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UCRL-50400 Vol 31

Tables and Graphs of Electron-Interaction Cross Sections from 10 eV to 100 GeV Derived from the LLNL Evaluated Electron Data Library (EEDL), Z = 1–100

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November 12, 1991

Lawrence Livermore National Laboratory

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MASTER

Dedication

This volume of the UCRL-50400 series is dedicated to E. F. Plechaty. As head of the TART Monte Carlo code effort at Lawrence Livermore National Laboratory for the past 30 years, Ernie had the foresight, knowledge, and determination to significantly influence the evaluated data libraries that are described in this series. It was Ernie's resolve 10 years ago that resulted in the All-Particle Method (i.e., the ability to track all resultant particles from a given reaction within a single transport code). This volume is one of the results of that endeavor. Although Ernie retired in 1990, his interest in this field has persisted, and his contributions continue.

Foreword

The UCRL-50400 series, *An Integrated System for Production of Neutronics and Photonics Calculational Constants*, describes an integrated, computer-oriented system for the production and application of neutronics and photonics calculational constants.

The system supplies reliable, up-to-date data, selects specific types of data on request, provides output in a variety of forms (ultimately in the form of input to other computer codes), and functions rapidly and efficiently.

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- Vol. 6, Part B, Rev. 4, *Tables and Graphs of Photon-Interaction Cross Sections from 10 eV to 100 GeV Derived from the LLNL Evaluated Photon Data Library (EPDL), Z = 51 to 100*, October 1989.
- Vol. 7, Part A, Rev. 1, *Major Neutron-Induced Interactions ($Z \leq 55$): Graphical, Experimental Data*, July 1976.
- Vol. 7, Part B, Rev. 1, *Major Neutron-Induced Interactions ($Z > 55$): Graphical, Experimental Data*, July 1976.
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- Vol. 8, Part B, Rev. 1, *Supplemental Neutron-Induced Interactions ($Z > 35$): Graphical, Experimental Data*, July 1976.
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• Vol. 15, Part C, *The LLL Evaluated-Nuclear-Data Library (ENDL): Translation of ENDL Neutron-Induced Interaction Data into the ENDF/B Format*, April 1976.

• Vol. 15, Part D, Rev. 1, *The LLL Evaluated-Nuclear-Data Library (ENDL): Descriptions of Individual Evaluations for Z = 0–98*, May 1978.

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• Vol. 22, Rev. 1, *GAMIDEN: A Program to Aid in the Identification of Unknown Materials by Gamma-Ray Spectroscopy*, June 1982.

• Vol. 23, *ENSL and CDRL: Evaluated Nuclear Structure Libraries*, February 1981.

• Vol. 23, Addendum, *ENSL82 and CDRL82: The 1982 Version of Evaluated Nuclear Structure Libraries*, January 1983.

• Vol. 24, *Thresholds and Q Values of Nuclear Reactions Induced by Neutrons, Protons, Deuterons, Tritons, ^{3}He Ions, Alpha Particles, and Photons*, March 1981.

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• Vol. 27, *Calculated Neutron KERMA Factors Based on the LLNL ENDL Data File*, January 1986.

• Vol. 28, *Index to the LLNL Evaluated Charged-Particle Library (ECPL)*, March 1986.

• Vol. 29, *Calculated Photon KERMA Factors Based on the LLNL EGDL Data File*, October 1986.

• Vol. 30, *Tables and Graphs of Atomic Subshell and Relaxation Data Derived from the LLNL Evaluated Atomic Data Library (EADL), Z = 1–100*, October 1991.

• Vol 31, *Tables and Graphs of Electron-Interaction Cross Sections from 10 eV to 100 GeV Derived from the LLNL Evaluated Electron Data Library (EEDL), Z = 1–100*, November 1991.

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Tables and Graphs of Electron-Interaction Cross Sections from 10 eV to 100 GeV Derived from the LLNL Evaluated Electron Data Library (EEDL), Z = 1–100

Abstract

Energy-dependent evaluated electron interaction cross sections and related parameters are presented for elements H through Fm (Z = 1 to 100). Data are given over the energy range from 10 eV to 100 GeV. Cross sections and average energy deposits are presented in tabulated and graphic form. In addition, ionization cross sections and average energy deposits for each shell are presented in graphic form. This information is derived from the Livermore Evaluated Electron Data Library (EEDL) as of July, 1991.

Overview

The ENDL family of evaluated data libraries[1] currently is being updated to include complete photon and electron interaction data plus atomic relaxation data to couple photons and electrons. All of these data bases will be completely consistent; they will conserve energy and will all use the same atomic parameters (e.g., subshell binding energies). These data bases will allow complete coupled electron-photon transport calculations to be performed in a consistent manner.

The current volume documents the new EEDL electron interaction library. Earlier volumes documented the photon interaction[2,3] and atomic relaxation[4,5] libraries.

As in past volumes of this publication describing evaluated data libraries, the emphasis here is on presenting an overview of the contents of the EEDL, as well as an explanation of the data contained herein, so that it may be correctly interpreted and used. For further details of the methods used to create the current library and a description of the complete contents of this library, see Ref. 6.

Introduction

The Livermore Evaluated Electron Library (EEDL) contains data for isolated, neutral atoms of the elements H through Fm (Z = 1 to 100) and over the energy range from 10 eV to 100 GeV. The data in this library includes cross sections, normalized angular distributions, normalized energy spectra, and energy-deposition terms. The reactions considered include bremsstrahlung, elastic scattering, excitation, and impact ionization, the latter data being given on a subshell basis. This volume details the various cross sections and the energy deposition.

Sources of Evaluated Data

Bremsstrahlung Cross Sections

The bremsstrahlung cross sections were derived from the computerized data of Seltzer and Berger.[7,8] The original Seltzer and Berger results were in the form of photon yield spectra for an incident electron kinetic energy from 1 keV to 10 GeV. By using systematics and cubic spline fits, these spectra were extended down to 10 eV and up to 100 GeV. For use in applications, both a cross section and a spectrum-averaged photon energy (i.e., the stopping power) are required in addition to a normalized photon spectrum. In defining a cross section, it is not possible to extend the spectra down to a photon energy, k, of zero because the spectra has a $1/k$ singularity. In this work, the spectra was terminated at a photon cutoff energy of 0.1 eV, which is 1% of the lowest incident electron energy considered and consistent with the accuracy to which the spectral tables were created. These cutoff spectra defined the cross section and the average photon energy in this library.

Elastic Scattering Cross Sections

Several different models were used for elastic scattering. Between 1 and 256 keV, Riley et al.[9] obtained differential cross sections by a phase-shift analysis of the Dirac equation and fit the results to an analytical expression. The coefficients in this equation were obtained from the SANDYL Monte Carlo data file[10] for nine incident energies between 1 and 256 keV, for Z = 1 to 100. At higher energies, a factorization cross section,[11] in which screening is treated separately from relativistic and spin effects, has proven satisfactory and was used here. The screening parameter was that of Moliére,[12] as empirically modified by Seltzer[13] for better low-energy behavior. The Mott-to-Rutherford cross-section ratio was obtained from Wilderman,[14] whose convergence parameters were also used.

The angular distribution at high energies has an extremely large forward bias. This forward component is more appropriately treated by multiple scattering theory, which leads us to define two elastic-scattering cross sections. The total elastic-scattering cross section is defined by integrating the angular distribution over the scattering cosine from –1 to 1. The cutoff elastic-scattering cross section is similarly obtained by integrating over the scattering cosine from –1 to 0.999999.

As previously noted, Riley's data was used from 1 to 256 keV, and the factorization cross section was used at higher energy. Of course, the two cross sections do not agree at the joining, with the difference being greater at large atomic number. A smoothing algorithm using cubic splines was therefore used to determine the cross sections between 256 keV and 10 MeV.

The data between 10 eV and 256 keV were obtained by log-log extrapolation of the cross section. The transport cross section was likewise calculated and extrapolated down to 10 eV. At this energy, the extrapolated scattering and transport cross sections were approximately equal, independent of the target atomic number. At low energy, this indicated a symmetrical angular distribution, which for simplicity we define to be isotropic.

Impact Ionization Cross Sections

Seltzer[15] divides ionization collisions into two components; close collisions and distant collisions. To the latter event, he suggests adding a third term that takes into account the density effect caused by the polarizability of the medium. For close collisions, the present data base uses Seltzer's modification of the Möller[16] binary collision cross section, which takes into consideration the binding of the atomic electron in a given subshell. The Möller cross section accounts for relativistic effects, particle spin, and like-particle scattering. For distant collisions, Seltzer's modification of the Weizsacker[17]-Williams[18] method (see Ref. 19 also) was used. This cross section is described in terms of a virtual photon field interacting with the atomic electrons. The atomic data required in the present description included subshell binding energies, number of electrons, mean electron kinetic energy, and the mean radius. These were obtained

from the Livermore Evaluated Atomic Data Library (EADL).[4] The subshell photoelectric cross sections required for the distant-collision component came from the Livermore Evaluated Photon Data Library (EPDL).[2,3] Scofield's[20] relativistic cross section was used for the density effect. The density-effect differential cross section is a negative correction to the differential cross section for distant collisions. When the sum of these two cross sections becomes negative, it is set to zero. This creates saturation in the subshell cross section at high energy. Differential energy spectra for the recoil electron for all subshells were obtained in this manner from 10 eV (or threshold) up to 100 GeV. These were then integrated to obtain the subshell cross sections and the average recoil electron energy.

Stopping Power and Excitation

For a given reaction, the stopping power, dE/dx, is defined as being the average energy loss per unit path length. The collisional (ionization plus excitation) stopping power, based on Bethe theory, was obtained using a computer code furnished by Seltzer[21] and was considered valid down to about 10 keV. The ionization stopping power was obtained from our data by integration over the recoil spectra, by appropriately summing over all subshells and then converting from a per collision to a per unit path length basis. The difference between the collisional and the ionization stopping power was defined to be the excitation stopping power. It was noted that down to 10 keV, β^2 ($\beta = v/c$, where v is the electron speed and c is the speed of light) times the excitation stopping power was almost a constant. The ratio of excitation to ionization stopping power known at higher energies was extrapolated down to lower energies to yield the excitation stopping power. Adding the stopping powers together to obtain the collisional stopping power yielded low-energy results that are in very good agreement with the work of Akkerman and Chernov[22] as well as with the results of Ashley et al.[23]

Excitation Cross Sections

A very simplistic model was used for excitation. It was assumed that all excitation arises through distant collisions from the outermost subshell; this corresponds to using the distant-collision portion of the model that was used for ionization.[17–20] This approach yielded differential energy spectra that were unnormalized because the number of participating electrons was unknown. Integrating over the spectra yielded an unnormalized cross section, stopping power, and straggling. These were normalized to the excitation stopping power at 100 GeV.

Energy Deposition

The energy deposition terms defined here are the stopping powers, dE/dx, defined for each reaction. The energy deposition for bremsstrahlung is equal to the total average energy into the photons. The energy deposition for elastic scattering is taken to be zero, since the energy loss of the electron is negligible because of the large mass difference between incident electron and target nucleus. The energy deposition for impact ionization is based on the summation over all subshells of the sum of the subshell binding energy plus the total average knockon electron energy. As noted earlier, the excitation stopping power was taken to be the difference between the collisional and the ionization stopping powers.

Atomic Parameters

Subshell binding energies and relaxation data[4] have been used to define the fluorescence energy deposition presented here. These parameters are for neutral elements; initially ionized atoms and molecular binding effects have not been included.

Atomic Weights and Densities

The atomic weights and the densities used in these calculations are presented at the tops of the tables and graphs for each element. Standard temperature and pressure (STP) values of density were used when available. If the density was unknown or poorly known, a value of 13.5 g/cm^3 was assumed. It should be noted that the densities used here correspond to elemental densities. The density of any given element in a compound or molecule may differ greatly from that used here; this is particularly true for elements that are gaseous in their elemental form. Therefore, the mean free paths presented here should be used with caution. In any given application, it is better to calculate the mean free path directly from the cross sections and actual elemental density.

Procedures Used to Derive Data

Cross Sections

The cross sections as presented here are a subset of the contents of the EEDL. The size of the data tables has been minimized by presenting only those values that are required to allow log-log interpolation between tabulated values for all quantities on a uniform energy grid (i.e., a sufficient number of energy points are included in the tables to allow data to be interpolated to within an accuracy of about 1%).

Specifically, to define a cross section at an energy E between two tabulated energies E_1 and E_2, one should use the following log-log interpolation scheme:

$$\log[\sigma(E)] = \frac{\log(E/E_1)\cdot\log[\sigma(E_2)] + \log(E_2/E)\cdot\log[\sigma(E_1)]}{\log(E_2/E_1)} \quad . \tag{1}$$

Total Mean Free Path and Range

The microscopic total cross section is defined by

$$\sigma_T(E) = \sigma_{el}(E) + \sigma_{ion}(E) + \sigma_{exc}(E) + \sigma_{brem}(E) \qquad \text{(in barns)} \ , \tag{2}$$

where T refers to total, el to elastic, ion to ionization (summed over all subshells), exc to excitation, and brem to bremsstrahlung; E is the incident electron energy (MeV).

The total mean free path (the inverse of the macroscopic total cross section) and mass attenuation coefficient have been derived from the total cross section by using the relationships

$$\lambda(E) = \frac{A}{\rho\cdot N_0\cdot\sigma_T(E)} \qquad \text{(in cm)} \tag{3}$$

$$\mu(E) = \frac{N_0\cdot\sigma_T(E)}{A} \qquad \text{(in cm}^2\text{/g)} \ , \tag{4}$$

where

A = atomic weight (based on carbon-12 = 12)
ρ = density in g/cm^3
N_0 = Avogadro's number (0.6022137)
$\lambda(E)$ = the mean free path at energy E in cm
$\mu(E)$ = the mass attenuation coefficient at energy E, in cm^2/g.

The range has been derived in the continuous slowing-down approximation by use of the expression

$$R(E_i, E_f) = \int_{E_1}^{E_f} \left(\frac{dE}{dx}\right)^{-1} dE \ , \qquad \text{(in cm)} \tag{5}$$

where

R = range, in cm

E_i = initial energy, in MeV

E_f = final energy, in MeV

dE/dx = stopping power (collisional plus bremsstrahlung), in MeV/cm. In all cases, we define the final energy, E_f as 100 eV.

Energy Deposition

Energy depositions are defined as the mean energy loss per unit path length, dE/dx, for each reaction. For ionization, the energy loss for a given collision, $E - E'$, is

$$E - E' = W + B_j \ , \tag{6}$$

where W is the kinetic energy of the knockon electron and B_j is the subshell binding energy. The subshell atomic stopping power is given by

$$S(E)_j = \int_0^{(E-B_j)/2} (W + B_j) \frac{d\sigma(E,W)_j}{dW} dW \ , \tag{7}$$

where the differential subshell ionization cross section is on a per atom basis. The ionization stopping power is then obtained by summing over all subshells

$$\frac{dE(E)_{\text{ion}}}{dx} = \frac{\rho N_0}{A} \sum_j S(E)_j \qquad \text{(in MeV/cm)} \ . \tag{8}$$

For bremsstrahlung, the energy loss for a given collision is equal to the energy of the emitted photon. The atomic stopping power for this reaction is then

$$S(E)_j = \int_{0.1\,\text{eV}}^{k} k \frac{d\sigma(E,k)_j}{dk} dk \ , \tag{9}$$

where k is the photon energy and the differential cross section is on a per-atom basis. The lower energy in the integral is the lowest bremsstrahlung spectra energy in the library. The bremsstrahlung stopping power is

$$\frac{dE(E)_{\text{brem}}}{dx} = \frac{\rho N_0}{A} S(E) \qquad \text{(in MeV/cm)} \ . \tag{10}$$

The excitation stopping power is taken as the difference between the collisional stopping power of Seltzer[21] and the ionization stopping power from Eq. (8).

Impact Ionization Shell Cross Sections

The ionization shell cross sections presented here have been derived by summing the subshell cross sections contained in the EEDL.

Accuracy of the Data

Bremsstrahlung

Based on our extrapolations and Seltzer's and Berger's[7,8] estimates, our stated uncertainties in the bremsstrahlung cross section are

- 10 eV to 1 keV, 10 to 25%
- 1 keV to 2 MeV, 5 to 10%
- 2 to 50 MeV, ≤10%
- 50 MeV to 10 GeV, ≈3%
- 10 to 100 GeV, ≈5%.

At low energies, however, coherent solid-state and molecular effects can increase this greatly. Fortunately, because the bremsstrahlung cross section and energy loss are a small part of the total at low energy, uncertainties in these data will have little effect on applications.

Elastic Scattering

For elastic scattering, theory seems to be adequate except at low energies. However, Berger and Wang[24] indicate that no theory exists that will in general calculate the differential cross section above 1 keV for molecules or in solids. Here, theory predicts too high a cross section at small angles, and experiment shows diffraction effects. At 10 eV, we have compared the transport cross section calculated from our data to the semi-empirical values of Itikawa.[25] From this comparison, it appears that our results, because of neglecting resonance effects, can overestimate the transport cross section by up to 1000% at low energies. The error in our elastic data would be at least this large.

Ionization

Comparing our K-shell ionization cross section to the compiled experimental data of Tawara and Kato[26] and Long et al.,[27] we find that the uncertainties in our data appear to be ≤30 to 40% at low energies. The error might be as large as a factor of 2 above several hundred MeV for intermediate-Z elements because of the uncertainty in the onset in energy of the density effect. Errors in the outer subshells are probably at least as much. Finally, our neglect of solid-state effects will introduce even larger uncertainties at low energies.

Stopping Power

Berger's and Seltzer's[21] collisional stopping-power errors are

- 10 to 100 keV,
  - 2 to 3% for low-Z material
  - 5 to 10% for high-Z material
- above 100 keV, 1 to 2%.

Our estimated ionization stopping-power errors are

- 10 to 100 eV, up to 1000%
- 100 eV to 1 keV, 10 to 20%
- 1 to 10 keV, 5 to 10%
- 100 keV to 100 GeV, 2 to 5%.

Our estimated excitation stopping-power errors are

- 10 to 100 eV, up to 1000%
- 100 eV to 100 GeV, 20 to 50%.

Subshell Parameters

By comparing subshell parameters from a number of different sources, one can see that there is still a disagreement of about 1% between the edge energies. For use in applications, particularly coupled electron-photon transport, knowing the exact edge energies is not as important as ensuring that the same edge energies are used throughout. Therefore, Scofield's subshell parameters[4] are consistently used for both photon and electron data.

Associated Libraries and Availability of the Data

EEDL contains only the data necessary to describe the interactions of electrons with matter. For performing coupled photon-electron calculations, two additional libraries are available.

- The Livermore Evaluated Photon Data Library (EPDL),[2] to describe the interaction of photons with matter.
- The Livermore Evaluated Atomic Data Library (EADL),[4] to describe the relaxation of singly ionized atoms.

All three of these libraries are available in the ENDL format.[1]

Explanation of Graphs and Tables

The electron data in this report are in the form of graphs and tables; included are cross sections, energy depositions, mean free paths, and particle ranges. Data are presented in order of increasing Z (atomic number).

For each element, four figures are followed by tabulated data. In the first figure, "Cross Sections," the integrated cross sections are plotted. The total cross section is defined by Eq. (2). For elastic scattering, results are presented for the total elastic (defined by integrating the angular distribution over $-1 \leq \mu \leq 1$) and the cutoff elastic (defined by integrating the angular distribution over $-1 \leq \mu \leq 0.999999$). The second figure, "Energy Deposition," shows the various energy-deposition terms for electron interactions. Results are given both as the stopping power, dE/dx (in MeV/cm), and as the mass stopping power, $(1/\rho)(dE/dx)$ (in MeV-cm^2/g). The fluorescence deposition is the component of the ionization that yields x rays. The difference between the ionization and the fluorescence deposition is the electron deposition, which includes both the original knockon contribution as well as the contribution from the subsequent orbital electrons in the relaxation of the atom back to neutrality. (Editor's note: We know that "Bremsstrahlung" is misspelled in these figures, but the effort to redo 200 figures to correct it would be prohibitive.)

The final two plots are the ionization shell quantities. The third figure, "Shell Cross Sections," shows the total ionization cross section and the components for each atomic shell. The final figure, "Energy Deposition," shows the corresponding divisions for energy deposition.

The tables cover the energy range from 10 eV to 100 GeV. Included in the table are enough points to allow log-log interpolation between tabulated values as well as element subshell binding energies (e.g., L2) and the decade marks. The tabulated energy points will not necessarily be the same for all elements. Under "Mean Free Path" are the mean free path, Eq. (3), and the mass attenuation coefficient, Eq. (4). The range is from an incident energy, E, down to an energy of 100 eV. The cross sections and energy depositions include both the total and the various components.

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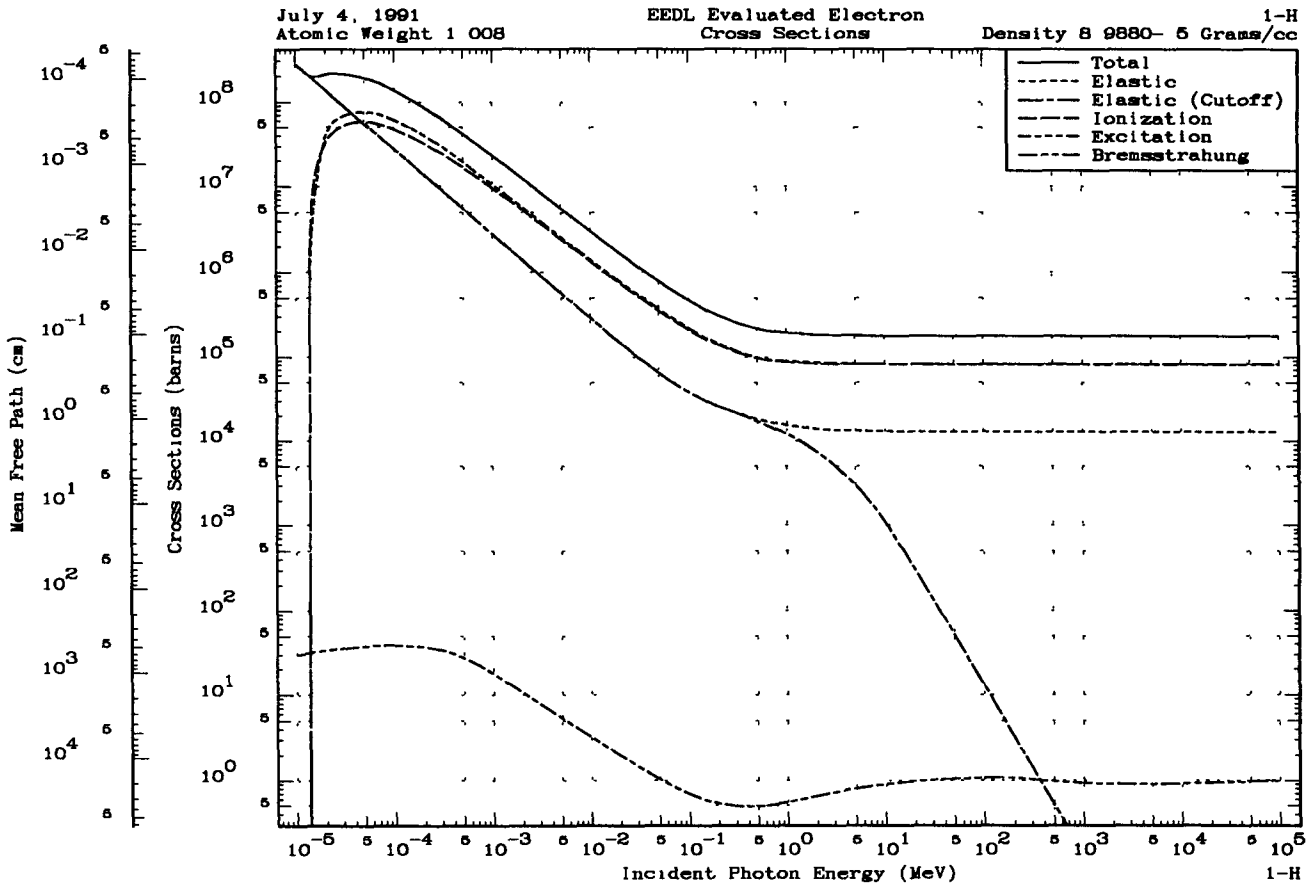
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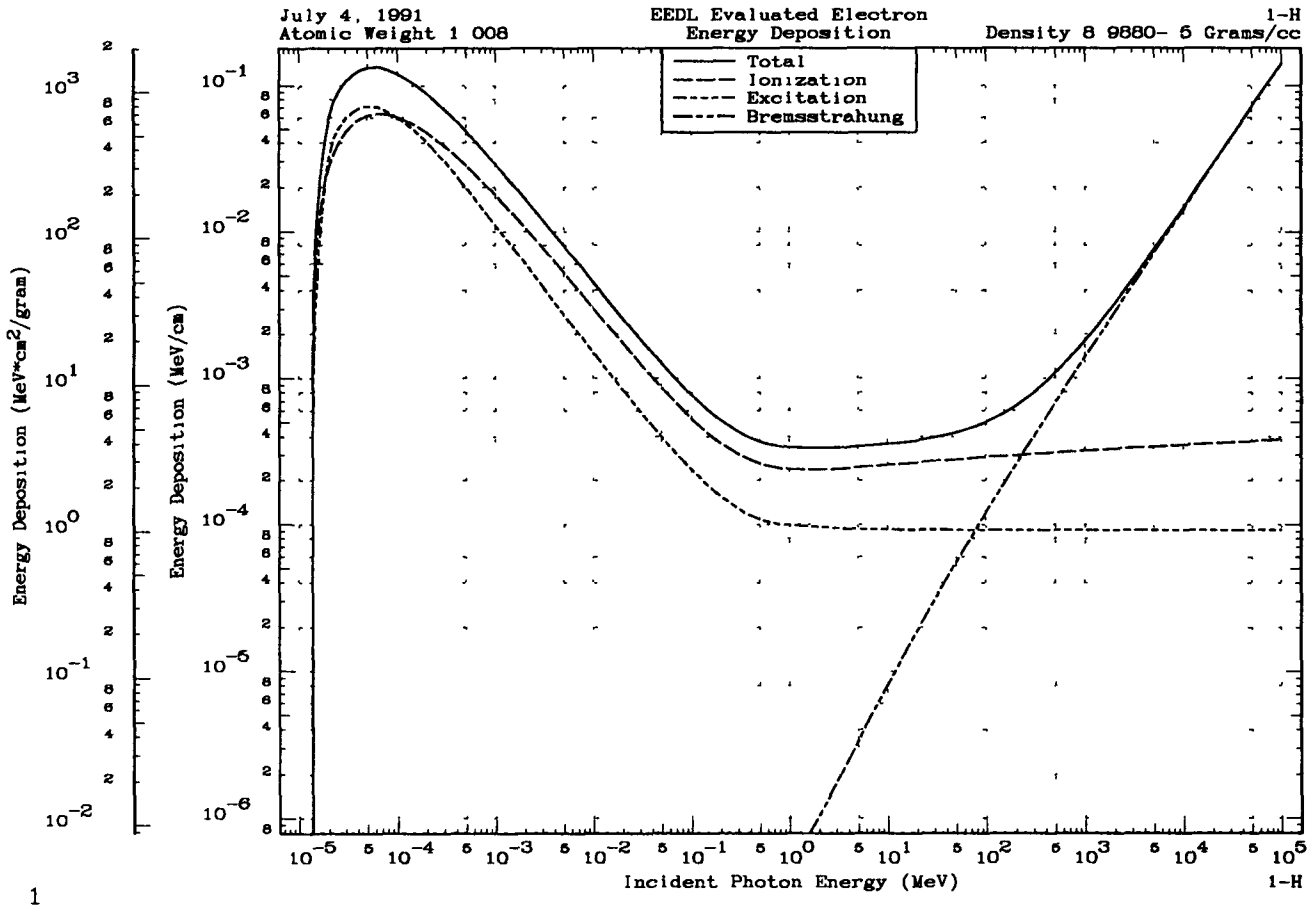
EEDL Evaluated Electron
Cross Sections
1-H
Density 8 9880- 5 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
1-H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1-H
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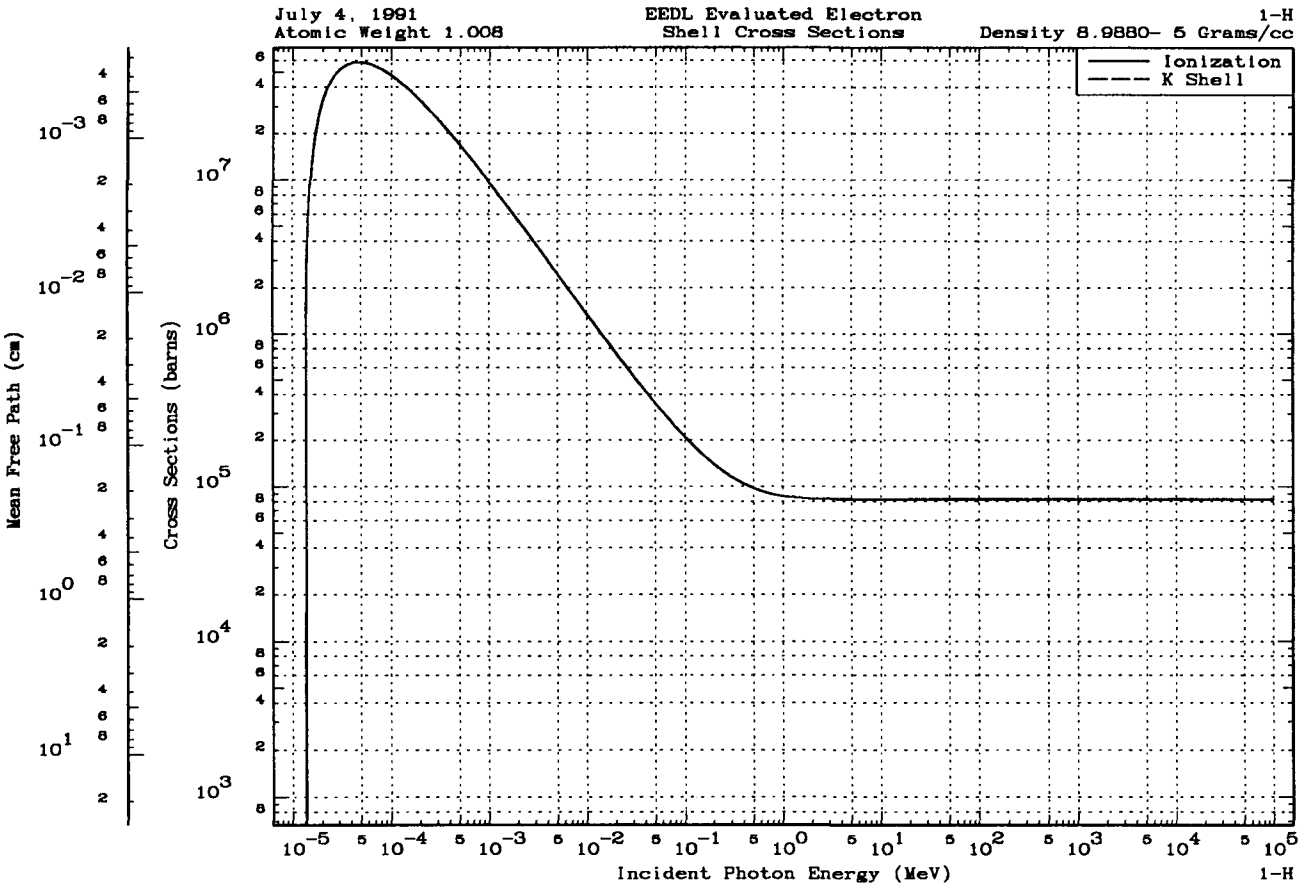
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
1-H

1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EEDL Evaluated Electron
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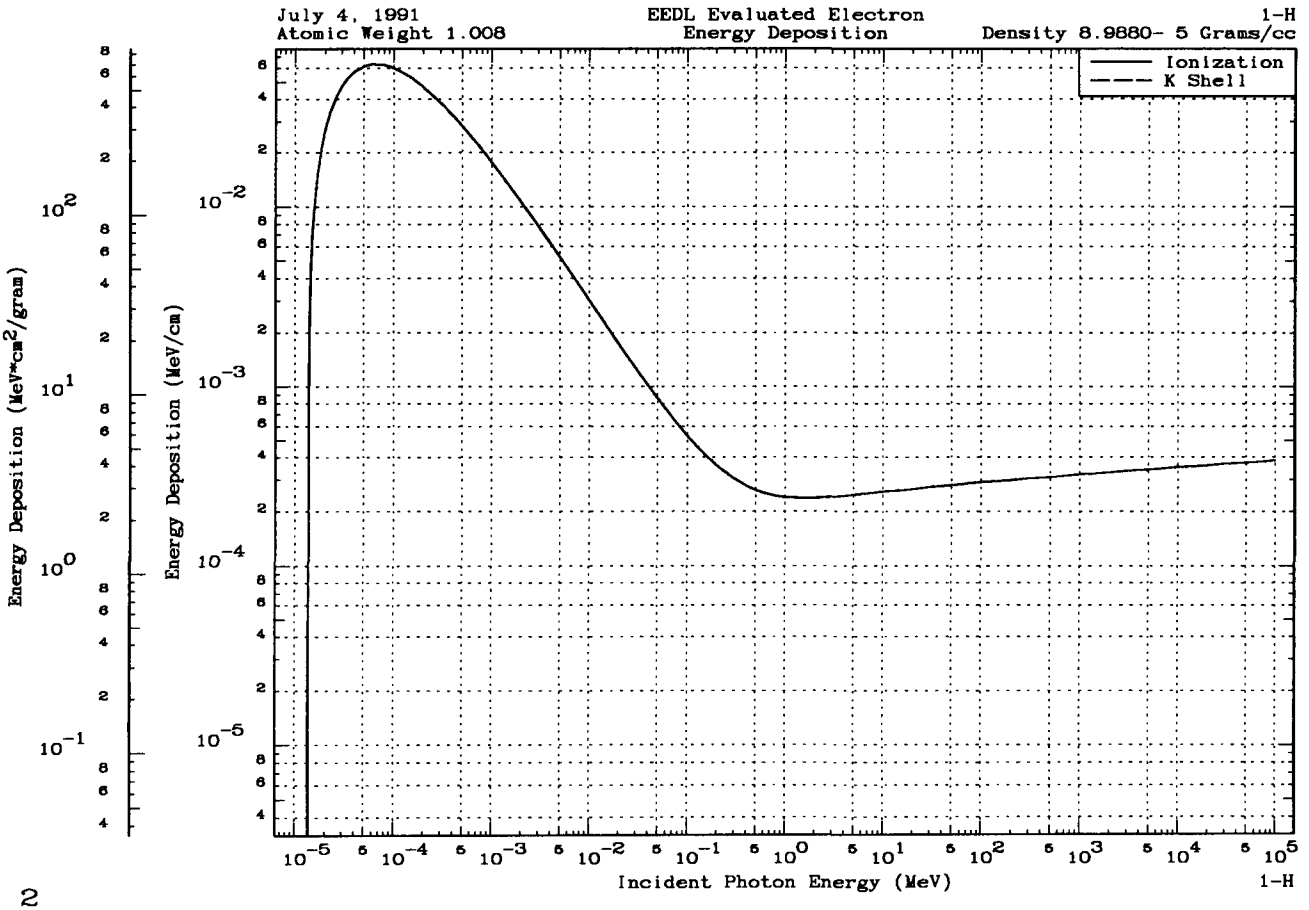
Ionization
K Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
1-H

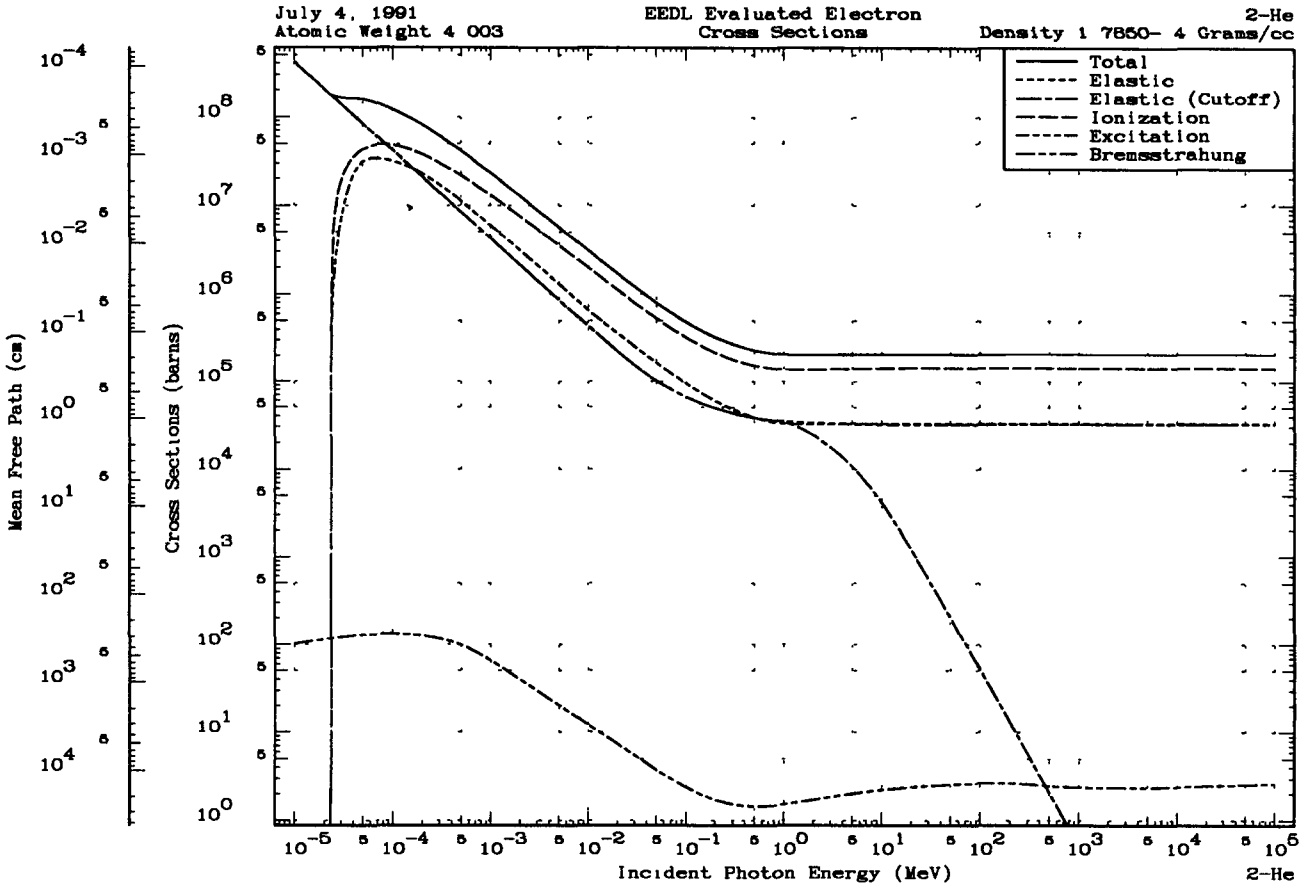

July 4, 1991
Atomic Weight 1.008
EEDL Evaluated Electron
Energy Deposition
1-H
Density 8.9880- 5 Grams/cc
Ionization
K Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
1-H

2

Atomic Weight 1.008 Density 8.9880– 5 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	6.7743–5	1.6424+8		2.7490+8	2.7490+8			2.9783+1	3.4304–9			3.4304–9
K 1.3610–5	9.2068–5	1.2084+8		2.0227+8	2.0227+8	0.0000+0	0.0000+0	3.1457+1	4.5912–9	0.0000+0	0.0000+0	4.5912–9
1.3784–5	9.2354–5	1.2047+8		2.0164+8	1.9973+8	1.2890+6	6.2196+5	3.1528+1	1.4011–3	9.4512–4	4.5596–4	4.6483–9
1.4088–5	9.2833–5	1.1985+8		2.0060+8	1.9544+8	3.4683+6	1.6945+6	3.1651+1	3.8060–3	2.5570–3	1.2490–3	4.7483–9
1.4544–5	9.3499–5	1.1900+8		1.9917+8	1.8934+8	6.5722+6	3.2634+6	3.1830+1	7.3101–3	4.8854–3	2.4247–3	4.8990–9
1.5000–5	9.4117–5	1.1821+8		1.9786+8	1.8361+8	9.4755+6	4.7837+6	3.2005+1	1.0684–2	7.1012–3	3.5827–3	5.0503–9
1.5625–5	9.4524–5	1.1770+8		1.9701+8	1.7629+8	1.3227+7	7.4913+6	3.2237+1	1.5679–2	1.0018–2	5.6612–3	5.2588–9
1.6719–5	9.4136–5	1.1819+8		1.9782+8	1.6481+8	1.9102+7	1.3909+7	3.2627+1	2.5410–2	1.4734–2	1.0676–2	5.6265–9
1.7500–5	9.3420–5	1.1910+8		1.9934+8	1.5749+8	2.2422+7	1.9431+7	3.2892+1	3.2596–2	1.7518–2	1.5078–2	5.8913–9
1.8359–5	9.1826–5	1.2116+8		2.0280+8	1.5015+8	2.6528+7	2.6121+7	3.3173+1	4.1529–2	2.1017–2	2.0512–2	6.1845–9
2.0000–5	8.9027–5	1.2497+8		2.0918+8	1.3789+8	3.2715+7	3.8576+7	3.3681+1	5.7548–2	2.6569–2	3.0978–2	6.7503–9
2.2500–5	8.6649–5	1.2840+8		2.1492+8	1.2263+8	4.0010+7	5.2276+7	3.4204+1	7.6547–2	3.3641–2	4.2907–2	7.5104–9
2.5000–5	8.6629–5	1.2843+8		2.1497+8	1.1042+8	4.4984+7	5.9562+7	3.4679+1	8.8965–2	3.9022–2	4.9942–2	8.2791–9
2.6250–5	8.6881–5	1.2806+8		2.1434+8	1.0519+8	4.7493+7	6.1664+7	3.4901+1	9.4083–2	4.1832–2	5.2251–2	8.6665–9
3.0000–5	8.7778–5	1.2675+8		2.1215+8	9.2094+7	5.2254+7	6.7804+7	3.5517+1	1.0719–1	4.7929–2	5.9257–2	9.8399–9
3.5000–5	8.9833–5	1.2385+8		2.0730+8	7.8994+7	5.5862+7	7.2444+7	3.6216+1	1.1844–1	5.3689–2	6.4756–2	1.1409–8
4.0000–5	9.2183–5	1.2069+8		2.0201+8	6.9162+7	5.7674+7	7.5178+7	3.6832+1	1.2633–1	5.7632–2	6.8697–2	1.3001–8
4.5000–5	9.4799–5	1.1736+8		1.9644+8	6.1510+7	5.7914+7	7.7016+7	3.7174+1	1.3101–1	5.9749–2	7.1262–2	1.4425–8
5.0000–5	9.8077–5	1.1344+8		1.8988+8	5.5386+7	5.8129+7	7.6361+7	3.7483+1	1.3339–1	6.1855–2	7.1532–2	1.5859–8
6.0000–5	1.0488–4	1.0608+8		1.7756+8	4.6194+7	5.6788+7	7.4579+7	3.7866+1	1.3443–1	6.3482–2	7.0952–2	1.8580–8
7.0000–5	1.1230–4	9.9074+7		1.6583+8	3.9622+7	5.4354+7	7.1851+7	3.8192+1	1.3201–1	6.3034–2	6.8978–2	2.1321–8
8.0000–5	1.2043–4	9.2389+7		1.5464+8	3.4691+7	5.2330+7	6.7617+7	3.8478+1	1.2837–1	6.2875–2	6.5497–2	2.4081–8
1.0000–4	1.3587–4	8.1887+7	0.0000+0	1.3706+8	2.7781+7	4.7840+7	6.1439+7	3.8448+1	1.2066–1	6.0545–2	6.0116–2	2.8918–8
1.2500–4	1.5611–4	7.1268+7	2.1672–4	1.1929+8	2.2245+7	4.2613+7	5.4428+7	3.7943+1	1.1021–1	5.6579–2	5.3630–2	3.4172–8
1.5000–4	1.7466–4	6.3699+7	4.5210–4	1.0662+8	1.8551+7	3.8768+7	4.9299+7	3.7535+1	1.0231–1	5.3395–2	4.8914–2	3.9379–8
2.0000–4	2.1352–4	5.2108+7	9.7840–4	8.7217+7	1.3930+7	3.2509+7	4.0778+7	3.6517+1	8.8053–2	4.7267–2	4.0786–2	4.8821–8
2.6623–4	2.6553–4	4.1901+7	1.7986–3	7.0133+7	1.0476+7	2.6759+7	3.2898+7	3.4564+1	7.3869–2	4.0748–2	3.3121–2	5.8071–8
3.0000–4	2.9075–4	3.8267+7	2.2721–3	6.4050+7	9.3018+6	2.4671+7	3.0077+7	3.3292+1	6.8816–2	3.8434–2	3.0382–2	6.1759–8
4.0000–4	3.6747–4	3.0277+7	3.8712–3	5.0677+7	6.9845+6	1.9980+7	2.3712+7	3.0279+1	5.6649–2	3.2541–2	2.4108–2	7.0772–8
5.0000–4	4.4381–4	2.5069+7	5.7813–3	4.1960+7	5.5927+6	1.6849+7	1.9518+7	2.7386+1	4.8278–2	2.8341–2	1.9937–2	7.6184–8
6.0000–4	5.1838–4	2.1463+7	7.9935–3	3.5924+7	4.6640+6	1.4608+7	1.6652+7	2.4845+1	4.2265–2	2.5193–2	1.7071–2	7.9536–8
8.0000–4	6.6354–4	1.6768+7	1.3250–2	2.8065+7	3.5021+6	1.1599+7	1.2964+7	2.0768+1	3.4118–2	2.0755–2	1.3364–2	8.3051–8
1.0000–3	8.0453–4	1.3829+7	1.9621–2	2.3147+7	2.8042+6	9.6636+6	1.0679+7	1.7715+1	2.8818–2	1.7766–2	1.1052–2	8.3782–8
1.5000–3	1.1461–3	9.7073+6	3.9843–2	1.6248+7	1.8728+6	6.8870+6	7.4881+6	1.3087+1	2.1041–2	1.3239–2	7.8014–3	8.3559–8
2.0000–3	1.4771–3	7.5321+6	6.6418–2	1.2607+7	1.4063+6	5.3947+6	5.8060+6	1.0558+1	1.6750–2	1.0675–2	6.0750–3	8.3652–8
3.0000–3	2.1142–3	5.2625+6	1.3636–1	8.8082+6	9.4084+5	3.8088+6	4.0585+6	7.8032+0	1.2098–2	7.8273–3	4.2703–3	8.3689–8
4.0000–3	2.7280–3	4.0784+6	2.2903–1	6.8263+6	7.0741+5	2.9699+6	3.1490+6	6.3150+0	9.5808–3	6.2554–3	3.3253–3	8.3971–8
5.0000–3	3.3242–3	3.3470+6	3.4319–1	5.6020+6	5.6800+5	2.4471+6	2.5870+6	5.3599+0	7.9872–3	5.2482–3	2.7389–3	8.4337–8
6.0000–3	3.9087–3	2.8465+6	4.7801–1	4.7643+6	4.7477+5	2.0884+6	2.2011+6	4.6772+0	6.8753–3	4.5402–3	2.3350–3	8.4654–8
8.0000–3	5.0500–3	2.2032+6	8.0479–1	3.6876+6	3.5781+5	1.6264+6	1.7034+6	3.7740+0	5.4225–3	3.6099–3	1.8125–3	8.5288–8
1.0000–2	6.1590–3	1.8065+6	1.2088+0	3.0236+6	2.8808+5	1.3402+6	1.3954+6	3.2013+0	4.5070–3	3.0189–3	1.4880–3	8.5911–8
1.5000–2	8.7489–3	1.2717+6	2.5109+0	2.1285+6	1.9460+5	9.4480+5	9.8912+5	2.3882+0	3.2423–3	2.1835–3	1.0587–3	8.7381–8
2.0000–2	1.1194–2	9.9392+5	4.2393+0	1.6636+6	1.4803+5	7.3909+5	7.7647+5	1.9436+0	2.5695–3	1.7363–3	8.3309–4	8.8679–8
3.0000–2	1.5748–2	7.0650+5	8.7928+0	1.1825+6	1.0141+5	5.2641+5	5.5470+5	1.4546+0	1.8608–3	1.2637–3	5.9697–4	9.1322–8
4.0000–2	1.9936–2	5.5807+5	1.4789+1	9.3408+5	7.8189+4	4.1658+5	4.3931+5	1.1894+0	1.4883–3	1.0145–3	4.7379–4	9.3609–8
5.0000–2	2.3819–2	4.6710+5	2.2091+1	7.8182+5	6.4459+4	3.4920+5	3.6816+5	1.0240+0	1.2572–3	8.5946–4	3.9767–4	9.5825–8
6.0000–2	2.7432–2	4.0558+5	3.0592+1	6.7884+5	5.5537+4	3.0356+5	3.1974+5	9.1234–1	1.0991–3	7.5320–4	3.4579–4	9.8057–8
8.0000–2	3.3966–2	3.2756+5	5.0704+1	5.4827+5	4.4647+4	2.4558+5	2.5804+5	7.7147–1	8.9657–4	6.1688–4	2.7958–4	1.0249–7
1.0000–1	3.9717–2	2.8013+5	7.4719+1	4.6887+5	3.8302+4	2.1027+5	2.2030+5	6.8653–1	7.7217–4	5.3304–4	2.3903–4	1.0713–7
1.5000–1	5.1460–2	2.1621+5	1.4780+2	3.6188+5	3.0068+4	1.6262+5	1.6919+5	5.7818–1	6.0319–4	4.1904–4	1.8403–4	1.1955–7
2.0000–1	6.0431–2	1.8411+5	2.3717+2	3.0816+5	2.5929+4	1.3871+5	1.4352+5	5.2959–1	5.1790–4	3.6141–4	1.5636–4	1.3314–7
3.0000–1	7.2982–2	1.5245+5	4.4785+2	2.5516+5	2.1754+4	1.1515+5	1.1826+5	4.9492–1	4.3388–4	3.0456–4	1.2915–4	1.6397–7
3.5000–1	7.7577–2	1.4342+5	5.6628+2	2.4005+5	2.0565+4	1.0894+5	1.1055+5	4.9221–1	4.1071–4	2.8970–4	1.2083–4	1.8132–7
4.0000–1	8.1066–2	1.3725+5	6.9055+2	2.2972+5	1.9587+4	1.0383+5	1.0630+5	4.8988–1	3.9409–4	2.7760–4	1.1629–4	1.9863–7
5.0000–1	8.6472–2	1.2867+5	9.5168+2	2.1536+5	1.8270+4	9.7412+4	9.9674+4	4.9448–1	3.7203–4	2.6259–4	1.0920–4	2.3534–7
6.0000–1	9.0182–2	1.2337+5	1.2254+3	2.0650+5	1.7394+4	9.3396+4	9.5707+4	5.0410–1	3.5877–4	2.5350–4	1.0499–4	2.7585–7
8.0000–1	9.4646–2	1.1755+5	1.7938+3	1.9676+5	1.6242+4	8.8856+4	9.1658+4	5.2800–1	3.4506–4	2.4392–4	1.0078–4	3.6481–7
1.0000+0	9.6919–2	1.1480+5	2.3784+3	1.9214+5	1.5546+4	8.6517+4	9.0079+4	5.5245–1	3.3921–4	2.3950–4	9.9246–5	4.6181–7
1.5000+0	9.9512–2	1.1181+5	3.8596+3	1.8714+5	1.4609+4	8.4594+4	8.7933+4	6.0839–1	3.3592–4	2.3791–4	9.7270–5	7.3795–7
2.0000+0	1.0129–1	1.0984+5	5.3503+3	1.8385+5	1.4128+4	8.3256+4	8.6468+4	6.5263–1	3.3491–4	2.3782–4	9.6041–5	1.0471–6
3.0000+0	1.0250–1	1.0854+5	8.3260+3	1.8168+5	1.3678+4	8.3034+4	8.4962+4	7.1761–1	3.3720–4	2.4080–4	9.4655–5	1.7472–6
4.0000+0	1.0324–1	1.0777+5	1.1278+4	1.8038+5	1.3465+4	8.2878+4	8.4036+4	7.6411–1	3.4038–4	2.4395–4	9.3909–5	2.5258–6
5.0000+0	1.0376–1	1.0723+5	1.4200+4	1.7947+5	1.3352+4	8.2757+4	8.3366+4	7.9639–1	3.4400–4	2.4719–4	9.3442–5	3.3716–6
6.0000+0	1.0414–1	1.0683+5	1.7091+4	1.7881+5	1.3286+4	8.2658+4	8.2867+4	8.2298–1	3.4791–4	2.5049–4	9.3162–5	4.2584–6
8.0000+0	1.0444–1	1.0653+5	2.2797+4	1.7831+5	1.3203+4	8.2669+4	8.2435+4	8.6540–1	3.5311–4	2.5416–4	9.2824–5	6.1265–6
1.0000+1	1.0464–1	1.0633+5	2.8417+4	1.7796+5	1.3149+4	8.2677+4	8.2137+4	8.9486–1	3.5858–4	2.5783–4	9.2636–5	8.1122–6
1.5000+1	1.0480–1	1.0616+5	4.2189+4	1.7770+5	1.3075+4	8.2689+4	8.1931+4	9.4210–1	3.6756–4	2.6174–4	9.2421–5	1.3400–5
2.0000+1	1.0489–1	1.0608+5	5.5622+4	1.7755+5	1.3022+4	8.2697+4	8.1829+4	9.7177–1	3.7693–4	2.6564–4	9.2325–5	1.8964–5
3.0000+1	1.0495–1	1.0601+5	8.1489+4	1.7744+5	1.2995+4	8.2708+4	8.1736+4	1.0108+0	3.9640–4	2.7343–4	9.2255–5	3.0714–5
4.0000+1	1.0498–1	1.0598+5	1.0625+5	1.7738+5	1.2994+4	8.2710+4	8.1676+4	1.0344+0	4.1138–4	2.7619–4	9.2223–5	4.2968–5
5.0000+1	1.0503–1	1.0594+5	1.3012+5	1.7731+5	1.2994+4	8.2711+4	8.1606+4	1.0484+0	4.2672–4	2.7894–4	9.2180–5	5.5597–5
6.0000+1	1.0504–1	1.0592+5	1.5313+5	1.7729+5	1.2994+4	8.2712+4	8.1579+4	1.0578+0	4.4233–4	2.8170–4	9.2185–5	6.8448–5
8.0000+1	1.0508–1	1.0588+5	1.9681+5	1.7722+5	1.2994+4	8.2714+4	8.1512+4	1.0695+0	4.7391–4	2.8720–4	9.2180–5	9.4533–5
1.0000+2	1.0512–1	1.0584+5	2.3773+5	1.7716+5	1.2993+4	8.2714+4	8.1449+4	1.0762+0	5.0375–4	2.9028–4	9.2180–5	1.2129–4
1.5000+2	1.0511–1	1.0585+5	3.3055+5	1.7716+5	1.2993+4	8.2714+4	8.1453+4	1.0835+0	5.7529–4	2.9404–4	9.2185–5	1.8907–4
2.0000+2	1.0512–1	1.0584+5	4.1238+5	1.7716+5	1.2993+4	8.2714+4	8.1448+4	1.0739+0	6.4810–4	2.9779–4	9.2180–5	2.5813–4
3.0000+2	1.0512–1	1.0584+5	5.5153+5	1.7716+5	1.2992+4	8.2715+4	8.1452+4	1.0395+0	7.9419–4	3.0531–4	9.2185–5	3.9670–4
4.0000+2	1.0512–1	1.0584+5	6.6739+5	1.7715+5	1.2992+4	8.2715+4	8.1447+4	1.0036+0	9.3589–4	3.0767–4	9.2180–5	5.3604–4
5.0000+2	1.0513–1	1.0583+5	7.6673+5	1.7713+5	1.2992+4	8.2715+4	8.1422+4	9.7897–1	1.0808–3	3.1002–4	9.2153–5	6.7865–4
6.0000+2	1.0513–1	1.0583+5	8.5360+5	1.7714+5	1.2992+4	8.2715+4	8.1431+4	9.6028–1	1.2244–3	3.1238–4	9.2164–5	8.1982–4

Atomic Weight 1.008												Density 8.9880– 5 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+2	1.0512–1	1.0584+5	1.0004+6	1.7715+5	1.2991+4	8.2715+4	8.1439+4	9.3885–1	1.5099–3	3.1710–4	9.2174–5	1.1006–3
1.0000+3	1.0513–1	1.0584+5	1.1216+6	1.7714+5	1.2991+4	8.2715+4	8.1437+4	9.2629–1	1.7984–3	3.2181–4	9.2174–5	1.3844–3
1.5000+3	1.0512–1	1.0584+5	1.3558+6	1.7715+5	1.2991+4	8.2715+4	8.1442+4	9.0987–1	2.5127–3	3.2558–4	9.2180–5	2.0949–3
2.0000+3	1.0512–1	1.0584+5	1.5310+6	1.7715+5	1.2991+4	8.2715+4	8.1442+4	9.0052–1	3.2221–3	3.2934–4	9.2180–5	2.8006–3
3.0000+3	1.0512–1	1.0584+5	1.7879+6	1.7715+5	1.2990+4	8.2715+4	8.1446+4	8.9539–1	4.6532–3	3.3687–4	9.2185–5	4.2241–3
4.0000+3	1.0512–1	1.0584+5	1.9752+6	1.7715+5	1.2990+4	8.2715+4	8.1442+4	8.9555–1	6.0849–3	3.3922–4	9.2180–5	5.6535–3
5.0000+3	1.0513–1	1.0583+5	2.1228+6	1.7713+5	1.2990+4	8.2715+4	8.1423+4	8.9633–1	7.5198–3	3.4157–4	9.2158–5	7.0861–3
6.0000+3	1.0513–1	1.0583+5	2.2446+6	1.7714+5	1.2990+4	8.2715+4	8.1432+4	8.9873–1	8.9454–3	3.4393–4	9.2169–5	8.5093–3
8.0000+3	1.0513–1	1.0583+5	2.4385+6	1.7714+5	1.2989+4	8.2715+4	8.1437+4	9.0254–1	1.1806–2	3.4864–4	9.2174–5	1.1366–2
1.0000+4	1.0512–1	1.0584+5	2.5903+6	1.7715+5	1.2989+4	8.2715+4	8.1442+4	9.0835–1	1.4649–2	3.5335–4	9.2180–5	1.4203–2
1.5000+4	1.0512–1	1.0584+5	2.8684+6	1.7715+5	1.2989+4	8.2715+4	8.1446+4	9.2077–1	2.1779–2	3.5711–4	9.2185–5	2.1329–2
2.0000+4	1.0512–1	1.0584+5	3.0673+6	1.7715+5	1.2989+4	8.2715+4	8.1442+4	9.3128–1	2.8843–2	3.6087–4	9.2180–5	2.8390–2
3.0000+4	1.0512–1	1.0584+5	3.3488+6	1.7716+5	1.2988+4	8.2715+4	8.1451+4	9.4631–1	4.3156–2	3.6839–4	9.2190–5	4.2696–2
4.0000+4	1.0512–1	1.0584+5	3.5493+6	1.7715+5	1.2988+4	8.2715+4	8.1446+4	9.5681–1	5.7259–2	3.7075–4	9.2185–5	5.6796–2
5.0000+4	1.0514–1	1.0582+5	3.7053+6	1.7713+5	1.2988+4	8.2715+4	8.1423+4	9.6503–1	7.1492–2	3.7310–4	9.2158–5	7.1027–2
6.0000+4	1.0513–1	1.0583+5	3.8328+6	1.7714+5	1.2988+4	8.2715+4	8.1437+4	9.7181–1	8.5833–2	3.7545–4	9.2174–5	8.5365–2
8.0000+4	1.0512–1	1.0584+5	4.0341+6	1.7715+5	1.2987+4	8.2715+4	8.1442+4	9.8237–1	1.1422–1	3.8016–4	9.2180–5	1.1374–1
1.0000+5	1.0513–1	1.0584+5	4.1903+6	1.7714+5	1.2987+4	8.2715+4	8.1442+4	9.9062–1	1.4280–1	3.8487–4	9.2180–5	1.4233–1


July 4, 1991
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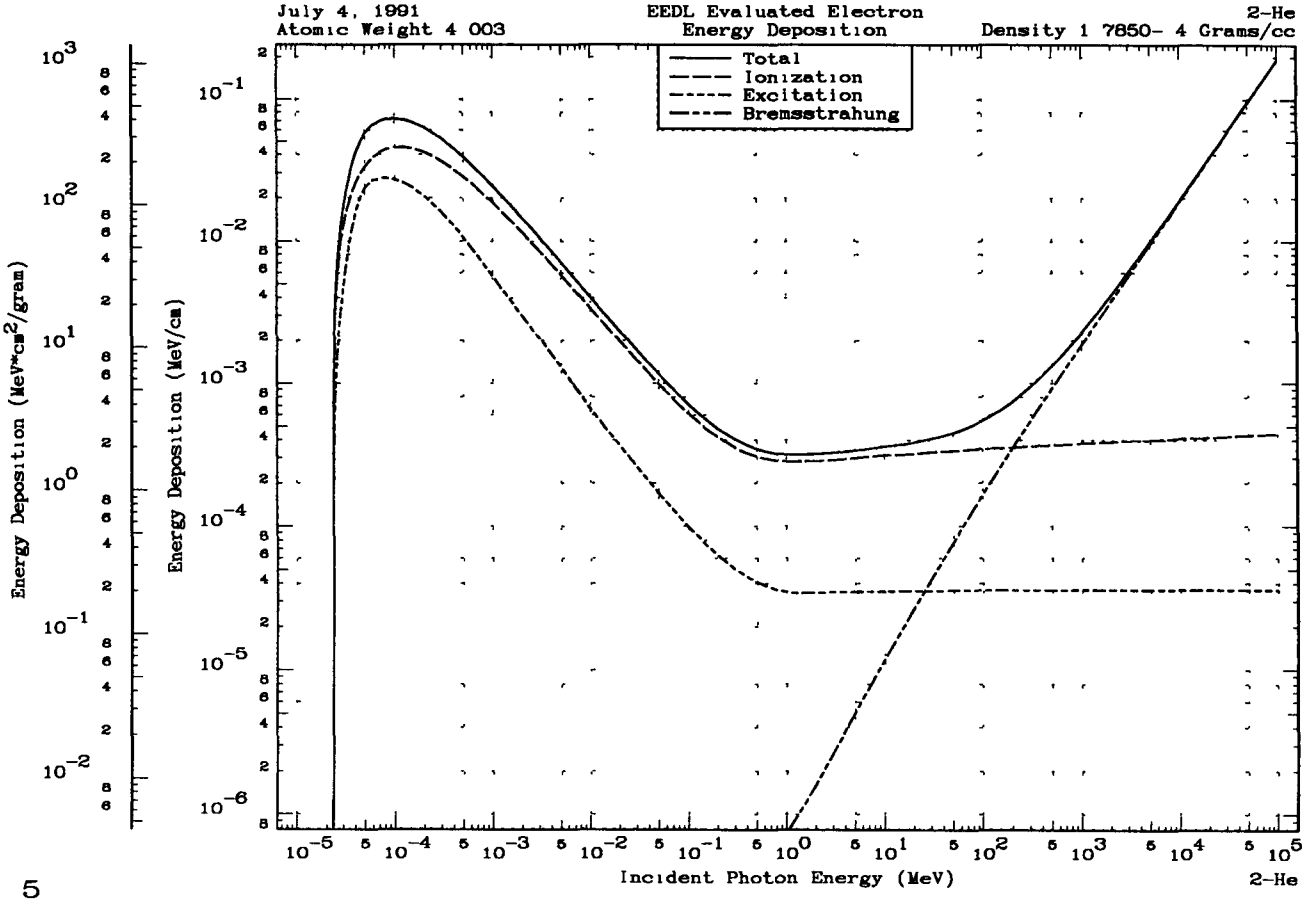
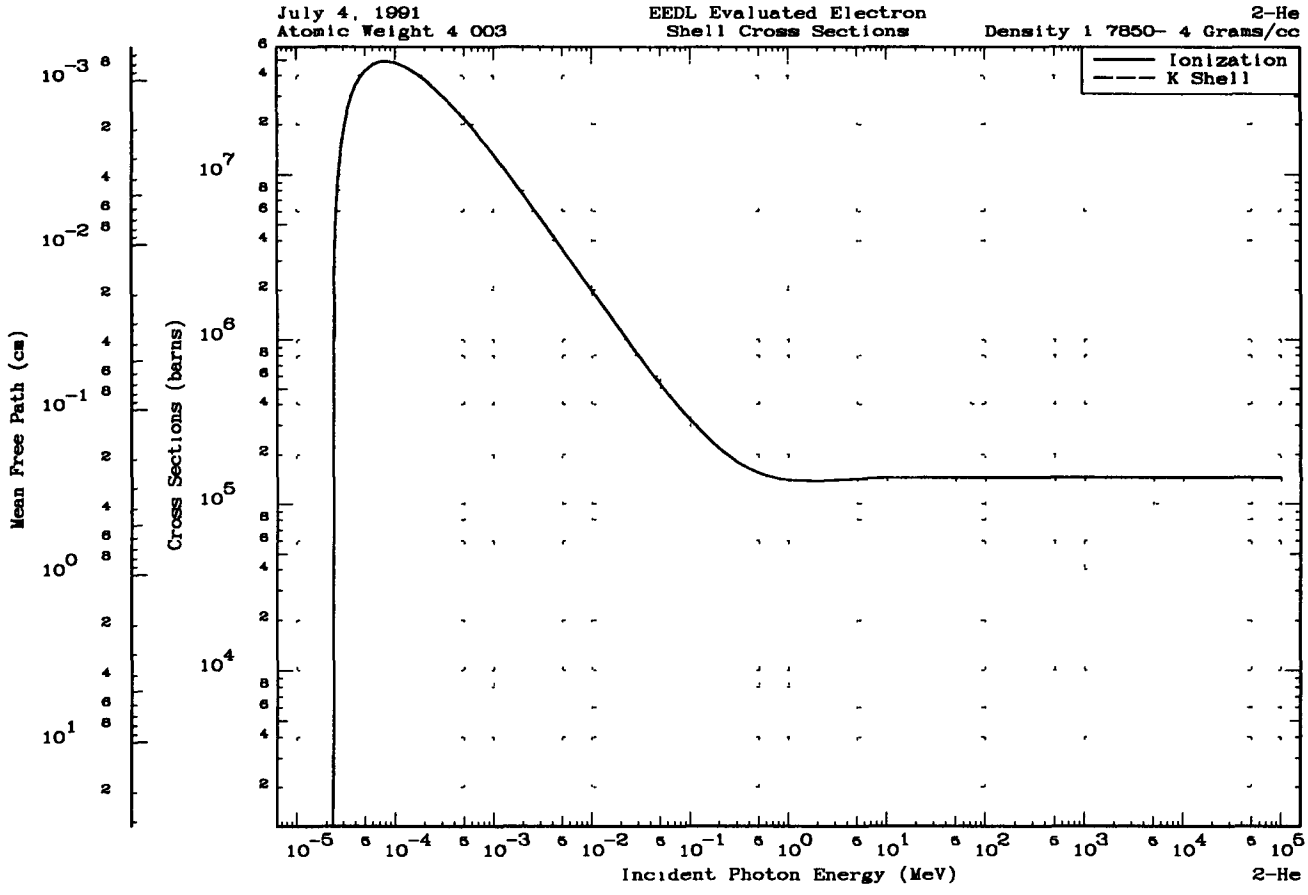
EEDL Evaluated Electron
Cross Sections
2-He
Density 1 7850- 4 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
2-He


July 4, 1991
Atomic Weight 4 003
EEDL Evaluated Electron
Energy Deposition
2-He
Density 1 7850- 4 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
2-He

5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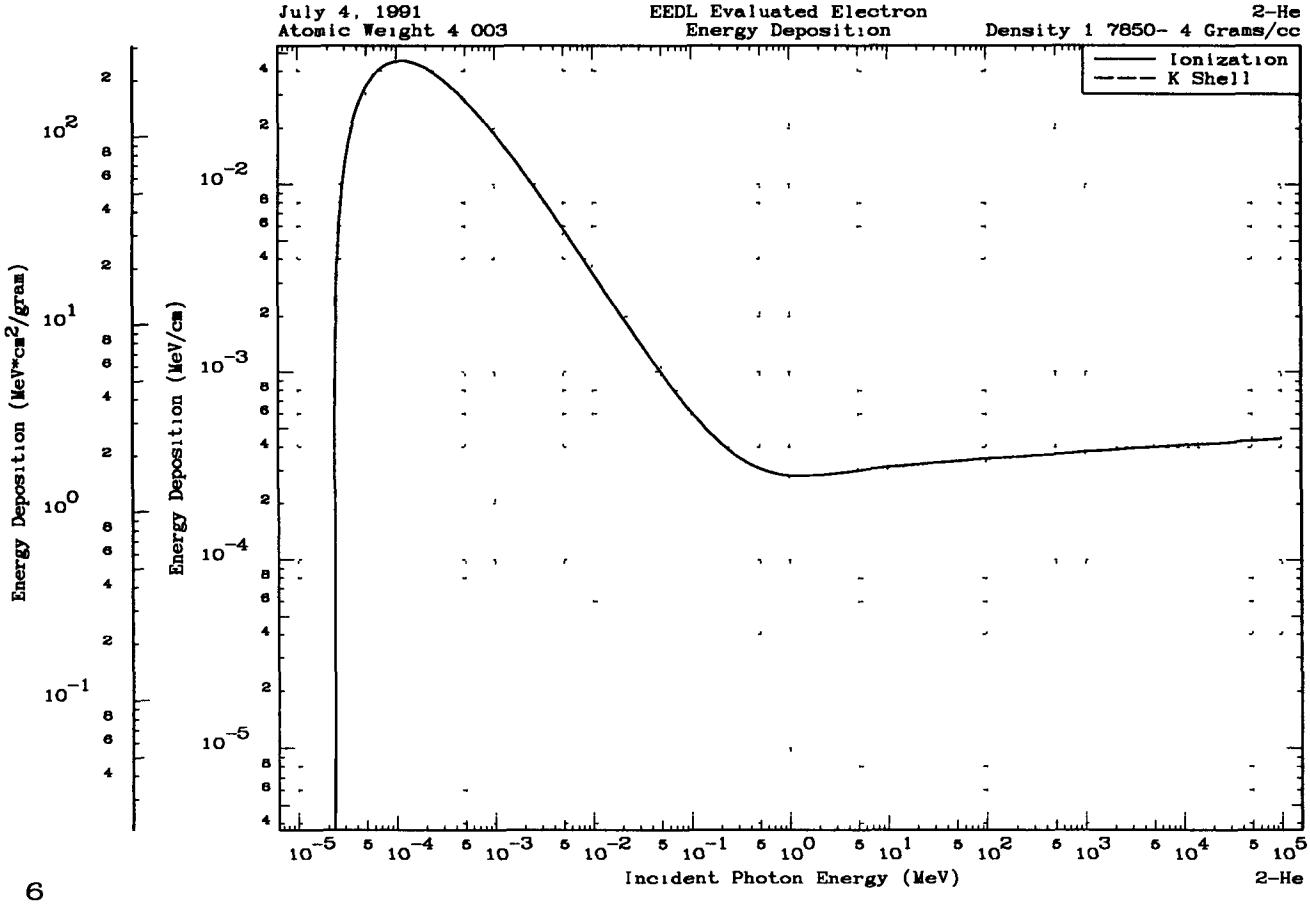
Atomic Weight 4 003
EEDL Evaluated Electron
Shell Cross Sections
2-He
Density 1 7850- 4 Grams/cc
Ionization
K Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
2-He

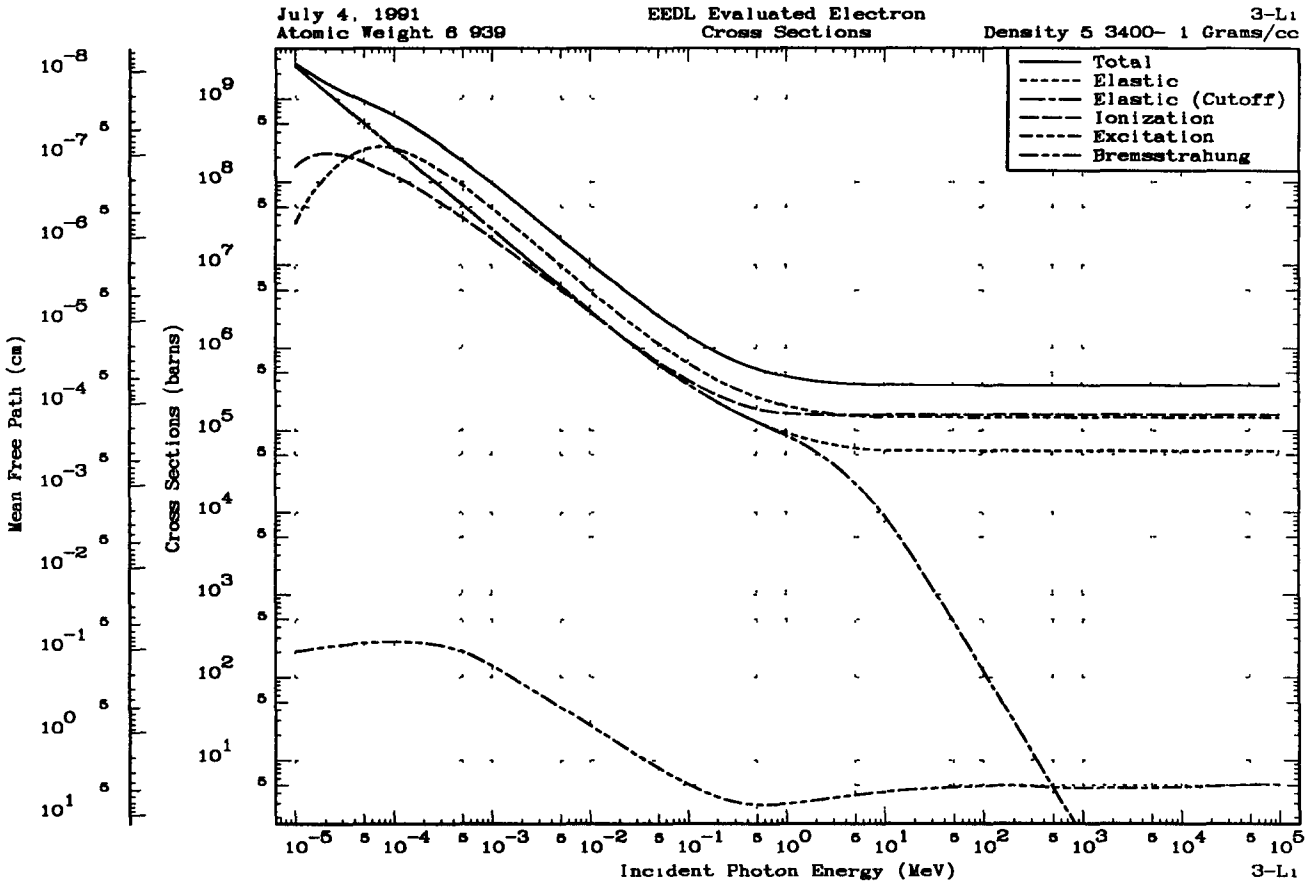

July 4, 1991
Atomic Weight 4 003
EEDL Evaluated Electron
Energy Deposition
2-He
Density 1 7850- 4 Grams/cc
Ionization
K Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
2-He

6

Atomic Weight 4.003 Density 1.7850– 4 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	8.9879–5	6.2331+7		4.1428+8	4.1428+8			1.0236+2	5.9017–9			5.9017–9
1.5000–5	1.3455–4	4.1636+7		2.7673+8	2.7673+8			1.1009+2	8.7024–9			8.7024–9
2.0000–5	1.7915–4	3.1270+7		2.0784+8	2.0784+8			1.1592+2	1.1643–8			1.1643–8
K 2.3420–5	2.0963–4	2.6724+7		1.7762+8	1.7762+8	0.0000+0	0.0000+0	1.1854+2	1.3498–8	0.0000+0	0.0000+0	1.3498–8
2.3626–5	2.1029–4	2.6640+7		1.7707+8	1.7609+8	7.6259+5	2.1775+5	1.1868+2	6.1796–4	4.8071–4	1.3724–4	1.3607–8
2.3831–5	2.1117–4	2.6530+7		1.7633+8	1.7458+8	1.3201+6	4.3340+5	1.1881+2	1.1077–3	8.3395–4	2.7370–4	1.3716–8
2.4024–5	2.1163–4	2.6472+7		1.7595+8	1.7318+8	2.2011+6	5.6481+5	1.1894+2	1.7508–3	1.3934–3	3.5737–4	1.3818–8
2.4602–5	2.1353–4	2.6236+7		1.7438+8	1.6913+8	4.0139+6	1.2328+6	1.1931+2	3.3410–3	2.5565–3	7.8448–4	1.4125–8
2.4771–5	2.1386–4	2.6196+7		1.7411+8	1.6798+8	4.7720+6	1.3557+6	1.1941+2	3.9089–3	3.0448–3	8.6409–4	1.4215–8
2.5952–5	2.1728–4	2.5783+7		1.7137+8	1.6037+8	8.4072+6	2.5876+6	1.2014+2	7.0967–3	5.4285–3	1.6682–3	1.4845–8
2.6078–5	2.1749–4	2.5758+7		1.7120+8	1.5960+8	8.9185+6	2.6829+6	1.2022+2	7.4977–3	5.7659–3	1.7318–3	1.4912–8
2.7976–5	2.2228–4	2.5203+7		1.6751+8	1.4883+8	1.4159+7	4.5289+6	1.2133+2	1.2305–2	9.3279–3	2.9767–3	1.5931–8
2.8039–5	2.2236–4	2.5195+7		1.6746+8	1.4849+8	1.4370+7	4.5947+6	1.2136+2	1.2495–2	9.4731–3	3.0218–3	1.5965–8
3.0000–5	2.2565–4	2.4827+7		1.6502+8	1.3883+8	1.9100+7	7.0845+6	1.2244+2	1.7570–2	1.2824–2	4.7455–3	1.7025–8
3.2500–5	2.2819–4	2.4551+7		1.6318+8	1.2820+8	2.4219+7	1.0757+7	1.2372+2	2.3957–2	1.6617–2	7.3405–3	1.8388–8
3.5000–5	2.2973–4	2.4386+7		1.6208+8	1.1909+8	2.8206+7	1.4787+7	1.2493+2	3.0042–2	1.9766–2	1.0277–2	1.9762–8
3.6250–5	2.2973–4	2.4386+7		1.6208+8	1.1500+8	3.0316+7	1.6764+7	1.2550+2	3.3222–2	2.1467–2	1.1755–2	2.0453–8
4.0000–5	2.3043–4	2.4312+7		1.6159+8	1.0427+8	3.4996+7	2.2325+7	1.2712+2	4.1571–2	2.5495–2	1.6075–2	2.2543–8
4.5000–5	2.3236–4	2.4110+7		1.6025+8	9.2735+7	3.9661+7	2.7853+7	1.2841+2	5.0447–2	2.9860–2	2.0587–2	2.5052–8
5.0000–5	2.3607–4	2.3731+7		1.5773+8	8.3504+7	4.2924+7	3.1301+7	1.2957+2	5.7096–2	3.3363–2	2.3733–2	2.7580–8
6.0000–5	2.4733–4	2.2651+7		1.5055+8	6.9648+7	4.6930+7	3.3968+7	1.3108+2	6.5178–2	3.8443–2	2.6735–2	3.2406–8
7.0000–5	2.6227–4	2.1360+7		1.4197+8	5.9743+7	4.8590+7	3.3638+7	1.3238+2	6.8619–2	4.1468–2	2.7151–2	3.7274–8
8.0000–5	2.7656–4	2.0257+7		1.3464+8	5.2309+7	4.8971+7	3.3355+7	1.3351+2	7.1062–2	4.3470–2	2.7592–2	4.2180–8
1.0000–4	3.0640–4	1.8284+7	0.0000+0	1.2153+8	4.1892+7	4.8060+7	3.1572+7	1.3376+2	7.2188–2	4.5264–2	2.6923–2	5.0919–8
1.2500–4	3.4347–4	1.6311+7	3.4949–4	1.0841+8	3.3545+7	4.5627+7	2.9237+7	1.3245+2	7.0881–2	4.5447–2	2.5434–2	6.0587–8
1.5000–4	3.8106–4	1.4702+7	7.0859–4	9.7715+7	2.7975+7	4.2815+7	2.6925+7	1.3139+2	6.8371–2	4.4484–2	2.3887–2	7.0188–8
2.0000–4	4.5560–4	1.2296+7	1.4730–3	8.1728+7	2.1006+7	3.7804+7	2.2918+7	1.2819+2	6.2536–2	4.1810–2	2.0726–2	8.7547–8
3.0000–4	6.0431–4	9.2705+6	3.2223–3	6.1616+7	1.4027+7	3.0293+7	1.7296+7	1.1838+2	5.2113–2	3.6159–2	1.5953–2	1.1346–7
4.0000–4	7.5184–4	7.4514+6	5.2982–3	4.9526+7	1.0533+7	2.5292+7	1.3700+7	1.0806+2	4.4435–2	3.1657–2	1.2777–2	1.3124–7
5.0000–4	8.9840–4	6.2358+6	7.7062–3	4.1446+7	8.4341+6	2.1767+7	1.1245+7	9.9025+1	3.8750–2	2.8183–2	1.0567–2	1.4453–7
6.0000–4	1.0436–3	5.3684+6	1.0443–2	3.5681+7	7.0337+6	1.9148+7	9.4995+6	9.0483+1	3.4412–2	2.5433–2	8.9789–3	1.5291–7
8.0000–4	1.3262–3	4.2242+6	1.6837–2	2.8076+7	5.2815+6	1.5512+7	7.2822+6	7.6473+1	2.8340–2	2.1396–2	6.9437–3	1.6231–7
1.0000–3	1.6015–3	3.4982+6	2.4463–2	2.3250+7	4.2291+6	1.3093+7	5.9284+6	6.5805+1	2.4221–2	1.8533–2	5.6887–3	1.6590–7
1.5000–3	2.2697–3	2.4683+6	4.8306–2	1.6405+7	2.8245+6	9.5287+6	4.0522+6	4.9214+1	1.8025–2	1.4095–2	3.9299–3	1.6821–7
2.0000–3	2.9164–3	1.9210+6	7.9162–2	1.2768+7	2.1211+6	7.5574+6	3.0890+6	3.9963+1	1.4511–2	1.1494–2	3.0168–3	1.6947–7
3.0000–3	4.1609–3	1.3464+6	1.5939–1	8.9488+6	1.4195+6	5.4166+6	2.1127+6	2.9651+1	1.0619–2	8.5368–3	2.0821–3	1.7036–7
4.0000–3	5.3650–3	1.0442+6	2.6460–1	6.9404+6	1.0675+6	4.2641+6	1.6087+6	2.3924+1	8.4716–3	6.8767–3	1.5948–3	1.7098–7
5.0000–3	6.5433–3	8.5619+5	3.9348–1	5.6906+6	8.5688+5	3.5363+6	1.2974+6	2.0304+1	7.0886–3	5.7967–3	1.2917–3	1.7149–7
6.0000–3	7.6994–3	7.2762+5	5.4510–1	4.8361+6	7.1604+5	3.0340+6	1.0861+6	1.7721+1	6.1255–3	5.0404–3	1.0849–3	1.7205–7
8.0000–3	9.9601–3	5.6247+5	9.1106–1	3.7385+6	5.4022+5	2.3809+6	8.1735+5	1.4291+1	4.8539–3	4.0331–3	8.2065–4	1.7314–7
1.0000–2	1.2162–2	4.6064+5	1.3619+0	3.0617+6	4.3535+5	1.9722+6	6.5409+5	1.2109+1	4.0436–3	3.3844–3	6.5903–4	1.7406–7
1.5000–2	1.7266–2	3.2446+5	2.8083+0	2.1565+6	2.9416+5	1.4030+6	4.5939+5	9.0112+0	2.9298–3	2.4639–3	4.6569–4	1.7590–7
2.0000–2	2.2093–2	2.5357+5	4.7165+0	1.6854+6	2.2297+5	1.1043+6	3.5813+5	7.3089+0	2.3332–3	1.9686–3	3.6449–4	1.7762–7
3.0000–2	3.1060–2	1.8037+5	9.7185+0	1.1988+6	1.5309+5	7.9274+5	2.5297+5	5.4185+0	1.6986–3	1.4397–3	2.5880–4	1.8082–7
4.0000–2	3.9220–2	1.4284+5	1.6276+1	9.4939+5	1.2032+5	6.3058+5	1.9849+5	4.3908+0	1.3634–3	1.1595–3	2.0376–4	1.8421–7
5.0000–2	4.6700–2	1.1996+5	2.4238+1	7.9732+5	1.0170+5	5.3065+5	1.6497+5	3.7424+0	1.1544–3	9.8441–4	1.6977–4	1.8719–7
6.0000–2	5.3601–2	1.0452+5	3.3486+1	6.9467+5	8.9749+4	4.6274+5	1.4218+5	3.2972+0	1.0114–3	8.6463–4	1.4660–4	1.9020–7
8.0000–2	6.5978–2	8.4911+4	5.5311+1	5.6436+5	7.4987+4	3.7617+5	1.1320+5	2.7312+0	8.2753–4	7.1027–4	1.1706–4	1.9632–7
1.0000–1	7.6773–2	7.2972+4	8.1304+1	4.8500+5	6.6257+4	3.2326+5	9.5488+4	2.3844+0	7.1409–4	6.1492–4	9.8966–5	2.0308–7
1.5000–1	9.8506–2	5.6872+4	1.6019+2	3.7800+5	5.4810+4	2.5165+5	7.1541+4	1.9247+0	5.5979–4	4.8514–4	7.4427–5	2.2073–7
2.0000–1	1.1487–1	4.8769+4	2.5638+2	3.2414+5	4.8973+4	2.1564+5	5.9530+4	1.7052+0	4.8177–4	4.1944–4	6.2089–5	2.4061–7
3.0000–1	1.3725–1	4.0818+4	4.8244+2	2.7129+5	4.3128+4	1.8018+5	4.7982+4	1.5190+0	4.0518–4	3.5468–4	5.0216–5	2.8622–7
4.0000–1	1.5167–1	3.6938+4	7.4112+2	2.4551+5	4.0127+4	1.6330+5	4.2080+4	1.4557+0	3.6853–4	3.2405–4	4.4144–5	3.3815–7
5.0000–1	1.6131–1	3.4729+4	1.0203+3	2.3083+5	3.8340+4	1.5385+5	3.8632+4	1.4366+0	3.4813–4	3.0714–4	4.0599–5	3.9521–7
6.0000–1	1.6779–1	3.3389+4	1.3126+3	2.2192+5	3.7177+4	1.4808+5	3.6658+4	1.4408+0	3.3606–4	2.9703–4	3.8576–5	4.5773–7
8.0000–1	1.7590–1	3.1849+4	1.9195+3	2.1168+5	3.5715+4	1.4190+5	3.4067+4	1.4742+0	3.2313–4	2.8660–4	3.5936–5	5.9199–7
1.0000+0	1.7989–1	3.1142+4	2.5434+3	2.0698+5	3.4866+4	1.3912+5	3.2996+4	1.5179+0	3.1801–4	2.8239–4	3.4876–5	7.3883–7
1.2500+0	1.8144–1	3.0877+4	3.3300+3	2.0522+5	3.4312+4	1.3859+5	3.2312+4	1.5773+0	3.1763–4	2.8249–4	3.4201–5	9.4340–7
1.5000+0	1.8217–1	3.0753+4	4.1164+3	2.0440+5	3.3865+4	1.3817+5	3.2363+4	1.6276+0	3.1823–4	2.8277–4	3.4304–5	1.1547–6
2.0000+0	1.8308–1	3.0600+4	5.6837+3	2.0338+5	3.3434+4	1.3749+5	3.2450+4	1.7180+0	3.1980–4	2.8369–4	3.4492–5	1.6200–6
3.0000+0	1.8186–1	3.0805+4	8.7760+3	2.0474+5	3.3183+4	1.3910+5	3.2455+4	1.8521+0	3.2700–4	2.8965–4	3.4685–5	2.6626–6
4.0000+0	1.8094–1	3.0962+4	1.1805+4	2.0579+5	3.3121+4	1.4025+5	3.2414+4	1.9475+0	3.3337–4	2.9472–4	3.4825–5	3.8233–6
5.0000+0	1.8021–1	3.1087+4	1.4778+4	2.0662+5	3.3114+4	1.4115+5	3.2347+4	2.0249+0	3.3927–4	2.9930–4	3.4932–5	5.0395–6
6.0000+0	1.7964–1	3.1185+4	1.7701+4	2.0727+5	3.3109+4	1.4189+5	3.2266+4	2.0796+0	3.4492–4	3.0357–4	3.5021–5	6.3348–6
8.0000+0	1.7900–1	3.1297+4	2.3435+4	2.0802+5	3.3100+4	1.4266+5	3.2260+4	2.1688+0	3.5274–4	3.0856–4	3.5160–5	9.0250–6
1.0000+1	1.7854–1	3.1379+4	2.9044+4	2.0856+5	3.3093+4	1.4325+5	3.2215+4	2.2267+0	3.6035–4	3.1322–4	3.5257–5	1.1875–5
1.5000+1	1.7829–1	3.1421+4	4.2688+4	2.0884+5	3.2945+4	1.4364+5	3.2250+4	2.3262+0	3.7266–4	3.1795–4	3.5364–5	1.9343–5
2.0000+1	1.7816–1	3.1445+4	5.5887+4	2.0900+5	3.2816+4	1.4392+5	3.2257+4	2.3897+0	3.8506–4	3.2246–4	3.5440–5	2.7157–5
3.0000+1	1.7792–1	3.1488+4	8.1043+4	2.0928+5	3.2727+4	1.4432+5	3.2230+4	2.4736+0	4.1025–4	3.3113–4	3.5547–5	4.3575–5
4.0000+1	1.7792–1	3.1487+4	1.0484+5	2.0928+5	3.2726+4	1.4437+5	3.2178+4	2.5243+0	4.3021–4	3.3402–4	3.5625–5	6.0561–5
5.0000+1	1.7785–1	3.1499+4	1.2756+5	2.0936+5	3.2726+4	1.4441+5	3.2222+4	2.5574+0	4.5049–4	3.3689–4	3.5684–5	7.7915–5
6.0000+1	1.7781–1	3.1506+4	1.4927+5	2.0940+5	3.2725+4	1.4444+5	3.2237+4	2.5791+0	4.7096–4	3.3974–4	3.5711–5	9.5505–5
8.0000+1	1.7776–1	3.1515+4	1.8997+5	2.0947+5	3.2725+4	1.4449+5	3.2249+4	2.6088+0	5.1236–4	3.4542–4	3.5746–5	1.3119–4
1.0000+2	1.7775–1	3.1518+4	2.2758+5	2.0948+5	3.2724+4	1.4450+5	3.2257+4	2.6282+0	5.5160–4	3.4851–4	3.5775–5	1.6732–4
1.5000+2	1.7771–1	3.1525+4	3.1116+5	2.0953+5	3.2723+4	1.4451+5	3.2301+4	2.6527+0	6.4738–4	3.5230–4	3.5826–5	2.5926–4
2.0000+2	1.7767–1	3.1531+4	3.8313+5	2.0957+5	3.2723+4	1.4451+5	3.2334+4	2.6490+0	7.4447–4	3.5607–4	3.5864–5	3.5253–4
3.0000+2	1.7763–1	3.1538+4	5.0248+5	2.0962+5	3.2722+4	1.4452+5	3.2376+4	2.5816+0	9.3871–4	3.6362–4	3.5912–5	5.3917–4
4.0000+2	1.7762–1	3.1541+4	5.9942+5	2.0963+5	3.2721+4	1.4452+5	3.2394+4	2.5150+0	1.1305–3	3.6598–4	3.5934–5	7.2856–4
5.0000+2	1.7761–1	3.1543+4	6.8116+5	2.0965+5	3.2720+4	1.4452+5	3.2406+4	2.4701+0	1.3212–3	3.6835–4	3.5950–5	9.1687–4
6.0000+2	1.7760–1	3.1544+4	7.5191+5	2.0966+5	3.2720+4	1.4452+5	3.2417+4	2.4360+0	1.5099–3	3.7071–4	3.5963–5	1.1032–3

Atomic Weight 4.003												Density 1.7850– 4 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+2	1.7759–1	3.1546+4	8.6994+5	2.0967+5	3.2719+4	1.4452+5	3.2432+4	2.4009+0	1.8934–3	3.7542–4	3.5985–5	1.4820–3
1.0000+3	1.7758–1	3.1549+4	9.6617+5	2.0969+5	3.2719+4	1.4452+5	3.2445+4	2.3814+0	2.2748–3	3.8015–4	3.6004–5	1.8587–3
1.5000+3	1.7755–1	3.1552+4	1.1499+6	2.0971+5	3.2718+4	1.4452+5	3.2472+4	2.3591+0	3.2219–3	3.8391–4	3.6033–5	2.8020–3
2.0000+3	1.7756–1	3.1552+4	1.2860+6	2.0971+5	3.2717+4	1.4452+5	3.2467+4	2.3480+0	4.1688–3	3.8767–4	3.6028–5	3.7451–3
3.0000+3	1.7755–1	3.1553+4	1.4835+6	2.0971+5	3.2716+4	1.4452+5	3.2475+4	2.3468+0	6.0782–3	3.9520–4	3.6036–5	5.6470–3
4.0000+3	1.7756–1	3.1552+4	1.6266+6	2.0971+5	3.2716+4	1.4452+5	3.2472+4	2.3531+0	7.9779–3	3.9756–4	3.6033–5	7.5443–3
5.0000+3	1.7758–1	3.1548+4	1.7390+6	2.0968+5	3.2715+4	1.4452+5	3.2448+4	2.3594+0	9.8819–3	3.9991–4	3.6006–5	9.4460–3
6.0000+3	1.7757–1	3.1550+4	1.8316+6	2.0970+5	3.2715+4	1.4452+5	3.2460+4	2.3686+0	1.1779–2	4.0227–4	3.6020–5	1.1340–2
8.0000+3	1.7756–1	3.1551+4	1.9787+6	2.0970+5	3.2714+4	1.4452+5	3.2465+4	2.3833+0	1.5592–2	4.0698–4	3.6025–5	1.5149–2
1.0000+4	1.7756–1	3.1551+4	2.0934+6	2.0970+5	3.2713+4	1.4452+5	3.2467+4	2.3948+0	1.9425–2	4.1169–4	3.6028–5	1.8977–2
1.5000+4	1.7756–1	3.1552+4	2.3034+6	2.0971+5	3.2712+4	1.4452+5	3.2474+4	2.4335+0	2.8806–2	4.1486–4	3.6036–5	2.8355–2
2.0000+4	1.7756–1	3.1551+4	2.4534+6	2.0970+5	3.2712+4	1.4452+5	3.2467+4	2.4614+0	3.8308–2	4.1802–4	3.6028–5	3.7854–2
3.0000+4	1.7756–1	3.1552+4	2.6658+6	2.0971+5	3.2711+4	1.4452+5	3.2474+4	2.5006+0	5.7123–2	4.2435–4	3.6036–5	5.6663–2
4.0000+4	1.7756–1	3.1551+4	2.8169+6	2.0970+5	3.2710+4	1.4452+5	3.2472+4	2.5287+0	7.6142–2	4.3069–4	3.6033–5	7.5675–2
5.0000+4	1.7758–1	3.1548+4	2.9342+6	2.0968+5	3.2710+4	1.4452+5	3.2450+4	2.5503+0	9.4980–2	4.3278–4	3.6009–5	9.4511–2
6.0000+4	1.7757–1	3.1549+4	3.0303+6	2.0969+5	3.2709+4	1.4452+5	3.2460+4	2.5680+0	1.1380–1	4.3487–4	3.6020–5	1.1333–1
8.0000+4	1.7757–1	3.1550+4	3.1819+6	2.0970+5	3.2708+4	1.4452+5	3.2467+4	2.5960+0	1.5178–1	4.3904–4	3.6028–5	1.5130–1
1.0000+5	1.7756–1	3.1551+4	3.2995+6	2.0970+5	3.2708+4	1.4452+5	3.2469+4	2.6179+0	1.8982–1	4.4322–4	3.6030–5	1.8934–1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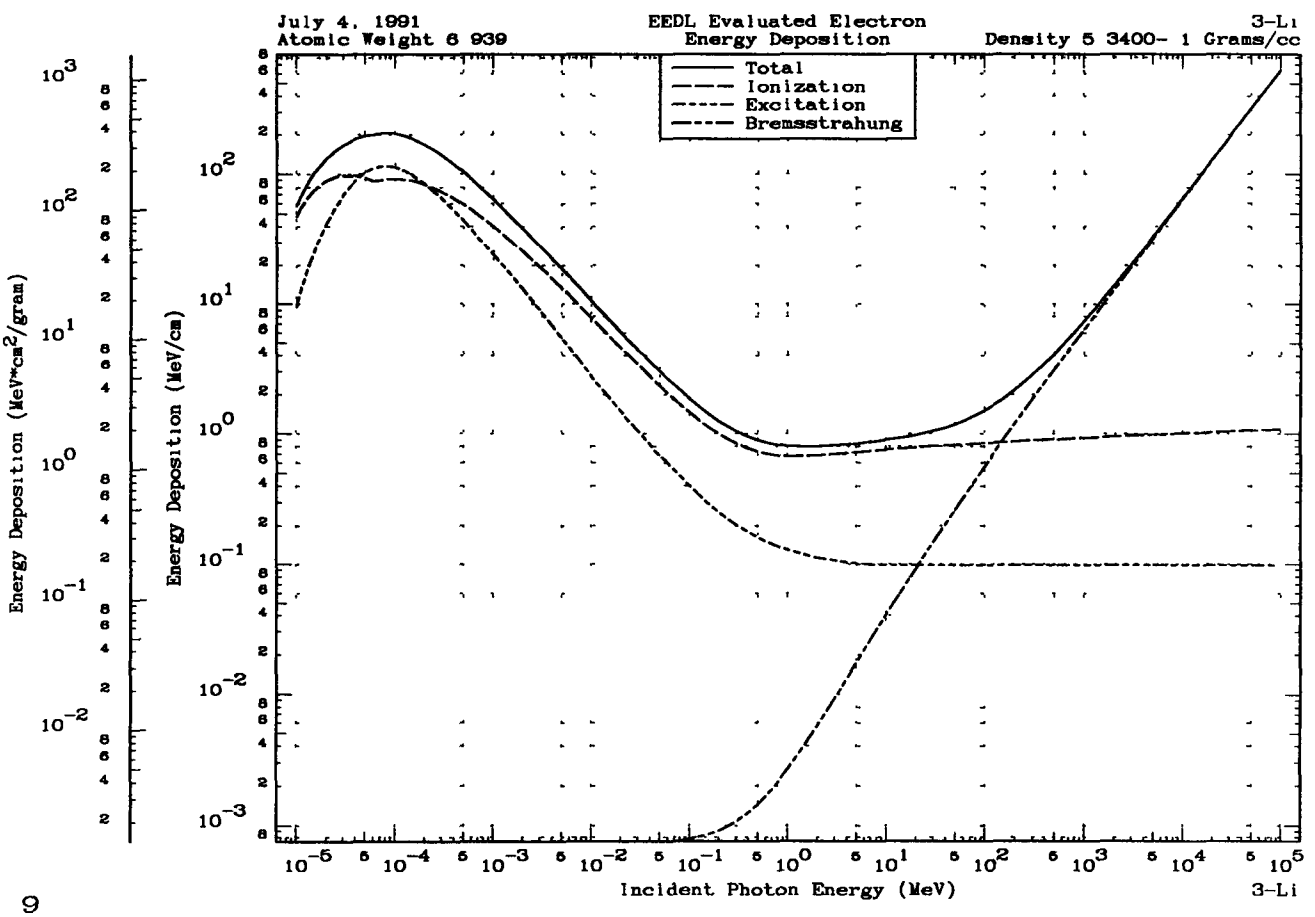
Atomic Weight 6 939
EEDL Evaluated Electron
Cross Sections
3-Li
Density 5 3400- 1 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
3-Li


July 4, 1991
Atomic Weight 6 939
EEDL Evaluated Electron
Energy Deposition
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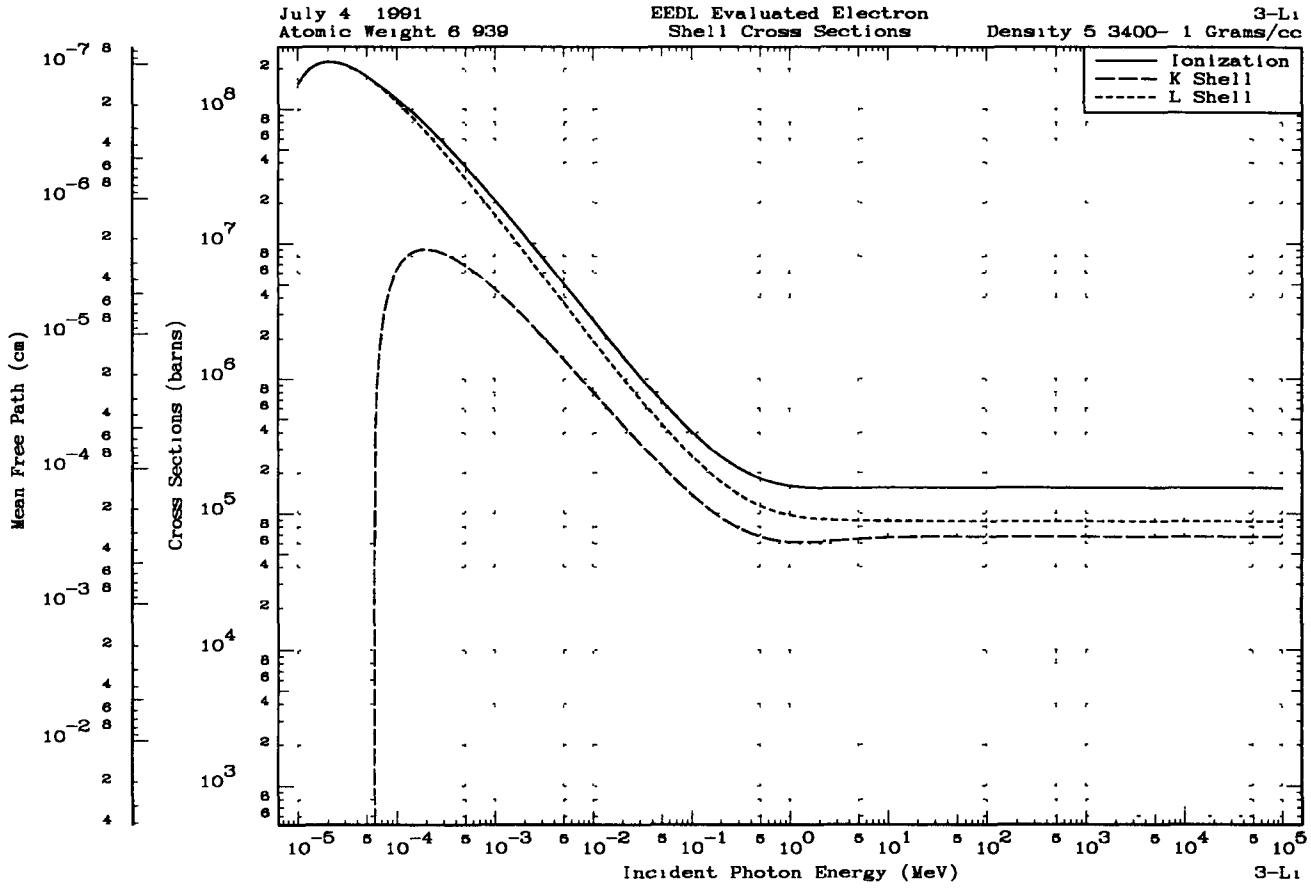
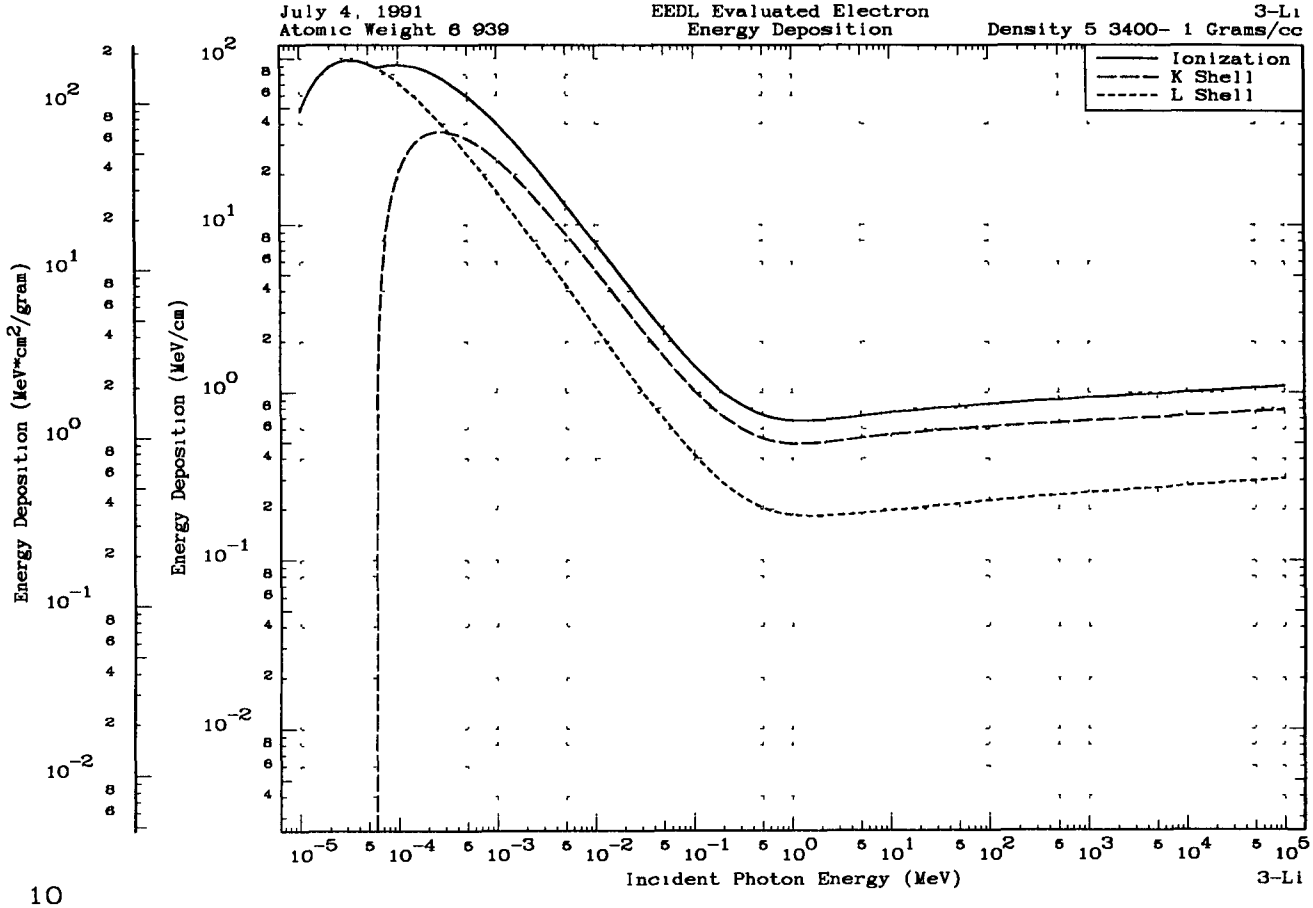
Density 5 3400- 1 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
3-Li


July 4 1991
Atomic Weight 6 939
EEDL Evaluated Electron
Shell Cross Sections
3-Li
Density 5 3400- 1 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
3-Li

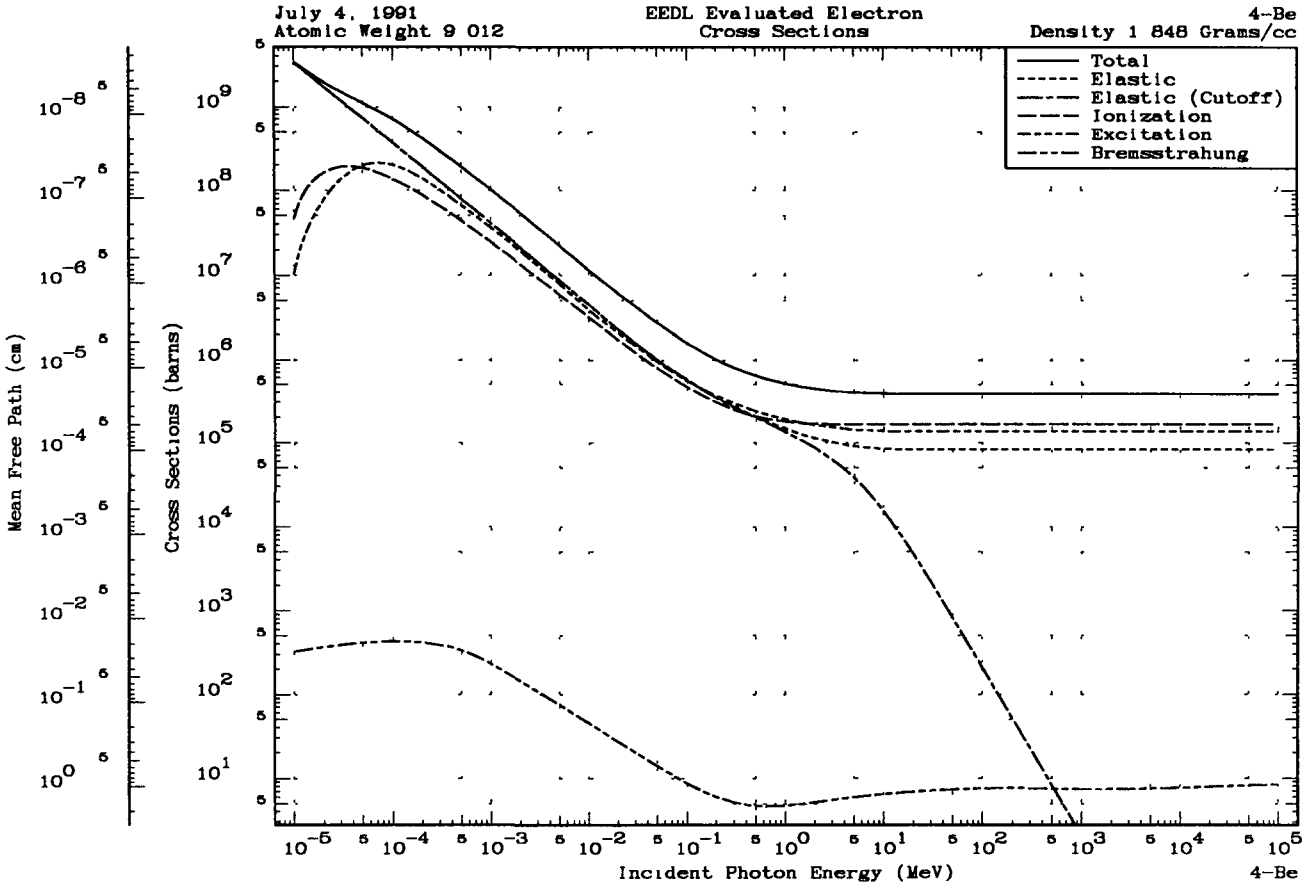

July 4, 1991
Atomic Weight 6 939
EEDL Evaluated Electron
Energy Deposition
3-Li
Density 5 3400- 1 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
3-Li

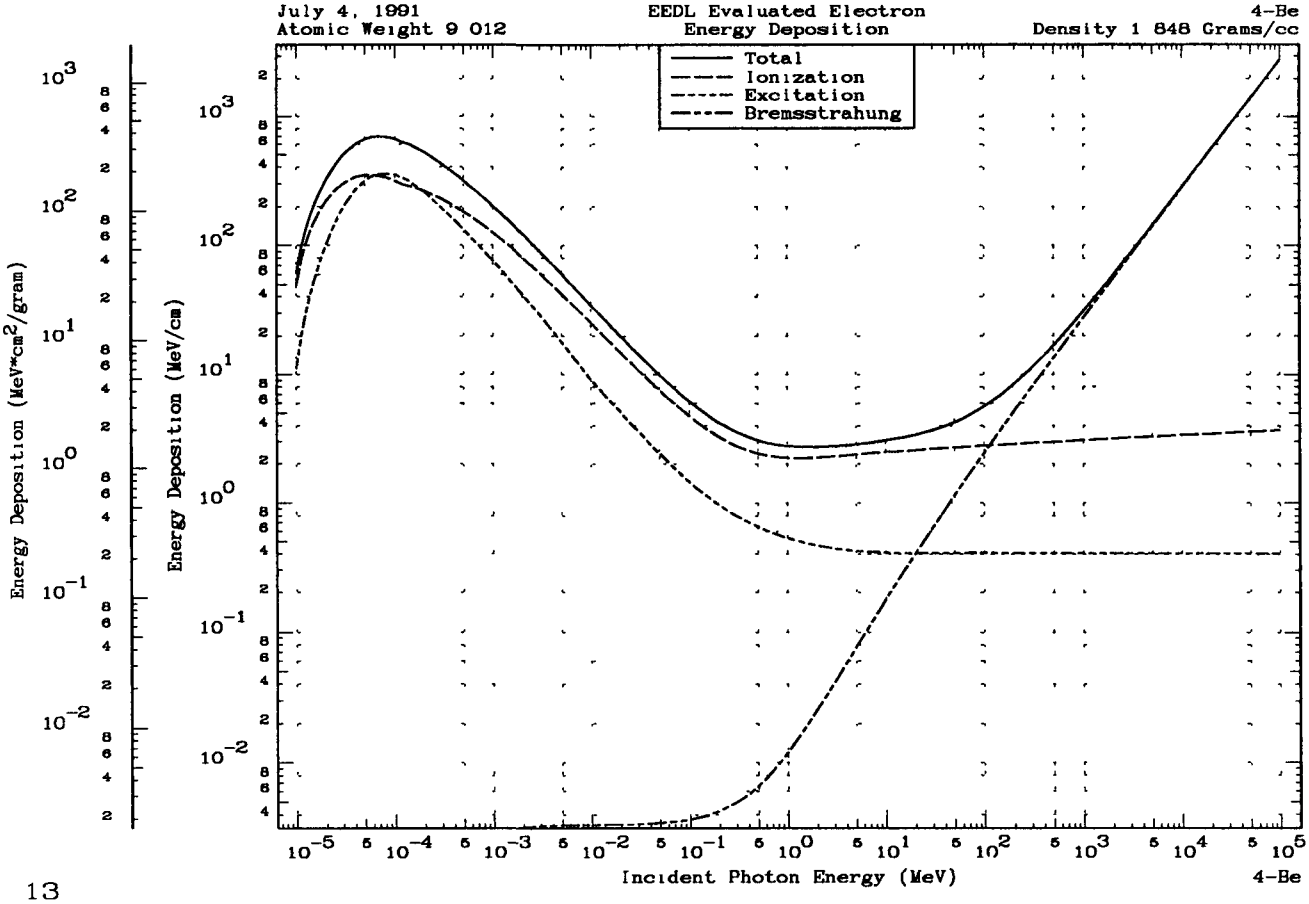
10

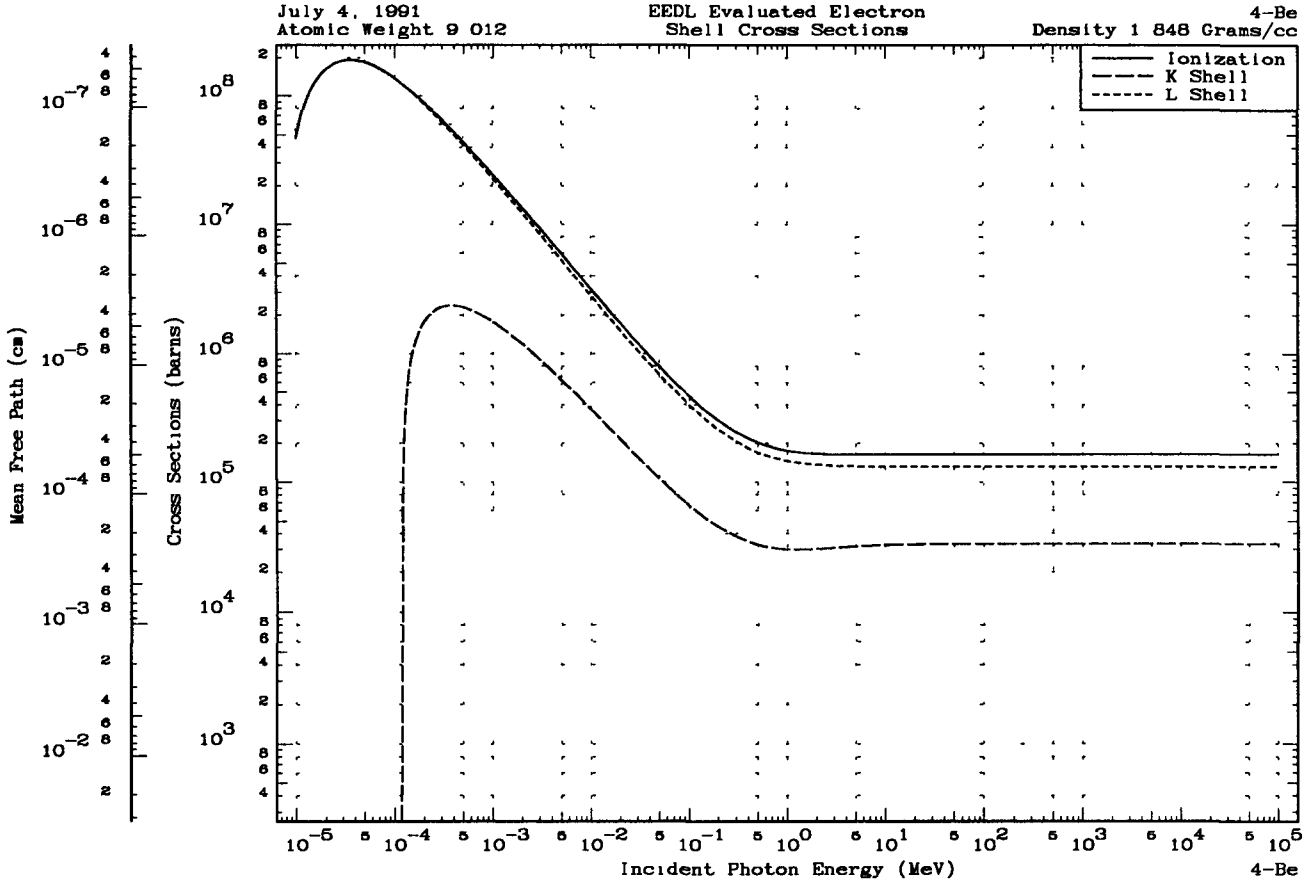
Atomic Weight 6.939 — Density 5.3400– 1 Grams/cc

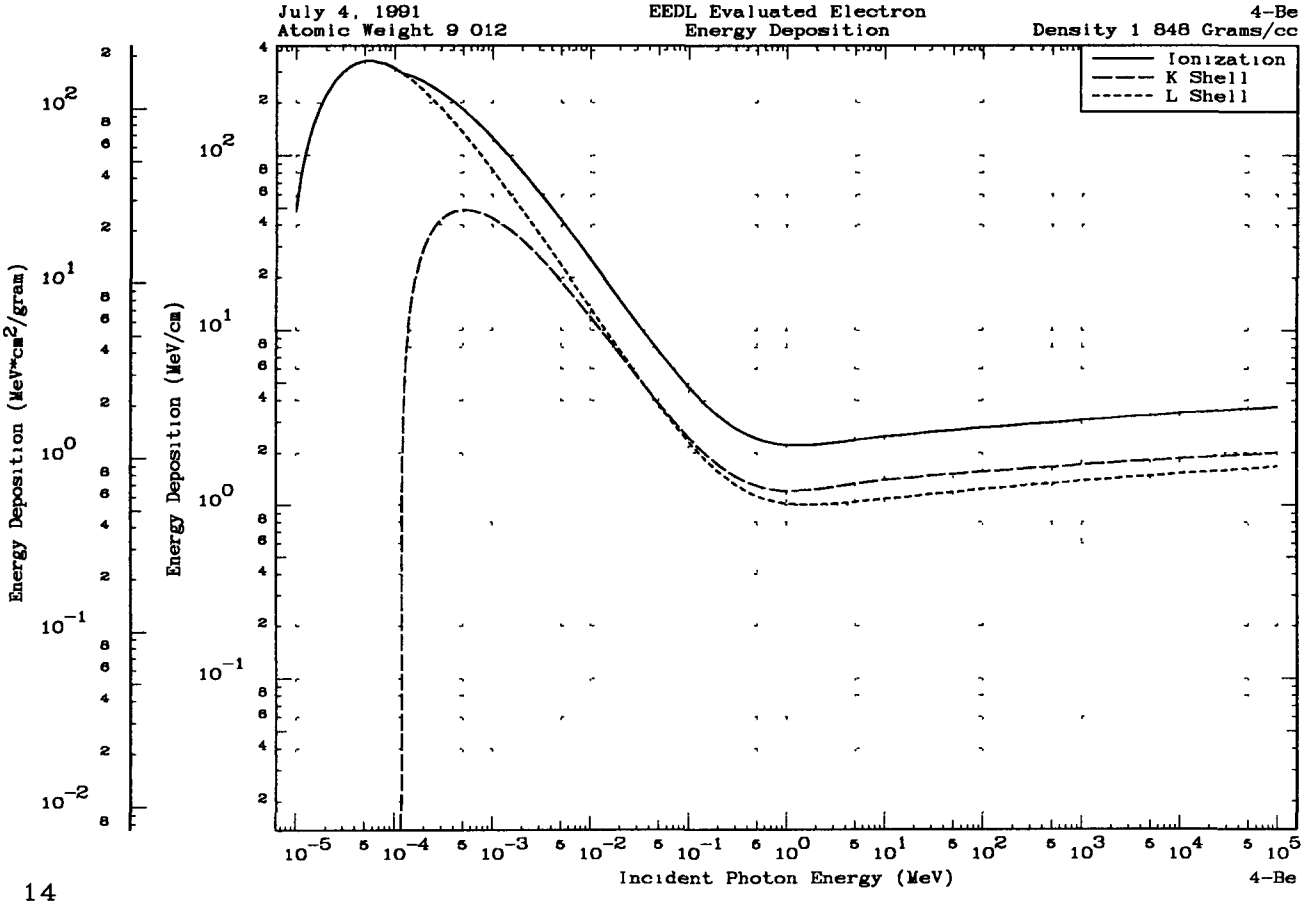
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	8.2289–9	2.2757+8		2.6222+9	2.4363+9	1.5433+8	3.1555+7	2.0181+2	5.6894+1	4.7438+1	9.4565+0	2.0099–5
1.1250–5	9.0293–9	2.0740+8		2.3897+9	2.1711+9	1.7537+8	4.3245+7	2.0616+2	6.9534+1	5.6182+1	1.3353+1	2.2441–5
1.3125–5	1.0155–8	1.8442+8		2.1249+9	1.8672+9	1.9750+8	6.0265+7	2.1200+2	8.6541+1	6.7112+1	1.9429+1	2.6022–5
1.5000–5	1.1206–8	1.6711+8		1.9255+9	1.6385+9	2.1113+8	7.5914+7	2.1718+2	1.0091+2	7.5399+1	2.5508+1	2.9675–5
1.7500–5	1.2510–8	1.4969+8		1.7249+9	1.4091+9	2.2091+8	9.4868+7	2.2333+2	1.1631+2	8.3276+1	3.3034+1	3.4652–5
2.0000–5	1.3692–8	1.3677+8		1.5760+9	1.2365+9	2.2439+8	1.1507+8	2.2879+2	1.3052+2	8.9043+1	4.1472+1	3.9738–5
2.5000–5	1.5805–8	1.1848+8		1.3652+9	9.9397+8	2.2149+8	1.4975+8	2.3593+2	1.5115+2	9.5113+1	5.6037+1	4.8894–5
3.0000–5	1.7606–8	1.0637+8		1.2256+9	8.3157+8	2.1366+8	1.8037+8	2.4193+2	1.6741+2	9.7421+1	6.9984+1	5.8256–5
3.5000–5	1.9228–8	9.7395+7		1.1222+9	7.1514+8	2.0272+8	2.0437+8	2.4696+2	1.7742+2	9.6678+1	8.0741+1	6.7685–5
4.0000–5	2.0656–8	9.0658+7		1.0446+9	6.2755+8	1.9369+8	2.2336+8	2.5140+2	1.8626+2	9.6431+1	8.9824+1	7.7268–5
5.0000–5	2.3194–8	8.0740+7		9.3032+8	5.0446+8	1.7463+8	2.5123+8	2.5651+2	1.9566+2	9.2668+1	1.0300+2	9.4775–5
K 5.9850–5	2.5528–8	7.3356+7		8.4525+8	4.2308+8	1.5838+8	2.6379+8	2.5973+2	1.9852+2	8.8235+1	1.1028+2	1.1138–4
6.0000–5	2.5564–8	7.3255+7		8.4408+8	4.2204+8	1.5820+8	2.6383+8	2.5978+2	1.9861+2	8.8279+1	1.1033+2	1.1163–4
6.1250–5	2.5853–8	7.2434+7		8.3462+8	4.1361+8	1.5648+8	2.6453+8	2.6015+2	1.9915+2	8.8389+1	1.1076+2	1.1375–4
6.3594–5	2.6382–8	7.0983+7		8.1790+8	3.9869+8	1.5341+8	2.6580+8	2.6083+2	2.0017+2	8.8629+1	1.1154+2	1.1773–4
6.7695–5	2.7264–8	6.8686+7		7.9143+8	3.7504+8	1.4846+8	2.6793+8	2.6197+2	2.0202+2	8.9133+1	1.1289+2	1.2471–4
7.3848–5	2.8494–8	6.5720+7		7.5726+8	3.4444+8	1.4189+8	2.7093+8	2.6356+2	2.0485+2	9.0017+1	1.1483+2	1.3523–4
8.0000–5	2.9787–8	6.2867+7		7.2439+8	3.1850+8	1.3614+8	2.6975+8	2.6502+2	2.0595+2	9.0939+1	1.1501+2	1.4581–4
8.5000–5	3.0889–8	6.0626+7		6.9857+8	3.0016+8	1.3147+8	2.6694+8	2.6529+2	2.0558+2	9.1143+1	1.1444+2	1.5355–4
9.2500–5	3.2467–8	5.7680+7		6.6461+8	2.7632+8	1.2523+8	2.6306+8	2.6567+2	2.0516+2	9.1457+1	1.1370+2	1.6517–4
1.0000–4	3.3965–8	5.5135+7	0.0000+0	6.3529+8	2.5603+8	1.1973+8	2.5953+8	2.6601+2	2.0479+2	9.1698+1	1.1309+2	1.7680–4
1.1250–4	3.6749–8	5.0959+7	6.1778–8	5.8717+8	2.2817+8	1.1113+8	2.4787+8	2.6497+2	1.9990+2	9.1064+1	1.0884+2	1.9422–4
1.3125–4	4.0683–8	4.6030+7	1.5705–7	5.3038+8	1.9625+8	1.0075+8	2.3339+8	2.6362+2	1.9373+2	9.0080+1	1.0365+2	2.2026–4
1.5000–4	4.4730–8	4.1866+7	2.5565–7	4.8240+8	1.7222+8	9.2450+7	2.1773+8	2.6245+2	1.8666+2	8.8876+1	9.7786+1	2.4620–4
1.7500–4	5.0134–8	3.7353+7	3.9331–7	4.3040+8	1.4812+8	8.3036+7	1.9924+8	2.5952+2	1.7662+2	8.6215+1	9.0409+1	2.7805–4
2.0000–4	5.5317–8	3.3853+7	5.3832–7	3.9007+8	1.2999+8	7.5585+7	1.8449+8	2.5701+2	1.6825+2	8.3676+1	8.4578+1	3.0963–4
2.5000–4	6.6102–8	2.8330+7	8.5129–7	3.2643+8	1.0451+8	6.4021+7	1.5790+8	2.4697+2	1.5156+2	7.8153+1	7.3407+1	3.5954–4
3.0000–4	7.6437–8	2.4499+7	1.1956–6	2.8229+8	8.7442+7	5.5806+7	1.3905+8	2.3906+2	1.3903+2	7.3492+1	6.5540+1	4.0804–4
4.0000–4	9.7690–8	1.9169+7	1.9745–6	2.2088+8	6.6000+7	4.4518+7	1.1036+8	2.1967+2	1.1832+2	6.5311+1	5.3004+1	4.7921–4
5.0000–4	1.1920–7	1.5710+7	2.8793–6	1.8102+8	5.3061+7	3.7180+7	9.0779+7	2.0244+2	1.0308+2	5.8861+1	4.4219+1	5.3453–4
6.0000–4	1.4096–7	1.3285+7	3.9086–6	1.5307+8	4.4396+7	3.2002+7	7.6675+7	1.8595+2	9.1441+1	5.3668+1	3.7772+1	5.7213–4
8.0000–4	1.8383–7	1.0187+7	6.3167–6	1.1738+8	3.3510+7	2.5151+7	5.8718+7	1.5852+2	7.5201+1	4.5781+1	2.9419+1	6.1840–4
1.0000–3	2.2592–7	8.2891+6	9.1879–6	9.5511+7	2.6940+7	2.0805+7	4.7765+7	1.3728+2	6.4393+1	4.0157+1	2.4235+1	6.3950–4
1.5000–3	3.3052–7	5.6657+6	1.8158–5	6.5283+7	1.8120+7	1.4654+7	3.2509+7	1.0369+2	4.7899+1	3.1042+1	1.6857+1	6.5628–4
2.0000–3	4.3365–7	4.3184+6	2.9766–5	4.9758+7	1.3676+7	1.1385+7	2.4697+7	8.4698+1	3.8583+1	2.5589+1	1.2993+1	6.6636–4
3.0000–3	6.3828–7	2.9339+6	5.9976–5	3.3806+7	9.1891+6	7.9551+6	1.6662+7	6.3261+1	2.8167+1	1.9231+1	8.9351+0	6.7668–4
4.0000–3	8.4239–7	2.2230+6	9.9702–5	2.5615+7	6.9306+6	6.1588+6	1.2525+7	5.1203+1	2.2397+1	1.5593+1	6.8033+0	6.7940–4
5.0000–3	1.0468–6	1.7889+6	1.4850–4	2.0613+7	5.5738+6	5.0480+6	9.9907+6	4.3390+1	1.8701+1	1.3222+1	5.4783+0	6.8013–4
6.0000–3	1.2518–6	1.4960+6	2.0607–4	1.7237+7	4.6650+6	4.2898+6	8.2825+6	3.7882+1	1.6103+1	1.1527+1	4.5758+0	6.8153–4
8.0000–3	1.6626–6	1.1263+6	3.4564–4	1.2978+7	3.5268+6	3.3190+6	6.1321+6	3.0704+1	1.2692+1	9.2648+0	3.4260+0	6.8424–4
1.0000–2	2.0740–6	9.0292+5	5.1834–4	1.0404+7	2.8455+6	2.7214+6	4.8369+6	2.6020+1	1.0537+1	7.8098+0	2.7261+0	6.8635–4
1.1250–2	2.3280–6	8.0442+5	6.4293–4	9.2690+6	2.5414+6	2.4522+6	4.2753+6	2.3832+1	9.5454+0	7.1262+0	2.4185+0	6.8558–4
1.5000–2	3.0092–6	6.2231+5	1.0814–3	7.1705+6	1.9284+6	1.9017+6	3.3404+6	1.9230+1	7.6315+0	5.7201+0	1.9107+0	6.9104–4
2.0000–2	3.9066–6	4.7936+5	1.8141–3	5.5234+6	1.4681+6	1.4789+6	2.5765+6	1.5542+1	6.0757+0	4.5865+0	1.4885+0	6.9640–4
2.2500–2	4.3754–6	4.2800+5	2.2459–3	4.9316+6	1.3147+6	1.3367+6	2.2801+6	1.4264+1	5.5119+0	4.1894+0	1.3218+0	6.9679–4
3.0000–2	5.6127–6	3.3364+5	3.7621–3	3.8444+6	1.0043+6	1.0444+6	1.7958+6	1.1567+1	4.4215+0	3.3690+0	1.0518+0	7.0531–4
4.0000–2	7.2103–6	2.5972+5	6.2814–3	2.9926+6	7.7333+5	8.2147+5	1.3978+6	9.4175+0	3.5489+0	2.7218+0	8.2636–1	7.1536–4
4.5000–2	8.0411–6	2.3289+5	7.7566–3	2.6834+6	6.9682+5	7.4657+5	1.2400+6	8.6672+0	3.2351+0	2.4986+0	7.3575–1	7.1989–4
5.0000–2	8.7168–6	2.1483+5	9.3600–3	2.4754+6	6.3482+5	6.8538+5	1.1552+6	8.0469+0	3.0045+0	2.3159+0	6.8788–1	7.2547–4
6.0000–2	1.0139–5	1.8469+5	1.2914–2	2.1281+6	5.4295+5	5.9353+5	9.9161+5	7.0875+0	2.6310+0	2.0363+0	5.9390–1	7.3492–4
8.0000–2	1.2770–5	1.4664+5	2.1305–2	1.6897+6	4.2757+5	4.7715+5	7.8494+5	5.8428+0	2.1519+0	1.6768+0	4.7438–1	7.5479–4
1.0000–1	1.5149–5	1.2361+5	3.1303–2	1.4244+6	3.5819+5	4.0665+5	6.5951+5	5.0716+0	1.8565+0	1.4544+0	4.0132–1	7.7629–4
1.5000–1	2.0216–5	9.2632+4	6.1672–2	1.0674+6	2.6502+5	3.1181+5	4.9051+5	4.0475+0	1.4527+0	1.1497+0	3.0219–1	8.3716–4
2.0000–1	2.4317–5	7.7009+4	9.8758–2	8.8734+5	2.1751+5	2.6435+5	4.0547+5	3.5519+0	1.2489+0	9.9599–1	2.5198–1	9.0569–4
3.0000–1	3.0447–5	6.1505+4	1.8606–1	7.0869+5	1.6878+5	2.1751+5	3.2239+5	3.1100+0	1.0479+0	8.4399–1	2.0285–1	1.0635–3
4.0000–1	3.4952–5	5.3578+4	2.8621–1	6.1735+5	1.4318+5	1.9489+5	2.7929+5	2.9374+0	9.5065–1	7.7203–1	1.7738–1	1.2435–3
5.0000–1	3.8430–5	4.8729+4	3.9460–1	5.6148+5	1.2730+5	1.8192+5	2.5226+5	2.8669+0	8.9504–1	7.3223–1	1.6137–1	1.4410–3
6.0000–1	4.1105–5	4.5558+4	5.0850–1	5.2494+5	1.1643+5	1.7373+5	2.3478+5	2.8498+0	8.6122–1	7.0848–1	1.5109–1	1.6559–3
8.0000–1	4.5091–5	4.1531+4	7.4585–1	4.7854+5	1.0205+5	1.6436+5	2.1213+5	2.8802+0	8.2428–1	6.8435–1	1.3780–1	2.1258–3
1.0000+0	4.8006–5	3.9009+4	9.9121–1	4.4948+5	9.3040+4	1.5948+5	1.9696+5	2.9387+0	8.0608–1	6.7455–1	1.2889–1	2.6376–3
1.5000+0	5.2133–5	3.5921+4	1.6146+0	4.1390+5	8.0374+4	1.5496+5	1.7856+5	3.1076+0	7.9805–1	6.7561–1	1.1836–1	4.0781–3
2.0000+0	5.4719–5	3.4223+4	2.2417+0	3.9433+5	7.3540+4	1.5350+5	1.6729+5	3.2535+0	7.9667–1	6.7956–1	1.1142–1	5.6856–3
3.0000+0	5.7155–5	3.2764+4	3.4852+0	3.7753+5	6.6387+4	1.5272+5	1.5842+5	3.4742+0	8.1176–1	6.9593–1	1.0652–1	9.3103–3
4.0000+0	5.8652–5	3.1928+4	4.7066+0	3.6789+5	6.2659+4	1.5318+5	1.5205+5	3.6339+0	8.2574–1	7.0926–1	1.0324–1	1.3249–2
5.0000+0	5.9443–5	3.1504+4	5.9073+0	3.6300+5	6.0523+4	1.5355+5	1.4892+5	3.7580+0	8.3999–1	7.2124–1	1.0130–1	1.7442–2
6.0000+0	5.9851–5	3.1289+4	7.0875+0	3.6052+5	5.9182+4	1.5386+5	1.4748+5	3.8565+0	8.5471–1	7.3239–1	1.0051–1	2.1823–2
8.0000+0	6.0438–5	3.0985+4	9.3990+0	3.5702+5	5.7590+4	1.5430+5	1.4512+5	4.0077+0	8.7585–1	7.4559–1	9.9269–2	3.0990–2
1.0000+1	6.0675–5	3.0864+4	1.1655+1	3.5563+5	5.6908+4	1.5465+5	1.4406+5	4.1081+0	8.9743–1	7.5786–1	9.8908–2	4.0655–2
1.5000+1	6.0753–5	3.0824+4	1.7113+1	3.5517+5	5.6522+4	1.5490+5	1.4375+5	4.2817+0	9.3491–1	7.7027–1	9.8722–2	6.5922–2
2.0000+1	6.0802–5	3.0799+4	2.2355+1	3.5489+5	5.6301+4	1.5507+5	1.4351+5	4.3929+0	9.7300–1	7.8199–1	9.8587–2	9.2423–2
3.0000+1	6.0797–5	3.0802+4	3.2244+1	3.5491+5	5.6148+4	1.5532+5	1.4344+5	4.5394+0	1.0506+0	8.0447–1	9.8601–2	1.4749–1
4.0000+1	6.0795–5	3.0803+4	4.1481+1	3.5493+5	5.6147+4	1.5535+5	1.4342+5	4.6321+0	1.1151+0	8.1197–1	9.8649–2	2.0447–1
5.0000+1	6.0796–5	3.0802+4	5.0195+1	3.5492+5	5.6146+4	1.5538+5	1.4339+5	4.6988+0	1.1809+0	8.1940–1	9.8685–2	2.6282–1
6.0000+1	6.0826–5	3.0787+4	5.8433+1	3.5474+5	5.6145+4	1.5540+5	1.4319+5	4.7401+0	1.2473+0	8.2679–1	9.8611–2	3.2189–1
8.0000+1	6.0902–5	3.0749+4	7.3661+1	3.5430+5	5.6144+4	1.5544+5	1.4272+5	4.7995+0	1.3817+0	8.4149–1	9.8407–2	4.4184–1
1.0000+2	6.0957–5	3.0721+4	8.7497+1	3.5398+5	5.6143+4	1.5545+5	1.4239+5	4.8408+0	1.5113+0	8.4957–1	9.8301–2	5.6342–1
1.5000+2	6.0985–5	3.0707+4	1.1749+2	3.5382+5	5.6141+4	1.5545+5	1.4223+5	4.8971+0	1.8328+0	8.5936–1	9.8189–2	8.7527–1
2.0000+2	6.0998–5	3.0700+4	1.4261+2	3.5374+5	5.6140+4	1.5545+5	1.4214+5	4.8959+0	2.1580+0	8.6914–1	9.8133–2	1.1907+0
3.0000+2	6.1004–5	3.0697+4	1.8309+2	3.5371+5	5.6138+4	1.5546+5	1.4211+5	4.8258+0	2.8113+0	8.8869–1	9.8111–2	1.8245+0
4.0000+2	6.1012–5	3.0694+4	2.1512+2	3.5367+5	5.6137+4	1.5546+5	1.4207+5	4.7427+0	3.4551+0	8.9480–1	9.8083–2	2.4622+0

Atomic Weight 6.939												Density 5.3400– 1 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+2	6.1031–5	3.0684+4	2.4166+2	3.5356+5	5.6136+4	1.5546+5	1.4196+5	4.6859+0	4.0993+0	9.0091–1	9.8009–2	3.1004+0
6.0000+2	6.1025–5	3.0687+4	2.6432+2	3.5359+5	5.6135+4	1.5546+5	1.4199+5	4.6431+0	4.7396+0	9.0702–1	9.8031–2	3.7345+0
8.0000+2	6.1024–5	3.0687+4	3.0162+2	3.5359+5	5.6134+4	1.5546+5	1.4200+5	4.6041+0	6.0376+0	9.1924–1	9.8042–2	5.0204+0
1.0000+3	6.1024–5	3.0687+4	3.3163+2	3.5359+5	5.6133+4	1.5546+5	1.4200+5	4.5869+0	7.3341+0	9.3146–1	9.8046–2	6.3046+0
1.5000+3	6.1021–5	3.0689+4	3.8816+2	3.5361+5	5.6131+4	1.5546+5	1.4202+5	4.5655+0	1.0548+1	9.4120–1	9.8060–2	9.5092+0
2.0000+3	6.1024–5	3.0687+4	4.2952+2	3.5359+5	5.6130+4	1.5546+5	1.4200+5	4.5638+0	1.3774+1	9.5094–1	9.8046–2	1.2725+1
3.0000+3	6.1024–5	3.0687+4	4.8902+2	3.5360+5	5.6128+4	1.5546+5	1.4200+5	4.5814+0	2.0257+1	9.7043–1	9.8050–2	1.9188+1
4.0000+3	6.1025–5	3.0687+4	5.3187+2	3.5359+5	5.6127+4	1.5546+5	1.4200+5	4.6055+0	2.6714+1	9.7653–1	9.8046–2	2.5640+1
5.0000+3	6.1043–5	3.0678+4	5.6538+2	3.5349+5	5.6125+4	1.5546+5	1.4190+5	4.6264+0	3.3197+1	9.8262–1	9.7976–2	3.2116+1
6.0000+3	6.1036–5	3.0681+4	5.9291+2	3.5353+5	5.6125+4	1.5546+5	1.4194+5	4.6488+0	3.9647+1	9.8872–1	9.8004–2	3.8561+1
8.0000+3	6.1034–5	3.0682+4	6.3655+2	3.5354+5	5.6123+4	1.5546+5	1.4195+5	4.6844+0	5.2628+1	1.0009+0	9.8013–2	5.1530+1
1.0000+4	6.1033–5	3.0683+4	6.7049+2	3.5354+5	5.6122+4	1.5546+5	1.4196+5	4.7121+0	6.5695+1	1.0131+0	9.8018–2	6.4584+1
1.5000+4	6.1029–5	3.0685+4	7.3252+2	3.5356+5	5.6121+4	1.5546+5	1.4198+5	4.7883+0	9.7612+1	1.0218+0	9.8032–2	9.6492+1
2.0000+4	6.1033–5	3.0683+4	7.7677+2	3.5354+5	5.6119+4	1.5546+5	1.4196+5	4.8432+0	1.2994+2	1.0305+0	9.8018–2	1.2881+2
3.0000+4	6.1029–5	3.0685+4	8.3934+2	3.5357+5	5.6118+4	1.5546+5	1.4198+5	4.9202+0	1.9396+2	1.0479+0	9.8036–2	1.9282+2
4.0000+4	6.1033–5	3.0683+4	8.8383+2	3.5354+5	5.6116+4	1.5546+5	1.4196+5	4.9755+0	2.5867+2	1.0609+0	9.8022–2	2.5751+2
5.0000+4	6.1050–5	3.0674+4	9.1837+2	3.5344+5	5.6115+4	1.5546+5	1.4186+5	5.0180+0	3.2278+2	1.0665+0	9.7953–2	3.2161+2
6.0000+4	6.1043–5	3.0678+4	9.4663+2	3.5348+5	5.6115+4	1.5546+5	1.4190+5	5.0527+0	3.8682+2	1.0722+0	9.7981–2	3.8566+2
8.0000+4	6.1040–5	3.0679+4	9.9124+2	3.5350+5	5.6113+4	1.5546+5	1.4192+5	5.1080+0	5.1604+2	1.0834+0	9.7995–2	5.1486+2
1.0000+5	6.1039–5	3.0680+4	1.0258+3	3.5351+5	5.6112+4	1.5546+5	1.4193+5	5.1508+0	6.4549+2	1.0947+0	9.7999–2	6.4429+2


July 4, 1991
Atomic Weight 9 012
EEDL Evaluated Electron
Cross Sections
4-Be
Density 1 848 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
4-Be


July 4, 1991
Atomic Weight 9 012
EEDL Evaluated Electron
Energy Deposition
4-Be
Density 1 848 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
4-Be

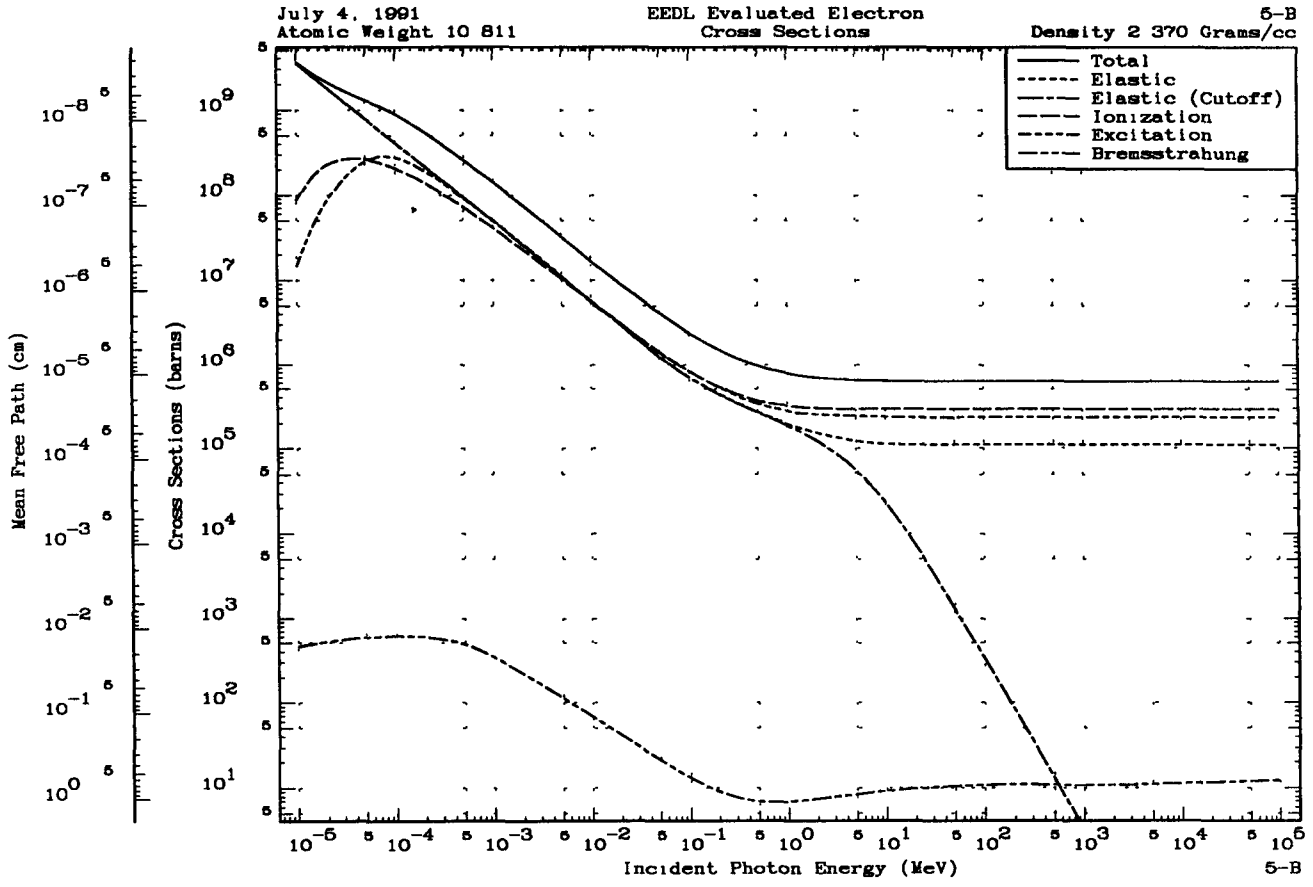

July 4, 1991
Atomic Weight 9 012
EEDL Evaluated Electron
Shell Cross Sections
4-Be
Density 1 848 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
4-Be


July 4, 1991
Atomic Weight 9 012
EEDL Evaluated Electron
Energy Deposition
4-Be
Density 1 848 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
4-Be

Atomic Weight 9.012 Density 1.848 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	2.3786–9	2.2750+8		3.4045+9	3.3476+9	4.6424+7	1.0444+7	3.2294+2	6.0662+1	4.9545+1	1.1117+1	8.5737–5
1.1250–5	2.6293–9	2.0581+8		3.0799+9	2.9907+9	7.0710+7	1.8449+7	3.2994+2	9.8437+1	7.8203+1	2.0234+1	9.5750–5
1.2187–5	2.8109–9	1.9251+8		2.8810+9	2.7703+9	8.6117+7	2.4562+7	3.3478+2	1.2528+2	9.7744+1	2.7533+1	1.0336–4
1.3594–5	3.0725–9	1.7612+8		2.6357+9	2.4952+9	1.0629+8	3.4120+7	3.4150+2	1.6477+2	1.2528+2	3.9487+1	1.1493–4
1.5000–5	3.3222–9	1.6288+8		2.4375+9	2.2709+9	1.2295+8	4.3684+7	3.4767+2	2.0220+2	1.5006+2	5.2142+1	1.2668–4
1.7500–5	3.7387–9	1.4474+8		2.1660+9	1.9594+9	1.4585+8	6.0769+7	3.5756+2	2.6382+2	1.8803+2	7.5792+1	1.4796–4
2.0000–5	4.1226–9	1.3126+8		1.9643+9	1.7243+9	1.6212+8	7.7851+7	3.6636+2	3.2140+2	2.2013+2	1.0127+2	1.6971–4
2.2500–5	4.4825–9	1.2072+8		1.8066+9	1.5405+9	1.7211+8	9.4014+7	3.7243+2	3.6990+2	2.4402+2	1.2588+2	1.8923–4
2.5000–5	4.8103–9	1.1249+8		1.6835+9	1.3927+9	1.8156+8	1.0922+8	3.7794+2	4.1871+2	2.6831+2	1.5040+2	2.0899–4
2.6250–5	4.9681–9	1.0892+8		1.6300+9	1.3292+9	1.8375+8	1.1707+8	3.8052+2	4.3976+2	2.7632+2	1.6344+2	2.1895–4
3.0000–5	5.4105–9	1.0001+8		1.4967+9	1.1697+9	1.8989+8	1.3713+8	3.8767+2	4.9962+2	3.0032+2	1.9930+2	2.4915–4
3.5000–5	5.9611–9	9.0776+7		1.3585+9	1.0094+9	1.9284+8	1.5624+8	3.9585+2	5.5546+2	3.2128+2	2.3418+2	2.8963–4
4.0000–5	6.4533–9	8.3852+7		1.2549+9	8.8841+8	1.9151+8	1.7494+8	4.0306+2	6.0540+2	3.3525+2	2.7015+2	3.3078–4
5.0000–5	7.3710–9	7.3413+7		1.0986+9	7.1774+8	1.8447+8	1.9642+8	4.1154+2	6.6288+2	3.4775+2	3.1513+2	4.0629–4
5.5000–5	7.7973–9	6.9399+7		1.0386+9	6.5524+8	1.7913+8	2.0420+8	4.1442+2	6.7955+2	3.4755+2	3.3200+2	4.4264–4
6.0000–5	8.2287–9	6.5761+7		9.8412+8	6.0294+8	1.7438+8	2.0680+8	4.1707+2	6.8863+2	3.4796+2	3.4068+2	4.7919–4
7.0000–5	9.0489–9	5.9800+7		8.9492+8	5.2032+8	1.6341+8	2.1119+8	4.2179+2	6.9441+2	3.4027+2	3.5414+2	5.5283–4
8.0000–5	9.8634–9	5.4862+7		8.2102+8	4.5797+8	1.5447+8	2.0859+8	4.2593+2	6.9100+2	3.3506+2	3.5594+2	6.2713–4
1.0000–4	1.1436–8	4.7319+7	0.0000+0	7.0813+8	3.6999+8	1.3726+8	2.0089+8	4.2804+2	6.6691+2	3.1599+2	3.5091+2	7.6230–4
K 1.1836–4	1.2915–8	4.1899+7	2.8323–8	6.2703+8	3.1505+8	1.2399+8	1.8799+8	4.2616+2	6.2993+2	2.9739+2	3.3254+2	8.7475–4
1.2034–4	1.3072–8	4.1396+7	3.1470–8	6.1950+8	3.1011+8	1.2275+8	1.8664+8	4.2598+2	6.2710+2	2.9643+2	3.3067+2	8.8684–4
1.2404–4	1.3364–8	4.0492+7	3.7405–8	6.0597+8	3.0126+8	1.2051+8	1.8420+8	4.2564+2	6.2200+2	2.9471+2	3.2729+2	9.0949–4
1.2729–4	1.3617–8	3.9740+7	4.2640–8	5.9471+8	2.9393+8	1.1863+8	1.8215+8	4.2535+2	6.1776+2	2.9329+2	3.2447+2	9.2930–4
1.3297–4	1.4054–8	3.8504+7	5.1882–8	5.7621+8	2.8195+8	1.1553+8	1.7873+8	4.2487+2	6.1075+2	2.9096+2	3.1979+2	9.6394–4
1.4027–4	1.4607–8	3.7046+7	6.3922–8	5.5440+8	2.6794+8	1.1183+8	1.7463+8	4.2428+2	6.0242+2	2.8818+2	3.1423+2	1.0084–3
1.4148–4	1.4706–8	3.6795+7	6.5940–8	5.5064+8	2.6574+8	1.1126+8	1.7365+8	4.2418+2	6.0063+2	2.8788+2	3.1276+2	1.0158–3
1.5000–4	1.5400–8	3.5137+7	8.0268–8	5.2583+8	2.5133+8	1.0738+8	1.6712+8	4.2353+2	5.8814+2	2.8516+2	3.0299+2	1.0677–3
1.6250–4	1.6404–8	3.2988+7	1.0188–7	4.9367+8	2.3286+8	1.0178+8	1.5903+8	4.2110+2	5.6897+2	2.7889+2	2.9008+2	1.1375–3
1.8125–4	1.7874–8	3.0274+7	1.3556–7	4.5305+8	2.0983+8	9.4602+7	1.4862+8	4.1781+2	5.4457+2	2.7100+2	2.7356+2	1.2416–3
2.0000–4	1.9308–8	2.8026+7	1.7065–7	4.1942+8	1.9103+8	8.8568+7	1.3982+8	4.1486+2	5.2412+2	2.6442+2	2.5969+2	1.3450–3
2.2500–4	2.1332–8	2.5366+7	2.1985–7	3.7961+8	1.7073+8	8.1276+7	1.2760+8	4.0549+2	4.9243+2	2.5349+2	2.3894+2	1.4520–3
2.6250–4	2.4303–8	2.2266+7	2.9908–7	3.3321+8	1.4739+8	7.2615+7	1.1321+8	3.9355+2	4.5474+2	2.4017+2	2.1457+2	1.6093–3
3.0000–4	2.7203–8	1.9892+7	3.8433–7	2.9768+8	1.2977+8	6.5856+7	1.0206+8	3.8349+2	4.2538+2	2.2961+2	1.9577+2	1.7631–3
3.5000–4	3.1079–8	1.7411+7	5.0707–7	2.6056+8	1.1207+8	5.8417+7	9.0074+7	3.7065+2	3.8981+2	2.1509+2	1.7472+2	1.9524–3
4.0000–4	3.4877–8	1.5515+7	6.4015–7	2.3219+8	9.8708+7	5.2645+7	8.0834+7	3.5988+2	3.6196+2	2.0342+2	1.5855+2	2.1368–3
5.0000–4	4.2463–8	1.2743+7	9.3536–7	1.9071+8	7.9847+7	4.3996+7	6.6863+7	3.3086+2	3.1655+2	1.8322+2	1.3333+2	2.3816–3
6.0000–4	4.9976–8	1.0828+7	1.2697–6	1.6204+8	6.7145+7	3.7871+7	5.7022+7	3.0616+2	2.8232+2	1.6711+2	1.1521+2	2.5808–3
8.0000–4	6.4669–8	8.3676+6	2.0458–6	1.2522+8	5.1084+7	2.9750+7	4.4388+7	2.6279+2	2.3455+2	1.4304+2	9.1504+1	2.8263–3
1.0000–3	7.9013–8	6.8486+6	2.9632–6	1.0249+8	4.1323+7	2.4585+7	3.6582+7	2.2885+2	2.0226+2	1.2573+2	7.6530+1	2.9531–3
1.2500–3	9.7084–8	5.5738+6	4.3005–6	8.3412+7	3.3419+7	2.0245+7	2.9747+7	1.9716+2	1.7241+2	1.0936+2	6.3045+1	3.0138–3
1.5000–3	1.1486–7	4.7110+6	5.8447–6	7.0501+7	2.8098+7	1.7280+7	2.5123+7	1.7454+2	1.5182+2	9.7886+1	5.3930+1	3.0840–3
2.0000–3	1.5005–7	3.6063+6	9.4952–6	5.3968+7	2.1326+7	1.3411+7	1.9231+7	1.4348+2	1.2312+2	8.1107+1	4.2009+1	3.1683–3
3.0000–3	2.2028–7	2.4566+6	1.8929–5	3.6763+7	1.4361+7	9.3468+6	1.3055+7	1.0776+2	9.0549+1	6.1359+1	2.9186+1	3.2376–3
4.0000–3	2.9012–7	1.8652+6	3.1261–5	2.7913+7	1.0848+7	7.2225+6	9.8421+6	8.7514+1	7.2320+1	4.9968+1	2.2349+1	3.2691–3
5.0000–3	3.5955–7	1.5050+6	4.6352–5	2.2523+7	8.7447+6	5.9116+6	7.8663+6	7.4324+1	6.0551+1	4.2476+1	1.8071+1	3.2879–3
6.0000–3	4.2888–7	1.2617+6	6.4112–5	1.8882+7	7.3328+6	5.0174+6	6.5314+6	6.4968+1	5.2270+1	3.7123+1	1.5143+1	3.2939–3
8.0000–3	5.6735–7	9.5377+5	1.0704–4	1.4273+7	5.5532+6	3.8737+6	4.8464+6	5.2477+1	4.1333+1	2.9934+1	1.1395+1	3.3001–3
1.0000–2	7.0666–7	7.6575+5	1.6001–4	1.1460+7	4.4584+6	3.1709+6	3.8303+6	4.4637+1	3.4392+1	2.5287+1	9.1019+0	3.3062–3
1.5000–2	1.0283–6	5.2624+5	3.2968–4	7.8752+6	2.9939+6	2.2080+6	2.6733+6	3.3041+1	2.5039+1	1.8565+1	6.4708+0	3.3251–3
2.0000–2	1.3351–6	4.0529+5	5.5261–4	6.0653+6	2.2764+6	1.7126+6	2.0762+6	2.6708+1	2.0006+1	1.4914+1	5.0891+0	3.3358–3
2.6250–2	1.7015–6	3.1802+5	8.9938–4	4.7593+6	1.7759+6	1.3528+6	1.6306+6	2.1924+1	1.6177+1	1.2133+1	4.0402+0	3.3484–3
3.0000–2	1.9110–6	2.8316+5	1.1430–3	4.2375+6	1.5721+6	1.2049+6	1.4606+6	1.9899+1	1.4631+1	1.0985+1	3.6424+0	3.3714–3
4.0000–2	2.4473–6	2.2111+5	1.9034–3	3.3089+6	1.2202+6	9.4501+5	1.1437+6	1.6198+1	1.1776+1	8.8867+0	2.8863+0	3.4056–3
4.5000–2	2.7130–6	1.9946+5	2.3473–3	2.9849+6	1.1026+6	8.5780+5	1.0245+6	1.4908+1	1.0763+1	8.1629+0	2.5970+0	3.4263–3
5.0000–2	2.9517–6	1.8333+5	2.8293–3	2.7435+6	1.0071+6	7.8665+5	9.4982+5	1.3842+1	9.9931+0	7.5713+0	2.4184+0	3.4521–3
6.0000–2	3.4288–6	1.5782+5	3.8971–3	2.3617+6	8.6355+5	6.7989+5	8.1829+5	1.2183+1	8.7636+0	6.6615+0	2.0987+0	3.4897–3
8.0000–2	4.3114–6	1.2551+5	6.4137–3	1.8783+6	6.8176+5	5.4503+5	6.5146+5	1.0019+1	7.1834+0	5.4901+0	1.6897+0	3.5741–3
1.0000–1	5.1108–6	1.0588+5	9.4066–3	1.5845+6	5.7150+5	4.6334+5	5.4964+5	8.6779+0	6.2055+0	4.7640+0	1.4378+0	3.6662–3
1.5000–1	6.7315–6	8.0387+4	1.8446–2	1.2030+6	4.2307+5	3.5367+5	4.2624+5	6.8711+0	4.9077+0	3.7717+0	1.1321+0	3.9308–3
2.0000–1	8.0540–6	6.7188+4	2.9401–2	1.0055+6	3.4730+5	2.9881+5	3.5935+5	5.9914+0	4.2373+0	3.2685+0	9.6458–1	4.2323–3
3.0000–1	1.0044–5	5.3873+4	5.5068–2	8.0622+5	2.6916+5	2.4461+5	2.9245+5	5.1835+0	3.5735+0	2.7717+0	7.9686–1	4.9295–3
4.0000–1	1.1493–5	4.7084+4	8.4380–2	7.0461+5	2.2768+5	2.1829+5	2.5863+5	4.8511+0	3.2547+0	2.5367+0	7.1229–1	5.7281–3
5.0000–1	1.2624–5	4.2866+4	1.1601–1	6.4149+5	2.0172+5	2.0308+5	2.3668+5	4.7009+0	3.0709+0	2.4069+0	6.5733–1	6.6048–3
6.0000–1	1.3557–5	3.9916+4	1.4921–1	5.9734+5	1.8384+5	1.9337+5	2.2013+5	4.6463+0	2.9526+0	2.3295+0	6.1560–1	7.5597–3
8.0000–1	1.4921–5	3.6266+4	2.1844–1	5.4273+5	1.6012+5	1.8202+5	2.0058+5	4.6571+0	2.8266+0	2.2499+0	5.6705–1	9.6514–3
1.0000+0	1.5914–5	3.4003+4	2.8998–1	5.0885+5	1.4526+5	1.7586+5	1.8772+5	4.7268+0	2.7646+0	2.2175+0	5.3509–1	1.1923–2
1.5000+0	1.7474–5	3.0967+4	4.7210–1	4.6342+5	1.2412+5	1.6917+5	1.7012+5	4.9623+0	2.7265+0	2.2164+0	4.9181–1	1.8328–2
2.0000+0	1.8373–5	2.9453+4	6.5556–1	4.4077+5	1.1261+5	1.6704+5	1.6111+5	5.1748+0	2.7241+0	2.2306+0	4.6804–1	2.5465–2
3.0000+0	1.9472–5	2.7790+4	1.0199+0	4.1588+5	1.0053+5	1.6469+5	1.5065+5	5.5092+0	2.7659+0	2.2825+0	4.4205–1	4.1352–2
4.0000+0	2.0065–5	2.6968+4	1.3783+0	4.0359+5	9.4165+4	1.6451+5	1.4490+5	5.7459+0	2.8138+0	2.3254+0	4.2953–1	5.8858–2
5.0000+0	2.0417–5	2.6504+4	1.7306+0	3.9664+5	9.0358+4	1.6438+5	1.4189+5	5.9260+0	2.8638+0	2.3651+0	4.2140–1	7.7230–2
6.0000+0	2.0619–5	2.6244+4	2.0770+0	3.9275+5	8.7962+4	1.6416+5	1.4062+5	6.0687+0	2.9095+0	2.3948+0	4.1841–1	9.6293–2
8.0000+0	2.0877–5	2.5920+4	2.7551+0	3.8789+5	8.5085+4	1.6428+5	1.3852+5	6.3009+0	2.9902+0	2.4397+0	4.1373–1	1.3675–1
1.0000+1	2.1040–5	2.5718+4	3.4150+0	3.8488+5	8.3700+4	1.6438+5	1.3679+5	6.4648+0	3.0712+0	2.4821+0	4.1014–1	1.7897–1
1.5000+1	2.1156–5	2.5578+4	5.0049+0	3.8278+5	8.2885+4	1.6447+5	1.3542+5	6.7245+0	3.2198+0	2.5240+0	4.0614–1	2.8963–1
2.0000+1	2.1165–5	2.5567+4	6.5213+0	3.8262+5	8.2567+4	1.6453+5	1.3551+5	6.8969+0	3.3760+0	2.5642+0	4.0654–1	4.0527–1
3.0000+1	2.1168–5	2.5563+4	9.3518+0	3.8256+5	8.2307+4	1.6462+5	1.3563+5	7.1179+0	3.6947+0	2.6420+0	4.0711–1	6.4559–1
4.0000+1	2.1165–5	2.5567+4	1.1962+1	3.8261+5	8.2295+4	1.6463+5	1.3568+5	7.2562+0	3.9703+0	2.6683+0	4.0751–1	8.9454–1
5.0000+1	2.1160–5	2.5573+4	1.4396+1	3.8270+5	8.2294+4	1.6464+5	1.3576+5	7.3535+0	4.2515+0	2.6944+0	4.0798–1	1.1491+0
6.0000+1	2.1156–5	2.5578+4	1.6673+1	3.8278+5	8.2292+4	1.6465+5	1.3583+5	7.4163+0	4.5354+0	2.7204+0	4.0843–1	1.4066+0

Atomic Weight 9.012												Density 1.848 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+1	2.1151–5	2.5584+4	2.0824+1	3.8287+5	8.2291+4	1.6466+5	1.3591+5	7.5086+0	5.1104+0	2.7721+0	4.0915–1	1.9291+0
1.0000+2	2.1164–5	2.5569+4	2.4539+1	3.8264+5	8.2289+4	1.6466+5	1.3568+5	7.5750+0	5.6683+0	2.8007+0	4.0893–1	2.4586+0
1.5000+2	2.1168–5	2.5564+4	3.2427+1	3.8256+5	8.2287+4	1.6467+5	1.3560+5	7.6743+0	7.0596+0	2.8354+0	4.0870–1	3.8155+0
2.0000+2	2.1170–5	2.5560+4	3.8885+1	3.8251+5	8.2285+4	1.6467+5	1.3555+5	7.6912+0	8.4674+0	2.8701+0	4.0856–1	5.1887+0
3.0000+2	2.1171–5	2.5559+4	4.9070+1	3.8250+5	8.2282+4	1.6467+5	1.3554+5	7.6175+0	1.1307+1	2.9395+0	4.0852–1	7.9587+0
4.0000+2	2.1173–5	2.5558+4	5.6976+1	3.8247+5	8.2280+4	1.6467+5	1.3552+5	7.5325+0	1.4093+1	2.9612+0	4.0846–1	1.0724+1
5.0000+2	2.1177–5	2.5552+4	6.3452+1	3.8239+5	8.2279+4	1.6467+5	1.3543+5	7.4606+0	1.6873+1	2.9829+0	4.0821–1	1.3481+1
6.0000+2	2.1176–5	2.5554+4	6.8932+1	3.8242+5	8.2277+4	1.6467+5	1.3546+5	7.4262+0	1.9692+1	3.0046+0	4.0830–1	1.6280+1
8.0000+2	2.1175–5	2.5555+4	7.7865+1	3.8243+5	8.2276+4	1.6467+5	1.3548+5	7.3861+0	2.5325+1	3.0480+0	4.0836–1	2.1869+1
1.0000+3	2.1175–5	2.5555+4	8.4994+1	3.8243+5	8.2274+4	1.6467+5	1.3548+5	7.3695+0	3.0970+1	3.0914+0	4.0839–1	2.7470+1
1.5000+3	2.1174–5	2.5556+4	9.8321+1	3.8245+5	8.2271+4	1.6467+5	1.3550+5	7.3705+0	4.4931+1	3.1260+0	4.0843–1	4.1396+1
2.0000+3	2.1175–5	2.5555+4	1.0801+2	3.8243+5	8.2270+4	1.6467+5	1.3548+5	7.3851+0	5.8956+1	3.1606+0	4.0839–1	5.5387+1
3.0000+3	2.1174–5	2.5556+4	1.2188+2	3.8245+5	8.2267+4	1.6467+5	1.3550+5	7.4300+0	8.7063+1	3.2298+0	4.0846–1	8.3425+1
4.0000+3	2.1175–5	2.5555+4	1.3183+2	3.8244+5	8.2265+4	1.6467+5	1.3549+5	7.4728+0	1.1516+2	3.2515+0	4.0842–1	1.1150+2
5.0000+3	2.1179–5	2.5550+4	1.3960+2	3.8236+5	8.2264+4	1.6467+5	1.3541+5	7.5196+0	1.4328+2	3.2732+0	4.0819–1	1.3960+2
6.0000+3	2.1177–5	2.5552+4	1.4597+2	3.8240+5	8.2262+4	1.6467+5	1.3546+5	7.5580+0	1.7156+2	3.2948+0	4.0831–1	1.6785+2
8.0000+3	2.1176–5	2.5553+4	1.5605+2	3.8241+5	8.2261+4	1.6467+5	1.3547+5	7.6236+0	2.2778+2	3.3381+0	4.0835–1	2.2404+2
1.0000+4	2.1176–5	2.5554+4	1.6391+2	3.8241+5	8.2259+4	1.6467+5	1.3548+5	7.6798+0	2.8364+2	3.3814+0	4.0837–1	2.7985+2
1.5000+4	2.1175–5	2.5555+4	1.7824+2	3.8243+5	8.2257+4	1.6467+5	1.3550+5	7.7948+0	4.2311+2	3.4133+0	4.0843–1	4.1929+2
2.0000+4	2.1176–5	2.5554+4	1.8845+2	3.8242+5	8.2255+4	1.6467+5	1.3549+5	7.8844+0	5.6329+2	3.4452+0	4.0841–1	5.5944+2
3.0000+4	2.1175–5	2.5555+4	2.0286+2	3.8244+5	8.2252+4	1.6467+5	1.3550+5	8.0108+0	8.4335+2	3.5089+0	4.0846–1	8.3943+2
4.0000+4	2.1175–5	2.5555+4	2.1310+2	3.8243+5	8.2250+4	1.6467+5	1.3550+5	8.1002+0	1.1230+3	3.5488+0	4.0845–1	1.1190+3
5.0000+4	2.1180–5	2.5549+4	2.2104+2	3.8234+5	8.2249+4	1.6467+5	1.3541+5	8.1702+0	1.4053+3	3.5692+0	4.0819–1	1.4013+3
6.0000+4	2.1178–5	2.5551+4	2.2754+2	3.8238+5	8.2247+4	1.6467+5	1.3546+5	8.2266+0	1.6837+3	3.5897+0	4.0831–1	1.6797+3
8.0000+4	2.1177–5	2.5553+4	2.3779+2	3.8240+5	8.2246+4	1.6467+5	1.3547+5	8.3160+0	2.2431+3	3.6306+0	4.0836–1	2.2390+3
1.0000+5	2.1177–5	2.5553+4	2.4575+2	3.8240+5	8.2244+4	1.6467+5	1.3548+5	8.3860+0	2.8076+3	3.6714+0	4.0839–1	2.8036+3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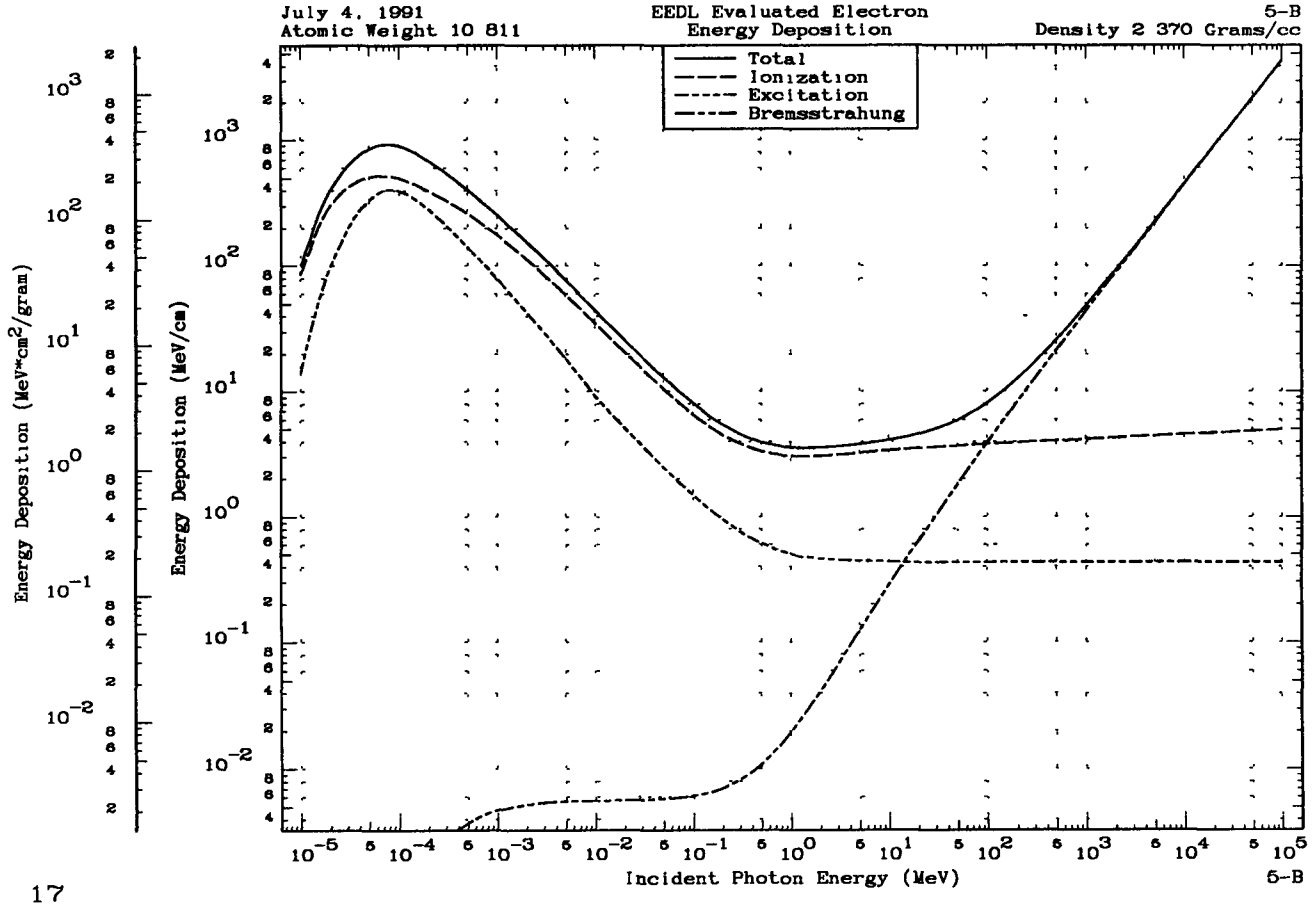
EEDL Evaluated Electron
Cross Sections
5-B
Density 2 370 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
5-B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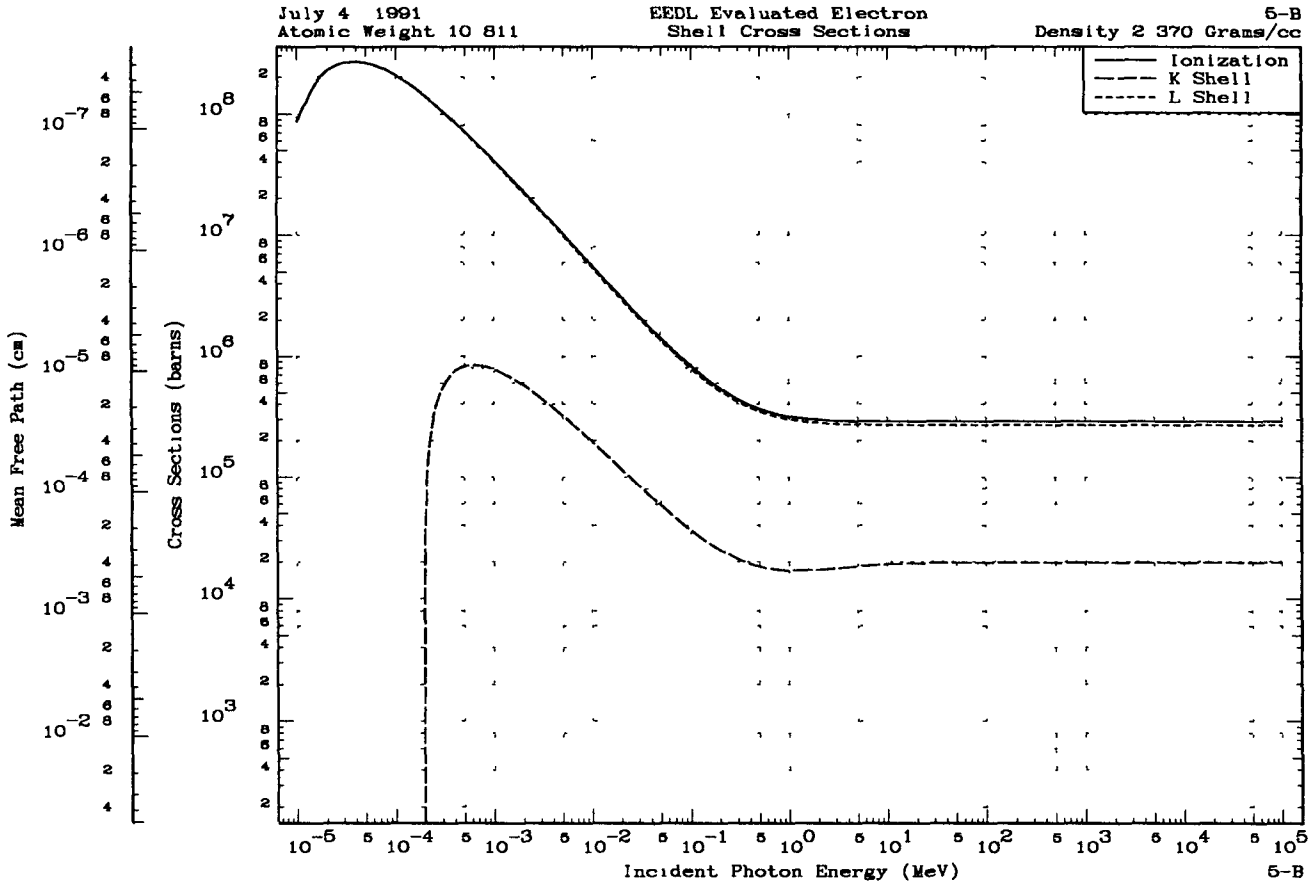
EEDL Evaluated Electron
Energy Deposition
5-B
Density 2 370 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
5-B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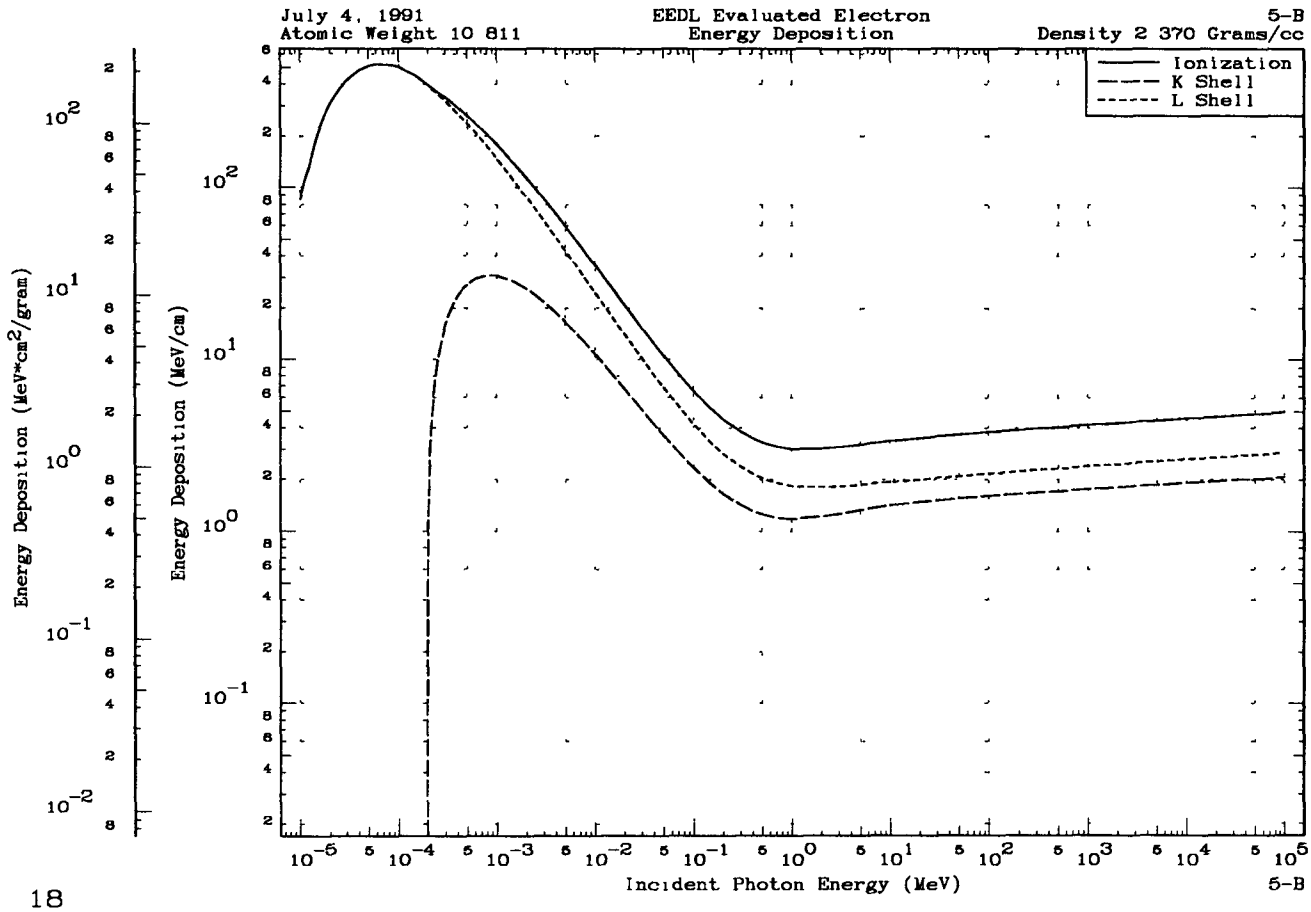
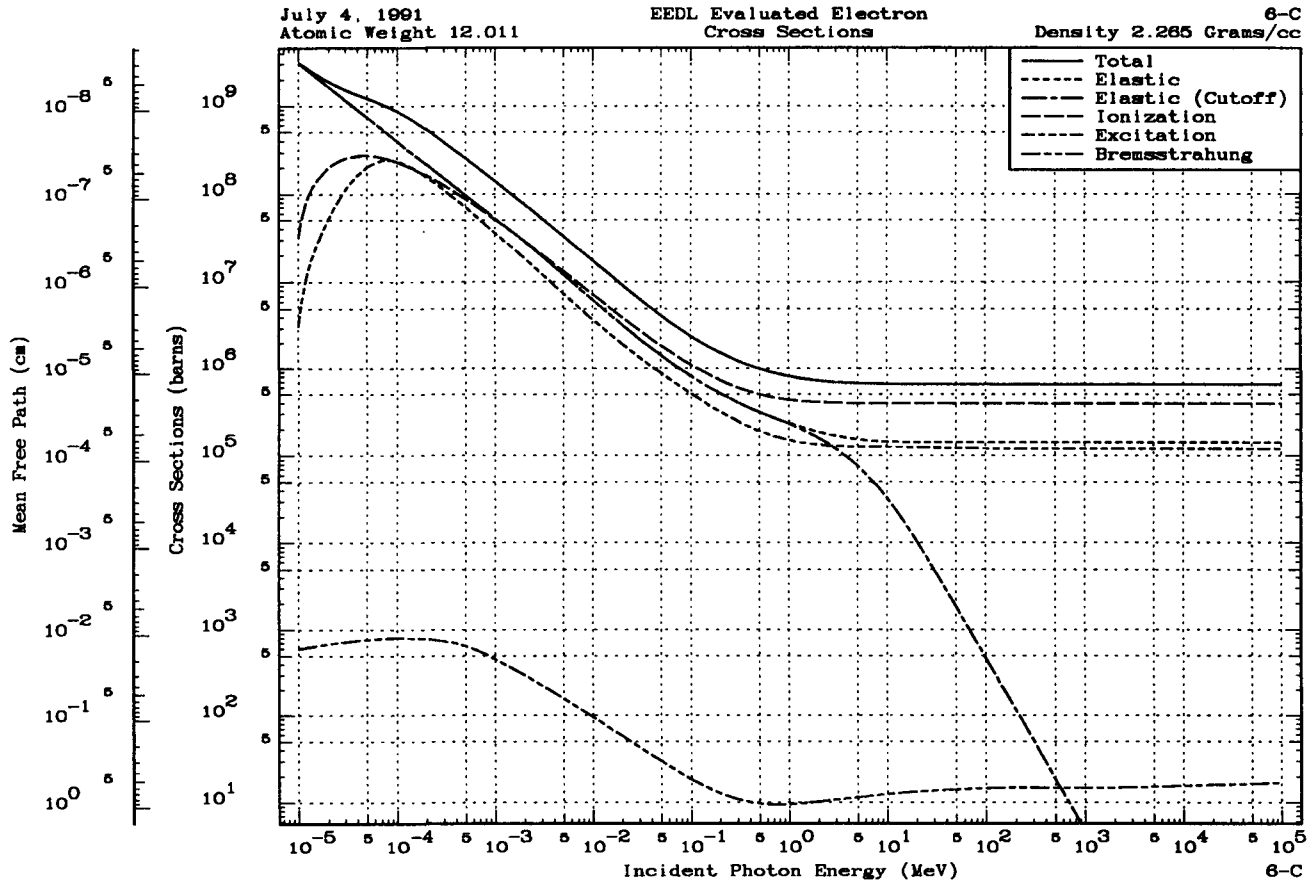
Atomic Weight 10 811
EEDL Evaluated Electron
Shell Cross Sections
5-B
Density 2 370 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
5-B


July 4, 1991
Atomic Weight 10 811
EEDL Evaluated Electron
Energy Deposition
5-B
Density 2 370 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
5-B

Atomic Weight 10.811 — Density 2.370 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	2.1009–9	2.0084+8		3.6055+9	3.5047+9	8.6347+7	1.4452+7	4.5815+2	9.9420+1	8.5237+1	1.4183+1	1.3007–4
	1.1250–5	2.3146–9	1.8230+8		3.2726+9	3.1425+9	1.0914+8	2.0942+7	4.6812+2	1.3302+2	1.1176+2	2.1266+1	1.4528–4
L1	1.2580–5	2.5327–9	1.6660+8		2.9908+9	2.8336+9	1.2841+8	2.8797+7	4.7778+2	1.6680+2	1.3651+2	3.0290+1	1.6172–4
	1.2731–5	2.5556–9	1.6510+8		2.9639+9	2.8024+9	1.3181+8	2.9726+7	4.7883+2	1.7270+2	1.4134+2	3.1366+1	1.6361–4
	1.3015–5	2.5981–9	1.6240+8		2.9155+9	2.7458+9	1.3813+8	3.1515+7	4.8076+2	1.8384+2	1.5039+2	3.3453+1	1.6715–4
	1.3125–5	2.6146–9	1.6138+8		2.8971+9	2.7245+9	1.4037+8	3.2228+7	4.8150+2	1.8784+2	1.5355+2	3.4289+1	1.6854–4
	1.3511–5	2.6724–9	1.5789+8		2.8344+9	2.6523+9	1.4733+8	3.4805+7	4.8406+2	2.0165+2	1.6432+2	3.7329+1	1.7339–4
	1.4256–5	2.7809–9	1.5173+8		2.7238+9	2.5237+9	1.5994+8	4.0130+7	4.8883+2	2.2786+2	1.8416+2	4.3703+1	1.8279–4
	1.5000–5	2.8856–9	1.4622+8		2.6250+9	2.4075+9	1.7219+8	4.5264+7	4.9340+2	2.5395+2	2.0391+2	5.0043+1	1.9227–4
	1.6250–5	3.0573–9	1.3801+8		2.4776+9	2.2355+9	1.8820+8	5.3880+7	5.0067+2	2.9250+2	2.3181+2	6.0686+1	2.0835–4
	1.7500–5	3.2185–9	1.3110+8		2.3535+9	2.0872+9	2.0291+8	6.3312+7	5.0750+2	3.3116+2	2.5854+2	7.2625+1	2.2462–4
	1.8125–5	3.2966–9	1.2799+8		2.2977+9	2.0205+9	2.0892+8	6.8337+7	5.1076+2	3.4977+2	2.7067+2	7.9099+1	2.3282–4
	2.0000–5	3.5194–9	1.1989+8		2.1523+9	1.8444+9	2.2487+8	8.2953+7	5.2004+2	4.0314+2	3.0454+2	9.8600+1	2.5768–4
	2.2500–5	3.7986–9	1.1108+8		1.9941+9	1.6538+9	2.3871+8	1.0153+8	5.2874+2	4.6292+2	3.3977+2	1.2315+2	2.8740–4
	2.5000–5	4.0539–9	1.0408+8		1.8685+9	1.5001+9	2.5018+8	1.1824+8	5.3666+2	5.1849+2	3.7222+2	1.4628+2	3.1748–4
	2.6250–5	4.1739–9	1.0109+8		1.8148+9	1.4338+9	2.5409+8	1.2688+8	5.4036+2	5.4427+2	3.8576+2	1.5851+2	3.3266–4
	3.0000–5	4.4978–9	9.3811+7		1.6841+9	1.2670+9	2.6319+8	1.5389+8	5.5063+2	6.1965+2	4.2180+2	1.9786+2	3.7867–4
	3.5000–5	4.8830–9	8.6410+7		1.5512+9	1.0986+9	2.6711+8	1.8556+8	5.6238+2	6.9683+2	4.5359+2	2.4324+2	4.4035–4
	4.0000–5	5.2252–9	8.0752+7		1.4497+9	9.7086+8	2.6919+8	2.0961+8	5.7276+2	7.6186+2	4.8181+2	2.8005+2	5.0307–4
	5.0000–5	5.8217–9	7.2478+7		1.3011+9	7.8974+8	2.6329+8	2.4810+8	5.8516+2	8.4980+2	5.1076+2	3.3905+2	6.1853–4
	6.0000–5	6.3433–9	6.6518+7		1.1941+9	6.6714+8	2.5299+8	2.7400+8	5.9336+2	9.0064+2	5.2234+2	3.7830+2	7.3019–4
	7.0000–5	6.8540–9	6.1561+7		1.1051+9	5.7845+8	2.4013+8	2.8656+8	6.0038+2	9.1977+2	5.1926+2	4.0051+2	8.4305–4
	8.0000–5	7.3647–9	5.7292+7		1.0285+9	5.1122+8	2.2961+8	2.8769+8	6.0654+2	9.2597+2	5.1900+2	4.0697+2	9.5698–4
	1.0000–4	8.4008–9	5.0226+7	0.0000+0	9.0167+8	4.1585+8	2.0811+8	2.7772+8	6.1019+2	8.9941+2	5.0145+2	3.9795+2	1.1653–3
	1.2500–4	9.7310–9	4.3360+7	2.8765–8	7.7841+8	3.3839+8	1.8424+8	2.5578+8	6.0750+2	8.3947+2	4.6912+2	3.7035+2	1.4025–3
	1.5000–4	1.1062–8	3.8144+7	5.9568–8	6.8476+8	2.8594+8	1.6681+8	2.3201+8	6.0531+2	7.8441+2	4.4501+2	3.3941+2	1.6389–3
K	1.9561–4	1.3510–8	3.1233+7	1.2158–7	5.6069+8	2.2375+8	1.4106+8	1.9588+8	5.9666+2	6.8873+2	3.9875+2	2.8998+2	2.0418–3
	1.9780–4	1.3627–8	3.0963+7	1.2477–7	5.5584+8	2.2146+8	1.4009+8	1.9430+8	5.9545+2	6.8533+2	3.9749+2	2.8783+2	2.0569–3
	2.0000–4	1.3745–8	3.0698+7	1.2798–7	5.5109+8	2.1921+8	1.3913+8	1.9275+8	5.9425+2	6.8199+2	3.9626+2	2.8573+2	2.0720–3
	2.0625–4	1.4086–8	2.9955+7	1.3722–7	5.3775+8	2.1307+8	1.3621+8	1.8847+8	5.9093+2	6.7075+2	3.9104+2	2.7970+2	2.1149–3
	2.1211–4	1.4403–8	2.9295+7	1.4602–7	5.2590+8	2.0763+8	1.3361+8	1.8466+8	5.8793+2	6.6074+2	3.8640+2	2.7434+2	2.1549–3
	2.2310–4	1.4994–8	2.8142+7	1.6288–7	5.0520+8	1.9816+8	1.2905+8	1.7799+8	5.8255+2	6.4323+2	3.7829+2	2.6494+2	2.2295–3
	2.4232–4	1.6011–8	2.6353+7	1.9342–7	4.7309+8	1.8359+8	1.2191+8	1.6758+8	5.7385+2	6.1605+2	3.6575+2	2.5030+2	2.3588–3
	2.5674–4	1.6763–8	2.5171+7	2.1717–7	4.5188+8	1.7405+8	1.1716+8	1.6067+8	5.6784+2	5.9808+2	3.5749+2	2.4059+2	2.4548–3
	2.7308–4	1.7603–8	2.3969+7	2.4492–7	4.3030+8	1.6441+8	1.1229+8	1.5361+8	5.6150+2	5.7968+2	3.4900+2	2.3067+2	2.5626–3
	2.7837–4	1.7888–8	2.3588+7	2.5409–7	4.2346+8	1.6152+8	1.1082+8	1.5112+8	5.5955+2	5.7371+2	3.4655+2	2.2715+2	2.5973–3
	3.0000–4	1.9041–8	2.2160+7	2.9256–7	3.9781+8	1.5073+8	1.0526+8	1.4182+8	5.5198+2	5.5108+2	3.3711+2	2.1397+2	2.7381–3
	3.2500–4	2.0368–8	2.0716+7	3.3902–7	3.7190+8	1.4001+8	9.9236+7	1.3266+8	5.4286+2	5.2525+2	3.2451+2	2.0074+2	2.8908–3
	3.6250–4	2.2326–8	1.8899+7	4.1273–7	3.3927+8	1.2660+8	9.1565+7	1.2111+8	5.3066+2	4.9260+2	3.0854+2	1.8405+2	3.1161–3
	4.0000–4	2.4252–8	1.7398+7	4.9104–7	3.1234+8	1.1562+8	8.5158+7	1.1156+8	5.1990+2	4.6544+2	2.9516+2	1.7028+2	3.3373–3
	4.5000–4	2.6843–8	1.5719+7	6.0249–7	2.8219+8	1.0373+8	7.7801+7	1.0065+8	4.9838+2	4.3218+2	2.7789+2	1.5429+2	3.5438–3
	5.0000–4	2.9394–8	1.4355+7	7.2198–7	2.5770+8	9.4133+7	7.1758+7	9.1808+7	4.7989+2	4.0503+2	2.6371+2	1.4133+2	3.7442–3
	6.0000–4	3.4403–8	1.2265+7	9.8346–7	2.2018+8	7.9577+7	6.2180+7	7.8420+7	4.4563+2	3.6069+2	2.3916+2	1.2152+2	4.0808–3
	8.0000–4	4.4119–8	9.5636+6	1.5914–6	1.7169+8	6.1049+7	4.9342+7	6.1296+7	3.8497+2	2.9915+2	2.0321+2	9.5939+1	4.5165–3
	1.0000–3	5.3525–8	7.8831+6	2.3109–6	1.4152+8	4.9703+7	4.1086+7	5.0728+7	3.3708+2	2.5783+2	1.7785+2	7.9979+1	4.7615–3
	1.2500–3	6.5362–8	6.4555+6	3.3600–6	1.1589+8	4.0460+7	3.4084+7	4.1345+7	2.9195+2	2.1978+2	1.5417+2	6.5597+1	4.9052–3
	1.5000–3	7.6945–8	5.4837+6	4.5711–6	9.8444+7	3.4199+7	2.9262+7	3.4982+7	2.5960+2	1.9362+2	1.3777+2	5.5850+1	5.0562–3
	2.0000–3	9.9623–8	4.2354+6	7.4318–6	7.6034+7	2.6193+7	2.2903+7	2.6938+7	2.1470+2	1.5721+2	1.1384+2	4.3367+1	5.2500–3
	3.0000–3	1.4437–7	2.9227+6	1.4809–5	5.2469+7	1.7861+7	1.6141+7	1.8467+7	1.6231+2	1.1599+2	8.5927+1	3.0059+1	5.4286–3
	4.0000–3	1.8906–7	2.2318+6	2.4429–5	4.0065+7	1.3570+7	1.2562+7	1.3934+7	1.3223+2	9.2774+1	6.9918+1	2.2851+1	5.5069–3
	5.0000–3	2.3371–7	1.8054+6	3.6185–5	3.2411+7	1.0934+7	1.0333+7	1.1144+7	1.1252+2	7.7791+1	5.9407+1	1.8378+1	5.5494–3
	6.0000–3	2.7821–7	1.5166+6	4.9999–5	2.7227+7	9.1646+6	8.8047+6	9.2570+6	9.8511+1	6.7237+1	5.1897+1	1.5335+1	5.5811–3
	8.0000–3	3.6691–7	1.1500+6	8.3338–5	2.0645+7	6.9378+6	6.8362+6	6.8704+6	7.9716+1	5.3284+1	4.1818+1	1.1461+1	5.6091–3
	1.0000–2	4.5471–7	9.2794+5	1.2440–4	1.6658+7	5.6126+6	5.6174+6	5.4283+6	6.7545+1	4.4408+1	3.5299+1	9.1031+0	5.6174–3
	1.3125–2	5.7987–7	7.2765+5	2.0253–4	1.3063+7	4.3442+6	4.4247+6	4.2939+6	5.5379+1	3.5887+1	2.8638+1	7.2433+0	5.6112–3
	1.5000–2	6.5204–7	6.4711+5	2.5747–4	1.1617+7	3.8307+6	3.9355+6	3.8508+6	5.0234+1	3.2424+1	2.5899+1	6.5188+0	5.6371–3
	2.0000–2	8.4051–7	5.0200+5	4.2952–4	9.0120+6	2.9259+6	3.0627+6	3.0234+6	4.0636+1	2.5939+1	2.0780+1	5.1533+0	5.6574–3
	2.6250–2	1.0678–6	3.9515+5	6.9676–4	7.0938+6	2.2684+6	2.4248+6	2.4006+6	3.3377+1	2.1009+1	1.6889+1	4.1152+0	5.6618–3
	3.0000–2	1.1979–6	3.5224+5	8.8436–4	6.3234+6	2.0019+6	2.1621+6	2.1594+6	3.0303+1	1.9002+1	1.5282+1	3.7143+0	5.6932–3
	4.0000–2	1.5327–6	2.7528+5	1.4695–3	4.9419+6	1.5342+6	1.6992+6	1.7085+6	2.4682+1	1.5310+1	1.2347+1	2.9573+0	5.7407–3
	5.0000–2	1.8478–6	2.2834+5	2.1776–3	4.0993+6	1.2534+6	1.4163+6	1.4296+6	2.1073+1	1.2997+1	1.0505+1	2.4863+0	5.7933–3
	6.0000–2	2.1437–6	1.9683+5	2.9983–3	3.5335+6	1.0693+6	1.2252+6	1.2390+6	1.8557+1	1.1409+1	9.2405+0	2.1629+0	5.8624–3
	8.0000–2	2.6849–6	1.5715+5	4.9302–3	2.8212+6	8.4292+5	9.8346+5	9.9482+5	1.5245+1	9.3626+0	7.6098+0	1.7467+0	5.9892–3
	1.0000–1	3.1676–6	1.3321+5	7.2259–3	2.3914+6	7.1017+5	8.3675+5	8.4442+5	1.3178+1	8.0922+0	6.5970+0	1.4890+0	6.1330–3
	1.5000–1	4.1797–6	1.0095+5	1.4181–2	1.8123+6	5.3454+5	6.3954+5	6.3818+5	1.0410+1	6.3556+0	5.2153+0	1.1337+0	6.5438–3
	2.0000–1	4.9888–6	8.4577+4	2.2650–2	1.5183+6	4.4511+5	5.4080+5	5.3242+5	9.0467+0	5.4736+0	4.5160+0	9.5056–1	7.0281–3
	3.0000–1	6.2137–6	6.7905+4	4.2563–2	1.2190+6	3.5127+5	4.4296+5	4.2478+5	7.7799+0	4.5960+0	3.8244+0	7.6350–1	8.1430–3
	3.5000–1	6.7171–6	6.2816+4	5.3743–2	1.1277+6	3.2294+5	4.1672+5	3.8802+5	7.4862+0	4.3501+0	3.6423+0	6.9902–1	8.7905–3
	4.0000–1	7.1045–6	5.9390+4	6.5477–2	1.0662+6	3.0025+5	3.9524+5	3.7068+5	7.2407+0	4.1738+0	3.4951+0	6.6929–1	9.4259–3
	4.5000–1	7.4811–6	5.6401+4	7.7655–2	1.0125+6	2.8260+5	3.8036+5	3.4954+5	7.1037+0	4.0384+0	3.3960+0	6.3219–1	1.0135–2
	5.0000–1	7.7795–6	5.4237+4	9.0196–2	9.7367+5	2.6770+5	3.6752+5	3.3846+5	6.9833+0	3.9358+0	3.3118+0	6.1317–1	1.0836–2
	6.0000–1	8.3046–6	5.0808+4	1.1608–1	9.1211+5	2.4507+5	3.4970+5	3.1733+5	6.8741+0	3.7907+0	3.2019+0	5.7641–1	1.2375–2
	7.0000–1	8.7564–6	4.8187+4	1.4280–1	8.6505+5	2.2838+5	3.3826+5	2.9841+5	6.8600+0	3.6951+0	3.1380+0	5.4302–1	1.4060–2
	8.0000–1	9.0701–6	4.6520+4	1.7009–1	8.3513+5	2.1484+5	3.2865+5	2.9162+5	6.8478+0	3.6340+0	3.0866+0	5.3165–1	1.5742–2
	1.0000+0	9.5978–6	4.3962+4	2.2567–1	7.8921+5	1.9534+5	3.1699+5	2.7687+5	6.9248+0	3.5632+0	3.0377+0	5.0611–1	1.9443–2
	1.2500+0	1.0104–5	4.1761+4	2.9616–1	7.4970+5	1.7946+5	3.0949+5	2.6074+5	7.0927+0	3.5302+0	3.0281+0	4.7760–1	2.4498–2
	1.5000+0	1.0382–5	4.0641+4	3.6698–1	7.2960+5	1.6744+5	3.0351+5	2.5865+5	7.2329+0	3.5302+0	3.0258+0	4.7472–1	2.9656–2
	2.0000+0	1.0786–5	3.9120+4	5.0831–1	7.0230+5	1.5211+5	2.9915+5	2.5103+5	7.5189+0	3.5455+0	3.0430+0	4.6141–1	4.1063–2
	3.0000+0	1.1238–5	3.7545+4	7.8723–1	6.7402+5	1.3574+5	2.9353+5	2.4474+5	7.9605+0	3.6253+0	3.1077+0	4.5117–1	6.6466–2
	4.0000+0	1.1435–5	3.6899+4	1.0601+0	6.6241+5	1.2705+5	2.9271+5	2.4264+5	8.2650+0	3.7040+0	3.1620+0	4.4749–1	9.4486–2

Atomic Weight 10.811												Density 2.370 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+0	1.1567–5	3.6478+4	1.3273+0	6.5485+5	1.2175+5	2.9209+5	2.4101+5	8.5093+0	3.7804+0	3.2122+0	4.4465–1	1.2351–1
6.0000+0	1.1660–5	3.6187+4	1.5895+0	6.4963+5	1.1845+5	2.9151+5	2.3966+5	8.7120+0	3.8499+0	3.2531+0	4.4234–1	1.5448–1
8.0000+0	1.1781–5	3.5814+4	2.1007+0	6.4293+5	1.1450+5	2.9092+5	2.3751+5	9.0416+0	3.9748+0	3.3176+0	4.3872–1	2.1851–1
1.0000+1	1.1849–5	3.5609+4	2.5964+0	6.3927+5	1.1257+5	2.9088+5	2.3581+5	9.2612+0	4.0954+0	3.3734+0	4.3594–1	2.8600–1
1.5000+1	1.1911–5	3.5425+4	3.7833+0	6.3595+5	1.1144+5	2.9094+5	2.3356+5	9.6400+0	4.3320+0	3.4387+0	4.3180–1	4.6155–1
2.0000+1	1.1948–5	3.5315+4	4.9065+0	6.3398+5	1.1101+5	2.9098+5	2.3198+5	9.8800+0	4.5736+0	3.4999+0	4.2889–1	6.4486–1
3.0000+1	1.1962–5	3.5273+4	6.9896+0	6.3322+5	1.1066+5	2.9088+5	2.3167+5	1.0192+1	5.0349+0	3.5805+0	4.2833–1	1.0261+0
4.0000+1	1.1962–5	3.5274+4	8.8945+0	6.3323+5	1.1064+5	2.9091+5	2.3167+5	1.0384+1	5.4700+0	3.6221+0	4.2836–1	1.4196+0
5.0000+1	1.1957–5	3.5287+4	1.0652+1	6.3347+5	1.1064+5	2.9094+5	2.3188+5	1.0519+1	5.9127+0	3.6631+0	4.2878–1	1.8208+0
6.0000+1	1.1950–5	3.5308+4	1.2283+1	6.3386+5	1.1064+5	2.9096+5	2.3225+5	1.0618+1	6.3618+0	3.7036+0	4.2948–1	2.2287+0
8.0000+1	1.1940–5	3.5340+4	1.5226+1	6.3442+5	1.1064+5	2.9095+5	2.3282+5	1.0757+1	7.2490+0	3.7609+0	4.3059–1	3.0575+0
1.0000+2	1.1931–5	3.5364+4	1.7828+1	6.3486+5	1.1063+5	2.9095+5	2.3326+5	1.0863+1	8.1364+0	3.8060+0	4.3145–1	3.8989+0
1.5000+2	1.1915–5	3.5411+4	2.3271+1	6.3571+5	1.1063+5	2.9096+5	2.3411+5	1.1022+1	1.0325+1	3.8525+0	4.3302–1	6.0394+0
2.0000+2	1.1918–5	3.5405+4	2.7657+1	6.3559+5	1.1063+5	2.9096+5	2.3400+5	1.1056+1	1.2544+1	3.8990+0	4.3281–1	8.2118+0
3.0000+2	1.1918–5	3.5403+4	3.4478+1	6.3556+5	1.1062+5	2.9096+5	2.3397+5	1.0996+1	1.7005+1	3.9918+0	4.3275–1	1.2581+1
4.0000+2	1.1919–5	3.5400+4	3.9707+1	6.3551+5	1.1062+5	2.9096+5	2.3392+5	1.0905+1	2.1408+1	4.0208+0	4.3266–1	1.6954+1
5.0000+2	1.1923–5	3.5389+4	4.3956+1	6.3531+5	1.1062+5	2.9096+5	2.3372+5	1.0831+1	2.5798+1	4.0498+0	4.3231–1	2.1316+1
6.0000+2	1.1921–5	3.5394+4	4.7533+1	6.3540+5	1.1062+5	2.9096+5	2.3381+5	1.0800+1	3.0243+1	4.0788+0	4.3246–1	2.5732+1
8.0000+2	1.1921–5	3.5395+4	5.3332+1	6.3541+5	1.1061+5	2.9096+5	2.3383+5	1.0773+1	3.9105+1	4.1368+0	4.3250–1	3.4536+1
1.0000+3	1.1920–5	3.5396+4	5.7943+1	6.3544+5	1.1061+5	2.9096+5	2.3386+5	1.0774+1	4.7962+1	4.1948+0	4.3256–1	4.3335+1
1.5000+3	1.1920–5	3.5398+4	6.6518+1	6.3547+5	1.1061+5	2.9096+5	2.3389+5	1.0806+1	7.0040+1	4.2396+0	4.3262–1	6.5368+1
2.0000+3	1.1920–5	3.5396+4	7.2720+1	6.3544+5	1.1061+5	2.9096+5	2.3387+5	1.0844+1	9.2210+1	4.2844+0	4.3257–1	8.7493+1
3.0000+3	1.1919–5	3.5399+4	8.1570+1	6.3549+5	1.1060+5	2.9096+5	2.3392+5	1.0927+1	1.3670+2	4.3740+0	4.3268–1	1.3189+2
4.0000+3	1.1920–5	3.5398+4	8.7905+1	6.3546+5	1.1060+5	2.9096+5	2.3389+5	1.1003+1	1.8107+2	4.4128+0	4.3262–1	1.7622+2
5.0000+3	1.1923–5	3.5388+4	9.2843+1	6.3529+5	1.1060+5	2.9096+5	2.3372+5	1.1066+1	2.2563+2	4.4410+0	4.3231–1	2.2076+2
6.0000+3	1.1922–5	3.5393+4	9.6890+1	6.3537+5	1.1059+5	2.9096+5	2.3381+5	1.1128+1	2.6986+2	4.4693+0	4.3246–1	2.6496+2
8.0000+3	1.1921–5	3.5395+4	1.0329+2	6.3541+5	1.1059+5	2.9096+5	2.3385+5	1.1228+1	3.5895+2	4.5259+0	4.3254–1	3.5399+2
1.0000+4	1.1921–5	3.5396+4	1.0827+2	6.3543+5	1.1059+5	2.9096+5	2.3386+5	1.1306+1	4.4873+2	4.5825+0	4.3257–1	4.4371+2
1.5000+4	1.1920–5	3.5398+4	1.1734+2	6.3547+5	1.1059+5	2.9096+5	2.3391+5	1.1488+1	6.6806+2	4.6243+0	4.3266–1	6.6301+2
2.0000+4	1.1920–5	3.5397+4	1.2380+2	6.3545+5	1.1058+5	2.9096+5	2.3390+5	1.1620+1	8.9024+2	4.6662+0	4.3263–1	8.8514+2
3.0000+4	1.1919–5	3.5399+4	1.3293+2	6.3549+5	1.1058+5	2.9096+5	2.3394+5	1.1804+1	1.3301+3	4.7499+0	4.3272–1	1.3249+3
4.0000+4	1.1920–5	3.5398+4	1.3941+2	6.3546+5	1.1058+5	2.9096+5	2.3391+5	1.1937+1	1.7748+3	4.8081+0	4.3266–1	1.7695+3
5.0000+4	1.1923–5	3.5388+4	1.4445+2	6.3530+5	1.1057+5	2.9096+5	2.3375+5	1.2039+1	2.2152+3	4.8351+0	4.3236–1	2.2100+3
6.0000+4	1.1922–5	3.5393+4	1.4857+2	6.3538+5	1.1057+5	2.9096+5	2.3384+5	1.2122+1	2.6553+3	4.8621+0	4.3252–1	2.6500+3
8.0000+4	1.1921–5	3.5395+4	1.5506+2	6.3542+5	1.1057+5	2.9096+5	2.3388+5	1.2255+1	3.5432+3	4.9160+0	4.3260–1	3.5379+3
1.0000+5	1.1920–5	3.5396+4	1.6010+2	6.3544+5	1.1057+5	2.9096+5	2.3390+5	1.2357+1	4.4327+3	4.9700+0	4.3263–1	4.4273+3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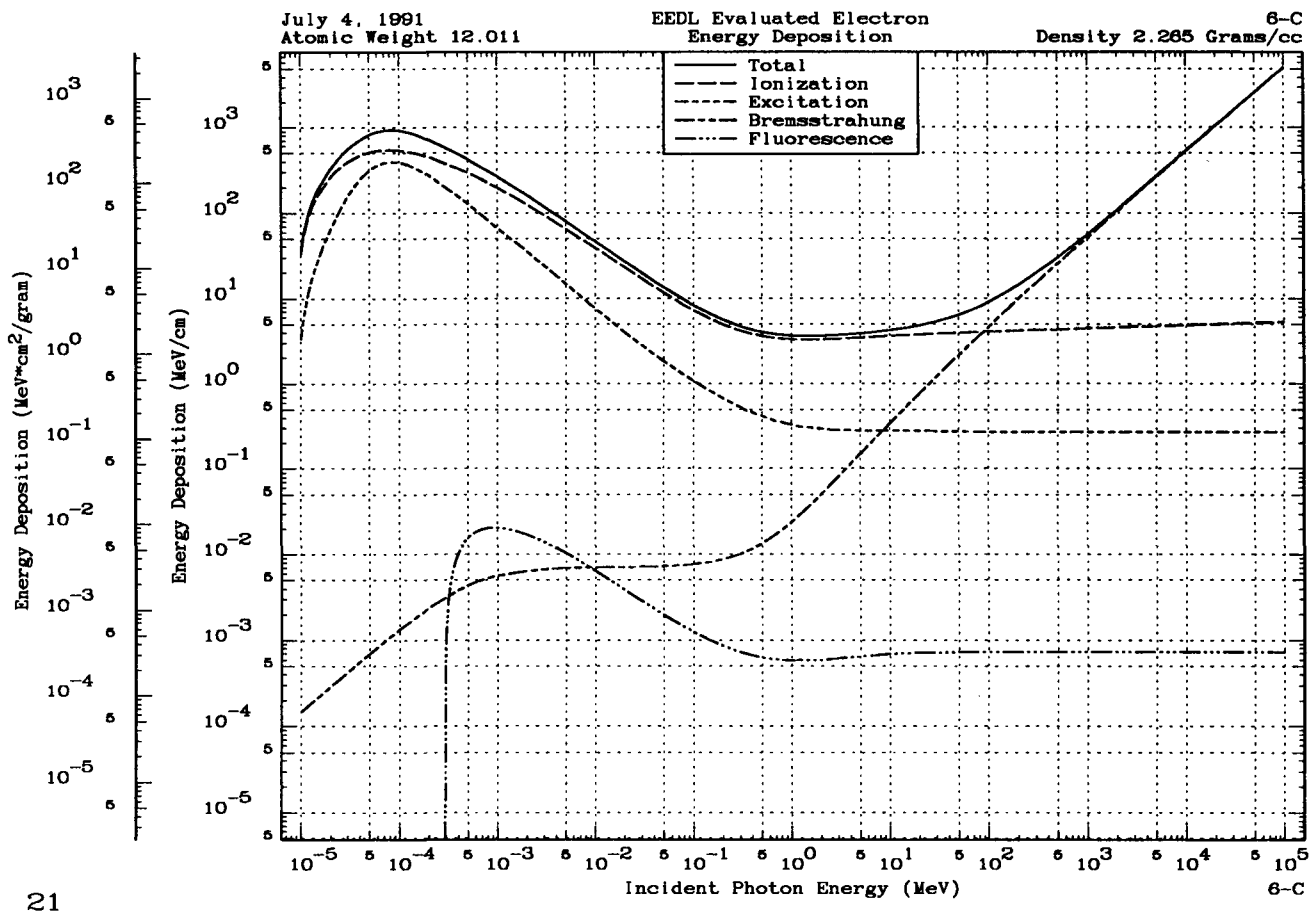
EEDL Evaluated Electron
Cross Sections
6-C
Density 2.265 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
6-C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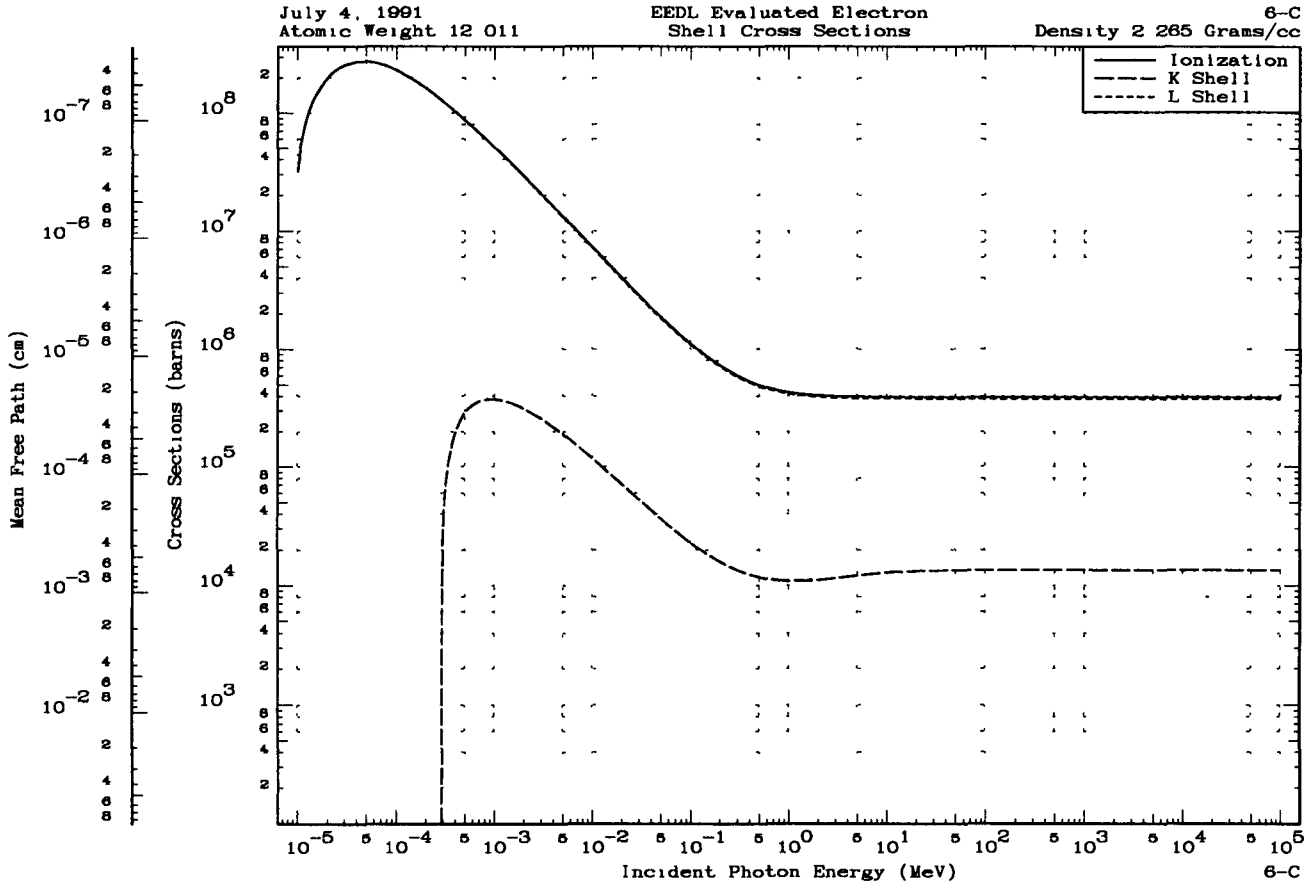
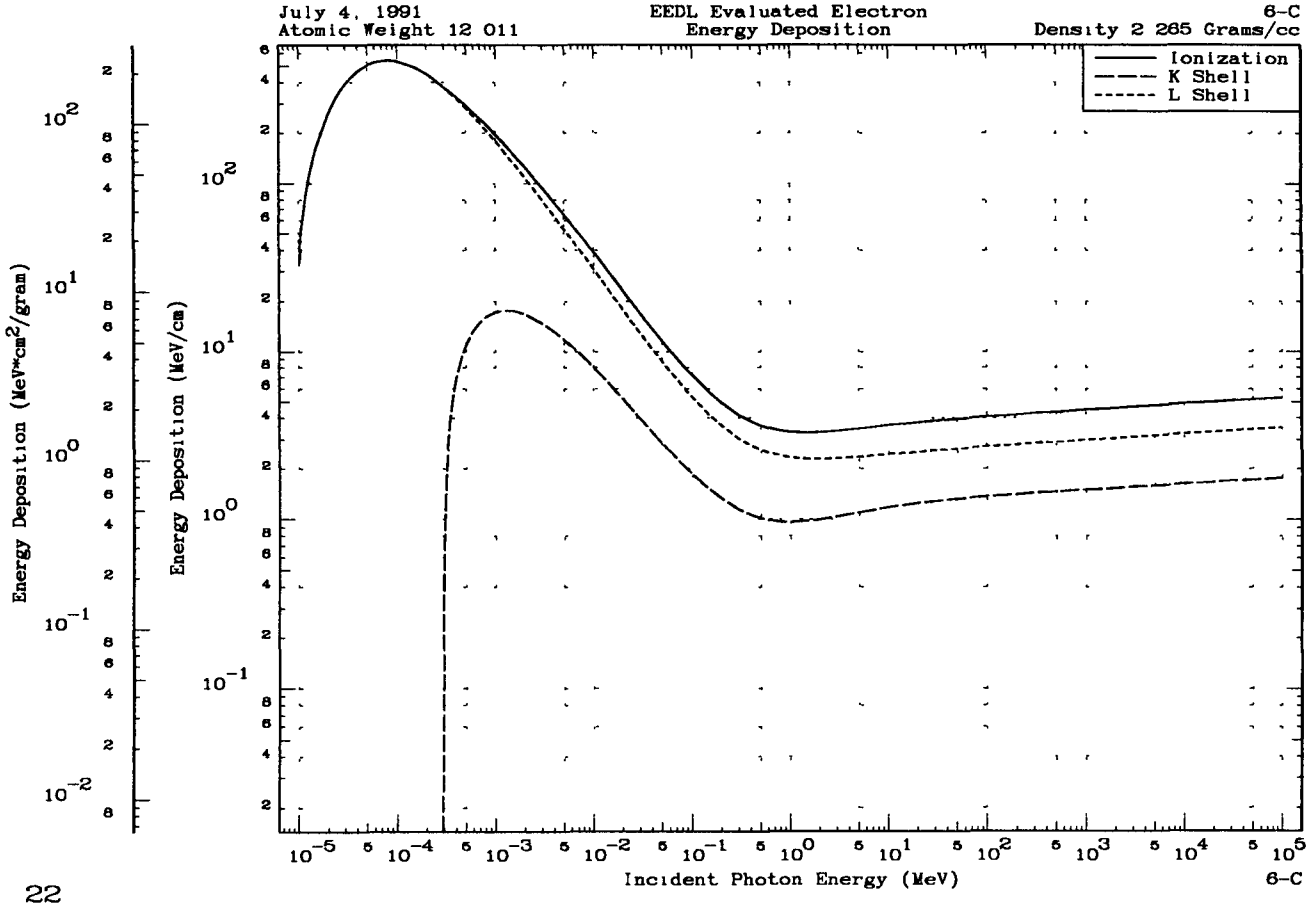
EEDL Evaluated Electron
Energy Deposition
6-C
Density 2.265 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
6-C

21

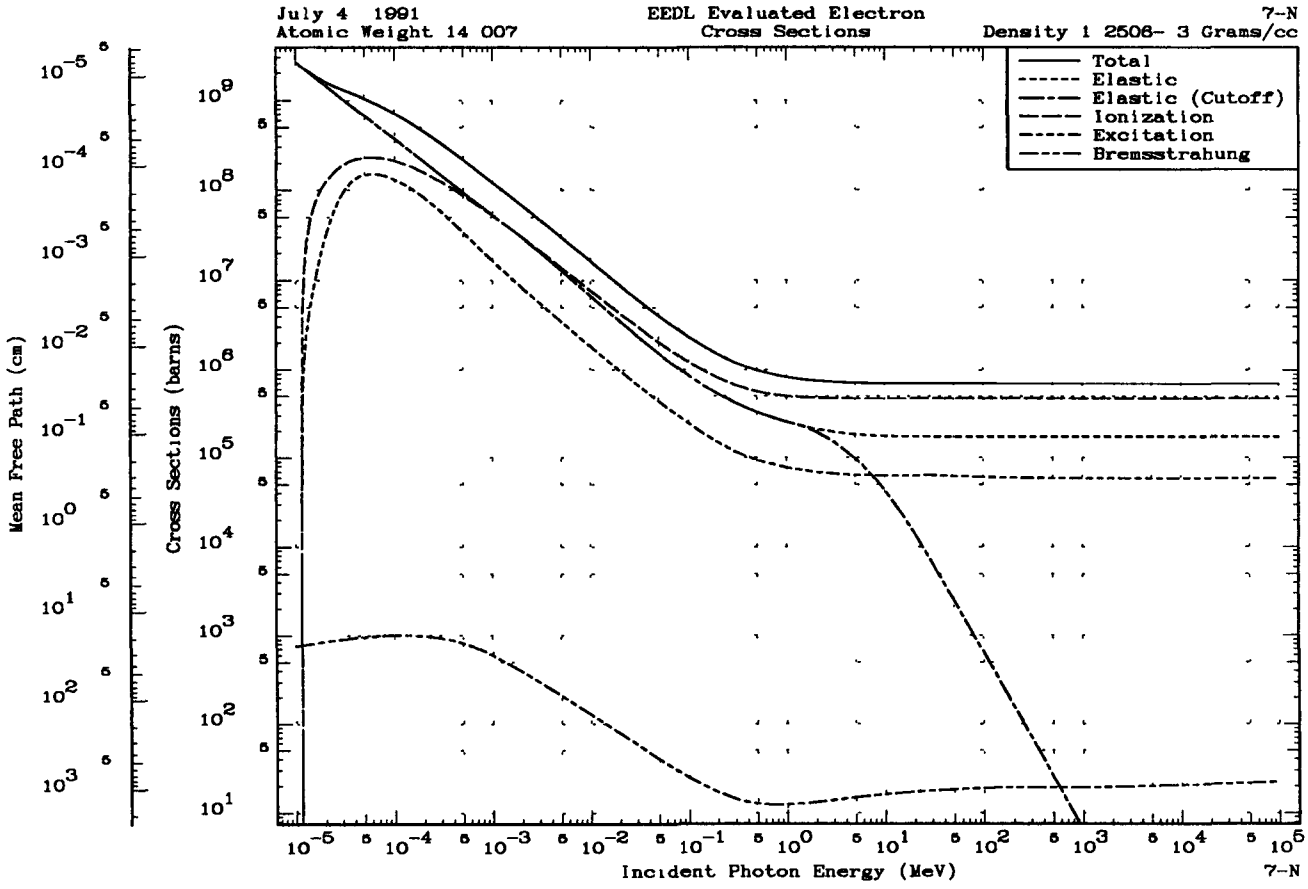

July 4, 1991
Atomic Weight 12 011
EEDL Evaluated Electron
Shell Cross Sections
6-C
Density 2 265 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
6-C


July 4, 1991
Atomic Weight 12 011
EEDL Evaluated Electron
Energy Deposition
6-C
Density 2 265 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
6-C

Atomic Weight 12.011 Density 2.265 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	2.8424–9	1.5533+8		3.0980+9	3.0635+9	3.1365+7	3.1686+6	6.0313+2	3.6226+1	3.2903+1	3.3223+0	1.4731–4
1.0625–5	2.9775–9	1.4828+8		2.9575+9	2.9033+9	4.8781+7	5.4386+6	6.0987+2	5.7798+1	5.2013+1	5.7856+0	1.5590–4
1.1719–5	3.2046–9	1.3777+8		2.7479+9	2.6618+9	7.6258+7	9.8290+6	6.2094+2	9.4325+1	8.3605+1	1.0720+1	1.7110–4
1.2539–5	3.3680–9	1.3109+8		2.6145+9	2.5069+9	9.4294+7	1.3342+7	6.2869+2	1.2016+2	1.0534+2	1.4819+1	1.8263–4
1.3769–5	3.6031–9	1.2253+8		2.4439+9	2.3074+9	1.1774+8	1.8803+7	6.3958+2	1.5665+2	1.3519+2	2.1451+1	2.0012–4
1.5000–5	3.8271–9	1.1536+8		2.3009+9	2.1388+9	1.3776+8	2.4369+7	6.4971+2	1.9102+2	1.6249+2	2.8537+1	2.1785–4
L1 1.7560–5	4.2595–9	1.0365+8		2.0673+9	1.8600+9	1.7026+8	3.7041+7	6.6876+2	2.5625+2	2.1092+2	4.5333+1	2.5542–4
1.7865–5	4.3073–9	1.0250+8		2.0444+9	1.8319+9	1.7390+8	3.8609+7	6.7088+2	2.6464+2	2.1717+2	4.7464+1	2.5996–4
1.8399–5	4.3890–9	1.0059+8		2.0063+9	1.7847+9	1.8021+8	4.1445+7	6.7451+2	2.7947+2	2.2812+2	5.1348+1	2.6792–4
1.9199–5	4.5065–9	9.7970+7		1.9540+9	1.7186+9	1.8952+8	4.5921+7	6.7980+2	3.0212+2	2.4456+2	5.7555+1	2.7994–4
2.0000–5	4.6180–9	9.5604+7		1.9068+9	1.6575+9	1.9870+8	5.0668+7	6.8492+2	3.2530+2	2.6107+2	6.4234+1	2.9203–4
2.1250–5	4.7910–9	9.2152+7		1.8380+9	1.5708+9	2.0942+8	5.7789+7	6.9085+2	3.5617+2	2.8191+2	7.4256+1	3.0886–4
2.2500–5	4.9522–9	8.9153+7		1.7782+9	1.4932+9	2.1957+8	6.5417+7	6.9650+2	3.8742+2	3.0223+2	8.5184+1	3.2579–4
2.3438–5	5.0691–9	8.7097+7		1.7371+9	1.4401+9	2.2555+8	7.1474+7	7.0056+2	4.0979+2	3.1580+2	9.3994+1	3.3856–4
2.6250–5	5.3923–9	8.1876+7		1.6330+9	1.3025+9	2.4168+8	8.8820+7	7.1195+2	4.7460+2	3.5436+2	1.2024+2	3.7721–4
2.6719–5	5.4431–9	8.1113+7		1.6178+9	1.2822+9	2.4367+8	9.1886+7	7.1374+2	4.8477+2	3.5978+2	1.2499+2	3.8370–4
3.0000–5	5.7735–9	7.6470+7		1.5252+9	1.1571+9	2.5600+8	1.1205+8	7.2561+2	5.5285+2	3.9537+2	1.5748+2	4.2948–4
3.5000–5	6.2211–9	7.0968+7		1.4155+9	1.0096+9	2.6532+8	1.4056+8	7.4125+2	6.3651+2	4.3298+2	2.0353+2	4.9959–4
4.0000–5	6.5944–9	6.6951+7		1.3353+9	8.9705+8	2.7294+8	1.6535+8	7.5506+2	7.1497+2	4.6849+2	2.4648+2	5.7090–4
4.5000–5	6.9494–9	6.3531+7		1.2671+9	8.0827+8	2.7404+8	1.8482+8	7.6386+2	7.7079+2	4.9005+2	2.8074+2	6.3638–4
5.0000–5	7.2473–9	6.0920+7		1.2150+9	7.3633+8	2.7455+8	2.0418+8	7.7181+2	8.2609+2	5.1017+2	3.1592+2	7.0246–4
6.0000–5	7.8465–9	5.6268+7		1.1223+9	6.2664+8	2.6884+8	2.2678+8	7.8303+2	8.9120+2	5.3137+2	3.5983+2	8.2989–4
7.0000–5	8.4110–9	5.2491+7		1.0469+9	5.4680+8	2.5966+8	2.4047+8	7.9264+2	9.2605+2	5.3846+2	3.8759+2	9.5874–4
8.0000–5	8.9835–9	4.9146+7		9.8021+8	4.8592+8	2.5129+8	2.4300+8	8.0106+2	9.4247+2	5.4468+2	3.9778+2	1.0889–3
1.0000–4	1.0141–8	4.3535+7	0.0000+0	8.6830+8	3.9915+8	2.3213+8	2.3703+8	8.0665+2	9.3283+2	5.3747+2	3.9536+2	1.3277–3
1.2500–4	1.1674–8	3.7820+7	2.7576–8	7.5432+8	3.2787+8	2.0960+8	2.1685+8	8.0409+2	8.8087+2	5.1420+2	3.6667+2	1.6009–3
1.5000–4	1.3254–8	3.3310+7	5.6884–8	6.6437+8	2.7919+8	1.9213+8	1.9306+8	8.0200+2	8.2569+2	4.9482+2	3.3087+2	1.8734–3
2.0000–4	1.6426–8	2.6878+7	1.2163–7	5.3608+8	2.1665+8	1.6328+8	1.5615+8	7.8891+2	7.2121+2	4.4925+2	2.7196+2	2.3754–3
K 2.9101–4	2.2138–8	1.9943+7	2.6184–7	3.9777+8	1.5573+8	1.2839+8	1.1366+8	7.3978+2	5.8196+2	3.8025+2	2.0171+2	3.0903–3
2.9550–4	2.2414–8	1.9698+7	2.6959–7	3.9287+8	1.5364+8	1.2710+8	1.1213+8	7.3784+2	5.7708+2	3.7791+2	1.9917+2	3.1247–3
3.0000–4	2.2689–8	1.9459+7	2.7742–7	3.8810+8	1.5162+8	1.2584+8	1.1064+8	7.3594+2	5.7234+2	3.7563+2	1.9670+2	3.1590–3
3.1250–4	2.3458–8	1.8821+7	2.9953–7	3.7539+8	1.4629+8	1.2231+8	1.0680+8	7.3005+2	5.5843+2	3.6824+2	1.9018+2	3.2496–3
3.2344–4	2.4125–8	1.8301+7	3.1932–7	3.6500+8	1.4194+8	1.1941+8	1.0366+8	7.2512+2	5.4707+2	3.6220+2	1.8486+2	3.3284–3
3.4258–4	2.5283–8	1.7463+7	3.5490–7	3.4829+8	1.3496+8	1.1471+8	9.8617+7	7.1697+2	5.2880+2	3.5247+2	1.7633+2	3.4652–3
3.7129–4	2.6996–8	1.6354+7	4.1047–7	3.2619+8	1.2576+8	1.0846+8	9.1970+7	7.0571+2	5.0468+2	3.3961+2	1.6507+2	3.6680–3
4.0000–4	2.8683–8	1.5392+7	4.6857–7	3.0700+8	1.1781+8	1.0297+8	8.6218+7	6.9544+2	4.8378+2	3.2844+2	1.5534+2	3.8681–3
4.5000–4	3.1655–8	1.3947+7	5.7579–7	2.7818+8	1.0625+8	9.4481+7	7.7441+7	6.6792+2	4.4927+2	3.0906+2	1.4021+2	4.1192–3
5.0000–4	3.4571–8	1.2771+7	6.9072–7	2.5471+8	9.6881+7	8.7483+7	7.0349+7	6.4422+2	4.2117+2	2.9318+2	1.2798+2	4.3629–3
5.5000–4	3.7496–8	1.1775+7	8.1317–7	2.3485+8	8.9115+7	8.1419+7	6.4313+7	6.2079+2	3.9573+2	2.7827+2	1.1745+2	4.5729–3
6.0000–4	4.0379–8	1.0934+7	9.4308–7	2.1808+8	8.2571+7	7.6250+7	5.9256+7	6.0014+2	3.7425+2	2.6561+2	1.0863+2	4.7773–3
7.0000–4	4.6156–8	9.5655+6	1.2246–6	1.9078+8	7.2148+7	6.7659+7	5.0977+7	5.5664+2	3.3686+2	2.4285+2	9.3998+1	5.0619–3
8.0000–4	5.1818–8	8.5202+6	1.5348–6	1.6994+8	6.4189+7	6.1001+7	4.4746+7	5.2152+2	3.0821+2	2.2522+2	8.2984+1	5.3335–3
1.0000–3	6.3066–8	7.0006+6	2.2359–6	1.3963+8	5.2827+7	5.1078+7	3.5722+7	4.5896+2	2.6351+2	1.9670+2	6.6808+1	5.6655–3
1.2500–3	7.6561–8	5.7666+6	3.2618–6	1.1502+8	4.3446+7	4.2592+7	2.8978+7	3.9955+2	2.2488+2	1.7029+2	5.4586+1	5.8839–3
1.5000–3	8.9700–8	4.9220+6	4.4452–6	9.8169+7	3.7032+7	3.6713+7	2.4424+7	3.5677+2	1.9820+2	1.5185+2	4.6338+1	6.1036–3
2.0000–3	1.1578–7	3.8134+6	7.2416–6	7.6059+7	2.8670+7	2.8906+7	1.8484+7	2.9681+2	1.6071+2	1.2530+2	3.5399+1	6.3987–3
3.0000–3	1.6741–7	2.6372+6	1.4461–5	5.2599+7	1.9719+7	2.0528+7	1.2351+7	2.2581+2	1.1846+2	9.4507+1	2.3946+1	6.6912–3
4.0000–3	2.1810–7	2.0243+6	2.3870–5	4.0376+7	1.5036+7	1.6057+7	9.2823+6	1.8467+2	9.4984+1	7.6834+1	1.8144+1	6.8412–3
5.0000–3	2.6807–7	1.6470+6	3.5333–5	3.2849+7	1.2144+7	1.3257+7	7.4483+6	1.5746+2	7.9911+1	6.5255+1	1.4648+1	6.9182–3
6.0000–3	3.1727–7	1.3916+6	4.8760–5	2.7755+7	1.0198+7	1.1329+7	6.2274+6	1.3805+2	6.9301+1	5.6988+1	1.2307+1	6.9685–3
8.0000–3	4.1375–7	1.0671+6	8.0996–5	2.1283+7	7.7435+6	8.8378+6	4.7013+6	1.1193+2	5.5307+1	4.5939+1	9.3601+0	7.0252–3
1.0000–2	5.0755–7	8.6987+5	1.2045–4	1.7350+7	6.2778+6	7.2866+6	3.7851+6	9.4976+1	4.6348+1	3.8762+1	7.5783+0	7.0578–3
1.5000–2	7.3312–7	6.0222+5	2.4650–4	1.2011+7	4.2979+6	5.1355+6	2.5778+6	7.0620+1	3.3660+1	2.8440+1	5.2126+0	7.0859–3
2.0000–2	9.5038–7	4.6455+5	4.1253–4	9.2656+6	3.2886+6	4.0135+6	1.9634+6	5.7234+1	2.6828+1	2.2824+1	3.9970+0	7.0942–3
3.0000–2	1.3606–6	3.2449+5	8.4695–4	6.4720+6	2.2606+6	2.8497+6	1.3616+6	4.2730+1	1.9589+1	1.6784+1	2.7984+0	7.1295–3
4.0000–2	1.7455–6	2.5294+5	1.4155–3	5.0448+6	1.7470+6	2.2475+6	1.0503+6	3.4832+1	1.5729+1	1.3549+1	2.1729+0	7.1798–3
5.0000–2	2.1005–6	2.1019+5	2.1046–3	4.1922+6	1.4381+6	1.8783+6	8.7570+5	2.9748+1	1.3358+1	1.1530+1	1.8209+0	7.2403–3
6.0000–2	2.4351–6	1.8131+5	2.9032–3	3.6162+6	1.2317+6	1.6281+6	7.5640+5	2.6183+1	1.1721+1	1.0135+1	1.5792+0	7.3077–3
8.0000–2	3.0524–6	1.4464+5	4.7838–3	2.8849+6	9.7017+5	1.3109+6	6.0383+5	2.1501+1	9.6185+0	8.3424+0	1.2686+0	7.4594–3
1.0000–1	3.6078–6	1.2237+5	7.0180–3	2.4408+6	8.1316+5	1.1178+6	5.0974+5	1.8570+1	8.3162+0	7.2325+0	1.0761+0	7.6308–3
1.5000–1	4.7667–6	9.2622+4	1.3784–2	1.8474+6	6.0900+5	8.5777+5	3.8058+5	1.4633+1	6.5346+0	5.7163+0	8.1022–1	8.1107–3
2.0000–1	5.6848–6	7.7663+4	2.2021–2	1.5490+6	5.0781+5	7.2701+5	3.1416+5	1.2682+1	5.6283+0	4.9468+0	6.7273–1	8.6897–3
3.0000–1	7.0568–6	6.2564+4	4.1383–2	1.2478+6	4.0426+5	5.9731+5	2.4625+5	1.0856+1	4.7274+0	4.1857+0	5.3162–1	1.0028–2
3.5000–1	7.6117–6	5.8003+4	5.2253–2	1.1569+6	3.7306+5	5.6249+5	2.2132+5	1.0421+1	4.4747+0	3.9847+0	4.7916–1	1.0804–2
4.0000–1	8.0505–6	5.4842+4	6.3660–2	1.0938+6	3.4798+5	5.3397+5	2.1186+5	1.0059+1	4.2936+0	3.8221+0	4.5998–1	1.1564–2
4.5000–1	8.4646–6	5.2158+4	7.5498–2	1.0403+6	3.2860+5	5.1420+5	1.9749+5	9.8638+0	4.1545+0	3.7124+0	4.2972–1	1.2432–2
5.0000–1	8.8011–6	5.0164+4	8.7688–2	1.0005+6	3.1218+5	4.9714+5	1.9120+5	9.6924+0	4.0493+0	3.6190+0	4.1694–1	1.3289–2
5.5000–1	9.1200–6	4.8410+4	1.0017–1	9.6555+5	2.9892+5	4.8460+5	1.8202+5	9.6007+0	3.9649+0	3.5531+0	3.9762–1	1.4219–2
6.0000–1	9.3847–6	4.7045+4	1.1288–1	9.3831+5	2.8730+5	4.7343+5	1.7756+5	9.5177+0	3.8990+0	3.4953+0	3.8855–1	1.5142–2
7.0000–1	9.8790–6	4.4691+4	1.3886–1	8.9137+5	2.6896+5	4.5818+5	1.6421+5	9.4766+0	3.8010+0	3.4236+0	3.6026–1	1.7169–2
8.0000–1	1.0238–5	4.3126+4	1.6539–1	8.6014+5	2.5402+5	4.4538+5	1.6074+5	9.4410+0	3.7386+0	3.3659+0	3.5353–1	1.9189–2
9.0000–1	1.0571–5	4.1764+4	1.9229–1	8.3299+5	2.4246+5	4.3710+5	1.5341+5	9.4817+0	3.6940+0	3.3345+0	3.3806–1	2.1402–2
1.0000+0	1.0827–5	4.0777+4	2.1947–1	8.1330+5	2.3258+5	4.2983+5	1.5089+5	9.5183+0	3.6654+0	3.3086+0	3.3313–1	2.3623–2
1.2500+0	1.1380–5	3.8796+4	2.8800–1	7.7380+5	2.1514+5	4.1972+5	1.3893+5	9.7048+0	3.6306+0	3.2932+0	3.0767–1	2.9759–2
1.5000+0	1.1710–5	3.7702+4	3.5687–1	7.5198+5	2.0187+5	4.1164+5	1.3846+5	9.8599+0	3.6302+0	3.2867+0	3.0755–1	3.5998–2
1.7500+0	1.1980–5	3.6852+4	4.2570–1	7.3502+5	1.9266+5	4.0859+5	1.3376+5	1.0044+1	3.6339+0	3.2937+0	2.9745–1	4.2808–2
2.0000+0	1.2164–5	3.6296+4	4.9436–1	7.2392+5	1.8502+5	4.0597+5	1.3292+5	1.0206+1	3.6480+0	3.3023+0	2.9593–1	4.9737–2
2.5000+0	1.2493–5	3.5340+4	6.3076–1	7.0485+5	1.7492+5	4.0181+5	1.2812+5	1.0514+1	3.6833+0	3.3326+0	2.8594–1	6.4829–2
3.0000+0	1.2698–5	3.4768+4	7.6566–1	6.9346+5	1.6708+5	3.9844+5	1.2793+5	1.0772+1	3.7299+0	3.3633+0	2.8620–1	8.0348–2
4.0000+0	1.2940–5	3.4120+4	1.0307+0	6.8052+5	1.5764+5	3.9666+5	1.2622+5	1.1207+1	3.8172+0	3.4214+0	2.8256–1	1.1324–1

Atomic Weight 12.011												Density 2.265 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+0	1.3078–5	3.3760+4	1.2900+0	6.7334+5	1.5213+5	3.9581+5	1.2538+5	1.1504+1	3.8963+0	3.4668+0	2.8089–1	1.4864–1
6.0000+0	1.3164–5	3.3539+4	1.5442+0	6.6894+5	1.4868+5	3.9511+5	1.2514+5	1.1754+1	3.9717+0	3.5062+0	2.8054–1	1.8494–1
8.0000+0	1.3270–5	3.3272+4	2.0384+0	6.6361+5	1.4458+5	3.9401+5	1.2500+5	1.2158+1	4.1227+0	3.5801+0	2.8062–1	2.6199–1
1.0000+1	1.3310–5	3.3171+4	2.5154+0	6.6159+5	1.4280+5	3.9386+5	1.2491+5	1.2460+1	4.2643+0	3.6413+0	2.8082–1	3.4216–1
1.5000+1	1.3333–5	3.3113+4	3.6510+0	6.6045+5	1.4184+5	3.9391+5	1.2470+5	1.2955+1	4.5442+0	3.7117+0	2.8034–1	5.5221–1
2.0000+1	1.3356–5	3.3057+4	4.7185+0	6.5932+5	1.4129+5	3.9394+5	1.2408+5	1.3277+1	4.8261+0	3.7764+0	2.7896–1	7.7074–1
3.0000+1	1.3393–5	3.2966+4	6.6823+0	6.5751+5	1.4083+5	3.9382+5	1.2284+5	1.3697+1	5.3681+0	3.8680+0	2.7621–1	1.2240+0
4.0000+1	1.3408–5	3.2928+4	8.4616+0	6.5675+5	1.4082+5	3.9387+5	1.2205+5	1.3961+1	5.8801+0	3.9130+0	2.7446–1	1.6927+0
5.0000+1	1.3421–5	3.2896+4	1.0091+1	6.5612+5	1.4082+5	3.9390+5	1.2138+5	1.4149+1	6.4011+0	3.9568+0	2.7298–1	2.1713+0
6.0000+1	1.3427–5	3.2882+4	1.1594+1	6.5584+5	1.4082+5	3.9390+5	1.2110+5	1.4290+1	6.9161+0	3.9879+0	2.7239–1	2.6558+0
8.0000+1	1.3435–5	3.2862+4	1.4287+1	6.5543+5	1.4081+5	3.9390+5	1.2070+5	1.4493+1	7.9583+0	4.0496+0	2.7154–1	3.6371+0
1.0000+2	1.3440–5	3.2849+4	1.6648+1	6.5518+5	1.4081+5	3.9391+5	1.2044+5	1.4630+1	9.0067+0	4.1006+0	2.7103–1	4.6350+0
1.5000+2	1.3445–5	3.2837+4	2.1528+1	6.5494+5	1.4081+5	3.9391+5	1.2021+5	1.4847+1	1.1593+1	4.1489+0	2.7050–1	7.1734+0
2.0000+2	1.3448–5	3.2831+4	2.5416+1	6.5481+5	1.4080+5	3.9391+5	1.2008+5	1.4913+1	1.4216+1	4.1970+0	2.7021–1	9.7492+0
3.0000+2	1.3449–5	3.2827+4	3.1399+1	6.5474+5	1.4080+5	3.9391+5	1.2001+5	1.4877+1	1.9492+1	4.2930+0	2.7006–1	1.4929+1
4.0000+2	1.3451–5	3.2824+4	3.5945+1	6.5468+5	1.4079+5	3.9391+5	1.1996+5	1.4789+1	2.4703+1	4.3245+0	2.6994–1	2.0109+1
5.0000+2	1.3454–5	3.2816+4	3.9619+1	6.5451+5	1.4079+5	3.9391+5	1.1979+5	1.4717+1	2.9901+1	4.3560+0	2.6956–1	2.5275+1
6.0000+2	1.3453–5	3.2819+4	4.2700+1	6.5457+5	1.4079+5	3.9391+5	1.1985+5	1.4694+1	3.5158+1	4.3874+0	2.6970–1	3.0501+1
8.0000+2	1.3453–5	3.2819+4	4.7678+1	6.5458+5	1.4078+5	3.9391+5	1.1987+5	1.4685+1	4.5643+1	4.4503+0	2.6973–1	4.0923+1
1.0000+3	1.3452–5	3.2819+4	5.1623+1	6.5459+5	1.4078+5	3.9391+5	1.1988+5	1.4705+1	5.6111+1	4.5027+0	2.6976–1	5.1338+1
1.5000+3	1.3452–5	3.2821+4	5.8940+1	6.5462+5	1.4078+5	3.9391+5	1.1992+5	1.4777+1	8.2216+1	4.5480+0	2.6985–1	7.7398+1
2.0000+3	1.3452–5	3.2820+4	6.4219+1	6.5459+5	1.4077+5	3.9391+5	1.1989+5	1.4847+1	1.0843+2	4.5932+0	2.6978–1	1.0356+2
3.0000+3	1.3452–5	3.2821+4	7.1744+1	6.5462+5	1.4077+5	3.9391+5	1.1993+5	1.4977+1	1.6080+2	4.6837+0	2.6987–1	1.5585+2
4.0000+3	1.3452–5	3.2820+4	7.7123+1	6.5460+5	1.4076+5	3.9391+5	1.1991+5	1.5091+1	2.1344+2	4.7304+0	2.6982–1	2.0844+2
5.0000+3	1.3455–5	3.2813+4	8.1309+1	6.5445+5	1.4076+5	3.9391+5	1.1976+5	1.5183+1	2.6640+2	4.7591+0	2.6949–1	2.6137+2
6.0000+3	1.3454–5	3.2816+4	8.4736+1	6.5451+5	1.4076+5	3.9391+5	1.1983+5	1.5273+1	3.1867+2	4.7879+0	2.6964–1	3.1361+2
8.0000+3	1.3453–5	3.2817+4	9.0159+1	6.5455+5	1.4075+5	3.9391+5	1.1986+5	1.5416+1	4.2401+2	4.8454+0	2.6972–1	4.1890+2
1.0000+4	1.3453–5	3.2818+4	9.4368+1	6.5456+5	1.4075+5	3.9391+5	1.1988+5	1.5527+1	5.3019+2	4.9029+0	2.6977–1	5.2502+2
1.5000+4	1.3452–5	3.2820+4	1.0204+2	6.5459+5	1.4075+5	3.9391+5	1.1992+5	1.5778+1	7.8957+2	4.9456+0	2.6985–1	7.8436+2
2.0000+4	1.3453–5	3.2818+4	1.0751+2	6.5457+5	1.4074+5	3.9391+5	1.1989+5	1.5958+1	1.0523+3	4.9883+0	2.6979–1	1.0471+3
3.0000+4	1.3452–5	3.2820+4	1.1523+2	6.5460+5	1.4074+5	3.9391+5	1.1993+5	1.6212+1	1.5726+3	5.0736+0	2.6988–1	1.5673+3
4.0000+4	1.3453–5	3.2819+4	1.2072+2	6.5458+5	1.4073+5	3.9391+5	1.1992+5	1.6394+1	2.0986+3	5.1372+0	2.6985–1	2.0932+3
5.0000+4	1.3456–5	3.2811+4	1.2497+2	6.5443+5	1.4073+5	3.9391+5	1.1977+5	1.6534+1	2.6196+3	5.1648+0	2.6951–1	2.6141+3
6.0000+4	1.3454–5	3.2815+4	1.2846+2	6.5450+5	1.4073+5	3.9391+5	1.1984+5	1.6648+1	3.1402+3	5.1924+0	2.6968–1	3.1347+3
8.0000+4	1.3454–5	3.2816+4	1.3395+2	6.5453+5	1.4073+5	3.9391+5	1.1987+5	1.6830+1	4.1905+3	5.2476+0	2.6974–1	4.1849+3
1.0000+5	1.3453–5	3.2817+4	1.3821+2	6.5455+5	1.4072+5	3.9391+5	1.1989+5	1.6971+1	5.2426+3	5.3029+0	2.6979–1	5.2370+3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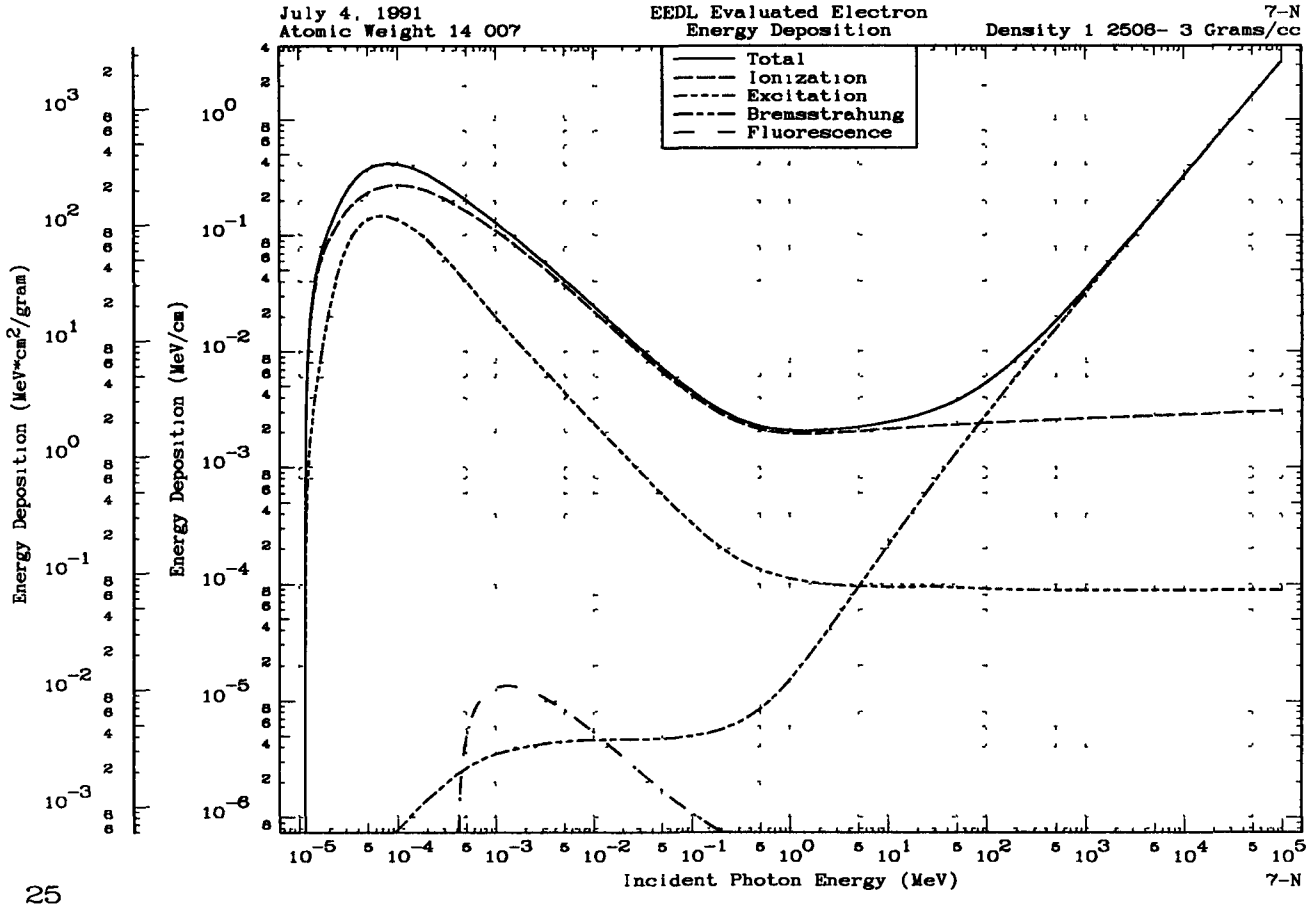
EEDL Evaluated Electron
Cross Sections
7-N
Density 1 2506- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
7-N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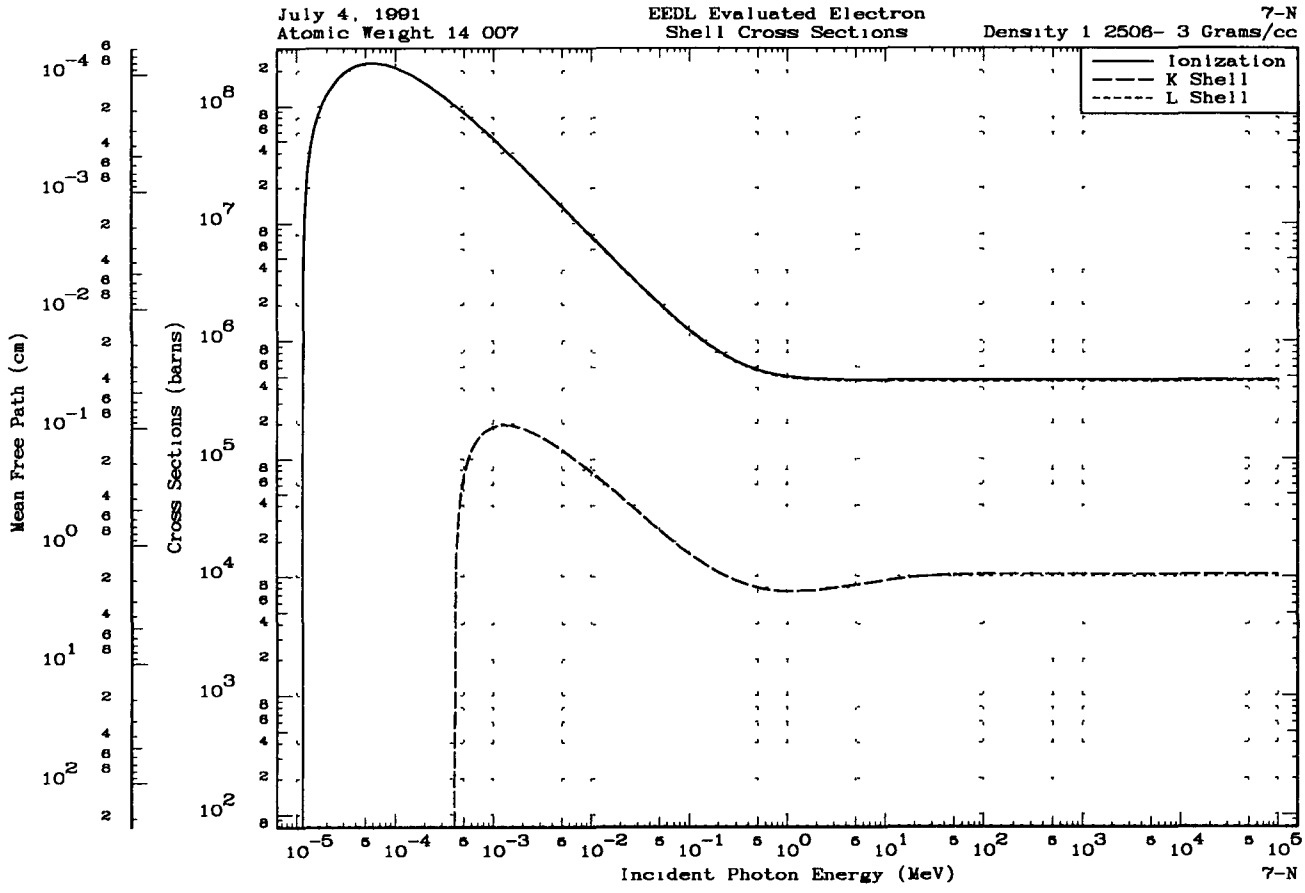
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
7-N

25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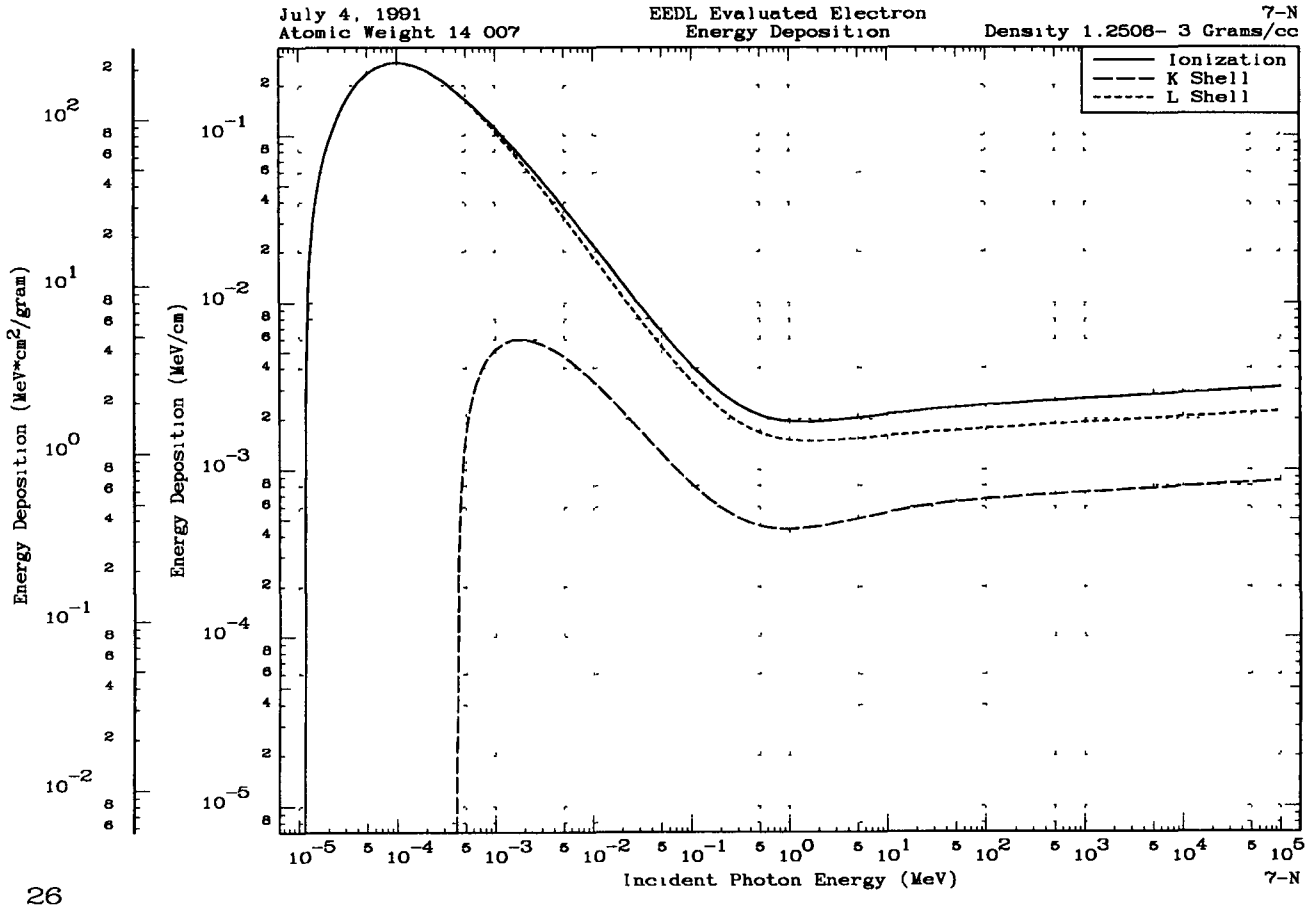
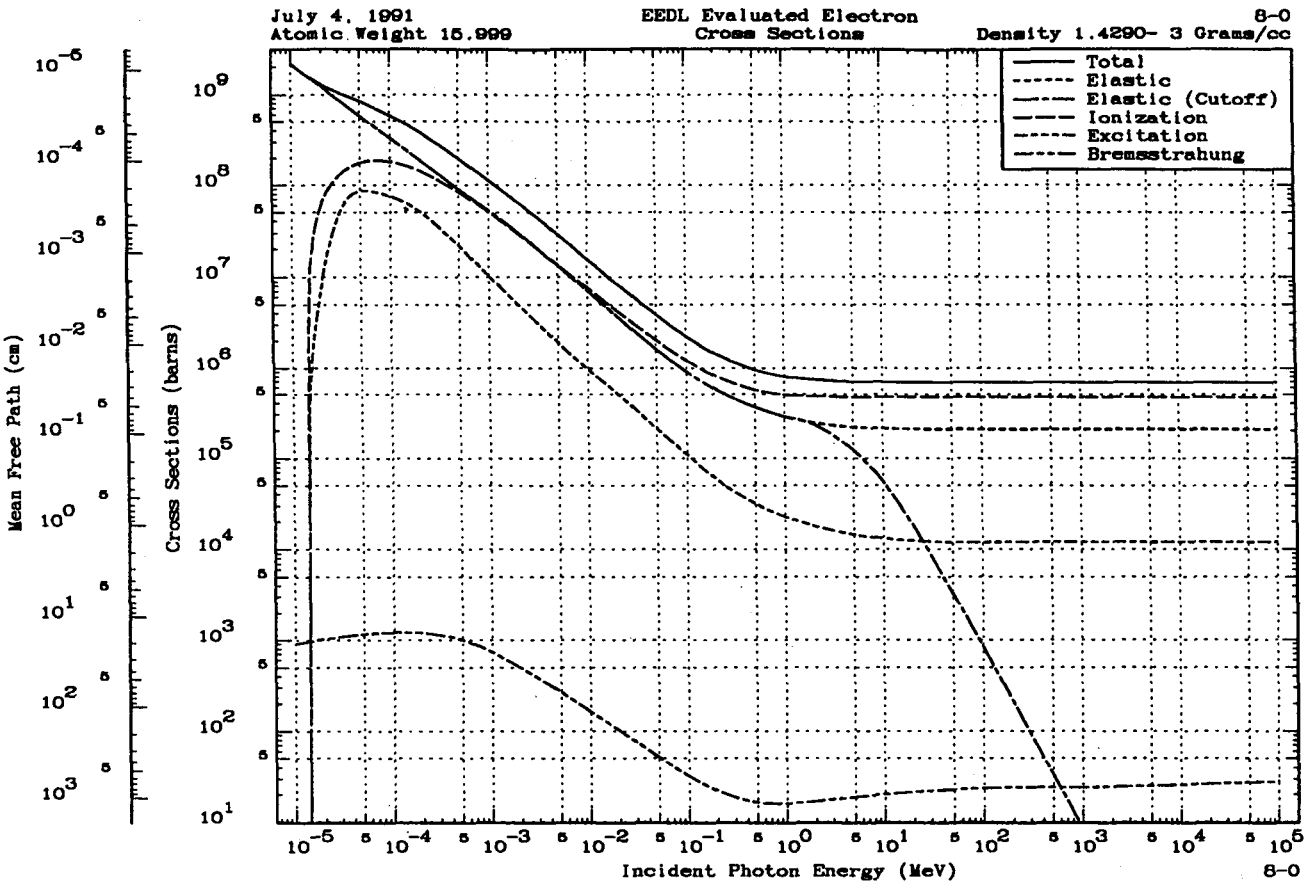
Shell Cross Sections
7-N
Density 1 2506- 3 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
7-N


July 4, 1991
Atomic Weight 14 007
EEDL Evaluated Electron
Energy Deposition
7-N
Density 1.2506- 3 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
7-N

Atomic Weight 14.007 — Density 1.2506– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.0429–6	1.1354+8		2.6407+9	2.6407+9			7.5411+2	8.7219–8			8.7219–8
L3	1.1480–5	7.9220–6	1.0094+8		2.3476+9	2.3476+9	0.0000+0	0.0000+0	7.7352+2	9.9341–8	0.0000+0	0.0000+0	9.9341–8
L2	1.1500–5	7.9327–6	1.0080+8		2.3445+9	2.3442+9	2.8628+5	2.2864+4	7.7377+2	1.9114–4	1.7679–4	1.4249–5	9.9506–8
	1.1700–5	8.0341–6	9.9528+7		2.3149+9	2.3100+9	4.5322+6	3.7491+5	7.7623+2	3.0468–3	2.8122–3	2.3451–4	1.0116–7
	1.1719–5	8.0440–6	9.9405+7		2.3120+9	2.3068+9	4.8163+6	4.0806+5	7.7646+2	3.2452–3	2.9897–3	2.5533–4	1.0132–7
	1.2112–5	8.2440–6	9.6993+7		2.2559+9	2.2428+9	1.1976+7	1.1349+6	7.8119+2	8.2124–3	7.4971–3	7.1519–4	1.0458–7
	1.2539–5	8.4538–6	9.4587+7		2.2000+9	2.1776+9	2.0561+7	1.8431+6	7.8619+2	1.4161–2	1.2990–2	1.1705–3	1.0815–7
	1.2834–5	8.5936–6	9.3048+7		2.1642+9	2.1348+9	2.6829+7	2.5529+6	7.8956+2	1.8686–2	1.7056–2	1.6299–3	1.1063–7
	1.2847–5	8.5998–6	9.2981+7		2.1626+9	2.1330+9	2.7025+7	2.5882+6	7.8971+2	1.8839–2	1.7186–2	1.6528–3	1.1073–7
	1.3154–5	8.7486–6	9.1399+7		2.1258+9	2.0905+9	3.2225+7	3.1243+6	7.9315+2	2.2630–2	2.0624–2	2.0061–3	1.1332–7
	1.3917–5	9.1013–6	8.7857+7		2.0434+9	1.9924+9	4.6152+7	4.8948+6	8.0142+2	3.3187–2	3.0001–2	3.1856–3	1.1978–7
	1.3923–5	9.1040–6	8.7832+7		2.0429+9	1.9917+9	4.6244+7	4.9111+6	8.0148+2	3.3262–2	3.0065–2	3.1965–3	1.1983–7
	1.4077–5	9.1746–6	8.7155+7		2.0271+9	1.9731+9	4.8756+7	5.2557+6	8.0311+2	3.5228–2	3.1798–2	3.4301–3	1.2114–7
	1.5000–5	9.5826–6	8.3445+7		1.9408+9	1.8692+9	6.3878+7	7.7717+6	8.1255+2	4.7586–2	4.2432–2	5.1540–3	1.2903–7
	1.6250–5	1.0109–5	7.9103+7		1.8398+9	1.7459+9	8.1880+7	1.2047+7	8.2462+2	6.3830–2	5.5666–2	8.1633–3	1.3984–7
	1.8125–5	1.0834–5	7.3806+7		1.7166+9	1.5907+9	1.0528+8	2.0601+7	8.4136+2	8.8442–2	7.4037–2	1.4405–2	1.5629–7
	2.0000–5	1.1494–5	6.9566+7		1.6180+9	1.4627+9	1.2446+8	3.0812+7	8.5674+2	1.1247–1	9.0261–2	2.2211–2	1.7301–7
L1	2.3100–5	1.2448–5	6.4234+7		1.4940+9	1.2937+9	1.4945+8	5.0844+7	8.7556+2	1.5180–1	1.1353–1	3.8263–2	1.9847–7
	2.3531–5	1.2570–5	6.3613+7		1.4796+9	1.2735+9	1.5261+8	5.3472+7	8.7782+2	1.5726–1	1.1682–1	4.0439–2	2.0193–7
	2.4340–5	1.2787–5	6.2533+7		1.4544+9	1.2373+9	1.5848+8	5.8628+7	8.8197+2	1.6775–1	1.2301–1	4.4748–2	2.0844–7
	2.5047–5	1.2965–5	6.1674+7		1.4345+9	1.2075+9	1.6359+8	6.3389+7	8.8550+2	1.7722–1	1.2845–1	4.8770–2	2.1415–7
	2.6250–5	1.3243–5	6.0380+7		1.4043+9	1.1602+9	1.7215+8	7.2028+7	8.9132+2	1.9391–1	1.3775–1	5.6165–2	2.2389–7
	2.6286–5	1.3252–5	6.0339+7		1.4034+9	1.1588+9	1.7234+8	7.2227+7	8.9149+2	1.9432–1	1.3798–1	5.6341–2	2.2418–7
	2.8143–5	1.3693–5	5.8396+7		1.3582+9	1.0933+9	1.8190+8	8.2988+7	9.0002+2	2.1580–1	1.4973–1	6.6068–2	2.3934–7
	3.0000–5	1.4078–5	5.6797+7		1.3210+9	1.0354+9	1.9115+8	9.4509+7	9.0808+2	2.3828–1	1.6153–1	7.6756–2	2.5461–7
	3.2500–5	1.4582–5	5.4837+7		1.2754+9	9.6722+8	2.0021+8	1.0801+8	9.1828+2	2.6361–1	1.7412–1	8.9485–2	2.7533–7
	3.5000–5	1.5057–5	5.3105+7		1.2352+9	9.0811+8	2.0876+8	1.1829+8	9.2783+2	2.8649–1	1.8656–1	9.9927–2	2.9625–7
	3.6250–5	1.5287–5	5.2309+7		1.2166+9	8.8140+8	2.1174+8	1.2349+8	9.3239+2	2.9715–1	1.9182–1	1.0533–1	3.0677–7
	4.0000–5	1.5971–5	5.0068+7		1.1645+9	8.1059+8	2.1992+8	1.3400+8	9.4528+2	3.2465–1	2.0708–1	1.1757–1	3.3860–7
	4.5000–5	1.6846–5	4.7465+7		1.1040+9	7.3333+8	2.2556+8	1.4509+8	9.5653+2	3.5216–1	2.2139–1	1.3077–1	3.7758–7
	5.0000–5	1.7709–5	4.5154+7		1.0502+9	6.7047+8	2.3054+8	1.4920+8	9.6671+2	3.7337–1	2.3535–1	1.3803–1	4.1691–7
	6.0000–5	1.9371–5	4.1279+7		9.6009+8	5.7417+8	2.3237+8	1.5355+8	9.8121+2	4.0035–1	2.5282–1	1.4753–1	4.9286–7
	7.0000–5	2.1054–5	3.7979+7		8.8334+8	5.0369+8	2.2875+8	1.5090+8	9.9364+2	4.1017–1	2.6153–1	1.4863–1	5.6968–7
	8.0000–5	2.2661–5	3.5286+7		8.2070+8	4.4967+8	2.2525+8	1.4578+8	1.0045+3	4.1682–1	2.6970–1	1.4711–1	6.4728–7
	1.0000–4	2.5920–5	3.0849+7	0.0000+0	7.1751+8	3.7226+8	2.1307+8	1.3218+8	1.0124+3	4.1093–1	2.7354–1	1.3739–1	7.9023–7
	1.2500–4	2.9915–5	2.6730+7	6.2189–5	6.2171+8	3.0818+8	1.9600+8	1.1753+8	1.0103+3	3.9321–1	2.6863–1	1.2458–1	9.5435–7
	1.5000–4	3.3751–5	2.3692+7	1.2725–4	5.5104+8	2.6409+8	1.8256+8	1.0439+8	1.0086+3	3.7539–1	2.6259–1	1.1280–1	1.1182–6
	2.0000–4	4.1412–5	1.9309+7	2.6778–4	4.4909+8	2.0701+8	1.5823+8	8.3860+7	9.9394+2	3.3692–1	2.4439–1	9.2526–2	1.4214–6
	2.5000–4	4.9114–5	1.6281+7	4.2474–4	3.7867+8	1.7143+8	1.3877+8	6.8467+7	9.5868+2	3.0088–1	2.2439–1	7.6484–2	1.6643–6
	3.0000–4	5.6418–5	1.4173+7	5.9829–4	3.2965+8	1.4696+8	1.2468+8	5.8011+7	9.3080+2	2.7567–1	2.1007–1	6.5604–2	1.9006–6
	4.0000–4	7.1100–5	1.1246+7	9.9266–4	2.6158+8	1.1537+8	1.0311+8	4.3088+7	8.8219+2	2.3268–1	1.8318–1	4.9496–2	2.3366–6
K	4.0485–4	7.1800–5	1.1137+7	1.0136–3	2.5903+8	1.1421+8	1.0224+8	4.2570+7	8.7871+2	2.3089–1	1.8197–1	4.8925–2	2.3521–6
	4.0782–4	7.2231–5	1.1070+7	1.0265–3	2.5748+8	1.1351+8	1.0172+8	4.2244+7	8.7660+2	2.2986–1	1.8129–1	4.8566–2	2.3616–6
	4.1935–4	7.3898–5	1.0821+7	1.0770–3	2.5167+8	1.1088+8	9.9764+7	4.1024+7	8.6862+2	2.2600–1	1.7877–1	4.7227–2	2.3982–6
	4.3951–4	7.6792–5	1.0413+7	1.1675–3	2.4219+8	1.0659+8	9.6547+7	3.9048+7	8.5534+2	2.1971–1	1.7465–1	4.5056–2	2.4616–6
	4.6976–4	8.1083–5	9.8617+6	1.3079–3	2.2937+8	1.0079+8	9.2167+7	3.6409+7	8.3686+2	2.1123–1	1.6907–1	4.2157–2	2.5553–6
	5.0000–4	8.5319–5	9.3721+6	1.4537–3	2.1798+8	9.5642+7	8.8242+7	3.4098+7	8.1989+2	2.0372–1	1.6410–1	3.9617–2	2.6475–6
	5.5000–4	9.2336–5	8.6599+6	1.7066–3	2.0142+8	8.8278+7	8.2354+7	3.0784+7	7.9017+2	1.9190–1	1.5598–1	3.5925–2	2.7749–6
	6.0000–4	9.9233–5	8.0579+6	1.9741–3	1.8742+8	8.2051+7	7.7323+7	2.8042+7	7.6397+2	1.8195–1	1.4908–1	3.2868–2	2.8989–6
	6.5000–4	1.0609–4	7.5374+6	2.2561–3	1.7531+8	7.6721+7	7.2816+7	2.5773+7	7.3634+2	1.7269–1	1.4238–1	3.0308–2	2.9960–6
	7.2500–4	1.1619–4	6.8819+6	2.7058–3	1.6006+8	7.0004+7	6.7088+7	2.2970+7	7.0026+2	1.6105–1	1.3390–1	2.7145–2	3.1372–6
	8.0000–4	1.2611–4	6.3405+6	3.1859–3	1.4747+8	6.4454+7	6.2311+7	2.0706+7	6.6926+2	1.5145–1	1.2685–1	2.4590–2	3.2736–6
	1.0000–3	1.5203–4	5.2597+6	4.6059–3	1.2233+8	5.3482+7	5.2427+7	1.6425+7	5.9173+2	1.3075–1	1.1105–1	1.9695–2	3.4995–6
	1.2500–3	1.8346–4	4.3586+6	6.6688–3	1.0138+8	4.4340+7	4.3880+7	1.3156+7	5.1761+2	1.1211–1	9.6199–2	1.5904–2	3.6592–6
	1.5000–3	2.1387–4	3.7387+6	9.0374–3	8.6958+7	3.8043+7	3.7940+7	1.0974+7	4.6399+2	9.9246–2	8.5867–2	1.3375–2	3.8163–6
	2.0000–3	2.7343–4	2.9244+6	1.4599–2	6.8018+7	2.9736+7	2.9990+7	8.2923+6	3.8828+2	8.1150–2	7.0932–2	1.0214–2	4.0345–6
	3.0000–3	3.8937–4	2.0536+6	2.8802–2	4.7764+7	2.0687+7	2.1416+7	5.6611+6	2.9763+2	6.0661–2	5.3587–2	7.0690–3	4.2723–6
	4.0000–3	5.0232–4	1.5918+6	4.7092–2	3.7024+7	1.5880+7	1.6812+7	4.3321+6	2.4422+2	4.9095–2	4.3633–2	5.4581–3	4.3920–6
	5.0000–3	6.1366–4	1.3030+6	6.9210–2	3.0307+7	1.2882+7	1.3917+7	3.5071+6	2.0871+2	4.1540–2	3.7087–2	4.4482–3	4.4685–6
	6.0000–3	7.2303–4	1.1059+6	9.4985–2	2.5722+7	1.0857+7	1.1919+7	2.9461+6	1.8314+2	3.6180–2	3.2420–2	3.7555–3	4.5148–6
	8.0000–3	9.3637–4	8.5395+5	1.5655–1	1.9862+7	8.2800+6	9.3303+6	2.2514+6	1.4872+2	2.9048–2	2.6152–2	2.8919–3	4.5669–6
	1.0000–2	1.1433–3	6.9939+5	2.3146–1	1.6267+7	6.7097+6	7.7158+6	1.8413+6	1.2654+2	2.4480–2	2.2097–2	2.3783–3	4.5902–6
	1.5000–2	1.6415–3	4.8713+5	4.6928–1	1.1330+7	4.5789+6	5.4701+6	1.2807+6	9.5291+1	1.7911–2	1.6237–2	1.6698–3	4.6213–6
	2.0000–2	2.1167–3	3.7777+5	7.8047–1	8.7865+6	3.5019+6	4.2955+6	9.8895+5	7.7695+1	1.4354–2	1.3051–2	1.2978–3	4.6296–6
	3.0000–2	3.0138–3	2.6532+5	1.5905+0	6.1710+6	2.4121+6	3.0724+6	6.8651+5	5.7825+1	1.0533–2	9.6194–3	9.0881–4	4.6445–6
	4.0000–2	3.8481–3	2.0779+5	2.6459+0	4.8330+6	1.8669+6	2.4360+6	5.3010+5	4.6809+1	8.4903–3	7.7798–3	7.0583–4	4.6690–6
	5.0000–2	4.6263–3	1.7284+5	3.9221+0	4.0201+6	1.5374+6	2.0448+6	4.3775+5	3.9798+1	7.2165–3	6.6264–3	5.8544–4	4.7042–6
	6.0000–2	5.3587–3	1.4922+5	5.3993+0	3.4706+6	1.3161+6	1.7795+6	3.7492+5	3.4968+1	6.3409–3	5.8330–3	5.0317–4	4.7460–6
	8.0000–2	6.7073–3	1.1922+5	8.8729+0	2.7728+6	1.0365+6	1.4413+6	2.9494+5	2.8749+1	5.2117–3	4.8089–3	3.9799–4	4.8404–6
	9.0000–2	7.3311–3	1.0907+5	1.0867+1	2.5369+6	9.4384+5	1.3284+6	2.6463+5	2.6625+1	4.8233–3	4.4606–3	3.5783–4	4.8888–6
	1.0000–1	7.9174–3	1.0100+5	1.3010+1	2.3490+6	8.6800+5	1.2348+6	2.4615+5	2.4858+1	4.5111–3	4.1727–3	3.3355–4	4.9436–6
	1.5000–1	1.0445–2	7.6558+4	2.5462+1	1.7806+6	6.4485+5	9.5556+5	1.8020+5	1.9583+1	3.5573–3	3.3061–3	2.4599–4	5.2446–6
	2.0000–1	1.2423–2	6.4364+4	4.0565+1	1.4970+6	5.3334+5	8.1494+5	1.4873+5	1.6943+1	3.0757–3	2.8660–3	2.0411–4	5.6009–6
	3.0000–1	1.5306–2	5.2242+4	7.5892+1	1.2151+6	4.2169+5	6.7564+5	1.1772+5	1.4447+1	2.5991–3	2.4298–3	1.6282–4	6.4510–6
	4.0000–1	1.7297–2	4.6230+4	1.1614+2	1.0752+6	3.6383+5	6.0804+5	1.0336+5	1.3356+1	2.3739–3	2.2226–3	1.4381–4	7.4262–6
	5.0000–1	1.8734–2	4.2683+4	1.5940+2	9.9275+5	3.2829+5	5.6912+5	9.5325+4	1.2809+1	2.2497–3	2.1079–3	1.3328–4	8.5000–6
	6.0000–1	1.9830–2	4.0323+4	2.0463+2	9.3786+5	3.0428+5	5.4436+5	8.9212+4	1.2557+1	2.1734–3	2.0385–3	1.2525–4	9.6740–6
	8.0000–1	2.1356–2	3.7443+4	2.9833+2	8.7087+5	2.7262+5	5.1556+5	8.2672+4	1.2425+1	2.0956–3	1.9665–3	1.1688–4	1.2236–5
	1.0000+0	2.2384–2	3.5723+4	3.9456+2	8.3087+5	2.5279+5	5.0002+5	7.8052+4	1.2492+1	2.0616–3	1.9356–3	1.1096–4	1.5020–5
	1.5000+0	2.3823–2	3.3565+4	6.3763+2	7.8068+5	2.2537+5	4.8256+5	7.2737+4	1.2905+1	2.0523–3	1.9251–3	1.0445–4	2.2803–5

Atomic Weight 14.007												Density 1.2506– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000+0	2.4499–2	3.2638+4	8.8023+2	7.5913+5	2.1082+5	4.7856+5	6.9740+4	1.3332+1	2.0697–3	1.9378–3	1.0053–4	3.1420–5
3.0000+0	2.5271–2	3.1641+4	1.3573+3	7.3594+5	1.9571+5	4.7321+5	6.6994+4	1.4047+1	2.1230–3	1.9751–3	9.7322–5	5.0577–5
4.0000+0	2.5732–2	3.1075+4	1.8222+3	7.2276+5	1.8779+5	4.6948+5	6.5473+4	1.4583+1	2.1789–3	2.0114–3	9.5860–5	7.1707–5
5.0000+0	2.5917–2	3.0853+4	2.2763+3	7.1759+5	1.8321+5	4.6928+5	6.5079+4	1.5013+1	2.2252–3	2.0362–3	9.5419–5	9.3586–5
6.0000+0	2.6040–2	3.0707+4	2.7211+3	7.1420+5	1.8029+5	4.6915+5	6.4741+4	1.5308+1	2.2713–3	2.0594–3	9.5058–5	1.1686–4
8.0000+0	2.6192–2	3.0529+4	3.5848+3	7.1007+5	1.7693+5	4.6895+5	6.4168+4	1.5784+1	2.3609–3	2.1017–3	9.4489–5	1.6471–4
1.0000+1	2.6277–2	3.0430+4	4.4164+3	7.0776+5	1.7525+5	4.6881+5	6.3690+4	1.6145+1	2.4497–3	2.1404–3	9.4053–5	2.1524–4
1.5000+1	2.6311–2	3.0391+4	6.3872+3	7.0685+5	1.7382+5	4.6913+5	6.3881+4	1.6761+1	2.6265–3	2.1855–3	9.4354–5	3.4661–4
2.0000+1	2.6321–2	3.0379+4	8.2299+3	7.0658+5	1.7314+5	4.6937+5	6.4047+4	1.7171+1	2.8021–3	2.2247–3	9.4618–5	4.8270–4
3.0000+1	2.6327–2	3.0373+4	1.1596+4	7.0643+5	1.7260+5	4.6954+5	6.4276+4	1.7698+1	3.1466–3	2.2847–3	9.4994–5	7.6690–4
4.0000+1	2.6345–2	3.0352+4	1.4622+4	7.0595+5	1.7257+5	4.6970+5	6.3658+4	1.8030+1	3.4667–3	2.3137–3	9.4118–5	1.0589–3
5.0000+1	2.6369–2	3.0324+4	1.7383+4	7.0530+5	1.7257+5	4.6975+5	6.2968+4	1.8268+1	3.7828–3	2.3332–3	9.3134–5	1.3564–3
6.0000+1	2.6384–2	3.0307+4	1.9921+4	7.0489+5	1.7256+5	4.6979+5	6.2529+4	1.8445+1	4.1028–3	2.3523–3	9.2521–5	1.6580–3
8.0000+1	2.6408–2	3.0279+4	2.4447+4	7.0425+5	1.7256+5	4.6984+5	6.1826+4	1.8704+1	4.7507–3	2.3895–3	9.1553–5	2.2697–3
1.0000+2	2.6425–2	3.0260+4	2.8392+4	7.0380+5	1.7255+5	4.6989+5	6.1339+4	1.8889+1	5.4012–3	2.4209–3	9.0902–5	2.8894–3
1.5000+2	2.6447–2	3.0235+4	3.6495+4	7.0322+5	1.7255+5	4.6990+5	6.0751+4	1.9180+1	7.0098–3	2.4465–3	9.0031–5	4.4733–3
2.0000+2	2.6458–2	3.0222+4	4.2910+4	7.0292+5	1.7254+5	4.6991+5	6.0442+4	1.9310+1	8.6360–3	2.4719–3	8.9574–5	6.0746–3
3.0000+2	2.6466–2	3.0213+4	5.2728+4	7.0271+5	1.7254+5	4.6993+5	6.0220+4	1.9275+1	1.1910–2	2.5221–3	8.9246–5	9.2984–3
4.0000+2	2.6471–2	3.0207+4	6.0152+4	7.0258+5	1.7253+5	4.6993+5	6.0100+4	1.9201+1	1.5160–2	2.5514–3	8.9069–5	1.2520–2
5.0000+2	2.6478–2	3.0199+4	6.6131+4	7.0240+5	1.7253+5	4.6993+5	5.9918+4	1.9138+1	1.8391–2	2.5679–3	8.8800–5	1.5734–2
6.0000+2	2.6477–2	3.0200+4	7.1137+4	7.0242+5	1.7252+5	4.6993+5	5.9940+4	1.9128+1	2.1655–2	2.5844–3	8.8832–5	1.8982–2
8.0000+2	2.6477–2	3.0200+4	7.9212+4	7.0241+5	1.7252+5	4.6993+5	5.9935+4	1.9144+1	2.8167–2	2.6174–3	8.8827–5	2.5460–2
1.0000+3	2.6478–2	3.0200+4	8.5600+4	7.0240+5	1.7251+5	4.6994+5	5.9931+4	1.9188+1	3.4670–2	2.6454–3	8.8821–5	3.1935–2
1.5000+3	2.6478–2	3.0200+4	9.7430+4	7.0241+5	1.7251+5	4.6994+5	5.9942+4	1.9310+1	5.0899–2	2.6700–3	8.8837–5	4.8140–2
2.0000+3	2.6479–2	3.0198+4	1.0595+5	7.0237+5	1.7250+5	4.6994+5	5.9916+4	1.9419+1	6.7201–2	2.6946–3	8.8800–5	6.4417–2
3.0000+3	2.6478–2	3.0199+4	1.1809+5	7.0240+5	1.7250+5	4.6994+5	5.9945+4	1.9607+1	9.9750–2	2.7438–3	8.8843–5	9.6918–2
4.0000+3	2.6479–2	3.0198+4	1.2676+5	7.0237+5	1.7249+5	4.6994+5	5.9927+4	1.9765+1	1.3245–1	2.7722–3	8.8816–5	1.2959–1
5.0000+3	2.6484–2	3.0193+4	1.3350+5	7.0224+5	1.7249+5	4.6994+5	5.9797+4	1.9893+1	1.6536–1	2.7880–3	8.8622–5	1.6248–1
6.0000+3	2.6482–2	3.0195+4	1.3902+5	7.0229+5	1.7249+5	4.6994+5	5.9851+4	2.0014+1	1.9772–1	2.8037–3	8.8703–5	1.9482–1
8.0000+3	2.6481–2	3.0196+4	1.4777+5	7.0232+5	1.7248+5	4.6994+5	5.9884+4	2.0205+1	2.6292–1	2.8351–3	8.8751–5	2.6000–1
1.0000+4	2.6480–2	3.0197+4	1.5456+5	7.0233+5	1.7248+5	4.6994+5	5.9902+4	2.0355+1	3.2867–1	2.8665–3	8.8778–5	3.2571–1
1.5000+4	2.6480–2	3.0197+4	1.6694+5	7.0235+5	1.7247+5	4.6994+5	5.9927+4	2.0684+1	4.8971–1	2.8899–3	8.8816–5	4.8673–1
2.0000+4	2.6480–2	3.0197+4	1.7575+5	7.0234+5	1.7246+5	4.6994+5	5.9916+4	2.0921+1	6.5285–1	2.9133–3	8.8800–5	6.4984–1
3.0000+4	2.6479–2	3.0198+4	1.8819+5	7.0236+5	1.7246+5	4.6994+5	5.9942+4	2.1253+1	9.7580–1	2.9600–3	8.8837–5	9.7275–1
4.0000+4	2.6480–2	3.0197+4	1.9703+5	7.0233+5	1.7245+5	4.6994+5	5.9923+4	2.1492+1	1.3023+0	2.9964–3	8.8811–5	1.2992+0
5.0000+4	2.6485–2	3.0191+4	2.0389+5	7.0221+5	1.7245+5	4.6994+5	5.9807+4	2.1675+1	1.6256+0	3.0116–3	8.8638–5	1.6225+0
6.0000+4	2.6483–2	3.0194+4	2.0950+5	7.0227+5	1.7245+5	4.6994+5	5.9862+4	2.1825+1	1.9487+0	3.0268–3	8.8719–5	1.9456+0
8.0000+4	2.6482–2	3.0195+4	2.1836+5	7.0229+5	1.7244+5	4.6994+5	5.9891+4	2.2063+1	2.6006+0	3.0571–3	8.8762–5	2.5975+0
1.0000+5	2.6482–2	3.0195+4	2.2522+5	7.0230+5	1.7244+5	4.6994+5	5.9901+4	2.2249+1	3.2536+0	3.0874–3	8.8778–5	3.2505+0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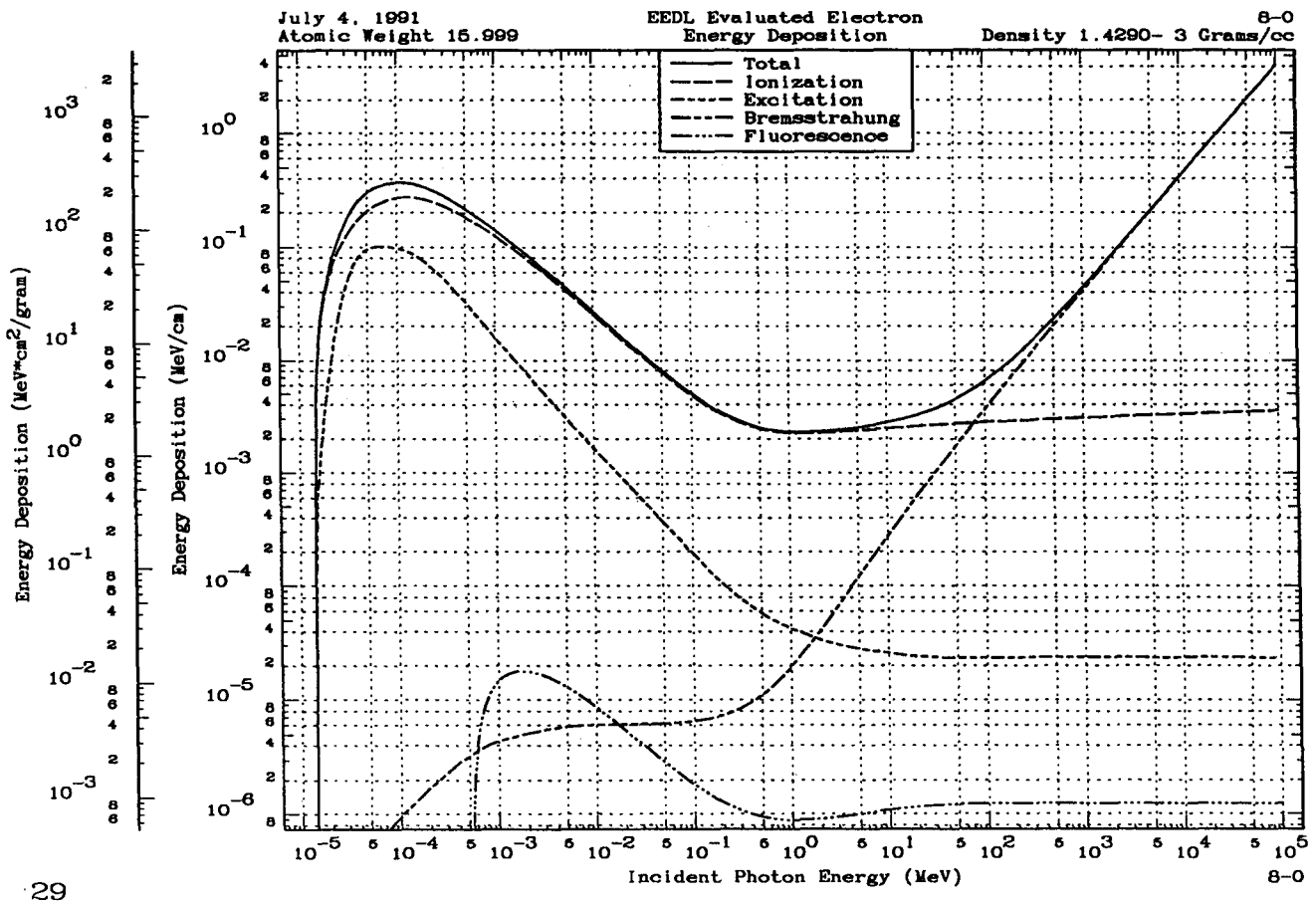
EEDL Evaluated Electron
Cross Sections
8-O
Density 1.4290- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
8-O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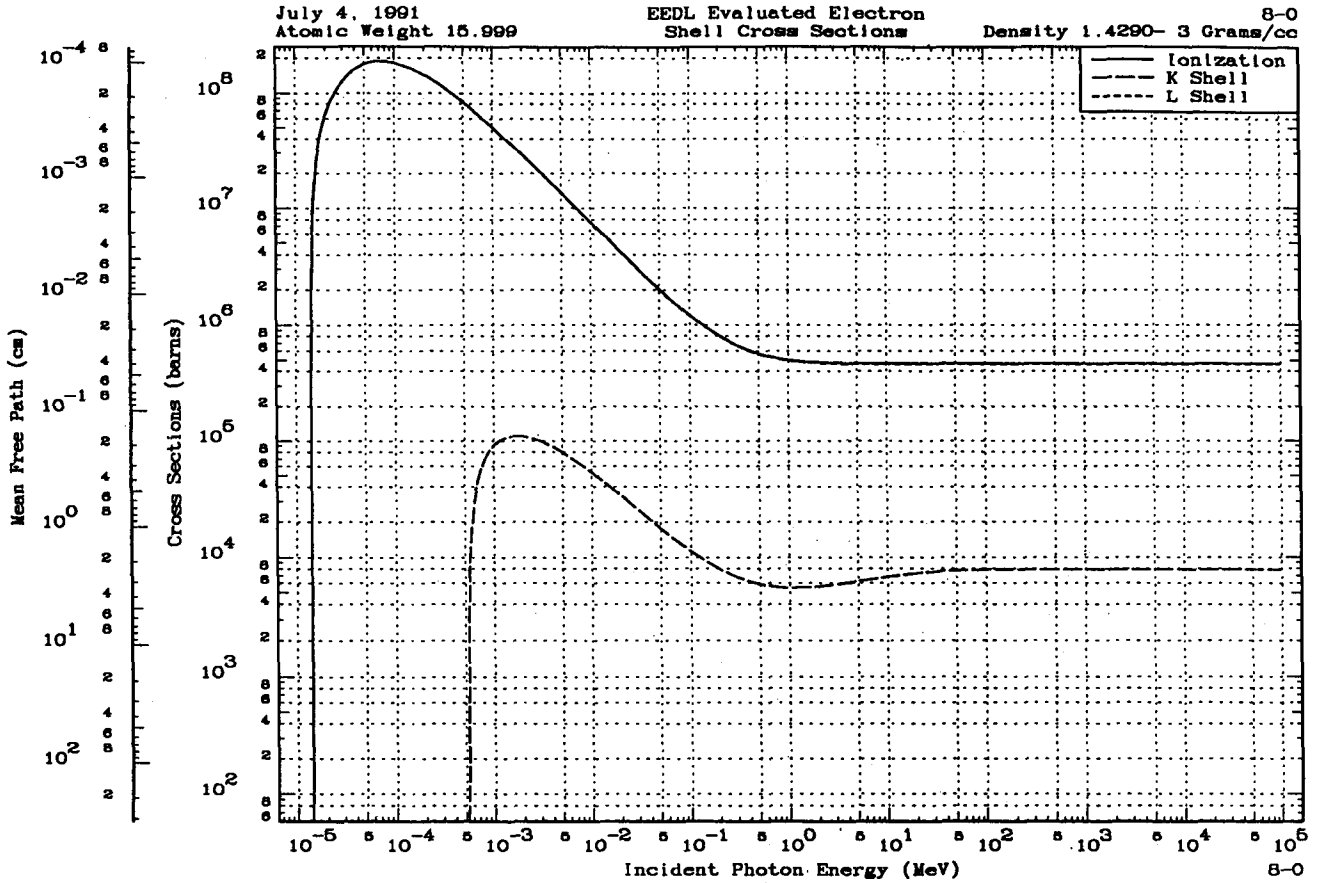
EEDL Evaluated Electron
Energy Deposition
8-O
Density 1.4290- 3 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
8-O

29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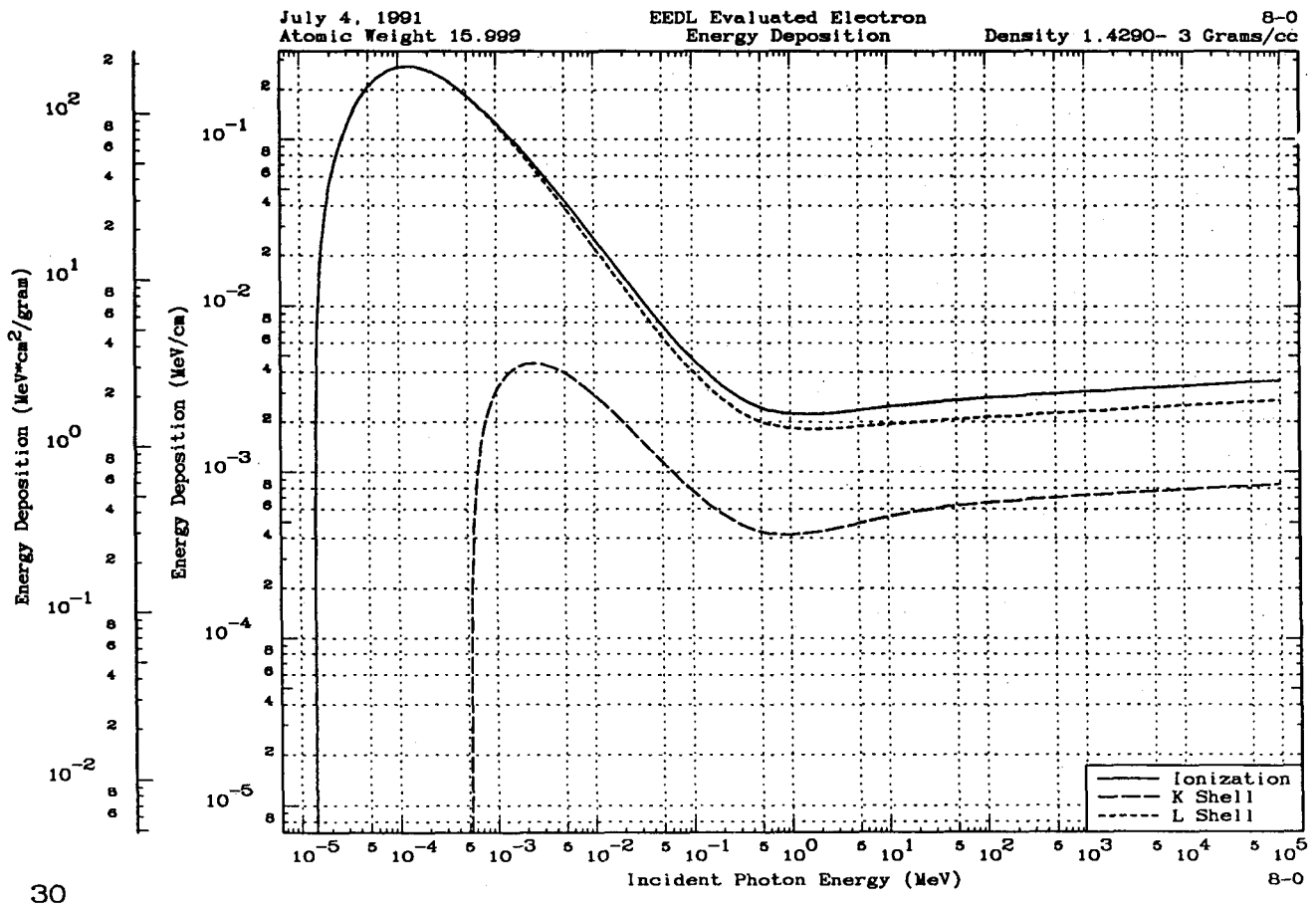
EEDL Evaluated Electron
Shell Cross Sections
8-0
Density 1.4290- 3 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
8-0

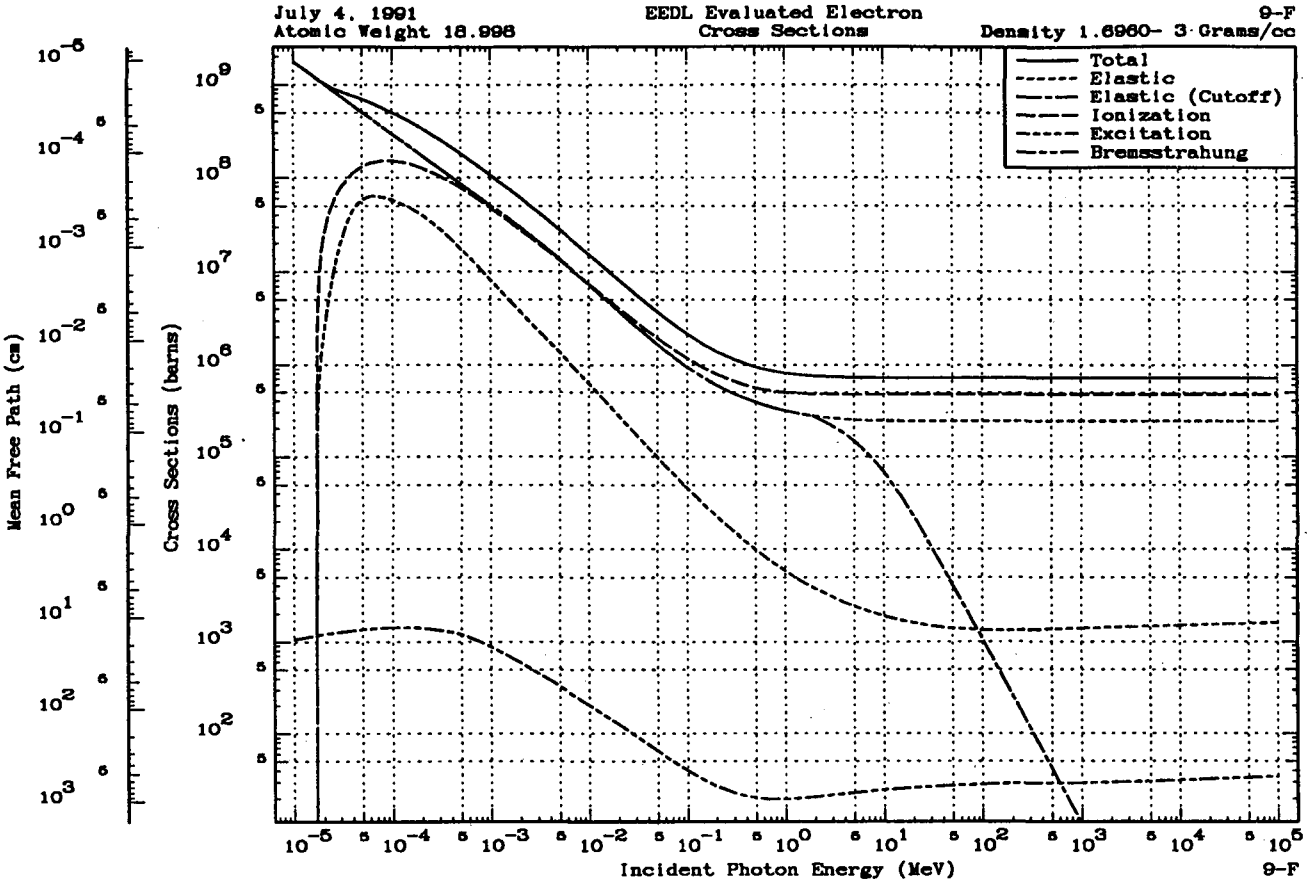

July 4, 1991
Atomic Weight 15.999
EEDL Evaluated Electron
Energy Deposition
8-0
Density 1.4290- 3 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
8-0

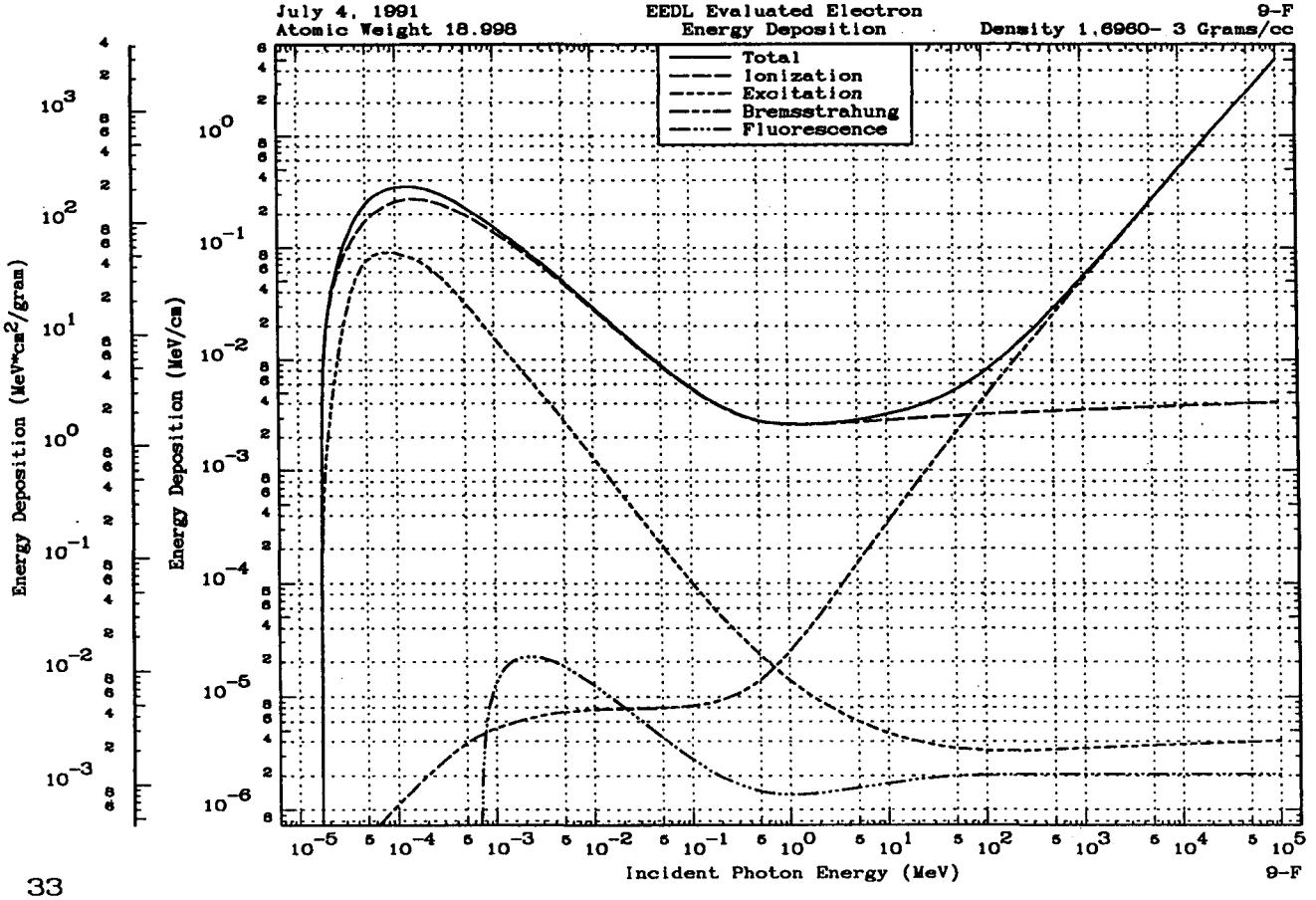
30

Atomic Weight 15.999 — Density 1.4290– 3 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	8.6375–6	8.1018+7		2.1525+9	2.1525+9			9.0754+2	1.0501–7			1.0501–7
L3 1.4150–5	1.1454–5	6.1098+7		1.6232+9	1.6232+9	0.0000+0	0.0000+0	9.6761+2	1.4664–7	0.0000+0	0.0000+0	1.4664–7
L2 1.4190–5	1.1477–5	6.0972+7		1.6199+9	1.6195+9	3.5687+5	2.1531+4	9.6812+2	2.8859–4	2.7180–4	1.6635–5	1.4705–7
1.4575–5	1.1690–5	5.9863+7		1.5904+9	1.5846+9	5.4197+6	3.4699+5	9.7291+2	4.4270–3	4.1588–3	2.6809–4	1.5101–7
1.4595–5	1.1701–5	5.9805+7		1.5889+9	1.5829+9	5.6281+6	3.6447+5	9.7316+2	4.6021–3	4.3203–3	2.8159–4	1.5122–7
1.5000–5	1.1921–5	5.8703+7		1.5596+9	1.5480+9	1.0816+7	7.3239+5	9.7809+2	8.9281–3	8.3621–3	5.6584–4	1.5540–7
1.6250–5	1.2577–5	5.5641+7		1.4783+9	1.4505+9	2.5772+7	1.9709+6	9.9266+2	2.1910–2	2.0355–2	1.5546–3	1.6843–7
1.7188–5	1.3051–5	5.3622+7		1.4246+9	1.3859+9	3.5675+7	3.0591+6	1.0030+3	3.1074–2	2.8624–2	2.4503–3	1.7830–7
1.8125–5	1.3498–5	5.1846+7		1.3774+9	1.3273+9	4.5477+7	4.6386+6	1.0129+3	4.0830–2	3.7059–2	3.7718–3	1.8826–7
1.8594–5	1.3713–5	5.1031+7		1.3558+9	1.3000+9	5.0250+7	5.4995+6	1.0177+3	4.5764–2	4.1259–2	4.5053–3	1.9327–7
2.0000–5	1.4326–5	4.8846+7		1.2977+9	1.2252+9	6.3550+7	8.9418+6	1.0314+3	6.0829–2	5.3340–2	7.4883–3	2.0841–7
2.2500–5	1.5315–5	4.5692+7		1.2139+9	1.1134+9	8.3604+7	1.6980+7	1.0492+3	8.7425–2	7.2724–2	1.4701–2	2.3262–7
2.6250–5	1.6564–5	4.2248+7		1.1224+9	9.8222+8	1.0777+8	3.2433+7	1.0729+3	1.2814–1	9.8676–2	2.9459–2	2.6949–7
L1 2.9230–5	1.7417–5	4.0178+7		1.0674+9	9.0001+8	1.2241+8	4.5027+7	1.0898+3	1.5860–1	1.1618–1	4.2420–2	2.9925–7
2.9615–5	1.7512–5	3.9961+7		1.0617+9	8.9048+8	1.2452+8	4.6647+7	1.0918+3	1.6297–1	1.1886–1	4.4111–2	3.0307–7
3.0000–5	1.7604–5	3.9752+7		1.0561+9	8.8118+8	1.2664+8	4.8303+7	1.0937+3	1.6740–1	1.2155–1	4.5848–2	3.0691–7
3.1250–5	1.7916–5	3.9060+7		1.0377+9	8.5248+8	1.3176+8	5.3491+7	1.1000+3	1.7992–1	1.2855–1	5.1362–2	3.1939–7
3.3438–5	1.8441–5	3.7948+7		1.0082+9	8.0696+8	1.4056+8	6.0660+7	1.1106+3	2.0034–1	1.4093–1	5.9416–2	3.4138–7
3.5000–5	1.8774–5	3.7275+7		9.9032+8	7.7762+8	1.4666+8	6.6035+7	1.1177+3	2.1532–1	1.4973–1	6.5590–2	3.5719–7
3.6719–5	1.9176–5	3.6494+7		9.6955+8	7.4797+8	1.5174+8	6.9837+7	1.1253+3	2.2824–1	1.5782–1	7.0426–2	3.7467–7
4.0000–5	1.9864–5	3.5229+7		9.3594+8	6.9780+8	1.6096+8	7.7178+7	1.1389+3	2.5309–1	1.7303–1	8.0062–2	4.0833–7
4.5000–5	2.0951–5	3.3400+7		8.8737+8	6.3426+8	1.6994+8	8.3175+7	1.1527+3	2.7990–1	1.9074–1	8.9168–2	4.5549–7
5.0000–5	2.1965–5	3.1860+7		8.4644+8	5.8234+8	1.7819+8	8.5910+7	1.1652+3	3.0335–1	2.0827–1	9.5080–2	5.0308–7
5.5000–5	2.3023–5	3.0395+7		8.0753+8	5.3904+8	1.8223+8	8.6254+7	1.1746+3	3.1823–1	2.2038–1	9.7851–2	5.4894–7
6.0000–5	2.3996–5	2.9163+7		7.7480+8	5.0233+8	1.8590+8	8.6570+7	1.1832+3	3.3286–1	2.3225–1	1.0061–1	5.9509–7
7.0000–5	2.6017–5	2.6897+7		7.1460+8	4.4339+8	1.8712+8	8.4086+7	1.1986+3	3.4737–1	2.4625–1	1.0112–1	6.8819–7
8.0000–5	2.7836–5	2.5140+7		6.6791+8	3.9796+8	1.8796+8	8.1993+7	1.2121+3	3.6159–1	2.5968–1	1.0191–1	7.8225–7
1.0000–4	3.1486–5	2.2225+7	0.0000+0	5.9047+8	3.3245+8	1.8268+8	7.5342+7	1.2226+3	3.6942–1	2.7172–1	9.7699–2	9.5608–7
1.2500–4	3.5885–5	1.9501+7	6.8045–5	5.1809+8	2.7772+8	1.7155+8	6.8815+7	1.2213+3	3.6539–1	2.7357–1	9.1817–2	1.1563–6
1.5000–4	3.9977–5	1.7505+7	1.3705–4	4.6506+8	2.3976+8	1.6262+8	6.2688+7	1.2203+3	3.5922–1	2.7322–1	8.5995–2	1.3564–6
2.0000–4	4.8237–5	1.4507+7	2.8146–4	3.8543+8	1.9014+8	1.4391+8	5.1384+7	1.2045+3	3.3357–1	2.6109–1	7.2478–2	1.7282–6
2.5000–4	5.6457–5	1.2395+7	4.3823–4	3.2931+8	1.5897+8	1.2790+8	4.2434+7	1.1641+3	3.0473–1	2.4395–1	6.0780–2	2.0292–6
3.0000–4	6.4202–5	1.0900+7	6.0819–4	2.8958+8	1.3734+8	1.1595+8	3.6291+7	1.1320+3	2.8390–1	2.3113–1	5.2773–2	2.3226–6
4.0000–4	7.9639–5	8.7870+6	9.8660–4	2.3345+8	1.0911+8	9.7174+7	2.7172+7	1.0758+3	2.4555–1	2.0531–1	4.0240–2	2.8658–6
5.0000–4	9.4423–5	7.4112+6	1.4195–3	1.9690+8	9.1288+7	8.3785+7	2.1826+7	1.0029+3	2.1706–1	1.8432–1	3.2739–2	3.2605–6
K 5.3728–4	9.9857–5	7.0079+6	1.5950–3	1.8618+8	8.6221+7	7.9685+7	2.0277+7	9.8043+2	2.0782–1	1.7730–1	3.0522–2	3.4022–6
5.4512–4	1.0099–4	6.9290+6	1.6329–3	1.8409+8	8.5235+7	7.8887+7	1.9965+7	9.7463+2	2.0609–1	1.7601–1	3.0078–2	3.4252–6
5.5884–4	1.0297–4	6.7958+6	1.6999–3	1.8055+8	8.3570+7	7.7536+7	1.9442+7	9.6474+2	2.0319–1	1.7385–1	2.9332–2	3.4652–6
5.7942–4	1.0592–4	6.6066+6	1.8022–3	1.7552+8	8.1204+7	7.5611+7	1.8706+7	9.5055+2	1.9907–1	1.7078–1	2.8281–2	3.5246–6
6.0000–4	1.0885–4	6.4291+6	1.9066–3	1.7081+8	7.8985+7	7.3798+7	1.8021+7	9.3704+2	1.9518–1	1.6787–1	2.7305–2	3.5833–6
6.2500–4	1.1244–4	6.2237+6	2.0364–3	1.6535+8	7.6467+7	7.1645+7	1.7236+7	9.2025+2	1.9030–1	1.6413–1	2.6165–2	3.6471–6
6.6875–4	1.1865–4	5.8977+6	2.2711–3	1.5669+8	7.2468+7	6.8212+7	1.6009+7	8.9307+2	1.8254–1	1.5816–1	2.4383–2	3.7568–6
7.3438–4	1.2781–4	5.4752+6	2.6408–3	1.4546+8	6.7277+7	6.3732+7	1.4454+7	8.5679+2	1.7253–1	1.5040–1	2.2123–2	3.9170–6
8.0000–4	1.3679–4	5.1159+6	3.0308–3	1.3592+8	6.2858+7	5.9894+7	1.3166+7	8.2491+2	1.6405–1	1.4380–1	2.0249–2	4.0724–6
9.0000–4	1.5040–4	4.6528+6	3.6638–3	1.2362+8	5.7247+7	5.4798+7	1.1570+7	7.7478+2	1.5210–1	1.3420–1	1.7895–2	4.2273–6
1.0000–3	1.6370–4	4.2747+6	4.3432–3	1.1357+8	5.2653+7	5.0608+7	1.0307+7	7.3252+2	1.4238–1	1.2634–1	1.6030–2	4.3771–6
1.1250–3	1.8020–4	3.8834+6	5.2567–3	1.0317+8	4.7935+7	4.6158+7	9.0783+6	6.8418+2	1.3143–1	1.1724–1	1.4184–2	4.4906–6
1.3125–3	2.0430–4	3.4253+6	6.7576–3	9.1002+7	4.2393+7	4.0919+7	7.6885+6	6.2571+2	1.1864–1	1.0654–1	1.2096–2	4.6586–6
1.5000–3	2.2774–4	3.0728+6	8.4071–3	8.1636+7	3.8114+7	3.6864+7	6.6578+6	5.7911+2	1.0884–1	9.8293–2	1.0547–2	4.8225–6
2.0000–3	2.8927–4	2.4192+6	1.3471–2	6.4271+7	3.0118+7	2.9245+7	4.9073+6	4.8731+2	8.9267–2	8.1395–2	7.8675–3	5.1357–6
2.5000–3	3.5052–4	1.9964+6	1.9536–2	5.3040+7	2.4813+7	2.4343+7	3.8836+6	4.2264+2	7.5985–2	6.9705–2	6.2747–3	5.3137–6
3.0000–3	4.1004–4	1.7066+6	2.6547–2	4.5341+7	2.1180+7	2.0953+7	3.2079+6	3.7622+2	6.6833–2	6.1604–2	5.2229–3	5.4952–6
4.0000–3	5.2749–4	1.3266+6	4.3131–2	3.5246+7	1.6358+7	1.6482+7	2.4050+6	3.1003+2	5.4211–2	5.0249–2	3.9554–3	5.6885–6
5.0000–3	6.4317–4	1.0880+6	6.3153–2	2.8907+7	1.3333+7	1.3661+7	1.9132+6	2.6568+2	4.5909–2	4.2733–2	3.1697–3	5.8160–6
6.0000–3	7.5693–4	9.2451+5	8.6459–2	2.4562+7	1.1268+7	1.1711+7	1.5819+6	2.3356+2	4.0039–2	3.7397–2	2.6360–3	5.8971–6
8.0000–3	9.7848–4	7.1518+5	1.4204–1	1.9001+7	8.6278+6	9.1808+6	1.1919+6	1.9010+2	3.2216–2	3.0207–2	2.0034–3	5.9888–6
1.0000–2	1.1948–3	5.8571+5	2.0955–1	1.5561+7	7.0022+6	7.5982+6	9.6038+5	1.6200+2	2.7174–2	2.5543–2	1.6244–3	6.0447–6
1.5000–2	1.7138–3	4.0832+5	4.2350–1	1.0848+7	4.7913+6	5.3946+6	6.6198+5	1.2221+2	1.9938–2	1.8801–2	1.1317–3	6.0892–6
2.0000–2	2.2090–3	3.1679+5	7.0289–1	8.4163+6	3.6685+6	4.2395+6	5.0813+5	9.9792+1	1.5999–2	1.5118–2	8.7485–4	6.1087–6
3.0000–2	3.1450–3	2.2251+5	1.4292+0	5.9116+6	2.5325+6	3.0356+6	3.4332+5	7.4371+1	1.1757–2	1.1154–2	5.9661–4	6.1299–6
4.0000–2	4.0195–3	1.7410+5	2.3744+0	4.6254+6	1.9603+6	2.4088+6	2.5623+5	6.0233+1	9.4828–3	9.0286–3	4.4810–4	6.1650–6
4.5000–2	4.4329–3	1.5786+5	2.9247+0	4.1940+6	1.7695+6	2.1969+6	2.2755+5	5.5297+1	8.7002–3	8.2952–3	3.9890–4	6.1761–6
5.0000–2	4.8334–3	1.4478+5	3.5214+0	3.8465+6	1.6146+6	2.0233+6	2.0863+5	5.1226+1	8.0674–3	7.6945–3	3.6661–4	6.1996–6
6.0000–2	5.5997–3	1.2497+5	4.8426+0	3.3201+6	1.3825+6	1.7614+6	1.7618+5	4.5000+1	7.0918–3	6.7748–3	3.1078–4	6.2503–6
8.0000–2	7.0070–3	9.9871+4	7.9465+0	2.6533+6	1.0905+6	1.4278+6	1.3507+5	3.6998+1	5.8356–3	5.5896–3	2.3968–4	6.3658–6
9.0000–2	7.6553–3	9.1413+4	9.7270+0	2.4286+6	9.9407+5	1.3163+6	1.1821+5	3.4274+1	5.4027–3	5.1860–3	2.1023–4	6.4290–6
1.0000–1	8.2666–3	8.4653+4	1.1640+1	2.2490+6	9.1510+5	1.2240+6	1.0992+5	3.2007+1	5.0547–3	4.8523–3	1.9593–4	6.5007–6
1.5000–1	1.0884–2	6.4294+4	2.2749+1	1.7081+6	6.8461+5	9.4828+5	7.5224+4	2.5184+1	3.9891–3	3.8470–3	1.3516–4	6.8832–6
2.0000–1	1.2930–2	5.4123+4	3.6215+1	1.4379+6	5.6982+5	8.0930+5	5.8792+4	2.1758+1	3.4501–3	3.3365–3	1.0624–4	7.3361–6
2.5000–1	1.4487–2	4.8303+4	5.1396+1	1.2833+6	5.0386+5	7.3045+5	4.8975+4	1.9904+1	3.1419–3	3.0451–3	8.8868–5	7.8853–6
3.0000–1	1.5883–2	4.4060+4	6.7907+1	1.1706+6	4.5568+5	6.7177+5	4.3122+4	1.8507+1	2.9175–3	2.8305–3	7.8572–5	8.4237–6
4.0000–1	1.7921–2	3.9049+4	1.0375+2	1.0374+6	3.9642+5	6.0510+5	3.5901+4	1.7057+1	2.6654–3	2.5899–3	6.5825–5	9.6716–6
5.0000–1	1.9386–2	3.6098+4	1.4229+2	9.5905+5	3.6055+5	5.6681+5	3.1675+4	1.6365+1	2.5263–3	2.4569–3	5.8375–5	1.1069–5
6.0000–1	2.0489–2	3.4154+4	1.8254+2	9.0740+5	3.3621+5	5.4259+5	2.8586+4	1.6014+1	2.4422–3	2.3767–3	5.2920–5	1.2577–5
8.0000–1	2.2035–2	3.1758+4	2.6591+2	8.4373+5	3.0415+5	5.1444+5	2.5118+4	1.5802+1	2.3566–3	2.2939–3	4.6847–5	1.5868–5
1.0000+0	2.3051–2	3.0358+4	3.5144+2	8.0655+5	2.8449+5	4.9933+5	2.2715+4	1.5868+1	2.3202–3	2.2581–3	4.2622–5	1.9470–5
1.5000+0	2.4467–2	2.8601+4	5.6722+2	7.5987+5	2.5724+5	4.8291+5	1.9704+4	1.6338+1	2.3141–3	2.2473–3	3.7310–5	2.9492–5
2.0000+0	2.5160–2	2.7814+4	7.8232+2	7.3895+5	2.4257+5	4.7856+5	1.7809+4	1.6864+1	2.3348–3	2.2603–3	3.4039–5	4.0531–5
3.0000+0	2.5899–2	2.7020+4	1.2049+3	7.1786+5	2.2799+5	4.7378+5	1.6074+4	1.7735+1	2.3979–3	2.3019–3	3.0878–5	6.5104–5
4.0000+0	2.6333–2	2.6574+4	1.6163+3	7.0602+5	2.2043+5	4.7044+5	1.5125+4	1.8319+1	2.4640–3	2.3426–3	2.9202–5	9.2143–5

Atomic Weight 15.999												Density 1.4290– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+0	2.6526–2	2.6381+4	2.0174+3	7.0088+5	2.1613+5	4.7021+5	1.4517+4	1.8785+1	2.5224–3	2.3742–3	2.8168–5	1.2002–4
6.0000+0	2.6653–2	2.6256+4	2.4097+3	6.9755+5	2.1340+5	4.7011+5	1.4025+4	1.9181+1	2.5767–3	2.3996–3	2.7352–5	1.4974–4
8.0000+0	2.6796–2	2.6115+4	3.1702+3	6.9382+5	2.1032+5	4.6995+5	1.3536+4	1.9822+1	2.6838–3	2.4464–3	2.6455–5	2.1095–4
1.0000+1	2.6876–2	2.6037+4	3.9009+3	6.9175+5	2.0874+5	4.6983+5	1.3162+4	2.0254+1	2.7908–3	2.4897–3	2.5780–5	2.7540–4
1.5000+1	2.6950–2	2.5966+4	5.6264+3	6.8986+5	2.0716+5	4.7012+5	1.2555+4	2.0998+1	3.0071–3	2.5397–3	2.4597–5	4.4277–4
2.0000+1	2.6982–2	2.5935+4	7.2320+3	6.8904+5	2.0636+5	4.7033+5	1.2334+4	2.1494+1	3.2237–3	2.5835–3	2.4172–5	6.1600–4
3.0000+1	2.7011–2	2.5908+4	1.0144+4	6.8831+5	2.0571+5	4.7050+5	1.2076+4	2.2127+1	3.6541–3	2.6531–3	2.3676–5	9.7740–4
4.0000+1	2.7012–2	2.5907+4	1.2740+4	6.8829+5	2.0567+5	4.7065+5	1.1949+4	2.2531+1	4.0570–3	2.6851–3	2.3440–5	1.3485–3
5.0000+1	2.7012–2	2.5907+4	1.5090+4	6.8828+5	2.0566+5	4.7069+5	1.1900+4	2.2817+1	4.4574–3	2.7075–3	2.3355–5	1.7266–3
6.0000+1	2.7012–2	2.5907+4	1.7238+4	6.8828+5	2.0566+5	4.7073+5	1.1868+4	2.3026+1	4.8620–3	2.7293–3	2.3304–5	2.1094–3
8.0000+1	2.7009–2	2.5909+4	2.1039+4	6.8835+5	2.0565+5	4.7078+5	1.1894+4	2.3341+1	5.6811–3	2.7719–3	2.3378–5	2.8858–3
1.0000+2	2.7007–2	2.5911+4	2.4327+4	6.8841+5	2.0565+5	4.7082+5	1.1912+4	2.3571+1	6.5045–3	2.8085–3	2.3436–5	3.6725–3
1.5000+2	2.7005–2	2.5914+4	3.1014+4	6.8847+5	2.0564+5	4.7084+5	1.1966+4	2.3943+1	8.5417–3	2.8375–3	2.3541–5	5.6806–3
2.0000+2	2.7003–2	2.5915+4	3.6259+4	6.8851+5	2.0563+5	4.7085+5	1.2004+4	2.4123+1	1.0600–2	2.8662–3	2.3616–5	7.7101–3
3.0000+2	2.7001–2	2.5917+4	4.4227+4	6.8856+5	2.0563+5	4.7086+5	1.2046+4	2.4127+1	1.4727–2	2.9231–3	2.3700–5	1.1780–2
4.0000+2	2.7001–2	2.5917+4	5.0214+4	6.8856+5	2.0562+5	4.7087+5	1.2053+4	2.4074+1	1.8843–2	2.9588–3	2.3714–5	1.5860–2
5.0000+2	2.7001–2	2.5917+4	5.5016+4	6.8856+5	2.0561+5	4.7087+5	1.2059+4	2.4027+1	2.2942–2	2.9774–3	2.3725–5	1.9941–2
6.0000+2	2.7001–2	2.5917+4	5.9024+4	6.8857+5	2.0561+5	4.7087+5	1.2063+4	2.4035+1	2.7069–2	2.9961–3	2.3735–5	2.4049–2
8.0000+2	2.7001–2	2.5918+4	6.5475+4	6.8857+5	2.0560+5	4.7087+5	1.2071+4	2.4079+1	3.5306–2	3.0333–3	2.3750–5	3.2249–2
1.0000+3	2.7001–2	2.5918+4	7.0567+4	6.8857+5	2.0560+5	4.7087+5	1.2076+4	2.4146+1	4.3533–2	3.0655–3	2.3761–5	4.0444–2
1.5000+3	2.7002–2	2.5916+4	7.9975+4	6.8853+5	2.0559+5	4.7087+5	1.2045+4	2.4311+1	6.4083–2	3.0933–3	2.3699–5	6.0966–2
2.0000+3	2.7003–2	2.5915+4	8.6738+4	6.8851+5	2.0558+5	4.7087+5	1.2028+4	2.4453+1	8.4730–2	3.1211–3	2.3666–5	8.1586–2
3.0000+3	2.7003–2	2.5916+4	9.6357+4	6.8852+5	2.0557+5	4.7087+5	1.2050+4	2.4717+1	1.2590–1	3.1767–3	2.3709–5	1.2270–1
4.0000+3	2.7003–2	2.5915+4	1.0323+5	6.8850+5	2.0557+5	4.7087+5	1.2034+4	2.4939+1	1.6724–1	3.2115–3	2.3677–5	1.6401–1
5.0000+3	2.7008–2	2.5911+4	1.0857+5	6.8839+5	2.0556+5	4.7087+5	1.1930+4	2.5118+1	2.0886–1	3.2293–3	2.3473–5	2.0561–1
6.0000+3	2.7006–2	2.5912+4	1.1294+5	6.8843+5	2.0556+5	4.7087+5	1.1979+4	2.5274+1	2.4976–1	3.2471–3	2.3569–5	2.4649–1
8.0000+3	2.7005–2	2.5913+4	1.1986+5	6.8846+5	2.0556+5	4.7087+5	1.2006+4	2.5522+1	3.3222–1	3.2827–3	2.3623–5	3.2891–1
1.0000+4	2.7005–2	2.5913+4	1.2523+5	6.8846+5	2.0555+5	4.7087+5	1.2015+4	2.5715+1	4.1536–1	3.3183–3	2.3640–5	4.1202–1
1.5000+4	2.7004–2	2.5914+4	1.3503+5	6.8847+5	2.0554+5	4.7087+5	1.2036+4	2.6131+1	6.1899–1	3.3449–3	2.3682–5	6.1562–1
2.0000+4	2.7005–2	2.5913+4	1.4200+5	6.8846+5	2.0554+5	4.7087+5	1.2028+4	2.6430+1	8.2526–1	3.3714–3	2.3666–5	8.2186–1
3.0000+4	2.7004–2	2.5914+4	1.5184+5	6.8847+5	2.0553+5	4.7087+5	1.2047+4	2.6850+1	1.2337+0	3.4245–3	2.3704–5	1.2302+0
4.0000+4	2.7005–2	2.5913+4	1.5883+5	6.8845+5	2.0552+5	4.7087+5	1.2036+4	2.7152+1	1.6465+0	3.4673–3	2.3682–5	1.6430+0
5.0000+4	2.7010–2	2.5909+4	1.6426+5	6.8834+5	2.0552+5	4.7087+5	1.1930+4	2.7383+1	2.0555+0	3.4846–3	2.3473–5	2.0520+0
6.0000+4	2.7008–2	2.5911+4	1.6870+5	6.8839+5	2.0551+5	4.7087+5	1.1982+4	2.7573+1	2.4641+0	3.5018–3	2.3575–5	2.4606+0
8.0000+4	2.7007–2	2.5912+4	1.7570+5	6.8841+5	2.0550+5	4.7087+5	1.2009+4	2.7874+1	3.2885+0	3.5364–3	2.3629–5	3.2849+0
1.0000+5	2.7007–2	2.5912+4	1.8112+5	6.8842+5	2.0550+5	4.7087+5	1.2017+4	2.8108+1	4.1144+0	3.5709–3	2.3645–5	4.1108+0


July 4, 1991
Atomic Weight 18.998
EEDL Evaluated Electron
Cross Sections
9-F
Density 1.6960- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
9-F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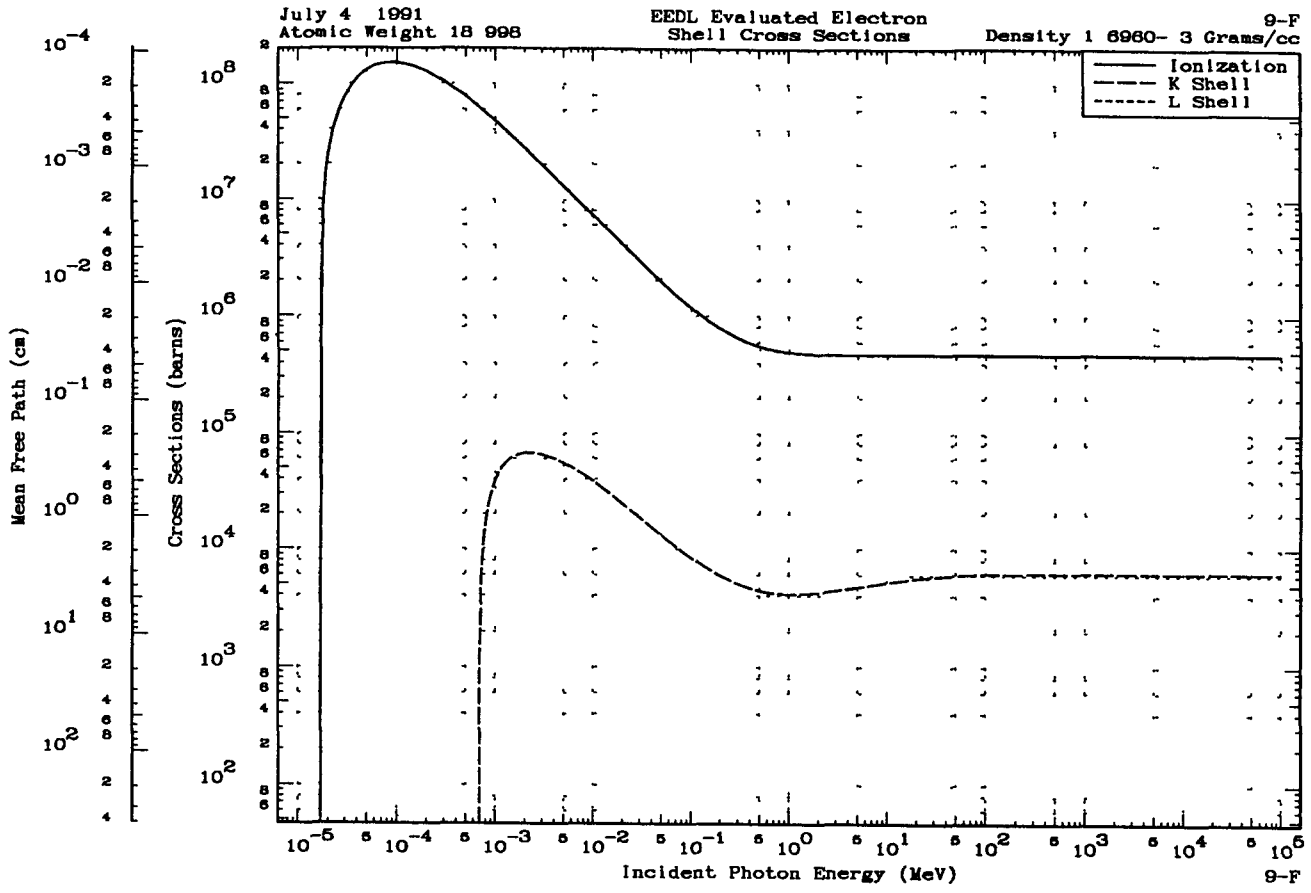
EEDL Evaluated Electron
Energy Deposition
9-F
Density 1.6960- 3 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
9-F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EEDL Evaluated Electron
Shell Cross Sections
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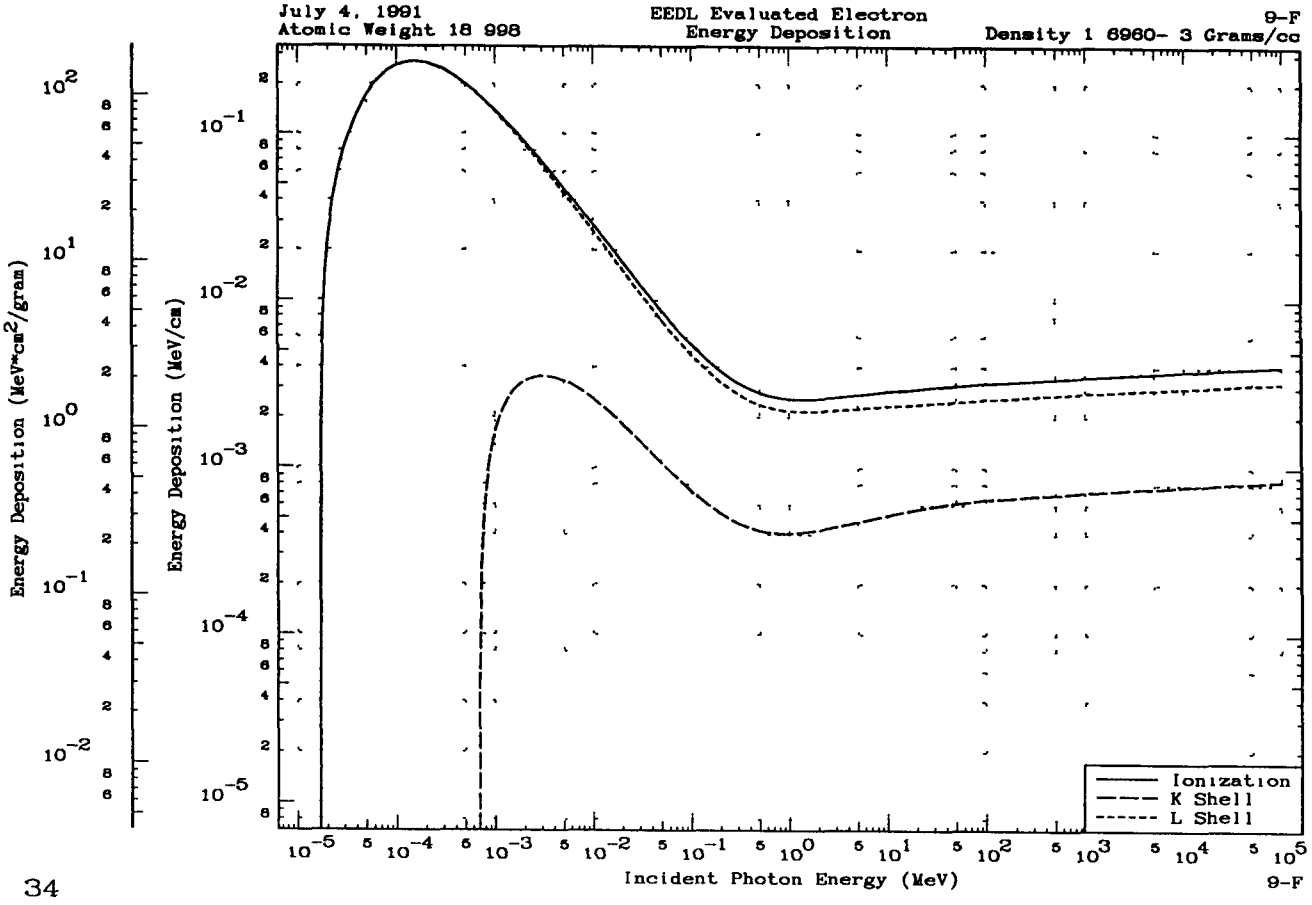
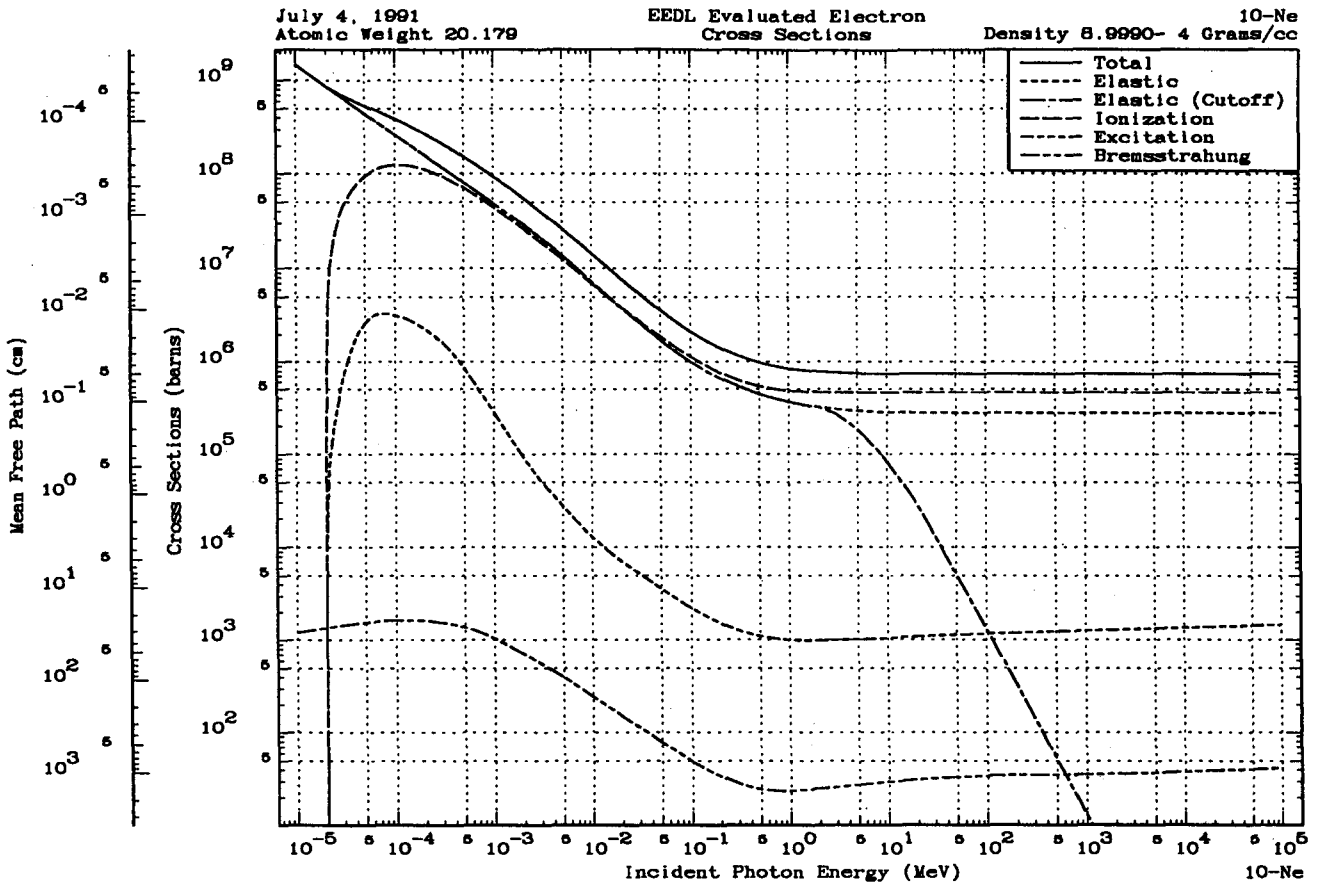
Density 1 6960- 3 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
9-F


July 4, 1991
Atomic Weight 18 998
EEDL Evaluated Electron
Energy Deposition
9-F
Density 1 6960- 3 Grams/cc
Ionization
K Shell
L Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
9-F

Atomic Weight 18.998 — Density 1.6960– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0511–5	5.6096+7		1.7697+9	1.7697+9			1.0568+3	1.2224–7			1.2224–7
	1.5000–5	1.4407–5	4.0925+7		1.2911+9	1.2911+9			1.1393+3	1.8096–7			1.8096–7
L3	1.6980–5	1.5866–5	3.7163+7		1.1724+9	1.1724+9	0.0000+0	0.0000+0	1.1657+3	2.0510–7	0.0000+0	0.0000+0	2.0510–7
L2	1.7050–5	1.5911–5	3.7058+7		1.1691+9	1.1687+9	3.9811+5	2.6555+4	1.1666+3	3.8878–4	3.6379–4	2.4784–5	2.0596–7
	1.7358–5	1.6095–5	3.6634+7		1.1557+9	1.1525+9	2.9861+6	2.0688+5	1.1705+3	2.9373–3	2.7436–3	1.9352–4	2.0975–7
	1.7419–5	1.6133–5	3.6547+7		1.1530+9	1.1494+9	3.3635+6	2.4435+5	1.1712+3	3.3221–3	3.0932–3	2.2868–4	2.1050–7
	1.8018–5	1.6483–5	3.5771+7		1.1285+9	1.1195+9	8.3150+6	6.2688+5	1.1786+3	8.3041–3	7.7146–3	5.8926–4	2.1793–7
	1.8064–5	1.6510–5	3.5713+7		1.1266+9	1.1173+9	8.6793+6	6.5746+5	1.1792+3	8.6767–3	8.0582–3	6.1822–4	2.1850–7
	1.9009–5	1.7045–5	3.4591+7		1.0913+9	1.0739+9	1.6081+7	1.3109+6	1.1904+3	1.6378–2	1.5136–2	1.2413–3	2.3029–7
	1.9032–5	1.7058–5	3.4566+7		1.0905+9	1.0729+9	1.6255+7	1.3325+6	1.1906+3	1.6567–2	1.5305–2	1.2619–3	2.3057–7
	2.0000–5	1.7585–5	3.3529+7		1.0578+9	1.0323+9	2.3432+7	2.0718+6	1.2016+3	2.4346–2	2.2370–2	1.9759–3	2.4275–7
	2.2500–5	1.8848–5	3.1283+7		9.8689+8	9.4191+8	4.0152+7	4.8281+6	1.2224+3	4.4407–2	3.9651–2	4.7557–3	2.7097–7
	2.4375–5	1.9727–5	2.9889+7		9.4293+8	8.8507+8	5.0057+7	7.7997+6	1.2368+3	5.8531–2	5.0665–2	7.8658–3	2.9237–7
	2.6250–5	2.0477–5	2.8794+7		9.0840+8	8.3551+8	6.1393+7	1.1494+7	1.2502+3	7.5513–2	6.3651–2	1.1862–2	3.1397–7
	2.7188–5	2.0845–5	2.8286+7		8.9236+8	8.1300+8	6.5542+7	1.3813+7	1.2566+3	8.3132–2	6.8716–2	1.4416–2	3.2485–7
	3.0000–5	2.1819–5	2.7024+7		8.5253+8	7.5310+8	7.8725+7	2.0703+7	1.2748+3	1.0763–1	8.5291–2	2.2336–2	3.5771–7
	3.5000–5	2.3317–5	2.5287+7		7.9774+8	6.6820+8	9.5855+7	3.3684+7	1.3030+3	1.4761–1	1.0939–1	3.8220–2	4.1643–7
L1	3.5930–5	2.3553–5	2.5034+7		7.8976+8	6.5474+8	9.9120+7	3.5899+7	1.3079+3	1.5529–1	1.1418–1	4.1105–2	4.2747–7
	3.6439–5	2.3686–5	2.4893+7		7.8533+8	6.4764+8	1.0065+8	3.7036+7	1.3105+3	1.5920–1	1.1661–1	4.2593–2	4.3352–7
	3.7329–5	2.3908–5	2.4662+7		7.7803+8	6.3563+8	1.0332+8	3.9072+7	1.3150+3	1.6616–1	1.2088–1	4.5279–2	4.4413–7
	3.8665–5	2.4217–5	2.4347+7		7.6809+8	6.1855+8	1.0730+8	4.2239+7	1.3216+3	1.7686–1	1.2736–1	4.9508–2	4.6012–7
	4.0000–5	2.4515–5	2.4051+7		7.5876+8	6.0248+8	1.1127+8	4.5012+7	1.3280+3	1.8726–1	1.3390–1	5.3353–2	4.7617–7
	4.2500–5	2.5106–5	2.3485+7		7.4089+8	5.7482+8	1.1692+8	4.9151+7	1.3364+3	2.0332–1	1.4397–1	5.9340–2	5.0369–7
	4.5000–5	2.5631–5	2.3004+7		7.2573+8	5.4991+8	1.2242+8	5.3400+7	1.3444+3	2.1972–1	1.5408–1	6.5646–2	5.3135–7
	4.6250–5	2.5913–5	2.2754+7		7.1783+8	5.3835+8	1.2478+8	5.4710+7	1.3483+3	2.2662–1	1.5877–1	6.7858–2	5.4523–7
	5.0000–5	2.6689–5	2.2092+7		6.9695+8	5.0678+8	1.3156+8	5.8613+7	1.3593+3	2.4734–1	1.7270–1	7.4635–2	5.8706–7
	5.5000–5	2.7802–5	2.1208+7		6.6905+8	4.7068+8	1.3744+8	6.0927+7	1.3705+3	2.6675–1	1.8691–1	7.9841–2	6.4080–7
	6.0000–5	2.8791–5	2.0479+7		6.4608+8	4.3998+8	1.4298+8	6.3119+7	1.3809+3	2.8616–1	2.0111–1	8.5054–2	6.9489–7
	7.0000–5	3.0913–5	1.9073+7		6.0172+8	3.9049+8	1.4772+8	6.3506+7	1.3994+3	3.0868–1	2.1945–1	8.9231–2	8.0404–7
	8.0000–5	3.2869–5	1.7939+7		5.6592+8	3.5214+8	1.5181+8	6.1961+7	1.4157+3	3.2797–1	2.3734–1	9.0629–2	9.1436–7
	9.0000–5	3.4870–5	1.6909+7		5.3344+8	3.2160+8	1.5189+8	5.9948+7	1.4228+3	3.3732–1	2.4715–1	9.0164–2	1.0164–6
	1.0000–4	3.6719–5	1.6058+7	0.0000+0	5.0659+8	2.9653+8	1.5185+8	5.8203+7	1.4291+3	3.4660–1	2.5666–1	8.9946–2	1.1189–6
	1.1250–4	3.9144–5	1.5063+7	3.5947–5	4.7520+8	2.7081+8	1.4921+8	5.5184+7	1.4292+3	3.4887–1	2.6188–1	8.6986–2	1.2372–6
	1.2500–4	4.1422–5	1.4235+7	7.1641–5	4.4907+8	2.4970+8	1.4675+8	5.2616+7	1.4292+3	3.5152–1	2.6696–1	8.4564–2	1.3555–6
	1.3125–4	4.2552–5	1.3856+7	8.9420–5	4.3714+8	2.4049+8	1.4518+8	5.1467+7	1.4293+3	3.5158–1	2.6806–1	8.3514–2	1.4146–6
	1.5000–4	4.5789–5	1.2877+7	1.4272–4	4.0624+8	2.1698+8	1.4081+8	4.8451+7	1.4293+3	3.5198–1	2.7111–1	8.0866–2	1.5920–6
	2.0000–4	5.4437–5	1.0831+7	2.8801–4	3.4170+8	1.7385+8	1.2736+8	4.0492+7	1.4134+3	3.3641–1	2.6620–1	7.0205–2	2.0334–6
	2.5000–4	6.3027–5	9.3551+6	4.4177–4	2.9513+8	1.4653+8	1.1472+8	3.3884+7	1.3689+3	3.1423–1	2.5433–1	5.9899–2	2.3948–6
	3.0000–4	7.1029–5	8.3012+6	6.0563–4	2.6188+8	1.2742+8	1.0517+8	2.9294+7	1.3335+3	2.9620–1	2.4342–1	5.2779–2	2.7475–6
	4.0000–4	8.7114–5	6.7684+6	9.6535–4	2.1353+8	1.0229+8	8.9309+7	2.1931+7	1.2710+3	2.6055–1	2.2018–1	4.0371–2	3.4032–6
	5.0000–4	1.0260–4	5.7467+6	1.3714–3	1.8129+8	8.6278+7	7.7651+7	1.7364+7	1.1886+3	2.3248–1	2.0004–1	3.2439–2	3.8884–6
	6.0000–4	1.1750–4	5.0180+6	1.8235–3	1.5831+8	7.5151+7	6.8782+7	1.4374+7	1.1138+3	2.1029–1	1.8312–1	2.7164–2	4.2893–6
K	6.8837–4	1.3049–4	4.5187+6	2.2613–3	1.4255+8	6.7725+7	6.2532+7	1.2297+7	1.0508+3	1.9367–1	1.7024–1	2.3423–2	4.5708–6
	6.9535–4	1.3150–4	4.4839+6	2.2974–3	1.4146+8	6.7209+7	6.2088+7	1.2157+7	1.0463+3	1.9252–1	1.6934–1	2.3170–2	4.5922–6
	7.2151–4	1.3527–4	4.3587+6	2.4348–3	1.3751+8	6.5356+7	6.0490+7	1.1660+7	1.0299+3	1.8839–1	1.6612–1	2.2268–2	4.6719–6
	7.6076–4	1.4088–4	4.1854+6	2.6463–3	1.3204+8	6.2786+7	5.8271+7	1.0983+7	1.0068+3	1.8271–1	1.6167–1	2.1037–2	4.7896–6
	8.0000–4	1.4640–4	4.0274+6	2.8642–3	1.2706+8	6.0440+7	5.6239+7	1.0376+7	9.8543+2	1.7756–1	1.5762–1	1.9934–2	4.9053–6
	8.5000–4	1.5345–4	3.8424+6	3.1511–3	1.2122+8	5.7727+7	5.3795+7	9.6936+6	9.5523+2	1.7098–1	1.5230–1	1.8680–2	5.0059–6
	9.2500–4	1.6385–4	3.5986+6	3.6012–3	1.1353+8	5.4147+7	5.0563+7	8.8165+6	9.1465+2	1.6236–1	1.4529–1	1.7067–2	5.1535–6
	1.0000–3	1.7404–4	3.3878+6	4.0740–3	1.0688+8	5.1043+7	4.7756+7	8.0783+6	8.7877+2	1.5495–1	1.3924–1	1.5709–2	5.2975–6
	1.1250–3	1.9098–4	3.0874+6	4.9126–3	9.7401+7	4.6671+7	4.3643+7	7.0858+6	8.2271+2	1.4332–1	1.2946–1	1.3850–2	5.4501–6
	1.2188–3	2.0340–4	2.8988+6	5.5839–3	9.1451+7	4.3915+7	4.1053+7	6.4819+6	7.8667+2	1.3605–1	1.2333–1	1.2718–2	5.5632–6
	1.3594–3	2.2165–4	2.6602+6	6.6540–3	8.3922+7	4.0416+7	3.7765+7	5.7402+6	7.4004+2	1.2689–1	1.1556–1	1.1326–2	5.7298–6
	1.5000–3	2.3948–4	2.4621+6	7.7965–3	7.7674+7	3.7502+7	3.5027+7	5.1445+6	7.0037+2	1.1934–1	1.0913–1	1.0208–2	5.8925–6
	1.7500–3	2.7129–4	2.1734+6	1.0004–2	6.8565+7	3.3234+7	3.0996+7	4.3352+6	6.4001+2	1.0738–1	9.8713–2	8.6593–3	6.0974–6
	2.0000–3	3.0221–4	1.9510+6	1.2438–2	6.1550+7	2.9931+7	2.7881+7	3.7377+6	5.9193+2	9.8209–2	9.0688–2	7.5151–3	6.2987–6
	2.5000–3	3.6473–4	1.6166+6	1.7946–2	5.1000+7	2.4827+7	2.3250+7	2.9224+6	5.1536+2	8.3733–2	7.7800–2	5.9267–3	6.5522–6
	3.0000–3	4.2524–4	1.3866+6	2.4303–2	4.3743+7	2.1309+7	2.0043+7	2.3902+6	4.6021+2	7.3772–2	6.8876–2	4.8889–3	6.8049–6
	4.0000–3	5.4485–4	1.0822+6	3.9316–2	3.4140+7	1.6583+7	1.5796+7	1.7608+6	3.8109+2	5.9925–2	5.6276–2	3.6418–3	7.1034–6
	5.0000–3	6.6278–4	8.8962+5	5.7415–2	2.8066+7	1.3577+7	1.3111+7	1.3771+6	3.2753+2	5.0829–2	4.7950–2	2.8717–3	7.2968–6
	6.0000–3	7.7901–4	7.5689+5	7.8463–2	2.3878+7	1.1513+7	1.1250+7	1.1147+6	2.8854+2	4.4339–2	4.1993–2	2.3392–3	7.4262–6
	8.0000–3	1.0064–3	5.8589+5	1.2866–1	1.8483+7	8.8553+6	8.8285+6	7.9925+5	2.3552+2	3.5667–2	3.3966–2	1.6932–3	7.5840–6
	1.0000–2	1.2290–3	4.7975+5	1.8964–1	1.5135+7	7.2025+6	7.3143+6	6.1798+5	2.0112+2	3.0083–2	2.8757–2	1.3184–3	7.6664–6
	1.5000–2	1.7657–3	3.3394+5	3.8307–1	1.0535+7	4.9475+6	5.2008+6	3.8656+5	1.5208+2	2.2033–2	2.1191–2	8.3430–4	7.7672–6
	2.0000–2	2.2789–3	2.5873+5	6.3592–1	8.1624+6	3.7935+6	4.0915+6	2.7724+5	1.2437+2	1.7675–2	1.7064–2	6.0297–4	7.7940–6
	3.0000–2	3.2466–3	1.8161+5	1.2932+0	5.7295+6	2.6216+6	2.9339+6	1.7399+5	9.2779+1	1.2994–2	1.2604–2	3.8227–4	7.8287–6
	4.0000–2	4.1451–3	1.4225+5	2.1477+0	4.4875+6	2.0308+6	2.3311+6	1.2559+5	7.5170+1	1.0501–2	1.0215–2	2.7777–4	7.8586–6
	5.0000–2	4.9856–3	1.1827+5	3.1788+0	3.7310+6	1.6736+6	1.9598+6	9.7548+4	6.3981+1	8.9371–3	8.7123–3	2.1682–4	7.9188–6
	6.0000–2	5.7755–3	1.0209+5	4.3710+0	3.2207+6	1.4337+6	1.7074+6	7.9532+4	5.6270+1	7.8626–3	7.6771–3	1.7748–4	7.9736–6
	8.0000–2	7.2236–3	8.1624+4	7.1692+0	2.5750+6	1.1312+6	1.3854+6	5.8374+4	4.6330+1	6.4769–3	6.3377–3	1.3106–4	8.1180–6
	1.0000–1	8.5150–3	6.9245+4	1.0482+1	2.1845+6	9.4965+5	1.1889+6	4.5930+4	4.0088+1	5.6166–3	5.5047–3	1.0360–4	8.2729–6
	1.5000–1	1.1168–2	5.2794+4	2.0465+1	1.6655+6	7.1253+5	9.2283+5	3.0124+4	3.1527+1	4.4468–3	4.3695–3	6.8496–5	8.7518–6
	2.0000–1	1.3221–2	4.4598+4	3.2533+1	1.4070+6	5.9542+5	7.8891+5	2.2604+4	2.7206+1	3.8534–3	3.7924–3	5.1689–5	9.3165–6
	3.0000–1	1.6141–2	3.6529+4	6.0685+1	1.1524+6	4.8031+5	6.5650+5	1.5558+4	2.3090+1	3.2671–3	3.2205–3	3.5864–5	1.0672–5
	4.0000–1	1.8125–2	3.2532+4	9.2669+1	1.0263+6	4.2165+5	5.9265+5	1.1978+4	2.1243+1	2.9901–3	2.9501–3	2.7780–5	1.2229–5
	5.0000–1	1.9537–2	3.0180+4	1.2699+2	9.5210+5	3.8591+5	5.5620+5	9.9698+3	2.0349+1	2.8380–3	2.8008–3	2.3239–5	1.3975–5
	6.0000–1	2.0577–2	2.8655+4	1.6281+2	9.0398+5	3.6212+5	5.3323+5	8.6099+3	1.9886+1	2.7468–3	2.7108–3	2.0157–5	1.5860–5
	8.0000–1	2.2016–2	2.6782+4	2.3686+2	8.4490+5	3.3100+5	5.0702+5	6.8683+3	1.9584+1	2.6554–3	2.6192–3	1.6200–5	1.9975–5
	1.0000+0	2.2936–2	2.5708+4	3.1269+2	8.1102+5	3.1182+5	4.9329+5	5.8842+3	1.9650+1	2.6196–3	2.5812–3	1.3965–5	2.4478–5
	1.5000+0	2.4111–2	2.4454+4	5.0336+2	7.7147+5	2.8607+5	4.8088+5	4.5030+3	2.0220+1	2.6251–3	2.5773–3	1.0795–5	3.6996–5

Atomic Weight 18.998												Density 1.6960– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000+0	2.4771–2	2.3803+4	6.9291+2	7.5093+5	2.7259+5	4.7452+5	3.7929+3	2.0844+1	2.6505–3	2.5905–3	9.1865–6	5.0779–5
3.0000+0	2.5295–2	2.3310+4	1.0647+3	7.3538+5	2.5960+5	4.7267+5	3.0816+3	2.1919+1	2.7287–3	2.6398–3	7.5119–6	8.1432–5
4.0000+0	2.5577–2	2.3053+4	1.4260+3	7.2726+5	2.5319+5	4.7138+5	2.6748+3	2.2622+1	2.8074–3	2.6857–3	6.5619–6	1.1512–4
5.0000+0	2.5731–2	2.2915+4	1.7776+3	7.2290+5	2.4944+5	4.7099+5	2.4466+3	2.3183+1	2.8814–3	2.7255–3	6.0405–6	1.4982–4
6.0000+0	2.5827–2	2.2830+4	2.1202+3	7.2022+5	2.4722+5	4.7070+5	2.2745+3	2.3654+1	2.9562–3	2.7637–3	5.6513–6	1.8678–4
8.0000+0	2.5918–2	2.2749+4	2.7827+3	7.1769+5	2.4462+5	4.7100+5	2.0411+3	2.4419+1	3.0826–3	2.8147–3	5.0877–6	2.6283–4
1.0000+1	2.5958–2	2.2714+4	3.4186+3	7.1658+5	2.4341+5	4.7125+5	1.8987+3	2.4917+1	3.2091–3	2.8615–3	4.7482–6	3.4282–4
1.5000+1	2.6013–2	2.2667+4	4.9159+3	7.1508+5	2.4169+5	4.7166+5	1.7103+3	2.5758+1	3.4728–3	2.9183–3	4.2785–6	5.5023–4
2.0000+1	2.6040–2	2.2643+4	6.3037+3	7.1434+5	2.4075+5	4.7196+5	1.6109+3	2.6305+1	3.7365–3	2.9680–3	4.0313–6	7.6444–4
3.0000+1	2.6059–2	2.2626+4	8.8070+3	7.1381+5	2.3999+5	4.7230+5	1.4900+3	2.6996+1	4.2645–3	3.0499–3	3.7316–6	1.2108–3
4.0000+1	2.6057–2	2.2628+4	1.1026+4	7.1387+5	2.3994+5	4.7246+5	1.4332+3	2.7450+1	4.7586–3	3.0860–3	3.5922–6	1.6690–3
5.0000+1	2.6056–2	2.2629+4	1.3025+4	7.1389+5	2.3993+5	4.7253+5	1.3951+3	2.7778+1	5.2509–3	3.1121–3	3.4991–6	2.1354–3
6.0000+1	2.6055–2	2.2630+4	1.4845+4	7.1392+5	2.3993+5	4.7258+5	1.3780+3	2.8024+1	5.7485–3	3.1373–3	3.4588–6	2.6077–3
8.0000+1	2.6053–2	2.2631+4	1.8051+4	7.1396+5	2.3992+5	4.7267+5	1.3510+3	2.8402+1	6.7549–3	3.1862–3	3.3962–6	3.5653–3
1.0000+2	2.6053–2	2.2632+4	2.0810+4	7.1399+5	2.3991+5	4.7271+5	1.3300+3	2.8686+1	7.7672–3	3.2281–3	3.3483–6	4.5358–3
1.5000+2	2.6052–2	2.2632+4	2.6389+4	7.1399+5	2.3990+5	4.7273+5	1.3248+3	2.9157+1	1.0275–2	3.2611–3	3.3354–6	7.0104–3
2.0000+2	2.6052–2	2.2633+4	3.0739+4	7.1400+5	2.3990+5	4.7275+5	1.3269+3	2.9366+1	1.2806–2	3.2935–3	3.3405–6	9.5091–3
3.0000+2	2.6051–2	2.2633+4	3.7317+4	7.1403+5	2.3989+5	4.7277+5	1.3376+3	2.9435+1	1.7880–2	3.3576–3	3.3676–6	1.4520–2
4.0000+2	2.6051–2	2.2634+4	4.2242+4	7.1403+5	2.3988+5	4.7277+5	1.3519+3	2.9410+1	2.2938–2	3.3999–3	3.4037–6	1.9535–2
5.0000+2	2.6051–2	2.2634+4	4.6182+4	7.1404+5	2.3987+5	4.7278+5	1.3631+3	2.9379+1	2.7983–2	3.4207–3	3.4318–6	2.4559–2
6.0000+2	2.6050–2	2.2634+4	4.9466+4	7.1405+5	2.3987+5	4.7278+5	1.3720+3	2.9418+1	3.3055–2	3.4415–3	3.4543–6	2.9610–2
8.0000+2	2.6050–2	2.2634+4	5.4745+4	7.1406+5	2.3986+5	4.7278+5	1.3861+3	2.9515+1	4.3174–2	3.4830–3	3.4899–6	3.9687–2
1.0000+3	2.6050–2	2.2634+4	5.8908+4	7.1406+5	2.3985+5	4.7278+5	1.3970+3	2.9628+1	5.3275–2	3.5194–3	3.5175–6	4.9752–2
1.5000+3	2.6050–2	2.2635+4	6.6589+4	7.1407+5	2.3984+5	4.7278+5	1.4169+3	2.9868+1	7.8538–2	3.5504–3	3.5676–6	7.4984–2
2.0000+3	2.6049–2	2.2635+4	7.2105+4	7.1408+5	2.3984+5	4.7278+5	1.4311+3	3.0058+1	1.0394–1	3.5813–3	3.6031–6	1.0035–1
3.0000+3	2.6049–2	2.2635+4	7.9943+4	7.1409+5	2.3982+5	4.7278+5	1.4509+3	3.0378+1	1.5459–1	3.6432–3	3.6532–6	1.5094–1
4.0000+3	2.6049–2	2.2635+4	8.5535+4	7.1409+5	2.3982+5	4.7278+5	1.4650+3	3.0645+1	2.0542–1	3.6844–3	3.6887–6	2.0173–1
5.0000+3	2.6049–2	2.2636+4	8.9882+4	7.1410+5	2.3981+5	4.7278+5	1.4760+3	3.0861+1	2.5658–1	3.7042–3	3.7164–6	2.5287–1
6.0000+3	2.6048–2	2.2636+4	9.3441+4	7.1410+5	2.3981+5	4.7278+5	1.4849+3	3.1056+1	3.0688–1	3.7241–3	3.7388–6	3.0315–1
8.0000+3	2.6048–2	2.2636+4	9.9072+4	7.1411+5	2.3980+5	4.7278+5	1.4990+3	3.1366+1	4.0828–1	3.7639–3	3.7743–6	4.0451–1
1.0000+4	2.6048–2	2.2636+4	1.0344+5	7.1411+5	2.3979+5	4.7278+5	1.5099+3	3.1608+1	5.1054–1	3.8037–3	3.8017–6	5.0673–1
1.5000+4	2.6048–2	2.2636+4	1.1141+5	7.1412+5	2.3978+5	4.7278+5	1.5298+3	3.2119+1	7.6101–1	3.8334–3	3.8517–6	7.5717–1
2.0000+4	2.6047–2	2.2637+4	1.1708+5	7.1413+5	2.3977+5	4.7278+5	1.5439+3	3.2486+1	1.0147+0	3.8631–3	3.8872–6	1.0108+0
3.0000+4	2.6047–2	2.2637+4	1.2509+5	7.1414+5	2.3976+5	4.7278+5	1.5637+3	3.3003+1	1.5170+0	3.9225–3	3.9372–6	1.5131+0
4.0000+4	2.6047–2	2.2637+4	1.3077+5	7.1415+5	2.3976+5	4.7278+5	1.5778+3	3.3373+1	2.0248+0	3.9716–3	3.9727–6	2.0208+0
5.0000+4	2.6047–2	2.2637+4	1.3519+5	7.1415+5	2.3975+5	4.7278+5	1.5889+3	3.3658+1	2.5278+0	3.9910–3	4.0005–6	2.5238+0
6.0000+4	2.6046–2	2.2637+4	1.3879+5	7.1416+5	2.3974+5	4.7278+5	1.5977+3	3.3891+1	3.0304+0	4.0103–3	4.0229–6	3.0264+0
8.0000+4	2.6046–2	2.2638+4	1.4449+5	7.1416+5	2.3974+5	4.7278+5	1.6118+3	3.4261+1	4.0444+0	4.0490–3	4.0583–6	4.0403+0
1.0000+5	2.6046–2	2.2638+4	1.4890+5	7.1417+5	2.3973+5	4.7278+5	1.6227+3	3.4548+1	5.0601+0	4.0877–3	4.0858–6	5.0560+0


July 4, 1991
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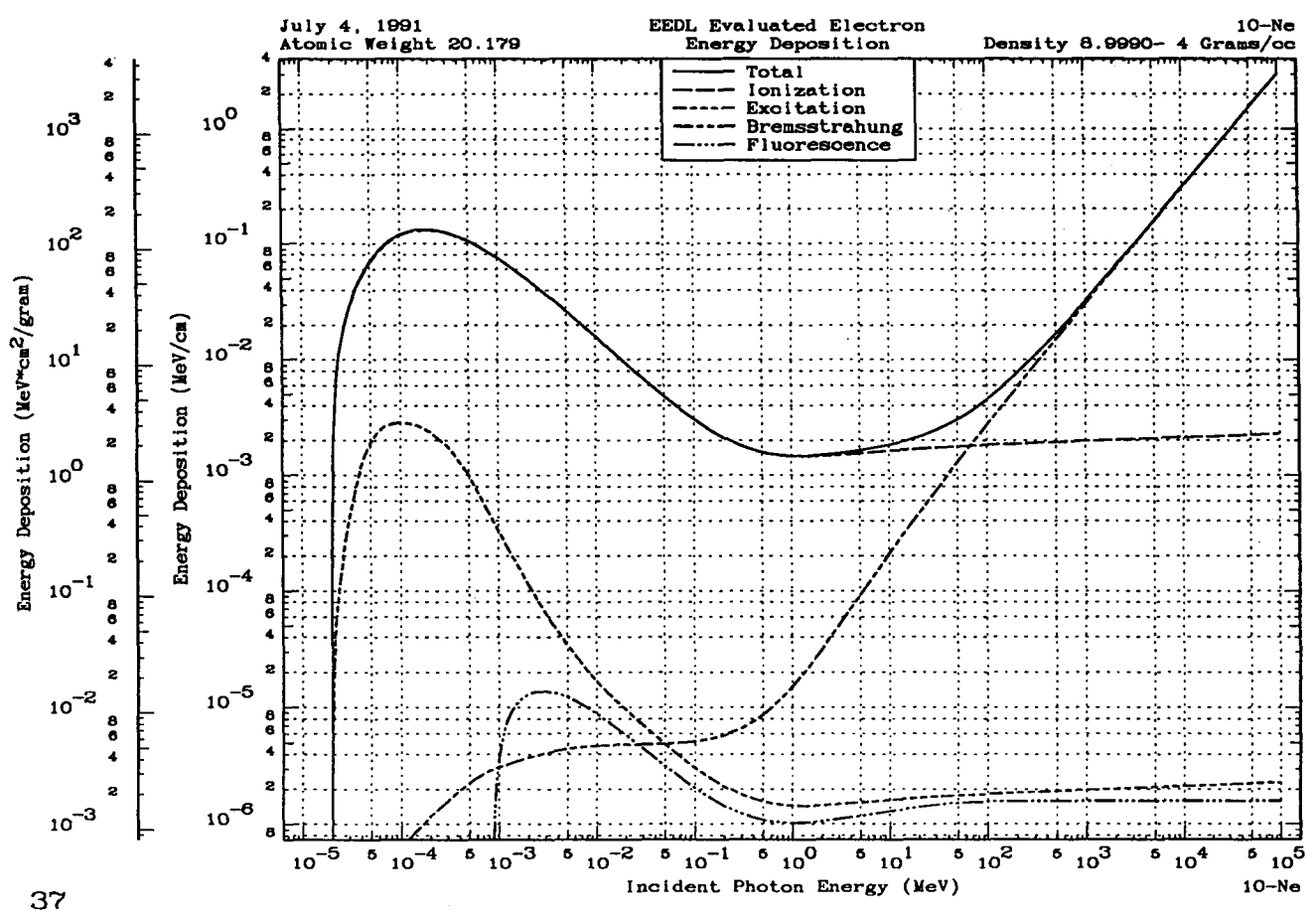
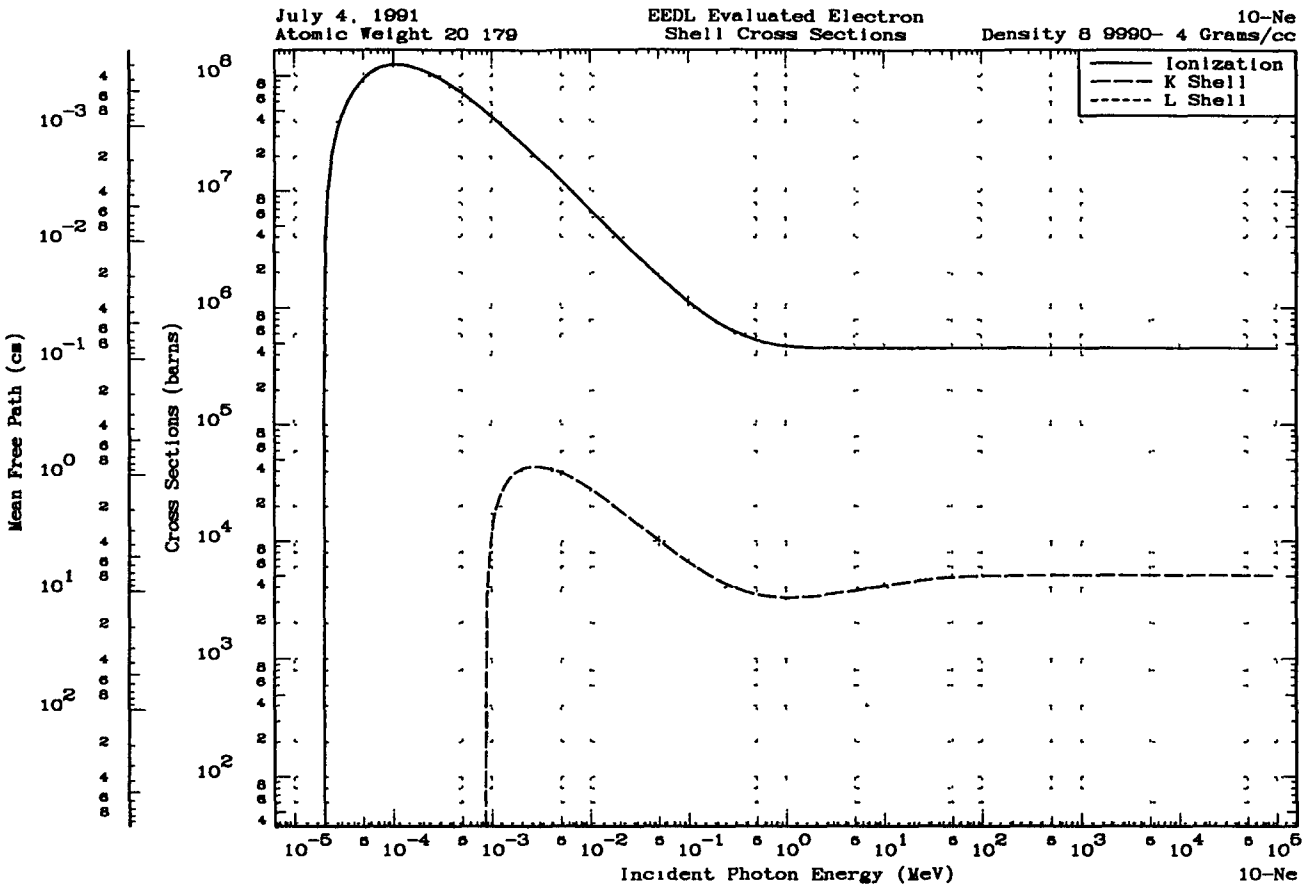
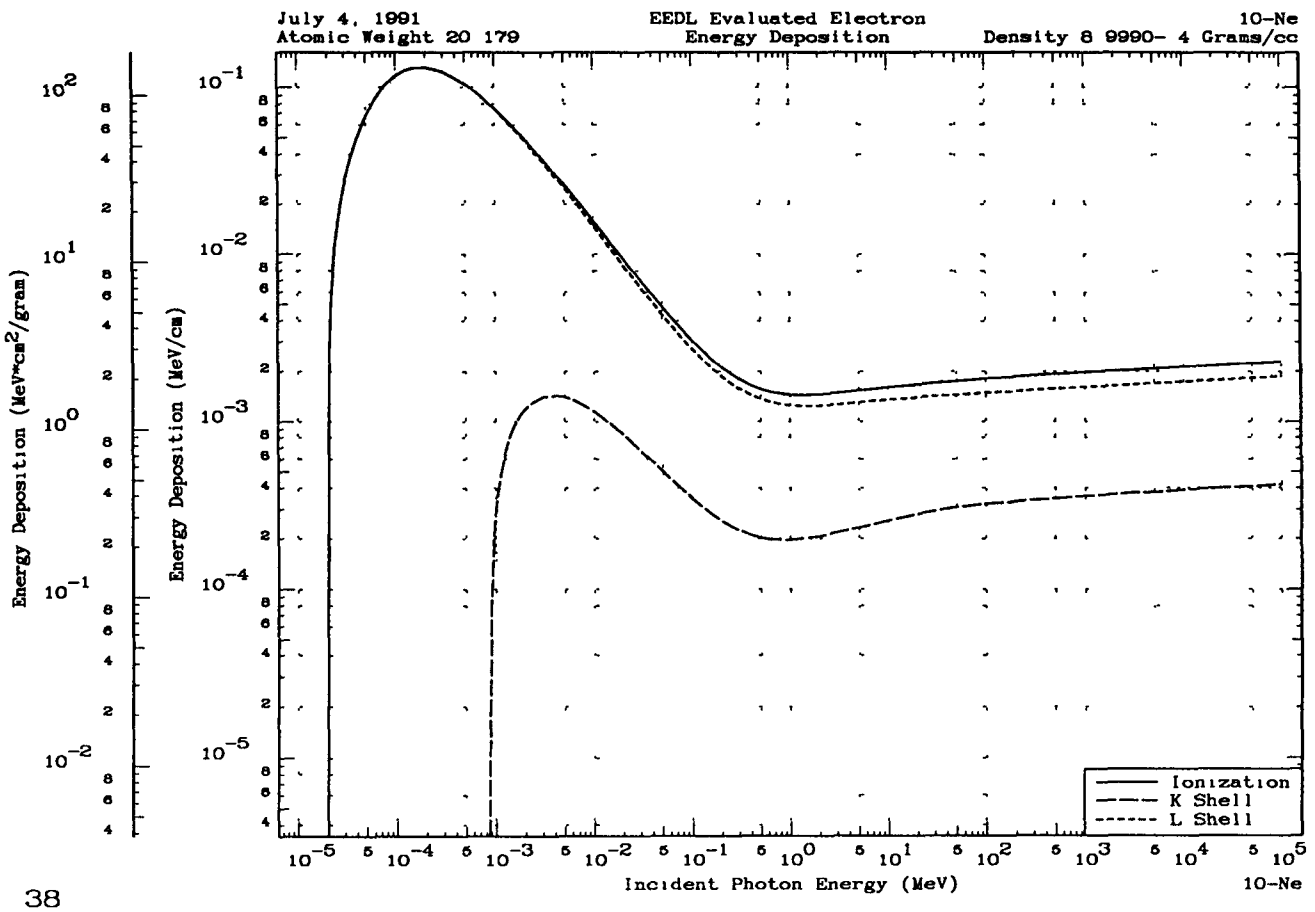
EEDL Evaluated Electron
Cross Sections
10-Ne
Density 8.9990- 4 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
10-Ne


July 4, 1991
Atomic Weight 20.179
EEDL Evaluated Electron
Energy Deposition
10-Ne
Density 8.9990- 4 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
10-Ne


July 4, 1991
Atomic Weight 20 179
EEDL Evaluated Electron
Shell Cross Sections
10-Ne
Density 8 9990- 4 Grams/cc
Ionization
K Shell
L Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
10-Ne


July 4, 1991
Atomic Weight 20 179
EEDL Evaluated Electron
Energy Deposition
10-Ne
Density 8 9990- 4 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
Incident Photon Energy (MeV)
10-Ne

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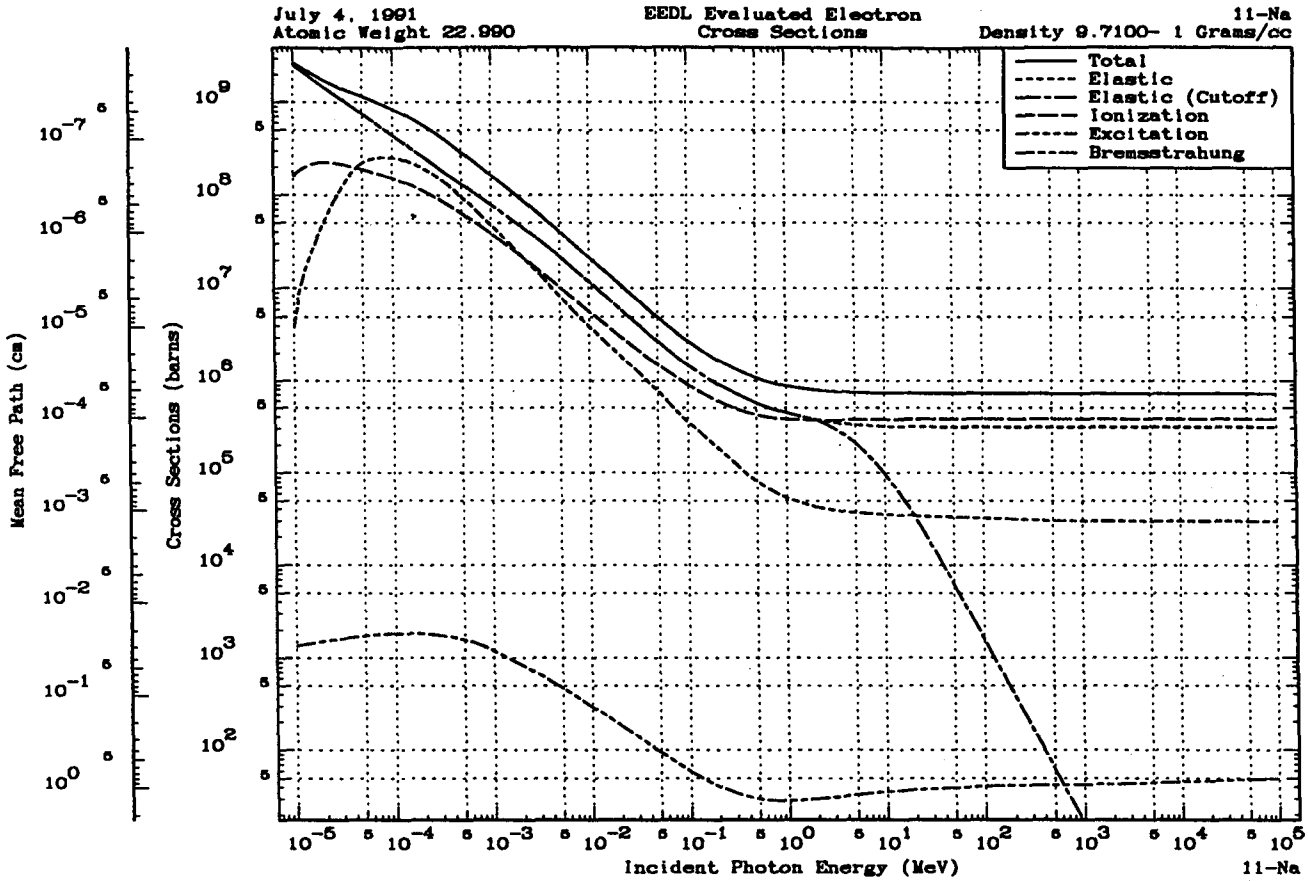
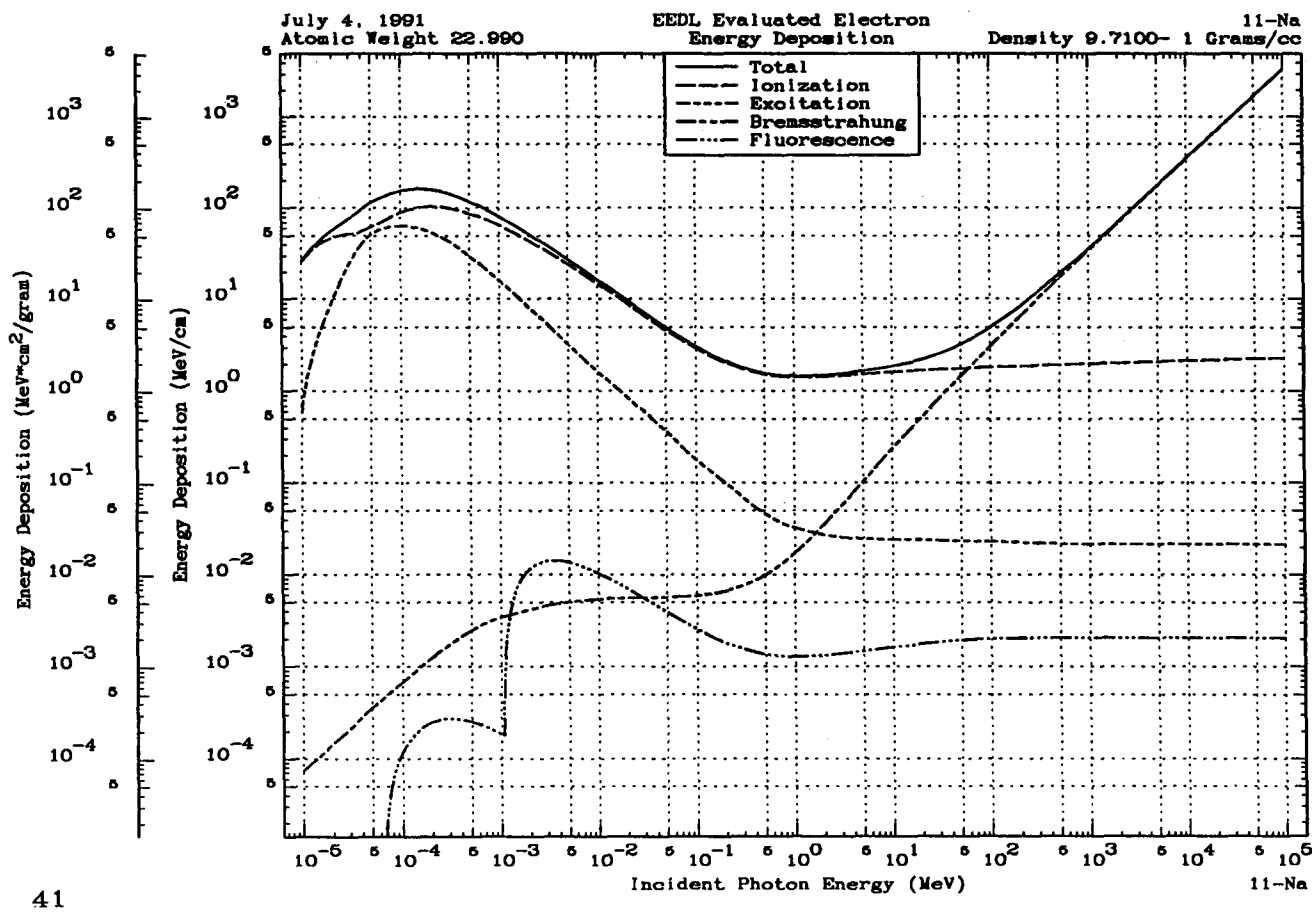
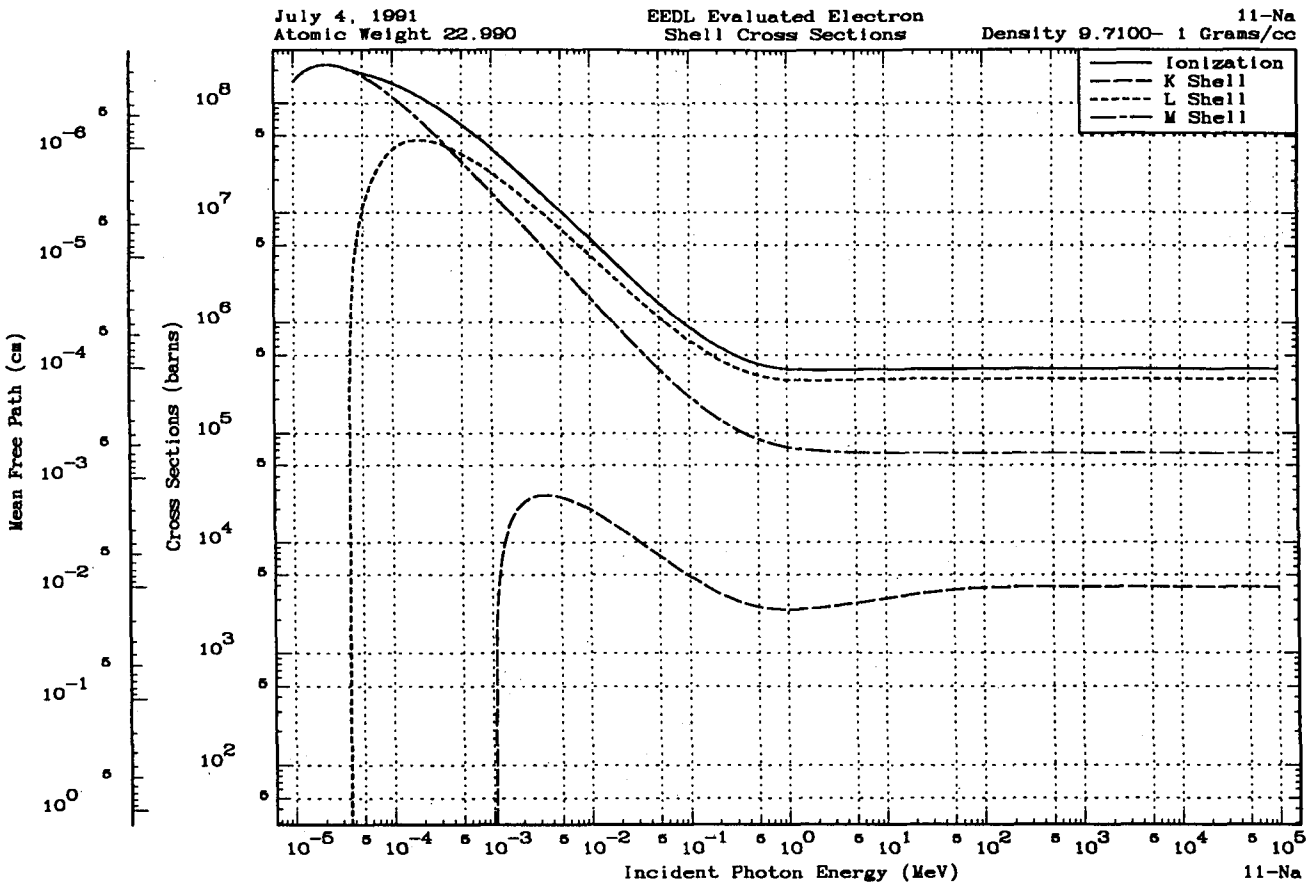
Atomic Weight 20.179 — Density 8.9990– 4 Grams/cc

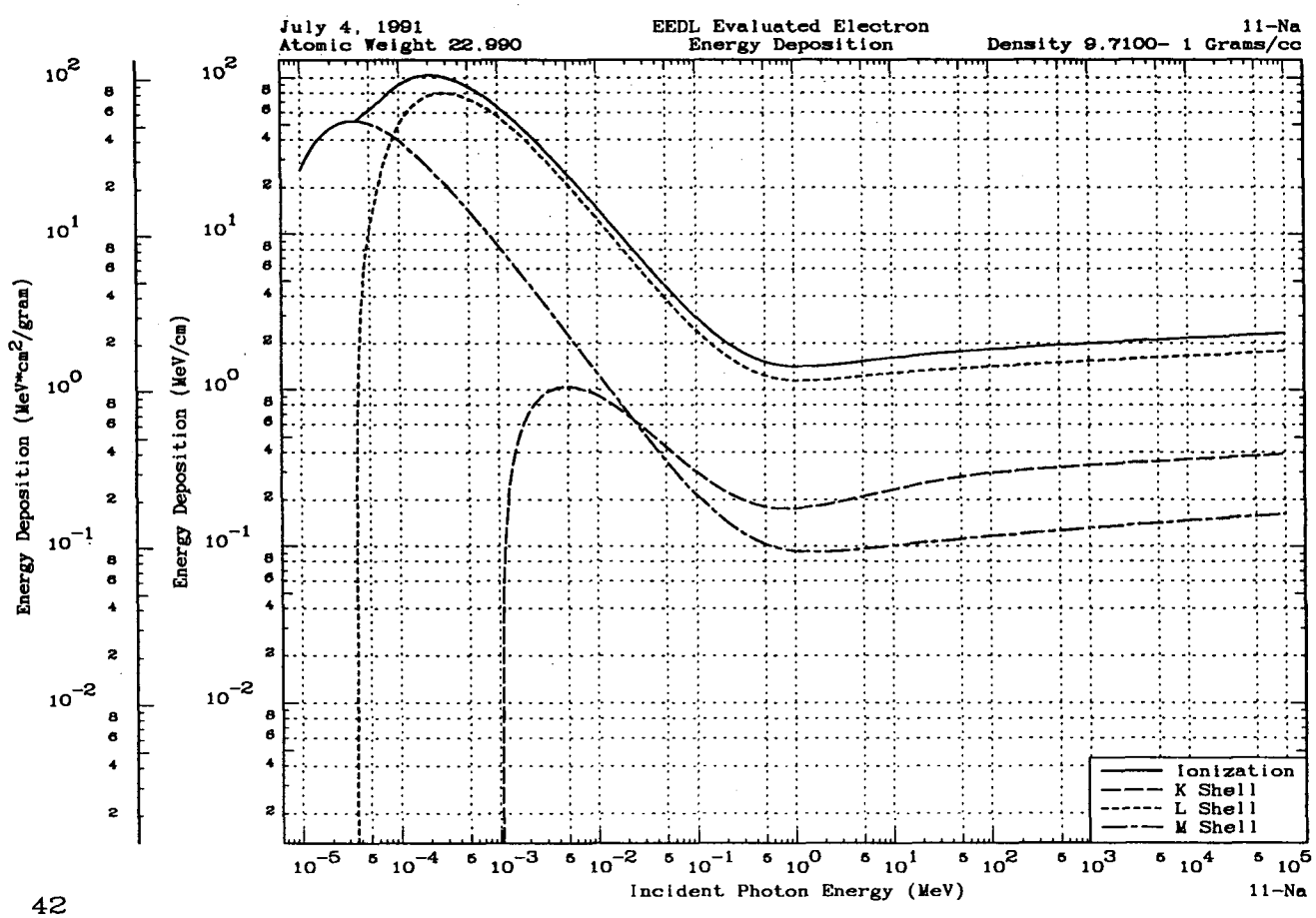
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	2.5298–5	4.3926+7		1.4719+9	1.4719+9			1.2018+3	6.9452–8			6.9452–8
	1.5000–5	3.4235–5	3.2459+7		1.0876+9	1.0876+9			1.2959+3	1.0285–7			1.0285–7
L3	1.9960–5	4.2368–5	2.6228+7		8.7885+8	8.7885+8	0.0000+0	0.0000+0	1.3666+3	1.3771–7	0.0000+0	0.0000+0	1.3771–7
	2.0000–5	4.2424–5	2.6193+7		8.7769+8	8.7754+8	1.5052+5	1.2047+3	1.3671+3	8.1512–5	8.0728–5	6.4608–7	1.3800–7
L2	2.0080–5	4.2547–5	2.6118+7		8.7515+8	8.7493+8	2.1636+5	3.5365+3	1.3681+3	1.1823–4	1.1616–4	1.9374–6	1.3858–7
	2.0625–5	4.3241–5	2.5699+7		8.6111+8	8.5762+8	3.4626+6	2.8154+4	1.3734+3	1.8898–3	1.8741–3	1.5508–5	1.4206–7
	2.0700–5	4.3342–5	2.5638+7		8.5910+8	8.5530+8	3.7632+6	3.1619+4	1.3742+3	2.0564–3	2.0388–3	1.7431–5	1.4254–7
	2.1797–5	4.4717–5	2.4851+7		8.3269+8	8.2297+8	9.6312+6	8.5171+4	1.3846+3	5.3372–3	5.2896–3	4.7471–5	1.4959–7
	2.1862–5	4.4797–5	2.4806+7		8.3120+8	8.2115+8	9.9610+6	8.8502+4	1.3852+3	5.5247–3	5.4752–3	4.9360–5	1.5001–7
	2.3848–5	4.7160–5	2.3563+7		7.8956+8	7.6957+8	1.9794+7	1.9111+5	1.4030+3	1.1254–2	1.1145–2	1.0870–4	1.6287–7
	2.3897–5	4.7217–5	2.3535+7		7.8860+8	7.6839+8	2.0018+7	1.9463+5	1.4034+3	1.1389–2	1.1278–2	1.1076–4	1.6319–7
	2.5423–5	4.8972–5	2.2691+7		7.6033+8	7.3371+8	2.6340+7	2.8284+5	1.4162+3	1.5275–2	1.5112–2	1.6335–4	1.7317–7
	2.6924–5	5.0557–5	2.1980+7		7.3650+8	7.0297+8	3.3132+7	3.9993+5	1.4282+3	1.9578–2	1.9343–2	2.3431–4	1.8305–7
	2.6948–5	5.0583–5	2.1969+7		7.3612+8	7.0249+8	3.3223+7	4.0210+5	1.4284+3	1.9638–2	1.9402–2	2.3564–4	1.8321–7
	2.7711–5	5.1383–5	2.1626+7		7.2465+8	6.8801+8	3.6185+7	4.6251+5	1.4343+3	2.1588–2	2.1315–2	2.7301–4	1.8826–7
	3.0000–5	5.3632–5	2.0720+7		6.9427+8	6.4845+8	4.5131+7	6.8836+5	1.4511+3	2.7683–2	2.7267–2	4.1509–4	2.0350–7
	3.5000–5	5.8114–5	1.9122+7		6.4072+8	5.7818+8	6.1302+7	1.2414+6	1.4835+3	3.9720–2	3.8934–2	7.8589–4	2.3697–7
	4.0000–5	6.2103–5	1.7893+7		5.9957+8	5.2349+8	7.4262+7	1.8144+6	1.5121+3	5.0666–2	4.9462–2	1.2031–3	2.7103–7
L1	4.3230–5	6.4503–5	1.7228+7		5.7726+8	4.9412+8	8.1000+7	2.1423+6	1.5286+3	5.6874–2	5.5414–2	1.4595–3	2.9311–7
	4.4076–5	6.5107–5	1.7068+7		5.7191+8	4.8705+8	8.2653+7	2.2066+6	1.5312+3	5.8498–2	5.6985–2	1.5126–3	2.9825–7
	4.5557–5	6.6128–5	1.6804+7		5.6308+8	4.7522+8	8.5532+7	2.3208+6	1.5357+3	6.1367–2	5.9758–2	1.6080–3	3.0725–7
	4.7779–5	6.7576–5	1.6444+7		5.5101+8	4.5869+8	8.9822+7	2.4957+6	1.5423+3	6.5731–2	6.3974–2	1.7569–3	3.2079–7
	5.0000–5	6.8927–5	1.6122+7		5.4021+8	4.4345+8	9.4084+7	2.6750+6	1.5485+3	7.0178–2	6.8264–2	1.9128–3	3.3438–7
	5.5000–5	7.2058–5	1.5421+7		5.1674+8	4.1311+8	1.0067+8	2.9617+6	1.5618+3	7.7949–2	7.5764–2	2.1850–3	3.6512–7
	6.0000–5	7.4865–5	1.4843+7		4.9737+8	3.8722+8	1.0699+8	3.1488+6	1.5739+3	8.5755–2	8.3360–2	2.3944–3	3.9606–7
	7.0000–5	8.0302–5	1.3838+7		4.6369+8	3.4534+8	1.1502+8	3.3242+6	1.5957+3	9.7485–2	9.4834–2	2.6503–3	4.5852–7
	8.0000–5	8.5395–5	1.3013+7		4.3604+8	3.1275+8	1.1997+8	3.3154+6	1.6148+3	1.0707–1	1.0430–1	2.7657–3	5.2167–7
	9.0000–5	9.0358–5	1.2298+7		4.1209+8	2.8668+8	1.2212+8	3.2803+6	1.6236+3	1.1355–1	1.1072–1	2.8291–3	5.8029–7
	1.0000–4	9.4886–5	1.1711+7	0.0000+0	3.9242+8	2.6522+8	1.2402+8	3.1840+6	1.6315+3	1.1986–1	1.1703–1	2.8360–3	6.3916–7
	1.1250–4	1.0065–4	1.1041+7	1.0238–4	3.6995+8	2.4312+8	1.2375+8	3.0816+6	1.6326+3	1.2434–1	1.2153–1	2.8153–3	7.0733–7
	1.2500–4	1.0598–4	1.0485+7	2.0119–4	3.5134+8	2.2491+8	1.2343+8	2.9928+6	1.6335+3	1.2871–1	1.2590–1	2.8026–3	7.7554–7
	1.3125–4	1.0873–4	1.0221+7	2.4954–4	3.4247+8	2.1695+8	1.2259+8	2.9258+6	1.6340+3	1.2981–1	1.2704–1	2.7734–3	8.0966–7
	1.5000–4	1.1652–4	9.5366+6	3.9223–4	3.1955+8	1.9657+8	1.2023+8	2.7502+6	1.6352+3	1.3301–1	1.3030–1	2.7012–3	9.1205–7
	1.7500–4	1.2695–4	8.7537+6	5.7993–4	2.9332+8	1.7542+8	1.1540+8	2.5023+6	1.6270+3	1.3338–1	1.3085–1	2.5206–3	1.0402–6
	2.0000–4	1.3663–4	8.1332+6	7.6688–4	2.7253+8	1.5894+8	1.1128+8	2.3057+6	1.6199+3	1.3407–1	1.3169–1	2.3804–3	1.1678–6
	2.5000–4	1.5611–4	7.1181+6	1.1454–3	2.3851+8	1.3491+8	1.0169+8	1.9155+6	1.5722+3	1.3016–1	1.2814–1	2.0272–3	1.3795–6
	3.0000–4	1.7402–4	6.3856+6	1.5353–3	2.1397+8	1.1800+8	9.4323+7	1.6462+6	1.5342+3	1.2633–1	1.2455–1	1.7848–3	1.5864–6
	3.5000–4	1.9211–4	5.7844+6	1.9405–3	1.9382+8	1.0541+8	8.7012+7	1.4032+6	1.4977+3	1.2046–1	1.1892–1	1.5412–3	1.7814–6
	4.0000–4	2.0928–4	5.3097+6	2.3635–3	1.7792+8	9.5590+7	8.1145+7	1.1820+6	1.4667+3	1.1598–1	1.1466–1	1.3149–3	1.9726–6
	4.5000–4	2.2638–4	4.9086+6	2.8045–3	1.6448+8	8.7704+7	7.5754+7	1.0203+6	1.4181+3	1.1081–1	1.0966–1	1.1447–3	2.1198–6
	5.0000–4	2.4288–4	4.5753+6	3.2646–3	1.5331+8	8.1202+7	7.1237+7	8.6904+5	1.3759+3	1.0658–1	1.0559–1	9.8326–4	2.2632–6
	6.0000–4	2.7520–4	4.0380+6	4.2413–3	1.3531+8	7.1141+7	6.3519+7	6.4419+5	1.2929+3	9.8314–2	9.7573–2	7.3814–4	2.5053–6
	8.0000–4	3.3697–4	3.2977+6	6.4256–3	1.1050+8	5.7740+7	5.2357+7	4.0227+5	1.1495+3	8.5125–2	8.4652–2	4.6950–4	2.8822–6
K	8.5818–4	3.5450–4	3.1347+6	7.1228–3	1.0504+8	5.4873+7	4.9804+7	3.5896+5	1.1102+3	8.1792–2	8.1369–2	4.2043–4	2.9548–6
	8.9363–4	3.6500–4	3.0445+6	7.5610–3	1.0201+8	5.3285+7	4.8392+7	3.3593+5	1.0881+3	8.0029–2	7.9631–2	3.9445–4	2.9984–6
	9.4682–4	3.8054–4	2.9202+6	8.2358–3	9.7849+7	5.1097+7	4.6446+7	3.0559+5	1.0574+3	7.7613–2	7.7250–2	3.6016–4	3.0627–6
	1.0000–3	3.9583–4	2.8073+6	8.9308–3	9.4069+7	4.9110+7	4.4678+7	2.7943+5	1.0291+3	7.5434–2	7.5101–2	3.3055–4	3.1260–6
	1.0625–3	4.1399–4	2.6842+6	9.7747–3	8.9942+7	4.6989+7	4.2699+7	2.5338+5	9.9583+2	7.2713–2	7.2409–2	3.0058–4	3.1744–6
	1.1172–3	4.2966–4	2.5863+6	1.0538–2	8.6663+7	4.5301+7	4.1127+7	2.3365+5	9.6908+2	7.0558–2	7.0277–2	2.7786–4	3.2165–6
	1.2129–3	4.5659–4	2.4338+6	1.1928–2	8.1551+7	4.2668+7	3.8677+7	2.0462+5	9.2683+2	6.7212–2	6.6964–2	2.4438–4	3.2894–6
	1.3564–3	4.9597–4	2.2405+6	1.4134–2	7.5076+7	3.9329+7	3.5576+7	1.7081+5	8.7227+2	6.3001–2	6.2792–2	2.0531–4	3.3967–6
	1.5000–3	5.3426–4	2.0800+6	1.6477–2	6.9695+7	3.6550+7	3.3000+7	1.4521+5	8.2595+2	5.9530–2	5.9351–2	1.7565–4	3.5012–6
	1.7500–3	6.0132–4	1.8480+6	2.0887–2	6.1923+7	3.2547+7	2.9260+7	1.1424+5	7.5680+2	5.3955–2	5.3812–2	1.3920–4	3.6348–6
	2.0000–3	6.6616–4	1.6681+6	2.5715–2	5.5895+7	2.9436+7	2.6366+7	9.2808+4	7.0160+2	4.9656–2	4.9538–2	1.1391–4	3.7652–6
	2.2500–3	7.3260–4	1.5168+6	3.0954–2	5.0827+7	2.6763+7	2.3985+7	7.8277+4	6.5341+2	4.5831–2	4.5730–2	9.6529–5	3.8506–6
	3.0000–3	9.2404–4	1.2026+6	4.8924–2	4.0296+7	2.1210+7	1.9034+7	5.1643+4	5.4917+2	3.7896–2	3.7827–2	6.4589–5	4.1035–6
	4.0000–3	1.1748–3	9.4591+5	7.8043–2	3.1696+7	1.6629+7	1.5031+7	3.5469+4	4.5692+2	3.1017–2	3.0967–2	4.4901–5	4.3106–6
	5.0000–3	1.4212–3	7.8188+5	1.1290–1	2.6199+7	1.3677+7	1.2495+7	2.6915+4	3.9418+2	2.6475–2	2.6436–2	3.4376–5	4.4485–6
	6.0000–3	1.6637–3	6.6792+5	1.5322–1	2.2381+7	1.1628+7	1.0731+7	2.1785+4	3.4834+2	2.3207–2	2.3174–2	2.8016–5	4.5431–6
	8.0000–3	2.1362–3	5.2019+5	2.4879–1	1.7431+7	8.9825+6	8.4318+6	1.5930+4	2.8535+2	1.8799–2	1.8774–2	2.0699–5	4.6629–6
	1.0000–2	2.5985–3	4.2765+5	3.6423–1	1.4330+7	7.3260+6	6.9908+6	1.2700+4	2.4375+2	1.5931–2	1.5910–2	1.6626–5	4.7365–6
	1.5000–2	3.7076–3	2.9972+5	7.2806–1	1.0043+7	5.0573+6	4.9765+6	8.8784+3	1.8216+2	1.1764–2	1.1748–2	1.1768–5	4.8123–6
	2.0000–2	4.7644–3	2.3324+5	1.2005+0	7.8153+6	3.8902+6	3.9179+6	7.0845+3	1.4874+2	9.4859–3	9.4716–3	9.4687–6	4.8456–6
	3.0000–2	6.7599–3	1.6439+5	2.4213+0	5.5083+6	2.6910+6	2.8120+6	5.1863+3	1.1162+2	7.0195–3	7.0076–3	7.0073–6	4.8696–6
	4.0000–2	8.6176–3	1.2895+5	4.0002+0	4.3208+6	2.0808+6	2.2357+6	4.1761+3	9.1175+1	5.6941–3	5.6835–3	5.6830–6	4.8903–6
	5.0000–2	1.0352–2	1.0735+5	5.8992+0	3.5970+6	1.7130+6	1.8804+6	3.5450+3	7.8003+1	4.8597–3	4.8499–3	4.8500–6	4.9150–6
	6.0000–2	1.1958–2	9.2930+4	8.0891+0	3.1139+6	1.4719+6	1.6388+6	3.1119+3	6.8747+1	4.2852–3	4.2759–3	4.2755–6	4.9575–6
	8.0000–2	1.4836–2	7.4903+4	1.3216+1	2.5098+6	1.1763+6	1.3309+6	2.5542+3	5.6623+1	3.5412–3	3.5326–3	3.5319–6	5.0462–6
	1.0000–1	1.7335–2	6.4105+4	1.9266+1	2.1480+6	1.0028+6	1.1430+6	2.2103+3	4.8988+1	3.0805–3	3.0722–3	3.0710–6	5.1394–6
	1.5000–1	2.2366–2	4.9683+4	3.7435+1	1.6648+6	7.7505+5	8.8796+5	1.7405+3	3.8535+1	2.4476–3	2.4397–3	2.4387–6	5.4281–6
	2.0000–1	2.6209–2	4.2399+4	5.9332+1	1.4207+6	6.5957+5	7.5960+5	1.5023+3	3.3287+1	2.1267–3	2.1188–3	2.1174–6	5.7746–6
	3.0000–1	3.1668–2	3.5090+4	1.1026+2	1.1758+6	5.4240+5	6.3211+5	1.2672+3	2.8198+1	1.8090–3	1.8006–3	1.8006–6	6.6008–6
	4.0000–1	3.5363–2	3.1424+4	1.6794+2	1.0530+6	4.8046+5	5.7132+5	1.1546+3	2.5906+1	1.6603–3	1.6511–3	1.6507–6	7.5544–6
	5.0000–1	3.7974–2	2.9263+4	2.2971+2	9.8055+5	4.4276+5	5.3667+5	1.0913+3	2.4707+1	1.5785–3	1.5683–3	1.5682–6	8.6040–6
	6.0000–1	3.9912–2	2.7842+4	2.9405+2	9.3293+5	4.1687+5	5.1497+5	1.0524+3	2.4106+1	1.5301–3	1.5189–3	1.5189–6	9.7553–6
	8.0000–1	4.2604–2	2.6083+4	4.2678+2	8.7399+5	3.8254+5	4.9041+5	1.0100+3	2.3690+1	1.4837–3	1.4699–3	1.4686–6	1.2272–5
	1.0000+0	4.4327–2	2.5069+4	5.6244+2	8.4001+5	3.6126+5	4.7773+5	9.8977+2	2.3732+1	1.4650–3	1.4486–3	1.4483–6	1.5004–5
	1.5000+0	4.6517–2	2.3889+4	9.0279+2	8.0047+5	3.3178+5	4.6769+5	9.7523+2	2.4450+1	1.4732–3	1.4491–3	1.4424–6	2.2633–5
	2.0000+0	4.7871–2	2.3213+4	1.2405+3	7.7782+5	3.1613+5	4.6070+5	9.7317+2	2.5131+1	1.4884–3	1.4559–3	1.4552–6	3.1058–5
	3.0000+0	4.8898–2	2.2726+4	1.9019+3	7.6149+5	3.0024+5	4.6024+5	9.8715+2	2.6061+1	1.5353–3	1.4841–3	1.4869–6	4.9692–5

Atomic Weight 20.179												Density 8.9990– 4 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+0	4.9449–2	2.2472+4	2.5437+3	7.5300+5	2.9206+5	4.5992+5	9.9841+2	2.6902+1	1.5816–3	1.5099–3	1.5147–6	7.0168–5
5.0000+0	4.9786–2	2.2320+4	3.1670+3	7.4791+5	2.8719+5	4.5968+5	1.0064+3	2.7573+1	1.6271–3	1.5343–3	1.5378–6	9.1262–5
6.0000+0	4.9991–2	2.2229+4	3.7731+3	7.4484+5	2.8430+5	4.5950+5	1.0116+3	2.8101+1	1.6727–3	1.5578–3	1.5569–6	1.1335–4
8.0000+0	5.0181–2	2.2145+4	4.9431+3	7.4202+5	2.8091+5	4.6005+5	1.0272+3	2.8902+1	1.7468–3	1.5856–3	1.5870–6	1.5958–4
1.0000+1	5.0271–2	2.2105+4	6.0646+3	7.4070+5	2.7914+5	4.6049+5	1.0381+3	2.9502+1	1.8203–3	1.6111–3	1.6100–6	2.0758–4
1.5000+1	5.0370–2	2.2061+4	8.6986+3	7.3923+5	2.7714+5	4.6100+5	1.0639+3	3.0495+1	1.9784–3	1.6437–3	1.6509–6	3.3299–4
2.0000+1	5.0419–2	2.2040+4	1.1130+4	7.3851+5	2.7603+5	4.6137+5	1.0814+3	3.1179+1	2.1366–3	1.6725–3	1.6788–6	4.6249–4
3.0000+1	5.0444–2	2.2029+4	1.5499+4	7.3815+5	2.7526+5	4.6175+5	1.1045+3	3.2085+1	2.4480–3	1.7141–3	1.7164–6	7.3223–4
4.0000+1	5.0432–2	2.2034+4	1.9354+4	7.3832+5	2.7525+5	4.6192+5	1.1198+3	3.2690+1	2.7457–3	1.7351–3	1.7418–6	1.0089–3
5.0000+1	5.0426–2	2.2037+4	2.2812+4	7.3842+5	2.7524+5	4.6201+5	1.1309+3	3.3105+1	3.0438–3	1.7515–3	1.7607–6	1.2906–3
6.0000+1	5.0421–2	2.2039+4	2.5945+4	7.3849+5	2.7524+5	4.6208+5	1.1393+3	3.3398+1	3.3446–3	1.7673–3	1.7755–6	1.5756–3
8.0000+1	5.0414–2	2.2042+4	3.1442+4	7.3859+5	2.7523+5	4.6217+5	1.1516+3	3.3870+1	3.9481–3	1.7932–3	1.7981–6	2.1531–3
1.0000+2	5.0411–2	2.2044+4	3.6154+4	7.3864+5	2.7522+5	4.6222+5	1.1603+3	3.4245+1	4.5563–3	1.8159–3	1.8151–6	2.7386–3
1.5000+2	5.0409–2	2.2044+4	4.5633+4	7.3867+5	2.7520+5	4.6225+5	1.1794+3	3.4796+1	6.0647–3	1.8342–3	1.8449–6	4.2286–3
2.0000+2	5.0407–2	2.2045+4	5.2989+4	7.3869+5	2.7519+5	4.6227+5	1.1926+3	3.5059+1	7.5869–3	1.8522–3	1.8655–6	5.7328–3
3.0000+2	5.0405–2	2.2046+4	6.4071+4	7.3871+5	2.7518+5	4.6229+5	1.2107+3	3.5188+1	1.0630–2	1.8876–3	1.8941–6	8.7409–3
4.0000+2	5.0405–2	2.2046+4	7.2344+4	7.3872+5	2.7517+5	4.6229+5	1.2235+3	3.5195+1	1.3671–2	1.9119–3	1.9141–6	1.1757–2
5.0000+2	5.0405–2	2.2046+4	7.8949+4	7.3873+5	2.7516+5	4.6230+5	1.2335+3	3.5185+1	1.6713–2	1.9234–3	1.9297–6	1.4788–2
6.0000+2	5.0405–2	2.2046+4	8.4447+4	7.3873+5	2.7515+5	4.6230+5	1.2414+3	3.5234+1	1.9749–2	1.9349–3	1.9422–6	1.7813–2
8.0000+2	5.0404–2	2.2046+4	9.3277+4	7.3873+5	2.7515+5	4.6230+5	1.2540+3	3.5360+1	2.5819–2	1.9578–3	1.9620–6	2.3859–2
1.0000+3	5.0404–2	2.2047+4	1.0023+5	7.3874+5	2.7514+5	4.6230+5	1.2638+3	3.5507+1	3.1892–2	1.9781–3	1.9773–6	2.9912–2
1.5000+3	5.0404–2	2.2047+4	1.1305+5	7.3874+5	2.7512+5	4.6230+5	1.2816+3	3.5837+1	4.7090–2	1.9951–3	2.0051–6	4.5093–2
2.0000+3	5.0404–2	2.2047+4	1.2225+5	7.3874+5	2.7511+5	4.6230+5	1.2942+3	3.6105+1	6.2387–2	2.0122–3	2.0249–6	6.0372–2
3.0000+3	5.0403–2	2.2047+4	1.3530+5	7.3875+5	2.7510+5	4.6230+5	1.3119+3	3.6515+1	9.2829–2	2.0463–3	2.0526–6	9.0781–2
4.0000+3	5.0403–2	2.2047+4	1.4462+5	7.3875+5	2.7509+5	4.6230+5	1.3245+3	3.6842+1	1.2339–1	2.0700–3	2.0724–6	1.2132–1
5.0000+3	5.0403–2	2.2047+4	1.5185+5	7.3875+5	2.7508+5	4.6230+5	1.3344+3	3.7103+1	1.5415–1	2.0810–3	2.0878–6	1.5206–1
6.0000+3	5.0403–2	2.2047+4	1.5778+5	7.3875+5	2.7507+5	4.6230+5	1.3423+3	3.7340+1	1.8438–1	2.0919–3	2.1002–6	1.8229–1
8.0000+3	5.0403–2	2.2047+4	1.6715+5	7.3876+5	2.7506+5	4.6230+5	1.3549+3	3.7718+1	2.4535–1	2.1139–3	2.1199–6	2.4323–1
1.0000+4	5.0402–2	2.2047+4	1.7442+5	7.3876+5	2.7506+5	4.6230+5	1.3646+3	3.8014+1	3.0684–1	2.1359–3	2.1351–6	3.0470–1
1.5000+4	5.0402–2	2.2047+4	1.8768+5	7.3876+5	2.7504+5	4.6230+5	1.3824+3	3.8628+1	4.5743–1	2.1523–3	2.1629–6	4.5528–1
2.0000+4	5.0402–2	2.2047+4	1.9711+5	7.3877+5	2.7503+5	4.6230+5	1.3950+3	3.9070+1	6.0998–1	2.1687–3	2.1826–6	6.0781–1
3.0000+4	5.0402–2	2.2048+4	2.1043+5	7.3877+5	2.7502+5	4.6230+5	1.4127+3	3.9691+1	9.1200–1	2.2016–3	2.2103–6	9.0980–1
4.0000+4	5.0401–2	2.2048+4	2.1989+5	7.3877+5	2.7501+5	4.6230+5	1.4253+3	4.0136+1	1.2173+0	2.2292–3	2.2300–6	1.2151+0
5.0000+4	5.0401–2	2.2048+4	2.2722+5	7.3878+5	2.7500+5	4.6230+5	1.4351+3	4.0479+1	1.5198+0	2.2400–3	2.2454–6	1.5175+0
6.0000+4	5.0401–2	2.2048+4	2.3323+5	7.3878+5	2.7499+5	4.6230+5	1.4431+3	4.0759+1	1.8219+0	2.2507–3	2.2578–6	1.8197+0
8.0000+4	5.0401–2	2.2048+4	2.4269+5	7.3878+5	2.7498+5	4.6230+5	1.4556+3	4.1204+1	2.4316+0	2.2721–3	2.2775–6	2.4293+0
1.0000+5	5.0401–2	2.2048+4	2.5003+5	7.3878+5	2.7497+5	4.6230+5	1.4654+3	4.1550+1	3.0424+0	2.2935–3	2.2928–6	3.0401+0


July 4, 1991
Atomic Weight 22.990
EEDL Evaluated Electron
Cross Sections
11-Na
Density 9.7100- 1 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
11-Na


July 4, 1991
Atomic Weight 22.990
EEDL Evaluated Electron
Energy Deposition
11-Na
Density 9.7100- 1 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
11-Na

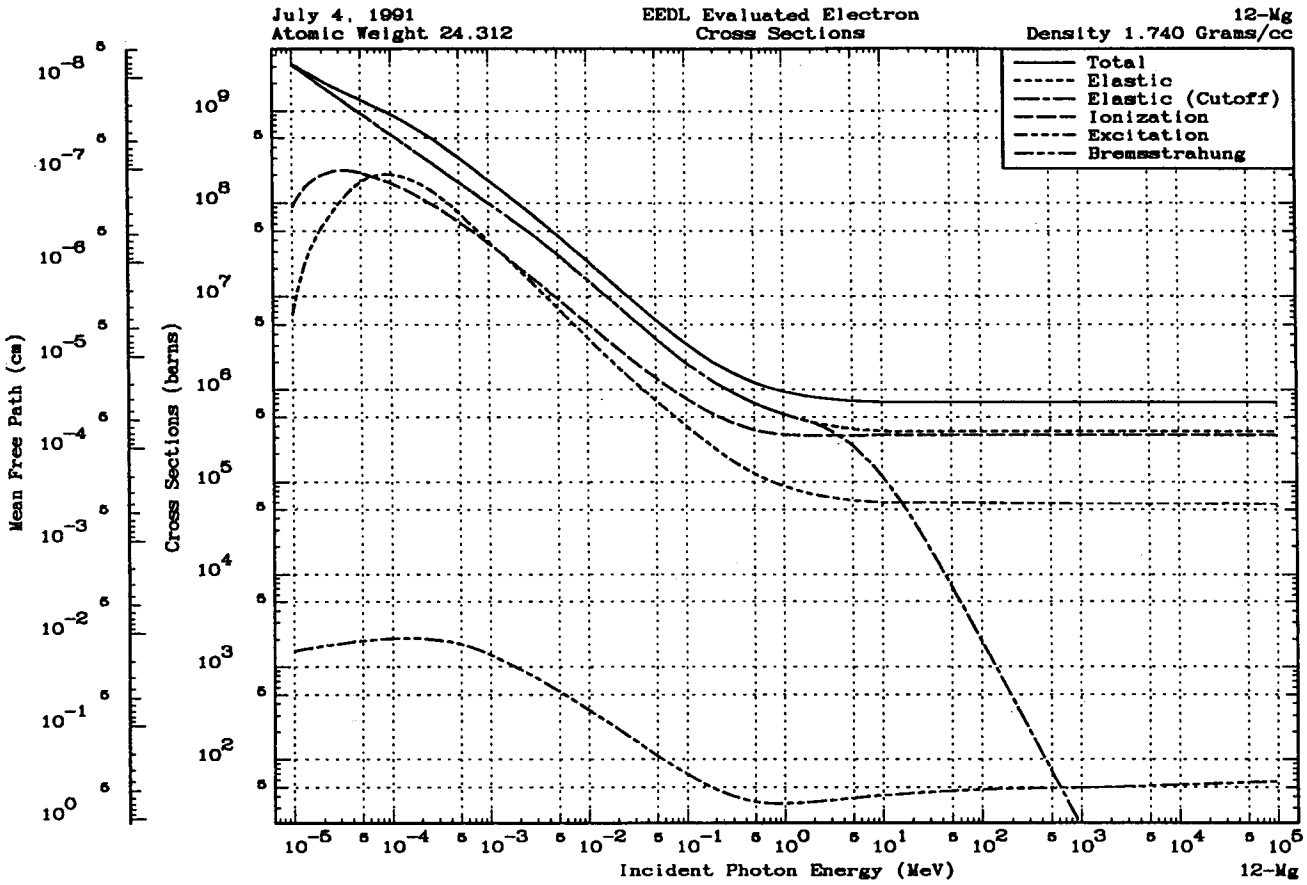

July 4, 1991
Atomic Weight 22.990
EEDL Evaluated Electron
Shell Cross Sections
11-Na
Density 9.7100- 1 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
11-Na


July 4, 1991
Atomic Weight 22.990
EEDL Evaluated Electron
Energy Deposition
11-Na
Density 9.7100- 1 Grams/cc
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
Incident Photon Energy (MeV)
11-Na

Atomic Weight 22.990													Density 9.7100– 1 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000+1	5.4289–5	1.8970+4	5.9798+0	7.2419+5	3.1601+5	3.7341+5	3.4735+4	3.5342+1	1.8708+0	1.6109+0	2.4191–2	2.3568–1
1.5000+1	5.4443–5	1.8916+4	8.5336+0	7.2214+5	3.1358+5	3.7426+5	3.4266+4	3.6451+1	2.0476+0	1.6460+0	2.4016–2	3.7755–1
2.0000+1	5.4522–5	1.8889+4	1.0876+1	7.2110+5	3.1232+5	3.7487+5	3.3876+4	3.7184+1	2.2246+0	1.6770+0	2.3892–2	5.2373–1
3.0000+1	5.4585–5	1.8867+4	1.5052+1	7.2027+5	3.1144+5	3.7561+5	3.3178+4	3.8111+1	2.5723+0	1.7207+0	2.3693–2	8.2791–1
4.0000+1	5.4588–5	1.8866+4	1.8707+1	7.2023+5	3.1143+5	3.7582+5	3.2940+4	3.8728+1	2.9065+0	1.7430+0	2.3551–2	1.1399+0
5.0000+1	5.4593–5	1.8864+4	2.1964+1	7.2016+5	3.1142+5	3.7595+5	3.2747+4	3.9173+1	3.2413+0	1.7615+0	2.3442–2	1.4564+0
6.0000+1	5.4600–5	1.8862+4	2.4899+1	7.2007+5	3.1141+5	3.7606+5	3.2559+4	3.9509+1	3.5784+0	1.7791+0	2.3335–2	1.7760+0
8.0000+1	5.4615–5	1.8857+4	3.0017+1	7.1987+5	3.1140+5	3.7620+5	3.2229+4	4.0018+1	4.2563+0	1.8064+0	2.3154–2	2.4268+0
1.0000+2	5.4630–5	1.8852+4	3.4374+1	7.1967+5	3.1139+5	3.7629+5	3.1958+4	4.0398+1	4.9423+0	1.8304+0	2.3015–2	3.0889+0
1.5000+2	5.4657–5	1.8842+4	4.3069+1	7.1931+5	3.1137+5	3.7632+5	3.1576+4	4.1098+1	6.6412+0	1.8502+0	2.2743–2	4.7683+0
2.0000+2	5.4681–5	1.8834+4	4.9765+1	7.1899+5	3.1136+5	3.7635+5	3.1242+4	4.1512+1	8.3586+0	1.8695+0	2.2504–2	6.4666+0
3.0000+2	5.4715–5	1.8822+4	5.9789+1	7.1855+5	3.1134+5	3.7639+5	3.0775+4	4.1694+1	1.1790+1	1.9072+0	2.2173–2	9.8608+0
4.0000+2	5.4741–5	1.8813+4	6.7234+1	7.1821+5	3.1133+5	3.7640+5	3.0439+4	4.1732+1	1.5222+1	1.9315+0	2.1935–2	1.3269+1
5.0000+2	5.4765–5	1.8805+4	7.3159+1	7.1789+5	3.1132+5	3.7640+5	3.0132+4	4.1744+1	1.8644+1	1.9436+0	2.1719–2	1.6679+1
6.0000+2	5.4765–5	1.8805+4	7.8086+1	7.1790+5	3.1131+5	3.7640+5	3.0140+4	4.1824+1	2.2051+1	1.9556+0	2.1729–2	2.0073+1
8.0000+2	5.4770–5	1.8804+4	8.5986+1	7.1784+5	3.1130+5	3.7641+5	3.0087+4	4.1998+1	2.8885+1	1.9796+0	2.1701–2	2.6884+1
1.0000+3	5.4773–5	1.8802+4	9.2198+1	7.1779+5	3.1129+5	3.7641+5	3.0046+4	4.2184+1	3.5751+1	2.0011+0	2.1681–2	3.3729+1
1.5000+3	5.4775–5	1.8802+4	1.0362+2	7.1776+5	3.1128+5	3.7641+5	3.0039+4	4.2580+1	5.2920+1	2.0191+0	2.1676–2	5.0880+1
2.0000+3	5.4781–5	1.8800+4	1.1180+2	7.1769+5	3.1126+5	3.7641+5	2.9979+4	4.2894+1	7.0187+1	2.0370+0	2.1633–2	6.8129+1
3.0000+3	5.4779–5	1.8800+4	1.2339+2	7.1771+5	3.1125+5	3.7641+5	3.0010+4	4.3419+1	1.0453+2	2.0729+0	2.1655–2	1.0243+2
4.0000+3	5.4783–5	1.8799+4	1.3166+2	7.1766+5	3.1123+5	3.7641+5	2.9978+4	4.3841+1	1.3899+2	2.0965+0	2.1633–2	1.3687+2
5.0000+3	5.4798–5	1.8794+4	1.3809+2	7.1746+5	3.1123+5	3.7641+5	2.9784+4	4.4179+1	1.7369+2	2.1080+0	2.1493–2	1.7157+2
6.0000+3	5.4792–5	1.8796+4	1.4334+2	7.1754+5	3.1122+5	3.7641+5	2.9876+4	4.4466+1	2.0780+2	2.1195+0	2.1559–2	2.0566+2
8.0000+3	5.4789–5	1.8797+4	1.5166+2	7.1758+5	3.1121+5	3.7641+5	2.9921+4	4.4922+1	2.7658+2	2.1425+0	2.1592–2	2.7441+2
1.0000+4	5.4789–5	1.8797+4	1.5811+2	7.1758+5	3.1120+5	3.7641+5	2.9932+4	4.5279+1	3.4595+2	2.1656+0	2.1599–2	3.4376+2
1.5000+4	5.4787–5	1.8798+4	1.6987+2	7.1761+5	3.1118+5	3.7641+5	2.9981+4	4.6011+1	5.1582+2	2.1829+0	2.1635–2	5.1362+2
2.0000+4	5.4789–5	1.8797+4	1.7823+2	7.1758+5	3.1117+5	3.7641+5	2.9963+4	4.6537+1	6.8789+2	2.2002+0	2.1622–2	6.8567+2
3.0000+4	5.4787–5	1.8797+4	1.9004+2	7.1760+5	3.1115+5	3.7641+5	2.9999+4	4.7276+1	1.0286+3	2.2349+0	2.1648–2	1.0263+3
4.0000+4	5.4790–5	1.8797+4	1.9843+2	7.1757+5	3.1114+5	3.7641+5	2.9981+4	4.7807+1	1.3730+3	2.2622+0	2.1635–2	1.3707+3
5.0000+4	5.4805–5	1.8791+4	2.0493+2	7.1737+5	3.1113+5	3.7641+5	2.9787+4	4.8215+1	1.7142+3	2.2735+0	2.1495–2	1.7119+3
6.0000+4	5.4799–5	1.8793+4	2.1025+2	7.1745+5	3.1112+5	3.7641+5	2.9872+4	4.8548+1	2.0551+3	2.2848+0	2.1556–2	2.0528+3
8.0000+4	5.4796–5	1.8795+4	2.1865+2	7.1749+5	3.1111+5	3.7641+5	2.9925+4	4.9078+1	2.7429+3	2.3073+0	2.1594–2	2.7405+3
1.0000+5	5.4796–5	1.8795+4	2.2515+2	7.1749+5	3.1110+5	3.7641+5	2.9939+4	4.9490+1	3.4319+3	2.3298+0	2.1605–2	3.4295+3

Atomic Weight 22.990 Density 9.7100– 1 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	1.4603–8	7.0522+7		2.6922+9	2.5300+9	1.5838+8	3.8396+6	1.3420+3	2.6235+1	2.5633+1	6.0215–1	7.3465–5
1.1250–5	1.5726–8	6.5487+7		2.5000+9	2.3136+9	1.7777+8	8.5665+6	1.3719+3	3.1406+1	3.0022+1	1.3837+0	8.2109–5
1.3125–5	1.7300–8	5.9530+7		2.2726+9	2.0582+9	1.9821+8	1.6166+7	1.4119+3	3.8290+1	3.5565+1	2.7250+0	9.5330–5
1.5000–5	1.8767–8	5.4877+7		2.0950+9	1.8598+9	2.1133+8	2.3799+7	1.4475+3	4.4103+1	3.9924+1	4.1793+0	1.0883–4
1.7500–5	2.0569–8	5.0070+7		1.9114+9	1.6545+9	2.2131+8	3.5640+7	1.4897+3	5.0762+1	4.4245+1	6.5167+0	1.2724–4
2.0000–5	2.2218–8	4.6354+7		1.7696+9	1.4950+9	2.2503+8	4.9502+7	1.5273+3	5.6878+1	4.7468+1	9.4100+0	1.4606–4
2.5000–5	2.5099–8	4.1032+7		1.5664+9	1.2621+9	2.2303+8	8.1260+7	1.5786+3	6.7433+1	5.1132+1	1.6301+1	1.8038–4
3.0000–5	2.7492–8	3.7460+7		1.4301+9	1.0990+9	2.1587+8	1.1515+8	1.6219+3	7.7047+1	5.2736+1	2.4311+1	2.1554–4
L3 3.6220–5	2.9964–8	3.4370+7		1.3121+9	9.5281+8	2.0303+8	1.5625+8	1.6666+3	8.6926+1	5.2631+1	3.4294+1	2.5982–4
L2 3.6420–5	3.0029–8	3.4295+7		1.3092+9	9.4885+8	2.0279+8	1.5760+8	1.6680+3	8.7373+1	5.2746+1	3.4627+1	2.6125–4
3.7165–5	3.0283–8	3.4008+7		1.2983+9	9.3441+8	2.0212+8	1.6174+8	1.6729+3	8.9046+1	5.3376+1	3.5670+1	2.6663–4
3.7315–5	3.0334–8	3.3951+7		1.2961+9	9.3157+8	2.0194+8	1.6257+8	1.6738+3	8.9343+1	5.3461+1	3.5881+1	2.6771–4
4.0000–5	3.1171–8	3.3040+7		1.2613+9	8.8382+8	1.9979+8	1.7768+8	1.6907+3	9.5540+1	5.5795+1	3.9745+1	2.8720–4
4.5000–5	3.2605–8	3.1586+7		1.2058+9	8.0841+8	1.9356+8	2.0385+8	1.7125+3	1.0538+2	5.8902+1	4.6477+1	3.2071–4
5.0000–5	3.3997–8	3.0292+7		1.1564+9	7.4643+8	1.8867+8	2.2133+8	1.7322+3	1.1373+2	6.2317+1	5.1415+1	3.5457–4
6.0000–5	3.6731–8	2.8038+7		1.0704+9	6.5018+8	1.7896+8	2.4125+8	1.7614+3	1.2593+2	6.8320+1	5.7608+1	4.2025–4
L1 6.4480–5	3.7979–8	2.7117+7		1.0352+9	6.1569+8	1.7445+8	2.4506+8	1.7731+3	1.2940+2	7.0371+1	5.9032+1	4.4996–4
6.5450–5	3.8238–8	2.6933+7		1.0282+9	6.0878+8	1.7365+8	2.4575+8	1.7755+3	1.3028+2	7.0958+1	5.9317+1	4.5642–4
6.7269–5	3.8712–8	2.6603+7		1.0156+9	5.9629+8	1.7226+8	2.4703+8	1.7800+3	1.3196+2	7.2115+1	5.9845+1	4.6854–4
7.0000–5	3.9398–8	2.6140+7		9.9792+8	5.7861+8	1.7041+8	2.4889+8	1.7865+3	1.3461+2	7.3973+1	6.0631+1	4.8679–4
7.0452–5	3.9510–8	2.6066+7		9.9508+8	5.7581+8	1.7008+8	2.4920+8	1.7875+3	1.3499+2	7.4233+1	6.0760+1	4.8982–4
7.5226–5	4.0655–8	2.5332+7		9.6706+8	5.4795+8	1.6680+8	2.5230+8	1.7983+3	1.3914+2	7.7026+1	6.2110+1	5.2187–4
8.0000–5	4.1717–8	2.4687+7		9.4244+8	5.2305+8	1.6415+8	2.5525+8	1.8084+3	1.4356+2	8.0128+1	6.3435+1	5.5409–4
9.0000–5	4.4206–8	2.3297+7		8.8937+8	4.7864+8	1.5786+8	2.5288+8	1.8191+3	1.4875+2	8.4971+1	6.3777+1	6.1675–4
1.0000–4	4.6511–8	2.2142+7	0.0000+0	8.4529+8	4.4212+8	1.5240+8	2.5077+8	1.8287+3	1.5355+2	8.9382+1	6.4171+1	6.7970–4
1.1250–4	4.9239–8	2.0916+7	8.0300–8	7.9847+8	4.0458+8	1.4560+8	2.4829+8	1.8309+3	1.5780+2	9.3427+1	6.4371+1	7.5284–4
1.3125–4	5.3636–8	1.9201+7	1.9819–7	7.3301+8	3.6022+8	1.3680+8	2.3599+8	1.8339+3	1.6031+2	9.7943+1	6.2369+1	8.6268–4
1.5000–4	5.7749–8	1.7833+7	3.1460–7	6.8080+8	3.2575+8	1.2922+8	2.2583+8	1.8364+3	1.6181+2	1.0099+2	6.0820+1	9.7266–4
1.7500–4	6.3483–8	1.6223+7	4.7019–7	6.1931+8	2.9004+8	1.1955+8	2.0972+8	1.8289+3	1.5956+2	1.0205+2	5.7508+1	1.1108–3
2.0000–4	6.8845–8	1.4959+7	6.2739–7	5.7108+8	2.6228+8	1.1209+8	1.9670+8	1.8224+3	1.5853+2	1.0362+2	5.4900+1	1.2485–3
2.5000–4	7.9582–8	1.2941+7	9.4924–7	4.9403+8	2.2178+8	9.9060+7	1.7319+8	1.7723+3	1.5221+2	1.0267+2	4.9544+1	1.4792–3
3.0000–4	9.0577–8	1.1370+7	1.2860–6	4.3406+8	1.9338+8	8.9048+7	1.5163+8	1.7324+3	1.4484+2	1.0040+2	4.4436+1	1.7049–3
4.0000–4	1.1243–7	9.1601+6	2.0128–6	3.4969+8	1.5595+8	7.4284+7	1.1945+8	1.6608+3	1.3057+2	9.4365+1	3.6204+1	2.1278–3
5.0000–4	1.3453–7	7.6551+6	2.8197–6	2.9224+8	1.3200+8	6.3787+7	9.6447+7	1.5627+3	1.1752+2	8.7529+1	2.9991+1	2.4511–3
6.0000–4	1.5592–7	6.6053+6	3.7065–6	2.5216+8	1.1519+8	5.6318+7	8.0651+7	1.4724+3	1.0813+2	8.2525+1	2.5601+1	2.7227–3
8.0000–4	1.9780–7	5.2066+6	5.7030–6	1.9877+8	9.2948+7	4.5668+7	6.0147+7	1.3152+3	9.2622+1	7.2911+1	1.9708+1	3.1494–3
1.0000–3	2.3825–7	4.3226+6	8.0061–6	1.6502+8	7.8750+7	3.8565+7	4.7700+7	1.1791+3	8.1308+1	6.5297+1	1.6008+1	3.4084–3
K 1.0640–3	2.5086–7	4.1054+6	8.8086–6	1.5672+8	7.5190+7	3.6740+7	4.4793+7	1.1439+3	7.8213+1	6.3095+1	1.5115+1	3.4880–3
1.0912–3	2.5631–7	4.0180+6	9.1598–6	1.5339+8	7.3783+7	3.6014+7	4.3592+7	1.1288+3	7.6957+1	6.2210+1	1.4744+1	3.5125–3
1.1168–3	2.6140–7	3.9398+6	9.4942–6	1.5040+8	7.2519+7	3.5363+7	4.2521+7	1.1152+3	7.5832+1	6.1415+1	1.4414+1	3.5354–3
1.1647–3	2.7089–7	3.8018+6	1.0134–5	1.4514+8	7.0279+7	3.4211+7	4.0645+7	1.0910+3	7.3849+1	6.0011+1	1.3834+1	3.5782–3
1.2485–3	2.8732–7	3.5844+6	1.1294–5	1.3684+8	6.6724+7	3.2390+7	3.7720+7	1.0520+3	7.0726+1	5.7791+1	1.2931+1	3.6521–3
1.3114–3	2.9951–7	3.4385+6	1.2196–5	1.3126+8	6.4320+7	3.1163+7	3.5781+7	1.0253+3	6.8631+1	5.6296+1	1.2332+1	3.7069–3
1.4057–3	3.1760–7	3.2426+6	1.3599–5	1.2379+8	6.1069+7	2.9510+7	3.3208+7	9.8871+2	6.5822+1	5.4282+1	1.1536+1	3.7880–3
1.5000–3	3.3547–7	3.0699+6	1.5060–5	1.1719+8	5.8178+7	2.8046+7	3.0970+7	9.5568+2	6.3349+1	5.2501+1	1.0844+1	3.8676–3
1.6250–3	3.5942–7	2.8653+6	1.7086–5	1.0939+8	5.4731+7	2.6282+7	2.8372+7	9.1455+2	6.0040+1	5.0028+1	1.0009+1	3.9470–3
1.8125–3	3.9479–7	2.6087+6	2.0322–5	9.9587+7	5.0354+7	2.4056+7	2.5176+7	8.6127+2	5.5886+1	4.6901+1	8.9806+0	4.0644–3
2.0000–3	4.2954–7	2.3976+6	2.3784–5	9.1529+7	4.6710+7	2.2214+7	2.2604+7	8.1591+2	5.2469+1	4.4313+1	8.1525+0	4.1794–3
2.2500–3	4.7635–7	2.1620+6	2.8748–5	8.2534+7	4.2481+7	2.0142+7	1.9910+7	7.6139+2	4.8313+1	4.1055+1	7.2536+0	4.2838–3
2.6250–3	5.4524–7	1.8888+6	3.6927–5	7.2107+7	3.7520+7	1.7724+7	1.6862+7	6.9551+2	4.3474+1	3.7234+1	6.2361+0	4.4388–3
3.0000–3	6.1274–7	1.6808+6	4.5942–5	6.4164+7	3.3693+7	1.5868+7	1.4602+7	6.4306+2	3.9775+1	3.4289+1	5.4805+0	4.5902–3
4.0000–3	7.9371–7	1.2975+6	7.3742–5	4.9534+7	2.6450+7	1.2447+7	1.0636+7	5.3730+2	3.2419+1	2.8311+1	4.1027+0	4.8497–3
5.0000–3	9.7557–7	1.0557+6	1.0718–4	4.0300+7	2.1761+7	1.0294+7	8.2451+6	4.6471+2	2.7531+1	2.4279+1	3.2473+0	5.0274–3
6.0000–3	1.1555–6	8.9128+5	1.4600–4	3.4025+7	1.8499+7	8.8087+6	6.7174+6	4.1128+2	2.4067+1	2.1372+1	2.6903+0	5.1528–3
8.0000–3	1.5068–6	6.8350+5	2.3826–4	2.6093+7	1.4273+7	6.8833+6	4.9363+6	3.3785+2	1.9449+1	1.7415+1	2.0284+0	5.3160–3
1.0000–2	1.8518–6	5.5615+5	3.4996–4	2.1231+7	1.1657+7	5.6829+6	3.8911+6	2.8970+2	1.6446+1	1.4810+1	1.6308+0	5.4175–3
1.5000–2	2.6799–6	3.8430+5	7.0260–4	1.4671+7	8.0686+6	4.0173+6	2.5847+6	2.1960+2	1.2130+1	1.1002+1	1.1221+0	5.5277–3
2.0000–2	3.4761–6	2.9627+5	1.1609–3	1.1310+7	6.2204+6	3.1484+6	1.9412+6	1.8062+2	9.7738+0	8.9047+0	8.6353–1	5.5779–3
3.0000–2	5.0086–6	2.0562+5	2.3466–3	7.8496+6	4.3067+6	2.2469+6	1.2959+6	1.3512+2	7.2228+0	6.6210+0	5.9623–1	5.6187–3
4.0000–2	6.5049–6	1.5832+5	3.8828–3	6.0440+6	3.3044+6	1.7799+6	9.5954+5	1.0962+2	5.8447+0	5.3872+0	4.5193–1	5.6504–3
5.0000–2	7.9571–6	1.2943+5	5.7348–3	4.9409+6	2.6898+6	1.4931+6	7.5796+5	9.3432+1	4.9778+0	4.6088+0	3.6332–1	5.6804–3
6.0000–2	9.3681–6	1.0993+5	7.8761–3	4.1968+6	2.2830+6	1.2987+6	6.1499+5	8.2253+1	4.3753+0	4.0705+0	2.9907–1	5.7232–3
8.0000–2	1.2002–5	8.5805+4	1.2909–2	3.2757+6	1.7817+6	1.0515+6	4.4241+5	6.7856+1	3.5975+0	3.3717+0	2.2001–1	5.8259–3
9.0000–2	1.3211–5	7.7957+4	1.5796–2	2.9760+6	1.6195+6	9.6903+5	3.8748+5	6.2908+1	3.3333+0	3.1331+0	1.9432–1	5.8763–3
1.0000–1	1.4339–5	7.1822+4	1.8896–2	2.7418+6	1.4869+6	9.0080+5	3.5409+5	5.8789+1	3.1206+0	2.9356+0	1.7906–1	5.9357–3
1.5000–1	1.9218–5	5.3589+4	3.6856–2	2.0458+6	1.1051+6	6.9744+5	2.4320+5	4.6268+1	2.4724+0	2.3394+0	1.2679–1	6.2594–3
2.0000–1	2.3168–5	4.4453+4	5.8564–2	1.6970+6	9.1529+5	5.9533+5	1.8634+5	3.9908+1	2.1421+0	2.0362+0	9.9248–2	6.6496–3
3.0000–1	2.9164–5	3.5313+4	1.0924–1	1.3481+6	7.2651+5	4.9483+5	1.2674+5	3.3819+1	1.8138+0	1.7366+0	6.9570–2	7.5906–3
4.0000–1	3.3553–5	3.0693+4	1.6688–1	1.1717+6	6.2859+5	4.4670+5	9.6407+4	3.1065+1	1.6581+0	1.5954+0	5.4068–2	8.6749–3
5.0000–1	3.6733–5	2.8036+4	2.2876–1	1.0703+6	5.6926+5	4.1953+5	8.1482+4	2.9619+1	1.5748+0	1.5185+0	4.6498–2	9.8684–3
6.0000–1	3.9196–5	2.6275+4	2.9327–1	1.0031+6	5.2897+5	4.0270+5	7.1360+4	2.8882+1	1.5255+0	1.4730+0	4.1307–2	1.1179–2
8.0000–1	4.2728–5	2.4103+4	4.2643–1	9.2014+5	4.7590+5	3.8419+5	6.0025+4	2.8338+1	1.4788+0	1.4292+0	3.5548–2	1.4044–2
1.0000+0	4.5075–5	2.2848+4	5.6246–1	8.7223+5	4.4329+5	3.7508+5	5.3827+4	2.8333+1	1.4618+0	1.4122+0	3.2453–2	1.7146–2
1.5000+0	4.8339–5	2.1305+4	9.0297–1	8.1333+5	3.9795+5	3.6895+5	4.6406+4	2.9062+1	1.4750+0	1.4204+0	2.8742–2	2.5806–2
2.0000+0	5.0288–5	2.0479+4	1.2398+0	7.8181+5	3.7346+5	3.6606+5	4.2266+4	2.9829+1	1.4941+0	1.4318+0	2.6903–2	3.5365–2
3.0000+0	5.2059–5	1.9783+4	1.8969+0	7.5521+5	3.4894+5	3.6713+5	3.9109+4	3.1026+1	1.5498+0	1.4678+0	2.5491–2	5.6451–2
4.0000+0	5.2968–5	1.9443+4	2.5314+0	7.4226+5	3.3615+5	3.6874+5	3.7336+4	3.2108+1	1.6029+0	1.4982+0	2.4911–2	7.9724–2
5.0000+0	5.3464–5	1.9263+4	3.1455+0	7.3537+5	3.2874+5	3.7000+5	3.6594+4	3.2973+1	1.6541+0	1.5258+0	2.4595–2	1.0375–1
6.0000+0	5.3759–5	1.9157+4	3.7410+0	7.3133+5	3.2409+5	3.7105+5	3.6155+4	3.3639+1	1.7047+0	1.5514+0	2.4475–2	1.2886–1
8.0000+0	5.4127–5	1.9027+4	4.8864+0	7.2636+5	3.1858+5	3.7237+5	3.5370+4	3.4625+1	1.7882+0	1.5826+0	2.4289–2	1.8130–1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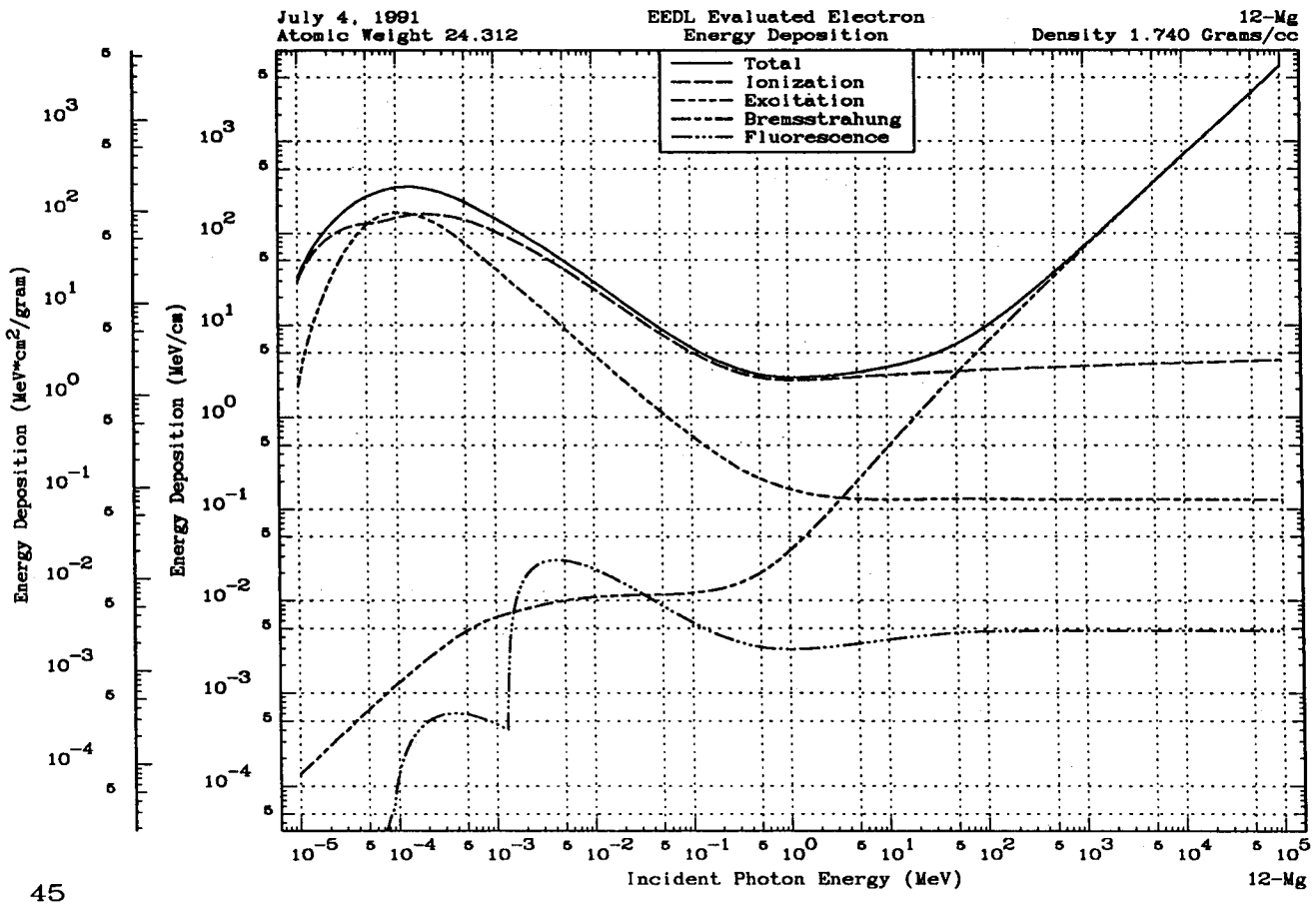
EEDL Evaluated Electron
Cross Sections
12-Mg
Density 1.740 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
12-Mg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Fluorescence
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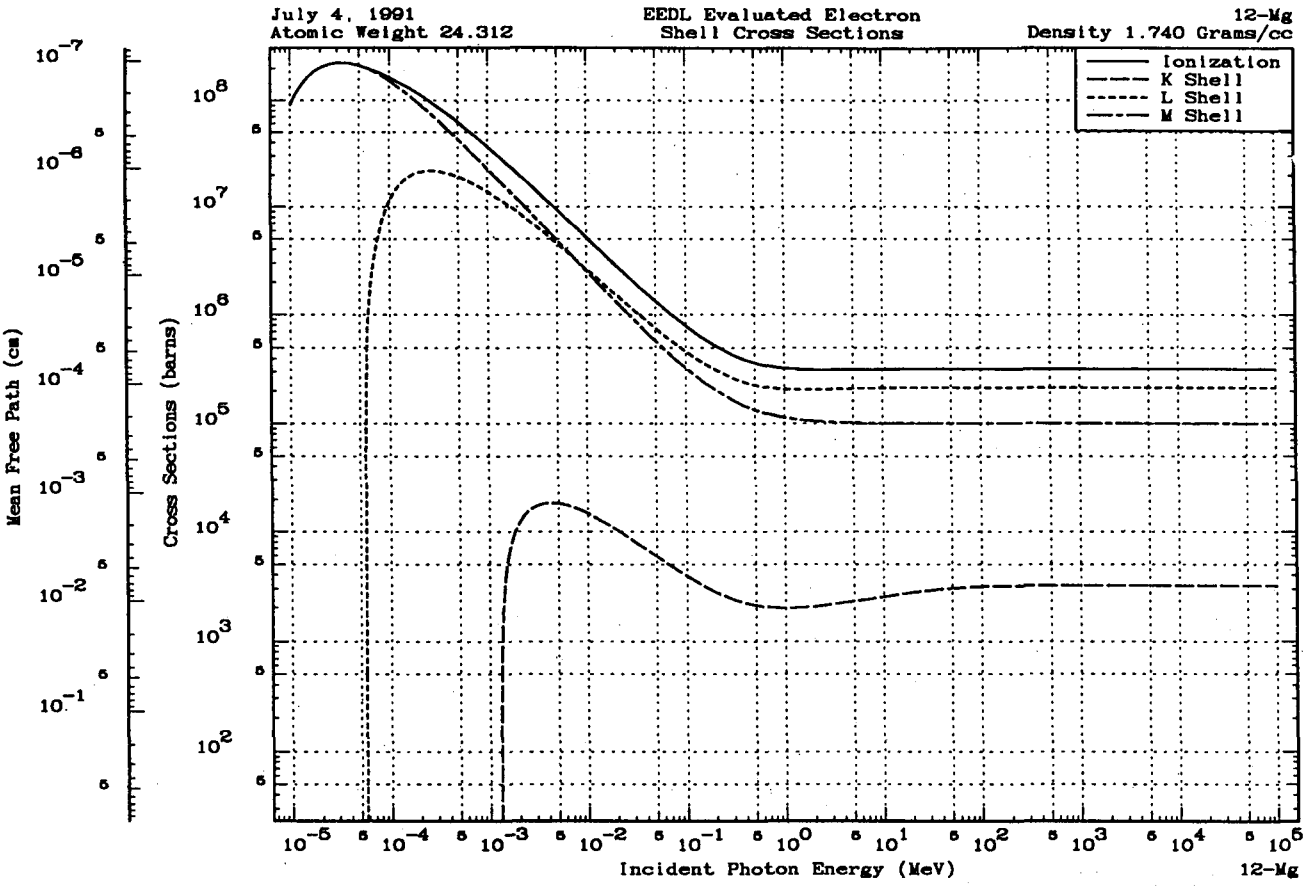
July 4, 1991
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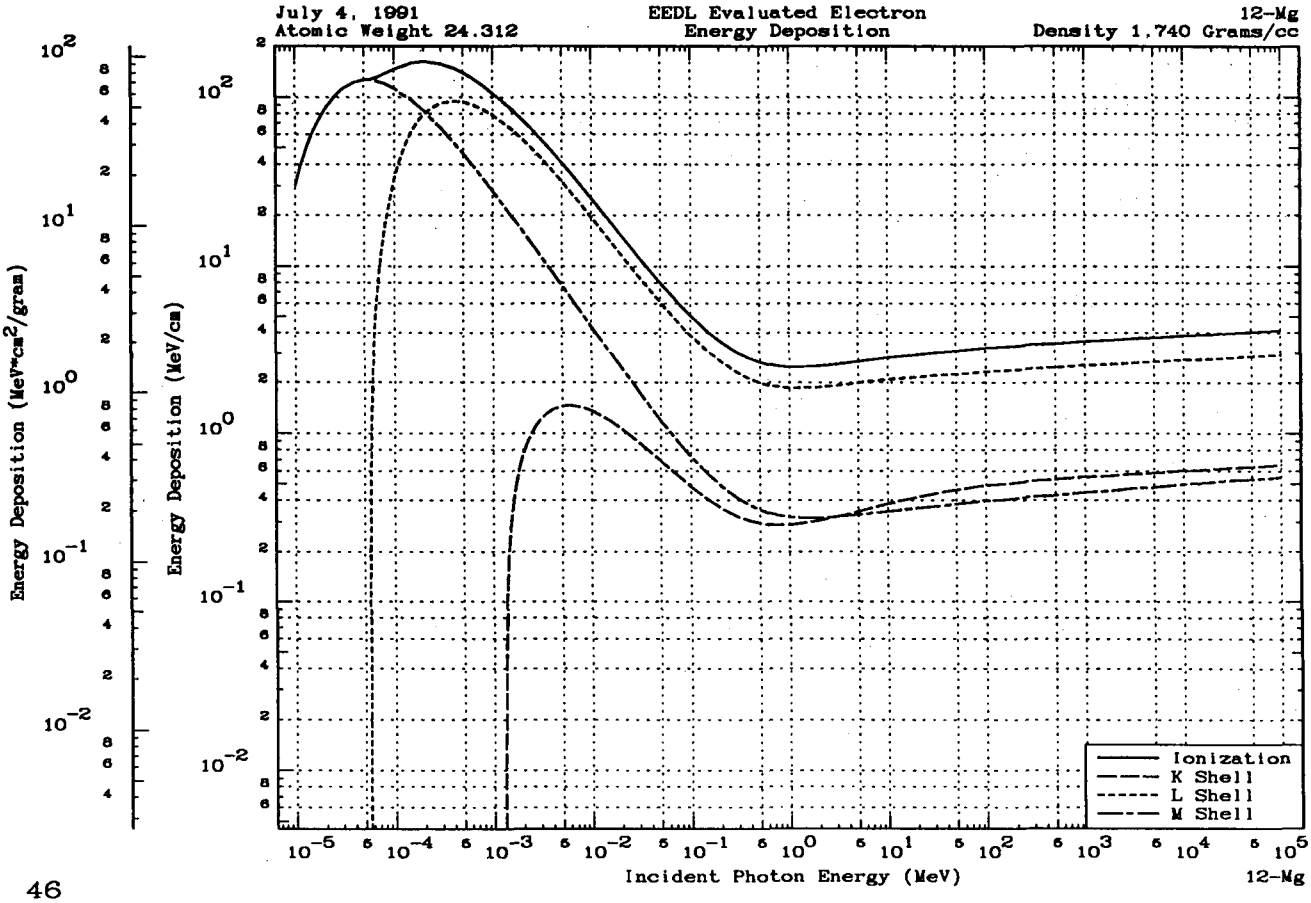
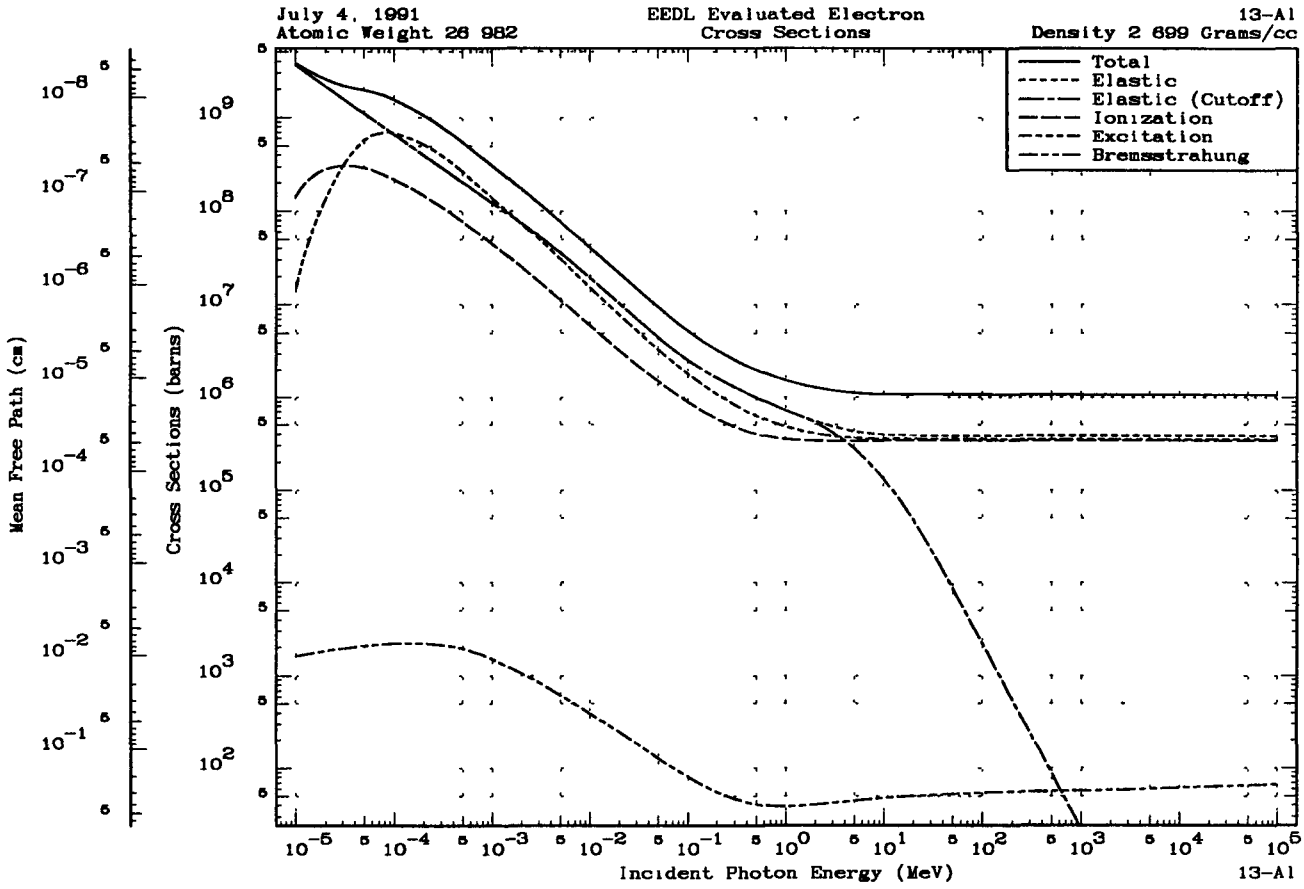
EEDL Evaluated Electron
Shell Cross Sections
12-Mg
Density 1.740 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
12-Mg

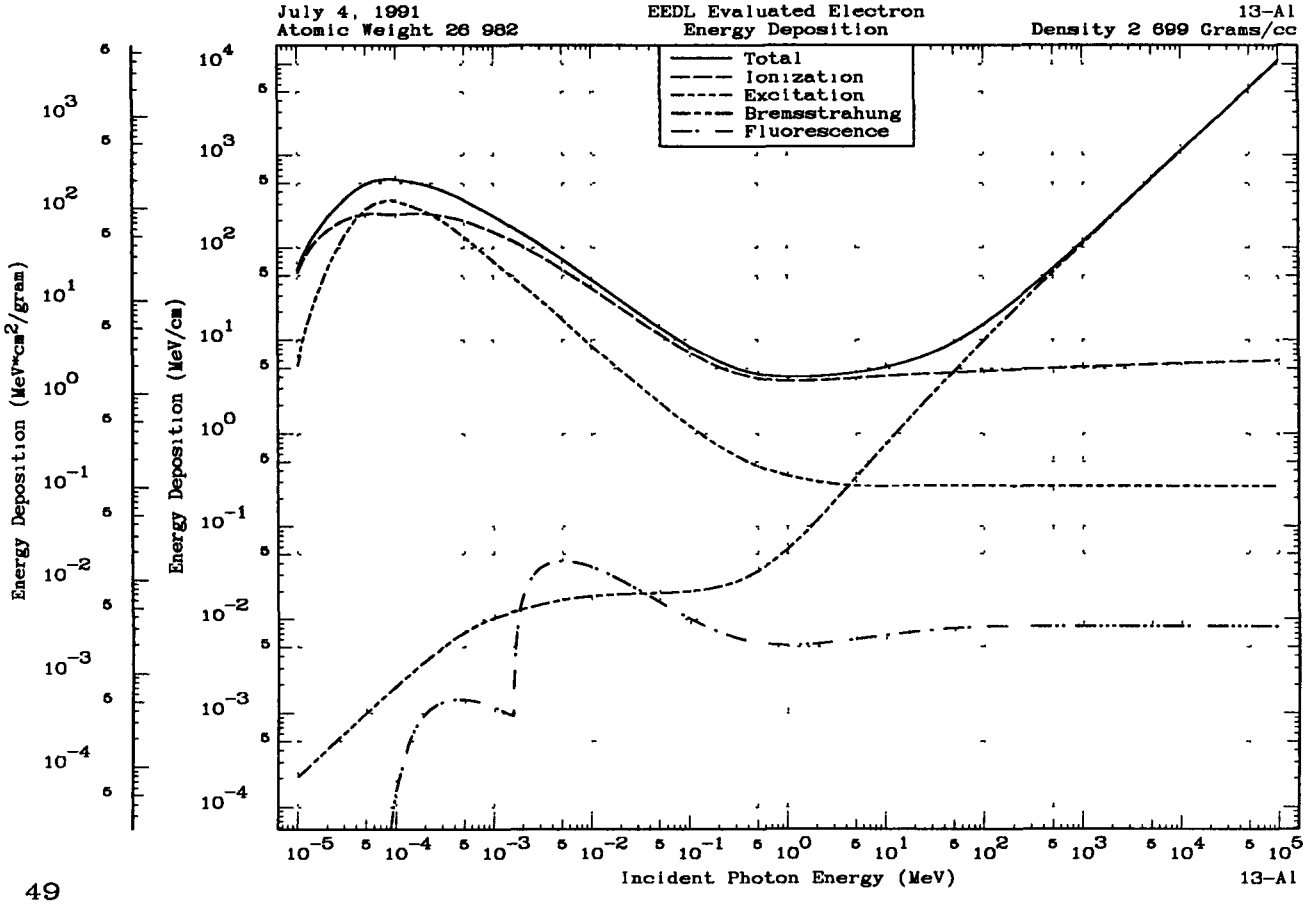

July 4, 1991
Atomic Weight 24.312
EEDL Evaluated Electron
Energy Deposition
12-Mg
Density 1.740 Grams/cc
Ionization
K Shell
L Shell
M Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
12-Mg

Atomic Weight 24.312 Density 1.740 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	7.1778–9	8.0068+7		3.2324+9	3.1360+9	9.0010+7	6.4208+6	1.4755+3	3.1904+1	2.9799+1	2.1054+0	1.3689–4
1.1250–5	7.7451–9	7.4203+7		2.9957+9	2.8700+9	1.1395+8	1.1702+7	1.5084+3	4.3234+1	3.9229+1	4.0053+0	1.5301–4
1.3125–5	8.5334–9	6.7349+7		2.7189+9	2.5557+9	1.4204+8	2.1251+7	1.5525+3	5.9330+1	5.1712+1	7.6169+0	1.7767–4
1.5000–5	9.2564–9	6.2088+7		2.5066+9	2.3113+9	1.6407+8	3.1146+7	1.5918+3	7.4453+1	6.2787+1	1.1666+1	2.0286–4
1.7500–5	1.0144–8	5.6655+7		2.2872+9	2.0582+9	1.8547+8	4.3549+7	1.6384+3	9.3477+1	7.5179+1	1.8298+1	2.3720–4
2.0000–5	1.0961–8	5.2434+7		2.1168+9	1.8614+9	2.0015+8	5.5267+7	1.6799+3	1.1140+2	8.5663+1	2.5742+1	2.7232–4
2.5000–5	1.2425–8	4.6254+7		1.8673+9	1.5737+9	2.1680+8	7.6838+7	1.7369+3	1.4384+2	1.0134+2	4.2498+1	3.3645–4
3.0000–5	1.3683–8	4.2001+7		1.6956+9	1.3719+9	2.2313+8	1.0058+8	1.7849+3	1.7301+2	1.1190+2	6.1112+1	4.0215–4
4.0000–5	1.5828–8	3.6310+7		1.4659+9	1.1053+9	2.2045+8	1.4015+8	1.8613+3	2.1777+2	1.2289+2	9.4885+1	5.3612–4
5.0000–5	1.7672–8	3.2521+7		1.3129+9	9.3471+8	2.1015+8	1.6806+8	1.9080+3	2.4800+2	1.2664+2	1.2136+2	6.6235–4
L3 5.6240–5	1.8723–8	3.0695+7		1.2392+9	8.5569+8	2.0190+8	1.8160+8	1.9292+3	2.6133+2	1.2640+2	1.3493+2	7.3905–4
L2 5.6550–5	1.8771–8	3.0616+7		1.2360+9	8.5217+8	2.0158+8	1.8226+8	1.9302+3	2.6214+2	1.2653+2	1.3561+2	7.4287–4
5.8120–5	1.9030–8	3.0200+7		1.2192+9	8.3482+8	2.0011+8	1.8426+8	1.9352+3	2.6551+2	1.2752+2	1.3800+2	7.6229–4
5.8275–5	1.9056–8	3.0159+7		1.2176+9	8.3315+8	1.9996+8	1.8445+8	1.9357+3	2.6583+2	1.2760+2	1.3823+2	7.6421–4
6.0000–5	1.9333–8	2.9728+7		1.2001+9	8.1509+8	1.9844+8	1.8661+8	1.9410+3	2.6961+2	1.2875+2	1.4085+2	7.8559–4
6.5000–5	2.0136–8	2.8541+7		1.1522+9	7.6758+8	1.9259+8	1.9206+8	1.9557+3	2.7742+2	1.3035+2	1.4707+2	8.4784–4
7.2500–5	2.1243–8	2.7055+7		1.0922+9	7.0720+8	1.8528+8	1.9975+8	1.9760+3	2.9000+2	1.3375+2	1.5625+2	9.4194–4
8.0000–5	2.2361–8	2.5702+7		1.0376+9	6.5685+8	1.7925+8	2.0152+8	1.9944+3	2.9890+2	1.3795+2	1.6095+2	1.0368–3
L1 8.9460–5	2.3687–8	2.4263+7		9.7951+8	6.0418+8	1.7103+8	2.0430+8	2.0149+3	3.0733+2	1.4134+2	1.6599+2	1.1571–3
9.0778–5	2.3875–8	2.4072+7		9.7181+8	5.9761+8	1.7001+8	2.0419+8	2.0154+3	3.0818+2	1.4188+2	1.6630+2	1.1716–3
9.3083–5	2.4199–8	2.3750+7		9.5881+8	5.8651+8	1.6829+8	2.0401+8	2.0162+3	3.0973+2	1.4290+2	1.6683+2	1.1971–3
9.6542–5	2.4673–8	2.3293+7		9.4037+8	5.7072+8	1.6589+8	2.0375+8	2.0173+3	3.1226+2	1.4462+2	1.6764+2	1.2353–3
1.0000–4	2.5135–8	2.2865+7	0.0000+0	9.2310+8	5.5590+8	1.6370+8	2.0350+8	2.0184+3	3.1501+2	1.4656+2	1.6845+2	1.2735–3
1.0625–4	2.6032–8	2.2077+7	1.9821–8	8.9128+8	5.3126+8	1.5894+8	2.0107+8	2.0203+3	3.1564+2	1.4803+2	1.6761+2	1.3426–3
1.1250–4	2.6897–8	2.1367+7	3.9583–8	8.6260+8	5.0903+8	1.5476+8	1.9881+8	2.0221+3	3.1687+2	1.4998+2	1.6688+2	1.4118–3
1.1719–4	2.7534–8	2.0873+7	5.4366–8	8.4265+8	4.9372+8	1.5171+8	1.9721+8	2.0234+3	3.1741+2	1.5102+2	1.6640+2	1.4637–3
1.3125–4	2.9357–8	1.9577+7	9.8472–8	7.9033+8	4.5360+8	1.4389+8	1.9284+8	2.0269+3	3.2023+2	1.5500+2	1.6523+2	1.6195–3
1.3359–4	2.9674–8	1.9368+7	1.0579–7	7.8189+8	4.4764+8	1.4267+8	1.9158+8	2.0275+3	3.2010+2	1.5554+2	1.6456+2	1.6455–3
1.5000–4	3.1820–8	1.8061+7	1.5703–7	7.2916+8	4.1050+8	1.3513+8	1.8352+8	2.0312+3	3.2024+2	1.5979+2	1.6044+2	1.8277–3
1.7500–4	3.5111–8	1.6369+7	2.3593–7	6.6082+8	3.6580+8	1.2410+8	1.7092+8	2.0248+3	3.1357+2	1.6149+2	1.5208+2	2.0902–3
2.0000–4	3.8229–8	1.5033+7	3.1633–7	6.0691+8	3.3104+8	1.1518+8	1.6070+8	2.0193+3	3.0830+2	1.6282+2	1.4548+2	2.3519–3
2.2500–4	4.1455–8	1.3864+7	3.9880–7	5.5969+8	3.0318+8	1.0699+8	1.4952+8	1.9921+3	2.9805+2	1.6107+2	1.3698+2	2.5746–3
2.5000–4	4.4555–8	1.2899+7	4.8381–7	5.2074+8	2.8025+8	1.0031+8	1.4018+8	1.9680+3	2.9016+2	1.6023+2	1.2993+2	2.7949–3
2.6250–4	4.6078–8	1.2473+7	5.2717–7	5.0353+8	2.7023+8	9.7250+7	1.3605+8	1.9570+3	2.8630+2	1.5945+2	1.2685+2	2.9042–3
3.0000–4	5.0754–8	1.1323+7	6.6088–7	4.5714+8	2.4459+8	8.9423+7	1.2312+8	1.9270+3	2.7469+2	1.5790+2	1.1679+2	3.2290–3
3.5000–4	5.6957–8	1.0090+7	8.4894–7	4.0735+8	2.1812+8	8.0457+7	1.0878+8	1.8869+3	2.5727+2	1.5271+2	1.0456+2	3.6408–3
4.0000–4	6.2922–8	9.1337+6	1.0484–6	3.6874+8	1.9751+8	7.3517+7	9.7706+7	1.8528+3	2.4423+2	1.4907+2	9.5152+1	4.0454–3
5.0000–4	7.5279–8	7.6344+6	1.4808–6	3.0821+8	1.6735+8	6.2692+7	7.8169+7	1.7487+3	2.1876+2	1.4025+2	7.8507+1	4.6790–3
6.0000–4	8.7245–8	6.5873+6	1.9605–6	2.6594+8	1.4615+8	5.4781+7	6.5005+7	1.6521+3	1.9847+2	1.3187+2	6.6594+1	5.2150–3
8.0000–4	1.1001–7	5.2240+6	3.0507–6	2.1090+8	1.1808+8	4.3967+7	4.8853+7	1.4827+3	1.6924+2	1.1762+2	5.1608+1	6.0656–3
1.0000–3	1.3188–7	4.3578+6	4.3122–6	1.7593+8	1.0012+8	3.6875+7	3.8931+7	1.3341+3	1.4830+2	1.0620+2	4.2095+1	6.5871–3
K 1.2945–3	1.6288–7	3.5284+6	6.4631–6	1.4245+8	8.2679+7	2.9927+7	2.9839+7	1.1738+3	1.2613+2	9.3012+1	3.3107+1	7.1833–3
1.3202–3	1.6552–7	3.4721+6	6.6681–6	1.4017+8	8.1480+7	2.9448+7	2.9245+7	1.1620+3	1.2456+2	9.2045+1	3.2510+1	7.2250–3
1.3651–3	1.7011–7	3.3784+6	7.0328–6	1.3639+8	7.9477+7	2.8650+7	2.8261+7	1.1421+3	1.2196+2	9.0435+1	3.1520+1	7.2976–3
1.4326–3	1.7695–7	3.2479+6	7.5940–6	1.3112+8	7.6678+7	2.7541+7	2.6902+7	1.1141+3	1.1836+2	8.8195+1	3.0154+1	7.4056–3
1.5000–3	1.8372–7	3.1282+6	8.1718–6	1.2629+8	7.4100+7	2.6523+7	2.5666+7	1.0881+3	1.1506+2	8.6142+1	2.8911+1	7.5125–3
1.6250–3	1.9618–7	2.9295+6	9.2871–6	1.1827+8	6.9749+7	2.4805+7	2.3714+7	1.0428+3	1.0915+2	8.2241+1	2.6903+1	7.6812–3
1.8125–3	2.1452–7	2.6790+6	1.1066–5	1.0816+8	6.4222+7	2.2644+7	2.1288+7	9.8414+2	1.0173+2	7.7316+1	2.4409+1	7.9299–3
2.0000–3	2.3250–7	2.4719+6	1.2967–5	9.9794+7	5.9616+7	2.0862+7	1.9315+7	9.3407+2	9.5632+1	7.3244+1	2.2380+1	8.1727–3
2.2500–3	2.5684–7	2.2377+6	1.5689–5	9.0336+7	5.4294+7	1.8866+7	1.7176+7	8.7311+2	8.8116+1	6.8013+1	2.0095+1	8.3913–3
2.6250–3	2.9253–7	1.9646+6	2.0171–5	7.9315+7	4.8039+7	1.6545+7	1.4730+7	7.9930+2	7.9372+1	6.1882+1	1.7482+1	8.7144–3
3.0000–3	3.2737–7	1.7555+6	2.5107–5	7.0873+7	4.3207+7	1.4770+7	1.2895+7	7.4043+2	7.2693+1	5.7162+1	1.5522+1	9.0290–3
3.5000–3	3.7468–7	1.5339+6	3.2372–5	6.1923+7	3.8011+7	1.2928+7	1.0984+7	6.7400+2	6.5076+1	5.1672+1	1.3396+1	9.3115–3
4.0000–3	4.2109–7	1.3648+6	4.0421–5	5.5099+7	3.4018+7	1.1521+7	9.5593+6	6.2128+2	5.9263+1	4.7445+1	1.1809+1	9.5904–3
5.0000–3	5.1511–7	1.1157+6	5.8705–5	4.5042+7	2.8012+7	9.4892+6	7.5399+6	5.3889+2	5.0363+1	4.0853+1	9.4993+0	9.9774–3
6.0000–3	6.0838–7	9.4466+5	7.9919–5	3.8137+7	2.3822+7	8.0945+6	6.2199+6	4.7803+2	4.4054+1	3.6083+1	7.9602+0	1.0253–2
8.0000–3	7.9105–7	7.2652+5	1.3034–4	2.9330+7	1.8432+7	6.2949+6	4.6031+6	3.9418+2	3.5580+1	2.9536+1	6.0340+0	1.0644–2
1.0000–2	9.6922–7	5.9296+5	1.9140–4	2.3939+7	1.5106+7	5.1789+6	3.6539+6	3.3884+2	3.0078+1	2.5190+1	4.8776+0	1.0883–2
1.5000–2	1.4004–6	4.1041+5	3.8444–4	1.6568+7	1.0522+7	3.6384+6	2.4077+6	2.5764+2	2.2131+1	1.8801+1	3.3185+0	1.1155–2
2.0000–2	1.8188–6	3.1598+5	6.3578–4	1.2756+7	8.1127+6	2.8397+6	1.8037+6	2.1212+2	1.7812+1	1.5260+1	2.5410+0	1.1299–2
3.0000–2	2.6251–6	2.1893+5	1.2867–3	8.8384+6	5.6154+6	2.0149+6	1.2080+6	1.5791+2	1.3149+1	1.1384+1	1.7538+0	1.1399–2
4.0000–2	3.3923–6	1.6942+5	2.1299–3	6.8396+6	4.3301+6	1.5900+6	9.1935+5	1.2774+2	1.0657+1	9.2826+0	1.3624+0	1.1478–2
5.0000–2	4.1239–6	1.3936+5	3.1448–3	5.6262+6	3.5466+6	1.3299+6	7.4945+5	1.0882+2	9.0924+0	7.9528+0	1.1280+0	1.1560–2
6.0000–2	4.8241–6	1.1913+5	4.3158–3	4.8096+6	3.0212+6	1.1540+6	6.3428+5	9.6066+1	8.0098+0	7.0315+0	9.6665–1	1.1631–2
8.0000–2	6.1338–6	9.3696+4	7.0612–3	3.7826+6	2.3626+6	9.3105+5	4.8891+5	7.9752+1	6.6053+0	5.8336+0	7.5986–1	1.1819–2
1.0000–1	7.3281–6	7.8426+4	1.0309–2	3.1661+6	1.9687+6	7.9548+5	4.0188+5	6.9431+1	5.7318+0	5.0860+0	6.3375–1	1.2053–2
1.5000–1	9.8824–6	5.8155+4	2.0093–2	2.3478+6	1.4492+6	6.1289+5	2.8569+5	5.4708+1	4.5355+0	4.0603+0	4.6255–1	1.2706–2
2.0000–1	1.1978–5	4.7979+4	3.1934–2	1.9370+6	1.1890+6	5.2142+5	2.2644+5	4.7139+1	3.9244+0	3.5375+0	3.7346–1	1.3484–2
3.0000–1	1.5197–5	3.7818+4	5.9601–2	1.5267+6	9.2769+5	4.3134+5	1.6766+5	3.9869+1	3.3213+0	3.0221+0	2.8376–1	1.5361–2
4.0000–1	1.7564–5	3.2720+4	9.1069–2	1.3210+6	7.9291+5	3.8811+5	1.3990+5	3.6626+1	3.0385+0	2.7797+0	2.4127–1	1.7536–2
5.0000–1	1.9376–5	2.9662+4	1.2484–1	1.1975+6	7.1004+5	3.6361+5	1.2378+5	3.4924+1	2.8852+0	2.6486+0	2.1673–1	1.9922–2
6.0000–1	2.0814–5	2.7612+4	1.6007–1	1.1147+6	6.5347+5	3.4831+5	1.1291+5	3.4052+1	2.7925+0	2.5698+0	2.0020–1	2.2542–2
8.0000–1	2.2981–5	2.5008+4	2.3288–1	1.0096+6	5.7976+5	3.3122+5	9.8574+4	3.3398+1	2.7018+0	2.4951+0	1.7838–1	2.8291–2
1.0000+0	2.4499–5	2.3459+4	3.0737–1	9.4705+5	5.3404+5	3.2264+5	9.0335+4	3.3343+1	2.6680+0	2.4674+0	1.6614–1	3.4499–2
1.5000+0	2.6833–5	2.1418+4	4.9419–1	8.6468+5	4.6966+5	3.1584+5	7.9149+4	3.4083+1	2.6847+0	2.4836+0	1.4925–1	5.1857–2
2.0000+0	2.8250–5	2.0344+4	6.7928–1	8.2130+5	4.3490+5	3.1324+5	7.3122+4	3.4899+1	2.7183+0	2.5059+0	1.4139–1	7.0986–2
3.0000+0	2.9720–5	1.9338+4	1.0406+0	7.8069+5	3.9984+5	3.1295+5	6.7856+4	3.6201+1	2.8176+0	2.5709+0	1.3373–1	1.1303–1
4.0000+0	3.0522–5	1.8830+4	1.3895+0	7.6018+5	3.8137+5	3.1402+5	6.4745+4	3.7363+1	2.9147+0	2.6253+0	1.3001–1	1.5937–1
5.0000+0	3.0984–5	1.8548+4	1.7271+0	7.4882+5	3.7090+5	3.1487+5	6.3016+4	3.8290+1	3.0108+0	2.6748+0	1.2888–1	2.0711–1
6.0000+0	3.1262–5	1.8384+4	2.0541+0	7.4218+5	3.6436+5	3.1557+5	6.2207+4	3.9011+1	3.1057+0	2.7208+0	1.2797–1	2.5697–1

Atomic Weight 24.312												Density 1.740 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+0	3.1604–5	1.8185+4	2.6822+0	7.3413+5	3.5680+5	3.1648+5	6.0809+4	4.0093+1	3.2634+0	2.7758+0	1.2655–1	3.6108–1
1.0000+1	3.1763–5	1.8094+4	3.2808+0	7.3046+5	3.5330+5	3.1719+5	5.9929+4	4.0894+1	3.4209+0	2.8260+0	1.2615–1	4.6874–1
1.5000+1	3.1840–5	1.8050+4	4.6732+0	7.2871+5	3.5079+5	3.1779+5	6.0079+4	4.2206+1	3.7664+0	2.8891+0	1.2702–1	7.5026–1
2.0000+1	3.1881–5	1.8027+4	5.9429+0	7.2775+5	3.4937+5	3.1823+5	6.0109+4	4.3108+1	4.1143+0	2.9451+0	1.2763–1	1.0416+0
3.0000+1	3.1895–5	1.8019+4	8.1923+0	7.2745+5	3.4840+5	3.1878+5	6.0233+4	4.4292+1	4.7946+0	3.0213+0	1.2899–1	1.6443+0
4.0000+1	3.1914–5	1.8008+4	1.0146+1	7.2702+5	3.4837+5	3.1893+5	5.9671+4	4.5081+1	5.4583+0	3.0620+0	1.2887–1	2.2675+0
5.0000+1	3.1915–5	1.8008+4	1.1874+1	7.2699+5	3.4836+5	3.1902+5	5.9566+4	4.5649+1	6.1233+0	3.0957+0	1.2875–1	2.8989+0
6.0000+1	3.1909–5	1.8011+4	1.3424+1	7.2712+5	3.4835+5	3.1909+5	5.9634+4	4.6075+1	6.7929+0	3.1283+0	1.2900–1	3.5357+0
8.0000+1	3.1908–5	1.8012+4	1.6111+1	7.2715+5	3.4834+5	3.1919+5	5.9572+4	4.6695+1	8.1378+0	3.1766+0	1.2907–1	4.8322+0
1.0000+2	3.1912–5	1.8009+4	1.8383+1	7.2705+5	3.4833+5	3.1925+5	5.9425+4	4.7137+1	9.4983+0	3.2195+0	1.2895–1	6.1499+0
1.5000+2	3.1922–5	1.8004+4	2.2887+1	7.2684+5	3.4831+5	3.1928+5	5.9203+4	4.7929+1	1.2876+1	3.2585+0	1.2848–1	9.4891+0
2.0000+2	3.1931–5	1.7999+4	2.6331+1	7.2662+5	3.4829+5	3.1930+5	5.8981+4	4.8415+1	1.6291+1	3.2968+0	1.2801–1	1.2866+1
3.0000+2	3.1941–5	1.7993+4	3.1458+1	7.2640+5	3.4827+5	3.1933+5	5.8756+4	4.8690+1	2.3116+1	3.3721+0	1.2755–1	1.9616+1
4.0000+2	3.1947–5	1.7989+4	3.5250+1	7.2625+5	3.4826+5	3.1933+5	5.8616+4	4.8788+1	2.9920+1	3.3957+0	1.2727–1	2.6397+1
5.0000+2	3.1957–5	1.7984+4	3.8261+1	7.2604+5	3.4824+5	3.1933+5	5.8417+4	4.8847+1	3.6735+1	3.4193+0	1.2686–1	3.3189+1
6.0000+2	3.1957–5	1.7984+4	4.0759+1	7.2603+5	3.4824+5	3.1933+5	5.8416+4	4.8966+1	4.3516+1	3.4428+0	1.2688–i	3.9946+1
8.0000+2	3.1959–5	1.7983+4	4.4759+1	7.2598+5	3.4822+5	3.1934+5	5.8377+4	4.9209+1	5.7116+1	3.4898+0	1.2684–1	5.3499+1
1.0000+3	3.1961–5	1.7982+4	4.7898+1	7.2593+5	3.4821+5	3.1934+5	5.8340+4	4.9459+1	7.0775+1	3.5325+0	1.2681–1	6.7115+1
1.5000+3	3.1962–5	1.7981+4	5.3663+1	7.2592+5	3.4819+5	3.1934+5	5.8344+4	4.9983+1	1.0492+2	3.5660+0	1.2681–1	1.0122+2
2.0000+3	3.1963–5	1.7980+4	5.7786+1	7.2589+5	3.4818+5	3.1934+5	5.8324+4	5.0393+1	1.3926+2	3.5994+0	1.2677–1	1.3553+2
3.0000+3	3.1963–5	1.7980+4	6.3628+1	7.2589+5	3.4815+5	3.1934+5	5.8347+4	5.1003+1	2.0762+2	3.6662+0	1.2682–1	2.0382+2
4.0000+3	3.1964–5	1.7980+4	6.7790+1	7.2587+5	3.4814+5	3.1934+5	5.8337+4	5.1482+1	2.7624+2	3.7080+0	1.2680–1	2.7240+2
5.0000+3	3.1970–5	1.7977+4	7.1021+1	7.2574+5	3.4813+5	3.1934+5	5.8224+4	5.1864+1	3.4532+2	3.7294+0	1.2656–1	3.4147+2
6.0000+3	3.1968–5	1.7978+4	7.3665+1	7.2579+5	3.4812+5	3.1934+5	5.8277+4	5.2205+1	4.1320+2	3.7508+0	1.2667–1	4.0932+2
8.0000+3	3.1967–5	1.7978+4	7.7845+1	7.2580+5	3.4811+5	3.1934+5	5.8306+4	5.2748+1	5.5008+2	3.7937+0	1.2674–1	5.4616+2
1.0000+4	3.1967–5	1.7978+4	8.1089+1	7.2581+5	3.4810+5	3.1934+5	5.8324+4	5.3174+1	6.8817+2	3.8365+0	1.2677–1	6.8421+2
1.5000+4	3.1966–5	1.7979+4	8.7000+1	7.2583+5	3.4808+5	3.1934+5	5.8359+4	5.4033+1	1.0262+3	3.8689+0	1.2685–1	1.0222+3
2.0000+4	3.1967–5	1.7978+4	9.1204+1	7.2580+5	3.4806+5	3.1934+5	5.8352+4	5.4650+1	1.3687+3	3.9013+0	1.2684–1	1.3647+3
3.0000+4	3.1966–5	1.7979+4	9.7138+1	7.2582+5	3.4804+5	3.1934+5	5.8381+4	5.5519+1	2.0468+3	3.9661+0	1.2690–1	2.0427+3
4.0000+4	3.1967–5	1.7978+4	1.0135+2	7.2579+5	3.4803+5	3.1934+5	5.8373+4	5.6142+1	2.7322+3	4.0143+0	1.2688–1	2.7281+3
5.0000+4	3.1973–5	1.7975+4	1.0462+2	7.2567+5	3.4801+5	3.1934+5	5.8264+4	5.6621+1	3.4113+3	4.0352+0	1.2665–1	3.4071+3
6.0000+4	3.1971–5	1.7976+4	1.0729+2	7.2572+5	3.4801+5	3.1934+5	5.8322+4	5.7012+1	4.0898+3	4.0562+0	1.2677–1	4.0856+3
8.0000+4	3.1970–5	1.7977+4	1.1151+2	7.2574+5	3.4799+5	3.1934+5	5.8355+4	5.7635+1	5.4586+3	4.0981+0	1.2684–1	5.4544+3
1.0000+5	3.1970–5	1.7977+4	1.1478+2	7.2574+5	3.4798+5	3.1934+5	5.8365+4	5.8118+1	6.8299+3	4.1401+0	1.2687–1	6.8256+3


July 4, 1991
Atomic Weight 26 982
EEDL Evaluated Electron
Cross Sections
13-Al
Density 2 699 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
13-Al


July 4, 1991
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EEDL Evaluated Electron
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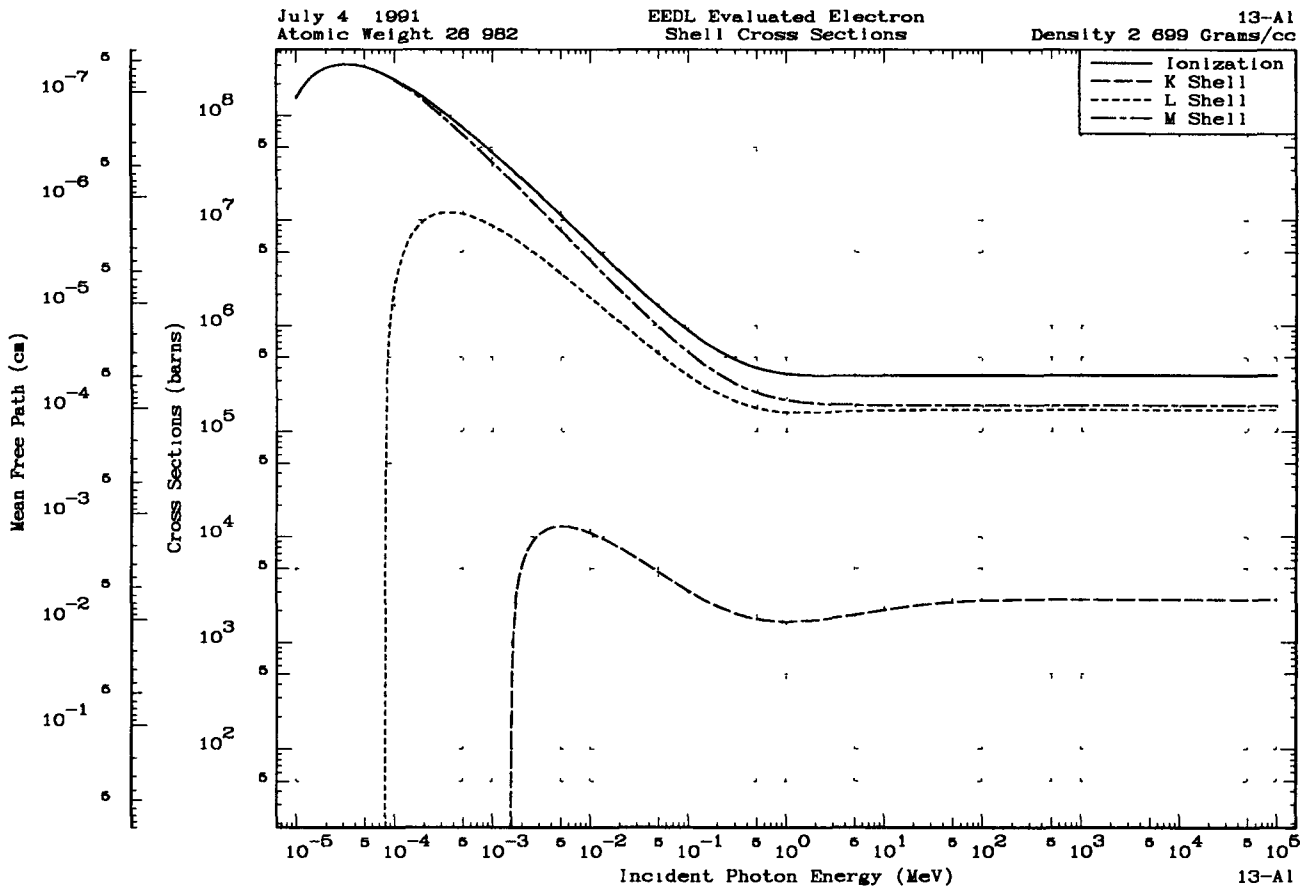
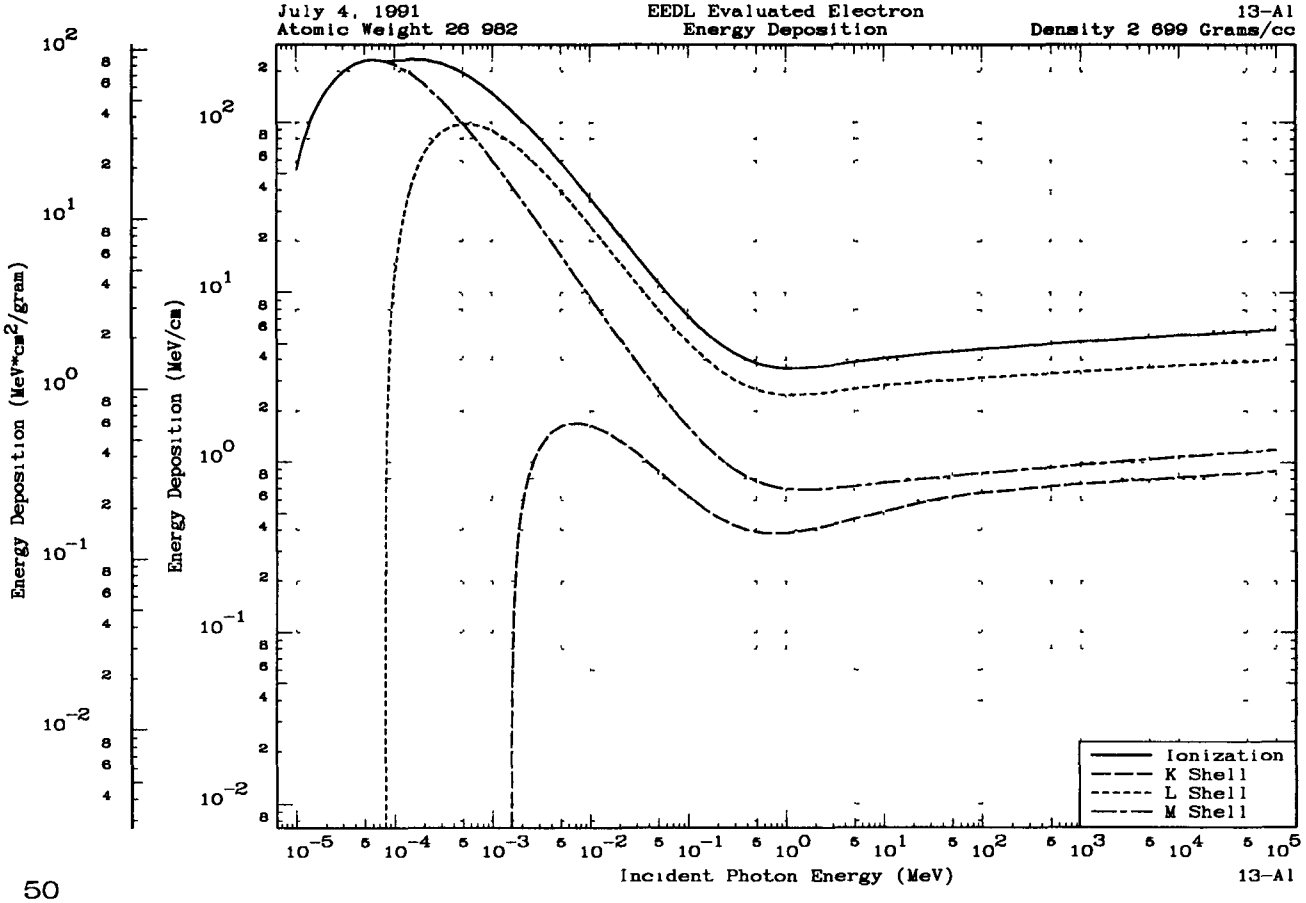
13-Al
Density 2 699 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
13-Al


July 4 1991
Atomic Weight 26 982
EEDL Evaluated Electron
Shell Cross Sections
13-Al
Density 2 699 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
13-Al


July 4, 1991
Atomic Weight 26 982
EEDL Evaluated Electron
Energy Deposition
13-Al
Density 2 699 Grams/cc
Ionization
K Shell
L Shell
M Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
13-Al

Atomic Weight 26.982 Density 2.699 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.3855–9	8.4488+7		3.7854+9	3.6259+9	1.4463+8	1.4893+7	1.6101+3	5.8626+1	5.3296+1	5.3296+0	2.0879–4
M1	1.0160–5	4.4311–9	8.3618+7		3.7464+9	3.5835+9	1.4701+8	1.5868+7	1.6149+3	6.0189+1	5.4481+1	5.7079+0	2.1192–4
	1.0311–5	4.4714–9	8.2865+7		3.7127+9	3.5446+9	1.5099+8	1.7088+7	1.6193+3	6.2830+1	5.6661+1	6.1695+0	2.1488–4
	1.0604–5	4.5479–9	8.1470+7		3.6502+9	3.4720+9	1.5854+8	1.9658+7	1.6279+3	6.7987+1	6.0838+1	7.1489+0	2.2063–4
	1.0879–5	4.6185–9	8.0226+7		3.5944+9	3.4069+9	1.6550+8	2.2051+7	1.6357+3	7.2803+1	6.4731+1	8.0728+0	2.2606–4
	1.1250–5	4.7115–9	7.8642+7		3.5235+9	3.3234+9	1.7437+8	2.5629+7	1.6461+3	7.9213+1	6.9745+1	9.4676+0	2.3341–4
	1.1394–5	4.7474–9	7.8048+7		3.4968+9	3.2923+9	1.7765+8	2.6861+7	1.6500+3	8.1686+1	7.1729+1	9.9571+0	2.3627–4
	1.2296–5	4.9654–9	7.4621+7		3.3433+9	3.1121+9	1.9565+8	3.5572+7	1.6737+3	9.6323+1	8.2851+1	1.3471+1	2.5430–4
	1.2476–5	5.0076–9	7.3992+7		3.3151+9	3.0787+9	1.9886+8	3.7535+7	1.6783+3	9.9153+1	8.4877+1	1.4275+1	2.5793–4
	1.3125–5	5.1553–9	7.1873+7		3.2202+9	2.9654+9	2.1075+8	4.3992+7	1.6944+3	1.0953+2	9.2547+1	1.6985+1	2.7106–4
	1.3648–5	5.2703–9	7.0303+7		3.1499+9	2.8810+9	2.1913+8	4.9714+7	1.7068+3	1.1782+2	9.8391+1	1.9425+1	2.8171–4
	1.3738–5	5.2900–9	7.0041+7		3.1381+9	2.8670+9	2.2036+8	5.0749+7	1.7089+3	1.1914+2	9.9269+1	1.9870+1	2.8355–4
	1.5000–5	5.5544–9	6.6707+7		2.9887+9	2.6866+9	2.3792+8	6.4208+7	1.7374+3	1.3801+2	1.1215+2	2.5861+1	3.0952–4
	1.7500–5	6.0200–9	6.1548+7		2.7576+9	2.3972+9	2.6396+8	9.6420+7	1.7884+3	1.7378+2	1.3381+2	3.9976+1	3.6195–4
	2.0000–5	6.4173–9	5.7738+7		2.5869+9	2.1718+9	2.8107+8	1.3397+8	1.8338+3	2.0909+2	1.5196+2	5.7130+1	4.1559–4
	2.2500–5	6.7592–9	5.4818+7		2.4560+9	1.9907+9	2.9103+8	1.7432+8	1.8666+3	2.4075+2	1.6584+2	7.4916+1	4.6429–4
	2.5000–5	7.0466–9	5.2582+7		2.3559+9	1.8415+9	2.9897+8	2.1539+8	1.8964+3	2.7199+2	1.7871+2	9.3284+1	5.1363–4
	2.6250–5	7.1699–9	5.1677+7		2.3154+9	1.7763+9	3.0153+8	2.3757+8	1.9104+3	2.8747+2	1.8418+2	1.0328+2	5.3853–4
	3.0000–5	7.4838–9	4.9510+7		2.2182+9	1.6093+9	3.0657+8	3.0242+8	1.9492+3	3.3138+2	1.9839+2	1.3298+2	6.1410–4
	3.5000–5	7.8101–9	4.7441+7		2.1256+9	1.4362+9	3.0559+8	3.8373+8	1.9938+3	3.8065+2	2.1053+2	1.7012+2	7.1564–4
	4.0000–5	8.0381–9	4.6096+7		2.0653+9	1.3015+9	3.0338+8	4.6041+8	2.0333+3	4.2705+2	2.2127+2	2.0578+2	8.1903–4
	5.0000–5	8.4191–9	4.4010+7		1.9718+9	1.1040+9	2.9032+8	5.7751+8	2.0851+3	4.9146+2	2.3121+2	2.6025+2	1.0125–3
	6.0000–5	8.7702–9	4.2248+7		1.8929+9	9.6507+8	2.7484+8	6.5294+8	2.1221+3	5.3134+2	2.3438+2	2.9696+2	1.2016–3
	8.0000–5	9.6214–9	3.8510+7		1.7254+9	7.8078+8	2.4377+8	7.0085+8	2.1817+3	5.5235+2	2.2968+2	3.2266+2	1.5873–3
L3	8.0730–5	9.6539–9	3.8380+7		1.7196+9	7.7559+8	2.4263+8	7.0137+8	2.1836+3	5.5223+2	2.2923+2	3.2300+2	1.6015–3
L2	8.1200–5	9.6745–9	3.8299+7		1.7159+9	7.7230+8	2.4193+8	7.0169+8	2.1849+3	5.5231+2	2.2910+2	3.2321+2	1.6107–3
	8.1934–5	9.7076–9	3.8168+7		1.7101+9	7.6722+8	2.4089+8	7.0197+8	2.1859+3	5.5247+2	2.2902+2	3.2345+2	1.6239–3
	8.2375–5	9.7273–9	3.8091+7		1.7066+9	7.6420+8	2.4026+8	7.0214+8	2.1866+3	5.5252+2	2.2892+2	3.2360+2	1.6319–3
	8.4193–5	9.8075–9	3.7780+7		1.6927+9	7.5207+8	2.3777+8	7.0283+8	2.1891+3	5.5305+2	2.2886+2	3.2419+2	1.6647–3
	8.4578–5	9.8242–9	3.7715+7		1.6898+9	7.4955+8	2.3725+8	7.0298+8	2.1897+3	5.5316+2	2.2884+2	3.2431+2	1.6717–3
	8.8144–5	9.9755–9	3.7143+7		1.6642+9	7.2719+8	2.3268+8	7.0429+8	2.1946+3	5.5449+2	2.2903+2	3.2545+2	1.7362–3
	8.8434–5	9.9875–9	3.7099+7		1.6622+9	7.2544+8	2.3232+8	7.0439+8	2.1950+3	5.5460+2	2.2906+2	3.2555+2	1.7415–3
	8.9879–5	1.0047–8	3.6879+7		1.6523+9	7.1687+8	2.3054+8	7.0490+8	2.1969+3	5.5508+2	2.2908+2	3.2600+2	1.7677–3
	9.4072–5	1.0276–8	3.6058+7		1.6155+9	6.9329+8	2.2577+8	6.9648+8	2.2023+3	5.5275+2	2.3002+2	3.2273+2	1.8438–3
	9.4217–5	1.0283–8	3.6031+7		1.6143+9	6.9251+8	2.2561+8	6.9619+8	2.2025+3	5.5268+2	2.3005+2	3.2262+2	1.8464–3
	1.0000–4	1.0588–8	3.4993+7	0.0000+0	1.5678+9	6.6291+8	2.1959+8	6.8534+8	2.2096+3	5.5006+2	2.3162+2	3.1844+2	1.9516–3
	1.1250–4	1.1253–8	3.2926+7	2.2941–8	1.4752+9	6.0805+8	2.0604+8	6.6113+8	2.2148+3	5.3971+2	2.3117+2	3.0854+2	2.1652–3
L1	1.1905–4	1.1584–8	3.1984+7	3.5128–8	1.4330+9	5.8333+8	1.9988+8	6.4980+8	2.2172+3	5.3527+2	2.3132+2	3.0395+2	2.2772–3
	1.2098–4	1.1687–8	3.1704+7	3.8746–8	1.4205+9	5.7647+8	1.9815+8	6.4583+8	2.2179+3	5.3384+2	2.3157+2	3.0227+2	2.3103–3
	1.2188–4	1.1734–8	3.1577+7	4.0416–8	1.4148+9	5.7338+8	1.9737+8	6.4402+8	2.2183+3	5.3320+2	2.3169+2	3.0151+2	2.3256–3
	1.2461–4	1.1877–8	3.1196+7	4.5557–8	1.3977+9	5.6412+8	1.9498+8	6.3859+8	2.2192+3	5.3104+2	2.3181+2	2.9922+2	2.3724–3
	1.3096–4	1.2203–8	3.0362+7	5.7559–8	1.3603+9	5.4393+8	1.8980+8	6.2661+8	2.2214+3	5.2667+2	2.3247+2	2.9419+2	2.4812–3
	1.3594–4	1.2453–8	2.9753+7	6.7040–8	1.3331+9	5.2925+8	1.8606+8	6.1776+8	2.2231+3	5.2385+2	2.3336+2	2.9049+2	2.5666–3
	1.4048–4	1.2677–8	2.9227+7	7.5731–8	1.3095+9	5.1665+8	1.8278+8	6.1007+8	2.2245+3	5.2117+2	2.3389+2	2.8728+2	2.6445–3
	1.5000–4	1.3135–8	2.8210+7	9.4080–8	1.2639+9	4.9238+8	1.7651+8	5.9501+8	2.2274+3	5.1659+2	2.3558+2	2.8101+2	2.8081–3
	1.6250–4	1.3778–8	2.6893+7	1.1854–7	1.2049+9	4.6431+8	1.6801+8	5.7257+8	2.2247+3	5.0568+2	2.3448+2	2.7120+2	3.0117–3
	1.7500–4	1.4398–8	2.5733+7	1.4347–7	1.1530+9	4.3975+8	1.6066+8	5.5255+8	2.2222+3	4.9700+2	2.3452+2	2.6247+2	3.2150–3
	1.8125–4	1.4702–8	2.5202+7	1.5610–7	1.1291+9	4.2857+8	1.5724+8	5.4332+8	2.2211+3	4.9270+2	2.3424+2	2.5846+2	3.3167–3
	2.0000–4	1.5586–8	2.3773+7	1.9458–7	1.0651+9	3.9872+8	1.4814+8	5.1823+8	2.2178+3	4.8200+2	2.3440+2	2.4759+2	3.6212–3
	2.2500–4	1.6838–8	2.2006+7	2.4752–7	9.8594+8	3.6580+8	1.3688+8	4.8325+8	2.1899+3	4.6251+2	2.3066+2	2.3185+2	3.9697–3
	2.6250–4	1.8627–8	1.9892+7	3.3071–7	8.9124+8	3.2679+8	1.2343+8	4.4102+8	2.1539+3	4.3921+2	2.2630+2	2.1290+2	4.4857–3
	3.0000–4	2.0477–8	1.8095+7	4.1825–7	8.1072+8	2.9637+8	1.1281+8	4.0154+8	2.1232+3	4.1779+2	2.2273+2	1.9505+2	4.9947–3
	3.5000–4	2.2975–8	1.6127+7	5.4228–7	7.2256+8	2.6493+8	1.0086+8	3.5677+8	2.0817+3	3.8881+2	2.1444+2	1.7436+2	5.6418–3
	4.0000–4	2.5380–8	1.4599+7	6.7458–7	6.5409+8	2.4041+8	9.1647+7	3.2204+8	2.0464+3	3.6722+2	2.0887+2	1.5835+2	6.2783–3
	5.0000–4	3.0383–8	1.2195+7	9.6293–7	5.4638+8	2.0440+8	7.7476+7	2.6449+8	1.9365+3	3.2717+2	1.9584+2	1.3132+2	7.2871–3
	6.0000–4	3.5274–8	1.0504+7	1.2839–6	4.7063+8	1.7903+8	6.7274+7	2.2432+8	1.8338+3	2.9638+2	1.8410+2	1.1227+2	8.1459–3
	8.0000–4	4.4777–8	8.2748+6	2.0155–6	3.7074+8	1.4531+8	5.3513+7	1.7192+8	1.6523+3	2.5161+2	1.6442+2	8.7177+1	9.5206–3
	1.0000–3	5.4011–8	6.8601+6	2.8648–6	3.0736+8	1.2368+8	4.4606+7	1.3907+8	1.4916+3	2.2008+2	1.4881+2	7.1262+1	1.0371–2
	1.5000–3	7.5762–8	4.8906+6	5.4367–6	2.1912+8	9.2125+7	3.1782+7	9.5209+7	1.2238+3	1.7081+2	1.2105+2	4.9746+1	1.1892–2
K	1.5499–3	7.7847–8	4.7596+6	5.7321–6	2.1325+8	8.9956+7	3.0903+7	9.2390+7	1.2038+3	1.6710+2	1.1875+2	4.8340+1	1.2017–2
	1.5780–3	7.9028–8	4.6885+6	5.9014–6	2.1006+8	8.8757+7	3.0430+7	9.0873+7	1.1926+3	1.6514+2	1.1754+2	4.7585+1	1.2079–2
	1.6308–3	8.1234–8	4.5611+6	6.2243–6	2.0436+8	8.6607+7	2.9585+7	8.8164+7	1.1725+3	1.6163+2	1.1539+2	4.6237+1	1.2196–2
	1.6769–3	8.3154–8	4.4558+6	6.5124–6	1.9964+8	8.4823+7	2.8886+7	8.5928+7	1.1558+3	1.5874+2	1.1360+2	4.5124+1	1.2297–2
	1.7577–3	8.6492–8	4.2839+6	7.0289–6	1.9193+8	8.1898+7	2.7747+7	8.2287+7	1.1280+3	1.5401+2	1.1069+2	4.3312+1	1.2473–2
	1.8788–3	9.1450–8	4.0516+6	7.8323–6	1.8153+8	7.7926+7	2.6212+7	7.7391+7	1.0898+3	1.4764+2	1.0675+2	4.0875+1	1.2733–2
	2.0000–3	9.6352–8	3.8455+6	8.6690–6	1.7229+8	7.4377+7	2.4851+7	7.3065+7	1.0552+3	1.4200+2	1.0326+2	3.8724+1	1.2990–2
	2.1250–3	1.0150–7	3.6505+6	9.5679–6	1.6356+8	7.0908+7	2.3574+7	6.9072+7	1.0201+3	1.3616+2	9.9446+1	3.6703+1	1.3177–2
	2.3438–3	1.1040–7	3.3561+6	1.1229–5	1.5037+8	6.5641+7	2.1650+7	6.3075+7	9.6586+2	1.2735+2	9.3671+1	3.3669+1	1.3501–2
	2.6719–3	1.2353–7	2.9995+6	1.3920–5	1.3439+8	5.9204+7	1.9324+7	5.5860+7	8.9781+2	1.1669+2	8.6651+1	3.0020+1	1.3980–2
	3.0000–3	1.3641–7	2.7162+6	1.6839–5	1.2170+8	5.4040+7	1.7480+7	5.0173+7	8.4166+2	1.0821+2	8.1054+1	2.7146+1	1.4445–2
	3.5000–3	1.5657–7	2.3666+6	2.1719–5	1.0603+8	4.7609+7	1.5262+7	4.3159+7	7.6790+2	9.6914+1	7.3371+1	2.3528+1	1.4937–2
	4.0000–3	1.7639–7	2.1006+6	2.7122–5	9.4114+7	4.2660+7	1.3572+7	3.7882+7	7.0925+2	8.8286+1	6.7465+1	2.0806+1	1.5419–2
	5.0000–3	2.1657–7	1.7108+6	3.9393–5	7.6653+7	3.5261+7	1.1141+7	3.0249+7	6.1709+2	7.5056+1	5.8229+1	1.6811+1	1.6104–2
	6.0000–3	2.5681–7	1.4428+6	5.3638–5	6.4643+7	3.0099+7	9.4777+6	2.5066+7	5.4865+2	6.5566+1	5.1482+1	1.4067+1	1.6600–2
	8.0000–3	3.3541–7	1.1047+6	8.7520–5	4.9494+7	2.3370+7	7.3410+6	1.8782+7	4.5389+2	5.2938+1	4.2215+1	1.0706+1	1.7312–2
	1.0000–2	4.1316–7	8.9680+5	1.2856–4	4.0180+7	1.9130+7	6.0205+6	1.5029+7	3.9104+2	4.4752+1	3.6059+1	8.6749+0	1.7760–2
	1.5000–2	5.9886–7	6.1871+5	2.5802–4	2.7720+7	1.3285+7	4.2068+6	1.0229+7	2.9839+2	3.3078+1	2.7022+1	6.0377+0	1.8289–2
	2.0000–2	7.7910–7	4.7558+5	4.2609–4	2.1308+7	1.0250+7	3.2696+6	7.7883+6	2.4574+2	2.6654+1	2.1964+1	4.6713+0	1.8562–2
	3.0000–2	1.1249–6	3.2938+5	8.6078–4	1.4757+7	7.1112+6	2.3060+6	5.3401+6	1.8332+2	1.9705+1	1.6410+1	3.2757+0	1.8797–2
	4.0000–2	1.4548–6	2.5470+5	1.4235–3	1.1411+7	5.5042+6	1.8119+6	4.0951+6	1.4838+2	1.5966+1	1.3396+1	2.5517+0	1.8936–2

Atomic Weight 26.982 Density 2.699 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000–2	1.7714–6	2.0917+5	2.1012–3	9.3716+6	4.5279+6	1.5108+6	3.3328+6	1.2647+2	1.3610+1	1.1489+1	2.1023+0	1.9073–2
6.0000–2	2.0692–6	1.7907+5	2.8834–3	8.0229+6	3.8764+6	1.3075+6	2.8389+6	1.1172+2	1.1993+1	1.0166+1	1.8082+0	1.9201–2
8.0000–2	2.6205–6	1.4139+5	4.7163–3	6.3349+6	3.0671+6	1.0505+6	2.2172+6	9.2836+1	9.8970+0	8.4440+0	1.4335+0	1.9529–2
1.0000–1	3.1193–6	1.1878+5	6.8838–3	5.3219+6	2.5863+6	8.9464+5	1.8409+6	8.0866+1	8.5883+0	7.3646+0	1.2038+0	1.9896–2
1.5000–1	4.1689–6	8.8876+4	1.3411–2	3.9820+6	1.9607+6	6.8544+5	1.3359+6	6.3779+1	6.8014+0	5.8892+0	8.9122–1	2.0971–2
2.0000–1	5.0178–6	7.3841+4	2.1304–2	3.3084+6	1.6450+6	5.8085+5	1.0825+6	5.4974+1	5.8899+0	5.1353+0	7.3231–1	2.2251–2
3.0000–1	6.3355–6	5.8484+4	3.9726–2	2.6203+6	1.3092+6	4.7771+5	8.3337+5	4.6483+1	4.9918+0	4.3915+0	5.7491–1	2.5307–2
4.0000–1	7.3735–6	5.0250+4	6.0675–2	2.2514+6	1.1205+6	4.2802+5	7.0280+5	4.2670+1	4.5617+0	4.0413+0	4.9153–1	2.8858–2
5.0000–1	8.1926–6	4.5226+4	8.3172–2	2.0263+6	9.9697+5	3.9963+5	6.2966+5	4.0654+1	4.3300+0	3.8522+0	4.4507–1	3.2743–2
6.0000–1	8.8794–6	4.1728+4	1.0666–1	1.8696+6	9.1024+5	3.8171+5	5.7759+5	3.9602+1	4.1872+0	3.7384+0	4.1181–1	3.7009–2
8.0000–1	9.9345–6	3.7296+4	1.5521–1	1.6710+6	7.9287+5	3.6129+5	5.1683+5	3.8769+1	4.0518+0	3.6320+0	3.7345–1	4.6358–2
1.0000+0	1.0749–5	3.4470+4	2.0490–1	1.5444+6	7.1670+5	3.5065+5	4.7701+5	3.8673+1	3.9976+0	3.5930+0	3.4816–1	5.6493–2
1.5000+0	1.2077–5	3.0681+4	3.2962–1	1.3746+6	6.0616+5	3.4067+5	4.2774+5	3.9471+1	4.0205+0	3.6182+0	3.1753–1	8.4803–2
2.0000+0	1.2919–5	2.8680+4	4.5321–1	1.2850+6	5.4519+5	3.3733+5	4.0241+5	4.0397+1	4.0708+0	3.6539+0	3.0098–1	1.1599–1
3.0000+0	1.3917–5	2.6624+4	6.9436–1	1.1928+6	4.8040+5	3.3503+5	3.7737+5	4.2023+1	4.2236+0	3.7517+0	2.8661–1	1.8532–1
4.0000+0	1.4464–5	2.5617+4	9.2708–1	1.1477+6	4.4605+5	3.3555+5	3.6607+5	4.3299+1	4.3713+0	3.8331+0	2.7883–1	2.5943–1
5.0000+0	1.4791–5	2.5051+4	1.1520+0	1.1224+6	4.2526+5	3.3596+5	3.6112+5	4.4382+1	4.5206+0	3.9071+0	2.7584–1	3.3774–1
6.0000+0	1.5010–5	2.4684+4	1.3698+0	1.1060+6	4.1271+5	3.3628+5	3.5693+5	4.5286+1	4.6628+0	3.9715+0	2.7342–1	4.1791–1
8.0000+0	1.5242–5	2.4310+4	1.7876+0	1.0892+6	3.9780+5	3.3691+5	3.5439+5	4.6503+1	4.9148+0	4.0537+0	2.7304–1	5.8804–1
1.0000+1	1.5350–5	2.4139+4	2.1845+0	1.0815+6	3.9175+5	3.3741+5	3.5229+5	4.7469+1	5.1644+0	4.1290+0	2.7299–1	7.6245–1
1.5000+1	1.5383–5	2.4086+4	3.1047+0	1.0791+6	3.8849+5	3.3787+5	3.5272+5	4.8946+1	5.7118+0	4.2215+0	2.7341–1	1.2169+0
2.0000+1	1.5377–5	2.4096+4	3.9398+0	1.0796+6	3.8688+5	3.3821+5	3.5448+5	4.9875+1	6.2719+0	4.3042+0	2.7485–1	1.6928+0
3.0000+1	1.5349–5	2.4140+4	5.4093+0	1.0816+6	3.8602+5	3.3860+5	3.5690+5	5.1165+1	7.3671+0	4.4188+0	2.7691–1	2.6715+0
4.0000+1	1.5360–5	2.4122+4	6.6771+0	1.0808+6	3.8600+5	3.3872+5	3.5600+5	5.2013+1	8.4324+0	4.4783+0	2.7639–1	3.6778+0
5.0000+1	1.5372–5	2.4103+4	7.7934+0	1.0799+6	3.8598+5	3.3879+5	3.5509+5	5.2640+1	9.5058+0	4.5281+0	2.7585–1	4.7018+0
6.0000+1	1.5375–5	2.4099+4	8.7896+0	1.0797+6	3.8597+5	3.3885+5	3.5485+5	5.3112+1	1.0591+1	4.5764+0	2.7584–1	5.7383+0
8.0000+1	1.5388–5	2.4078+4	1.0507+1	1.0788+6	3.8596+5	3.3893+5	3.5386+5	5.3793+1	1.2762+1	4.6497+0	2.7543–1	7.8364+0
1.0000+2	1.5403–5	2.4054+4	1.1953+1	1.0777+6	3.8594+5	3.3898+5	3.5276+5	5.4362+1	1.4963+1	4.7130+0	2.7492–1	9.9750+0
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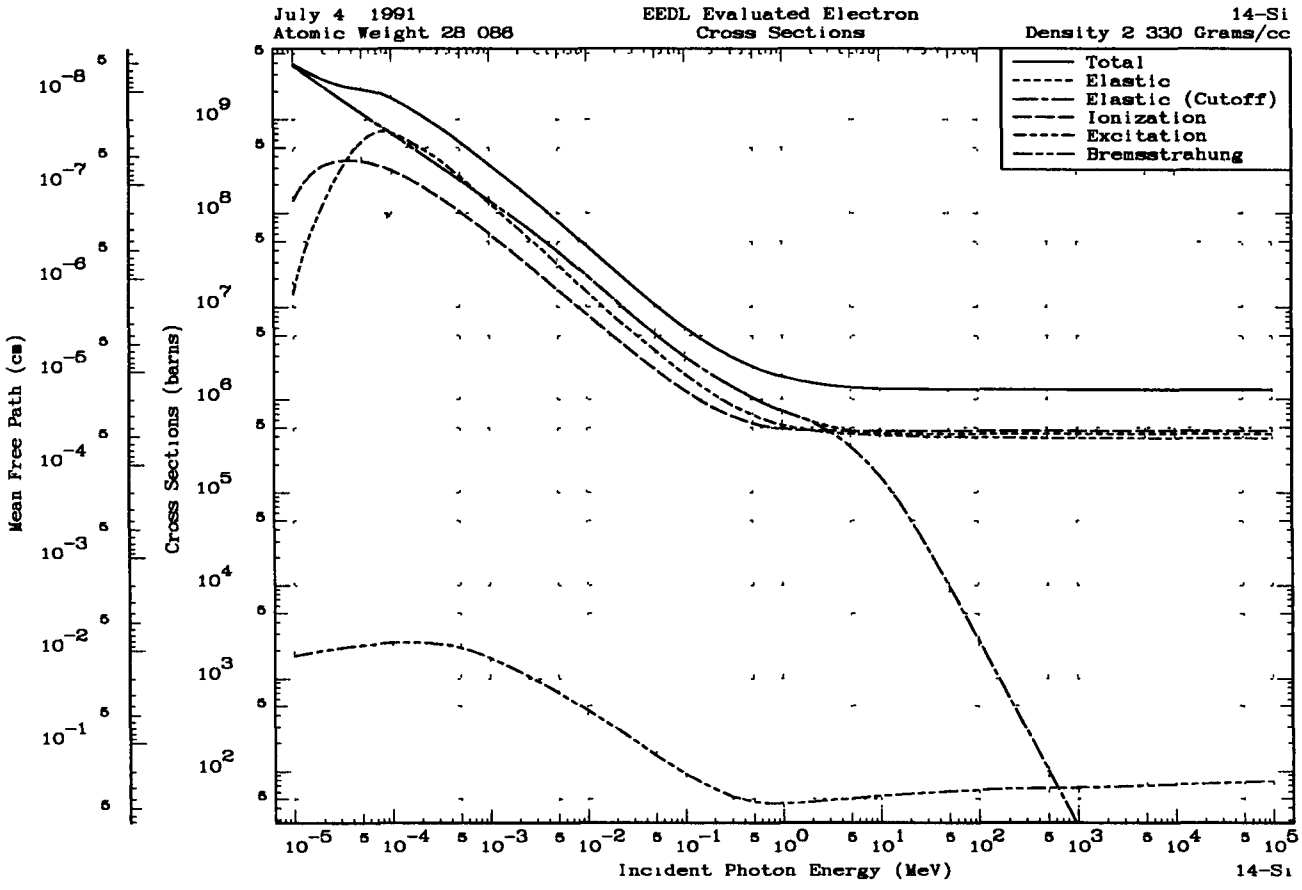
3.0000+2	1.5453–5	2.3978+4	2.0175+1	1.0743+6	3.8587+5	3.3903+5	3.4933+5	5.6272+1	3.7031+1	4.9426+0	2.7225–1	3.1816+1
4.0000+2	1.5462–5	2.3964+4	2.2539+1	1.0737+6	3.8585+5	3.3903+5	3.4871+5	5.6406+1	4.8057+1	4.9782+0	2.7178–1	4.2807+1
5.0000+2	1.5473–5	2.3946+4	2.4412+1	1.0729+6	3.8584+5	3.3904+5	3.4793+5	5.6503+1	5.9108+1	5.0138+0	2.7117–1	5.3823+1
6.0000+2	1.5473–5	2.3947+4	2.5963+1	1.0729+6	3.8583+5	3.3904+5	3.4799+5	5.6664+1	7.0152+1	5.0493+0	2.7122–1	6.4831+1
8.0000+2	1.5475–5	2.3944+4	2.8442+1	1.0728+6	3.8581+5	3.3904+5	3.4786+5	5.6973+1	9.2246+1	5.1202+0	2.7113–1	8.6854+1
1.0000+3	1.5476–5	2.3942+4	3.0385+1	1.0727+6	3.8580+5	3.3904+5	3.4782+5	5.7268+1	1.1436+2	5.1852+0	2.7110–1	1.0891+2
1.5000+3	1.5476–5	2.3942+4	3.3950+1	1.0727+6	3.8577+5	3.3904+5	3.4781+5	5.7872+1	1.6975+2	5.2361+0	2.7109–1	1.6424+2
2.0000+3	1.5478–5	2.3939+4	3.6497+1	1.0726+6	3.8575+5	3.3904+5	3.4771+5	5.8338+1	2.2550+2	5.2871+0	2.7102–1	2.1994+2
3.0000+3	1.5477–5	2.3940+4	4.0104+1	1.0726+6	3.8573+5	3.3904+5	3.4780+5	5.9092+1	3.3637+2	5.3889+0	2.7108–1	3.3071+2
4.0000+3	1.5479–5	2.3938+4	4.2673+1	1.0725+6	3.8571+5	3.3904+5	3.4770+5	5.9688+1	4.4760+2	5.4500+0	2.7101–1	4.4188+2
5.0000+3	1.5486–5	2.3926+4	4.4667+1	1.0720+6	3.8570+5	3.3904+5	3.4719+5	6.0163+1	5.5963+2	5.4826+0	2.7061–1	5.5387+2
6.0000+3	1.5483–5	2.3931+4	4.6298+1	1.0722+6	3.8568+5	3.3904+5	3.4742+5	6.0561+1	6.6972+2	5.5151+0	2.7079–1	6.6393+2
8.0000+3	1.5481–5	2.3934+4	4.8877+1	1.0723+6	3.8567+5	3.3904+5	3.4755+5	6.1195+1	8.9173+2	5.5802+0	2.7089–1	8.8589+2
1.0000+4	1.5481–5	2.3934+4	5.0878+1	1.0724+6	3.8565+5	3.3904+5	3.4760+5	6.1691+1	1.1157+3	5.6453+0	2.7093–1	1.1098+3
1.5000+4	1.5480–5	2.3936+4	5.4523+1	1.0724+6	3.8563+5	3.3904+5	3.4770+5	6.2687+1	1.6641+3	5.6955+0	2.7101–1	1.6581+3
2.0000+4	1.5480–5	2.3936+4	5.7116+1	1.0724+6	3.8561+5	3.3904+5	3.4770+5	6.3404+1	2.2195+3	5.7457+0	2.7101–1	2.2134+3
3.0000+4	1.5480–5	2.3936+4	6.0775+1	1.0724+6	3.8558+5	3.3904+5	3.4774+5	6.4411+1	3.3193+3	5.8460+0	2.7104–1	3.3132+3
4.0000+4	1.5480–5	2.3935+4	6.3374+1	1.0724+6	3.8556+5	3.3904+5	3.4772+5	6.5134+1	4.4311+3	5.9116+0	2.7102–1	4.4249+3
5.0000+4	1.5488–5	2.3923+4	6.5389+1	1.0718+6	3.8555+5	3.3904+5	3.4718+5	6.5690+1	5.5325+3	5.9438+0	2.7060–1	5.5263+3
6.0000+4	1.5484–5	2.3929+4	6.7038+1	1.0721+6	3.8554+5	3.3904+5	3.4746+5	6.6144+1	6.6330+3	5.9761+0	2.7083–1	6.6267+3
8.0000+4	1.5483–5	2.3931+4	6.9639+1	1.0722+6	3.8552+5	3.3904+5	3.4755+5	6.6866+1	8.8532+3	6.0406+0	2.7089–1	8.8469+3
1.0000+5	1.5482–5	2.3932+4	7.1654+1	1.0722+6	3.8551+5	3.3904+5	3.4763+5	6.7427+1	1.1077+4	6.1051+0	2.7095–1	1.1071+4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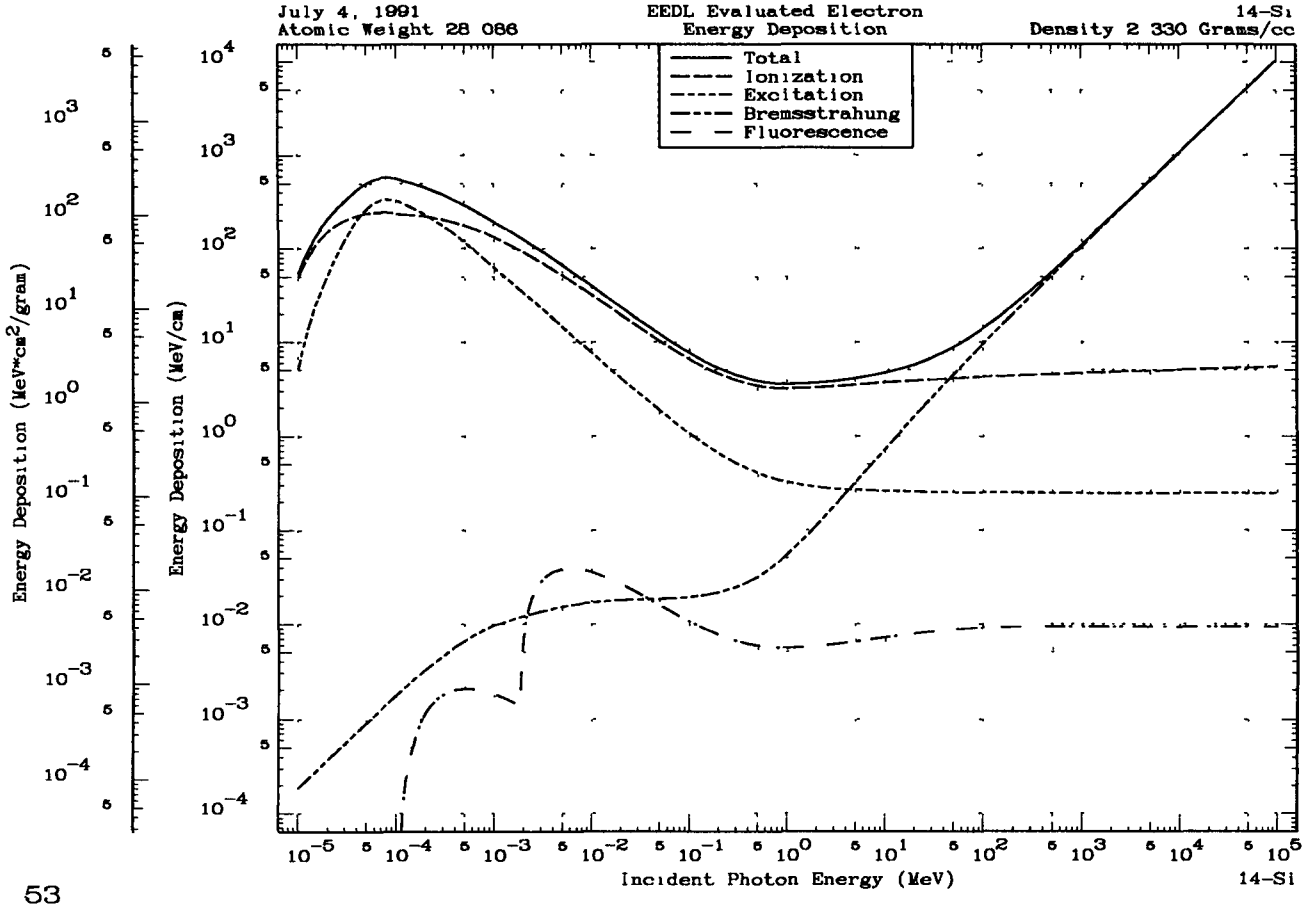
EEDL Evaluated Electron
Cross Sections
14-Si
Density 2 330 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
14-Si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Fluorescence
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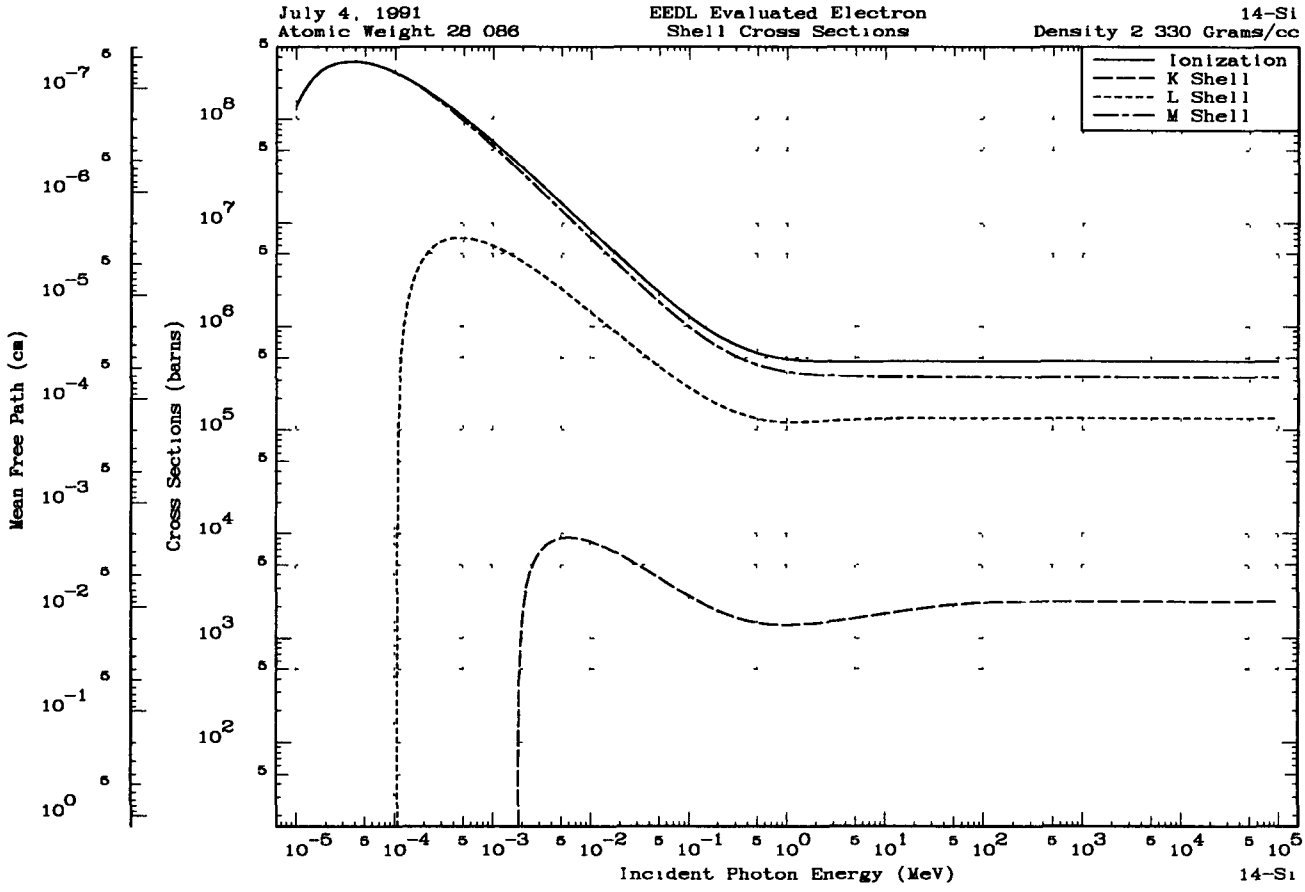
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EEDL Evaluated Electron
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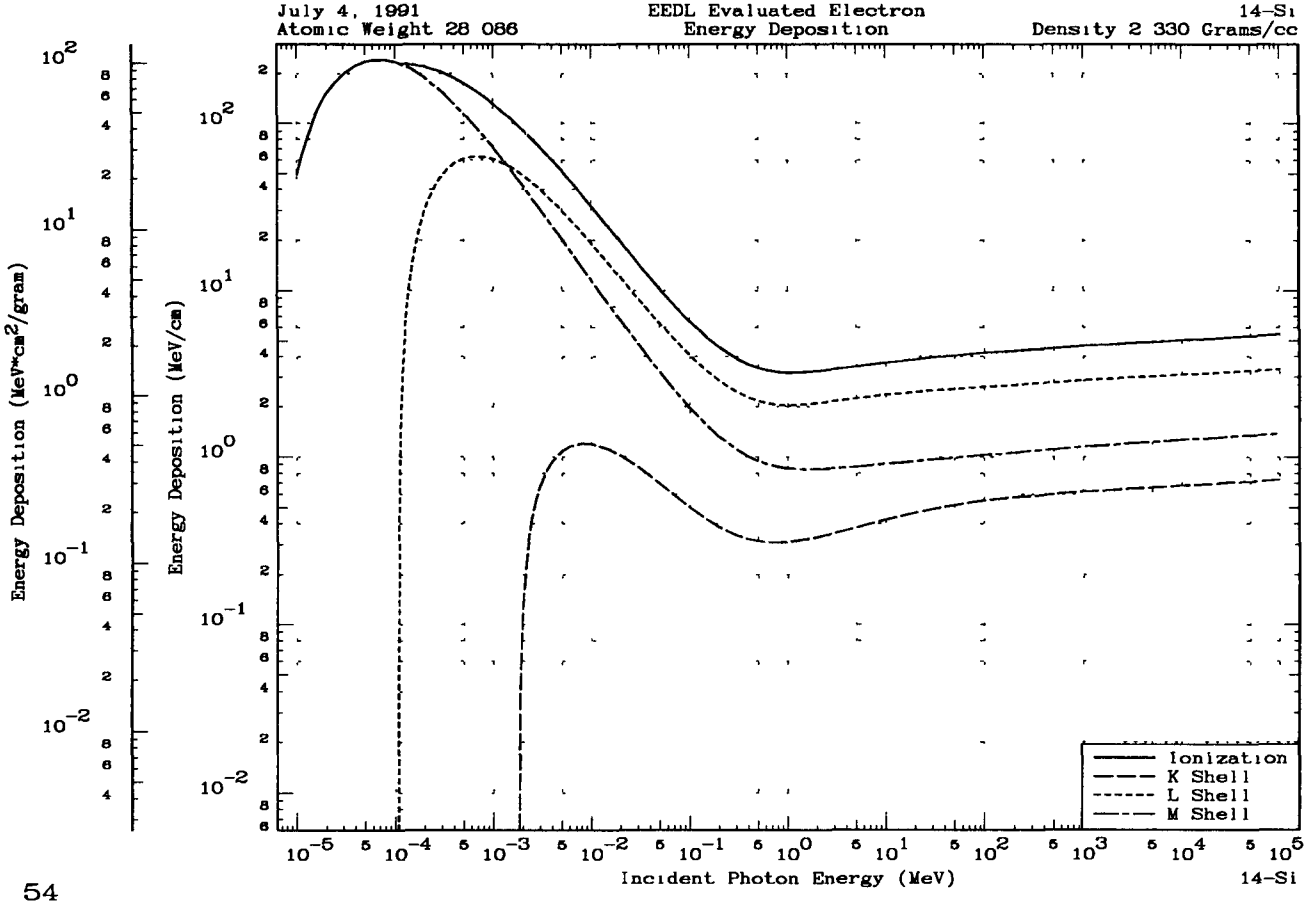
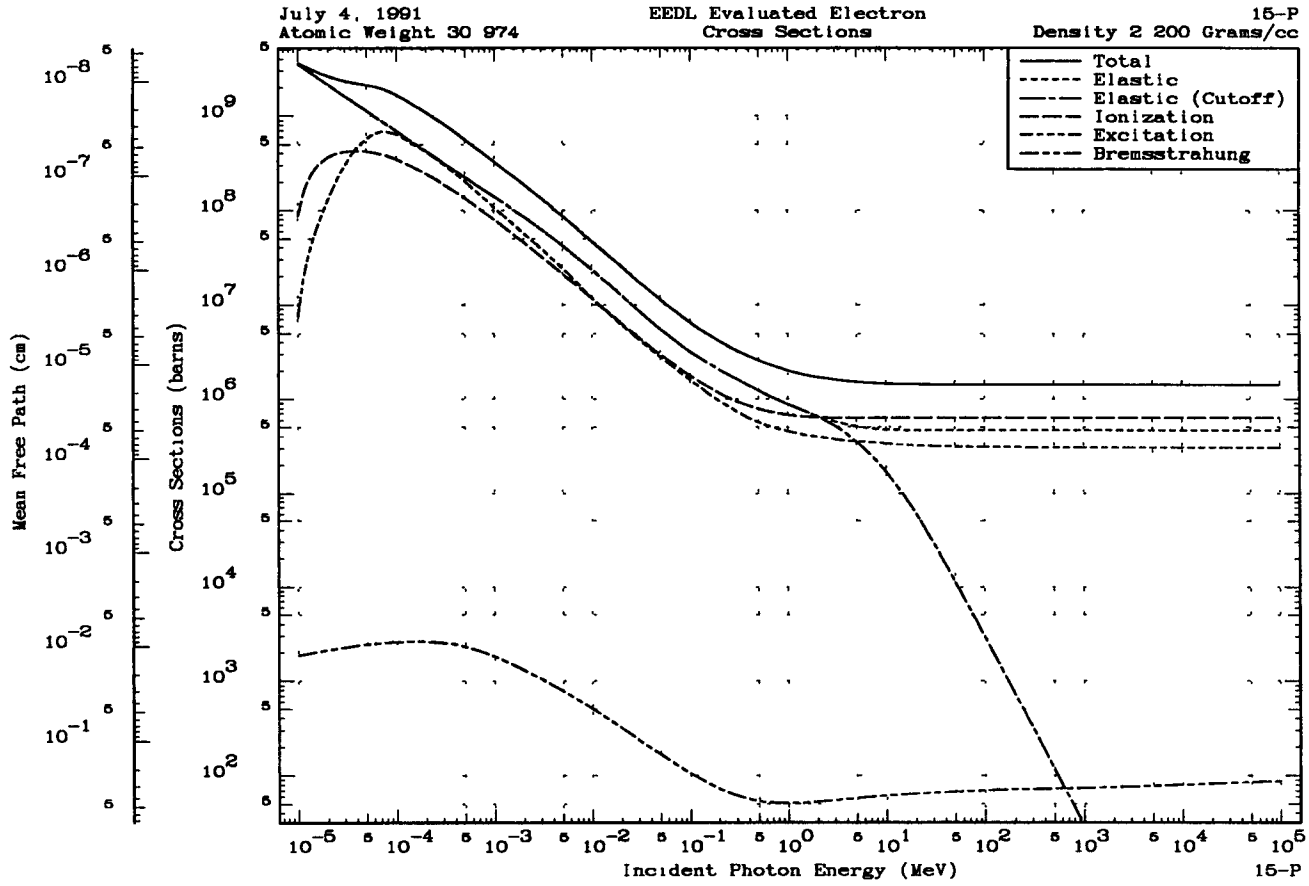
Density 2 330 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
14-Si

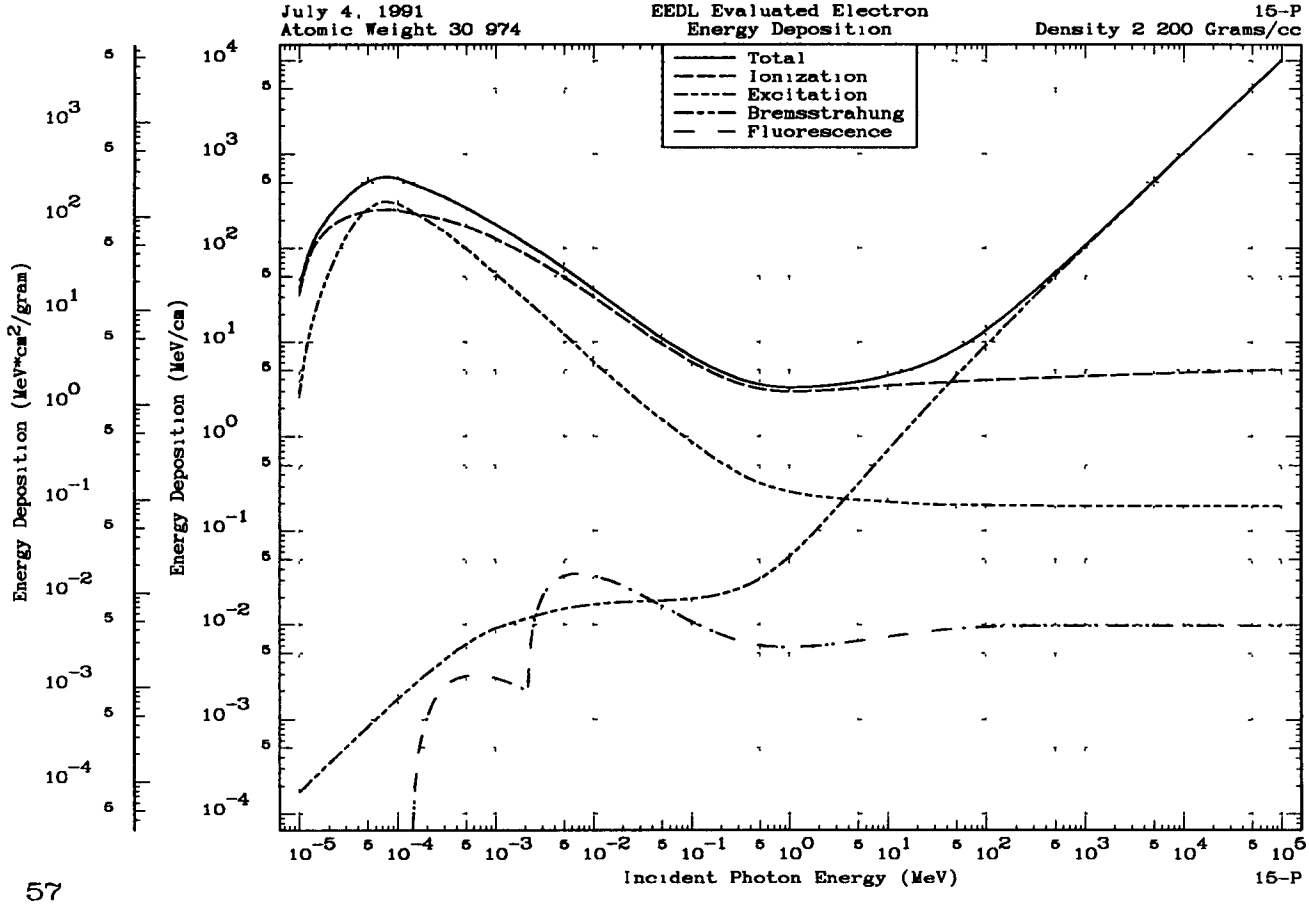

July 4, 1991
Atomic Weight 28 086
EEDL Evaluated Electron
Energy Deposition
14-Si
Density 2 330 Grams/cc
Ionization
K Shell
L Shell
M Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
14-Si

Atomic Weight 28.086 Density 2.330 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.1146–9	8.3913+7		3.9135+9	3.7661+9	1.3374+8	1.3675+7	1.7416+3	5.4278+1	4.9279+1	4.9989+0	1.8733–4
	1.1250–5	5.4853–9	7.8243+7		3.6491+9	3.4564+9	1.6930+8	2.3405+7	1.7806+3	7.3532+1	6.4698+1	8.8339+0	2.0944–4
	1.3125–5	5.9862–9	7.1696+7		3.3437+9	3.0891+9	2.1425+8	4.0332+7	1.8330+3	1.0221+2	8.6269+1	1.5941+1	2.4325–4
M1	1.3630–5	6.1149–9	7.0187+7		3.2734+9	3.0053+9	2.2308+8	4.4959+7	1.8461+3	1.0890+2	9.0916+1	1.7985+1	2.5248–4
	1.3801–5	6.1556–9	6.9723+7		3.2517+9	2.9781+9	2.2685+8	4.6767+7	1.8504+3	1.1181+2	9.3044+1	1.8767+1	2.5563–4
	1.4101–5	6.2253–9	6.8942+7		3.2153+9	2.9318+9	2.3342+8	5.0051+7	1.8579+3	1.1696+2	9.6771+1	2.0193+1	2.6114–4
	1.4550–5	6.3262–9	6.7842+7		3.1640+9	2.8656+9	2.4320+8	5.5267+7	1.8690+3	1.2486+2	1.0238+2	2.2479+1	2.6945–4
	1.5000–5	6.4228–9	6.6822+7		3.1164+9	2.8027+9	2.5287+8	6.0843+7	1.8797+3	1.3294+2	1.0800+2	2.4945+1	2.7779–4
	1.6250–5	6.6946–9	6.4109+7		2.9899+9	2.6439+9	2.7191+8	7.4062+7	1.9082+3	1.5070+2	1.1995+2	3.0750+1	3.0120–4
	1.7188–5	6.8816–9	6.2367+7		2.9087+9	2.5380+9	2.8563+8	8.5001+7	1.9285+3	1.6446+2	1.2883+2	3.5624+1	3.1894–4
	1.7500–5	6.9410–9	6.1834+7		2.8838+9	2.5049+9	2.9000+8	8.8848+7	1.9350+3	1.6906+2	1.3171+2	3.7352+1	3.2489–4
	1.8359–5	7.1031–9	6.0422+7		2.8180+9	2.4190+9	2.9901+8	9.9945+7	1.9526+3	1.8083+2	1.3846+2	4.2376+1	3.4132–4
	1.8594–5	7.1460–9	6.0059+7		2.8011+9	2.3967+9	3.0150+8	1.0287+8	1.9572+3	1.8406+2	1.4035+2	4.3715+1	3.4584–4
	2.0000–5	7.3877–9	5.8095+7		2.7094+9	2.2727+9	3.1537+8	1.2135+8	1.9843+3	2.0349+2	1.5120+2	5.2282+1	3.7306–4
	2.2500–5	7.7729–9	5.5215+7		2.5751+9	2.0858+9	3.3012+8	1.5923+8	2.0200+3	2.3437+2	1.6523+2	6.9136+1	4.1685–4
	2.5000–5	8.0956–9	5.3015+7		2.4725+9	1.9316+9	3.4305+8	1.9782+8	2.0525+3	2.6519+2	1.7863+2	8.6551+1	4.6123–4
	2.6250–5	8.2377–9	5.2100+7		2.4298+9	1.8642+9	3.4694+8	2.1872+8	2.0677+3	2.7997+2	1.8390+2	9.6065+1	4.8362–4
	3.0000–5	8.5930–9	4.9946+7		2.3294+9	1.6913+9	3.5681+8	2.8122+8	2.1100+3	3.2364+2	1.9871+2	1.2493+2	5.5159–4
	3.5000–5	8.9607–9	4.7896+7		2.2338+9	1.5120+9	3.5978+8	3.6199+8	2.1586+3	3.7276+2	2.1148+2	1.6128+2	6.4294–4
	4.0000–5	9.1627–9	4.6840+7		2.1845+9	1.3721+9	3.6192+8	4.5047+8	2.2017+3	4.2506+2	2.2376+2	2.0130+2	7.3597–4
	5.0000–5	9.5168–9	4.5097+7		2.1033+9	1.1667+9	3.5371+8	5.8279+8	2.2587+3	4.9901+2	2.3686+2	2.6215+2	9.1035–4
	6.0000–5	9.8217–9	4.3697+7		2.0380+9	1.0220+9	3.4021+8	6.7577+8	2.2996+3	5.4900+2	2.4276+2	3.0624+2	1.0810–3
	7.0000–5	1.0190–8	4.2118+7		1.9643+9	9.1381+8	3.2367+8	7.2680+8	2.3347+3	5.7302+2	2.4239+2	3.3063+2	1.2540–3
	8.0000–5	1.0653–8	4.0289+7		1.8790+9	8.2941+8	3.1013+8	7.3945+8	2.3656+3	5.8094+2	2.4327+2	3.3767+2	1.4292–3
	1.0000–4	1.1758–8	3.6502+7	0.0000+0	1.7024+9	7.0590+8	2.8215+8	7.1433+8	2.3976+3	5.6511+2	2.3697+2	3.2814+2	1.7591–3
L3	1.0798–4	1.2261–8	3.5005+7	1.4292–8	1.6326+9	6.6781+8	2.7137+8	6.9339+8	2.4020+3	5.5168+2	2.3261+2	3.1907+2	1.8828–3
	1.0864–4	1.2307–8	3.4872+7	1.5484–8	1.6264+9	6.6488+8	2.7056+8	6.9092+8	2.4023+3	5.5037+2	2.3240+2	3.1797+2	1.8930–3
L2	1.0867–4	1.2310–8	3.4865+7	1.5544–8	1.6260+9	6.6474+8	2.7051+8	6.9079+8	2.4023+3	5.5030+2	2.3238+2	3.1792+2	1.8935–3
	1.0932–4	1.2354–8	3.4741+7	1.6719–8	1.6202+9	6.6190+8	2.6968+8	6.8866+8	2.4027+3	5.4910+2	2.3212+2	3.1698+2	1.9035–3
	1.0993–4	1.2396–8	3.4624+7	1.7837–8	1.6148+9	6.5923+8	2.6890+8	6.8665+8	2.4030+3	5.4801+2	2.3192+2	3.1609+2	1.9130–3
	1.1059–4	1.2440–8	3.4499+7	1.9039–8	1.6090+9	6.5639+8	2.6807+8	6.8451+8	2.4033+3	5.4685+2	2.3170+2	3.1515+2	1.9232–3
	1.1118–4	1.2481–8	3.4388+7	2.0126–8	1.6038+9	6.5386+8	2.6732+8	6.8260+8	2.4036+3	5.4583+2	2.3152+2	3.1431+2	1.9325–3
	1.1182–4	1.2524–8	3.4269+7	2.1296–8	1.5983+9	6.5116+8	2.6653+8	6.8056+8	2.4040+3	5.4472+2	2.3131+2	3.1341+2	1.9424–3
	1.1361–4	1.2644–8	3.3943+7	2.4589–8	1.5830+9	6.4373+8	2.6436+8	6.7494+8	2.4049+3	5.4176+2	2.3082+2	3.1094+2	1.9702–3
	1.1421–4	1.2684–8	3.3836+7	2.5692–8	1.5780+9	6.4130+8	2.6365+8	6.7309+8	2.4052+3	5.4078+2	2.3066+2	3.1013+2	1.9794–3
	1.1816–4	1.2947–8	3.3150+7	3.3041–8	1.5461+9	6.2573+8	2.5911+8	6.6123+8	2.4071+3	5.3475+2	2.2984+2	3.0491+2	2.0408–3
	1.1868–4	1.2981–8	3.3063+7	3.4018–8	1.5420+9	6.2374+8	2.5852+8	6.5971+8	2.4074+3	5.3398+2	2.2974+2	3.0424+2	2.0490–3
	1.2612–4	1.3464–8	3.1877+7	4.8082–8	1.4867+9	5.9693+8	2.5065+8	6.3909+8	2.4109+3	5.2375+2	2.2857+2	2.9518+2	2.1647–3
	1.3434–4	1.3983–8	3.0693+7	6.3930–8	1.4315+9	5.7030+8	2.4281+8	6.1834+8	2.4145+3	5.1405+2	2.2797+2	2.8608+2	2.2928–3
	1.3806–4	1.4214–8	3.0195+7	7.1192–8	1.4082+9	5.5916+8	2.3951+8	6.0958+8	2.4161+3	5.1013+2	2.2788+2	2.8225+2	2.3507–3
	1.5000–4	1.4936–8	2.8735+7	9.4866–8	1.3401+9	5.2663+8	2.2979+8	5.8372+8	2.4209+3	4.9869+2	2.2775+2	2.7094+2	2.5371–3
L1	1.5155–4	1.5032–8	2.8552+7	9.7980–8	1.3316+9	5.2273+8	2.2840+8	5.8047+8	2.4214+3	4.9678+2	2.2730+2	2.6948+2	2.5613–3
	1.5458–4	1.5222–8	2.8194+7	1.0410–7	1.3149+9	5.1531+8	2.2576+8	5.7386+8	2.4209+3	4.9313+2	2.2660+2	2.6653+2	2.6062–3
	1.6026–4	1.5575–8	2.7555+7	1.1569–7	1.2851+9	5.0205+8	2.2107+8	5.6199+8	2.4199+3	4.8679+2	2.2555+2	2.6123+2	2.6904–3
	1.6250–4	1.5714–8	2.7313+7	1.2031–7	1.2738+9	4.9703+8	2.1930+8	5.5749+8	2.4195+3	4.8443+2	2.2521+2	2.5922+2	2.7236–3
	1.7019–4	1.6183–8	2.6521+7	1.3632–7	1.2369+9	4.8070+8	2.1346+8	5.4275+8	2.4183+3	4.7649+2	2.2384+2	2.5265+2	2.8376–3
	1.8125–4	1.6842–8	2.5483+7	1.5977–7	1.1885+9	4.5932+8	2.0583+8	5.2332+8	2.4166+3	4.6656+2	2.2256+2	2.4400+2	3.0013–3
	1.8510–4	1.7068–8	2.5145+7	1.6804–7	1.1727+9	4.5240+8	2.0333+8	5.1699+8	2.4160+3	4.6326+2	2.2208+2	2.4118+2	3.0582–3
	2.0000–4	1.7927–8	2.3941+7	2.0061–7	1.1165+9	4.2778+8	1.9445+8	4.9432+8	2.4139+3	4.5194+2	2.2084+2	2.3110+2	3.2787–3
	2.2500–4	1.9450–8	2.2066+7	2.5737–7	1.0291+9	3.9306+8	1.8020+8	4.5584+8	2.3857+3	4.2921+2	2.1555+2	2.1366+2	3.5990–3
	2.6250–4	2.1640–8	1.9833+7	3.4759–7	9.2495+8	3.5184+8	1.6313+8	4.0998+8	2.3492+3	4.0239+2	2.0949+2	1.9290+2	4.0737–3
	3.0000–4	2.3736–8	1.8081+7	4.4329–7	8.4328+8	3.1965+8	1.4964+8	3.7399+8	2.3181+3	3.8151+2	2.0486+2	1.7664+2	4.5425–3
	3.5000–4	2.6693–8	1.6079+7	5.7961–7	7.4988+8	2.8623+8	1.3426+8	3.2939+8	2.2742+3	3.5245+2	1.9629+2	1.5616+2	5.1353–3
	4.0000–4	2.9549–8	1.4524+7	7.2623–7	6.7739+8	2.6012+8	1.2219+8	2.9507+8	2.2369+3	3.2982+2	1.8940+2	1.4041+2	5.7187–3
	5.0000–4	3.5187–8	1.2197+7	1.0478–6	5.6885+8	2.2169+8	1.0372+8	2.4344+8	2.1091+3	2.9277+2	1.7621+2	1.1656+2	6.6058–3
	6.0000–4	4.0770–8	1.0527+7	1.4074–6	4.9096+8	1.9457+8	9.0347+7	2.0604+8	2.0101+3	2.6396+2	1.6482+2	9.9129+1	7.4527–3
	8.0000–4	5.1654–8	8.3089+6	2.2317–6	3.8751+8	1.5855+8	7.2213+7	1.5675+8	1.8155+3	2.2247+2	1.4645+2	7.6013+1	8.7042–3
	1.0000–3	6.1974–8	6.9252+6	3.1928–6	3.2298+8	1.3530+8	6.0413+7	1.2727+8	1.6545+3	1.9436+2	1.3225+2	6.2104+1	9.6384–3
	1.2500–3	7.4312–8	5.7754+6	4.5731–6	2.6935+8	1.1536+8	5.0272+7	1.0372+8	1.4868+3	1.6849+2	1.1757+2	5.0913+1	1.0363–2
	1.5000–3	8.6163–8	4.9811+6	6.1410–6	2.3231+8	1.0127+8	4.3279+7	8.7760+7	1.3625+3	1.5074+2	1.0740+2	4.3329+1	1.1056–2
K	1.8285–3	1.0127–7	4.2382+6	8.4655–6	1.9766+8	8.7610+7	3.6653+7	7.3396+7	1.2344+3	1.3230+2	9.5846+1	3.6443+1	1.1779–2
	1.8714–3	1.0320–7	4.1587+6	8.7920–6	1.9395+8	8.6124+7	3.5945+7	7.1882+7	1.2200+3	1.3036+2	9.4634+1	3.5717+1	1.1865–2
	1.9357–3	1.0609–7	4.0455+6	9.2906–6	1.8867+8	8.4003+7	3.4939+7	6.9731+7	1.1992+3	1.2761+2	9.2912+1	3.4684+1	1.1994–2
	2.0000–3	1.0896–7	3.9390+6	9.7998–6	1.8371+8	8.2000+7	3.3993+7	6.7711+7	1.1796+3	1.2502+2	9.1294+1	3.3715+1	1.2122–2
	2.1250–3	1.1465–7	3.7435+6	1.0821–5	1.7459+8	7.8213+7	3.2276+7	6.4098+7	1.1413+3	1.1989+2	8.7915+1	3.1964+1	1.2307–2
	2.2344–3	1.1958–7	3.5890+6	1.1749–5	1.6738+8	7.5210+7	3.0921+7	6.1252+7	1.1106+3	1.1584+2	8.5245+1	3.0586+1	1.2468–2
	2.4258–3	1.2812–7	3.3498+6	1.3447–5	1.5623+8	7.0541+7	2.8825+7	5.6863+7	1.0622+3	1.0958+2	8.1109+1	2.8461+1	1.2747–2
	2.7129–3	1.4072–7	3.0498+6	1.6166–5	1.4224+8	6.4647+7	2.6200+7	5.1390+7	9.9953+2	1.0175+2	7.5922+1	2.5811+1	1.3158–2
	3.0000–3	1.5310–7	2.8032+6	1.9081–5	1.3074+8	5.9769+7	2.4047+7	4.6919+7	9.4638+2	9.5319+1	7.1658+1	2.3648+1	1.3559–2
	3.5000–3	1.7511–7	2.4510+6	2.4618–5	1.1431+8	5.2730+7	2.1052+7	4.0527+7	8.6530+2	8.5438+1	6.4908+1	2.0516+1	1.4054–2
	4.0000–3	1.9669–7	2.1821+6	3.0746–5	1.0177+8	4.7307+7	1.8762+7	3.5697+7	8.0070+2	7.7881+1	5.9715+1	1.8151+1	1.4538–2
	5.0000–3	2.4014–7	1.7872+6	4.4650–5	8.3353+7	3.9226+7	1.5448+7	2.8678+7	6.9870+2	6.6272+1	5.1573+1	1.4684+1	1.5236–2
	6.0000–3	2.8339–7	1.5145+6	6.0779–5	7.0633+7	3.3579+7	1.3171+7	2.3882+7	6.2256+2	5.7920+1	4.5605+1	1.2299+1	1.5749–2
	8.0000–3	3.6712–7	1.1691+6	9.9118–5	5.4523+7	2.6231+7	1.0231+7	1.8060+7	5.1664+2	4.6805+1	3.7402+1	9.3863+0	1.6495–2
	1.0000–2	4.4925–7	9.5533+5	1.4552–4	4.4555+7	2.1584+7	8.4081+6	1.4562+7	4.4603+2	3.9602+1	3.1962+1	7.6228+0	1.6974–2
	1.5000–2	6.4822–7	6.6210+5	2.9195–4	3.0879+7	1.5083+7	5.8882+6	9.9072+6	3.4131+2	2.9217+1	2.3945+1	5.2552+0	1.7567–2
	2.0000–2	8.4130–7	5.1015+5	4.8217–4	2.3792+7	1.1617+7	4.5826+6	7.5919+6	2.8146+2	2.3556+1	1.9472+1	4.0664+0	1.7879–2
	3.0000–2	1.2063–6	3.5580+5	9.7332–4	1.6594+7	8.0349+6	3.2355+6	5.3231+6	2.1030+2	1.7467+1	1.4559+1	2.8901+0	1.8158–2
	4.0000–2	1.5496–6	2.7697+5	1.6077–3	1.2917+7	6.2323+6	2.5421+6	4.1426+6	1.7038+2	1.4176+1	1.1886+1	2.2709+0	1.8307–2
	5.0000–2	1.8748–6	2.2892+5	2.3706–3	1.0676+7	5.1481+6	2.1175+6	3.4107+6	1.4534+2	1.2094+1	1.0192+1	1.8835+0	1.8464–2

Atomic Weight 28.086												Density 2.330 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.0000–2	2.1839–6	1.9652+5	3.2510–3	9.1653+6	4.4234+6	1.8320+6	2.9098+6	1.2846+2	1.0654+1	9.0185+0	1.6166+0	1.8593–2
8.0000–2	2.7656–6	1.5519+5	5.3158–3	7.2376+6	3.5017+6	1.4708+6	2.2650+6	1.0685+2	8.7795+0	7.4904+0	1.2702+0	1.8904–2
1.0000–1	3.2897–6	1.3046+5	7.7588–3	6.0846+6	2.9417+6	1.2519+6	1.8909+6	9.3148+1	7.6210+0	6.5337+0	1.0681+0	1.9260–2
1.5000–1	4.4185–6	9.7134+4	1.5114–2	4.5301+6	2.1868+6	9.5769+5	1.3855+6	7.3522+1	6.0365+0	5.2235+0	7.9275–1	2.0296–2
2.0000–1	5.3513–6	8.0202+4	2.4005–2	3.7405+6	1.7990+6	8.1055+5	1.1309+6	6.3369+1	5.2298+0	4.5553+0	6.5292–1	2.1524–2
3.0000–1	6.8103–6	6.3020+4	4.4748–2	2.9391+6	1.3963+6	6.6523+5	8.7751+5	5.3549+1	4.4339+0	3.8963+0	5.1313–1	2.4454–2
4.0000–1	7.9047–6	5.4295+4	6.8315–2	2.5322+6	1.1811+6	5.9486+5	7.5619+5	4.9134+1	4.0583+0	3.5842+0	4.4625–1	2.7855–2
5.0000–1	8.7773–6	4.8897+4	9.3603–2	2.2805+6	1.0458+6	5.5428+5	6.8034+5	4.6803+1	3.8522+0	3.4162+0	4.0438–1	3.1577–2
6.0000–1	9.4904–6	4.5223+4	1.1999–1	2.1091+6	9.5261+5	5.2861+5	6.2784+5	4.5594+1	3.7276+0	3.3166+0	3.7539–1	3.5659–2
8.0000–1	1.0559–5	4.0646+4	1.7451–1	1.8957+6	8.2873+5	4.9865+5	5.6823+5	4.4625+1	3.6096+0	3.2221+0	3.4293–1	4.4613–2
1.0000+0	1.1351–5	3.7811+4	2.3027–1	1.7634+6	7.5052+5	4.8263+5	5.3021+5	4.4471+1	3.5648+0	3.1882+0	3.2227–1	5.4322–2
1.5000+0	1.2603–5	3.4054+4	3.6978–1	1.5882+6	6.3892+5	4.6701+5	4.8223+5	4.5256+1	3.6028+0	3.2247+0	2.9673–1	8.1426–2
2.0000+0	1.3317–5	3.2229+4	5.0740–1	1.5031+6	5.7846+5	4.6255+5	4.6202+5	4.6406+1	3.6640+0	3.2668+0	2.8590–1	1.1126–1
3.0000+0	1.4222–5	3.0177+4	7.7531–1	1.4074+6	5.1529+5	4.5678+5	4.3526+5	4.8466+1	3.8020+0	3.3527+0	2.7247–1	1.7684–1
4.0000+0	1.4631–5	2.9333+4	1.0336+0	1.3680+6	4.8212+5	4.5669+5	4.2918+5	4.9836+1	3.9412+0	3.4233+0	2.6927–1	2.4855–1
5.0000+0	1.4901–5	2.8802+4	1.2831+0	1.3433+6	4.6224+5	4.5665+5	4.2431+5	5.0925+1	4.0757+0	3.4867+0	2.6682–1	3.2214–1
6.0000+0	1.5082–5	2.8456+4	1.5247+0	1.3271+6	4.5030+5	4.5658+5	4.2020+5	5.1838+1	4.2052+0	3.5400+0	2.6483–1	4.0032–1
8.0000+0	1.5323–5	2.8009+4	1.9872+0	1.3063+6	4.3625+5	4.5657+5	4.1339+5	5.3312+1	4.4442+0	3.6219+0	2.6172–1	5.6064–1
1.0000+1	1.5443–5	2.7791+4	2.4258+0	1.2961+6	4.3011+5	4.5719+5	4.0874+5	5.4281+1	4.6790+0	3.6915+0	2.5996–1	7.2760–1
1.5000+1	1.5530–5	2.7636+4	3.4394+0	1.2889+6	4.2691+5	4.5771+5	4.0421+5	5.5943+1	5.1956+0	3.7760+0	2.5715–1	1.1624+0
2.0000+1	1.5586–5	2.7537+4	4.3563+0	1.2843+6	4.2512+5	4.5809+5	4.0100+5	5.7048+1	5.7194+0	3.8511+0	2.5518–1	1.6131+0
3.0000+1	1.5663–5	2.7401+4	5.9634+0	1.2779+6	4.2417+5	4.5853+5	3.9515+5	5.8459+1	6.7538+0	3.9586+0	2.5159–1	2.5436+0
4.0000+1	1.5686–5	2.7361+4	7.3429+0	1.2761+6	4.2415+5	4.5867+5	3.9318+5	5.9361+1	7.7681+0	4.0150+0	2.5048–1	3.5026+0
5.0000+1	1.5703–5	2.7331+4	8.5523+0	1.2747+6	4.2413+5	4.5877+5	3.9170+5	6.0037+1	8.7896+0	4.0636+0	2.4967–1	4.4763+0
6.0000+1	1.5709–5	2.7322+4	9.6284+0	1.2742+6	4.2412+5	4.5883+5	3.9123+5	6.0568+1	9.8160+0	4.1053+0	2.4951–1	5.4612+0
8.0000+1	1.5721–5	2.7299+4	1.1477+1	1.2732+6	4.2410+5	4.5893+5	3.9011+5	6.1404+1	1.1891+1	4.1778+0	2.4907–1	7.4640+0
1.0000+2	1.5736–5	2.7274+4	1.3027+1	1.2720+6	4.2408+5	4.5897+5	3.8888+5	6.2052+1	1.3973+1	4.2244+0	2.4856–1	9.5001+0
1.5000+2	1.5757–5	2.7238+4	1.6068+1	1.2703+6	4.2405+5	4.5899+5	3.8724+5	6.3200+1	1.9181+1	4.2798+0	2.4752–1	1.4653+1
2.0000+2	1.5773–5	2.7210+4	1.8372+1	1.2690+6	4.2403+5	4.5900+5	3.8593+5	6.3875+1	2.4428+1	4.3338+0	2.4668–1	1.9848+1
3.0000+2	1.5789–5	2.7182+4	2.1778+1	1.2677+6	4.2400+5	4.5901+5	3.8464+5	6.4331+1	3.4928+1	4.4269+0	2.4586–1	3.0255+1
4.0000+2	1.5799–5	2.7165+4	2.4280+1	1.2669+6	4.2398+5	4.5901+5	3.8384+5	6.4542+1	4.5444+1	4.4612+0	2.4536–1	4.0737+1
5.0000+2	1.5811–5	2.7144+4	2.6259+1	1.2659+6	4.2396+5	4.5902+5	3.8289+5	6.4686+1	5.5990+1	4.4953+0	2.4475–1	5.1250+1
6.0000+2	1.5812–5	2.7144+4	2.7897+1	1.2659+6	4.2395+5	4.5902+5	3.8289+5	6.4885+1	6.6452+1	4.5293+0	2.4475–1	6.1678+1
8.0000+2	1.5814–5	2.7139+4	3.0512+1	1.2657+6	4.2393+5	4.5902+5	3.8272+5	6.5261+1	8.7441+1	4.5887+0	2.4465–1	8.2608+1
1.0000+3	1.5816–5	2.7136+4	3.2561+1	1.2656+6	4.2391+5	4.5902+5	3.8256+5	6.5617+1	1.0853+2	4.6481+0	2.4456–1	1.0364+2
1.5000+3	1.5817–5	2.7135+4	3.6316+1	1.2655+6	4.2388+5	4.5902+5	3.8253+5	6.6342+1	1.6128+2	4.6972+0	2.4454–1	1.5634+2
2.0000+3	1.5818–5	2.7132+4	3.8996+1	1.2654+6	4.2386+5	4.5902+5	3.8242+5	6.6900+1	2.1434+2	4.7463+0	2.4447–1	2.0935+2
3.0000+3	1.5818–5	2.7133+4	4.2790+1	1.2654+6	4.2383+5	4.5902+5	3.8249+5	6.7787+1	3.1988+2	4.8444+0	2.4451–1	3.1479+2
4.0000+3	1.5819–5	2.7130+4	4.5490+1	1.2653+6	4.2381+5	4.5902+5	3.8239+5	6.8481+1	4.2580+2	4.8751+0	2.4445–1	4.2068+2
5.0000+3	1.5826–5	2.7119+4	4.7586+1	1.2648+6	4.2379+5	4.5902+5	3.8188+5	6.9033+1	5.3253+2	4.9058+0	2.4412–1	5.2738+2
6.0000+3	1.5824–5	2.7122+4	4.9300+1	1.2649+6	4.2378+5	4.5902+5	3.8205+5	6.9494+1	6.3734+2	4.9365+0	2.4423–1	6.3216+2
8.0000+3	1.5823–5	2.7124+4	5.2010+1	1.2650+6	4.2376+5	4.5902+5	3.8217+5	7.0227+1	8.4873+2	4.9978+0	2.4430–1	8.4349+2
1.0000+4	1.5822–5	2.7126+4	5.4112+1	1.2651+6	4.2375+5	4.5902+5	3.8224+5	7.0801+1	1.0620+3	5.0592+0	2.4435–1	1.0567+3
1.5000+4	1.5821–5	2.7128+4	5.7941+1	1.2652+6	4.2372+5	4.5902+5	3.8240+5	7.1944+1	1.5841+3	5.1037+0	2.4445–1	1.5788+3
2.0000+4	1.5821–5	2.7128+4	6.0665+1	1.2652+6	4.2369+5	4.5902+5	3.8240+5	7.2766+1	2.1130+3	5.1483+0	2.4445–1	2.1076+3
3.0000+4	1.5820–5	2.7129+4	6.4509+1	1.2652+6	4.2366+5	4.5902+5	3.8248+5	7.3923+1	3.1603+3	5.2374+0	2.4450–1	3.1548+3
4.0000+4	1.5821–5	2.7127+4	6.7238+1	1.2651+6	4.2364+5	4.5902+5	3.8240+5	7.4753+1	4.2189+3	5.2976+0	2.4445–1	4.2134+3
5.0000+4	1.5828–5	2.7115+4	6.9355+1	1.2646+6	4.2363+5	4.5902+5	3.8185+5	7.5391+1	5.2677+3	5.3263+0	2.4410–1	5.2621+3
6.0000+4	1.5826–5	2.7120+4	7.1086+1	1.2648+6	4.2361+5	4.5902+5	3.8209+5	7.5911+1	6.3156+3	5.3550+0	2.4425–1	6.3100+3
8.0000+4	1.5824–5	2.7123+4	7.3818+1	1.2649+6	4.2359+5	4.5902+5	3.8224+5	7.6740+1	8.4296+3	5.4124+0	2.4435–1	8.4240+3
1.0000+5	1.5824–5	2.7122+4	7.5934+1	1.2649+6	4.2358+5	4.5902+5	3.8224+5	7.7384+1	1.0547+4	5.4697+0	2.4435–1	1.0542+4


July 4, 1991
Atomic Weight 30 974
EEDL Evaluated Electron
Cross Sections
15-P
Density 2 200 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
15-P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Density 2 200 Grams/cc
Total
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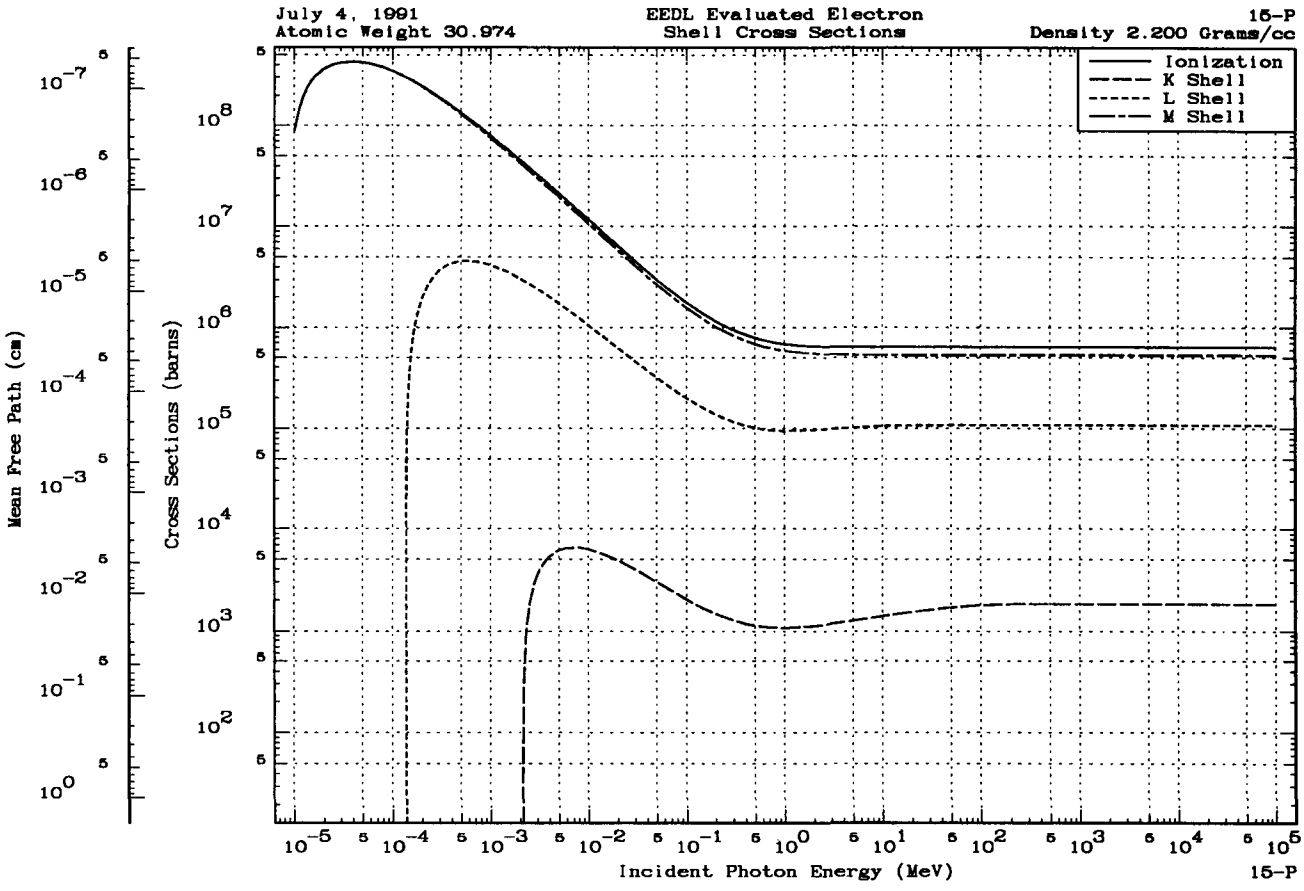
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
15-P

57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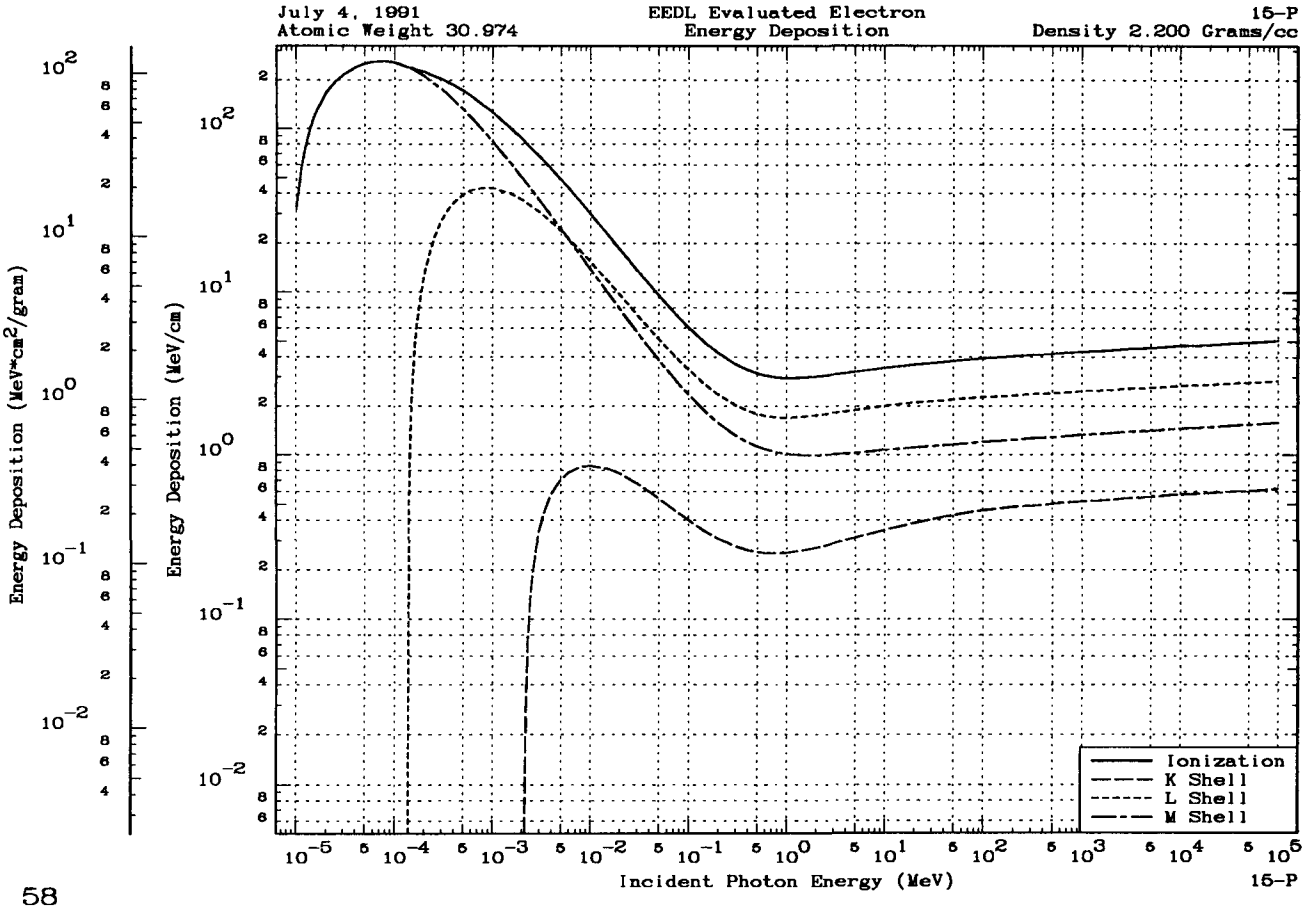
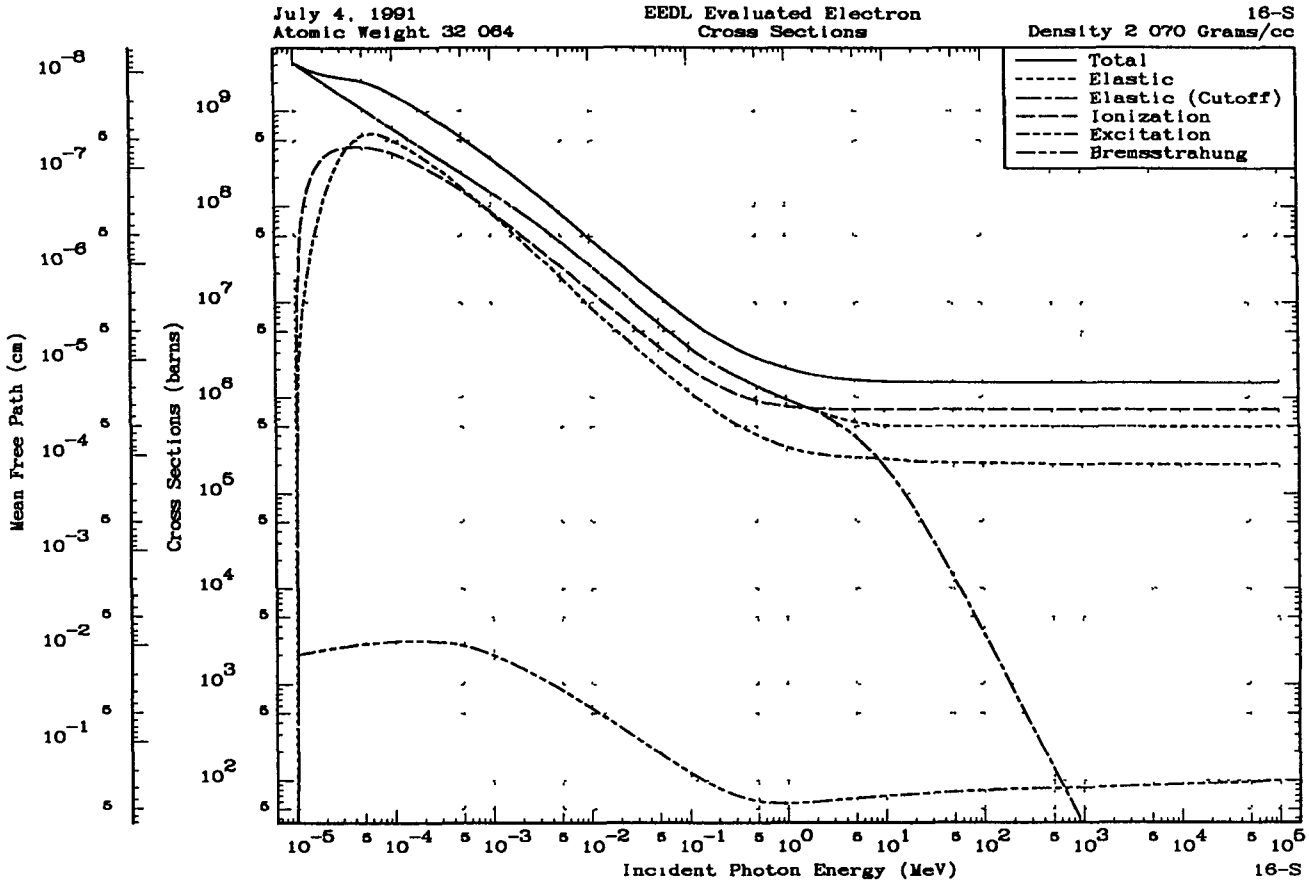
EEDL Evaluated Electron
Shell Cross Sections
15-P
Density 2.200 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
15-P

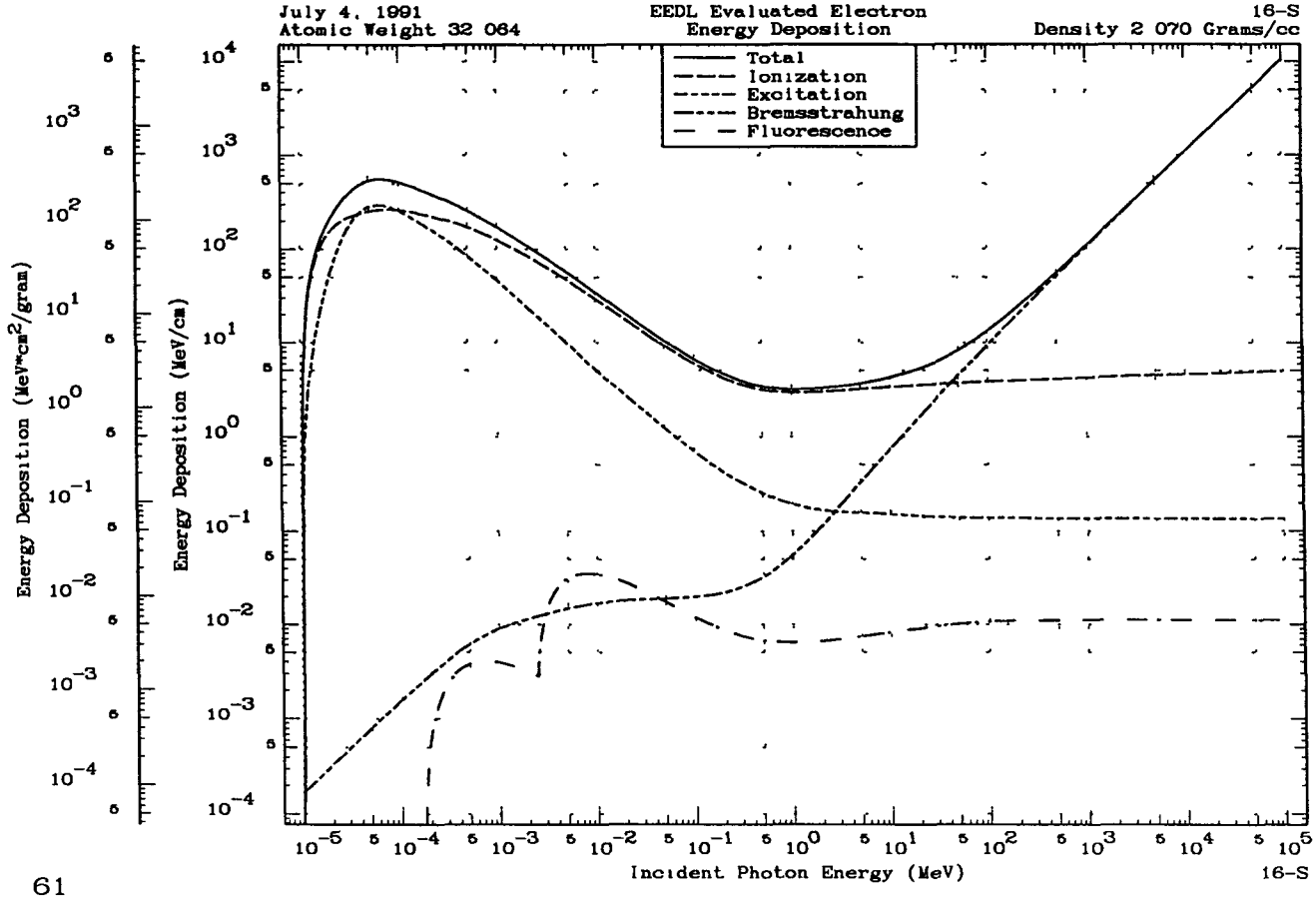

July 4, 1991
Atomic Weight 30.974
EEDL Evaluated Electron
Energy Deposition
15-P
Density 2.200 Grams/cc
Ionization
K Shell
L Shell
M Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
15-P

Atomic Weight 30.974 Density 2.200 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.4521–9	7.0449+7		3.6234+9	3.5301+9	8.5947+7	7.4365+6	1.8722+3	3.4965+1	3.2186+1	2.7789+0	1.7244–4
	1.1250–5	6.8514–9	6.6344+7		3.4123+9	3.2483+9	1.4654+8	1.7426+7	1.9143+3	6.3380+1	5.6691+1	6.6888+0	1.9280–4
	1.2187–5	7.1187–9	6.3852+7		3.2841+9	3.0699+9	1.8757+8	2.6652+7	1.9434+3	8.4740+1	7.4306+1	1.0434+1	2.0828–4
	1.3594–5	7.4875–9	6.0707+7		3.1224+9	2.8419+9	2.3863+8	4.1784+7	1.9839+3	1.1426+2	9.7429+1	1.6835+1	2.3185–4
	1.5000–5	7.8271–9	5.8073+7		2.9869+9	2.6511+9	2.7819+8	5.7590+7	2.0211+3	1.4046+2	1.1660+2	2.3862+1	2.5578–4
	1.6250–5	8.1067–9	5.6070+7		2.8839+9	2.5054+9	3.0583+8	7.2634+7	2.0518+3	1.6132+2	1.3076+2	3.0559+1	2.7735–4
M1	1.7210–5	8.3109–9	5.4693+7		2.8130+9	2.4059+9	3.2136+8	8.5786+7	2.0742+3	1.7599+2	1.3948+2	3.6513+1	2.9409–4
	1.7384–5	8.3465–9	5.4459+7		2.8010+9	2.3888+9	3.2413+8	8.8065+7	2.0781+3	1.7867+2	1.4113+2	3.7541+1	2.9714–4
	1.7711–5	8.4117–9	5.4037+7		2.7793+9	2.3576+9	3.2928+8	9.2438+7	2.0854+3	1.8375+2	1.4423+2	3.9519+1	3.0289–4
	1.8283–5	8.5204–9	5.3348+7		2.7438+9	2.3052+9	3.3818+8	1.0041+8	2.0980+3	1.9278+2	1.4963+2	4.3143+1	3.1298–4
	1.9142–5	8.6711–9	5.2421+7		2.6962+9	2.2318+9	3.5128+8	1.1313+8	2.1162+3	2.0669+2	1.5772+2	4.8977+1	3.2822–4
	2.0000–5	8.8068–9	5.1613+7		2.6546+9	2.1637+9	3.6412+8	1.2680+8	2.1338+3	2.2109+2	1.6578+2	5.5307+1	3.4356–4
	2.1250–5	9.0154–9	5.0419+7		2.5932+9	2.0730+9	3.7431+8	1.4587+8	2.1536+3	2.3725+2	1.7333+2	6.3920+1	3.6369–4
	2.3438–5	9.3203–9	4.8770+7		2.5084+9	1.9344+9	3.9102+8	1.8292+8	2.1860+3	2.6704+2	1.8623+2	8.0811+1	3.9924–4
	2.5000–5	9.4934–9	4.7880+7		2.4626+9	1.8483+9	4.0205+8	2.1233+8	2.2076+3	2.8948+2	1.9513+2	9.4348+1	4.2489–4
	2.6719–5	9.6801–9	4.6957+7		2.4151+9	1.7635+9	4.0825+8	2.4341+8	2.2301+3	3.1069+2	2.0184+2	1.0884+2	4.5333–4
	3.0000–5	9.9774–9	4.5558+7		2.3432+9	1.6250+9	4.1876+8	2.9946+8	2.2699+3	3.4958+2	2.1407+2	1.3551+2	5.0826–4
	3.5000–5	1.0306–8	4.4106+7		2.2685+9	1.4577+9	4.2397+8	3.8683+8	2.3226+3	4.0177+2	2.2612+2	1.7564+2	5.9256–4
	4.0000–5	1.0537–8	4.3137+7		2.2187+9	1.3268+9	4.2817+8	4.6373+8	2.3692+3	4.4898+2	2.3771+2	2.1126+2	6.7841–4
	5.0000–5	1.0955–8	4.1494+7		2.1342+9	1.1338+9	4.2183+8	5.7854+8	2.4314+3	5.1595+2	2.5041+2	2.6554+2	8.3960–4
	6.0000–5	1.1391–8	3.9904+7		2.0524+9	9.9713+8	4.0910+8	6.4613+8	2.4763+3	5.5415+2	2.5671+2	2.9743+2	9.9748–4
	7.0000–5	1.1885–8	3.8245+7		1.9671+9	8.9465+8	3.9295+8	6.7947+8	2.5149+3	5.7167+2	2.5780+2	3.1387+2	1.1576–3
	8.0000–5	1.2491–8	3.6390+7		1.8717+9	8.1443+8	3.7900+8	6.7822+8	2.5489+3	5.7357+2	2.5920+2	3.1438+2	1.3198–3
	1.0000–4	1.3833–8	3.2860+7	0.0000+0	1.6901+9	6.9657+8	3.4937+8	6.4416+8	2.5849+3	5.5477+2	2.5473+2	3.0004+2	1.6260–3
	1.2500–4	1.5789–8	2.8789+7	4.7014–8	1.4807+9	5.9576+8	3.1497+8	5.6999+8	2.6009+3	5.0939+2	2.4271+2	2.6668+2	1.9874–3
L3	1.3818–4	1.6855–8	2.6968+7	7.3465–8	1.3871+9	5.5536+8	3.0068+8	5.3102+8	2.6082+3	4.8733+2	2.3830+2	2.4903+2	2.1786–3
	1.3892–4	1.6913–8	2.6876+7	7.4983–8	1.3823+9	5.5329+8	2.9988+8	5.2916+8	2.6085+3	4.8624+2	2.3806+2	2.4818+2	2.1893–3
L2	1.3914–4	1.6930–8	2.6849+7	7.5437–8	1.3809+9	5.5267+8	2.9965+8	5.2860+8	2.6086+3	4.8591+2	2.3798+2	2.4793+2	2.1925–3
	1.4030–4	1.7017–8	2.6711+7	7.7837–8	1.3738+9	5.4946+8	2.9842+8	5.2595+8	2.6093+3	4.8441+2	2.3767+2	2.4673+2	2.2095–3
	1.4050–4	1.7032–8	2.6688+7	7.8237–8	1.3727+9	5.4893+8	2.9822+8	5.2552+8	2.6094+3	4.8416+2	2.3762+2	2.4654+2	2.2123–3
	1.4152–4	1.7108–8	2.6570+7	8.0343–8	1.3666+9	5.4616+8	2.9717+8	5.2323+8	2.6099+3	4.8288+2	2.3737+2	2.4551+2	2.2271–3
	1.4168–4	1.7120–8	2.6550+7	8.0693–8	1.3655+9	5.4570+8	2.9699+8	5.2286+8	2.6100+3	4.8266+2	2.3733+2	2.4534+2	2.2295–3
	1.4364–4	1.7266–8	2.6327+7	8.4747–8	1.3541+9	5.4049+8	2.9502+8	5.1856+8	2.6109+3	4.8030+2	2.3690+2	2.4340+2	2.2579–3
	1.4376–4	1.7275–8	2.6312+7	8.5011–8	1.3533+9	5.4016+8	2.9489+8	5.1828+8	2.6110+3	4.8015+2	2.3687+2	2.4327+2	2.2598–3
	1.4688–4	1.7505–8	2.5966+7	9.1530–8	1.3355+9	5.3210+8	2.9181+8	5.1162+8	2.6126+3	4.7647+2	2.3620+2	2.4027+2	2.3051–3
	1.5000–4	1.7733–8	2.5632+7	9.8098–8	1.3184+9	5.2433+8	2.8885+8	5.0518+8	2.6141+3	4.7306+2	2.3569+2	2.3736+2	2.3505–3
	1.6250–4	1.8660–8	2.4360+7	1.2495–7	1.2529+9	4.9574+8	2.7640+8	4.8076+8	2.6185+3	4.5796+2	2.3175+2	2.2621+2	2.5308–3
	1.7188–4	1.9337–8	2.3506+7	1.4565–7	1.2090+9	4.7664+8	2.6800+8	4.6436+8	2.6216+3	4.4791+2	2.2919+2	2.1872+2	2.6663–3
	1.8125–4	2.0001–8	2.2726+7	1.6679–7	1.1689+9	4.5923+8	2.6031+8	4.4934+8	2.6245+3	4.3892+2	2.2705+2	2.1187+2	2.8018–3
L1	1.8715–4	2.0412–8	2.2269+7	1.8032–7	1.1453+9	4.4904+8	2.5579+8	4.4052+8	2.6263+3	4.3374+2	2.2588+2	2.0785+2	2.8872–3
	1.9036–4	2.0640–8	2.2023+7	1.8775–7	1.1327+9	4.4372+8	2.5343+8	4.3556+8	2.6221+3	4.3091+2	2.2531+2	2.0560+2	2.9263–3
	2.0000–4	2.1315–8	2.1325+7	2.1032–7	1.0968+9	4.2863+8	2.4672+8	4.2147+8	2.6101+3	4.2316+2	2.2395+2	1.9920+2	3.0433–3
	2.1250–4	2.2221–8	2.0455+7	2.4029–7	1.0521+9	4.1084+8	2.3764+8	4.0360+8	2.5955+3	4.1106+2	2.2010+2	1.9096+2	3.1944–3
	2.2500–4	2.3110–8	1.9669+7	2.7109–7	1.0116+9	3.9476+8	2.2943+8	3.8745+8	2.5818+3	4.0049+2	2.1698+2	1.8350+2	3.3448–3
	2.3438–4	2.3766–8	1.9126+7	2.9472–7	9.8370+8	3.8365+8	2.2373+8	3.7631+8	2.5720+3	3.9309+2	2.1472+2	1.7837+2	3.4571–3
	2.4375–4	2.4414–8	1.8618+7	3.1878–7	9.5759+8	3.7328+8	2.1840+8	3.6591+8	2.5627+3	3.8628+2	2.1270+2	1.7357+2	3.5690–3
	2.6250–4	2.5687–8	1.7696+7	3.6811–7	9.1015+8	3.5444+8	2.0867+8	3.4704+8	2.5451+3	3.7399+2	2.0912+2	1.6487+2	3.7919–3
	2.6719–4	2.6000–8	1.7482+7	3.8069–7	8.9918+8	3.5008+8	2.0641+8	3.4268+8	2.5409+3	3.7118+2	2.0831+2	1.6287+2	3.8474–3
	2.7188–4	2.6312–8	1.7275+7	3.9337–7	8.8852+8	3.4585+8	2.0422+8	3.3845+8	2.5368+3	3.6845+2	2.0753+2	1.6092+2	3.9028–3
	3.0000–4	2.8148–8	1.6148+7	4.7127–7	8.3056+8	3.2286+8	1.9224+8	3.1546+8	2.5138+3	3.5371+2	2.0337+2	1.5033+2	4.2338–3
	3.5000–4	3.1551–8	1.4407+7	6.1841–7	7.4098+8	2.9006+8	1.7328+8	2.7764+8	2.4691+3	3.2626+2	1.9354+2	1.3271+2	4.7940–3
	4.0000–4	3.4827–8	1.3051+7	7.7689–7	6.7128+8	2.6435+8	1.5835+8	2.4857+8	2.4310+3	3.0500+2	1.8584+2	1.1916+2	5.3458–3
	4.5000–4	3.8085–8	1.1935+7	9.4625–7	6.1386+8	2.4359+8	1.4564+8	2.2463+8	2.3597+3	2.8566+2	1.7771+2	1.0794+2	5.7757–3
	5.0000–4	4.1251–8	1.1019+7	1.1262–6	5.6675+8	2.2640+8	1.3517+8	2.0517+8	2.2977+3	2.7020+2	1.7137+2	9.8820+1	6.1953–3
	6.0000–4	4.7530–8	9.5633+6	1.5158–6	4.9187+8	1.9948+8	1.1828+8	1.7411+8	2.1943+3	2.4357+2	1.5938+2	8.4188+1	7.0075–3
	7.0000–4	5.3736–8	8.4589+6	1.9461–6	4.3507+8	1.7927+8	1.0525+8	1.5055+8	2.0817+3	2.2163+2	1.4859+2	7.3027+1	7.6243–3
	8.0000–4	5.9744–8	7.6082+6	2.4150–6	3.9131+8	1.6342+8	9.5153+7	1.3274+8	1.9888+3	2.0505+2	1.4045+2	6.4588+1	8.2171–3
	1.0000–3	7.1290–8	6.3760+6	3.4585–6	3.2794+8	1.4010+8	7.9980+7	1.0786+8	1.8175+3	1.7890+2	1.2614+2	5.2744+1	9.1260–3
	1.2500–3	8.5070–8	5.3432+6	4.9584–6	2.7482+8	1.2000+8	6.6916+7	8.7902+7	1.6381+3	1.5503+2	1.1183+2	4.3185+1	9.8416–3
	1.5000–3	9.8244–8	4.6267+6	6.6625–6	2.3797+8	1.0574+8	5.7857+7	7.4371+7	1.5047+3	1.3868+2	1.0196+2	3.6706+1	1.0525–2
	2.0000–3	1.2355–7	3.6789+6	1.0618–5	1.8922+8	8.6194+7	4.5705+7	5.7320+7	1.3060+3	1.1487+2	8.6377+1	2.8479+1	1.1554–2
K	2.1304–3	1.3004–7	3.4954+6	1.1778–5	1.7978+8	8.2243+7	4.3369+7	5.4166+7	1.2648+3	1.1003+2	8.3076+1	2.6945+1	1.1788–2
	2.1847–3	1.3277–7	3.4236+6	1.2276–5	1.7609+8	8.0695+7	4.2465+7	5.2926+7	1.2479+3	1.0813+2	8.1772+1	2.6342+1	1.1867–2
	2.2867–3	1.3785–7	3.2975+6	1.3234–5	1.6960+8	7.7966+7	4.0879+7	5.0754+7	1.2179+3	1.0478+2	7.9480+1	2.5285+1	1.2015–2
	2.3758–3	1.4226–7	3.1952+6	1.4096–5	1.6434+8	7.5747+7	3.9594+7	4.9000+7	1.1933+3	1.0207+2	7.7624+1	2.4433+1	1.2143–2
	2.5319–3	1.4990–7	3.0323+6	1.5658–5	1.5596+8	7.2197+7	3.7546+7	4.6217+7	1.1535+3	9.7758+1	7.4667+1	2.3079+1	1.2365–2
	2.7659–3	1.6121–7	2.8196+6	1.8124–5	1.4502+8	6.7537+7	3.4876+7	4.2609+7	1.1003+3	9.2148+1	7.0810+1	2.1326+1	1.2694–2
	3.0000–3	1.7234–7	2.6375+6	2.0732–5	1.3566+8	6.3521+7	3.2591+7	3.9543+7	1.0536+3	8.7360+1	6.7512+1	1.9836+1	1.3015–2
	3.2500–3	1.8446–7	2.4642+6	2.3676–5	1.2674+8	5.9637+7	3.0457+7	3.6648+7	1.0068+3	8.2507+1	6.4079+1	1.8415+1	1.3270–2
	3.6250–3	2.0237–7	2.2461+6	2.8398–5	1.1553+8	5.4719+7	2.7769+7	3.3037+7	9.4632+2	7.6407+1	5.9750+1	1.6643+1	1.3647–2
	4.0000–3	2.1999–7	2.0662+6	3.3475–5	1.0627+8	5.0633+7	2.5551+7	3.0088+7	8.9490+2	7.1382+1	5.6172+1	1.5196+1	1.4016–2
	4.5000–3	2.4386–7	1.8640+6	4.0785–5	9.5871+7	4.5964+7	2.3108+7	2.6799+7	8.3440+2	6.5507+1	5.1921+1	1.3571+1	1.4383–2
	5.0000–3	2.6738–7	1.7000+6	4.8710–5	8.7438+7	4.2153+7	2.1122+7	2.4162+7	7.8375+2	6.0739+1	4.8456+1	1.2268+1	1.4745–2
	6.0000–3	3.1444–7	1.4456+6	6.6304–5	7.4350+7	3.6175+7	1.8066+7	2.0108+7	7.0024+2	5.3106+1	4.2835+1	1.0255+1	1.5267–2
	8.0000–3	4.0764–7	1.1151+6	1.0817–4	5.7352+7	2.8315+7	1.4106+7	1.4929+7	5.8330+2	4.2803+1	3.5120+1	7.6676+0	1.6051–2
	1.0000–2	5.0013–7	9.0886+5	1.5900–4	4.6746+7	2.3341+7	1.1631+7	1.1773+7	5.0378+2	3.6086+1	2.9989+1	6.0799+0	1.6568–2
	1.1250–2	5.5700–7	8.1607+5	1.9524–4	4.1973+7	2.1042+7	1.0506+7	1.0424+7	4.6494+2	3.2938+1	2.7524+1	5.3969+0	1.6713–2
	1.5000–2	7.1626–7	6.3461+5	3.2150–4	3.2640+7	1.6335+7	8.1953+6	8.1096+6	3.8219+2	2.6686+1	2.2439+1	4.2302+0	1.7247–2
	2.0000–2	9.2653–7	4.9059+5	5.2968–4	2.5233+7	1.2589+7	6.4008+6	6.2425+6	3.1256+2	2.1533+1	1.8235+1	3.2801+0	1.7607–2
	3.0000–2	1.3314–6	3.4140+5	1.0676–3	1.7559+7	8.7043+6	4.5383+6	4.3166+6	2.3492+2	1.5930+1	1.3620+1	2.2918+0	1.7905–2

Atomic Weight 30.974												Density 2.200 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000–2	1.7075–6	2.6621+5	1.7629–3	1.3692+7	6.7365+6	3.5750+6	3.3802+6	1.9266+2	1.2940+1	1.1113+1	1.8080+0	1.8087–2
5.0000–2	2.0610–6	2.2055+5	2.5983–3	1.1343+7	5.5609+6	2.9846+6	2.7976+6	1.6539+2	1.1049+1	9.5262+0	1.5050+0	1.8226–2
6.0000–2	2.3932–6	1.8993+5	3.5615–3	9.7687+6	4.7794+6	2.5852+6	2.4040+6	1.4655+2	9.7425+0	8.4248+0	1.2993+0	1.8382–2
8.0000–2	3.0011–6	1.5146+5	5.8158–3	7.7900+6	3.8011+6	2.0787+6	1.9101+6	1.2198+2	8.0546+0	6.9959+0	1.0400+0	1.8701–2
1.0000–1	3.5513–6	1.2799+5	8.4785–3	6.5832+6	3.2176+6	1.7709+6	1.5946+6	1.0628+2	6.9928+0	6.1005+0	8.7318–1	1.9052–2
1.5000–1	4.7079–6	9.6549+4	1.6495–2	4.9658+6	2.4425+6	1.3565+6	1.1667+6	8.3873+1	5.5373+0	4.8718+0	6.4545–1	2.0087–2
2.0000–1	5.6398–6	8.0597+4	2.6188–2	4.1453+6	2.0464+6	1.1487+6	9.5012+5	7.2293+1	4.7971+0	4.2464+0	5.2950–1	2.1285–2
3.0000–1	7.0797–6	6.4204+4	4.8803–2	3.3022+6	1.6221+6	9.4285+5	7.3719+5	6.1146+1	4.0669+0	3.6277+0	4.1513–1	2.4154–2
4.0000–1	8.1809–6	5.5562+4	7.4502–2	2.8577+6	1.3839+6	8.4262+5	6.3108+5	5.6076+1	3.7206+0	3.3351+0	3.5807–1	2.7480–2
5.0000–1	9.0463–6	5.0247+4	1.0208–1	2.5844+6	1.2281+6	7.8461+5	5.7156+5	5.3380+1	3.5342+0	3.1768+0	3.2625–1	3.1121–2
6.0000–1	9.7672–6	4.6538+4	1.3084–1	2.3936+6	1.1188+6	7.4746+5	5.2726+5	5.1965+1	3.4198+0	3.0822+0	3.0246–1	3.5111–2
8.0000–1	1.0848–5	4.1900+4	1.9025–1	2.1550+6	9.7118+5	7.0389+5	4.7991+5	5.0813+1	3.3132+0	2.9919+0	2.7750–1	4.3856–2
1.0000+0	1.1648–5	3.9023+4	2.5097–1	2.0071+6	8.7552+5	6.8018+5	4.5132+5	5.0578+1	3.2745+0	2.9586+0	2.6257–1	5.3362–2
1.5000+0	1.2951–5	3.5096+4	4.0277–1	1.8051+6	7.3699+5	6.5501+5	4.1305+5	5.1411+1	3.3133+0	2.9904+0	2.4293–1	7.9914–2
2.0000+0	1.3727–5	3.3113+4	5.5233–1	1.7031+6	6.6076+5	6.4753+5	3.9479+5	5.2668+1	3.3731+0	3.0305+0	2.3339–1	1.0914–1
3.0000+0	1.4669–5	3.0986+4	8.4299–1	1.5937+6	5.7992+5	6.3757+5	3.7616+5	5.4939+1	3.5088+0	3.1107+0	2.2476–1	1.7330–1
4.0000+0	1.5187–5	2.9931+4	1.1228+0	1.5394+6	5.3711+5	6.3684+5	3.6543+5	5.6524+1	3.6385+0	3.1761+0	2.1883–1	2.4361–1
5.0000+0	1.5511–5	2.9305+4	1.3930+0	1.5072+6	5.1128+5	6.3630+5	3.5960+5	5.7784+1	3.7655+0	3.2339+0	2.1581–1	3.1581–1
6.0000+0	1.5724–5	2.8908+4	1.6544+0	1.4868+6	4.9567+5	6.3581+5	3.5528+5	5.8805+1	3.8854+0	3.2806+0	2.1369–1	3.9108–1
8.0000+0	1.6012–5	2.8389+4	2.1543+0	1.4601+6	4.7730+5	6.3521+5	3.4755+5	6.0407+1	4.1188+0	3.3607+0	2.0997–1	5.4818–1
1.0000+1	1.6175–5	2.8102+4	2.6271+0	1.4454+6	4.6931+5	6.3589+5	3.4014+5	6.1572+1	4.3435+0	3.4270+0	2.0641–1	7.1002–1
1.5000+1	1.6329–5	2.7836+4	3.7163+0	1.4317+6	4.6556+5	6.3662+5	3.2947+5	6.3401+1	4.8467+0	3.5134+0	1.9999–1	1.1332+0
2.0000+1	1.6416–5	2.7689+4	4.6971+0	1.4241+6	4.6357+5	6.3715+5	3.2333+5	6.4629+1	5.3579+0	3.5897+0	1.9632–1	1.5718+0
3.0000+1	1.6488–5	2.7569+4	6.4112+0	1.4180+6	4.6283+5	6.3721+5	3.1786+5	6.6184+1	6.3374+0	3.6667+0	1.9311–1	2.4776+0
4.0000+1	1.6512–5	2.7529+4	7.8772+0	1.4159+6	4.6280+5	6.3744+5	3.1560+5	6.7237+1	7.3294+0	3.7241+0	1.9185–1	3.4134+0
5.0000+1	1.6528–5	2.7502+4	9.1560+0	1.4145+6	4.6278+5	6.3760+5	3.1405+5	6.7954+1	8.3309+0	3.7749+0	1.9102–1	4.3650+0
6.0000+1	1.6531–5	2.7496+4	1.0289+1	1.4142+6	4.6276+5	6.3771+5	3.1366+5	6.8545+1	9.3361+0	3.8191+0	1.9089–1	5.3262+0
8.0000+1	1.6541–5	2.7480+4	1.2230+1	1.4134+6	4.6274+5	6.3778+5	3.1278+5	6.9471+1	1.1340+1	3.8745+0	1.9057–1	7.2752+0
1.0000+2	1.6552–5	2.7462+4	1.3853+1	1.4125+6	4.6272+5	6.3782+5	3.1185+5	7.0204+1	1.3366+1	3.9244+0	1.9022–1	9.2514+0
1.5000+2	1.6568–5	2.7435+4	1.7024+1	1.4111+6	4.6268+5	6.3785+5	3.1046+5	7.1529+1	1.8435+1	3.9760+0	1.8937–1	1.4270+1
2.0000+2	1.6583–5	2.7410+4	1.9418+1	1.4098+6	4.6265+5	6.3788+5	3.0921+5	7.2318+1	2.3541+1	4.0260+0	1.8861–1	1.9326+1
3.0000+2	1.6599–5	2.7384+4	2.2947+1	1.4085+6	4.6262+5	6.3790+5	3.0788+5	7.2884+1	3.3757+1	4.1124+0	1.8780–1	2.9457+1
4.0000+2	1.6610–5	2.7366+4	2.5534+1	1.4075+6	4.6259+5	6.3790+5	3.0697+5	7.3162+1	4.3990+1	4.1439+0	1.8726–1	3.9659+1
5.0000+2	1.6621–5	2.7348+4	2.7577+1	1.4066+6	4.6257+5	6.3790+5	3.0603+5	7.3357+1	5.4257+1	4.1752+0	1.8668–1	4.9895+1
6.0000+2	1.6622–5	2.7346+4	2.9266+1	1.4065+6	4.6255+5	6.3791+5	3.0597+5	7.3605+1	6.4439+1	4.2064+0	1.8665–1	6.0046+1
8.0000+2	1.6625–5	2.7341+4	3.1962+1	1.4062+6	4.6253+5	6.3791+5	3.0573+5	7.4056+1	8.4914+1	4.2611+0	1.8651–1	8.0466+1
1.0000+3	1.6627–5	2.7337+4	3.4070+1	1.4060+6	4.6251+5	6.3791+5	3.0556+5	7.4468+1	1.0554+2	4.3158+0	1.8641–1	1.0104+2
1.5000+3	1.6628–5	2.7335+4	3.7931+1	1.4059+6	4.6247+5	6.3791+5	3.0549+5	7.5336+1	1.5683+2	4.3609+0	1.8637–1	1.5228+2
2.0000+3	1.6630–5	2.7332+4	4.0689+1	1.4058+6	4.6245+5	6.3791+5	3.0535+5	7.6000+1	2.0813+2	4.4059+0	1.8628–1	2.0354+2
3.0000+3	1.6630–5	2.7333+4	4.4595+1	1.4058+6	4.6241+5	6.3791+5	3.0542+5	7.7038+1	3.1079+2	4.4960+0	1.8632–1	3.0611+2
4.0000+3	1.6632–5	2.7330+4	4.7373+1	1.4057+6	4.6238+5	6.3791+5	3.0528+5	7.7832+1	4.1400+2	4.5247+0	1.8624–1	4.0929+2
5.0000+3	1.6638–5	2.7320+4	4.9528+1	1.4051+6	4.6236+5	6.3791+5	3.0479+5	7.8453+1	5.1812+2	4.5534+0	1.8594–1	5.1338+2
6.0000+3	1.6635–5	2.7325+4	5.1290+1	1.4054+6	4.6235+5	6.3791+5	3.0507+5	7.8980+1	6.2017+2	4.5821+0	1.8611–1	6.1540+2
8.0000+3	1.6634–5	2.7326+4	5.4075+1	1.4054+6	4.6232+5	6.3791+5	3.0514+5	7.9818+1	8.2600+2	4.6395+0	1.8615–1	8.2118+2
1.0000+4	1.6635–5	2.7325+4	5.6234+1	1.4054+6	4.6230+5	6.3791+5	3.0514+5	8.0475+1	1.0337+3	4.6930+0	1.8615–1	1.0288+3
1.5000+4	1.6633–5	2.7327+4	6.0168+1	1.4055+6	4.6227+5	6.3791+5	3.0528+5	8.1774+1	1.5422+3	4.7337+0	1.8624–1	1.5373+3
2.0000+4	1.6634–5	2.7326+4	6.2966+1	1.4054+6	4.6224+5	6.3791+5	3.0521+5	8.2709+1	2.0573+3	4.7743+0	1.8619–1	2.0524+3
3.0000+4	1.6633–5	2.7328+4	6.6913+1	1.4056+6	4.6220+5	6.3791+5	3.0535+5	8.4023+1	3.0772+3	4.8556+0	1.8628–1	3.0721+3
4.0000+4	1.6634–5	2.7326+4	6.9716+1	1.4054+6	4.6218+5	6.3791+5	3.0528+5	8.4967+1	4.1080+3	4.9123+0	1.8624–1	4.1029+3
5.0000+4	1.6640–5	2.7316+4	7.1890+1	1.4049+6	4.6216+5	6.3791+5	3.0478+5	8.5692+1	5.1293+3	4.9385+0	1.8594–1	5.1242+3
6.0000+4	1.6638–5	2.7320+4	7.3668+1	1.4051+6	4.6214+5	6.3791+5	3.0500+5	8.6284+1	6.1497+3	4.9648+0	1.8607–1	6.1446+3
8.0000+4	1.6637–5	2.7322+4	7.6473+1	1.4052+6	4.6211+5	6.3791+5	3.0514+5	8.7226+1	8.2084+3	5.0172+0	1.8615–1	8.2032+3
1.0000+5	1.6637–5	2.7321+4	7.8647+1	1.4052+6	4.6210+5	6.3791+5	3.0514+5	8.7957+1	1.0271+4	5.0696+0	1.8615–1	1.0265+4


July 4, 1991
Atomic Weight 32 064
EEDL Evaluated Electron
Cross Sections
16-S
Density 2 070 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
16-S


July 4, 1991
Atomic Weight 32 064
EEDL Evaluated Electron
Energy Deposition
16-S
Density 2 070 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
16-S

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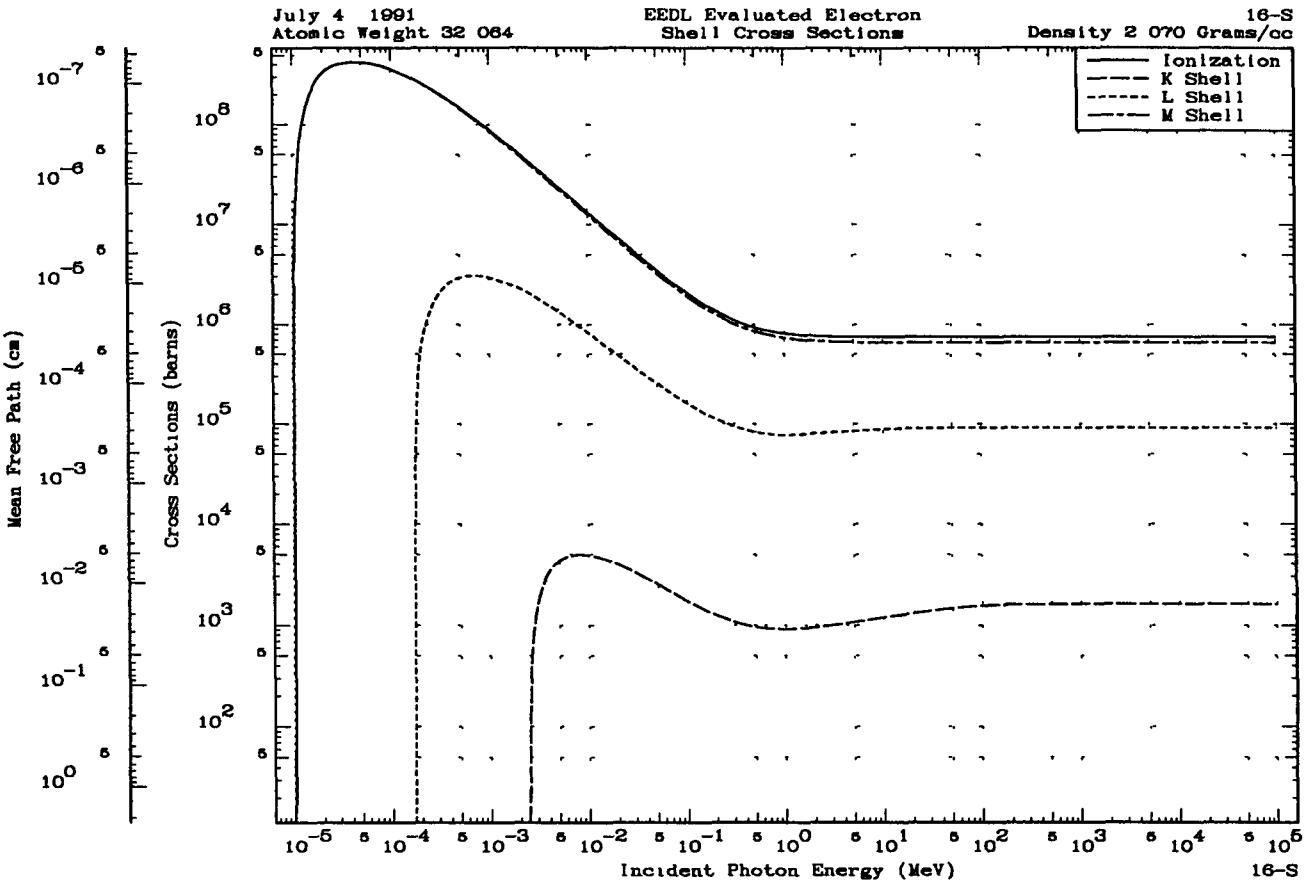
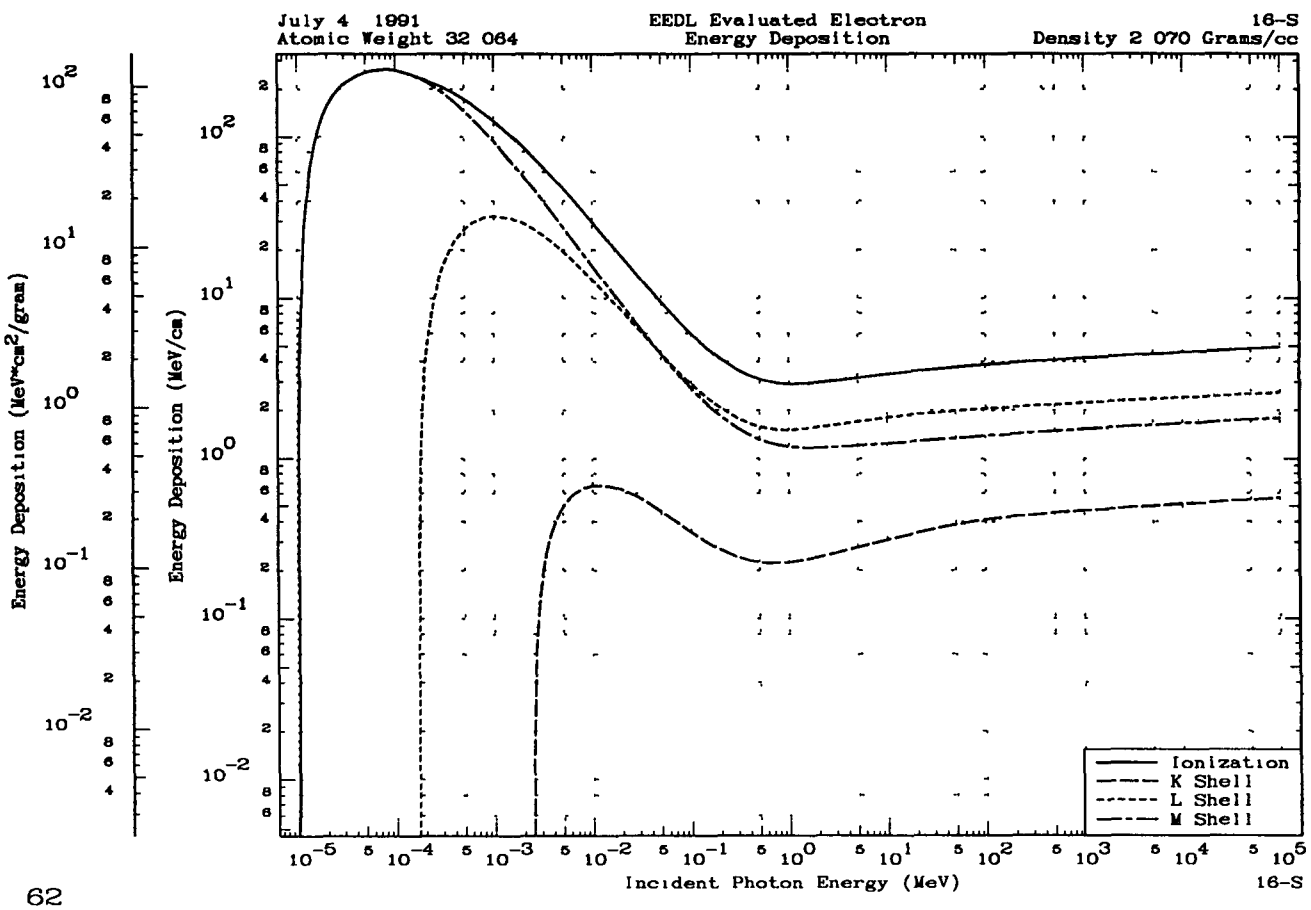

July 4 1991
Atomic Weight 32 064
EEDL Evaluated Electron
Shell Cross Sections
16-S
Density 2 070 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
16-S


July 4 1991
Atomic Weight 32 064
EEDL Evaluated Electron
Energy Deposition
16-S
Density 2 070 Grams/cc
Ionization
K Shell
L Shell
M Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
16-S

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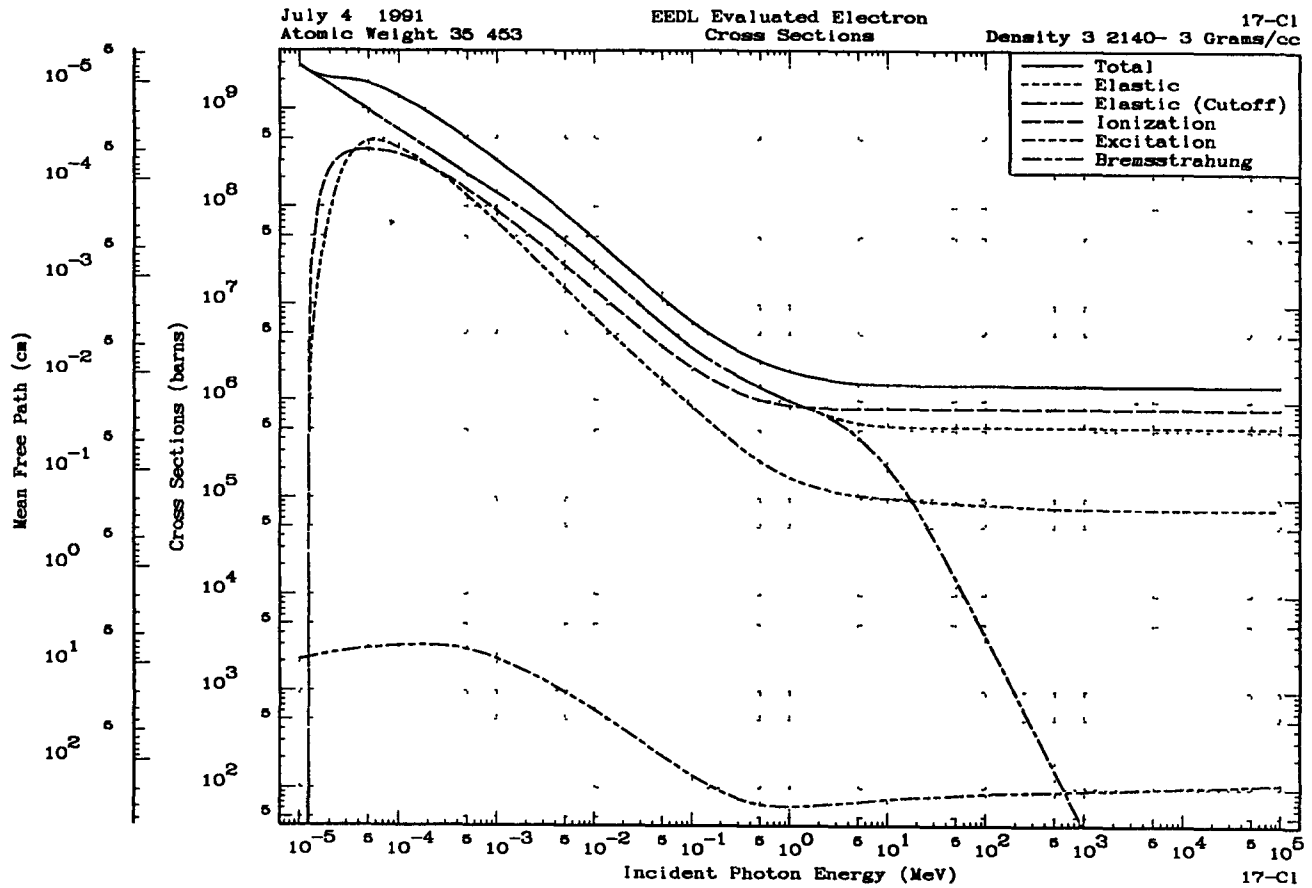
Atomic Weight 32.064 Density 2.070 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.0350–9	6.0124+7		3.2012+9	3.2012+9			2.0022+3	1.6763–4			1.6763–4
M3	1.0250–5	8.1719–9	5.9116+7		3.1475+9	3.1475+9	0.0000+0	0.0000+0	2.0116+3	1.7157–4	0.0000+0	0.0000+0	1.7157–4
M2	1.0340–5	8.2129–9	5.8821+7		3.1319+9	3.1288+9	2.8679+6	2.1198+5	2.0149+3	1.2303+0	1.1454+0	8.4781–2	1.7299–4
	1.0547–5	8.2979–9	5.8219+7		3.0998+9	3.0866+9	1.2564+7	5.6871+5	2.0225+3	5.2800+0	5.0513+0	2.2848–1	1.7626–4
	1.0631–5	8.3355–9	5.7956+7		3.0858+9	3.0699+9	1.5080+7	8.4551+5	2.0256+3	6.4173+0	6.0768+0	3.4030–1	1.7760–4
	1.0844–5	8.4296–9	5.7309+7		3.0513+9	3.0285+9	2.0559+7	2.2692+6	2.0332+3	9.2449+0	8.3273+0	9.1749–1	1.8097–4
	1.0922–5	8.4629–9	5.7083+7		3.0393+9	3.0137+9	2.2998+7	2.6421+6	2.0359+3	1.0403+1	9.3324+0	1.0701+0	1.8221–4
	1.1660–5	8.7131–9	5.5444+7		2.9520+9	2.8817+9	6.3967+7	6.3356+6	2.0612+3	2.9021+1	2.6414+1	2.6066+0	1.9402–4
	1.1723–5	8.7333–9	5.5316+7		2.9452+9	2.8711+9	6.7327+7	6.8105+6	2.0634+3	3.0649+1	2.7843+1	2.8057+0	1.9503–4
	1.1883–5	8.7903–9	5.4957+7		2.9261+9	2.8446+9	7.3311+7	8.1604+6	2.0686+3	3.3797+1	3.0424+1	3.3731+0	1.9760–4
	1.1942–5	8.8112–9	5.4827+7		2.9192+9	2.8350+9	7.5634+7	8.5535+6	2.0706+3	3.4969+1	3.1429+1	3.5400+0	1.9855–4
	1.2495–5	8.9904–9	5.3734+7		2.8610+9	2.7485+9	1.0061+8	1.1880+7	2.0884+3	4.7286+1	4.2312+1	4.9737+0	2.0749–4
	1.3362–5	9.2431–9	5.2265+7		2.7828+9	2.6252+9	1.3824+8	1.9324+7	2.1150+3	6.7475+1	5.9239+1	8.2359+0	2.2163–4
	1.3471–5	9.2728–9	5.2098+7		2.7739+9	2.6106+9	1.4275+8	2.0501+7	2.1183+3	7.0068+1	6.1311+1	8.7568+0	2.2342–4
	1.3748–5	9.3465–9	5.1687+7		2.7520+9	2.5745+9	1.5467+8	2.2795+7	2.1265+3	7.6601+1	6.6809+1	9.7914+0	2.2796–4
	1.5000–5	9.6576–9	5.0022+7		2.6634+9	2.4254+9	2.0202+8	3.5929+7	2.1618+3	1.0522+2	8.9394+1	1.5824+1	2.4872–4
	1.6250–5	9.9308–9	4.8646+7		2.5901+9	2.2961+9	2.4204+8	5.1938+7	2.1948+3	1.3275+2	1.0948+2	2.3270+1	2.6970–4
	1.8125–5	1.0279–8	4.6996+7		2.5022+9	2.1307+9	2.8979+8	8.1704+7	2.2406+3	1.7247+2	1.3493+2	3.7539+1	3.0165–4
	2.0000–5	1.0568–8	4.5714+7		2.4340+9	1.9919+9	3.2470+8	1.1740+8	2.2827+3	2.1023+2	1.5495+2	5.5281+1	3.3413–4
M1	2.0950–5	1.0704–8	4.5131+7		2.4029+9	1.9296+9	3.3724+8	1.3609+8	2.3019+3	2.2729+2	1.6267+2	6.4615+1	3.5035–4
	2.1233–5	1.0740–8	4.4981+7		2.3950+9	1.9120+9	3.4128+8	1.4168+8	2.3065+3	2.3262+2	1.6526+2	6.7366+1	3.5476–4
	2.1781–5	1.0803–8	4.4718+7		2.3809+9	1.8789+9	3.4907+8	1.5295+8	2.3153+3	2.4320+2	1.7027+2	7.2924+1	3.6332–4
	2.2500–5	1.0874–8	4.4425+7		2.3653+9	1.8376+9	3.5911+8	1.6862+8	2.3266+3	2.5748+2	1.7679+2	8.0688+1	3.7459–4
	2.2808–5	1.0908–8	4.4289+7		2.3581+9	1.8206+9	3.6190+8	1.7564+8	2.3313+3	2.6298+2	1.7880+2	8.4180+1	3.7943–4
	2.4606–5	1.1079–8	4.3604+7		2.3216+9	1.7285+9	3.7714+8	2.1603+8	2.3580+3	2.9440+2	1.8993+2	1.0447+2	4.0785–4
	2.6250–5	1.1207–8	4.3107+7		2.2952+9	1.6536+9	3.9035+8	2.5120+8	2.3809+3	3.2234+2	1.9986+2	1.2248+2	4.3404–4
	2.7303–5	1.1281–8	4.2824+7		2.2801+9	1.6097+9	3.9511+8	2.7533+8	2.3950+3	3.3917+2	2.0423+2	1.3495+2	4.5093–4
	3.0000–5	1.1455–8	4.2173+7		2.2454+9	1.5092+9	4.0622+8	3.3004+8	2.4290+3	3.7875+2	2.1484+2	1.6391+2	4.9453–4
	3.5000–5	1.1723–8	4.1210+7		2.1941+9	1.3584+9	4.1526+8	4.2051+8	2.4857+3	4.3754+2	2.2735+2	2.1019+2	5.7665–4
	4.0000–5	1.1979–8	4.0328+7		2.1472+9	1.2400+9	4.2295+8	4.8424+8	2.5359+3	4.8291+2	2.3932+2	2.4359+2	6.6030–4
	4.5000–5	1.2246–8	3.9448+7		2.1003+9	1.1442+9	4.2247+8	5.3362+8	2.5712+3	5.1486+2	2.4600+2	2.6885+2	7.3851–4
	5.0000–5	1.2558–8	3.8469+7		2.0482+9	1.0648+9	4.2191+8	5.6145+8	2.6033+3	5.3588+2	2.5257+2	2.8331+2	8.1757–4
	6.0000–5	1.3302–8	3.6316+7		1.9336+9	9.4025+8	4.1343+8	5.7992+8	2.6522+3	5.5338+2	2.5975+2	2.9362+2	9.7175–4
	7.0000–5	1.4117–8	3.4221+7		1.8221+9	8.4648+8	4.0044+8	5.7515+8	2.6942+3	5.5437+2	2.6200+2	2.9236+2	1.1282–3
	8.0000–5	1.4994–8	3.2220+7		1.7155+9	7.7284+8	3.8923+8	5.5345+8	2.7312+3	5.4707+2	2.6463+2	2.8244+2	1.2866–3
	1.0000–4	1.6811–8	2.8736+7	0.0000+0	1.5300+9	6.6424+8	3.6303+8	5.0275+8	2.7714+3	5.2007+2	2.6230+2	2.5776+2	1.5864–3
	1.2500–4	1.9161–8	2.5213+7	5.0056–8	1.3424+9	5.7091+8	3.3073+8	4.4076+8	2.7906+3	4.7937+2	2.5241+2	2.2696+2	1.9411–3
	1.5000–4	2.1322–8	2.2657+7	1.0388–7	1.2064+9	5.0448+8	3.0605+8	3.9584+8	2.8064+3	4.4993+2	2.4522+2	2.0470+2	2.2977–3
L3	1.7140–4	2.3238–8	2.0789+7	1.5297–7	1.1069+9	4.6083+8	2.8544+8	3.6061+8	2.8180+3	4.2223+2	2.3531+2	1.8691+2	2.6043–3
	1.7229–4	2.3315–8	2.0720+7	1.5509–7	1.1032+9	4.5920+8	2.8467+8	3.5935+8	2.8185+3	4.2129+2	2.3501+2	1.8628+2	2.6172–3
L2	1.7273–4	2.3352–8	2.0687+7	1.5612–7	1.1015+9	4.5842+8	2.8430+8	3.5874+8	2.8187+3	4.2083+2	2.3486+2	1.8597+2	2.6234–3
	1.7316–4	2.3389–8	2.0655+7	1.5715–7	1.0998+9	4.5764+8	2.8394+8	3.5817+8	2.8185+3	4.2042+2	2.3473+2	1.8569+2	2.6290–3
	1.7443–4	2.3496–8	2.0561+7	1.6018–7	1.0947+9	4.5537+8	2.8287+8	3.5649+8	2.8178+3	4.1921+2	2.3436+2	1.8484+2	2.6457–3
	1.7484–4	2.3530–8	2.0531+7	1.6114–7	1.0932+9	4.5466+8	2.8254+8	3.5596+8	2.8176+3	4.1884+2	2.3425+2	1.8458+2	2.6510–3
	1.7603–4	2.3630–8	2.0444+7	1.6400–7	1.0885+9	4.5256+8	2.8156+8	3.5441+8	2.8170+3	4.1774+2	2.3393+2	1.8380+2	2.6667–3
	1.7641–4	2.3661–8	2.0417+7	1.6490–7	1.0871+9	4.5191+8	2.8125+8	3.5392+8	2.8168+3	4.1739+2	2.3383+2	1.8356+2	2.6716–3
	1.7903–4	2.3879–8	2.0231+7	1.7119–7	1.0772+9	4.4741+8	2.7915+8	3.5060+8	2.8155+3	4.1508+2	2.3319+2	1.8189+2	2.7059–3
	1.7936–4	2.3907–8	2.0208+7	1.7199–7	1.0759+9	4.4685+8	2.7888+8	3.5018+8	2.8153+3	4.1480+2	2.3311+2	1.8169+2	2.7102–3
	1.8452–4	2.4332–8	1.9854+7	1.8450–7	1.0571+9	4.3833+8	2.7489+8	3.4387+8	2.8127+3	4.1048+2	2.3195+2	1.7853+2	2.7778–3
	1.8951–4	2.4740–8	1.9527+7	1.9672–7	1.0397+9	4.3046+8	2.7120+8	3.3803+8	2.8103+3	4.0660+2	2.3099+2	1.7561+2	2.8431–3
	1.9226–4	2.4962–8	1.9353+7	2.0349–7	1.0304+9	4.2628+8	2.6923+8	3.3492+8	2.8090+3	4.0457+2	2.3051+2	1.7405+2	2.8790–3
	2.0000–4	2.5581–8	1.8885+7	2.2276–7	1.0055+9	4.1502+8	2.6391+8	3.2655+8	2.8055+3	3.9909+2	2.2922+2	1.6987+2	2.9800–3
	2.1250–4	2.6605–8	1.8158+7	2.5449–7	9.6679+8	3.9834+8	2.5490+8	3.1355+8	2.7908+3	3.8867+2	2.2539+2	1.6328+2	3.1297–3
L1	2.2597–4	2.7685–8	1.7450+7	2.8961–7	9.2908+8	3.8211+8	2.4607+8	3.0090+8	2.7760+3	3.7847+2	2.2160+2	1.5686+2	3.2903–3
	2.3060–4	2.8063–8	1.7214+7	3.0189–7	9.1656+8	3.7693+8	2.4314+8	2.9649+8	2.7711+3	3.7501+2	2.2038+2	1.5462+2	3.3453–3
	2.3438–4	2.8370–8	1.7028+7	3.1200–7	9.0665+8	3.7282+8	2.4082+8	2.9300+8	2.7673+3	3.7230+2	2.1944+2	1.5285+2	3.3901–3
	2.3927–4	2.8766–8	1.6794+7	3.2522–7	8.9417+8	3.6766+8	2.3789+8	2.8862+8	2.7623+3	3.6877+2	2.1815+2	1.5062+2	3.4482–3
	2.5078–4	2.9685–8	1.6274+7	3.5676–7	8.6647+8	3.5620+8	2.3136+8	2.7891+8	2.7511+3	3.6107+2	2.1538+2	1.4569+2	3.5842–3
	2.5445–4	2.9976–8	1.6116+7	3.6697–7	8.5808+8	3.5273+8	2.2938+8	2.7597+8	2.7476+3	3.5877+2	2.1457+2	1.4420+2	3.6275–3
	2.6719–4	3.0971–8	1.5598+7	4.0283–7	8.3050+8	3.4131+8	2.2287+8	2.6632+8	2.7361+3	3.5132+2	2.1202+2	1.3930+2	3.7773–3
	2.7539–4	3.1604–8	1.5286+7	4.2633–7	8.1387+8	3.3442+8	2.1892+8	2.6052+8	2.7289+3	3.4680+2	2.1044+2	1.3636+2	3.8735–3
	2.7723–4	3.1745–8	1.5218+7	4.3163–7	8.1026+8	3.3293+8	2.1807+8	2.5926+8	2.7273+3	3.4582+2	2.1010+2	1.3572+2	3.8950–3
	3.0000–4	3.3465–8	1.4436+7	4.9856–7	7.6860+8	3.1568+8	2.0815+8	2.4477+8	2.7088+3	3.3473+2	2.0636+2	1.2837+2	4.1608–3
	3.2500–4	3.5421–8	1.3639+7	5.7482–7	7.2617+8	2.9913+8	1.9761+8	2.2943+8	2.6851+3	3.2107+2	2.0057+2	1.2050+2	4.4405–3
	3.5000–4	3.7330–8	1.2941+7	6.5412–7	6.8904+8	2.8459+8	1.8836+8	2.1608+8	2.6634+3	3.0947+2	1.9581+2	1.1365+2	4.7181–3
	3.6250–4	3.8270–8	1.2623+7	6.9487–7	6.7211+8	2.7795+8	1.8412+8	2.1004+8	2.6532+3	3.0408+2	1.9352+2	1.1055+2	4.8561–3
	4.0000–4	4.1032–8	1.1774+7	8.2114–7	6.2687+8	2.6015+8	1.7275+8	1.9396+8	2.6247+3	2.9000+2	1.8768+2	1.0231+2	5.2675–3
	4.5000–4	4.4736–8	1.0799+7	9.9919–7	5.7496+8	2.4034+8	1.5934+8	1.7528+8	2.5507+3	2.7185+2	1.7918+2	9.2671+1	5.7002–3
	5.0000–4	4.8324–8	9.9968+6	1.1882–6	5.3227+8	2.2390+8	1.4826+8	1.6010+8	2.4863+3	2.5739+2	1.7254+2	8.4839+1	6.1229–3
	6.0000–4	5.5362–8	8.7261+6	1.5968–6	4.6461+8	1.9809+8	1.3023+8	1.3630+8	2.3786+3	2.3248+2	1.5998+2	7.2500+1	6.9419–3
	7.0000–4	6.2124–8	7.7763+6	2.0467–6	4.1404+8	1.7871+8	1.1622+8	1.1911+8	2.2605+3	2.1236+2	1.4881+2	6.3550+1	7.5691–3
	8.0000–4	6.8631–8	7.0390+6	2.5354–6	3.7478+8	1.6346+8	1.0534+8	1.0598+8	2.1629+3	1.9711+2	1.4038+2	5.6719+1	8.1724–3
	1.0000–3	8.1245–8	5.9461+6	3.6191–6	3.1659+8	1.4085+8	8.8903+7	8.6837+7	1.9820+3	1.7251+2	1.2580+2	4.6700+1	9.1042–3
	1.2500–3	9.6716–8	4.9950+6	5.1765–6	2.6595+8	1.2127+8	7.4620+7	7.0059+7	1.7913+3	1.4912+2	1.1126+2	3.7846+1	9.8458–3
	1.5000–3	1.1145–7	4.3345+6	6.9497–6	2.3078+8	1.0731+8	6.4685+7	5.8786+7	1.6492+3	1.3316+2	1.0125+2	3.1898+1	1.0554–2
	2.0000–3	1.3978–7	3.4562+6	1.1072–5	1.8402+8	8.8012+7	5.1329+7	4.4678+7	1.4366+3	1.1013+2	8.5722+1	2.4400+1	1.1626–2
K	2.4559–3	1.6488–7	2.9300+6	1.5507–5	1.5601+8	7.5841+7	4.3395+7	3.6769+7	1.2951+3	9.5800+1	7.5614+1	2.0173+1	1.2408–2
	2.4899–3	1.6673–7	2.8975+6	1.5864–5	1.5427+8	7.5067+7	4.2905+7	3.6298+7	1.2857+3	9.4892+1	7.4959+1	1.9920+1	1.2456–2
	2.5537–3	1.7019–7	2.8385+6	1.6542–5	1.5113+8	7.3665+7	4.2018+7	3.5448+7	1.2686+3	9.3251+1	7.3774+1	1.9464+1	1.2545–2
	2.6653–3	1.7621–7	2.7416+6	1.7756–5	1.4597+8	7.1352+7	4.0561+7	3.4056+7	1.2402+3	9.0557+1	7.1827+1	1.8718+1	1.2701–2

Atomic Weight 32.064												Density 2.070 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.8326–3	1.8515–7	2.6092+6	1.9643–5	1.3893+8	6.8184+7	3.8573+7	3.2167+7	1.2009+3	8.6889+1	6.9170+1	1.7705+1	1.2931–2
3.0000–3	1.9398–7	2.4904+6	2.1606–5	1.3260+8	6.5327+7	3.6789+7	3.0483+7	1.1649+3	8.3604+1	6.6789+1	1.6802+1	1.3158–2
3.2500–3	2.0733–7	2.3301+6	2.4683–5	1.2406+8	6.1423+7	3.4413+7	2.8224+7	1.1143+3	7.8975+1	6.3379+1	1.5583+1	1.3429–2
3.6250–3	2.2702–7	2.1280+6	2.9615–5	1.1330+8	5.6470+7	3.1419+7	2.5410+7	1.0487+3	7.3156+1	5.9078+1	1.4064+1	1.3828–2
4.0000–3	2.4635–7	1.9610+6	3.4917–5	1.0441+8	5.2349+7	2.8945+7	2.3114+7	9.9296+2	6.8363+1	5.5523+1	1.2825+1	1.4218–2
4.5000–3	2.7248–7	1.7730+6	4.2548–5	9.4399+7	4.7636+7	2.6214+7	2.0549+7	9.2710+2	6.2761+1	5.1315+1	1.1432+1	1.4611–2
5.0000–3	2.9816–7	1.6203+6	5.0818–5	8.6268+7	4.3781+7	2.3991+7	1.8496+7	8.7189+2	5.8212+1	4.7881+1	1.0316+1	1.4997–2
6.0000–3	3.4934–7	1.3829+6	6.9173–5	7.3629+7	3.7727+7	2.0562+7	1.5339+7	7.8091+2	5.0913+1	4.2306+1	8.5916+0	1.5586–2
7.0000–3	4.0019–7	1.2072+6	8.9975–5	6.4274+7	3.3203+7	1.8039+7	1.3030+7	7.0895+2	4.5340+1	3.8001+1	7.3231+0	1.6003–2
8.0000–3	4.5010–7	1.0733+6	1.1314–4	5.7146+7	2.9725+7	1.6107+7	1.1313+7	6.5200+2	4.1084+1	3.4688+1	6.3794+0	1.6422–2
1.0000–2	5.4771–7	8.8202+5	1.6599–4	4.6962+7	2.4588+7	1.3317+7	9.0563+6	5.6415+2	3.4772+1	2.9621+1	5.1338+0	1.6999–2
1.2500–2	6.6654–7	7.2478+5	2.4409–4	3.8590+7	2.0254+7	1.1010+7	7.3254+6	4.8530+2	2.9398+1	2.5208+1	4.1726+0	1.7366–2
1.5000–2	7.8248–7	6.1739+5	3.3498–4	3.2872+7	1.7286+7	9.4258+6	6.1598+6	4.2913+2	2.5699+1	2.2156+1	3.5254+0	1.7782–2
2.0000–2	1.0084–6	4.7908+5	5.5099–4	2.5508+7	1.3355+7	7.3846+6	4.7682+6	3.5159+2	2.0768+1	1.8002+1	2.7475+0	1.8205–2
3.0000–2	1.4388–6	3.3575+5	1.1082–3	1.7876+7	9.2960+6	5.2571+6	3.3231+6	2.6539+2	1.5396+1	1.3444+1	1.9335+0	1.8575–2
4.0000–2	1.8359–6	2.6313+5	1.8279–3	1.4010+7	7.2836+6	4.1540+6	2.5722+6	2.1802+2	1.2494+1	1.0968+1	1.5069+0	1.8783–2
5.0000–2	2.2072–6	2.1887+5	2.6935–3	1.1654+7	6.0697+6	3.4753+6	2.1085+6	1.8739+2	1.0660+1	9.3996+0	1.2419+0	1.8946–2
6.0000–2	2.5585–6	1.8882+5	3.6919–3	1.0053+7	5.2365+6	3.0153+6	1.8014+6	1.6607+2	9.3980+0	8.3133+0	1.0656+0	1.9094–2
8.0000–2	3.2203–6	1.5001+5	6.0301–3	7.9872+6	4.1450+6	2.4301+6	1.4120+6	1.3814+2	7.7611+0	6.9006+0	8.4108–1	1.9452–2
1.0000–1	3.8303–6	1.2612+5	8.7928–3	6.7153+6	3.4675+6	2.0736+6	1.1741+6	1.2030+2	6.7411+0	6.0181+0	7.0318–1	1.9832–2
1.5000–1	5.1022–6	9.4683+4	1.7107–2	5.0412+6	2.5973+6	1.5924+6	8.5146+5	9.4923+1	5.3406+0	4.8048+0	5.1494–1	2.0875–2
2.0000–1	6.0992–6	7.9205+4	2.7157–2	4.2172+6	2.1790+6	1.3503+6	6.8785+5	8.1849+1	4.6272+0	4.1861+0	4.1891–1	2.2132–2
3.0000–1	7.5978–6	6.3583+4	5.0587–2	3.3854+6	1.7408+6	1.1101+6	5.3435+5	6.9208+1	3.9280+0	3.5742+0	3.2872–1	2.5079–2
4.0000–1	8.7510–6	5.5204+4	7.7195–2	2.9393+6	1.4925+6	9.9287+5	4.5387+5	6.3435+1	3.5933+0	3.2835+0	2.8127–1	2.8534–2
5.0000–1	9.6802–6	4.9905+4	1.0576–1	2.6571+6	1.3284+6	9.2483+5	4.0385+5	6.0351+1	3.4105+0	3.1264+0	2.5176–1	3.2300–2
6.0000–1	1.0429–5	4.6322+4	1.3556–1	2.4664+6	1.2123+6	8.8115+5	3.7282+5	5.8721+1	3.3014+0	3.0314+0	2.3357–1	3.6415–2
8.0000–1	1.1623–5	4.1563+4	1.9715–1	2.2129+6	1.0546+6	8.2967+5	3.2858+5	5.7365+1	3.1935+0	2.9406+0	2.0750–1	4.5402–2
1.0000+0	1.2505–5	3.8633+4	2.6016–1	2.0569+6	9.5181+5	8.0154+5	3.0352+5	5.7105+1	3.1549+0	2.9068+0	1.9289–1	5.5212–2
1.5000+0	1.3967–5	3.4589+4	4.1776–1	1.8417+6	8.0192+5	7.7069+5	2.6899+5	5.8052+1	3.1902+0	2.9348+0	1.7287–1	8.2554–2
2.0000+0	1.4803–5	3.2635+4	5.7297–1	1.7376+6	7.1898+5	7.6141+5	2.5716+5	5.9442+1	3.2530+0	2.9741+0	1.6619–1	1.1266–1
3.0000+0	1.5858–5	3.0463+4	8.7410–1	1.6220+6	6.3059+5	7.4892+5	2.4241+5	6.2019+1	3.3896+0	3.0524+0	1.5845–1	1.7876–1
4.0000+0	1.6383–5	2.9487+4	1.1634+0	1.5700+6	5.8365+5	7.4719+5	2.3909+5	6.3798+1	3.5247+0	3.1168+0	1.5676–1	2.5110–1
5.0000+0	1.6729–5	2.8877+4	1.4420+0	1.5375+6	5.5520+5	7.4588+5	2.3638+5	6.5212+1	3.6545+0	3.1737+0	1.5546–1	3.2537–1
6.0000+0	1.6956–5	2.8490+4	1.7111+0	1.5169+6	5.3800+5	7.4481+5	2.3405+5	6.6290+1	3.7793+0	3.2220+0	1.5440–1	4.0290–1
8.0000+0	1.7234–5	2.8032+4	2.2245+0	1.4925+6	5.1756+5	7.4535+5	2.2953+5	6.7865+1	4.0145+0	3.2977+0	1.5235–1	5.6453–1
1.0000+1	1.7364–5	2.7822+4	2.7088+0	1.4813+6	5.0924+5	7.4580+5	2.2621+5	6.9057+1	4.2454+0	3.3643+0	1.5045–1	7.3074–1
1.5000+1	1.7468–5	2.7656+4	3.8202+0	1.4725+6	5.0480+5	7.4660+5	2.2104+5	7.1061+1	4.7622+0	3.4499+0	1.4706–1	1.1652+0
2.0000+1	1.7546–5	2.7532+4	4.8165+0	1.4659+6	5.0262+5	7.4719+5	2.1602+5	7.2434+1	5.2840+0	3.5250+0	1.4377–1	1.6152+0
3.0000+1	1.7614–5	2.7427+4	6.5492+0	1.4603+6	5.0181+5	7.4724+5	2.1119+5	7.4196+1	6.2877+0	3.6029+0	1.4065–1	2.5442+0
4.0000+1	1.7637–5	2.7391+4	8.0238+0	1.4584+6	5.0178+5	7.4749+5	2.0908+5	7.5414+1	7.3008+0	3.6581+0	1.3934–1	3.5034+0
5.0000+1	1.7651–5	2.7369+4	9.3056+0	1.4572+6	5.0175+5	7.4768+5	2.0772+5	7.6257+1	8.3243+0	3.7073+0	1.3853–1	4.4784+0
6.0000+1	1.7653–5	2.7366+4	1.0438+1	1.4571+6	5.0173+5	7.4781+5	2.0746+5	7.6952+1	9.3523+0	3.7502+0	1.3845–1	5.4637+0
8.0000+1	1.7657–5	2.7359+4	1.2372+1	1.4567+6	5.0170+5	7.4787+5	2.0706+5	7.8017+1	1.1404+1	3.8048+0	1.3838–1	7.4605+0
1.0000+2	1.7662–5	2.7352+4	1.3983+1	1.4563+6	5.0168+5	7.4791+5	2.0664+5	7.8852+1	1.3479+1	3.8545+0	1.3829–1	9.4859+0
1.5000+2	1.7668–5	2.7342+4	1.7121+1	1.4558+6	5.0164+5	7.4795+5	2.0612+5	8.0344+1	1.8674+1	3.9051+0	1.3794–1	1.4631+1
2.0000+2	1.7678–5	2.7327+4	1.9481+1	1.4550+6	5.0161+5	7.4798+5	2.0531+5	8.1237+1	2.3906+1	3.9538+0	1.3740–1	1.9815+1
3.0000+2	1.7691–5	2.7308+4	2.2951+1	1.4540+6	5.0157+5	7.4800+5	2.0432+5	8.1918+1	3.4374+1	4.0384+0	1.3673–1	3.0199+1
4.0000+2	1.7700–5	2.7293+4	2.5490+1	1.4532+6	5.0154+5	7.4801+5	2.0356+5	8.2262+1	4.4865+1	4.0690+0	1.3623–1	4.0659+1
5.0000+2	1.7710–5	2.7277+4	2.7492+1	1.4524+6	5.0152+5	7.4801+5	2.0274+5	8.2560+1	5.5378+1	4.0993+0	1.3568–1	5.1143+1
6.0000+2	1.7711–5	2.7276+4	2.9145+1	1.4523+6	5.0150+5	7.4802+5	2.0268+5	8.2810+1	6.5919+1	4.1295+0	1.3565–1	6.1655+1
8.0000+2	1.7714–5	2.7271+4	3.1780+1	1.4520+6	5.0147+5	7.4802+5	2.0244+5	8.3398+1	8.6867+1	4.1828+0	1.3549–1	8.2549+1
1.0000+3	1.7717–5	2.7267+4	3.3841+1	1.4518+6	5.0145+5	7.4802+5	2.0226+5	8.3857+1	1.0794+2	4.2359+0	1.3537–1	1.0357+2
1.5000+3	1.7718–5	2.7265+4	3.7615+1	1.4517+6	5.0140+5	7.4802+5	2.0220+5	8.4869+1	1.6051+2	4.2797+0	1.3533–1	1.5610+2
2.0000+3	1.7721–5	2.7262+4	4.0309+1	1.4515+6	5.0138+5	7.4802+5	2.0202+5	8.5636+1	2.1311+2	4.3233+0	1.3522–1	2.0865+2
3.0000+3	1.7720–5	2.7263+4	4.4123+1	1.4516+6	5.0133+5	7.4802+5	2.0214+5	8.6822+1	3.1833+2	4.4107+0	1.3530–1	3.1378+2
4.0000+3	1.7721–5	2.7260+4	4.6835+1	1.4514+6	5.0131+5	7.4802+5	2.0202+5	8.7722+1	4.2410+2	4.4385+0	1.3522–1	4.1952+2
5.0000+3	1.7727–5	2.7251+4	4.8938+1	1.4510+6	5.0128+5	7.4802+5	2.0156+5	8.8427+1	5.3081+2	4.4663+0	1.3491–1	5.2621+2
6.0000+3	1.7725–5	2.7255+4	5.0658+1	1.4512+6	5.0126+5	7.4802+5	2.0179+5	8.9026+1	6.3539+2	4.4941+0	1.3506–1	6.3077+2
8.0000+3	1.7724–5	2.7256+4	5.3376+1	1.4512+6	5.0123+5	7.4802+5	2.0185+5	8.9978+1	8.4635+2	4.5497+0	1.3510–1	8.4166+2
1.0000+4	1.7723–5	2.7258+4	5.5484+1	1.4513+6	5.0121+5	7.4802+5	2.0196+5	9.0724+1	1.0592+3	4.6017+0	1.3518–1	1.0545+3
1.5000+4	1.7723–5	2.7258+4	5.9322+1	1.4513+6	5.0117+5	7.4802+5	2.0202+5	9.2198+1	1.5808+3	4.6410+0	1.3522–1	1.5761+3
2.0000+4	1.7723–5	2.7257+4	6.2051+1	1.4513+6	5.0114+5	7.4802+5	2.0202+5	9.3259+1	2.1093+3	4.6802+0	1.3522–1	2.1045+3
3.0000+4	1.7722–5	2.7259+4	6.5901+1	1.4513+6	5.0110+5	7.4802+5	2.0214+5	9.4741+1	3.1551+3	4.7587+0	1.3530–1	3.1502+3
4.0000+4	1.7723–5	2.7257+4	6.8635+1	1.4513+6	5.0107+5	7.4802+5	2.0208+5	9.5805+1	4.2121+3	4.8148+0	1.3526–1	4.2072+3
5.0000+4	1.7729–5	2.7248+4	7.0755+1	1.4508+6	5.0104+5	7.4802+5	2.0162+5	9.6623+1	5.2593+3	4.8401+0	1.3495–1	5.2544+3
6.0000+4	1.7727–5	2.7252+4	7.2489+1	1.4510+6	5.0103+5	7.4802+5	2.0185+5	9.7290+1	6.3057+3	4.8655+0	1.3510–1	6.3007+3
8.0000+4	1.7726–5	2.7254+4	7.5225+1	1.4511+6	5.0100+5	7.4802+5	2.0197+5	9.8352+1	8.4166+3	4.9162+0	1.3518–1	8.4116+3
1.0000+5	1.7725–5	2.7254+4	7.7345+1	1.4511+6	5.0097+5	7.4802+5	2.0202+5	9.9177+1	1.0531+4	4.9669+0	1.3522–1	1.0526+4


July 4 1991
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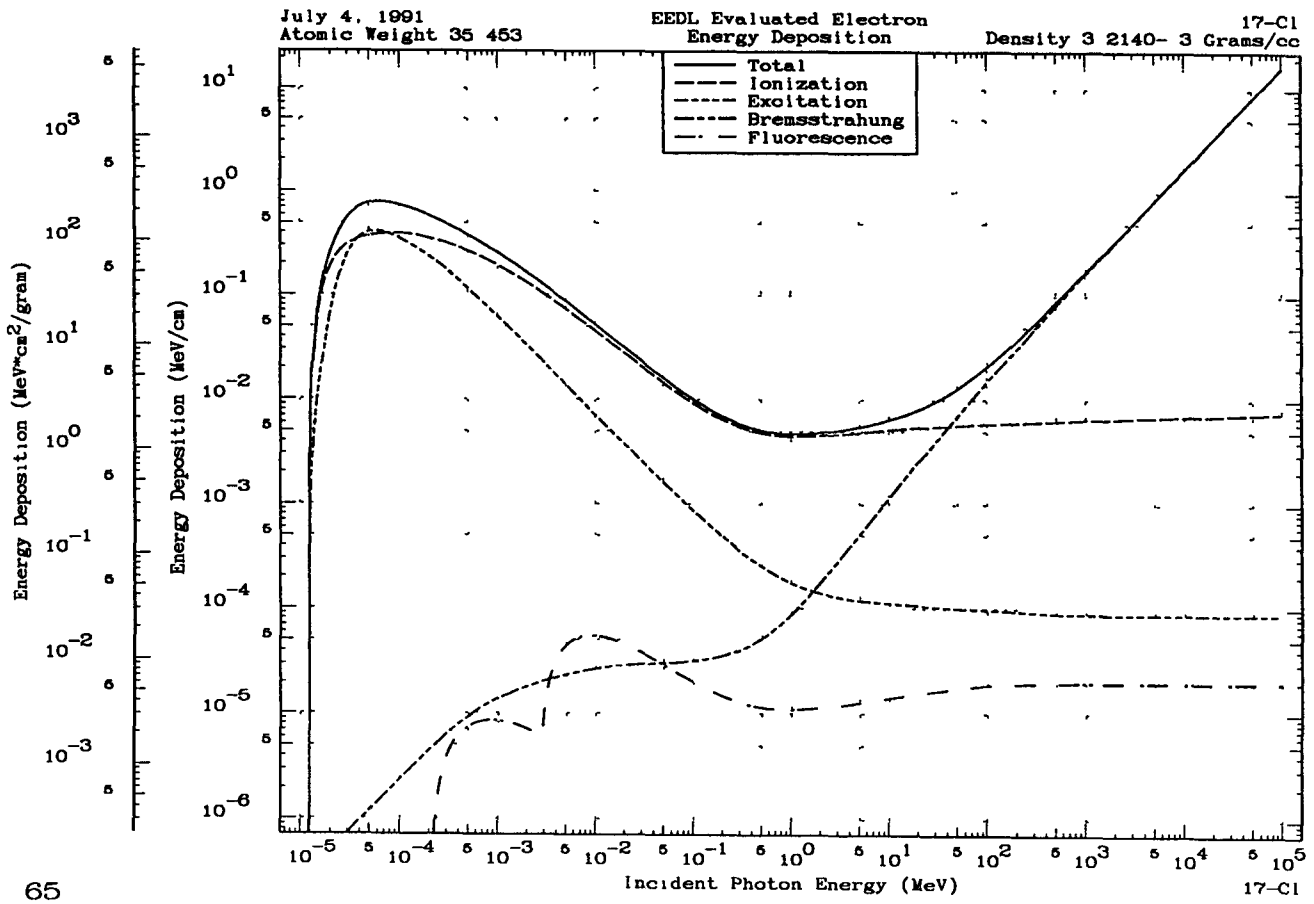
EEDL Evaluated Electron
Cross Sections
17-Cl
Density 3 2140- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
17-Cl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Total
Ionization
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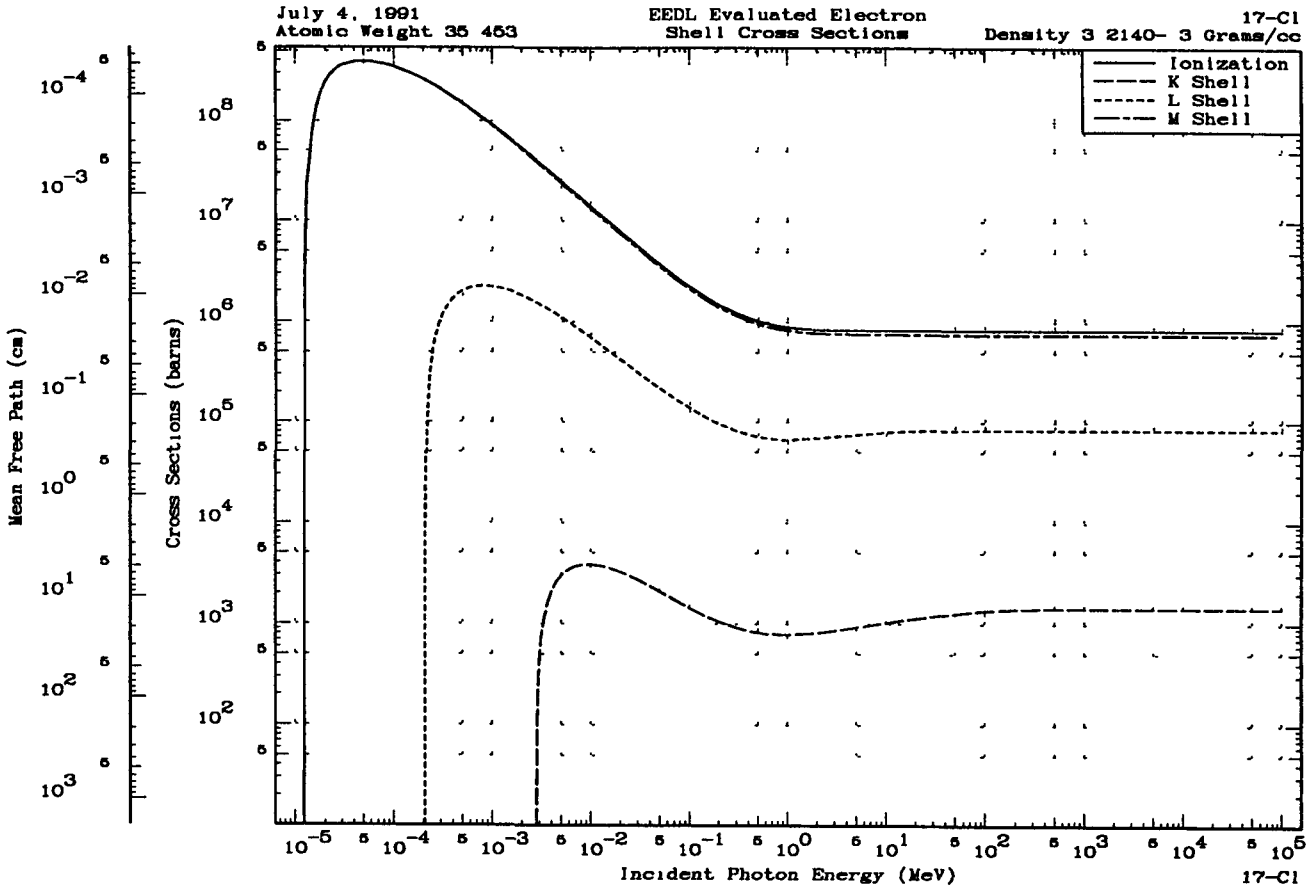
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
17-Cl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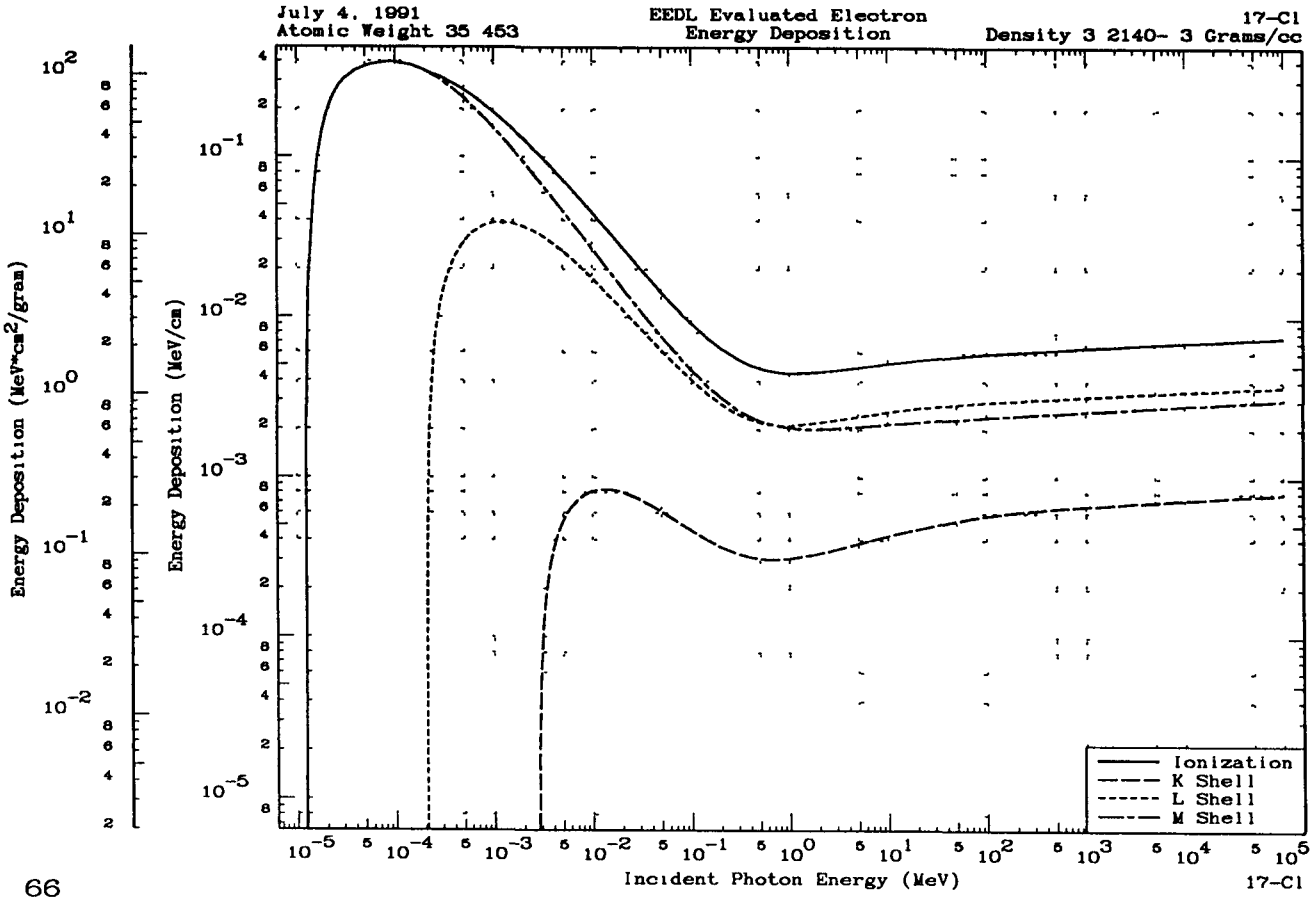
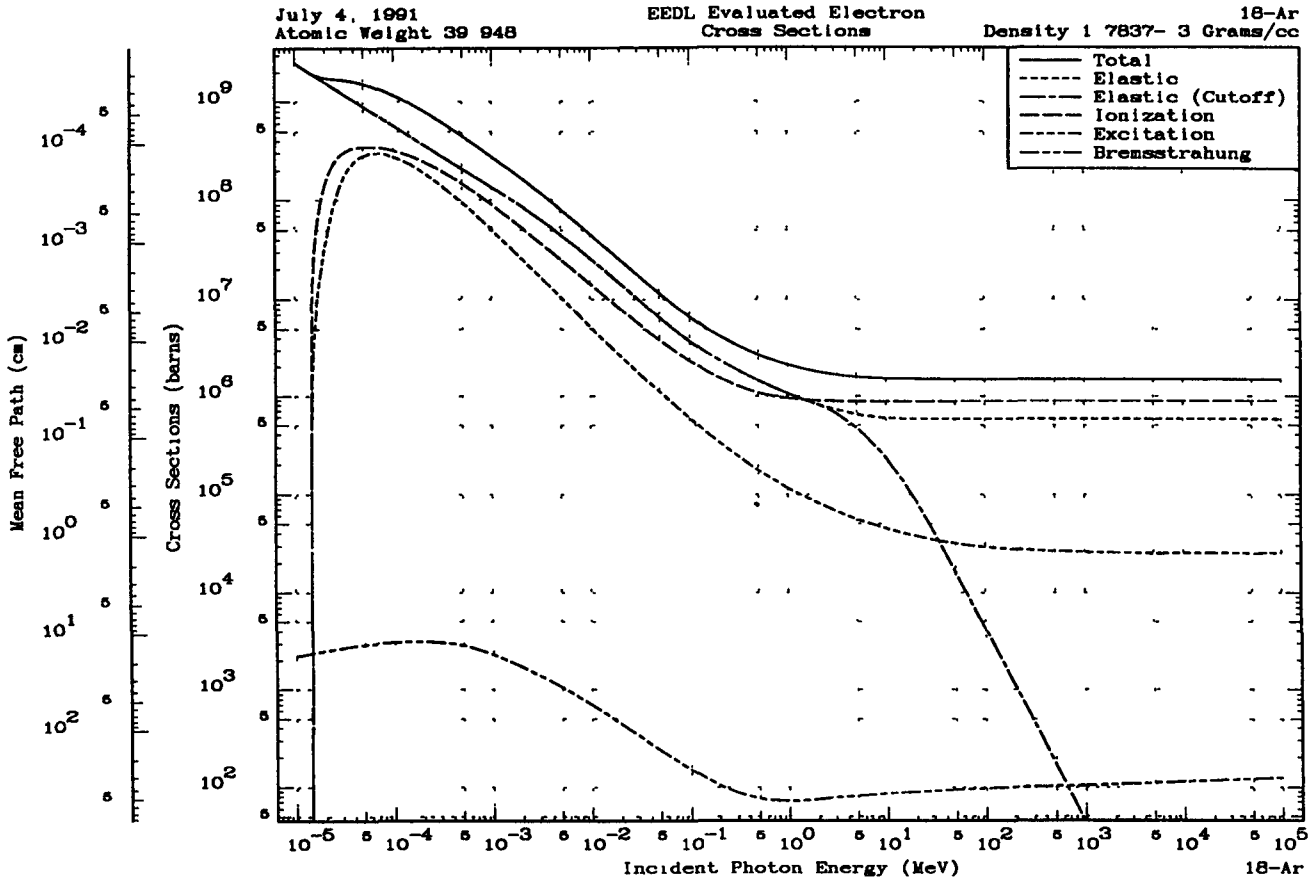
EEDL Evaluated Electron
Shell Cross Sections
17-Cl
Density 3 2140- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
17-Cl


July 4, 1991
Atomic Weight 35 453
EEDL Evaluated Electron
Energy Deposition
17-Cl
Density 3 2140- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
17-Cl

Atomic Weight 35.453 — Density 3.2140– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.4460–6	4.8268+7		2.8416+9	2.8416+9			2.0968+3	2.4655–7			2.4655–7
M3	1.2290–5	7.3875–6	4.2117+7		2.4795+9	2.4795+9	0.0000+0	0.0000+0	2.1806+3	3.0035–7	0.0000+0	0.0000+0	3.0035–7
M2	1.2420–5	7.4286–6	4.1884+7		2.4657+9	2.4623+9	3.1142+6	3.3731+5	2.1849+3	2.3225–3	2.0951–3	2.2711–4	3.0345–7
	1.2629–5	7.4925–6	4.1527+7		2.4447+9	2.4353+9	8.2576+6	1.1822+6	2.1919+3	6.3918–3	5.5918–3	7.9969–4	3.0845–7
	1.2743–5	7.5241–6	4.1352+7		2.4344+9	2.4209+9	1.1918+7	1.6771+6	2.1956+3	9.2283–3	8.0906–3	1.1374–3	3.1118–7
	1.2968–5	7.5763–6	4.1068+7		2.4177+9	2.3931+9	2.2109+7	2.5180+6	2.2029+3	1.6790–2	1.5073–2	1.7163–3	3.1656–7
	1.3065–5	7.6048–6	4.0913+7		2.4086+9	2.3812+9	2.4374+7	2.9976+6	2.2060+3	1.8700–2	1.6652–2	2.0476–3	3.1891–7
	1.3222–5	7.6523–6	4.0659+7		2.3937+9	2.3625+9	2.7198+7	3.9581+6	2.2110+3	2.1352–2	1.8639–2	2.7132–3	3.2269–7
	1.3871–5	7.8323–6	3.9725+7		2.3387+9	2.2888+9	4.2242+7	7.5859+6	2.2313+3	3.4591–2	2.9315–2	5.2748–3	3.3838–7
	1.5000–5	8.0503–6	3.8649+7		2.2753+9	2.1734+9	8.6868+7	1.5018+7	2.2647+3	7.2301–2	6.1600–2	1.0700–2	3.6596–7
	1.6250–5	8.2357–6	3.7779+7		2.2241+9	2.0614+9	1.3621+8	2.6489+7	2.2994+3	1.1809–1	9.8865–2	1.9223–2	3.9686–7
	1.8125–5	8.4708–6	3.6731+7		2.1624+9	1.9178+9	1.9325+8	5.1287+7	2.3476+3	1.8295–1	1.4471–1	3.8235–2	4.4392–7
	2.0000–5	8.6330–6	3.6041+7		2.1218+9	1.7970+9	2.4059+8	8.4161+7	2.3919+3	2.4959–1	1.8518–1	6.4410–2	4.9178–7
	2.2500–5	8.7746–6	3.5459+7		2.0875+9	1.6624+9	2.8776+8	1.3737+8	2.4367+3	3.3618–1	2.2842–1	1.0776–1	5.5039–7
M1	2.4840–5	8.8745–6	3.5060+7		2.0640+9	1.5571+9	3.1773+8	1.8916+8	2.4751+3	4.0999–1	2.5823–1	1.5176–1	6.0601–7
	2.5163–5	8.8890–6	3.5003+7		2.0606+9	1.5439+9	3.2100+8	1.9575+8	2.4799+3	4.1905–1	2.6173–1	1.5732–1	6.1358–7
	2.5767–5	8.9116–6	3.4914+7		2.0554+9	1.5199+9	3.2709+8	2.0848+8	2.4888+3	4.3640–1	2.6829–1	1.6811–1	6.2781–7
	2.6825–5	8.9371–6	3.4814+7		2.0496+9	1.4799+9	3.3763+8	2.3198+8	2.5041+3	4.6791–1	2.7977–1	1.8814–1	6.5279–7
	2.7188–5	8.9421–6	3.4795+7		2.0484+9	1.4669+9	3.4116+8	2.4038+8	2.5091+3	4.7898–1	2.8364–1	1.9534–1	6.6137–7
	2.8413–5	8.9887–6	3.4615+7		2.0378+9	1.4247+9	3.4890+8	2.6415+8	2.5259+3	5.0917–1	2.9309–1	2.1608–1	6.9051–7
	3.0000–5	9.0244–6	3.4478+7		2.0297+9	1.3745+9	3.5856+8	2.9671+8	2.5468+3	5.4996–1	3.0515–1	2.4480–1	7.2848–7
	3.2500–5	9.1214–6	3.4111+7		2.0081+9	1.3038+9	3.6596+8	3.3840+8	2.5779+3	5.9701–1	3.1637–1	2.8063–1	7.8882–7
	3.6250–5	9.2605–6	3.3598+7		1.9780+9	1.2132+9	3.7613+8	3.8867+8	2.6208+3	6.5746–1	3.3265–1	3.2481–1	8.8042–7
	4.0000–5	9.4016–6	3.3094+7		1.9483+9	1.1369+9	3.8543+8	4.2595+8	2.6602+3	7.0714–1	3.4847–1	3.5868–1	9.7327–7
	4.5000–5	9.6526–6	3.2234+7		1.8976+9	1.0520+9	3.8767+8	4.5799+8	2.6981+3	7.4578–1	3.5914–1	3.8664–1	1.0890–6
	5.0000–5	9.9123–6	3.1389+7		1.8479+9	9.8139+8	3.8962+8	4.7691+8	2.7325+3	7.7323–1	3.6960–1	4.0362–1	1.2061–6
	6.0000–5	1.0536–5	2.9530+7		1.7385+9	8.7025+8	3.8550+8	4.8273+8	2.7855+3	7.9231–1	3.8153–1	4.1079–1	1.4347–6
	7.0000–5	1.1212–5	2.7751+7		1.6337+9	7.8627+8	3.7631+8	4.7112+8	2.8311+3	7.8828–1	3.8645–1	4.0183–1	1.6668–6
	8.0000–5	1.1902–5	2.6142+7		1.5390+9	7.2011+8	3.6839+8	4.5049+8	2.8713+3	7.7704–1	3.9191–1	3.8513–1	1.9019–6
	1.0000–4	1.3315–5	2.3368+7	0.0000+0	1.3757+9	6.2218+8	3.4781+8	4.0570+8	2.9167+3	7.4087–1	3.9211–1	3.4875–1	2.3486–6
	1.2500–4	1.5050–5	2.0673+7	3.4891–5	1.2170+9	5.3757+8	3.2046+8	3.5902+8	2.9411+3	6.9272–1	3.8272–1	3.1001–1	2.8793–6
	1.5000–4	1.6632–5	1.8707+7	7.1976–5	1.1013+9	4.7705+8	2.9937+8	3.2490+8	2.9612+3	6.5586–1	3.7407–1	2.8179–1	3.4135–6
	2.0000–4	1.9861–5	1.5666+7	1.5293–4	9.2227+8	3.9512+8	2.6098+8	2.6618+8	2.9669+3	5.8097–1	3.4866–1	2.3231–1	4.4402–6
L3	2.0770–4	2.0356–5	1.5285+7	1.6631–4	8.9984+8	3.8546+8	2.5566+8	2.5872+8	2.9585+3	5.7005–1	3.4410–1	2.2595–1	4.5804–6
	2.0914–4	2.0446–5	1.5217+7	1.6884–4	8.9587+8	3.8372+8	2.5470+8	2.5744+8	2.9570+3	5.6823–1	3.4337–1	2.2486–1	4.6067–6
L2	2.0948–4	2.0467–5	1.5202+7	1.6944–4	8.9494+8	3.8331+8	2.5448+8	2.5714+8	2.9566+3	5.6781–1	3.4320–1	2.2460–1	4.6128–6
	2.1056–4	2.0535–5	1.5152+7	1.7134–4	8.9200+8	3.8202+8	2.5376+8	2.5622+8	2.9555+3	5.6649–1	3.4267–1	2.2382–1	4.6325–6
	2.1089–4	2.0555–5	1.5137+7	1.7193–4	8.9110+8	3.8163+8	2.5354+8	2.5593+8	2.9551+3	5.6608–1	3.4250–1	2.2357–1	4.6385–6
	2.1196–4	2.0622–5	1.5088+7	1.7381–4	8.8825+8	3.8037+8	2.5284+8	2.5503+8	2.9540+3	5.6481–1	3.4200–1	2.2281–1	4.6579–6
	2.1229–4	2.0642–5	1.5073+7	1.7439–4	8.8737+8	3.7999+8	2.5263+8	2.5475+8	2.9537+3	5.6442–1	3.4184–1	2.2257–1	4.6638–6
	2.1366–4	2.0727–5	1.5011+7	1.7682–4	8.8374+8	3.7839+8	2.5174+8	2.5360+8	2.9523+3	5.6281–1	3.4121–1	2.2160–1	4.6887–6
	2.1471–4	2.0792–5	1.4964+7	1.7870–4	8.8097+8	3.7718+8	2.5106+8	2.5273+8	2.9512+3	5.6161–1	3.4075–1	2.2085–1	4.7078–6
	2.1635–4	2.0893–5	1.4892+7	1.8163–4	8.7670+8	3.7530+8	2.5001+8	2.5138+8	2.9495+3	5.5974–1	3.4003–1	2.1970–1	4.7377–6
	2.2004–4	2.1119–5	1.4733+7	1.8824–4	8.6732+8	3.7118+8	2.4772+8	2.4842+8	2.9458+3	5.5577–1	3.3857–1	2.1719–1	4.8045–6
	2.2158–4	2.1213–5	1.4667+7	1.9102–4	8.6347+8	3.6949+8	2.4678+8	2.4720+8	2.9442+3	5.5412–1	3.3796–1	2.1615–1	4.8325–6
	2.3004–4	2.1725–5	1.4322+7	2.0639–4	8.4315+8	3.6055+8	2.4181+8	2.4079+8	2.9360+3	5.4566–1	3.3495–1	2.1070–1	4.9854–6
	2.3138–4	2.1806–5	1.4269+7	2.0887–4	8.4002+8	3.5917+8	2.4104+8	2.3981+8	2.9347+3	5.4435–1	3.3448–1	2.0987–1	5.0098–6
	2.4753–4	2.2761–5	1.3670+7	2.3892–4	8.0477+8	3.4368+8	2.3237+8	2.2872+8	2.9199+3	5.2994–1	3.2949–1	2.0045–1	5.3007–6
	2.4854–4	2.2820–5	1.3635+7	2.4083–4	8.0269+8	3.4276+8	2.3186+8	2.2807+8	2.9190+3	5.2910–1	3.2920–1	1.9989–1	5.3189–6
	2.6065–4	2.3520–5	1.3229+7	2.6392–4	7.7880+8	3.3226+8	2.2595+8	2.2058+8	2.9086+3	5.1945–1	3.2591–1	1.9354–1	5.5362–6
	2.6140–4	2.3563–5	1.3204+7	2.6538–4	7.7736+8	3.3163+8	2.2559+8	2.2013+8	2.9080+3	5.1887–1	3.2571–1	1.9316–1	5.5498–6
L1	2.6805–4	2.3942–5	1.2995+7	2.7826–4	7.6505+8	3.2623+8	2.2254+8	2.1628+8	2.9025+3	5.1384–1	3.2394–1	1.8989–1	5.6687–6
	2.7604–4	2.4411–5	1.2746+7	2.9390–4	7.5035+8	3.2006+8	2.1881+8	2.1148+8	2.8961+3	5.0730–1	3.2151–1	1.8579–1	5.8115–6
	2.8032–4	2.4661–5	1.2617+7	3.0238–4	7.4275+8	3.1686+8	2.1689+8	2.0900+8	2.8928+3	5.0398–1	3.2030–1	1.8367–1	5.8879–6
	2.8070–4	2.4683–5	1.2605+7	3.0313–4	7.4209+8	3.1658+8	2.1672+8	2.0878+8	2.8925+3	5.0368–1	3.2019–1	1.8349–1	5.8947–6
	2.8802–4	2.5107–5	1.2393+7	3.1774–4	7.2957+8	3.1132+8	2.1353+8	2.0471+8	2.8869+3	4.9807–1	3.1806–1	1.8001–1	6.0250–6
	3.0000–4	2.5792–5	1.2063+7	3.4200–4	7.1019+8	3.0317+8	2.0859+8	1.9842+8	2.8781+3	4.8957–1	3.1492–1	1.7465–1	6.2380–6
	3.2500–4	2.7265–5	1.1412+7	3.9411–4	6.7183+8	2.8782+8	1.9849+8	1.8551+8	2.8558+3	4.7001–1	3.0648–1	1.6352–1	6.6657–6
	3.6250–4	2.9408–5	1.0580+7	4.7607–4	6.2286+8	2.6813+8	1.8550+8	1.6923+8	2.8257+3	4.4529–1	2.9577–1	1.4951–1	7.3019–6
	4.0000–4	3.1481–5	9.8834+6	5.6228–4	5.8185+8	2.5154+8	1.7452+8	1.5579+8	2.7988+3	4.2490–1	2.8695–1	1.3794–1	7.9322–6
	4.5000–4	3.4194–5	9.0993+6	6.8361–4	5.3568+8	2.3304+8	1.6143+8	1.4121+8	2.7253+3	3.9955–1	2.7421–1	1.2533–1	8.6052–6
	5.0000–4	3.6816–5	8.4513+6	8.1212–4	4.9754+8	2.1764+8	1.5056+8	1.2933+8	2.6612+3	3.7878–1	2.6372–1	1.1505–1	9.2633–6
	5.5000–4	3.9429–5	7.8911+6	9.4764–4	4.6456+8	2.0460+8	1.4098+8	1.1898+8	2.6045+3	3.5927–1	2.5322–1	1.0604–1	9.9081–6
	6.0000–4	4.1972–5	7.4130+6	1.0901–3	4.3641+8	1.9337+8	1.3279+8	1.1025+8	2.5538+3	3.4300–1	2.4453–1	9.8455–2	1.0541–5
	7.0000–4	4.7018–5	6.6174+6	1.3951–3	3.8958+8	1.7502+8	1.1885+8	9.5709+7	2.4334+3	3.1308–1	2.2733–1	8.5737–2	1.1525–5
	8.0000–4	5.1862–5	5.9994+6	1.7267–3	3.5319+8	1.6053+8	1.0798+8	8.4672+7	2.3337+3	2.9046–1	2.1436–1	7.6087–2	1.2474–5
	1.0000–3	6.1142–5	5.0888+6	2.4619–3	2.9958+8	1.3905+8	9.1467+7	6.9062+7	2.1466+3	2.5440–1	1.9202–1	6.2368–2	1.3944–5
	1.2500–3	7.2327–5	4.3019+6	3.5167–3	2.5326+8	1.2033+8	7.7005+7	5.5918+7	1.9464+3	2.2044–1	1.6969–1	5.0730–2	1.5110–5
	1.5000–3	8.2921–5	3.7522+6	4.7150–3	2.2090+8	1.0692+8	6.6917+7	4.7058+7	1.7967+3	1.9723–1	1.5433–1	4.2887–2	1.6226–5
	2.0000–3	1.0342–4	3.0085+6	7.4967–3	1.7711+8	8.8289+7	5.3273+7	3.5547+7	1.5712+3	1.6333–1	1.3070–1	3.2612–2	1.7928–5
K	2.8049–3	1.3506–4	2.3037+6	1.3015–2	1.3562+8	6.9504+7	4.0524+7	2.5591+7	1.3270+3	1.2969–1	1.0601–1	2.3658–2	2.0002–5
	2.8537–3	1.3694–4	2.2721+6	1.3393–2	1.3376+8	6.8638+7	3.9959+7	2.5165+7	1.3149+3	1.2818–1	1.0489–1	2.3274–2	2.0100–5
	2.9268–3	1.3974–4	2.2266+6	1.3969–2	1.3108+8	6.7386+7	3.9144+7	2.4553+7	1.2973+3	1.2601–1	1.0327–1	2.2723–2	2.0246–5
	3.0000–3	1.4252–4	2.1831+6	1.4554–2	1.2852+8	6.6188+7	3.8365+7	2.3969+7	1.2804+3	1.2394–1	1.0172–1	2.2198–2	2.0392–5
	3.1250–3	1.4730–4	2.1123+6	1.5577–2	1.2435+8	6.4201+7	3.7097+7	2.3052+7	1.2522+3	1.2041–1	9.9027–2	2.1367–2	2.0613–5
	3.3437–3	1.5558–4	1.9999+6	1.7437–2	1.1774+8	6.1039+7	3.5087+7	2.1609+7	1.2070+3	1.1484–1	9.4761–2	2.0059–2	2.0996–5
	3.6719–3	1.6779–4	1.8543+6	2.0388–2	1.0917+8	5.6919+7	3.2486+7	1.9760+7	1.1470+3	1.0764–1	8.9241–2	1.8383–2	2.1562–5
	4.0000–3	1.7979–4	1.7306+6	2.3526–2	1.0188+8	5.3396+7	3.0278+7	1.8209+7	1.0948+3	1.0155–1	8.4556–2	1.6977–2	2.2117–5
	4.5000–3	1.9815–4	1.5702+6	2.8658–2	9.2440+7	4.8708+7	2.7457+7	1.6273+7	1.0234+3	9.3395–2	7.8160–2	1.5212–2	2.2763–5
	5.0000–3	2.1615–4	1.4394+6	3.4212–2	8.4741+7	4.4864+7	2.5158+7	1.4717+7	9.6349+2	8.6757–2	7.2941–2	1.3793–2	2.3397–5

Atomic Weight 35.453												Density 3.2140– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.5000–3	2.3419–4	1.3286+6	4.0176–2	7.8214+7	4.1572+7	2.3234+7	1.3406+7	9.1022+2	8.0975–2	6.8360–2	1.2590–2	2.3869–5
6.0000–3	2.5196–4	1.2349+6	4.6545–2	7.2698+7	3.8779+7	2.1607+7	1.2311+7	8.6416+2	7.6091–2	6.4480–2	1.1586–2	2.4339–5
7.0000–3	2.8748–4	1.0823+6	6.0449–2	6.3716+7	3.4188+7	1.8989+7	1.0538+7	7.8585+2	6.7909–2	5.7932–2	9.9515–3	2.5049–5
8.0000–3	3.2223–4	9.6556+5	7.5899–2	5.6844+7	3.0654+7	1.6979+7	9.2107+6	7.2378+2	6.1644–2	5.2892–2	8.7268–3	2.5755–5
1.0000–2	3.9081–4	7.9615+5	1.1110–1	4.6870+7	2.5408+7	1.4075+7	7.3872+6	6.2730+2	5.2249–2	4.5188–2	7.0350–3	2.6708–5
1.2500–2	4.7440–4	6.5586+5	1.6307–1	3.8611+7	2.0996+7	1.1667+7	5.9480+6	5.4050+2	4.4181–2	3.8463–2	5.6908–3	2.7381–5
1.5000–2	5.5576–4	5.5985+5	2.2354–1	3.2959+7	1.7966+7	1.0009+7	4.9828+6	4.7857+2	3.8626–2	3.3808–2	4.7895–3	2.8112–5
2.0000–2	7.1335–4	4.3616+5	3.6731–1	2.5677+7	1.3997+7	7.8705+6	3.8095+6	3.9249+2	3.1198–2	2.7483–2	3.6857–3	2.8805–5
3.0000–2	1.0129–3	3.0717+5	7.3825–1	1.8083+7	9.8369+6	5.6348+6	2.6112+6	2.9590+2	2.3122–2	2.0543–2	2.5497–3	2.9494–5
4.0000–2	1.2937–3	2.4050+5	1.2174+0	1.4158+7	7.6859+6	4.4690+6	2.0032+6	2.4400+2	1.8770–2	1.6771–2	1.9688–3	2.9886–5
5.0000–2	1.5595–3	1.9951+5	1.7935+0	1.1745+7	6.3641+6	3.7501+6	1.6310+6	2.0987+2	1.6017–2	1.4376–2	1.6111–3	3.0181–5
6.0000–2	1.8115–3	1.7176+5	2.4582+0	1.0112+7	5.4697+6	3.2614+6	1.3803+6	1.8608+2	1.4115–2	1.2715–2	1.3691–3	3.0436–5
8.0000–2	2.2794–3	1.3650+5	4.0154+0	8.0361+6	4.3344+6	2.6386+6	1.0630+6	1.5489+2	1.1651–2	1.0559–2	1.0612–3	3.1015–5
1.0000–1	2.7036–3	1.1508+5	5.8559+0	6.7751+6	3.6490+6	2.2580+6	8.6796+5	1.3493+2	1.0118–2	9.2151–3	8.7088–4	3.1602–5
1.5000–1	3.5894–3	8.6683+4	1.1397+1	5.1031+6	2.7494+6	1.7423+6	6.1125+5	1.0659+2	8.0108–3	7.3585–3	6.1898–4	3.3304–5
2.0000–1	4.2998–3	7.2361+4	1.8099+1	4.2600+6	2.2982+6	1.4823+6	4.7933+5	9.1961+1	6.9364–3	6.4125–3	4.8863–4	3.5285–5
3.0000–1	5.3989–3	5.7630+4	3.3748+1	3.3928+6	1.8213+6	1.2237+6	3.4767+5	7.7807+1	5.8738–3	5.4759–3	3.5787–4	3.9963–5
4.0000–1	6.2405–3	4.9858+4	5.1551+1	2.9352+6	1.5577+6	1.0971+6	2.8029+5	7.1314+1	5.3678–3	5.0318–3	2.9060–4	4.5416–5
5.0000–1	6.9058–3	4.5055+4	7.0669+1	2.6524+6	1.3860+6	1.0237+6	2.4265+5	6.7818+1	5.0958–3	4.7914–3	2.5305–4	5.1364–5
6.0000–1	7.4559–3	4.1730+4	9.0619+1	2.4567+6	1.2644+6	9.7657+5	2.1564+5	6.5940+1	4.9299–3	4.6460–3	2.2601–4	5.7880–5
8.0000–1	8.3038–3	3.7469+4	1.3185+2	2.2059+6	1.1007+6	9.2098+5	1.8414+5	6.4339+1	4.7723–3	4.5056–3	1.9458–4	7.2106–5
1.0000+0	8.9375–3	3.4813+4	1.7402+2	2.0495+6	9.9526+5	8.9045+5	1.6368+5	6.3939+1	4.7141–3	4.4524–3	1.7411–4	8.7507–5
1.5000+0	9.9531–3	3.1260+4	2.7940+2	1.8403+6	8.4348+5	8.5688+5	1.3993+5	6.4906+1	4.7754–3	4.4940–3	1.5065–4	1.3080–4
2.0000+0	1.0555–2	2.9477+4	3.8305+2	1.7353+6	7.6006+5	8.4702+5	1.2818+5	6.6567+1	4.8729–3	4.5557–3	1.3888–4	1.7833–4
3.0000+0	1.1299–2	2.7537+4	5.8389+2	1.6211+6	6.7048+5	8.3371+5	1.1687+5	6.9498+1	5.0865–3	4.6757–3	1.2830–4	2.8250–4
4.0000+0	1.1697–2	2.6599+4	7.7657+2	1.5659+6	6.2323+5	8.3168+5	1.1095+5	7.1107+1	5.2948–3	4.7764–3	1.2226–4	3.9619–4
5.0000+0	1.1942–2	2.6054+4	9.6201+2	1.5338+6	5.9553+5	8.3040+5	1.0781+5	7.2380+1	5.4918–3	4.8601–3	1.1925–4	5.1236–4
6.0000+0	1.2104–2	2.5705+4	1.1409+3	1.5133+6	5.7799+5	8.2951+5	1.0570+5	7.3586+1	5.6900–3	4.9369–3	1.1737–4	6.3570–4
8.0000+0	1.2292–2	2.5313+4	1.4814+3	1.4902+6	5.5742+5	8.3042+5	1.0230+5	7.5530+1	6.0627–3	5.0601–3	1.1446–4	8.8815–4
1.0000+1	1.2374–2	2.5145+4	1.8016+3	1.4803+6	5.4903+5	8.3116+5	1.0004+5	7.6838+1	6.4302–3	5.1671–3	1.1224–4	1.1508–3
1.5000+1	1.2427–2	2.5036+4	2.5336+3	1.4739+6	5.4433+5	8.3239+5	9.7120+4	7.9117+1	7.2473–3	5.3042–3	1.0906–4	1.8340–3
2.0000+1	1.2457–2	2.4977+4	3.1871+3	1.4704+6	5.4196+5	8.3328+5	9.5075+4	8.0660+1	8.0707–3	5.4218–3	1.0685–4	2.5420–3
3.0000+1	1.2486–2	2.4920+4	4.3185+3	1.4670+6	5.4107+5	8.3348+5	9.2401+4	8.2674+1	9.6535–3	5.5459–3	1.0402–4	4.0036–3
4.0000+1	1.2499–2	2.4893+4	5.2774+3	1.4655+6	5.4104+5	8.3385+5	9.0531+4	8.4059+1	1.1245–2	5.6303–3	1.0209–4	5.5127–3
5.0000+1	1.2508–2	2.4875+4	6.1086+3	1.4644+6	5.4101+5	8.3413+5	8.9194+4	8.5011+1	1.2853–2	5.7059–3	1.0075–4	7.0460–3
6.0000+1	1.2515–2	2.4861+4	6.8415+3	1.4636+6	5.4099+5	8.3433+5	8.8189+4	8.5797+1	1.4467–2	5.7716–3	9.9787–5	8.5957–3
8.0000+1	1.2526–2	2.4839+4	8.0896+3	1.4623+6	5.4096+5	8.3443+5	8.6840+4	8.6980+1	1.7690–2	5.8557–3	9.8280–5	1.1736–2
1.0000+2	1.2534–2	2.4824+4	9.1272+3	1.4614+6	5.4093+5	8.3450+5	8.5897+4	8.7914+1	2.0951–2	5.9330–3	9.7232–5	1.4921–2
1.5000+2	1.2544–2	2.4805+4	1.1143+4	1.4603+6	5.4088+5	8.3456+5	8.4734+4	8.9604+1	2.9115–2	6.0107–3	9.5916–5	2.3009–2
2.0000+2	1.2551–2	2.4791+4	1.2655+4	1.4595+6	5.4085+5	8.3460+5	8.3917+4	9.0622+1	3.7339–2	6.0848–3	9.4993–5	3.1159–2
3.0000+2	1.2569–2	2.4754+4	1.4874+4	1.4573+6	5.4080+5	8.3464+5	8.1744+4	9.1432+1	5.3789–2	6.2144–3	9.2537–5	4.7482–2
4.0000+2	1.2580–2	2.4732+4	1.6496+4	1.4560+6	5.4077+5	8.3465+5	8.0488+4	9.1867+1	7.0270–2	6.2623–3	9.1117–5	6.3916–2
5.0000+2	1.2591–2	2.4712+4	1.7774+4	1.4548+6	5.4074+5	8.3466+5	7.9328+4	9.2181+1	8.6815–2	6.3096–3	8.9807–5	8.0415–2
6.0000+2	1.2593–2	2.4708+4	1.8829+4	1.4546+6	5.4072+5	8.3466+5	7.9085+4	9.2539+1	1.0321–1	6.3508–3	8.9534–5	9.6766–2
8.0000+2	1.2597–2	2.4700+4	2.0510+4	1.4541+6	5.4069+5	8.3466+5	7.8646+4	9.3174+1	1.3619–1	6.4330–3	8.9043–5	1.2967–1
1.0000+3	1.2599–2	2.4695+4	2.1825+4	1.4538+6	5.4066+5	8.3467+5	7.8400+4	9.3740+1	1.6942–1	6.5098–3	8.8770–5	1.6282–1
1.5000+3	1.2602–2	2.4689+4	2.4229+4	1.4535+6	5.4062+5	8.3467+5	7.8110+4	9.4899+1	2.5198–1	6.5721–3	8.8442–5	2.4532–1
2.0000+3	1.2604–2	2.4686+4	2.5945+4	1.4533+6	5.4058+5	8.3467+5	7.7917+4	9.5774+1	3.3458–1	6.6344–3	8.8224–5	3.2786–1
3.0000+3	1.2604–2	2.4685+4	2.8374+4	1.4532+6	5.4054+5	8.3467+5	7.7917+4	9.7120+1	4.9991–1	6.7587–3	8.8224–5	4.9307–1
4.0000+3	1.2606–2	2.4683+4	3.0101+4	1.4531+6	5.4050+5	8.3467+5	7.7821+4	9.8139+1	6.6625–1	6.8204–3	8.8114–5	6.5934–1
5.0000+3	1.2610–2	2.4675+4	3.1439+4	1.4526+6	5.4048+5	8.3467+5	7.7387+4	9.8937+1	8.3406–1	6.8605–3	8.7623–5	8.2711–1
6.0000+3	1.2608–2	2.4678+4	3.2534+4	1.4528+6	5.4046+5	8.3467+5	7.7580+4	9.9611+1	9.9843–1	6.9005–3	8.7841–5	9.9145–1
8.0000+3	1.2608–2	2.4678+4	3.4263+4	1.4528+6	5.4042+5	8.3467+5	7.7628+4	1.0068+2	1.3300+0	6.9807–3	8.7896–5	1.3229+0
1.0000+4	1.2608–2	2.4678+4	3.5605+4	1.4528+6	5.4040+5	8.3467+5	7.7676+4	1.0152+2	1.6646+0	7.0559–3	8.7951–5	1.6575+0
1.5000+4	1.2607–2	2.4679+4	3.8047+4	1.4529+6	5.4035+5	8.3467+5	7.7773+4	1.0317+2	2.4845+0	7.1142–3	8.8060–5	2.4773+0
2.0000+4	1.2608–2	2.4678+4	3.9783+4	1.4528+6	5.4032+5	8.3467+5	7.7724+4	1.0436+2	3.3151+0	7.1725–3	8.8005–5	3.3079+0
3.0000+4	1.2608–2	2.4678+4	4.2233+4	1.4528+6	5.4027+5	8.3467+5	7.7773+4	1.0602+2	4.9589+0	7.2893–3	8.8060–5	4.9516+0
4.0000+4	1.2609–2	2.4677+4	4.3972+4	1.4527+6	5.4024+5	8.3467+5	7.7724+4	1.0721+2	6.6205+0	7.3744–3	8.8005–5	6.6130+0
5.0000+4	1.2612–2	2.4670+4	4.5321+4	1.4524+6	5.4021+5	8.3467+5	7.7387+4	1.0812+2	8.2665+0	7.4121–3	8.7623–5	8.2590+0
6.0000+4	1.2610–2	2.4673+4	4.6424+4	1.4526+6	5.4019+5	8.3467+5	7.7580+4	1.0887+2	9.9112+0	7.4499–3	8.7841–5	9.9036+0
8.0000+4	1.2610–2	2.4674+4	4.8165+4	1.4526+6	5.4015+5	8.3467+5	7.7676+4	1.1006+2	1.3229+1	7.5253–3	8.7951–5	1.3222+1
1.0000+5	1.2610–2	2.4674+4	4.9513+4	1.4526+6	5.4013+5	8.3467+5	7.7676+4	1.1098+2	1.6553+1	7.6007–3	8.7951–5	1.6546+1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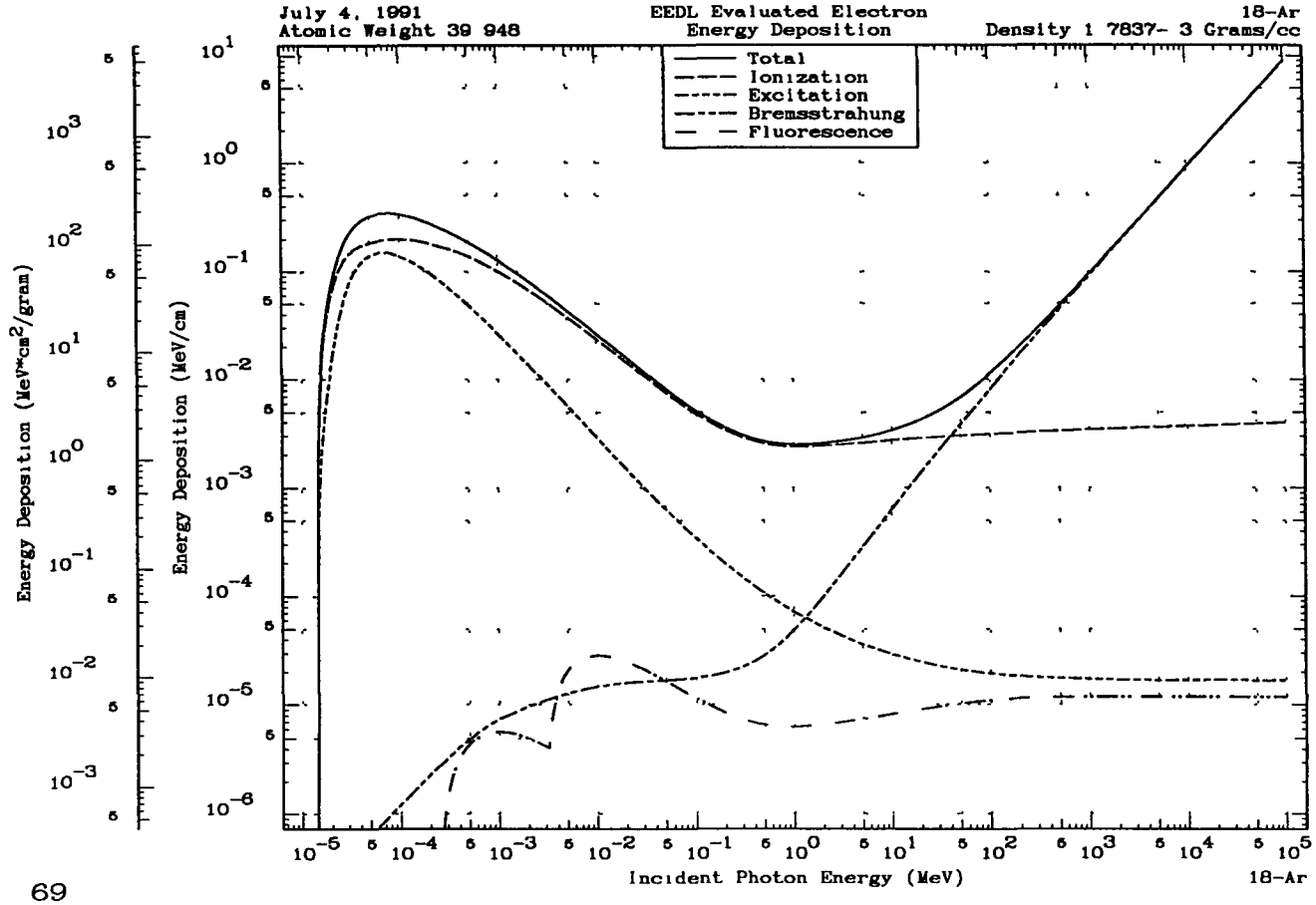
EEDL Evaluated Electron
Cross Sections
18-Ar
Density 1 7837- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
18-Ar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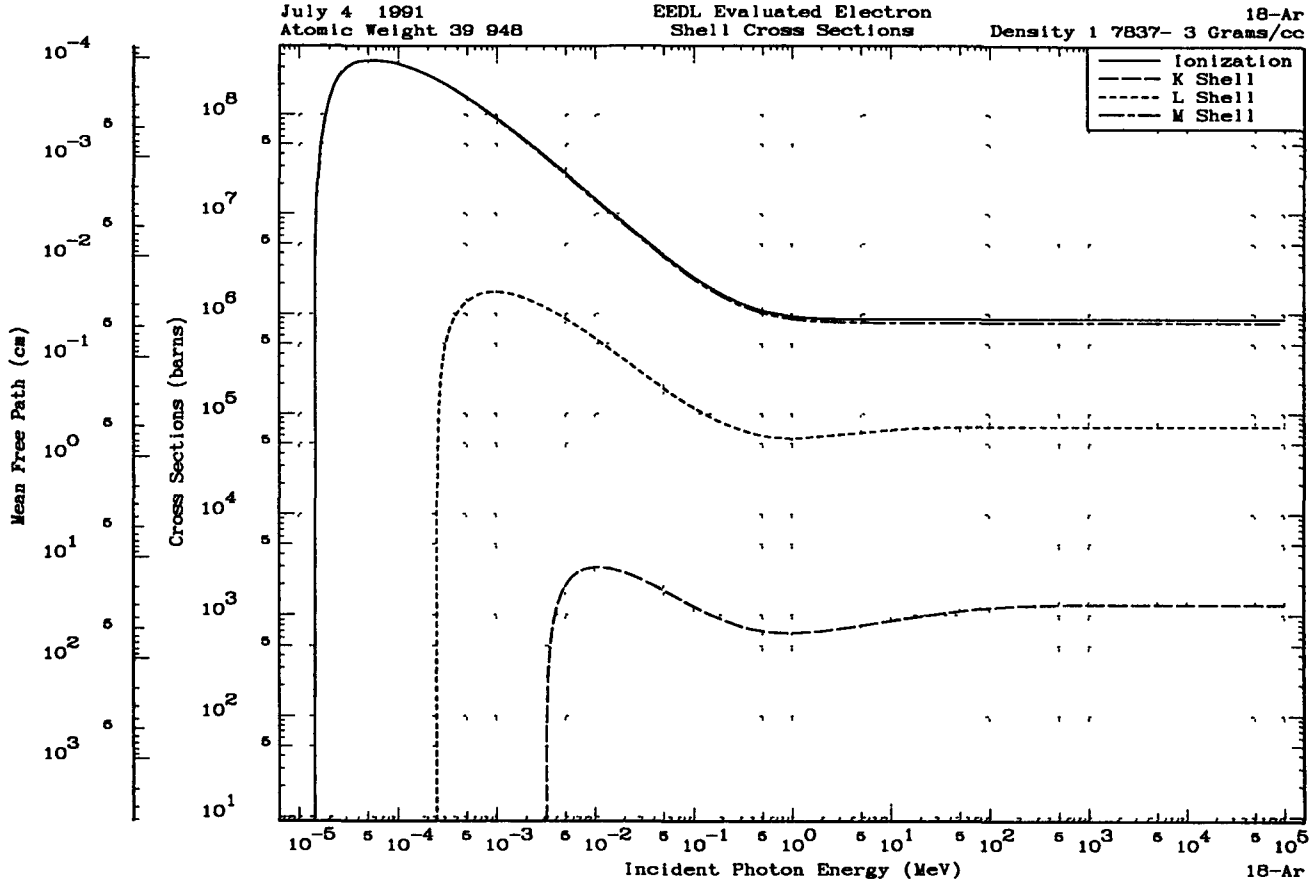
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EEDL Evaluated Electron
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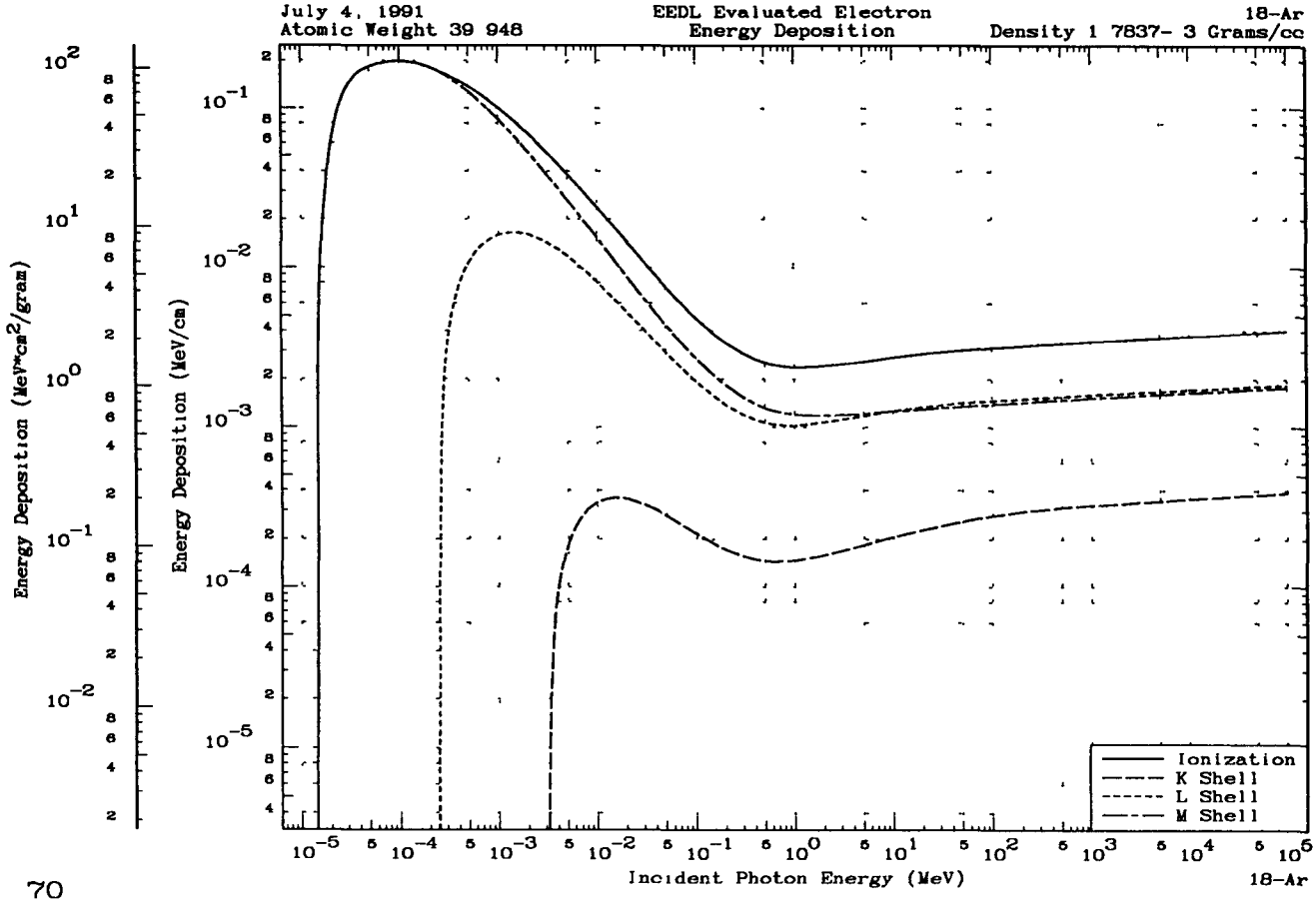
Density 1 7837- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
18-Ar

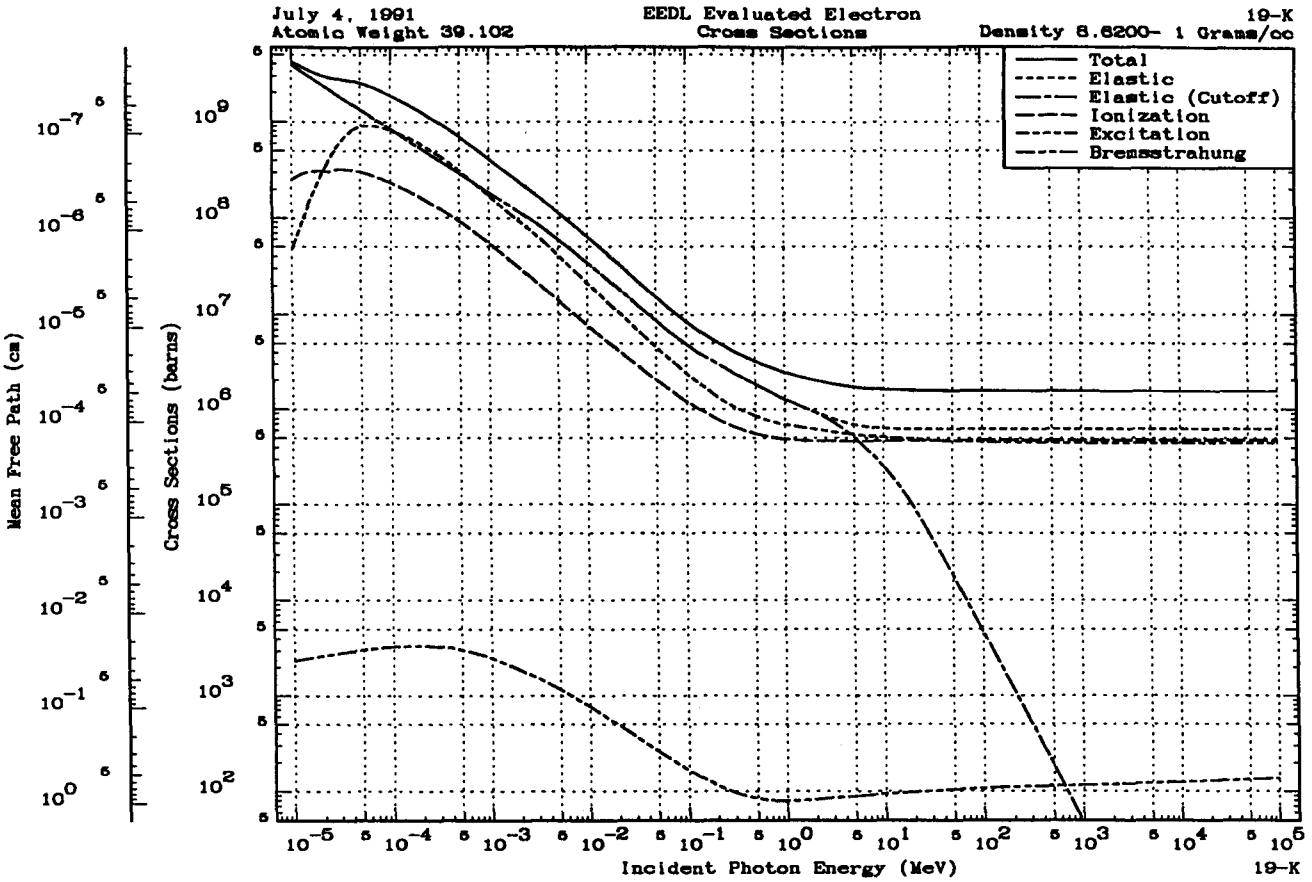

July 4, 1991
Atomic Weight 39 948
EEDL Evaluated Electron
Energy Deposition
18-Ar
Density 1 7837- 3 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
Incident Photon Energy (MeV)
18-Ar

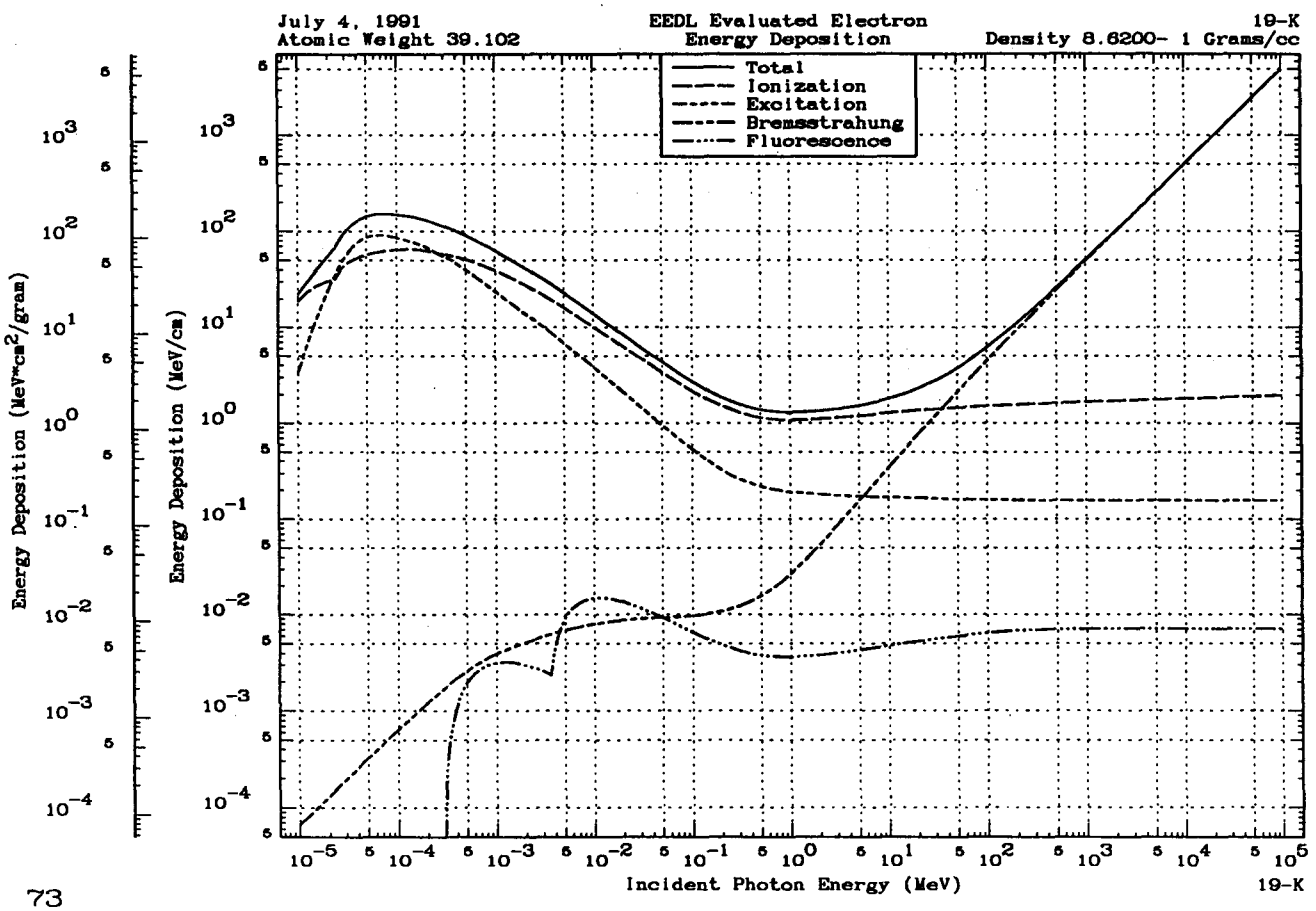
70

Atomic Weight 39.948 Density 1.7837– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.4914–5	3.7590+7		2.4935+9	2.4935+9			2.2227+3	1.2874–7			1.2874–7
M3	1.4430–5	1.8849–5	2.9743+7		1.9730+9	1.9730+9	0.0000+0	0.0000+0	2.3834+3	1.8383–7	0.0000+0	0.0000+0	1.8383–7
M2	1.4620–5	1.8972–5	2.9550+7		1.9602+9	1.9566+9	3.1977+6	4.0236+5	2.3894+3	1.4018–3	1.2449–3	1.5676–4	1.8626–7
	1.4715–5	1.9025–5	2.9469+7		1.9548+9	1.9485+9	5.5548+6	7.0925+5	2.3923+3	2.4459–3	2.1690–3	2.7672–4	1.8747–7
	1.5000–5	1.9178–5	2.9234+7		1.9392+9	1.9248+9	1.2705+7	1.6833+6	2.4010+3	5.6504–3	4.9905–3	6.5967–4	1.9113–7
	1.5625–5	1.9519–5	2.8722+7		1.9053+9	1.8753+9	2.5872+7	4.0914+6	2.4198+3	1.1905–2	1.0280–2	1.6248–3	1.9918–7
	1.6250–5	1.9784–5	2.8337+7		1.8798+9	1.8289+9	4.4275+7	6.5430+6	2.4379+3	2.0406–2	1.7773–2	2.6326–3	2.0728–7
	1.6719–5	1.9986–5	2.8051+7		1.8608+9	1.7960+9	5.5521+7	9.1961+6	2.4511+3	2.6206–2	2.2469–2	3.7362–3	2.1338–7
	1.7812–5	2.0412–5	2.7465+7		1.8219+9	1.7249+9	8.2102+7	1.4955+7	2.4808+3	4.0036–2	3.3823–2	6.2130–3	2.2773–7
	1.8125–5	2.0502–5	2.7346+7		1.8140+9	1.7058+9	9.1450+7	1.6746+7	2.4891+3	4.4844–2	3.7865–2	6.9797–3	2.3187–7
	2.0000–5	2.0953–5	2.6757+7		1.7750+9	1.6019+9	1.4133+8	3.1740+7	2.5362+3	7.3738–2	6.0254–2	1.3484–2	2.5688–7
	2.2500–5	2.1362–5	2.6244+7		1.7409+9	1.4858+9	1.9662+8	5.8438+7	2.5831+3	1.1229–1	8.6778–2	2.5511–2	2.8726–7
	2.4375–5	2.1560–5	2.6003+7		1.7249+9	1.4118+9	2.3092+8	8.2160+7	2.6156+3	1.4086–1	1.0427–1	3.6591–2	3.1033–7
	2.7188–5	2.1809–5	2.5706+7		1.7052+9	1.3167+9	2.6994+8	1.1855+8	2.6605+3	1.7984–1	1.2547–1	5.4364–2	3.4534–7
M1	2.8920–5	2.1955–5	2.5535+7		1.6939+9	1.2658+9	2.8634+8	1.4174+8	2.6862+3	2.0118–1	1.3503–1	6.6148–2	3.6715–7
	2.9460–5	2.1998–5	2.5486+7		1.6906+9	1.2510+9	2.9167+8	1.4798+8	2.6938+3	2.0754–1	1.3824–1	6.9306–2	3.7391–7
	3.0000–5	2.2033–5	2.5445+7		1.6879+9	1.2365+9	2.9699+8	1.5438+8	2.7012+3	2.1401–1	1.4145–1	7.2558–2	3.8068–7
	3.1250–5	2.2151–5	2.5310+7		1.6789+9	1.2048+9	3.0423+8	1.6990+8	2.7181+3	2.2641–1	1.4622–1	8.0190–2	3.9642–7
	3.3438–5	2.2381–5	2.5049+7		1.6616+9	1.1540+9	3.1654+8	1.9109+8	2.7462+3	2.4534–1	1.5449–1	9.0857–2	4.2416–7
	3.5000–5	2.2501–5	2.4916+7		1.6528+9	1.1209+9	3.2500+8	2.0687+8	2.7653+3	2.5918–1	1.6031–1	9.8873–2	4.4412–7
	3.6719–5	2.2723–5	2.4673+7		1.6367+9	1.0872+9	3.3017+8	2.1928+8	2.7856+3	2.6977–1	1.6437–1	1.0540–1	4.6621–7
	4.0000–5	2.3067–5	2.4305+7		1.6123+9	1.0296+9	3.3942+8	2.4329+8	2.8221+3	2.9008–1	1.7187–1	1.1821–1	5.0875–7
	4.5000–5	2.3696–5	2.3659+7		1.5695+9	9.5519+8	3.4446+8	2.6979+8	2.8628+3	3.0993–1	1.7819–1	1.3174–1	5.6939–7
	5.0000–5	2.4371–5	2.3004+7		1.5260+9	8.9324+8	3.4897+8	2.8376+8	2.8997+3	3.2357–1	1.8430–1	1.3926–1	6.3072–7
	6.0000–5	2.5712–5	2.1804+7		1.4464+9	7.9538+8	3.4917+8	3.0184+8	2.9567+3	3.3990–1	1.9140–1	1.4850–1	7.5058–7
	7.0000–5	2.7246–5	2.0577+7		1.3650+9	7.2116+8	3.4344+8	3.0037+8	3.0059+3	3.4274–1	1.9456–1	1.4818–1	8.7227–7
	8.0000–5	2.8607–5	1.9598+7		1.3000+9	6.6248+8	3.3845+8	2.9910+8	3.0491+3	3.4588–1	1.9793–1	1.4795–1	9.9561–7
	1.0000–4	3.1645–5	1.7716+7	0.0000+0	1.1752+9	5.7528+8	3.2302+8	2.7690+8	3.0989+3	3.3734–1	1.9949–1	1.3785–1	1.2304–6
	1.2500–4	3.5281–5	1.5890+7	7.5685–5	1.0541+9	4.9956+8	3.0078+8	2.5376+8	3.1269+3	3.2339–1	1.9648–1	1.2691–1	1.5098–6
	1.5000–4	3.8721–5	1.4479+7	1.5463–4	9.6046+8	4.4515+8	2.8348+8	2.3183+8	3.1499+3	3.1009–1	1.9361–1	1.1648–1	1.7913–6
	2.0000–4	4.5611–5	1.2292+7	3.2392–4	8.1536+8	3.7110+8	2.5018+8	1.9408+8	3.1593+3	2.8108–1	1.8291–1	9.8162–2	2.3336–6
L3	2.4709–4	5.1944–5	1.0793+7	4.9917–4	7.1596+8	3.2479+8	2.2485+8	1.6632+8	3.1133+3	2.5671–1	1.7218–1	8.4518–2	2.7866–6
	2.4874–4	5.2159–5	1.0749+7	5.0561–4	7.1301+8	3.2342+8	2.2410+8	1.6549+8	3.1118+3	2.5603–1	1.7192–1	8.4109–2	2.8024–6
L2	2.4943–4	5.2248–5	1.0730+7	5.0830–4	7.1180+8	3.2286+8	2.2379+8	1.6514+8	3.1112+3	2.5575–1	1.7181–1	8.3940–2	2.8089–6
	2.5035–4	5.2367–5	1.0706+7	5.1188–4	7.1018+8	3.2212+8	2.2334+8	1.6471+8	3.1104+3	2.5535–1	1.7162–1	8.3726–2	2.8177–6
	2.5101–4	5.2453–5	1.0688+7	5.1448–4	7.0900+8	3.2159+8	2.2302+8	1.6439+8	3.1099+3	2.5505–1	1.7148–1	8.3571–2	2.8240–6
	2.5190–4	5.2569–5	1.0665+7	5.1796–4	7.0745+8	3.2088+8	2.2259+8	1.6398+8	3.1091+3	2.5467–1	1.7130–1	8.3365–2	2.8325–6
	2.5254–4	5.2652–5	1.0648+7	5.2049–4	7.0633+8	3.2036+8	2.2228+8	1.6368+8	3.1085+3	2.5439–1	1.7117–1	8.3217–2	2.8387–6
	2.5340–4	5.2764–5	1.0625+7	5.2387–4	7.0483+8	3.1968+8	2.2187+8	1.6328+8	3.1078+3	2.5403–1	1.7101–1	8.3020–2	2.8469–6
	2.5402–4	5.2845–5	1.0609+7	5.2633–4	7.0376+8	3.1919+8	2.2157+8	1.6299+8	3.1073+3	2.5377–1	1.7089–1	8.2878–2	2.8528–6
	2.5546–4	5.3030–5	1.0572+7	5.3200–4	7.0129+8	3.1806+8	2.2089+8	1.6233+8	3.1061+3	2.5317–1	1.7062–1	8.2552–2	2.8665–6
	2.5631–4	5.3140–5	1.0550+7	5.3537–4	6.9984+8	3.1740+8	2.2049+8	1.6195+8	3.1053+3	2.5283–1	1.7047–1	8.2361–2	2.8746–6
	2.5825–4	5.3389–5	1.0501+7	5.4302–4	6.9658+8	3.1591+8	2.1959+8	1.6108+8	3.1037+3	2.5205–1	1.7012–1	8.1931–2	2.8931–6
	2.6177–4	5.3840–5	1.0413+7	5.5706–4	6.9074+8	3.1324+8	2.1799+8	1.5951+8	3.1008+3	2.5070–1	1.6954–1	8.1160–2	2.9267–6
	2.6346–4	5.4056–5	1.0371+7	5.6381–4	6.8798+8	3.1198+8	2.1723+8	1.5878+8	3.0994+3	2.5005–1	1.6925–1	8.0797–2	2.9428–6
	2.7133–4	5.5052–5	1.0184+7	5.9545–4	6.7554+8	3.0628+8	2.1380+8	1.5546+8	3.0931+3	2.4721–1	1.6805–1	7.9158–2	3.0176–6
	2.7260–4	5.5212–5	1.0154+7	6.0058–4	6.7359+8	3.0539+8	2.1326+8	1.5494+8	3.0921+3	2.4677–1	1.6786–1	7.8902–2	3.0297–6
	2.8567–4	5.6838–5	9.8636+6	6.5401–4	6.5431+8	2.9656+8	2.0792+8	1.4982+8	3.0821+3	2.4243–1	1.6605–1	7.6374–2	3.1536–6
	2.8630–4	5.6917–5	9.8501+6	6.5662–4	6.5341+8	2.9615+8	2.0768+8	1.4958+8	3.0816+3	2.4222–1	1.6596–1	7.6257–2	3.1596–6
	3.0000–4	5.8591–5	9.5687+6	7.1368–4	6.3474+8	2.8760+8	2.0249+8	1.4465+8	3.0716+3	2.3806–1	1.6423–1	7.3821–2	3.2892–6
L1	3.1343–4	6.0256–5	9.3041+6	7.7066–4	6.1719+8	2.7982+8	1.9729+8	1.4008+8	3.0623+3	2.3337–1	1.6182–1	7.1541–2	3.4158–6
	3.1884–4	6.0941–5	9.1995+6	7.9393–4	6.1025+8	2.7683+8	1.9530+8	1.3812+8	3.0573+3	2.3151–1	1.6094–1	7.0564–2	3.4648–6
	3.2500–4	6.1716–5	9.0841+6	8.2066–4	6.0260+8	2.7354+8	1.9310+8	1.3596+8	3.0517+3	2.2948–1	1.5999–1	6.9488–2	3.5205–6
	3.2899–4	6.2214–5	9.0113+6	8.3808–4	5.9777+8	2.7146+8	1.9171+8	1.3460+8	3.0482+3	2.2817–1	1.5936–1	6.8811–2	3.5565–6
	3.3438–4	6.2885–5	8.9152+6	8.6178–4	5.9139+8	2.6871+8	1.8987+8	1.3281+8	3.0435+3	2.2645–1	1.5853–1	6.7920–2	3.6052–6
	3.4674–4	6.4410–5	8.7041+6	9.1684–4	5.7739+8	2.6267+8	1.8582+8	1.2890+8	3.0330+3	2.2268–1	1.5671–1	6.5970–2	3.7165–6
	3.6250–4	6.6325–5	8.4527+6	9.8833–4	5.6072+8	2.5545+8	1.8100+8	1.2426+8	3.0202+3	2.1829–1	1.5463–1	6.3663–2	3.8579–6
	3.6719–4	6.6890–5	8.3814+6	1.0099–3	5.5599+8	2.5340+8	1.7962+8	1.2296+8	3.0165+3	2.1704–1	1.5402–1	6.3011–2	3.8999–6
	3.7337–4	6.7630–5	8.2897+6	1.0385–3	5.4990+8	2.5077+8	1.7785+8	1.2128+8	3.0117+3	2.1542–1	1.5324–1	6.2175–2	3.9551–6
	4.0000–4	7.0769–5	7.9220+6	1.1639–3	5.2550+8	2.4018+8	1.7074+8	1.1459+8	2.9920+3	2.0905–1	1.5021–1	5.8844–2	4.1922–6
	4.5000–4	7.6608–5	7.3182+6	1.4102–3	4.8545+8	2.2310+8	1.5836+8	1.0399+8	2.9164+3	1.9720–1	1.4365–1	5.3539–2	4.5544–6
	5.0000–4	8.2232–5	6.8177+6	1.6702–3	4.5226+8	2.0885+8	1.4805+8	9.5349+7	2.8503+3	1.8750–1	1.3828–1	4.9213–2	4.9087–6
	5.5000–4	8.7770–5	6.3875+6	1.9435–3	4.2372+8	1.9676+8	1.3889+8	8.8065+7	2.7919+3	1.7838–1	1.3283–1	4.5544–2	5.2561–6
	6.0000–4	9.3143–5	6.0191+6	2.2300–3	3.9928+8	1.8633+8	1.3104+8	8.1902+7	2.7395+3	1.7078–1	1.2833–1	4.2442–2	5.5974–6
	7.0000–4	1.0384–4	5.3990+6	2.8414–3	3.5814+8	1.6930+8	1.1763+8	7.1204+7	2.6124+3	1.5656–1	1.1953–1	3.7018–2	6.1210–6
	8.0000–4	1.1407–4	4.9147+6	3.5037–3	3.2602+8	1.5581+8	1.0713+8	6.3073+7	2.5071+3	1.4555–1	1.1265–1	3.2896–2	6.6259–6
	1.0000–3	1.3397–4	4.1847+6	4.9703–3	2.7759+8	1.3565+8	9.1043+7	5.0892+7	2.3157+3	1.2757–1	1.0089–1	2.6679–2	7.4643–6
	1.2500–3	1.5762–4	3.5568+6	7.0701–3	2.3594+8	1.1801+8	7.6873+7	4.1061+7	2.1033+3	1.1094–1	8.9305–2	2.1627–2	8.0945–6
	1.5000–3	1.7992–4	3.1160+6	9.4504–3	2.0670+8	1.0530+8	6.6938+7	3.4455+7	1.9442+3	9.9326–2	8.1084–2	1.8233–2	8.6981–6
	2.0000–3	2.2259–4	2.5187+6	1.4963–2	1.6708+8	8.7517+7	5.3454+7	2.6104+7	1.7067+3	8.2602–2	6.8684–2	1.3909–2	9.6575–6
	3.0000–3	3.0388–4	1.8449+6	2.8790–2	1.2238+8	6.6157+7	3.8627+7	1.7597+7	1.3962+3	6.2933–2	5.3454–2	9.4679–3	1.1019–5
K	3.1776–3	3.1781–4	1.7641+6	3.1669–2	1.1702+8	6.3514+7	3.6861+7	1.6642+7	1.3557+3	6.0441–2	5.1464–2	8.9651–3	1.1227–5
	3.2290–3	3.2188–4	1.7417+6	3.2524–2	1.1554+8	6.2773+7	3.6381+7	1.6385+7	1.3441+3	5.9767–2	5.0926–2	8.8293–3	1.1276–5
	3.3254–3	3.2947–4	1.7016+6	3.4153–2	1.1288+8	6.1438+7	3.5516+7	1.5922+7	1.3229+3	5.8556–2	4.9959–2	8.5859–3	1.1366–5
	3.4940–3	3.4264–4	1.6362+6	3.7083–2	1.0854+8	5.9256+7	3.4108+7	1.5174+7	1.2881+3	5.6587–2	4.8384–2	8.1918–3	1.1524–5
	3.7470–3	3.6214–4	1.5481+6	4.1662–2	1.0269+8	5.6304+7	3.2213+7	1.4176+7	1.2405+3	5.3945–2	4.6267–2	7.6663–3	1.1757–5
	4.0000–3	3.8136–4	1.4701+6	4.6456–2	9.7520+7	5.3678+7	3.0538+7	1.3302+7	1.1975+3	5.1615–2	4.4397–2	7.2065–3	1.1987–5
	4.2500–3	4.0057–4	1.3996+6	5.1404–2	9.2841+7	5.1261+7	2.9051+7	1.2527+7	1.1574+3	4.9434–2	4.2627–2	6.7958–3	1.2169–5
	4.6250–3	4.2899–4	1.3069+6	5.9218–2	8.6691+7	4.8071+7	2.7098+7	1.1521+7	1.1036+3	4.6576–2	4.0301–2	6.2625–3	1.2439–5
	5.0000–3	4.5695–4	1.2269+6	6.7490–2	8.1386+7	4.5306+7	2.5415+7	1.0665+7	1.0562+3	4.4118–2	3.8297–2	5.8088–3	1.2705–5

Atomic Weight 39.948												Density 1.7837– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.5000–3	4.9443–4	1.1339+6	7.9218–2	7.5218+7	4.2060+7	2.3487+7	9.6697+6	9.9893+2	4.1181–2	3.5890–2	5.2783–3	1.2980–5
6.0000–3	5.3129–4	1.0552+6	9.1740–2	7.0000+7	3.9301+7	2.1855+7	8.8425+6	9.4933+2	3.8702–2	3.3852–2	4.8374–3	1.3251–5
7.0000–3	6.0451–4	9.2742+5	1.1906–1	6.1521+7	3.4746+7	1.9227+7	7.5469+6	8.6462+2	3.4577–2	3.0420–2	4.1428–3	1.3664–5
8.0000–3	6.7596–4	8.2938+5	1.4939–1	5.5017+7	3.1229+7	1.7208+7	6.5792+6	7.9739+2	3.1417–2	2.7779–2	3.6239–3	1.4073–5
1.0000–2	8.1742–4	6.8586+5	2.1843–1	4.5496+7	2.5977+7	1.4288+7	5.2312+6	6.9252+2	2.6652–2	2.3741–2	2.8965–3	1.4637–5
1.2500–2	9.9040–4	5.6607+5	3.2029–1	3.7550+7	2.1525+7	1.1865+7	4.1596+6	5.9744+2	2.2550–2	2.0221–2	2.3142–3	1.5022–5
1.5000–2	1.1584–3	4.8396+5	4.3873–1	3.2104+7	1.8460+7	1.0194+7	3.4491+6	5.2953+2	1.9727–2	1.7783–2	1.9280–3	1.5437–5
2.0000–2	1.4840–3	3.7778+5	7.2015–1	2.5060+7	1.4423+7	8.0332+6	2.6033+6	4.3513+2	1.5942–2	1.4462–2	1.4649–3	1.5888–5
3.0000–2	2.1007–3	2.6688+5	1.4455+0	1.7703+7	1.0173+7	5.7705+6	1.7598+6	3.2851+2	1.1834–2	1.0818–2	9.9937–4	1.6299–5
4.0000–2	2.6788–3	2.0929+5	2.3809+0	1.3883+7	7.9458+6	4.5880+6	1.3492+6	2.7129+2	9.6228–3	8.8351–3	7.7113–4	1.6555–5
5.0000–2	3.2269–3	1.7374+5	3.5037+0	1.1525+7	6.5632+6	3.8576+6	1.1039+6	2.3358+2	8.2270–3	7.5762–3	6.3405–4	1.6736–5
6.0000–2	3.7440–3	1.4974+5	4.7967+0	9.9332+6	5.6354+6	3.3605+6	9.3703+5	2.0727+2	7.2604–3	6.7032–3	5.4034–4	1.6891–5
8.0000–2	4.7017–3	1.1924+5	7.8210+0	7.9098+6	4.4619+6	2.7259+6	7.2187+5	1.7272+2	6.0055–3	5.5694–3	4.1891–4	1.7226–5
1.0000–1	5.5586–3	1.0086+5	1.1389+1	6.6905+6	3.7580+6	2.3374+6	5.9486+5	1.5058+2	5.2239–3	4.8595–3	3.4690–4	1.7552–5
1.5000–1	7.3394–3	7.6387+4	2.2104+1	5.0671+6	2.8361+6	1.8105+6	4.2044+5	1.1903+2	4.1501–3	3.8842–3	2.4737–4	1.8508–5
2.0000–1	8.7431–3	6.4123+4	3.5021+1	4.2536+6	2.3738+6	1.5438+6	3.3587+5	1.0270+2	3.6043–3	3.3858–3	1.9888–4	1.9606–5
3.0000–1	1.0885–2	5.1503+4	6.5083+1	3.4165+6	1.8877+6	1.2792+6	2.4946+5	8.6855+1	3.0632–3	2.8919–3	1.4910–4	2.2178–5
4.0000–1	1.2504–2	4.4836+4	9.9175+1	2.9742+6	1.6192+6	1.1502+6	2.0462+5	7.9568+1	2.8070–3	2.6587–3	1.2316–4	2.5181–5
5.0000–1	1.3792–2	4.0649+4	1.3573+2	2.6965+6	1.4458+6	1.0752+6	1.7542+5	7.5634+1	2.6660–3	2.5314–3	1.0619–4	2.8457–5
6.0000–1	1.4826–2	3.7814+4	1.7384+2	2.5084+6	1.3242+6	1.0271+6	1.5702+5	7.3513+1	2.5824–3	2.4548–3	9.5526–5	3.2044–5
8.0000–1	1.6436–2	3.4111+4	2.5244+2	2.2628+6	1.1597+6	9.7069+5	1.3230+5	7.1667+1	2.5069–3	2.3859–3	8.1152–5	3.9859–5
1.0000+0	1.7634–2	3.1792+4	3.3278+2	2.1089+6	1.0538+6	9.3926+5	1.1581+5	7.1226+1	2.4720–3	2.3522–3	7.1512–5	4.8361–5
1.5000+0	1.9583–2	2.8629+4	5.3377+2	1.8991+6	8.9975+5	9.0500+5	9.4260+4	7.2305+1	2.5035–3	2.3723–3	5.8946–5	7.2218–5
2.0000+0	2.0754–2	2.7013+4	7.3148+2	1.7919+6	8.1501+5	8.9504+5	8.1798+4	7.4191+1	2.5544–3	2.4046–3	5.1447–5	9.8380–5
3.0000+0	2.2225–2	2.5225+4	1.1146+3	1.6733+6	7.2333+5	8.8153+5	6.8387+4	7.7497+1	2.6666–3	2.4674–3	4.3515–5	1.5570–4
4.0000+0	2.3028–2	2.4346+4	1.4822+3	1.6150+6	6.7424+5	8.8017+5	6.0505+4	7.9202+1	2.7757–3	2.5186–3	3.8957–5	2.1818–4
5.0000+0	2.3549–2	2.3807+4	1.8359+3	1.5792+6	6.4416+5	8.7936+5	5.5619+4	8.0550+1	2.8790–3	2.5611–3	3.5919–5	2.8195–4
6.0000+0	2.3893–2	2.3465+4	2.1770+3	1.5565+6	6.2499+5	8.7894+5	5.2510+4	8.1842+1	2.9852–3	2.6015–3	3.4012–5	3.4965–4
8.0000+0	2.4335–2	2.3038+4	2.8247+3	1.5282+6	6.0192+5	8.7833+5	4.7893+4	8.3921+1	3.1923–3	2.6730–3	3.1208–5	4.8809–4
1.0000+1	2.4545–2	2.2841+4	3.4326+3	1.5152+6	5.9116+5	8.7940+5	4.4536+4	8.5312+1	3.3895–3	2.7281–3	2.9194–5	6.3215–4
1.5000+1	2.4713–2	2.2686+4	4.8184+3	1.5049+6	5.8375+5	8.8092+5	4.0109+4	8.7738+1	3.8361–3	2.8031–3	2.6336–5	1.0066–3
2.0000+1	2.4775–2	2.2629+4	6.0509+3	1.5011+6	5.8131+5	8.8203+5	3.7659+4	8.9385+1	4.2858–3	2.8665–3	2.4769–5	1.3946–3
3.0000+1	2.4833–2	2.2577+4	8.1751+3	1.4976+6	5.8062+5	8.8249+5	3.4424+4	9.1576+1	5.1564–3	2.9382–3	2.2718–5	2.1955–3
4.0000+1	2.4853–2	2.2558+4	9.9671+3	1.4964+6	5.8058+5	8.8300+5	3.2731+4	9.3082+1	6.0271–3	2.9856–3	2.1673–5	3.0198–3
5.0000+1	2.4865–2	2.2547+4	1.1516+4	1.4957+6	5.8055+5	8.8335+5	3.1677+4	9.4185+1	6.9031–3	3.0244–3	2.0980–5	3.8577–3
6.0000+1	2.4878–2	2.2536+4	1.2880+4	1.4949+6	5.8052+5	8.8346+5	3.0840+4	9.5029+1	7.7774–3	3.0513–3	2.0430–5	4.7057–3
8.0000+1	2.4894–2	2.2521+4	1.5197+4	1.4939+6	5.8048+5	8.8362+5	2.9719+4	9.6371+1	9.5466–3	3.0978–3	1.9697–5	6.4291–3
1.0000+2	2.4903–2	2.2512+4	1.7117+4	1.4934+6	5.8045+5	8.8373+5	2.9090+4	9.7421+1	1.1341–2	3.1409–3	1.9289–5	8.1804–3
1.5000+2	2.4921–2	2.2496+4	2.0834+4	1.4923+6	5.8039+5	8.8380+5	2.8005+4	9.9307+1	1.5810–2	3.1822–3	1.8570–5	1.2610–2
2.0000+2	2.4930–2	2.2488+4	2.3617+4	1.4918+6	5.8035+5	8.8385+5	2.7464+4	1.0046+2	2.0314–2	3.2213–3	1.8212–5	1.7074–2
3.0000+2	2.4939–2	2.2481+4	2.7691+4	1.4913+6	5.8030+5	8.8391+5	2.6944+4	1.0141+2	2.9323–2	3.2900–3	1.7868–5	2.6015–2
4.0000+2	2.4945–2	2.2475+4	3.0664+4	1.4909+6	5.8026+5	8.8392+5	2.6579+4	1.0192+2	3.8352–2	3.3152–3	1.7627–5	3.5019–2
5.0000+2	2.4950–2	2.2471+4	3.3006+4	1.4906+6	5.8023+5	8.8393+5	2.6335+4	1.0235+2	4.7364–2	3.3399–3	1.7466–5	4.4007–2
6.0000+2	2.4951–2	2.2469+4	3.4939+4	1.4905+6	5.8020+5	8.8393+5	2.6247+4	1.0275+2	5.6362–2	3.3615–3	1.7408–5	5.2983–2
8.0000+2	2.4954–2	2.2466+4	3.8017+4	1.4903+6	5.8016+5	8.8394+5	2.6107+4	1.0347+2	7.4406–2	3.4045–3	1.7317–5	7.0984–2
1.0000+3	2.4960–2	2.2461+4	4.0423+4	1.4899+6	5.8013+5	8.8394+5	2.5780+4	1.0413+2	9.2515–2	3.4449–3	1.7102–5	8.9053–2
1.5000+3	2.4963–2	2.2458+4	4.4822+4	1.4898+6	5.8007+5	8.8394+5	2.5659+4	1.0543+2	1.3781–1	3.4772–3	1.7021–5	1.3432–1
2.0000+3	2.4968–2	2.2454+4	4.7957+4	1.4895+6	5.8003+5	8.8394+5	2.5415+4	1.0641+2	1.8339–1	3.5095–3	1.6860–5	1.7986–1
3.0000+3	2.4969–2	2.2453+4	5.2388+4	1.4894+6	5.7997+5	8.8394+5	2.5415+4	1.0791+2	2.7401–1	3.5740–3	1.6860–5	2.7042–1
4.0000+3	2.4972–2	2.2450+4	5.5539+4	1.4892+6	5.7993+5	8.8394+5	2.5253+4	1.0906+2	3.6497–1	3.6076–3	1.6752–5	3.6134–1
5.0000+3	2.4978–2	2.2445+4	5.7984+4	1.4889+6	5.7990+5	8.8394+5	2.4929+4	1.0997+2	4.5662–1	3.6284–3	1.6537–5	4.5298–1
6.0000+3	2.4977–2	2.2446+4	5.9983+4	1.4890+6	5.7988+5	8.8394+5	2.5051+4	1.1072+2	5.4663–1	3.6492–3	1.6618–5	5.4297–1
8.0000+3	2.4976–2	2.2447+4	6.3142+4	1.4890+6	5.7984+5	8.8394+5	2.5132+4	1.1192+2	7.2820–1	3.6908–3	1.6671–5	7.2450–1
1.0000+4	2.4976–2	2.2447+4	6.5592+4	1.4890+6	5.7981+5	8.8394+5	2.5172+4	1.1285+2	9.1144–1	3.7299–3	1.6698–5	9.0769–1
1.5000+4	2.4976–2	2.2447+4	7.0052+4	1.4890+6	5.7975+5	8.8394+5	2.5213+4	1.1469+2	1.3605+0	3.7602–3	1.6725–5	1.3567+0
2.0000+4	2.4977–2	2.2446+4	7.3222+4	1.4890+6	5.7971+5	8.8394+5	2.5213+4	1.1601+2	1.8154+0	3.7905–3	1.6725–5	1.8116+0
3.0000+4	2.4976–2	2.2447+4	7.7696+4	1.4890+6	5.7965+5	8.8394+5	2.5294+4	1.1785+2	2.7156+0	3.8512–3	1.6779–5	2.7117+0
4.0000+4	2.4978–2	2.2445+4	8.0872+4	1.4889+6	5.7961+5	8.8394+5	2.5213+4	1.1917+2	3.6255+0	3.8963–3	1.6725–5	3.6216+0
5.0000+4	2.4984–2	2.2439+4	8.3335+4	1.4885+6	5.7958+5	8.8394+5	2.4888+4	1.2019+2	4.5270+0	3.9159–3	1.6510–5	4.5230+0
6.0000+4	2.4982–2	2.2442+4	8.5350+4	1.4887+6	5.7955+5	8.8394+5	2.5051+4	1.2102+2	5.4277+0	3.9355–3	1.6618–5	5.4237+0
8.0000+4	2.4981–2	2.2442+4	8.8528+4	1.4887+6	5.7951+5	8.8394+5	2.5132+4	1.2234+2	7.2448+0	3.9748–3	1.6671–5	7.2408+0
1.0000+5	2.4981–2	2.2442+4	9.0991+4	1.4887+6	5.7948+5	8.8394+5	2.5172+4	1.2337+2	9.0651+0	4.0140–3	1.6698–5	9.0611+0


July 4, 1991
Atomic Weight 39.102
EEDL Evaluated Electron
Cross Sections
19-K
Density 8.6200- 1 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
19-K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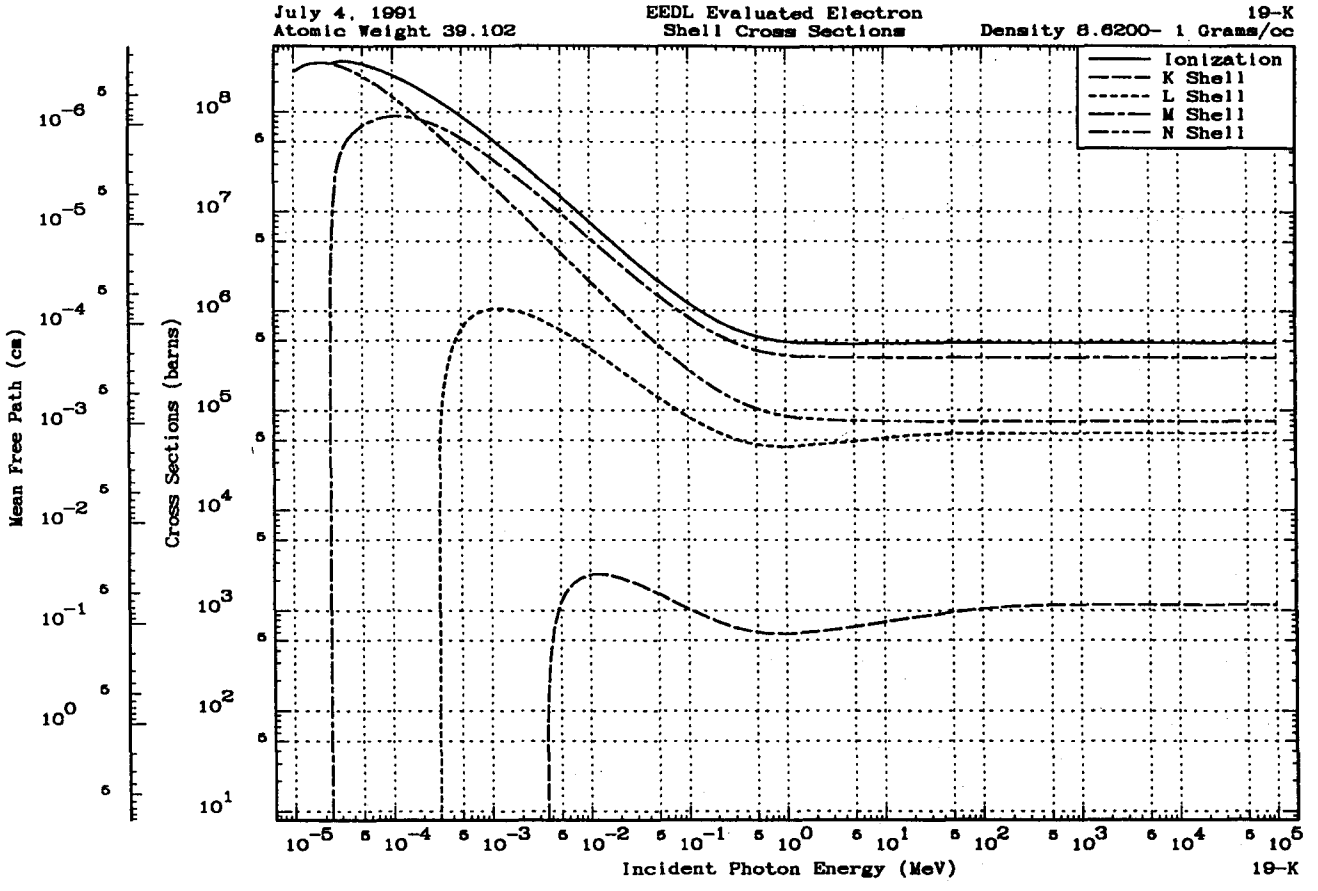
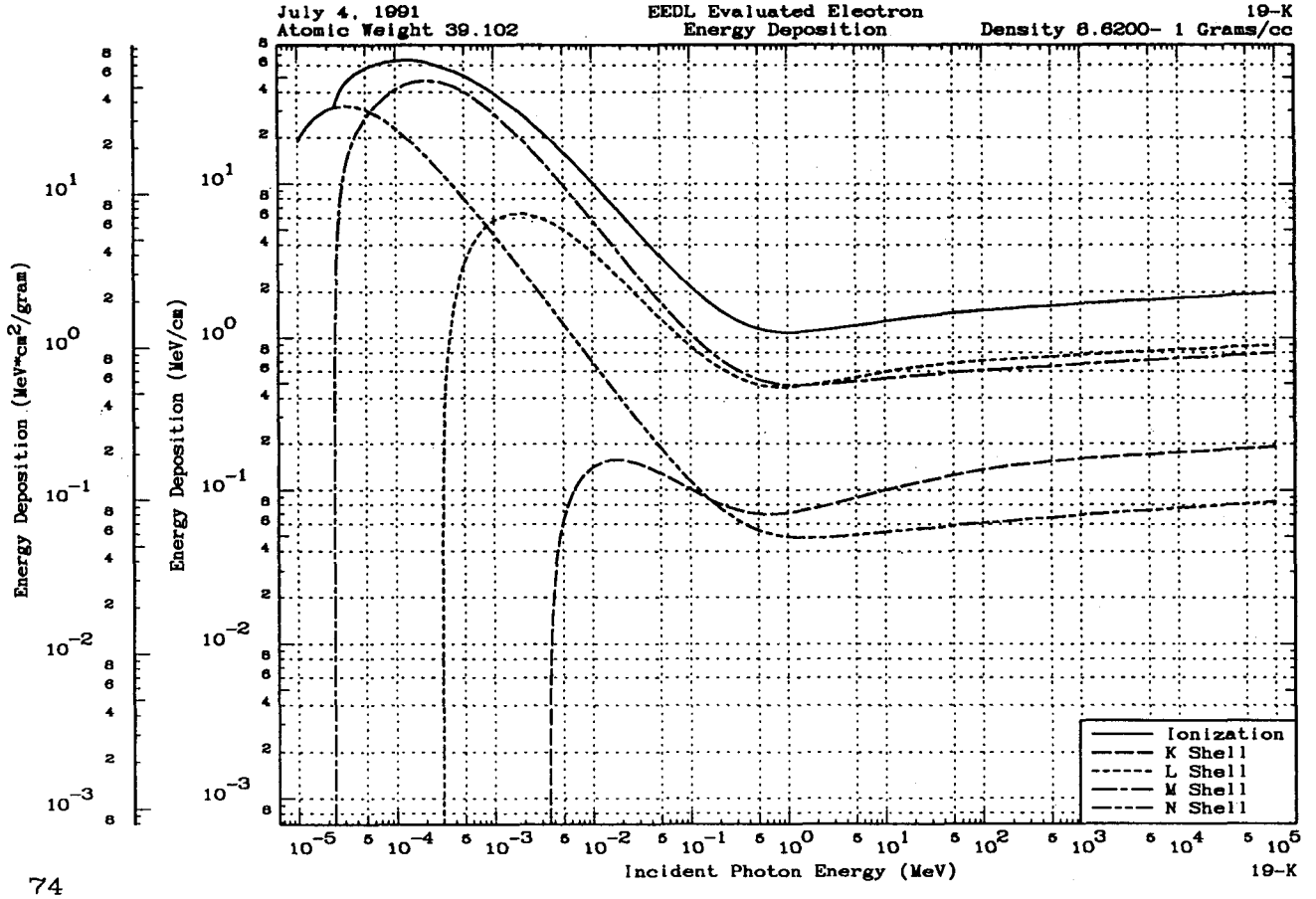
Density 8.6200- 1 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
19-K


July 4, 1991
Atomic Weight 39.102
EEDL Evaluated Electron
Shell Cross Sections
19-K
Density 8.6200- 1 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
19-K

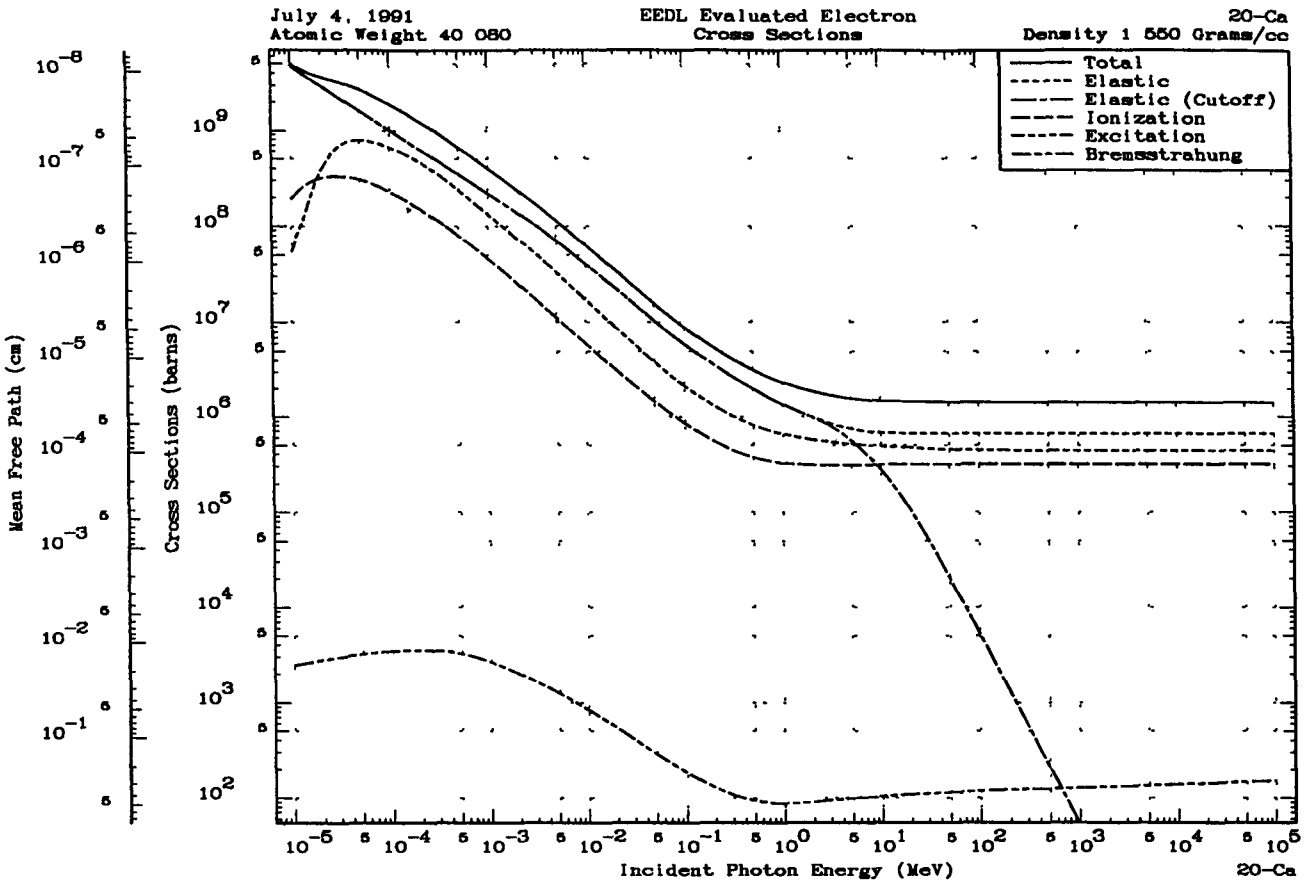

July 4, 1991
Atomic Weight 39.102
EEDL Evaluated Electron
Energy Deposition
19-K
Density 8.6200- 1 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
19-K

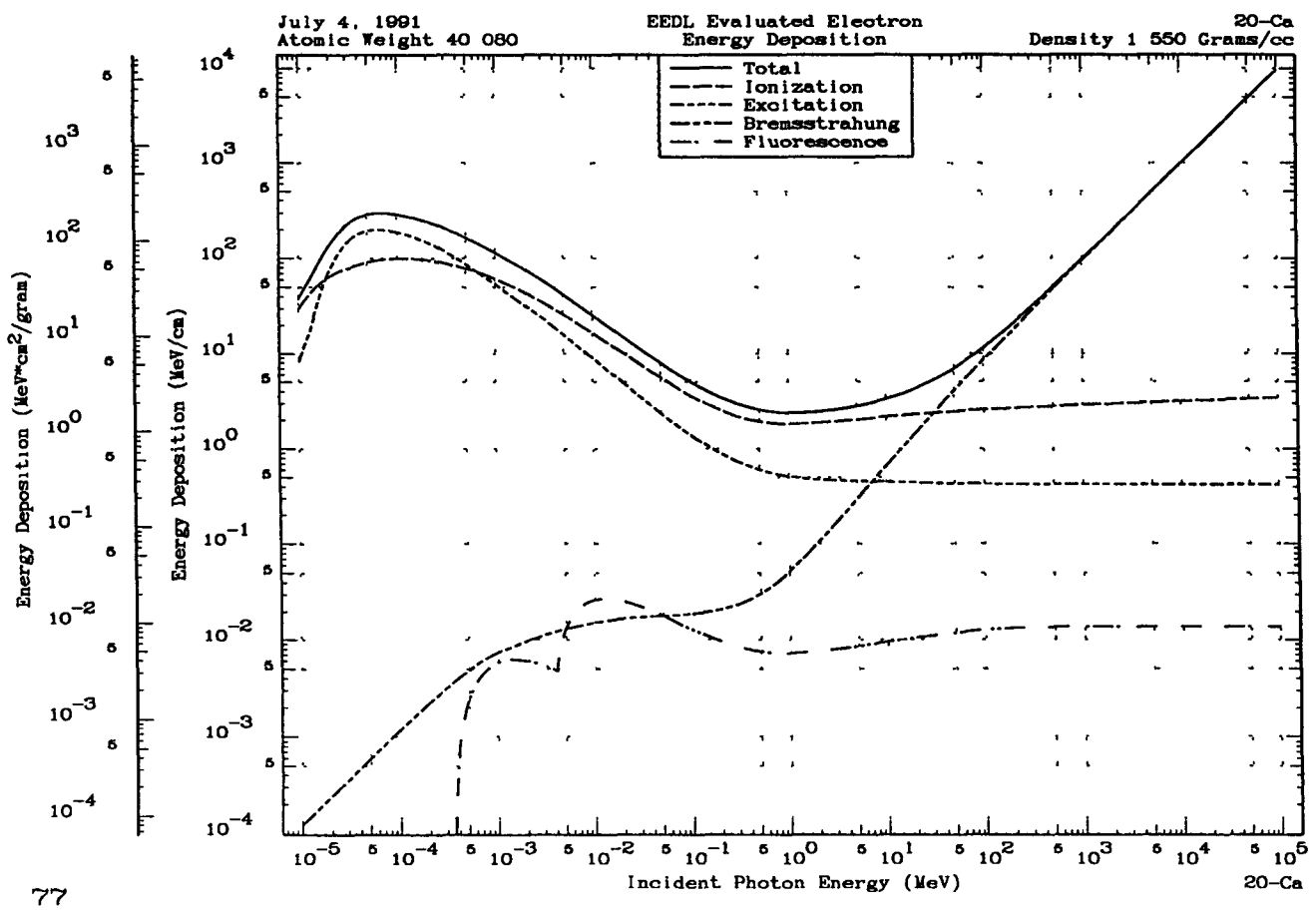
Atomic Weight 39.102 — Density 8.6200– 1 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.7928–8	6.4709+7		4.2016+9	3.9006+9	2.5349+8	4.7489+7	2.3417+3	2.2271+1	1.8912+1	3.3589+0	6.6968–5
	1.2500–5	2.0136–8	5.7612+7		3.7408+9	3.3623+9	2.8883+8	8.9629+7	2.4435+3	3.0201+1	2.3508+1	6.6929+0	8.2964–5
	1.3125–5	2.0630–8	5.6232+7		3.6512+9	3.2549+9	2.9329+8	1.0298+8	2.4664+3	3.2103+1	2.4312+1	7.7916+0	8.7041–5
	1.5000–5	2.1956–8	5.2838+7		3.4308+9	2.9782+9	3.0586+8	1.4676+8	2.5300+3	3.8269+1	2.6731+1	1.1538+1	9.9447–5
	2.0000–5	2.4620–8	4.7120+7		3.0595+9	2.4593+9	3.1185+8	2.8837+8	2.6726+3	5.4689+1	3.0443+1	2.4245+1	1.3368–4
M3	2.3470–5	2.5839–8	4.4897+7		2.9152+9	2.2109+9	3.0494+8	3.9927+8	2.7426+3	6.6225+1	3.1541+1	3.4684+1	1.5608–4
M2	2.3750–5	2.5912–8	4.4770+7		2.9069+9	2.1936+9	3.0591+8	4.0748+8	2.7476+3	6.7575+1	3.2092+1	3.5483+1	1.5786–4
	2.3878–5	2.5944–8	4.4716+7		2.9034+9	2.1857+9	3.0655+8	4.1116+8	2.7498+3	6.8264+1	3.2429+1	3.5835+1	1.5867–4
	2.4141–5	2.6010–8	4.4602+7		2.8960+9	2.1699+9	3.0742+8	4.1875+8	2.7544+3	6.9540+1	3.2979+1	3.6561+1	1.6034–4
	2.4507–5	2.6092–8	4.4462+7		2.8869+9	2.1482+9	3.0928+8	4.2943+8	2.7608+3	7.1536+1	3.3951+1	3.7585+1	1.6268–4
	2.4643–5	2.6119–8	4.4415+7		2.8839+9	2.1403+9	3.1015+8	4.3344+8	2.7631+3	7.2342+1	3.4371+1	3.7971+1	1.6355–4
	2.5194–5	2.6233–8	4.4223+7		2.8714+9	2.1091+9	3.1259+8	4.4975+8	2.7725+3	7.5268+1	3.5724+1	3.9544+1	1.6707–4
	2.5313–5	2.6255–8	4.4185+7		2.8690+9	2.1025+9	3.1317+8	4.5332+8	2.7745+3	7.5924+1	3.6034+1	3.9889+1	1.6783–4
	2.5794–5	2.6347–8	4.4031+7		2.8589+9	2.0763+9	3.1482+8	4.6783+8	2.7825+3	7.8362+1	3.7064+1	4.1298+1	1.7092–4
	2.6485–5	2.6462–8	4.3840+7		2.8466+9	2.0401+9	3.1750+8	4.8896+8	2.7938+3	8.2001+1	3.8640+1	4.3361+1	1.7536–4
	2.6846–5	2.6517–8	4.3749+7		2.8406+9	2.0218+9	3.1866+8	5.0016+8	2.7995+3	8.3844+1	3.9384+1	4.4460+1	1.7769–4
	2.7364–5	2.6589–8	4.3630+7		2.8329+9	1.9963+9	3.2024+8	5.1640+8	2.8077+3	8.6488+1	4.0429+1	4.6060+1	1.8104–4
	2.7634–5	2.6625–8	4.3571+7		2.8291+9	1.9832+9	3.2089+8	5.2498+8	2.8120+3	8.7822+1	4.0915+1	4.6908+1	1.8279–4
	2.8682–5	2.6742–8	4.3381+7		2.8168+9	1.9347+9	3.2335+8	5.5868+8	2.8280+3	9.3038+1	4.2776+1	5.0262+1	1.8959–4
	2.8738–5	2.6747–8	4.3372+7		2.8162+9	1.9322+9	3.2345+8	5.6052+8	2.8289+3	9.3311+1	4.2866+1	5.0445+1	1.8996–4
	2.8817–5	2.6759–8	4.3353+7		2.8149+9	1.9287+9	3.2360+8	5.6263+8	2.8300+3	9.3656+1	4.2994+1	5.0662+1	1.9047–4
	3.0000–5	2.6921–8	4.3092+7		2.7980+9	1.8777+9	3.2566+8	5.9457+8	2.8475+3	9.8791+1	4.4843+1	5.3949+1	1.9820–4
	3.2500–5	2.7225–8	4.2612+7		2.7668+9	1.7805+9	3.2493+8	6.6136+8	2.8826+3	1.0817+2	4.7520+1	6.0649+1	2.1465–4
	3.6250–5	2.7690–8	4.1896+7		2.7203+9	1.6560+9	3.2218+8	7.4216+8	2.9311+3	1.1976+2	5.0621+1	6.9138+1	2.3963–4
	4.0000–5	2.8146–8	4.1217+7		2.6763+9	1.5512+9	3.1849+8	8.0661+8	2.9756+3	1.2939+2	5.3071+1	7.6314+1	2.6496–4
M1	4.0500–5	2.8205–8	4.1130+7		2.6706+9	1.5384+9	3.1750+8	8.1468+8	2.9812+3	1.3043+2	5.3251+1	7.7177+1	2.6836–4
	4.1094–5	2.8316–8	4.0969+7		2.6602+9	1.5236+9	3.1638+8	8.2014+8	2.9865+3	1.3131+2	5.3495+1	7.7816+1	2.7209–4
	4.2207–5	2.8516–8	4.0682+7		2.6415+9	1.4968+9	3.1437+8	8.3028+8	2.9962+3	1.3296+2	5.3958+1	7.9006+1	2.7909–4
	4.4155–5	2.8844–8	4.0220+7		2.6115+9	1.4527+9	3.1115+8	8.4767+8	3.0126+3	1.3586+2	5.4791+1	8.1070+1	2.9140–4
	4.7078–5	2.9286–8	3.9612+7		2.5720+9	1.3922+9	3.0689+8	8.7299+8	3.0361+3	1.4021+2	5.6084+1	8.4123+1	3.0995–4
	5.0000–5	2.9675–8	3.9093+7		2.5384+9	1.3376+9	3.0325+8	8.9748+8	3.0583+3	1.4456+2	5.7432+1	8.7133+1	3.2863–4
	5.5000–5	3.0674–8	3.7820+7		2.4557+9	1.2556+9	2.9461+8	9.0546+8	3.0901+3	1.4774+2	5.8678+1	8.9064+1	3.5981–4
	6.0000–5	3.1578–8	3.6737+7		2.3854+9	1.1851+9	2.8743+8	9.1280+8	3.1194+3	1.5099+2	6.0041+1	9.0953+1	3.9125–4
	7.0000–5	3.3555–8	3.4573+7		2.2449+9	1.0700+9	2.7142+8	9.0344+8	3.1720+3	1.5269+2	6.1313+1	9.1373+1	4.5484–4
	8.0000–5	3.5648–8	3.2543+7		2.1130+9	9.7934+8	2.5921+8	8.7450+8	3.2183+3	1.5268+2	6.2920+1	8.9756+1	5.1931–4
	9.0000–5	3.7769–8	3.0715+7		1.9943+9	9.0607+8	2.4669+8	8.4159+8	3.2469+3	1.5132+2	6.3531+1	8.7791+1	5.8056–4
	1.0000–4	3.9753–8	2.9182+7	0.0000+0	1.8948+9	8.4519+8	2.3644+8	8.1321+8	3.2726+3	1.5056+2	6.4361+1	8.6195+1	6.4226–4
	1.1250–4	4.2278–8	2.7440+7	8.3805–8	1.7817+9	7.8195+8	2.2365+8	7.7607+8	3.2894+3	1.4776+2	6.4486+1	8.3275+1	7.1547–4
	1.2500–4	4.4656–8	2.5979+7	1.6901–7	1.6868+9	7.2941+8	2.1311+8	7.4428+8	3.3045+3	1.4567+2	6.4832+1	8.0839+1	7.8898–4
	1.3125–4	4.5809–8	2.5325+7	2.1208–7	1.6443+9	7.0629+8	2.0805+8	7.3001+8	3.3115+3	1.4455+2	6.4785+1	7.9766+1	8.2584–4
	1.5000–4	4.9104–8	2.3625+7	3.4303–7	1.5340+9	6.4669+8	1.9499+8	6.9232+8	3.3308+3	1.4182+2	6.4813+1	7.7009+1	9.3683–4
	2.0000–4	5.8006–8	2.0000+7	7.0856–7	1.2986+9	5.3482+8	1.6670+8	5.9706+8	3.3445+3	1.3188+2	6.3151+1	6.8723+1	1.2224–3
	2.5000–4	6.7057–8	1.7300+7	1.1039–6	1.1233+9	4.6171+8	1.4533+8	5.1626+8	3.2974+3	1.2121+2	6.0328+1	6.0884+1	1.4771–3
L3	2.9864–4	7.5254–8	1.5416+7	1.5183–6	1.0009+9	4.1069+8	1.3046+8	4.5979+8	3.2604+3	1.1360+2	5.8104+1	5.5490+1	1.7221–3
	3.0000–4	7.5470–8	1.5372+7	1.5303–6	9.9808+8	4.0946+8	1.3010+8	4.5851+8	3.2594+3	1.1345+2	5.8080+1	5.5370+1	1.7289–3
	3.0156–4	7.5720–8	1.5321+7	1.5441–6	9.9478+8	4.0807+8	1.2965+8	4.5706+8	3.2583+3	1.1323+2	5.8009+1	5.5221+1	1.7367–3
L2	3.0165–4	7.5734–8	1.5318+7	1.5449–6	9.9460+8	4.0799+8	1.2963+8	4.5698+8	3.2583+3	1.1322+2	5.8005+1	5.5212+1	1.7372–3
	3.0310–4	7.5978–8	1.5269+7	1.5577–6	9.9141+8	4.0671+8	1.2922+8	4.5548+8	3.2573+3	1.1301+2	5.7949+1	5.5058+1	1.7444–3
	3.0319–4	7.5992–8	1.5266+7	1.5585–6	9.9123+8	4.0664+8	1.2919+8	4.5539+8	3.2572+3	1.1300+2	5.7945+1	5.5049+1	1.7449–3
	3.0613–4	7.6485–8	1.5168+7	1.5846–6	9.8484+8	4.0407+8	1.2837+8	4.5240+8	3.2552+3	1.1257+2	5.7823+1	5.4740+1	1.7596–3
	3.0621–4	7.6499–8	1.5165+7	1.5853–6	9.8466+8	4.0400+8	1.2835+8	4.5231+8	3.2552+3	1.1255+2	5.7820+1	5.4732+1	1.7600–3
	3.0914–4	7.6988–8	1.5068+7	1.6114–6	9.7840+8	4.0149+8	1.2753+8	4.4938+8	3.2532+3	1.1212+2	5.7687+1	5.4429+1	1.7747–3
	3.1200–4	7.7463–8	1.4976+7	1.6369–6	9.7241+8	3.9908+8	1.2676+8	4.4657+8	3.2513+3	1.1171+2	5.7564+1	5.4140+1	1.7889–3
	3.1482–4	7.7932–8	1.4886+7	1.6622–6	9.6655+8	3.9673+8	1.2600+8	4.4382+8	3.2494+3	1.1129+2	5.7436+1	5.3857+1	1.8030–3
	3.2300–4	7.9280–8	1.4633+7	1.7361–6	9.5011+8	3.9012+8	1.2387+8	4.3612+8	3.2442+3	1.1015+2	5.7085+1	5.3065+1	1.8439–3
	3.2547–4	7.9686–8	1.4558+7	1.7585–6	9.4528+8	3.8818+8	1.2325+8	4.3385+8	3.2426+3	1.0981+2	5.6979+1	5.2832+1	1.8562–3
	3.4225–4	8.2411–8	1.4077+7	1.9128–6	9.1402+8	3.7560+8	1.1921+8	4.1920+8	3.2322+3	1.0766+2	5.6327+1	5.1330+1	1.9397–3
	3.4410–4	8.2710–8	1.4026+7	1.9301–6	9.1072+8	3.7427+8	1.1879+8	4.1765+8	3.2311+3	1.0743+2	5.6258+1	5.1172+1	1.9489–3
L1	3.7116–4	8.7003–8	1.3334+7	2.1856–6	8.6578+8	3.5617+8	1.1301+8	3.9660+8	3.2156+3	1.0439+2	5.5363+1	4.9022+1	2.0831–3
	3.7837–4	8.8188–8	1.3155+7	2.2549–6	8.5415+8	3.5171+8	1.1159+8	3.9084+8	3.2066+3	1.0359+2	5.5147+1	4.8441+1	2.1147–3
	4.0000–4	9.1701–8	1.2651+7	2.4660–6	8.2142+8	3.3914+8	1.0759+8	3.7468+8	3.1808+3	1.0142+2	5.4601+1	4.6813+1	2.2091–3
	4.2500–4	9.5807–8	1.2109+7	2.7160–6	7.8622+8	3.2594+8	1.0311+8	3.5717+8	3.1409+3	9.8526+1	5.3607+1	4.4917+1	2.3068–3
	4.5000–4	9.9841–8	1.1619+7	2.9731–6	7.5446+8	3.1397+8	9.9083+7	3.4140+8	3.1037+3	9.5995+1	5.2780+1	4.3213+1	2.4034–3
	4.6250–4	1.0183–7	1.1392+7	3.1041–6	7.3969+8	3.0839+8	9.7207+7	3.3409+8	3.0860+3	9.4807+1	5.2379+1	4.2425+1	2.4514–3
	5.0000–4	1.0772–7	1.0770+7	3.5065–6	6.9927+8	2.9305+8	9.2085+7	3.1414+8	3.0363+3	9.1626+1	5.1346+1	4.0277+1	2.5938–3
	5.5000–4	1.1576–7	1.0021+7	4.0656–6	6.5068+8	2.7532+8	8.5935+7	2.8942+8	2.9766+3	8.7263+1	4.9754+1	3.7505+1	2.7805–3
	6.0000–4	1.2362–7	9.3845+6	4.6509–6	6.0934+8	2.6008+8	8.0699+7	2.6856+8	2.9231+3	8.3595+1	4.8422+1	3.5170+1	2.9641–3
	7.0000–4	1.3900–7	8.3461+6	5.8979–6	5.4191+8	2.3516+8	7.1849+7	2.3490+8	2.7919+3	7.6892+1	4.5611+1	3.1278+1	3.2474–3
	8.0000–4	1.5382–7	7.5417+6	7.2439–6	4.8969+8	2.1552+8	6.4995+7	2.0917+8	2.6829+3	7.1756+1	4.3440+1	2.8312+1	3.5208–3
	9.0000–4	1.6829–7	6.8933+6	8.6846–6	4.4759+8	1.9962+8	5.9292+7	1.8867+8	2.5760+3	6.7111+1	4.1245+1	2.5863+1	3.7523–3
	1.0000–3	1.8235–7	6.3618+6	1.0218–5	4.1307+8	1.8640+8	5.4636+7	1.7204+8	2.4839+3	6.3387+1	3.9503+1	2.3881+1	3.9767–3
	1.2500–3	2.1646–7	5.3593+6	1.4431–5	3.4798+8	1.6108+8	4.5648+7	1.4125+8	2.2614+3	5.5469+1	3.5401+1	2.0064+1	4.3220–3
	1.5000–3	2.4890–7	4.6608+6	1.9176–5	3.0263+8	1.4297+8	3.9426+7	1.2023+8	2.0944+3	4.9987+1	3.2516+1	1.7467+1	4.6526–3
	2.0000–3	3.0995–7	3.7428+6	3.0072–5	2.4302+8	1.1793+8	3.1068+7	9.4023+7	1.8442+3	4.2023+1	2.7916+1	1.4101+1	5.1806–3
	2.5000–3	3.6938–7	3.1406+6	4.2850–5	2.0392+8	1.0067+8	2.5730+7	7.7519+7	1.6551+3	3.6374+1	2.4478+1	1.1890+1	5.5666–3
	3.0000–3	4.2620–7	2.7220+6	5.7384–5	1.7674+8	8.8463+7	2.2066+7	6.6209+7	1.5151+3	3.2501+1	2.2114+1	1.0380+1	5.9353–3
K	3.5833–3	4.9248–7	2.3556+6	7.6427–5	1.5295+8	7.7561+7	1.8954+7	5.6434+7	1.3821+3	2.8836+1	1.9815+1	9.0148+0	6.2695–3
	3.6354–3	4.9842–7	2.3276+6	7.8242–5	1.5113+8	7.6727+7	1.8721+7	5.5680+7	1.3715+3	2.8555+1	1.9641+1	8.9079+0	6.2956–3
	3.7265–3	5.0877–7	2.2802+6	8.1461–5	1.4806+8	7.5316+7	1.8328+7	5.4410+7	1.3536+3	2.8083+1	1.9349+1	8.7279+0	6.3411–3
	3.8633–3	5.2421–7	2.2130+6	8.6388–5	1.4369+8	7.3309+7	1.7770+7	5.2613+7	1.3278+3	2.7413+1	1.8934+1	8.4733+0	6.4088–3

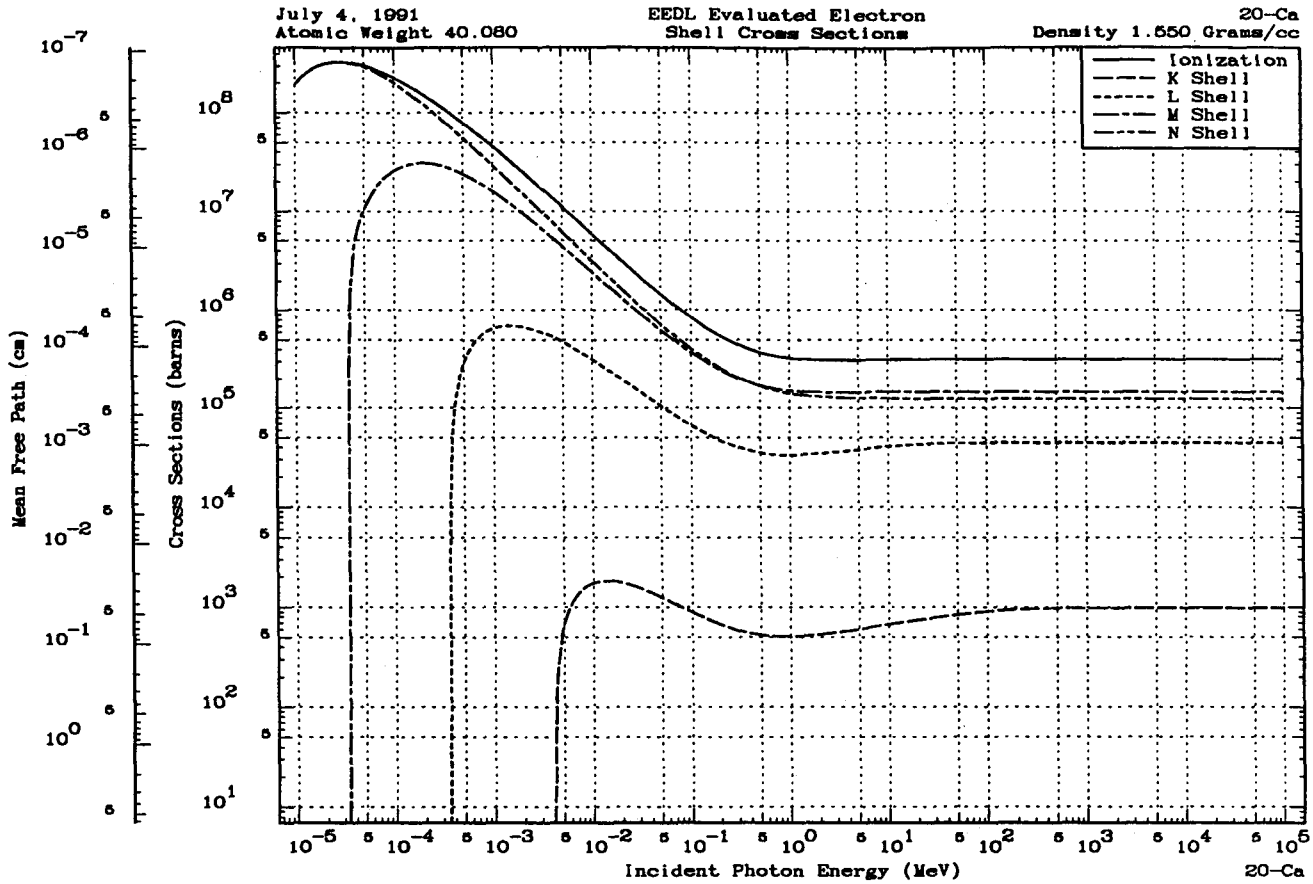
Atomic Weight 39.102 Density 8.6200– 1 Grams/cc

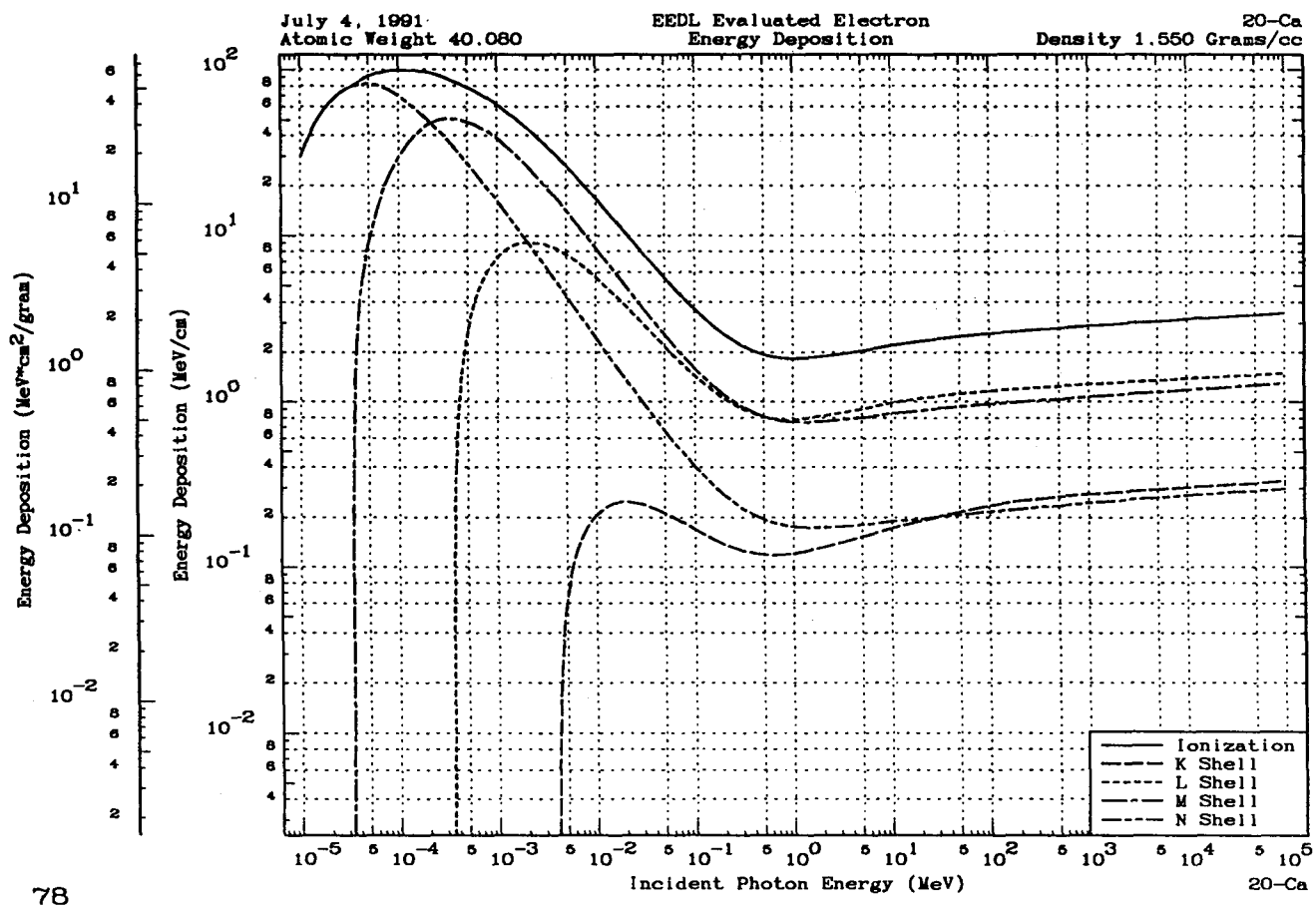
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000–3	5.3955–7	2.1501+6	9.1434–5	1.3961+8	7.1423+7	1.7248+7	5.0935+7	1.3034+3	2.6788+1	1.8546+1	8.2356+0	6.4760–3
4.2500–3	5.6797–7	2.0425+6	1.0097–4	1.3262+8	6.8132+7	1.6369+7	4.8121+7	1.2605+3	2.5674+1	1.7839+1	7.8275+0	6.5785–3
4.6250–3	6.1008–7	1.9015+6	1.1600–4	1.2347+8	6.3793+7	1.5219+7	4.4454+7	1.2029+3	2.4216+1	1.6913+1	7.2961+0	6.7304–3
5.0000–3	6.5165–7	1.7802+6	1.3190–4	1.1559+8	6.0038+7	1.4230+7	4.1322+7	1.1522+3	2.2966+1	1.6117+1	6.8423+0	6.8797–3
5.5000–3	7.0684–7	1.6412+6	1.5442–4	1.0657+8	5.5677+7	1.3103+7	3.7785+7	1.0906+3	2.1470+1	1.5146+1	6.3176+0	7.0354–3
6.0000–3	7.6126–7	1.5239+6	1.7842–4	9.8948+7	5.1974+7	1.2153+7	3.4821+7	1.0373+3	2.0210+1	1.4325+1	5.8782+0	7.1892–3
7.0000–3	8.6857–7	1.3356+6	2.3069–4	8.6723+7	4.5966+7	1.0630+7	3.0127+7	9.4594+2	1.8088+1	1.2918+1	5.1633+0	7.4252–3
8.0000–3	9.7358–7	1.1916+6	2.8861–4	7.7370+7	4.1327+7	9.4669+6	2.6575+7	8.7337+2	1.6468+1	1.1837+1	4.6229+0	7.6578–3
1.0000–2	1.1795–6	9.8352+5	4.2011–4	6.3861+7	3.4543+7	7.8008+6	2.1516+7	7.5985+2	1.4015+1	1.0176+1	3.8306+0	7.9830–3
1.2500–2	1.4328–6	8.0965+5	6.1374–4	5.2571+7	2.8791+7	6.4315+6	1.7348+7	6.5657+2	1.1868+1	8.7054+0	3.1544+0	8.2109–3
1.5000–2	1.6794–6	6.9080+5	8.3861–4	4.4854+7	2.4809+7	5.4940+6	1.4550+7	5.8270+2	1.0399+1	7.6896+0	2.7007+0	8.4522–3
2.0000–2	2.1696–6	5.3471+5	1.3725–3	3.4719+7	1.9393+7	4.2950+6	1.1030+7	4.7969+2	8.4033+0	6.2871+0	2.1075+0	8.7214–3
3.0000–2	3.1280–6	3.7088+5	2.7494–3	2.4081+7	1.3557+7	3.0540+6	7.4695+6	3.6289+2	6.2303+0	4.7351+0	1.4862+0	8.9758–3
4.0000–2	4.0501–6	2.8644+5	4.5289–3	1.8599+7	1.0533+7	2.4134+6	5.6524+6	2.9997+2	5.0502+0	3.8838+0	1.1573+0	9.1309–3
5.0000–2	4.9366–6	2.3500+5	6.6714–3	1.5258+7	8.6798+6	2.0204+6	4.5580+6	2.5849+2	4.3045+0	3.3420+0	9.5323–1	9.2423–3
6.0000–2	5.7845–6	2.0055+5	9.1451–3	1.3022+7	7.4311+6	1.7544+6	3.8362+6	2.2954+2	3.7913+0	2.9654+0	8.1652–1	9.3354–3
8.0000–2	7.3638–6	1.5754+5	1.4943–2	1.0229+7	5.8541+6	1.4167+6	2.9583+6	1.9146+2	3.1295+0	2.4729+0	6.4708–1	9.5197–3
1.0000–1	8.8202–6	1.3153+5	2.1800–2	8.5401+6	4.9099+6	1.2111+6	2.4189+6	1.6702+2	2.7132+0	2.1632+0	5.4028–1	9.7127–3
1.5000–1	1.1881–5	9.7644+4	4.2477–2	6.3401+6	3.6904+6	9.3369+5	1.7159+6	1.3209+2	2.1454+0	1.7373+0	3.9790–1	1.0244–2
2.0000–1	1.4332–5	8.0943+4	6.7498–2	5.2557+6	3.0855+6	7.9453+5	1.3755+6	1.1397+2	1.8580+0	1.5197+0	3.2746–1	1.0850–2
2.5000–1	1.6355–5	7.0933+4	9.5676–2	4.6057+6	2.7107+6	7.1570+5	1.1792+6	1.0392+2	1.6934+0	1.3958+0	2.8601–1	1.1554–2
3.0000–1	1.8121–5	6.4021+4	1.2625–1	4.1569+6	2.4386+6	6.5717+5	1.0610+6	9.6375+1	1.5789+0	1.3045+0	2.6212–1	1.2254–2
4.0000–1	2.0978–5	5.5301+4	1.9225–1	3.5907+6	2.0697+6	5.9088+5	9.3005+5	8.8273+1	1.4531+0	1.2032+0	2.3598–1	1.3905–2
5.0000–1	2.3307–5	4.9774+4	2.6274–1	3.2318+6	1.8285+6	5.5291+5	8.5033+5	8.3895+1	1.3848+0	1.1487+0	2.2038–1	1.5713–2
6.0000–1	2.5281–5	4.5888+4	3.3605–1	2.9795+6	1.6565+6	5.2889+5	7.9407+5	8.1519+1	1.3437+0	1.1166+0	2.0942–1	1.7682–2
8.0000–1	2.8309–5	4.0980+4	4.8673–1	2.6608+6	1.4233+6	5.0165+5	7.3579+5	7.9453+1	1.3110+0	1.0894+0	1.9957–1	2.1979–2
1.0000+0	3.0715–5	3.7769+4	6.4016–1	2.4524+6	1.2721+6	4.8677+5	6.9339+5	7.8918+1	1.2962+0	1.0773+0	1.9225–1	2.6639–2
1.5000+0	3.4723–5	3.3410+4	1.0227+0	2.1693+6	1.0533+6	4.7221+5	6.4372+5	8.0028+1	1.3179+0	1.0925+0	1.8565–1	3.9723–2
2.0000+0	3.7305–5	3.1098+4	1.3980+0	2.0192+6	9.3297+5	4.6961+5	6.1653+5	8.2007+1	1.3470+0	1.1113+0	1.8159–1	5.4063–2
3.0000+0	4.0764–5	2.8459+4	2.1240+0	1.8478+6	8.0450+5	4.6623+5	5.7702+5	8.5504+1	1.4084+0	1.1458+0	1.7716–1	8.5460–2
4.0000+0	4.2746–5	2.7139+4	2.8189+0	1.7622+6	7.3742+5	4.6489+5	5.5978+5	8.7414+1	1.4698+0	1.1753+0	1.7485–1	1.1965–1
5.0000+0	4.4111–5	2.6299+4	3.4869+0	1.7076+6	6.9695+5	4.6562+5	5.4498+5	8.8925+1	1.5247+0	1.1969+0	1.7314–1	1.5457–1
6.0000+0	4.5081–5	2.5734+4	4.1308+0	1.6709+6	6.7175+5	4.6654+5	5.3250+5	9.0338+1	1.5818+0	1.2182+0	1.7203–1	1.9160–1
8.0000+0	4.6190–5	2.5116+4	5.3530+0	1.6308+6	6.4237+5	4.6837+5	5.1996+5	9.2612+1	1.6922+0	1.2546+0	1.7033–1	2.6733–1
1.0000+1	4.6806–5	2.4785+4	6.4983+0	1.6093+6	6.2977+5	4.6983+5	5.0963+5	9.4148+1	1.8012+0	1.2859+0	1.6925–1	3.4610–1
1.5000+1	4.7201–5	2.4578+4	9.1003+0	1.5958+6	6.2361+5	4.7198+5	5.0016+5	9.6833+1	2.0473+0	1.3289+0	1.6755–1	5.5087–1
2.0000+1	4.7490–5	2.4428+4	1.1406+1	1.5861+6	6.2079+5	4.7354+5	4.9172+5	9.8662+1	2.2937+0	1.3646+0	1.6615–1	7.6296–1
3.0000+1	4.7923–5	2.4208+4	1.5371+1	1.5718+6	6.2024+5	4.7471+5	4.7677+5	1.0110+2	2.7662+0	1.4015+0	1.6385–1	1.2008+0
4.0000+1	4.8073–5	2.4132+4	1.8704+1	1.5669+6	6.2019+5	4.7552+5	4.7108+5	1.0281+2	3.2461+0	1.4309+0	1.6222–1	1.6529+0
5.0000+1	4.8201–5	2.4068+4	2.1579+1	1.5627+6	6.2015+5	4.7577+5	4.6672+5	1.0400+2	3.7228+0	1.4494+0	1.6103–1	2.1124+0
6.0000+1	4.8283–5	2.4027+4	2.4105+1	1.5601+6	6.2013+5	4.7596+5	4.6388+5	1.0498+2	4.2027+0	1.4655+0	1.6037–1	2.5768+0
8.0000+1	4.8404–5	2.3967+4	2.8389+1	1.5562+6	6.2008+5	4.7625+5	4.5975+5	1.0659+2	5.1689+0	1.4905+0	1.5957–1	3.5189+0
1.0000+2	4.8493–5	2.3923+4	3.1933+1	1.5533+6	6.2005+5	4.7646+5	4.5669+5	1.0778+2	6.1452+0	1.5122+0	1.5914–1	4.4739+0
1.5000+2	4.8543–5	2.3898+4	3.8783+1	1.5517+6	6.1998+5	4.7657+5	4.5506+5	1.0979+2	8.5892+0	1.5345+0	1.5861–1	6.8961+0
2.0000+2	4.8577–5	2.3882+4	4.3902+1	1.5507+6	6.1994+5	4.7664+5	4.5396+5	1.1101+2	1.1050+1	1.5553+0	1.5826–1	9.3369+0
3.0000+2	4.8627–5	2.3857+4	5.1385+1	1.5490+6	6.1987+5	4.7673+5	4.5234+5	1.1209+2	1.5976+1	1.5920+0	1.5777–1	1.4227+1
4.0000+2	4.8665–5	2.3838+4	5.6839+1	1.5478+6	6.1983+5	4.7674+5	4.5114+5	1.1271+2	2.0916+1	1.6054+0	1.5742–1	1.9153+1
5.0000+2	4.8706–5	2.3818+4	6.1131+1	1.5465+6	6.1979+5	4.7676+5	4.4986+5	1.1323+2	2.5864+1	1.6184+0	1.5705–1	2.4088+1
6.0000+2	4.8725–5	2.3809+4	6.4668+1	1.5459+6	6.1977+5	4.7676+5	4.4927+5	1.1366+2	3.0826+1	1.6298+0	1.5692–1	2.9039+1
8.0000+2	4.8758–5	2.3793+4	7.0299+1	1.5449+6	6.1972+5	4.7677+5	4.4828+5	1.1455+2	4.0653+1	1.6524+0	1.5672–1	3.8844+1
1.0000+3	4.8783–5	2.3781+4	7.4703+1	1.5441+6	6.1968+5	4.7678+5	4.4752+5	1.1525+2	5.0545+1	1.6736+0	1.5660–1	4.8715+1
1.5000+3	4.8798–5	2.3773+4	8.2751+1	1.5436+6	6.1962+5	4.7678+5	4.4710+5	1.1673+2	7.5345+1	1.6915+0	1.5645–1	7.3497+1
2.0000+3	4.8806–5	2.3769+4	8.8485+1	1.5433+6	6.1958+5	4.7678+5	4.4687+5	1.1785+2	1.0026+2	1.7093+0	1.5637–1	9.8390+1
3.0000+3	4.8812–5	2.3766+4	9.6589+1	1.5432+6	6.1951+5	4.7678+5	4.4675+5	1.1953+2	1.4983+2	1.7449+0	1.5634–1	1.4793+2
4.0000+3	4.8817–5	2.3764+4	1.0235+2	1.5430+6	6.1947+5	4.7678+5	4.4663+5	1.2082+2	1.9959+2	1.7561+0	1.5630–1	1.9768+2
5.0000+3	4.8831–5	2.3757+4	1.0682+2	1.5426+6	6.1943+5	4.7678+5	4.4624+5	1.2184+2	2.4974+2	1.7674+0	1.5616–1	2.4781+2
6.0000+3	4.8828–5	2.3759+4	1.1048+2	1.5427+6	6.1940+5	4.7678+5	4.4635+5	1.2268+2	2.9898+2	1.7786+0	1.5620–1	2.9705+2
8.0000+3	4.8828–5	2.3759+4	1.1625+2	1.5427+6	6.1936+5	4.7678+5	4.4641+5	1.2401+2	3.9833+2	1.8011+0	1.5623–1	3.9637+2
1.0000+4	4.8828–5	2.3759+4	1.2073+2	1.5427+6	6.1932+5	4.7678+5	4.4643+5	1.2506+2	4.9859+2	1.8224+0	1.5624–1	4.9661+2
1.5000+4	4.8828–5	2.3759+4	1.2888+2	1.5427+6	6.1926+5	4.7678+5	4.4651+5	1.2709+2	7.4426+2	1.8383+0	1.5627–1	7.4226+2
2.0000+4	4.8830–5	2.3758+4	1.3468+2	1.5426+6	6.1922+5	4.7678+5	4.4647+5	1.2855+2	9.9312+2	1.8542+0	1.5626–1	9.9111+2
3.0000+4	4.8829–5	2.3758+4	1.4286+2	1.5426+6	6.1915+5	4.7678+5	4.4655+5	1.3059+2	1.4856+3	1.8860+0	1.5628–1	1.4836+3
4.0000+4	4.8832–5	2.3757+4	1.4866+2	1.5425+6	6.1911+5	4.7678+5	4.4651+5	1.3206+2	1.9835+3	1.9089+0	1.5627–1	1.9814+3
5.0000+4	4.8844–5	2.3751+4	1.5316+2	1.5422+6	6.1907+5	4.7678+5	4.4617+5	1.3319+2	2.4767+3	1.9191+0	1.5615–1	2.4746+3
6.0000+4	4.8840–5	2.3753+4	1.5685+2	1.5423+6	6.1904+5	4.7678+5	4.4632+5	1.3411+2	2.9694+3	1.9294+0	1.5620–1	2.9674+3
8.0000+4	4.8839–5	2.3753+4	1.6266+2	1.5423+6	6.1900+5	4.7678+5	4.4640+5	1.3557+2	3.9636+3	1.9499+0	1.5623–1	3.9615+3
1.0000+5	4.8839–5	2.3753+4	1.6716+2	1.5423+6	6.1896+5	4.7678+5	4.4643+5	1.3671+2	4.9595+3	1.9705+0	1.5624–1	4.9574+3


July 4, 1991
Atomic Weight 40 080
EEDL Evaluated Electron
Cross Sections
20-Ca
Density 1 550 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
20-Ca


July 4, 1991
Atomic Weight 40 080
EEDL Evaluated Electron
Energy Deposition
20-Ca
Density 1 550 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
20-Ca

77


July 4, 1991
Atomic Weight 40.080
EEDL Evaluated Electron
Shell Cross Sections
20-Ca
Density 1.550 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
20-Ca

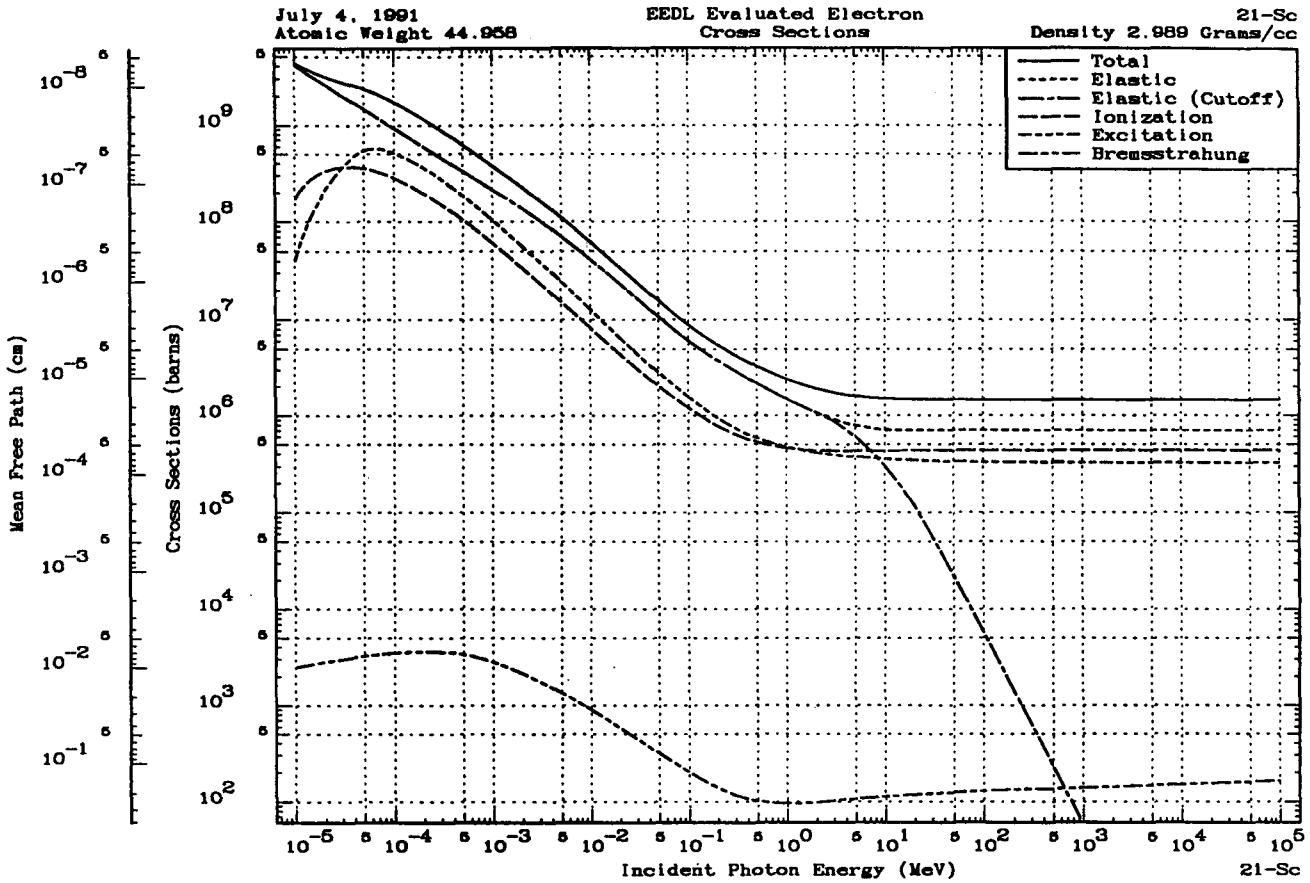

July 4, 1991
Atomic Weight 40.080
EEDL Evaluated Electron
Energy Deposition
20-Ca
Density 1.550 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
Incident Photon Energy (MeV)
20-Ca

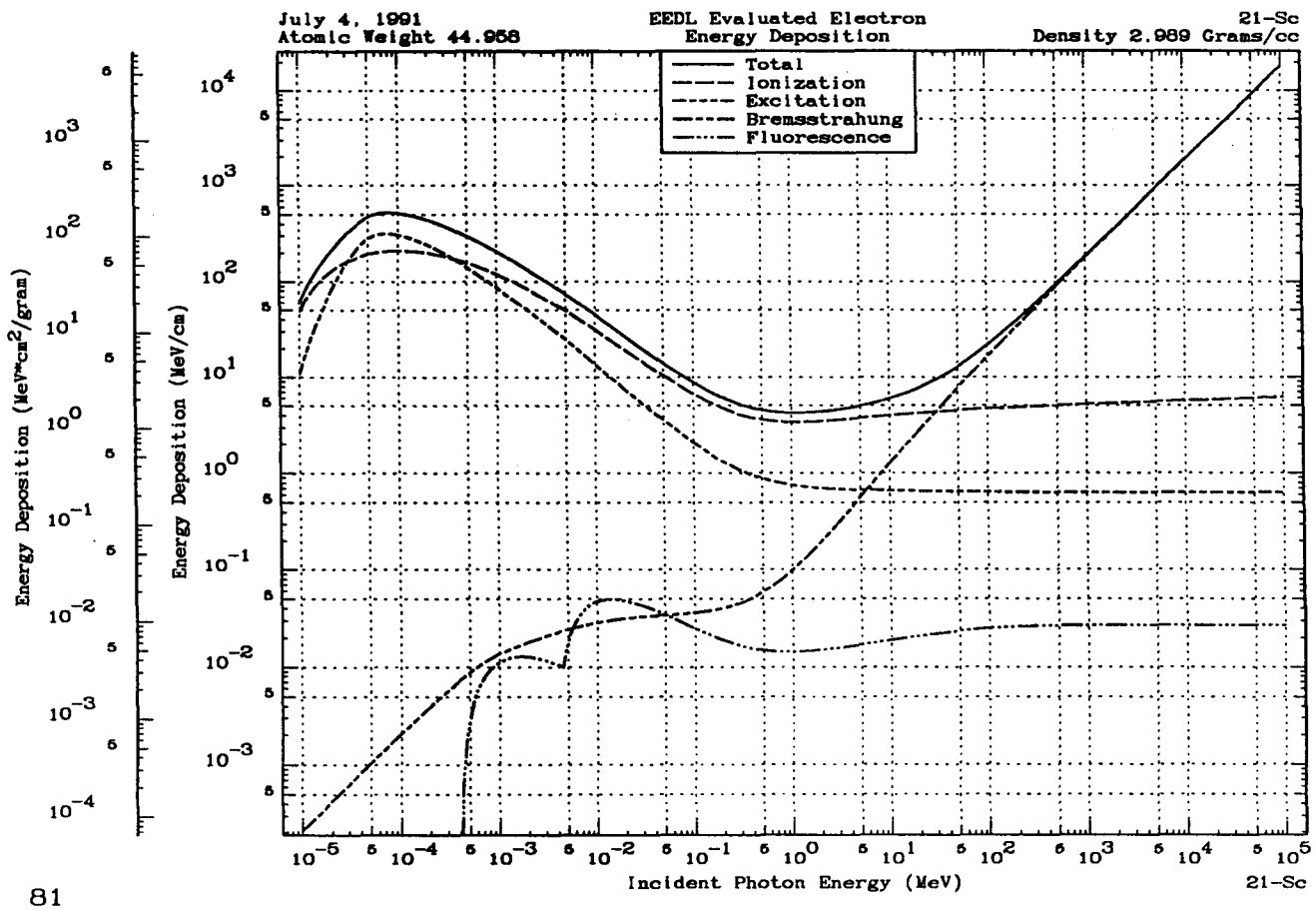
Atomic Weight 40.080 Density 1.550 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.6658–9	7.4449+7		4.9549+9	4.7077+9	1.9239+8	5.4851+7	2.4690+3	3.7716+1	2.9513+1	8.2022+0	1.2388–4
	1.1250–5	9.2322–9	6.9882+7		4.6510+9	4.3510+9	2.2190+8	7.8046+7	2.5252+3	4.7526+1	3.5505+1	1.2021+1	1.3856–4
	1.3125–5	9.9988–9	6.4524+7		4.2944+9	3.9247+9	2.5546+8	1.1419+8	2.6007+3	6.1762+1	4.3405+1	1.8356+1	1.6103–4
	1.5000–5	1.0604–8	6.0841+7		4.0492+9	3.5893+9	2.8106+8	1.7882+8	2.6678+3	8.0271+1	5.0323+1	2.9948+1	1.8399–4
	1.7500–5	1.1225–8	5.7475+7		3.8252+9	3.2377+9	3.0370+8	2.8383+8	2.7476+3	1.0758+2	5.7661+1	4.9915+1	2.1530–4
	2.0000–5	1.1711–8	5.5088+7		3.6664+9	2.9610+9	3.1754+8	3.8780+8	2.8185+3	1.3517+2	6.3723+1	7.1451+1	2.4735–4
	2.5000–5	1.2495–8	5.1635+7		3.4366+9	2.5504+9	3.2927+8	5.5683+8	2.9189+3	1.8329+2	7.2173+1	1.1111+2	3.0634–4
	3.0000–5	1.3190–8	4.8911+7		3.2553+9	2.2576+9	3.2965+8	6.6800+8	3.0036+3	2.2090+2	7.7390+1	1.4351+2	3.6686–4
M3	3.3600–5	1.3678–8	4.7168+7		3.1392+9	2.0930+9	3.2563+8	7.2059+8	3.0563+3	2.4020+2	7.9637+1	1.6056+2	4.1084–4
	3.4000–5	1.3731–8	4.6987+7		3.1272+9	2.0765+9	3.2546+8	7.2520+8	3.0618+3	2.4228+2	8.0082+1	1.6220+2	4.1577–4
M2	3.4010–5	1.3732–8	4.6982+7		3.1269+9	2.0761+9	3.2546+8	7.2532+8	3.0620+3	2.4233+2	8.0091+1	1.6224+2	4.1589–4
	3.4384–5	1.3789–8	4.6788+7		3.1139+9	2.0610+9	3.2481+8	7.2811+8	3.0671+3	2.4369+2	8.0330+1	1.6336+2	4.2051–4
	3.5500–5	1.3954–8	4.6235+7		3.0771+9	2.0175+9	3.2331+8	7.3630+8	3.0822+3	2.4801+2	8.1329+1	1.6668+2	4.3431–4
	3.5788–5	1.3996–8	4.6097+7		3.0680+9	2.0067+9	3.2292+8	7.3839+8	3.0860+3	2.4912+2	8.1579+1	1.6754+2	4.3789–4
	3.7750–5	1.4269–8	4.5213+7		3.0091+9	1.9365+9	3.2035+8	7.5233+8	3.1114+3	2.5661+2	8.3245+1	1.7337+2	4.6232–4
	3.7894–5	1.4289–8	4.5152+7		3.0050+9	1.9315+9	3.2016+8	7.5333+8	3.1132+3	2.5716+2	8.3365+1	1.7380+2	4.6412–4
	4.0000–5	1.4564–8	4.4300+7		2.9483+9	1.8630+9	3.1753+8	7.6775+8	3.1392+3	2.6513+2	8.5082+1	1.8005+2	4.9055–4
	4.2500–5	1.4926–8	4.3224+7		2.8768+9	1.7892+9	3.1402+8	7.7357+8	3.1628+3	2.7087+2	8.6837+1	1.8403+2	5.1981–4
	4.6250–5	1.5435–8	4.1799+7		2.7819+9	1.6910+9	3.0913+8	7.8176+8	3.1961+3	2.7934+2	8.9377+1	1.8996+2	5.6403–4
	5.0000–5	1.5907–8	4.0557+7		2.6993+9	1.6053+9	3.0464+8	7.8939+8	3.2271+3	2.8766+2	9.1829+1	1.9583+2	6.0863–4
M1	5.3160–5	1.6360–8	3.9436+7		2.6246+9	1.5409+9	2.9838+8	7.8534+8	3.2489+3	2.8987+2	9.2497+1	1.9737+2	6.4514–4
	5.4015–5	1.6479–8	3.9149+7		2.6056+9	1.5246+9	2.9687+8	7.8411+8	3.2545+3	2.9054+2	9.2794+1	1.9775+2	6.5505–4
	5.5511–5	1.6686–8	3.8666+7		2.5734+9	1.4970+9	2.9434+8	7.8200+8	3.2643+3	2.9175+2	9.3342+1	1.9841+2	6.7243–4
	5.7756–5	1.6987–8	3.7979+7		2.5277+9	1.4579+9	2.9077+8	7.7895+8	3.2785+3	2.9365+2	9.4230+1	1.9942+2	6.9858–4
	6.0000–5	1.7280–8	3.7335+7		2.4848+9	1.4213+9	2.8747+8	7.7602+8	3.2922+3	2.9564+2	9.5193+1	2.0045+2	7.2483–4
	6.5000–5	1.7993–8	3.5856+7		2.3864+9	1.3475+9	2.7814+8	7.6077+8	3.3212+3	2.9514+2	9.5792+1	1.9935+2	7.8363–4
	7.0000–5	1.8674–8	3.4549+7		2.2994+9	1.2825+9	2.7001+8	7.4692+8	3.3483+3	2.9519+2	9.6671+1	1.9851+2	8.4287–4
	7.2500–5	1.9004–8	3.3949+7		2.2595+9	1.2528+9	2.6617+8	7.4045+8	3.3612+3	2.9524+2	9.7066+1	1.9818+2	8.7264–4
	8.0000–5	1.9955–8	3.2331+7		2.1517+9	1.1732+9	2.5590+8	7.2259+8	3.3977+3	2.9593+2	9.8475+1	1.9745+2	9.6254–4
	9.0000–5	2.1282–8	3.0315+7		2.0176+9	1.0849+9	2.4161+8	6.9105+8	3.4285+3	2.9139+2	9.8700+1	1.9269+2	1.0764–3
	1.0000–4	2.2534–8	2.8631+7	0.0000+0	1.9055+9	1.0116+9	2.2990+8	6.6400+8	3.4564+3	2.8842+2	9.9558+1	1.8886+2	1.1911–3
	1.1250–4	2.4092–8	2.6779+7	4.3851–8	1.7822+9	9.3548+8	2.1526+8	6.3150+8	3.4750+3	2.8173+2	9.8959+1	1.8277+2	1.3275–3
	1.2500–4	2.5569–8	2.5232+7	8.8614–8	1.6793+9	8.7225+8	2.0327+8	6.0377+8	3.4918+3	2.7679+2	9.9022+1	1.7776+2	1.4644–3
	1.3125–4	2.6284–8	2.4545+7	1.1129–7	1.6336+9	8.4443+8	1.9781+8	5.9135+8	3.4995+3	2.7447+2	9.8892+1	1.7558+2	1.5331–3
	1.5000–4	2.8500–8	2.2637+7	1.8062–7	1.5066+9	7.7276+8	1.8382+8	5.5004+8	3.5209+3	2.6642+2	9.8977+1	1.6744+2	1.7399–3
	1.7500–4	3.1370–8	2.0566+7	2.7667–7	1.3688+9	6.9755+8	1.6693+8	5.0429+8	3.5301+3	2.5427+2	9.7165+1	1.5710+2	2.0062–3
	2.0000–4	3.4080–8	1.8931+7	3.7675–7	1.2599+9	6.3834+8	1.5383+8	4.6774+8	3.5382+3	2.4540+2	9.6344+1	1.4905+2	2.2730–3
	2.5000–4	3.9376–8	1.6385+7	5.8866–7	1.0905+9	5.5057+8	1.3239+8	4.0750+8	3.4916+3	2.2674+2	9.2684+1	1.3405+2	2.7507–3
	3.0000–4	4.4685–8	1.4438+7	8.1763–7	9.6090+8	4.8789+8	1.1686+8	3.5615+8	3.4540+3	2.1021+2	8.9372+1	1.2083+2	3.2232–3
L3	3.5520–4	5.0379–8	1.2806+7	1.0913–6	8.5230+8	4.3643+8	1.0328+8	3.1258+8	3.4196+3	1.9345+2	8.4981+1	1.0846+2	3.7399–3
L2	3.5904–4	5.0758–8	1.2711+7	1.1112–6	8.4594+8	4.3335+8	1.0247+8	3.1012+8	3.4174+3	1.9256+2	8.4769+1	1.0779+2	3.7757–3
	3.6928–4	5.1768–8	1.2463+7	1.1647–6	8.2944+8	4.2539+8	1.0039+8	3.0365+8	3.4064+3	1.9028+2	8.4247+1	1.0603+2	3.8637–3
	3.7760–4	5.2582–8	1.2270+7	1.2086–6	8.1660+8	4.1919+8	9.8783+7	2.9862+8	3.3976+3	1.8860+2	8.3921+1	1.0467+2	3.9350–3
	4.0000–4	5.4745–8	1.1785+7	1.3287–6	7.8433+8	4.0356+8	9.4761+7	2.8601+8	3.3751+3	1.8439+2	8.3126+1	1.0126+2	4.1262–3
	4.2500–4	5.7159–8	1.1287+7	1.4663–6	7.5120+8	3.8775+8	9.0460+7	2.7299+8	3.3341+3	1.7898+2	8.1581+1	9.7395+1	4.3113–3
L1	4.3411–4	5.8029–8	1.1118+7	1.5175–6	7.3995+8	3.8236+8	8.9003+7	2.6858+8	3.3199+3	1.7714+2	8.1045+1	9.6086+1	4.3783–3
	4.4235–4	5.8837–8	1.0965+7	1.5642–6	7.2979+8	3.7766+8	8.7729+7	2.6440+8	3.3074+3	1.7546+2	8.0601+1	9.4852+1	4.4386–3
	4.6250–4	6.0797–8	1.0612+7	1.6803–6	7.0626+8	3.6672+8	8.4792+7	2.5474+8	3.2778+3	1.7165+2	7.9636+1	9.2005+1	4.5854–3
	4.7117–4	6.1633–8	1.0468+7	1.7311–6	6.9668+8	3.6226+8	8.3597+7	2.5082+8	3.2655+3	1.7009+2	7.9238+1	9.0851+1	4.6482–3
	5.0000–4	6.4381–8	1.0021+7	1.9030–6	6.6694+8	3.4835+8	7.9902+7	2.3869+8	3.2267+3	1.6535+2	7.8061+1	8.7283+1	4.8554–3
	5.5000–4	6.9037–8	9.3451+6	2.2125–6	6.2196+8	3.2714+8	7.4240+7	2.2058+8	3.1653+3	1.5781+2	7.6094+1	8.1715+1	5.2097–3
	6.0000–4	7.3575–8	8.7688+6	2.5358–6	5.8360+8	3.0890+8	6.9447+7	2.0525+8	3.1102+3	1.5152+2	7.4500+1	7.7017+1	5.5580–3
	6.5000–4	7.8044–8	8.2666+6	2.8730–6	5.5018+8	2.9305+8	6.5094+7	1.9204+8	3.0377+3	1.4511+2	7.2323+1	7.2786+1	5.8307–3
	7.0000–4	8.2418–8	7.8279+6	3.2243–6	5.2098+8	2.7910+8	6.1317+7	1.8056+8	2.9721+3	1.3957+2	7.0447+1	6.9120+1	6.0983–3
	7.2500–4	8.4572–8	7.6285+6	3.4050–6	5.0771+8	2.7273+8	5.9611+7	1.7537+8	2.9416+3	1.3709+2	6.9623+1	6.7465+1	6.2303–3
	8.0000–4	9.0914–8	7.0964+6	3.9656–6	4.7230+8	2.5563+8	5.5083+7	1.6158+8	2.8575+3	1.3052+2	6.7435+1	6.3081+1	6.6197–3
	9.0000–4	9.9157–8	6.5065+6	4.7571–6	4.3303+8	2.3663+8	4.9953+7	1.4645+8	2.7442+3	1.2227+2	6.4221+1	5.8042+1	7.0622–3
	1.0000–3	1.0715–7	6.0213+6	5.5978–6	4.0075+8	2.2083+8	4.5791+7	1.3412+8	2.6467+3	1.1568+2	6.1720+1	5.3949+1	7.4911–3
	1.1250–3	1.1696–7	5.5159+6	6.7170–6	3.6711+8	2.0435+8	4.1406+7	1.2135+8	2.5234+3	1.0780+2	5.8318+1	4.9471+1	7.8289–3
	1.2500–3	1.2649–7	5.1006+6	7.9121–6	3.3946+8	1.9064+8	3.7853+7	1.1097+8	2.4180+3	1.0146+2	5.5611+1	4.5837+1	8.1600–3
	1.3125–3	1.3115–7	4.9191+6	8.5367–6	3.2739+8	1.8461+8	3.6312+7	1.0646+8	2.3706+3	9.8677+1	5.4404+1	4.4264+1	8.3230–3
	1.5000–3	1.4480–7	4.4555+6	1.0507–5	2.9654+8	1.6906+8	3.2418+7	9.5051+7	2.2458+3	9.1695+1	5.1396+1	4.0290+1	8.8017–3
	2.0000–3	1.7967–7	3.5908+6	1.6444–5	2.3898+8	1.3933+8	2.5226+7	7.4424+7	1.9830+3	7.7159+1	4.4463+1	3.2686+1	9.8271–3
	2.5000–3	2.1350–7	3.0219+6	2.3401–5	2.0112+8	1.1894+8	2.0686+7	6.1494+7	1.7840+3	6.6838+1	3.9151+1	2.7677+1	1.0582–2
	3.0000–3	2.4574–7	2.6253+6	3.1305–5	1.7473+8	1.0451+8	1.7600+7	5.2615+7	1.6363+3	5.9801+1	3.5536+1	2.4253+1	1.1303–2
	4.0000–3	3.1019–7	2.0799+6	4.9703–5	1.3843+8	8.4350+7	1.3589+7	4.0486+7	1.4120+3	4.9249+1	2.9948+1	1.9289+1	1.2367–2
K	4.0150–3	3.1116–7	2.0734+6	5.0008–5	1.3800+8	8.4103+7	1.3543+7	4.0347+7	1.4092+3	4.9118+1	2.9876+1	1.9229+1	1.2380–2
	4.0766–3	3.1516–7	2.0471+6	5.1268–5	1.3624+8	8.3108+7	1.3357+7	3.9776+7	1.3976+3	4.8590+1	2.9591+1	1.8987+1	1.2430–2
	4.1920–3	3.2263–7	1.9997+6	5.3667–5	1.3309+8	8.1313+7	1.3024+7	3.8749+7	1.3765+3	4.7641+1	2.9078+1	1.8550+1	1.2522–2
	4.3940–3	3.3563–7	1.9222+6	5.7978–5	1.2793+8	7.8375+7	1.2480+7	3.7077+7	1.3417+3	4.6094+1	2.8241+1	1.7840+1	1.2683–2
	4.6970–3	3.5494–7	1.8177+6	6.4705–5	1.2097+8	7.4392+7	1.1749+7	3.4832+7	1.2938+3	4.4013+1	2.7114+1	1.6887+1	1.2921–2
	5.0000–3	3.7404–7	1.7249+6	7.1737–5	1.1480+8	7.0842+7	1.1104+7	3.2850+7	1.2505+3	4.2176+1	2.6117+1	1.6046+1	1.3157–2
	5.5000–3	4.0558–7	1.5907+6	8.3997–5	1.0587+8	6.5638+7	1.0185+7	3.0045+7	1.1851+3	3.9418+1	2.4581+1	1.4824+1	1.3482–2
	6.0000–3	4.3668–7	1.4774+6	9.7070–5	9.8330+7	6.1222+7	9.4129+6	2.7694+7	1.1285+3	3.7101+1	2.3287+1	1.3800+1	1.3802–2
	6.5000–3	4.6765–7	1.3796+6	1.1094–4	9.1817+7	5.7367+7	8.7532+6	2.5695+7	1.0762+3	3.5005+1	2.2087+1	1.2904+1	1.4032–2
	7.2500–3	5.1347–7	1.2565+6	1.3321–4	8.3624+7	5.2497+7	7.9278+6	2.3199+7	1.0087+3	3.2380+1	2.0580+1	1.1786+1	1.4376–2
	8.0000–3	5.5858–7	1.1550+6	1.5718–4	7.6870+7	4.8462+7	7.2512+6	2.1157+7	9.5155+2	3.0224+1	1.9338+1	1.0872+1	1.4715–2
	9.0000–3	6.1824–7	1.0435+6	1.9171–4	6.9452+7	4.3987+7	6.5156+6	1.8949+7	8.8474+2	2.7732+1	1.7865+1	9.8516+0	1.5039–2
	1.0000–2	6.7697–7	9.5302+5	2.2915–4	6.3428+7	4.0336+7	5.9215+6	1.7170+7	8.2896+2	2.5714+1	1.6669+1	9.0304+0	1.5363–2
	1.2500–2	8.2092–7	7.8590+5	3.3469–4	5.2305+7	3.3556+7	4.8410+6	1.3908+7	7.1750+2	2.1774+1	1.4290+1	7.4673+0	1.5846–2

Atomic Weight 40.080 Density 1.550 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000–2	9.6087–7	6.7144+5	4.5723–4	4.4687+7	2.8871+7	4.1071+6	1.1708+7	6.3764+2	1.9088+1	1.2656+1	6.4148+0	1.6347–2
2.0000–2	1.2334–6	5.2306+5	7.4806–4	3.4812+7	2.2712+7	3.1771+6	8.9230+6	5.2582+2	1.5427+1	1.0382+1	5.0277+0	1.6908–2
3.0000–2	1.7570–6	3.6719+5	1.4983–3	2.4438+7	1.6120+7	2.2274+6	6.0907+6	3.9859+2	1.1432+1	7.8479+0	3.5663+0	1.7453–2
4.0000–2	2.2594–6	2.8555+5	2.4675–3	1.9004+7	1.2592+7	1.7427+6	4.6695+6	3.2975+2	9.2776+0	6.4516+0	2.8082+0	1.7788–2
5.0000–2	2.7396–6	2.3550+5	3.6322–3	1.5673+7	1.0394+7	1.4483+6	3.8309+6	2.8443+2	7.9293+0	5.5602+0	2.3510+0	1.8026–2
6.0000–2	3.1973–6	2.0178+5	4.9744–3	1.3430+7	8.9195+6	1.2503+6	3.2594+6	2.5276+2	6.9921+0	4.9407+0	2.0332+0	1.8222–2
8.0000–2	4.0384–6	1.5975+5	8.1145–3	1.0632+7	7.0686+6	1.0008+6	2.5628+6	2.1107+2	5.7844+0	4.1264+0	1.6394+0	1.8601–2
1.0000–1	4.7981–6	1.3446+5	1.1818–2	8.9491+6	5.9505+6	8.4980+5	2.1486+6	1.8428+2	5.0339+0	3.6141+0	1.4008+0	1.8985–2
1.5000–1	6.4507–6	1.0001+5	2.2933–2	6.6564+6	4.4191+6	6.4751+5	1.5897+6	1.4589+2	4.0019+0	2.9094+0	1.0725+0	2.0011–2
2.0000–1	7.8660–6	8.2019+4	3.6337–2	5.4587+6	3.6082+6	5.4661+5	1.3038+6	1.2594+2	3.4713+0	2.5495+0	9.0062–1	2.1185–2
3.0000–1	1.0154–5	6.3537+4	6.7530–2	4.2287+6	2.7484+6	4.4718+5	1.0330+6	1.0657+2	2.9543+0	2.1927+0	7.3764–1	2.3942–2
4.0000–1	1.1987–5	5.3821+4	1.0286–1	3.5820+6	2.2843+6	3.9917+5	8.9843+5	9.7607+1	2.7096+0	2.0253+0	6.5713–1	2.7153–2
5.0000–1	1.3530–5	4.7683+4	1.4075–1	3.1735+6	1.9913+6	3.7164+5	8.1049+5	9.2729+1	2.5705+0	1.9356+0	6.0417–1	3.0663–2
6.0000–1	1.4803–5	4.3583+4	1.8026–1	2.9006+6	1.7888+6	3.5421+5	7.5750+5	9.0045+1	2.4914+0	1.8833+0	5.7359–1	3.4478–2
8.0000–1	1.6877–5	3.8226+4	2.6181–1	2.5441+6	1.5217+6	3.3415+5	6.8823+5	8.7670+1	2.4143+0	1.8370+0	5.3449–1	4.2825–2
1.0000+0	1.8473–5	3.4924+4	3.4511–1	2.3244+6	1.3520+6	3.2346+5	6.4883+5	8.7044+1	2.3875+0	1.8217+0	5.1392–1	5.1860–2
1.5000+0	2.1265–5	3.0339+4	5.5350–1	2.0192+6	1.1127+6	3.1297+5	5.9347+5	8.8304+1	2.4113+0	1.8497+0	4.8442–1	7.7220–2
2.0000+0	2.3099–5	2.7930+4	7.5868–1	1.8589+6	9.8319+5	3.1059+5	5.6498+5	9.0383+1	2.4626+0	1.8822+0	4.7531–1	1.0504–1
3.0000+0	2.5291–5	2.5510+4	1.1557+0	1.6978+6	8.4939+5	3.0806+5	5.4025+5	9.4293+1	2.5759+0	1.9434+0	4.6667–1	1.6591–1
4.0000+0	2.6703–5	2.4160+4	1.5356+0	1.6080+6	7.7894+5	3.0787+5	5.2108+5	9.7340+1	2.6889+0	1.9954+0	4.6192–1	2.3154–1
5.0000+0	2.7533–5	2.3433+4	1.9001+0	1.5595+6	7.3773+5	3.0857+5	5.1315+5	9.9115+1	2.7991+0	2.0398+0	4.5875–1	3.0048–1
6.0000+0	2.8104–5	2.2956+4	2.2507+0	1.5278+6	7.1192+5	3.0919+5	5.0661+5	1.0005+2	2.9059+0	2.0775+0	4.5672–1	3.7166–1
8.0000+0	2.8848–5	2.2364+4	2.9155+0	1.4884+6	6.8240+5	3.1073+5	4.9517+5	1.0200+2	3.1137+0	2.1413+0	4.5386–1	5.1852–1
1.0000+1	2.9285–5	2.2030+4	3.5377+0	1.4662+6	6.6933+5	3.1183+5	4.8494+5	1.0392+2	3.3167+0	2.1943+0	4.5176–1	6.7067–1
1.5000+1	2.9544–5	2.1837+4	4.9493+0	1.4533+6	6.6314+5	3.1338+5	4.7672+5	1.0675+2	3.7775+0	2.2651+0	4.4755–1	1.0649+0
2.0000+1	2.9730–5	2.1701+4	6.1971+0	1.4443+6	6.6046+5	3.1450+5	4.6920+5	1.0861+2	4.2458+0	2.3244+0	4.4387–1	1.4775+0
3.0000+1	2.9979–5	2.1521+4	8.3299+0	1.4323+6	6.6002+5	3.1524+5	4.5693+5	1.1122+2	5.1613+0	2.3962+0	4.3884–1	2.3262+0
4.0000+1	3.0051–5	2.1469+4	1.0114+1	1.4289+6	6.5996+5	3.1573+5	4.5305+5	1.1306+2	6.0742+0	2.4420+0	4.3581–1	3.1964+0
5.0000+1	3.0107–5	2.1429+4	1.1646+1	1.4262+6	6.5992+5	3.1606+5	4.5012+5	1.1435+2	6.9984+0	2.4800+0	4.3369–1	4.0847+0
6.0000+1	3.0143–5	2.1403+4	1.2989+1	1.4245+6	6.5989+5	3.1617+5	4.4831+5	1.1542+2	7.9204+0	2.5053+0	4.3264–1	4.9825+0
8.0000+1	3.0201–5	2.1362+4	1.5256+1	1.4217+6	6.5983+5	3.1635+5	4.4545+5	1.1718+2	9.7885+0	2.5533+0	4.3127–1	6.8039+0
1.0000+2	3.0247–5	2.1329+4	1.7125+1	1.4196+6	6.5979+5	3.1648+5	4.4319+5	1.1850+2	1.1670+1	2.5893+0	4.3045–1	8.6504+0
1.5000+2	3.0277–5	2.1309+4	2.0722+1	1.4182+6	6.5971+5	3.1655+5	4.4181+5	1.2072+2	1.6392+1	2.6289+0	4.2920–1	1.3334+1
2.0000+2	3.0299–5	2.1293+4	2.3401+1	1.4172+6	6.5966+5	3.1660+5	4.4079+5	1.2209+2	2.1147+1	2.6664+0	4.2829–1	1.8053+1
3.0000+2	3.0327–5	2.1273+4	2.7305+1	1.4158+6	6.5958+5	3.1665+5	4.3948+5	1.2334+2	3.0669+1	2.7329+0	4.2717–1	2.7509+1
4.0000+2	3.0349–5	2.1258+4	3.0143+1	1.4148+6	6.5953+5	3.1666+5	4.3852+5	1.2406+2	4.0221+1	2.7570+0	4.2640–1	3.7037+1
5.0000+2	3.0368–5	2.1245+4	3.2374+1	1.4139+6	6.5949+5	3.1667+5	4.3764+5	1.2462+2	4.9798+1	2.7806+0	4.2570–1	4.6592+1
6.0000+2	3.0377–5	2.1238+4	3.4212+1	1.4135+6	6.5946+5	3.1668+5	4.3726+5	1.2518+2	5.9291+1	2.8015+0	4.2549–1	5.6064+1
8.0000+2	3.0392–5	2.1228+4	3.7137+1	1.4128+6	6.5940+5	3.1668+5	4.3662+5	1.2615+2	7.8353+1	2.8430+0	4.2519–1	7.5085+1
1.0000+3	3.0404–5	2.1219+4	3.9420+1	1.4123+6	6.5936+5	3.1669+5	4.3608+5	1.2700+2	9.7510+1	2.8821+0	4.2498–1	9.4203+1
1.5000+3	3.0410–5	2.1215+4	4.3591+1	1.4120+6	6.5928+5	3.1669+5	4.3586+5	1.2865+2	1.4546+2	2.9149+0	4.2477–1	1.4212+2
2.0000+3	3.0414–5	2.1213+4	4.6559+1	1.4118+6	6.5923+5	3.1669+5	4.3574+5	1.2989+2	1.9373+2	2.9477+0	4.2466–1	1.9035+2
3.0000+3	3.0417–5	2.1211+4	5.0752+1	1.4117+6	6.5915+5	3.1669+5	4.3568+5	1.3176+2	2.8965+2	3.0133+0	4.2461–1	2.8621+2
4.0000+3	3.0420–5	2.1208+4	5.3733+1	1.4115+6	6.5910+5	3.1669+5	4.3558+5	1.3318+2	3.8586+2	3.0340+0	4.2452–1	3.8240+2
5.0000+3	3.0426–5	2.1204+4	5.6045+1	1.4112+6	6.5906+5	3.1669+5	4.3534+5	1.3432+2	4.8282+2	3.0548+0	4.2428–1	4.7934+2
6.0000+3	3.0425–5	2.1205+4	5.7935+1	1.4113+6	6.5903+5	3.1669+5	4.3543+5	1.3524+2	5.7807+2	3.0755+0	4.2438–1	5.7457+2
8.0000+3	3.0425–5	2.1205+4	6.0923+1	1.4113+6	6.5897+5	3.1669+5	4.3547+5	1.3672+2	7.7022+2	3.1170+0	4.2442–1	7.6668+2
1.0000+4	3.0426–5	2.1204+4	6.3239+1	1.4112+6	6.5893+5	3.1669+5	4.3548+5	1.3788+2	9.6416+2	3.1564+0	4.2445–1	9.6058+2
1.5000+4	3.0427–5	2.1204+4	6.7455+1	1.4112+6	6.5885+5	3.1669+5	4.3553+5	1.4012+2	1.4393+3	3.1874+0	4.2449–1	1.4357+3
2.0000+4	3.0428–5	2.1203+4	7.0451+1	1.4111+6	6.5880+5	3.1669+5	4.3551+5	1.4173+2	1.9207+3	3.2185+0	4.2447–1	1.9170+3
3.0000+4	3.0429–5	2.1202+4	7.4680+1	1.4111+6	6.5873+5	3.1669+5	4.3553+5	1.4398+2	2.8733+3	3.2807+0	4.2449–1	2.8696+3
4.0000+4	3.0431–5	2.1201+4	7.7681+1	1.4110+6	6.5867+5	3.1669+5	4.3551+5	1.4560+2	3.8361+3	3.3114+0	4.2447–1	3.8324+3
5.0000+4	3.0436–5	2.1197+4	8.0009+1	1.4108+6	6.5863+5	3.1669+5	4.3529+5	1.4684+2	4.7901+3	3.3312+0	4.2426–1	4.7863+3
6.0000+4	3.0435–5	2.1198+4	8.1913+1	1.4108+6	6.5859+5	3.1669+5	4.3539+5	1.4785+2	5.7432+3	3.3509+0	4.2435–1	5.7394+3
8.0000+4	3.0435–5	2.1198+4	8.4917+1	1.4108+6	6.5854+5	3.1669+5	4.3546+5	1.4947+2	7.6661+3	3.3903+0	4.2442–1	7.6623+3
1.0000+5	3.0435–5	2.1198+4	8.7244+1	1.4108+6	6.5850+5	3.1669+5	4.3546+5	1.5072+2	9.5924+3	3.4298+0	4.2442–1	9.5885+3


July 4, 1991
Atomic Weight 44.958
EEDL Evaluated Electron
Cross Sections
21-Sc
Density 2.989 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
21-Sc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EEDL Evaluated Electron
Energy Deposition
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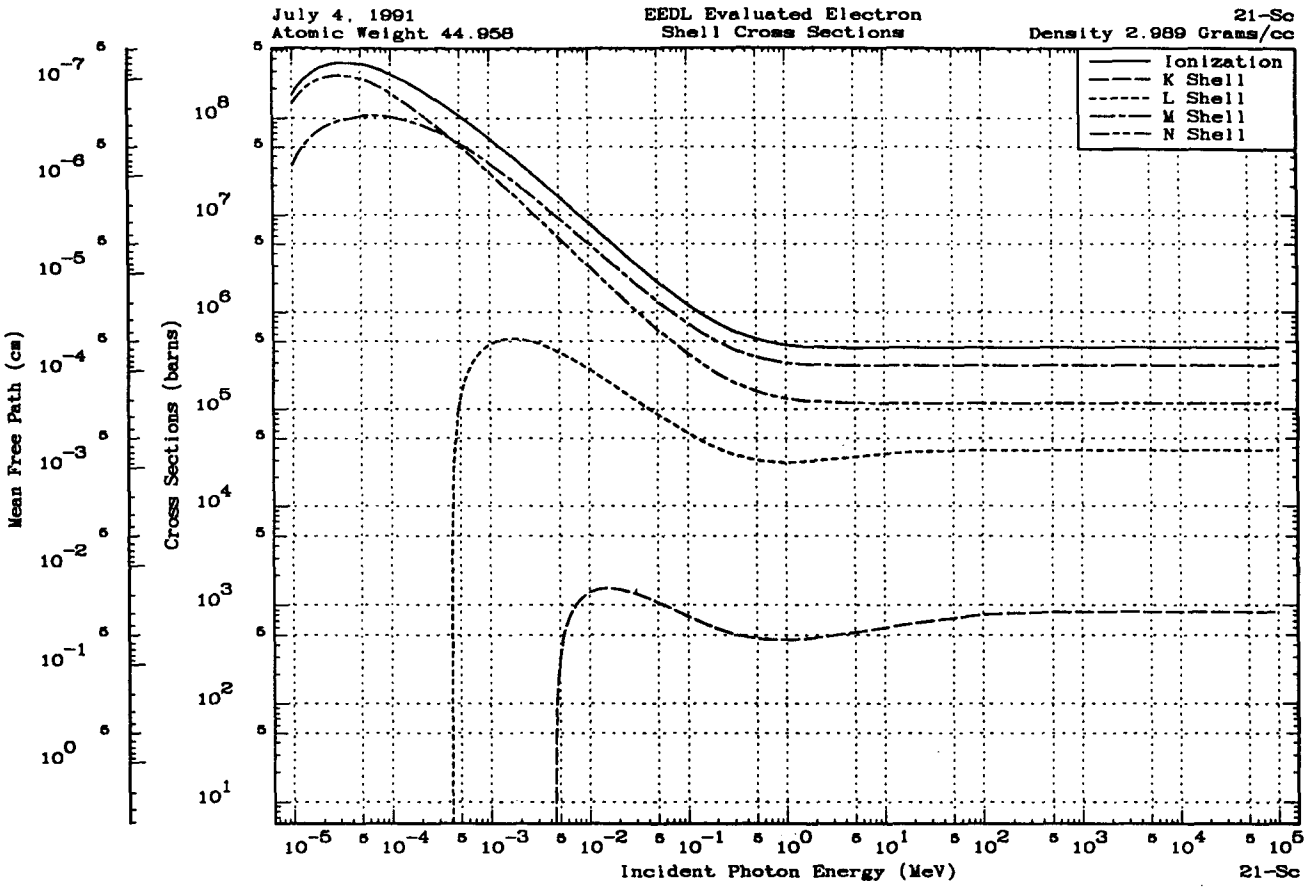
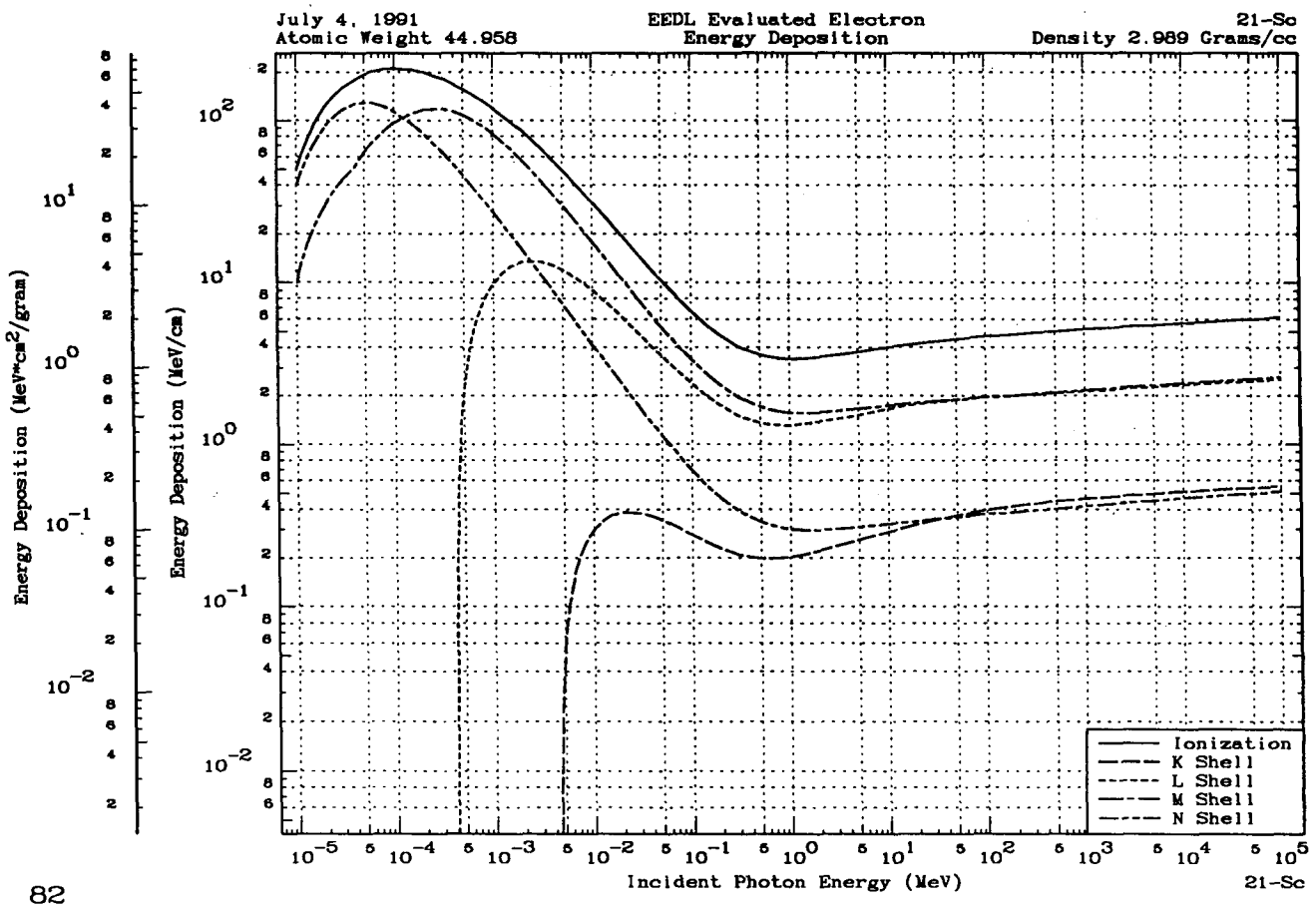
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
21-Sc

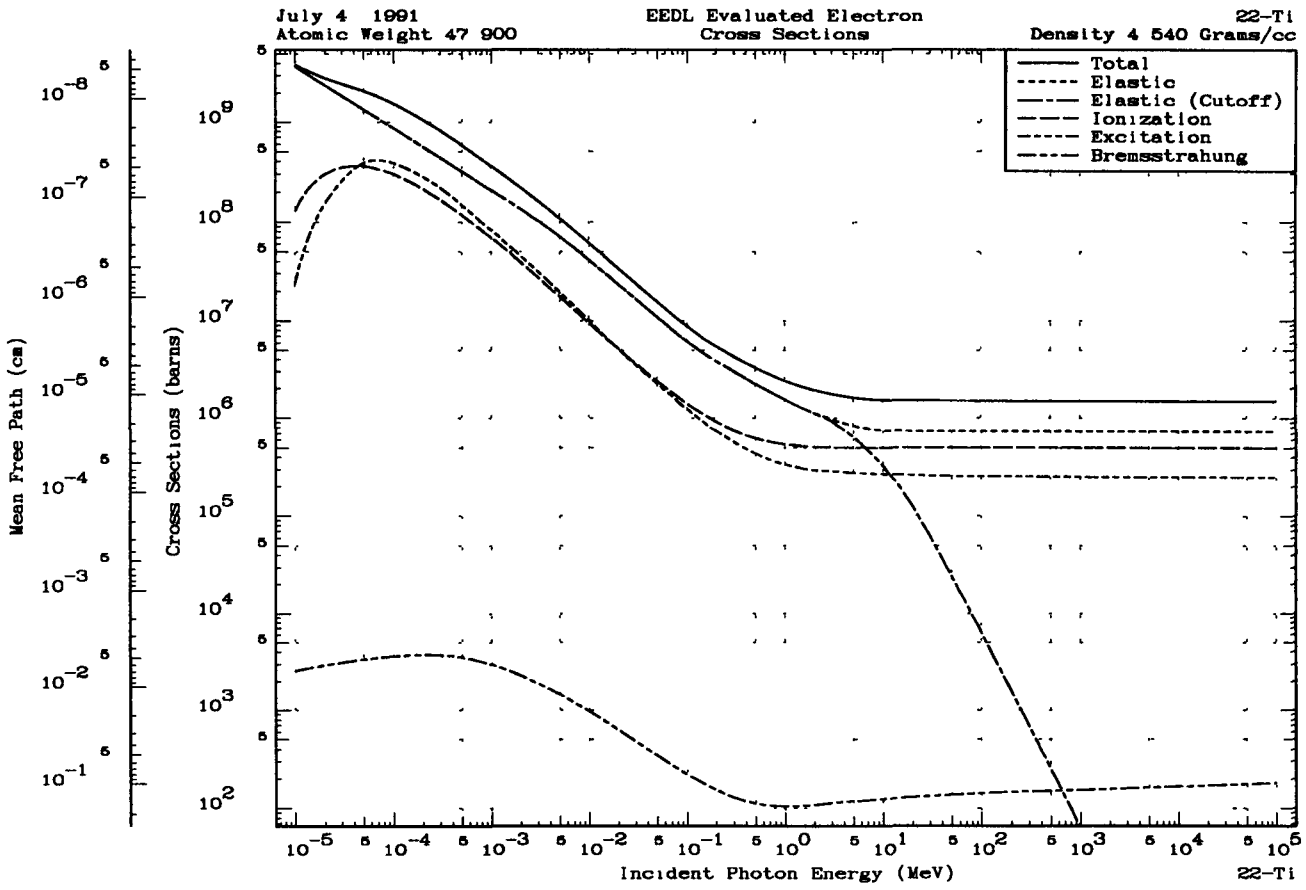

July 4, 1991
Atomic Weight 44.958
EEDL Evaluated Electron
Shell Cross Sections
21-Sc
Density 2.989 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
21-Sc


July 4, 1991
Atomic Weight 44.958
EEDL Evaluated Electron
Energy Deposition
21-Sc
Density 2.989 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
21-Sc

Atomic Weight 44.958 Density 2.989 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.7818–9	5.7865+7		4.3199+9	4.1078+9	1.7218+8	3.9839+7	2.4639+3	5.9688+1	4.8842+1	1.0845+1	2.1255–4
	1.1250–5	6.1319–9	5.4561+7		4.0732+9	3.8067+9	2.0696+8	5.9510+7	2.5204+3	7.7899+1	6.1201+1	1.6698+1	2.3779–4
	1.3125–5	6.5992–9	5.0697+7		3.7848+9	3.4457+9	2.4828+8	9.0769+7	2.5964+3	1.0443+2	7.7816+1	2.6609+1	2.7643–4
	1.5000–5	7.0098–9	4.7728+7		3.5631+9	3.1608+9	2.7988+8	1.2240+8	2.6640+3	1.2972+2	9.2301+1	3.7418+1	3.1593–4
	1.7500–5	7.4884–9	4.4677+7		3.3353+9	2.8611+9	3.1119+8	1.6307+8	2.7443+3	1.6200+2	1.0881+2	5.3190+1	3.6980–4
	2.0000–5	7.8878–9	4.2415+7		3.1665+9	2.6245+9	3.3288+8	2.0909+8	2.8158+3	1.9547+2	1.2299+2	7.2476+1	4.2494–4
	2.5000–5	8.5553–9	3.9106+7		2.9194+9	2.2720+9	3.5768+8	2.8973+8	2.9182+3	2.5691+2	1.4451+2	1.1241+2	5.2672–4
	3.0000–5	9.0782–9	3.6853+7		2.7513+9	2.0194+9	3.6848+8	3.6335+8	3.0045+3	3.1589+2	1.5991+2	1.5599+2	6.3119–4
M3	3.9060–5	9.8270–9	3.4045+7		2.5416+9	1.7034+9	3.6758+8	4.7067+8	3.1315+3	4.0015+2	1.7617+2	2.2398+2	8.2448–4
	3.9530–5	9.8638–9	3.3918+7		2.5321+9	1.6903+9	3.6747+8	4.7436+8	3.1374+3	4.0380+2	1.7713+2	2.2667+2	8.3468–4
M2	3.9600–5	9.8693–9	3.3899+7		2.5307+9	1.6884+9	3.6745+8	4.7491+8	3.1382+3	4.0434+2	1.7726+2	2.2708+2	8.3620–4
	4.0000–5	9.8999–9	3.3794+7		2.5229+9	1.6774+9	3.6744+8	4.7802+8	3.1432+3	4.0756+2	1.7820+2	2.2936+2	8.4491–4
	4.1250–5	9.9954–9	3.3471+7		2.4988+9	1.6445+9	3.6615+8	4.8813+8	3.1557+3	4.1639+2	1.8014+2	2.3625+2	8.7024–4
	4.3438–5	1.0152–8	3.2955+7		2.4602+9	1.5906+9	3.6398+8	5.0559+8	3.1769+3	4.3188+2	1.8350+2	2.4838+2	9.1478–4
	4.6719–5	1.0364–8	3.2281+7		2.4099+9	1.5177+9	3.6095+8	5.3126+8	3.2070+3	4.5525+2	1.8845+2	2.6680+2	9.8203–4
	5.0000–5	1.0603–8	3.1553+7		2.3555+9	1.4527+9	3.5813+8	5.4470+8	3.2352+3	4.7280+2	1.9329+2	2.7951+2	1.0498–3
	5.5000–5	1.0948–8	3.0559+7		2.2814+9	1.3661+9	3.5027+8	5.6499+8	3.2713+3	4.9399+2	1.9718+2	2.9681+2	1.1504–3
	6.0000–5	1.1335–8	2.9515+7		2.2034+9	1.2916+9	3.4326+8	5.6853+8	3.3045+3	5.0668+2	2.0108+2	3.0560+2	1.2520–3
M1	6.0910–5	1.1403–8	2.9339+7		2.1903+9	1.2791+9	3.4146+8	5.6968+8	3.3103+3	5.0833+2	2.0120+2	3.0712+2	1.2706–3
	6.2103–5	1.1499–8	2.9095+7		2.1721+9	1.2633+9	3.3924+8	5.6959+8	3.3178+3	5.0979+2	2.0155+2	3.0824+2	1.2950–3
	6.4340–5	1.1674–8	2.8659+7		2.1395+9	1.2348+9	3.3527+8	5.6943+8	3.3315+3	5.1262+2	2.0229+2	3.1033+2	1.3408–3
	6.8255–5	1.1969–8	2.7952+7		2.0868+9	1.1887+9	3.2887+8	5.6916+8	3.3544+3	5.1784+2	2.0384+2	3.1400+2	1.4215–3
	7.0000–5	1.2096–8	2.7659+7		2.0649+9	1.1696+9	3.2621+8	5.6905+8	3.3643+3	5.2024+2	2.0460+2	3.1564+2	1.4576–3
	7.4128–5	1.2424–8	2.6928+7		2.0103+9	1.1272+9	3.2012+8	5.6295+8	3.3868+3	5.2242+2	2.0619+2	3.1623+2	1.5433–3
	8.0000–5	1.2871–8	2.5993+7		1.9405+9	1.0732+9	3.1235+8	5.5493+8	3.4169+3	5.2611+2	2.0880+2	3.1731+2	1.6662–3
	9.0000–5	1.3684–8	2.4449+7		1.8252+9	9.9521+8	2.9725+8	5.3276+8	3.4520+3	5.2031+2	2.0922+2	3.1109+2	1.8658–3
	1.0000–4	1.4449–8	2.3154+7	0.0000+0	1.7285+9	9.3022+8	2.8463+8	5.1368+8	3.4836+3	5.1677+2	2.1060+2	3.0617+2	2.0672–3
	1.1250–4	1.5420–8	2.1696+7	2.4469–8	1.6197+9	8.6259+8	2.6814+8	4.8901+8	3.5077+3	5.0499+2	2.0843+2	2.9656+2	2.3078–3
	1.2500–4	1.6338–8	2.0477+7	4.9438–8	1.5287+9	8.0626+8	2.5449+8	4.6795+8	3.5294+3	4.9626+2	2.0761+2	2.8865+2	2.5498–3
	1.3125–4	1.6782–8	1.9936+7	6.2081–8	1.4883+9	7.8144+8	2.4833+8	4.5850+8	3.5395+3	4.9241+2	2.0719+2	2.8522+2	2.6713–3
	1.5000–4	1.8142–8	1.8442+7	1.0068–7	1.3767+9	7.1735+8	2.3242+8	4.2698+8	3.5673+3	4.7930+2	2.0702+2	2.7227+2	3.0376–3
	1.7500–4	1.9920–8	1.6795+7	1.5405–7	1.2538+9	6.4986+8	2.1244+8	3.9153+8	3.5852+3	4.5757+2	2.0224+2	2.5532+2	3.5122–3
	2.0000–4	2.1595–8	1.5492+7	2.0966–7	1.1566+9	5.9656+8	1.9680+8	3.6322+8	3.6009+3	4.4176+2	1.9965+2	2.4210+2	3.9887–3
	2.5000–4	2.4862–8	1.3457+7	3.2746–7	1.0046+9	5.1725+8	1.7057+8	3.1679+8	3.5718+3	4.0762+2	1.8998+2	2.1763+2	4.8555–3
	3.0000–4	2.8077–8	1.1916+7	4.5455–7	8.8956+8	4.6034+8	1.5160+8	2.7762+8	3.5482+3	3.7951+2	1.8312+2	1.9639+2	5.7166–3
	4.0000–4	3.4252–8	9.7675+6	7.3638–7	7.2919+8	3.8342+8	1.2387+8	2.2189+8	3.4915+3	3.3123+2	1.6774+2	1.6348+2	7.3748–3
L3	4.0886–4	3.4778–8	9.6200+6	7.6329–7	7.1818+8	3.7812+8	1.2188+8	2.1818+8	3.4785+3	3.2739+2	1.6629+2	1.6109+2	7.4982–3
L2	4.1368–4	3.5059–8	9.5429+6	7.7805–7	7.1242+8	3.7532+8	1.2083+8	2.1628+8	3.4716+3	3.2548+2	1.6560+2	1.5987+2	7.5653–3
	4.1456–4	3.5110–8	9.5288+6	7.8074–7	7.1137+8	3.7481+8	1.2064+8	2.1591+8	3.4704+3	3.2513+2	1.6549+2	1.5964+2	7.5774–3
	4.1908–4	3.5378–8	9.4567+6	7.9468–7	7.0599+8	3.7224+8	1.1968+8	2.1406+8	3.4640+3	3.2333+2	1.6486+2	1.5846+2	7.6401–3
	4.2919–4	3.5974–8	9.3001+6	8.2616–7	6.9429+8	3.6665+8	1.1759+8	2.1005+8	3.4500+3	3.1949+2	1.6358+2	1.5590+2	7.7801–3
	4.3592–4	3.6367–8	9.1995+6	8.4729–7	6.8678+8	3.6304+8	1.1626+8	2.0748+8	3.4409+3	3.1709+2	1.6283+2	1.5426+2	7.8729–3
	4.6460–4	3.8024–8	8.7987+6	9.3912–7	6.5686+8	3.4864+8	1.1096+8	1.9725+8	3.4039+3	3.0752+2	1.5977+2	1.4774+2	8.2660–3
	4.6796–4	3.8216–8	8.7544+6	9.5008–7	6.5356+8	3.4705+8	1.1038+8	1.9613+8	3.3997+3	3.0648+2	1.5945+2	1.4703+2	8.3119–3
L1	4.9429–4	3.9705–8	8.4261+6	1.0371–6	6.2904+8	3.3519+8	1.0606+8	1.8779+8	3.3683+3	2.9877+2	1.5704+2	1.4173+2	8.6691–3
	5.0000–4	4.0028–8	8.3581+6	1.0563–6	6.2397+8	3.3276+8	1.0517+8	1.8604+8	3.3617+3	2.9723+2	1.5660+2	1.4062+2	8.7462–3
	5.2500–4	4.1458–8	8.0699+6	1.1414–6	6.0246+8	3.2260+8	1.0134+8	1.7851+8	3.3340+3	2.8985+2	1.5389+2	1.3595+2	9.0820–3
	5.5000–4	4.2866–8	7.8047+6	1.2287–6	5.8266+8	3.1321+8	9.7829+7	1.7162+8	3.3077+3	2.8322+2	1.5155+2	1.3167+2	9.4154–3
	5.6250–4	4.3563–8	7.6798+6	1.2731–6	5.7333+8	3.0877+8	9.6176+7	1.6838+8	3.2951+3	2.8009+2	1.5042+2	1.2966+2	9.5812–3
	6.0000–4	4.5627–8	7.3325+6	1.4090–6	5.4740+8	2.9637+8	9.1596+7	1.5943+8	3.2592+3	2.7155+2	1.4742+2	1.2413+2	1.0075–2
	6.5000–4	4.8311–8	6.9251+6	1.5972–6	5.1699+8	2.8172+8	8.6010+7	1.4926+8	3.1907+3	2.6007+2	1.4273+2	1.1732+2	1.0594–2
	7.2500–4	5.2223–8	6.4063+6	1.8938–6	4.7826+8	2.6288+8	7.8954+7	1.3642+8	3.0994+3	2.4570+2	1.3693+2	1.0876+2	1.1356–2
	8.0000–4	5.6014–8	5.9728+6	2.2066–6	4.4590+8	2.4699+8	7.3110+7	1.2580+8	3.0195+3	2.3393+2	1.3222+2	1.0170+2	1.2100–2
	9.0000–4	6.0953–8	5.4888+6	2.6483–6	4.0977+8	2.2930+8	6.6459+7	1.1401+8	2.9092+3	2.1909+2	1.2558+2	9.3499+1	1.2950–2
	1.0000–3	6.5729–8	5.0900+6	3.1177–6	3.7999+8	2.1455+8	6.1037+7	1.0440+8	2.8139+3	2.0709+2	1.2023+2	8.6838+1	1.3775–2
	1.1250–3	7.1661–8	4.6686+6	3.7435–6	3.4854+8	1.9910+8	5.5324+7	9.4108+7	2.6874+3	1.9258+2	1.1328+2	7.9281+1	1.4417–2
	1.2500–3	7.7404–8	4.3222+6	4.4130–6	3.2268+8	1.8622+8	5.0681+7	8.5767+7	2.5790+3	1.8092+2	1.0774+2	7.3166+1	1.5047–2
	1.3125–3	8.0214–8	4.1708+6	4.7635–6	3.1137+8	1.8055+8	4.8664+7	8.2159+7	2.5303+3	1.7583+2	1.0529+2	7.0525+1	1.5357–2
	1.5000–3	8.8419–8	3.7838+6	5.8706–6	2.8248+8	1.6588+8	4.3557+7	7.3042+7	2.4017+3	1.6304+2	9.9160+1	6.3864+1	1.6268–2
	1.7500–3	9.9123–8	3.3752+6	7.4795–6	2.5197+8	1.5005+8	3.8175+7	6.3742+7	2.2508+3	1.4798+2	9.1261+1	5.6699+1	1.7260–2
	2.0000–3	1.0941–7	3.0579+6	9.2376–6	2.2829+8	1.3757+8	3.4063+7	5.6649+7	2.1278+3	1.3657+2	8.5304+1	5.1248+1	1.8220–2
	2.5000–3	1.2976–7	2.5783+6	1.3174–5	1.9248+8	1.1791+8	2.8047+7	4.6523+7	1.9173+3	1.1795+2	7.4858+1	4.3077+1	1.9653–2
	3.0000–3	1.4911–7	2.2437+6	1.7658–5	1.6750+8	1.0395+8	2.3939+7	3.9609+7	1.7609+3	1.0530+2	6.7759+1	3.7517+1	2.1021–2
	4.0000–3	1.8720–7	1.7872+6	2.8106–5	1.3342+8	8.4380+7	1.8578+7	3.0461+7	1.5217+3	8.6714+1	5.6918+1	2.9773+1	2.3043–2
K	4.4658–3	2.0455–7	1.6356+6	3.3685–5	1.2210+8	7.7621+7	1.6849+7	2.7631+7	1.4349+3	8.0368+1	5.3057+1	2.7287+1	2.3798–2
	4.5326–3	2.0707–7	1.6157+6	3.4520–5	1.2062+8	7.6753+7	1.6629+7	2.7234+7	1.4233+3	7.9533+1	5.2569+1	2.6940+1	2.3893–2
	4.6494–3	2.1147–7	1.5821+6	3.6002–5	1.1811+8	7.5286+7	1.6258+7	2.6566+7	1.4036+3	7.8129+1	5.1748+1	2.6357+1	2.4059–2
	4.8247–3	2.1802–7	1.5346+6	3.8275–5	1.1456+8	7.3204+7	1.5733+7	2.5624+7	1.3755+3	7.6146+1	5.0586+1	2.5535+1	2.4307–2
	5.0000–3	2.2452–7	1.4901+6	4.0605–5	1.1124+8	7.1250+7	1.5243+7	2.4747+7	1.3489+3	7.4297+1	4.9502+1	2.4771+1	2.4552–2
	5.2500–3	2.3381–7	1.4309+6	4.4029–5	1.0682+8	6.8615+7	1.4595+7	2.3613+7	1.3127+3	7.1732+1	4.7957+1	2.3750+1	2.4867–2
	5.6250–3	2.4759–7	1.3513+6	4.9387–5	1.0088+8	6.5054+7	1.3725+7	2.2098+7	1.2631+3	6.8295+1	4.5883+1	2.2386+1	2.5334–2
	6.0000–3	2.6121–7	1.2808+6	5.5003–5	9.5620+7	6.1890+7	1.2959+7	2.0769+7	1.2184+3	6.5271+1	4.4054+1	2.1190+1	2.5794–2
	6.5000–3	2.7923–7	1.1981+6	6.2891–5	8.9446+7	5.8150+7	1.2065+7	1.9230+7	1.1625+3	6.1546+1	4.1752+1	1.9768+1	2.6244–2
	7.2500–3	3.0583–7	1.0939+6	7.5563–5	8.1668+7	5.3409+7	1.0945+7	1.7313+7	1.0905+3	5.6883+1	3.8860+1	1.7996+1	2.6914–2
	8.0000–3	3.3195–7	1.0079+6	8.9212–5	7.5242+7	4.9467+7	1.0025+7	1.5749+7	1.0293+3	5.3059+1	3.6479+1	1.6552+1	2.7573–2
	9.0000–3	3.6648–7	9.1291+5	1.0889–4	6.8153+7	4.5066+7	9.0243+6	1.4062+7	9.5811+2	4.8646+1	3.3671+1	1.4947+1	2.8213–2
	1.0000–2	4.0037–7	8.3563+5	1.3024–4	6.2383+7	4.1462+7	8.2144+6	1.2706+7	8.9858+2	4.5076+1	3.1389+1	1.3657+1	2.8850–2
	1.2500–2	4.8355–7	6.9188+5	1.9046–4	5.1652+7	3.4664+7	6.7373+6	1.0250+7	7.7990+2	3.8150+1	2.6880+1	1.1241+1	2.9817–2
	1.5000–2	5.6409–7	5.9309+5	2.6041–4	4.4277+7	2.9946+7	5.7307+6	8.5996+6	6.9466+2	3.3432+1	2.3783+1	9.6187+0	3.0813–2
	2.0000–2	7.2290–7	4.6280+5	4.2637–4	3.4550+7	2.3550+7	4.4489+6	6.5508+6	5.7477+2	2.7048+1	1.9485+1	7.5307+0	3.1954–2

Atomic Weight 44.958												Density 2.989 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000–2	1.0304–6	3.2468+5	8.5364–4	2.4239+7	1.6608+7	3.1326+6	4.4980+6	4.3674+2	2.0104+1	1.4702+1	5.3687+0	3.3095–2
4.0000–2	1.3249–6	2.5252+5	1.4046–3	1.8852+7	1.2947+7	2.4578+6	3.4467+6	3.6143+2	1.6327+1	1.2071+1	4.2228+0	3.3800–2
5.0000–2	1.6046–6	2.0849+5	2.0659–3	1.5565+7	1.0678+7	2.0462+6	2.8401+6	3.1174+2	1.3976+1	1.0394+1	3.5481+0	3.4262–2
6.0000–2	1.8692–6	1.7898+5	2.8267–3	1.3362+7	9.1624+6	1.7687+6	2.4306+6	2.7695+2	1.2345+1	9.2253+0	3.0854+0	3.4667–2
8.0000–2	2.3622–6	1.4163+5	4.6055–3	1.0573+7	7.2526+6	1.4184+6	1.9022+6	2.3128+2	1.0210+1	7.6993+0	2.4749+0	3.5411–2
1.0000–1	2.8095–6	1.1908+5	6.7065–3	8.8899+6	6.1102+6	1.2061+6	1.5734+6	2.0190+2	8.8603+0	6.7383+0	2.0859+0	3.6152–2
1.5000–1	3.7460–6	8.9312+4	1.3025–2	6.6675+6	4.5925+6	9.2120+5	1.1537+6	1.6008+2	7.0369+0	5.4176+0	1.5812+0	3.8088–2
1.7500–1	4.1481–6	8.0654+4	1.6721–2	6.0212+6	4.1574+6	8.4192+5	1.0217+6	1.4805+2	6.4982+0	5.0421+0	1.4169+0	3.9216–2
2.0000–1	4.5103–6	7.4177+4	2.0688–2	5.5377+6	3.8140+6	7.7880+5	9.4475+5	1.3835+2	6.1098+0	4.7440+0	1.3255+0	4.0380–2
3.0000–1	5.7336–6	5.8351+4	3.8412–2	4.3562+6	2.9751+6	6.3800+5	7.4294+5	1.1710+2	5.1987+0	4.0758+0	1.0772+0	4.5595–2
4.0000–1	6.7315–6	4.9701+4	5.8502–2	3.7104+6	2.5004+6	5.6970+5	6.4020+5	1.0724+2	4.7631+0	3.7612+0	9.5030–1	5.1658–2
5.0000–1	7.5449–6	4.4342+4	8.0008–2	3.3104+6	2.1929+6	5.3029+5	5.8711+5	1.0209+2	4.5384+0	3.5920+0	8.8792–1	5.8435–2
6.0000–1	8.2508–6	4.0549+4	1.0239–1	3.0272+6	1.9750+6	5.0520+5	5.4690+5	9.9073+1	4.3986+0	3.4930+0	8.3999–1	6.5668–2
8.0000–1	9.3836–6	3.5654+4	1.4847–1	2.6617+6	1.6819+6	4.7611+5	5.0362+5	9.6316+1	4.2818+0	3.4075+0	7.9287–1	8.1421–2
1.0000+0	1.0289–5	3.2515+4	1.9546–1	2.4274+6	1.4934+6	4.6010+5	4.7389+5	9.5658+1	4.2309+0	3.3718+0	7.6052–1	9.8622–2
1.5000+0	1.1886–5	2.8148+4	3.1296–1	2.1014+6	1.2230+6	4.4304+5	4.3523+5	9.6865+1	4.2796+0	3.4143+0	7.1884–1	1.4646–1
2.0000+0	1.2967–5	2.5801+4	4.2858–1	1.9262+6	1.0751+6	4.3834+5	4.1267+5	9.8877+1	4.3701+0	3.4696+0	7.0162–1	1.9886–1
3.0000+0	1.4313–5	2.3375+4	6.5227–1	1.7450+6	9.2014+5	4.3246+5	3.9235+5	1.0298+2	4.5724+0	3.5746+0	6.8396–1	3.1385–1
4.0000+0	1.5155–5	2.2076+4	8.6620–1	1.6481+6	8.3810+5	4.3153+5	3.7837+5	1.0638+2	4.7778+0	3.6648+0	6.7600–1	4.3701–1
5.0000+0	1.5657–5	2.1368+4	1.0712+0	1.5953+6	7.9029+5	4.3151+5	3.7334+5	1.0783+2	4.9819+0	3.7415+0	6.7219–1	5.6817–1
6.0000+0	1.6000–5	2.0910+4	1.2680+0	1.5610+6	7.6022+5	4.3155+5	3.6912+5	1.0904+2	5.1778+0	3.8070+0	6.6971–1	7.0110–1
8.0000+0	1.6446–5	2.0343+4	1.6405+0	1.5187+6	7.2503+5	4.3210+5	3.6145+5	1.1161+2	5.5649+0	3.9176+0	6.6583–1	9.8154–1
1.0000+1	1.6681–5	2.0057+4	1.9884+0	1.4973+6	7.0997+5	4.3276+5	3.5449+5	1.1364+2	5.9398+0	4.0088+0	6.6282–1	1.2681+0
1.5000+1	1.6806–5	1.9907+4	2.7747+0	1.4862+6	7.0306+5	4.3378+5	3.4922+5	1.1679+2	6.7973+0	4.1273+0	6.5738–1	2.0126+0
2.0000+1	1.6878–5	1.9822+4	3.4666+0	1.4798+6	7.0018+5	4.3452+5	3.4499+5	1.1882+2	7.6730+0	4.2285+0	6.5378–1	2.7907+0
3.0000+1	1.6955–5	1.9732+4	4.6425+0	1.4731+6	6.9970+5	4.3493+5	3.3833+5	1.2165+2	9.3931+0	4.3532+0	6.4969–1	4.3902+0
4.0000+1	1.6975–5	1.9709+4	5.6204+0	1.4714+6	6.9964+5	4.3526+5	3.3635+5	1.2363+2	1.1107+1	4.4311+0	6.4681–1	6.0293+0
5.0000+1	1.6992–5	1.9690+4	6.4569+0	1.4699+6	6.9960+5	4.3549+5	3.3471+5	1.2500+2	1.2842+1	4.4962+0	6.4457–1	7.7017+0
6.0000+1	1.7008–5	1.9671+4	7.1874+0	1.4685+6	6.9956+5	4.3556+5	3.3330+5	1.2613+2	1.4575+1	4.5405+0	6.4277–1	9.3914+0
8.0000+1	1.7033–5	1.9642+4	8.4168+0	1.4663+6	6.9950+5	4.3567+5	3.3105+5	1.2803+2	1.8086+1	4.6250+0	6.4024–1	1.2820+1
1.0000+2	1.7048–5	1.9625+4	9.4268+0	1.4651+6	6.9946+5	4.3575+5	3.2974+5	1.2945+2	2.1626+1	4.6889+0	6.3952–1	1.6297+1
1.5000+2	1.7056–5	1.9616+4	1.1364+1	1.4644+6	6.9937+5	4.3580+5	3.2909+5	1.3185+2	3.0513+1	4.7577+0	6.3836–1	2.5117+1
2.0000+2	1.7063–5	1.9608+4	1.2801+1	1.4638+6	6.9931+5	4.3583+5	3.2853+5	1.3335+2	3.9467+1	4.8235+0	6.3736–1	3.4006+1
3.0000+2	1.7072–5	1.9597+4	1.4889+1	1.4630+6	6.9923+5	4.3587+5	3.2777+5	1.3478+2	5.7392+1	4.9411+0	6.3608–1	5.1815+1
4.0000+2	1.7079–5	1.9589+4	1.6405+1	1.4624+6	6.9917+5	4.3587+5	3.2722+5	1.3564+2	7.5381+1	4.9866+0	6.3520–1	6.9759+1
5.0000+2	1.7087–5	1.9580+4	1.7595+1	1.4618+6	6.9912+5	4.3588+5	3.2661+5	1.3635+2	9.3393+1	5.0283+0	6.3420–1	8.7730+1
6.0000+2	1.7089–5	1.9577+4	1.8573+1	1.4615+6	6.9908+5	4.3588+5	3.2643+5	1.3693+2	1.1147+2	5.0655+0	6.3404–1	1.0577+2
8.0000+2	1.7094–5	1.9571+4	2.0129+1	1.4611+6	6.9903+5	4.3589+5	3.2605+5	1.3808+2	1.4725+2	5.1395+0	6.3368–1	1.4148+2
1.0000+3	1.7098–5	1.9567+4	2.1344+1	1.4608+6	6.9898+5	4.3589+5	3.2575+5	1.3897+2	1.8329+2	5.2096+0	6.3348–1	1.7745+2
1.5000+3	1.7100–5	1.9564+4	2.3562+1	1.4606+6	6.9889+5	4.3589+5	3.2565+5	1.4082+2	2.7360+2	5.2680+0	6.3328–1	2.6770+2
2.0000+3	1.7102–5	1.9562+4	2.5142+1	1.4604+6	6.9883+5	4.3589+5	3.2554+5	1.4219+2	3.6388+2	5.3264+0	6.3308–1	3.5792+2
3.0000+3	1.7103–5	1.9561+4	2.7374+1	1.4604+6	6.9875+5	4.3589+5	3.2556+5	1.4427+2	5.4430+2	5.4431+0	6.3312–1	5.3823+2
4.0000+3	1.7105–5	1.9559+4	2.8959+1	1.4602+6	6.9869+5	4.3589+5	3.2548+5	1.4584+2	7.2570+2	5.4828+0	6.3296–1	7.1958+2
5.0000+3	1.7107–5	1.9556+4	3.0188+1	1.4600+6	6.9865+5	4.3589+5	3.2529+5	1.4706+2	9.0877+2	5.5226+0	6.3260–1	9.0262+2
6.0000+3	1.7107–5	1.9557+4	3.1192+1	1.4600+6	6.9861+5	4.3589+5	3.2537+5	1.4808+2	1.0881+3	5.5597+0	6.3276–1	1.0819+3
8.0000+3	1.7107–5	1.9556+4	3.2779+1	1.4600+6	6.9855+5	4.3589+5	3.2538+5	1.4971+2	1.4499+3	5.6338+0	6.3280–1	1.4437+3
1.0000+4	1.7108–5	1.9556+4	3.4009+1	1.4599+6	6.9850+5	4.3589+5	3.2540+5	1.5098+2	1.8151+3	5.7043+0	6.3284–1	1.8088+3
1.5000+4	1.7108–5	1.9555+4	3.6249+1	1.4599+6	6.9842+5	4.3589+5	3.2544+5	1.5343+2	2.7099+3	5.7597+0	6.3292–1	2.7035+3
2.0000+4	1.7109–5	1.9555+4	3.7840+1	1.4598+6	6.9836+5	4.3589+5	3.2544+5	1.5520+2	3.6164+3	5.8152+0	6.3292–1	3.6099+3
3.0000+4	1.7109–5	1.9554+4	4.0086+1	1.4598+6	6.9827+5	4.3589+5	3.2548+5	1.5767+2	5.4102+3	5.9262+0	6.3300–1	5.4037+3
4.0000+4	1.7111–5	1.9553+4	4.1680+1	1.4597+6	6.9822+5	4.3589+5	3.2544+5	1.5944+2	7.2234+3	5.9832+0	6.3292–1	7.2168+3
5.0000+4	1.7113–5	1.9550+4	4.2916+1	1.4595+6	6.9817+5	4.3589+5	3.2525+5	1.6080+2	9.0197+3	6.0212+0	6.3256–1	9.0131+3
6.0000+4	1.7113–5	1.9550+4	4.3928+1	1.4595+6	6.9813+5	4.3589+5	3.2534+5	1.6191+2	1.0815+4	6.0565+0	6.3272–1	1.0808+4
8.0000+4	1.7113–5	1.9550+4	4.5523+1	1.4595+6	6.9807+5	4.3589+5	3.2540+5	1.6367+2	1.4435+4	6.1272+0	6.3284–1	1.4429+4
1.0000+5	1.7113–5	1.9550+4	4.6759+1	1.4595+6	6.9803+5	4.3589+5	3.2542+5	1.6505+2	1.8063+4	6.1979+0	6.3288–1	1.8056+4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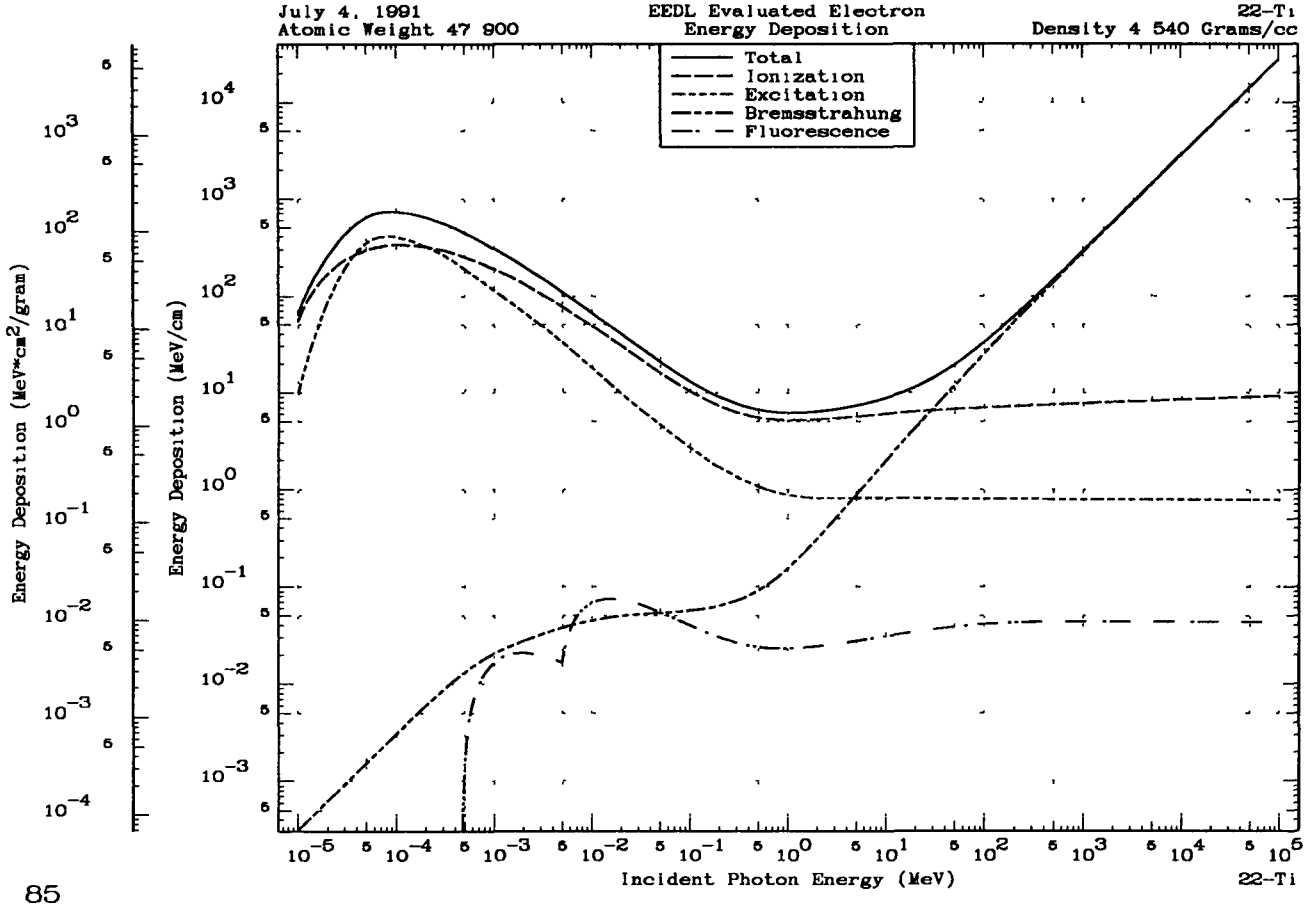
Atomic Weight 47 900
EEDL Evaluated Electron
Cross Sections
22-Ti
Density 4 540 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
22-Ti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Bremsstrahung
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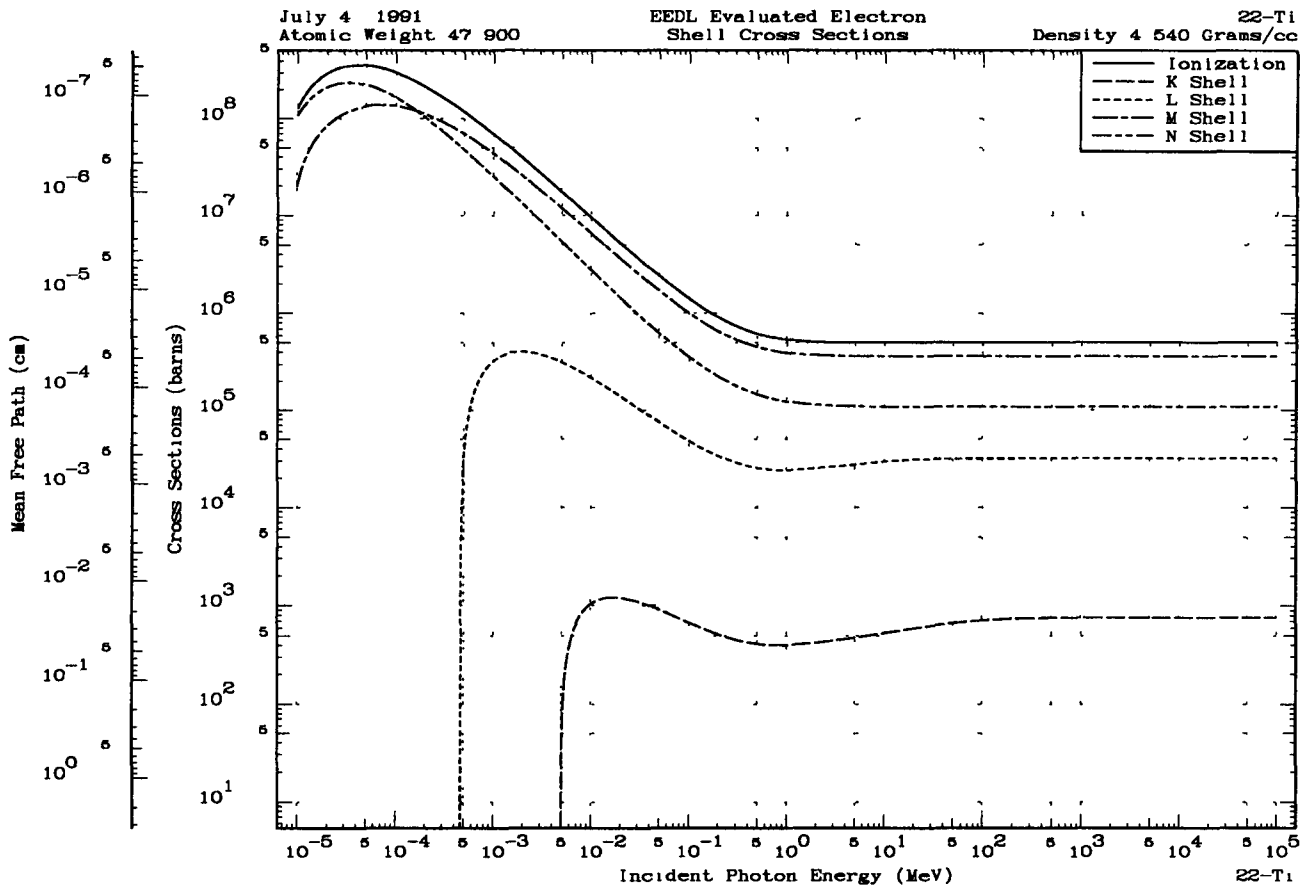
22-Ti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EEDL Evaluated Electron
Shell Cross Sections
22-Ti
Density 4 540 Grams/cc
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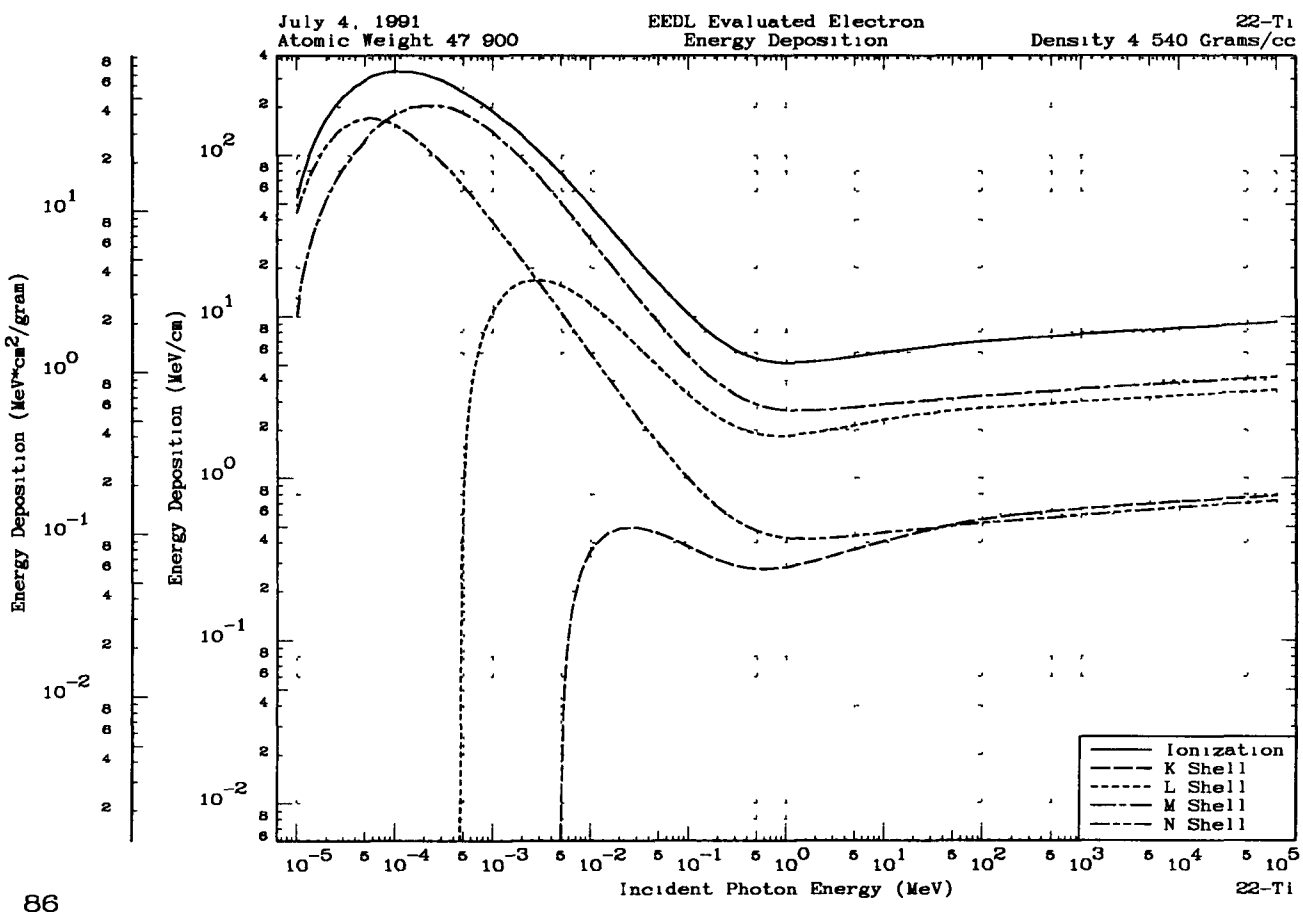
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
22-Ti

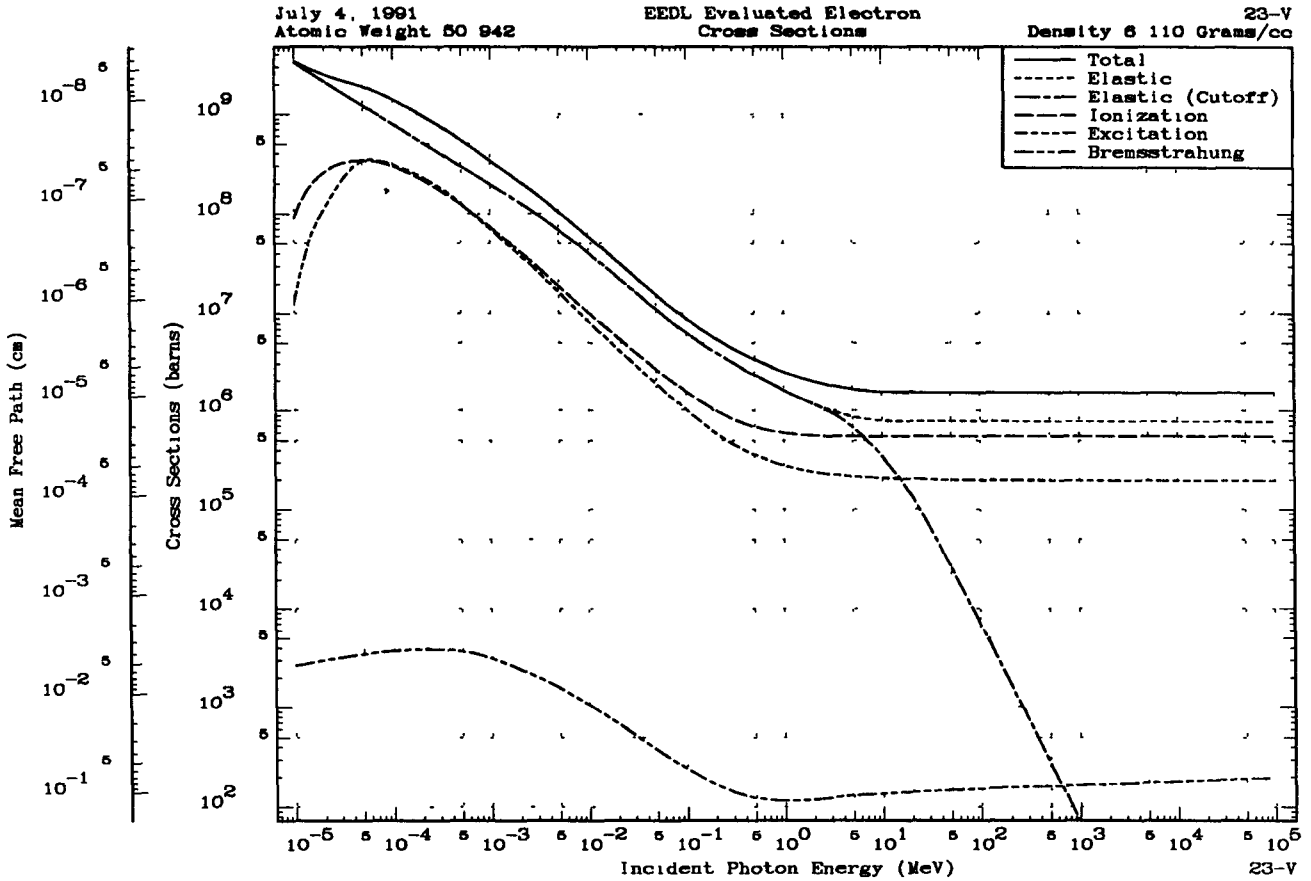

July 4, 1991
Atomic Weight 47 900
EEDL Evaluated Electron
Energy Deposition
22-Ti
Density 4 540 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
22-Ti

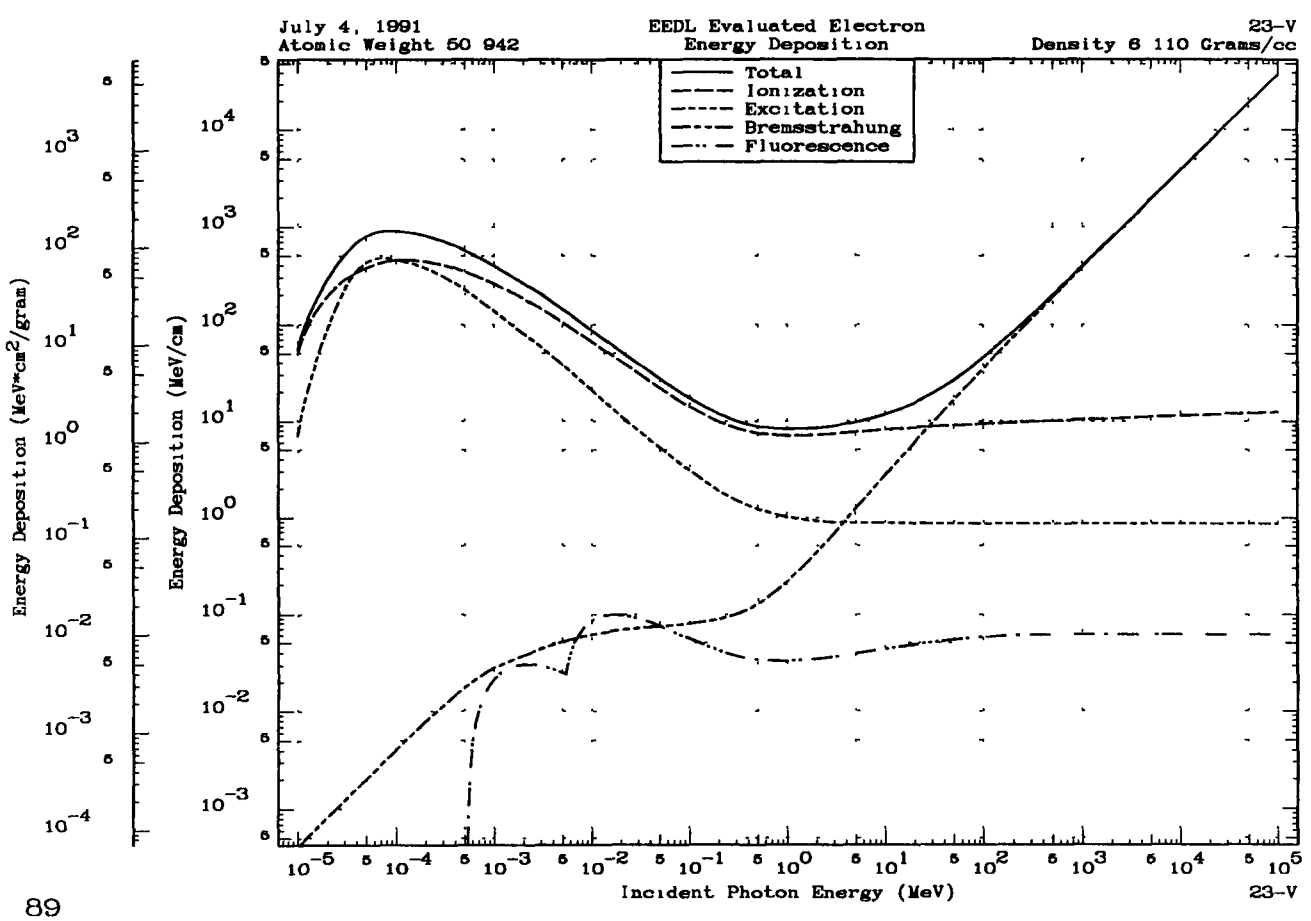
Atomic Weight 47.900 Density 4.540 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.5400–9	4.8516+7		3.8590+9	3.7071+9	1.2780+8	2.4076+7	2.5698+3	6.4192+1	5.4415+1	9.7764+0	3.1606–4
	1.0625–5	4.6798–9	4.7067+7		3.7437+9	3.5678+9	1.4480+8	3.1089+7	2.6000+3	7.6003+1	6.3176+1	1.2827+1	3.3476–4
	1.1250–5	4.8103–9	4.5790+7		3.6422+9	3.4414+9	1.6202+8	3.8775+7	2.6288+3	8.8552+1	7.2300+1	1.6251+1	3.5362–4
	1.1719–5	4.9067–9	4.4891+7		3.5706+9	3.3538+9	1.7282+8	4.4010+7	2.6496+3	9.7045+1	7.8383+1	1.8661+1	3.6787–4
	1.3125–5	5.1693–9	4.2610+7		3.3892+9	3.1221+9	2.0454+8	6.2551+7	2.7082+3	1.2449+2	9.7051+1	2.7441+1	4.1111–4
	1.3359–5	5.2104–9	4.2274+7		3.3625+9	3.0875+9	2.0890+8	6.6076+7	2.7175+3	1.2897+2	9.9820+1	2.9149+1	4.1838–4
	1.5000–5	5.4817–9	4.0182+7		3.1961+9	2.8696+9	2.3805+8	8.8374+7	2.7789+3	1.5967+2	1.1917+2	4.0501+1	4.6988–4
	1.7500–5	5.8441–9	3.7690+7		2.9979+9	2.6035+9	2.7270+8	1.2171+8	2.8628+3	2.0611+2	1.4503+2	6.1074+1	5.5005–4
	2.0000–5	6.1577–9	3.5770+7		2.8452+9	2.3929+9	2.9868+8	1.5356+8	2.9376+3	2.5335+2	1.6805+2	8.5298+1	6.3211–4
	2.5000–5	6.6921–9	3.2914+7		2.6180+9	2.0784+9	3.3215+8	2.0743+8	3.0448+3	3.4333+2	2.0502+2	1.3831+2	7.8368–4
	3.0000–5	7.1209–9	3.0932+7		2.4603+9	1.8524+9	3.5033+8	2.5764+8	3.1353+3	4.2425+2	2.3308+2	1.9117+2	9.3930–4
	3.5000–5	7.4882–9	2.9415+7		2.3396+9	1.6809+9	3.5636+8	3.0240+8	3.2124+3	4.9026+2	2.5159+2	2.3866+2	1.0970–3
	4.0000–5	7.7983–9	2.8245+7		2.2466+9	1.5452+9	3.6194+8	3.3947+8	3.2807+3	5.5424+2	2.7028+2	2.8395+2	1.2577–3
M3	4.4420–5	8.0764–9	2.7273+7		2.1693+9	1.4465+9	3.5953+8	3.6323+8	3.3310+3	5.9348+2	2.7909+2	3.1439+2	1.3974–3
M2	4.5100–5	8.1167–9	2.7137+7		2.1585+9	1.4327+9	3.5936+8	3.6640+8	3.3369+3	5.9952+2	2.8089+2	3.1863+2	1.4176–3
	4.5118–5	8.1177–9	2.7134+7		2.1582+9	1.4324+9	3.5936+8	3.6648+8	3.3371+3	5.9968+2	2.8094+2	3.1873+2	1.4181–3
	4.5712–5	8.1523–9	2.7019+7		2.1491+9	1.4206+9	3.5925+8	3.6922+8	3.3423+3	6.0491+2	2.8260+2	3.2231+2	1.4357–3
	4.6338–5	8.1877–9	2.6902+7		2.1398+9	1.4085+9	3.5919+8	3.7208+8	3.3476+3	6.1055+2	2.8449+2	3.2607+2	1.4543–3
	4.6784–5	8.2127–9	2.6820+7		2.1332+9	1.4000+9	3.5912+8	3.7411+8	3.3514+3	6.1452+2	2.8577+2	3.2875+2	1.4675–3
	4.8169–5	8.2881–9	2.6576+7		2.1139+9	1.3745+9	3.5897+8	3.8036+8	3.3629+3	6.2693+2	2.8983+2	3.3710+2	1.5087–3
	4.8392–5	8.2999–9	2.6538+7		2.1108+9	1.3705+9	3.5894+8	3.8136+8	3.3647+3	6.2892+2	2.9047+2	3.3845+2	1.5154–3
	5.0000–5	8.3831–9	2.6275+7		2.0899+9	1.3426+9	3.5877+8	3.8851+8	3.3777+3	6.4331+2	2.9513+2	3.4817+2	1.5634–3
	5.2500–5	8.5354–9	2.5806+7		2.0526+9	1.3020+9	3.5635+8	3.9428+8	3.3972+3	6.5715+2	2.9960+2	3.5755+2	1.6383–3
	5.6250–5	8.7504–9	2.5172+7		2.0022+9	1.2466+9	3.5298+8	4.0258+8	3.4249+3	6.7778+2	3.0624+2	3.7153+2	1.7514–3
	6.0000–5	8.9509–9	2.4608+7		1.9573+9	1.1969+9	3.4987+8	4.1051+8	3.4510+3	6.9826+2	3.1283+2	3.8543+2	1.8652–3
M1	6.8610–5	9.4610–9	2.3281+7		1.8518+9	1.1000+9	3.3761+8	4.1419+8	3.5059+3	7.1921+2	3.1885+2	4.0037+2	2.1292–3
	7.0000–5	9.5461–9	2.3074+7		1.8353+9	1.0862+9	3.3594+8	4.1316+8	3.5142+3	7.2112+2	3.2025+2	4.0087+2	2.1722–3
	7.0034–5	9.5482–9	2.3069+7		1.8349+9	1.0859+9	3.3590+8	4.1313+8	3.5144+3	7.2116+2	3.2027+2	4.0088+2	2.1732–3
	7.2525–5	9.6986–9	2.2711+7		1.8064+9	1.0622+9	3.3288+8	4.1134+8	3.5289+3	7.2421+2	3.2240+2	4.0182+2	2.2504–3
	7.6263–5	9.9175–9	2.2210+7		1.7666+9	1.0291+9	3.2866+8	4.0879+8	3.5498+3	7.2910+2	3.2579+2	4.0330+2	2.3668–3
	8.0000–5	1.0129–8	2.1746+7		1.7297+9	9.9855+8	3.2478+8	4.0637+8	3.5698+3	7.3431+2	3.2943+2	4.0488+2	2.4837–3
	8.5000–5	1.0419–8	2.1141+7		1.6816+9	9.6114+8	3.1775+8	4.0266+8	3.5891+3	7.3551+2	3.3042+2	4.0509+2	2.6327–3
	9.0000–5	1.0698–8	2.0590+7		1.6377+9	9.2715+8	3.1137+8	3.9919+8	3.6074+3	7.3733+2	3.3184+2	4.0548+2	2.7824–3
	9.2500–5	1.0848–8	2.0304+7		1.6150+9	9.1129+8	3.0834+8	3.9536+8	3.6161+3	7.3608+2	3.3256+2	4.0352+2	2.8575–3
	1.0000–4	1.1286–8	1.9516+7	0.0000+0	1.5523+9	8.6762+8	2.9998+8	3.8467+8	3.6413+3	7.3335+2	3.3514+2	3.9821+2	3.0837–3
	1.1250–4	1.2013–8	1.8335+7	1.7209–8	1.4583+9	8.0589+8	2.8420+8	3.6826+8	3.6677+3	7.1943+2	3.3237+2	3.8706+2	3.4445–3
	1.2500–4	1.2699–8	1.7345+7	3.4706–8	1.3796+9	7.5440+8	2.7108+8	3.5418+8	3.6915+3	7.0943+2	3.3155+2	3.7787+2	3.8074–3
	1.3125–4	1.3029–8	1.6906+7	4.3543–8	1.3447+9	7.3168+8	2.6516+8	3.4784+8	3.7026+3	7.0510+2	3.3123+2	3.7387+2	3.9897–3
	1.5000–4	1.4021–8	1.5710+7	7.0408–8	1.2495+9	6.7295+8	2.4982+8	3.2678+8	3.7331+3	6.9081+2	3.3180+2	3.5901+2	4.5392–3
	1.7500–4	1.5336–8	1.4363+7	1.0736–7	1.1424+9	6.1098+8	2.2972+8	3.0171+8	3.7539+3	6.6239+2	3.2438+2	3.3800+2	5.2525–3
	2.0000–4	1.6569–8	1.3294+7	1.4570–7	1.0574+9	5.6194+8	2.1391+8	2.8155+8	3.7721+3	6.4187+2	3.2034+2	3.2153+2	5.9692–3
	2.5000–4	1.8982–8	1.1604+7	2.2657–7	9.2297+8	4.8860+8	1.8672+8	2.4764+8	3.7461+3	5.9531+2	3.0491+2	2.9039+2	7.2794–3
	3.0000–4	2.1320–8	1.0331+7	3.1333–7	8.2175+8	4.3585+8	1.6701+8	2.1889+8	3.7250+3	5.5767+2	2.9428+2	2.6338+2	8.5821–3
	4.0000–4	2.5760–8	8.5508+6	5.0434–7	6.8013+8	3.6437+8	1.3754+8	1.7821+8	3.6708+3	4.9083+2	2.6994+2	2.2088+2	1.1096–2
L3	4.6524–4	2.8621–8	7.6960+6	6.4253–7	6.1213+8	3.3170+8	1.2345+8	1.5699+8	3.5797+3	4.5384+2	2.5503+2	1.9880+2	1.2472–2
L2	4.7122–4	2.8879–8	7.6273+6	6.5575–7	6.0667+8	3.2907+8	1.2234+8	1.5526+8	3.5721+3	4.5102+2	2.5397+2	1.9703+2	1.2596–2
	4.7393–4	2.8995–8	7.5965+6	6.6177–7	6.0423+8	3.2790+8	1.2184+8	1.5448+8	3.5687+3	4.4977+2	2.5353+2	1.9623+2	1.2652–2
	4.7482–4	2.9034–8	7.5865+6	6.6374–7	6.0343+8	3.2752+8	1.2168+8	1.5423+8	3.5676+3	4.4936+2	2.5338+2	1.9597+2	1.2671–2
	4.8111–4	2.9304–8	7.5165+6	6.7780–7	5.9786+8	3.2485+8	1.2055+8	1.5246+8	3.5598+3	4.4651+2	2.5233+2	1.9416+2	1.2802–2
	5.0000–4	3.0109–8	7.3156+6	7.2048–7	5.8188+8	3.1716+8	1.1731+8	1.4740+8	3.5371+3	4.3859+2	2.4960+2	1.8898+2	1.3192–2
	5.2500–4	3.1148–8	7.0714+6	7.7820–7	5.6246+8	3.0768+8	1.1315+8	1.4162+8	3.5085+3	4.2764+2	2.4508+2	1.8254+2	1.3705–2
L1	5.5744–4	3.2474–8	6.7828+6	8.5522–7	5.3951+8	2.9642+8	1.0826+8	1.3482+8	3.4737+3	4.1482+2	2.3982+2	1.7499+2	1.4366–2
	5.6250–4	3.2680–8	6.7401+6	8.6744–7	5.3610+8	2.9476+8	1.0754+8	1.3380+8	3.4685+3	4.1298+2	2.3911+2	1.7386+2	1.4468–2
	5.7872–4	3.3337–8	6.6073+6	9.0700–7	5.2554+8	2.8960+8	1.0531+8	1.3063+8	3.4521+3	4.0718+2	2.3679+2	1.7037+2	1.4796–2
	6.0000–4	3.4189–8	6.4425+6	9.5972–7	5.1244+8	2.8317+8	1.0256+8	1.2671+8	3.4314+3	4.0012+2	2.3404+2	1.6606+2	1.5223–2
	6.5000–4	3.6171–8	6.0895+6	1.0874–6	4.8436+8	2.6942+8	9.6446+7	1.1849+8	3.3624+3	3.8297+2	2.2631+2	1.5664+2	1.6021–2
	6.8750–4	3.7626–8	5.8540+6	1.1868–6	4.6563+8	2.6019+8	9.2389+7	1.1305+8	3.3148+3	3.7163+2	2.2120+2	1.5042+2	1.6610–2
	7.2500–4	3.9056–8	5.6397+6	1.2891–6	4.4858+8	2.5173+8	8.8715+7	1.0813+8	3.2704+3	3.6155+2	2.1674+2	1.4479+2	1.7193–2
	7.4375–4	3.9762–8	5.5395+6	1.3413–6	4.4061+8	2.4777+8	8.7001+7	1.0584+8	3.2492+3	3.5682+2	2.1463+2	1.4218+2	1.7482–2
	8.0000–4	4.1847–8	5.2635+6	1.5019–6	4.1866+8	2.3679+8	8.2298+7	9.9571+7	3.1896+3	3.4404+2	2.0900+2	1.3503+2	1.8340–2
	9.0000–4	4.5508–8	4.8402+6	1.8023–6	3.8498+8	2.2006+8	7.4963+7	8.9954+7	3.0788+3	3.2183+2	1.9822+2	1.2359+2	1.9655–2
	1.0000–3	4.9044–8	4.4911+6	2.1221–6	3.5722+8	2.0611+8	6.8971+7	8.2142+7	2.9830+3	3.0386+2	1.8951+2	1.1432+2	2.0934–2
	1.1250–3	5.3371–8	4.1270+6	2.5484–6	3.2826+8	1.9152+8	6.2620+7	7.4121+7	2.8521+3	2.8277+2	1.7839+2	1.0436+2	2.1933–2
	1.3125–3	5.9597–8	3.6959+6	3.2420–6	2.9397+8	1.7397+8	5.5198+7	6.4795+7	2.6894+3	2.5825+2	1.6542+2	9.2813+1	2.3394–2
	1.5000–3	6.5557–8	3.3599+6	3.9957–6	2.6725+8	1.6008+8	4.9494+7	5.7671+7	2.5560+3	2.3953+2	1.5549+2	8.4014+1	2.4811–2
	1.7500–3	7.3254–8	3.0069+6	5.0903–6	2.3916+8	1.4519+8	4.3465+7	5.0510+7	2.3988+3	2.1763+2	1.4285+2	7.4754+1	2.6359–2
	2.0000–3	8.0628–8	2.7319+6	6.2852–6	2.1729+8	1.3341+8	3.8849+7	4.5030+7	2.2706+3	2.0103+2	1.3331+2	6.7689+1	2.7859–2
	2.5000–3	9.5202–8	2.3137+6	8.9587–6	1.8403+8	1.1494+8	3.2066+7	3.7021+7	2.0500+3	1.7368+2	1.1678+2	5.6870+1	3.0108–2
	3.0000–3	1.0900–7	2.0208+6	1.2004–5	1.6073+8	1.0176+8	2.7421+7	3.1547+7	1.8858+3	1.5501+2	1.0548+2	4.9501+1	3.2255–2
	4.0000–3	1.3617–7	1.6176+6	1.9107–5	1.2866+8	8.3165+7	2.1334+7	2.4161+7	1.6336+3	1.2749+2	8.8405+1	3.9054+1	3.5447–2
K	4.9406–3	1.6113–7	1.3670+6	2.7042–5	1.0873+8	7.1154+7	1.7716+7	1.9857+7	1.4603+3	1.0999+2	7.7172+1	3.2776+1	3.7722–2
	5.0000–3	1.6269–7	1.3539+6	2.7585–5	1.0769+8	7.0528+7	1.7531+7	1.9627+7	1.4507+3	1.0908+2	7.6602+1	3.2444+1	3.7843–2
	5.1250–3	1.6600–7	1.3269+6	2.8741–5	1.0554+8	6.9216+7	1.7152+7	1.9172+7	1.4311+3	1.0718+2	7.5378+1	3.1764+1	3.8094–2
	5.3438–3	1.7175–7	1.2825+6	3.0812–5	1.0201+8	6.7049+7	1.6530+7	1.8425+7	1.3986+3	1.0405+2	7.3366+1	3.0649+1	3.8531–2
	5.6719–3	1.8030–7	1.2217+6	3.4032–5	9.7171+7	6.4078+7	1.5682+7	1.7410+7	1.3535+3	9.9799+1	7.0626+1	2.9133+1	3.9180–2
	6.0000–3	1.8875–7	1.1670+6	3.7384–5	9.2821+7	6.1394+7	1.4922+7	1.6504+7	1.3122+3	9.5991+1	6.8171+1	2.7781+1	3.9820–2
	6.5000–3	2.0168–7	1.0922+6	4.2746–5	8.6870+7	5.7673+7	1.3902+7	1.5294+7	1.2528+3	9.0552+1	6.4585+1	2.5927+1	4.0540–2
	7.2500–3	2.2075–7	9.9780+5	5.1357–5	7.9365+7	5.2957+7	1.2622+7	1.3785+7	1.1761+3	8.3737+1	6.0079+1	2.3616+1	4.1609–2
	8.0000–3	2.3947–7	9.1980+5	6.0627–5	7.3161+7	4.9037+7	1.1569+7	1.2553+7	1.1109+3	7.8145+1	5.6372+1	2.1730+1	4.2660–2
	9.0000–3	2.6454–7	8.3264+5	7.3986–5	6.6228+7	4.4592+7	1.0424+7	1.1211+7	1.0350+3	7.1657+1	5.1999+1	1.9615+1	4.3711–2

Atomic Weight 47.900 Density 4.540 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–2	2.8917–7	7.6172+5	8.8479–5	6.0587+7	4.0959+7	9.4953+6	1.0132+7	9.7157+2	6.6408+1	4.8447+1	1.7916+1	4.4753–2
1.1250–2	3.1974–7	6.8888+5	1.0815–4	5.4794+7	3.7213+7	8.5586+6	9.0212+6	9.0224+2	6.0738+1	4.4585+1	1.6107+1	4.5530–2
1.3125–2	3.6466–7	6.0403+5	1.4083–4	4.8045+7	3.2823+7	7.4713+6	7.7492+6	8.1892+2	5.4166+1	4.0084+1	1.4036+1	4.6731–2
1.5000–2	4.0860–7	5.3907+5	1.7714–4	4.2878+7	2.9442+7	6.6422+6	6.7933+6	7.5299+2	4.9166+1	3.6638+1	1.2480+1	4.7940–2
2.0000–2	5.2189–7	4.2205+5	2.9012–4	3.3570+7	2.3285+7	5.1650+6	5.1195+6	6.2410+2	3.9690+1	2.9985+1	9.6554+0	4.9829–2
3.0000–2	7.3347–7	3.0030+5	5.8107–4	2.3886+7	1.6714+7	3.6441+6	3.5271+6	4.7523+2	2.9546+1	2.2597+1	6.8979+0	5.1761–2
4.0000–2	9.3449–7	2.3571+5	9.5540–4	1.8748+7	1.3154+7	2.8627+6	2.7306+6	3.9337+2	2.4070+1	1.8540+1	5.4763+0	5.2929–2
5.0000–2	1.1272–6	1.9540+5	1.4042–3	1.5542+7	1.0916+7	2.3858+6	2.2395+6	3.3978+2	2.0587+1	1.5955+1	4.5787+0	5.3783–2
6.0000–2	1.3130–6	1.6775+5	1.9209–3	1.3343+7	9.3736+6	2.0640+6	1.9053+6	3.0213+2	1.8169+1	1.4159+1	3.9556+0	5.4449–2
8.0000–2	1.6617–6	1.3255+5	3.1296–3	1.0543+7	7.4018+6	1.6565+6	1.4846+6	2.5257+2	1.5023+1	1.1809+1	3.1587+0	5.5665–2
1.0000–1	1.9788–6	1.1131+5	4.5560–3	8.8536+6	6.2084+6	1.4096+6	1.2353+6	2.2070+2	1.3065+1	1.0331+1	2.6769+0	5.6803–2
1.5000–1	2.6444–6	8.3294+4	8.8406–3	6.6252+6	4.6451+6	1.0779+6	9.0203+5	1.7500+2	1.0378+1	8.2982+0	2.0196+0	5.9912–2
1.7500–1	2.9248–6	7.5308+4	1.1347–2	5.9900+6	4.2075+6	9.8543+5	7.9696+5	1.6185+2	9.5848+0	7.7182+0	1.8048+0	6.1676–2
2.0000–1	3.1798–6	6.9270+4	1.4037–2	5.5098+6	3.8618+6	9.1178+5	7.3600+5	1.5125+2	9.0071+0	7.2579+0	1.6857+0	6.3496–2
3.0000–1	4.0324–6	5.4624+4	2.6068–2	4.3448+6	3.0260+6	7.4751+5	5.7112+5	1.2814+2	7.6537+0	6.2308+0	1.3512+0	7.1718–2
3.5000–1	4.3973–6	5.0091+4	3.2765–2	3.9842+6	2.7622+6	7.0363+5	5.1822+5	1.2227+2	7.2797+0	5.9626+0	1.2405+0	7.6520–2
4.0000–1	4.7214–6	4.6652+4	3.9762–2	3.7107+6	2.5524+6	6.6771+5	4.9048+5	1.1741+2	7.0153+0	5.7463+0	1.1878+0	8.1240–2
5.0000–1	5.3026–6	4.1539+4	5.4393–2	3.3040+6	2.2455+6	6.2163+5	4.3679+5	1.1153+2	6.6568+0	5.4878+0	1.0772+0	9.1681–2
6.0000–1	5.8037–6	3.7953+4	6.9667–2	3.0187+6	2.0276+6	5.9220+5	3.9882+5	1.0825+2	6.4389+0	5.3372+0	9.9870–1	1.0304–1
8.0000–1	6.6174–6	3.3286+4	1.0124–1	2.6475+6	1.7338+6	5.5762+5	3.5599+5	1.0528+2	6.2310+0	5.1898+0	9.1348–1	1.2774–1
1.0000+0	7.2464–6	3.0396+4	1.3350–1	2.4177+6	1.5443+6	5.3869+5	3.3459+5	1.0439+2	6.1674+0	5.1383+0	8.7478–1	1.5439–1
1.5000+0	8.3569–6	2.6357+4	2.1407–1	2.0965+6	1.2717+6	5.1790+5	3.0677+5	1.0567+2	6.2453+0	5.1914+0	8.2490–1	2.2910–1
2.0000+0	9.0850–6	2.4245+4	2.9319–1	1.9284+6	1.1226+6	5.1178+5	2.9398+5	1.0791+2	6.3935+0	5.2692+0	8.1325–1	3.1102–1
3.0000+0	9.9765–6	2.2078+4	4.4570–1	1.7561+6	9.6435+5	5.0388+5	2.8777+5	1.1252+2	6.7232+0	5.4204+0	8.1257–1	4.9018–1
4.0000+0	1.0508–5	2.0962+4	5.9095–1	1.6673+6	8.8202+5	5.0252+5	2.8266+5	1.1612+2	7.0487+0	5.5523+0	8.1445–1	6.8194–1
5.0000+0	1.0867–5	2.0269+4	7.2974–1	1.6122+6	8.3245+5	5.0205+5	2.7759+5	1.1754+2	7.3640+0	5.6618+0	8.1593–1	8.8629–1
6.0000+0	1.1090–5	1.9862+4	8.6283–1	1.5798+6	8.0171+5	5.0170+5	2.7627+5	1.1871+2	7.6657+0	5.7554+0	8.1713–1	1.0931+0
8.0000+0	1.1375–5	1.9365+4	1.1141+0	1.5403+6	7.6585+5	5.0163+5	2.7266+5	1.2148+2	8.2633+0	5.9172+0	8.1645–1	1.5296+0
1.0000+1	1.1513–5	1.9132+4	1.3480+0	1.5218+6	7.5053+5	5.0202+5	2.6909+5	1.2367+2	8.8392+0	6.0478+0	8.1565–1	1.9757+0
1.5000+1	1.1585–5	1.9013+4	1.8751+0	1.5123+6	7.4292+5	5.0273+5	2.6651+5	1.2707+2	1.0166+1	6.2188+0	8.1302–1	3.1342+0
2.0000+1	1.1626–5	1.8946+4	2.3369+0	1.5070+6	7.3984+5	5.0325+5	2.6377+5	1.2927+2	1.1517+1	6.3668+0	8.0983–1	4.3401+0
3.0000+1	1.1665–5	1.8883+4	3.1181+0	1.5019+6	7.3933+5	5.0355+5	2.5892+5	1.3233+2	1.4174+1	6.5416+0	8.0503–1	6.8274+0
4.0000+1	1.1673–5	1.8869+4	3.7646+0	1.5008+6	7.3927+5	5.0380+5	2.5764+5	1.3447+2	1.6841+1	6.6558+0	8.0206–1	9.3830+0
5.0000+1	1.1680–5	1.8858+4	4.3154+0	1.5000+6	7.3921+5	5.0396+5	2.5664+5	1.3596+2	1.9536+1	6.7521+0	7.9995–1	1.1984+1
6.0000+1	1.1684–5	1.8851+4	4.7949+0	1.4994+6	7.3917+5	5.0401+5	2.5612+5	1.3719+2	2.2231+1	6.8194+0	7.9932–1	1.4612+1
8.0000+1	1.1691–5	1.8841+4	5.5995+0	1.4986+6	7.3911+5	5.0409+5	2.5524+5	1.3925+2	2.7683+1	6.9398+0	7.9858–1	1.9945+1
1.0000+2	1.1697–5	1.8832+4	6.2585+0	1.4979+6	7.3906+5	5.0415+5	2.5451+5	1.4079+2	3.3186+1	7.0360+0	7.9830–1	2.5351+1
1.5000+2	1.1699–5	1.8828+4	7.5181+0	1.4976+6	7.3896+5	5.0418+5	2.5430+5	1.4343+2	4.6999+1	7.1364+0	7.9773–1	3.9065+1
2.0000+2	1.1701–5	1.8824+4	8.4500+0	1.4972+6	7.3890+5	5.0421+5	2.5399+5	1.4507+2	6.0917+1	7.2330+0	7.9687–1	5.2887+1
3.0000+2	1.1705–5	1.8818+4	9.8018+0	1.4968+6	7.3881+5	5.0423+5	2.5358+5	1.4668+2	8.8772+1	7.4066+0	7.9579–1	8.0569+1
4.0000+2	1.1709–5	1.8812+4	1.0781+1	1.4963+6	7.3874+5	5.0424+5	2.5320+5	1.4766+2	1.1674+2	7.4801+0	7.9482–1	1.0847+2
5.0000+2	1.1712–5	1.8806+4	1.1549+1	1.4958+6	7.3869+5	5.0424+5	2.5277+5	1.4846+2	1.4473+2	7.5437+0	7.9367–1	1.3640+2
6.0000+2	1.1713–5	1.8805+4	1.2180+1	1.4957+6	7.3865+5	5.0425+5	2.5268+5	1.4912+2	1.7283+2	7.6010+0	7.9362–1	1.6444+2
8.0000+2	1.1716–5	1.8801+4	1.3184+1	1.4954+6	7.3858+5	5.0425+5	2.5243+5	1.5039+2	2.2844+2	7.7154+0	7.9327–1	2.1994+2
1.0000+3	1.1718–5	1.8798+4	1.3967+1	1.4952+6	7.3853+5	5.0425+5	2.5223+5	1.5139+2	2.8444+2	7.8084+0	7.9305–1	2.7584+2
1.5000+3	1.1719–5	1.8796+4	1.5395+1	1.4950+6	7.3844+5	5.0425+5	2.5219+5	1.5343+2	4.2482+2	7.8946+0	7.9293–1	4.1614+2
2.0000+3	1.1720–5	1.8795+4	1.6412+1	1.4949+6	7.3837+5	5.0425+5	2.5213+5	1.5494+2	5.6514+2	7.9807+0	7.9276–1	5.5636+2
3.0000+3	1.1720–5	1.8794+4	1.7849+1	1.4949+6	7.3828+5	5.0425+5	2.5217+5	1.5723+2	8.4555+2	8.1528+0	7.9287–1	8.3660+2
4.0000+3	1.1721–5	1.8792+4	1.8870+1	1.4947+6	7.3822+5	5.0425+5	2.5211+5	1.5894+2	1.1274+3	8.2153+0	7.9270–1	1.1184+3
5.0000+3	1.1723–5	1.8789+4	1.9661+1	1.4945+6	7.3816+5	5.0425+5	2.5193+5	1.6028+2	1.4119+3	8.2779+0	7.9213–1	1.4029+3
6.0000+3	1.1722–5	1.8790+4	2.0307+1	1.4945+6	7.3812+5	5.0425+5	2.5202+5	1.6140+2	1.6907+3	8.3327+0	7.9242–1	1.6816+3
8.0000+3	1.1723–5	1.8790+4	2.1328+1	1.4945+6	7.3806+5	5.0425+5	2.5207+5	1.6317+2	2.2530+3	8.4424+0	7.9259–1	2.2438+3
1.0000+4	1.1723–5	1.8790+4	2.2120+1	1.4945+6	7.3801+5	5.0425+5	2.5210+5	1.6456+2	2.8206+3	8.5469+0	7.9270–1	2.8113+3
1.5000+4	1.1723–5	1.8789+4	2.3561+1	1.4945+6	7.3791+5	5.0425+5	2.5214+5	1.6723+2	4.2112+3	8.6289+0	7.9282–1	4.2017+3
2.0000+4	1.1724–5	1.8788+4	2.4586+1	1.4944+6	7.3785+5	5.0425+5	2.5214+5	1.6916+2	5.6198+3	8.7109+0	7.9282–1	5.6103+3
3.0000+4	1.1724–5	1.8788+4	2.6031+1	1.4944+6	7.3776+5	5.0425+5	2.5221+5	1.7185+2	8.4077+3	8.8750+0	7.9305–1	8.3980+3
4.0000+4	1.1724–5	1.8787+4	2.7056+1	1.4943+6	7.3769+5	5.0425+5	2.5219+5	1.7377+2	1.1226+4	8.9621+0	7.9299–1	1.1216+4
5.0000+4	1.1726–5	1.8784+4	2.7852+1	1.4941+6	7.3764+5	5.0425+5	2.5199+5	1.7526+2	1.4017+4	9.0222+0	7.9236–1	1.4008+4
6.0000+4	1.1726–5	1.8785+4	2.8502+1	1.4941+6	7.3760+5	5.0425+5	2.5210+5	1.7647+2	1.6807+4	9.0746+0	7.9270–1	1.6797+4
8.0000+4	1.1726–5	1.8785+4	2.9529+1	1.4941+6	7.3753+5	5.0425+5	2.5215+5	1.7839+2	2.2434+4	9.1793+0	7.9287–1	2.2424+4
1.0000+5	1.1726–5	1.8784+4	3.0324+1	1.4941+6	7.3748+5	5.0425+5	2.5217+5	1.7989+2	2.8072+4	9.2841+0	7.9293–1	2.8062+4


July 4, 1991
Atomic Weight 50 942
EEDL Evaluated Electron
Cross Sections
23-V
Density 6 110 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
23-V


July 4, 1991
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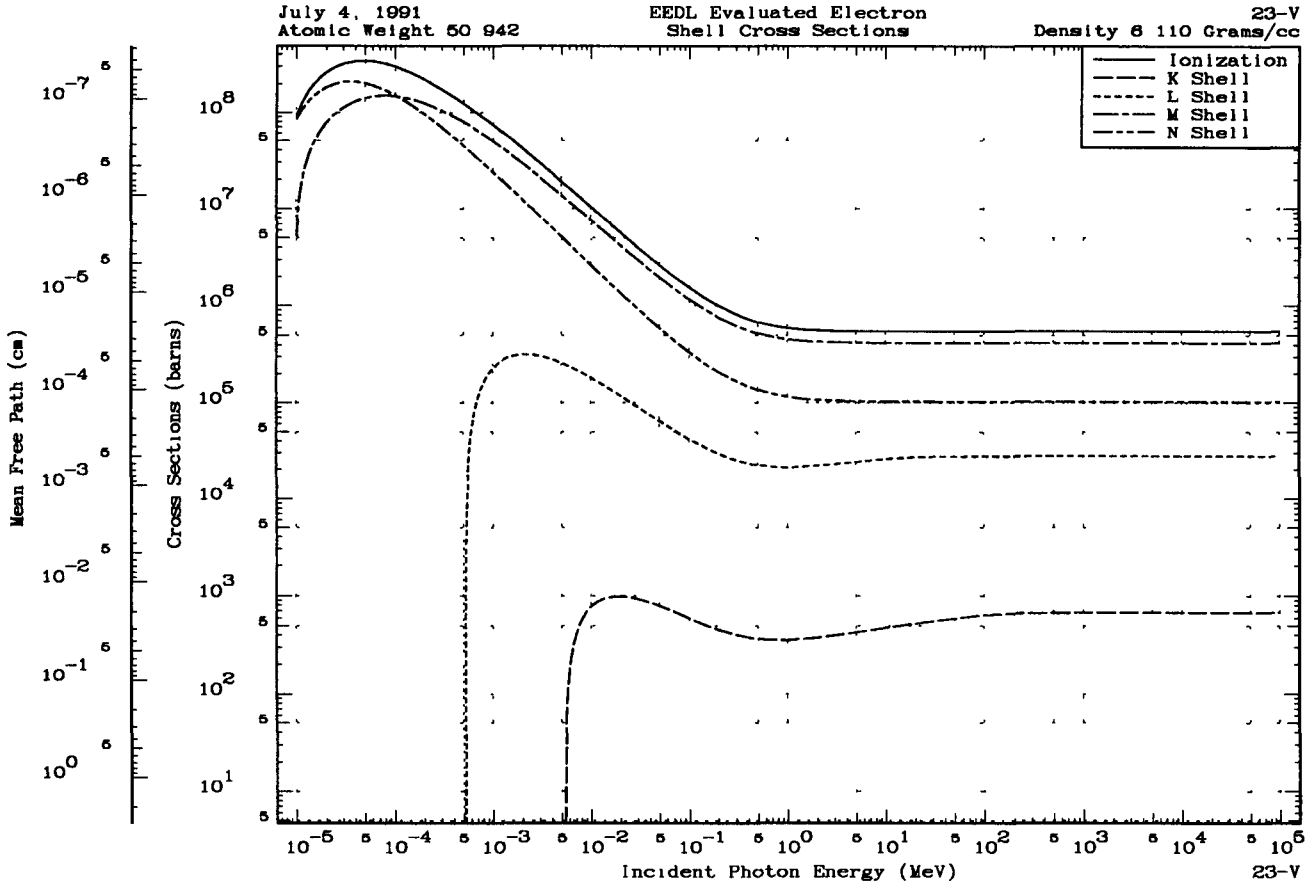
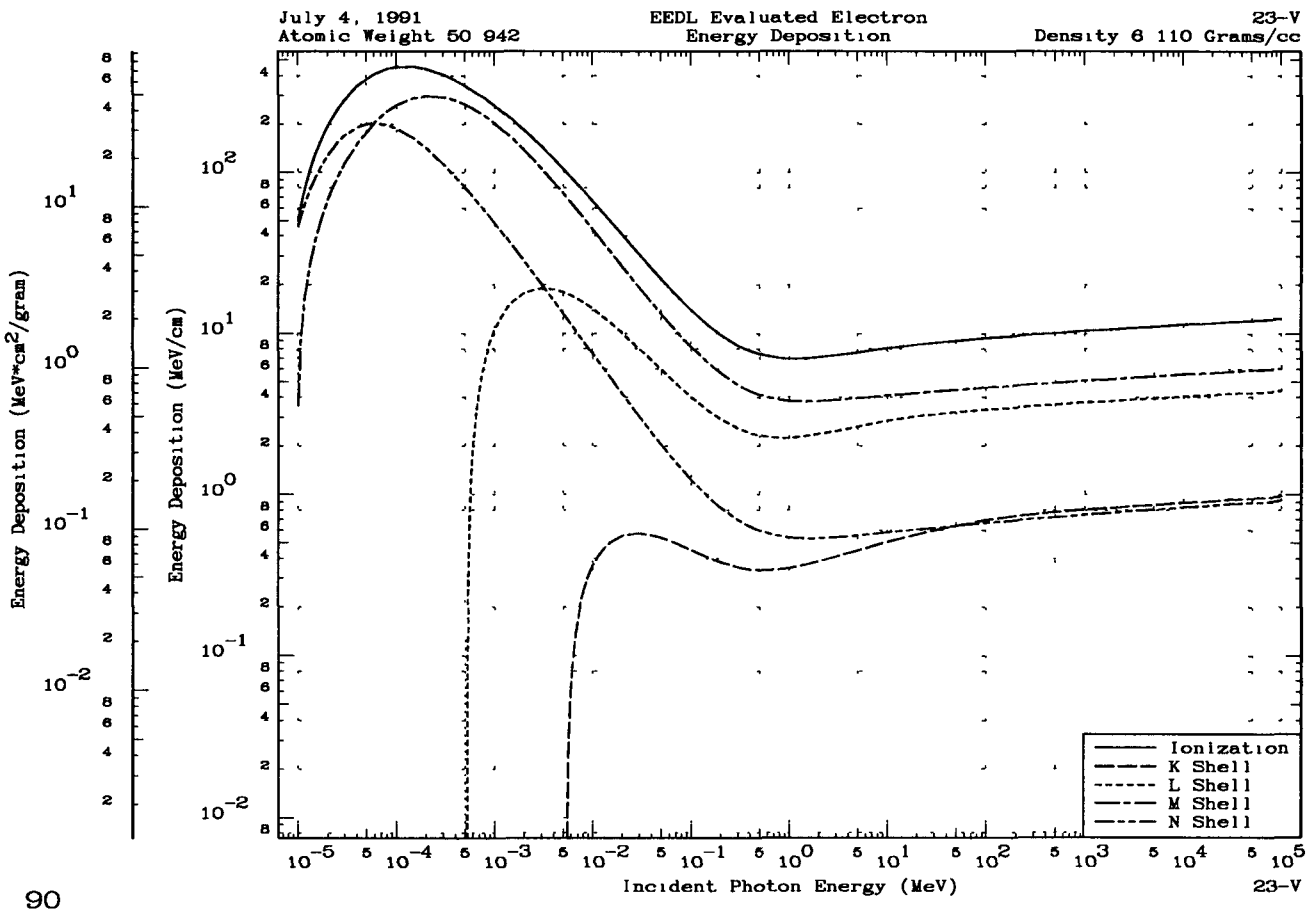
EEDL Evaluated Electron
Energy Deposition
23-V
Density 6 110 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
23-V

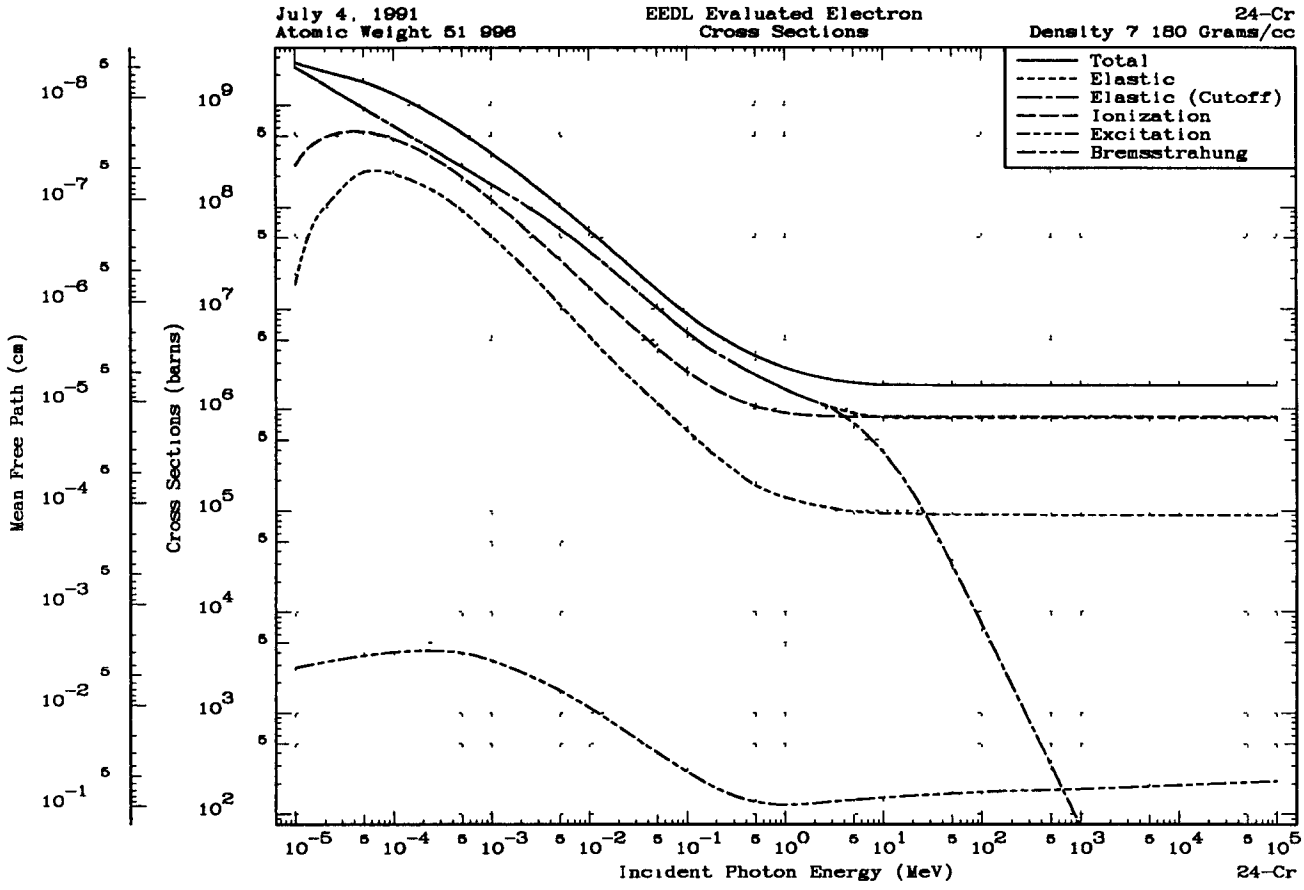

July 4, 1991
Atomic Weight 50 942
EEDL Evaluated Electron
Shell Cross Sections
23-V
Density 6 110 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
23-V

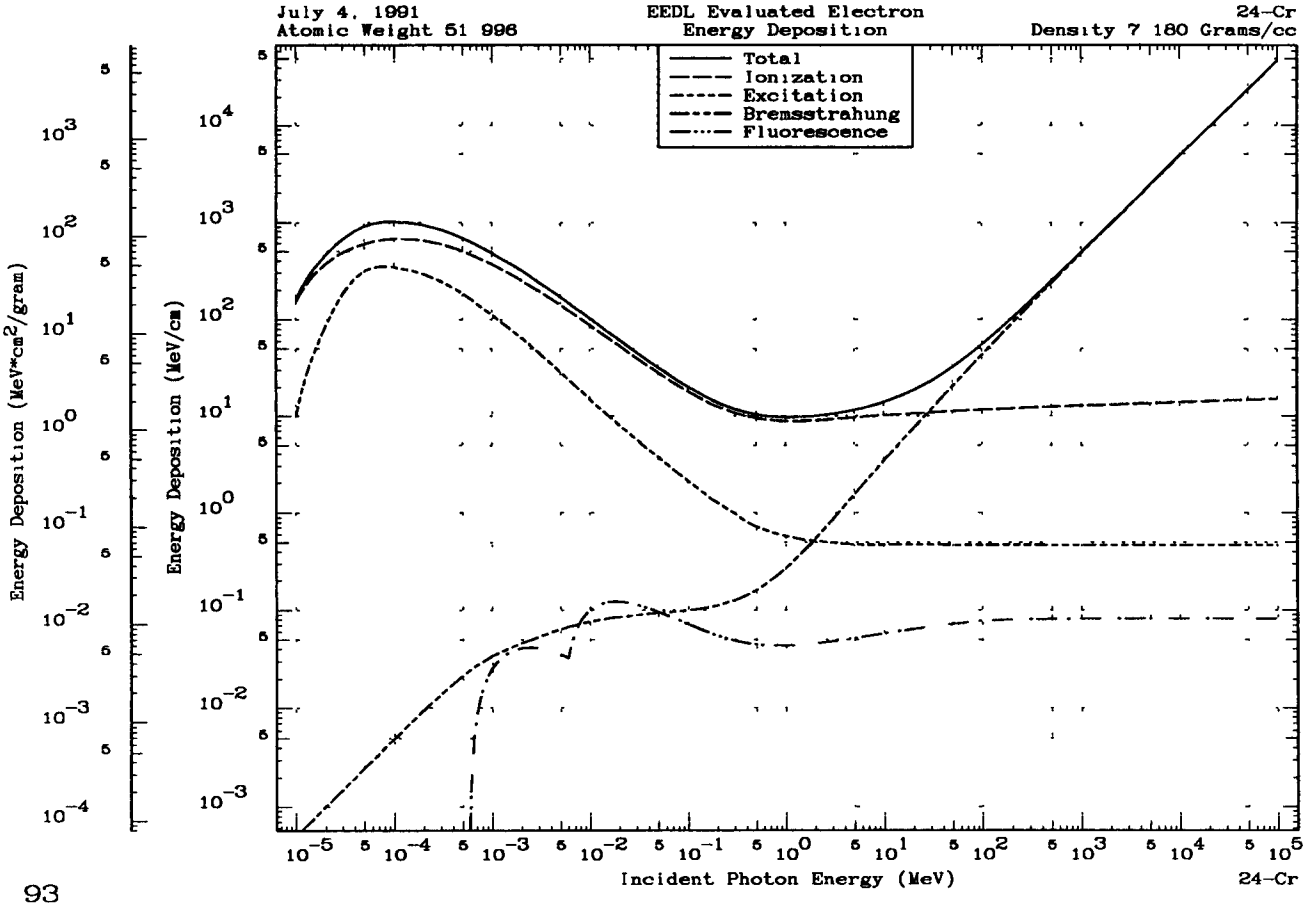

July 4, 1991
Atomic Weight 50 942
EEDL Evaluated Electron
Energy Deposition
23-V
Density 6 110 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
23-V

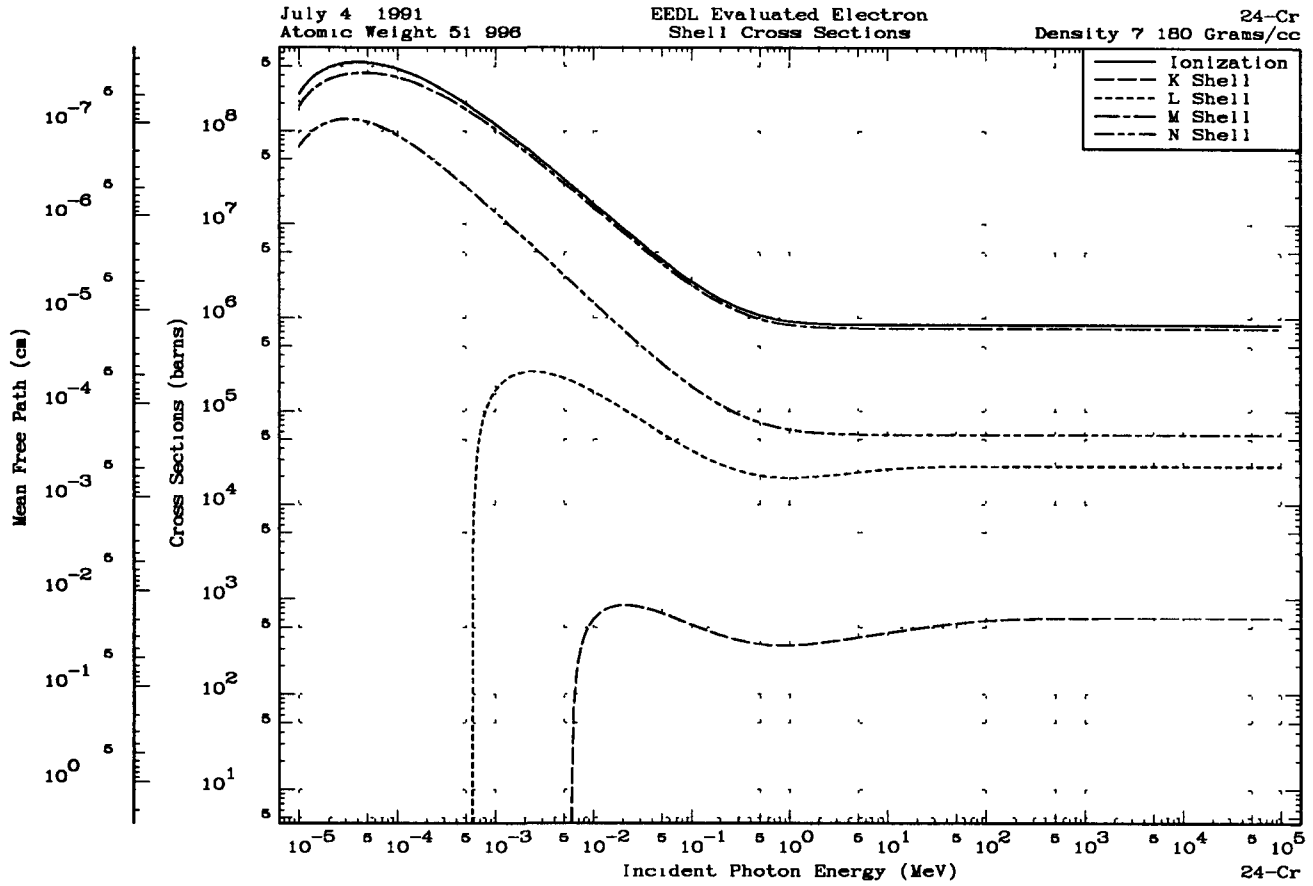
Atomic Weight 50.942 Density 6.110 Grams/cc

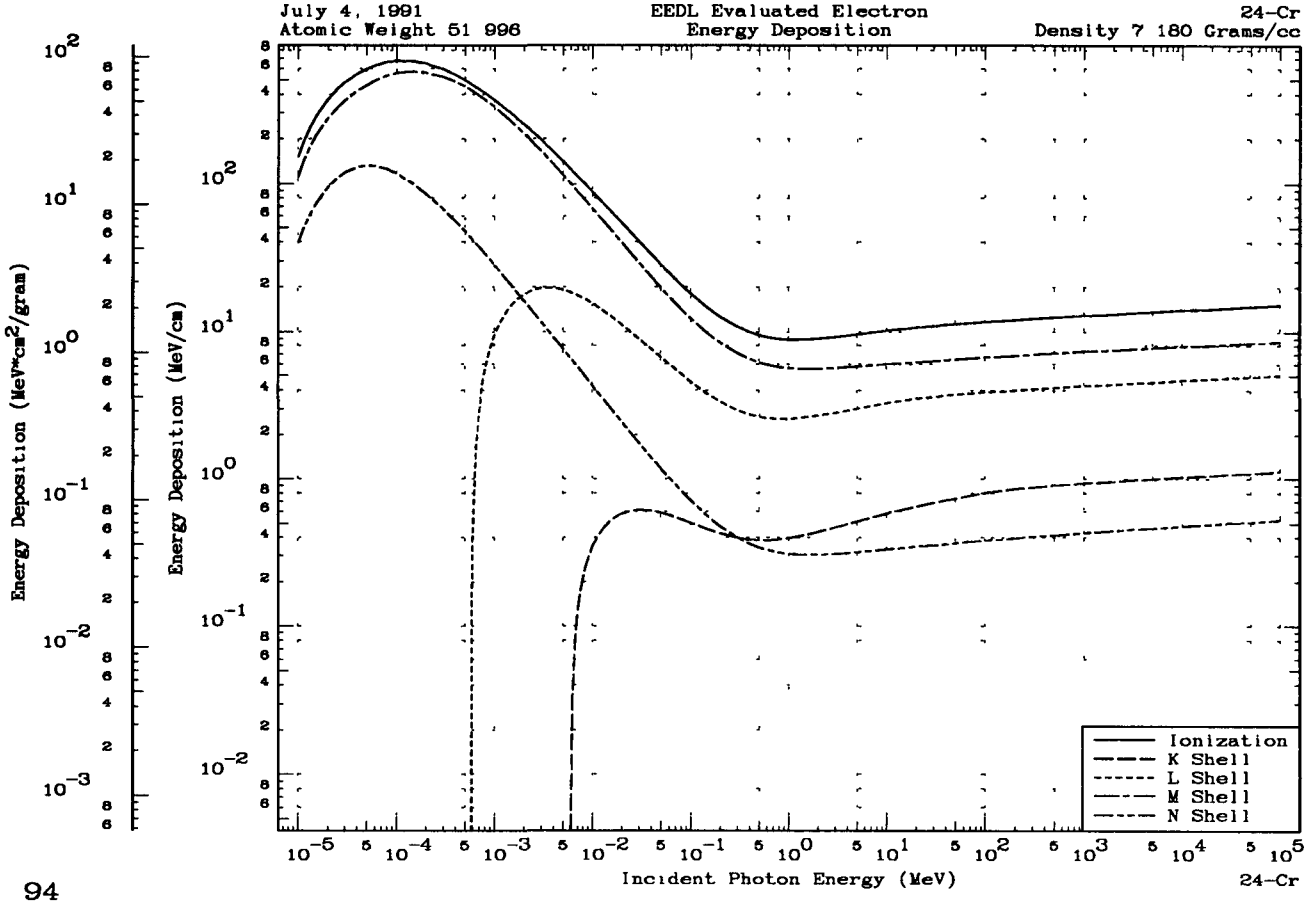
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.0797–9	4.0118+7		3.3936+9	3.2904+9	8.9856+7	1.3299+7	2.6569+3	5.6472+1	4.9365+1	7.1069+0	4.1356–4
	1.0625–5	4.2025–9	3.8945+7		3.2944+9	3.1697+9	1.0648+8	1.8240+7	2.6883+3	7.0518+1	6.0580+1	9.9371+0	4.3804–4
	1.1250–5	4.3184–9	3.7900+7		3.2060+9	3.0600+9	1.2222+8	2.3775+7	2.7182+3	8.4652+1	7.1453+1	1.3199+1	4.6274–4
	1.1719–5	4.4012–9	3.7187+7		3.1457+9	2.9839+9	1.3361+8	2.8163+7	2.7397+3	9.5650+1	7.9794+1	1.5855+1	4.8140–4
	1.3125–5	4.6323–9	3.5332+7		2.9887+9	2.7826+9	1.6405+8	4.2147+7	2.8005+3	1.2743+2	1.0305+2	2.4379+1	5.3804–4
	1.3359–5	4.6678–9	3.5063+7		2.9660+9	2.7524+9	1.6874+8	4.4882+7	2.8101+3	1.3295+2	1.0687+2	2.6076+1	5.4755–4
	1.5000–5	4.9057–9	3.3362+7		2.8221+9	2.5627+9	1.9754+8	6.1955+7	2.8738+3	1.6934+2	1.3143+2	3.7910+1	6.1500–4
	1.7500–5	5.2245–9	3.1327+7		2.6500+9	2.3303+9	2.3265+8	8.6983+7	2.9608+3	2.2695+2	1.6489+2	6.2058+1	7.2001–4
	2.0000–5	5.5011–9	2.9752+7		2.5167+9	2.1462+9	2.5993+8	1.1063+8	3.0383+3	2.8538+2	1.9522+2	9.0164+1	8.2751–4
	2.2500–5	5.7426–9	2.8500+7		2.4109+9	1.9958+9	2.7997+8	1.3509+8	3.0967+3	3.4208+2	2.2086+2	1.2121+2	9.2617–4
	2.5000–5	5.9442–9	2.7534+7		2.3291+9	1.8703+9	2.9729+8	1.6151+8	3.1499+3	4.0371+2	2.4549+2	1.5822+2	1.0262–3
	2.6250–5	6.0381–9	2.7105+7		2.2929+9	1.8149+9	3.0385+8	1.7414+8	3.1749+3	4.3117+2	2.5618+2	1.7499+2	1.0768–3
	3.0000–5	6.2777–9	2.6071+7		2.2054+9	1.6715+9	3.1995+8	2.1397+8	3.2441+3	5.1683+2	2.8557+2	2.3126+2	1.2303–3
	3.5000–5	6.5620–9	2.4941+7		2.1098+9	1.5202+9	3.3056+8	2.5901+8	3.3244+3	6.0955+2	3.1393+2	2.9563+2	1.4371–3
	4.0000–5	6.8015–9	2.4063+7		2.0355+9	1.4004+9	3.4045+8	2.9471+8	3.3956+3	6.9705+2	3.4282+2	3.5424+2	1.6481–3
M3	4.9790–5	7.2689–9	2.2516+7		1.9046+9	1.2240+9	3.4291+8	3.3773+8	3.4956+3	8.1003+2	3.7752+2	4.3251+2	2.0414–3
	5.0000–5	7.2797–9	2.2483+7		1.9018+9	1.2208+9	3.4300+8	3.3798+8	3.4974+3	8.1173+2	3.7841+2	4.3332+2	2.0497–3
M2	5.0650–5	7.3151–9	2.2374+7		1.8926+9	1.2112+9	3.4262+8	3.3880+8	3.5028+3	8.1576+2	3.7997+2	4.3579+2	2.0753–3
	5.1234–5	7.3464–9	2.2278+7		1.8846+9	1.2027+9	3.4241+8	3.3946+8	3.5076+3	8.1967+2	3.8187+2	4.3780+2	2.0983–3
	5.1250–5	7.3473–9	2.2276+7		1.8843+9	1.2025+9	3.4241+8	3.3948+8	3.5077+3	8.1978+2	3.8192+2	4.3785+2	2.0989–3
	5.2330–5	7.4046–9	2.2103+7		1.8697+9	1.1871+9	3.4192+8	3.4068+8	3.5165+3	8.2654+2	3.8498+2	4.4156+2	2.1415–3
	5.3438–5	7.4621–9	2.1933+7		1.8554+9	1.1719+9	3.4151+8	3.4189+8	3.5253+3	8.3369+2	3.8835+2	4.4534+2	2.1853–3
	5.4248–5	7.5035–9	2.1812+7		1.8451+9	1.1612+9	3.4118+8	3.4276+8	3.5317+3	8.3879+2	3.9068+2	4.4810+2	2.2174–3
	5.6719–5	7.6261–9	2.1461+7		1.8154+9	1.1298+9	3.4027+8	3.4536+8	3.5506+3	8.5451+2	3.9801+2	4.5649+2	2.3156–3
	5.7124–5	7.6458–9	2.1406+7		1.8108+9	1.1249+9	3.4013+8	3.4578+8	3.5536+3	8.5706+2	3.9920+2	4.5786+2	2.3318–3
	6.0000–5	7.7813–9	2.1033+7		1.7792+9	1.0914+9	3.3916+8	3.4867+8	3.5746+3	8.7521+2	4.0766+2	4.6756+2	2.4467–3
	6.5000–5	8.0583–9	2.0310+7		1.7181+9	1.0390+9	3.3400+8	3.4501+8	3.6090+3	8.8478+2	4.1509+2	4.6969+2	2.6478–3
	7.2500–5	8.4473–9	1.9375+7		1.6390+9	9.7165+8	3.2721+8	3.4009+8	3.6566+3	8.9987+2	4.2648+2	4.7339+2	2.9526–3
M1	7.6420–5	8.6395–9	1.8944+7		1.6025+9	9.4074+8	3.2401+8	3.3774+8	3.6797+3	9.0794+2	4.3241+2	4.7552+2	3.1132–3
	7.8210–5	8.7285–9	1.8751+7		1.5862+9	9.2747+8	3.2261+8	3.3607+8	3.6899+3	9.1053+2	4.3530+2	4.7522+2	3.1868–3
	8.0000–5	8.8160–9	1.8565+7		1.5704+9	9.1468+8	3.2127+8	3.3444+8	3.6999+3	9.1321+2	4.3826+2	4.7495+2	3.2607–3
	8.5000–5	9.0782–9	1.8028+7		1.5250+9	8.8142+8	3.1538+8	3.2824+8	3.7206+3	9.1145+2	4.4104+2	4.7040+2	3.4572–3
	9.0000–5	9.3312–9	1.7540+7		1.4837+9	8.5117+8	3.1003+8	3.2250+8	3.7402+3	9.1065+2	4.4429+2	4.6636+2	3.6547–3
	9.2500–5	9.4548–9	1.7310+7		1.4643+9	8.3703+8	3.0749+8	3.1978+8	3.7496+3	9.1043+2	4.4592+2	4.6450+2	3.7537–3
	1.0000–4	9.8138–9	1.6677+7	0.0000+0	1.4107+9	7.9809+8	3.0046+8	3.1217+8	3.7766+3	9.1075+2	4.5121+2	4.5953+2	4.0522–3
	1.1250–4	1.0429–8	1.5693+7	1.3836–8	1.3275+9	7.4267+8	2.8619+8	2.9864+8	3.8058+3	8.9623+2	4.5039+2	4.4583+2	4.5294–3
	1.2500–4	1.1010–8	1.4866+7	2.7868–8	1.2575+9	6.9636+8	2.7409+8	2.8704+8	3.8322+3	8.8540+2	4.5091+2	4.3448+2	5.0096–3
	1.3125–4	1.1288–8	1.4499+7	3.4945–8	1.2265+9	6.7591+8	2.6877+8	2.8181+8	3.8444+3	8.8074+2	4.5122+2	4.2952+2	5.2508–3
	1.5000–4	1.2084–8	1.3543+7	5.6369–8	1.1457+9	6.2295+8	2.5470+8	2.6801+8	3.8782+3	8.6966+2	4.5281+2	4.1684+2	5.9782–3
	1.7500–4	1.3165–8	1.2432+7	8.5639–8	1.0516+9	5.6695+8	2.3559+8	2.4910+8	3.9029+3	8.3879+2	4.4439+2	3.9440+2	6.9250–3
	2.0000–4	1.4174–8	1.1547+7	1.1584–7	9.7675+8	5.2252+8	2.2042+8	2.3381+8	3.9244+3	8.1661+2	4.3989+2	3.7671+2	7.8769–3
	2.5000–4	1.6171–8	1.0121+7	1.7935–7	8.5617+8	4.5608+8	1.9367+8	2.0641+8	3.9038+3	7.5885+2	4.1975+2	3.3909+2	9.6277–3
	3.0000–4	1.8008–8	9.0884+6	2.4705–7	7.6880+8	4.0812+8	1.7425+8	1.8643+8	3.8871+3	7.1867+2	4.0652+2	3.1214+2	1.1371–2
	4.0000–4	2.1684–8	7.5478+6	3.9461–7	6.3847+8	3.4286+8	1.4466+8	1.5095+8	3.8392+3	6.3826+2	3.7437+2	2.6388+2	1.4745–2
	5.0000–4	2.5177–8	6.5007+6	5.6006–7	5.4990+8	2.9955+8	1.2401+8	1.2634+8	3.7081+3	5.7180+2	3.4600+2	2.2578+2	1.7585–2
L3	5.2454–4	2.6014–8	6.2915+6	6.0352–7	5.3220+8	2.9099+8	1.1978+8	1.2143+8	3.6805+3	5.5736+2	3.3908+2	2.1826+2	1.8268–2
L2	5.3188–4	2.6263–8	6.2319+6	6.1674–7	5.2717+8	2.8855+8	1.1859+8	1.2002+8	3.6725+3	5.5339+2	3.3725+2	2.1612+2	1.8472–2
	5.3397–4	2.6334–8	6.2151+6	6.2052–7	5.2574+8	2.8787+8	1.1826+8	1.1962+8	3.6703+3	5.5229+2	3.3676+2	2.1551+2	1.8530–2
	5.3614–4	2.6407–8	6.1978+6	6.2445–7	5.2428+8	2.8716+8	1.1791+8	1.1920+8	3.6680+3	5.5113+2	3.3623+2	2.1488+2	1.8590–2
	5.4412–4	2.6677–8	6.1352+6	6.3899–7	5.1898+8	2.8461+8	1.1667+8	1.1771+8	3.6595+3	5.4699+2	3.3435+2	2.1262+2	1.8810–2
	5.5809–4	2.7145–8	6.0293+6	6.6469–7	5.1002+8	2.8027+8	1.1456+8	1.1519+8	3.6451+3	5.4012+2	3.3130+2	2.0880+2	1.9195–2
	5.6699–4	2.7442–8	5.9642+6	6.8122–7	5.0452+8	2.7760+8	1.1327+8	1.1364+8	3.6361+3	5.3601+2	3.2953+2	2.0646+2	1.9440–2
	5.7905–4	2.7841–8	5.8786+6	7.0384–7	4.9728+8	2.7409+8	1.1157+8	1.1162+8	3.6242+3	5.3053+2	3.2711+2	2.0340+2	1.9770–2
	6.0000–4	2.8528–8	5.7371+6	7.4367–7	4.8530+8	2.6826+8	1.0877+8	1.0828+8	3.6042+3	5.2160+2	3.2323+2	1.9835+2	2.0342–2
L1	6.2379–4	2.9294–8	5.5870+6	7.8976–7	4.7262+8	2.6202+8	1.0567+8	1.0493+8	3.5825+3	5.1082+2	3.1790+2	1.9290+2	2.0987–2
	6.4582–4	3.0002–8	5.4552+6	8.3328–7	4.6146+8	2.5659+8	1.0295+8	1.0192+8	3.5508+3	5.0143+2	3.1335+2	1.8806+2	2.1449–2
	6.5000–4	3.0136–8	5.4310+6	8.4164–7	4.5941+8	2.5559+8	1.0245+8	1.0137+8	3.5449+3	4.9973+2	3.1253+2	1.8717+2	2.1536–2
	6.8436–4	3.1223–8	5.2419+6	9.1134–7	4.4342+8	2.4776+8	9.8571+7	9.7082+7	3.4984+3	4.8629+2	3.0598+2	1.8028+2	2.2248–2
	6.8750–4	3.1321–8	5.2255+6	9.1780–7	4.4203+8	2.4708+8	9.8234+7	9.6711+7	3.4943+3	4.8513+2	3.0542+2	1.7969+2	2.2313–2
	7.2500–4	3.2484–8	5.0383+6	9.9616–7	4.2620+8	2.3929+8	9.4408+7	9.2497+7	3.4470+3	4.7209+2	2.9915+2	1.7292+2	2.3081–2
	7.4218–4	3.3011–8	4.9579+6	1.0328–6	4.1940+8	2.3593+8	9.2770+7	9.0698+7	3.4264+3	4.6653+2	2.9647+2	1.7004+2	2.3430–2
	7.4375–4	3.3059–8	4.9508+6	1.0361–6	4.1879+8	2.3563+8	9.2624+7	9.0537+7	3.4245+3	4.6603+2	2.9623+2	1.6978+2	2.3462–2
	8.0000–4	3.4753–8	4.7094+6	1.1590–6	3.9838+8	2.2549+8	8.7720+7	8.5166+7	3.3611+3	4.4955+2	2.8835+2	1.6118+2	2.4592–2
	9.0000–4	3.7708–8	4.3404+6	1.3888–6	3.6716+8	2.1008+8	8.0041+7	7.7040+7	3.2488+3	4.2097+2	2.7331+2	1.4763+2	2.6391–2
	1.0000–3	4.0556–8	4.0356+6	1.6332–6	3.4138+8	1.9719+8	7.3757+7	7.0431+7	3.1516+3	3.9784+2	2.6117+2	1.3664+2	2.8144–2
	1.1250–3	4.4050–8	3.7154+6	1.9587–6	3.1429+8	1.8363+8	6.7064+7	6.3596+7	3.0169+3	3.7045+2	2.4565+2	1.2477+2	2.9512–2
	1.3125–3	4.9067–8	3.3356+6	2.4880–6	2.8216+8	1.6729+8	5.9227+7	5.5644+7	2.8493+3	3.3858+2	2.2757+2	1.1098+2	3.1516–2
	1.5000–3	5.3855–8	3.0390+6	3.0626–6	2.5707+8	1.5431+8	5.3195+7	4.9563+7	2.7117+3	3.1425+2	2.1376+2	1.0046+2	3.3460–2
	1.7500–3	6.0102–8	2.7232+6	3.8971–6	2.3036+8	1.4023+8	4.6795+7	4.3325+7	2.5487+3	2.8542+2	1.9621+2	8.9175+1	3.5592–2
	2.0000–3	6.6075–8	2.4770+6	4.8083–6	2.0953+8	1.2908+8	4.1887+7	3.8559+7	2.4155+3	2.6358+2	1.8297+2	8.0572+1	3.7658–2
	2.5000–3	7.7946–8	2.0997+6	6.8476–6	1.7762+8	1.1140+8	3.4641+7	3.1581+7	2.1850+3	2.2766+2	1.6020+2	6.7418+1	4.0781–2
	3.0000–3	8.9173–8	1.8354+6	9.1723–6	1.5526+8	9.8761+7	2.9666+7	2.6828+7	2.0131+3	2.0297+2	1.4445+2	5.8483+1	4.3761–2
	4.0000–3	1.1116–7	1.4723+6	1.4598–5	1.2454+8	8.0966+7	2.3128+7	2.0447+7	1.7477+3	1.6682+2	1.2089+2	4.5885+1	4.8221–2
	5.0000–3	1.3242–7	1.2359+6	2.1072–5	1.0455+8	6.8979+7	1.9036+7	1.6530+7	1.5548+3	1.4273+2	1.0476+2	3.7920+1	5.1583–2
K	5.4396–3	1.4163–7	1.1556+6	2.4246–5	9.7751+7	6.4829+7	1.7682+7	1.5238+7	1.4855+3	1.3433+2	9.9066+1	3.5213+1	5.2832–2
	5.5096–3	1.4309–7	1.1438+6	2.4770–5	9.6754+7	6.4221+7	1.7485+7	1.5047+7	1.4752+3	1.3312+2	9.8246+1	3.4816+1	5.3025–2
	5.6322–3	1.4564–7	1.1238+6	2.5698–5	9.5064+7	6.3188+7	1.7151+7	1.4724+7	1.4576+3	1.3106+2	9.6859+1	3.4147+1	5.3362–2
	5.8161–3	1.4943–7	1.0953+6	2.7117–5	9.2651+7	6.1710+7	1.6676+7	1.4264+7	1.4324+3	1.2813+2	9.4881+1	3.3195+1	5.3864–2
	6.0000–3	1.5320–7	1.0683+6	2.8568–5	9.0372+7	6.0310+7	1.6228+7	1.3832+7	1.4084+3	1.2537+2	9.3018+1	3.2300+1	5.4362–2
	6.2500–3	1.5837–7	1.0335+6	3.0592–5	8.7421+7	5.8474+7	1.5655+7	1.3291+7	1.3759+3	1.2166+2	9.0465+1	3.1144+1	5.4875–2

Atomic Weight 50.942												Density 6.110 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.6875–3	1.6732–7	9.7817+5	3.4277–5	8.2744+7	5.5553+7	1.4750+7	1.2440+7	1.3238+3	1.1581+2	8.6429+1	2.9326+1	5.5768–2
7.3437–3	1.8053–7	9.0657+5	4.0137–5	7.6688+7	5.1751+7	1.3585+7	1.1351+7	1.2550+3	1.0829+2	8.1227+1	2.7001+1	5.7092–2
8.0000–3	1.9352–7	8.4574+5	4.6382–5	7.1543+7	4.8502+7	1.2600+7	1.0439+7	1.1951+3	1.0195+2	7.6832+1	2.5055+1	5.8394–2
9.0000–3	2.1346–7	7.6675+5	5.6623–5	6.4860+7	4.4201+7	1.1359+7	9.2985+6	1.1143+3	9.3466+1	7.0847+1	2.2559+1	5.9867–2
1.0000–2	2.3301–7	7.0240+5	6.7735–5	5.9417+7	4.0678+7	1.0354+7	8.3843+6	1.0466+3	8.6608+1	6.5988+1	2.0559+1	6.1324–2
1.1250–2	2.5725–7	6.3621+5	8.2815–5	5.3818+7	3.7004+7	9.3365+6	7.4762+6	9.7252+2	7.9278+1	6.0708+1	1.8507+1	6.2458–2
1.3125–2	2.9280–7	5.5896+5	1.0783–4	4.7283+7	3.2693+7	8.1551+6	6.4345+6	8.8345+2	7.0775+1	5.4556+1	1.6155+1	6.4196–2
1.5000–2	3.2752–7	4.9971+5	1.3562–4	4.2271+7	2.9366+7	7.2537+6	5.6503+6	8.1292+2	6.4299+1	4.9849+1	1.4385+1	6.5933–2
2.0000–2	4.1718–7	3.9231+5	2.2192–4	3.3186+7	2.3266+7	5.6465+6	4.2729+6	6.7468+2	5.2000+1	4.0766+1	1.1165+1	6.8685–2
2.5000–2	5.0245–7	3.2574+5	3.2620–4	2.7555+7	1.9418+7	4.6636+6	3.4719+6	5.8149+2	4.4113+1	3.4804+1	9.2388+0	6.9969–2
3.0000–2	5.8486–7	2.7984+5	4.4713–4	2.3672+7	1.6752+7	3.9893+6	2.9302+6	5.1498+2	3.8702+1	3.0692+1	7.9380+0	7.1505–2
4.0000–2	7.4308–7	2.2025+5	7.3304–4	1.8632+7	1.3241+7	3.1366+6	2.2537+6	4.2667+2	3.1498+1	2.5164+1	6.2606+0	7.3273–2
5.0000–2	8.9422–7	1.8303+5	1.0760–3	1.5482+7	1.1027+7	2.6155+6	1.8393+6	3.6932+2	2.6934+1	2.1652+1	5.2077+0	7.4502–2
6.0000–2	1.0387–6	1.5757+5	1.4709–3	1.3329+7	9.4963+6	2.2635+6	1.5690+6	3.2862+2	2.3782+1	1.9195+1	4.5118+0	7.5518–2
8.0000–2	1.3090–6	1.2503+5	2.3938–3	1.0577+7	7.5330+6	1.8181+6	1.2254+6	2.7494+2	1.9686+1	1.5999+1	3.6097+0	7.7318–2
1.0000–1	1.5551–6	1.0524+5	3.4822–3	8.9026+6	6.3383+6	1.5479+6	1.0161+6	2.4028+2	1.7124+1	1.3995+1	3.0503+0	7.8953–2
1.5000–1	2.0742–6	7.8904+4	6.7512–3	6.6746+6	4.7532+6	1.1844+6	7.3680+5	1.9079+2	1.3602+1	1.1233+1	2.2848+0	8.3325–2
2.0000–1	2.4974–6	6.5533+4	1.0698–2	5.5436+6	3.9521+6	1.0023+6	5.8891+5	1.6498+2	1.1777+1	9.8196+0	1.8688+0	8.8297–2
3.0000–1	3.1609–6	5.1779+4	1.9887–2	4.3800+6	3.0961+6	8.2197+5	4.6182+5	1.3960+2	1.0037+1	8.4231+0	1.5139+0	9.9683–2
4.0000–1	3.6942–6	4.4304+4	3.0283–2	3.7477+6	2.6159+6	7.3442+5	3.9732+5	1.2778+2	9.2128+0	7.7668+0	1.3333+0	1.1267–1
5.0000–1	4.1413–6	3.9520+4	4.1410–2	3.3431+6	2.3019+6	6.8373+5	3.5728+5	1.2158+2	8.7643+0	7.4159+0	1.2210+0	1.2743–1
6.0000–1	4.5160–6	3.6242+4	5.2995–2	3.0657+6	2.0815+6	6.5135+5	3.3276+5	1.1791+2	8.5014+0	7.2036+0	1.1548+0	1.4305–1
8.0000–1	5.1326–6	3.1887+4	7.6878–2	2.6974+6	1.7849+6	6.1351+5	2.9890+5	1.1450+2	8.2484+0	7.0087+0	1.0626+0	1.7707–1
1.0000+0	5.6138–6	2.9154+4	1.0126–1	2.4662+6	1.5934+6	5.9261+5	2.8005+5	1.1359+2	8.1591+0	6.9303+0	1.0146+0	2.1419–1
1.5000+0	6.4676–6	2.5305+4	1.6219–1	2.1406+6	1.3175+6	5.6916+5	2.5388+5	1.1485+2	8.2517+0	6.9887+0	9.4578–1	3.1726–1
2.0000+0	7.0319–6	2.3275+4	2.2212–1	1.9688+6	1.1666+6	5.6224+5	2.3985+5	1.1731+2	8.4357+0	7.0865+0	9.1905–1	4.3015–1
3.0000+0	7.7411–6	2.1142+4	3.3786–1	1.7885+6	1.0074+6	5.5315+5	2.2778+5	1.2241+2	8.8478+0	7.2797+0	8.9066–1	6.7739–1
4.0000+0	8.1613–6	2.0054+4	4.4819–1	1.6964+6	9.2348+5	5.5163+5	2.2114+5	1.2630+2	9.2825+0	7.4548+0	8.8214–1	9.4568–1
5.0000+0	8.4462–6	1.9378+4	5.5360–1	1.6392+6	8.7288+5	5.5092+5	2.1524+5	1.2940+2	9.6941+0	7.5966+0	8.7571–1	1.2217+0
6.0000+0	8.6212–6	1.8984+4	6.5464–1	1.6059+6	8.4207+5	5.5038+5	2.1332+5	1.3118+2	1.0103+1	7.7185+0	8.7311–1	1.5110+0
8.0000+0	8.8397–6	1.8515+4	8.4511–1	1.5662+6	8.0576+5	5.4993+5	2.1036+5	1.3275+2	1.0909+1	7.9272+0	8.7131–1	2.1105+0
1.0000+1	8.9415–6	1.8304+4	1.0221+0	1.5484+6	7.9017+5	5.5020+5	2.0785+5	1.3450+2	1.1694+1	8.0975+0	8.7109–1	2.7255+0
1.5000+1	8.9906–6	1.8204+4	1.4196+0	1.5399+6	7.8212+5	5.5076+5	2.0689+5	1.3870+2	1.3512+1	8.3202+0	8.7116–1	4.3206+0
2.0000+1	9.0123–6	1.8160+4	1.7664+0	1.5362+6	7.7933+5	5.5117+5	2.0556+5	1.4094+2	1.5364+1	8.5147+0	8.6965–1	5.9793+0
3.0000+1	9.0294–6	1.8126+4	2.3507+0	1.5333+6	7.7898+5	5.5135+5	2.0283+5	1.4370+2	1.8993+1	8.7329+0	8.6611–1	9.3939+0
4.0000+1	9.0427–6	1.8099+4	2.8322+0	1.5310+6	7.7891+5	5.5156+5	2.0043+5	1.4582+2	2.2650+1	8.8826+0	8.6379–1	1.2904+1
5.0000+1	9.0459–6	1.8093+4	3.2412+0	1.5305+6	7.7885+5	5.5169+5	1.9982+5	1.4742+2	2.6341+1	9.0094+0	8.6192–1	1.6470+1
6.0000+1	9.0472–6	1.8090+4	3.5964+0	1.5303+6	7.7880+5	5.5173+5	1.9961+5	1.4869+2	3.0040+1	9.1005+0	8.6177–1	2.0078+1
8.0000+1	9.0493–6	1.8086+4	4.1909+0	1.5299+6	7.7872+5	5.5179+5	1.9927+5	1.5078+2	3.7527+1	9.2530+0	8.6184–1	2.7412+1
1.0000+2	9.0513–6	1.8082+4	4.6763+0	1.5296+6	7.7866+5	5.5184+5	1.9893+5	1.5248+2	4.5112+1	9.3822+0	8.6192–1	3.4868+1
1.5000+2	9.0519–6	1.8081+4	5.6014+0	1.5295+6	7.7855+5	5.5187+5	1.9892+5	1.5536+2	6.4086+1	9.5127+0	8.6199–1	5.3711+1
2.0000+2	9.0530–6	1.8079+4	6.2842+0	1.5293+6	7.7847+5	5.5189+5	1.9878+5	1.5722+2	8.3212+1	9.6385+0	8.6148–1	7.2711+1
3.0000+2	9.0550–6	1.8075+4	7.2729+0	1.5289+6	7.7836+5	5.5191+5	1.9851+5	1.5904+2	1.2148+2	9.8663+0	8.6054–1	1.1076+2
4.0000+2	9.0571–6	1.8071+4	7.9882+0	1.5286+6	7.7829+5	5.5191+5	1.9825+5	1.6014+2	1.5986+2	9.9676+0	8.5961–1	1.4904+2
5.0000+2	9.0596–6	1.8065+4	8.5486+0	1.5282+6	7.7823+5	5.5191+5	1.9788+5	1.6097+2	1.9843+2	1.0051+1	8.5823–1	1.8752+2
6.0000+2	9.0603–6	1.8064+4	9.0095+0	1.5281+6	7.7818+5	5.5192+5	1.9781+5	1.6175+2	2.3660+2	1.0126+1	8.5816–1	2.2562+2
8.0000+2	9.0617–6	1.8061+4	9.7417+0	1.5278+6	7.7810+5	5.5192+5	1.9764+5	1.6307+2	3.1328+2	1.0276+1	8.5787–1	3.0214+2
1.0000+3	9.0631–6	1.8059+4	1.0312+1	1.5276+6	7.7804+5	5.5192+5	1.9748+5	1.6419+2	3.9032+2	1.0399+1	8.5758–1	3.7906+2
1.5000+3	9.0639–6	1.8057+4	1.1353+1	1.5275+6	7.7793+5	5.5192+5	1.9744+5	1.6645+2	5.8318+2	1.0512+1	8.5744–1	5.7181+2
2.0000+3	9.0647–6	1.8055+4	1.2094+1	1.5273+6	7.7786+5	5.5192+5	1.9738+5	1.6813+2	7.7596+2	1.0625+1	8.5715–1	7.6447+2
3.0000+3	9.0654–6	1.8054+4	1.3141+1	1.5272+6	7.7775+5	5.5192+5	1.9737+5	1.7064+2	1.1612+3	1.0850+1	8.5715–1	1.1495+3
4.0000+3	9.0660–6	1.8053+4	1.3884+1	1.5271+6	7.7767+5	5.5192+5	1.9734+5	1.7252+2	1.5484+3	1.0937+1	8.5701–1	1.5367+3
5.0000+3	9.0674–6	1.8050+4	1.4460+1	1.5269+6	7.7761+5	5.5192+5	1.9716+5	1.7398+2	1.9393+3	1.1023+1	8.5621–1	1.9275+3
6.0000+3	9.0673–6	1.8050+4	1.4930+1	1.5269+6	7.7756+5	5.5192+5	1.9722+5	1.7520+2	2.3223+3	1.1095+1	8.5650–1	2.3103+3
8.0000+3	9.0675–6	1.8050+4	1.5674+1	1.5268+6	7.7748+5	5.5192+5	1.9727+5	1.7712+2	3.0949+3	1.1239+1	8.5672–1	3.0828+3
1.0000+4	9.0677–6	1.8049+4	1.6250+1	1.5268+6	7.7743+5	5.5192+5	1.9730+5	1.7863+2	3.8747+3	1.1376+1	8.5686–1	3.8625+3
1.5000+4	9.0682–6	1.8048+4	1.7299+1	1.5267+6	7.7732+5	5.5192+5	1.9732+5	1.8154+2	5.7852+3	1.1484+1	8.5693–1	5.7729+3
2.0000+4	9.0688–6	1.8047+4	1.8045+1	1.5266+6	7.7724+5	5.5192+5	1.9730+5	1.8363+2	7.7206+3	1.1591+1	8.5686–1	7.7081+3
3.0000+4	9.0690–6	1.8047+4	1.9096+1	1.5266+6	7.7713+5	5.5192+5	1.9735+5	1.8654+2	1.1551+4	1.1806+1	8.5708–1	1.1538+4
4.0000+4	9.0697–6	1.8045+4	1.9843+1	1.5265+6	7.7705+5	5.5192+5	1.9732+5	1.8864+2	1.5423+4	1.1924+1	8.5693–1	1.5410+4
5.0000+4	9.0711–6	1.8043+4	2.0422+1	1.5262+6	7.7699+5	5.5192+5	1.9713+5	1.9025+2	1.9258+4	1.2007+1	8.5614–1	1.9245+4
6.0000+4	9.0708–6	1.8043+4	2.0896+1	1.5263+6	7.7695+5	5.5192+5	1.9723+5	1.9156+2	2.3091+4	1.2076+1	8.5657–1	2.3078+4
8.0000+4	9.0712–6	1.8042+4	2.1643+1	1.5262+6	7.7687+5	5.5192+5	1.9725+5	1.9365+2	3.0822+4	1.2214+1	8.5664–1	3.0809+4
1.0000+5	9.0713–6	1.8042+4	2.2222+1	1.5262+6	7.7681+5	5.5192+5	1.9728+5	1.9528+2	3.8568+4	1.2352+1	8.5679–1	3.8555+4


July 4, 1991
Atomic Weight 51 996
EEDL Evaluated Electron
Cross Sections
24-Cr
Density 7 180 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
24-Cr


July 4, 1991
Atomic Weight 51 996
EEDL Evaluated Electron
Energy Deposition
24-Cr
Density 7 180 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
24-Cr

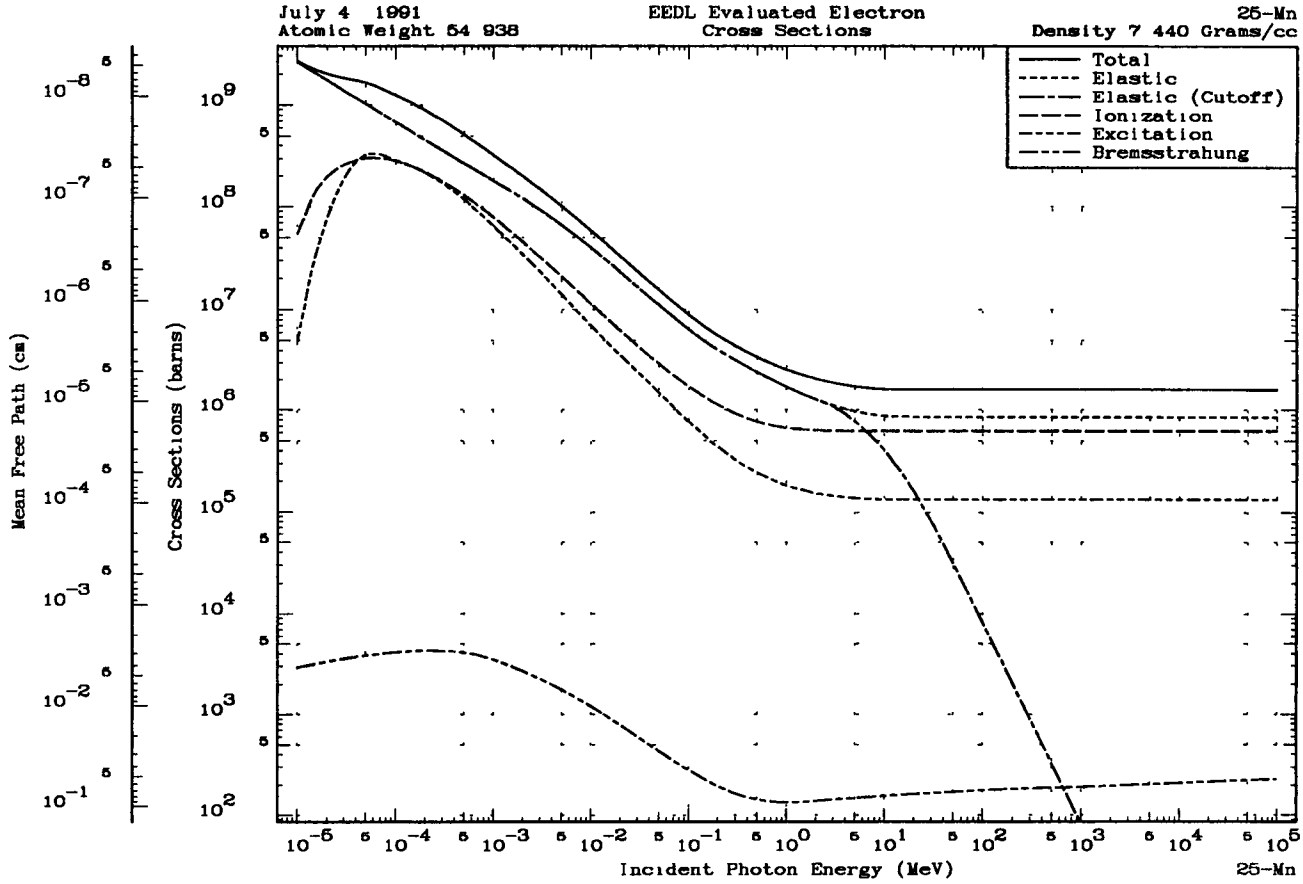

July 4 1991
Atomic Weight 51 996
EEDL Evaluated Electron
Shell Cross Sections
24-Cr
Density 7 180 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
24-Cr


July 4, 1991
Atomic Weight 51 996
EEDL Evaluated Electron
Energy Deposition
24-Cr
Density 7 180 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
24-Cr

Atomic Weight 51.996 Density 7.180 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.5025–9	3.0933+7		2.6708+9	2.4018+9	2.5159+8	1.7405+7	2.8199+3	1.6021+2	1.5030+2	9.9158+0	5.0534–4
	1.1250–5	4.6716–9	2.9813+7		2.5741+9	2.2419+9	3.0322+8	2.8989+7	2.8848+3	2.0511+2	1.8806+2	1.7049+1	5.6543–4
	1.3125–5	4.8906–9	2.8478+7		2.4589+9	2.0487+9	3.6257+8	4.7619+7	2.9720+3	2.6656+2	2.3724+2	2.9319+1	6.5742–4
	1.5000–5	5.0755–9	2.7441+7		2.3693+9	1.8948+9	4.0837+8	6.6082+7	3.0498+3	3.2278+2	2.8027+2	4.2510+1	7.5144–4
	1.7500–5	5.3036–9	2.6260+7		2.2674+9	1.7315+9	4.4986+8	8.6018+7	3.1420+3	3.8875+2	3.2625+2	6.2503+1	8.7972–4
	2.0000–5	5.5036–9	2.5307+7		2.1850+9	1.6014+9	4.8349+8	1.0009+8	3.2241+3	4.5491+2	3.6945+2	8.5463+1	1.0110–3
	2.5000–5	5.8560–9	2.3783+7		2.0535+9	1.4055+9	5.2151+8	1.2644+8	3.3423+3	5.7016+2	4.3469+2	1.3547+2	1.2538–3
	3.0000–5	6.1412–9	2.2679+7		1.9581+9	1.2634+9	5.4171+8	1.5305+8	3.4420+3	6.6825+2	4.8462+2	1.8363+2	1.5030–3
	3.5000–5	6.3935–9	2.1784+7		1.8809+9	1.1547+9	5.4794+8	1.7818+8	3.5270+3	7.4528+2	5.1893+2	2.2635+2	1.7555–3
	4.0000–5	6.6129–9	2.1061+7		1.8185+9	1.0682+9	5.5349+8	1.9676+8	3.6023+3	8.1704+2	5.5322+2	2.6382+2	2.0131–3
	5.0000–5	7.0582–9	1.9733+7		1.7037+9	9.3791+8	5.4614+8	2.1969+8	3.7096+3	9.0768+2	5.9387+2	3.1381+2	2.5033–3
M3	5.0200–5	7.0674–9	1.9707+7		1.7015+9	9.3572+8	5.4581+8	2.1998+8	3.7114+3	9.0886+2	5.9434+2	3.1452+2	2.5129–3
	5.0813–5	7.0958–9	1.9628+7		1.6947+9	9.2913+8	5.4493+8	2.2065+8	3.7168+3	9.1263+2	5.9623+2	3.1639+2	2.5423–3
M2	5.1250–5	7.1160–9	1.9572+7		1.6899+9	9.2450+8	5.4426+8	2.2112+8	3.7206+3	9.1515+2	5.9742+2	3.1772+2	2.5634–3
	5.1797–5	7.1419–9	1.9501+7		1.6838+9	9.1880+8	5.4351+8	2.2145+8	3.7253+3	9.1813+2	5.9919+2	3.1894+2	2.5897–3
	5.3109–5	7.2027–9	1.9337+7		1.6695+9	9.0549+8	5.4184+8	2.2222+8	3.7364+3	9.2573+2	6.0388+2	3.2185+2	2.6530–3
	5.3848–5	7.2363–9	1.9247+7		1.6618+9	8.9823+8	5.4091+8	2.2265+8	3.7425+3	9.2997+2	6.0649+2	3.2349+2	2.6887–3
	5.4832–5	7.2806–9	1.9130+7		1.6517+9	8.8879+8	5.3967+8	2.2321+8	3.7506+3	9.3552+2	6.0986+2	3.2566+2	2.7363–3
	5.6924–5	7.3724–9	1.8892+7		1.6311+9	8.6960+8	5.3714+8	2.2438+8	3.7673+3	9.4731+2	6.1704+2	3.3026+2	2.8378–3
	5.7416–5	7.3935–9	1.8838+7		1.6265+9	8.6525+8	5.3657+8	2.2465+8	3.7712+3	9.5010+2	6.1875+2	3.3134+2	2.8618–3
	6.0000–5	7.5019–9	1.8565+7		1.6030+9	8.4333+8	5.3361+8	2.2603+8	3.7910+3	9.6457+2	6.2759+2	3.3698+2	2.9878–3
	6.5000–5	7.7331–9	1.8010+7		1.5550+9	8.0493+8	5.2429+8	2.2581+8	3.8273+3	9.7757+2	6.3620+2	3.4137+2	3.2333–3
	6.8750–5	7.8982–9	1.7634+7		1.5225+9	7.7907+8	5.1782+8	2.2565+8	3.8529+3	9.8725+2	6.4257+2	3.4467+2	3.4186–3
	7.2500–5	8.0561–9	1.7288+7		1.4927+9	7.5535+8	5.1184+8	2.2550+8	3.8773+3	9.9732+2	6.4933+2	3.4798+2	3.6051–3
	7.4375–5	8.1383–9	1.7114+7		1.4776+9	7.4420+8	5.0898+8	2.2443+8	3.8891+3	1.0008+3	6.5266+2	3.4810+2	3.6987–3
M1	7.9190–5	8.3427–9	1.6694+7		1.4414+9	7.1751+8	5.0206+8	2.2183+8	3.9182+3	1.0100+3	6.6146+2	3.4853+2	3.9402–3
	8.0000–5	8.3760–9	1.6628+7		1.4357+9	7.1329+8	5.0097+8	2.2141+8	3.9230+3	1.0116+3	6.6312+2	3.4850+2	3.9810–3
	8.2500–5	8.4880–9	1.6409+7		1.4167+9	7.0069+8	4.9618+8	2.1987+8	3.9339+3	1.0119+3	6.6434+2	3.4759+2	4.1007–3
	8.6875–5	8.6786–9	1.6048+7		1.3856+9	6.8003+8	4.8829+8	2.1731+8	3.9524+3	1.0131+3	6.6692+2	3.4617+2	4.3108–3
	9.0000–5	8.8108–9	1.5807+7		1.3648+9	6.6625+8	4.8300+8	2.1557+8	3.9651+3	1.0143+3	6.6902+2	3.4526+2	4.4615–3
	9.3438–5	8.9532–9	1.5556+7		1.3431+9	6.5195+8	4.7743+8	2.1375+8	3.9786+3	1.0157+3	6.7133+2	3.4437+2	4.6277–3
	1.0000–4	9.2157–9	1.5113+7	0.0000+0	1.3049+9	6.2682+8	4.6757+8	2.1048+8	4.0031+3	1.0192+3	6.7628+2	3.4292+2	4.9463–3
	1.1250–4	9.7449–9	1.4292+7	1.2332–8	1.2340+9	5.8548+8	4.4583+8	2.0269+8	4.0333+3	1.0081+3	6.7325+2	3.3481+2	5.5279–3
	1.2500–4	1.0241–8	1.3600+7	2.4773–8	1.1743+9	5.5083+8	4.2747+8	1.9597+8	4.0606+3	1.0014+3	6.7323+2	3.2814+2	6.1132–3
	1.3125–4	1.0478–8	1.3292+7	3.1028–8	1.1476+9	5.3548+8	4.1920+8	1.9293+8	4.0732+3	9.9713+2	6.7190+2	3.2523+2	6.4071–3
	1.5000–4	1.1155–8	1.2486+7	4.9912–8	1.0781+9	4.9563+8	3.9756+8	1.8486+8	4.1081+3	9.8865+2	6.7075+2	3.1789+2	7.2935–3
	1.7500–4	1.2081–8	1.1528+7	7.5567–8	9.9536+8	4.5330+8	3.6882+8	1.7324+8	4.1331+3	9.6049+2	6.5717+2	3.0331+2	8.4467–3
	2.0000–4	1.2945–8	1.0759+7	1.0188–7	9.2897+8	4.1956+8	3.4564+8	1.6376+8	4.1548+3	9.3992+2	6.4808+2	2.9183+2	9.6059–3
	2.2500–4	1.3828–8	1.0072+7	1.2895–7	8.6964+8	3.9197+8	3.2334+8	1.5433+8	4.1420+3	9.0724+2	6.2943+2	2.7780+2	1.0673–2
	2.5000–4	1.4667–8	9.4960+6	1.5691–7	8.1990+8	3.6883+8	3.0471+8	1.4636+8	4.1305+3	8.8128+2	6.1518+2	2.6608+2	1.1737–2
	2.6250–4	1.5073–8	9.2401+6	1.7118–7	7.9780+8	3.5859+8	2.9641+8	1.4281+8	4.1252+3	8.6975+2	6.0883+2	2.6091+2	1.2268–2
	3.0000–4	1.6242–8	8.5752+6	2.1502–7	7.4039+8	3.3197+8	2.7490+8	1.3352+8	4.1108+3	8.4123+2	5.9367+2	2.4755+2	1.3857–2
	4.0000–4	1.9385–8	7.1846+6	3.4036–7	6.2033+8	2.8147+8	2.2903+8	1.0983+8	4.0570+3	7.5600+2	5.4319+2	2.1279+2	1.7961–2
	5.0000–4	2.2367–8	6.2268+6	4.7930–7	5.3763+8	2.4768+8	1.9674+8	9.3210+7	3.9157+3	6.8464+2	4.9984+2	1.8478+2	2.1416–2
L3	5.8081–4	2.4704–8	5.6377+6	6.0173–7	4.8677+8	2.2730+8	1.7684+8	8.2629+7	3.8237+3	6.3611+2	4.6890+2	1.6718+2	2.4133–2
L2	5.8974–4	2.4960–8	5.5800+6	6.1581–7	4.8179+8	2.2532+8	1.7494+8	8.1527+7	3.8144+3	6.3151+2	4.6614+2	1.6534+2	2.4430–2
	5.9041–4	2.4979–8	5.5757+6	6.1687–7	4.8142+8	2.2517+8	1.7480+8	8.1445+7	3.8137+3	6.3118+2	4.6594+2	1.6521+2	2.4452–2
	6.0000–4	2.5252–8	5.5154+6	6.3213–7	4.7621+8	2.2310+8	1.7281+8	8.0288+7	3.8040+3	6.2646+2	4.6316+2	1.6328+2	2.4770–2
	6.5000–4	2.6656–8	5.2250+6	7.1362–7	4.5114+8	2.1312+8	1.6292+8	7.5095+7	3.7452+3	6.0086+2	4.4687+2	1.5396+2	2.6283–2
L1	6.8734–4	2.7679–8	5.0318+6	7.7664–7	4.3445+8	2.0642+8	1.5636+8	7.1671+7	3.7048+3	5.8411+2	4.3626+2	1.4782+2	2.7400–2
	7.1550–4	2.8451–8	4.8953+6	8.2537–7	4.2266+8	2.0173+8	1.5173+8	6.9198+7	3.6618+3	5.7197+2	4.2850+2	1.4344+2	2.8050–2
	7.4375–4	2.9215–8	4.7673+6	8.7524–7	4.1161+8	1.9732+8	1.4740+8	6.6895+7	3.6209+3	5.6082+2	4.2142+2	1.3937+2	2.8696–2
	7.5775–4	2.9590–8	4.7069+6	9.0033–7	4.0640+8	1.9523+8	1.4535+8	6.5813+7	3.6014+3	5.5554+2	4.1806+2	1.3745+2	2.9014–2
	8.0000–4	3.0707–8	4.5356+6	9.7740–7	3.9161+8	1.8927+8	1.3958+8	6.2764+7	3.5451+3	5.4081+2	4.0872+2	1.3206+2	2.9965–2
	9.0000–4	3.3304–8	4.1819+6	1.1684–6	3.6107+8	1.7701+8	1.2743+8	5.6636+7	3.4260+3	5.0670+2	3.8591+2	1.2076+2	3.2172–2
	1.0000–3	3.5806–8	3.8897+6	1.3713–6	3.3584+8	1.6671+8	1.1747+8	5.1664+7	3.3228+3	4.7914+2	3.6750+2	1.1161+2	3.4319–2
	1.1250–3	3.8887–8	3.5816+6	1.6416–6	3.0924+8	1.5584+8	1.0685+8	4.6550+7	3.1811+3	4.4620+2	3.4440+2	1.0176+2	3.6026–2
	1.3125–3	4.3305–8	3.2161+6	2.0809–6	2.7769+8	1.4267+8	9.4401+7	4.0614+7	3.0049+3	4.0794+2	3.1754+2	9.0366+1	3.8521–2
	1.5000–3	4.7519–8	2.9310+6	2.5578–6	2.5306+8	1.3217+8	8.4805+7	3.6087+7	2.8600+3	3.7874+2	2.9700+2	8.1695+1	4.0939–2
	1.7500–3	5.3045–8	2.6256+6	3.2504–6	2.2670+8	1.2070+8	7.4604+7	3.1397+7	2.6905+3	3.4381+2	2.7150+2	7.2257+1	4.3606–2
	2.0000–3	5.8326–8	2.3879+6	4.0073–6	2.0617+8	1.1157+8	6.6770+7	2.7830+7	2.5518+3	3.1710+2	2.5196+2	6.5094+1	4.6189–2
	2.5000–3	6.8884–8	2.0219+6	5.7051–6	1.7457+8	9.6940+7	5.5203+7	2.2427+7	2.3138+3	2.7302+2	2.1929+2	5.3677+1	5.0113–2
	3.0000–3	7.8861–8	1.7661+6	7.6458–6	1.5249+8	8.6423+7	4.7259+7	1.8801+7	2.1359+3	2.4285+2	1.9677+2	4.6021+1	5.3860–2
	3.5000–3	8.8792–8	1.5686+6	9.8183–6	1.3543+8	7.8043+7	4.1344+7	1.6043+7	1.9843+3	2.1790+2	1.7793+2	3.9913+1	5.6725–2
	4.0000–3	9.8364–8	1.4159+6	1.2219–5	1.2225+8	7.1443+7	3.6824+7	1.3984+7	1.8617+3	1.9896+2	1.6355+2	3.5348+1	5.9494–2
	5.0000–3	1.1718–7	1.1886+6	1.7651–5	1.0263+8	6.1236+7	3.0296+7	1.1092+7	1.6613+3	1.6996+2	1.4117+2	2.8723+1	6.3756–2
K	5.9576–3	1.3465–7	1.0343+6	2.3647–5	8.9304+7	5.4073+7	2.5969+7	9.2615+6	1.5144+3	1.4990+2	1.2540+2	2.4434+1	6.7168–2
	6.0000–3	1.3542–7	1.0285+6	2.3930–5	8.8802+7	5.3801+7	2.5807+7	9.1925+6	1.5085+3	1.4916+2	1.2482+2	2.4274+1	6.7287–2
	6.2500–3	1.3994–7	9.9522+5	2.5632–5	8.5929+7	5.2221+7	2.4894+7	8.8133+6	1.4744+3	1.4473+2	1.2130+2	2.3362+1	6.7941–2
	6.6875–3	1.4778–7	9.4246+5	2.8730–5	8.1373+7	4.9703+7	2.3450+7	8.2189+6	1.4195+3	1.3774+2	1.1574+2	2.1931+1	6.9080–2
	7.0156–3	1.5359–7	9.0683+5	3.1154–5	7.8297+7	4.7994+7	2.2479+7	7.8225+6	1.3819+3	1.3306+2	1.1201+2	2.0977+1	6.9927–2
	7.5078–3	1.6219–7	8.5873+5	3.4943–5	7.4144+7	4.5675+7	2.1174+7	7.2938+6	1.3304+3	1.2676+2	1.0698+2	1.9705+1	7.1186–2
	8.0000–3	1.7067–7	8.1603+5	3.8914–5	7.0457+7	4.3605+7	2.0020+7	6.8311+6	1.2839+3	1.2121+2	1.0255+2	1.8591+1	7.2428–2
	8.5000–3	1.7940–7	7.7634+5	4.3132–5	6.7030+7	4.1640+7	1.8974+7	6.4151+6	1.2389+3	1.1588+2	9.8249+1	1.7562+1	7.3375–2
	9.2500–3	1.9231–7	7.2421+5	4.9806–5	6.2530+7	3.9046+7	1.7606+7	5.8769+6	1.1788+3	1.0893+2	9.2622+1	1.6230+1	7.4787–2
	1.0000–2	2.0503–7	6.7930+5	5.6887–5	5.8652+7	3.6797+7	1.6433+7	5.4207+6	1.1260+3	1.0297+2	8.7793+1	1.5102+1	7.6184–2
	1.1250–2	2.2611–7	6.1595+5	6.9572–5	5.3182+7	3.3561+7	1.4809+7	4.8108+6	1.0466+3	9.4242+1	8.0619+1	1.3545+1	7.7663–2
	1.3125–2	2.5699–7	5.4195+5	9.0619–5	4.6793+7	2.9753+7	1.2924+7	4.1150+6	9.5109+2	8.4122+1	7.2273+1	1.1769+1	7.9913–2
	1.5000–2	2.8709–7	4.8512+5	1.1400–4	4.1886+7	2.6805+7	1.1487+7	3.5941+6	8.7543+2	7.6417+1	6.5895+1	1.0440+1	8.2151–2
	1.7500–2	3.2657–7	4.2648+5	1.4861–4	3.6823+7	2.3699+7	1.0034+7	3.0895+6	7.9228+2	6.8177+1	5.8988+1	9.1052+0	8.3924–2

Atomic Weight 51.996												Density 7.180 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000–2	3.6510–7	3.8147+5	1.8709–4	3.2937+7	2.1301+7	8.9251+6	2.7100+6	7.2666+2	6.1886+1	5.3699+1	8.1019+0	8.5756–2
2.5000–2	4.3965–7	3.1679+5	2.7473–4	2.7352+7	1.7809+7	7.3606+6	2.1823+6	6.2665+2	5.2471+1	4.5725+1	6.6585+0	8.7494–2
3.0000–2	5.1167–7	2.7220+5	3.7641–4	2.3502+7	1.5385+7	6.2884+6	1.8284+6	5.5525+2	4.6017+1	4.0236+1	5.6911+0	8.9521–2
4.0000–2	6.4839–7	2.1480+5	6.1680–4	1.8546+7	1.2212+7	4.9353+6	1.3988+6	4.5910+2	3.7474+1	3.2905+1	4.4776+0	9.1834–2
5.0000–2	7.7796–7	1.7903+5	9.0496–4	1.5457+7	1.0208+7	4.1097+6	1.1388+6	3.9916+2	3.2072+1	2.8254+1	3.7243+0	9.3549–2
6.0000–2	9.0168–7	1.5446+5	1.2366–3	1.3336+7	8.8181+6	3.5530+6	9.6499+5	3.5568+2	2.8318+1	2.5013+1	3.2107+0	9.4920–2
8.0000–2	1.1348–6	1.2273+5	2.0117–3	1.0597+7	7.0041+6	2.8491+6	7.4330+5	2.9823+2	2.3437+1	2.0800+1	2.5405+0	9.7316–2
1.0000–1	1.3491–6	1.0323+5	2.9260–3	8.9134+6	5.8830+6	2.4225+6	6.0755+5	2.6099+2	2.0384+1	1.8165+1	2.1195+0	9.9469–2
1.5000–1	1.7928–6	7.7686+4	5.6705–3	6.7076+6	4.4247+6	1.8498+6	4.3289+5	2.0748+2	1.6211+1	1.4540+1	1.5664+0	1.0502–1
1.7500–1	1.9753–6	7.0509+4	7.2743–3	6.0879+6	4.0242+6	1.6901+6	3.7336+5	1.9192+2	1.4981+1	1.3504+1	1.3685+0	1.0808–1
2.0000–1	2.1426–6	6.5003+4	8.9963–3	5.6124+6	3.7067+6	1.5630+6	3.4252+5	1.7939+2	1.4066+1	1.2683+1	1.2716+0	1.1125–1
3.0000–1	2.6814–6	5.1941+4	1.6697–2	4.4847+6	2.9504+6	1.2796+6	2.5450+5	1.5163+2	1.1961+1	1.0856+1	9.7952–1	1.2562–1
4.0000–1	3.1105–6	4.4776+4	2.5439–2	3.8660+6	2.5210+6	1.1416+6	2.0330+5	1.3865+2	1.0934+1	9.9898+0	8.0279–1	1.4189–1
5.0000–1	3.4577–6	4.0280+4	3.4813–2	3.4778+6	2.2379+6	1.0616+6	1.7817+5	1.3183+2	1.0404+1	9.5254+0	7.1798–1	1.6035–1
6.0000–1	3.7436–6	3.7204+4	4.4574–2	3.2122+6	2.0378+6	1.0102+6	1.6401+5	1.2781+2	1.0088+1	9.2363+0	6.7209–1	1.7988–1
8.0000–1	4.2042–6	3.3127+4	6.4683–2	2.8603+6	1.7665+6	9.4975+5	1.4391+5	1.2410+2	9.8049+0	8.9768+0	6.0555–1	2.2250–1
1.0000+0	4.5547–6	3.0578+4	8.5185–2	2.6402+6	1.5899+6	9.1609+5	1.3409+5	1.2316+2	9.7051+0	8.8603+0	5.7583–1	2.6903–1
1.5000+0	5.1606–6	2.6988+4	1.3638–1	2.3302+6	1.3328+6	8.7737+5	1.1988+5	1.2460+2	9.8278+0	8.8992+0	5.3054–1	3.9809–1
2.0000+0	5.5434–6	2.5125+4	1.8666–1	2.1693+6	1.1909+6	8.6536+5	1.1298+5	1.2714+2	1.0061+1	9.0058+0	5.1547–1	5.3933–1
3.0000+0	6.0287–6	2.3102+4	2.8364–1	1.9947+6	1.0396+6	8.4920+5	1.0574+5	1.3233+2	1.0568+1	9.2251+0	4.9496–1	8.4833–1
4.0000+0	6.3092–6	2.2075+4	3.7595–1	1.9060+6	9.5923+5	8.4646+5	1.0017+5	1.3553+2	1.1101+1	9.4391+0	4.8091–1	1.1813+0
5.0000+0	6.4886–6	2.1465+4	4.6402–1	1.8533+6	9.1040+5	8.4473+5	9.8019+4	1.3785+2	1.1611+1	9.6082+0	4.7417–1	1.5289+0
6.0000+0	6.6039–6	2.1090+4	5.4833–1	1.8209+6	8.8068+5	8.4335+5	9.6768+4	1.3959+2	1.2115+1	9.7543+0	4.7167–1	1.8886+0
8.0000+0	6.7497–6	2.0634+4	7.0704–1	1.7816+6	8.4507+5	8.4133+5	9.5062+4	1.4242+2	1.3101+1	9.9986+0	4.7034–1	2.6319+0
1.0000+1	6.8119–6	2.0446+4	8.5430–1	1.7653+6	8.3004+5	8.4127+5	9.3869+4	1.4469+2	1.4074+1	1.0203+1	4.7134–1	3.3992+0
1.5000+1	6.8432–6	2.0353+4	1.1838+0	1.7573+6	8.2167+5	8.4163+5	9.3820+4	1.4889+2	1.6329+1	1.0468+1	4.7425–1	5.3865+0
2.0000+1	6.8559–6	2.0315+4	1.4703+0	1.7540+6	8.1870+5	8.4191+5	9.3249+4	1.5118+2	1.8630+1	1.0700+1	4.7450–1	7.4553+0
3.0000+1	6.8635–6	2.0292+4	1.9512+0	1.7521+6	8.1833+5	8.4186+5	9.1712+4	1.5451+2	2.3122+1	1.0933+1	4.7284–1	1.1716+1
4.0000+1	6.8657–6	2.0286+4	2.3457+0	1.7515+6	8.1824+5	8.4183+5	9.1270+4	1.5696+2	2.7711+1	1.1148+1	4.7118–1	1.6092+1
5.0000+1	6.8672–6	2.0281+4	2.6795+0	1.7511+6	8.1818+5	8.4195+5	9.0830+4	1.5874+2	3.2317+1	1.1301+1	4.6951–1	2.0546+1
6.0000+1	6.8675–6	2.0280+4	2.9688+0	1.7510+6	8.1812+5	8.4199+5	9.0761+4	1.6021+2	3.6930+1	1.1413+1	4.6976–1	2.5048+1
8.0000+1	6.8682–6	2.0278+4	3.4518+0	1.7509+6	8.1804+5	8.4204+5	9.0622+4	1.6266+2	4.6232+1	1.1581+1	4.7026–1	3.4181+1
1.0000+2	6.8687–6	2.0277+4	3.8455+0	1.7507+6	8.1797+5	8.4208+5	9.0517+4	1.6450+2	5.5646+1	1.1738+1	4.7092–1	4.3437+1
1.5000+2	6.8684–6	2.0278+4	4.5944+0	1.7508+6	8.1785+5	8.4211+5	9.0681+4	1.6764+2	7.9273+1	1.1893+1	4.7184–1	6.6909+1
2.0000+2	6.8688–6	2.0277+4	5.1460+0	1.7507+6	8.1777+5	8.4212+5	9.0653+4	1.6960+2	1.0307+2	1.2042+1	4.7176–1	9.0555+1
3.0000+2	6.8696–6	2.0274+4	5.9436+0	1.7505+6	8.1765+5	8.4214+5	9.0533+4	1.7157+2	1.5068+2	1.2312+1	4.7126–1	1.3789+2
4.0000+2	6.8707–6	2.0271+4	6.5200+0	1.7502+6	8.1757+5	8.4214+5	9.0350+4	1.7277+2	1.9851+2	1.2445+1	4.7043–1	1.8559+2
5.0000+2	6.8722–6	2.0267+4	6.9713+0	1.7499+6	8.1750+5	8.4215+5	9.0023+4	1.7369+2	2.4642+2	1.2544+1	4.6885–1	2.3340+2
6.0000+2	6.8724–6	2.0266+4	7.3424+0	1.7498+6	8.1745+5	8.4215+5	9.0031+4	1.7456+2	2.9389+2	1.2633+1	4.6901–1	2.8079+2
8.0000+2	6.8732–6	2.0264+4	7.9319+0	1.7496+6	8.1736+5	8.4215+5	8.9904+4	1.7604+2	3.8916+2	1.2812+1	4.6860–1	3.7588+2
1.0000+3	6.8738–6	2.0262+4	8.3914+0	1.7494+6	8.1730+5	8.4215+5	8.9809+4	1.7730+2	4.8480+2	1.2959+1	4.6835–1	4.7137+2
1.5000+3	6.8743–6	2.0260+4	9.2294+0	1.7493+6	8.1718+5	8.4215+5	8.9793+4	1.7974+2	7.2451+2	1.3092+1	4.6826–1	7.1095+2
2.0000+3	6.8748–6	2.0259+4	9.8250+0	1.7492+6	8.1710+5	8.4215+5	8.9744+4	1.8156+2	9.6599+2	1.3224+1	4.6801–1	9.5229+2
3.0000+3	6.8753–6	2.0257+4	1.0666+1	1.7491+6	8.1698+5	8.4215+5	8.9744+4	1.8426+2	1.4455+3	1.3489+1	4.6801–1	1.4316+3
4.0000+3	6.8757–6	2.0256+4	1.1263+1	1.7489+6	8.1689+5	8.4215+5	8.9711+4	1.8629+2	1.9268+3	1.3602+1	4.6785–1	1.9127+3
5.0000+3	6.8767–6	2.0253+4	1.1726+1	1.7487+6	8.1683+5	8.4215+5	8.9519+4	1.8790+2	2.4119+3	1.3715+1	4.6685–1	2.3977+3
6.0000+3	6.8766–6	2.0254+4	1.2104+1	1.7487+6	8.1678+5	8.4215+5	8.9614+4	1.8921+2	2.8882+3	1.3800+1	4.6735–1	2.8740+3
8.0000+3	6.8768–6	2.0253+4	1.2702+1	1.7487+6	8.1669+5	8.4215+5	8.9645+4	1.9131+2	3.8493+3	1.3970+1	4.6752–1	3.8349+3
1.0000+4	6.8770–6	2.0252+4	1.3165+1	1.7486+6	8.1663+5	8.4215+5	8.9643+4	1.9295+2	4.8194+3	1.4133+1	4.6752–1	4.8048+3
1.5000+4	6.8772–6	2.0252+4	1.4008+1	1.7486+6	8.1651+5	8.4215+5	8.9707+4	1.9608+2	7.1964+3	1.4259+1	4.6785–1	7.1817+3
2.0000+4	6.8777–6	2.0250+4	1.4608+1	1.7485+6	8.1642+5	8.4215+5	8.9675+4	1.9834+2	9.6044+3	1.4386+1	4.6768–1	9.5896+3
3.0000+4	6.8780–6	2.0249+4	1.5453+1	1.7484+6	8.1630+5	8.4215+5	8.9707+4	2.0149+2	1.4370+4	1.4639+1	4.6785–1	1.4355+4
4.0000+4	6.8785–6	2.0248+4	1.6053+1	1.7483+6	8.1622+5	8.4215+5	8.9675+4	2.0375+2	1.9186+4	1.4788+1	4.6768–1	1.9171+4
5.0000+4	6.8794–6	2.0245+4	1.6519+1	1.7480+6	8.1615+5	8.4215+5	8.9500+4	2.0549+2	2.3958+4	1.4897+1	4.6677–1	2.3943+4
6.0000+4	6.8792–6	2.0246+4	1.6900+1	1.7480+6	8.1610+5	8.4215+5	8.9595+4	2.0691+2	2.8726+4	1.4979+1	4.6727–1	2.8711+4
8.0000+4	6.8795–6	2.0245+4	1.7500+1	1.7480+6	8.1602+5	8.4215+5	8.9611+4	2.0917+2	3.8345+4	1.5142+1	4.6735–1	3.8329+4
1.0000+5	6.8796–6	2.0245+4	1.7965+1	1.7480+6	8.1595+5	8.4215+5	8.9643+4	2.1092+2	4.7981+4	1.5305+1	4.6752–1	4.7965+4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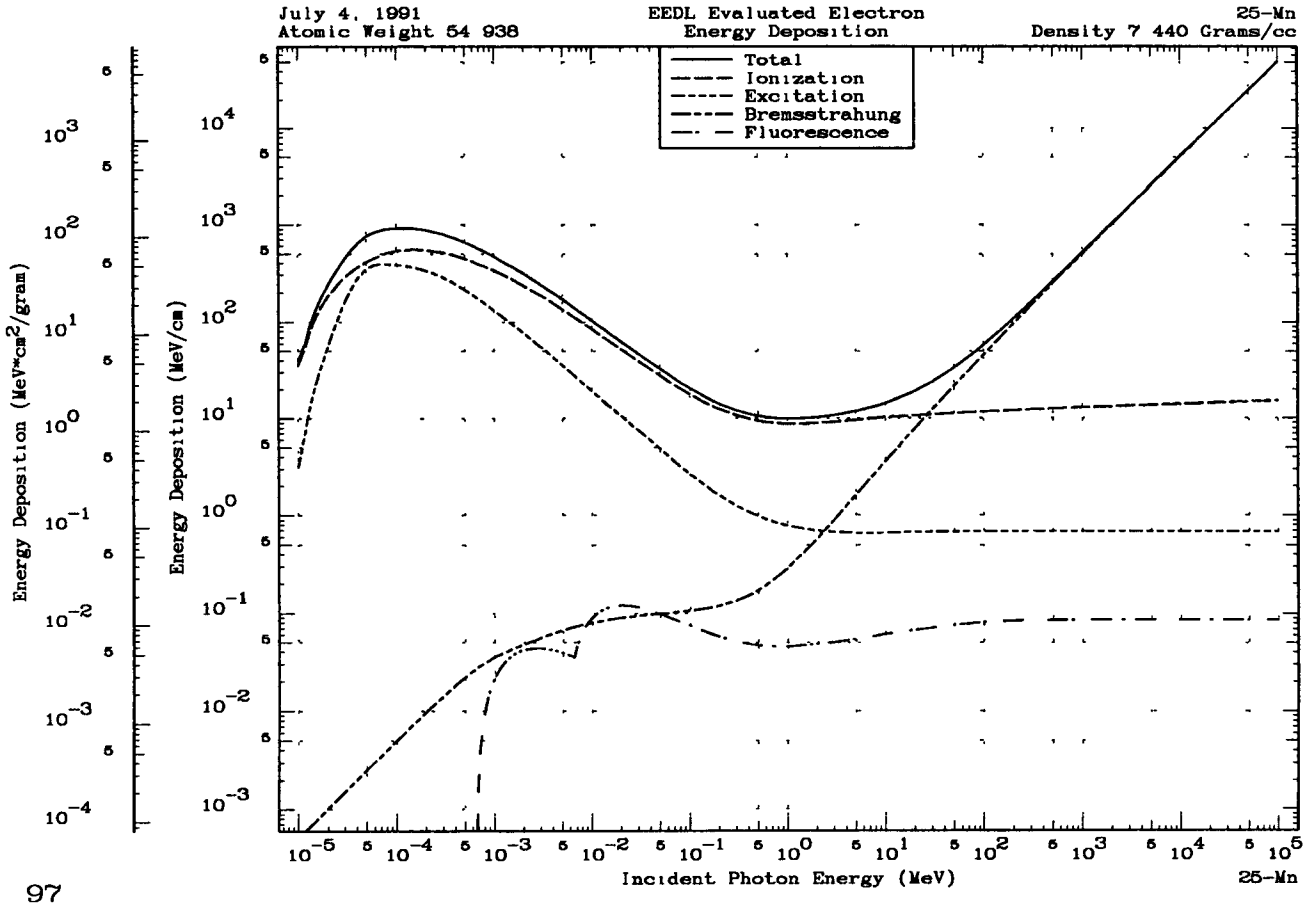
Atomic Weight 54 938
EEDL Evaluated Electron
Cross Sections
25-Mn
Density 7 440 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
25-Mn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EEDL Evaluated Electron
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Density 7 440 Grams/cc
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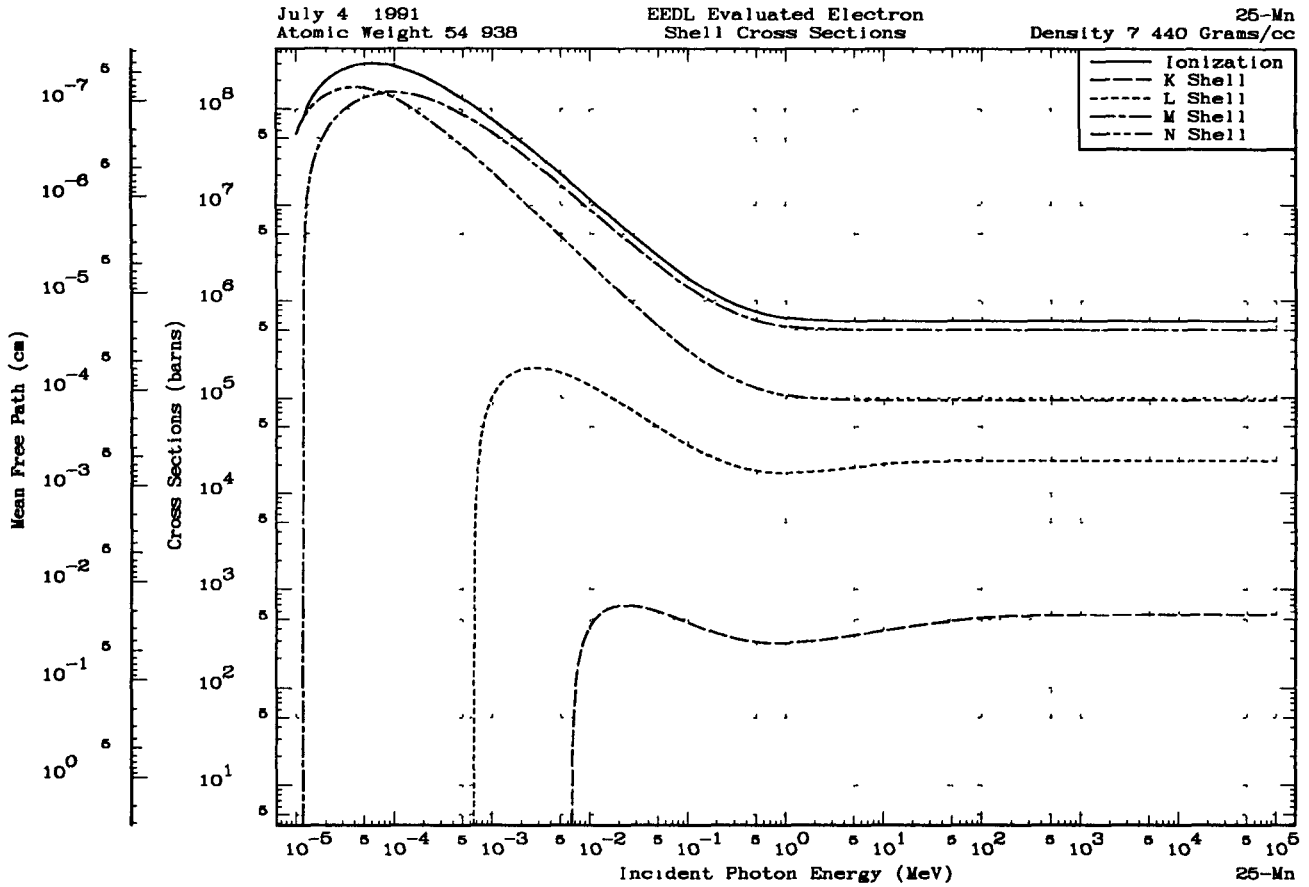
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
25-Mn

97


July 4 1991
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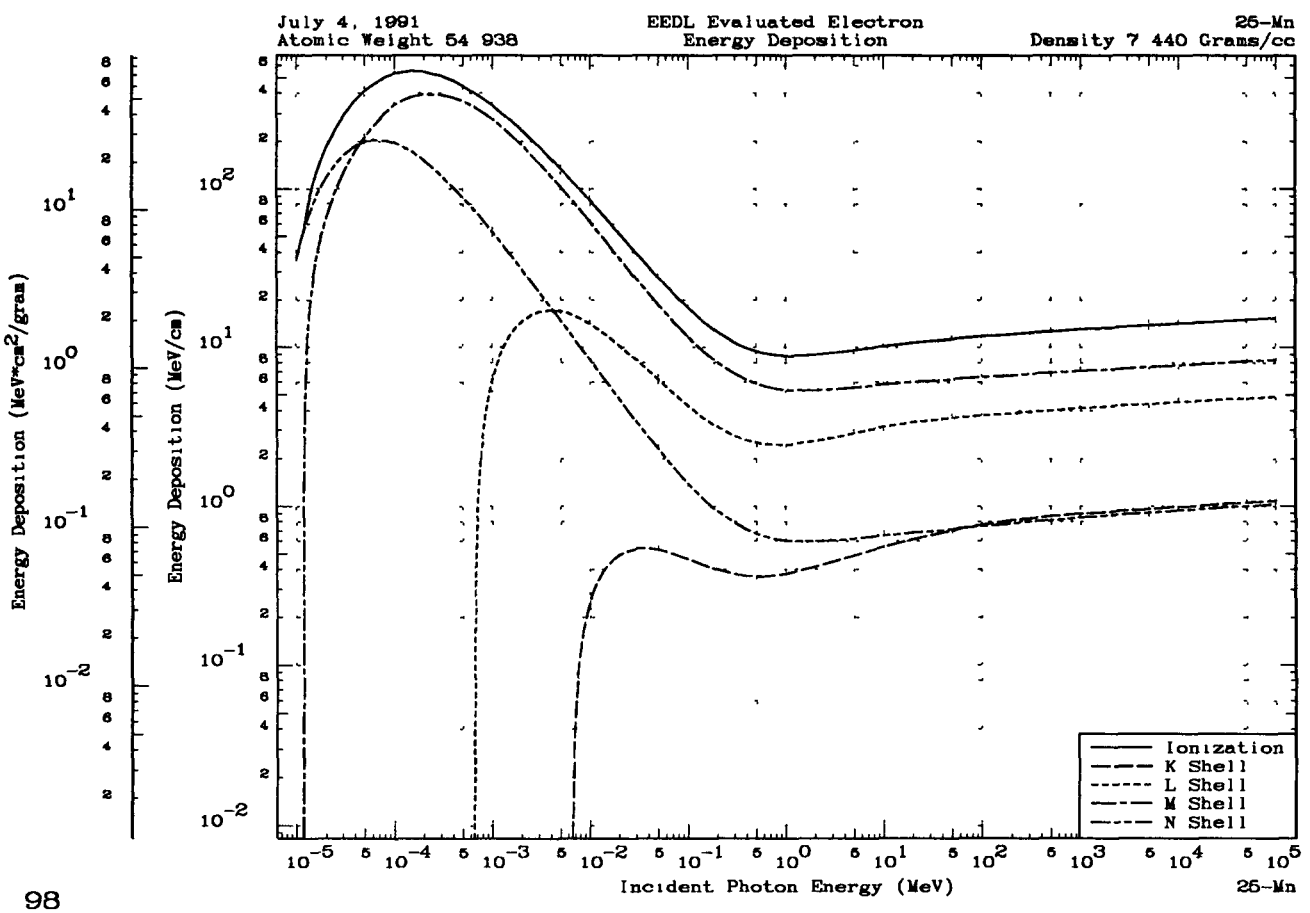
EEDL Evaluated Electron
Shell Cross Sections
25-Mn
Density 7 440 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
25-Mn


July 4, 1991
Atomic Weight 54 938
EEDL Evaluated Electron
Energy Deposition
25-Mn
Density 7 440 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
Incident Photon Energy (MeV)
25-Mn

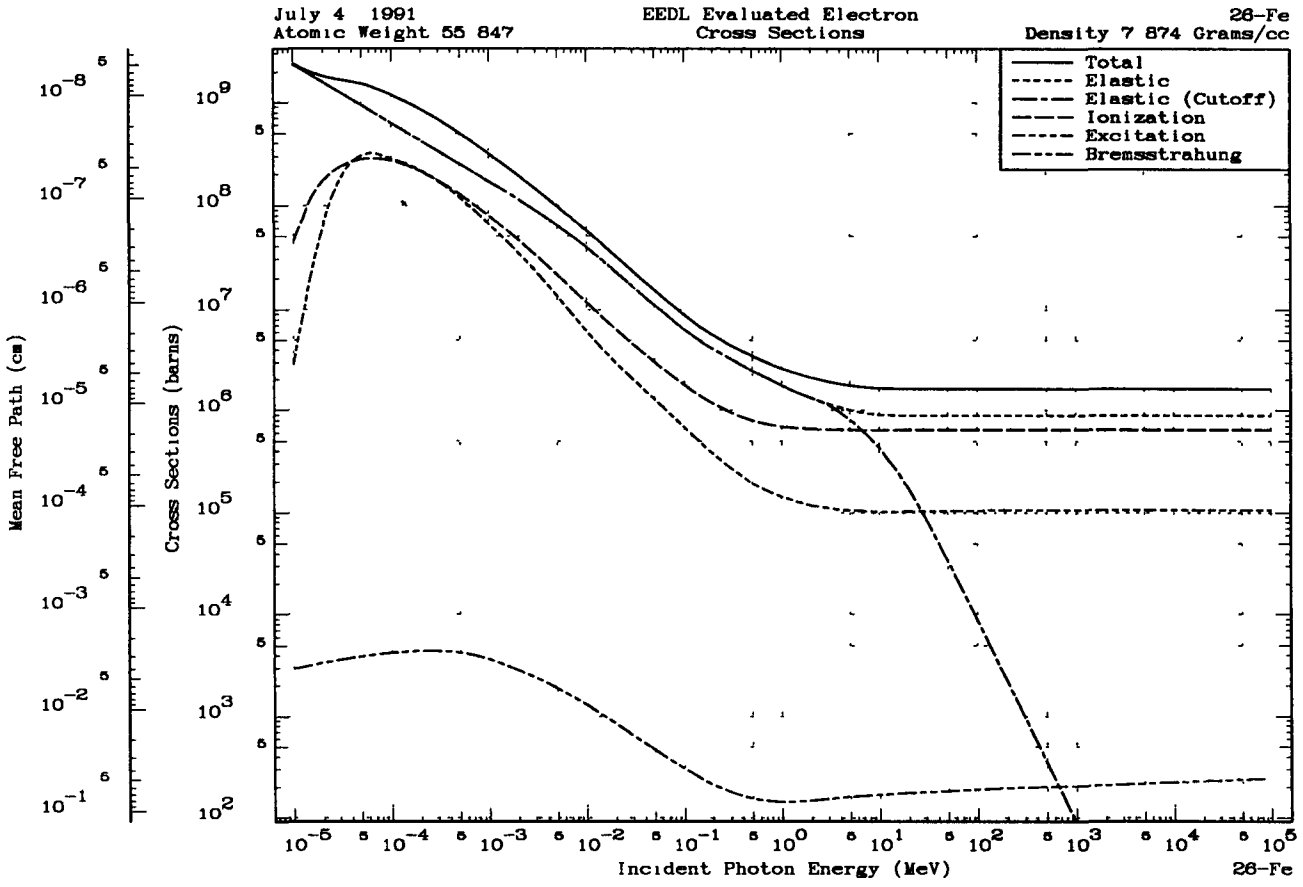
98

Atomic Weight 54.938 Density 7.440 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.5567–9	2.9497+7		2.6909+9	2.6314+9	5.4683+7	4.8521+6	2.9233+3	3.8566+1	3.5442+1	3.1236+0	5.1381–4
	1.1250–5	4.8353–9	2.7797+7		2.5359+9	2.4553+9	7.1896+7	8.6337+6	2.9907+3	5.4189+1	4.8411+1	5.7770+0	5.7494–4
M5	1.1720–5	4.9360–9	2.7230+7		2.4841+9	2.3970+9	7.6919+7	1.0217+7	3.0145+3	5.9457+1	5.2523+1	6.9338+0	5.9819–4
M4	1.1850–5	4.9613–9	2.7091+7		2.4715+9	2.3815+9	7.9132+7	1.0826+7	3.0209+3	6.1818+1	5.4456+1	7.3612+0	6.0465–4
	1.1925–5	4.9751–9	2.7016+7		2.4646+9	2.3727+9	8.0708+7	1.1219+7	3.0246+3	6.3497+1	5.5863+1	7.6338+0	6.0838–4
	1.2047–5	4.9978–9	2.6894+7		2.4534+9	2.3585+9	8.3021+7	1.1881+7	3.0306+3	6.6013+1	5.7917+1	8.0949+0	6.1445–4
	1.2309–5	5.0443–9	2.6646+7		2.4308+9	2.3288+9	8.8559+7	1.3418+7	3.0433+3	7.2076+1	6.2909+1	9.1665+0	6.2755–4
	1.2416–5	5.0628–9	2.6548+7		2.4219+9	2.3171+9	9.0748+7	1.4087+7	3.0484+3	7.4529+1	6.4894+1	9.6340+0	6.3288–4
	1.2982–5	5.1583–9	2.6057+7		2.3771+9	2.2571+9	1.0244+8	1.7484+7	3.0748+3	8.7635+1	7.5609+1	1.2026+1	6.6131–4
	1.3062–5	5.1713–9	2.5991+7		2.3711+9	2.2490+9	1.0407+8	1.8012+7	3.0784+3	8.9521+1	7.7121+1	1.2399+1	6.6534–4
	1.3125–5	5.1817–9	2.5939+7		2.3663+9	2.2427+9	1.0523+8	1.8437+7	3.0813+3	9.0895+1	7.8194+1	1.2700+1	6.6852–4
	1.3991–5	5.3206–9	2.5262+7		2.3045+9	2.1600+9	1.2044+8	2.4130+7	3.1196+3	1.0985+2	9.3081+1	1.6767+1	7.1245–4
	1.4031–5	5.3267–9	2.5233+7		2.3019+9	2.1564+9	1.2112+8	2.4421+7	3.1214+3	1.1074+2	9.3766+1	1.6976+1	7.1449–4
	1.5000–5	5.4687–9	2.4578+7		2.2422+9	2.0734+9	1.3734+8	3.1476+7	3.1620+3	1.3230+2	1.1021+2	2.2092+1	7.6418–4
	1.6250–5	5.6420–9	2.3823+7		2.1733+9	1.9781+9	1.5457+8	4.0641+7	3.2114+3	1.5757+2	1.2894+2	2.8633+1	8.2902–4
	1.7500–5	5.7952–9	2.3193+7		2.1158+9	1.8938+9	1.7059+8	5.1489+7	3.2578+3	1.8357+2	1.4716+2	3.6412+1	8.9468–4
	1.8125–5	5.8664–9	2.2912+7		2.0902+9	1.8551+9	1.7784+8	5.7221+7	3.2800+3	1.9658+2	1.5604+2	4.0542+1	9.2780–4
	2.0000–5	6.0553–9	2.2197+7		2.0250+9	1.7508+9	1.9722+8	7.6943+7	3.3431+3	2.3587+2	1.8104+2	5.4820+1	1.0283–3
	2.2500–5	6.2665–9	2.1449+7		1.9567+9	1.6337+9	2.1744+8	1.0556+8	3.4074+3	2.8839+2	2.1014+2	7.8248+1	1.1510–3
	2.5000–5	6.4376–9	2.0879+7		1.9047+9	1.5356+9	2.3525+8	1.3386+8	3.4660+3	3.4126+2	2.3818+2	1.0308+2	1.2754–3
	2.6250–5	6.5076–9	2.0654+7		1.8842+9	1.4922+9	2.4262+8	1.4942+8	3.4935+3	3.6867+2	2.5100+2	1.1767+2	1.3382–3
	3.0000–5	6.6862–9	2.0102+7		1.8339+9	1.3795+9	2.6146+8	1.9288+8	3.5698+3	4.4916+2	2.8715+2	1.6201+2	1.5291–3
	3.5000–5	6.8866–9	1.9517+7		1.7805+9	1.2603+9	2.7719+8	2.4302+8	3.6582+3	5.4537+2	3.2518+2	2.2018+2	1.7863–3
	4.0000–5	7.0511–9	1.9062+7		1.7390+9	1.1654+9	2.8992+8	2.8370+8	3.7366+3	6.3713+2	3.6134+2	2.7579+2	2.0486–3
	5.0000–5	7.4200–9	1.8114+7		1.6525+9	1.0225+9	3.0144+8	3.2859+8	3.8488+3	7.6667+2	4.1431+2	3.5236+2	2.5484–3
	6.0000–5	7.8773–9	1.7063+7		1.5566+9	9.1884+8	3.0354+8	3.3419+8	3.9341+3	8.3541+2	4.5126+2	3.8414+2	3.0426–3
M3	6.0780–5	7.9137–9	1.6984+7		1.5494+9	9.1191+8	3.0319+8	3.3431+8	3.9402+3	8.3875+2	4.5302+2	3.8573+2	3.0815–3
	6.1981–5	7.9686–9	1.6867+7		1.5387+9	9.0151+8	3.0278+8	3.3445+8	3.9495+3	8.4442+2	4.5629+2	3.8812+2	3.1415–3
M2	6.2090–5	7.9736–9	1.6857+7		1.5378+9	9.0058+8	3.0274+8	3.3446+8	3.9503+3	8.4491+2	4.5657+2	3.8834+2	3.1470–3
	6.3209–5	8.0308–9	1.6737+7		1.5268+9	8.9121+8	3.0230+8	3.3330+8	3.9588+3	8.4857+2	4.5952+2	3.8905+2	3.2031–3
	6.4234–5	8.0824–9	1.6630+7		1.5171+9	8.8287+8	3.0195+8	3.3226+8	3.9664+3	8.5210+2	4.6239+2	3.8971+2	3.2545–3
	6.5308–5	8.1360–9	1.6520+7		1.5071+9	8.7434+8	3.0156+8	3.3119+8	3.9743+3	8.5569+2	4.6527+2	3.9042+2	3.3085–3
	6.8175–5	8.2755–9	1.6242+7		1.4817+9	8.5263+8	3.0062+8	3.2843+8	3.9949+3	8.6552+2	4.7316+2	3.9236+2	3.4530–3
	6.8981–5	8.3140–9	1.6167+7		1.4748+9	8.4678+8	3.0036+8	3.2768+8	4.0005+3	8.6826+2	4.7534+2	3.9292+2	3.4938–3
	7.4088–5	8.5498–9	1.5721+7		1.4341+9	8.1212+8	2.9887+8	3.2315+8	4.0350+3	8.8596+2	4.8936+2	3.9659+2	3.7532–3
	7.4491–5	8.5679–9	1.5688+7		1.4311+9	8.0955+8	2.9876+8	3.2281+8	4.0376+3	8.8735+2	4.9046+2	3.9689+2	3.7737–3
	8.0000–5	8.8430–9	1.5199+7		1.3866+9	7.7644+8	2.9735+8	3.1280+8	4.0724+3	8.9963+2	5.0554+2	3.9409+2	4.0559–3
	9.0000–5	9.3246–9	1.4414+7		1.3150+9	7.2494+8	2.9023+8	2.9981+8	4.1237+3	9.0804+2	5.1876+2	3.8928+2	4.5601–3
M1	9.2580–5	9.4434–9	1.4233+7		1.2984+9	7.1310+8	2.8856+8	2.9677+8	4.1361+3	9.1046+2	5.2217+2	3.8828+2	4.6910–3
	9.4435–5	9.5285–9	1.4106+7		1.2868+9	7.0491+8	2.8743+8	2.9450+8	4.1415+3	9.1234+2	5.2489+2	3.8745+2	4.7787–3
	9.7218–5	9.6541–9	1.3922+7		1.2701+9	6.9308+8	2.8581+8	2.9120+8	4.1495+3	9.1534+2	5.2905+2	3.8629+2	4.9105–3
	1.0000–4	9.7773–9	1.3747+7	0.0000+0	1.2541+9	6.8178+8	2.8427+8	2.8803+8	4.1572+3	9.1855+2	5.3332+2	3.8522+2	5.0424–3
	1.0625–4	1.0061–8	1.3360+7	6.8094–9	1.2188+9	6.5812+8	2.7854+8	2.8211+8	4.1739+3	9.1715+2	5.3527+2	3.8187+2	5.3396–3
	1.1250–4	1.0334–8	1.3006+7	1.3625–8	1.1865+9	6.3656+8	2.7333+8	2.7665+8	4.1898+3	9.1675+2	5.3780+2	3.7894+2	5.6377–3
	1.1719–4	1.0533–8	1.2760+7	1.8739–8	1.1641+9	6.2160+8	2.6967+8	2.7280+8	4.2011+3	9.1681+2	5.3981+2	3.7699+2	5.8620–3
	1.2500–4	1.0855–8	1.2382+7	2.7255–8	1.1296+9	5.9866+8	2.6405+8	2.6684+8	4.2191+3	9.1779+2	5.4364+2	3.7415+2	6.2369–3
	1.2539–4	1.0871–8	1.2364+7	2.7681–8	1.1279+9	5.9757+8	2.6379+8	2.6656+8	4.2199+3	9.1780+2	5.4378+2	3.7402+2	6.2557–3
	1.3125–4	1.1104–8	1.2104+7	3.4064–8	1.1042+9	5.8189+8	2.5994+8	2.6242+8	4.2327+3	9.1823+2	5.4603+2	3.7219+2	6.5378–3
	1.3359–4	1.1196–8	1.2006+7	3.6612–8	1.0952+9	5.7592+8	2.5846+8	2.6084+8	4.2377+3	9.1842+2	5.4688+2	3.7153+2	6.6507–3
	1.3770–4	1.1363–8	1.1828+7	4.1083–8	1.0791+9	5.6586+8	2.5596+8	2.5725+8	4.2462+3	9.1766+2	5.4850+2	3.6915+2	6.8491–3
	1.5000–4	1.1849–8	1.1343+7	5.4498–8	1.0348+9	5.3833+8	2.4910+8	2.4737+8	4.2703+3	9.1692+2	5.5407+2	3.6285+2	7.4457–3
	1.7500–4	1.2842–8	1.0467+7	8.2070–8	9.5484+8	4.9209+8	2.3283+8	2.2992+8	4.2981+3	8.9658+2	5.4925+2	3.4733+2	8.6287–3
	2.0000–4	1.3765–8	9.7646+6	1.1016–7	8.9080+8	4.5526+8	2.1973+8	2.1580+8	4.3223+3	8.8314+2	5.4767+2	3.3546+2	9.8183–3
	2.2500–4	1.4701–8	9.1429+6	1.3890–7	8.3408+8	4.2514+8	2.0646+8	2.0247+8	4.3112+3	8.5684+2	5.3588+2	3.2096+2	1.0917–2
	2.5000–4	1.5589–8	8.6219+6	1.6843–7	7.8654+8	3.9989+8	1.9540+8	1.9125+8	4.3012+3	8.3652+2	5.2747+2	3.0904+2	1.2014–2
	2.6250–4	1.6019–8	8.3905+6	1.8345–7	7.6544+8	3.8872+8	1.9045+8	1.8627+8	4.2966+3	8.2760+2	5.2375+2	3.0384+2	1.2561–2
	3.0000–4	1.7317–8	7.7618+6	2.2949–7	7.0808+8	3.5969+8	1.7764+8	1.7074+8	4.2841+3	8.0186+2	5.1548+2	2.8637+2	1.4201–2
	3.5000–4	1.9027–8	7.0641+6	2.9357–7	6.4444+8	3.2906+8	1.6191+8	1.5346+8	4.2570+3	7.5885+2	4.9474+2	2.6409+2	1.6326–2
	4.0000–4	2.0640–8	6.5121+6	3.6089–7	5.9408+8	3.0464+8	1.4953+8	1.3991+8	4.2337+3	7.2683+2	4.7992+2	2.4689+2	1.8440–2
	5.0000–4	2.3807–8	5.6458+6	5.0505–7	5.1504+8	2.6783+8	1.2941+8	1.1780+8	4.0924+3	6.6162+2	4.4711+2	2.1449+2	2.2036–2
	6.0000–4	2.6901–8	4.9964+6	6.6274–7	4.5580+8	2.4108+8	1.1425+8	1.0047+8	3.9804+3	6.0741+2	4.1773+2	1.8966+2	2.5529–2
L3	6.5222–4	2.8431–8	4.7276+6	7.5056–7	4.3128+8	2.2976+8	1.0765+8	9.3869+7	3.9302+3	5.8203+2	4.0285+2	1.7915+2	2.7319–2
	6.6146–4	2.8697–8	4.6837+6	7.6648–7	4.2727+8	2.2791+8	1.0658+8	9.2782+7	3.9215+3	5.7802+2	4.0056+2	1.7743+2	2.7629–2
L2	6.6297–4	2.8741–8	4.6765+6	7.6911–7	4.2663+8	2.2761+8	1.0641+8	9.2606+7	3.9201+3	5.7737+2	4.0019+2	1.7715+2	2.7680–2
	6.6725–4	2.8866–8	4.6563+6	7.7653–7	4.2478+8	2.2677+8	1.0592+8	9.2097+7	3.9130+3	5.7549+2	3.9911+2	1.7636+2	2.7785–2
	6.7140–4	2.8986–8	4.6370+6	7.8375–7	4.2302+8	2.2596+8	1.0545+8	9.1609+7	3.9061+3	5.7371+2	3.9808+2	1.7559+2	2.7886–2
	6.7877–4	2.9200–8	4.6031+6	7.9664–7	4.1992+8	2.2454+8	1.0462+8	9.0757+7	3.8941+3	5.7063+2	3.9634+2	1.7426+2	2.8067–2
	6.7944–4	2.9219–8	4.6000+6	7.9780–7	4.1965+8	2.2442+8	1.0455+8	9.0681+7	3.8930+3	5.7035+2	3.9618+2	1.7414+2	2.8083–2
	7.0908–4	3.0069–8	4.4700+6	8.5032–7	4.0778+8	2.1897+8	1.0139+8	8.7425+7	3.8464+3	5.5856+2	3.8948+2	1.6905+2	2.8802–2
	7.0958–4	3.0083–8	4.4679+6	8.5121–7	4.0759+8	2.1888+8	1.0134+8	8.7373+7	3.8457+3	5.5837+2	3.8937+2	1.6897+2	2.8814–2
	7.5454–4	3.1348–8	4.2876+6	9.3292–7	3.9114+8	2.1128+8	9.6965+7	8.2895+7	3.7796+3	5.4228+2	3.8026+2	1.6199+2	2.9893–2
	7.5479–4	3.1355–8	4.2866+6	9.3338–7	3.9106+8	2.1124+8	9.6943+7	8.2872+7	3.7792+3	5.4219+2	3.8021+2	1.6195+2	2.9899–2
L1	7.6647–4	3.1680–8	4.2428+6	9.5500–7	3.8705+8	2.0938+8	9.5881+7	8.1790+7	3.7629+3	5.3829+2	3.7800+2	1.6026+2	3.0177–2
	8.0000–4	3.2613–8	4.1214+6	1.0179–6	3.7598+8	2.0429+8	9.2963+7	7.8727+7	3.7177+3	5.2758+2	3.7199+2	1.5557+2	3.0969–2
	8.5000–4	3.3988–8	3.9546+6	1.1143–6	3.6076+8	1.9731+8	8.8828+7	7.4623+7	3.6547+3	5.1059+2	3.6182+2	1.4874+2	3.2136–2
	9.2500–4	3.5999–8	3.7337+6	1.2644–6	3.4061+8	1.8798+8	8.3375+7	6.9254+7	3.5686+3	4.8842+2	3.4857+2	1.3982+2	3.3857–2
	1.0000–3	3.7954–8	3.5414+6	1.4210–6	3.2307+8	1.7976+8	7.8654+7	6.4647+7	3.4909+3	4.6949+2	3.3728+2	1.3218+2	3.5545–2
	1.1250–3	4.1185–8	3.2635+6	1.6967–6	2.9772+8	1.6796+8	7.1709+7	5.8048+7	3.3455+3	4.3780+2	3.1727+2	1.2050+2	3.7350–2
	1.3125–3	4.5812–8	2.9339+6	2.1440–6	2.6765+8	1.5368+8	6.3554+7	5.0418+7	3.1643+3	4.0108+2	2.9401+2	1.0703+2	3.9989–2
	1.5000–3	5.0217–8	2.6766+6	2.6286–6	2.4417+8	1.4229+8	5.7257+7	4.4624+7	3.0152+3	3.7314+2	2.7627+2	9.6822+1	4.2548–2

Atomic Weight 54.938 Density 7.440 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.7500–3	5.5953–8	2.4022+6	3.3307–6	2.1914+8	1.2989+8	5.0502+7	3.8751+7	2.8402+3	3.3949+2	2.5365+2	7.5791+1	4.5378–2
2.0000–3	6.1425–8	2.1882+6	4.0965–6	1.9962+8	1.2002+8	4.5305+7	3.4293+7	2.6968+3	3.1381+2	2.3632+2	7.7435+1	4.8119–2
2.5000–3	7.2299–8	1.8591+6	5.8092–6	1.6960+8	1.0427+8	3.7591+7	2.7732+7	2.4505+3	2.7111+2	2.0669+2	6.4370+1	5.2335–2
3.0000–3	8.2543–8	1.6283+6	7.7605–6	1.4855+8	9.2952+7	3.2280+7	2.3314+7	2.2661+3	2.4191+2	1.8626+2	5.5589+1	5.6358–2
4.0000–3	1.0257–7	1.3104+6	1.2311–5	1.1954+8	7.6825+7	2.5257+7	1.7456+7	1.9786+3	1.9899+2	1.5575+2	4.3176+1	6.2316–2
5.0000–3	1.2185–7	1.1031+6	1.7735–5	1.0063+8	6.5822+7	2.0840+7	1.3966+7	1.7688+3	1.7050+2	1.3491+2	3.5521+1	6.6894–2
6.0000–3	1.4053–7	9.5644+5	2.3985–5	8.7253+7	5.7830+7	1.7793+7	1.1629+7	1.6083+3	1.4992+2	1.1960+2	3.0249+1	7.0697–2
K 6.5109–3	1.4984–7	8.9701+5	2.7494–5	8.1832+7	5.4539+7	1.6570+7	1.0722+7	1.5380+3	1.4133+2	1.1312+2	2.8142+1	7.2229–2
6.6040–3	1.5154–7	8.8696+5	2.8156–5	8.0914+7	5.3978+7	1.6366+7	1.0569+7	1.5259+3	1.3989+2	1.1203+2	2.7786+1	7.2484–2
6.7785–3	1.5471–7	8.6878+5	2.9416–5	7.9256+7	5.2962+7	1.5998+7	1.0295+7	1.5039+3	1.3728+2	1.1006+2	2.7146+1	7.2960–2
7.0838–3	1.6021–7	8.3893+5	3.1675–5	7.6533+7	5.1289+7	1.5395+7	9.8475+6	1.4675+3	1.3302+2	1.0684+2	2.6100+1	7.3789–2
7.5419–3	1.6838–7	7.9826+5	3.5196–5	7.2823+7	4.9000+7	1.4577+7	9.2444+6	1.4173+3	1.2724+2	1.0247+2	2.4692+1	7.5022–2
8.0000–3	1.7643–7	7.6183+5	3.8871–5	6.9499+7	4.6940+7	1.3847+7	8.7107+6	1.3716+3	1.2210+2	9.8577+1	2.3445+1	7.6241–2
8.5000–3	1.8523–7	7.2563+5	4.3058–5	6.6197+7	4.4864+7	1.3134+7	8.1976+6	1.3242+3	1.1680+2	9.4515+1	2.2210+1	7.7288–2
9.2500–3	1.9823–7	6.7803+5	4.9677–5	6.1855+7	4.2121+7	1.2200+7	7.5320+6	1.2608+3	1.0988+2	8.9195+1	2.0607+1	7.8846–2
1.0000–2	2.1102–7	6.3695+5	5.6693–5	5.8107+7	3.9741+7	1.1399+7	6.9664+6	1.2051+3	1.0395+2	8.4627+1	1.9245+1	8.0385–2
1.1250–2	2.3233–7	5.7852+5	6.9252–5	5.2776+7	3.6282+7	1.0287+7	6.2062+6	1.1209+3	9.5246+1	7.7819+1	1.7346+1	8.2005–2
1.3125–2	2.6348–7	5.1012+5	9.0062–5	4.6537+7	3.2206+7	8.9944+6	5.3353+6	1.0195+3	8.5144+1	6.9890+1	1.5170+1	8.4462–2
1.5000–2	2.9379–7	4.5750+5	1.1314–4	4.1736+7	2.9047+7	8.0072+6	4.6803+6	9.3912+2	7.7447+1	6.3825+1	1.3535+1	8.6898–2
1.7500–2	3.3447–7	4.0185+5	1.4729–4	3.6660+7	2.5625+7	7.0084+6	4.0258+6	8.5064+2	6.9126+1	5.7209+1	1.1828+1	8.8867–2
2.0000–2	3.7421–7	3.5918+5	1.8523–4	3.2766+7	2.2988+7	6.2446+6	3.5333+6	7.8075+2	6.2775+1	5.2140+1	1.0544+1	9.0890–2
2.5000–2	4.5122–7	2.9788+5	2.7154–4	2.7174+7	1.9140+7	5.1651+6	2.8686+6	6.7400+2	5.3342+1	4.4501+1	8.7480+0	9.2869–2
3.0000–2	5.2573–7	2.5566+5	3.7147–4	2.3323+7	1.6479+7	4.4234+6	2.4195+6	5.9771+2	4.6867+1	3.9236+1	7.5363+0	9.5133–2
4.0000–2	6.6495–7	2.0213+5	6.0747–4	1.8440+7	1.3111+7	3.4836+6	1.8452+6	4.9479+2	3.8174+1	3.2160+1	5.9167+0	9.7761–2
5.0000–2	7.9516–7	1.6903+5	8.9058–4	1.5420+7	1.1030+7	2.9080+6	1.4817+6	4.3048+2	3.2615+1	2.7657+1	4.8582+0	9.9703–2
6.0000–2	9.1941–7	1.4619+5	1.2169–3	1.3336+7	9.5778+6	2.5192+6	1.2391+6	3.8387+2	2.8754+1	2.4517+1	4.1355+0	1.0126–1
8.0000–2	1.1558–6	1.1629+5	1.9813–3	1.0609+7	7.6474+6	2.0263+6	9.3504+5	3.2222+2	2.3738+1	2.0427+1	3.2074+0	1.0394–1
1.0000–1	1.3749–6	9.7760+4	2.8836–3	8.9183+6	6.4219+6	1.7269+6	7.6924+5	2.8219+2	2.0662+1	1.7862+1	2.6938+0	1.0633–1
1.5000–1	1.8325–6	7.3346+4	5.5915–3	6.6912+6	4.8203+6	1.3237+6	5.4696+5	2.2454+2	1.6428+1	1.4329+1	1.9868+0	1.1234–1
1.7500–1	2.0218–6	6.6479+4	7.1740–3	6.0647+6	4.3777+6	1.2112+6	4.7551+5	2.0773+2	1.5184+1	1.3319+1	1.7496+0	1.1561–1
2.0000–1	2.1955–6	6.1220+4	8.8727–3	5.5849+6	4.0273+6	1.1216+6	4.3581+5	1.9419+2	1.4260+1	1.2517+1	1.6240+0	1.1900–1
3.0000–1	2.7616–6	4.8670+4	1.6470–2	4.4401+6	3.1926+6	9.2153+5	3.2572+5	1.6413+2	1.2123+1	1.0731+1	1.2579+0	1.3437–1
4.0000–1	3.2097–6	4.1876+4	2.5079–2	3.8202+6	2.7223+6	8.2411+5	2.7367+5	1.5020+2	1.1123+1	9.8867+0	1.0842+0	1.5175–1
5.0000–1	3.5787–6	3.7558+4	3.4288–2	3.4263+6	2.4132+6	7.6796+5	2.4499+5	1.4276+2	1.0599+1	9.4380+0	9.8983–1	1.7128–1
6.0000–1	3.8899–6	3.4553+4	4.3871–2	3.1521+6	2.1960+6	7.3189+5	2.2412+5	1.3845+2	1.0272+1	9.1592+0	9.2051–1	1.9212–1
8.0000–1	4.3963–6	3.0573+4	6.3619–2	2.7891+6	1.9012+6	6.8986+5	1.9792+5	1.3445+2	9.9847+0	8.9130+0	8.3431–1	2.3746–1
1.0000+0	4.7928–6	2.8044+4	8.3759–2	2.5584+6	1.7095+6	6.6655+5	1.8223+5	1.3333+2	9.8770+0	8.8062+0	7.8374–1	2.8696–1
1.5000+0	5.4849–6	2.4505+4	1.3405–1	2.2355+6	1.4308+6	6.4040+5	1.6420+5	1.3461+2	1.0008+1	8.8565+0	7.2730–1	4.2414–1
2.0000+0	5.9494–6	2.2592+4	1.8344–1	2.0610+6	1.2759+6	6.3262+5	1.5237+5	1.3750+2	1.0239+1	8.9698+0	6.9530–1	5.7415–1
3.0000+0	6.5302–6	2.0583+4	2.7862–1	1.8777+6	1.1107+6	6.2226+5	1.4456+5	1.4291+2	1.0778+1	9.1997+0	6.7641–1	9.0193–1
4.0000+0	6.8779–6	1.9542+4	3.6904–1	1.7828+6	1.0228+6	6.2074+5	1.3907+5	1.4576+2	1.1346+1	9.4186+0	6.6695–1	1.2599+0
5.0000+0	7.1048–6	1.8918+4	4.5519–1	1.7258+6	9.6899+5	6.1983+5	1.3684+5	1.4801+2	1.1876+1	9.5902+0	6.6117–1	1.6246+0
6.0000+0	7.2580–6	1.8519+4	5.3757–1	1.6894+6	9.3469+5	6.1912+5	1.3545+5	1.4993+2	1.2403+1	9.7391+0	6.5929–1	2.0046+0
8.0000+0	7.4536–6	1.8033+4	6.9240–1	1.6451+6	8.9302+5	6.1832+5	1.3358+5	1.5310+2	1.3447+1	9.9907+0	6.5978–1	2.7969+0
1.0000+1	7.5497–6	1.7803+4	8.3576–1	1.6241+6	8.7316+5	6.1852+5	1.3228+5	1.5560+2	1.4467+1	1.0199+1	6.6288–1	3.6049+0
1.5000+1	7.6006–6	1.7684+4	1.1556+0	1.6132+6	8.6099+5	6.1901+5	1.3308+5	1.6029+2	1.6855+1	1.0475+1	6.7128–1	5.7087+0
2.0000+1	7.6145–6	1.7652+4	1.4327+0	1.6103+6	8.5758+5	6.1937+5	1.3320+5	1.6293+2	1.9290+1	1.0717+1	6.7626–1	7.8962+0
3.0000+1	7.6189–6	1.7641+4	1.8961+0	1.6094+6	8.5745+5	6.1948+5	1.3228+5	1.6624+2	2.4049+1	1.0966+1	6.8033–1	1.2403+1
4.0000+1	7.6183–6	1.7643+4	2.2751+0	1.6095+6	8.5735+5	6.1968+5	1.3230+5	1.6896+2	2.8864+1	1.1152+1	6.8131–1	1.7031+1
5.0000+1	7.6189–6	1.7641+4	2.5953+0	1.6094+6	8.5728+5	6.1982+5	1.3211+5	1.7100+2	3.3726+1	1.1312+1	6.8123–1	2.1733+1
6.0000+1	7.6185–6	1.7642+4	2.8722+0	1.6094+6	8.5722+5	6.1986+5	1.3220+5	1.7260+2	3.8606+1	1.1431+1	6.8261–1	2.6493+1
8.0000+1	7.6185–6	1.7642+4	3.3336+0	1.6094+6	8.5713+5	6.1991+5	1.3223+5	1.7518+2	4.8458+1	1.1606+1	6.8457–1	3.6167+1
1.0000+2	7.6187–6	1.7642+4	3.7088+0	1.6094+6	8.5706+5	6.1996+5	1.3221+5	1.7721+2	5.8460+1	1.1771+1	6.8629–1	4.6002+1
1.5000+2	7.6166–6	1.7647+4	4.4209+0	1.6099+6	8.5693+5	6.1998+5	1.3276+5	1.8059+2	8.3453+1	1.1929+1	6.8922–1	7.0834+1
2.0000+2	7.6158–6	1.7649+4	4.9445+0	1.6100+6	8.5684+5	6.2000+5	1.3299+5	1.8272+2	1.0863+2	1.2081+1	6.9053–1	9.5862+1
3.0000+2	7.6158–6	1.7649+4	5.7008+0	1.6100+6	8.5671+5	6.2002+5	1.3310+5	1.8488+2	1.5901+2	1.2359+1	6.9126–1	1.4595+2
4.0000+2	7.6166–6	1.7647+4	6.2468+0	1.6099+6	8.5662+5	6.2003+5	1.3302+5	1.8621+2	2.0962+2	1.2493+1	6.9102–1	1.9643+2
5.0000+2	7.6184–6	1.7643+4	6.6741+0	1.6095+6	8.5655+5	6.2003+5	1.3273+5	1.8724+2	2.6032+2	1.2593+1	6.8971–1	2.4703+2
6.0000+2	7.6185–6	1.7642+4	7.0253+0	1.6094+6	8.5649+5	6.2003+5	1.3274+5	1.8821+2	3.1055+2	1.2685+1	6.8995–1	2.9718+2
8.0000+2	7.6194–6	1.7640+4	7.5831+0	1.6093+6	8.5640+5	6.2003+5	1.3264+5	1.8984+2	4.1138+2	1.2868+1	6.8979–1	3.9782+2
1.0000+3	7.6203–6	1.7638+4	8.0177+0	1.6091+6	8.5633+5	6.2003+5	1.3252+5	1.9122+2	5.1260+2	1.3020+1	6.8955–1	4.9889+2
1.5000+3	7.6210–6	1.7637+4	8.8101+0	1.6089+6	8.5620+5	6.2003+5	1.3250+5	1.9388+2	7.6629+2	1.3155+1	6.8947–1	7.5244+2
2.0000+3	7.6217–6	1.7635+4	9.3732+0	1.6088+6	8.5611+5	6.2003+5	1.3246+5	1.9586+2	1.0218+3	1.3291+1	6.8922–1	1.0079+3
3.0000+3	7.6222–6	1.7634+4	1.0168+1	1.6087+6	8.5598+5	6.2003+5	1.3247+5	1.9879+2	1.5293+3	1.3562+1	6.8930–1	1.5150+3
4.0000+3	7.6228–6	1.7633+4	1.0732+1	1.6086+6	8.5588+5	6.2003+5	1.3244+5	2.0099+2	2.0386+3	1.3677+1	6.8914–1	2.0242+3
5.0000+3	7.6240–6	1.7630+4	1.1170+1	1.6083+6	8.5581+5	6.2003+5	1.3224+5	2.0273+2	2.5519+3	1.3791+1	6.8808–1	2.5374+3
6.0000+3	7.6239–6	1.7630+4	1.1527+1	1.6083+6	8.5575+5	6.2003+5	1.3231+5	2.0416+2	3.0560+3	1.3878+1	6.8849–1	3.0414+3
8.0000+3	7.6242–6	1.7629+4	1.2092+1	1.6083+6	8.5566+5	6.2003+5	1.3236+5	2.0642+2	4.0731+3	1.4052+1	6.8873–1	4.0583+3
1.0000+4	7.6244–6	1.7629+4	1.2530+1	1.6082+6	8.5559+5	6.2003+5	1.3237+5	2.0819+2	5.0998+3	1.4219+1	6.8881–1	5.0848+3
1.5000+4	7.6248–6	1.7628+4	1.3327+1	1.6081+6	8.5546+5	6.2003+5	1.3242+5	2.1157+2	7.6152+3	1.4349+1	6.8906–1	7.6002+3
2.0000+4	7.6254–6	1.7627+4	1.3894+1	1.6080+6	8.5537+5	6.2003+5	1.3239+5	2.1401+2	1.0164+4	1.4478+1	6.8890–1	1.0148+4
3.0000+4	7.6257–6	1.7626+4	1.4692+1	1.6079+6	8.5524+5	6.2003+5	1.3243+5	2.1741+2	1.5206+4	1.4738+1	6.8914–1	1.5191+4
4.0000+4	7.6263–6	1.7624+4	1.5260+1	1.6078+6	8.5515+5	6.2003+5	1.3240+5	2.1985+2	2.0304+4	1.4887+1	6.8898–1	2.0288+4
5.0000+4	7.6275–6	1.7622+4	1.5699+1	1.6076+6	8.5508+5	6.2003+5	1.3223+5	2.2173+2	2.5354+4	1.4998+1	6.8808–1	2.5338+4
6.0000+4	7.6274–6	1.7622+4	1.6059+1	1.6076+6	8.5502+5	6.2003+5	1.3231+5	2.2326+2	3.0399+4	1.5082+1	6.8849–1	3.0383+4
8.0000+4	7.6276–6	1.7621+4	1.6627+1	1.6075+6	8.5493+5	6.2003+5	1.3234+5	2.2569+2	4.0579+4	1.5249+1	6.8865–1	4.0563+4
1.0000+5	7.6278–6	1.7621+4	1.7066+1	1.6075+6	8.5486+5	6.2003+5	1.3237+5	2.2758+2	5.0776+4	1.5416+1	6.8882–1	5.0760+4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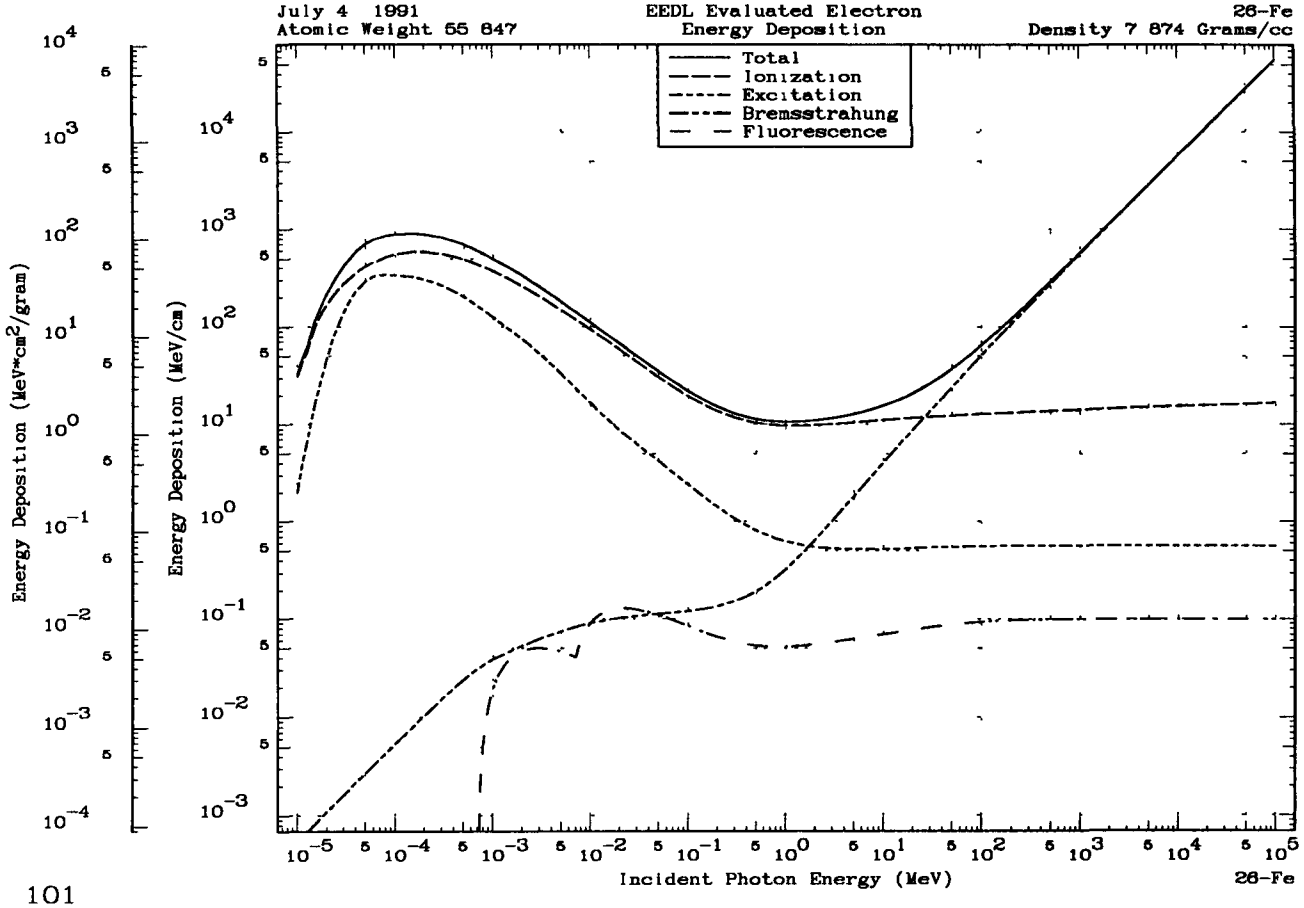
EEDL Evaluated Electron
Cross Sections
26-Fe
Density 7 874 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
26-Fe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Fluorescence
Energy Deposition (MeV*cm²/gram)
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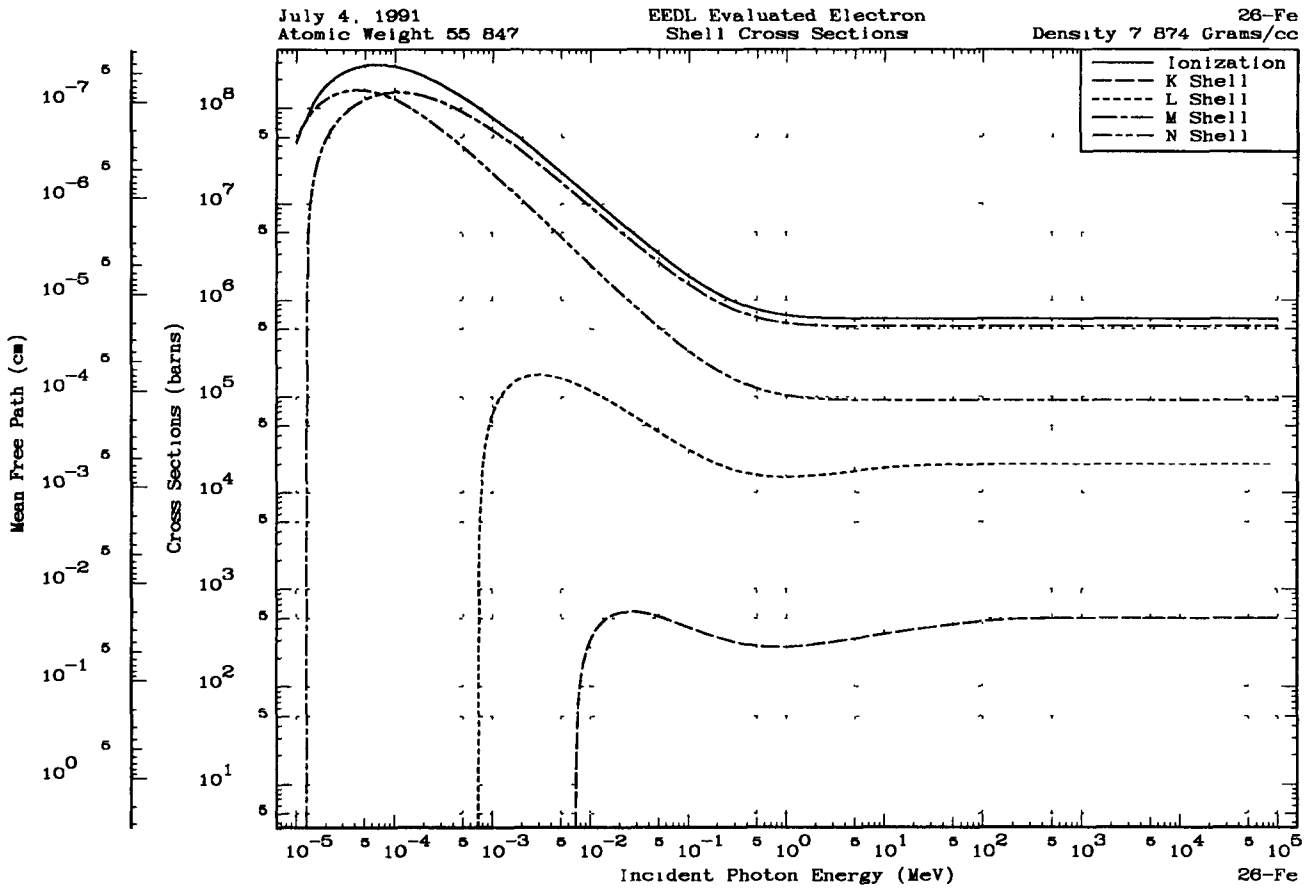
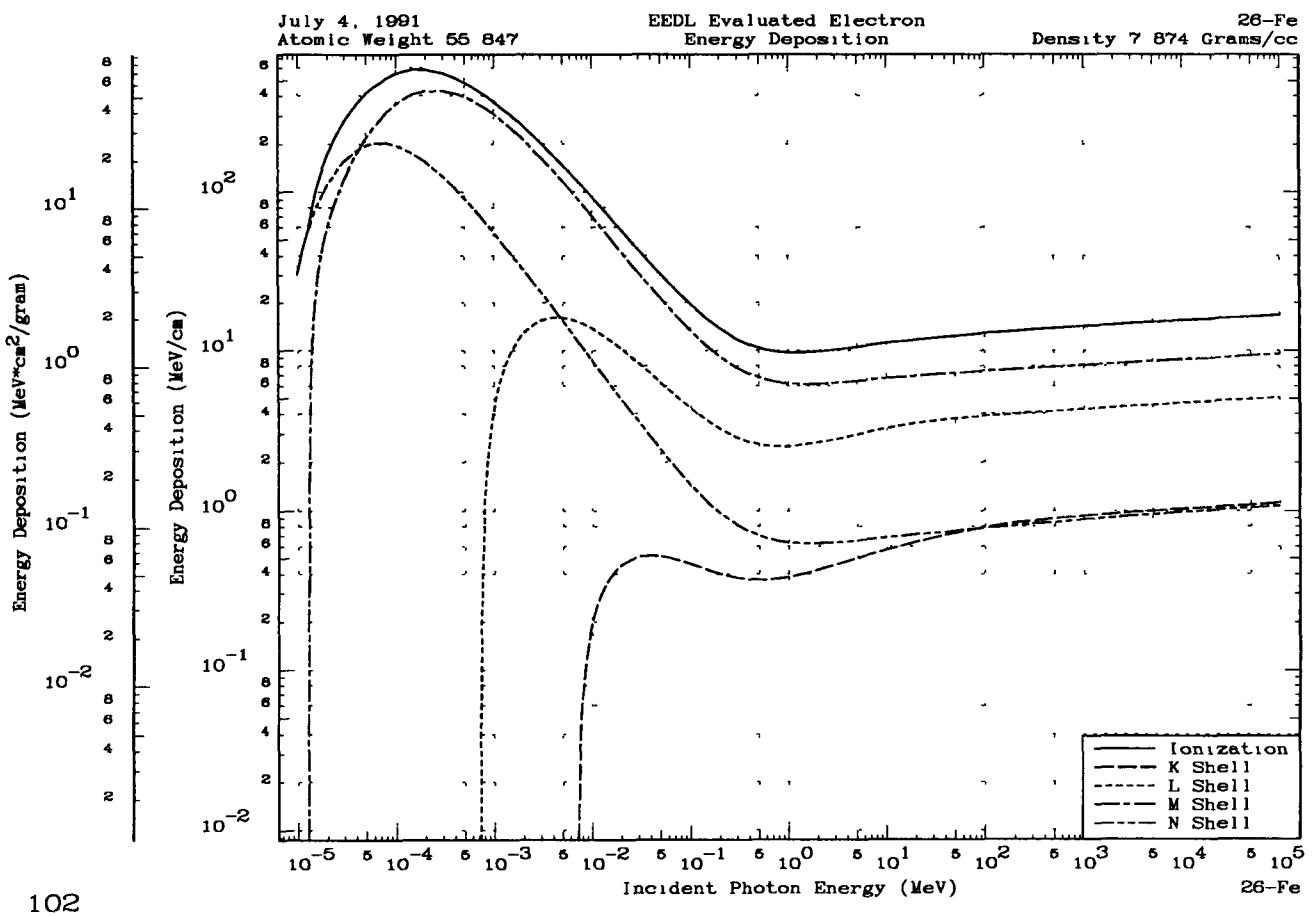
Incident Photon Energy (MeV)
26-Fe

101


July 4, 1991
Atomic Weight 55 847
EEDL Evaluated Electron
Shell Cross Sections
26-Fe
Density 7 874 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
26-Fe


July 4, 1991
Atomic Weight 55 847
EEDL Evaluated Electron
Energy Deposition
26-Fe
Density 7 874 Grams/cc
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
Incident Photon Energy (MeV)
26-Fe

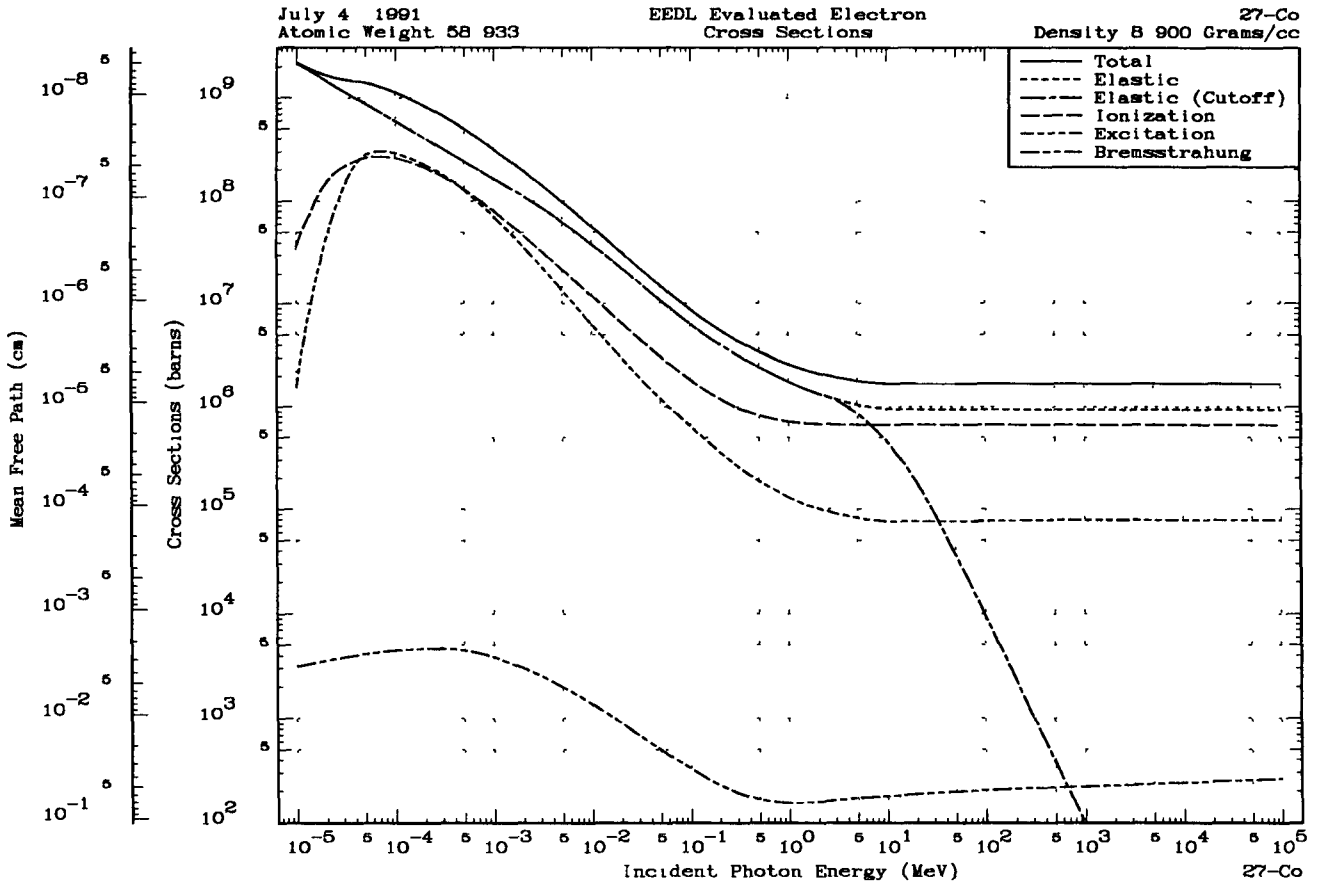
Atomic Weight 55.847 Density 7.874 Grams/cc

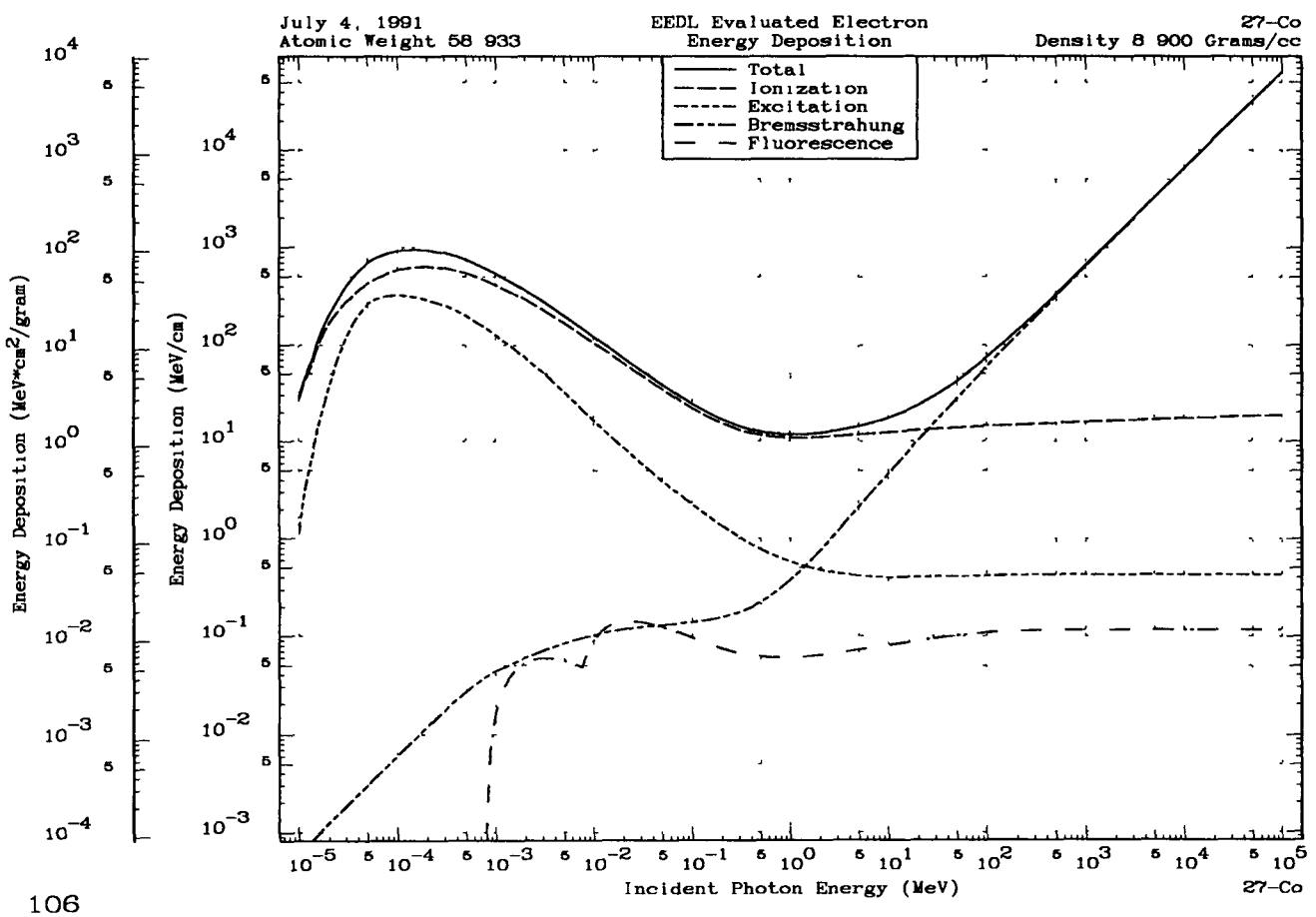
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.8838–9	2.6004+7		2.4115+9	2.3641+9	4.4544+7	2.8444+6	2.9702+3	3.2805+1	3.0845+1	1.9597+0	5.4360–4
	1.1250–5	5.1757–9	2.4538+7		2.2756+9	2.2094+9	6.0532+7	5.6444+6	3.0389+3	4.7518+1	4.3508+1	4.0099+0	6.0834–4
M5	1.2740–5	5.4972–9	2.3103+7		2.1425+9	2.0569+9	7.5936+7	9.5824+6	3.1132+3	6.4013+1	5.6960+1	7.0524+0	6.8691–4
	1.2881–5	5.5232–9	2.2994+7		2.1324+9	2.0439+9	7.8280+7	1.0144+7	3.1199+3	6.6698+1	5.9215+1	7.4826+0	6.9443–4
M4	1.2910–5	5.5286–9	2.2971+7		2.1303+9	2.0413+9	7.8693+7	1.0262+7	3.1212+3	6.7178+1	5.9605+1	7.5729+0	6.9597–4
	1.3146–5	5.5701–9	2.2800+7		2.1144+9	2.0202+9	8.2907+7	1.1335+7	3.1322+3	7.2293+1	6.3919+1	8.3735+0	7.0858–4
	1.3171–5	5.5746–9	2.2782+7		2.1127+9	2.0180+9	8.3303+7	1.1454+7	3.1334+3	7.2786+1	6.4323+1	8.4626+0	7.0992–4
	1.3610–5	5.6489–9	2.2482+7		2.0849+9	1.9803+9	9.0875+7	1.3707+7	3.1534+3	8.2307+1	7.2158+1	1.0148+1	7.3343–4
	1.3628–5	5.6519–9	2.2470+7		2.0838+9	1.9788+9	9.1199+7	1.3809+7	3.1542+3	8.2723+1	7.2497+1	1.0224+1	7.3442–4
	1.4305–5	5.7606–9	2.2046+7		2.0445+9	1.9244+9	1.0264+8	1.7419+7	3.1840+3	9.7499+1	8.4562+1	1.2937+1	7.7096–4
	1.4314–5	5.7621–9	2.2041+7		2.0440+9	1.9237+9	1.0280+8	1.7472+7	3.1844+3	9.7706+1	8.4729+1	1.2977+1	7.7146–4
	1.5000–5	5.8649–9	2.1654+7		2.0081+9	1.8726+9	1.1408+8	2.1414+7	3.2135+3	1.1285+2	9.6893+1	1.5954+1	8.0878–4
	1.6250–5	6.0429–9	2.1016+7		1.9490+9	1.7884+9	1.3079+8	2.9748+7	3.2639+3	1.3837+2	1.1618+2	2.2194+1	8.7748–4
	1.7500–5	6.2007–9	2.0482+7		1.8994+9	1.7138+9	1.4626+8	3.9277+7	3.3112+3	1.6416+2	1.3481+2	2.9344+1	9.4703–4
	1.8125–5	6.2716–9	2.0250+7		1.8779+9	1.6796+9	1.5350+8	4.4800+7	3.3338+3	1.7765+2	1.4415+2	3.3494+1	9.8213–4
	2.0000–5	6.4596–9	1.9661+7		1.8233+9	1.5872+9	1.7264+8	6.3415+7	3.3982+3	2.1759+2	1.7008+2	4.7510+1	1.0886–3
	2.2500–5	6.6641–9	1.9057+7		1.7673+9	1.4833+9	1.9219+8	9.1796+7	3.4641+3	2.6945+2	1.9961+2	6.9837+1	1.2187–3
	2.5000–5	6.8176–9	1.8628+7		1.7275+9	1.3961+9	2.0963+8	1.2175+8	3.5241+3	3.2226+2	2.2823+2	9.4034+1	1.3507–3
	2.6250–5	6.8893–9	1.8434+7		1.7095+9	1.3575+9	2.1703+8	1.3498+8	3.5523+3	3.4658+2	2.4154+2	1.0504+2	1.4174–3
	3.0000–5	7.0427–9	1.8033+7		1.6723+9	1.2572+9	2.3603+8	1.7904+8	3.6305+3	4.2366+2	2.7904+2	1.4462+2	1.6200–3
	3.5000–5	7.2248–9	1.7578+7		1.6301+9	1.1509+9	2.5241+8	2.2687+8	3.7212+3	5.1179+2	3.1909+2	1.9271+2	1.8930–3
	4.0000–5	7.3783–9	1.7213+7		1.5962+9	1.0660+9	2.6600+8	2.6420+8	3.8016+3	5.9292+2	3.5752+2	2.3540+2	2.1715–3
	5.0000–5	7.7265–9	1.6437+7		1.5243+9	9.3806+8	2.7995+8	3.0629+8	3.9178+3	7.1113+2	4.1587+2	2.9526+2	2.7032–3
	6.0000–5	8.1243–9	1.5632+7		1.4497+9	8.4499+8	2.8458+8	3.2010+8	4.0065+3	7.8642+2	4.5833+2	3.2809+2	3.2297–3
M3	6.6450–5	8.4150–9	1.5092+7		1.3996+9	7.9700+8	2.8310+8	3.1947+8	4.0570+3	8.1211+2	4.7531+2	3.3679+2	3.5743–3
	6.7297–5	8.4514–9	1.5027+7		1.3936+9	7.9125+8	2.8300+8	3.1932+8	4.0633+3	8.1579+2	4.7792+2	3.3787+2	3.6199–3
M2	6.8040–5	8.4830–9	1.4971+7		1.3884+9	7.8629+8	2.8289+8	3.1918+8	4.0688+3	8.1894+2	4.8012+2	3.3881+2	3.6599–3
	6.8788–5	8.5188–9	1.4908+7		1.3825+9	7.8139+8	2.8284+8	3.1829+8	4.0743+3	8.2161+2	4.8262+2	3.3899+2	3.7001–3
	6.8885–5	8.5234–9	1.4900+7		1.3818+9	7.8076+8	2.8283+8	3.1818+8	4.0750+3	8.2197+2	4.8295+2	3.3901+2	3.7054–3
	7.0189–5	8.5854–9	1.4793+7		1.3718+9	7.7243+8	2.8271+8	3.1666+8	4.0844+3	8.2645+2	4.8712+2	3.3933+2	3.7758–3
	7.1664–5	8.6542–9	1.4675+7		1.3609+9	7.6330+8	2.8262+8	3.1499+8	4.0948+3	8.3170+2	4.9199+2	3.3972+2	3.8556–3
	7.2642–5	8.6993–9	1.4599+7		1.3539+9	7.5740+8	2.8254+8	3.1390+8	4.1016+3	8.3513+2	4.9515+2	3.3998+2	3.9086–3
	7.5832–5	8.8429–9	1.4362+7		1.3319+9	7.3901+8	2.8236+8	3.1048+8	4.1233+3	8.4653+2	5.0561+2	3.4092+2	4.0820–3
	7.6321–5	8.8645–9	1.4327+7		1.3286+9	7.3629+8	2.8234+8	3.0997+8	4.1266+3	8.4828+2	5.0720+2	3.4107+2	4.1087–3
	8.0000–5	9.0236–9	1.4074+7		1.3052+9	7.1673+8	2.8218+8	3.0627+8	4.1505+3	8.6157+2	5.1927+2	3.4229+2	4.3099–3
	8.5000–5	9.2555–9	1.3722+7		1.2725+9	6.9241+8	2.7940+8	3.0067+8	4.1748+3	8.6898+2	5.2778+2	3.4119+2	4.5718–3
	9.0000–5	9.4777–9	1.3400+7		1.2427+9	6.7024+8	2.7691+8	2.9549+8	4.1979+3	8.7714+2	5.3675+2	3.4038+2	4.8350–3
	9.2500–5	9.5859–9	1.3249+7		1.2286+9	6.5987+8	2.7573+8	2.9303+8	4.2090+3	8.8124+2	5.4116+2	3.4007+2	4.9670–3
	1.0000–4	9.8982–9	1.2831+7	0.0000+0	1.1899+9	6.3122+8	2.7248+8	2.8616+8	4.2407+3	8.9422+2	5.5475+2	3.3947+2	5.3651–3
M1	1.0101–4	9.9413–9	1.2775+7	1.1292–9	1.1847+9	6.2762+8	2.7174+8	2.8535+8	4.2438+3	8.9467+2	5.5543+2	3.3923+2	5.4165–3
	1.0254–4	1.0009–8	1.2688+7	2.8403–9	1.1767+9	6.2227+8	2.7051+8	2.8388+8	4.2484+3	8.9479+2	5.5626+2	3.3852+2	5.4945–3
	1.0551–4	1.0139–8	1.2526+7	6.1543–9	1.1616+9	6.1224+8	2.6821+8	2.8111+8	4.2570+3	8.9520+2	5.5797+2	3.3722+2	5.6459–3
	1.1107–4	1.0377–8	1.2239+7	1.2363–8	1.1350+9	5.9460+8	2.6417+8	2.7619+8	4.2727+3	8.9657+2	5.6156+2	3.3500+2	5.9305–3
	1.1250–4	1.0437–8	1.2168+7	1.3958–8	1.1284+9	5.9028+8	2.6318+8	2.7498+8	4.2766+3	8.9701+2	5.6253+2	3.3447+2	6.0039–3
	1.2080–4	1.0776–8	1.1785+7	2.3199–8	1.0929+9	5.6683+8	2.5773+8	2.6834+8	4.2984+3	8.9990+2	5.6816+2	3.3173+2	6.4306–3
	1.2500–4	1.0942–8	1.1606+7	2.7859–8	1.0763+9	5.5591+8	2.5519+8	2.6521+8	4.3089+3	9.0176+2	5.7123+2	3.3053+2	6.6472–3
	1.3125–4	1.1183–8	1.1356+7	3.4781–8	1.0532+9	5.4068+8	2.5167+8	2.6080+8	4.3240+3	9.0395+2	5.7501+2	3.2894+2	6.9704–3
	1.3540–4	1.1339–8	1.1200+7	3.9369–8	1.0387+9	5.3118+8	2.4944+8	2.5802+8	4.3336+3	9.0550+2	5.7749+2	3.2801+2	7.1856–3
	1.5000–4	1.1866–8	1.0703+7	5.5431–8	9.9257+8	5.0110+8	2.4236+8	2.4910+8	4.3654+3	9.1240+2	5.8701+2	3.2538+2	7.9459–3
	1.7500–4	1.2816–8	9.9098+6	8.3042–8	9.1899+8	4.5900+8	2.2761+8	2.3239+8	4.3983+3	8.9849+2	5.8503+2	3.1345+2	9.2213–3
	2.0000–4	1.3696–8	9.2729+6	1.1099–7	8.5993+8	4.2539+8	2.1571+8	2.1883+8	4.4269+3	8.9067+2	5.8619+2	3.0447+2	1.0505–2
	2.2500–4	1.4594–8	8.7020+6	1.3942–7	8.0699+8	3.9788+8	2.0328+8	2.0584+8	4.4207+3	8.6791+2	5.7523+2	2.9267+2	1.1700–2
	2.5000–4	1.5445–8	8.2227+6	1.6852–7	7.6254+8	3.7478+8	1.9289+8	1.9487+8	4.4151+3	8.5068+2	5.6765+2	2.8302+2	1.2893–2
	2.6250–4	1.5856–8	8.0096+6	1.8328–7	7.4278+8	3.6454+8	1.8825+8	1.8999+8	4.4125+3	8.4323+2	5.6439+2	2.7883+2	1.3490–2
	3.0000–4	1.7101–8	7.4264+6	2.2832–7	6.8870+8	3.3792+8	1.7621+8	1.7456+8	4.4055+3	8.2171+2	5.5754+2	2.6416+2	1.5276–2
	3.5000–4	1.8747–8	6.7744+6	2.9070–7	6.2824+8	3.0979+8	1.6115+8	1.5729+8	4.3849+3	7.8187+2	5.3685+2	2.4501+2	1.7600–2
	4.0000–4	2.0295–8	6.2576+6	3.5588–7	5.8031+8	2.8732+8	1.4926+8	1.4372+8	4.3672+3	7.5253+2	5.2226+2	2.3025+2	1.9914–2
	5.0000–4	2.3352–8	5.4386+6	4.9447–7	5.0435+8	2.5337+8	1.2977+8	1.2121+8	4.2361+3	6.9144+2	4.8878+2	2.0263+2	2.3895–2
	6.0000–4	2.6303–8	4.8283+6	6.4492–7	4.4776+8	2.2863+8	1.1497+8	1.0415+8	4.1320+3	6.3858+2	4.5833+2	1.8022+2	2.7774–2
L3	7.2069–4	2.9678–8	4.2793+6	8.4250–7	3.9685+8	2.0625+8	1.0109+8	8.9502+7	3.9870+3	5.8393+2	4.2429+2	1.5960+2	3.1735–2
	7.3060–4	2.9954–8	4.2398+6	8.5953–7	3.9318+8	2.0467+8	1.0013+8	8.8377+7	3.9727+3	5.8011+2	4.2206+2	1.5802+2	3.2002–2
L2	7.3355–4	3.0036–8	4.2282+6	8.6462–7	3.9211+8	2.0421+8	9.9849+7	8.8048+7	3.9685+3	5.7898+2	4.2139+2	1.5755+2	3.2081–2
	7.3770–4	3.0153–8	4.2119+6	8.7180–7	3.9060+8	2.0356+8	9.9454+7	8.7575+7	3.9626+3	5.7742+2	4.2049+2	1.5690+2	3.2192–2
	7.4160–4	3.0262–8	4.1968+6	8.7855–7	3.8919+8	2.0296+8	9.9089+7	8.7137+7	3.9571+3	5.7598+2	4.1966+2	1.5629+2	3.2296–2
	7.4795–4	3.0439–8	4.1723+6	8.8961–7	3.8692+8	2.0199+8	9.8499+7	8.6432+7	3.9482+3	5.7369+2	4.1836+2	1.5530+2	3.2466–2
	7.4890–4	3.0465–8	4.1687+6	8.9125–7	3.8659+8	2.0185+8	9.8412+7	8.6328+7	3.9469+3	5.7335+2	4.1816+2	1.5516+2	3.2492–2
	7.5528–4	3.0643–8	4.1446+6	9.0242–7	3.8435+8	2.0089+8	9.7828+7	8.5632+7	3.9381+3	5.7105+2	4.1683+2	1.5419+2	3.2662–2
	7.7764–4	3.1260–8	4.0628+6	9.4183–7	3.7676+8	1.9762+8	9.5853+7	8.3285+7	3.9079+3	5.6338+2	4.1243+2	1.5092+2	3.3256–2
	8.0000–4	3.1870–8	3.9849+6	9.8177–7	3.6955+8	1.9450+8	9.3976+7	8.1066+7	3.8788+3	5.5626+2	4.0840+2	1.4783+2	3.3847–2
L1	8.4296–4	3.3017–8	3.8465+6	1.0601–6	3.5671+8	1.8890+8	9.0426+7	7.7389+7	3.8257+3	5.4108+2	3.9881+2	1.4223+2	3.4972–2
	8.5000–4	3.3205–8	3.8247+6	1.0731–6	3.5469+8	1.8802+8	8.9874+7	7.6793+7	3.8174+3	5.3874+2	3.9737+2	1.4133+2	3.5155–2
	8.8222–4	3.4061–8	3.7286+6	1.1335–6	3.4578+8	1.8415+8	8.7446+7	7.4180+7	3.7801+3	5.2835+2	3.9089+2	1.3742+2	3.5989–2
	9.2500–4	3.5180–8	3.6100+6	1.2155–6	3.3478+8	1.7934+8	8.4456+7	7.0982+7	3.7333+3	5.1576+2	3.8309+2	1.3264+2	3.7087–2
	9.4111–4	3.5597–8	3.5677+6	1.2468–6	3.3086+8	1.7761+8	8.3391+7	6.9851+7	3.7163+3	5.1129+2	3.8030+2	1.3095+2	3.7497–2
	1.0000–3	3.7099–8	3.4233+6	1.3637–6	3.1746+8	1.7168+8	7.9760+7	6.6015+7	3.6574+3	4.9620+2	3.7094+2	1.2521+2	3.8983–2
	1.0625–3	3.8688–8	3.2827+6	1.4920–6	3.0443+8	1.6592+8	7.6100+7	6.2400+7	3.5812+3	4.7878+2	3.5933+2	1.1941+2	3.9996–2
	1.1250–3	4.0244–8	3.1558+6	1.6247–6	2.9265+8	1.6067+8	7.2808+7	5.9173+7	3.5109+3	4.6333+2	3.4906+2	1.1423+2	4.0999–2
	1.1719–3	4.1392–8	3.0682+6	1.7270–6	2.8454+8	1.5702+8	7.0545+7	5.6970+7	3.4615+3	4.5267+2	3.4193+2	1.1070+2	4.1744–2
	1.3125–3	4.4742–8	2.8385+6	2.0475–6	2.6323+8	1.4732+8	6.4635+7	5.1277+7	3.3280+3	4.2529+2	3.2367+2	1.0158+2	4.3948–2
	1.3359–3	4.5288–8	2.8043+6	2.1028–6	2.6006+8	1.4585+8	6.3758+7	5.0440+7	3.3076+3	4.2124+2	3.2095+2	1.0024+2	4.4311–2

Atomic Weight 55.847 Density 7.874 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000–3	4.9020–8	2.5908+6	2.5043–6	2.4026+8	1.3665+8	5.8314+7	4.5294+7	3.1773+3	3.9638+2	3.0432+2	9.2014+1	4.6813–2
1.6250–3	5.1846–8	2.4496+6	2.8274–6	2.2716+8	1.3046+8	5.4672+7	4.2028+7	3.0828+3	3.7741+2	2.9097+2	8.6395+1	4.8412–2
1.7500–3	5.4600–8	2.3260+6	3.1660–6	2.1570+8	1.2498+8	5.1507+7	3.9214+7	2.9979+3	3.6109+2	2.7948+2	8.1560+1	4.9986–2
1.8125–3	5.5953–8	2.2698+6	3.3409–6	2.1049+8	1.2247+8	5.0072+7	3.7948+7	2.9585+3	3.5367+2	2.7424+2	7.9386+1	5.0764–2
2.0000–3	5.9918–8	2.1196+6	3.8862–6	1.9656+8	1.1568+8	4.6263+7	3.4611+7	2.8508+3	3.3414+2	2.6043+2	7.3661+1	5.3062–2
2.2500–3	6.5319–8	1.9443+6	4.6640–6	1.8031+8	1.0755+8	4.1951+7	3.0805+7	2.7120+3	3.0909+2	2.4241+2	6.6625+1	5.5464–2
2.5000–3	7.0541–8	1.8004+6	5.5004–6	1.6696+8	1.0076+8	3.8440+7	2.7758+7	2.5937+3	2.8890+2	2.2785+2	6.0992+1	5.7811–2
2.6250–3	7.3093–8	1.7375+6	5.9398–6	1.6113+8	9.7762+7	3.6916+7	2.6450+7	2.5406+3	2.8011+2	2.2147+2	5.8575+1	5.8963–2
3.0000–3	8.0538–8	1.5769+6	7.3344–6	1.4624+8	9.0006+7	3.3049+7	2.3179+7	2.4009+3	2.5800+2	2.0541+2	5.2530+1	6.2340–2
4.0000–3	1.0008–7	1.2690+6	1.1600–5	1.1769+8	7.4654+7	2.5898+7	1.7132+7	2.0976+3	2.1239+2	1.7178+2	4.0533+1	6.9078–2
5.0000–3	1.1898–7	1.0674+6	1.6686–5	9.8989+7	6.4172+7	2.1389+7	1.3426+7	1.8758+3	1.8162+2	1.4876+2	3.2795+1	7.4278–2
6.0000–3	1.3736–7	9.2459+5	2.2560–5	8.5743+7	5.6533+7	1.8275+7	1.0933+7	1.7062+3	1.5935+2	1.3188+2	2.7390+1	7.8608–2
K 7.0834–3	1.5672–7	8.1035+5	2.9779–5	7.5149+7	5.0256+7	1.5828+7	9.0633+6	1.5588+3	1.4118+2	1.1787+2	2.3230+1	8.2299–2
7.1980–3	1.5874–7	8.0004+5	3.0595–5	7.4192+7	4.9682+7	1.5610+7	8.8998+6	1.5450+3	1.3954+2	1.1660+2	2.2859+1	8.2638–2
7.3985–3	1.6226–7	7.8269+5	3.2046–5	7.2583+7	4.8713+7	1.5242+7	8.6267+6	1.5215+3	1.3679+2	1.1446+2	2.2240+1	8.3229–2
7.6992–3	1.6750–7	7.5821+5	3.4277–5	7.0314+7	4.7343+7	1.4724+7	8.2453+6	1.4881+3	1.3292+2	1.1146+2	2.1375+1	8.4111–2
8.0000–3	1.7269–7	7.3542+5	3.6571–5	6.8200+7	4.6061+7	1.4243+7	7.8946+6	1.4567+3	1.2933+2	1.0867+2	2.0578+1	8.4986–2
8.5000–3	1.8139–7	7.0016+5	4.0524–5	6.4930+7	4.4046+7	1.3513+7	7.3699+6	1.4068+3	1.2363+2	1.0419+2	1.9356+1	8.6176–2
9.2500–3	1.9423–7	6.5385+5	4.6781–5	6.0635+7	4.1383+7	1.2556+7	6.6957+6	1.3401+3	1.1620+2	9.8326+1	1.7784+1	8.7946–2
1.0000–2	2.0686–7	6.1394+5	5.3418–5	5.6934+7	3.9070+7	1.1734+7	6.1290+6	1.2814+3	1.0984+2	9.3292+1	1.6461+1	8.9692–2
1.1250–2	2.2785–7	5.5740+5	6.5309–5	5.1691+7	3.5703+7	1.0593+7	5.3927+6	1.1933+3	1.0055+2	8.5777+1	1.4679+1	9.1585–2
1.2188–2	2.4329–7	5.2202+5	7.4911–5	4.8410+7	3.3583+7	9.8824+6	4.9435+6	1.1370+3	9.4770+1	8.1088+1	1.3590+1	9.3015–2
1.3594–2	2.6603–7	4.7739+5	9.0348–5	4.4272+7	3.0891+7	8.9890+6	4.3904+6	1.0644+3	8.7535+1	7.5191+1	1.2248+1	9.5158–2
1.5000–2	2.8831–7	4.4049+5	1.0698–4	4.0850+7	2.8650+7	8.2534+6	3.9450+6	1.0029+3	8.1597+1	7.0333+1	1.1166+1	9.7277–2
1.7500–2	3.2795–7	3.8725+5	1.3939–4	3.5912+7	2.5322+7	7.2264+6	3.3631+6	9.0995+2	7.2837+1	6.3044+1	9.6929+0	9.9583–2
2.0000–2	3.6663–7	3.4639+5	1.7540–4	3.2123+7	2.2753+7	6.4409+6	2.9289+6	8.3644+2	6.6154+1	5.7459+1	8.5926+0	1.0194–1
2.5000–2	4.4090–7	2.8805+5	2.5724–4	2.6713+7	1.9000+7	5.3279+6	2.3841+6	7.2335+2	5.6292+1	4.9020+1	7.1677+0	1.0438–1
3.0000–2	5.1258–7	2.4777+5	3.5188–4	2.2977+7	1.6398+7	4.5632+6	2.0151+6	6.4239+2	4.9518+1	4.3206+1	6.2048+0	1.0711–1
4.0000–2	6.4574–7	1.9668+5	5.7484–4	1.8239+7	1.3081+7	3.5958+6	1.5617+6	5.3326+2	4.0490+1	3.5409+1	4.9700+0	1.1012–1
5.0000–2	7.6968–7	1.6500+5	8.4123–4	1.5302+7	1.1017+7	3.0034+6	1.2809+6	4.6322+2	3.4734+1	3.0443+1	4.1785+0	1.1251–1
6.0000–2	8.8790–7	1.4303+5	1.1472–3	1.3264+7	9.5751+6	2.6028+6	1.0861+6	4.1312+2	3.0717+1	2.6989+1	3.6137+0	1.1432–1
8.0000–2	1.1128–6	1.1413+5	1.8611–3	1.0584+7	7.6510+6	2.0947+6	8.3794+5	3.4671+2	2.5472+1	2.2481+1	2.8735+0	1.1745–1
1.0000–1	1.3217–6	9.6091+4	2.7017–3	8.9111+6	6.4390+6	1.7861+6	6.8572+5	3.0371+2	2.2188+1	1.9663+1	2.4056+0	1.2015–1
1.5000–1	1.7589–6	7.2203+4	5.2230–3	6.6958+6	4.8460+6	1.3702+6	4.7947+5	2.4166+2	1.7648+1	1.5770+1	1.7505+0	1.2706–1
1.7500–1	1.9384–6	6.5517+4	6.6958–3	6.0758+6	4.4086+6	1.2541+6	4.1282+5	2.2370+2	1.6318+1	1.4659+1	1.5282+0	1.3081–1
2.0000–1	2.1031–6	6.0388+4	8.2764–3	5.6001+6	4.0619+6	1.1615+6	3.7655+5	2.0923+2	1.5326+1	1.3778+1	1.4131+0	1.3468–1
3.0000–1	2.6364–6	4.8171+4	1.5347–2	4.4672+6	3.2387+6	9.5500+5	2.7334+5	1.7747+2	1.3024+1	1.1806+1	1.0658+0	1.5215–1
4.0000–1	3.0577–6	4.1535+4	2.3359–2	3.8518+6	2.7720+6	8.5451+5	2.2517+5	1.6254+2	1.1952+1	1.0878+1	9.0189–1	1.7178–1
5.0000–1	3.4077–6	3.7269+4	3.1935–2	3.4562+6	2.4644+6	7.9666+5	1.9493+5	1.5430+2	1.1376+1	1.0384+1	7.9746–1	1.9367–1
6.0000–1	3.6977–6	3.4346+4	4.0860–2	3.1851+6	2.2478+6	7.5947+5	1.7771+5	1.4961+2	1.1033+1	1.0077+1	7.3965–1	2.1710–1
8.0000–1	4.1702–6	3.0454+4	5.9238–2	2.8242+6	1.9529+6	7.1608+5	1.5509+5	1.4527+2	1.0734+1	9.8021+0	6.6340–1	2.6852–1
1.0000+0	4.5373–6	2.7990+4	7.7960–2	2.5957+6	1.7605+6	6.9221+5	1.4283+5	1.4383+2	1.0631+1	9.6834+0	6.2390–1	3.2401–1
1.5000+0	5.1832–6	2.4502+4	1.2465–1	2.2723+6	1.4800+6	6.6570+5	1.2640+5	1.4491+2	1.0786+1	9.7388+0	5.6923–1	4.7796–1
2.0000+0	5.6141–6	2.2621+4	1.7046–1	2.0978+6	1.3234+6	6.5694+5	1.1734+5	1.4759+2	1.1047+1	9.8559+0	5.4501–1	6.4645–1
3.0000+0	6.1553–6	2.0633+4	2.5861–1	1.9134+6	1.1558+6	6.4643+5	1.1097+5	1.5319+2	1.1646+1	1.0102+1	5.2889–1	1.0148+0
4.0000+0	6.4786–6	1.9603+4	3.4228–1	1.8179+6	1.0663+6	6.4506+5	1.0641+5	1.5742+2	1.2262+1	1.0328+1	5.2026–1	1.4136+0
5.0000+0	6.6884–6	1.8988+4	4.2186–1	1.7609+6	1.0112+6	6.4401+5	1.0548+5	1.6078+2	1.2875+1	1.0533+1	5.1971–1	1.8225+0
6.0000+0	6.8331–6	1.8586+4	4.9780–1	1.7236+6	9.7563+5	6.4323+5	1.0459+5	1.6240+2	1.3466+1	1.0692+1	5.1927–1	2.2554+0
8.0000+0	7.0148–6	1.8105+4	6.4034–1	1.6789+6	9.3357+5	6.4233+5	1.0288+5	1.6499+2	1.4612+1	1.0959+1	5.1856–1	3.1337+0
1.0000+1	7.1092–6	1.7864+4	7.7217–1	1.6566+6	9.1253+5	6.4250+5	1.0145+5	1.6762+2	1.5746+1	1.1179+1	5.1908–1	4.0472+0
1.5000+1	7.1641–6	1.7727+4	1.0656+0	1.6440+6	8.9946+5	6.4296+5	1.0137+5	1.7230+2	1.8404+1	1.1470+1	5.2209–1	6.4118+0
2.0000+1	7.1699–6	1.7713+4	1.3190+0	1.6426+6	8.9664+5	6.4330+5	1.0252+5	1.7512+2	2.1117+1	1.1724+1	5.3152–1	8.8610+0
3.0000+1	7.1674–6	1.7719+4	1.7410+0	1.6432+6	8.9649+5	6.4344+5	1.0309+5	1.7873+2	2.6485+1	1.2029+1	5.4145–1	1.3914+1
4.0000+1	7.1643–6	1.7727+4	2.0847+0	1.6439+6	8.9638+5	6.4364+5	1.0372+5	1.8148+2	3.1869+1	1.2224+1	5.4553–1	1.9100+1
5.0000+1	7.1637–6	1.7728+4	2.3745+0	1.6441+6	8.9630+5	6.4374+5	1.0384+5	1.8359+2	3.7274+1	1.2378+1	5.4689–1	2.4349+1
6.0000+1	7.1626–6	1.7731+4	2.6250+0	1.6443+6	8.9623+5	6.4377+5	1.0411+5	1.8533+2	4.2703+1	1.2499+1	5.4910–1	2.9655+1
8.0000+1	7.1612–6	1.7734+4	3.0414+0	1.6446+6	8.9613+5	6.4384+5	1.0447+5	1.8799+2	5.3775+1	1.2704+1	5.5249–1	4.0518+1
1.0000+2	7.1604–6	1.7736+4	3.3794+0	1.6448+6	8.9604+5	6.4388+5	1.0470+5	1.9005+2	6.4939+1	1.2882+1	5.5521–1	5.1502+1
1.5000+2	7.1571–6	1.7745+4	4.0196+0	1.6456+6	8.9589+5	6.4390+5	1.0557+5	1.9371+2	9.2924+1	1.3053+1	5.5988–1	7.9312+1
2.0000+2	7.1556–6	1.7748+4	4.4896+0	1.6459+6	8.9579+5	6.4392+5	1.0600+5	1.9599+2	1.2109+2	1.3217+1	5.6226–1	1.0732+2
3.0000+2	7.1546–6	1.7751+4	5.1676+0	1.6461+6	8.9564+5	6.4394+5	1.0637+5	1.9836+2	1.7744+2	1.3516+1	5.6438–1	1.6336+2
4.0000+2	7.1550–6	1.7750+4	5.6567+0	1.6460+6	8.9553+5	6.4395+5	1.0637+5	1.9986+2	2.3407+2	1.3666+1	5.6455–1	2.1984+2
5.0000+2	7.1563–6	1.7747+4	6.0393+0	1.6458+6	8.9545+5	6.4395+5	1.0615+5	2.0105+2	2.9070+2	1.3775+1	5.6353–1	2.7636+2
6.0000+2	7.1564–6	1.7746+4	6.3535+0	1.6457+6	8.9538+5	6.4395+5	1.0620+5	2.0204+2	3.4757+2	1.3873+1	5.6396–1	3.3313+2
8.0000+2	7.1571–6	1.7745+4	6.8520+0	1.6456+6	8.9527+5	6.4396+5	1.0614+5	2.0387+2	4.6010+2	1.4070+1	5.6396–1	4.4546+2
1.0000+3	7.1578–6	1.7743+4	7.2406+0	1.6454+6	8.9519+5	6.4396+5	1.0605+5	2.0530+2	5.7347+2	1.4235+1	5.6379–1	5.5867+2
1.5000+3	7.1584–6	1.7741+4	7.9488+0	1.6453+6	8.9504+5	6.4396+5	1.0606+5	2.0822+2	8.5749+2	1.4381+1	5.6387–1	8.4255+2
2.0000+3	7.1592–6	1.7740+4	8.4525+0	1.6451+6	8.9493+5	6.4396+5	1.0600+5	2.1037+2	1.1414+3	1.4526+1	5.6353–1	1.1263+3
3.0000+3	7.1596–6	1.7738+4	9.1637+0	1.6450+6	8.9478+5	6.4396+5	1.0603+5	2.1357+2	1.7087+3	1.4817+1	5.6370–1	1.6933+3
4.0000+3	7.1603–6	1.7737+4	9.6688+0	1.6448+6	8.9467+5	6.4396+5	1.0598+5	2.1594+2	2.2789+3	1.4945+1	5.6344–1	2.2634+3
5.0000+3	7.1616–6	1.7734+4	1.0060+1	1.6445+6	8.9459+5	6.4396+5	1.0577+5	2.1779+2	2.8545+3	1.5073+1	5.6234–1	2.8388+3
6.0000+3	7.1615–6	1.7734+4	1.0380+1	1.6446+6	8.9452+5	6.4396+5	1.0587+5	2.1932+2	3.4183+3	1.5167+1	5.6285–1	3.4026+3
8.0000+3	7.1618–6	1.7733+4	1.0885+1	1.6445+6	8.9442+5	6.4396+5	1.0590+5	2.2175+2	4.5561+3	1.5354+1	5.6302–1	4.5401+3
1.0000+4	7.1620–6	1.7733+4	1.1276+1	1.6444+6	8.9434+5	6.4396+5	1.0593+5	2.2365+2	5.7045+3	1.5533+1	5.6319–1	5.6884+3
1.5000+4	7.1625–6	1.7731+4	1.1989+1	1.6443+6	8.9418+5	6.4396+5	1.0596+5	2.2728+2	8.5183+3	1.5673+1	5.6336–1	8.5020+3
2.0000+4	7.1630–6	1.7730+4	1.2495+1	1.6442+6	8.9408+5	6.4396+5	1.0595+5	2.2990+2	1.1369+4	1.5812+1	5.6327–1	1.1352+4
3.0000+4	7.1635–6	1.7729+4	1.3209+1	1.6441+6	8.9393+5	6.4396+5	1.0599+5	2.3355+2	1.7010+4	1.6091+1	5.6353–1	1.6993+4
4.0000+4	7.1640–6	1.7727+4	1.3716+1	1.6440+6	8.9382+5	6.4396+5	1.0596+5	2.3617+2	2.2712+4	1.6256+1	5.6336–1	2.2695+4
5.0000+4	7.1653–6	1.7724+4	1.4110+1	1.6437+6	8.9374+5	6.4396+5	1.0575+5	2.3819+2	2.8361+4	1.6380+1	5.6226–1	2.8344+4
6.0000+4	7.1652–6	1.7725+4	1.4431+1	1.6437+6	8.9367+5	6.4396+5	1.0585+5	2.3983+2	3.4005+4	1.6470+1	5.6277–1	3.3988+4

Atomic Weight 55.847												Density 7.874 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+4	7.1654–6	1.7724+4	1.4938+1	1.6437+6	8.9356+5	6.4396+5	1.0590+5	2.4245+2	4.5392+4	1.6650+1	5.6302–1	4.5375+4
1.0000+5	7.1657–6	1.7723+4	1.5331+1	1.6436+6	8.9348+5	6.4396+5	1.0591+5	2.4448+2	5.6799+4	1.6829+1	5.6311–1	5.6782+4


July 4 1991
Atomic Weight 58 933
EEDL Evaluated Electron
Cross Sections
27-Co
Density 8 900 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
27-Co


July 4, 1991
Atomic Weight 58 933
EEDL Evaluated Electron
Energy Deposition
27-Co
Density 8 900 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
27-Co

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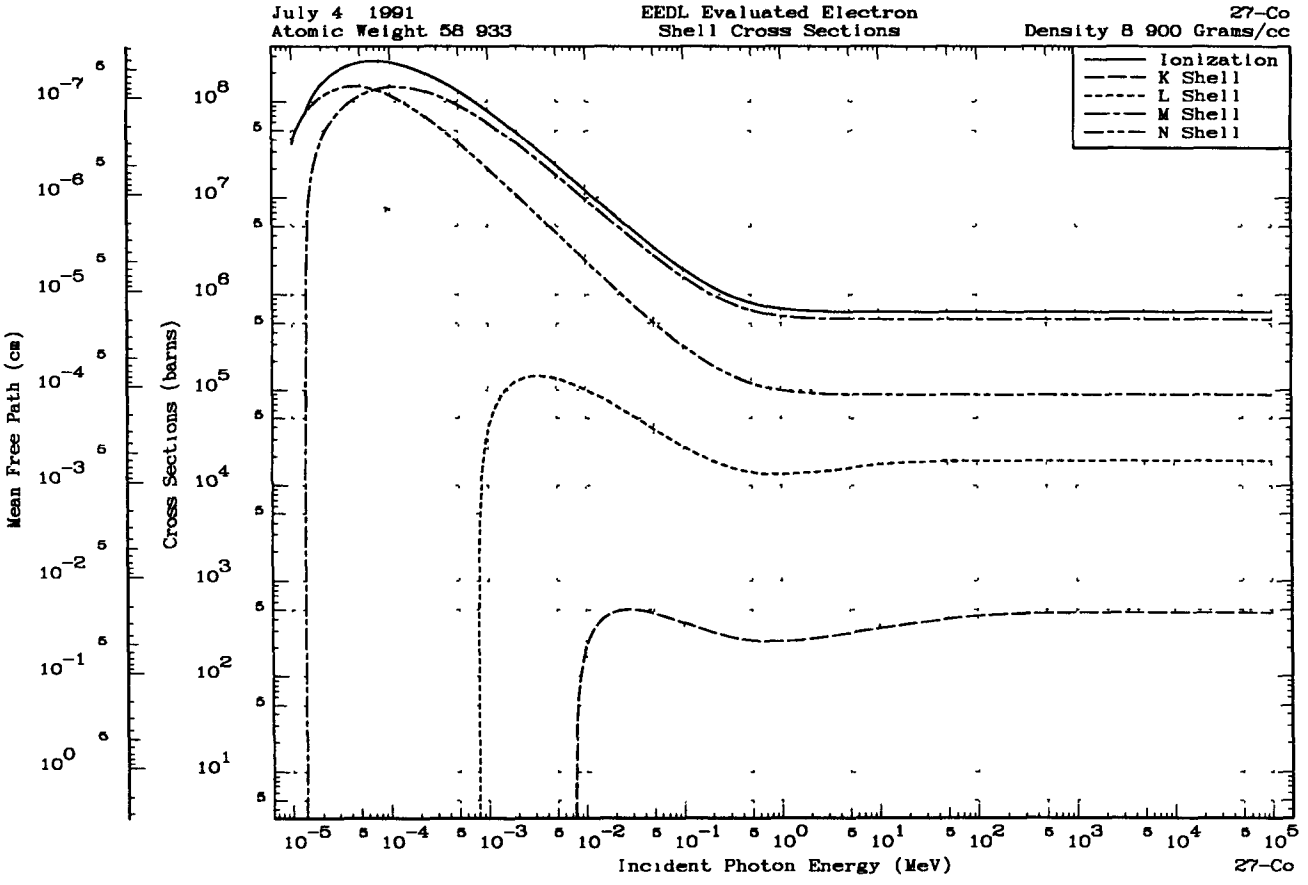
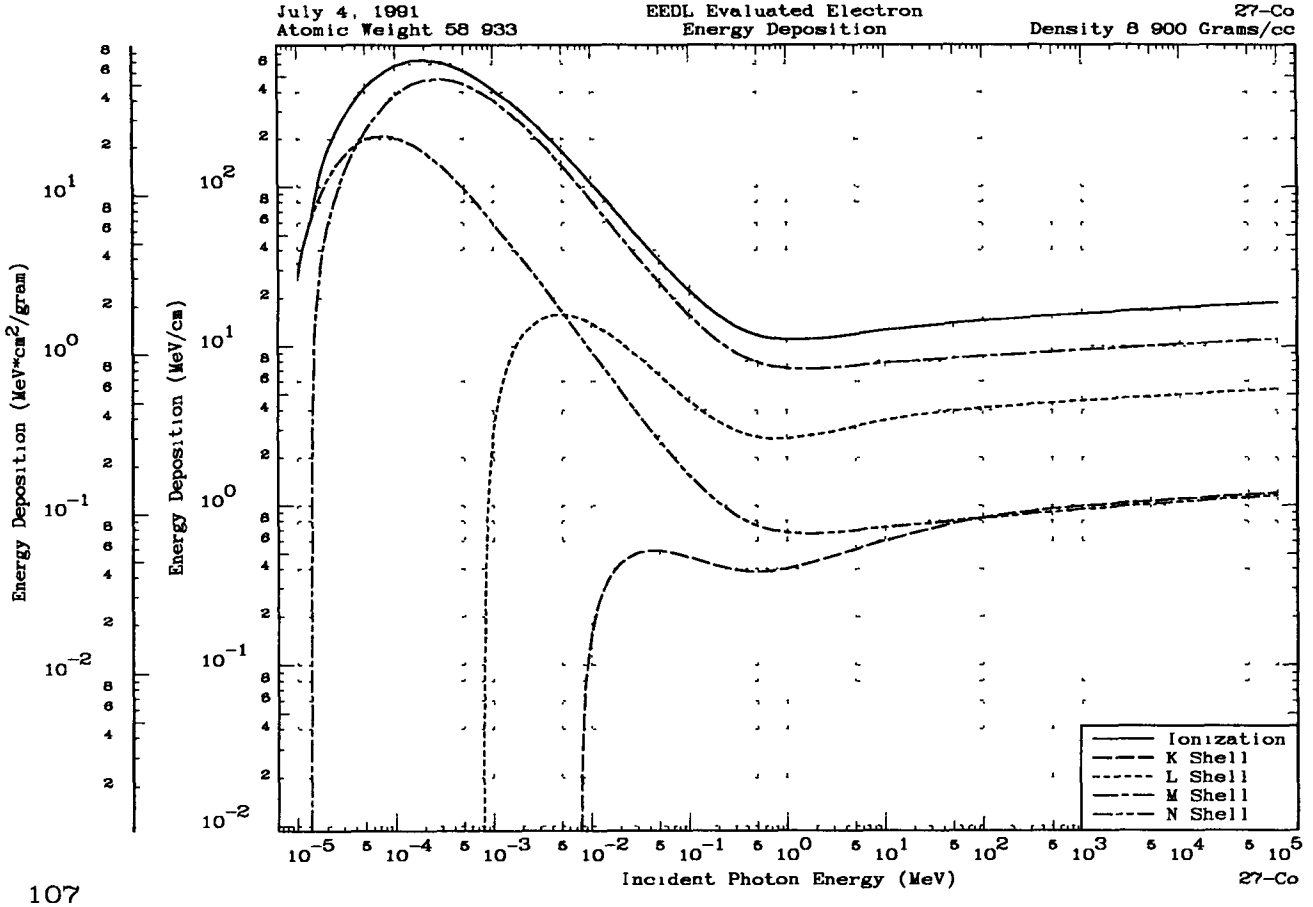

July 4 1991
Atomic Weight 58 933
EEDL Evaluated Electron
Shell Cross Sections
27-Co
Density 8 900 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
27-Co


July 4, 1991
Atomic Weight 58 933
EEDL Evaluated Electron
Energy Deposition
27-Co
Density 8 900 Grams/cc
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
Incident Photon Energy (MeV)
27-Co

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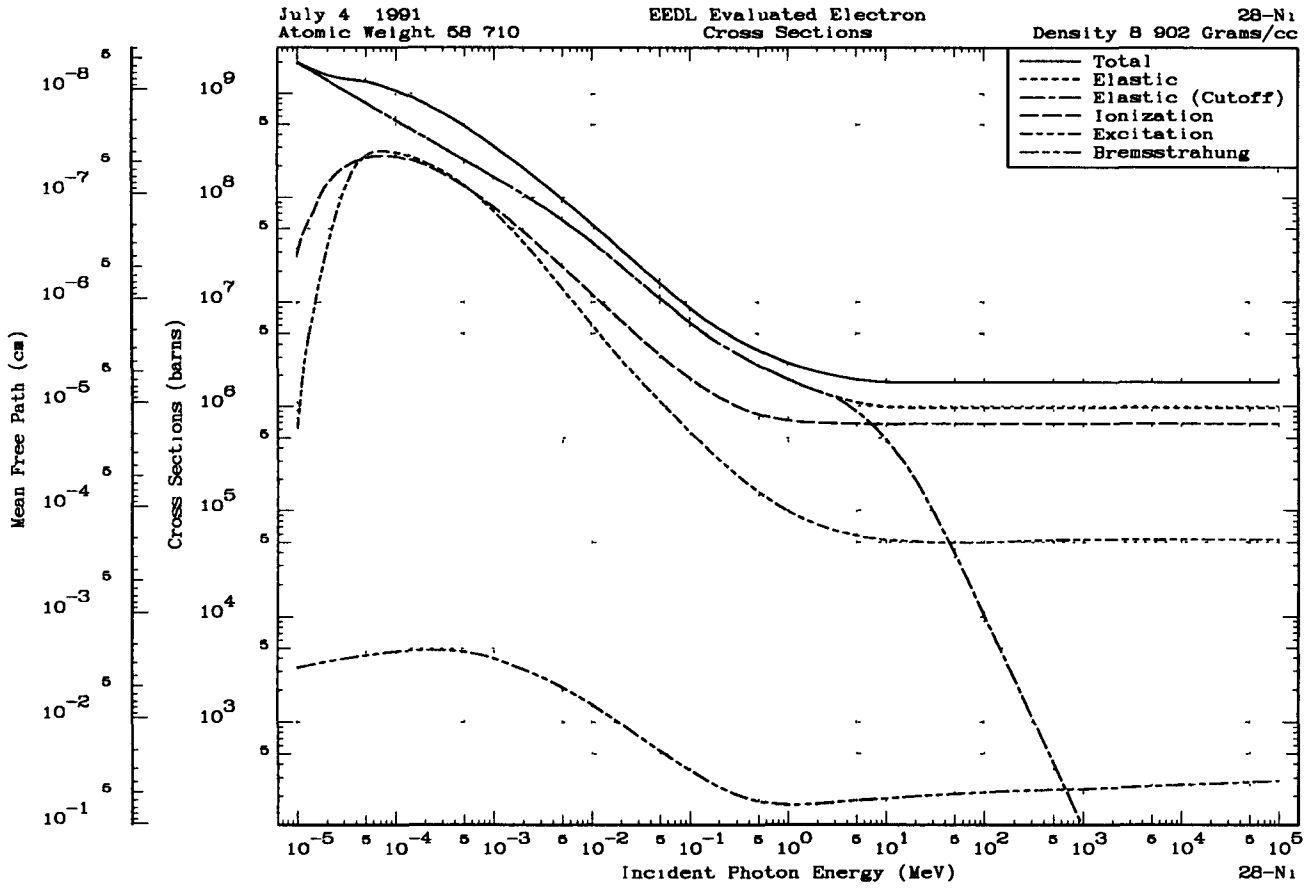
Atomic Weight 58.933 Density 8.900 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.9610–9	2.2649+7		2.2164+9	2.1789+9	3.5984+7	1.5343+6	3.1293+3	2.8539+1	2.7376+1	1.1627+0	6.1345–4
	1.1250–5	5.2527–9	2.1391+7		2.0933+9	2.0386+9	5.1180+7	3.5414+6	3.2016+3	4.3126+1	4.0368+1	2.7580+0	6.8650–4
	1.3125–5	5.6519–9	1.9880+7		1.9455+9	1.8685+9	6.9493+7	7.4460+6	3.2988+3	6.3761+1	5.7727+1	6.0328+0	7.9832–4
M5	1.3720–5	5.7714–9	1.9468+7		1.9052+9	1.8223+9	7.4051+7	8.8650+6	3.3273+3	6.9703+1	6.2500+1	7.2020+0	8.3434–4
	1.3880–5	5.7996–9	1.9374+7		1.8959+9	1.8104+9	7.6133+7	9.4115+6	3.3348+3	7.2509+1	6.4858+1	7.6508+0	8.4406–4
M4	1.3930–5	5.8086–9	1.9344+7		1.8930+9	1.8067+9	7.6686+7	9.5877+6	3.3371+3	7.3272+1	6.5475+1	7.7957+0	8.4711–4
	1.4160–5	5.8455–9	1.9222+7		1.8810+9	1.7901+9	8.0514+7	1.0476+7	3.3477+3	7.8476+1	6.9953+1	8.5222+0	8.6113–4
	1.4197–5	5.8516–9	1.9202+7		1.8791+9	1.7874+9	8.1068+7	1.0627+7	3.3494+3	7.9245+1	7.0599+1	8.6458+0	8.6342–4
	1.4580–5	5.9110–9	1.9009+7		1.8602+9	1.7607+9	8.7201+7	1.2271+7	3.3668+3	8.7825+1	7.7832+1	9.9916+0	8.8683–4
	1.4599–5	5.9138–9	1.9000+7		1.8593+9	1.7594+9	8.7512+7	1.2357+7	3.3676+3	8.8266+1	7.8203+1	1.0062+1	8.8798–4
	1.5000–5	5.9731–9	1.8811+7		1.8408+9	1.7327+9	9.3837+7	1.4310+7	3.3854+3	9.7417+1	8.5755+1	1.1662+1	9.1264–4
	1.5625–5	6.0665–9	1.8521+7		1.8125+9	1.6932+9	1.0220+8	1.7108+7	3.4123+3	1.1016+2	9.6215+1	1.3949+1	9.5127–4
	1.6250–5	6.1557–9	1.8253+7		1.7862+9	1.6561+9	1.0987+8	2.0311+7	3.4383+3	1.2254+2	1.0597+2	1.6569+1	9.9014–4
	1.6719–5	6.2179–9	1.8070+7		1.7684+9	1.6297+9	1.1616+8	2.2544+7	3.4574+3	1.3254+2	1.1414+2	1.8398+1	1.0195–3
	1.7500–5	6.3191–9	1.7781+7		1.7401+9	1.5881+9	1.2526+8	2.6657+7	3.4881+3	1.4793+2	1.2616+2	2.1767+1	1.0686–3
	1.8359–5	6.4217–9	1.7497+7		1.7123+9	1.5457+9	1.3478+8	3.1783+7	3.5207+3	1.6554+2	1.3956+2	2.5971+1	1.1231–3
	2.0000–5	6.5951–9	1.7037+7		1.6673+9	1.4727+9	1.5103+8	4.3509+7	3.5797+3	1.9907+2	1.6347+2	3.5598+1	1.2283–3
	2.2500–5	6.8205–9	1.6474+7		1.6121+9	1.3779+9	1.7044+8	6.3831+7	3.6489+3	2.4771+2	1.9499+2	5.2726+1	1.3751–3
	2.5000–5	6.9904–9	1.6073+7		1.5730+9	1.2982+9	1.8751+8	8.7228+7	3.7120+3	2.9777+2	2.2503+2	7.2735+1	1.5240–3
	2.6250–5	7.0662–9	1.5901+7		1.5561+9	1.2629+9	1.9470+8	9.8478+7	3.7416+3	3.2151+2	2.3901+2	8.2502+1	1.5992–3
	3.0000–5	7.2264–9	1.5548+7		1.5216+9	1.1711+9	2.1321+8	1.3726+8	3.8238+3	3.9489+2	2.7828+2	1.1660+2	1.8277–3
	3.5000–5	7.3863–9	1.5212+7		1.4886+9	1.0736+9	2.2989+8	1.8514+8	3.9191+3	4.8301+2	3.2111+2	1.6190+2	2.1356–3
	4.0000–5	7.4988–9	1.4984+7		1.4663+9	9.9573+8	2.4398+8	2.2659+8	4.0035+3	5.6630+2	3.6248+2	2.0382+2	2.4495–3
	5.0000–5	7.7556–9	1.4488+7		1.4178+9	8.7805+8	2.5955+8	2.8016+8	4.1251+3	6.9303+2	4.2664+2	2.6639+2	3.0489–3
	6.0000–5	8.1078–9	1.3858+7		1.3562+9	7.9230+8	2.6592+8	2.9794+8	4.2179+3	7.7167+2	4.7458+2	2.9708+2	3.6423–3
M3	7.2260–5	8.5797–9	1.3096+7		1.2816+9	7.1347+8	2.6626+8	3.0185+8	4.3146+3	8.2985+2	5.1555+2	3.1430+2	4.3840–3
	7.3228–5	8.6146–9	1.3043+7		1.2764+9	7.0814+8	2.6627+8	3.0199+8	4.3216+3	8.3441+2	5.1887+2	3.1554+2	4.4431–3
M2	7.4170–5	8.6481–9	1.2992+7		1.2715+9	7.0305+8	2.6626+8	3.0213+8	4.3284+3	8.3877+2	5.2202+2	3.1674+2	4.5008–3
	7.4921–5	8.6763–9	1.2950+7		1.2673+9	6.9907+8	2.6630+8	3.0194+8	4.3337+3	8.4221+2	5.2479+2	3.1741+2	4.5468–3
	7.5627–5	8.7028–9	1.2911+7		1.2635+9	6.9538+8	2.6632+8	3.0176+8	4.3386+3	8.4533+2	5.2728+2	3.1804+2	4.5902–3
	7.7460–5	8.7700–9	1.2812+7		1.2538+9	6.8606+8	2.6639+8	3.0131+8	4.3513+3	8.5359+2	5.3391+2	3.1968+2	4.7029–3
	7.7814–5	8.7829–9	1.2793+7		1.2519+9	6.8430+8	2.6641+8	3.0123+8	4.3538+3	8.5519+2	5.3518+2	3.2000+2	4.7246–3
	8.0000–5	8.8609–9	1.2680+7		1.2409+9	6.7370+8	2.6651+8	3.0071+8	4.3685+3	8.6504+2	5.4307+2	3.2196+2	4.8594–3
	8.5000–5	9.0603–9	1.2401+7		1.2136+9	6.5107+8	2.6460+8	2.9794+8	4.3938+3	8.7736+2	5.5413+2	3.2322+2	5.1544–3
	9.2500–5	9.3425–9	1.2027+7		1.1769+9	6.2076+8	2.6205+8	2.9412+8	4.4292+3	8.9622+2	5.7088+2	3.2533+2	5.5996–3
	1.0000–4	9.6068–9	1.1696+7	0.0000+0	1.1446+9	5.9408+8	2.5984+8	2.9065+8	4.4622+3	9.1552+2	5.8784+2	3.2767+2	6.0478–3
M1	1.0969–4	9.9703–9	1.1269+7	1.0529–8	1.1028+9	5.6405+8	2.5447+8	2.8431+8	4.4911+3	9.2506+2	5.9857+2	3.2648+2	6.6048–3
	1.1221–4	1.0071–8	1.1157+7	1.3251–8	1.0919+9	5.5692+8	2.5292+8	2.8200+8	4.4983+3	9.2620+2	6.0092+2	3.2527+2	6.7501–3
	1.1250–4	1.0082–8	1.1144+7	1.3565–8	1.0906+9	5.5611+8	2.5275+8	2.8174+8	4.4991+3	9.2632+2	6.0118+2	3.2514+2	6.7669–3
	1.1693–4	1.0256–8	1.0956+7	1.8345–8	1.0722+9	5.4419+8	2.5010+8	2.7786+8	4.5113+3	9.2826+2	6.0509+2	3.2317+2	7.0231–3
	1.2107–4	1.0413–8	1.0790+7	2.2794–8	1.0559+9	5.3369+8	2.4778+8	2.7442+8	4.5222+3	9.3040+2	6.0892+2	3.2147+2	7.2626–3
	1.2500–4	1.0561–8	1.0639+7	2.7016–8	1.0412+9	5.2421+8	2.4569+8	2.7129+8	4.5323+3	9.3269+2	6.1271+2	3.1998+2	7.4909–3
	1.2830–4	1.0682–8	1.0519+7	3.0551–8	1.0294+9	5.1661+8	2.4402+8	2.6876+8	4.5406+3	9.3407+2	6.1526+2	3.1880+2	7.6828–3
	1.3125–4	1.0788–8	1.0415+7	3.3707–8	1.0192+9	5.1006+8	2.4258+8	2.6658+8	4.5478+3	9.3539+2	6.1757+2	3.1781+2	7.8546–3
	1.3915–4	1.1067–8	1.0153+7	4.2136–8	9.9357+8	4.9362+8	2.3890+8	2.6104+8	4.5664+3	9.3913+2	6.2370+2	3.1542+2	8.3159–3
	1.5000–4	1.1433–8	9.8277+6	5.3651–8	9.6175+8	4.7327+8	2.3437+8	2.5410+8	4.5904+3	9.4547+2	6.3281+2	3.1264+2	8.9522–3
	1.7500–4	1.2313–8	9.1251+6	8.0231–8	8.9299+8	4.3408+8	2.2109+8	2.3781+8	4.6236+3	9.3567+2	6.3414+2	3.0153+2	1.0387–2
	2.0000–4	1.3126–8	8.5604+6	1.0700–7	8.3772+8	4.0277+8	2.1040+8	2.2455+8	4.6525+3	9.3183+2	6.3867+2	2.9314+2	1.1830–2
	2.2500–4	1.3970–8	8.0429+6	1.3415–7	7.8709+8	3.7703+8	1.9884+8	2.1121+8	4.6445+3	9.1023+2	6.2863+2	2.8159+2	1.3173–2
	2.5000–4	1.4769–8	7.6080+6	1.6186–7	7.4453+8	3.5541+8	1.8917+8	1.9995+8	4.6373+3	8.9416+2	6.2203+2	2.7212+2	1.4514–2
	2.6250–4	1.5154–8	7.4147+6	1.7589–7	7.2561+8	3.4582+8	1.8485+8	1.9494+8	4.6340+3	8.8736+2	6.1934+2	2.6801+2	1.5184–2
	3.0000–4	1.6257–8	6.9116+6	2.1853–7	6.7638+8	3.2087+8	1.7363+8	1.8187+8	4.6249+3	8.7188+2	6.1427+2	2.5759+2	1.7191–2
	3.5000–4	1.7782–8	6.3186+6	2.7717–7	6.1835+8	2.9447+8	1.5932+8	1.6456+8	4.6013+3	8.3359+2	5.9359+2	2.3999+2	1.9800–2
	4.0000–4	1.9214–8	5.8477+6	3.3818–7	5.7226+8	2.7336+8	1.4800+8	1.5090+8	4.5810+3	8.0572+2	5.7929+2	2.2641+2	2.2398–2
	5.0000–4	2.2084–8	5.0878+6	4.6727–7	4.9790+8	2.4145+8	1.2924+8	1.2720+8	4.4403+3	7.4433+2	5.4486+2	1.9944+2	2.6871–2
	6.0000–4	2.4834–8	4.5244+6	6.0670–7	4.4276+8	2.1817+8	1.1486+8	1.0972+8	4.3285+3	6.9085+2	5.1256+2	1.7826+2	3.1225–2
L3	7.9229–4	2.9784–8	3.7725+6	9.0293–7	3.6918+8	1.8691+8	9.4927+7	8.7339+7	4.0709+3	6.0907+2	4.5947+2	1.4957+2	3.7845–2
	8.0000–4	2.9977–8	3.7482+6	9.1562–7	3.6680+8	1.8591+8	9.4301+7	8.6587+7	4.0604+3	6.0660+2	4.5792+2	1.4864+2	3.8075–2
L2	8.0754–4	3.0162–8	3.7252+6	9.2808–7	3.6455+8	1.8494+8	9.3661+7	8.5946+7	4.0503+3	6.0371+2	4.5592+2	1.4775+2	3.8299–2
	8.1250–4	3.0285–8	3.7101+6	9.3631–7	3.6307+8	1.8431+8	9.3246+7	8.5512+7	4.0437+3	6.0185+2	4.5466+2	1.4715+2	3.8446–2
	8.1355–4	3.0311–8	3.7069+6	9.3806–7	3.6276+8	1.8418+8	9.3158+7	8.5420+7	4.0424+3	6.0145+2	4.5439+2	1.4702+2	3.8478–2
	8.1938–4	3.0455–8	3.6894+6	9.4776–7	3.6105+8	1.8345+8	9.2677+7	8.4917+7	4.0347+3	5.9927+2	4.5290+2	1.4633+2	3.8650–2
	8.2503–4	3.0594–8	3.6726+6	9.5720–7	3.5941+8	1.8275+8	9.2217+7	8.4436+7	4.0273+3	5.9719+2	4.5149+2	1.4567+2	3.8817–2
	8.3596–4	3.0862–8	3.6407+6	9.7557–7	3.5628+8	1.8142+8	9.1341+7	8.3521+7	4.0133+3	5.9326+2	4.4882+2	1.4441+2	3.9141–2
	8.5647–4	3.1362–8	3.5827+6	1.0103–6	3.5061+8	1.7899+8	8.9753+7	8.1863+7	3.9876+3	5.8626+2	4.4409+2	1.4212+2	3.9744–2
	8.5938–4	3.1432–8	3.5747+6	1.0153–6	3.4982+8	1.7865+8	8.9533+7	8.1633+7	3.9840+3	5.8530+2	4.4345+2	1.4181+2	3.9829–2
	8.9235–4	3.2226–8	3.4866+6	1.0722–6	3.4121+8	1.7495+8	8.7127+7	7.9129+7	3.9443+3	5.7463+2	4.3622+2	1.3837+2	4.0792–2
L1	9.2295–4	3.2952–8	3.4097+6	1.1258–6	3.3368+8	1.7170+8	8.5030+7	7.6951+7	3.9092+3	5.6546+2	4.3004+2	1.3538+2	4.1678–2
	9.2969–4	3.3119–8	3.3926+6	1.1378–6	3.3201+8	1.7100+8	8.4584+7	7.6416+7	3.9016+3	5.6344+2	4.2876+2	1.3464+2	4.1873–2
	9.4618–4	3.3524–8	3.3516+6	1.1672–6	3.2799+8	1.6934+8	8.3515+7	7.5136+7	3.8835+3	5.5855+2	4.2563+2	1.3288+2	4.2347–2
	9.6148–4	3.3898–8	3.3147+6	1.1947–6	3.2438+8	1.6784+8	8.2552+7	7.3987+7	3.8669+3	5.5416+2	4.2282+2	1.3130+2	4.2785–2
	1.0000–3	3.4829–8	3.2260+6	1.2649–6	3.1570+8	1.6421+8	8.0244+7	7.1247+7	3.8268+3	5.4376+2	4.1619+2	1.2752+2	4.3881–2
	1.0625–3	3.6330–8	3.0928+6	1.3818–6	3.0266+8	1.5875+8	7.6613+7	6.7297+7	3.7474+3	5.2504+2	4.0339+2	1.2160+2	4.5045–2
	1.1719–3	3.8884–8	2.8896+6	1.5959–6	2.8278+8	1.5031+8	7.1097+7	6.1371+7	3.6225+3	4.9688+2	3.8411+2	1.1273+2	4.7052–2
	1.3359–3	4.2565–8	2.6397+6	1.9379–6	2.5832+8	1.3972+8	6.4349+7	5.4254+7	3.4619+3	4.6296+2	3.6082+2	1.0209+2	4.9996–2
	1.5000–3	4.6091–8	2.4378+6	2.3030–6	2.3857+8	1.3098+8	5.8931+7	4.8652+7	3.3259+3	4.3620+2	3.4242+2	9.3728+1	5.2864–2
	1.7500–3	5.1419–8	2.1852+6	2.9033–6	2.1384+8	1.2002+8	5.2130+7	4.1694+7	3.1402+3	3.9728+2	3.1481+2	8.2407+1	5.6516–2
	2.0000–3	5.6495–8	1.9888+6	3.5573–6	1.9463+8	1.1127+8	4.6885+7	3.6476+7	2.9877+3	3.6763+2	2.9365+2	7.3917+1	6.0055–2
	2.2500–3	6.1604–8	1.8239+6	4.2642–6	1.7849+8	1.0369+8	4.2550+7	3.2249+7	2.8456+3	3.4000+2	2.7341+2	6.6523+1	6.2830–2
	2.5000–3	6.6540–8	1.6886+6	5.0247–6	1.6525+8	9.7345+7	3.9017+7	2.8885+7	2.7242+3	3.1777+2	2.5707+2	6.0633+1	6.5542–2

Atomic Weight 58.933 Density 8.900 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.6250–3	6.8950–8	1.6296+6	5.4241–6	1.5947+8	9.4541+7	3.7482+7	2.7448+7	2.6697+3	3.0810+2	2.4992+2	5.8115+1	6.6874–2
3.0000–3	7.5972–8	1.4790+6	6.6920–6	1.4473+8	8.7273+7	3.3586+7	2.3871+7	2.5262+3	2.8379+2	2.3188+2	5.1842+1	7.0779–2
4.0000–3	9.4366–8	1.1907+6	1.0570–5	1.1652+8	7.2791+7	2.6357+7	1.7371+7	2.2144+3	2.3356+2	1.9396+2	3.9528+1	7.8596–2
5.0000–3	1.1210–7	1.0023+6	1.5191–5	9.8085+7	6.2733+7	2.1790+7	1.3560+7	1.9829+3	2.0009+2	1.6802+2	3.1981+1	8.4619–2
6.0000–3	1.2930–7	8.6900+5	2.0517–5	8.5041+7	5.5335+7	1.8632+7	1.1072+7	1.8118+3	1.7599+2	1.4903+2	2.6872+1	8.9706–2
K 7.6807–3	1.5718–7	7.1485+5	3.0937–5	6.9956+7	4.6470+7	1.5051+7	8.4333+6	1.5872+3	1.4743+2	1.2608+2	2.1247+1	9.6176–2
7.7605–3	1.5848–7	7.0899+5	3.1480–5	6.9382+7	4.6127+7	1.4917+7	8.3362+6	1.5781+3	1.4635+2	1.2522+2	2.1038+1	9.6424–2
8.0000–3	1.6236–7	6.9204+5	3.3134–5	6.7723+7	4.5135+7	1.4530+7	8.0571+6	1.5515+3	1.4326+2	1.2272+2	2.0440+1	9.7166–2
8.2500–3	1.6644–7	6.7507+5	3.4899–5	6.6063+7	4.4126+7	1.4147+7	7.7882+6	1.5246+3	1.4005+2	1.2011+2	1.9842+1	9.7865–2
8.6875–3	1.7352–7	6.4754+5	3.8082–5	6.3368+7	4.2483+7	1.3527+7	7.3565+6	1.4806+3	1.3486+2	1.1588+2	1.8881+1	9.9084–2
9.3437–3	1.8400–7	6.1067+5	4.3078–5	5.9760+7	4.0271+7	1.2700+7	6.7886+6	1.4206+3	1.2795+2	1.1024+2	1.7615+1	1.0090–1
1.0000–2	1.9432–7	5.7823+5	4.8331–5	5.6586+7	3.8312+7	1.1974+7	6.2987+6	1.3669+3	1.2192+2	1.0529+2	1.6522+1	1.0269–1
1.0625–2	2.0417–7	5.5032+5	5.3575–5	5.3854+7	3.6599+7	1.1361+7	5.8933+6	1.3179+3	1.1649+2	1.0081+2	1.5575+1	1.0381–1
1.1719–2	2.2115–7	5.0806+5	6.3310–5	4.9720+7	3.3991+7	1.0435+7	5.2924+6	1.2423+3	1.0833+2	9.4049+1	1.4171+1	1.0579–1
1.3359–2	2.4604–7	4.5667+5	7.9188–5	4.4690+7	3.0791+7	9.3149+6	4.5836+6	1.1481+3	9.8475+1	8.5855+1	1.2511+1	1.0874–1
1.5000–2	2.7032–7	4.1566+5	9.6544–5	4.0677+7	2.8214+7	8.4254+6	4.0364+6	1.0707+3	9.0688+1	7.9349+1	1.1227+1	1.1166–1
1.7500–2	3.0681–7	3.6622+5	1.2570–4	3.5839+7	2.5024+7	7.3790+6	3.4348+6	9.7148+2	8.0983+1	7.1120+1	9.7490+0	1.1442–1
2.0000–2	3.4233–7	3.2822+5	1.5807–4	3.2120+7	2.2554+7	6.5785+6	2.9867+6	8.9300+2	7.3579+1	6.4815+1	8.6466+0	1.1722–1
2.5000–2	4.1170–7	2.7292+5	2.3174–4	2.6708+7	1.8894+7	5.4451+6	2.3677+6	7.7256+2	6.2468+1	5.5303+1	7.0446+0	1.2016–1
3.0000–2	4.7859–7	2.3477+5	3.1710–4	2.2975+7	1.6350+7	4.6659+6	1.9584+6	6.8632+2	5.4857+1	4.8749+1	5.9842+0	1.2340–1
4.0000–2	6.0622–7	1.8535+5	5.1853–4	1.8138+7	1.2981+7	3.6780+6	1.4783+6	5.6946+2	4.4772+1	3.9960+1	4.6853+0	1.2713–1
5.0000–2	7.2729–7	1.5449+5	7.5957–4	1.5119+7	1.0851+7	3.0729+6	1.1938+6	4.9612+2	3.8368+1	3.4350+1	3.8884+0	1.2999–1
6.0000–2	8.4187–7	1.3346+5	1.0366–3	1.3061+7	9.3924+6	2.6627+6	1.0054+6	4.4305+2	3.3921+1	3.0442+1	3.3465+0	1.3224–1
8.0000–2	1.0524–6	1.0676+5	1.6826–3	1.0448+7	7.5249+6	2.1437+6	7.7876+5	3.7266+2	2.8178+1	2.5362+1	2.6794+0	1.3609–1
1.0000–1	1.2418–6	9.0482+4	2.4419–3	8.8546+6	6.3851+6	1.8282+6	6.4092+5	3.2684+2	2.4581+1	2.2181+1	2.2605+0	1.3945–1
1.5000–1	1.6401–6	6.8510+4	4.7143–3	6.7044+6	4.8461+6	1.4033+6	4.5480+5	2.6057+2	1.9612+1	1.7789+1	1.6748+0	1.4758–1
2.0000–1	1.9638–6	5.7217+4	7.4455–3	5.5993+6	4.0494+6	1.1900+6	3.5967+5	2.2560+2	1.7062+1	1.5541+1	1.3645+0	1.5640–1
3.0000–1	2.4733–6	4.5430+4	1.3788–2	4.4458+6	3.2021+6	9.7880+5	2.6469+5	1.9096+2	1.4537+1	1.3315+1	1.0461+0	1.7660–1
4.0000–1	2.8740–6	3.9095+4	2.0966–2	3.8259+6	2.7339+6	8.7602+5	2.1582+5	1.7469+2	1.3345+1	1.2268+1	8.7768–1	1.9912–1
5.0000–1	3.2002–6	3.5110+4	2.8643–2	3.4359+6	2.4317+6	8.1681+5	1.8722+5	1.6610+2	1.2712+1	1.1709+1	7.7860–1	2.2457–1
6.0000–1	3.4712–6	3.2369+4	3.6631–2	3.1677+6	2.2201+6	7.7885+5	1.6861+5	1.6101+2	1.2327+1	1.1362+1	7.1408–1	2.5181–1
8.0000–1	3.9075–6	2.8755+4	5.3080–2	2.8140+6	1.9343+6	7.3451+5	1.4503+5	1.5616+2	1.1992+1	1.1049+1	6.3205–1	3.1072–1
1.0000+0	4.2438–6	2.6476+4	6.9843–2	2.5910+6	1.7506+6	7.1015+5	1.3012+5	1.5469+2	1.1870+1	1.0915+1	5.7963–1	3.7494–1
1.5000+0	4.8276–6	2.3275+4	1.1168–1	2.2777+6	1.4840+6	6.8288+5	1.1062+5	1.5569+2	1.2034+1	1.0970+1	5.1178–1	5.5272–1
2.0000+0	5.2035–6	2.1593+4	1.5273–1	2.1131+6	1.3369+6	6.7406+5	1.0200+5	1.5830+2	1.2326+1	1.1099+1	4.8116–1	7.4652–1
3.0000+0	5.6867–6	1.9758+4	2.3176–1	1.9336+6	1.1797+6	6.6335+5	9.0364+4	1.6359+2	1.2986+1	1.1372+1	4.4306–1	1.1706+0
4.0000+0	5.9674–6	1.8829+4	3.0679–1	1.8426+6	1.0944+6	6.6193+5	8.6088+4	1.6759+2	1.3679+1	1.1621+1	4.2842–1	1.6292+0
5.0000+0	6.1523–6	1.8263+4	3.7812–1	1.7872+6	1.0436+6	6.6084+5	8.2651+4	1.7076+2	1.4362+1	1.1847+1	4.1739–1	2.0981+0
6.0000+0	6.2787–6	1.7895+4	4.4618–1	1.7513+6	1.0107+6	6.6003+5	8.0354+4	1.7246+2	1.5031+1	1.2024+1	4.1173–1	2.5949+0
8.0000+0	6.4356–6	1.7459+4	5.7379–1	1.7085+6	9.7097+5	6.5907+5	7.8333+4	1.7517+2	1.6333+1	1.2324+1	4.0585–1	3.6026+0
1.0000+1	6.5180–6	1.7238+4	6.9166–1	1.6870+6	9.5095+5	6.5921+5	7.6619+4	1.7788+2	1.7620+1	1.2567+1	4.0136–1	4.6510+0
1.5000+1	6.5658–6	1.7113+4	9.5341–1	1.6747+6	9.3816+5	6.5966+5	7.6664+4	1.8303+2	2.0665+1	1.2896+1	4.0436–1	7.3652+0
2.0000+1	6.5767–6	1.7085+4	1.1788+0	1.6719+6	9.3519+5	6.5998+5	7.6548+4	1.8637+2	2.3770+1	1.3184+1	4.0651–1	1.0180+1
3.0000+1	6.5787–6	1.7079+4	1.5532+0	1.6714+6	9.3503+5	6.6008+5	7.6088+4	1.9067+2	2.9889+1	1.3495+1	4.0955–1	1.5985+1
4.0000+1	6.5772–6	1.7083+4	1.8573+0	1.6718+6	9.3491+5	6.6028+5	7.6390+4	1.9392+2	3.6076+1	1.3716+1	4.1173–1	2.1948+1
5.0000+1	6.5763–6	1.7086+4	2.1129+0	1.6720+6	9.3483+5	6.6039+5	7.6601+4	1.9619+2	4.2321+1	1.3895+1	4.1342–1	2.8013+1
6.0000+1	6.5758–6	1.7087+4	2.3332+0	1.6721+6	9.3475+5	6.6043+5	7.6756+4	1.9807+2	4.8596+1	1.4037+1	4.1481–1	3.4144+1
8.0000+1	6.5751–6	1.7089+4	2.6990+0	1.6723+6	9.3464+5	6.6049+5	7.6978+4	2.0110+2	6.1245+1	1.4253+1	4.1712–1	4.6575+1
1.0000+2	6.5747–6	1.7090+4	2.9956+0	1.6724+6	9.3455+5	6.6053+5	7.7115+4	2.0338+2	7.4047+1	1.4456+1	4.1898–1	5.9172+1
1.5000+2	6.5729–6	1.7094+4	3.5564+0	1.6729+6	9.3438+5	6.6056+5	7.7728+4	2.0735+2	1.0618+2	1.4644+1	4.2237–1	9.1115+1
2.0000+2	6.5715–6	1.7098+4	3.9674+0	1.6732+6	9.3427+5	6.6058+5	7.8163+4	2.0991+2	1.3854+2	1.4826+1	4.2480–1	1.2329+2
3.0000+2	6.5697–6	1.7103+4	4.5599+0	1.6737+6	9.3411+5	6.6060+5	7.8774+4	2.1246+2	2.0316+2	1.5158+1	4.2823–1	1.8758+2
4.0000+2	6.5684–6	1.7106+4	4.9869+0	1.6740+6	9.3399+5	6.6060+5	7.9203+4	2.1403+2	2.6816+2	1.5329+1	4.3069–1	2.5240+2
5.0000+2	6.5687–6	1.7105+4	5.3210+0	1.6739+6	9.3390+5	6.6060+5	7.9235+4	2.1529+2	3.3291+2	1.5449+1	4.3099–1	3.1703+2
6.0000+2	6.5686–6	1.7105+4	5.5953+0	1.6740+6	9.3383+5	6.6060+5	7.9313+4	2.1633+2	3.9795+2	1.5558+1	4.3154–1	3.8196+2
8.0000+2	6.5691–6	1.7104+4	6.0305+0	1.6738+6	9.3371+5	6.6061+5	7.9301+4	2.1832+2	5.2733+2	1.5776+1	4.3172–1	5.1113+2
1.0000+3	6.5696–6	1.7103+4	6.3694+0	1.6737+6	9.3362+5	6.6061+5	7.9256+4	2.1988+2	6.5771+2	1.5960+1	4.3172–1	6.4132+2
1.5000+3	6.5702–6	1.7101+4	6.9869+0	1.6736+6	9.3346+5	6.6061+5	7.9272+4	2.2299+2	9.8365+2	1.6121+1	4.3181–1	9.6709+2
2.0000+3	6.5708–6	1.7100+4	7.4259+0	1.6734+6	9.3335+5	6.6061+5	7.9222+4	2.2529+2	1.3095+3	1.6281+1	4.3154–1	1.2928+3
3.0000+3	6.5714–6	1.7098+4	8.0458+0	1.6733+6	9.3318+5	6.6061+5	7.9238+4	2.2873+2	1.9604+3	1.6603+1	4.3163–1	1.9434+3
4.0000+3	6.5720–6	1.7097+4	8.4860+0	1.6731+6	9.3307+5	6.6061+5	7.9204+4	2.3129+2	2.6147+3	1.6749+1	4.3144–1	2.5975+3
5.0000+3	6.5732–6	1.7094+4	8.8270+0	1.6728+6	9.3298+5	6.6061+5	7.8970+4	2.3330+2	3.2753+3	1.6895+1	4.3017–1	3.2579+3
6.0000+3	6.5732–6	1.7094+4	9.1056+0	1.6728+6	9.3291+5	6.6061+5	7.9053+4	2.3495+2	3.9223+3	1.6999+1	4.3063–1	3.9048+3
8.0000+3	6.5734–6	1.7093+4	9.5458+0	1.6727+6	9.3279+5	6.6061+5	7.9102+4	2.3758+2	5.2278+3	1.7206+1	4.3090–1	5.2102+3
1.0000+4	6.5736–6	1.7092+4	9.8869+0	1.6727+6	9.3270+5	6.6061+5	7.9135+4	2.3963+2	6.5458+3	1.7404+1	4.3108–1	6.5279+3
1.5000+4	6.5740–6	1.7091+4	1.0508+1	1.6726+6	9.3254+5	6.6061+5	7.9201+4	2.4353+2	9.7748+3	1.7558+1	4.3144–1	9.7569+3
2.0000+4	6.5746–6	1.7090+4	1.0949+1	1.6724+6	9.3242+5	6.6061+5	7.9151+4	2.4633+2	1.3046+4	1.7712+1	4.3117–1	1.3028+4
3.0000+4	6.5751–6	1.7089+4	1.1572+1	1.6723+6	9.3226+5	6.6061+5	7.9201+4	2.5024+2	1.9520+4	1.8020+1	4.3144–1	1.9501+4
4.0000+4	6.5756–6	1.7087+4	1.2013+1	1.6722+6	9.3215+5	6.6061+5	7.9168+4	2.5305+2	2.6063+4	1.8206+1	4.3126–1	2.6045+4
5.0000+4	6.5768–6	1.7084+4	1.2356+1	1.6719+6	9.3206+5	6.6061+5	7.8951+4	2.5521+2	3.2546+4	1.8348+1	4.3008–1	3.2527+4
6.0000+4	6.5766–6	1.7085+4	1.2636+1	1.6719+6	9.3198+5	6.6061+5	7.9068+4	2.5697+2	3.9023+4	1.8448+1	4.3072–1	3.9004+4
8.0000+4	6.5770–6	1.7084+4	1.3078+1	1.6718+6	9.3187+5	6.6061+5	7.9101+4	2.5978+2	5.2091+4	1.8647+1	4.3090–1	5.2072+4
1.0000+5	6.5772–6	1.7083+4	1.3421+1	1.6718+6	9.3178+5	6.6061+5	7.9134+4	2.6195+2	6.5182+4	1.8846+1	4.3108–1	6.5163+4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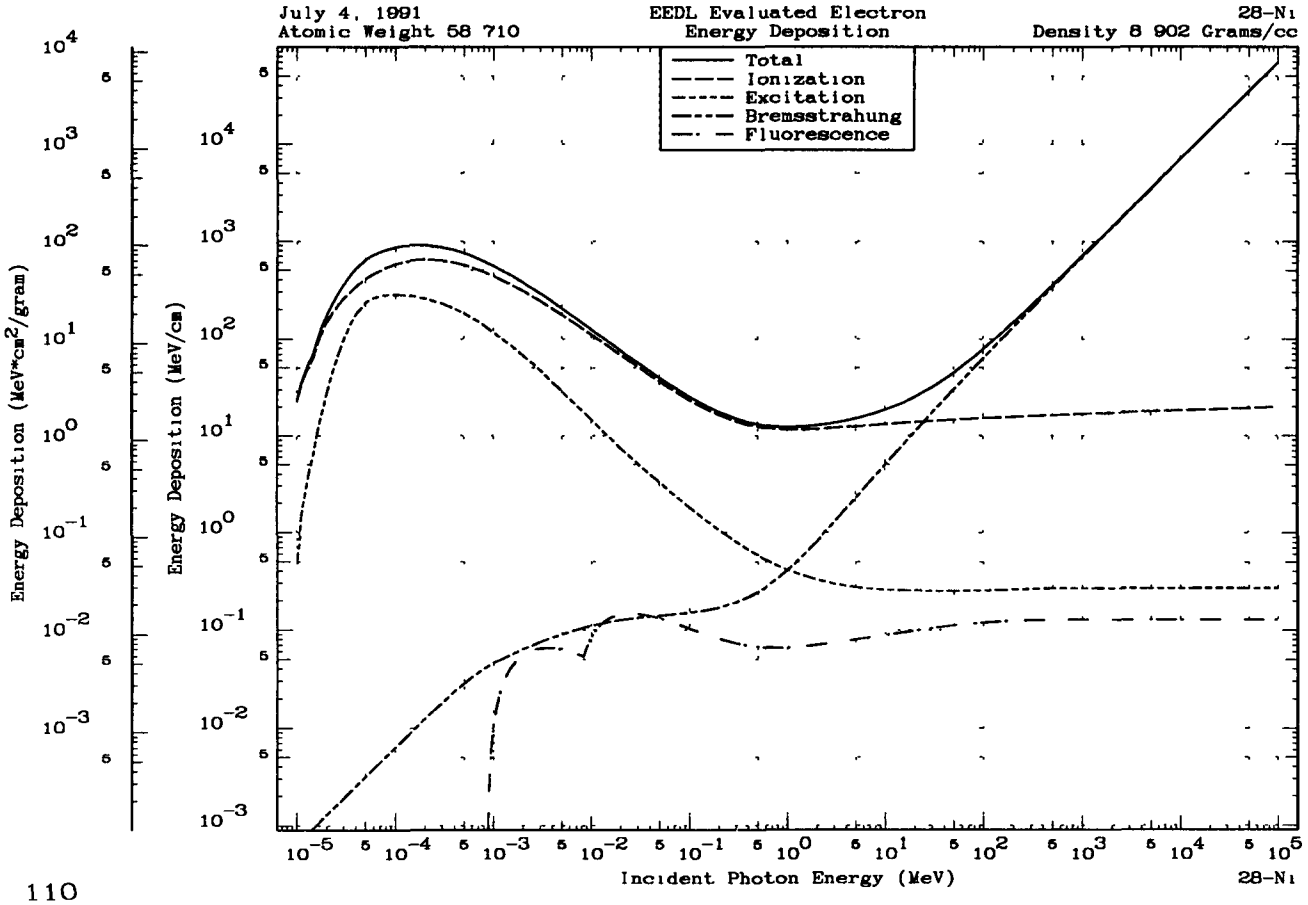
Atomic Weight 58 710
EEDL Evaluated Electron
Cross Sections
28-Ni
Density 8 902 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
28-Ni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28-Ni
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Ionization
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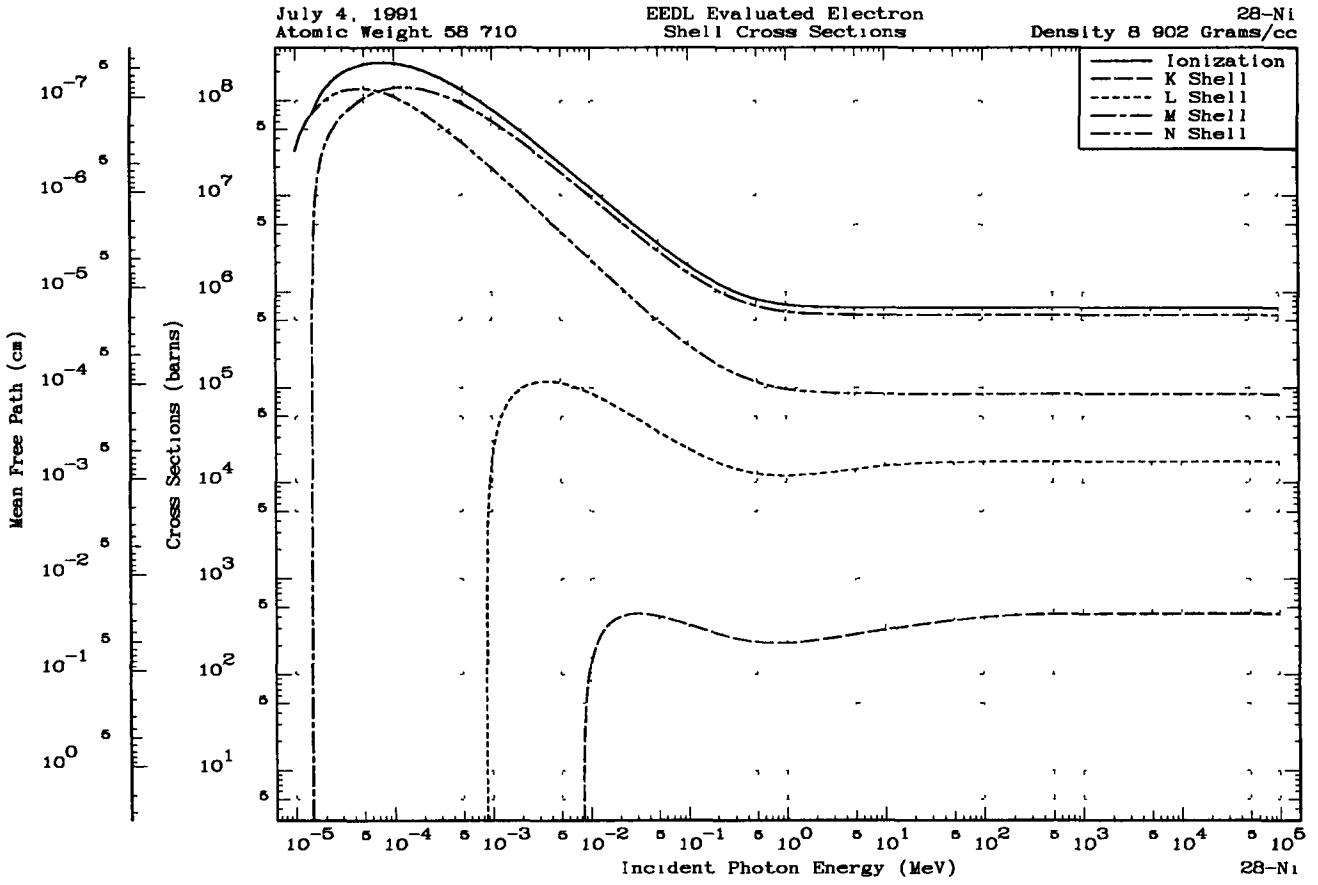
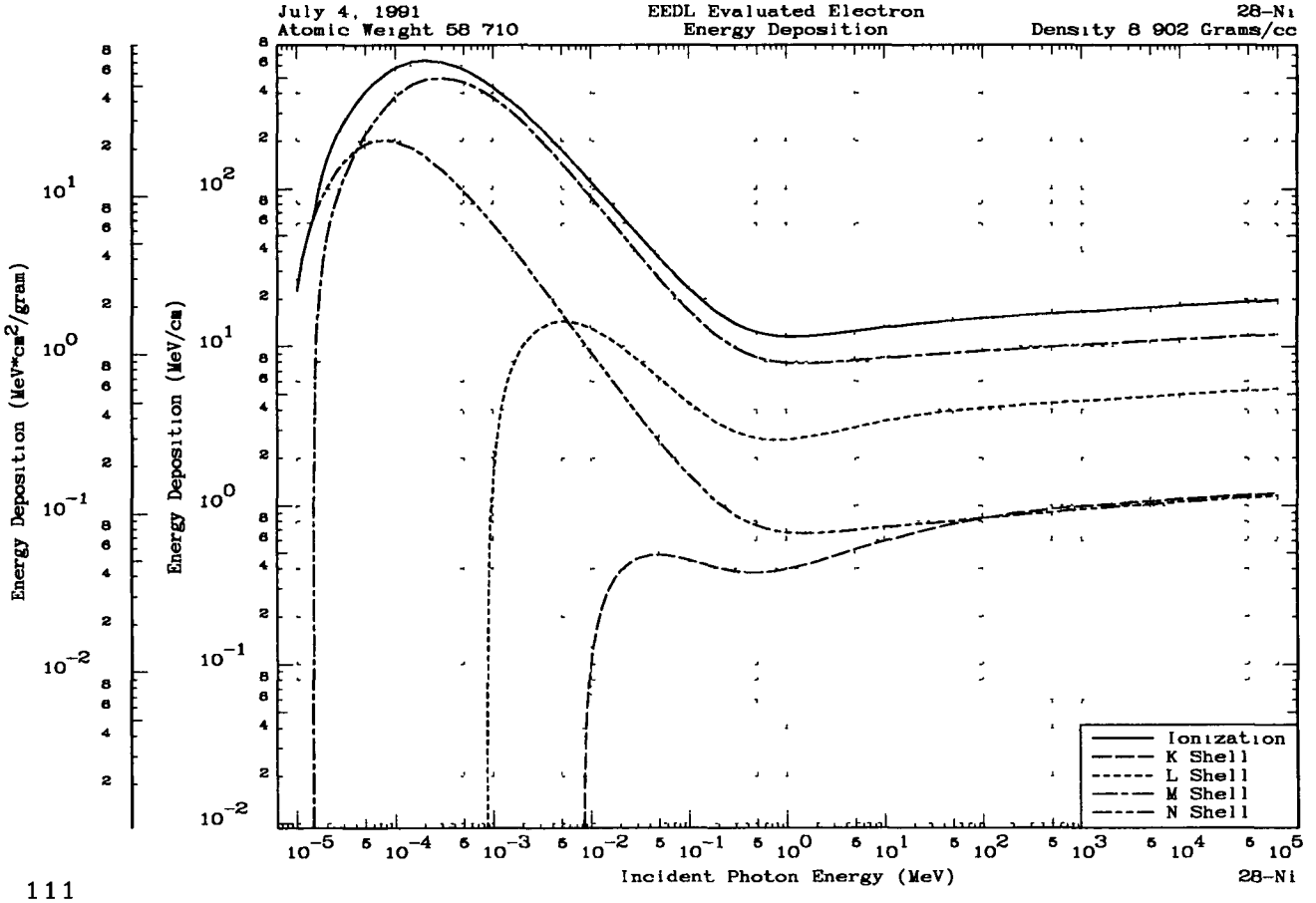
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
28-Ni


July 4, 1991
Atomic Weight 58 710
EEDL Evaluated Electron
Shell Cross Sections
28-Ni
Density 8 902 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
28-Ni

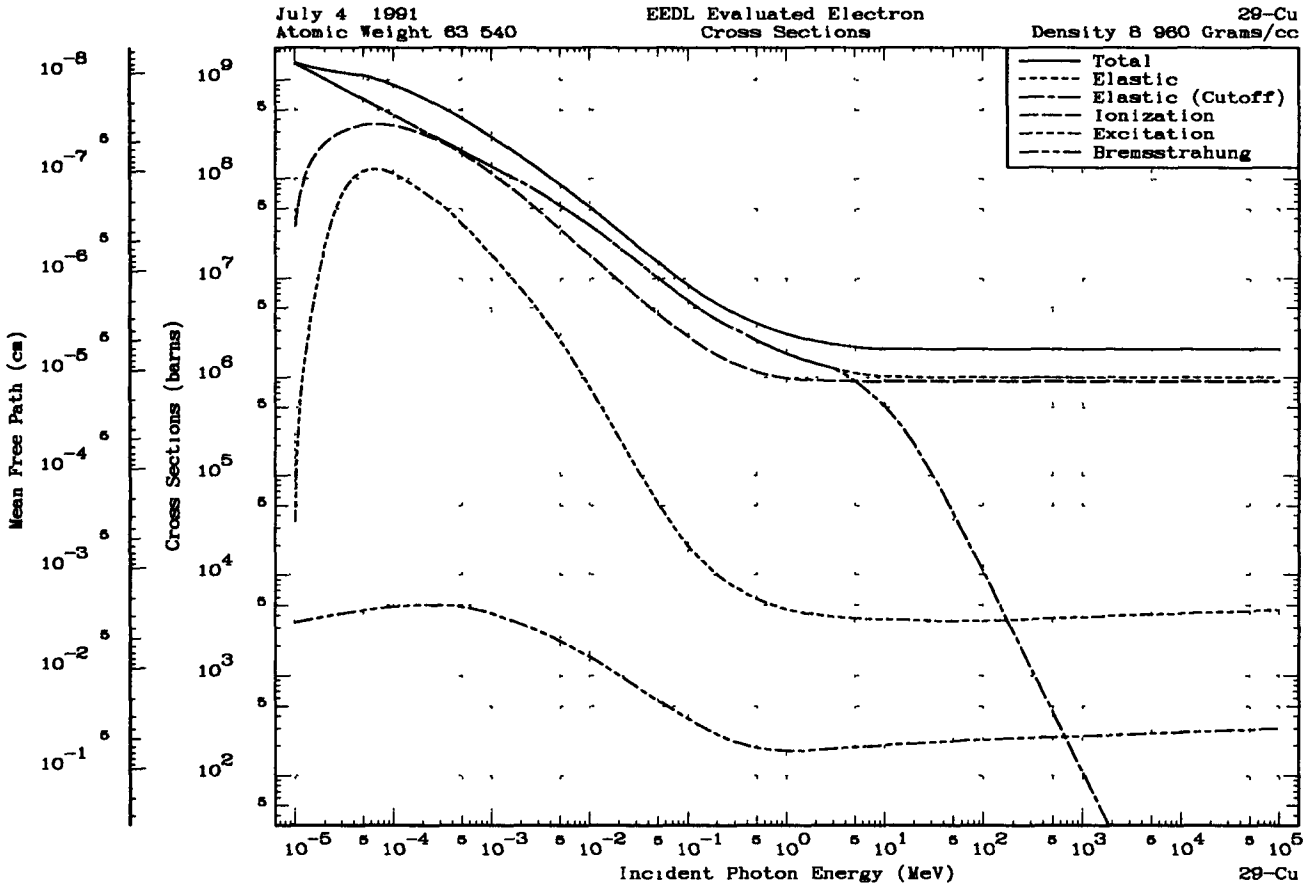

July 4, 1991
Atomic Weight 58 710
EEDL Evaluated Electron
Energy Deposition
28-Ni
Density 8 902 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
28-Ni

Atomic Weight 58.710 Density 8.902 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.4559–9	2.0590+7		2.0073+9	1.9778+9	2.8829+7	6.1513+5	3.2696+3	2.3050+1	2.2569+1	4.8024–1	6.4356–4
	1.1250–5	5.7708–9	1.9466+7		1.8978+9	1.8526+9	4.3144+7	1.9655+6	3.3451+3	3.6592+1	3.4999+1	1.5922+0	7.2018–4
	1.3125–5	6.2013–9	1.8115+7		1.7660+9	1.7007+9	6.0486+7	4.8436+6	3.4466+3	5.5636+1	5.1642+1	3.9936+0	8.3748–4
M5	1.4660–5	6.5235–9	1.7220+7		1.6788+9	1.5994+9	7.1619+7	7.7632+6	3.5213+3	7.0025+1	6.3531+1	6.4926+0	9.3548–4
	1.4830–5	6.5532–9	1.7142+7		1.6712+9	1.5892+9	7.3722+7	8.2535+6	3.5292+3	7.2950+1	6.6044+1	6.9052+0	9.4643–4
M4	1.4920–5	6.5690–9	1.7101+7		1.6671+9	1.5839+9	7.4761+7	8.5231+6	3.5333+3	7.4412+1	6.7279+1	7.1322+0	9.5223–4
	1.5000–5	6.5813–9	1.7069+7		1.6640+9	1.5792+9	7.6064+7	8.8060+6	3.5370+3	7.6266+1	6.8895+1	7.3701+0	9.5740–4
	1.5313–5	6.6335–9	1.6935+7		1.6510+9	1.5612+9	7.9925+7	9.8453+6	3.5512+3	8.2040+1	7.3797+1	8.2421+0	9.7763–4
	1.5625–5	6.6818–9	1.6812+7		1.6390+9	1.5438+9	8.4245+7	1.0983+7	3.5651+3	8.8566+1	7.9368+1	9.1965+0	9.9793–4
	1.5898–5	6.7231–9	1.6709+7		1.6289+9	1.5290+9	8.7870+7	1.2062+7	3.5771+3	9.4186+1	8.4083+1	1.0102+1	1.0157–3
	1.6172–5	6.7645–9	1.6606+7		1.6190+9	1.5146+9	9.1342+7	1.3061+7	3.5890+3	9.9563+1	8.8621+1	1.0942+1	1.0336–3
	1.6924–5	6.8716–9	1.6348+7		1.5937+9	1.4768+9	1.0077+8	1.6140+7	3.6207+3	1.1467+2	1.0114+2	1.3530+1	1.0830–3
	1.7129–5	6.8997–9	1.6281+7		1.5872+9	1.4670+9	1.0331+8	1.6954+7	3.6292+3	1.1878+2	1.0457+2	1.4214+1	1.0965–3
	1.7500–5	6.9507–9	1.6162+7		1.5756+9	1.4496+9	1.0747+8	1.8503+7	3.6443+3	1.2570+2	1.1018+2	1.5518+1	1.1210–3
	1.8462–5	7.0750–9	1.5878+7		1.5479+9	1.4072+9	1.1770+8	2.3018+7	3.6823+3	1.4425+2	1.2493+2	1.9320+1	1.1850–3
	1.8565–5	7.0875–9	1.5850+7		1.5452+9	1.4029+9	1.1877+8	2.3544+7	3.6863+3	1.4626+2	1.2649+2	1.9763+1	1.1919–3
	2.0000–5	7.2500–9	1.5494+7		1.5106+9	1.3460+9	1.3262+8	3.1906+7	3.7399+3	1.7411+2	1.4729+2	2.6814+1	1.2885–3
	2.2500–5	7.4905–9	1.4997+7		1.4621+9	1.2608+9	1.5185+8	4.9364+7	3.8122+3	2.2054+2	1.7888+2	4.1662+1	1.4425–3
	2.5000–5	7.6726–9	1.4641+7		1.4274+9	1.1892+9	1.6855+8	6.9604+7	3.8780+3	2.6752+2	2.0852+2	5.8993+1	1.5987–3
	2.6250–5	7.7416–9	1.4510+7		1.4146+9	1.1574+9	1.7560+8	8.1609+7	3.9089+3	2.9168+2	2.2236+2	6.9313+1	1.6776–3
	3.0000–5	7.9057–9	1.4209+7		1.3853+9	1.0747+9	1.9359+8	1.1696+8	3.9947+3	3.6081+2	2.6084+2	9.9968+1	1.9172–3
	3.5000–5	8.0493–9	1.3956+7		1.3606+9	9.8675+8	2.1031+8	1.6349+8	4.0941+3	4.4555+2	3.0334+2	1.4221+2	2.2401–3
	4.0000–5	8.1370–9	1.3805+7		1.3459+9	9.1641+8	2.2449+8	2.0499+8	4.1821+3	5.2580+2	3.4438+2	1.8142+2	2.5694–3
	5.0000–5	8.3680–9	1.3424+7		1.3087+9	8.0991+8	2.4077+8	2.5805+8	4.3090+3	6.4580+2	4.0896+2	2.3684+2	3.1980–3
	6.0000–5	8.7226–9	1.2879+7		1.2555+9	7.3216+8	2.4861+8	2.7476+8	4.4055+3	7.2077+2	4.5914+2	2.6163+2	3.8203–3
	7.0000–5	9.1083–9	1.2333+7		1.2024+9	6.7234+8	2.4980+8	2.8022+8	4.4889+3	7.6787+2	4.9350+2	2.7436+2	4.4535–3
M3	7.8210–5	9.4283–9	1.1915+7		1.1616+9	6.3235+8	2.5103+8	2.7817+8	4.5498+3	8.0108+2	5.2256+2	2.7851+2	4.9808–3
	7.9105–5	9.4616–9	1.1873+7		1.1575+9	6.2839+8	2.5117+8	2.7790+8	4.5561+3	8.0486+2	5.2590+2	2.7896+2	5.0386–3
	8.0000–5	9.4946–9	1.1831+7		1.1535+9	6.2451+8	2.5131+8	2.7763+8	4.5623+3	8.0865+2	5.2924+2	2.7940+2	5.0966–3
M2	8.0480–5	9.5130–9	1.1809+7		1.1512+9	6.2245+8	2.5117+8	2.7759+8	4.5657+3	8.0996+2	5.3033+2	2.7963+2	5.1277–3
	8.1700–5	9.5620–9	1.1748+7		1.1453+9	6.1732+8	2.5087+8	2.7713+8	4.5721+3	8.1325+2	5.3335+2	2.7989+2	5.2029–3
	8.2500–5	9.5937–9	1.1709+7		1.1415+9	6.1402+8	2.5068+8	2.7682+8	4.5763+3	8.1546+2	5.3539+2	2.8006+2	5.2523–3
	8.3988–5	9.6521–9	1.1638+7		1.1346+9	6.0802+8	2.5033+8	2.7627+8	4.5840+3	8.1946+2	5.3907+2	2.8039+2	5.3443–3
	8.6875–5	9.7630–9	1.1506+7		1.1217+9	5.9681+8	2.4969+8	2.7523+8	4.5986+3	8.2743+2	5.4638+2	2.8104+2	5.5232–3
	8.7991–5	9.8049–9	1.1457+7		1.1169+9	5.9264+8	2.4945+8	2.7484+8	4.6041+3	8.3048+2	5.4917+2	2.8130+2	5.5925–3
	9.3438–5	1.0003–8	1.1230+7		1.0948+9	5.7338+8	2.4839+8	2.7300+8	4.6301+3	8.4564+2	5.6301+2	2.8262+2	5.9317–3
	9.3995–5	1.0023–8	1.1207+7		1.0926+9	5.7150+8	2.4828+8	2.7282+8	4.6327+3	8.4719+2	5.6443+2	2.8276+2	5.9665–3
	1.0000–4	1.0230–8	1.0981+7	0.0000+0	1.0706+9	5.5236+8	2.4726+8	2.7094+8	4.6597+3	8.6408+2	5.7976+2	2.8431+2	6.3426–3
	1.1250–4	1.0696–8	1.0502+7	1.4349–8	1.0239+9	5.1771+8	2.4141+8	2.6475+8	4.6979+3	8.7822+2	5.9567+2	2.8255+2	7.0965–3
M1	1.1864–4	1.0911–8	1.0295+7	2.1311–8	1.0037+9	5.0279+8	2.3888+8	2.6200+8	4.7152+3	8.8559+2	6.0367+2	2.8192+2	7.4687–3
	1.2060–4	1.0986–8	1.0225+7	2.3523–8	9.9683+8	4.9828+8	2.3793+8	2.6061+8	4.7205+3	8.8677+2	6.0549+2	2.8127+2	7.5878–3
	1.2188–4	1.1035–8	1.0180+7	2.4960–8	9.9246+8	4.9541+8	2.3733+8	2.5972+8	4.7240+3	8.8754+2	6.0666+2	2.8087+2	7.6653–3
	1.2428–4	1.1125–8	1.0098+7	2.7662–8	9.8442+8	4.9012+8	2.3622+8	2.5807+8	4.7304+3	8.8909+2	6.0895+2	2.8013+2	7.8114–3
	1.3071–4	1.1361–8	9.8881+6	3.4877–8	9.6399+8	4.7671+8	2.3342+8	2.5387+8	4.7469+3	8.9359+2	6.1528+2	2.7831+2	8.2036–3
	1.3125–4	1.1380–8	9.8711+6	3.5486–8	9.6234+8	4.7562+8	2.3319+8	2.5353+8	4.7483+3	8.9399+2	6.1582+2	2.7816+2	8.2369–3
	1.3594–4	1.1547–8	9.7285+6	4.0720–8	9.4844+8	4.6652+8	2.3126+8	2.5065+8	4.7598+3	8.9739+2	6.2040+2	2.7698+2	8.5236–3
	1.4035–4	1.1700–8	9.6008+6	4.5630–8	9.3599+8	4.5839+8	2.2954+8	2.4805+8	4.7704+3	9.0081+2	6.2486+2	2.7595+2	8.7943–3
	1.5000–4	1.2025–8	9.3418+6	5.6292–8	9.1073+8	4.4193+8	2.2606+8	2.4274+8	4.7924+3	9.0891+2	6.3493+2	2.7397+2	9.3875–3
	1.6250–4	1.2475–8	9.0044+6	7.0069–8	8.7784+8	4.2290+8	2.1975+8	2.3519+8	4.8101+3	9.0567+2	6.3673+2	2.6893+2	1.0138–2
	1.7500–4	1.2906–8	8.7043+6	8.3882–8	8.4858+8	4.0600+8	2.1416+8	2.2841+8	4.8265+3	9.0425+2	6.3968+2	2.6455+2	1.0892–2
	1.8125–4	1.3114–8	8.5659+6	9.0795–8	8.3509+8	3.9824+8	2.1157+8	2.2527+8	4.8343+3	9.0392+2	6.4132+2	2.6258+2	1.1269–2
	2.0000–4	1.3715–8	8.1907+6	1.1153–7	7.9851+8	3.7725+8	2.0457+8	2.1669+8	4.8563+3	9.0474+2	6.4734+2	2.5738+2	1.2405–2
	2.2500–4	1.4549–8	7.7211+6	1.3940–7	7.5273+8	3.5364+8	1.9388+8	2.0520+8	4.8475+3	8.8945+2	6.4106+2	2.4837+2	1.3813–2
	2.5000–4	1.5336–8	7.3247+6	1.6768–7	7.1409+8	3.3378+8	1.8486+8	1.9545+8	4.8396+3	8.7816+2	6.3716+2	2.4098+2	1.5220–2
	2.6250–4	1.5714–8	7.1485+6	1.8197–7	6.9691+8	3.2497+8	1.8085+8	1.9109+8	4.8359+3	8.7234+2	6.3456+2	2.3776+2	1.5922–2
	3.0000–4	1.6794–8	6.6888+6	2.2528–7	6.5209+8	3.0201+8	1.7043+8	1.7965+8	4.8259+3	8.5937+2	6.2974+2	2.2961+2	1.8026–2
	3.5000–4	1.8295–8	6.1403+6	2.8461–7	5.9862+8	2.7767+8	1.5688+8	1.6406+8	4.8008+3	8.2616+2	6.1075+2	2.1539+2	2.0763–2
	4.0000–4	1.9698–8	5.7029+6	3.4602–7	5.5598+8	2.5818+8	1.4613+8	1.5166+8	4.7792+3	8.0234+2	5.9794+2	2.0437+2	2.3488–2
	5.0000–4	2.2466–8	5.0003+6	4.7501–7	4.8748+8	2.2864+8	1.2817+8	1.3066+8	4.6326+3	7.4883+2	5.6530+2	1.8351+2	2.8192–2
	6.0000–4	2.5181–8	4.4611+6	6.1321–7	4.3491+8	2.0702+8	1.1428+8	1.1361+8	4.5161+3	6.9888+2	5.3369+2	1.6516+2	3.2772–2
	7.0000–4	2.7752–8	4.0478+6	7.6113–7	3.9463+8	1.9039+8	1.0303+8	1.0120+8	4.3651+3	6.5372+2	5.0254+2	1.5114+2	3.6445–2
	8.0000–4	3.0325–8	3.7044+6	9.1858–7	3.6114+8	1.7707+8	9.4234+7	8.9833+7	4.2383+3	6.1689+2	4.7912+2	1.3773+2	4.0018–2
L3	8.6702–4	3.2005–8	3.5099+6	1.0295–6	3.4218+8	1.6953+8	8.8987+7	8.3656+7	4.1495+3	5.9187+2	4.6194+2	1.2989+2	4.2119–2
	8.7533–4	3.2212–8	3.4874+6	1.0436–6	3.3998+8	1.6866+8	8.8386+7	8.2934+7	4.1391+3	5.8907+2	4.6005+2	1.2898+2	4.2377–2
L2	8.8498–4	3.2451–8	3.4617+6	1.0600–6	3.3748+8	1.6766+8	8.7701+7	8.2111+7	4.1272+3	5.8587+2	4.5788+2	1.2795+2	4.2676–2
	8.9092–4	3.2599–8	3.4459+6	1.0701–6	3.3594+8	1.6706+8	8.7285+7	8.1596+7	4.1199+3	5.8396+2	4.5661+2	1.2731+2	4.2860–2
	8.9936–4	3.2810–8	3.4238+6	1.0846–6	3.3379+8	1.6621+8	8.6702+7	8.0875+7	4.1097+3	5.8124+2	4.5479+2	1.2641+2	4.3120–2
	9.2452–4	3.3432–8	3.3600+6	1.1282–6	3.2757+8	1.6375+8	8.5020+7	7.8802+7	4.0799+3	5.7350+2	4.4961+2	1.2384+2	4.3893–2
	9.4546–4	3.3946–8	3.3092+6	1.1649–6	3.2262+8	1.6178+8	8.3681+7	7.7158+7	4.0559+3	5.6743+2	4.4557+2	1.2181+2	4.4533–2
	1.0000–3	3.5264–8	3.1855+6	1.2623–6	3.1056+8	1.5694+8	8.0421+7	7.3190+7	3.9965+3	5.5275+2	4.3581+2	1.1690+2	4.6185–2
L1	1.0065–3	3.5418–8	3.1717+6	1.2741–6	3.0921+8	1.5639+8	8.0036+7	7.2778+7	3.9876+3	5.5082+2	4.3442+2	1.1635+2	4.6322–2
	1.0373–3	3.6165–8	3.1061+6	1.3305–6	3.0282+8	1.5384+8	7.8236+7	7.0732+7	3.9459+3	5.4144+2	4.2778+2	1.1361+2	4.6938–2
	1.0625–3	3.6770–8	3.0551+6	1.3773–6	2.9784+8	1.5185+8	7.6838+7	6.9149+7	3.9131+3	5.3421+2	4.2267+2	1.1149+2	4.7438–2
	1.0952–3	3.7547–8	2.9918+6	1.4390–6	2.9168+8	1.4937+8	7.5106+7	6.7198+7	3.8721+3	5.2523+2	4.1630+2	1.0888+2	4.8084–2
	1.1719–3	3.9340–8	2.8555+6	1.5878–6	2.7838+8	1.4397+8	7.1380+7	6.3034+7	3.7819+3	5.0616+2	4.0280+2	1.0331+2	4.9587–2
	1.1964–3	3.9903–8	2.8152+6	1.6364–6	2.7445+8	1.4235+8	7.0279+7	6.1814+7	3.7547+3	5.0054+2	3.9881+2	1.0168+2	5.0063–2
	1.2539–3	4.1211–8	2.7258+6	1.7528–6	2.6574+8	1.3876+8	6.7845+7	5.9131+7	3.6938+3	4.8820+2	3.9005+2	9.8100+1	5.1172–2
	1.3482–3	4.3309–8	2.5938+6	1.9496–6	2.5287+8	1.3340+8	6.4255+7	5.5216+7	3.6017+3	4.7016+2	3.7723+2	9.2876+1	5.2967–2
	1.3769–3	4.3938–8	2.5566+6	2.0111–6	2.4925+8	1.3187+8	6.3247+7	5.4126+7	3.5753+3	4.6515+2	3.7368+2	9.1421+1	5.3508–2
	1.5000–3	4.6579–8	2.4117+6	2.2813–6	2.3512+8	1.2587+8	5.9324+7	4.9921+7	3.4703+3	4.4578+2	3.5991+2	8.5818+1	5.5798–2

Atomic Weight 58.710 Density 8.902 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.6250–3	4.9297–8	2.2787+6	2.5686–6	2.2215+8	1.2036+8	5.5690+7	4.6099+7	3.3722+3	4.2471+2	3.4436+2	8.0289+1	5.7782–2
1.7500–3	5.1944–8	2.1626+6	2.8693–6	2.1083+8	1.1548+8	5.2529+7	4.2822+7	3.2838+3	4.0661+2	3.3100+2	7.5549+1	5.9737–2
1.8125–3	5.3244–8	2.1098+6	3.0246–6	2.0569+8	1.1323+8	5.1095+7	4.1352+7	3.2428+3	3.9840+2	3.2492+2	7.3424+1	6.0703–2
2.0000–3	5.7054–8	1.9689+6	3.5085–6	1.9195+8	1.0717+8	4.7283+7	3.7494+7	3.1304+3	3.7680+2	3.0889+2	6.7844+1	6.3559–2
2.2500–3	6.2200–8	1.8060+6	4.1977–6	1.7607+8	9.9904+7	4.2944+7	3.3218+7	2.9843+3	3.4905+2	2.8778+2	6.1201+1	6.6554–2
2.6250–3	6.9600–8	1.6140+6	5.3249–6	1.5735+8	9.1131+7	3.7866+7	2.8350+7	2.8034+3	3.1681+2	2.6311+2	5.3633+1	7.0919–2
3.0000–3	7.6825–8	1.4622+6	6.5581–6	1.4255+8	8.4157+7	3.3960+7	2.4433+7	2.6556+3	2.9169+2	2.4418+2	4.7429+1	7.5136–2
3.5000–3	8.6388–8	1.3003+6	8.3645–6	1.2677+8	7.6428+7	2.9845+7	2.0496+7	2.4789+3	2.6244+2	2.2157+2	4.0787+1	7.9443–2
4.0000–3	9.5560–8	1.1755+6	1.0355–5	1.1460+8	7.0309+7	2.6688+7	1.7603+7	2.3352+3	2.4032+2	2.0435+2	3.5888+1	8.3610–2
5.0000–3	1.1347–7	9.8999+5	1.4844–5	9.6515+7	6.0785+7	2.2081+7	1.3646+7	2.0986+3	2.0602+2	1.7705+2	2.8881+1	9.0189–2
6.0000–3	1.3071–7	8.5942+5	2.0015–5	8.3785+7	5.3802+7	1.8892+7	1.1089+7	1.9161+3	1.8132+2	1.5704+2	2.4187+1	9.5691–2
8.0000–3	1.6368–7	6.8632+5	3.2215–5	6.6909+7	4.4176+7	1.4746+7	7.9858+6	1.6439+3	1.4770+2	1.2935+2	1.8249+1	1.0385–1
K 8.3028–3	1.6858–7	6.6634+5	3.4293–5	6.4962+7	4.3018+7	1.4280+7	7.6628+6	1.6106+3	1.4372+2	1.2602+2	1.7593+1	1.0488–1
8.4089–3	1.7030–7	6.5961+5	3.5035–5	6.4306+7	4.2629+7	1.4124+7	7.5513+6	1.5991+3	1.4239+2	1.2492+2	1.7371+1	1.0520–1
8.6078–3	1.7352–7	6.4740+5	3.6444–5	6.3115+7	4.1922+7	1.3841+7	7.3503+6	1.5782+3	1.3999+2	1.2291+2	1.6971+1	1.0579–1
8.9558–3	1.7910–7	6.2723+5	3.8966–5	6.1149+7	4.0750+7	1.3375+7	7.0216+6	1.5433+3	1.3603+2	1.1960+2	1.6315+1	1.0683–1
9.4779–3	1.8738–7	5.9951+5	4.2882–5	5.8446+7	3.9132+7	1.2736+7	6.5772+6	1.4948+3	1.3061+2	1.1507+2	1.5428+1	1.0839–1
1.0000–2	1.9555–7	5.7444+5	4.6956–5	5.6003+7	3.7660+7	1.2159+7	6.1825+6	1.4503+3	1.2574+2	1.1099+2	1.4639+1	1.0992–1
1.0625–2	2.0546–7	5.4674+5	5.2041–5	5.3302+7	3.5995+7	1.1538+7	5.7672+6	1.3989+3	1.2014+2	1.0627+2	1.3766+1	1.1116–1
1.1719–2	2.2253–7	5.0481+5	6.1480–5	4.9215+7	3.3459+7	1.0600+7	5.1541+6	1.3196+3	1.1173+2	9.9137+1	1.2475+1	1.1335–1
1.2539–2	2.3511–7	4.7780+5	6.9005–5	4.6581+7	3.1813+7	9.9973+6	4.7693+6	1.2674+3	1.0634+2	9.4557+1	1.1664+1	1.1499–1
1.3770–2	2.5366–7	4.4285+5	8.0970–5	4.3173+7	2.9669+7	9.2199+6	4.2838+6	1.1987+3	9.9403+1	8.8647+1	1.0638+1	1.1742–1
1.5000–2	2.7188–7	4.1318+5	9.3728–5	4.0281+7	2.7834+7	8.5622+6	3.8832+6	1.1391+3	9.3560+1	8.3651+1	9.7895+0	1.1983–1
1.7500–2	3.0880–7	3.6377+5	1.2199–4	3.5464+7	2.4683+7	7.5011+6	3.2798+6	1.0346+3	8.3549+1	7.4976+1	8.4499+0	1.2291–1
2.0000–2	3.4476–7	3.2584+5	1.5337–4	3.1766+7	2.2242+7	6.6891+6	2.8335+6	9.5176+2	7.5914+1	6.8331+1	7.4567+0	1.2603–1
2.5000–2	4.1427–7	2.7116+5	2.2475–4	2.6435+7	1.8667+7	5.5394+6	2.2286+6	8.2426+2	6.4482+1	5.8313+1	6.0396+0	1.2930–1
3.0000–2	4.8124–7	2.3343+5	3.0742–4	2.2757+7	1.6176+7	4.7486+6	1.8316+6	7.3287+2	5.6651+1	5.1411+1	5.1072+0	1.3289–1
4.0000–2	6.0508–7	1.8565+5	5.0240–4	1.8099+7	1.2979+7	3.7452+6	1.3748+6	6.0857+2	4.6276+1	4.2152+1	3.9873+0	1.3722–1
5.0000–2	7.2112–7	1.5578+5	7.3560–4	1.5187+7	1.0955+7	3.1297+6	1.1017+6	5.3021+2	3.9656+1	3.6225+1	3.2907+0	1.4039–1
6.0000–2	8.3123–7	1.3514+5	1.0035–3	1.3175+7	9.5377+6	2.7135+6	9.2345+5	4.7406+2	3.5081+1	3.2114+1	2.8233+0	1.4303–1
8.0000–2	1.0407–6	1.0795+5	1.6284–3	1.0524+7	7.6378+6	2.1856+6	6.9989+5	3.9904+2	2.9117+1	2.6752+1	2.2171+0	1.4738–1
1.0000–1	1.2365–6	9.0845+4	2.3634–3	8.8565+6	6.4266+6	1.8645+6	5.6510+5	3.5017+2	2.5389+1	2.3400+1	1.8381+0	1.5114–1
1.5000–1	1.6417–6	6.8424+4	4.5631–3	6.6706+6	4.8455+6	1.4316+6	3.9328+5	2.7942+2	2.0265+1	1.8765+1	1.3394+0	1.6006–1
2.0000–1	1.9590–6	5.7343+4	7.2059–3	5.5904+6	4.0705+6	1.2144+6	3.0524+5	2.4209+2	1.7635+1	1.6392+1	1.0729+0	1.6969–1
3.0000–1	2.4454–6	4.5936+4	1.3340–2	4.4784+6	3.2597+6	9.9915+5	2.1926+5	2.0508+2	1.5040+1	1.4044+1	8.0472–1	1.9163–1
4.0000–1	2.8270–6	3.9736+4	2.0274–2	3.8739+6	2.8034+6	8.9479+5	1.7549+5	1.8790+2	1.3820+1	1.2940+1	6.6396–1	2.1618–1
5.0000–1	3.1390–6	3.5786+4	2.7684–2	3.4888+6	2.5036+6	8.3458+5	1.5044+5	1.7833+2	1.3175+1	1.2349+1	5.8271–1	2.4335–1
6.0000–1	3.3989–6	3.3051+4	3.5389–2	3.2221+6	2.2933+6	7.9603+5	1.3266+5	1.7289+2	1.2782+1	1.1986+1	5.2377–1	2.7278–1
8.0000–1	3.8164–6	2.9435+4	5.1248–2	2.8696+6	2.0067+6	7.5101+5	1.1174+5	1.6779+2	1.2442+1	1.1651+1	4.5462–1	3.3683–1
1.0000+0	4.1413–6	2.7125+4	6.7395–2	2.6444+6	1.8197+6	7.2639+5	9.8154+4	1.6598+2	1.2330+1	1.1515+1	4.0856–1	4.0601–1
1.5000+0	4.7050–6	2.3875+4	1.0764–1	2.3276+6	1.5468+6	6.9877+5	8.1883+4	1.6670+2	1.2520+1	1.1568+1	3.5454–1	5.9751–1
2.0000+0	5.0720–6	2.2148+4	1.4707–1	2.1592+6	1.3939+6	6.9160+5	7.3500+4	1.6926+2	1.2838+1	1.1707+1	3.2467–1	8.0627–1
3.0000+0	5.5392–6	2.0280+4	2.2288–1	1.9771+6	1.2301+6	6.8229+5	6.4545+4	1.7465+2	1.3551+1	1.1992+1	2.9666–1	1.2628+0
4.0000+0	5.8247–6	1.9286+4	2.9467–1	1.8802+6	1.1422+6	6.7704+5	6.0810+4	1.7887+2	1.4314+1	1.2274+1	2.8381–1	1.7562+0
5.0000+0	6.0105–6	1.8690+4	3.6287–1	1.8220+6	1.0875+6	6.7650+5	5.7875+4	1.8221+2	1.5021+1	1.2486+1	2.7422–1	2.2605+0
6.0000+0	6.1353–6	1.8310+4	4.2792–1	1.7850+6	1.0527+6	6.7609+5	5.5993+4	1.8412+2	1.5728+1	1.2664+1	2.6930–1	2.7947+0
8.0000+0	6.2910–6	1.7856+4	5.4982–1	1.7408+6	1.0108+6	6.7577+5	5.4074+4	1.8717+2	1.7106+1	1.2965+1	2.6308–1	3.8788+0
1.0000+1	6.3742–6	1.7623+4	6.6221–1	1.7181+6	9.8988+5	6.7553+5	5.2502+4	1.9010+2	1.8502+1	1.3238+1	2.5836–1	5.0059+0
1.5000+1	6.4261–6	1.7481+4	9.1114–1	1.7042+6	9.7652+5	6.7597+5	5.1530+4	1.9564+2	2.1757+1	1.3578+1	2.5534–1	7.9235+0
2.0000+1	6.4397–6	1.7444+4	1.1250+0	1.7006+6	9.7338+5	6.7628+5	5.0748+4	1.9916+2	2.5078+1	1.3877+1	2.5322–1	1.0948+1
3.0000+1	6.4447–6	1.7430+4	1.4792+0	1.6993+6	9.7321+5	6.7641+5	4.9473+4	2.0360+2	3.1647+1	1.4214+1	2.5026–1	1.7183+1
4.0000+1	6.4443–6	1.7432+4	1.7660+0	1.6994+6	9.7308+5	6.7663+5	4.9496+4	2.0697+2	3.8284+1	1.4449+1	2.5073–1	2.3585+1
5.0000+1	6.4441–6	1.7432+4	2.0068+0	1.6995+6	9.7299+5	6.7669+5	4.9587+4	2.0935+2	4.4961+1	1.4613+1	2.5155–1	3.0097+1
6.0000+1	6.4440–6	1.7433+4	2.2141+0	1.6995+6	9.7291+5	6.7674+5	4.9647+4	2.1131+2	5.1694+1	1.4763+1	2.5222–1	3.6679+1
8.0000+1	6.4439–6	1.7433+4	2.5576+0	1.6995+6	9.7278+5	6.7680+5	4.9714+4	2.1453+2	6.5270+1	1.4992+1	2.5328–1	5.0025+1
1.0000+2	6.4440–6	1.7432+4	2.8357+0	1.6995+6	9.7269+5	6.7685+5	4.9735+4	2.1696+2	7.9007+1	1.5208+1	2.5411–1	6.3545+1
1.5000+2	6.4418–6	1.7438+4	3.3609+0	1.7001+6	9.7251+5	6.7688+5	5.0451+4	2.2114+2	1.1347+2	1.5403+1	2.5781–1	9.7813+1
2.0000+2	6.4403–6	1.7442+4	3.7453+0	1.7005+6	9.7239+5	6.7689+5	5.0965+4	2.2380+2	1.4817+2	1.5591+1	2.6048–1	1.3232+2
3.0000+2	6.4380–6	1.7449+4	4.2989+0	1.7011+6	9.7221+5	6.7691+5	5.1702+4	2.2661+2	2.1755+2	1.5937+1	2.6432–1	2.0135+2
4.0000+2	6.4365–6	1.7453+4	4.6976+0	1.7015+6	9.7209+5	6.7692+5	5.2231+4	2.2838+2	2.8729+2	1.6121+1	2.6710–1	2.7090+2
5.0000+2	6.4353–6	1.7456+4	5.0094+0	1.7018+6	9.7199+5	6.7692+5	5.2640+4	2.2978+2	3.5674+2	1.6247+1	2.6928–1	3.4023+2
6.0000+2	6.4348–6	1.7457+4	5.2654+0	1.7019+6	9.7191+5	6.7692+5	5.2838+4	2.3094+2	4.2651+2	1.6361+1	2.7037–1	4.0988+2
8.0000+2	6.4350–6	1.7457+4	5.6714+0	1.7019+6	9.7179+5	6.7693+5	5.2913+4	2.3310+2	5.6533+2	1.6590+1	2.7092–1	5.4847+2
1.0000+3	6.4353–6	1.7456+4	5.9875+0	1.7018+6	9.7169+5	6.7693+5	5.2935+4	2.3478+2	7.0522+2	1.6776+1	2.7120–1	6.8817+2
1.5000+3	6.4357–6	1.7455+4	6.5634+0	1.7017+6	9.7152+5	6.7693+5	5.3006+4	2.3819+2	1.0546+3	1.6942+1	2.7156–1	1.0374+3
2.0000+3	6.4363–6	1.7453+4	6.9729+0	1.7015+6	9.7139+5	6.7693+5	5.2970+4	2.4068+2	1.4039+3	1.7108+1	2.7138–1	1.3865+3
3.0000+3	6.4367–6	1.7452+4	7.5510+0	1.7014+6	9.7122+5	6.7693+5	5.3023+4	2.4436+2	2.1021+3	1.7440+1	2.7165–1	2.0844+3
4.0000+3	6.4373–6	1.7451+4	7.9615+0	1.7013+6	9.7109+5	6.7693+5	5.2987+4	2.4707+2	2.8044+3	1.7596+1	2.7147–1	2.7865+3
5.0000+3	6.4386–6	1.7447+4	8.2794+0	1.7009+6	9.7100+5	6.7693+5	5.2737+4	2.4920+2	3.5133+3	1.7752+1	2.7019–1	3.4953+3
6.0000+3	6.4384–6	1.7447+4	8.5391+0	1.7010+6	9.7092+5	6.7693+5	5.2861+4	2.5098+2	4.2073+3	1.7859+1	2.7083–1	4.1892+3
8.0000+3	6.4386–6	1.7447+4	8.9495+0	1.7009+6	9.7079+5	6.7693+5	5.2932+4	2.5380+2	5.6078+3	1.8074+1	2.7120–1	5.5895+3
1.0000+4	6.4388–6	1.7446+4	9.2675+0	1.7009+6	9.7070+5	6.7693+5	5.2966+4	2.5601+2	7.0217+3	1.8279+1	2.7138–1	7.0032+3
1.5000+4	6.4393–6	1.7445+4	9.8463+0	1.7007+6	9.7052+5	6.7693+5	5.3020+4	2.6017+2	1.0486+4	1.8439+1	2.7165–1	1.0467+4
2.0000+4	6.4398–6	1.7444+4	1.0258+1	1.7006+6	9.7040+5	6.7693+5	5.3020+4	2.6316+2	1.3996+4	1.8598+1	2.7165–1	1.3977+4
3.0000+4	6.4401–6	1.7443+4	1.0838+1	1.7005+6	9.7022+5	6.7693+5	5.3091+4	2.6735+2	2.0941+4	1.8917+1	2.7202–1	2.0922+4
4.0000+4	6.4407–6	1.7441+4	1.1250+1	1.7004+6	9.7010+5	6.7693+5	5.3056+4	2.7035+2	2.7961+4	1.9112+1	2.7183–1	2.7942+4
5.0000+4	6.4419–6	1.7438+4	1.1569+1	1.7000+6	9.7001+5	6.7693+5	5.2842+4	2.7266+2	3.4916+4	1.9265+1	2.7074–1	3.4897+4
6.0000+4	6.4418–6	1.7438+4	1.1830+1	1.7001+6	9.6993+5	6.7693+5	5.2949+4	2.7454+2	4.1866+4	1.9368+1	2.7129–1	4.1846+4
8.0000+4	6.4419–6	1.7438+4	1.2242+1	1.7000+6	9.6980+5	6.7693+5	5.3038+4	2.7753+2	5.5885+4	1.9574+1	2.7174–1	5.5865+4
1.0000+5	6.4422–6	1.7437+4	1.2562+1	1.7000+6	9.6971+5	6.7693+5	5.3056+4	2.7986+2	6.9930+4	1.9780+1	2.7183–1	6.9910+4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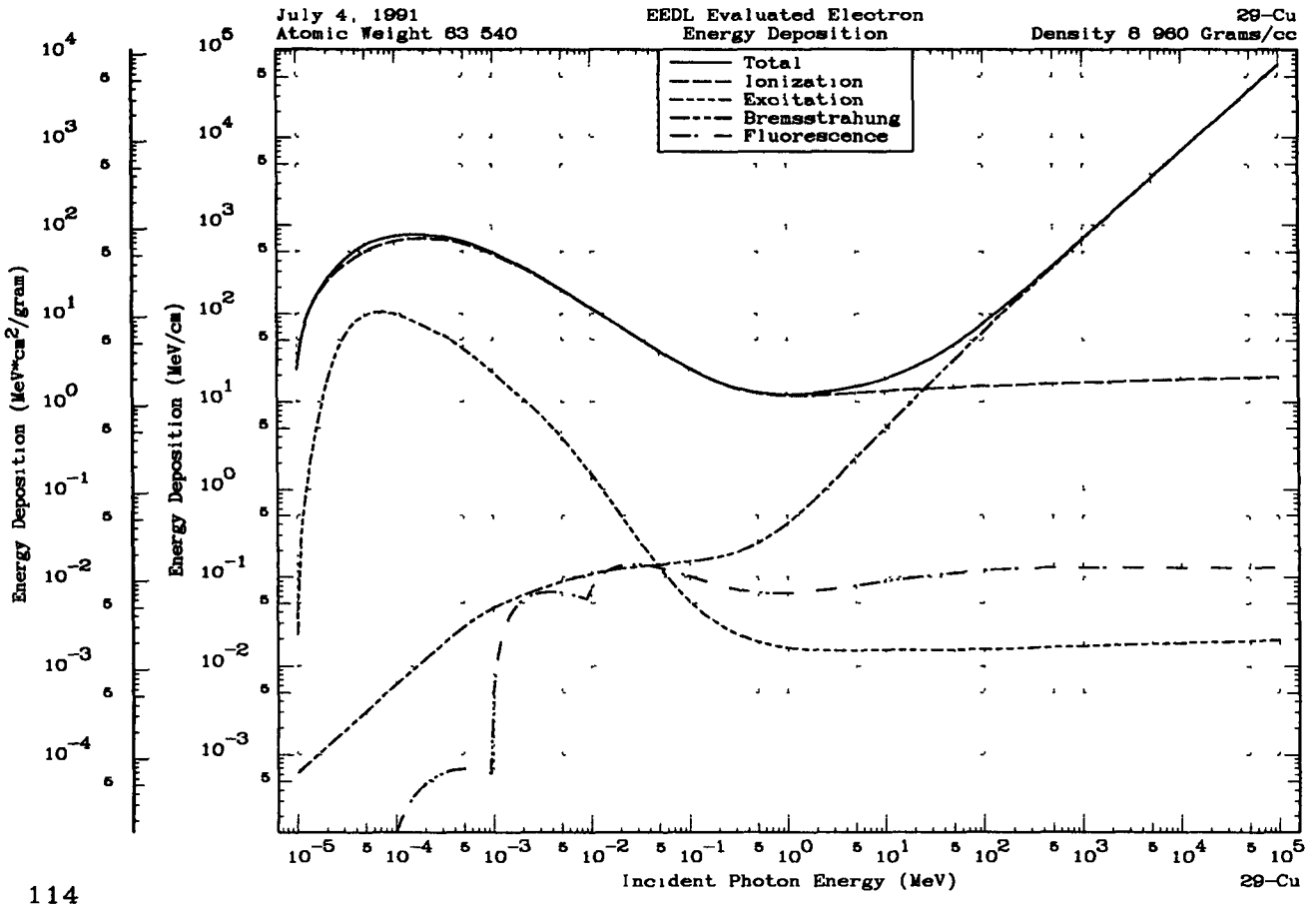
Atomic Weight 63 540
EEDL Evaluated Electron
Cross Sections
29-Cu
Density 8 960 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
29-Cu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EEDL Evaluated Electron
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Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
29-Cu

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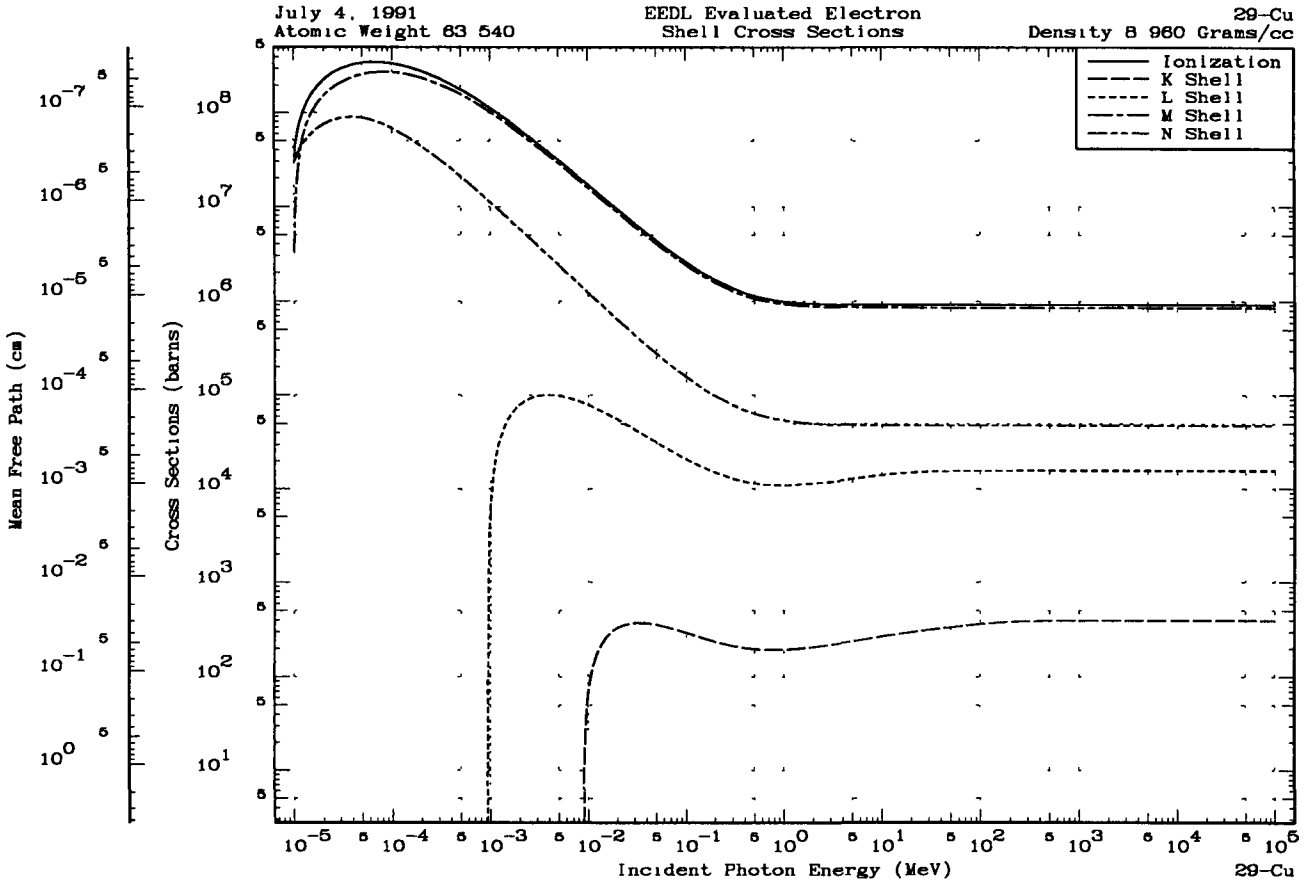
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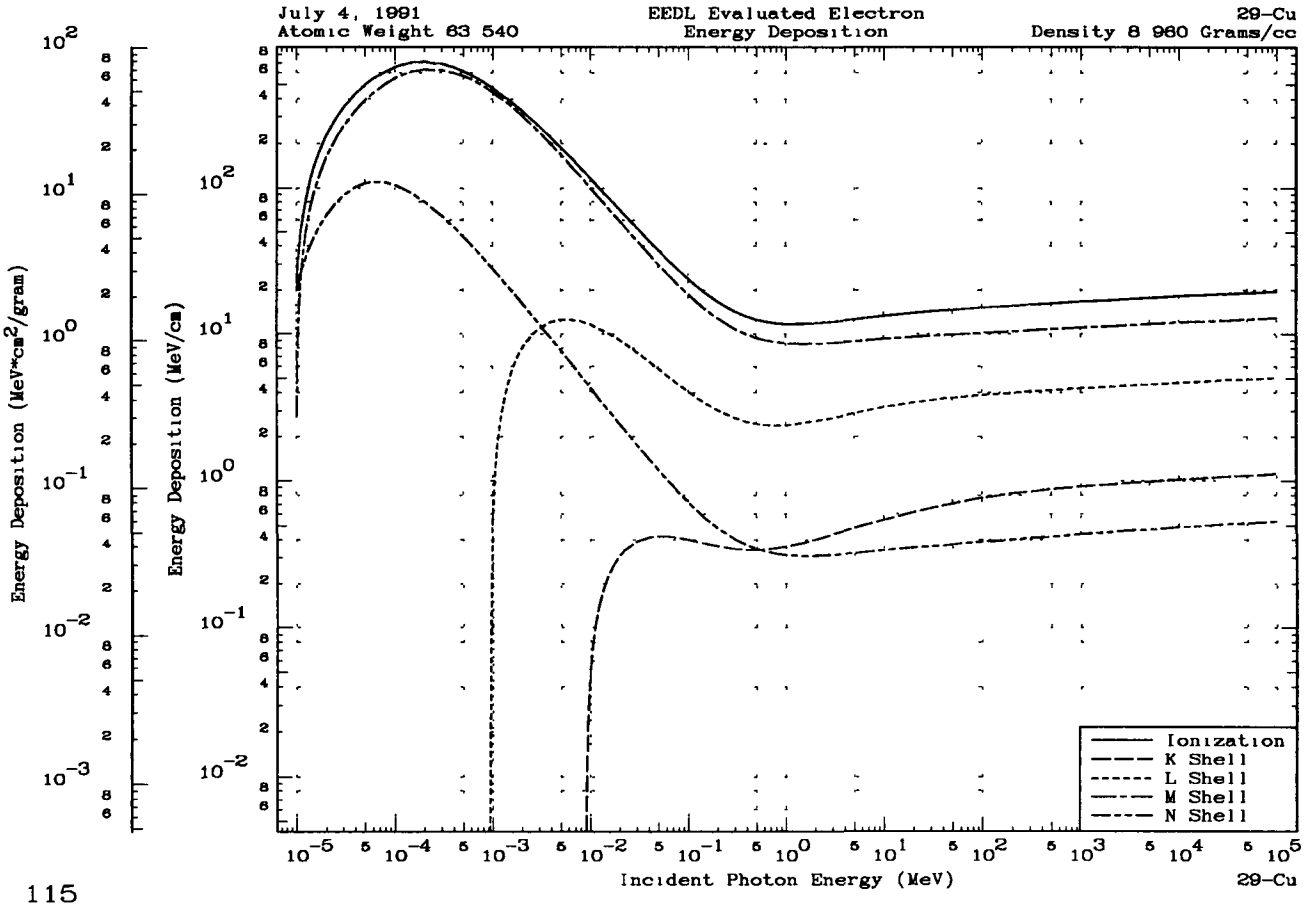
EEDL Evaluated Electron
Shell Cross Sections
29-Cu
Density 8 960 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
29-Cu


July 4, 1991
Atomic Weight 63 540
EEDL Evaluated Electron
Energy Deposition
29-Cu
Density 8 960 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
29-Cu

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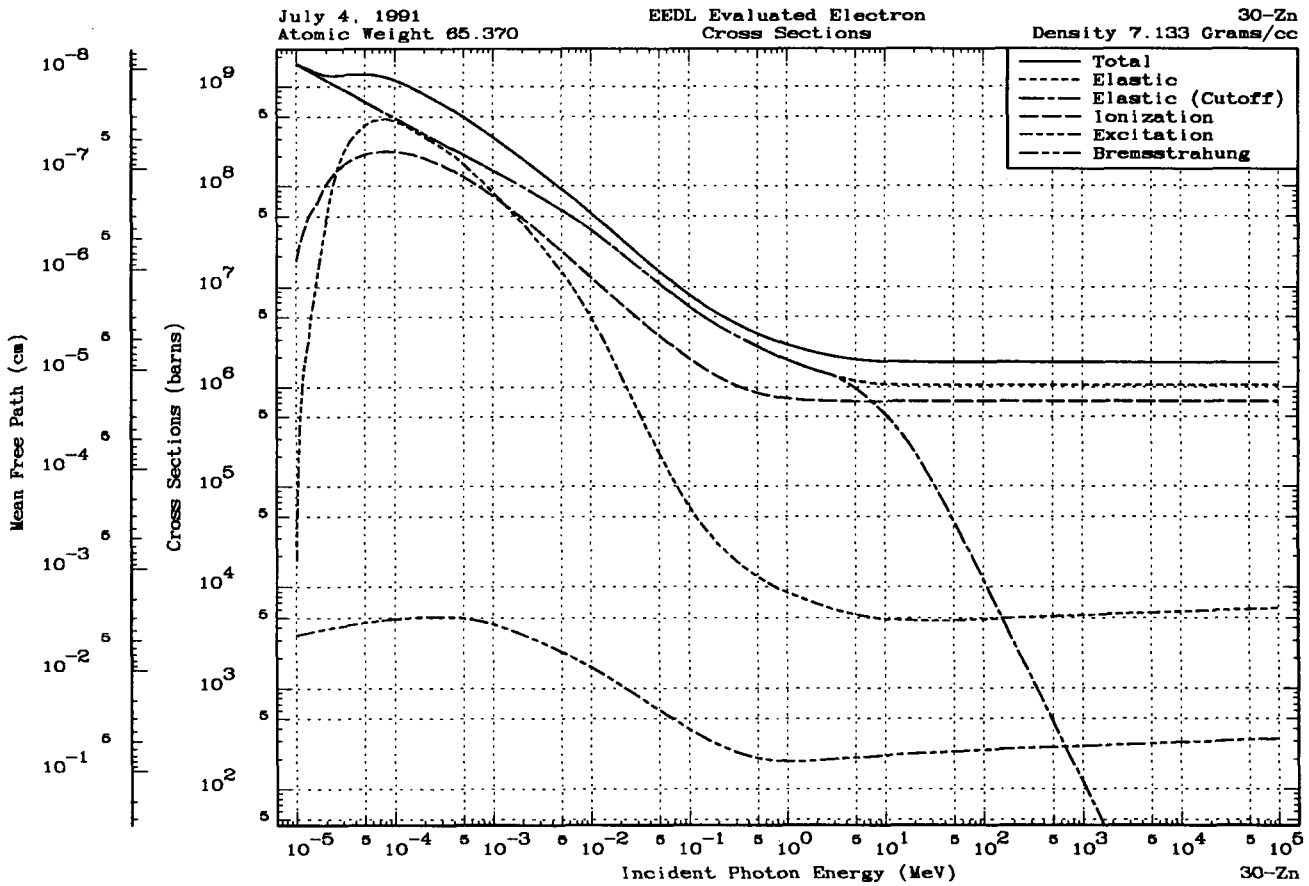
Atomic Weight 63.540 Density 8.960 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.7181–9	1.4460+7		1.5257+9	1.4921+9	3.3585+7	3.4669+4	3.3824+3	2.2941+1	2.2918+1	2.2916–2	6.1921–4
M4	1.0090–5	7.7457–9	1.4409+7		1.5203+9	1.4851+9	3.5182+7	5.4257+4	3.3883+3	2.4253+1	2.4216+1	3.6034–2	6.2448–4
	1.0243–5	7.7803–9	1.4345+7		1.5135+9	1.4733+9	4.0144+7	9.6785+4	3.3982+3	2.8418+1	2.8353+1	6.4547–2	6.3345–4
	1.0312–5	7.7948–9	1.4318+7		1.5107+9	1.4681+9	4.2512+7	1.1876+5	3.4026+3	3.0412+1	3.0332+1	7.9348–2	6.3750–4
	1.0541–5	7.8474–9	1.4222+7		1.5006+9	1.4511+9	4.9240+7	2.0267+5	3.4172+3	3.6144+1	3.6007+1	1.3626–1	6.5096–4
	1.0898–5	7.9208–9	1.4090+7		1.4867+9	1.4258+9	6.0508+7	3.6909+5	3.4393+3	4.5867+1	4.5616+1	2.5053–1	6.7207–4
	1.1098–5	7.9601–9	1.4021+7		1.4793+9	1.4122+9	6.6688+7	4.7811+5	3.4515+3	5.1291+1	5.0964+1	3.2625–1	6.8392–4
	1.1250–5	7.9907–9	1.3967+7		1.4737+9	1.4021+9	7.1051+7	5.6815+5	3.4606+3	5.5150+1	5.4760+1	3.8926–1	6.9296–4
	1.1411–5	8.0222–9	1.3912+7		1.4679+9	1.3916+9	7.5668+7	6.5852+5	3.4702+3	5.9322+1	5.8868+1	4.5310–1	7.0255–4
	1.1586–5	8.0582–9	1.3850+7		1.4613+9	1.3804+9	8.0145+7	7.7111+5	3.4804+3	6.3435+1	6.2901+1	5.3301–1	7.1299–4
	1.1924–5	8.1268–9	1.3733+7		1.4490+9	1.3596+9	8.8369+7	1.0395+6	3.4999+3	7.1118+1	7.0393+1	7.2487–1	7.3323–4
	1.2074–5	8.1545–9	1.3687+7		1.4441+9	1.3506+9	9.2281+7	1.1584+6	3.5084+3	7.4797+1	7.3985+1	8.1093–1	7.4225–4
	1.2308–5	8.1943–9	1.3620+7		1.4371+9	1.3370+9	9.8735+7	1.3406+6	3.5215+3	8.0894+1	7.9951+1	9.4194–1	7.5635–4
	1.2439–5	8.2182–9	1.3580+7		1.4329+9	1.3295+9	1.0190+8	1.4531+6	3.5287+3	8.3938+1	8.2915+1	1.0230+0	7.6427–4
	1.2693–5	8.2663–9	1.3501+7		1.4246+9	1.3154+9	1.0744+8	1.6941+6	3.5426+3	8.9362+1	8.8164+1	1.1974+0	7.7961–4
	1.3125–5	8.3405–9	1.3381+7		1.4119+9	1.2923+9	1.1740+8	2.1179+6	3.5657+3	9.9208+1	9.7701+1	1.5068+0	8.0585–4
	1.3654–5	8.4227–9	1.3251+7		1.3981+9	1.2656+9	1.2970+8	2.7568+6	3.5931+3	1.1180+2	1.0982+2	1.9772+0	8.3818–4
	1.3720–5	8.4332–9	1.3234+7		1.3963+9	1.2624+9	1.3106+8	2.8462+6	3.5964+3	1.1324+2	1.1119+2	2.0433+0	8.4219–4
	1.3846–5	8.4547–9	1.3201+7		1.3928+9	1.2563+9	1.3343+8	3.0256+6	3.6029+3	1.1579+2	1.1361+2	2.1762+0	8.4994–4
	1.5000–5	8.6239–9	1.2942+7		1.3655+9	1.2043+9	1.5624+8	4.9497+6	3.6592+3	1.4094+2	1.3732+2	3.6221+0	9.2127–4
	1.7500–5	8.9377–9	1.2487+7		1.3175+9	1.1101+9	1.9600+8	1.1480+7	3.7703+3	1.9100+2	1.8253+2	8.4672+0	1.0787–3
	2.0000–5	9.1840–9	1.2152+7		1.2822+9	1.0344+9	2.2686+8	2.0917+7	3.8693+3	2.3823+2	2.2268+2	1.5548+1	1.2399–3
	2.2500–5	9.3778–9	1.1901+7		1.2557+9	9.7198+8	2.5103+8	3.2705+7	3.9441+3	2.8207+2	2.5770+2	2.4373+1	1.3882–3
	2.5000–5	9.5289–9	1.1712+7		1.2358+9	9.1933+8	2.7081+8	4.5648+7	4.0123+3	3.2399+2	2.8988+2	3.4104+1	1.5385–3
	2.6250–5	9.5895–9	1.1638+7		1.2280+9	8.9593+8	2.7973+8	5.2318+7	4.0443+3	3.4460+2	3.0546+2	3.9137+1	1.6145–3
	3.0000–5	9.7602–9	1.1435+7		1.2065+9	8.3487+8	3.0086+8	7.0773+7	4.1331+3	4.0012+2	3.4697+2	5.3144+1	1.8452–3
	3.5000–5	9.9830–9	1.1180+7		1.1796+9	7.6972+8	3.1854+8	9.1325+7	4.2361+3	4.5970+2	3.9021+2	6.9497+1	2.1561–3
	4.0000–5	1.0176–8	1.0968+7		1.1572+9	7.1740+8	3.3490+8	1.0489+8	4.3273+3	5.1511+2	4.3423+2	8.0875+1	2.4732–3
	5.0000–5	1.0633–8	1.0496+7		1.1075+9	6.3784+8	3.5056+8	1.1907+8	4.4588+3	5.9326+2	4.9860+2	9.4652+1	3.0788–3
	6.0000–5	1.1107–8	1.0048+7		1.0602+9	5.7942+8	3.5567+8	1.2513+8	4.5591+3	6.4740+2	5.4536+2	1.0203+2	3.6784–3
M3	7.7860–5	1.1988–8	9.3101+6		9.8232+8	5.0510+8	3.5355+8	1.2365+8	4.7063+3	7.0767+2	6.0314+2	1.0452+2	4.7749–3
	7.8930–5	1.2040–8	9.2697+6		9.7805+8	5.0148+8	3.5351+8	1.2305+8	4.7142+3	7.1122+2	6.0697+2	1.0425+2	4.8416–3
	8.0000–5	1.2092–8	9.2301+6		9.7388+8	4.9794+8	3.5347+8	1.2246+8	4.7219+3	7.1478+2	6.1079+2	1.0398+2	4.9083–3
M2	8.0500–5	1.2118–8	9.2097+6		9.7172+8	4.9631+8	3.5318+8	1.2222+8	4.7255+3	7.1564+2	6.1178+2	1.0386+2	4.9395–3
	8.1719–5	1.2183–8	9.1606+6		9.6654+8	4.9239+8	3.5253+8	1.2161+8	4.7322+3	7.1800+2	6.1445+2	1.0354+2	5.0120–3
	8.2500–5	1.2225–8	9.1298+6		9.6329+8	4.8993+8	3.5212+8	1.2123+8	4.7365+3	7.1955+2	6.1621+2	1.0334+2	5.0586–3
	8.4004–5	1.2303–8	9.0715+6		9.5714+8	4.8529+8	3.5133+8	1.2051+8	4.7446+3	7.2246+2	6.1948+2	1.0297+2	5.1483–3
	8.6875–5	1.2450–8	8.9645+6		9.4585+8	4.7678+8	3.4990+8	1.1917+8	4.7597+3	7.2819+2	6.2590+2	1.0229+2	5.3198–3
	8.8003–5	1.2507–8	8.9239+6		9.4157+8	4.7355+8	3.4935+8	1.1866+8	4.7655+3	7.3042+2	6.2838+2	1.0203+2	5.3874–3
	9.3438–5	1.2772–8	8.7385+6		9.2201+8	4.5883+8	3.4684+8	1.1633+8	4.7925+3	7.4138+2	6.4050+2	1.0088+2	5.7138–3
	9.4002–5	1.2799–8	8.7202+6		9.2008+8	4.5738+8	3.4660+8	1.1610+8	4.7952+3	7.4253+2	6.4176+2	1.0076+2	5.7478–3
	1.0000–4	1.3077–8	8.5348+6	0.0000+0	9.0052+8	4.4271+8	3.4406+8	1.1374+8	4.8234+3	7.5482+2	6.5518+2	9.9637+1	6.1101–3
	1.1250–4	1.3701–8	8.1461+6	1.6435–8	8.5950+8	4.1625+8	3.3598+8	1.0727+8	4.8633+3	7.6639+2	6.7116+2	9.5214+1	6.8377–3
M1	1.2126–4	1.4110–8	7.9098+6	2.7799–8	8.3457+8	4.0023+8	3.3100+8	1.0334+8	4.8889+3	7.7534+2	6.8276+2	9.2571+1	7.3507–3
	1.2306–4	1.4201–8	7.8592+6	3.0114–8	8.2923+8	3.9716+8	3.2974+8	1.0232+8	4.8939+3	7.7593+2	6.8406+2	9.1862+1	7.4562–3
	1.2642–4	1.4369–8	7.7672+6	3.4451–8	8.1952+8	3.9159+8	3.2745+8	1.0048+8	4.9032+3	7.7716+2	6.8657+2	9.0580+1	7.6542–3
	1.3232–4	1.4656–8	7.6150+6	4.2023–8	8.0346+8	3.8236+8	3.2366+8	9.7441+7	4.9189+3	7.7970+2	6.9122+2	8.8478+1	8.0016–3
	1.3594–4	1.4828–8	7.5266+6	4.6660–8	7.9413+8	3.7700+8	3.2144+8	9.5686+7	4.9282+3	7.8146+2	6.9419+2	8.7267+1	8.2154–3
	1.4116–4	1.5072–8	7.4050+6	5.3330–8	7.8130+8	3.6964+8	3.1837+8	9.3289+7	4.9412+3	7.8411+2	6.9849+2	8.5618+1	8.5245–3
	1.5000–4	1.5471–8	7.2140+6	6.4569–8	7.6115+8	3.5807+8	3.1353+8	8.9550+7	4.9623+3	7.8920+2	7.0613+2	8.3061+1	9.0494–3
	1.6250–4	1.6058–8	6.9501+6	8.0435–8	7.3331+8	3.4338+8	3.0499+8	8.4933+7	4.9810+3	7.8650+2	7.0687+2	7.9625+1	9.7749–3
	1.7500–4	1.6619–8	6.7156+6	9.6339–8	7.0856+8	3.3032+8	2.9737+8	8.0871+7	4.9985+3	7.8543+2	7.0880+2	7.6623+1	1.0503–2
	1.8125–4	1.6891–8	6.6075+6	1.0430–7	6.9716+8	3.2431+8	2.9383+8	7.9016+7	5.0067+3	7.8524+2	7.0997+2	7.5259+1	1.0868–2
	2.0000–4	1.7675–8	6.3146+6	1.2816–7	6.6626+8	3.0802+8	2.8419+8	7.4035+7	5.0300+3	7.8629+2	7.1466+2	7.1623+1	1.1965–2
	2.2500–4	1.8756–8	5.9504+6	1.6024–7	6.2783+8	2.8961+8	2.6987+8	6.8345+7	5.0219+3	7.7214+2	7.0494+2	6.7189+1	1.3330–2
	2.5000–4	1.9775–8	5.6438+6	1.9283–7	5.9548+8	2.7407+8	2.5778+8	6.3626+7	5.0146+3	7.6224+2	6.9868+2	6.3546+1	1.4692–2
	2.6250–4	2.0265–8	5.5073+6	2.0927–7	5.8108+8	2.6716+8	2.5236+8	6.1553+7	5.0112+3	7.5818+2	6.9620+2	6.1958+1	1.5373–2
	3.0000–4	2.1665–8	5.1514+6	2.5901–7	5.4353+8	2.4913+8	2.3818+8	5.6218+7	5.0020+3	7.4967+2	6.9174+2	5.7908+1	1.7412–2
	3.5000–4	2.3577–8	4.7337+6	3.2694–7	4.9946+8	2.2997+8	2.1977+8	4.9709+7	4.9775+3	7.2263+2	6.7019+2	5.2415+1	2.0066–2
	4.0000–4	2.5418–8	4.3909+6	3.9715–7	4.6329+8	2.1457+8	2.0502+8	4.3697+7	4.9564+3	7.0185+2	6.5468+2	4.7141+1	2.2710–2
	5.0000–4	2.8945–8	3.8558+6	5.4440–7	4.0682+8	1.9115+8	1.8030+8	3.5380+7	4.8081+3	6.5684+2	6.1720+2	3.9610+1	2.7294–2
	6.0000–4	3.2282–8	3.4573+6	7.0155–7	3.6478+8	1.7392+8	1.6110+8	2.9761+7	4.6903+3	6.1628+2	5.8189+2	3.4359+1	3.1760–2
	8.0000–4	3.8638–8	2.8886+6	1.0458–6	3.0477+8	1.4983+8	1.3314+8	2.1800+7	4.4078+3	5.4698+2	5.2050+2	2.6441+1	3.8863–2
L3	9.3749–4	4.2746–8	2.6109+6	1.3067–6	2.7548+8	1.3801+8	1.1908+8	1.8392+7	4.2311+3	5.0744+2	4.8452+2	2.2883+1	4.3065–2
	9.5312–4	4.3198–8	2.5836+6	1.3376–6	2.7260+8	1.3683+8	1.1770+8	1.8059+7	4.2131+3	5.0373+2	4.8114+2	2.2541+1	4.3533–2
L2	9.5853–4	4.3354–8	2.5743+6	1.3484–6	2.7162+8	1.3643+8	1.1723+8	1.7946+7	4.2070+3	5.0246+2	4.7999+2	2.2426+1	4.3695–2
	9.7656–4	4.3872–8	2.5439+6	1.3844–6	2.6841+8	1.3512+8	1.1571+8	1.7576+7	4.1868+3	4.9844+2	4.7635+2	2.2048+1	4.4233–2
	9.7927–4	4.3949–8	2.5394+6	1.3899–6	2.6794+8	1.3493+8	1.1549+8	1.7521+7	4.1838+3	4.9784+2	4.7581+2	2.1992+1	4.4313–2
	1.0000–3	4.4539–8	2.5058+6	1.4317–6	2.6439+8	1.3347+8	1.1380+8	1.7115+7	4.1613+3	4.9342+2	4.7180+2	2.1577+1	4.4929–2
	1.0625–3	4.6321–8	2.4095+6	1.5603–6	2.5422+8	1.2934+8	1.0883+8	1.6049+7	4.0771+3	4.7840+2	4.5794+2	2.0416+1	4.6233–2
L1	1.0861–3	4.6982–8	2.3755+6	1.6099–6	2.5064+8	1.2788+8	1.0708+8	1.5680+7	4.0470+3	4.7313+2	4.5307+2	2.0013+1	4.6721–2
	1.1172–3	4.7863–8	2.3318+6	1.6761–6	2.4603+8	1.2602+8	1.0483+8	1.5173+7	4.0081+3	4.6602+2	4.4652+2	1.9454+1	4.7323–2
	1.1378–3	4.8444–8	2.3039+6	1.7207–6	2.4308+8	1.2483+8	1.0340+8	1.4853+7	3.9831+3	4.6146+2	4.4231+2	1.9101+1	4.7721–2
	1.2129–3	5.0518–8	2.2093+6	1.8861–6	2.3310+8	1.2076+8	9.8552+7	1.3788+7	3.8969+3	4.4624+2	4.2827+2	1.7925+1	4.9155–2
	1.2284–3	5.0940–8	2.1910+6	1.9209–6	2.3117+8	1.1996+8	9.7617+7	1.3586+7	3.8800+3	4.4331+2	4.2556+2	1.7701+1	4.9449–2
	1.2963–3	5.2764–8	2.1152+6	2.0762–6	2.2318+8	1.1666+8	9.3753+7	1.2761+7	3.8092+3	4.3125+2	4.1441+2	1.6788+1	5.0728–2
	1.3564–3	5.4350–8	2.0535+6	2.2173–6	2.1667+8	1.1394+8	9.0615+7	1.2104+7	3.7505+3	4.2160+2	4.0549+2	1.6060+1	5.1850–2
	1.5000–3	5.8023–8	1.9235+6	2.5661–6	2.0295+8	1.0815+8	8.4033+7	1.0767+7	3.6236+3	4.0152+2	3.8689+2	1.4573+1	5.4482–2
	1.6250–3	6.1225–8	1.8229+6	2.8848–6	1.9234+8	1.0364+8	7.8888+7	9.8068+6	3.5205+3	3.8323+2	3.6973+2	1.3445+1	5.6452–2
	1.7500–3	6.4334–8	1.7348+6	3.2179–6	1.8304+8	9.9634+7	7.4408+7	8.9948+6	3.4276+3	3.6739+2	3.5484+2	1.2488+1	5.8391–2

Atomic Weight 63.540 Density 8.960 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.8125–3	6.5858–8	1.6947+6	3.3897–6	1.7881+8	9.7792+7	7.2378+7	8.6340+6	3.3846+3	3.6027+2	3.4815+2	1.2063+1	5.9349–2
2.0000–3	7.0312–8	1.5873+6	3.9243–6	1.6748+8	9.2804+7	6.6974+7	7.6975+6	3.2665+3	3.4138+2	3.3036+2	1.0956+1	6.2178–2
2.2500–3	7.6293–8	1.4629+6	4.6840–6	1.5435+8	8.6823+7	6.0813+7	6.7106+6	3.1195+3	3.1700+2	3.0721+2	9.7263+0	6.5165–2
2.6250–3	8.4848–8	1.3154+6	5.9234–6	1.3879+8	7.9573+7	5.3602+7	5.6076+6	2.9370+3	2.8861+2	2.8019+2	8.3474+0	6.9524–2
3.0000–3	9.3038–8	1.1996+6	7.2744–6	1.2657+8	7.3785+7	4.8054+7	4.7272+6	2.7876+3	2.6680+2	2.5951+2	7.2222+0	7.3742–2
3.5000–3	1.0385–7	1.0747+6	9.2451–6	1.1339+8	6.7322+7	4.2203+7	3.8619+6	2.6050+3	2.4107+2	2.3494+2	6.0522+0	7.8038–2
4.0000–3	1.1417–7	9.7756+5	1.1408–5	1.0314+8	6.2182+7	3.7717+7	3.2415+6	2.4565+3	2.2154+2	2.1625+2	5.2075+0	8.2196–2
5.0000–3	1.3440–7	8.3043+5	1.6268–5	8.7619+7	5.4096+7	3.1171+7	2.3506+6	2.2112+3	1.9077+2	1.8675+2	3.9261+0	8.8777–2
6.0000–3	1.5384–7	7.2548+5	2.1843–5	7.6545+7	4.8101+7	2.6639+7	1.8038+6	2.0215+3	1.6840+2	1.6520+2	3.1086+0	9.4924–2
8.0000–3	1.9110–7	5.8402+5	3.4955–5	6.1621+7	3.9721+7	2.0754+7	1.1441+6	1.7378+3	1.3769+2	1.3552+2	2.0706+0	1.0252–1
K 8.9432–3	2.0823–7	5.3598+5	4.2081–5	5.6552+7	3.6756+7	1.8834+7	9.5979+5	1.6353+3	1.2717+2	1.2530+2	1.7655+0	1.0572–1
9.0753–3	2.1060–7	5.2996+5	4.3125–5	5.5916+7	3.6383+7	1.8595+7	9.3637+5	1.6218+3	1.2585+2	1.2402+2	1.7271+0	1.0609–1
9.3065–3	2.1472–7	5.1978+5	4.4979–5	5.4843+7	3.5752+7	1.8192+7	8.9751+5	1.5989+3	1.2363+2	1.2186+2	1.6632+0	1.0674–1
9.6532–3	2.2085–7	5.0535+5	4.7820–5	5.3319+7	3.4853+7	1.7621+7	8.4386+5	1.5662+3	1.2050+2	1.1881+2	1.5748+0	1.0771–1
1.0000–2	2.2693–7	4.9181+5	5.0733–5	5.1891+7	3.4007+7	1.7087+7	7.9514+5	1.5353+3	1.1757+2	1.1596+2	1.4943+0	1.0867–1
1.0625–2	2.3803–7	4.6887+5	5.6169–5	4.9471+7	3.2545+7	1.6208+7	7.1652+5	1.4813+3	1.1242+2	1.1095+2	1.3582+0	1.0994–1
1.1172–2	2.4762–7	4.5072+5	6.1124–5	4.7556+7	3.1383+7	1.5514+7	6.5734+5	1.4381+3	1.0836+2	1.0700+2	1.2554+0	1.1106–1
1.2129–2	2.6414–7	4.2254+5	7.0221–5	4.4582+7	2.9568+7	1.4442+7	5.7081+5	1.3700+3	1.0210+2	1.0088+2	1.1044+0	1.1301–1
1.3565–2	2.8835–7	3.8705+5	8.4848–5	4.0838+7	2.7265+7	1.3101+7	4.7104+5	1.2825+3	9.4288+1	9.3243+1	9.2900–1	1.1592–1
1.5000–2	3.1196–7	3.5776+5	1.0061–4	3.7747+7	2.5348+7	1.2002+7	3.9630+5	1.2086+3	8.7902+1	8.6986+1	7.9645–1	1.1878–1
1.7500–2	3.5287–7	3.1629+5	1.3067–4	3.3372+7	2.2564+7	1.0503+7	3.0392+5	1.0985+3	7.8610+1	7.7863+1	6.2514–1	1.2195–1
2.0000–2	3.9253–7	2.8433+5	1.6400–4	3.0000+7	2.0401+7	9.3562+6	2.4149+5	1.0113+3	7.1519+1	7.0886+1	5.0814–1	1.2516–1
2.2500–2	4.3157–7	2.5861+5	2.0048–4	2.7286+7	1.8626+7	8.4615+6	1.9727+5	9.3784+2	6.5640+1	6.5092+1	4.2182–1	1.2682–1
3.0000–2	5.4380–7	2.0524+5	3.2676–4	2.1655+7	1.4914+7	6.6198+6	1.2037+5	7.8015+2	5.3554+1	5.3152+1	2.6971–1	1.3234–1
4.0000–2	6.8512–7	1.6290+5	5.3293–4	1.7188+7	1.1903+7	5.2091+6	7.5066+4	6.4857+2	4.3779+1	4.3466+1	1.7552–1	1.3689–1
5.0000–2	8.1841–7	1.3637+5	7.7928–4	1.4389+7	9.9895+6	4.3461+6	5.2424+4	5.6531+2	3.7567+1	3.7300+1	1.2657–1	1.4019–1
6.0000–2	9.4410–7	1.1822+5	1.0620–3	1.2473+7	8.6699+6	3.7628+6	3.9820+4	5.0575+2	3.3258+1	3.3017+1	9.8601–2	1.4293–1
8.0000–2	1.1753–6	9.4964+4	1.7203–3	1.0020+7	6.9686+6	3.0240+6	2.6587+4	4.2618+2	2.7677+1	2.7461+1	6.8446–2	1.4741–1
1.0000–1	1.3819–6	8.0764+4	2.4927–3	8.5215+6	5.9257+6	2.5755+6	1.9930+4	3.7431+2	2.4189+1	2.3985+1	5.2820–2	1.5125–1
1.2500–1	1.6031–6	6.9620+4	3.5913–3	7.3456+6	5.1060+6	2.2237+6	1.5558+4	3.3088+2	2.1380+1	2.1182+1	4.2308–2	1.5550–1
1.5000–1	1.8098–6	6.1669+4	4.8188–3	6.5068+6	4.5212+6	1.9723+6	1.2990+4	2.9916+2	1.9386+1	1.9189+1	3.6223–2	1.6030–1
2.0000–1	2.1478–6	5.1962+4	7.5758–3	5.4826+6	3.8025+6	1.6698+6	1.0037+4	2.5935+2	1.6940+1	1.6741+1	2.8977–2	1.6998–1
2.5000–1	2.4180–6	4.6157+4	1.0656–2	4.8701+6	3.3638+6	1.4976+6	8.4873+3	2.3672+2	1.5546+1	1.5340+1	2.5100–2	1.8106–1
3.0000–1	2.6635–6	4.1902+4	1.3982–2	4.4211+6	3.0431+6	1.3702+6	7.5538+3	2.1970+2	1.4533+1	1.4318+1	2.2870–2	1.9210–1
4.0000–1	3.0536–6	3.6550+4	2.1142–2	3.8564+6	2.6254+6	1.2244+6	6.4173+3	2.0120+2	1.3414+1	1.3178+1	2.0091–2	2.1672–1
5.0000–1	3.3618–6	3.3199+4	2.8765–2	3.5028+6	2.3565+6	1.1403+6	5.7670+3	1.9088+2	1.2827+1	1.2565+1	1.8529–2	2.4362–1
6.0000–1	3.6118–6	3.0900+4	3.6669–2	3.2603+6	2.1686+6	1.0862+6	5.3754+3	1.8505+2	1.2476+1	1.2185+1	1.7638–2	2.7330–1
8.0000–1	4.0023–6	2.7886+4	5.2887–2	2.9423+6	1.9141+6	1.0232+6	4.8526+3	1.7955+2	1.2190+1	1.1836+1	1.6452–2	3.3716–1
1.0000+0	4.2920–6	2.6004+4	6.9348–2	2.7437+6	1.7504+6	9.8858+5	4.5600+3	1.7757+2	1.2110+1	1.1689+1	1.5852–2	4.0608–1
1.5000+0	4.7760–6	2.3368+4	1.1026–1	2.4656+6	1.5120+6	9.4923+5	4.2006+3	1.7822+2	1.2333+1	1.1721+1	1.5255–2	5.9677–1
2.0000+0	5.0746–6	2.1993+4	1.5026–1	2.3205+6	1.3796+6	9.3666+5	4.0389+3	1.8094+2	1.2666+1	1.1847+1	1.4993–2	8.0462–1
3.0000+0	5.4468–6	2.0491+4	2.2702–1	2.1620+6	1.2373+6	9.2067+5	3.8511+3	1.8642+2	1.3397+1	1.2122+1	1.4931–2	1.2596+0
4.0000+0	5.6528–6	1.9744+4	2.9968–1	2.0832+6	1.1609+6	9.1836+5	3.7760+3	1.9005+2	1.4135+1	1.2368+1	1.4887–2	1.7523+0
5.0000+0	5.7879–6	1.9283+4	3.6867–1	2.0346+6	1.1141+6	9.1660+5	3.7275+3	1.9291+2	1.4861+1	1.2592+1	1.4940–2	2.2539+0
6.0000+0	5.8804–6	1.8980+4	4.3440–1	2.0025+6	1.0835+6	9.1521+5	3.6832+3	1.9542+2	1.5573+1	1.2771+1	1.5005–2	2.7869+0
8.0000+0	5.9982–6	1.8607+4	5.5739–1	1.9632+6	1.0461+6	9.1320+5	3.6621+3	1.9946+2	1.6971+1	1,3083+1	1.5110–2	3.8725+0
1.0000+1	6.0578–6	1.8424+4	6.7075–1	1.9439+6	1.0269+6	9.1318+5	3.6361+3	2.0267+2	1.8332+1	1.3327+1	1.5192–2	4.9907+0
1.5000+1	6.0980–6	1.8302+4	9.2201–1	1.9311+6	1.0137+6	9.1354+5	3.6055+3	2.0869+2	2.1555+1	1.3656+1	1.5183–2	7.8829+0
2.0000+1	6.1044–6	1.8283+4	1.1379+0	1.9291+6	1.0115+6	9.1381+5	3.5760+3	2.1197+2	2.4848+1	1.3945+1	1.5176–2	1.0888+1
3.0000+1	6.1052–6	1.8281+4	1.4953+0	1.9288+6	1.0113+6	9.1383+5	3.5193+3	2.1668+2	3.1362+1	1.4285+1	1.5167–2	1.7062+1
4.0000+1	6.1049–6	1.8282+4	1.7849+0	1.9289+6	1.0111+6	9.1405+5	3.5178+3	2.2007+2	3.7913+1	1.4508+1	1.5185–2	2.3390+1
5.0000+1	6.1051–6	1.8281+4	2.0280+0	1.9289+6	1.0110+6	9.1412+5	3.5211+3	2.2269+2	4.4531+1	1.4665+1	1.5224–2	2.9851+1
6.0000+1	6.1052–6	1.8281+4	2.2372+0	1.9288+6	1.0109+6	9.1417+5	3.5229+3	2.2482+2	5.1206+1	1.4807+1	1.5256–2	3.6384+1
8.0000+1	6.1054–6	1.8280+4	2.5840+0	1.9288+6	1.0108+6	9.1423+5	3.5233+3	2.2817+2	6.4664+1	1.5031+1	1.5307–2	4.9617+1
1.0000+2	6.1056–6	1.8280+4	2.8647+0	1.9287+6	1.0107+6	9.1428+5	3.5209+3	2.3071+2	7.8278+1	1.5244+1	1.5346–2	6.3018+1
1.5000+2	6.1060–6	1.8278+4	3.3948+0	1.9286+6	1.0105+6	9.1431+5	3.5587+3	2.3515+2	1.1243+2	1.5432+1	1.5513–2	9.6982+1
2.0000+2	6.1063–6	1.8277+4	3.7828+0	1.9285+6	1.0103+6	9.1433+5	3.6027+3	2.3801+2	1.4681+2	1.5612+1	1.5708–2	1.3118+2
3.0000+2	6.1066–6	1.8276+4	4.3415+0	1.9284+6	1.0101+6	9.1435+5	3.6628+3	2.4105+2	2.1553+2	1.5943+1	1.5975–2	1.9957+2
4.0000+2	6.1069–6	1.8275+4	4.7440+0	1.9283+6	1.0100+6	9.1435+5	3.7043+3	2.4297+2	2.8461+2	1.6131+1	1.6162–2	2.6846+2
5.0000+2	6.1072–6	1.8275+4	5.0587+0	1.9282+6	1.0099+6	9.1435+5	3.7361+3	2.4449+2	3.5338+2	1.6249+1	1.6306–2	3.3712+2
6.0000+2	6.1073–6	1.8274+4	5.3172+0	1.9281+6	1.0098+6	9.1435+5	3.7615+3	2.4575+2	4.2248+2	1.6358+1	1.6423–2	4.0611+2
8.0000+2	6.1077–6	1.8273+4	5.7270+0	1.9280+6	1.0096+6	9.1436+5	3.8007+3	2.4806+2	5.5997+2	1.6574+1	1.6605–2	5.4338+2
1.0000+3	6.1079–6	1.8273+4	6.0461+0	1.9280+6	1.0095+6	9.1436+5	3.8304+3	2.4987+2	6.9853+2	1.6758+1	1.6746–2	6.8176+2
1.5000+3	6.1084–6	1.8271+4	6.6275+0	1.9278+6	1.0093+6	9.1436+5	3.8890+3	2.5349+2	1.0446+3	1.6916+1	1.7003–2	1.0277+3
2.0000+3	6.1086–6	1.8270+4	7.0410+0	1.9277+6	1.0092+6	9.1436+5	3.9304+3	2.5621+2	1.3904+3	1.7073+1	1.7184–2	1.3733+3
3.0000+3	6.1091–6	1.8269+4	7.6249+0	1.9276+6	1.0090+6	9.1436+5	3.9886+3	2.6030+2	2.0813+3	1.7387+1	1.7438–2	2.0639+3
4.0000+3	6.1094–6	1.8268+4	8.0395+0	1.9275+6	1.0088+6	9.1436+5	4.0299+3	2.6333+2	2.7760+3	1.7547+1	1.7619–2	2.7585+3
5.0000+3	6.1097–6	1.8267+4	8.3606+0	1.9274+6	1.0087+6	9.1436+5	4.0623+3	2.6570+2	3.4777+3	1.7706+1	1.7761–2	3.4600+3
6.0000+3	6.1099–6	1.8267+4	8.6230+0	1.9273+6	1.0086+6	9.1436+5	4.0883+3	2.6749+2	4.1653+3	1.7808+1	1.7875–2	4.1475+3
8.0000+3	6.1102–6	1.8266+4	9.0375+0	1.9272+6	1.0085+6	9.1436+5	4.1294+3	2.7034+2	5.5522+3	1.8011+1	1.8055–2	5.5342+3
1.0000+4	6.1104–6	1.8265+4	9.3587+0	1.9272+6	1.0084+6	9.1436+5	4.1614+3	2.7257+2	6.9517+3	1.8207+1	1.8195–2	6.9334+3
1.5000+4	6.1109–6	1.8264+4	9.9435+0	1.9270+6	1.0082+6	9.1436+5	4.2196+3	2.7697+2	1.0378+4	1.8358+1	1.8450–2	1.0360+4
2.0000+4	6.1112–6	1.8263+4	1.0359+1	1.9269+6	1.0080+6	9.1436+5	4.2610+3	2.8014+2	1.3848+4	1.8509+1	1.8631–2	1.3830+4
3.0000+4	6.1116–6	1.8261+4	1.0945+1	1.9268+6	1.0078+6	9.1436+5	4.3190+3	2.8459+2	2.0720+4	1.8811+1	1.8885–2	2.0701+4
4.0000+4	6.1119–6	1.8261+4	1.1362+1	1.9267+6	1.0077+6	9.1436+5	4.3604+3	2.8778+2	2.7666+4	1.9007+1	1.9065–2	2.7647+4
5.0000+4	6.1122–6	1.8260+4	1.1684+1	1.9266+6	1.0076+6	9.1436+5	4.3928+3	2.9024+2	3.4548+4	1.9162+1	1.9207–2	3.4529+4
6.0000+4	6.1124–6	1.8259+4	1.1948+1	1.9266+6	1.0075+6	9.1436+5	4.4189+3	2.9224+2	4.1424+4	1.9260+1	1.9321–2	4.1404+4
8.0000+4	6.1127–6	1.8258+4	1.2365+1	1.9264+6	1.0073+6	9.1436+5	4.4600+3	2.9543+2	5.5296+4	1.9457+1	1.9501–2	5.5276+4
1.0000+5	6.1129–6	1.8258+4	1.2688+1	1.9264+6	1.0072+6	9.1436+5	4.4921+3	2.9791+2	6.9192+4	1.9653+1	1.9641–2	6.9172+4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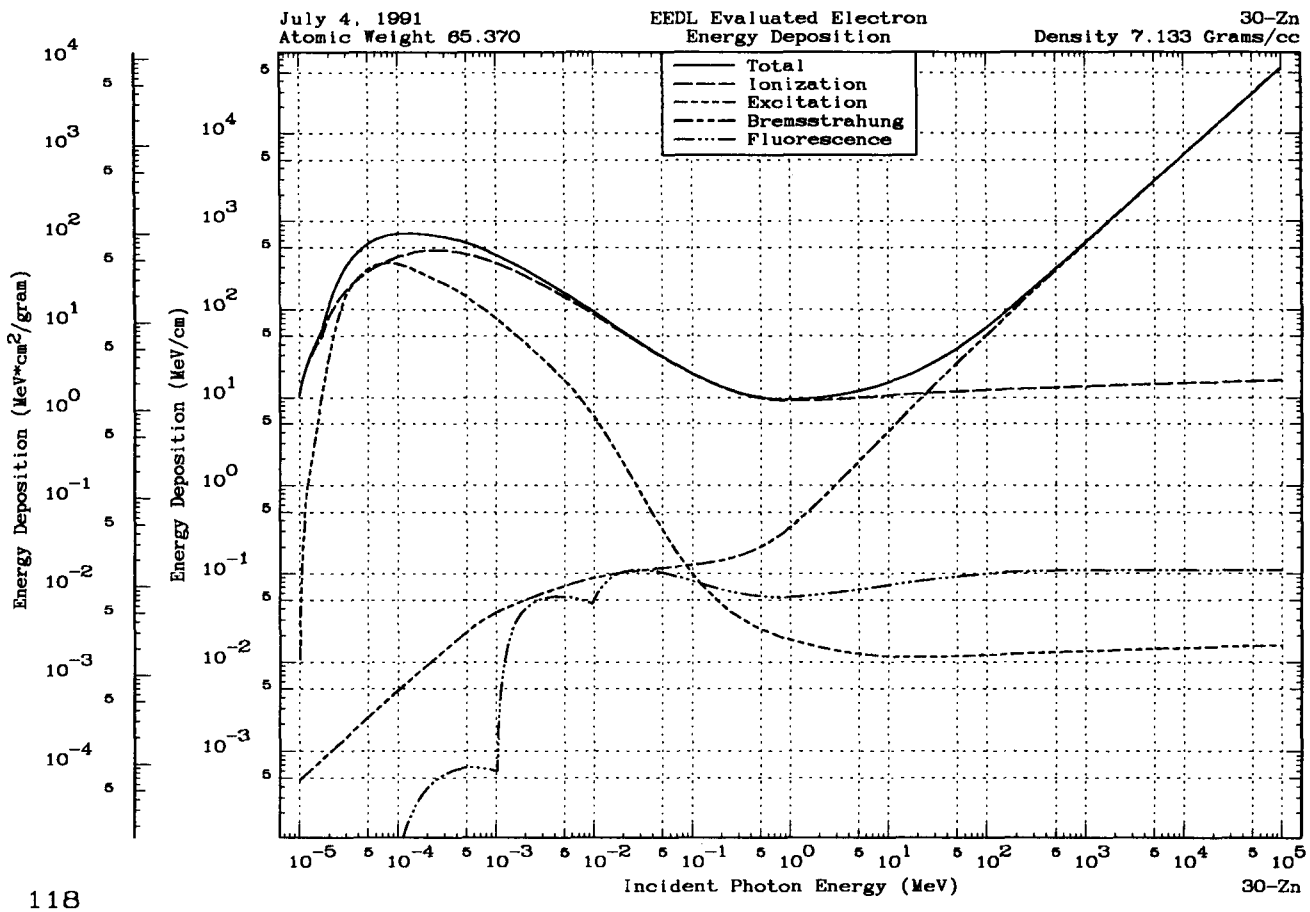
EEDL Evaluated Electron
Cross Sections
30-Zn
Density 7.133 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
30-Zn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Density 7.133 Grams/cc
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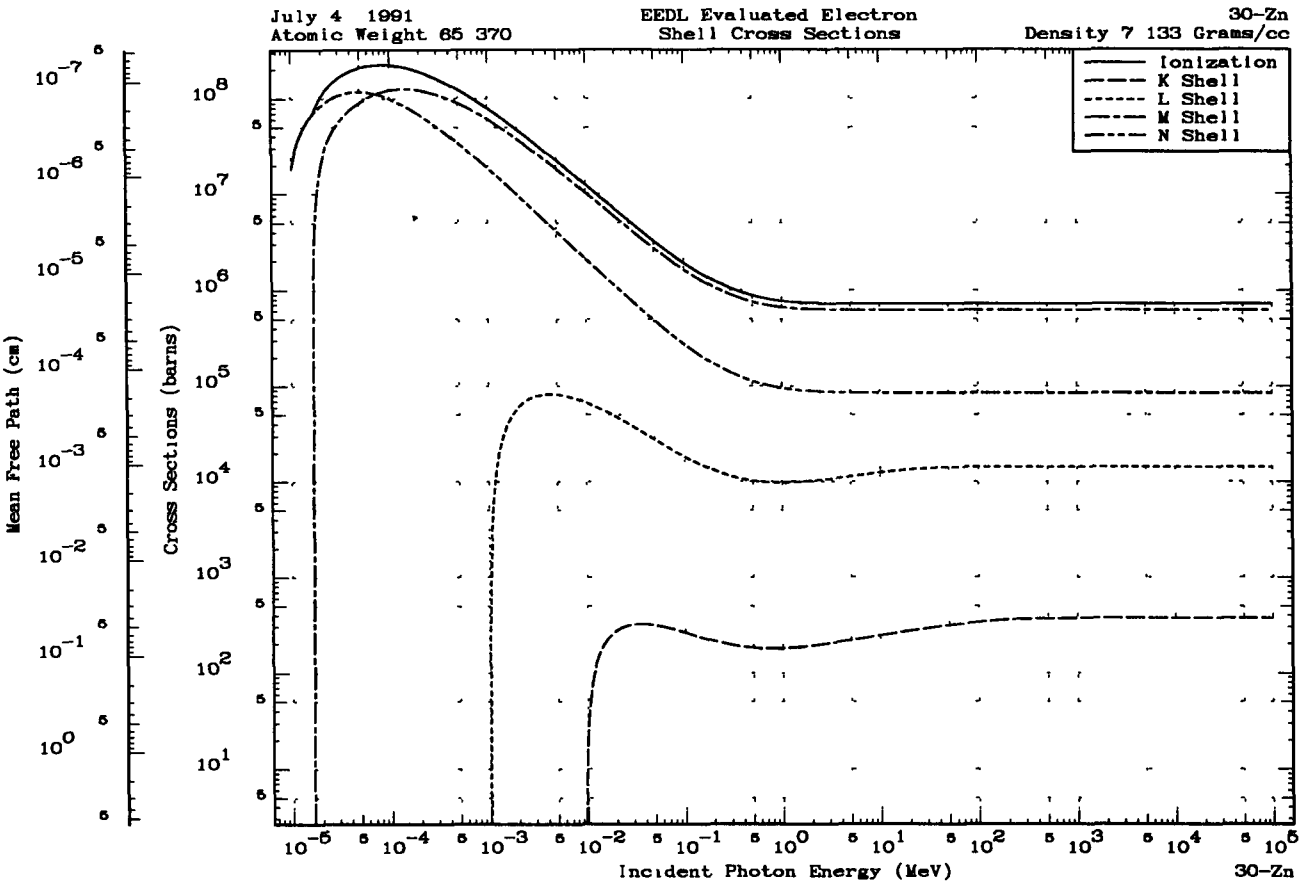
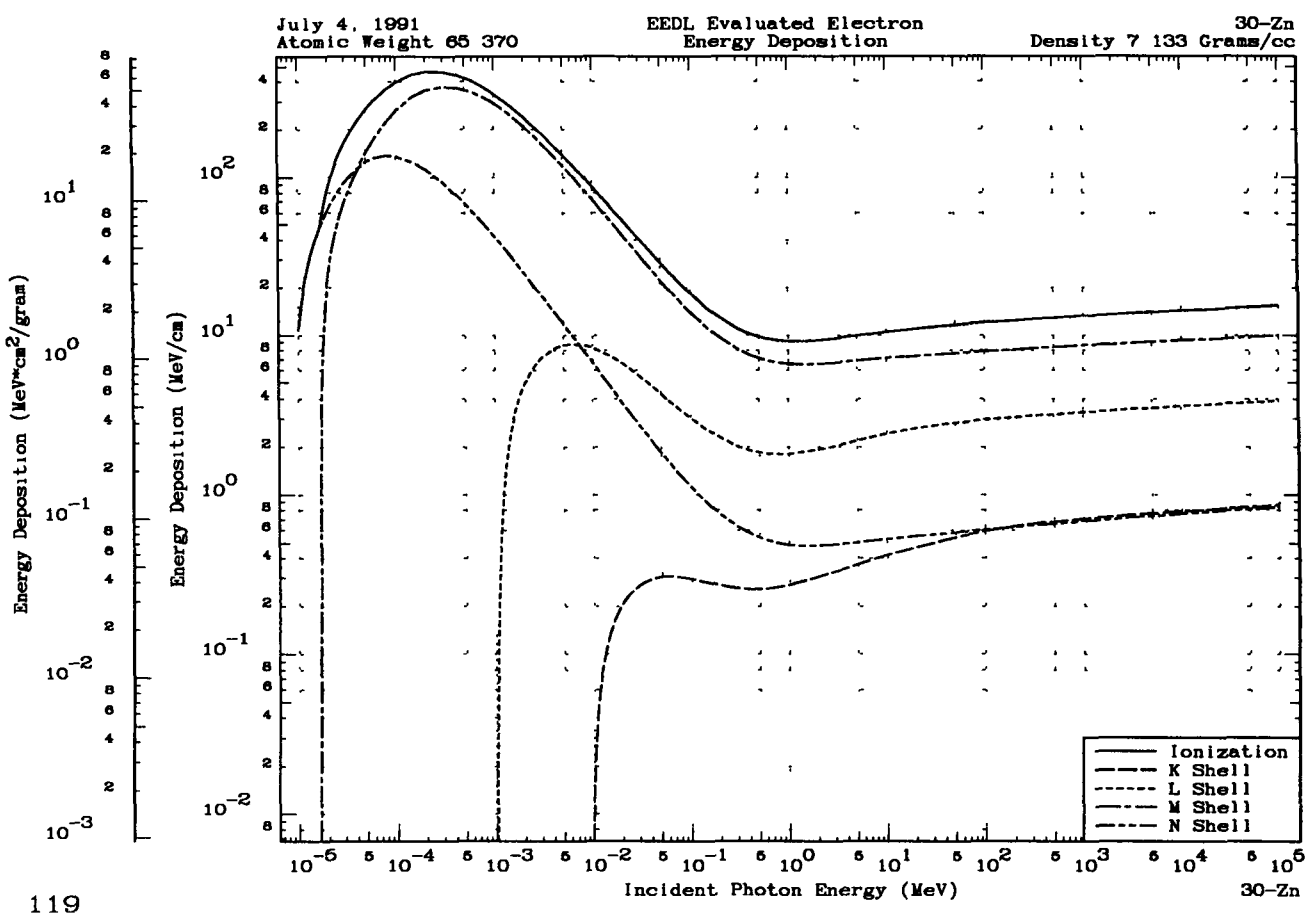
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
30-Zn


July 4 1991
Atomic Weight 65 370
EEDL Evaluated Electron
Shell Cross Sections
30-Zn
Density 7 133 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
30-Zn


July 4, 1991
Atomic Weight 65 370
EEDL Evaluated Electron
Energy Deposition
30-Zn
Density 7 133 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
Incident Photon Energy (MeV)
30-Zn

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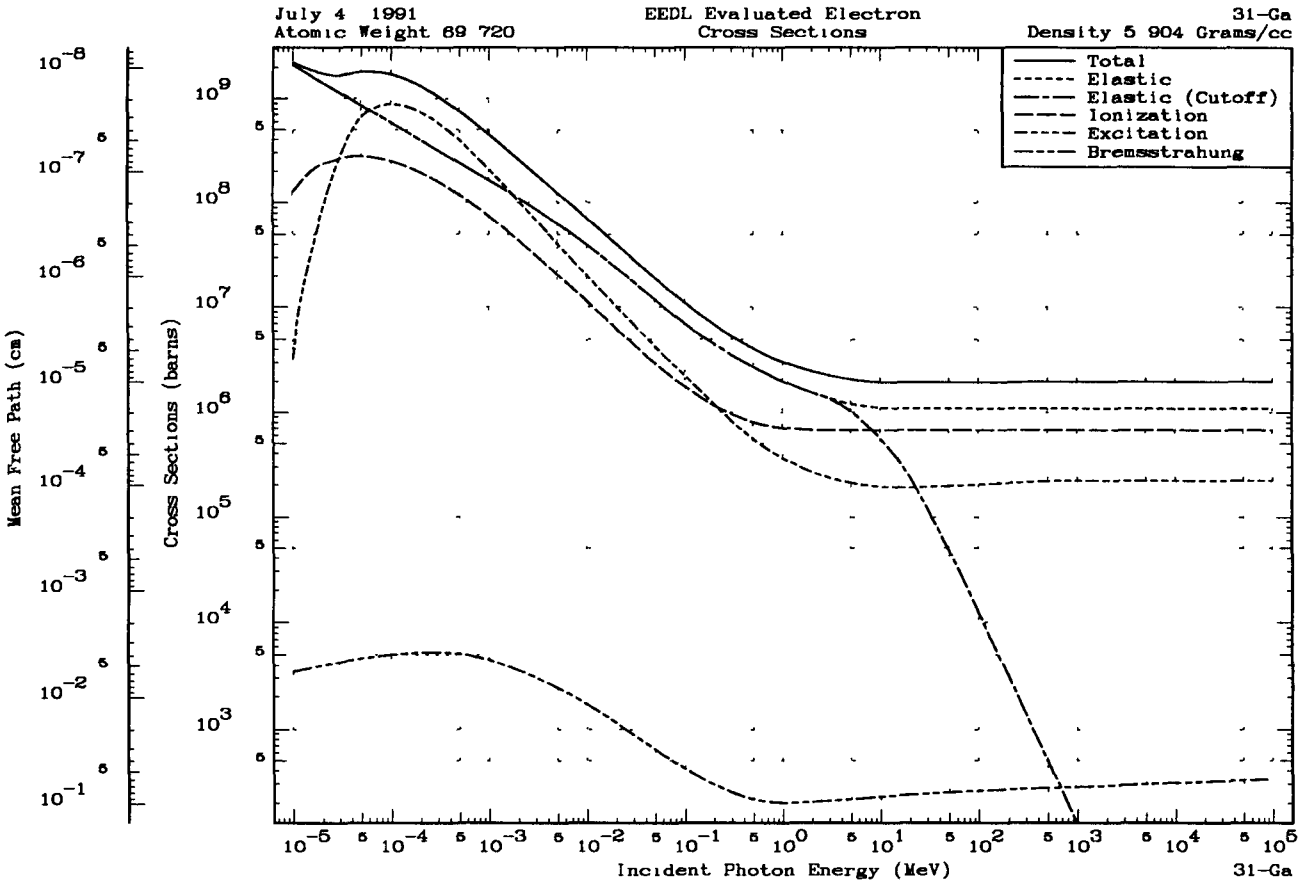
Atomic Weight 65.370 Density 7.133 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.9387–9	1.5684+7		1.7025+9	1.6843+9	1.8153+7	1.8127+4	3.3805+3	1.0701+1	1.0690+1	1.0661–2	4.7893–4
	1.0625–5	9.1925–9	1.5251+7		1.6555+9	1.6302+9	2.4972+7	2.8076+5	3.4207+3	1.5128+1	1.4961+1	1.6728–1	5.0736–4
	1.1719–5	9.6115–9	1.4586+7		1.5833+9	1.5464+9	3.5543+7	1.3255+6	3.4867+3	2.2738+1	2.1930+1	8.0758–1	5.5772–4
	1.3359–5	1.0191–8	1.3757+7		1.4933+9	1.4411+9	4.8944+7	3.2548+6	3.5769+3	3.3562+1	3.1513+1	2.0486+0	6.3457–4
	1.5000–5	1.0708–8	1.3092+7		1.4211+9	1.3540+9	5.9939+7	7.2001+6	3.6586+3	4.4817+1	4.0140+1	4.6769+0	7.1290–4
M5	1.6460–5	1.1116–8	1.2612+7		1.3691+9	1.2879+9	6.7786+7	1.3354+7	3.7254+3	5.5682+1	4.6879+1	8.8015+0	7.8379–4
	1.6681–5	1.1163–8	1.2558+7		1.3632+9	1.2787+9	6.9938+7	1.4560+7	3.7352+3	5.8579+1	4.8968+1	9.6101+0	7.9462–4
M4	1.6850–5	1.1201–8	1.2517+7		1.3587+9	1.2718+9	7.1359+7	1.5539+7	3.7425+3	6.0599+1	5.0330+1	1.0268+1	8.0290–4
	1.7047–5	1.1237–8	1.2476+7		1.3542+9	1.2638+9	7.3656+7	1.6701+7	3.7510+3	6.3755+1	5.2710+1	1.1045+1	8.1257–4
	1.7096–5	1.1246–8	1.2466+7		1.3532+9	1.2619+9	7.4253+7	1.7002+7	3.7531+3	6.4578+1	5.3330+1	1.1247+1	8.1500–4
	1.7416–5	1.1306–8	1.2400+7		1.3460+9	1.2494+9	7.7536+7	1.9075+7	3.7667+3	6.9375+1	5.6739+1	1.2635+1	8.3076–4
	1.7822–5	1.1374–8	1.2326+7		1.3379+9	1.2339+9	8.1985+7	2.2008+7	3.7836+3	7.6021+1	6.1418+1	1.4603+1	8.5085–4
	1.8062–5	1.1412–8	1.2284+7		1.3335+9	1.2251+9	8.4456+7	2.3912+7	3.7935+3	7.9921+1	6.4038+1	1.5882+1	8.6275–4
	1.8911–5	1.1527–8	1.2162+7		1.3202+9	1.1952+9	9.3186+7	3.1798+7	3.8276+3	9.4621+1	7.3424+1	2.1195+1	9.0508–4
	1.9031–5	1.1541–8	1.2147+7		1.3186+9	1.1911+9	9.4384+7	3.3071+7	3.8324+3	9.6786+1	7.4730+1	2.2055+1	9.1109–4
	2.0000–5	1.1641–8	1.2043+7		1.3073+9	1.1597+9	1.0378+8	4.3838+7	3.8697+3	1.1446+2	8.5105+1	2.9355+1	9.5983–4
	2.1250–5	1.1734–8	1.1948+7		1.2970+9	1.1224+9	1.1345+8	6.1070+7	3.9085+3	1.3756+2	9.6617+1	4.0940+1	1.0171–3
	2.3438–5	1.1777–8	1.1904+7		1.2922+9	1.0648+9	1.2888+8	9.8548+7	3.9720+3	1.8207+2	1.1587+2	6.6196+1	1.1185–3
	2.5000–5	1.1761–8	1.1920+7		1.2939+9	1.0284+9	1.3856+8	1.2696+8	4.0144+3	2.1404+2	1.2863+2	8.5404+1	1.1916–3
	2.6719–5	1.1704–8	1.1979+7		1.3003+9	9.9222+8	1.4801+8	1.6003+8	4.0586+3	2.4995+2	1.4213+2	1.0782+2	1.2728–3
	3.0000–5	1.1586–8	1.2100+7		1.3135+9	9.3223+8	1.6320+8	2.1804+8	4.1367+3	3.1279+2	1.6546+2	1.4733+2	1.4298–3
	3.5000–5	1.1501–8	1.2190+7		1.3232+9	8.5816+8	1.7941+8	2.8564+8	4.2410+3	3.8880+2	1.9493+2	1.9386+2	1.6713–3
	4.0000–5	1.1446–8	1.2248+7		1.3295+9	7.9878+8	1.9299+8	3.3774+8	4.3335+3	4.5316+2	2.2293+2	2.3022+2	1.9177–3
	4.5000–5	1.1448–8	1.2247+7		1.3294+9	7.4985+8	2.0201+8	3.7751+8	4.4042+3	5.0503+2	2.4606+2	2.5897+2	2.1521–3
	5.0000–5	1.1396–8	1.2302+7		1.3354+9	7.0862+8	2.0970+8	4.1702+8	4.4684+3	5.5618+2	2.6828+2	2.8789+2	2.3895–3
	6.0000–5	1.1527–8	1.2162+7		1.3202+9	6.4257+8	2.1892+8	4.5872+8	4.5722+3	6.2584+2	3.0488+2	3.2095+2	2.8575–3
	8.0000–5	1.2135–8	1.1553+7		1.2541+9	5.5063+8	2.2543+8	4.7799+8	4.7407+3	6.9960+2	3.5914+2	3.4045+2	3.8182–3
M3	9.0590–5	1.2639–8	1.1093+7		1.2041+9	5.1509+8	2.2443+8	4.6456+8	4.8118+3	7.1237+2	3.7797+2	3.3440+2	4.3327–3
	9.1766–5	1.2692–8	1.1046+7		1.1990+9	5.1154+8	2.2438+8	4.6312+8	4.8166+3	7.1407+2	3.8028+2	3.3378+2	4.3861–3
M2	9.3740–5	1.2780–8	1.0970+7		1.1908+9	5.0573+8	2.2430+8	4.6076+8	4.8246+3	7.1694+2	3.8417+2	3.3277+2	4.4758–3
	9.3825–5	1.2783–8	1.0967+7		1.1904+9	5.0548+8	2.2430+8	4.6066+8	4.8249+3	7.1708+2	3.8436+2	3.3272+2	4.4796–3
	9.5305–5	1.2849–8	1.0911+7		1.1844+9	5.0125+8	2.2426+8	4.5886+8	4.8308+3	7.1933+2	3.8736+2	3.3196+2	4.5470–3
	9.6912–5	1.2919–8	1.0852+7		1.1780+9	4.9678+8	2.2423+8	4.5696+8	4.8370+3	7.2186+2	3.9069+2	3.3117+2	4.6202–3
	9.7653–5	1.2951–8	1.0825+7		1.1751+9	4.9475+8	2.2421+8	4.5610+8	4.8399+3	7.2302+2	3.9221+2	3.3081+2	4.6539–3
	1.0000–4	1.3051–8	1.0742+7	0.0000+0	1.1661+9	4.8848+8	2.2418+8	4.5341+8	4.8488+3	7.2677+2	3.9707+2	3.2970+2	4.7610–3
	1.0625–4	1.3377–8	1.0480+7	8.5998–9	1.1376+9	4.7294+8	2.2193+8	4.4274+8	4.8717+3	7.2675+2	4.0357+2	3.2318+2	5.0471–3
	1.1172–4	1.3652–8	1.0269+7	1.6123–8	1.1147+9	4.6045+8	2.2012+8	4.3409+8	4.8907+3	7.2723+2	4.0929+2	3.1794+2	5.2983–3
	1.1719–4	1.3919–8	1.0072+7	2.3637–8	1.0934+9	4.4887+8	2.1847+8	4.2602+8	4.9088+3	7.2832+2	4.1524+2	3.1307+2	5.5504–3
	1.2129–4	1.4113–8	9.9340+6	2.9264–8	1.0783+9	4.4071+8	2.1731+8	4.2030+8	4.9219+3	7.2937+2	4.1972+2	3.0965+2	5.7400–3
	1.2539–4	1.4302–8	9.8023+6	3.4882–8	1.0640+9	4.3296+8	2.1621+8	4.1485+8	4.9346+3	7.3064+2	4.2424+2	3.0639+2	5.9300–3
M1	1.3743–4	1.4918–8	9.3978+6	5.1353–8	1.0201+9	4.1230+8	2.1331+8	3.9451+8	4.9699+3	7.3128+2	4.3776+2	2.9351+2	6.4903–3
	1.4057–4	1.5086–8	9.2928+6	5.5652–8	1.0087+9	4.0736+8	2.1239+8	3.8897+8	4.9786+3	7.3055+2	4.4050+2	2.9004+2	6.6371–3
	1.4529–4	1.5335–8	9.1421+6	6.2108–8	9.9237+8	4.0026+8	2.1107+8	3.8103+8	4.9913+3	7.2978+2	4.4469+2	2.8508+2	6.8578–3
	1.5000–4	1.5579–8	8.9989+6	6.8569–8	9.7683+8	3.9351+8	2.0982+8	3.7349+8	5.0037+3	7.2932+2	4.4893+2	2.8039+2	7.0790–3
	1.5625–4	1.5906–8	8.8138+6	7.7164–8	9.5673+8	3.8503+8	2.0722+8	3.6447+8	5.0152+3	7.2514+2	4.5070+2	2.7443+2	7.3660–3
	1.6719–4	1.6462–8	8.5162+6	9.2311–8	9.2443+8	3.7139+8	2.0304+8	3.5000+8	5.0343+3	7.1909+2	4.5418+2	2.6491+2	7.8698–3
	1.7500–4	1.6847–8	8.3217+6	1.0320–7	9.0332+8	3.6245+8	2.0031+8	3.4056+8	5.0473+3	7.1569+2	4.5697+2	2.5871+2	8.2307–3
	1.8359–4	1.7260–8	8.1227+6	1.1524–7	8.8171+8	3.5330+8	1.9748+8	3.3092+8	5.0610+3	7.1251+2	4.6009+2	2.5241+2	8.6286–3
	2.0000–4	1.8019–8	7.7804+6	1.3833–7	8.4456+8	3.3754+8	1.9263+8	3.1438+8	5.0854+3	7.0829+2	4.6663+2	2.4165+2	9.3910–3
	2.2500–4	1.9169–8	7.3135+6	1.7402–7	7.9388+8	3.1699+8	1.8349+8	2.9339+8	5.0853+3	6.9285+2	4.6529+2	2.2755+2	1.0483–2
	2.5000–4	2.0257–8	6.9209+6	2.1040–7	7.5126+8	2.9968+8	1.7578+8	2.7580+8	5.0852+3	6.8144+2	4.6560+2	2.1582+2	1.1576–2
	2.6250–4	2.0780–8	6.7467+6	2.2882–7	7.3235+8	2.9198+8	1.7236+8	2.6801+8	5.0851+3	6.7572+2	4.6505+2	2.1066+2	1.2122–2
	3.0000–4	2.2277–8	6.2931+6	2.8488–7	6.8311+8	2.7191+8	1.6338+8	2.4781+8	5.0850+3	6.6212+2	4.6474+2	1.9737+2	1.3760–2
	3.5000–4	2.4368–8	5.7531+6	3.6204–7	6.2450+8	2.5062+8	1.5132+8	2.2256+8	5.0713+3	6.3415+2	4.5442+2	1.7971+2	1.5900–2
	4.0000–4	2.6329–8	5.3246+6	4.4218–7	5.7798+8	2.3353+8	1.4168+8	2.0277+8	5.0594+3	6.1369+2	4.4771+2	1.6596+2	1.8035–2
	5.0000–4	3.0466–8	4.6017+6	6.1218–7	4.9951+8	2.0757+8	1.2474+8	1.6720+8	4.9286+3	5.6351+2	4.2358+2	1.3991+2	2.1784–2
	6.0000–4	3.4395–8	4.0760+6	7.9567–7	4.4245+8	1.8852+8	1.1229+8	1.4163+8	4.8242+3	5.2686+2	4.0608+2	1.2076+2	2.5449–2
	8.0000–4	4.1734–8	3.3593+6	1.1997–6	3.6464+8	1.6195+8	9.3388+7	1.0930+8	4.5584+3	4.6455+2	3.6843+2	9.6097+1	3.1296–2
	1.0000–3	4.8806–8	2.8724+6	1.6546–6	3.1180+8	1.4395+8	8.0164+7	8.7686+7	4.3219+3	4.1556+2	3.3655+2	7.8979+1	3.6309–2
L3	1.0260–3	4.9695–8	2.8211+6	1.7176–6	3.0622+8	1.4201+8	7.8698+7	8.5512+7	4.2864+3	4.0968+2	3.3245+2	7.7198+1	3.6754–2
	1.0334–3	4.9947–8	2.8068+6	1.7358–6	3.0468+8	1.4147+8	7.8292+7	8.4913+7	4.2765+3	4.0808+2	3.3134+2	7.6709+1	3.6880–2
	1.0407–3	5.0194–8	2.7930+6	1.7537–6	3.0318+8	1.4095+8	7.7898+7	8.4332+7	4.2669+3	4.0653+2	3.3026+2	7.6235+1	3.7005–2
L2	1.0505–3	5.0525–8	2.7747+6	1.7778–6	3.0120+8	1.4025+8	7.7375+7	8.3563+7	4.2540+3	4.0448+2	3.2883+2	7.5608+1	3.7171–2
	1.0550–3	5.0680–8	2.7663+6	1.7891–6	3.0028+8	1.3993+8	7.7136+7	8.3206+7	4.2481+3	4.0355+2	3.2819+2	7.5319+1	3.7249–2
	1.0786–3	5.1475–8	2.7235+6	1.8478–6	2.9564+8	1.3831+8	7.5923+7	8.1402+7	4.2181+3	3.9881+2	3.2491+2	7.3860+1	3.7648–2
	1.1107–3	5.2548–8	2.6679+6	1.9288–6	2.8960+8	1.3619+8	7.4342+7	7.9067+7	4.1786+3	3.9272+2	3.2071+2	7.1972+1	3.8189–2
L1	1.1844–3	5.4974–8	2.5502+6	2.1197–6	2.7682+8	1.3164+8	7.0995+7	7.4177+7	4.0931+3	3.7994+2	3.1188+2	6.8018+1	3.9422–2
	1.2080–3	5.5769–8	2.5138+6	2.1822–6	2.7287+8	1.3027+8	6.9965+7	7.2629+7	4.0674+3	3.7570+2	3.0891+2	6.6742+1	3.9783–2
	1.2238–3	5.6300–8	2.4901+6	2.2245–6	2.7030+8	1.2938+8	6.9293+7	7.1624+7	4.0505+3	3.7291+2	3.0696+2	6.5914+1	4.0025–2
	1.2810–3	5.8195–8	2.4090+6	2.3797–6	2.6150+8	1.2629+8	6.6991+7	6.8213+7	3.9920+3	3.6348+2	3.0034+2	6.3101+1	4.0893–2
	1.2929–3	5.8586–8	2.3930+6	2.4125–6	2.5976+8	1.2567+8	6.6534+7	6.7543+7	3.9802+3	3.6162+2	2.9903+2	6.2548+1	4.1073–2
	1.3420–3	6.0184–8	2.3294+6	2.5496–6	2.5286+8	1.2322+8	6.4726+7	6.4905+7	3.9331+3	3.5429+2	2.9388+2	6.0373+1	4.1812–2
	1.3905–3	6.1745–8	2.2705+6	2.6879–6	2.4646+8	1.2092+8	6.3049+7	6.2487+7	3.8888+3	3.4755+2	2.8913+2	5.8377+1	4.2537–2
	1.3964–3	6.1935–8	2.2636+6	2.7050–6	2.4571+8	1.2065+8	6.2851+7	6.2203+7	3.8835+3	3.4675+2	2.8857+2	5.8142+1	4.2626–2
	1.5000–3	6.5198–8	2.1503+6	3.0094–6	2.3341+8	1.1617+8	5.9618+7	5.7623+7	3.7958+3	3.3390+2	2.7949+2	5.4361+1	4.4157–2
	1.6250–3	6.9119–8	2.0283+6	3.3929–6	2.2017+8	1.1124+8	5.6050+7	5.2878+7	3.6911+3	3.1817+2	2.6781+2	5.0313+1	4.5778–2
	1.8125–3	7.4814–8	1.8739+6	4.0012–6	2.0341+8	1.0485+8	5.1530+7	4.7028+7	3.5529+3	2.9848+2	2.5312+2	4.5319+1	4.8163–2
	2.0000–3	8.0310–8	1.7457+6	4.6470–6	1.8949+8	9.9403+7	4.7773+7	4.2311+7	3.4328+3	2.8235+2	2.4101+2	4.1289+1	5.0494–2
	2.2500–3	8.7797–8	1.5968+6	5.5671–6	1.7333+8	9.2894+7	4.3455+7	3.6978+7	3.2769+3	2.6136+2	2.2477+2	3.6534+1	5.2967–2
	2.6250–3	9.8555–8	1.4225+6	7.0730–6	1.5441+8	8.5015+7	3.8394+7	3.1000+7	3.0836+3	2.3706+2	2.0581+2	3.1193+1	5.6567–2

Atomic Weight 65.370 Density 7.133 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000–3	1.0883–7	1.2882+6	8.7199–6	1.3984+8	7.8732+7	3.4493+7	2.6608+7	2.9254+3	2.1859+2	1.9127+2	2.7260+1	6.0044–2
3.5000–3	1.2250–7	1.1444+6	1.1129–5	1.2423+8	7.1749+7	3.0362+7	2.2114+7	2.7292+3	1.9688+2	1.7376+2	2.3064+1	6.3602–2
4.0000–3	1.3559–7	1.0339+6	1.3781–5	1.1223+8	6.6202+7	2.7189+7	1.8840+7	2.5699+3	1.8048+2	1.6042+2	1.9997+1	6.7031–2
5.0000–3	1.6141–7	8.6855+5	1.9758–5	9.4281+7	5.7528+7	2.2543+7	1.4208+7	2.3148+3	1.5477+2	1.3919+2	1.5503+1	7.2656–2
6.0000–3	1.8646–7	7.5187+5	2.6645–5	8.1615+7	5.1130+7	1.9313+7	1.1171+7	2.1143+3	1.3605+2	1.2350+2	1.2469+1	7.7073–2
7.0000–3	2.1127–7	6.6359+5	3.4420–5	7.2032+7	4.6152+7	1.6930+7	8.9482+6	1.9519+3	1.2147+2	1.1122+2	1.0172+1	8.0642–2
8.0000–3	2.3570–7	5.9478+5	4.3056–5	6.4564+7	4.2233+7	1.5106+7	7.2226+6	1.8213+3	1.1029+2	1.0185+2	8.3592+0	8.4103–2
K 9.6224–3	2.7456–7	5.1062+5	5.8802–5	5.5427+7	3.7178+7	1.2891+7	5.3558+6	1.6482+3	9.6112+1	8.9686+1	6.3379+0	8.8374–2
9.7168–3	2.7678–7	5.0652+5	5.9787–5	5.4983+7	3.6929+7	1.2784+7	5.2689+6	1.6395+3	9.5432+1	8.9099+1	6.2447+0	8.8592–2
1.0000–2	2.8339–7	4.9470+5	6.2786–5	5.3699+7	3.6203+7	1.2473+7	5.0214+6	1.6141+3	9.3467+1	8.7400+1	5.9787+0	8.9241–2
1.0313–2	2.9093–7	4.8187+5	6.6170–5	5.2307+7	3.5410+7	1.2147+7	4.7478+6	1.5858+3	9.1252+1	8.5491+1	5.6717+0	8.9778–2
1.0898–2	3.0492–7	4.5978+5	7.2728–5	4.9909+7	3.4030+7	1.1584+7	4.2933+6	1.5361+3	8.7438+1	8.2187+1	5.1605+0	9.0788–2
1.1411–2	3.1699–7	4.4227+5	7.8695–5	4.8008+7	3.2922+7	1.1135+7	3.9486+6	1.4959+3	8.4420+1	7.9557+1	4.7717+0	9.1673–2
1.2308–2	3.3778–7	4.1505+5	8.9629–5	4.5053+7	3.1177+7	1.0434+7	3.4402+6	1.4321+3	7.9737+1	7.5447+1	4.1963+0	9.3219–2
1.3654–2	3.6822–7	3.8073+5	1.0716–4	4.1328+7	2.8934+7	9.5450+6	2.8480+6	1.3489+3	7.3853+1	7.0236+1	3.5222+0	9.5521–2
1.5000–2	3.9827–7	3.5201+5	1.2602–4	3.8210+7	2.7041+7	8.8049+6	2.3629+6	1.2778+3	6.8963+1	6.5903+1	2.9624+0	9.7791–2
1.6250–2	4.2625–7	3.2890+5	1.4470–4	3.5702+7	2.5459+7	8.2232+6	2.0181+6	1.2171+3	6.4900+1	6.2248+1	2.5535+0	9.9128–2
1.8125–2	4.6726–7	3.0003+5	1.7478–4	3.2569+7	2.3449+7	7.4912+6	1.6273+6	1.1390+3	5.9835+1	5.7646+1	2.0873+0	1.0116–1
2.0000–2	5.0723–7	2.7639+5	2.0725–4	3.0002+7	2.1773+7	6.8875+6	1.3403+6	1.0729+3	5.5697+1	5.3851+1	1.7425+0	1.0319–1
2.2500–2	5.5985–7	2.5041+5	2.5415–4	2.7182+7	1.9886+7	6.2376+6	1.0574+6	9.9627+2	5.0998+1	4.9500+1	1.3927+0	1.0461–1
2.6250–2	6.3629–7	2.2033+5	3.3190–4	2.3917+7	1.7662+7	5.4789+6	7.7525+5	9.0420+2	4.5565+1	4.4417+1	1.0410+0	1.0692–1
3.0000–2	7.1023–7	1.9739+5	4.1817–4	2.1427+7	1.5937+7	4.8968+6	5.9250+5	8.3136+2	4.1436+1	4.0516+1	8.1075–1	1.0931–1
4.0000–2	8.9515–7	1.5661+5	6.8496–4	1.7000+7	1.2804+7	3.8652+6	3.3097+5	6.9170+2	3.3790+1	3.3208+1	4.6935–1	1.1320–1
5.0000–2	1.0674–6	1.3134+5	1.0042–3	1.4257+7	1.0810+7	3.2333+6	2.1270+5	6.0335+2	2.8981+1	2.8554+1	3.0996–1	1.1624–1
6.0000–2	1.2300–6	1.1398+5	1.3707–3	1.2372+7	9.4144+6	2.8061+6	1.5097+5	5.3786+2	2.5661+1	2.5318+1	2.2493–1	1.1854–1
7.0000–2	1.3854–6	1.0120+5	1.7800–3	1.0985+7	8.3701+6	2.5006+6	1.1349+5	4.8918+2	2.3239+1	2.2947+1	1.7200–1	1.2031–1
8.0000–2	1.5350–6	9.1329+4	2.2286–3	9.9137+6	7.5597+6	2.2631+6	9.0487+4	4.5059+2	2.1367+1	2.1105+1	1.3945–1	1.2234–1
1.0000–1	1.8150–6	7.7243+4	3.2287–3	8.3847+6	6.3898+6	1.9317+6	6.2788+4	3.9439+2	1.8689+1	1.8464+1	9.9264–2	1.2570–1
1.2500–1	2.1126–6	6.6359+4	4.6499–3	7.2033+6	5.4849+6	1.6722+6	4.5810+4	3.4911+2	1.6536+1	1.6332+1	7.4096–2	1.2937–1
1.5000–1	2.3910–6	5.8633+4	6.2364–3	6.3646+6	4.8416+6	1.4863+6	3.6387+4	3.1599+2	1.5006+1	1.4813+1	6.0184–2	1.3348–1
2.0000–1	2.8394–6	4.9374+4	9.7949–3	5.3595+6	4.0704+6	1.2627+6	2.6144+4	2.7526+2	1.3136+1	1.2950+1	4.4614–2	1.4151–1
2.5000–1	3.1957–6	4.3869+4	1.3764–2	4.7620+6	3.6049+6	1.1358+6	2.1042+4	2.5199+2	1.2072+1	1.1885+1	3.6701–2	1.5057–1
3.0000–1	3.5191–6	3.9837+4	1.8045–2	4.3243+6	3.2645+6	1.0416+6	1.8054+4	2.3445+2	1.1297+1	1.1105+1	3.2169–2	1.5964–1
4.0000–1	4.0408–6	3.4695+4	2.7249–2	3.7661+6	2.8170+6	9.3439+5	1.4525+4	2.1521+2	1.0444+1	1.0237+1	2.6685–2	1.8027–1
5.0000–1	4.4601–6	3.1433+4	3.7032–2	3.4121+6	2.5266+6	8.7265+5	1.2544+4	2.0431+2	1.0001+1	9.7747+0	2.3601–2	2.0255–1
6.0000–1	4.8035–6	2.9186+4	4.7167–2	3.1681+6	2.3232+6	8.3336+5	1.1329+4	1.9802+2	9.7357+0	9.4868+0	2.1732–2	2.2714–1
8.0000–1	5.3505–6	2.6202+4	6.7929–2	2.8442+6	2.0464+6	7.8792+5	9.7304+3	1.9192+2	9.5308+0	9.2315+0	1.9243–2	2.8001–1
1.0000+0	5.7675–6	2.4307+4	8.8965–2	2.6386+6	1.8662+6	7.6337+5	8.7892+3	1.8963+2	9.4837+0	9.1288+0	1.7792–2	3.3708–1
1.5000+0	6.4809–6	2.1632+4	1.4112–1	2.3481+6	1.6038+6	7.3657+5	7.5416+3	1.9005+2	9.6894+0	9.1786+0	1.5902–2	4.9483–1
2.0000+0	6.9372–6	2.0209+4	1.9199–1	2.1937+6	1.4568+6	7.2986+5	6.8231+3	1.9264+2	9.9721+0	9.2907+0	1.4684–2	6.6658–1
3.0000+0	7.5072–6	1.8674+4	2.8935–1	2.0271+6	1.2991+6	7.2180+5	6.0109+3	1.9862+2	1.0576+1	9.5209+0	1.3475–2	1.0420+0
4.0000+0	7.8547–6	1.7848+4	3.8119–1	1.9374+6	1.2142+6	7.1736+5	5.6216+3	2.0252+2	1.1207+1	9.7459+0	1.2803–2	1.4483+0
5.0000+0	8.0775–6	1.7356+4	4.6817–1	1.8840+6	1.1613+6	7.1712+5	5.3852+3	2.0560+2	1.1792+1	9.9176+0	1.2457–2	1.8620+0
6.0000+0	8.2267–6	1.7041+4	5.5090–1	1.8498+6	1.1275+6	7.1694+5	5.1854+3	2.0838+2	1.2386+1	1.0073+1	1.2182–2	2.3011+0
8.0000+0	8.4159–6	1.6658+4	7.0543–1	1.8082+6	1.0861+6	7.1693+5	4.9709+3	2.1282+2	1.3515+1	1.0307+1	1.1820–2	3.1960+0
1.0000+1	8.5108–6	1.6472+4	8.4753–1	1.7881+6	1.0661+6	7.1694+5	4.8338+3	2.1633+2	1.4650+1	1.0520+1	1.1633–2	4.1179+0
1.5000+1	8.5795–6	1.6340+4	1.1612+0	1.7737+6	1.0512+6	7.1758+5	4.7432+3	2.2283+2	1.7306+1	1.0792+1	1.1500–2	6.5019+0
2.0000+1	8.5890–6	1.6323+4	1.4296+0	1.7718+6	1.0488+6	7.1806+5	4.6850+3	2.2614+2	2.0019+1	1.1028+1	1.1443–2	8.9794+0
3.0000+1	8.5887–6	1.6323+4	1.8721+0	1.7719+6	1.0486+6	7.1836+5	4.6584+3	2.3084+2	2.5387+1	1.1307+1	1.1546–2	1.4068+1
4.0000+1	8.5879–6	1.6325+4	2.2293+0	1.7720+6	1.0485+6	7.1865+5	4.6806+3	2.3420+2	3.0783+1	1.1490+1	1.1619–2	1.9281+1
5.0000+1	8.5879–6	1.6325+4	2.5284+0	1.7720+6	1.0483+6	7.1875+5	4.7001+3	2.3687+2	3.6241+1	1.1621+1	1.1686–2	2.4609+1
6.0000+1	8.5878–6	1.6325+4	2.7852+0	1.7721+6	1.0482+6	7.1883+5	4.7335+3	2.3905+2	4.1742+1	1.1740+1	1.1788–2	2.9990+1
8.0000+1	8.5878–6	1.6325+4	3.2102+0	1.7721+6	1.0481+6	7.1894+5	4.7836+3	2.4247+2	5.2816+1	1.1923+1	1.1951–2	4.0880+1
1.0000+2	8.5878–6	1.6325+4	3.5536+0	1.7720+6	1.0480+6	7.1901+5	4.8196+3	2.4490+2	6.4031+1	1.2091+1	1.2079–2	5.1928+1
1.5000+2	8.5882–6	1.6324+4	4.2009+0	1.7720+6	1.0477+6	7.1905+5	4.9115+3	2.4983+2	9.2166+1	1.2244+1	1.2312–2	7.9910+1
2.0000+2	8.5885–6	1.6323+4	4.6741+0	1.7719+6	1.0476+6	7.1907+5	4.9733+3	2.5311+2	1.2043+2	1.2390+1	1.2469–2	1.0803+2
3.0000+2	8.5890–6	1.6323+4	5.3545+0	1.7718+6	1.0474+6	7.1910+5	5.0577+3	2.5666+2	1.7712+2	1.2660+1	1.2685–2	1.6445+2
4.0000+2	8.5894–6	1.6322+4	5.8442+0	1.7717+6	1.0472+6	7.1911+5	5.1159+3	2.5857+2	2.3396+2	1.2811+1	1.2836–2	2.2114+2
5.0000+2	8.5897–6	1.6321+4	6.2269+0	1.7716+6	1.0471+6	7.1911+5	5.1604+3	2.6008+2	2.9062+2	1.2899+1	1.2952–2	2.7771+2
6.0000+2	8.5900–6	1.6321+4	6.5412+0	1.7716+6	1.0470+6	7.1912+5	5.1958+3	2.6135+2	3.4754+2	1.2987+1	1.3045–2	3.3454+2
8.0000+2	8.5905–6	1.6320+4	7.0393+0	1.7715+6	1.0469+6	7.1912+5	5.2504+3	2.6387+2	4.6075+2	1.3162+1	1.3192–2	4.4758+2
1.0000+3	8.5908–6	1.6319+4	7.4271+0	1.7714+6	1.0467+6	7.1912+5	5.2919+3	2.6585+2	5.7489+2	1.3312+1	1.3305–2	5.6156+2
1.5000+3	8.5914–6	1.6318+4	8.1334+0	1.7713+6	1.0465+6	7.1912+5	5.3734+3	2.6972+2	8.6015+2	1.3439+1	1.3510–2	8.4670+2
2.0000+3	8.5919–6	1.6317+4	8.6351+0	1.7712+6	1.0464+6	7.1912+5	5.4311+3	2.7261+2	1.1465+3	1.3565+1	1.3656–2	1.1329+3
3.0000+3	8.5925–6	1.6316+4	9.3432+0	1.7711+6	1.0462+6	7.1912+5	5.5123+3	2.7699+2	1.7161+3	1.3818+1	1.3860–2	1.7023+3
4.0000+3	8.5929–6	1.6315+4	9.8462+0	1.7710+6	1.0460+6	7.1912+5	5.5698+3	2.8022+2	2.2876+3	1.3944+1	1.4005–2	2.2736+3
5.0000+3	8.5933–6	1.6314+4	1.0236+1	1.7709+6	1.0459+6	7.1912+5	5.6146+3	2.8277+2	2.8637+3	1.4070+1	1.4118–2	2.8496+3
6.0000+3	8.5936–6	1.6314+4	1.0555+1	1.7708+6	1.0458+6	7.1912+5	5.6509+3	2.8467+2	3.4303+3	1.4152+1	1.4209–2	3.4162+3
8.0000+3	8.5940–6	1.6313+4	1.1058+1	1.7708+6	1.0456+6	7.1912+5	5.7083+3	2.8769+2	4.5732+3	1.4315+1	1.4353–2	4.5588+3
1.0000+4	8.5944–6	1.6312+4	1.1448+1	1.7707+6	1.0455+6	7.1912+5	5.7528+3	2.9006+2	5.7263+3	1.4473+1	1.4466–2	5.7118+3
1.5000+4	8.5950–6	1.6311+4	1.2158+1	1.7706+6	1.0453+6	7.1912+5	5.8338+3	2.9474+2	8.5507+3	1.4594+1	1.4670–2	8.5361+3
2.0000+4	8.5955–6	1.6310+4	1.2662+1	1.7705+6	1.0452+6	7.1912+5	5.8913+3	2.9811+2	1.1412+4	1.4716+1	1.4814–2	1.1397+4
3.0000+4	8.5961–6	1.6309+4	1.3374+1	1.7703+6	1.0449+6	7.1912+5	5.9723+3	3.0285+2	1.7075+4	1.4958+1	1.5018–2	1.7060+4
4.0000+4	8.5965–6	1.6308+4	1.3879+1	1.7702+6	1.0448+6	7.1912+5	6.0298+3	3.0625+2	2.2799+4	1.5113+1	1.5162–2	2.2784+4
5.0000+4	8.5969–6	1.6307+4	1.4270+1	1.7702+6	1.0447+6	7.1912+5	6.0748+3	3.0886+2	2.8470+4	1.5236+1	1.5275–2	2.8455+4
6.0000+4	8.5972–6	1.6307+4	1.4591+1	1.7701+6	1.0446+6	7.1912+5	6.1111+3	3.1099+2	3.4136+4	1.5315+1	1.5367–2	3.4121+4
8.0000+4	8.5977–6	1.6306+4	1.5096+1	1.7700+6	1.0444+6	7.1912+5	6.1686+3	3.1439+2	4.5568+4	1.5472+1	1.5511–2	4.5553+4
1.0000+5	8.5980–6	1.6305+4	1.5488+1	1.7699+6	1.0443+6	7.1912+5	6.2130+3	3.1702+2	5.7020+4	1.5630+1	1.5623–2	5.7004+4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EEDL Evaluated Electron
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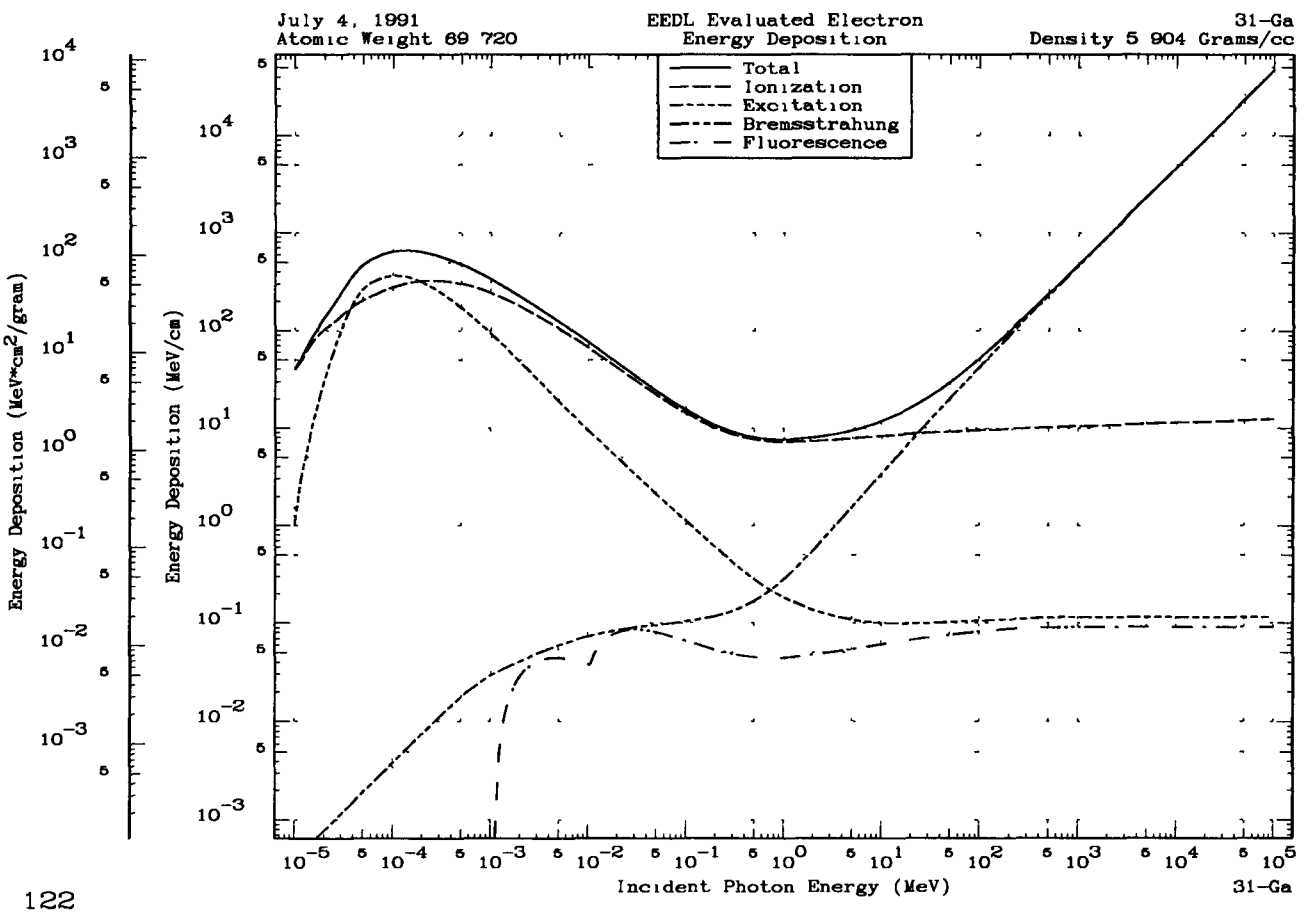
31-Ga
Density 5 904 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
31-Ga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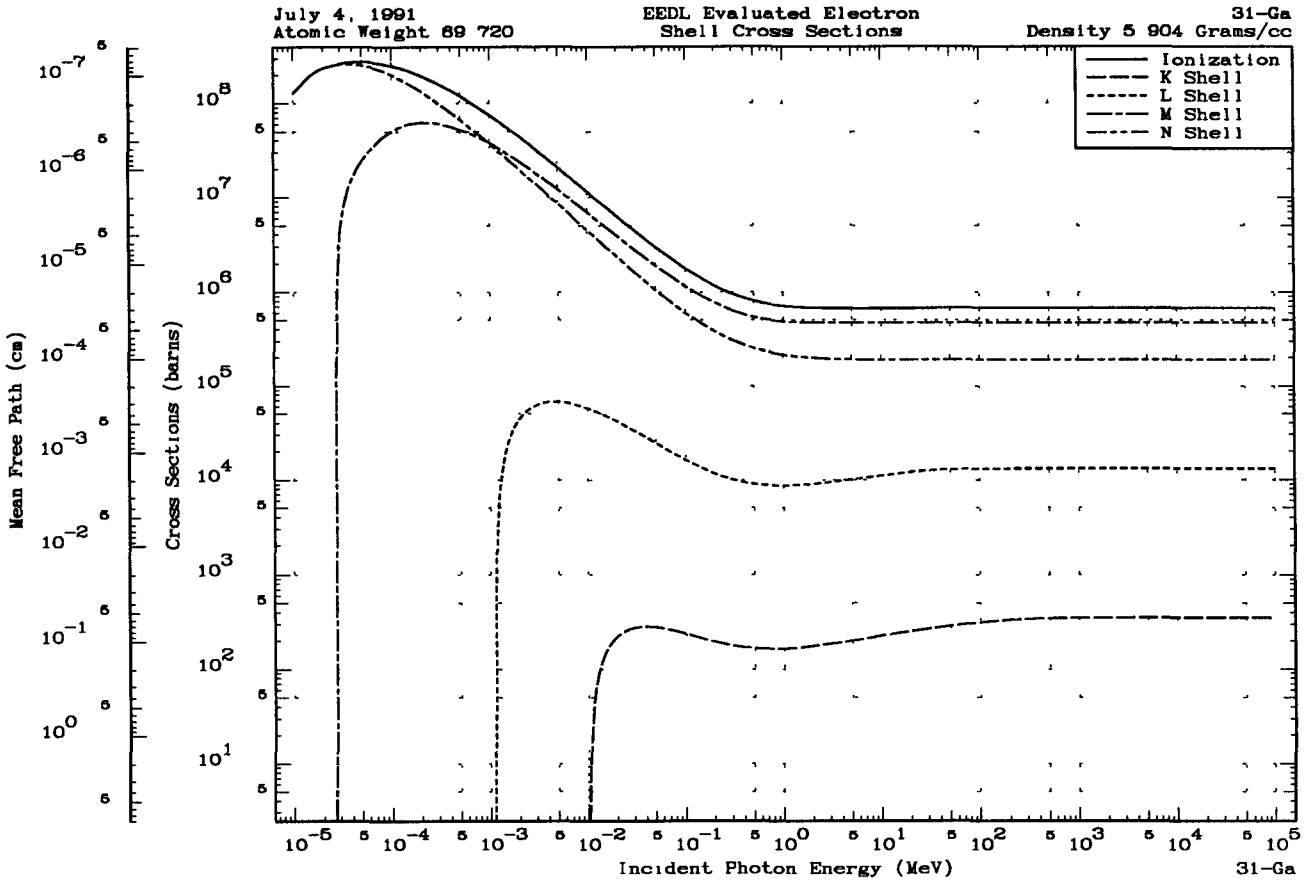
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
31-Ga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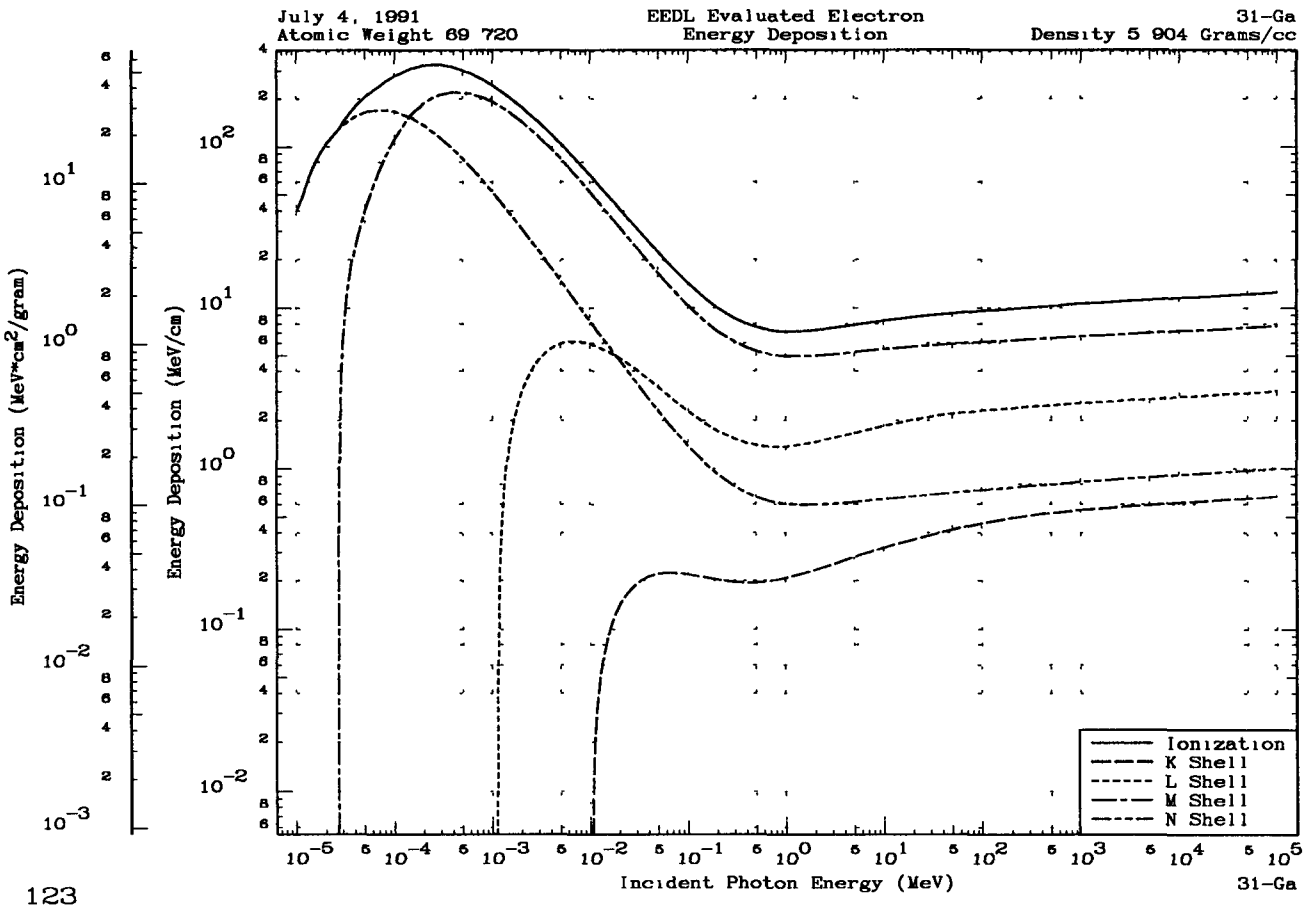
EEDL Evaluated Electron
Shell Cross Sections
31-Ga
Density 5 904 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
31-Ga


July 4, 1991
Atomic Weight 69 720
EEDL Evaluated Electron
Energy Deposition
31-Ga
Density 5 904 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
31-Ga

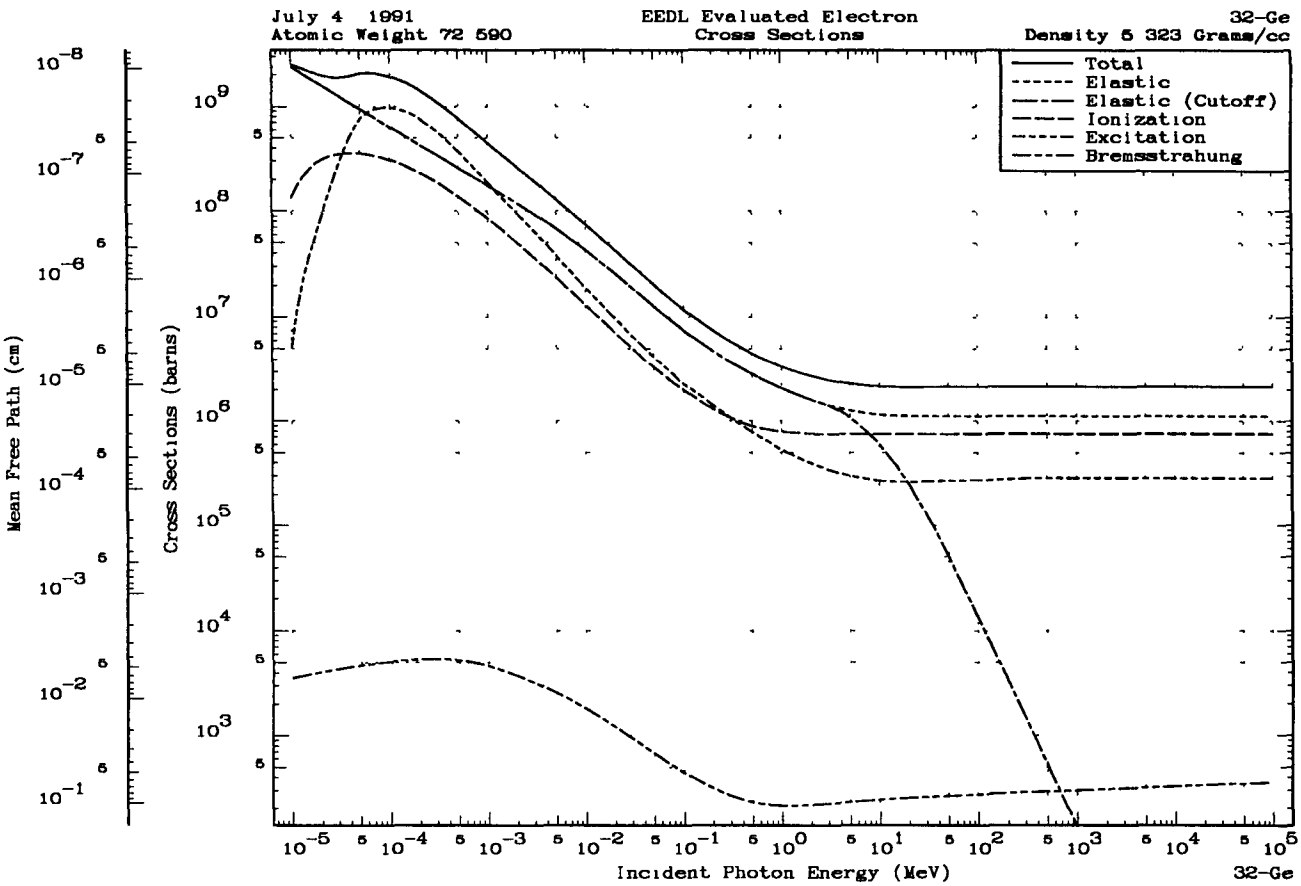
Atomic Weight 69.720 Density 5.904 Grams/cc

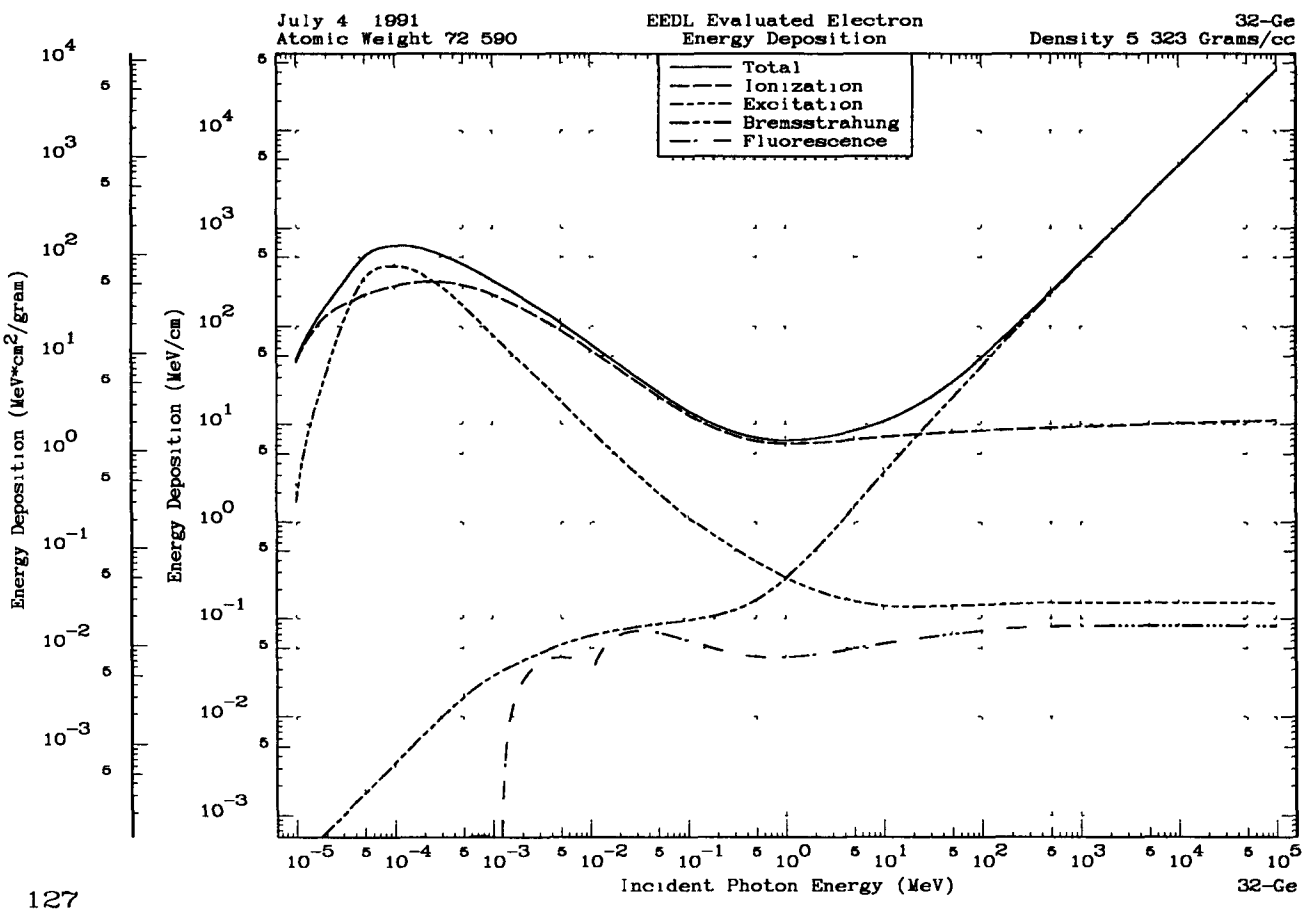
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.7187–9	1.9427+7		2.2491+9	2.1187+9	1.2714+8	3.2748+6	3.4888+3	4.0714+1	3.9720+1	9.9361–1	3.8361–4
	1.1250–5	9.1813–9	1.8448+7		2.1358+9	1.9835+9	1.4421+8	8.0124+6	3.5698+3	4.9474+1	4.6957+1	2.5170+0	4.2937–4
N1	1.1690–5	9.3313–9	1.8151+7		2.1014+9	1.9414+9	1.5026+8	9.7780+6	3.5966+3	5.2731+1	4.9622+1	3.1085+0	4.4566–4
	1.1897–5	9.3959–9	1.8027+7		2.0870+9	1.9225+9	1.5380+8	1.0737+7	3.6090+3	5.4843+1	5.1413+1	3.4291+0	4.5335–4
	1.2285–5	9.5130–9	1.7805+7		2.0613+9	1.8882+9	1.6032+8	1.2739+7	3.6316+3	5.8853+1	5.4749+1	4.1040+0	4.6783–4
	1.2964–5	9.7073–9	1.7448+7		2.0200+9	1.8323+9	1.7143+8	1.6343+7	3.6699+3	6.5883+1	6.0538+1	5.3443+0	4.9333–4
	1.3125–5	9.7516–9	1.7369+7		2.0109+9	1.8196+9	1.7394+8	1.7307+7	3.6788+3	6.7538+1	6.1858+1	5.6794+0	4.9942–4
	1.3473–5	9.8491–9	1.7197+7		1.9910+9	1.7932+9	1.7853+8	1.9240+7	3.6976+3	7.0869+1	6.4507+1	6.3614+0	5.1259–4
	1.5000–5	1.0237–8	1.6545+7		1.9155+9	1.6886+9	1.9718+8	2.9720+7	3.7758+3	8.5802+1	7.5652+1	1.0150+1	5.7105–4
	1.6250–5	1.0521–8	1.6099+7		1.8638+9	1.6147+9	2.0891+8	4.0210+7	3.8352+3	9.7289+1	8.3320+1	1.3968+1	6.1962–4
	1.7500–5	1.0763–8	1.5737+7		1.8219+9	1.5491+9	2.1964+8	5.3199+7	3.8910+3	1.0947+2	9.0677+1	1.8789+1	6.6879–4
	1.8125–5	1.0877–8	1.5572+7		1.8028+9	1.5189+9	2.2381+8	6.0034+7	3.9177+3	1.1541+2	9.4030+1	2.1378+1	6.9360–4
	2.0000–5	1.1163–8	1.5174+7		1.7567+9	1.4375+9	2.3490+8	8.4266+7	3.9937+3	1.3423+2	1.0349+2	3.0743+1	7.6887–4
	2.2500–5	1.1447–8	1.4797+7		1.7131+9	1.3458+9	2.4337+8	1.2384+8	4.0724+3	1.5869+2	1.1282+2	4.5864+1	8.6142–4
M5	2.6870–5	1.1671–8	1.4512+7		1.6801+9	1.2186+9	2.5529+8	2.0623+8	4.1939+3	2.0647+2	1.2809+2	7.8376+1	1.0264–3
	2.7261–5	1.1679–8	1.4503+7		1.6790+9	1.2088+9	2.5633+8	2.1390+8	4.2038+3	2.1116+2	1.2975+2	8.1407+1	1.0412–3
M4	2.7370–5	1.1681–8	1.4500+7		1.6787+9	1.2061+9	2.5657+8	2.1606+8	4.2065+3	2.1242+2	1.3016+2	8.2262+1	1.0453–3
	2.7699–5	1.1683–8	1.4498+7		1.6784+9	1.1981+9	2.5760+8	2.2278+8	4.2146+3	2.1671+2	1.3179+2	8.4921+1	1.0578–3
	2.7946–5	1.1683–8	1.4498+7		1.6784+9	1.1921+9	2.5840+8	2.2791+8	4.2206+3	2.2002+2	1.3306+2	8.6955+1	1.0671–3
	2.8849–5	1.1675–8	1.4508+7		1.6797+9	1.1711+9	2.6130+8	2.4728+8	4.2424+3	2.3236+2	1.3770+2	9.4657+1	1.1015–3
	2.8973–5	1.1672–8	1.4511+7		1.6800+9	1.1683+9	2.6170+8	2.5001+8	4.2453+3	2.3410+2	1.3835+2	9.5744+1	1.1062–3
	3.0000–5	1.1645–8	1.4545+7		1.6839+9	1.1457+9	2.6482+8	2.7336+8	4.2693+3	2.4857+2	1.4349+2	1.0508+2	1.1454–3
	3.2500–5	1.1592–8	1.4611+7		1.6916+9	1.0957+9	2.6859+8	3.2732+8	4.3249+3	2.7959+2	1.5309+2	1.2649+2	1.2417–3
	3.4375–5	1.1505–8	1.4721+7		1.7043+9	1.0619+9	2.7109+8	3.7137+8	4.3643+3	3.0400+2	1.5991+2	1.4409+2	1.3145–3
	3.5000–5	1.1468–8	1.4770+7		1.7099+9	1.0513+9	2.7192+8	3.8674+8	4.3770+3	3.1246+2	1.6221+2	1.5025+2	1.3390–3
	3.6250–5	1.1395–8	1.4864+7		1.7208+9	1.0309+9	2.7345+8	4.1650+8	4.4019+3	3.2900+2	1.6677+2	1.6223+2	1.3880–3
	3.6719–5	1.1365–8	1.4903+7		1.7254+9	1.0235+9	2.7394+8	4.2796+8	4.4110+3	3.3523+2	1.6836+2	1.6686+2	1.4064–3
	3.7188–5	1.1350–8	1.4923+7		1.7277+9	1.0163+9	2.7444+8	4.3702+8	4.4201+3	3.4055+2	1.6999+2	1.7056+2	1.4249–3
	4.0000–5	1.1231–8	1.5081+7		1.7459+9	9.7574+8	2.7726+8	4.9295+8	4.4725+3	3.7301+2	1.7948+2	1.9353+2	1.5364–3
	4.5000–5	1.0979–8	1.5428+7		1.7861+9	9.1367+8	2.7767+8	5.9475+8	4.5455+3	4.2712+2	1.9239+2	2.3473+2	1.7243–3
	5.0000–5	1.0797–8	1.5687+7		1.8162+9	8.6151+8	2.7814+8	6.7651+8	4.6118+3	4.7347+2	2.0506+2	2.6841+2	1.9146–3
	6.0000–5	1.0752–8	1.5753+7		1.8238+9	7.7817+8	2.7477+8	7.7087+8	4.7189+3	5.3478+2	2.2533+2	3.0945+2	2.2898–3
	7.0000–5	1.0887–8	1.5558+7		1.8012+9	7.1404+8	2.6833+8	8.1880+8	4.8115+3	5.7158+2	2.4063+2	3.3094+2	2.6718–3
	8.0000–5	1.0962–8	1.5452+7		1.7889+9	6.6277+8	2.6338+8	8.6272+8	4.8930+3	6.0755+2	2.5648+2	3.5107+2	3.0601–3
	1.0000–4	1.1378–8	1.4886+7	0.0000+0	1.7234+9	5.8518+8	2.5028+8	8.8796+8	5.0048+3	6.4317+2	2.7825+2	3.6491+2	3.8164–3
M3	1.0728–4	1.1575–8	1.4632+7	1.1270–8	1.6940+9	5.6280+8	2.4515+8	8.8607+8	5.0322+3	6.4876+2	2.8369+2	3.6506+2	4.0839–3
	1.0862–4	1.1615–8	1.4582+7	1.3327–8	1.6882+9	5.5896+8	2.4431+8	8.8495+8	5.0371+3	6.4965+2	2.8486+2	3.6478+2	4.1331–3
M2	1.1101–4	1.1686–8	1.4495+7	1.7008–8	1.6781+9	5.5223+8	2.4284+8	8.8299+8	5.0456+3	6.5129+2	2.8699+2	3.6429+2	4.2214–3
	1.1120–4	1.1692–8	1.4487+7	1.7303–8	1.6772+9	5.5171+8	2.4271+8	8.8278+8	5.0463+3	6.5136+2	2.8713+2	3.6423+2	4.2285–3
	1.1345–4	1.1762–8	1.4400+7	2.0748–8	1.6671+9	5.4562+8	2.4116+8	8.8037+8	5.0542+3	6.5209+2	2.8858+2	3.6350+2	4.3115–3
	1.1605–4	1.1842–8	1.4303+7	2.4738–8	1.6559+9	5.3879+8	2.3944+8	8.7764+8	5.0631+3	6.5306+2	2.9037+2	3.6268+2	4.4078–3
	1.1802–4	1.1902–8	1.4231+7	2.7746–8	1.6476+9	5.3380+8	2.3819+8	8.7562+8	5.0697+3	6.5382+2	2.9173+2	3.6209+2	4.4806–3
	1.2454–4	1.2092–8	1.4007+7	3.7701–8	1.6216+9	5.1810+8	2.3433+8	8.6919+8	5.0910+3	6.5667+2	2.9647+2	3.6020+2	4.7230–3
	1.2500–4	1.2106–8	1.3992+7	3.8402–8	1.6199+9	5.1704+8	2.3407+8	8.6875+8	5.0925+3	6.5688+2	2.9681+2	3.6007+2	4.7401–3
	1.2601–4	1.2134–8	1.3958+7	3.9943–8	1.6160+9	5.1473+8	2.3346+8	8.6779+8	5.0956+3	6.5726+2	2.9747+2	3.5979+2	4.7778–3
	1.3125–4	1.2281–8	1.3791+7	4.7900–8	1.5967+9	5.0323+8	2.3048+8	8.6296+8	5.1118+3	6.5931+2	3.0090+2	3.5840+2	4.9732–3
	1.3727–4	1.2445–8	1.3610+7	5.7014–8	1.5756+9	4.9087+8	2.2709+8	8.5767+8	5.1297+3	6.6144+2	3.0452+2	3.5691+2	5.1984–3
	1.3801–4	1.2465–8	1.3588+7	5.8128–8	1.5731+9	4.8941+8	2.2669+8	8.5704+8	5.1318+3	6.6171+2	3.0497+2	3.5674+2	5.2260–3
	1.5000–4	1.2885–8	1.3145+7	7.6265–8	1.5219+9	4.6730+8	2.2069+8	8.3387+8	5.1652+3	6.6093+2	3.1248+2	3.4845+2	5.6770–3
M1	1.5775–4	1.3148–8	1.2883+7	8.8016–8	1.4914+9	4.5442+8	2.1622+8	8.2080+8	5.1855+3	6.5802+2	3.1452+2	3.4349+2	5.9697–3
	1.6039–4	1.3244–8	1.2789+7	9.2034–8	1.4806+9	4.5025+8	2.1471+8	8.1566+8	5.1900+3	6.5661+2	3.1506+2	3.4154+2	6.0670–3
	1.6534–4	1.3421–8	1.2620+7	9.9588–8	1.4611+9	4.4272+8	2.1199+8	8.0633+8	5.1982+3	6.5418+2	3.1617+2	3.3800+2	6.2495–3
	1.7401–4	1.3724–8	1.2342+7	1.1287–7	1.4288+9	4.3035+8	2.0756+8	7.9090+8	5.2121+3	6.5057+2	3.1839+2	3.3217+2	6.5695–3
	1.7500–4	1.3758–8	1.2311+7	1.1440–7	1.4253+9	4.2900+8	2.0708+8	7.8920+8	5.2137+3	6.5019+2	3.1866+2	3.3153+2	6.6063–3
	1.8700–4	1.4161–8	1.1961+7	1.3291–7	1.3847+9	4.1350+8	2.0156+8	7.6964+8	5.2318+3	6.4611+2	3.2194+2	3.2417+2	7.0509–3
	2.0000–4	1.4669–8	1.1547+7	1.5314–7	1.3368+9	3.9836+8	1.9625+8	7.4220+8	5.2502+3	6.3951+2	3.2600+2	3.1350+2	7.5342–3
	2.2500–4	1.5629–8	1.0837+7	1.9280–7	1.2546+9	3.7316+8	1.8529+8	6.9616+8	5.2506+3	6.2126+2	3.2615+2	2.9510+2	8.4132–3
	2.4375–4	1.6316–8	1.0381+7	2.2324–7	1.2018+9	3.5696+8	1.7834+8	6.6652+8	5.2509+3	6.1041+2	3.2710+2	2.8329+2	9.0725–3
	2.5000–4	1.6539–8	1.0241+7	2.3351–7	1.1856+9	3.5198+8	1.7622+8	6.5741+8	5.2509+3	6.0725+2	3.2758+2	2.7967+2	9.2922–3
	2.6250–4	1.6982–8	9.9738+6	2.5421–7	1.1547+9	3.4258+8	1.7192+8	6.4020+8	5.2511+3	6.0016+2	3.2731+2	2.7283+2	9.7317–3
	2.7188–4	1.7346–8	9.7645+6	2.6991–7	1.1305+9	3.3597+8	1.6891+8	6.2558+8	5.2512+3	5.9417+2	3.2721+2	2.6695+2	1.0061–2
	3.0000–4	1.8408–8	9.2014+6	3.1787–7	1.0653+9	3.1812+8	1.6082+8	5.8633+8	5.2515+3	5.7890+2	3.2769+2	2.5120+2	1.1050–2
	3.5000–4	2.0321–8	8.3350+6	4.0667–7	9.6496+8	2.9222+8	1.4737+8	5.2537+8	5.2383+3	5.4744+2	3.2129+2	2.2614+2	1.2774–2
	4.0000–4	2.2132–8	7.6529+6	5.0002–7	8.8600+8	2.7149+8	1.3680+8	4.7771+8	5.2268+3	5.2408+2	3.1748+2	2.0658+2	1.4495–2
	5.0000–4	2.5998–8	6.5151+6	7.0053–7	7.5427+8	2.4014+8	1.1915+8	3.9498+8	5.0946+3	4.7420+2	3.0220+2	1.7199+2	1.7527–2
	6.0000–4	2.9713–8	5.7004+6	9.1977–7	6.5995+8	2.1722+8	1.0631+8	3.3641+8	4.9890+3	4.3849+2	2.9121+2	1.4726+2	2.0493–2
	7.0000–4	3.3416–8	5.0687+6	1.1570–6	5.8682+8	1.9957+8	9.5765+7	2.9148+8	4.8430+3	4.0503+2	2.7689+2	1.2812+2	2.2902–2
	8.0000–4	3.6969–8	4.5816+6	1.4119–6	5.3042+8	1.8543+8	8.7539+7	2.5745+8	4.7199+3	3.7988+2	2.6623+2	1.1363+2	2.5253–2
	1.0000–3	4.3870–8	3.8609+6	1.9702–6	4.4698+8	1.6402+8	7.4730+7	2.0823+8	4.4801+3	3.3742+2	2.4492+2	9.2472+1	2.9351–2
L3	1.1220–3	4.7873–8	3.5381+6	2.3437–6	4.0961+8	1.5393+8	6.8635+7	1.8705+8	4.3210+3	3.1610+2	2.3279+2	8.3287+1	3.1064–2
	1.1338–3	4.8252–8	3.5102+6	2.3811–6	4.0639+8	1.5304+8	6.8107+7	1.8524+8	4.3068+3	3.1430+2	2.3177+2	8.2505+1	3.1228–2
	1.1453–3	4.8620–8	3.4837+6	2.4177–6	4.0332+8	1.5220+8	6.7605+7	1.8351+8	4.2932+3	3.1259+2	2.3080+2	8.1760+1	3.1386–2
L2	1.1504–3	4.8784–8	3.4720+6	2.4341–6	4.0196+8	1.5182+8	6.7382+7	1.8275+8	4.2872+3	3.1183+2	2.3037+2	8.1431+1	3.1457–2
	1.1896–3	5.0066–8	3.3831+6	2.5610–6	3.9167+8	1.4904+8	6.5726+7	1.7690+8	4.2414+3	3.0603+2	2.2710+2	7.8895+1	3.1967–2
	1.2378–3	5.1626–8	3.2808+6	2.7203–6	3.7983+8	1.4581+8	6.3817+7	1.7020+8	4.1878+3	2.9937+2	2.2334+2	7.5995+1	3.2589–2
	1.2672–3	5.2569–8	3.2220+6	2.8191–6	3.7302+8	1.4394+8	6.2717+7	1.6636+8	4.1565+3	2.9557+2	2.2121+2	7.4332+1	3.2966–2
L1	1.2907–3	5.3319–8	3.1767+6	2.8990–6	3.6777+8	1.4248+8	6.1869+7	1.6342+8	4.1321+3	2.9264+2	2.1954+2	7.3057+1	3.3266–2
	1.3430–3	5.5031–8	3.0778+6	3.0800–6	3.5633+8	1.3940+8	6.0030+7	1.5690+8	4.0794+3	2.8581+2	2.1557+2	7.0216+1	3.3916–2
	1.3689–3	5.5871–8	3.0316+6	3.1710–6	3.5097+8	1.3794+8	5.9168+7	1.5387+8	4.0544+3	2.8265+2	2.1372+2	6.8892+1	3.4235–2
	1.3836–3	5.6346–8	3.0060+6	3.2231–6	3.4801+8	1.3713+8	5.8691+7	1.5219+8	4.0405+3	2.8090+2	2.1270+2	6.8162+1	3.4416–2

Atomic Weight 69.720 — Density 5.904 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.4215–3	5.7566–8	2.9423+6	3.3592–6	3.4064+8	1.3510+8	5.7501+7	1.4804+8	4.0054+3	2.7653+2	2.1014+2	6.6350+1	3.4880–2
1.5000–3	6.0063–8	2.8200+6	3.6474–6	3.2648+8	1.3115+8	5.5208+7	1.4011+8	3.9365+3	2.6821+2	2.0528+2	6.2894+1	3.5834–2
1.6250–3	6.3968–8	2.6478+6	4.1251–6	3.0655+8	1.2539+8	5.1857+7	1.2930+8	3.8300+3	2.5525+2	1.9707+2	5.8149+1	3.7176–2
1.8125–3	6.9676–8	2.4309+6	4.8840–6	2.8143+8	1.1793+8	4.7618+7	1.1588+8	3.6894+3	2.3905+2	1.8675+2	5.2261+1	3.9151–2
2.0000–3	7.5224–8	2.2516+6	5.6909–6	2.6068+8	1.1159+8	4.4102+7	1.0498+8	3.5671+3	2.2580+2	1.7828+2	4.7478+1	4.1082–2
2.2500–3	8.2599–8	2.0506+6	6.8413–6	2.3740+8	1.0405+8	4.0087+7	9.3263+7	3.4080+3	2.0904+2	1.6671+2	4.2287+1	4.3125–2
2.6250–3	9.3281–8	1.8158+6	8.7241–6	2.1022+8	9.4951+7	3.5387+7	7.9876+7	3.2104+3	1.8961+2	1.5321+2	3.6358+1	4.6101–2
3.0000–3	1.0357–7	1.6354+6	1.0783–5	1.8933+8	8.7714+7	3.1770+7	6.9844+7	3.0485+3	1.7482+2	1.4285+2	3.1915+1	4.8977–2
3.5000–3	1.1733–7	1.4436+6	1.3795–5	1.6713+8	7.9773+7	2.7947+7	5.9410+7	2.8514+3	1.5749+2	1.3019+2	2.7246+1	5.1927–2
4.0000–3	1.3061–7	1.2968+6	1.7111–5	1.5013+8	7.3478+7	2.5013+7	5.1640+7	2.6910+3	1.4428+2	1.2046+2	2.3769+1	5.4779–2
5.0000–3	1.5652–7	1.0822+6	2.4585–5	1.2529+8	6.3684+7	2.0720+7	4.0880+7	2.4276+3	1.2385+2	1.0487+2	1.8926+1	5.9441–2
6.0000–3	1.8143–7	9.3356+5	3.3182–5	1.0808+8	5.6508+7	1.7743+7	3.3828+7	2.2198+3	1.0909+2	9.3292+1	1.5732+1	6.3117–2
8.0000–3	2.2881–7	7.4026+5	5.3433–5	8.5703+7	4.6612+7	1.3868+7	2.5220+7	1.9154+3	8.9105+1	7.7223+1	1.1813+1	6.8992–2
1.0000–2	2.7410–7	6.1794+5	7.7711–5	7.1540+7	3.9913+7	1.1445+7	2.0181+7	1.6999+3	7.6005+1	6.6427+1	9.5042+0	7.3307–2
K 1.0331–2	2.8145–7	6.0180+5	8.2118–5	6.9672+7	3.8999+7	1.1128+7	1.9544+7	1.6705+3	7.4216+1	6.4931+1	9.2105+0	7.3944–2
1.0477–2	2.8470–7	5.9494+5	8.4094–5	6.8878+7	3.8607+7	1.0994+7	1.9275+7	1.6571+3	7.3454+1	6.4293+1	9.0863+0	7.4151–2
1.0760–2	2.9096–7	5.8214+5	8.7980–5	6.7396+7	3.7875+7	1.0745+7	1.8775+7	1.6320+3	7.2032+1	6.3102+1	8.8553+0	7.4552–2
1.1290–2	3.0260–7	5.5973+5	9.5468–5	6.4802+7	3.6587+7	1.0308+7	1.7904+7	1.5877+3	6.9548+1	6.1020+1	8.4532+0	7.5306–2
1.1753–2	3.1271–7	5.4165+5	1.0223–4	6.2708+7	3.5543+7	9.9571+6	1.7206+7	1.5515+3	6.7548+1	5.9341+1	8.1309+0	7.5965–2
1.2565–2	3.3020–7	5.1296+5	1.1454–4	5.9386+7	3.3876+7	9.4006+6	1.6108+7	1.4933+3	6.4381+1	5.6680+1	7.6238+0	7.7117–2
1.3783–2	3.5601–7	4.7577+5	1.3408–4	5.5081+7	3.1696+7	8.6812+6	1.4702+7	1.4163+3	6.0294+1	5.3240+1	6.9746+0	7.8833–2
1.5000–2	3.8136–7	4.4414+5	1.5487–4	5.1420+7	2.9824+7	8.0713+6	1.3523+7	1.3492+3	5.6834+1	5.0324+1	6.4301+0	8.0526–2
1.6250–2	4.0736–7	4.1579+5	1.7752–4	4.8137+7	2.8089+7	7.5370+6	1.2510+7	1.2858+3	5.3609+1	4.7569+1	5.9583+0	8.1666–2
1.8125–2	4.4568–7	3.8005+5	2.1388–4	4.3999+7	2.5883+7	6.8649+6	1.1249+7	1.2041+3	4.9554+1	4.4100+1	5.3710+0	8.3392–2
2.0000–2	4.8325–7	3.5050+5	2.5306–4	4.0578+7	2.4044+7	6.3107+6	1.0222+7	1.1349+3	4.6214+1	4.1236+1	4.8926+0	8.5119–2
2.2500–2	5.3270–7	3.1796+5	3.0951–4	3.6811+7	2.1958+7	5.7146+6	9.1368+6	1.0545+3	4.2414+1	3.7945+1	4.3830+0	8.6357–2
2.6250–2	6.0507–7	2.7993+5	4.0289–4	3.2408+7	1.9500+7	5.0189+6	7.8885+6	9.5781+2	3.7981+1	3.4096+1	3.7969+0	8.8342–2
3.0000–2	6.7559–7	2.5071+5	5.0632–4	2.9025+7	1.7593+7	4.4853+6	6.9460+6	8.8126+2	3.4583+1	3.1138+1	3.3544+0	9.0393–2
4.0000–2	8.5697–7	1.9765+5	8.2579–4	2.2882+7	1.4058+7	3.5410+6	5.2825+6	7.3461+2	2.8236+1	2.5576+1	2.5663+0	9.3789–2
5.0000–2	1.0296–6	1.6451+5	1.2079–3	1.9046+7	1.1809+7	2.9622+6	4.2743+6	6.4000+2	2.4210+1	2.2028+1	2.0857+0	9.6282–2
6.0000–2	1.1918–6	1.4212+5	1.6467–3	1.6453+7	1.0257+7	2.5706+6	3.6251+6	5.7111+2	2.1428+1	1.9554+1	1.7751+0	9.8332–2
8.0000–2	1.4953–6	1.1327+5	2.6692–3	1.3114+7	8.2558+6	2.0733+6	2.7840+6	4.7856+2	1.7803+1	1.6331+1	1.3705+0	1.0163–1
1.0000–1	1.7719–6	9.5590+4	3.8711–3	1.1067+7	7.0263+6	1.7709+6	2.2690+6	4.1965+2	1.5527+1	1.4302+1	1.1214+0	1.0448–1
1.5000–1	2.3651–6	7.1616+4	7.4686–3	8.2912+6	5.3620+6	1.3637+6	1.5651+6	3.3769+2	1.2388+1	1.1498+1	7.7882–1	1.1097–1
2.0000–1	2.8554–6	5.9318+4	1.1791–2	6.8675+6	4.5034+6	1.1596+6	1.2042+6	2.9482+2	1.0786+1	1.0067+1	6.0201–1	1.1773–1
3.0000–1	3.6472–6	4.6440+4	2.1817–2	5.3765+6	3.5860+6	9.5765+5	8.3261+5	2.5087+2	9.2029+0	8.6511+0	4.1889–1	1.3291–1
4.0000–1	4.2683–6	3.9683+4	3.3141–2	4.5942+6	3.0766+6	8.6020+5	6.5714+5	2.2953+2	8.4686+0	7.9864+0	3.3212–1	1.5000–1
5.0000–1	4.7775–6	3.5453+4	4.5227–2	4.1045+6	2.7467+6	8.0427+5	5.5329+5	2.1799+2	8.0825+0	7.6331+0	2.8063–1	1.6875–1
6.0000–1	5.1982–6	3.2584+4	5.7779–2	3.7723+6	2.5158+6	7.6884+5	4.8745+5	2.1110+2	7.8529+0	7.4159+0	2.4795–1	1.8901–1
8.0000–1	5.8728–6	2.8841+4	8.3550–2	3.3390+6	2.2025+6	7.2816+5	4.0814+5	2.0439+2	7.6690+0	7.2279+0	2.0857–1	2.3260–1
1.0000+0	6.3958–6	2.6483+4	1.0971–1	3.0660+6	1.9991+6	7.0651+5	3.6013+5	2.0209+2	7.6213+0	7.1566+0	1.8469–1	2.7995–1
1.5000+0	7.2979–6	2.3209+4	1.7464–1	2.6870+6	1.7038+6	6.8620+5	2.9677+5	2.0252+2	7.7815+0	7.2177+0	1.5317–1	4.1065–1
2.0000+0	7.9089–6	2.1416+4	2.3804–1	2.4794+6	1.5390+6	6.7599+5	2.6419+5	2.0536+2	7.9912+0	7.3016+0	1.3680–1	5.5276–1
3.0000+0	8.6455–6	1.9591+4	3.5941–1	2.2681+6	1.3628+6	6.7159+5	2.3354+5	2.1145+2	8.4931+0	7.5077+0	1.2175–1	8.6369–1
4.0000+0	9.0907–6	1.8632+4	4.7379–1	2.1571+6	1.2683+6	6.7094+5	2.1761+5	2.1566+2	8.9965+0	7.6829+0	1.1364–1	1.2000+0
5.0000+0	9.3873–6	1.8043+4	5.8198–1	2.0889+6	1.2095+6	6.7045+5	2.0873+5	2.1899+2	9.4945+0	7.8427+0	1.0918–1	1.5426+0
6.0000+0	9.5936–6	1.7655+4	6.8464–1	2.0440+6	1.1720+6	6.7004+5	2.0169+5	2.2184+2	9.9916+0	7.9800+0	1.0568–1	1.9059+0
8.0000+0	9.8427–6	1.7208+4	8.7606–1	1.9923+6	1.1263+6	6.7047+5	1.9525+5	2.2643+2	1.0918+1	8.1696+0	1.0266–1	2.6459+0
1.0000+1	9.9712–6	1.6987+4	1.0519+0	1.9666+6	1.1043+6	6.7116+5	1.9090+5	2.3002+2	1.1846+1	8.3378+0	1.0072–1	3.4078+0
1.5000+1	1.0058–5	1.6840+4	1.4391+0	1.9496+6	1.0882+6	6.7207+5	1.8903+5	2.3665+2	1.4039+1	8.5628+0	9.9760–2	5.3763+0
2.0000+1	1.0075–5	1.6812+4	1.7696+0	1.9464+6	1.0857+6	6.7273+5	1.8768+5	2.4006+2	1.6273+1	8.7537+0	9.9081–2	7.4206+0
3.0000+1	1.0061–5	1.6836+4	2.3131+0	1.9491+6	1.0855+6	6.7327+5	1.9008+5	2.4497+2	2.0706+1	8.9885+0	1.0041–1	1.1617+1
4.0000+1	1.0047–5	1.6858+4	2.7506+0	1.9517+6	1.0854+6	6.7361+5	1.9251+5	2.4853+2	2.5153+1	9.1361+0	1.0176–1	1.5915+1
5.0000+1	1.0037–5	1.6875+4	3.1163+0	1.9536+6	1.0852+6	6.7376+5	1.9440+5	2.5132+2	2.9651+1	9.2440+0	1.0282–1	2.0305+1
6.0000+1	1.0029–5	1.6888+4	3.4301+0	1.9552+6	1.0851+6	6.7387+5	1.9592+5	2.5361+2	3.4188+1	9.3421+0	1.0370–1	2.4742+1
8.0000+1	1.0017–5	1.6909+4	3.9486+0	1.9576+6	1.0850+6	6.7401+5	1.9834+5	2.5725+2	4.3327+1	9.4918+0	1.0511–1	3.3730+1
1.0000+2	1.0007–5	1.6925+4	4.3670+0	1.9595+6	1.0848+6	6.7411+5	2.0027+5	2.6003+2	5.2564+1	9.6280+0	1.0627–1	4.2829+1
1.5000+2	9.9878–6	1.6958+4	5.1550+0	1.9633+6	1.0846+6	6.7416+5	2.0429+5	2.6497+2	7.5744+1	9.7524+0	1.0841–1	6.5884+1
2.0000+2	9.9737–6	1.6982+4	5.7304+0	1.9661+6	1.0844+6	6.7419+5	2.0720+5	2.6848+2	9.9109+1	9.8709+0	1.0995–1	8.9129+1
3.0000+2	9.9557–6	1.7013+4	6.5573+0	1.9696+6	1.0842+6	6.7424+5	2.1093+5	2.7213+2	1.4576+2	1.0091+1	1.1194–1	1.3556+2
4.0000+2	9.9377–6	1.7044+4	7.1521+0	1.9732+6	1.0840+6	6.7425+5	2.1468+5	2.7436+2	1.9264+2	1.0211+1	1.1393–1	1.8232+2
5.0000+2	9.9349–6	1.7049+4	7.6169+0	1.9738+6	1.0839+6	6.7425+5	2.1534+5	2.7613+2	2.3937+2	1.0283+1	1.1428–1	2.2898+2
6.0000+2	9.9262–6	1.7064+4	7.9985+0	1.9755+6	1.0838+6	6.7425+5	2.1716+5	2.7765+2	2.8605+2	1.0355+1	1.1525–1	2.7558+2
8.0000+2	9.9203–6	1.7074+4	8.6034+0	1.9767+6	1.0836+6	6.7426+5	2.1850+5	2.8021+2	3.7962+2	1.0497+1	1.1597–1	3.6901+2
1.0000+3	9.9186–6	1.7077+4	9.0742+0	1.9770+6	1.0835+6	6.7426+5	2.1897+5	2.8238+2	4.7343+2	1.0615+1	1.1622–1	4.6269+2
1.5000+3	9.9178–6	1.7078+4	9.9322+0	1.9772+6	1.0833+6	6.7426+5	2.1935+5	2.8650+2	7.0780+2	1.0717+1	1.1643–1	6.9697+2
2.0000+3	9.9195–6	1.7075+4	1.0542+1	1.9768+6	1.0831+6	6.7426+5	2.1916+5	2.8955+2	9.4346+2	1.0819+1	1.1632–1	9.3253+2
3.0000+3	9.9202–6	1.7074+4	1.1402+1	1.9767+6	1.0829+6	6.7426+5	2.1925+5	2.9424+2	1.4149+3	1.1022+1	1.1637–1	1.4038+3
4.0000+3	9.9229–6	1.7069+4	1.2012+1	1.9762+6	1.0827+6	6.7426+5	2.1887+5	2.9769+2	1.8862+3	1.1123+1	1.1617–1	1.8749+3
5.0000+3	9.9308–6	1.7056+4	1.2484+1	1.9746+6	1.0826+6	6.7426+5	2.1743+5	3.0040+2	2.3609+3	1.1223+1	1.1540–1	2.3496+3
6.0000+3	9.9284–6	1.7060+4	1.2871+1	1.9751+6	1.0825+6	6.7426+5	2.1800+5	3.0242+2	2.8281+3	1.1288+1	1.1571–1	2.8167+3
8.0000+3	9.9278–6	1.7061+4	1.3481+1	1.9752+6	1.0823+6	6.7426+5	2.1829+5	3.0564+2	3.7705+3	1.1420+1	1.1586–1	3.7590+3
1.0000+4	9.9274–6	1.7062+4	1.3954+1	1.9753+6	1.0822+6	6.7426+5	2.1848+5	3.0815+2	4.7214+3	1.1546+1	1.1597–1	4.7098+3
1.5000+4	9.9276–6	1.7061+4	1.4815+1	1.9752+6	1.0820+6	6.7426+5	2.1868+5	3.1313+2	7.0499+3	1.1644+1	1.1607–1	7.0382+3
2.0000+4	9.9294–6	1.7058+4	1.5427+1	1.9749+6	1.0818+6	6.7426+5	2.1848+5	3.1671+2	9.4086+3	1.1741+1	1.1597–1	9.3968+3
3.0000+4	9.9281–6	1.7060+4	1.6290+1	1.9751+6	1.0816+6	6.7426+5	2.1897+5	3.2174+2	1.4078+4	1.1935+1	1.1622–1	1.4066+4
4.0000+4	9.9299–6	1.7057+4	1.6903+1	1.9748+6	1.0814+6	6.7426+5	2.1877+5	3.2535+2	1.8797+4	1.2061+1	1.1612–1	1.8785+4
5.0000+4	9.9382–6	1.7043+4	1.7378+1	1.9731+6	1.0813+6	6.7426+5	2.1724+5	3.2813+2	2.3473+4	1.2159+1	1.1530–1	2.3461+4
6.0000+4	9.9354–6	1.7048+4	1.7766+1	1.9737+6	1.0812+6	6.7426+5	2.1791+5	3.3039+2	2.8145+4	1.2222+1	1.1566–1	2.8133+4
8.0000+4	9.9347–6	1.7049+4	1.8379+1	1.9738+6	1.0810+6	6.7426+5	2.1820+5	3.3400+2	3.7571+4	1.2348+1	1.1581–1	3.7558+4

Atomic Weight 69.720													Density 5.904 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000+5	9.9349–6	1.7049+4	1.8854+1	1.9738+6	1.0809+6	6.7426+5	2.1829+5	3.3680+2	4.7013+4	1.2475+1	1.1586–1	4.7000+4


July 4 1991
Atomic Weight 72 590
EEDL Evaluated Electron
Cross Sections
32-Ge
Density 5 323 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
32-Ge


July 4 1991
Atomic Weight 72 590
EEDL Evaluated Electron
Energy Deposition
32-Ge
Density 5 323 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
32-Ge

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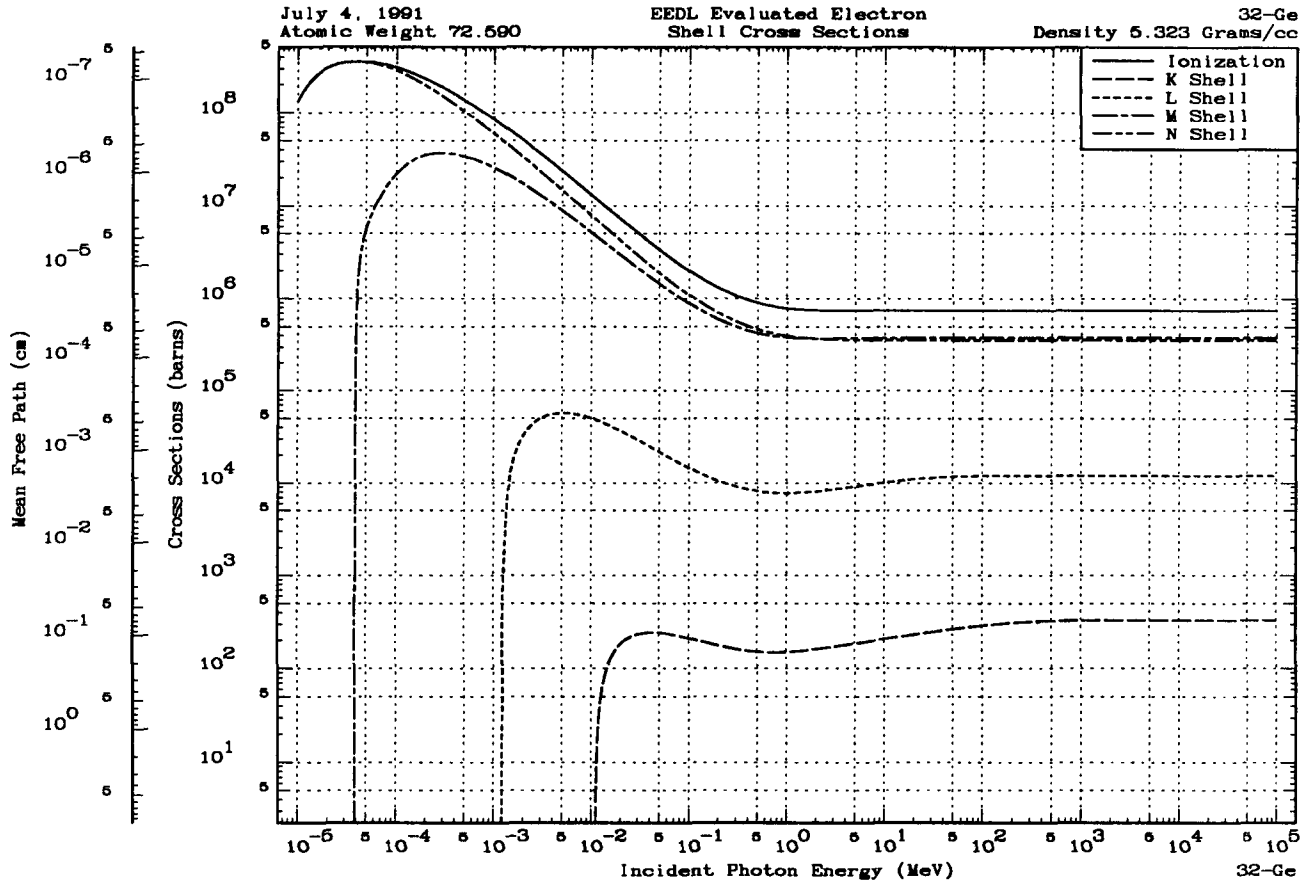
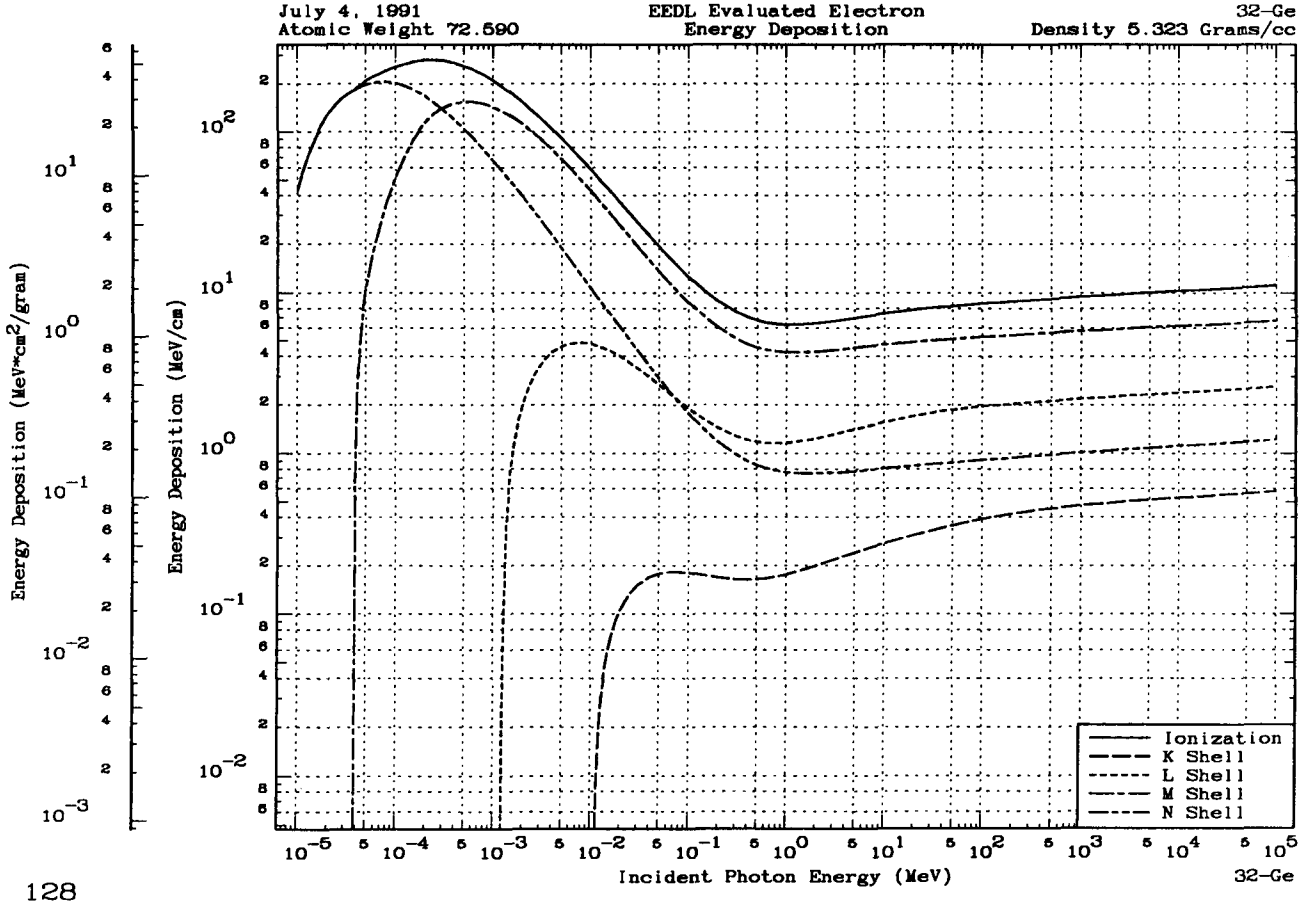

July 4, 1991
Atomic Weight 72.590
EEDL Evaluated Electron
Shell Cross Sections
32-Ge
Density 5.323 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
32-Ge

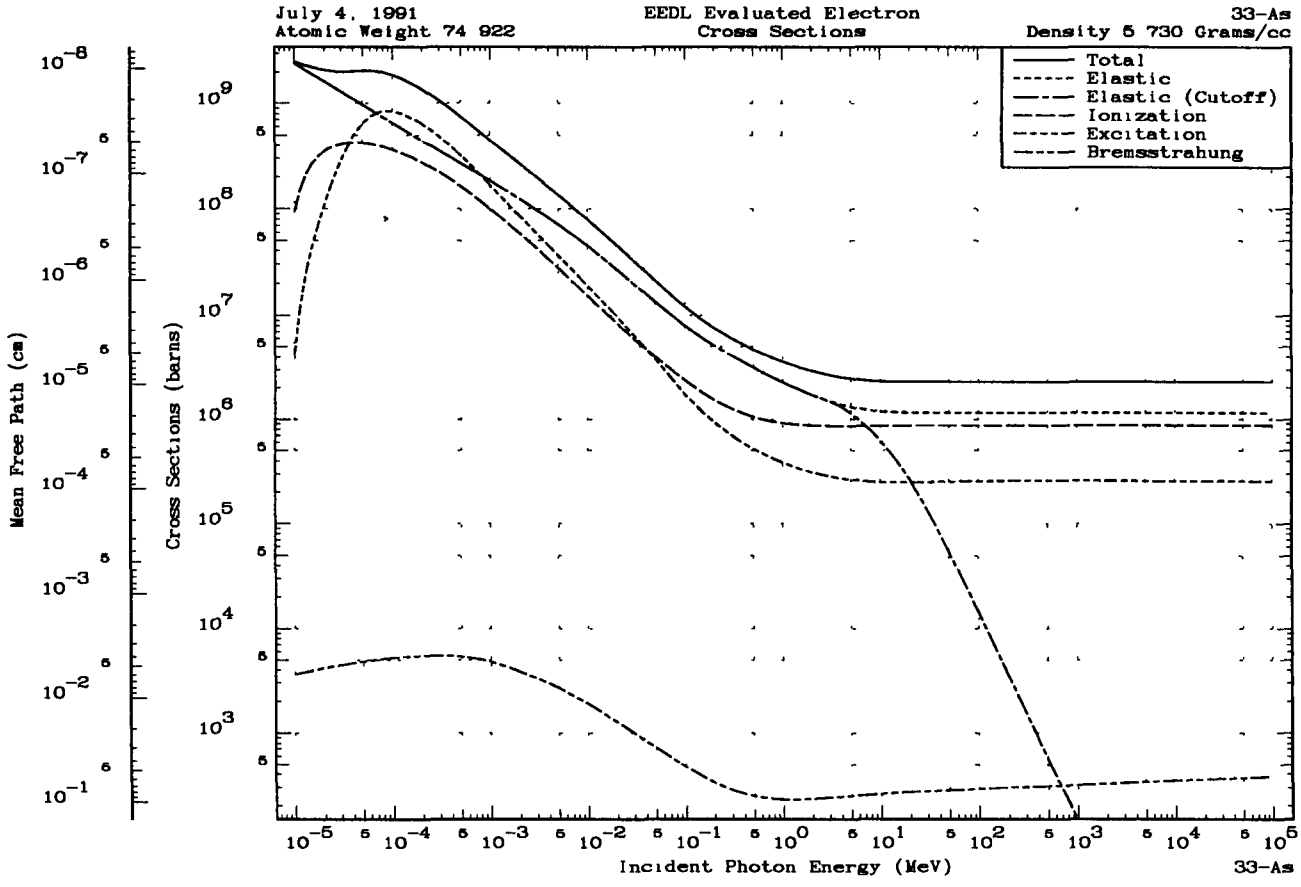

July 4, 1991
Atomic Weight 72.590
EEDL Evaluated Electron
Energy Deposition
32-Ge
Density 5.323 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
32-Ge

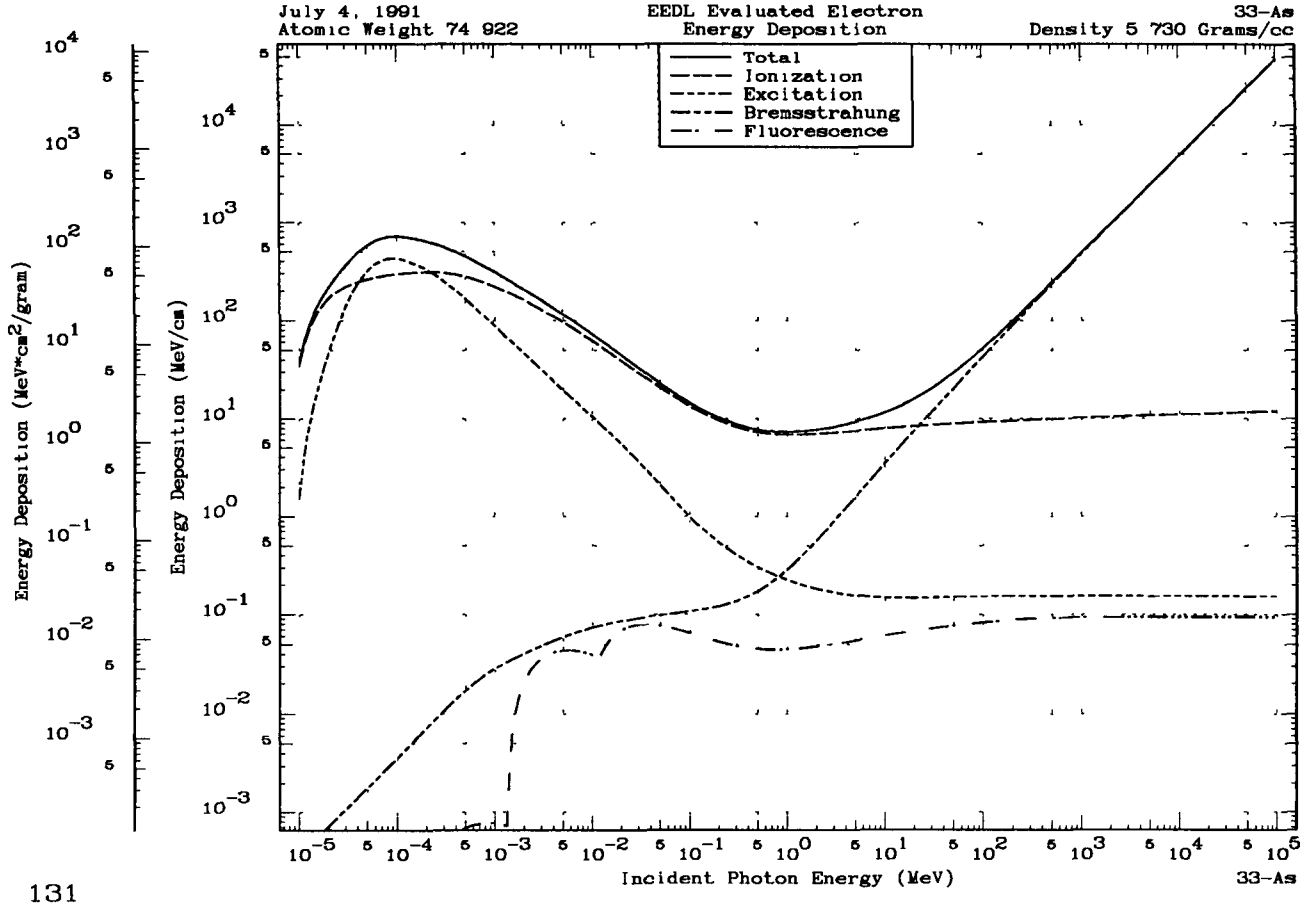
Atomic Weight 72.590 — Density 5.323 Grams/cc

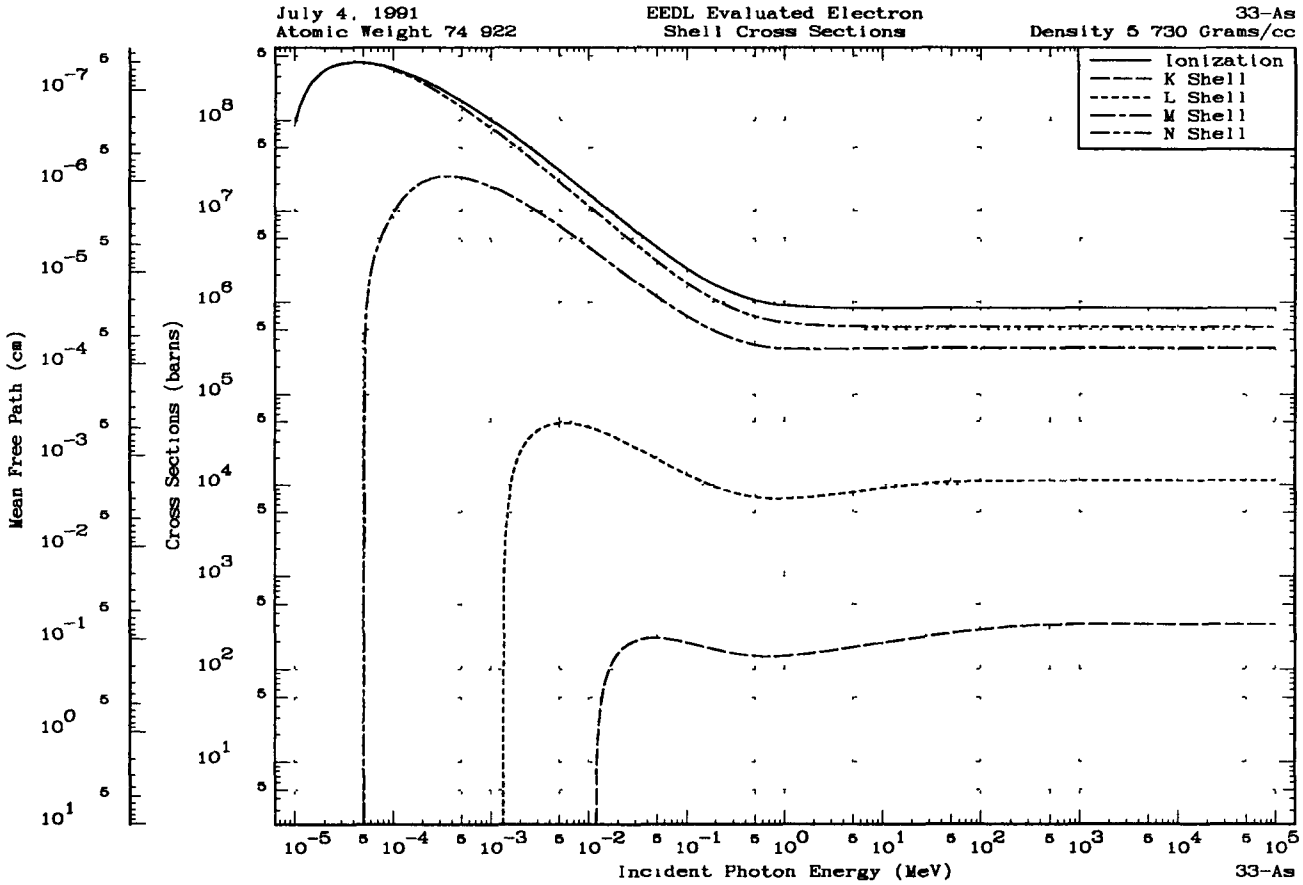
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.0997–9	2.0645+7		2.4885+9	2.3497+9	1.3372+8	5.1013+6	3.5665+3	4.4311+1	4.2704+1	1.6064+0	3.3961–4
	1.1250–5	9.5202–9	1.9733+7		2.3786+9	2.1982+9	1.6892+8	1.1459+7	3.6495+3	5.9647+1	5.5925+1	3.7214+0	3.8013–4
	1.3125–5	1.0061–8	1.8673+7		2.2509+9	2.0146+9	2.1285+8	2.3382+7	3.7610+3	8.2148+1	7.4208+1	7.9392+0	4.4218–4
N1	1.4780–5	1.0479–8	1.7928+7		2.1610+9	1.8837+9	2.4203+8	3.5290+7	3.8492+3	1.0015+2	8.7706+1	1.2443+1	4.9812–4
	1.5000–5	1.0524–8	1.7851+7		2.1518+9	1.8680+9	2.4655+8	3.7188+7	3.8603+3	1.0313+2	8.9968+1	1.3162+1	5.0563–4
	1.5313–5	1.0595–8	1.7731+7		2.1373+9	1.8464+9	2.5135+8	3.9590+7	3.8759+3	1.0660+2	9.2536+1	1.4068+1	5.1633–4
	1.5898–5	1.0721–8	1.7523+7		2.1122+9	1.8076+9	2.6024+8	4.4372+7	3.9044+3	1.1323+2	9.7342+1	1.5883+1	5.3649–4
	1.6924–5	1.0919–8	1.7205+7		2.0738+9	1.7448+9	2.7541+8	5.3646+7	3.9524+3	1.2519+2	1.0574+2	1.9447+1	5.7207–4
	1.7500–5	1.1020–8	1.7048+7		2.0550+9	1.7120+9	2.8354+8	5.9386+7	3.9783+3	1.3201+2	1.1033+2	2.1681+1	5.9221–4
	1.8462–5	1.1186–8	1.6794+7		2.0243+9	1.6610+9	2.9346+8	6.9863+7	4.0201+3	1.4237+2	1.1657+2	2.5805+1	6.2609–4
	2.0000–5	1.1409–8	1.6467+7		1.9849+9	1.5875+9	3.0837+8	8.9080+7	4.0834+3	1.5980+2	1.2628+2	3.3513+1	6.8087–4
	2.2500–5	1.1716–8	1.6035+7		1.9328+9	1.4851+9	3.2318+8	1.2453+8	4.1636+3	1.8542+2	1.3795+2	4.7463+1	7.6257–4
	2.5000–5	1.1895–8	1.5793+7		1.9037+9	1.3992+9	3.3642+8	1.6805+8	4.2367+3	2.1408+2	1.4920+2	6.4877+1	8.4549–4
	2.6250–5	1.1954–8	1.5716+7		1.8943+9	1.3611+9	3.4018+8	1.9307+8	4.2710+3	2.2843+2	1.5341+2	7.5010+1	8.8738–4
	3.0000–5	1.2000–8	1.5656+7		1.8871+9	1.2621+9	3.4997+8	2.7507+8	4.3662+3	2.7433+2	1.6543+2	1.0890+2	1.0147–3
	3.5000–5	1.1830–8	1.5880+7		1.9142+9	1.1568+9	3.5358+8	4.0377+8	4.4767+3	3.3727+2	1.7590+2	1.6137+2	1.1863–3
M5	3.8190–5	1.1651–8	1.6124+7		1.9436+9	1.1012+9	3.5540+8	4.8696+8	4.5405+3	3.7812+2	1.8233+2	1.9579+2	1.2976–3
	3.8643–5	1.1617–8	1.6172+7		1.9493+9	1.0939+9	3.5583+8	4.9960+8	4.5492+3	3.8458+2	1.8353+2	2.0105+2	1.3135–3
M4	3.8820–5	1.1603–8	1.6191+7		1.9517+9	1.0911+9	3.5597+8	5.0460+8	4.5526+3	3.8710+2	1.8397+2	2.0313+2	1.3197–3
	3.9321–5	1.1574–8	1.6232+7		1.9566+9	1.0832+9	3.5658+8	5.1679+8	4.5621+3	3.9378+2	1.8554+2	2.0824+2	1.3374–3
	3.9410–5	1.1568–8	1.6240+7		1.9575+9	1.0818+9	3.5667+8	5.1896+8	4.5637+3	3.9494+2	1.8579+2	2.0915+2	1.3405–3
	4.0000–5	1.1532–8	1.6290+7		1.9636+9	1.0728+9	3.5730+8	5.3350+8	4.5747+3	4.0275+2	1.8749+2	2.1526+2	1.3613–3
	4.1250–5	1.1470–8	1.6378+7		1.9742+9	1.0543+9	3.5712+8	5.6272+8	4.5943+3	4.1747+2	1.9017+2	2.2729+2	1.4028–3
	4.3438–5	1.1344–8	1.6561+7		1.9962+9	1.0240+9	3.5672+8	6.1544+8	4.6273+3	4.4365+2	1.9460+2	2.4904+2	1.4757–3
	4.6719–5	1.1116–8	1.6901+7		2.0372+9	9.8279+8	3.5618+8	6.9822+8	4.6742+3	4.8450+2	2.0118+2	2.8331+2	1.5859–3
	5.0000–5	1.0956–8	1.7148+7		2.0670+9	9.4585+8	3.5571+8	7.6541+8	4.7183+3	5.1912+2	2.0769+2	3.1143+2	1.6970–3
	6.0000–5	1.0847–8	1.7320+7		2.0877+9	8.5335+8	3.4827+8	8.8609+8	4.8289+3	5.8540+2	2.2150+2	3.6390+2	2.0302–3
	7.0000–5	1.0943–8	1.7168+7		2.0694+9	7.8224+8	3.3726+8	9.4987+8	4.9245+3	6.2232+2	2.3025+2	3.9207+2	2.3695–3
	8.0000–5	1.1210–8	1.6758+7		2.0200+9	7.2544+8	3.2850+8	9.6610+8	5.0087+3	6.4142+2	2.4064+2	4.0077+2	2.7144–3
	1.0000–4	1.1777–8	1.5952+7	0.0000+0	1.9228+9	6.3959+8	3.0853+8	9.7472+8	5.1251+3	6.6141+2	2.5416+2	4.0725+2	3.3873–3
M3	1.2498–4	1.2702–8	1.4790+7	3.7868–8	1.7827+9	5.6428+8	2.8580+8	9.3266+8	5.2174+3	6.5791+2	2.6559+2	3.9231+2	4.2098–3
	1.2654–4	1.2757–8	1.4727+7	4.0246–8	1.7751+9	5.6035+8	2.8436+8	9.3043+8	5.2226+3	6.5747+2	2.6598+2	3.9149+2	4.2617–3
M2	1.2938–4	1.2854–8	1.4615+7	4.4562–8	1.7617+9	5.5341+8	2.8183+8	9.2648+8	5.2319+3	6.5676+2	2.6671+2	3.9004+2	4.3559–3
	1.2948–4	1.2858–8	1.4611+7	4.4708–8	1.7612+9	5.5318+8	2.8175+8	9.2627+8	5.2322+3	6.5671+2	2.6674+2	3.8997+2	4.3591–3
	1.3196–4	1.2955–8	1.4501+7	4.8491–8	1.7480+9	5.4731+8	2.7962+8	9.2104+8	5.2402+3	6.5545+2	2.6747+2	3.8797+2	4.4418–3
	1.3461–4	1.3057–8	1.4388+7	5.2537–8	1.7343+9	5.4123+8	2.7743+8	9.1559+8	5.2485+3	6.5424+2	2.6834+2	3.8589+2	4.5301–3
	1.3647–4	1.3129–8	1.4310+7	5.5383–8	1.7249+9	5.3707+8	2.7594+8	9.1185+8	5.2543+3	6.5343+2	2.6896+2	3.8447+2	4.5922–3
	1.4230–4	1.3347–8	1.4075+7	6.4328–8	1.6966+9	5.2459+8	2.7148+8	9.0053+8	5.2719+3	6.5125+2	2.7108+2	3.8016+2	4.7873–3
	1.4323–4	1.3382–8	1.4039+7	6.5758–8	1.6922+9	5.2267+8	2.7079+8	8.9878+8	5.2747+3	6.5094+2	2.7144+2	3.7950+2	4.8185–3
	1.5000–4	1.3626–8	1.3787+7	7.6167–8	1.6618+9	5.0929+8	2.6607+8	8.8648+8	5.2942+3	6.4902+2	2.7417+2	3.7485+2	5.0456–3
	1.6250–4	1.4163–8	1.3265+7	9.5591–8	1.5989+9	4.8689+8	2.5652+8	8.5549+8	5.3283+3	6.3808+2	2.7566+2	3.6241+2	5.4672–3
M1	1.7925–4	1.4846–8	1.2654+7	1.2208–7	1.5253+9	4.6078+8	2.4555+8	8.1898+8	5.3703+3	6.2656+2	2.7876+2	3.4780+2	6.0359–3
	1.8184–4	1.4969–8	1.2550+7	1.2623–7	1.5128+9	4.5707+8	2.4395+8	8.1175+8	5.3723+3	6.2401+2	2.7912+2	3.4488+2	6.1193–3
	1.9092–4	1.5393–8	1.2204+7	1.4087–7	1.4711+9	4.4473+8	2.3866+8	7.8772+8	5.3791+3	6.1580+2	2.8060+2	3.3519+2	6.4116–3
	2.0000–4	1.5808–8	1.1884+7	1.5570–7	1.4325+9	4.3327+8	2.3378+8	7.6546+8	5.3857+3	6.0861+2	2.8238+2	3.2622+2	6.7043–3
	2.1250–4	1.6394–8	1.1459+7	1.7646–7	1.3813+9	4.1876+8	2.2640+8	7.3609+8	5.3872+3	5.9584+2	2.8173+2	3.1411+2	7.0982–3
	2.2500–4	1.6966–8	1.1073+7	1.9764–7	1.3347+9	4.0553+8	2.1973+8	7.0943+8	5.3888+3	5.8471+2	2.8158+2	3.0312+2	7.4922–3
	2.3438–4	1.7386–8	1.0805+7	2.1377–7	1.3024+9	3.9633+8	2.1512+8	6.9098+8	5.3898+3	5.7720+2	2.8168+2	2.9552+2	7.7878–3
	2.5000–4	1.8071–8	1.0396+7	2.4111–7	1.2531+9	3.8222+8	2.0810+8	6.6279+8	5.3915+3	5.6618+2	2.8226+2	2.8391+2	8.2806–3
	2.6250–4	1.8609–8	1.0095+7	2.6336–7	1.2169+9	3.7188+8	2.0274+8	6.4224+8	5.3928+3	5.5718+2	2.8171+2	2.7546+2	8.6749–3
	2.6719–4	1.8808–8	9.9884+6	2.7180–7	1.2040+9	3.6820+8	2.0084+8	6.3495+8	5.3933+3	5.5402+2	2.8154+2	2.7246+2	8.8228–3
	3.0000–4	2.0342–8	9.2351+6	3.3231–7	1.1132+9	3.4500+8	1.8891+8	5.7927+8	5.3963+3	5.3070+2	2.8129+2	2.4940+2	9.8583–3
	3.5000–4	2.2618–8	8.3060+6	4.2969–7	1.0012+9	3.1654+8	1.7229+8	5.1236+8	5.3864+3	4.9654+2	2.7519+2	2.2133+2	1.1408–2
	4.0000–4	2.4783–8	7.5803+6	5.3304–7	9.1372+8	2.9378+8	1.5925+8	4.6068+8	5.3779+3	4.7130+2	2.7161+2	1.9967+2	1.2954–2
	4.5000–4	2.7114–8	6.9286+6	6.4243–7	8.3516+8	2.7510+8	1.4758+8	4.1248+8	5.3097+3	4.4313+2	2.6390+2	1.7922+2	1.4334–2
	5.0000–4	2.9371–8	6.3962+6	7.5820–7	7.7099+8	2.5939+8	1.3794+8	3.7366+8	5.2493+3	4.2086+2	2.5810+2	1.6275+2	1.5697–2
	6.0000–4	3.3846–8	5.5506+6	1.0065–6	6.6906+8	2.3430+8	1.2247+8	3.1228+8	5.1466+3	3.8508+2	2.4848+2	1.3658+2	1.8382–2
	7.0000–4	3.8092–8	4.9318+6	1.2770–6	5.9447+8	2.1499+8	1.1003+8	2.6944+8	5.0050+3	3.5464+2	2.3644+2	1.1819+2	2.0612–2
	8.0000–4	4.2167–8	4.4552+6	1.5685–6	5.3703+8	1.9955+8	1.0035+8	2.3712+8	4.8855+3	3.3191+2	2.2757+2	1.0431+2	2.2790–2
	1.0000–3	5.0291–8	3.7356+6	2.2094–6	4.5028+8	1.7619+8	8.5403+7	1.8868+8	4.6345+3	2.9300+2	2.0961+2	8.3370+1	2.6384–2
L3	1.2228–3	5.8856–8	3.1919+6	3.0149–6	3.8475+8	1.5745+8	7.3483+7	1.5381+8	4.3604+3	2.6079+2	1.9254+2	6.8218+1	2.9249–2
	1.2401–3	5.9500–8	3.1574+6	3.0816–6	3.8059+8	1.5622+8	7.2713+7	1.5166+8	4.3411+3	2.5877+2	1.9146+2	6.7282+1	2.9448–2
L2	1.2554–3	6.0065–8	3.1277+6	3.1409–6	3.7700+8	1.5515+8	7.2050+7	1.4980+8	4.3244+3	2.5701+2	1.9051+2	6.6479+1	2.9624–2
	1.3165–3	6.2310–8	3.0150+6	3.3822–6	3.6342+8	1.5108+8	6.9469+7	1.4287+8	4.2601+3	2.4987+2	1.8638+2	6.3456+1	3.0322–2
	1.3701–3	6.4249–8	2.9240+6	3.5988–6	3.5245+8	1.4775+8	6.7382+7	1.3732+8	4.2070+3	2.4422+2	1.8316+2	6.1032+1	3.0929–2
L1	1.4023–3	6.5407–8	2.8722+6	3.7317–6	3.4622+8	1.4584+8	6.6193+7	1.3418+8	4.1762+3	2.4098+2	1.8129+2	5.9660+1	3.1291–2
	1.4083–3	6.5620–8	2.8629+6	3.7565–6	3.4509+8	1.4549+8	6.5978+7	1.3362+8	4.1707+3	2.4041+2	1.8096+2	5.9415+1	3.1358–2
	1.4511–3	6.7141–8	2.7980+6	3.9363–6	3.3727+8	1.4307+8	6.4482+7	1.2971+8	4.1314+3	2.3639+2	1.7864+2	5.7716+1	3.1838–2
	1.5000–3	6.8859–8	2.7282+6	4.1449–6	3.2886+8	1.4045+8	6.2872+7	1.2553+8	4.0885+3	2.3212+2	1.7619+2	5.5898+1	3.2381–2
	1.6250–3	7.3190–8	2.5668+6	4.6966–6	3.0940+8	1.3421+8	5.9026+7	1.1616+8	3.9803+3	2.2109+2	1.6926+2	5.1793+1	3.3613–2
	1.8125–3	7.9511–8	2.3628+6	5.5723–6	2.8480+8	1.2615+8	5.4163+7	1.0448+8	3.8373+3	2.0729+2	1.6057+2	4.6683+1	3.5427–2
	2.0000–3	8.5644–8	2.1935+6	6.5024–6	2.6441+8	1.1930+8	5.0131+7	9.4971+7	3.7128+3	1.9598+2	1.5343+2	4.2518+1	3.7201–2
	2.2500–3	9.3761–8	2.0037+6	7.8270–6	2.4152+8	1.1123+8	4.5554+7	8.4733+7	3.5502+3	1.8167+2	1.4363+2	3.8005+1	3.9083–2
	2.6250–3	1.0549–7	1.7809+6	9.9918–6	2.1467+8	1.0148+8	4.0198+7	7.2983+7	3.3480+3	1.6505+2	1.3218+2	3.2826+1	4.1827–2
	3.0000–3	1.1676–7	1.6090+6	1.2356–5	1.9394+8	9.3733+7	3.6077+7	6.4129+7	3.1822+3	1.5238+2	1.2342+2	2.8924+1	4.4478–2
	3.5000–3	1.3182–7	1.4252+6	1.5809–5	1.7179+8	8.5242+7	3.1736+7	5.4807+7	2.9796+3	1.3747+2	1.1264+2	2.4784+1	4.7208–2
	4.0000–3	1.4633–7	1.2838+6	1.9605–5	1.5475+8	7.8511+7	2.8405+7	4.7835+7	2.8145+3	1.2609+2	1.0435+2	2.1688+1	4.9846–2
	5.0000–3	1.7499–7	1.0736+6	2.8154–5	1.2941+8	6.8012+7	2.3534+7	3.7859+7	2.5427+3	1.0833+2	9.1036+1	1.7236+1	5.4167–2
	6.0000–3	2.0245–7	9.2794+5	3.7977–5	1.1185+8	6.0311+7	2.0152+7	3.1386+7	2.3278+3	9.5536+1	8.1142+1	1.4337+1	5.7583–2
	7.0000–3	2.2896–7	8.2051+5	4.9025–5	9.8903+7	5.4363+7	1.7658+7	2.6879+7	2.1528+3	8.5666+1	7.3295+1	1.2311+1	6.0354–2

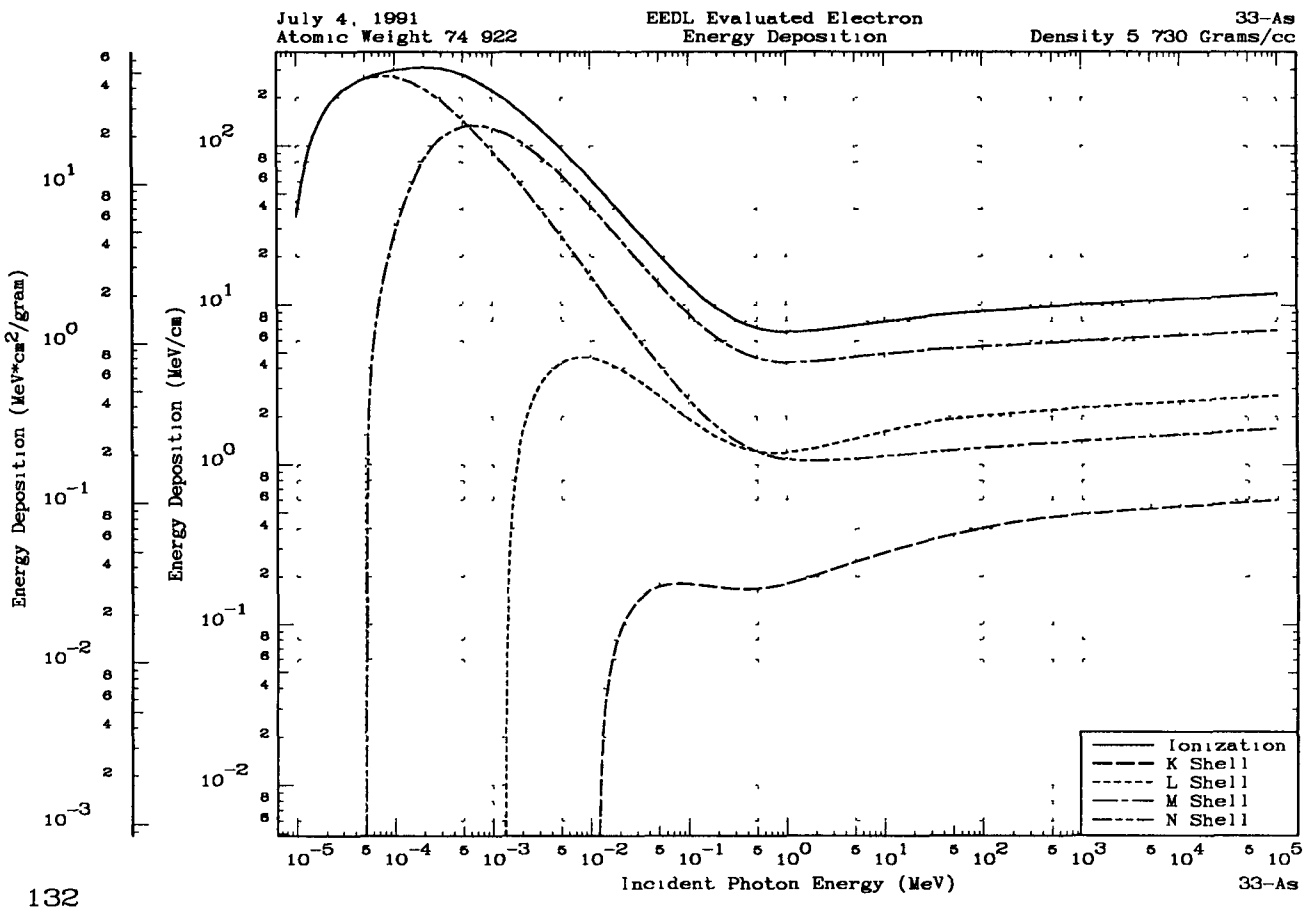
Atomic Weight 72.590 Density 5.323 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000–3	2.5460–7	7.3787+5	6.1244–5	8.8941+7	4.9687+7	1.5750+7	2.3502+7	2.0119+3	7.8134+1	6.7278+1	1.0793+1	6.3039–2
1.0000–2	3.0443–7	6.1709+5	8.8913–5	7.4384+7	4.2500+7	1.2996+7	1.8886+7	1.7877+3	6.6732+1	5.7956+1	8.7088+0	6.7102–2
K 1.1067–2	3.3025–7	5.6886+5	1.0549–4	6.8569+7	3.9533+7	1.1907+7	1.7128+7	1.6936+3	6.2034+1	5.4055+1	7.9104+0	6.8922–2
1.1190–2	3.3321–7	5.6381+5	1.0748–4	6.7961+7	3.9219+7	1.1794+7	1.6946+7	1.6829+3	6.1538+1	5.3641+1	7.8278+0	6.9077–2
1.1428–2	3.3892–7	5.5430+5	1.1138–4	6.6815+7	3.8628+7	1.1582+7	1.6603+7	1.6627+3	6.0604+1	5.2862+1	7.6726+0	6.9377–2
1.1875–2	3.4957–7	5.3742+5	1.1885–4	6.4780+7	3.7575+7	1.1205+7	1.5999+7	1.6265+3	5.8949+1	5.1481+1	7.3982+0	6.9939–2
1.2265–2	3.5882–7	5.2357+5	1.2556–4	6.3110+7	3.6707+7	1.0896+7	1.5505+7	1.5966+3	5.7593+1	5.0348+1	7.1743+0	7.0431–2
1.2949–2	3.7485–7	5.0116+5	1.3766–4	6.0410+7	3.5299+7	1.0398+7	1.4711+7	1.5476+3	5.5404+1	4.8518+1	6.8144+0	7.1291–2
1.3974–2	3.9859–7	4.7132+5	1.5667–4	5.6813+7	3.3410+7	9.7370+6	1.3664+7	1.4814+3	5.2499+1	4.6087+1	6.3397+0	7.2574–2
1.5000–2	4.2196–7	4.4522+5	1.7669–4	5.3666+7	3.1746+7	9.1604+6	1.2759+7	1.4223+3	4.9969+1	4.3966+1	5.9289+0	7.3844–2
1.6250–2	4.5023–7	4.1726+5	2.0244–4	5.0296+7	2.9915+7	8.5526+6	1.1827+7	1.3561+3	4.7159+1	4.1581+1	5.5032+0	7.4921–2
1.8125–2	4.9184–7	3.8196+5	2.4377–4	4.6041+7	2.7587+7	7.7881+6	1.0664+7	1.2706+3	4.3624+1	3.8575+1	4.9721+0	7.6549–2
2.0000–2	5.3259–7	3.5273+5	2.8825–4	4.2518+7	2.5644+7	7.1579+6	9.7149+6	1.1981+3	4.0709+1	3.6092+1	4.5383+0	7.8174–2
2.2500–2	5.8617–7	3.2049+5	3.5232–4	3.8632+7	2.3451+7	6.4783+6	8.7015+6	1.1139+3	3.7376+1	3.3224+1	4.0723+0	7.9361–2
2.6250–2	6.6445–7	2.8274+5	4.5827–4	3.4081+7	2.0861+7	5.6858+6	7.5331+6	1.0125+3	3.3484+1	2.9867+1	3.5351+0	8.1252–2
3.0000–2	7.4057–7	2.5367+5	5.7558–4	3.0578+7	1.8850+7	5.0783+6	6.6487+6	9.3219+2	3.0498+1	2.7286+1	3.1285+0	8.3196–2
4.0000–2	9.3510–7	2.0090+5	9.3749–4	2.4216+7	1.5080+7	4.0033+6	5.1322+6	7.7750+2	2.4950+1	2.2436+1	2.4270+0	8.6432–2
5.0000–2	1.1184–6	1.6798+5	1.3695–3	2.0247+7	1.2675+7	3.3454+6	4.2266+6	6.7779+2	2.1434+1	1.9338+1	2.0062+0	8.8877–2
6.0000–2	1.2922–6	1.4538+5	1.8650–3	1.7524+7	1.1016+7	2.9006+6	3.6070+6	6.0568+2	1.8984+1	1.7176+1	1.7172+0	9.0845–2
8.0000–2	1.6144–6	1.1637+5	3.0184–3	1.4027+7	8.8801+6	2.3368+6	2.8094+6	5.0815+2	1.5794+1	1.4356+1	1.3435+0	9.3949–2
9.0000–2	1.7672–6	1.0630+5	3.6750–3	1.2814+7	8.1597+6	2.1491+6	2.5045+6	4.7419+2	1.4678+1	1.3383+1	1.1998+0	9.5268–2
1.0000–1	1.9085–6	9.8436+4	4.3780–3	1.1865+7	7.5650+6	1.9940+6	2.3059+6	4.4574+2	1.3782+1	1.2579+1	1.1065+0	9.6693–2
1.5000–1	2.5091–6	7.4875+4	8.4190–3	9.0253+6	5.7542+6	1.5328+6	1.7379+6	3.5899+2	1.1064+1	1.0122+1	8.3891–1	1.0278–1
2.0000–1	3.0089–6	6.2436+4	1.3250–2	7.5260+6	4.8016+6	1.3018+6	1.4223+6	3.1357+2	9.6651+0	8.8666+0	6.8934–1	1.0914–1
3.0000–1	3.8134–6	4.9265+4	2.4422–2	5.9383+6	3.7851+6	1.0738+6	1.0792+6	2.6689+2	8.2728+0	7.6235+0	5.2599–1	1.2323–1
4.0000–1	4.4440–6	4.2274+4	3.7012–2	5.0957+6	3.2308+6	9.6350+5	9.0111+5	2.4441+2	7.6227+0	7.0427+0	4.4095–1	1.3913–1
5.0000–1	4.9656–6	3.7833+4	5.0437–2	4.5603+6	2.8763+6	9.0030+5	7.8350+5	2.3166+2	7.2768+0	6.7361+0	3.8458–1	1.5618–1
6.0000–1	5.3973–6	3.4807+4	6.4378–2	4.1956+6	2.6284+6	8.6014+5	7.0678+5	2.2441+2	7.0711+0	6.5482+0	3.4780–1	1.7509–1
8.0000–1	6.0940–6	3.0828+4	9.3007–2	3.7159+6	2.2975+6	8.1390+5	6.0426+5	2.1749+2	6.9013+0	6.3873+0	2.9853–1	2.1547–1
1.0000+0	6.6446–6	2.8273+4	1.2209–1	3.4080+6	2.0835+6	7.8922+5	5.3514+5	2.1485+2	6.8534+0	6.3292+0	2.6519–1	2.5902–1
1.5000+0	7.5806–6	2.4782+4	1.9431–1	2.9872+6	1.7759+6	7.6490+5	4.4615+5	2.1506+2	6.9935+0	6.3917+0	2.2231–1	3.7939–1
2.0000+0	8.2111–6	2.2879+4	2.6487–1	2.7578+6	1.6062+6	7.5501+5	3.9646+5	2.1790+2	7.1801+0	6.4718+0	1.9811–1	5.1019–1
3.0000+0	8.9991–6	2.0876+4	3.9990–1	2.5164+6	1.4230+6	7.4843+5	3.4474+5	2.2416+2	7.6353+0	6.6654+0	1.7329–1	7.9655–1
4.0000+0	9.4660–6	1.9846+4	5.2708–1	2.3922+6	1.3242+6	7.4825+5	3.1955+5	2.2864+2	8.0949+0	6.8282+0	1.6087–1	1.1059+0
5.0000+0	9.7931–6	1.9183+4	6.4729–1	2.3123+6	1.2628+6	7.4814+5	3.0117+5	2.3217+2	8.5476+0	6.9747+0	1.5185–1	1.4210+0
6.0000+0	1.0011–5	1.8766+4	7.6129–1	2.2621+6	1.2224+6	7.4803+5	2.9136+5	2.3521+2	8.9996+0	7.0973+0	1.4712–1	1.7551+0
8.0000+0	1.0295–5	1.8249+4	9.7365–1	2.1997+6	1.1728+6	7.4806+5	2.7861+5	2.4009+2	9.8491+0	7.2723+0	1.4111–1	2.4357+0
1.0000+1	1.0461–5	1.7959+4	1.1685+0	2.1647+6	1.1467+6	7.4888+5	2.6892+5	2.4391+2	1.0696+1	7.4234+0	1.3662–1	3.1362+0
1.5000+1	1.0584–5	1.7750+4	1.5968+0	2.1396+6	1.1248+6	7.4989+5	2.6471+5	2.5094+2	1.2707+1	7.6265+0	1.3453–1	4.9456+0
2.0000+1	1.0602–5	1.7720+4	1.9616+0	2.1359+6	1.1221+6	7.5063+5	2.6291+5	2.5451+2	1.4758+1	7.8001+0	1.3365–1	6.8238+0
3.0000+1	1.0583–5	1.7752+4	2.5600+0	2.1398+6	1.1219+6	7.5125+5	2.6640+5	2.5962+2	1.8830+1	8.0151+0	1.3550–1	1.0679+1
4.0000+1	1.0570–5	1.7774+4	3.0407+0	2.1425+6	1.1217+6	7.5163+5	2.6885+5	2.6330+2	2.2912+1	8.1490+0	1.3684–1	1.4627+1
5.0000+1	1.0561–5	1.7789+4	3.4419+0	2.1443+6	1.1216+6	7.5179+5	2.7064+5	2.6625+2	2.7044+1	8.2464+0	1.3783–1	1.8660+1
6.0000+1	1.0555–5	1.7798+4	3.7859+0	2.1453+6	1.1215+6	7.5192+5	2.7166+5	2.6868+2	3.1207+1	8.3348+0	1.3843–1	2.2733+1
8.0000+1	1.0548–5	1.7811+4	4.3535+0	2.1469+6	1.1213+6	7.5208+5	2.7321+5	2.7252+2	3.9590+1	8.4726+0	1.3938–1	3.0978+1
1.0000+2	1.0542–5	1.7820+4	4.8112+0	2.1480+6	1.1212+6	7.5220+5	2.7435+5	2.7529+2	4.8083+1	8.5945+0	1.4013–1	3.9349+1
1.5000+2	1.0536–5	1.7831+4	5.6721+0	2.1493+6	1.1209+6	7.5226+5	2.7588+5	2.8092+2	6.9379+1	8.7089+0	1.4091–1	6.0529+1
2.0000+2	1.0519–5	1.7859+4	6.2999+0	2.1527+6	1.1207+6	7.5230+5	2.7934+5	2.8487+2	9.0859+1	8.8174+0	1.4268–1	8.1899+1
3.0000+2	1.0496–5	1.7899+4	7.2017+0	2.1576+6	1.1205+6	7.5234+5	2.8443+5	2.8866+2	1.3366+2	9.0076+0	1.4529–1	1.2451+2
4.0000+2	1.0485–5	1.7917+4	7.8503+0	2.1597+6	1.1203+6	7.5236+5	2.8676+5	2.9088+2	1.7671+2	9.1166+0	1.4648–1	1.6745+2
5.0000+2	1.0486–5	1.7916+4	8.3569+0	2.1595+6	1.1202+6	7.5236+5	2.8666+5	2.9268+2	2.1962+2	9.1834+0	1.4643–1	2.1029+2
6.0000+2	1.0481–5	1.7924+4	8.7728+0	2.1605+6	1.1201+6	7.5236+5	2.8778+5	2.9427+2	2.6249+2	9.2496+0	1.4701–1	2.5309+2
8.0000+2	1.0479–5	1.7927+4	9.4320+0	2.1609+6	1.1199+6	7.5237+5	2.8837+5	2.9700+2	3.4839+2	9.3738+0	1.4732–1	3.3887+2
1.0000+3	1.0480–5	1.7927+4	9.9450+0	2.1609+6	1.1198+6	7.5237+5	2.8844+5	2.9934+2	4.3450+2	9.4809+0	1.4736–1	4.2487+2
1.5000+3	1.0480–5	1.7926+4	1.0879+1	2.1607+6	1.1195+6	7.5237+5	2.8853+5	3.0377+2	6.5028+2	9.5758+0	1.4741–1	6.4055+2
2.0000+3	1.0483–5	1.7921+4	1.1543+1	2.1601+6	1.1193+6	7.5237+5	2.8810+5	3.0703+2	8.6763+2	9.6706+0	1.4718–1	8.5781+2
3.0000+3	1.0484–5	1.7919+4	1.2478+1	2.1599+6	1.1191+6	7.5237+5	2.8810+5	3.1199+2	1.2989+3	9.8597+0	1.4718–1	1.2889+3
4.0000+3	1.0486–5	1.7915+4	1.3143+1	2.1595+6	1.1189+6	7.5237+5	2.8784+5	3.1564+2	1.7316+3	9.9551+0	1.4705–1	1.7215+3
5.0000+3	1.0494–5	1.7902+4	1.3658+1	2.1579+6	1.1188+6	7.5238+5	2.8637+5	3.1853+2	2.1678+3	1.0016+1	1.4630–1	2.1576+3
6.0000+3	1.0492–5	1.7906+4	1.4079+1	2.1583+6	1.1187+6	7.5238+5	2.8697+5	3.2067+2	2.5968+3	1.0076+1	1.4661–1	2.5866+3
8.0000+3	1.0492–5	1.7906+4	1.4743+1	2.1583+6	1.1185+6	7.5238+5	2.8715+5	3.2409+2	3.4621+3	1.0197+1	1.4670–1	3.4518+3
1.0000+4	1.0492–5	1.7905+4	1.5259+1	2.1583+6	1.1184+6	7.5238+5	2.8723+5	3.2677+2	4.3353+3	1.0314+1	1.4674–1	4.3249+3
1.5000+4	1.0492–5	1.7906+4	1.6196+1	2.1583+6	1.1181+6	7.5238+5	2.8749+5	3.3204+2	6.4737+3	1.0400+1	1.4688–1	6.4631+3
2.0000+4	1.0494–5	1.7903+4	1.6862+1	2.1580+6	1.1179+6	7.5238+5	2.8732+5	3.3584+2	8.6397+3	1.0487+1	1.4679–1	8.6290+3
3.0000+4	1.0493–5	1.7903+4	1.7802+1	2.1580+6	1.1177+6	7.5238+5	2.8758+5	3.4117+2	1.2927+4	1.0661+1	1.4692–1	1.2916+4
4.0000+4	1.0496–5	1.7899+4	1.8469+1	2.1576+6	1.1175+6	7.5238+5	2.8732+5	3.4500+2	1.7261+4	1.0775+1	1.4679–1	1.7250+4
5.0000+4	1.0502–5	1.7888+4	1.8987+1	2.1562+6	1.1174+6	7.5238+5	2.8611+5	3.4795+2	2.1555+4	1.0861+1	1.4617–1	2.1544+4
6.0000+4	1.0500–5	1.7892+4	1.9410+1	2.1566+6	1.1173+6	7.5238+5	2.8663+5	3.5035+2	2.5845+4	1.0917+1	1.4643–1	2.5834+4
8.0000+4	1.0499–5	1.7893+4	2.0077+1	2.1568+6	1.1171+6	7.5238+5	2.8697+5	3.5417+2	3.4501+4	1.1030+1	1.4661–1	3.4489+4
1.0000+5	1.0500–5	1.7892+4	2.0594+1	2.1567+6	1.1170+6	7.5238+5	2.8697+5	3.5714+2	4.3171+4	1.1143+1	1.4661–1	4.3160+4


July 4, 1991
Atomic Weight 74 922
EEDL Evaluated Electron
Cross Sections
33-As
Density 5 730 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
33-As


July 4, 1991
Atomic Weight 74 922
EEDL Evaluated Electron
Energy Deposition
33-As
Density 5 730 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
33-As


July 4, 1991
Atomic Weight 74 922
EEDL Evaluated Electron
Shell Cross Sections
33-As
Density 5 730 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
33-As

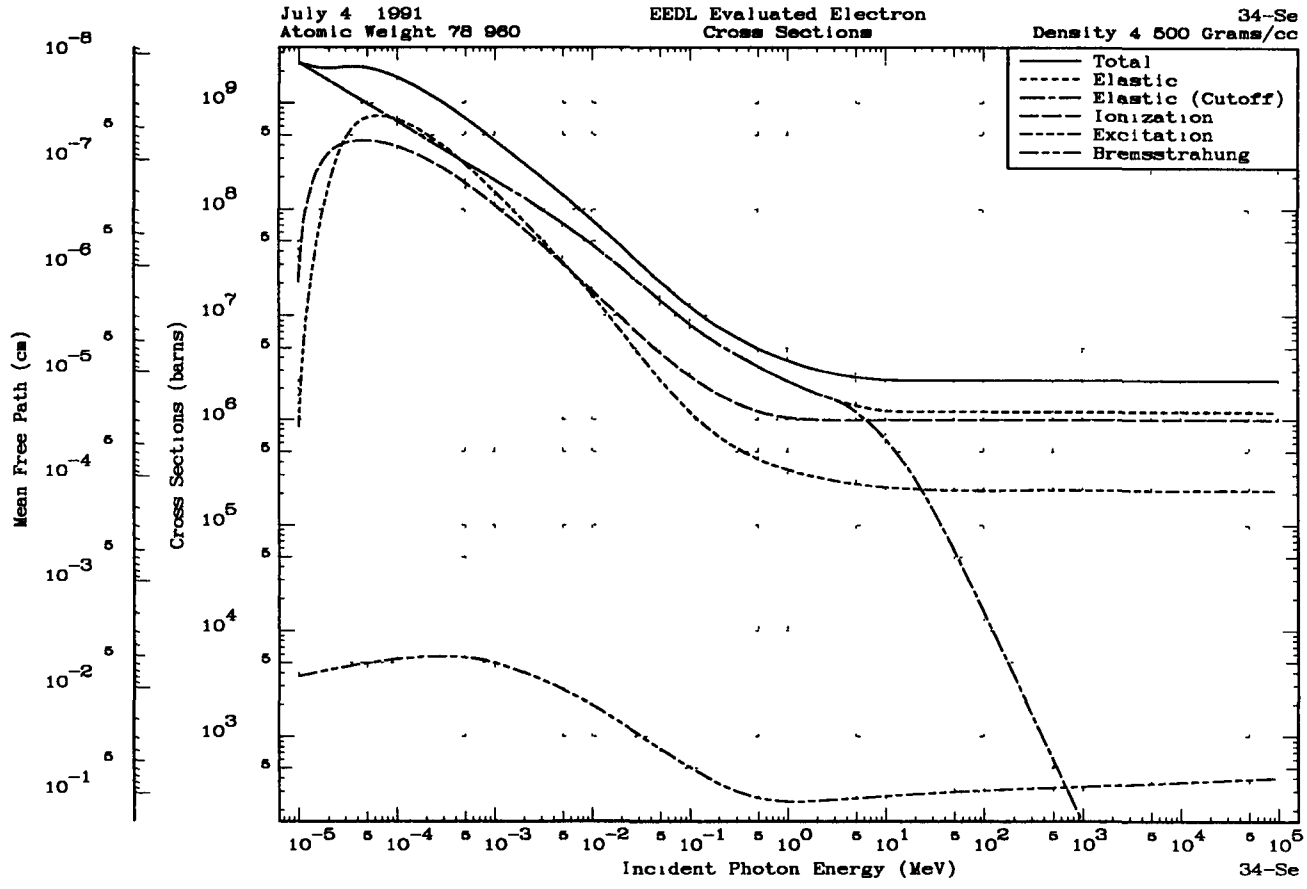

July 4, 1991
Atomic Weight 74 922
EEDL Evaluated Electron
Energy Deposition
33-As
Density 5 730 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
33-As

Atomic Weight 74.922 Density 5.730 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.6622–9	2.0147+7		2.5065+9	2.4085+9	9.4040+7	4.0244+6	3.6438+3	3.7991+1	3.6446+1	1.5449+0	3.6190–4
	1.1250–5	9.0048–9	1.9381+7		2.4112+9	2.2538+9	1.4663+8	1.0742+7	3.7287+3	6.3051+1	5.8794+1	4.2575+0	4.0510–4
	1.2187–5	9.2300–9	1.8908+7		2.3523+9	2.1545+9	1.8030+8	1.7571+7	3.7875+3	8.1151+1	7.4023+1	7.1278+0	4.3797–4
	1.3125–5	9.4156–9	1.8535+7		2.3060+9	2.0663+9	2.1468+8	2.4979+7	3.8428+3	1.0043+2	9.0103+1	1.0325+1	4.7126–4
	1.3594–5	9.5058–9	1.8359+7		2.2841+9	2.0259+9	2.2874+8	2.9504+7	3.8692+3	1.0929+2	9.6981+1	1.2309+1	4.8804–4
	1.5000–5	9.7462–9	1.7906+7		2.2277+9	1.9166+9	2.6836+8	4.2831+7	3.9444+3	1.3544+2	1.1708+2	1.8363+1	5.3890–4
N1	1.7860–5	1.0161–8	1.7176+7		2.1369+9	1.7371+9	3.2356+8	7.6243+7	4.0814+3	1.8209+2	1.4810+2	3.3996+1	6.4470–4
	1.8128–5	1.0194–8	1.7120+7		2.1299+9	1.7226+9	3.2757+8	7.9733+7	4.0932+3	1.8631+2	1.5066+2	3.5650+1	6.5474–4
	1.8596–5	1.0248–8	1.7030+7		2.1187+9	1.6980+9	3.3454+8	8.6093+7	4.1137+3	1.9383+2	1.5515+2	3.8680+1	6.7238–4
	1.9298–5	1.0319–8	1.6912+7		2.1041+9	1.6629+9	3.4486+8	9.6257+7	4.1436+3	2.0544+2	1.6188+2	4.3558+1	6.9898–4
	2.0000–5	1.0379–8	1.6815+7		2.0920+9	1.6298+9	3.5503+8	1.0719+8	4.1727+3	2.1747+2	1.6862+2	4.8853+1	7.2574–4
	2.1250–5	1.0491–8	1.6635+7		2.0696+9	1.5750+9	3.6780+8	1.2678+8	4.2148+3	2.3588+2	1.7770+2	5.8177+1	7.6916–4
	2.2500–5	1.0572–8	1.6507+7		2.0536+9	1.5251+9	3.8000+8	1.4851+8	4.2549+3	2.5522+2	1.8660+2	6.8616+1	8.1291–4
	2.3438–5	1.0632–8	1.6415+7		2.0422+9	1.4904+9	3.8551+8	1.6628+8	4.2838+3	2.6890+2	1.9168+2	7.7216+1	8.4593–4
	2.6250–5	1.0755–8	1.6227+7		2.0187+9	1.3982+9	4.0055+8	2.1994+8	4.3649+3	3.0992+2	2.0623+2	1.0369+2	9.4606–4
	2.6719–5	1.0766–8	1.6211+7		2.0168+9	1.3844+9	4.0268+8	2.2977+8	4.3777+3	3.1695+2	2.0836+2	1.0859+2	9.6290–4
	3.0000–5	1.0820–8	1.6129+7		2.0066+9	1.2969+9	4.1617+8	2.9354+8	4.4625+3	3.6364+2	2.2250+2	1.4114+2	1.0819–3
	3.5000–5	1.0807–8	1.6149+7		2.0091+9	1.1892+9	4.2301+8	3.9684+8	4.5759+3	4.2835+2	2.3569+2	1.9267+2	1.2650–3
	4.0000–5	1.0729–8	1.6266+7		2.0236+9	1.1032+9	4.2872+8	4.9166+8	4.6764+3	4.8937+2	2.4838+2	2.4099+2	1.4518–3
	5.0000–5	1.0614–8	1.6442+7		2.0456+9	9.7319+8	4.2463+8	6.4775+8	4.8240+3	5.8224+2	2.6230+2	3.1993+2	1.8103–3
M5	5.0550–5	1.0617–8	1.6437+7		2.0449+9	9.6722+8	4.2394+8	6.5377+8	4.8308+3	5.8571+2	2.6266+2	3.2305+2	1.8297–3
	5.1141–5	1.0620–8	1.6433+7		2.0445+9	9.6093+8	4.2332+8	6.6021+8	4.8380+3	5.8966+2	2.6328+2	3.2638+2	1.8505–3
M4	5.1320–5	1.0621–8	1.6432+7		2.0443+9	9.5904+8	4.2312+8	6.6217+8	4.8402+3	5.9084+2	2.6344+2	3.2740+2	1.8569–3
	5.1862–5	1.0622–8	1.6430+7		2.0440+9	9.5339+8	4.2261+8	6.6801+8	4.8467+3	5.9456+2	2.6412+2	3.3044+2	1.8761–3
	5.2248–5	1.0623–8	1.6428+7		2.0439+9	9.4943+8	4.2226+8	6.7216+8	4.8513+3	5.9725+2	2.6465+2	3.3260+2	1.8897–3
	5.2880–5	1.0624–8	1.6427+7		2.0437+9	9.4304+8	4.2168+8	6.7894+8	4.8588+3	6.0158+2	2.6544+2	3.3614+2	1.9121–3
	5.4186–5	1.0624–8	1.6427+7		2.0437+9	9.3020+8	4.2053+8	6.9292+8	4.8740+3	6.1060+2	2.6716+2	3.4344+2	1.9585–3
	5.4660–5	1.0624–8	1.6428+7		2.0438+9	9.2565+8	4.2011+8	6.9798+8	4.8794+3	6.1387+2	2.6778+2	3.4609+2	1.9753–3
	5.7093–5	1.0616–8	1.6439+7		2.0452+9	9.0327+8	4.1807+8	7.2385+8	4.9067+3	6.3063+2	2.7098+2	3.5965+2	2.0621–3
	5.7330–5	1.0615–8	1.6441+7		2.0454+9	9.0117+8	4.1788+8	7.2636+8	4.9093+3	6.3226+2	2.7129+2	3.6097+2	2.0706–3
	6.0000–5	1.0598–8	1.6468+7		2.0487+9	8.7841+8	4.1579+8	7.5452+8	4.9380+3	6.5063+2	2.7482+2	3.7581+2	2.1663–3
	6.5000–5	1.0687–8	1.6331+7		2.0317+9	8.3982+8	4.0884+8	7.8306+8	4.9889+3	6.6870+2	2.7803+2	3.9066+2	2.3469–3
	7.0000–5	1.0757–8	1.6224+7		2.0185+9	8.0560+8	4.0244+8	8.1044+8	5.0365+3	6.8610+2	2.8112+2	4.0498+2	2.5291–3
	8.0000–5	1.0942–8	1.5949+7		1.9843+9	7.4743+8	3.9187+8	8.4497+8	5.1234+3	7.1296+2	2.8935+2	4.2361+2	2.8977–3
	9.0000–5	1.1291–8	1.5457+7		1.9230+9	6.9981+8	3.7844+8	8.4472+8	5.1869+3	7.1777+2	2.9260+2	4.2516+2	3.2560–3
	1.0000–4	1.1601–8	1.5044+7	0.0000+0	1.8716+9	6.5979+8	3.6730+8	8.4450+8	5.2443+3	7.2434+2	2.9761+2	4.2672+2	3.6180–3
	1.2500–4	1.2598–8	1.3853+7	3.4875–8	1.7234+9	5.8244+8	3.3770+8	8.0330+8	5.3412+3	7.0942+2	3.0153+2	4.0788+2	4.5003–3
M3	1.4378–4	1.3442–8	1.2983+7	6.1697–8	1.6153+9	5.3861+8	3.2022+8	7.5642+8	5.4029+3	6.9098+2	3.0551+2	3.8546+2	5.1720–3
	1.4689–4	1.3576–8	1.2855+7	6.6206–8	1.5993+9	5.3221+8	3.1764+8	7.4945+8	5.4124+3	6.8860+2	3.0646+2	3.8213+2	5.2838–3
M2	1.4895–4	1.3664–8	1.2772+7	6.9201–8	1.5890+9	5.2808+8	3.1598+8	7.4496+8	5.4186+3	6.8711+2	3.0713+2	3.7998+2	5.3581–3
	1.5000–4	1.3708–8	1.2731+7	7.0730–8	1.5839+9	5.2601+8	3.1516+8	7.4268+8	5.4218+3	6.8641+2	3.0752+2	3.7889+2	5.3959–3
	1.5313–4	1.3844–8	1.2606+7	7.5293–8	1.5684+9	5.1999+8	3.1214+8	7.3623+8	5.4287+3	6.8316+2	3.0741+2	3.7574+2	5.5064–3
	1.5625–4	1.3978–8	1.2486+7	7.9878–8	1.5533+9	5.1415+8	3.0923+8	7.2997+8	5.4355+3	6.8010+2	3.0740+2	3.7269+2	5.6169–3
	1.5898–4	1.4093–8	1.2383+7	8.3905–8	1.5406+9	5.0919+8	3.0676+8	7.2463+8	5.4413+3	6.7753+2	3.0744+2	3.7009+2	5.7138–3
	1.6719–4	1.4434–8	1.2091+7	9.6077–8	1.5042+9	4.9507+8	2.9977+8	7.0937+8	5.4584+3	6.7054+2	3.0787+2	3.6266+2	6.0049–3
	1.6924–4	1.4518–8	1.2021+7	9.9138–8	1.4955+9	4.9171+8	2.9811+8	7.0572+8	5.4625+3	6.6894+2	3.0804+2	3.6089+2	6.0778–3
	1.7500–4	1.4750–8	1.1832+7	1.0778–7	1.4720+9	4.8259+8	2.9363+8	6.9580+8	5.4739+3	6.6469+2	3.0862+2	3.5607+2	6.2829–3
	1.8359–4	1.5090–8	1.1566+7	1.2077–7	1.4389+9	4.6983+8	2.8722+8	6.8183+8	5.4901+3	6.5850+2	3.0921+2	3.4929+2	6.5896–3
	1.8462–4	1.5129–8	1.1535+7	1.2233–7	1.4351+9	4.6838+8	2.8648+8	6.8022+8	5.4920+3	6.5781+2	3.0929+2	3.4851+2	6.6263–3
	2.0000–4	1.5830–8	1.1025+7	1.4597–7	1.3716+9	4.4789+8	2.7624+8	6.4744+8	5.5194+3	6.4347+2	3.1112+2	3.3234+2	7.1774–3
M1	2.0202–4	1.5922–8	1.0961+7	1.4911–7	1.3637+9	4.4538+8	2.7479+8	6.4347+8	5.5199+3	6.4120+2	3.1083+2	3.3036+2	7.2460–3
	2.0508–4	1.6067–8	1.0862+7	1.5390–7	1.3514+9	4.4166+8	2.7258+8	6.3712+8	5.5206+3	6.3757+2	3.1038+2	3.2718+2	7.3500–3
	2.1101–4	1.6345–8	1.0678+7	1.6325–7	1.3284+9	4.3470+8	2.6845+8	6.2525+8	5.5219+3	6.3088+2	3.0963+2	3.2124+2	7.5514–3
	2.2214–4	1.6856–8	1.0353+7	1.8105–7	1.2881+9	4.2242+8	2.6121+8	6.0443+8	5.5244+3	6.1947+2	3.0864+2	3.1083+2	7.9293–3
	2.2500–4	1.6986–8	1.0274+7	1.8568–7	1.2782+9	4.1942+8	2.5945+8	5.9934+8	5.5250+3	6.1675+2	3.0846+2	3.0829+2	8.0266–3
	2.4160–4	1.7726–8	9.8453+6	2.1292–7	1.2249+9	4.0310+8	2.4990+8	5.7185+8	5.5284+3	6.0233+2	3.0777+2	2.9455+2	8.5910–3
	2.5000–4	1.8092–8	9.6463+6	2.2693–7	1.2001+9	3.9549+8	2.4549+8	5.5912+8	5.5301+3	5.9594+2	3.0774+2	2.8819+2	8.8766–3
	2.6250–4	1.8630–8	9.3677+6	2.4808–7	1.1654+9	3.8488+8	2.3914+8	5.4141+8	5.5324+3	5.8609+2	3.0673+2	2.7935+2	9.3019–3
	2.7080–4	1.8981–8	9.1943+6	2.6232–7	1.1439+9	3.7826+8	2.3519+8	5.3041+8	5.5339+3	5.8006+2	3.0619+2	2.7386+2	9.5843–3
	3.0000–4	2.0290–8	8.6015+6	3.1359–7	1.0701+9	3.5727+8	2.2275+8	4.9009+8	5.5388+3	5.5899+2	3.0533+2	2.5365+2	1.0579–2
	3.5000–4	2.2481–8	7.7630+6	4.0605–7	9.6580+8	3.2801+8	2.0301+8	4.3478+8	5.5322+3	5.2300+2	2.9735+2	2.2563+2	1.2252–2
	4.0000–4	2.4560–8	7.1059+6	5.0416–7	8.8405+8	3.0460+8	1.8750+8	3.9194+8	5.5265+3	4.9649+2	2.9252+2	2.0395+2	1.3924–2
	4.5000–4	2.6745–8	6.5254+6	6.0782–7	8.1183+8	2.8536+8	1.7386+8	3.5261+8	5.4600+3	4.6850+2	2.8464+2	1.8385+2	1.5423–2
	5.0000–4	2.8851–8	6.0489+6	7.1713–7	7.5255+8	2.6918+8	1.6258+8	3.2078+8	5.4013+3	4.4649+2	2.7888+2	1.6759+2	1.6905–2
	6.0000–4	3.2870–8	5.3094+6	9.5109–7	6.6055+8	2.4332+8	1.4393+8	2.7329+8	5.3011+3	4.0893+2	2.6568+2	1.4322+2	1.9826–2
	7.0000–4	3.6924–8	4.7264+6	1.2060–6	5.8801+8	2.2345+8	1.2924+8	2.3532+8	5.1606+3	3.7598+2	2.5233+2	1.2363+2	2.2260–2
	8.0000–4	4.0806–8	4.2768+6	1.4811–6	5.3208+8	2.0755+8	1.1779+8	2.0673+8	5.0419+3	3.5144+2	2.4255+2	1.0887+2	2.4640–2
	1.0000–3	4.8225–8	3.6189+6	2.0857–6	4.5022+8	1.8356+8	1.0018+8	1.6648+8	4.7904+3	3.1102+2	2.2301+2	8.7983+1	2.8580–2
L3	1.3283–3	5.9604–8	2.9280+6	3.2290–6	3.6428+8	1.5689+8	8.0953+7	1.2643+8	4.4000+3	2.6452+2	1.9738+2	6.7105+1	3.3064–2
L2	1.3657–3	6.0840–8	2.8685+6	3.3715–6	3.5687+8	1.5449+8	7.9248+7	1.2313+8	4.3626+3	2.6031+2	1.9489+2	6.5379+1	3.3531–2
	1.4141–3	6.2426–8	2.7956+6	3.5595–6	3.4780+8	1.5153+8	7.7161+7	1.1911+8	4.3160+3	2.5522+2	1.9190+2	6.3281+1	3.4132–2
	1.4329–3	6.3034–8	2.7687+6	3.6330–6	3.4445+8	1.5043+8	7.6389+7	1.1763+8	4.2986+3	2.5334+2	1.9080+2	6.2508+1	3.4363–2
	1.5000–3	6.5196–8	2.6769+6	3.9015–6	3.3303+8	1.4666+8	7.3760+7	1.1261+8	4.2384+3	2.4700+2	1.8707+2	5.9889+1	3.5187–2
L1	1.5192–3	6.5811–8	2.6518+6	3.9795–6	3.2992+8	1.4563+8	7.3031+7	1.1126+8	4.2218+3	2.4508+2	1.8587+2	5.9179+1	3.5421–2
	1.5793–3	6.7725–8	2.5769+6	4.2276–6	3.2059+8	1.4246+8	7.0842+7	1.0729+8	4.1683+3	2.3941+2	1.8228+2	5.7100+1	3.6074–2
	1.6250–3	6.9166–8	2.5232+6	4.4201–6	3.1392+8	1.4017+8	6.9275+7	1.0447+8	4.1294+3	2.3539+2	1.7974+2	5.5619+1	3.6567–2
	1.6845–3	7.1022–8	2.4573+6	4.6755–6	3.0571+8	1.3734+8	6.7352+7	1.0101+8	4.0809+3	2.3045+2	1.7661+2	5.3809+1	3.7204–2
	1.7187–3	7.2083–8	2.4211+6	4.8251–6	3.0121+8	1.3578+8	6.6297+7	9.9130+7	4.0539+3	2.2776+2	1.7490+2	5.2820+1	3.7569–2
	1.8422–3	7.5854–8	2.3007+6	5.3782–6	2.8623+8	1.3054+8	6.2793+7	9.2902+7	3.9625+3	2.1883+2	1.6924+2	4.9555+1	3.8873–2
	1.8594–3	7.6371–8	2.2851+6	5.4567–6	2.8430+8	1.2985+8	6.2340+7	9.2101+7	3.9504+3	2.1769+2	1.6851+2	4.9135+1	3.9053–2

Atomic Weight 74.922 Density 5.730 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000–3	8.0561–8	2.1663+6	6.1160–6	2.6951+8	1.2459+8	5.8888+7	8.6031+7	3.8569+3	2.0898+2	1.6299+2	4.5953+1	4.0512–2
2.2500–3	8.8047–8	1.9821+6	7.3578–6	2.4660+8	1.1609+8	5.3538+7	7.6964+7	3.6900+3	1.9385+2	1.5263+2	4.1172+1	4.2573–2
2.4375–3	9.3508–8	1.8664+6	8.3493–6	2.3220+8	1.1065+8	5.0186+7	7.1354+7	3.5808+3	1.8441+2	1.4615+2	3.8215+1	4.4088–2
2.6250–3	9.8852–8	1.7655+6	9.3893–6	2.1964+8	1.0584+8	4.7272+7	6.6525+7	3.4825+3	1.7625+2	1.4053+2	3.5669+1	4.5578–2
2.7187–3	1.0148–7	1.7197+6	9.9268–6	2.1395+8	1.0364+8	4.5952+7	6.4354+7	3.4369+3	1.7257+2	1.3800+2	3.4525+1	4.6313–2
3.0000–3	1.0923–7	1.5978+6	1.1604–5	1.9878+8	9.7697+7	4.2447+7	5.8634+7	3.3122+3	1.6283+2	1.3127+2	3.1510+1	4.8484–2
3.5000–3	1.2272–7	1.4221+6	1.4833–5	1.7692+8	8.8863+7	3.7366+7	5.0686+7	3.1057+3	1.4721+2	1.1986+2	2.7299+1	5.1550–2
4.0000–3	1.3570–7	1.2861+6	1.8375–5	1.6000+8	8.1859+7	3.3462+7	4.4677+7	2.9372+3	1.3525+2	1.1108+2	2.4117+1	5.4513–2
5.0000–3	1.6066–7	1.0863+6	2.6327–5	1.3515+8	7.1074+7	2.7753+7	3.6315+7	2.6564+3	1.1670+2	9.6968+1	1.9669+1	5.9260–2
6.0000–3	1.8446–7	9.4611+5	3.5433–5	1.1771+8	6.3193+7	2.3785+7	3.0725+7	2.4361+3	1.0321+2	8.6464+1	1.6687+1	6.3145–2
7.0000–3	2.0767–7	8.4038+5	4.5650–5	1.0455+8	5.7069+7	2.0854+7	2.6626+7	2.2552+3	9.2728+1	7.8168+1	1.4493+1	6.6255–2
8.0000–3	2.3005–7	7.5861+5	5.6930–5	9.4378+7	5.2246+7	1.8611+7	2.3520+7	2.1095+3	8.4703+1	7.1804+1	1.2831+1	6.9266–2
1.0000–2	2.7444–7	6.3591+5	8.2446–5	7.9114+7	4.4721+7	1.5368+7	1.9023+7	1.8748+3	7.2381+1	6.1894+1	1.0414+1	7.3851–2
K 1.1829–2	3.1379–7	5.5616+5	1.0926–4	6.9192+7	3.9645+7	1.3300+7	1.6245+7	1.7120+3	6.4199+1	5.5207+1	8.9148+0	7.7013–2
1.2027–2	3.1802–7	5.4877+5	1.1237–4	6.8273+7	3.9166+7	1.3111+7	1.5993+7	1.6960+3	6.3432+1	5.4576+1	8.7786+0	7.7292–2
1.2399–2	3.2591–7	5.3549+5	1.1829–4	6.6620+7	3.8305+7	1.2773+7	1.5541+7	1.6671+3	6.2058+1	5.3445+1	8.5345+0	7.7817–2
1.3049–2	3.3960–7	5.1390+5	1.2896–4	6.3934+7	3.6899+7	1.2223+7	1.4811+7	1.6196+3	5.9827+1	5.1609+1	8.1398+0	7.8732–2
1.4024–2	3.5987–7	4.8495+5	1.4569–4	6.0332+7	3.5004+7	1.1488+7	1.3838+7	1.5550+3	5.6846+1	4.9151+1	7.6146+0	8.0098–2
1.5000–2	3.7986–7	4.5943+5	1.6325–4	5.7158+7	3.3325+7	1.0843+7	1.2989+7	1.4970+3	5.4228+1	4.6991+1	7.1560+0	8.1453–2
1.6250–2	4.0549–7	4.3040+5	1.8698–4	5.3546+7	3.1388+7	1.0123+7	1.2033+7	1.4277+3	5.1160+1	4.4441+1	6.6368+0	8.2634–2
1.8125–2	4.4322–7	3.9375+5	2.2509–4	4.8987+7	2.8927+7	9.2178+6	1.0841+7	1.3382+3	4.7300+1	4.1226+1	5.9897+0	8.4421–2
2.0000–2	4.8020–7	3.6343+5	2.6612–4	4.5215+7	2.6874+7	8.4716+6	9.8681+6	1.2623+3	4.4119+1	3.8571+1	5.4615+0	8.6208–2
2.2500–2	5.2975–7	3.2944+5	3.2529–4	4.0986+7	2.4578+7	7.6672+6	8.7397+6	1.1743+3	4.0443+1	3.5511+1	4.8447+0	8.7600–2
2.6250–2	6.0225–7	2.8978+5	4.2330–4	3.6052+7	2.1867+7	6.7289+6	7.4554+6	1.0683+3	3.6160+1	3.1928+1	4.1426+0	8.9795–2
3.0000–2	6.7286–7	2.5937+5	5.3201–4	3.2268+7	1.9761+7	6.0098+6	6.4965+6	9.8418+2	3.2881+1	2.9171+1	3.6184+0	9.2037–2
4.0000–2	8.5692–7	2.0366+5	8.6869–4	2.5338+7	1.5870+7	4.7357+6	4.7311+6	8.2188+2	2.6735+1	2.3993+1	2.6468+0	9.5756–2
5.0000–2	1.0318–6	1.6914+5	1.2728–3	2.1042+7	1.3387+7	3.9551+6	3.6997+6	7.1711+2	2.2857+1	2.0681+1	2.0767+0	9.8567–2
6.0000–2	1.1993–6	1.4552+5	1.7382–3	1.8104+7	1.1650+7	3.4272+6	3.0264+6	6.4141+2	2.0174+1	1.8370+1	1.7034+0	1.0084–1
8.0000–2	1.5126–6	1.1538+5	2.8261–3	1.4354+7	9.3905+6	2.7583+6	2.2046+6	5.3872+2	1.6703+1	1.5353+1	1.2460+0	1.0446–1
1.0000–1	1.8004–6	9.6936+4	4.1085–3	1.2060+7	7.9828+6	2.3522+6	1.7245+6	4.7272+2	1.4537+1	1.3452+1	9.7766–1	1.0753–1
1.5000–1	2.3910–6	7.2991+4	7.9484–3	9.0809+6	6.0983+6	1.8059+6	1.1763+6	3.7946+2	1.1614+1	1.0829+1	6.7059–1	1.1457–1
2.0000–1	2.8564–6	6.1098+4	1.2551–2	7.6013+6	5.1373+6	1.5323+6	9.3133+5	3.3093+2	1.0144+1	9.4897+0	5.3293–1	1.2164–1
3.0000–1	3.5783–6	4.8772+4	2.3186–2	6.0677+6	4.1069+6	1.2619+6	6.9863+5	2.8245+2	8.6997+0	8.1605+0	4.0189–1	1.3733–1
4.0000–1	4.1403–6	4.2152+4	3.5144–2	5.2441+6	3.5238+6	1.1309+6	5.8920+5	2.5923+2	8.0336+0	7.5383+0	3.4020–1	1.5504–1
5.0000–1	4.6020–6	3.7923+4	4.7871–2	4.7180+6	3.1408+6	1.0554+6	5.2151+5	2.4607+2	7.6844+0	7.2085+0	3.0199–1	1.7394–1
6.0000–1	4.9819–6	3.5031+4	6.1057–2	4.3582+6	2.8707+6	1.0074+6	4.7981+5	2.3847+2	7.4834+0	7.0101+0	2.7850–1	1.9478–1
8.0000–1	5.6016–6	3.1155+4	8.8073–2	3.8760+6	2.5026+6	9.5163+5	4.2154+5	2.3104+2	7.3231+0	6.8377+0	2.4560–1	2.3974–1
1.0000+0	6.0786–6	2.8710+4	1.1544–1	3.5719+6	2.2621+6	9.2185+5	3.8766+5	2.2810+2	7.2932+0	6.7787+0	2.2653–1	2.8805–1
1.5000+0	6.9193–6	2.5222+4	1.8319–1	3.1379+6	1.9108+6	8.9066+5	3.3619+5	2.2817+2	7.4671+0	6.8482+0	1.9748–1	4.2149–1
2.0000+0	7.4759–6	2.3344+4	2.4919–1	2.9043+6	1.7142+6	8.7936+5	3.1051+5	2.3112+2	7.6859+0	6.9367+0	1.8288–1	5.6636–1
3.0000+0	8.1755–6	2.1347+4	3.7515–1	2.6557+6	1.5017+6	8.6913+5	2.8471+5	2.3763+2	8.1972+0	7.1453+0	1.6862–1	8.8329–1
4.0000+0	8.5992–6	2.0295+4	4.9351–1	2.5249+6	1.3859+6	8.6859+5	2.7012+5	2.4221+2	8.7057+0	7.3200+0	1.6021–1	1.2255+0
5.0000+0	8.8696–6	1.9676+4	6.0519–1	2.4479+6	1.3152+6	8.6821+5	2.6428+5	2.4583+2	9.2072+0	7.4765+0	1.5697–1	1.5737+0
6.0000+0	9.0579–6	1.9267+4	7.1097–1	2.3970+6	1.2694+6	8.6786+5	2.5952+5	2.4896+2	9.7048+0	7.6076+0	1.5437–1	1.9428+0
8.0000+0	9.3106–6	1.8744+4	9.0769–1	2.3320+6	1.2124+6	8.6725+5	2.5204+5	2.5398+2	1.0643+1	7.7984+0	1.5035–1	2.6940+0
1.0000+1	9.4423–6	1.8483+4	1.0878+0	2.2994+6	1.1819+6	8.6801+5	2.4925+5	2.5795+2	1.1578+1	7.9616+0	1.4912–1	3.4671+0
1.5000+1	9.5347–6	1.8304+4	1.4830+0	2.2772+6	1.1605+6	8.6894+5	2.4748+5	2.6530+2	1.3792+1	8.1797+0	1.4811–1	5.4639+0
2.0000+1	9.5453–6	1.8283+4	1.8188+0	2.2746+6	1.1584+6	8.6962+5	2.4634+5	2.6904+2	1.6049+1	8.3641+0	1.4747–1	7.5371+0
3.0000+1	9.5320–6	1.8309+4	2.3681+0	2.2778+6	1.1581+6	8.7018+5	2.4923+5	2.7443+2	2.0546+1	8.6023+0	1.4928–1	1.1794+1
4.0000+1	9.5228–6	1.8327+4	2.8081+0	2.2800+6	1.1579+6	8.7055+5	2.5126+5	2.7833+2	2.5051+1	8.7466+0	1.5058–1	1.6154+1
5.0000+1	9.5162–6	1.8339+4	3.1748+0	2.2816+6	1.1578+6	8.7072+5	2.5281+5	2.8172+2	2.9620+1	8.8558+0	1.5160–1	2.0612+1
6.0000+1	9.5111–6	1.8349+4	3.4888+0	2.2828+6	1.1576+6	8.7082+5	2.5406+5	2.8389+2	3.4183+1	8.9365+0	1.5244–1	2.5094+1
8.0000+1	9.5055–6	1.8360+4	4.0066+0	2.2841+6	1.1574+6	8.7098+5	2.5543+5	2.8774+2	4.3440+1	9.0871+0	1.5344–1	3.4199+1
1.0000+2	9.5037–6	1.8363+4	4.4234+0	2.2846+6	1.1573+6	8.7109+5	2.5592+5	2.9108+2	5.2836+1	9.2204+0	1.5390–1	4.3462+1
1.5000+2	9.4987–6	1.8373+4	5.2062+0	2.2858+6	1.1570+6	8.7114+5	2.5735+5	2.9724+2	7.6354+1	9.3435+0	1.5476–1	6.6855+1
2.0000+2	9.4951–6	1.8380+4	5.7765+0	2.2867+6	1.1568+6	8.7118+5	2.5835+5	3.0125+2	1.0005+2	9.4603+0	1.5537–1	9.0433+1
3.0000+2	9.4950–6	1.8380+4	6.5952+0	2.2867+6	1.1565+6	8.7123+5	2.5862+5	3.0522+2	1.4729+2	9.6659+0	1.5554–1	1.3747+2
4.0000+2	9.4930–6	1.8384+4	7.1837+0	2.2872+6	1.1563+6	8.7124+5	2.5931+5	3.0767+2	1.9476+2	9.7818+0	1.5595–1	1.8482+2
5.0000+2	9.4974–6	1.8376+4	7.6429+0	2.2861+6	1.1562+6	8.7125+5	2.5838+5	3.0951+2	2.4247+2	9.8534+0	1.5540–1	2.3246+2
6.0000+2	9.4954–6	1.8380+4	8.0198+0	2.2866+6	1.1560+6	8.7125+5	2.5899+5	3.1128+2	2.8967+2	9.9246+0	1.5577–1	2.7959+2
8.0000+2	9.4965–6	1.8377+4	8.6171+0	2.2863+6	1.1559+6	8.7125+5	2.5890+5	3.1424+2	3.8438+2	1.0058+1	1.5572–1	3.7416+2
1.0000+3	9.4985–6	1.8373+4	9.0821+0	2.2859+6	1.1557+6	8.7126+5	2.5858+5	3.1673+2	4.7943+2	1.0174+1	1.5554–1	4.6911+2
1.5000+3	9.5009–6	1.8369+4	9.9287+0	2.2853+6	1.1554+6	8.7126+5	2.5827+5	3.2145+2	7.1765+2	1.0276+1	1.5535–1	7.0722+2
2.0000+3	9.5043–6	1.8362+4	1.0530+1	2.2845+6	1.1552+6	8.7126+5	2.5766+5	3.2492+2	9.5761+2	1.0378+1	1.5498–1	9.4708+2
3.0000+3	9.5057–6	1.8359+4	1.1377+1	2.2841+6	1.1549+6	8.7126+5	2.5758+5	3.3021+2	1.4337+3	1.0582+1	1.5494–1	1.4230+3
4.0000+3	9.5078–6	1.8355+4	1.1979+1	2.2836+6	1.1547+6	8.7126+5	2.5728+5	3.3409+2	1.9114+3	1.0684+1	1.5475–1	1.9006+3
5.0000+3	9.5142–6	1.8343+4	1.2446+1	2.2821+6	1.1546+6	8.7126+5	2.5590+5	3.3715+2	2.3930+3	1.0749+1	1.5392–1	2.3821+3
6.0000+3	9.5128–6	1.8346+4	1.2827+1	2.2824+6	1.1545+6	8.7126+5	2.5636+5	3.3942+2	2.8666+3	1.0814+1	1.5420–1	2.8557+3
8.0000+3	9.5123–6	1.8347+4	1.3429+1	2.2825+6	1.1543+6	8.7126+5	2.5666+5	3.4304+2	3.8220+3	1.0944+1	1.5438–1	3.8109+3
1.0000+4	9.5129–6	1.8346+4	1.3896+1	2.2824+6	1.1541+6	8.7126+5	2.5666+5	3.4587+2	4.7860+3	1.1070+1	1.5438–1	4.7748+3
1.5000+4	9.5131–6	1.8345+4	1.4745+1	2.2823+6	1.1538+6	8.7126+5	2.5689+5	3.5146+2	7.1466+3	1.1163+1	1.5452–1	7.1353+3
2.0000+4	9.5149–6	1.8342+4	1.5349+1	2.2819+6	1.1536+6	8.7126+5	2.5666+5	3.5547+2	9.5377+3	1.1256+1	1.5438–1	9.5263+3
3.0000+4	9.5144–6	1.8343+4	1.6200+1	2.2820+6	1.1533+6	8.7126+5	2.5704+5	3.6112+2	1.4271+4	1.1443+1	1.5461–1	1.4260+4
4.0000+4	9.5162–6	1.8339+4	1.6805+1	2.2816+6	1.1531+6	8.7126+5	2.5682+5	3.6517+2	1.9056+4	1.1567+1	1.5448–1	1.9044+4
5.0000+4	9.5223–6	1.8328+4	1.7273+1	2.2801+6	1.1530+6	8.7126+5	2.5551+5	3.6829+2	2.3796+4	1.1659+1	1.5369–1	2.3784+4
6.0000+4	9.5206–6	1.8331+4	1.7656+1	2.2806+6	1.1529+6	8.7126+5	2.5605+5	3.7083+2	2.8533+4	1.1719+1	1.5402–1	2.8521+4
8.0000+4	9.5198–6	1.8332+4	1.8261+1	2.2807+6	1.1527+6	8.7126+5	2.5643+5	3.7488+2	3.8088+4	1.1841+1	1.5425–1	3.8076+4
1.0000+5	9.5204–6	1.8331+4	1.8729+1	2.2806+6	1.1525+6	8.7126+5	2.5643+5	3.7802+2	4.7660+4	1.1962+1	1.5425–1	4.7648+4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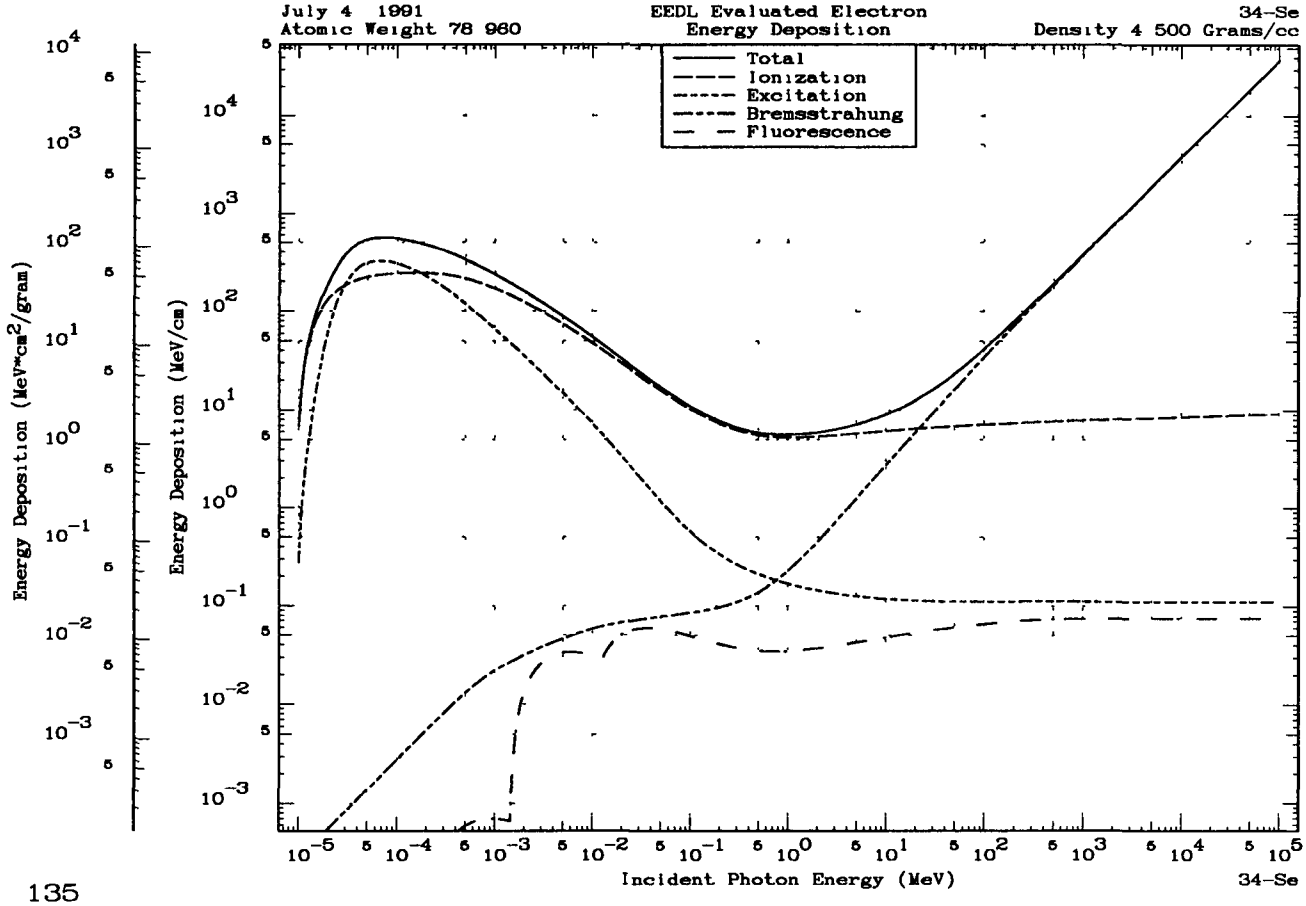
EEDL Evaluated Electron
Cross Sections
34-Se
Density 4 500 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
34-Se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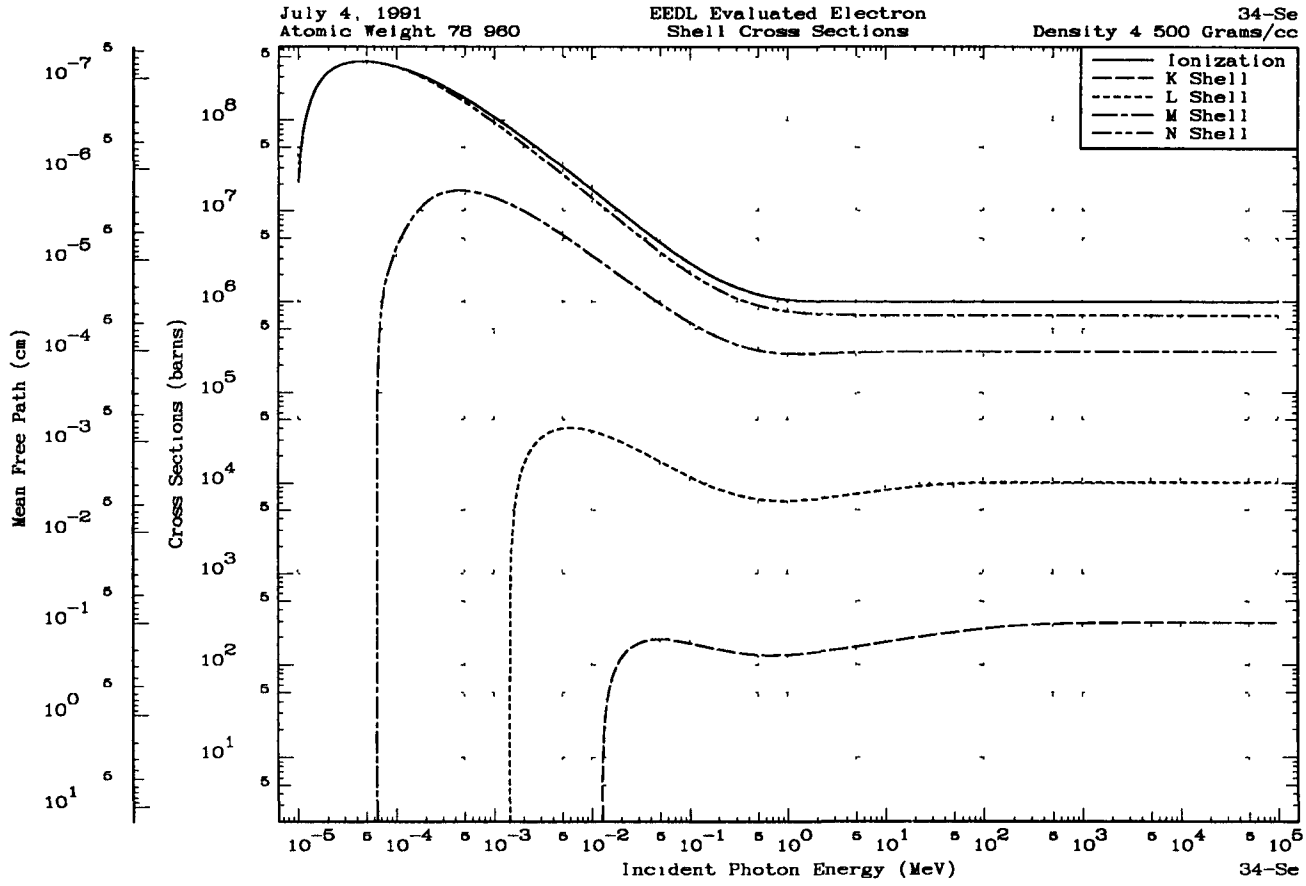
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
34-Se

135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EEDL Evaluated Electron
Shell Cross Sections
34-Se
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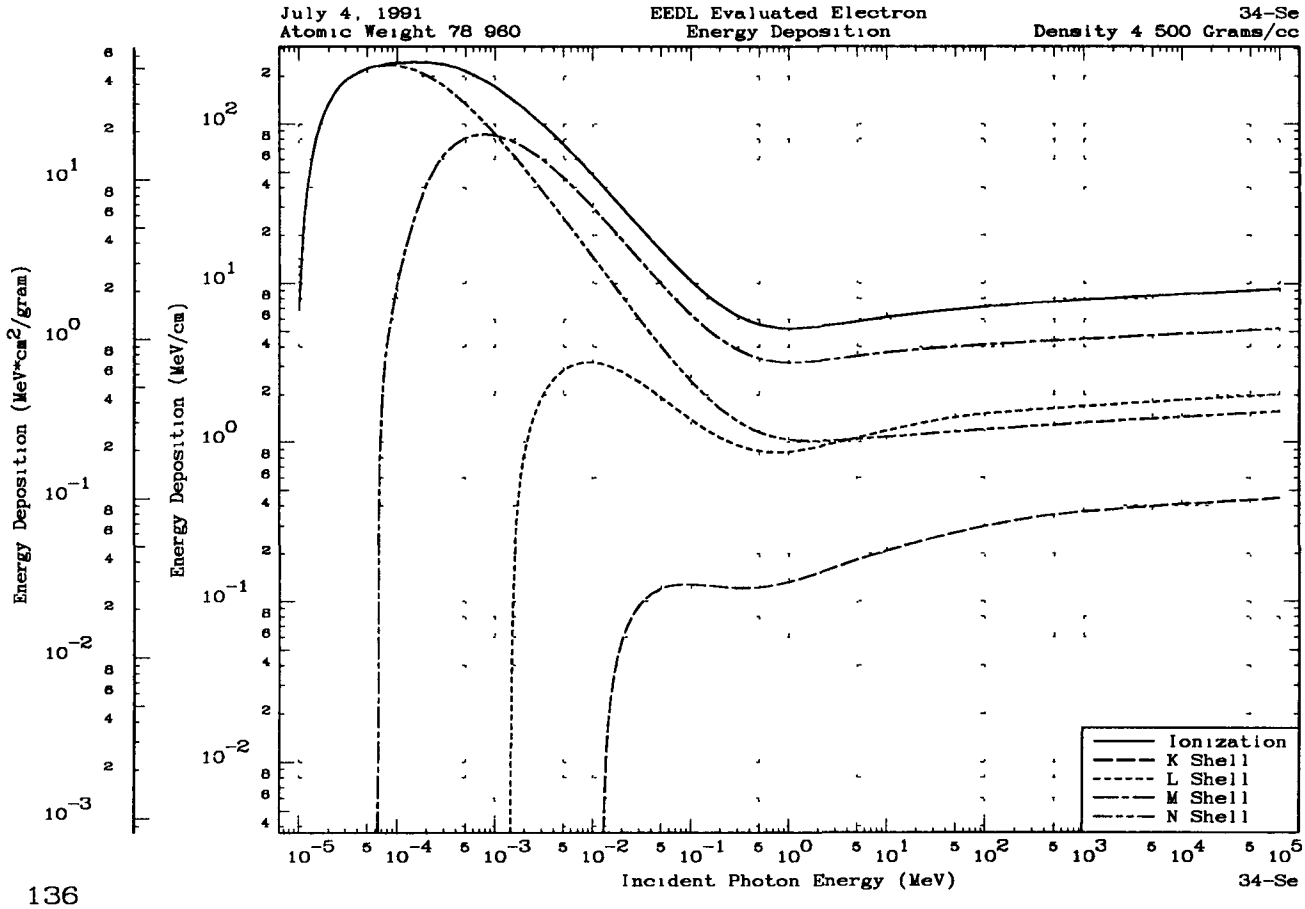
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
34-Se

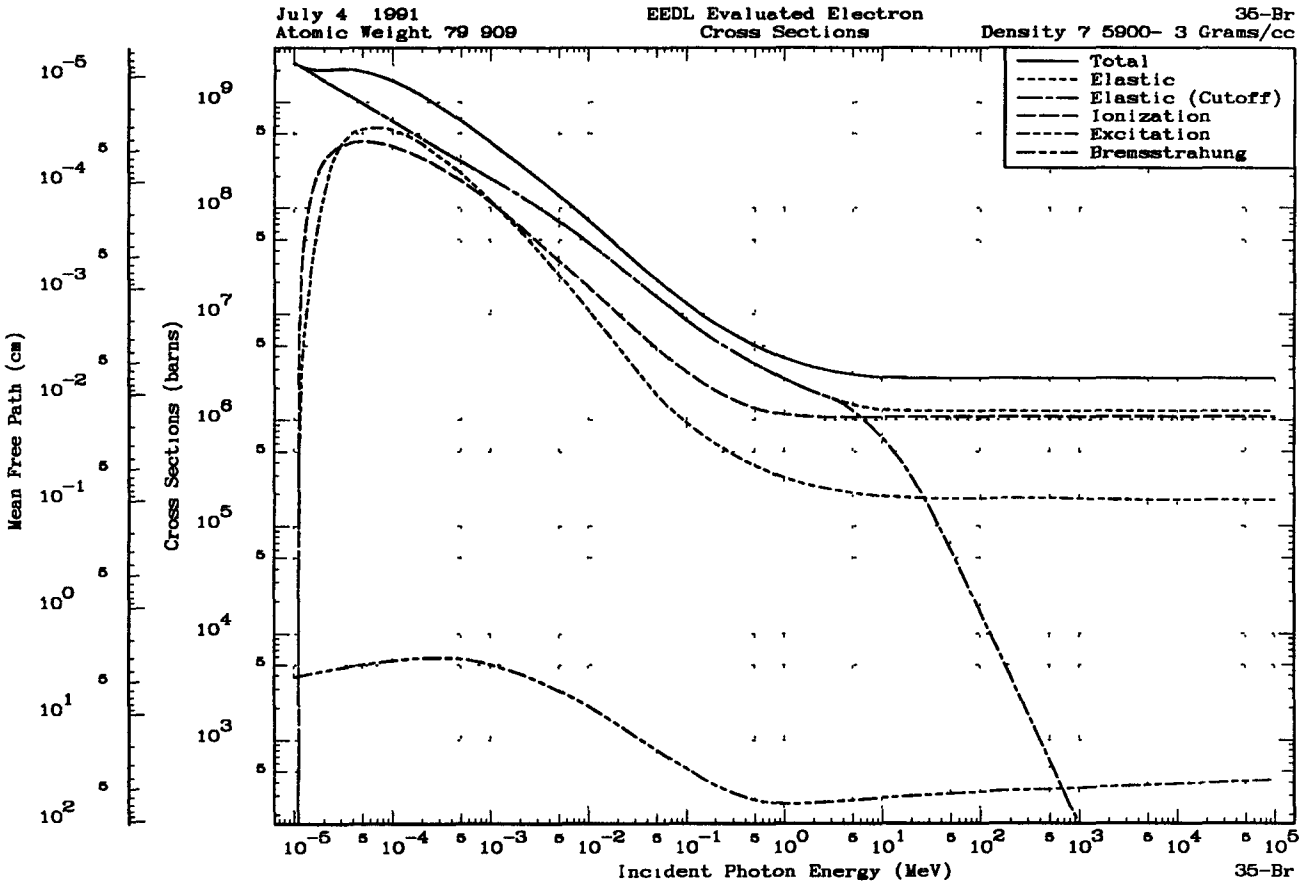

July 4, 1991
Atomic Weight 78 960
EEDL Evaluated Electron
Energy Deposition
34-Se
Density 4 500 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
34-Se

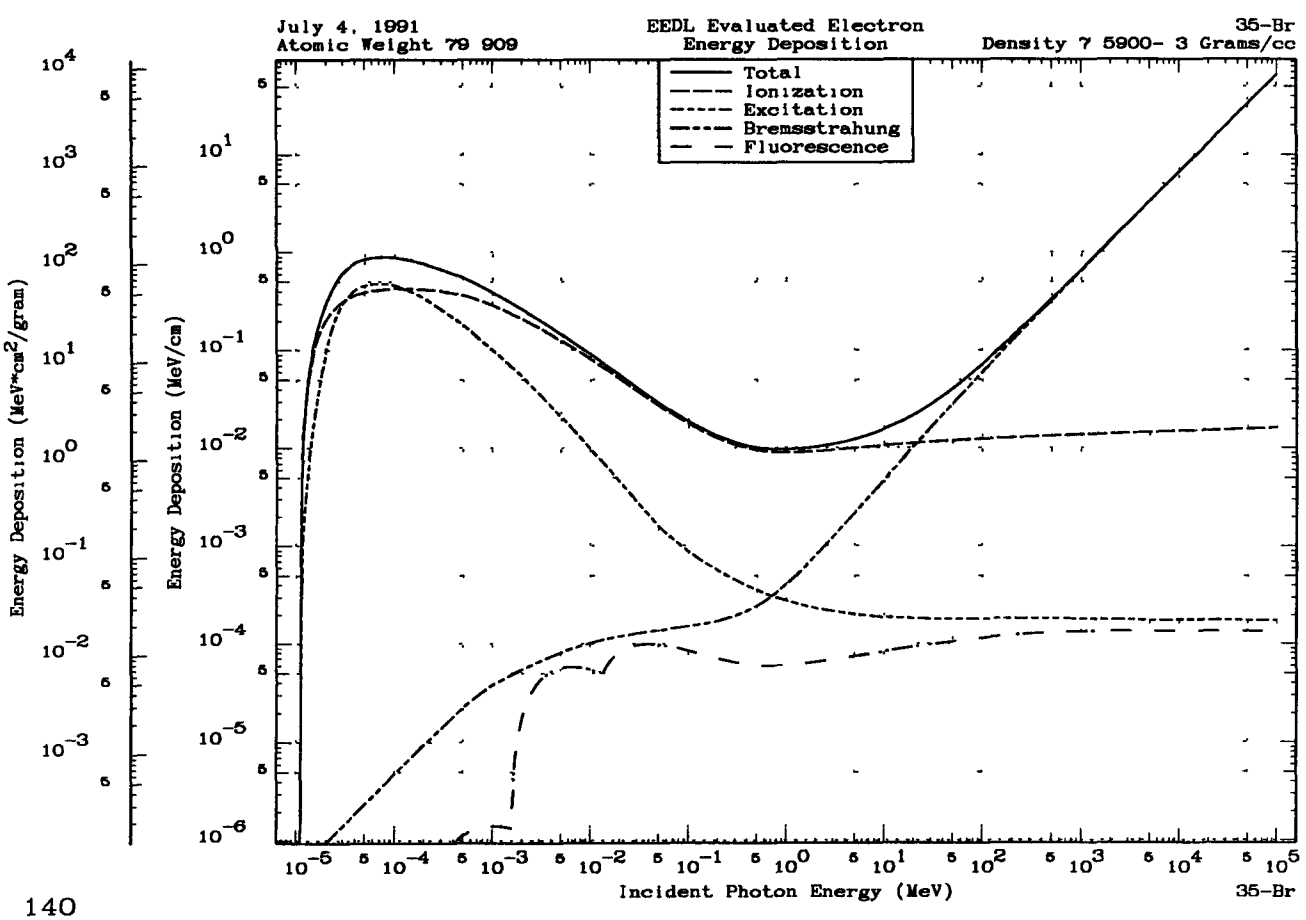
Atomic Weight 78.960 Density 4.500 Grams/cc

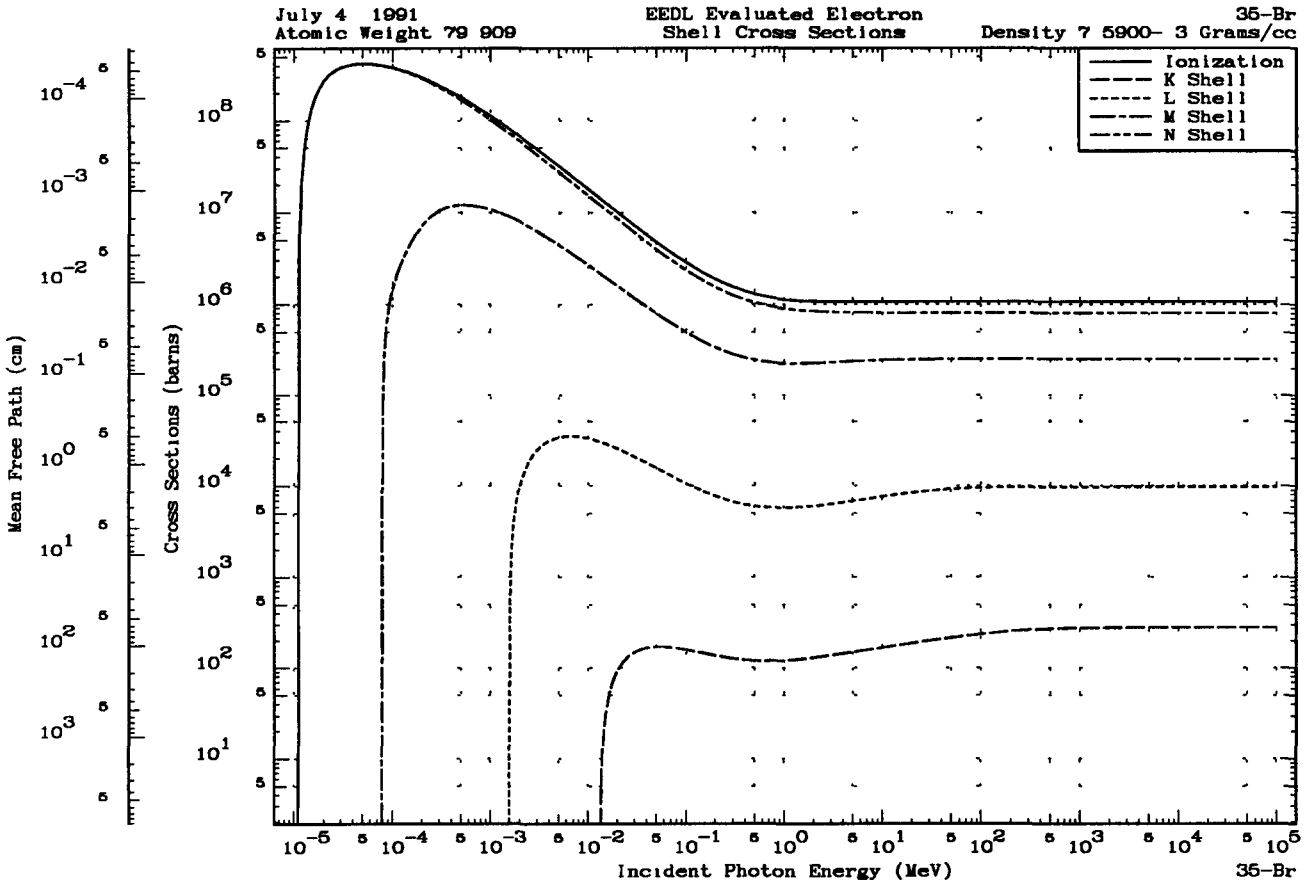
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.1930–8	1.8627+7		2.4423+9	2.4208+9	2.0598+7	8.4586+5	3.7338+3	7.0553+0	6.7778+0	2.7723–1	2.7634–4
	1.0625–5	1.2209–8	1.8202+7		2.3866+9	2.3402+9	4.3626+7	2.7886+6	3.7784+3	1.5574+1	1.4647+1	9.2674–1	2.9277–4
	1.1250–5	1.2415–8	1.7900+7		2.3470+9	2.2666+9	7.4913+7	5.5358+6	3.8209+3	2.7400+1	2.5534+1	1.8651+0	3.0934–4
	1.1719–5	1.2564–8	1.7688+7		2.3191+9	2.2154+9	9.5603+7	8.1345+6	3.8515+3	3.5748+1	3.2980+1	2.7685+0	3.2186–4
	1.2187–5	1.2700–8	1.7498+7		2.2942+9	2.1674+9	1.1574+8	1.1068+7	3.8812+3	4.4159+1	4.0354+1	3.8048+0	3.3444–4
	1.3359–5	1.2990–8	1.7107+7		2.2430+9	2.0589+9	1.6302+8	2.1015+7	3.9516+3	6.5735+1	5.8329+1	7.4050+0	3.6626–4
	1.3594–5	1.3035–8	1.7048+7		2.2352+9	2.0390+9	1.7249+8	2.3728+7	3.9651+3	7.0417+1	6.2015+1	8.4018+0	3.7268–4
	1.5000–5	1.3278–8	1.6736+7		2.1943+9	1.9298+9	2.2139+8	4.3089+7	4.0422+3	9.7510+1	8.1809+1	1.5701+1	4.1153–4
	1.6250–5	1.3447–8	1.6526+7		2.1669+9	1.8454+9	2.5518+8	6.6312+7	4.1060+3	1.2088+2	9.6301+1	2.4573+1	4.4656–4
	1.7500–5	1.3537–8	1.6417+7		2.1525+9	1.7705+9	2.8790+8	9.4085+7	4.1660+3	1.4634+2	1.1089+2	3.5446+1	4.8204–4
	1.8125–5	1.3566–8	1.6381+7		2.1478+9	1.7361+9	3.0069+8	1.1104+8	4.1947+3	1.5906+2	1.1688+2	4.2176+1	4.9994–4
	2.0000–5	1.3592–8	1.6349+7		2.1436+9	1.6431+9	3.3546+8	1.6502+8	4.2763+3	1.9799+2	1.3378+2	6.4211+1	5.5424–4
N1	2.0990–5	1.3593–8	1.6349+7		2.1436+9	1.5993+9	3.4866+8	1.9555+8	4.3153+3	2.1748+2	1.4068+2	7.6792+1	5.8250–4
	2.1272–5	1.3590–8	1.6352+7		2.1440+9	1.5875+9	3.5266+8	2.0387+8	4.3246+3	2.2301+2	1.4281+2	8.0201+1	5.8994–4
	2.1817–5	1.3576–8	1.6369+7		2.1462+9	1.5652+9	3.6036+8	2.2067+8	4.3425+3	2.3403+2	1.4692+2	8.7104+1	6.0439–4
	2.2500–5	1.3544–8	1.6407+7		2.1513+9	1.5384+9	3.6984+8	2.4300+8	4.3644+3	2.4835+2	1.5203+2	9.6323+1	6.2255–4
	2.2840–5	1.3531–8	1.6423+7		2.1533+9	1.5256+9	3.7306+8	2.5467+8	4.3751+3	2.5518+2	1.5401+2	1.0116+2	6.3161–4
	2.4630–5	1.3448–8	1.6525+7		2.1667+9	1.4626+9	3.8917+8	3.1494+8	4.4293+3	2.9055+2	1.6408+2	1.2648+2	6.7962–4
	2.6250–5	1.3377–8	1.6612+7		2.1781+9	1.4114+9	4.0307+8	3.6367+8	4.4756+3	3.2053+2	1.7304+2	1.4748+2	7.2347–4
	2.7315–5	1.3322–8	1.6681+7		2.1871+9	1.3804+9	4.0892+8	3.9785+8	4.5047+3	3.3974+2	1.7736+2	1.6238+2	7.5250–4
	3.0000–5	1.3217–8	1.6813+7		2.2045+9	1.3099+9	4.2266+8	4.7198+8	4.5741+3	3.8360+2	1.8787+2	1.9573+2	8.2635–4
	3.5000–5	1.3141–8	1.6911+7		2.2173+9	1.2019+9	4.3643+8	5.7894+8	4.6906+3	4.4363+2	2.0082+2	2.4280+2	9.6628–4
	4.0000–5	1.3171–8	1.6873+7		2.2123+9	1.1157+9	4.4163+8	6.5499+8	4.7939+3	4.8791+2	2.1014+2	2.7777+2	1.1091–3
	4.5000–5	1.3284–8	1.6728+7		2.1933+9	1.0447+9	4.4327+8	7.0532+8	4.8736+3	5.1743+2	2.1707+2	3.0036+2	1.2452–3
	5.0000–5	1.3484–8	1.6480+7		2.1608+9	9.8513+8	4.4465+8	7.3101+8	4.9460+3	5.3647+2	2.2389+2	3.1258+2	1.3832–3
	6.0000–5	1.4017–8	1.5854+7		2.0787+9	8.8990+8	4.3705+8	7.5174+8	5.0636+3	5.5496+2	2.3064+2	3.2431+2	1.6555–3
M5	6.3970–5	1.4278–8	1.5564+7		2.0407+9	8.5867+8	4.3161+8	7.5044+8	5.1056+3	5.5546+2	2.3134+2	3.2412+2	1.7651–3
M4	6.4910–5	1.4338–8	1.5498+7		2.0321+9	8.5172+8	4.3046+8	7.4991+8	5.1152+3	5.5569+2	2.3171+2	3.2398+2	1.7911–3
	6.4972–5	1.4342–8	1.5494+7		2.0315+9	8.5126+8	4.3039+8	7.4987+8	5.1159+3	5.5571+2	2.3174+2	3.2397+2	1.7929–3
	6.5853–5	1.4399–8	1.5433+7		2.0236+9	8.4489+8	4.2935+8	7.4933+8	5.1248+3	5.5596+2	2.3213+2	3.2383+2	1.8173–3
	6.6850–5	1.4461–8	1.5367+7		2.0148+9	8.3784+8	4.2822+8	7.4874+8	5.1347+3	5.5632+2	2.3265+2	3.2367+2	1.8451–3
	6.7621–5	1.4509–8	1.5316+7		2.0081+9	8.3250+8	4.2735+8	7.4829+8	5.1423+3	5.5658+2	2.3303+2	3.2355+2	1.8665–3
	7.0138–5	1.4662–8	1.5156+7		1.9872+9	8.1571+8	4.2462+8	7.4685+8	5.1666+3	5.5751+2	2.3432+2	3.2318+2	1.9368–3
	7.0716–5	1.4697–8	1.5120+7		1.9825+9	8.1199+8	4.2401+8	7.4652+8	5.1720+3	5.5772+2	2.3462+2	3.2310+2	1.9530–3
	7.5069–5	1.4948–8	1.4866+7		1.9492+9	7.8539+8	4.1962+8	7.4417+8	5.2120+3	5.5946+2	2.3693+2	3.2252+2	2.0754–3
	7.5358–5	1.4965–8	1.4850+7		1.9471+9	7.8370+8	4.1934+8	7.4402+8	5.2146+3	5.5958+2	2.3709+2	3.2249+2	2.0836–3
	8.0000–5	1.5217–8	1.4603+7		1.9147+9	7.5801+8	4.1501+8	7.4167+8	5.2550+3	5.6157+2	2.3963+2	3.2193+2	2.2150–3
	1.0000–4	1.6519–8	1.3452+7	0.0000+0	1.7638+9	6.6933+8	3.9071+8	7.0378+8	5.3803+3	5.5109+2	2.4336+2	3.0773+2	2.7665–3
	1.1250–4	1.7432–8	1.2748+7	2.2993–8	1.6715+9	6.2700+8	3.7421+8	6.7025+8	5.4336+3	5.3626+2	2.4254+2	2.9371+2	3.1032–3
	1.2500–4	1.8286–8	1.2152+7	4.6551–8	1.5934+9	5.9140+8	3.6035+8	6.4161+8	5.4817+3	5.2499+2	2.4321+2	2.8178+2	3.4426–3
	1.5000–4	1.9861–8	1.1189+7	9.4952–8	1.4670+9	5.3452+8	3.3762+8	5.9491+8	5.5660+3	5.0813+2	2.4570+2	2.6243+2	4.1292–3
M3	1.6371–4	2.0781–8	1.0693+7	1.2228–7	1.4021+9	5.0920+8	3.2452+8	5.6836+8	5.6069+3	4.9535+2	2.4428+2	2.5107+2	4.5095–3
	1.6825–4	2.1090–8	1.0537+7	1.3147–7	1.3815+9	5.0154+8	3.2060+8	5.5940+8	5.6197+3	4.9143+2	2.4419+2	2.4724+2	4.6359–3
M2	1.6977–4	2.1193–8	1.0486+7	1.3458–7	1.3749+9	4.9904+8	3.1932+8	5.5648+8	5.6239+3	4.9017+2	2.4418+2	2.4599+2	4.6785–3
	1.7355–4	2.1447–8	1.0362+7	1.4231–7	1.3586+9	4.9298+8	3.1619+8	5.4940+8	5.6300+3	4.8703+2	2.4406+2	2.4297+2	4.7804–3
	1.7618–4	2.1622–8	1.0278+7	1.4774–7	1.3476+9	4.8888+8	3.1407+8	5.4461+8	5.6342+3	4.8496+2	2.4403+2	2.4092+2	4.8515–3
	1.8016–4	2.1884–8	1.0155+7	1.5596–7	1.3314+9	4.8286+8	3.1096+8	5.3758+8	5.6404+3	4.8196+2	2.4402+2	2.3793+2	4.9589–3
	1.8809–4	2.2398–8	9.9213+6	1.7251–7	1.3009+9	4.7146+8	3.0510+8	5.2428+8	5.6523+3	4.7650+2	2.4423+2	2.3227+2	5.1734–3
	1.9008–4	2.2525–8	9.8654+6	1.7669–7	1.2935+9	4.6872+8	3.0370+8	5.2109+8	5.6552+3	4.7523+2	2.4432+2	2.3091+2	5.2273–3
	2.0000–4	2.3150–8	9.5992+6	1.9769–7	1.2586+9	4.5568+8	2.9703+8	5.0590+8	5.6694+3	4.6943+2	2.4498+2	2.2445+2	5.4963–3
	2.1250–4	2.3936–8	9.2841+6	2.2457–7	1.2173+9	4.4061+8	2.8805+8	4.8864+8	5.6733+3	4.6061+2	2.4360+2	2.1700+2	5.8228–3
M1	2.2610–4	2.4765–8	8.9732+6	2.5436–7	1.1765+9	4.2571+8	2.7922+8	4.7159+8	5.6774+3	4.5238+2	2.4272+2	2.0966+2	6.1783–3
	2.2841–4	2.4911–8	8.9206+6	2.5948–7	1.1696+9	4.2331+8	2.7772+8	4.6859+8	5.6781+3	4.5082+2	2.4245+2	2.0836+2	6.2387–3
	2.3288–4	2.5192–8	8.8210+6	2.6944–7	1.1566+9	4.1878+8	2.7489+8	4.6290+8	5.6793+3	4.4788+2	2.4198+2	2.0590+2	6.3557–3
	2.3438–4	2.5285–8	8.7885+6	2.7277–7	1.1523+9	4.1730+8	2.7397+8	4.6105+8	5.6797+3	4.4693+2	2.4183+2	2.0509+2	6.3947–3
	2.4375–4	2.5865–8	8.5918+6	2.9388–7	1.1265+9	4.0832+8	2.6838+8	4.4981+8	5.6823+3	4.4128+2	2.4104+2	2.0023+2	6.6400–3
	2.4966–4	2.6225–8	8.4738+6	3.0733–7	1.1111+9	4.0293+8	2.6503+8	4.4308+8	5.6839+3	4.3798+2	2.4065+2	1.9732+2	6.7947–3
	2.5000–4	2.6245–8	8.4672+6	3.0810–7	1.1102+9	4.0263+8	2.6485+8	4.4271+8	5.6840+3	4.3780+2	2.4063+2	1.9716+2	6.8035–3
	2.6250–4	2.6996–8	8.2316+6	3.3687–7	1.0793+9	3.9188+8	2.5808+8	4.2933+8	5.6872+3	4.3098+2	2.3959+2	1.9138+2	7.1308–3
	2.6719–4	2.7274–8	8.1477+6	3.4778–7	1.0683+9	3.8805+8	2.5567+8	4.2457+8	5.6883+3	4.2856+2	2.3923+2	1.8932+2	7.2536–3
	2.7188–4	2.7550–8	8.0661+6	3.5875–7	1.0576+9	3.8432+8	2.5332+8	4.1995+8	5.6895+3	4.2625+2	2.3891+2	1.8733+2	7.3764–3
	2.7483–4	2.7723–8	8.0159+6	3.6569–7	1.0510+9	3.8202+8	2.5187+8	4.1711+8	5.6902+3	4.2482+2	2.3872+2	1.8610+2	7.4538–3
	3.0000–4	2.9162–8	7.6203+6	4.2570–7	9.9914+8	3.6390+8	2.4050+8	3.9474+8	5.6959+3	4.1409+2	2.3764+2	1.7644+2	8.1136–3
	3.5000–4	3.2175–8	6.9068+6	5.5033–7	9.0559+8	3.3426+8	2.1959+8	3.5174+8	5.6918+3	3.8859+2	2.3097+2	1.5761+2	9.4034–3
	4.0000–4	3.5026–8	6.3444+6	6.8227–7	8.3186+8	3.1054+8	2.0302+8	3.1829+8	5.6882+3	3.6946+2	2.2648+2	1.4297+2	1.0692–2
	4.5000–4	3.7943–8	5.8567+6	8.2136–7	7.6791+8	2.9105+8	1.8845+8	2.8841+8	5.6224+3	3.4971+2	2.1992+2	1.2978+2	1.1853–2
	5.0000–4	4.0745–8	5.4540+6	9.6761–7	7.1510+8	2.7465+8	1.7639+8	2.6406+8	5.5642+3	3.3416+2	2.1511+2	1.1904+2	1.3001–2
	6.0000–4	4.6169–8	4.8132+6	1.2798–6	6.3109+8	2.4843+8	1.5640+8	2.2626+8	5.4649+3	3.0685+2	2.0453+2	1.0231+2	1.5265–2
	7.0000–4	5.1362–8	4.3266+6	1.6185–6	5.6729+8	2.2822+8	1.4060+8	1.9845+8	5.3221+3	2.8393+2	1.9399+2	8.9922+1	1.7160–2
	8.0000–4	5.6307–8	3.9466+6	1.9820–6	5.1746+8	2.1205+8	1.2826+8	1.7715+8	5.2015+3	2.6652+2	1.8607+2	8.0434+1	1.9013–2
	1.0000–3	6.6000–8	3.3670+6	2.7776–6	4.4147+8	1.8755+8	1.0927+8	1.4465+8	4.9456+3	2.3679+2	1.7088+2	6.5889+1	2.2090–2
	1.2500–3	7.7301–8	2.8748+6	3.9016–6	3.7693+8	1.6582+8	9.2486+7	1.1861+8	4.6300+3	2.0865+2	1.5444+2	5.4184+1	2.4741–2
L3	1.4386–3	8.5339–8	2.6040+6	4.8400–6	3.4142+8	1.5345+8	8.3286+7	1.0468+8	4.4416+3	1.9350+2	1.4556+2	4.7922+1	2.6673–2
	1.4693–3	8.6614–8	2.5657+6	4.9996–6	3.3640+8	1.5167+8	8.1972+7	1.0275+8	4.4131+3	1.9137+2	1.4429+2	4.7052+1	2.6968–2
L2	1.4812–3	8.7106–8	2.5512+6	5.0619–6	3.3450+8	1.5100+8	8.1476+7	1.0202+8	4.4023+3	1.9056+2	1.4381+2	4.6724+1	2.7083–2
	1.5000–3	8.7878–8	2.5287+6	5.1609–6	3.3156+8	1.4995+8	8.0706+7	1.0090+8	4.3855+3	1.8933+2	1.4308+2	4.6220+1	2.7262–2
	1.5625–3	9.0460–8	2.4566+6	5.4950–6	3.2210+8	1.4659+8	7.8200+7	9.7306+7	4.3302+3	1.8477+2	1.4015+2	4.4598+1	2.7813–2
	1.6250–3	9.3008–8	2.3893+6	5.8372–6	3.1327+8	1.4343+8	7.5867+7	9.3977+7	4.2777+3	1.8058+2	1.3745+2	4.3094+1	2.8360–2
L1	1.6415–3	9.3675–8	2.3723+6	5.9288–6	3.1104+8	1.4262+8	7.5278+7	9.3138+7	4.2643+3	1.7952+2	1.3677+2	4.2716+1	2.8503–2
	1.6719–3	9.4945–8	2.3405+6	6.0990–6	3.0688+8	1.4116+8	7.4213+7	9.1506+7	4.2399+3	1.7755+2	1.3554+2	4.1977+1	2.8758–2

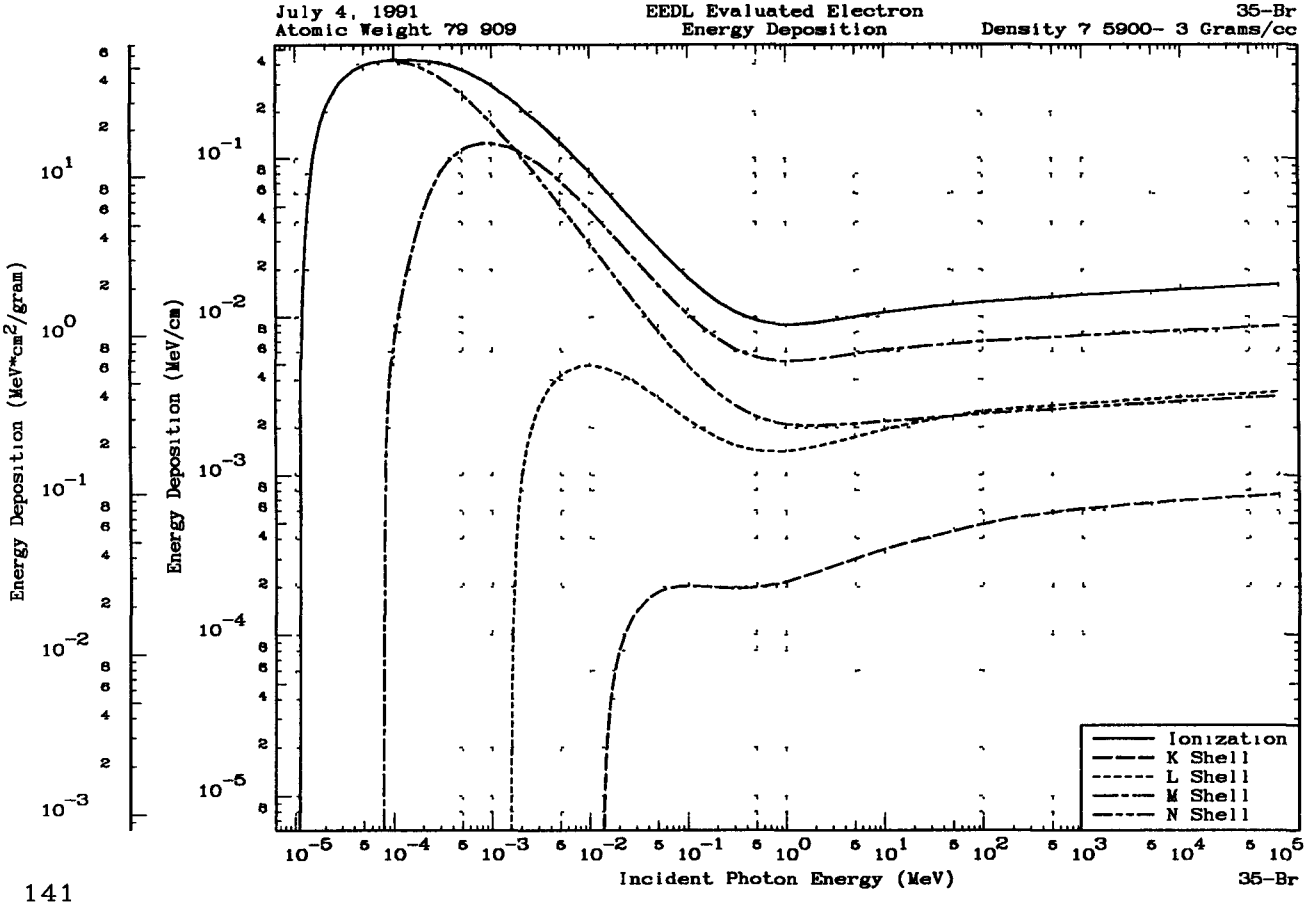
Atomic Weight 78.960													Density 4.500 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)				
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems	
1.6863–3	9.5546–8	2.3258+6	6.1805–6	3.0495+8	1.4048+8	7.3719+7	9.0752+7	4.2284+3	1.7663+2	1.3497+2	4.1635+1	2.8879–2	
1.7187–3	9.6891–8	2.2935+6	6.3652–6	3.0072+8	1.3898+8	7.2635+7	8.9101+7	4.2032+3	1.7464+2	1.3372+2	4.0888+1	2.9149–2	
1.7647–3	9.8784–8	2.2496+6	6.6305–6	2.9496+8	1.3693+8	7.1161+7	8.6862+7	4.1686+3	1.7192+2	1.3202+2	3.9875+1	2.9531–2	
1.8359–3	1.0169–7	2.1854+6	7.0495–6	2.8654+8	1.3391+8	6.9010+7	8.3613+7	4.1172+3	1.6799+2	1.2956+2	3.8405+1	3.0119–2	
1.8594–3	1.0263–7	2.1652+6	7.1896–6	2.8389+8	1.3296+8	6.8334+7	8.2598+7	4.1008+3	1.6676+2	1.2879+2	3.7945+1	3.0311–2	
1.8824–3	1.0356–7	2.1459+6	7.3279–6	2.8136+8	1.3204+8	6.7685+7	8.1625+7	4.0850+3	1.6558+2	1.2804+2	3.7505+1	3.0500–2	
2.0000–3	1.0824–7	2.0531+6	8.0507–6	2.6919+8	1.2761+8	6.4578+7	7.6994+7	4.0081+3	1.5996+2	1.2452+2	3.5409+1	3.1456–2	
2.2500–3	1.1816–7	1.8807+6	9.6732–6	2.4659+8	1.1904+8	5.8792+7	6.8753+7	3.8389+3	1.4834+2	1.1664+2	3.1662+1	3.3086–2	
2.4375–3	1.2539–7	1.7723+6	1.0969–5	2.3238+8	1.1355+8	5.5162+7	6.3662+7	3.7280+3	1.4110+2	1.1172+2	2.9348+1	3.4284–2	
2.7187–3	1.3593–7	1.6349+6	1.3029–5	2.1436+8	1.0646+8	5.0572+7	5.7319+7	3.5819+3	1.3201+2	1.0551+2	2.6465+1	3.6044–2	
3.0000–3	1.4615–7	1.5205+6	1.5223–5	1.9937+8	1.0045+8	4.6766+7	5.2145+7	3.4551+3	1.2455+2	1.0040+2	2.4113+1	3.7762–2	
3.5000–3	1.6417–7	1.3536+6	1.9444–5	1.7748+8	9.1427+7	4.1236+7	4.4811+7	3.2426+3	1.1252+2	9.1721+1	2.0760+1	4.0195–2	
4.0000–3	1.8148–7	1.2245+6	2.4080–5	1.6055+8	8.4268+7	3.6981+7	3.9297+7	3.0691+3	1.0333+2	8.5044+1	1.8240+1	4.2546–2	
4.5000–3	1.9851–7	1.1195+6	2.9114–5	1.4678+8	7.8195+7	3.3542+7	3.5040+7	2.9125+3	9.5440+1	7.9108+1	1.6288+1	4.4455–2	
5.0000–3	2.1503–7	1.0334+6	3.4536–5	1.3550+8	7.3134+7	3.0739+7	3.1624+7	2.7793+3	8.9055+1	7.4287+1	1.4722+1	4.6313–2	
6.0000–3	2.4716–7	8.9909+5	4.6473–5	1.1789+8	6.4968+7	2.6398+7	2.6517+7	2.5575+3	7.8701+1	6.6277+1	1.2374+1	4.9414–2	
8.0000–3	3.0947–7	7.1806+5	7.4526–5	9.4150+7	5.3686+7	2.0724+7	1.9738+7	2.2242+3	6.4368+1	5.5067+1	9.2466+0	5.4305–2	
1.0000–2	3.6977–7	6.0097+5	1.0814–4	7.8797+7	4.6033+7	1.7154+7	1.5608+7	1.9789+3	5.4873+1	4.7480+1	7.3344+0	5.7959–2	
K 1.2619–2	4.4733–7	4.9677+5	1.6005–4	6.5135+7	3.9082+7	1.4078+7	1.1973+7	1.7402+3	4.6275+1	4.0569+1	5.6447+0	6.1535–2	
1.2768–2	4.5168–7	4.9199+5	1.6328–4	6.4508+7	3.8754+7	1.3938+7	1.1814+7	1.7285+3	4.5874+1	4.0242+1	5.5706+0	6.1691–2	
1.3047–2	4.5980–7	4.8330+5	1.6941–4	6.3369+7	3.8157+7	1.3684+7	1.1526+7	1.7071+3	4.5147+1	3.9649+1	5.4363+0	6.1984–2	
1.3535–2	4.7392–7	4.6890+5	1.8038–4	6.1480+7	3.7164+7	1.3262+7	1.1053+7	1.6714+3	4.3942+1	3.8664+1	5.2156+0	6.2496–2	
1.4268–2	4.9492–7	4.4901+5	1.9737–4	5.8872+7	3.5783+7	1.2680+7	1.0407+7	1.6215+3	4.2282+1	3.7304+1	4.9148+0	6.3261–2	
1.5000–2	5.1568–7	4.3093+5	2.1501–4	5.6502+7	3.4520+7	1.2151+7	9.8291+6	1.5754+3	4.0776+1	3.6067+1	4.6453+0	6.4021–2	
1.6250–2	5.5109–7	4.0324+5	2.4658–4	5.2871+7	3.2549+7	1.1354+7	8.9669+6	1.5022+3	3.8420+1	3.4112+1	4.2422+0	6.4980–2	
1.8125–2	6.0321–7	3.6840+5	2.9737–4	4.8303+7	3.0041+7	1.0350+7	7.9111+6	1.4076+3	3.5462+1	3.1647+1	3.7485+0	6.6425–2	
2.0000–2	6.5426–7	3.3965+5	3.5214–4	4.4534+7	2.7945+7	9.5212+6	7.0664+6	1.3276+3	3.3031+1	2.9609+1	3.3535+0	6.7865–2	
2.2500–2	7.2174–7	3.0790+5	4.3119–4	4.0370+7	2.5586+7	8.6257+6	6.1579+6	1.2347+3	3.0263+1	2.7267+1	2.9267+0	6.9006–2	
2.6250–2	8.2030–7	2.7090+5	5.6220–4	3.5520+7	2.2796+7	7.5800+6	5.1430+6	1.1229+3	2.7044+1	2.4523+1	2.4498+0	7.0792–2	
3.0000–2	9.1612–7	2.4257+5	7.0758–4	3.1805+7	2.0626+7	6.7774+6	4.4001+6	1.0343+3	2.4584+1	2.2411+1	2.1005+0	7.2603–2	
3.5000–2	1.0407–6	2.1353+5	9.2246–4	2.7997+7	1.8350+7	5.9717+6	3.6749+6	9.3956+2	2.2001+1	2.0169+1	1.7580+0	7.4079–2	
4.0000–2	1.1618–6	1.9127+5	1.1606–3	2.5078+7	1.6582+7	5.3517+6	3.1440+6	8.6458+2	2.0021+1	1.8438+1	1.5072+0	7.5641–2	
5.0000–2	1.3941–6	1.5941+5	1.6999–3	2.0901+7	1.3995+7	4.4758+6	2.4295+6	7.5616+2	1.7139+1	1.5893+1	1.1685+0	7.7935–2	
6.0000–2	1.6128–6	1.3778+5	2.3198–3	1.8066+7	1.2184+7	3.8823+6	1.9989+6	6.7946+2	1.5163+1	1.4119+1	9.6393–1	7.9805–2	
8.0000–2	2.0204–6	1.0999+5	3.7646–3	1.4421+7	9.8180+6	3.1289+6	1.4740+6	5.7553+2	1.2602+1	1.1806+1	7.1374–1	8.2798–2	
1.0000–1	2.3871–6	9.3092+4	5.4614–3	1.2206+7	8.3430+6	2.6702+6	1.1922+6	5.0732+2	1.1008+1	1.0344+1	5.7909–1	8.5302–2	
1.2500–1	2.7798–6	7.9941+4	7.8753–3	1.0482+7	7.1971+6	2.3099+6	9.7419+5	4.4944+2	9.7314+0	9.1688+0	4.7455–1	8.7965–2	
1.5000–1	3.1416–6	7.0736+4	1.0571–2	9.2746+6	6.3787+6	2.0520+6	8.4351+5	4.0709+2	8.8308+0	8.3279+0	4.1205–1	9.0902–2	
2.0000–1	3.7275–6	5.9617+4	1.6617–2	7.8168+6	5.3834+6	1.7418+6	6.9126+5	3.5360+2	7.7327+0	7.2970+0	3.3902–1	9.6666–2	
2.5000–1	4.2057–6	5.2839+4	2.3360–2	6.9280+6	4.7652+6	1.5654+6	5.9711+5	3.2318+2	7.1060+0	6.7094+0	2.9367–1	1.0294–1	
3.0000–1	4.6329–6	4.7966+4	3.0631–2	6.2892+6	4.3132+6	1.4347+6	5.4100+5	3.0027+2	6.6533+0	6.2772+0	2.6683–1	1.0921–1	
4.0000–1	5.3363–6	4.1644+4	4.6254–2	5.4602+6	3.7035+6	1.2853+6	4.7105+5	2.7491+2	6.1551+0	5.7987+0	2.3324–1	1.2319–1	
5.0000–1	5.9127–6	3.7584+4	6.2853–2	4.9279+6	3.3009+6	1.1992+6	4.2754+5	2.6063+2	5.8952+0	5.5447+0	2.1236–1	1.3814–1	
6.0000–1	6.3922–6	3.4764+4	8.0036–2	4.5582+6	3.0157+6	1.1441+6	3.9813+5	2.5248+2	5.7452+0	5.3925+0	1.9826–1	1.5446–1	
8.0000–1	7.1627–6	3.1025+4	1.1520–1	4.0679+6	2.6261+6	1.0801+6	3.6146+5	2.4467+2	5.6316+0	5.2607+0	1.8073–1	1.9021–1	
1.0000+0	7.7603–6	2.8636+4	1.5077–1	3.7546+6	2.3708+6	1.0456+6	3.3799+5	2.4163+2	5.6128+0	5.2148+0	1.6953–1	2.2843–1	
1.5000+0	8.8023–6	2.5246+4	2.3871–1	3.3101+6	1.9969+6	1.0090+6	3.0398+5	2.4173+2	5.7596+0	5.2723+0	1.5334–1	3.3394–1	
2.0000+0	9.4864–6	2.3425+4	3.2421–1	3.0714+6	1.7873+6	9.9680+5	2.8716+5	2.4470+2	5.9374+0	5.3438+0	1.4529–1	4.4838–1	
3.0000+0	1.0364–5	2.1443+4	4.8707–1	2.8115+6	1.5604+6	9.8450+5	2.6638+5	2.5100+2	6.3474+0	5.5135+0	1.3561–1	6.9832–1	
4.0000+0	1.0890–5	2.0405+4	6.3981–1	2.6755+6	1.4367+6	9.8431+5	2.5415+5	2.5537+2	6.7511+0	5.6534+0	1.2960–1	9.6799–1	
5.0000+0	1.1234–5	1.9781+4	7.8376–1	2.5936+6	1.3611+6	9.8420+5	2.4801+5	2.5882+2	7.1459+0	5.7772+0	1.2667–1	1.2420+0	
6.0000+0	1.1473–5	1.9369+4	9.1999–1	2.5396+6	1.3122+6	9.8409+5	2.4303+5	2.6188+2	7.5385+0	5.8813+0	1.2433–1	1.5329+0	
8.0000+0	1.1796–5	1.8839+4	1.1731+0	2.4701+6	1.2513+6	9.8334+5	2.3521+5	2.6678+2	8.2781+0	6.0330+0	1.2073–1	2.1244+0	
1.0000+1	1.1972–5	1.8562+4	1.4045+0	2.4337+6	1.2187+6	9.8438+5	2.3040+5	2.7077+2	9.0137+0	6.1621+0	1.1865–1	2.7329+0	
1.5000+1	1.2103–5	1.8361+4	1.9117+0	2.4074+6	1.1959+6	9.8554+5	2.2567+5	2.7841+2	1.0756+1	6.3344+0	1.1625–1	4.3053+0	
2.0000+1	1.2126–5	1.8325+4	2.3419+0	2.4028+6	1.1938+6	9.8639+5	2.2235+5	2.8265+2	1.2531+1	6.4790+0	1.1458–1	5.9379+0	
3.0000+1	1.2147–5	1.8294+4	3.0447+0	2.3986+6	1.1934+6	9.8716+5	2.1771+5	2.8881+2	1.6074+1	6.6701+0	1.1227–1	9.2912+0	
4.0000+1	1.2154–5	1.8283+4	3.6069+0	2.3972+6	1.1932+6	9.8759+5	2.1614+5	2.9332+2	1.9622+1	6.7828+0	1.1154–1	1.2728+1	
5.0000+1	1.2156–5	1.8281+4	4.0749+0	2.3969+6	1.1931+6	9.8782+5	2.1573+5	2.9704+2	2.3215+1	6.8705+0	1.1140–1	1.6233+1	
6.0000+1	1.2158–5	1.8278+4	4.4753+0	2.3966+6	1.1929+6	9.8796+5	2.1537+5	2.9973+2	2.6823+1	6.9357+0	1.1129–1	1.9776+1	
8.0000+1	1.2161–5	1.8273+4	5.1348+0	2.3959+6	1.1927+6	9.8818+5	2.1473+5	3.0403+2	3.4116+1	7.0567+0	1.1112–1	2.6948+1	
1.0000+2	1.2164–5	1.8269+4	5.6655+0	2.3953+6	1.1926+6	9.8830+5	2.1418+5	3.0747+2	4.1494+1	7.1567+0	1.1099–1	3.4226+1	
1.5000+2	1.2162–5	1.8272+4	6.6621+0	2.3957+6	1.1923+6	9.8837+5	2.1478+5	3.1361+2	5.9981+1	7.2530+0	1.1130–1	5.2617+1	
2.0000+2	1.2160–5	1.8275+4	7.3882+0	2.3962+6	1.1921+6	9.8842+5	2.1538+5	3.1745+2	7.8577+1	7.3439+0	1.1161–1	7.1122+1	
3.0000+2	1.2153–5	1.8285+4	8.4295+0	2.3974+6	1.1918+6	9.8848+5	2.1689+5	3.2199+2	1.1591+2	7.5041+0	1.1240–1	1.0829+2	
4.0000+2	1.2152–5	1.8287+4	9.1771+0	2.3977+6	1.1916+6	9.8850+5	2.1735+5	3.2480+2	1.5334+2	7.5929+0	1.1264–1	1.4564+2	
5.0000+2	1.2158–5	1.8278+4	9.7609+0	2.3966+6	1.1914+6	9.8850+5	2.1635+5	3.2699+2	1.9062+2	7.6484+0	1.1213–1	1.8286+2	
6.0000+2	1.2157–5	1.8280+4	1.0240+1	2.3968+6	1.1912+6	9.8851+5	2.1674+5	3.2880+2	2.2809+2	7.7035+0	1.1233–1	2.2027+2	
8.0000+2	1.2159–5	1.8277+4	1.0999+1	2.3964+6	1.1910+6	9.8852+5	2.1652+5	3.3205+2	3.0250+2	7.8069+0	1.1223–1	2.9458+2	
1.0000+3	1.2161–5	1.8274+4	1.1589+1	2.3960+6	1.1909+6	9.8852+5	2.1624+5	3.3459+2	3.7753+2	7.8965+0	1.1209–1	3.6953+2	
1.5000+3	1.2165–5	1.8267+4	1.2664+1	2.3951+6	1.1906+6	9.8852+5	2.1565+5	3.3961+2	5.6530+2	7.9754+0	1.1178–1	5.5721+2	
2.0000+3	1.2169–5	1.8261+4	1.3428+1	2.3943+6	1.1904+6	9.8852+5	2.1505+5	3.4335+2	7.5283+2	8.0541+0	1.1147–1	7.4467+2	
3.0000+3	1.2172–5	1.8257+4	1.4506+1	2.3937+6	1.1901+6	9.8853+5	2.1479+5	3.4893+2	1.1274+3	8.2110+0	1.1134–1	1.1190+3	
4.0000+3	1.2175–5	1.8252+4	1.5272+1	2.3932+6	1.1899+6	9.8853+5	2.1446+5	3.5304+2	1.5040+3	8.2882+0	1.1116–1	1.4956+3	
5.0000+3	1.2182–5	1.8243+4	1.5864+1	2.3919+6	1.1897+6	9.8853+5	2.1333+5	3.5627+2	1.8843+3	8.3382+0	1.1058–1	1.8759+3	
6.0000+3	1.2180–5	1.8245+4	1.6349+1	2.3922+6	1.1896+6	9.8853+5	2.1373+5	3.5867+2	2.2574+3	8.3883+0	1.1079–1	2.2489+3	
8.0000+3	1.2181–5	1.8244+4	1.7113+1	2.3920+6	1.1893+6	9.8853+5	2.1379+5	3.6250+2	3.0098+3	8.4882+0	1.1082–1	3.0012+3	
1.0000+4	1.2181–5	1.8243+4	1.7706+1	2.3919+6	1.1892+6	9.8853+5	2.1386+5	3.6550+2	3.7690+3	8.5850+0	1.1086–1	3.7603+3	
1.5000+4	1.2182–5	1.8242+4	1.8784+1	2.3918+6	1.1889+6	9.8853+5	2.1406+5	3.7140+2	5.6280+3	8.6565+0	1.1096–1	5.6192+3	
2.0000+4	1.2184–5	1.8239+4	1.9551+1	2.3914+6	1.1887+6	9.8853+5	2.1386+5	3.7565+2	7.5111+3	8.7280+0	1.1086–1	7.5022+3	

Atomic Weight 78.960												Density 4.500 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+4	1.2184–5	1.8238+4	2.0632+1	2.3913+6	1.1884+6	9.8853+5	2.1406+5	3.8161+2	1.1239+4	8.8711+0	1.1096–1	1.1230+4
4.0000+4	1.2186–5	1.8236+4	2.1399+1	2.3910+6	1.1882+6	9.8853+5	2.1393+5	3.8590+2	1.5007+4	8.9678+0	1.1089–1	1.4998+4
5.0000+4	1.2193–5	1.8226+4	2.1994+1	2.3897+6	1.1880+6	9.8853+5	2.1280+5	3.8919+2	1.8740+4	9.0375+0	1.1031–1	1.8731+4
6.0000+4	1.2191–5	1.8229+4	2.2481+1	2.3901+6	1.1879+6	9.8853+5	2.1333+5	3.9188+2	2.2470+4	9.0840+0	1.1058–1	2.2461+4
8.0000+4	1.2190–5	1.8229+4	2.3248+1	2.3902+6	1.1877+6	9.8853+5	2.1359+5	3.9616+2	2.9995+4	9.1771+0	1.1072–1	2.9986+4
1.0000+5	1.2191–5	1.8229+4	2.3843+1	2.3901+6	1.1875+6	9.8853+5	2.1366+5	3.9948+2	3.7533+4	9.2702+0	1.1075–1	3.7524+4


July 4 1991
Atomic Weight 79 909
EEDL Evaluated Electron
Cross Sections
35-Br
Density 7 5900- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
35-Br


July 4, 1991
Atomic Weight 79 909
EEDL Evaluated Electron
Energy Deposition
35-Br
Density 7 5900- 3 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
35-Br


July 4 1991
Atomic Weight 79 909
EEDL Evaluated Electron
Shell Cross Sections
35-Br
Density 7 5900- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
35-Br


July 4, 1991
Atomic Weight 79 909
EEDL Evaluated Electron
Energy Deposition
35-Br
Density 7 5900- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
35-Br

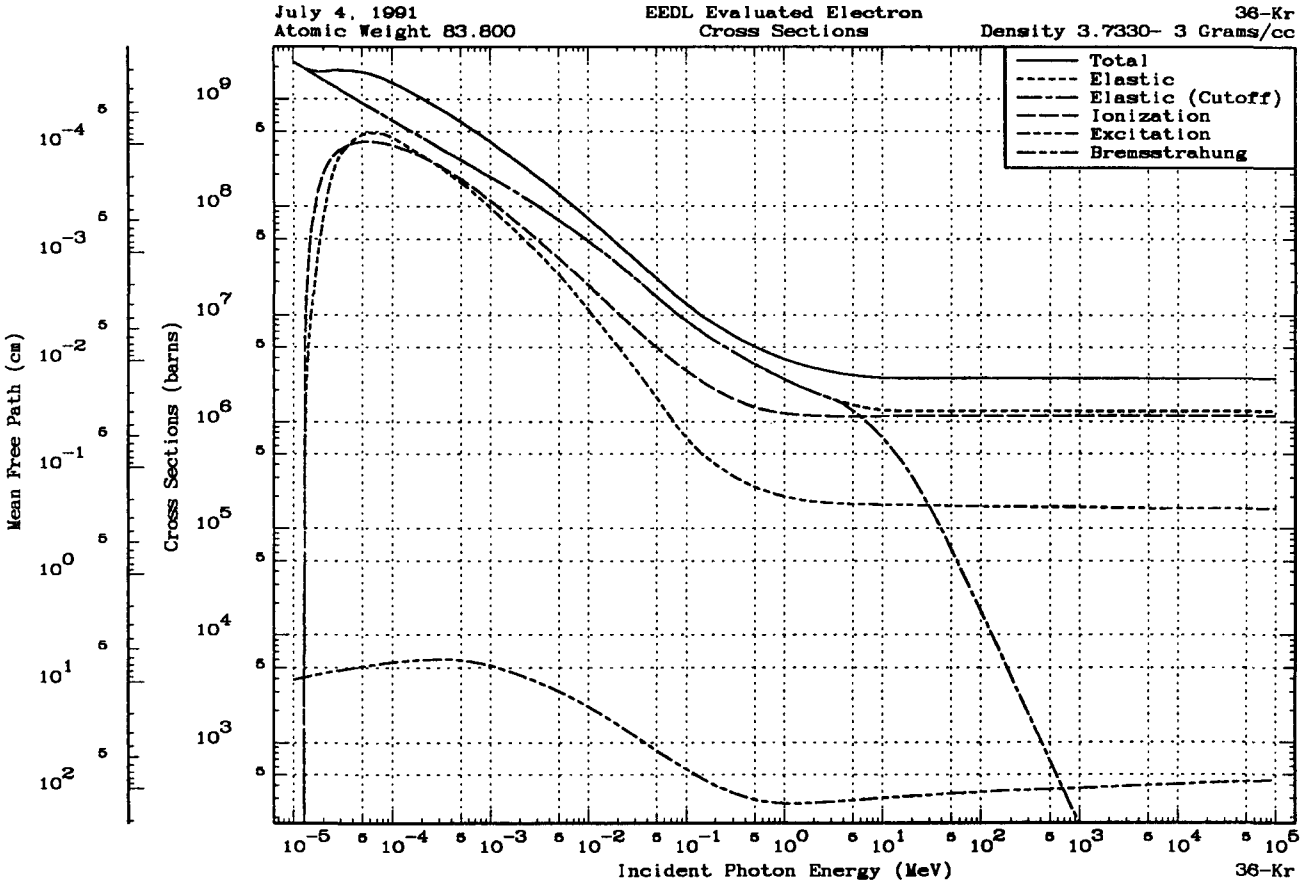
Atomic Weight 79.909 — Density 7.5900– 3 Grams/cc

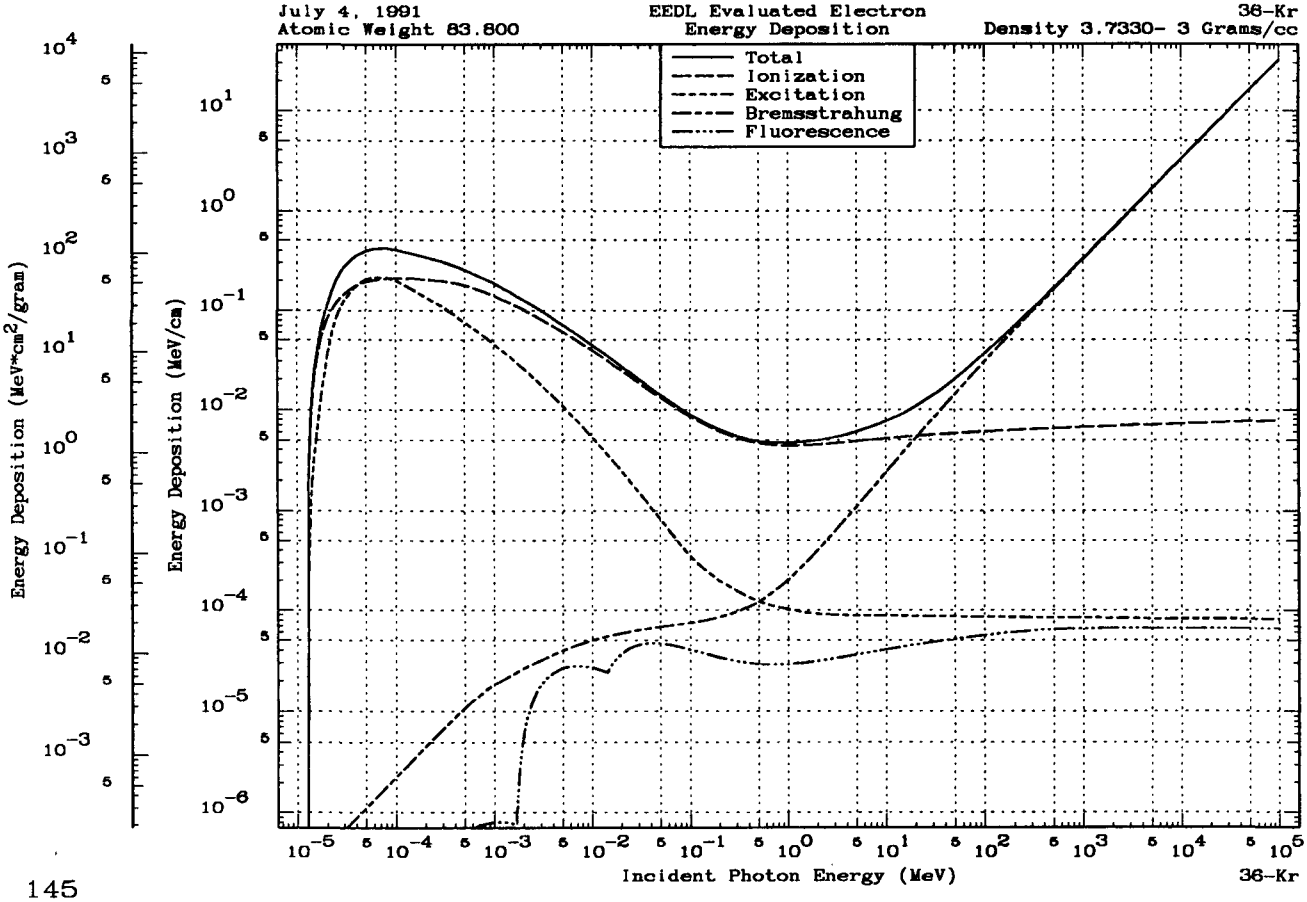
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.4443–6	1.7698+7		2.3484+9	2.3484+9			3.8439+3	4.7417–7			4.7417–7
N3	1.1030–5	7.8571–6	1.6769+7		2.2251+9	2.2251+9	0.0000+0	0.0000+0	3.9183+3	5.2076–7	0.0000+0	0.0000+0	5.2076–7
	1.1278–5	7.9299–6	1.6615+7		2.2046+9	2.1980+9	6.1608+6	4.9988+5	3.9354+3	4.2270–3	3.9090–3	3.1745–4	5.3208–7
N2	1.1590–5	8.0226–6	1.6423+7		2.1792+9	2.1652+9	1.2695+7	1.2491+6	3.9565+3	8.9118–3	8.1115–3	7.9972–4	5.4637–7
	1.1743–5	8.0524–6	1.6362+7		2.1711+9	2.1496+9	1.9630+7	1.8197+6	3.9666+3	1.3794–2	1.2625–2	1.1686–3	5.5340–7
	1.1803–5	8.0684–6	1.6329+7		2.1668+9	2.1436+9	2.1159+7	2.0277+6	3.9706+3	1.4942–2	1.3638–2	1.3038–3	5.5616–7
	1.2016–5	8.1263–6	1.6213+7		2.1514+9	2.1226+9	2.5794+7	2.9622+6	3.9845+3	1.8633–2	1.6720–2	1.9128–3	5.6597–7
	1.2602–5	8.2501–6	1.5970+7		2.1191+9	2.0677+9	4.5732+7	5.6637+6	4.0218+3	3.3837–2	3.0136–2	3.6999–3	5.9313–7
	1.2762–5	8.2811–6	1.5910+7		2.1111+9	2.0534+9	5.1035+7	6.7220+6	4.0318+3	3.8143–2	3.3737–2	4.4051–3	6.0056–7
	1.3372–5	8.3710–6	1.5739+7		2.0884+9	2.0013+9	7.6743+7	1.0413+7	4.0687+3	5.8250–2	5.1345–2	6.9053–3	6.2906–7
	1.5000–5	8.5626–6	1.5387+7		2.0417+9	1.8786+9	1.3727+8	2.5855+7	4.1613+3	1.1266–1	9.4974–2	1.7687–2	7.0617–7
	1.6250–5	8.6578–6	1.5218+7		2.0193+9	1.7976+9	1.7714+8	4.4500+7	4.2270+3	1.5624–1	1.2523–1	3.1018–2	7.6629–7
	1.8125–5	8.7236–6	1.5103+7		2.0041+9	1.6927+9	2.2905+8	8.2262+7	4.3183+3	2.2600–1	1.6706–1	5.8933–2	8.5789–7
	2.0000–5	8.7219–6	1.5106+7		2.0044+9	1.6034+9	2.7117+8	1.2982+8	4.4023+3	2.9865–1	2.0313–1	9.5518–2	9.5108–7
	2.2500–5	8.6545–6	1.5224+7		2.0201+9	1.5028+9	3.1422+8	2.0305+8	4.4909+3	3.9567–1	2.4268–1	1.5299–1	1.0667–6
N1	2.4180–5	8.6229–6	1.5279+7		2.0274+9	1.4444+9	3.3338+8	2.4969+8	4.5460+3	4.5297–1	2.6187–1	1.9110–1	1.1455–6
	2.4544–5	8.6100–6	1.5302+7		2.0305+9	1.4325+9	3.3772+8	2.6021+8	4.5570+3	4.6597–1	2.6638–1	1.9960–1	1.1623–6
	2.5226–5	8.5799–6	1.5356+7		2.0376+9	1.4111+9	3.4582+8	2.8069+8	4.5775+3	4.9106–1	2.7485–1	2.1621–1	1.1939–6
	2.6250–5	8.5554–6	1.5400+7		2.0434+9	1.3805+9	3.5785+8	3.0509+8	4.6073+3	5.2406–1	2.8760–1	2.3646–1	1.2415–6
	2.6419–5	8.5531–6	1.5404+7		2.0440+9	1.3756+9	3.5913+8	3.0922+8	4.6121+3	5.2902–1	2.8910–1	2.3992–1	1.2494–6
	2.8210–5	8.5126–6	1.5477+7		2.0537+9	1.3269+9	3.7211+8	3.5474+8	4.6617+3	5.8263–1	3.0442–1	2.7821–1	1.3334–6
	3.0000–5	8.5046–6	1.5492+7		2.0557+9	1.2827+9	3.8462+8	3.8837+8	4.7087+3	6.2747–1	3.1962–1	3.0785–1	1.4181–6
	3.2500–5	8.5097–6	1.5483+7		2.0544+9	1.2275+9	3.9415+8	4.3279+8	4.7705+3	6.7859–1	3.3312–1	3.4547–1	1.5375–6
	3.5000–5	8.5617–6	1.5389+7		2.0419+9	1.1785+9	4.0309+8	4.6033+8	4.8285+3	7.1632–1	3.4629–1	3.7003–1	1.6583–6
	3.6250–5	8.5834–6	1.5350+7		2.0368+9	1.1560+9	4.0680+8	4.7398+8	4.8562+3	7.3466–1	3.5233–1	3.8232–1	1.7191–6
	4.0000–5	8.6257–6	1.5274+7		2.0268+9	1.0951+9	4.1716+8	5.1447+8	4.9347+3	7.8923–1	3.6995–1	4.1928–1	1.9033–6
	4.5000–5	8.7905–6	1.4988+7		1.9888+9	1.0266+9	4.2091+8	5.4134+8	5.0167+3	8.2684–1	3.8286–1	4.4398–1	2.1371–6
	5.0000–5	8.9832–6	1.4667+7		1.9461+9	9.6884+8	4.2423+8	5.5306+8	5.0912+3	8.5198–1	3.9552–1	4.5646–1	2.3739–6
	6.0000–5	9.3433–6	1.4101+7		1.8711+9	8.7654+8	4.2114+8	5.7344+8	5.2121+3	8.8519–1	4.0966–1	4.7554–1	2.8415–6
	7.0000–5	9.7657–6	1.3491+7		1.7902+9	8.0539+8	4.1181+8	5.7299+8	5.3166+3	8.9286–1	4.1516–1	4.7770–1	3.3179–6
M5	7.8450–5	1.0081–5	1.3069+7		1.7341+9	7.5653+8	4.0495+8	5.7266+8	5.3952+3	8.9984–1	4.2027–1	4.7956–1	3.7267–6
M4	7.9590–5	1.0121–5	1.3017+7		1.7273+9	7.5056+8	4.0415+8	5.7255+8	5.4052+3	9.0104–1	4.2125–1	4.7978–1	3.7822–6
	8.0000–5	1.0136–5	1.2999+7		1.7248+9	7.4845+8	4.0388+8	5.7250+8	5.4088+3	9.0153–1	4.2167–1	4.7986–1	3.8022–6
	8.2500–5	1.0248–5	1.2856+7		1.7059+9	7.3591+8	4.0102+8	5.6900+8	5.4264+3	8.9960–1	4.2236–1	4.7723–1	3.9195–6
	8.6875–5	1.0439–5	1.2621+7		1.6747+9	7.1532+8	3.9627+8	5.6316+8	5.4560+3	8.9658–1	4.2370–1	4.7288–1	4.1256–6
	9.3438–5	1.0712–5	1.2299+7		1.6320+9	6.8728+8	3.8970+8	5.5503+8	5.4981+3	8.9290–1	4.2603–1	4.6686–1	4.4365–6
	1.0000–4	1.0972–5	1.2008+7	0.0000+0	1.5934+9	6.6213+8	3.8372+8	5.4756+8	5.5376+3	8.9008–1	4.2871–1	4.6137–1	4.7495–6
	1.1250–4	1.1549–5	1.1409+7	1.4215–5	1.5138+9	6.2086+8	3.6881+8	5.2415+8	5.5922+3	8.6876–1	4.2618–1	4.4258–1	5.3280–6
	1.2500–4	1.2088–5	1.0900+7	2.8742–5	1.4463+9	5.8613+8	3.5612+8	5.0405+8	5.6416+3	8.5212–1	4.2560–1	4.2651–1	5.9114–6
	1.3125–4	1.2345–5	1.0672+7	3.6108–5	1.4161+9	5.7071+8	3.5039+8	4.9501+8	5.6646+3	8.4510–1	4.2580–1	4.1930–1	6.2048–6
	1.5000–4	1.3077–5	1.0075+7	5.8521–5	1.3369+9	5.3055+8	3.3523+8	4.7109+8	5.7280+3	8.2805–1	4.2775–1	4.0029–1	7.0911–6
	1.7500–4	1.4138–5	9.3188+6	8.9352–5	1.2365+9	4.8769+8	3.1396+8	4.3487+8	5.8021+3	7.9393–1	4.2345–1	3.7048–1	8.2861–6
M3	1.8478–4	1.4533–5	9.0660+6	1.0176–4	1.2030+9	4.7342+8	3.0678+8	4.2277+8	5.8285+3	7.8300–1	4.2246–1	3.6053–1	8.7573–6
	1.8859–4	1.4683–5	8.9731+6	1.0663–4	1.1907+9	4.6817+8	3.0417+8	4.1831+8	5.8300+3	7.7928–1	4.2239–1	3.5689–1	8.9284–6
M2	1.9182–4	1.4810–5	8.8964+6	1.1079–4	1.1805+9	4.6384+8	3.0201+8	4.1463+8	5.8312+3	7.7626–1	4.2238–1	3.5387–1	9.0739–6
	1.9429–4	1.4911–5	8.8360+6	1.1398–4	1.1725+9	4.6061+8	3.0040+8	4.1145+8	5.8321+3	7.7379–1	4.2251–1	3.5127–1	9.1850–6
	1.9591–4	1.4977–5	8.7971+6	1.1607–4	1.1673+9	4.5852+8	2.9937+8	4.0940+8	5.8326+3	7.7220–1	4.2259–1	3.4959–1	9.2577–6
	2.0000–4	1.5142–5	8.7010+6	1.2138–4	1.1546+9	4.5338+8	2.9682+8	4.0436+8	5.8340+3	7.6835–1	4.2288–1	3.4545–1	9.4415–6
	2.0625–4	1.5412–5	8.5484+6	1.2956–4	1.1343+9	4.4582+8	2.9242+8	3.9606+8	5.8360+3	7.5999–1	4.2145–1	3.3853–1	9.7225–6
	2.1250–4	1.5679–5	8.4031+6	1.3782–4	1.1150+9	4.3861+8	2.8824+8	3.8817+8	5.8380+3	7.5226–1	4.2030–1	3.3195–1	1.0004–5
	2.1797–4	1.5909–5	8.2815+6	1.4513–4	1.0989+9	4.3256+8	2.8474+8	3.8158+8	5.8397+3	7.4590–1	4.1943–1	3.2646–1	1.0250–5
	2.2500–4	1.6201–5	8.1322+6	1.5460–4	1.0791+9	4.2512+8	2.8045+8	3.7350+8	5.8418+3	7.3830–1	4.1857–1	3.1972–1	1.0566–5
	2.3438–4	1.6585–5	7.9439+6	1.6738–4	1.0541+9	4.1574+8	2.7498+8	3.6337+8	5.8445+3	7.2856–1	4.1727–1	3.1128–1	1.0988–5
	2.3848–4	1.6751–5	7.8653+6	1.7303–4	1.0437+9	4.1182+8	2.7269+8	3.5915+8	5.8456+3	7.2456–1	4.1679–1	3.0776–1	1.1173–5
M1	2.5149–4	1.7269–5	7.6295+6	1.9113–4	1.0124+9	4.0004+8	2.6582+8	3.4652+8	5.8491+3	7.1295–1	4.1570–1	2.9724–1	1.1759–5
	2.5452–4	1.7390–5	7.5765+6	1.9540–4	1.0053+9	3.9742+8	2.6415+8	3.4376+8	5.8499+3	7.0993–1	4.1498–1	2.9494–1	1.1896–5
	2.6021–4	1.7614–5	7.4798+6	2.0343–4	9.9251+8	3.9266+8	2.6109+8	3.3875+8	5.8514+3	7.0450–1	4.1375–1	2.9074–1	1.2152–5
	2.6719–4	1.7888–5	7.3655+6	2.1339–4	9.7735+8	3.8702+8	2.5749+8	3.3284+8	5.8531+3	6.9821–1	4.1242–1	2.8578–1	1.2467–5
	2.6924–4	1.7967–5	7.3329+6	2.1633–4	9.7302+8	3.8540+8	2.5646+8	3.3115+8	5.8537+3	6.9643–1	4.1205–1	2.8437–1	1.2559–5
	2.7016–4	1.8003–5	7.3184+6	2.1764–4	9.7110+8	3.8469+8	2.5600+8	3.3040+8	5.8539+3	6.9564–1	4.1189–1	2.8374–1	1.2600–5
	2.8508–4	1.8573–5	7.0936+6	2.3928–4	9.4126+8	3.7355+8	2.4891+8	3.1879+8	5.8574+3	6.8366–1	4.0961–1	2.7403–1	1.3274–5
	3.0000–4	1.9131–5	6.8870+6	2.6128–4	9.1385+8	3.6328+8	2.4240+8	3.0816+8	5.8608+3	6.7321–1	4.0807–1	2.6513–1	1.3947–5
	3.2500–4	2.0073–5	6.5637+6	2.9899–4	8.7095+8	3.4783+8	2.3155+8	2.9156+8	5.8586+3	6.5282–1	4.0166–1	2.5115–1	1.5058–5
	3.5000–4	2.0984–5	6.2786+6	3.3779–4	8.3312+8	3.3411+8	2.2201+8	2.7700+8	5.8565+3	6.3573–1	3.9684–1	2.3888–1	1.6168–5
	3.6250–4	2.1431–5	6.1476+6	3.5758–4	8.1574+8	3.2780+8	2.1757+8	2.7036+8	5.8555+3	6.2762–1	3.9431–1	2.3329–1	1.6723–5
	4.0000–4	2.2735–5	5.7952+6	4.1835–4	7.6898+8	3.1074+8	2.0567+8	2.5257+8	5.8527+3	6.0666–1	3.8833–1	2.1832–1	1.8388–5
	4.5000–4	2.4516–5	5.3742+6	5.0290–4	7.1311+8	2.9152+8	1.9125+8	2.3034+8	5.7854+3	5.7642–1	3.7696–1	1.9944–1	2.0392–5
	5.0000–4	2.6221–5	5.0247+6	5.9150–4	6.6673+8	2.7533+8	1.7928+8	2.1212+8	5.7259+3	5.5243–1	3.6842–1	1.8398–1	2.2375–5
	6.0000–4	2.9609–5	4.4497+6	7.8023–4	5.9044+8	2.4941+8	1.5933+8	1.8169+8	5.6244+3	5.0786–1	3.4982–1	1.5802–1	2.6286–5
	7.0000–4	3.2892–5	4.0056+6	9.8492–4	5.3151+8	2.2941+8	1.4348+8	1.5862+8	5.4788+3	4.6974–1	3.3148–1	1.3823–1	2.9569–5
	8.0000–4	3.6011–5	3.6586+6	1.2046–3	4.8547+8	2.1338+8	1.3107+8	1.4102+8	5.3557+3	4.4091–1	3.1774–1	1.2313–1	3.2780–5
	1.0000–3	4.1910–5	3.1437+6	1.6845–3	4.1714+8	1.8906+8	1.1194+8	1.1613+8	5.0939+3	3.9350–1	2.9175–1	1.0171–1	3.8126–5
	1.2500–3	4.9010–5	2.6883+6	2.3611–3	3.5672+8	1.6747+8	9.4923+7	9.4320+7	4.7729+3	3.4651–1	2.6363–1	8.2831–2	4.2739–5
	1.5000–3	5.5637–5	2.3681+6	3.1185–3	3.1422+8	1.5167+8	8.2977+7	7.9576+7	4.5256+3	3.1420–1	2.4408–1	7.0070–2	4.7178–5
L3	1.5536–3	5.7017–5	2.3108+6	3.2909–3	3.0662+8	1.4880+8	8.0778+7	7.7039+7	4.4781+3	3.0758–1	2.3967–1	6.7862–2	4.8053–5
	1.5815–3	5.7730–5	2.2822+6	3.3821–3	3.0283+8	1.4736+8	7.9687+7	7.5782+7	4.4528+3	3.0435–1	2.3753–1	6.6769–2	4.8467–5
L2	1.6021–3	5.8254–5	2.2617+6	3.4500–3	3.0011+8	1.4632+8	7.8903+7	7.4881+7	4.4345+3	3.0201–1	2.3598–1	6.5986–2	4.8772–5
	1.6338–3	5.9060–5	2.2308+6	3.5556–3	2.9601+8	1.4474+8	7.7730+7	7.3539+7	4.4069+3	2.9858–1	2.3371–1	6.4820–2	4.9240–5
	1.6518–3	5.9516–5	2.2137+6	3.6162–3	2.9374+8	1.4386+8	7.7080+7	7.2799+7	4.3916+3	2.9667–1	2.3244–1	6.4176–2	4.9505–5
	1.7254–3	6.1358–5	2.1473+6	3.8671–3	2.8492+8	1.4043+8	7.4558+7	6.9931+7	4.3311+3	2.8930–1	2.2757–1	6.1685–2	5.0580–5

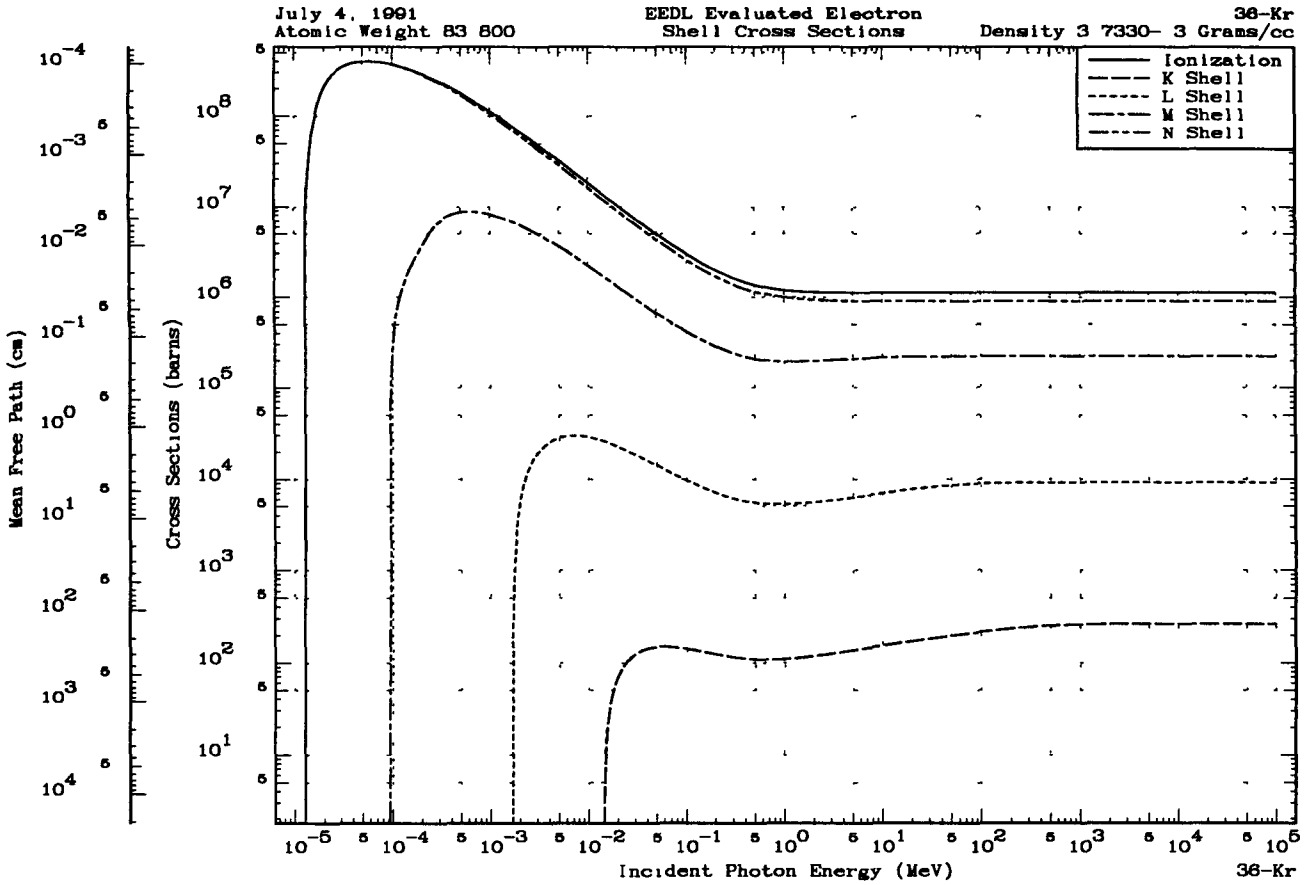
Atomic Weight 79.909 Density 7.5900– 3 Grams/cc

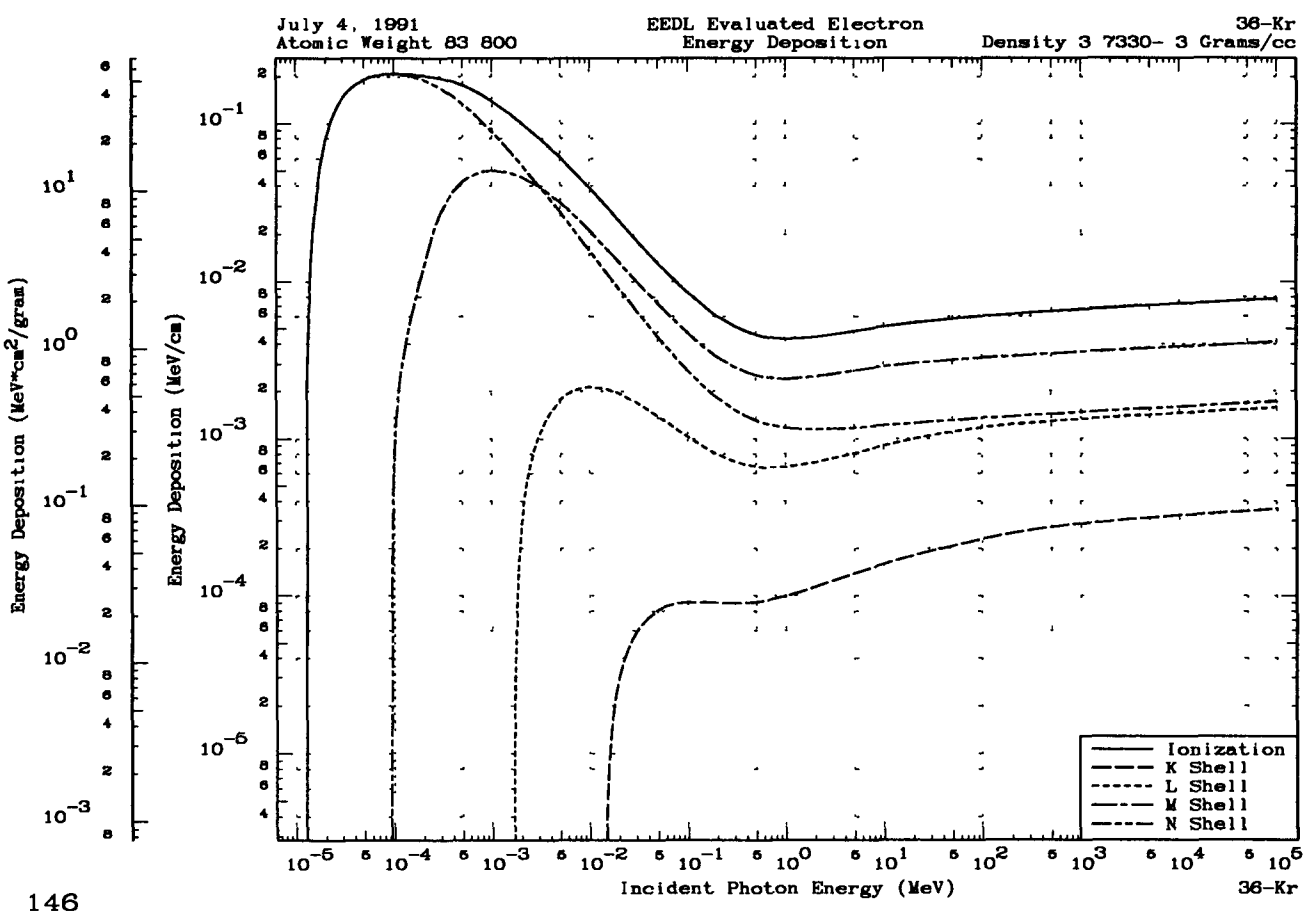
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.7389–3	6.1694–5	2.1356+6	3.9140–3	2.8337+8	1.3982+8	7.4115+7	6.9430+7	4.3204+3	2.8801–1	2.2671–1	6.1249–2	5.0776–5
L1 1.7692–3	6.2444–5	2.1099+6	4.0198–3	2.7997+8	1.3849+8	7.3143+7	6.8331+7	4.2967+3	2.8517–1	2.2483–1	6.0295–2	5.1216–5
1.8269–3	6.3865–5	2.0630+6	4.2240–3	2.7374+8	1.3605+8	7.1359+7	6.6329+7	4.2530+3	2.7998–1	2.2138–1	5.8551–2	5.2050–5
1.8627–3	6.4739–5	2.0351+6	4.3525–3	2.7005+8	1.3459+8	7.0302+7	6.5147+7	4.2269+3	2.7693–1	2.1935–1	5.7522–2	5.2563–5
1.8694–3	6.4903–5	2.0300+6	4.3769–3	2.6936+8	1.3432+8	7.0106+7	6.4929+7	4.2220+3	2.7636–1	2.1898–1	5.7332–2	5.2660–5
1.9134–3	6.5968–5	1.9972+6	4.5372–3	2.6501+8	1.3260+8	6.8863+7	6.3544+7	4.1908+3	2.7276–1	2.1658–1	5.6126–2	5.3289–5
2.0000–3	6.8040–5	1.9364+6	4.8584–3	2.5695+8	1.2939+8	6.6561+7	6.0991+7	4.1322+3	2.6615–1	2.1219–1	5.3903–2	5.4517–5
2.2500–3	7.4210–5	1.7754+6	5.8338–3	2.3558+8	1.2082+8	6.0654+7	5.4104+7	3.9618+3	2.4674–1	1.9881–1	4.7877–2	5.7388–5
2.4375–3	7.8700–5	1.6741+6	6.6129–3	2.2214+8	1.1532+8	5.6944+7	4.9873+7	3.8500+3	2.3467–1	1.9044–1	4.4175–2	5.9500–5
2.7187–3	8.5236–5	1.5457+6	7.8517–3	2.0511+8	1.0822+8	5.2251+7	4.4629+7	3.7026+3	2.1956–1	1.7991–1	3.9587–2	6.2603–5
3.0000–3	9.1563–5	1.4389+6	9.1703–3	1.9093+8	1.0220+8	4.8356+7	4.0377+7	3.5746+3	2.0716–1	1.7123–1	3.5866–2	6.5634–5
3.5000–3	1.0274–4	1.2824+6	1.1709–2	1.7017+8	9.3088+7	4.2701+7	3.4373+7	3.3624+3	1.8714–1	1.5648–1	3.0588–2	6.9947–5
4.0000–3	1.1345–4	1.1613+6	1.4496–2	1.5410+8	8.5856+7	3.8343+7	2.9899+7	3.1889+3	1.7186–1	1.4514–1	2.6654–2	7.4120–5
4.5000–3	1.2416–4	1.0612+6	1.7523–2	1.4081+8	7.9659+7	3.4823+7	2.6324+7	3.0314+3	1.5864–1	1.3507–1	2.3499–2	7.7519–5
5.0000–3	1.3454–4	9.7924+5	2.0786–2	1.2994+8	7.4496+7	3.1950+7	2.3489+7	2.8972+3	1.4796–1	1.2688–1	2.0998–2	8.0833–5
6.0000–3	1.5479–4	8.5115+5	2.7974–2	1.1294+8	6.6146+7	2.7492+7	1.9299+7	2.6694+3	1.3065–1	1.1327–1	1.7292–2	8.6354–5
7.0000–3	1.7450–4	7.5505+5	3.6053–2	1.0019+8	5.9754+7	2.4186+7	1.6246+7	2.4791+3	1.1716–1	1.0249–1	1.4582–2	9.0781–5
8.0000–3	1.9347–4	6.8099+5	4.4986–2	9.0362+7	5.4718+7	2.1647+7	1.3994+7	2.3253+3	1.0689–1	9.4210–2	1.2583–2	9.5075–5
1.0000–2	2.3044–4	5.7175+5	6.5222–2	7.5867+7	4.7039+7	1.7965+7	1.0862+7	2.0712+3	9.1187–2	8.1292–2	9.7939–3	1.0160–4
K 1.3435–2	2.9068–4	4.5326+5	1.0703–1	6.0144+7	3.8339+7	1.4028+7	7.7758+6	1.7594+3	7.3747–2	6.6600–2	7.0373–3	1.0954–4
1.3631–2	2.9402–4	4.4810+5	1.0970–1	5.9460+7	3.7949+7	1.3859+7	7.6494+6	1.7450+3	7.2982–2	6.5948–2	6.9243–3	1.0990–4
1.3973–2	2.9985–4	4.3939+5	1.1443–1	5.8303+7	3.7290+7	1.3574+7	7.4372+6	1.7204+3	7.1691–2	6.4846–2	6.7345–3	1.1054–4
1.4487–2	3.0854–4	4.2702+5	1.2169–1	5.6662+7	3.6351+7	1.3170+7	7.1390+6	1.6853+3	6.9862–2	6.3283–2	6.4678–3	1.1148–4
1.5000–2	3.1715–4	4.1542+5	1.2913–1	5.5124+7	3.5467+7	1.2792+7	6.8625+6	1.6521+3	6.8152–2	6.1819–2	6.2205–3	1.1243–4
1.6250–2	3.3823–4	3.8954+5	1.4801–1	5.1689+7	3.3455+7	1.1964+7	6.2672+6	1.5758+3	6.4285–2	5.8485–2	5.6863–3	1.1413–4
1.7188–2	3.5380–4	3.7239+5	1.6289–1	4.9413+7	3.2114+7	1.1417+7	5.8811+6	1.5245+3	6.1731–2	5.6276–2	5.3398–3	1.1541–4
1.8594–2	3.7682–4	3.4964+5	1.8632–1	4.6395+7	3.0324+7	1.0691+7	5.3795+6	1.4553+3	5.8354–2	5.3347–2	4.8896–3	1.1733–4
2.0000–2	3.9946–4	3.2983+5	2.1104–1	4.3766+7	2.8753+7	1.0059+7	4.9527+6	1.3939+3	5.5423–2	5.0798–2	4.5065–3	1.1924–4
2.2500–2	4.3952–4	2.9976+5	2.5812–1	3.9776+7	2.6329+7	9.1261+6	4.3199+6	1.2972+3	5.0849–2	4.6792–2	3.9362–3	1.2132–4
2.6250–2	4.9792–4	2.6460+5	3.3603–1	3.5111+7	2.3463+7	8.0348+6	3.6122+6	1.1807+3	4.5518–2	4.2095–2	3.2982–3	1.2455–4
3.0000–2	5.5458–4	2.3757+5	4.2235–1	3.1524+7	2.1233+7	7.1957+6	3.0936+6	1.0883+3	4.1434–2	3.8476–2	2.8305–3	1.2782–4
3.5000–2	6.2691–4	2.1016+5	5.4975–1	2.7887+7	1.8948+7	6.3513+6	2.5865+6	9.8932+2	3.7136–2	3.4634–2	2.3714–3	1.3051–4
4.0000–2	6.9695–4	1.8904+5	6.9076–1	2.5084+7	1.7168+7	5.7006+6	2.2149+6	9.1092+2	3.3833–2	3.1665–2	2.0350–3	1.3335–4
5.0000–2	8.3004–4	1.5873+5	1.0096+0	2.1062+7	1.4567+7	4.7792+6	1.7154+6	7.9437+2	2.9021–2	2.7303–2	1.5810–3	1.3742–4
6.0000–2	9.5383–4	1.3813+5	1.3753+0	1.8329+7	1.2737+7	4.1525+6	1.4383+6	7.1691+2	2.5731–2	2.4261–2	1.3290–3	1.4094–4
8.0000–2	1.1831–3	1.1136+5	2.2248+0	1.4776+7	1.0297+7	3.3553+6	1.1236+6	6.0787+2	2.1483–2	2.0294–2	1.0424–3	1.4646–4
1.0000–1	1.3913–3	9.4698+4	3.2186+0	1.2566+7	8.7475+6	2.8685+6	9.4914+5	5.3633+2	1.8824–2	1.7790–2	8.8334–4	1.5103–4
1.5000–1	1.8230–3	7.2271+4	6.1730+0	9.5898+6	6.6658+6	2.2102+6	7.1341+5	4.3102+2	1.5156–2	1.4327–2	6.6781–4	1.6125–4
2.0000–1	2.1617–3	6.0949+4	9.6935+0	8.0874+6	5.6111+6	1.8789+6	5.9702+5	3.7464+2	1.3290–2	1.2557–2	5.6119–4	1.7151–4
3.0000–1	2.6856–3	4.9059+4	1.7794+1	6.5097+6	4.4814+6	1.5500+6	4.7799+5	3.1804+2	1.1447–2	1.0801–2	4.5198–4	1.9377–4
4.0000–1	3.0978–3	4.2531+4	2.6874+1	5.6435+6	3.8405+6	1.3902+6	4.1260+5	2.9094+2	1.0589–2	9.9784–3	3.9183–4	2.1846–4
5.0000–1	3.4347–3	3.8359+4	3.6524+1	5.0899+6	3.4185+6	1.2974+6	3.7376+5	2.7574+2	1.0142–2	9.5407–3	3.5616–4	2.4487–4
6.0000–1	3.7152–3	3.5463+4	4.6511+1	4.7057+6	3.1202+6	1.2381+6	3.4709+5	2.6705+2	9.8848–3	9.2794–3	3.3169–4	2.7370–4
8.0000–1	4.1706–3	3.1590+4	6.6952+1	4.1918+6	2.7136+6	1.1691+6	3.0884+5	2.5876+2	9.6847–3	9.0513–3	2.9645–4	3.3690–4
1.0000+0	4.5200–3	2.9149+4	8.7634+1	3.8678+6	2.4477+6	1.1317+6	2.8812+5	2.5556+2	9.6557–3	8.9737–3	2.7755–4	4.0447–4
1.5000+0	5.1331–3	2.5667+4	1.3873+2	3.4058+6	2.0592+6	1.0920+6	2.5442+5	2.5569+2	9.9161–3	9.0786–3	2.4667–4	5.9092–4
2.0000+0	5.5334–3	2.3810+4	1.8837+2	3.1594+6	1.8418+6	1.0793+6	2.3808+5	2.5881+2	1.0230–2	9.2059–3	2.3162–4	7.9284–4
3.0000+0	6.0404–3	2.1812+4	2.8275+2	2.8943+6	1.6070+6	1.0663+6	2.2076+5	2.6542+2	1.0970–2	9.5211–3	2.1630–4	1.2326–3
4.0000+0	6.3394–3	2.0783+4	3.7103+2	2.7578+6	1.4792+6	1.0667+6	2.1157+5	2.7002+2	1.1691–2	9.7773–3	2.0769–4	1.7062–3
5.0000+0	6.5400–3	2.0146+4	4.5411+2	2.6732+6	1.4011+6	1.0672+6	2.0460+5	2.7363+2	1.2390–2	1.0001–2	2.0125–4	2.1874–3
6.0000+0	6.6781–3	1.9729+4	5.3272+2	2.6179+6	1.3506+6	1.0668+6	2.0012+5	2.7674+2	1.3058–2	1.0162–2	1.9723–4	2.6982–3
8.0000+0	6.8582–3	1.9211+4	6.7867+2	2.5491+6	1.2878+6	1.0665+6	1.9451+5	2.8172+2	1.4371–2	1.0442–2	1.9246–4	3.7362–3
1.0000+1	6.9575–3	1.8937+4	8.1191+2	2.5128+6	1.2543+6	1.0682+6	1.9008+5	2.8578+2	1.5669–2	1.0676–2	1.8883–4	4.8042–3
1.5000+1	7.0280–3	1.8747+4	1.1034+3	2.4876+6	1.2307+6	1.0698+6	1.8674+5	2.9358+2	1.8733–2	1.0983–2	1.8565–4	7.5639–3
2.0000+1	7.0364–3	1.8724+4	1.3502+3	2.4846+6	1.2285+6	1.0709+6	1.8485+5	2.9790+2	2.1859–2	1.1239–2	1.8391–4	1.0436–2
3.0000+1	7.0416–3	1.8711+4	1.7526+3	2.4827+6	1.2282+6	1.0721+6	1.8213+5	3.0430+2	2.8102–2	1.1586–2	1.8148–4	1.6334–2
4.0000+1	7.0440–3	1.8704+4	2.0740+3	2.4819+6	1.2280+6	1.0727+6	1.8096+5	3.0907+2	3.4348–2	1.1786–2	1.8060–4	2.2382–2
5.0000+1	7.0440–3	1.8704+4	2.3412+3	2.4819+6	1.2278+6	1.0730+6	1.8081+5	3.1257+2	4.0673–2	1.1944–2	1.8072–4	2.8548–2
6.0000+1	7.0443–3	1.8703+4	2.5696+3	2.4818+6	1.2277+6	1.0732+6	1.8063+5	3.1564+2	4.7023–2	1.2062–2	1.8083–4	3.4780–2
8.0000+1	7.0437–3	1.8705+4	2.9457+3	2.4820+6	1.2274+6	1.0735+6	1.8075+5	3.2055+2	5.9870–2	1.2280–2	1.8099–4	4.7410–2
1.0000+2	7.0426–3	1.8708+4	3.2480+3	2.4824+6	1.2272+6	1.0737+6	1.8110+5	3.2421+2	7.2847–2	1.2451–2	1.8139–4	6.0215–2
1.5000+2	7.0405–3	1.8714+4	3.8153+3	2.4831+6	1.2269+6	1.0738+6	1.8207+5	3.3083+2	1.0544–1	1.2620–2	1.8237–4	9.2634–2
2.0000+2	7.0390–3	1.8718+4	4.2284+3	2.4837+6	1.2267+6	1.0739+6	1.8276+5	3.3495+2	1.3812–1	1.2780–2	1.8306–4	1.2515–1
3.0000+2	7.0385–3	1.8719+4	4.8209+3	2.4839+6	1.2264+6	1.0740+6	1.8316+5	3.3969+2	2.0367–1	1.3060–2	1.8347–4	1.9043–1
4.0000+2	7.0384–3	1.8719+4	5.2463+3	2.4839+6	1.2262+6	1.0740+6	1.8339+5	3.4256+2	2.6949–1	1.3212–2	1.8371–4	2.5610–1
5.0000+2	7.0383–3	1.8719+4	5.5786+3	2.4839+6	1.2260+6	1.0740+6	1.8357+5	3.4483+2	3.3476–1	1.3310–2	1.8390–4	3.2127–1
6.0000+2	7.0405–3	1.8713+4	5.8514+3	2.4831+6	1.2259+6	1.0740+6	1.8292+5	3.4671+2	4.0039–1	1.3406–2	1.8326–4	3.8680–1
8.0000+2	7.0446–3	1.8703+4	6.2835+3	2.4817+6	1.2256+6	1.0740+6	1.8170+5	3.5022+2	5.3151–1	1.3587–2	1.8206–4	5.1774–1
1.0000+3	7.0477–3	1.8694+4	6.6195+3	2.4806+6	1.2255+6	1.0740+6	1.8077+5	3.5296+2	6.6374–1	1.3739–2	1.8114–4	6.4983–1
1.5000+3	7.0544–3	1.8677+4	7.2309+3	2.4783+6	1.2251+6	1.0740+6	1.7872+5	3.5826+2	9.9413–1	1.3875–2	1.7909–4	9.8007–1
2.0000+3	7.0574–3	1.8669+4	7.6653+3	2.4772+6	1.2249+6	1.0740+6	1.7787+5	3.6224+2	1.3235+0	1.4011–2	1.7824–4	1.3093+0
3.0000+3	7.0594–3	1.8663+4	8.2780+3	2.4765+6	1.2246+6	1.0740+6	1.7747+5	3.6811+2	1.9854+0	1.4281–2	1.7783–4	1.9710+0
4.0000+3	7.0614–3	1.8658+4	8.7127+3	2.4758+6	1.2244+6	1.0740+6	1.7701+5	3.7246+2	2.6470+0	1.4412–2	1.7738–4	2.6324+0
5.0000+3	7.0653–3	1.8648+4	9.0496+3	2.4744+6	1.2242+6	1.0740+6	1.7581+5	3.7589+2	3.3134+0	1.4498–2	1.7618–4	3.2987+0
6.0000+3	7.0647–3	1.8649+4	9.3250+3	2.4746+6	1.2241+6	1.0740+6	1.7615+5	3.7840+2	3.9692+0	1.4584–2	1.7652–4	3.9545+0
8.0000+3	7.0650–3	1.8649+4	9.7599+3	2.4745+6	1.2239+6	1.0740+6	1.7627+5	3.8241+2	5.2920+0	1.4756–2	1.7663–4	5.2770+0
1.0000+4	7.0653–3	1.8648+4	1.0097+4	2.4744+6	1.2237+6	1.0740+6	1.7632+5	3.8554+2	6.6266+0	1.4922–2	1.7669–4	6.6115+0
1.5000+4	7.0659–3	1.8646+4	1.0710+4	2.4742+6	1.2234+6	1.0740+6	1.7644+5	3.9177+2	9.8943+0	1.5045–2	1.7681–4	9.8790+0
2.0000+4	7.0670–3	1.8643+4	1.1146+4	2.4738+6	1.2232+6	1.0740+6	1.7627+5	3.9625+2	1.3204+1	1.5167–2	1.7663–4	1.3189+1
3.0000+4	7.0672–3	1.8643+4	1.1761+4	2.4738+6	1.2228+6	1.0740+6	1.7650+5	4.0254+2	1.9757+1	1.5412–2	1.7686–4	1.9742+1

Atomic Weight 79.909												Density 7.5900– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+4	7.0683–3	1.8640+4	1.2198+4	2.4734+6	1.2226+6	1.0740+6	1.7632+5	4.0706+2	2.6382+1	1.5580–2	1.7669–4	2.6366+1
5.0000+4	7.0716–3	1.8631+4	1.2536+4	2.4722+6	1.2224+6	1.0740+6	1.7535+5	4.1053+2	3.2944+1	1.5699–2	1.7572–4	3.2928+1
6.0000+4	7.0707–3	1.8634+4	1.2813+4	2.4725+6	1.2223+6	1.0740+6	1.7581+5	4.1337+2	3.9501+1	1.5778–2	1.7618–4	3.9486+1
8.0000+4	7.0708–3	1.8633+4	1.3250+4	2.4725+6	1.2221+6	1.0740+6	1.7598+5	4.1788+2	5.2730+1	1.5938–2	1.7635–4	5.2714+1
1.0000+5	7.0710–3	1.8633+4	1.3588+4	2.4724+6	1.2219+6	1.0740+6	1.7610+5	4.2138+2	6.5983+1	1.6098–2	1.7646–4	6.5967+1


July 4, 1991
Atomic Weight 83.800
EEDL Evaluated Electron
Cross Sections
36-Kr
Density 3.7330- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
36-Kr


July 4, 1991
Atomic Weight 83.800
EEDL Evaluated Electron
Energy Deposition
36-Kr
Density 3.7330- 3 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
36-Kr


July 4, 1991
Atomic Weight 83 800
EEDL Evaluated Electron
Shell Cross Sections
36-Kr
Density 3 7330- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
36-Kr


July 4, 1991
Atomic Weight 83 800
EEDL Evaluated Electron
Energy Deposition
36-Kr
Density 3 7330- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
36-Kr

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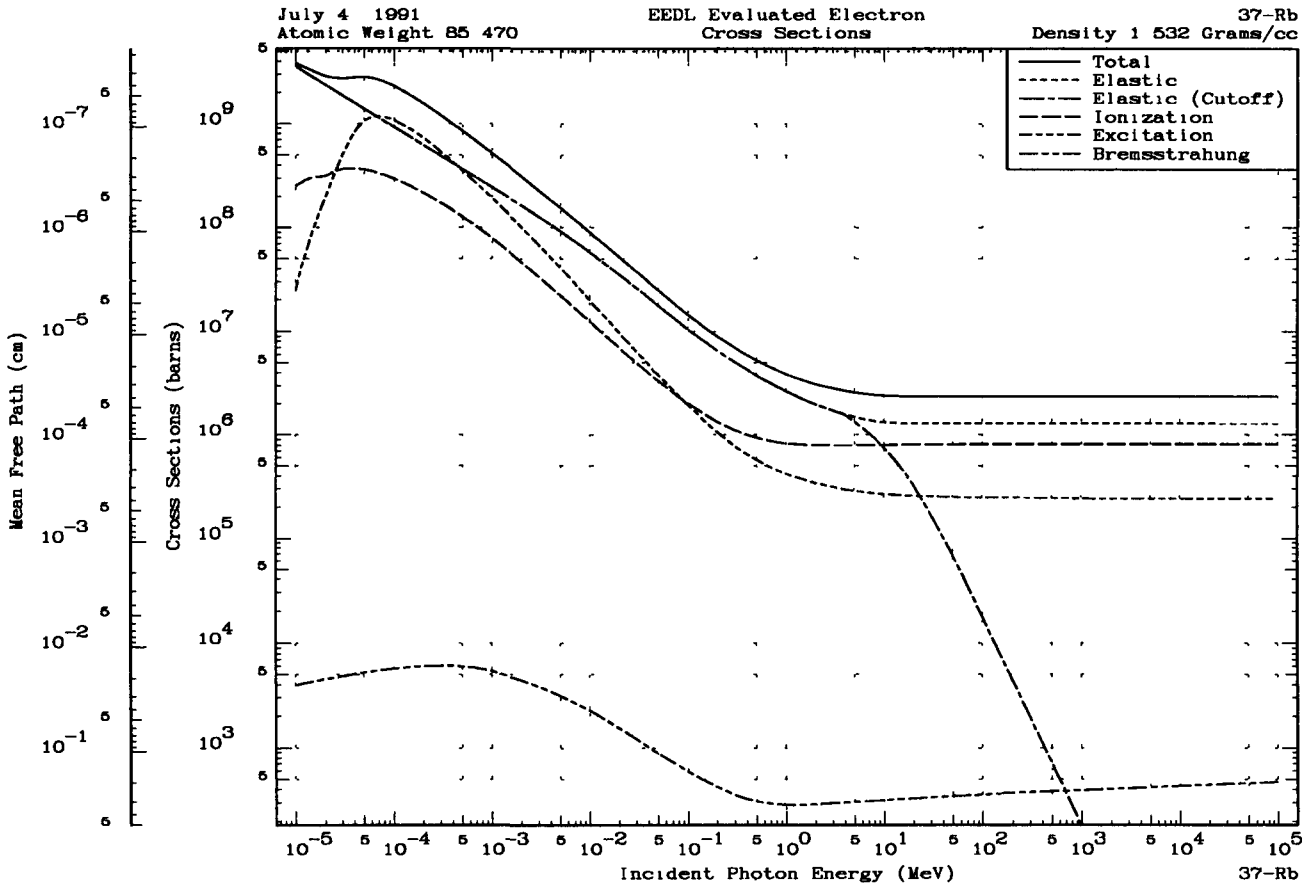
Atomic Weight 83.800 Density 3.7330– 3 Grams/cc

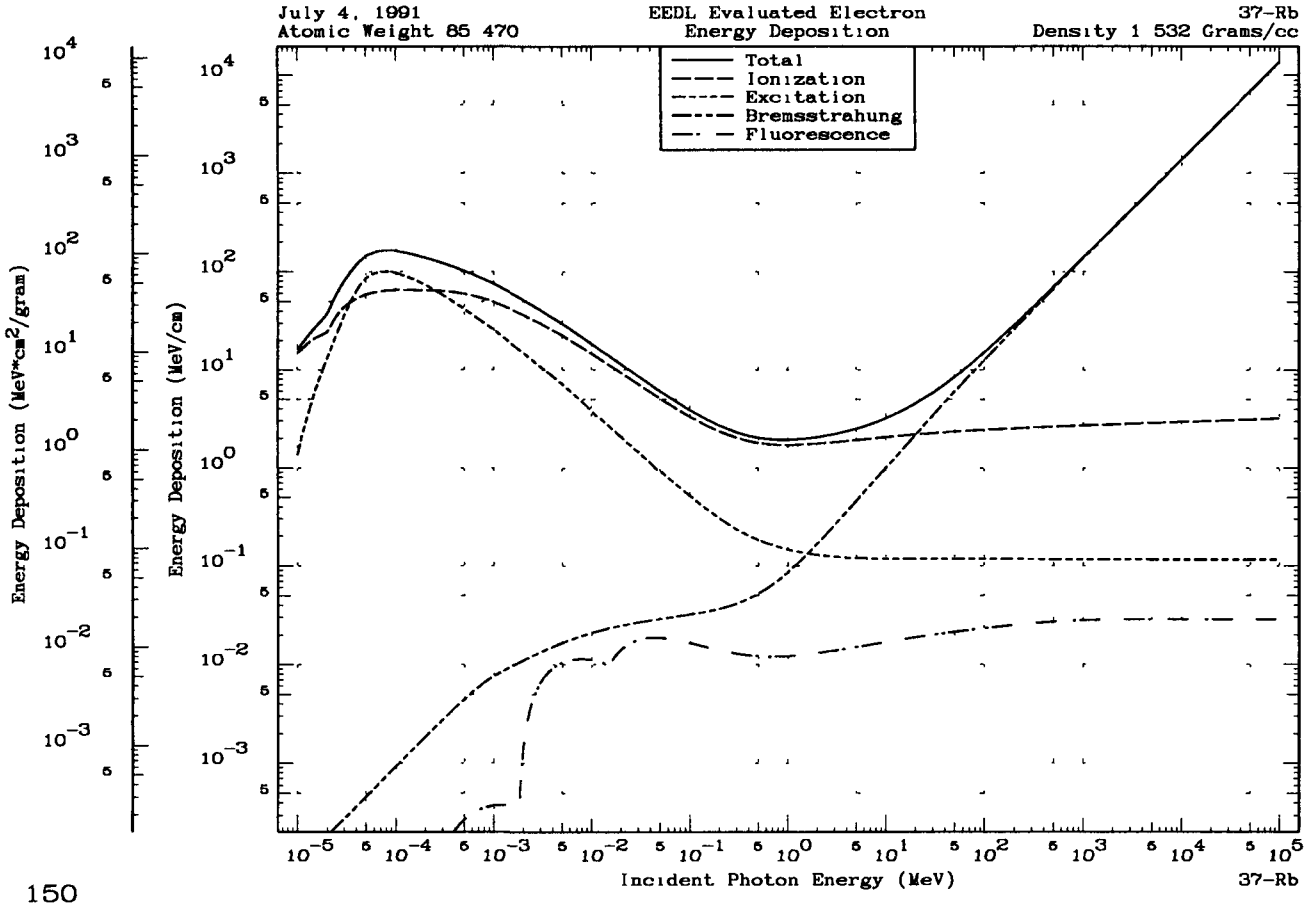
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.6872–5	1.5877+7		2.2093+9	2.2093+9			3.8851+3	2.2478–7			2.2478–7
N3	1.2720–5	1.9217–5	1.3940+7		1.9398+9	1.9398+9	0.0000+0	0.0000+0	4.0728+3	2.8382–7	0.0000+0	0.0000+0	2.8382–7
	1.3005–5	1.9384–5	1.3820+7		1.9231+9	1.9166+9	5.7270+6	6.8315+5	4.0906+3	2.2001–3	1.9653–3	2.3456–4	2.9012–7
N2	1.3430–5	1.9627–5	1.3649+7		1.8993+9	1.8836+9	1.3794+7	1.8630+6	4.1165+3	5.4188–3	4.7730–3	6.4553–4	2.9956–7
	1.3504–5	1.9652–5	1.3632+7		1.8969+9	1.8780+9	1.6659+7	2.1669+6	4.1209+3	6.5340–3	5.7818–3	7.5184–4	3.0121–7
	1.3626–5	1.9710–5	1.3591+7		1.8913+9	1.8689+9	1.9662+7	2.7056+6	4.1282+3	7.7945–3	6.8534–3	9.4080–4	3.0393–7
	1.3822–5	1.9797–5	1.3531+7		1.8830+9	1.8545+9	2.4930+7	3.5320+6	4.1398+3	9.9721–3	8.7393–3	1.2325–3	3.0833–7
	1.3970–5	1.9858–5	1.3490+7		1.8771+9	1.8439+9	2.8957+7	4.3036+6	4.1484+3	1.1691–2	1.0185–2	1.5057–3	3.1163–7
	1.4252–5	1.9952–5	1.3426+7		1.8683+9	1.8241+9	3.8527+7	5.7382+6	4.1647+3	1.5655–2	1.3637–2	2.0178–3	3.1796–7
	1.4411–5	2.0008–5	1.3389+7		1.8631+9	1.8131+9	4.3387+7	6.5803+6	4.1738+3	1.7739–2	1.5418–2	2.3205–3	3.2154–7
	1.4485–5	2.0036–5	1.3370+7		1.8605+9	1.8081+9	4.5389+7	7.0077+6	4.1780+3	1.8629–2	1.6154–2	2.4744–3	3.2321–7
	1.5000–5	2.0190–5	1.3268+7		1.8462+9	1.7743+9	6.1910+7	1.0063+7	4.2067+3	2.5853–2	2.2267–2	3.5856–3	3.3485–7
	1.7500–5	2.0653–5	1.2970+7		1.8049+9	1.6323+9	1.3650+8	3.6007+7	4.3359+3	6.4676–2	5.1330–2	1.3345–2	3.9226–7
	2.0000–5	2.0691–5	1.2947+7		1.8016+9	1.5186+9	2.0091+8	8.2086+7	4.4509+3	1.1004–1	7.8441–2	3.1599–2	4.5106–7
	2.2500–5	2.0493–5	1.3072+7		1.8190+9	1.4249+9	2.5169+8	1.4240+8	4.5397+3	1.5762–1	1.0146–1	5.6160–2	5.0550–7
	2.4375–5	2.0308–5	1.3191+7		1.8356+9	1.3645+9	2.8151+8	1.8957+8	4.6010+3	1.9178–1	1.1568–1	7.6108–2	5.4688–7
	2.7188–5	2.0131–5	1.3307+7		1.8517+9	1.2863+9	3.1453+8	2.5089+8	4.6860+3	2.3631–1	1.3293–1	1.0339–1	6.0976–7
N1	2.7440–5	2.0103–5	1.3325+7		1.8543+9	1.2799+9	3.1750+8	2.5691+8	4.6933+3	2.4057–1	1.3445–1	1.0612–1	6.1545–7
	2.7760–5	2.0092–5	1.3333+7		1.8553+9	1.2718+9	3.2033+8	2.6310+8	4.7022+3	2.4492–1	1.3604–1	1.0888–1	6.2259–7
	2.8320–5	2.0068–5	1.3349+7		1.8575+9	1.2582+9	3.2524+8	2.7412+8	4.7176+3	2.5264–1	1.3882–1	1.1382–1	6.3511–7
	2.9160–5	2.0019–5	1.3382+7		1.8621+9	1.2385+9	3.3256+8	2.9107+8	4.7403+3	2.6446–1	1.4299–1	1.2147–1	6.5396–7
	3.0000–5	2.0009–5	1.3388+7		1.8630+9	1.2196+9	3.3981+8	3.0358+8	4.7624+3	2.7449–1	1.4717–1	1.2732–1	6.7288–7
	3.1250–5	2.0065–5	1.3351+7		1.8578+9	1.1930+9	3.4709+8	3.1770+8	4.7944+3	2.8551–1	1.5169–1	1.3381–1	7.0117–7
	3.3438–5	2.0125–5	1.3311+7		1.8522+9	1.1502+9	3.5945+8	3.4255+8	4.8479+3	3.0491–1	1.5954–1	1.4537–1	7.5106–7
	3.5000–5	2.0143–5	1.3299+7		1.8506+9	1.1222+9	3.6795+8	3.6042+8	4.8843+3	3.1884–1	1.6507–1	1.5376–1	7.8698–7
	3.6719–5	2.0177–5	1.3277+7		1.8475+9	1.0936+9	3.7370+8	3.8018+8	4.9228+3	3.3245–1	1.6932–1	1.6313–1	8.2676–7
	4.0000–5	2.0286–5	1.3205+7		1.8376+9	1.0443+9	3.8405+8	4.0927+8	4.9924+3	3.5478–1	1.7722–1	1.7756–1	9.0342–7
	4.5000–5	2.0611–5	1.2997+7		1.8086+9	9.7999+8	3.9110+8	4.3749+8	5.0762+3	3.7596–1	1.8474–1	1.9122–1	1.0146–6
	5.0000–5	2.0852–5	1.2847+7		1.7877+9	9.2588+8	3.9744+8	4.6439+8	5.1524+3	3.9653–1	1.9204–1	2.0449–1	1.1273–6
	6.0000–5	2.1649–5	1.2374+7		1.7219+9	8.3919+8	3.9864+8	4.8402+8	5.2766+3	4.1508–1	2.0023–1	2.1485–1	1.3500–6
	7.0000–5	2.2668–5	1.1818+7		1.6445+9	7.7226+8	3.9265+8	4.7955+8	5.3839+3	4.1739–1	2.0383–1	2.1356–1	1.5770–6
	8.0000–5	2.3566–5	1.1367+7		1.5818+9	7.1862+8	3.8747+8	4.7571+8	5.4786+3	4.2017–1	2.0763–1	2.1253–1	1.8077–6
M5	9.3980–5	2.5148–5	1.0652+7		1.4823+9	6.5885+8	3.7498+8	4.4843+8	5.5822+3	4.0989–1	2.0852–1	2.0137–1	2.1276–6
M4	9.5350–5	2.5295–5	1.0590+7		1.4737+9	6.5373+8	3.7392+8	4.4603+8	5.5892+3	4.0916–1	2.0876–1	2.0039–1	2.1577–6
	9.5485–5	2.5309–5	1.0584+7		1.4729+9	6.5323+8	3.7382+8	4.4579+8	5.5899+3	4.0909–1	2.0879–1	2.0030–1	2.1606–6
	9.6512–5	2.5418–5	1.0539+7		1.4665+9	6.4947+8	3.7306+8	4.4401+8	5.5951+3	4.0859–1	2.0901–1	1.9958–1	2.1832–6
	9.7743–5	2.5547–5	1.0486+7		1.4591+9	6.4505+8	3.7216+8	4.4192+8	5.6013+3	4.0802–1	2.0928–1	1.9873–1	2.2102–6
	1.0000–4	2.5781–5	1.0391+7	0.0000+0	1.4459+9	6.3716+8	3.7056+8	4.3816+8	5.6124+3	4.0705–1	2.0983–1	1.9722–1	2.2600–6
	1.0625–4	2.6536–5	1.0095+7	1.5483–5	1.4047+9	6.1679+8	3.6382+8	4.2412+8	5.6420+3	4.0030–1	2.0921–1	1.9109–1	2.3980–6
	1.1719–4	2.7801–5	9.6357+6	4.3159–5	1.3408+9	5.8525+8	3.5323+8	4.0236+8	5.6903+3	3.9017–1	2.0855–1	1.8161–1	2.6412–6
	1.2500–4	2.8665–5	9.3452+6	6.3344–5	1.3004+9	5.6536+8	3.4641+8	3.8865+8	5.7223+3	3.8391–1	2.0827–1	1.7564–1	2.8159–6
	1.3359–4	2.9583–5	9.0552+6	8.5907–5	1.2601+9	5.4557+8	3.3948+8	3.7500+8	5.7555+3	3.7786–1	2.0815–1	1.6971–1	3.0092–6
	1.5000–4	3.1247–5	8.5730+6	1.2987–4	1.1930+9	5.1274+8	3.2784+8	3.5237+8	5.8138+3	3.6852–1	2.0863–1	1.5989–1	3.3808–6
	1.7500–4	3.3809–5	7.9234+6	1.9930–4	1.1026+9	4.7210+8	3.0794+8	3.2253+8	5.8750+3	3.5173–1	2.0500–1	1.4673–1	3.9423–6
	2.0000–4	3.6184–5	7.4033+6	2.7161–4	1.0302+9	4.3950+8	2.9197+8	2.9873+8	5.9287+3	3.3985–1	2.0359–1	1.3626–1	4.5090–6
M3	2.0696–4	3.6848–5	7.2700+6	2.9220–4	1.0116+9	4.3152+8	2.8731+8	2.9281+8	5.9323+3	3.3618–1	2.0256–1	1.3362–1	4.6599–6
	2.1278–4	3.7393–5	7.1639+6	3.0957–4	9.9688+8	4.2516+8	2.8363+8	2.8809+8	5.9352+3	3.3342–1	2.0190–1	1.3152–1	4.7860–6
M2	2.1512–4	3.7611–5	7.1224+6	3.1661–4	9.9111+8	4.2267+8	2.8219+8	2.8624+8	5.9363+3	3.3236–1	2.0165–1	1.3070–1	4.8369–6
	2.2043–4	3.8105–5	7.0302+6	3.3263–4	9.7827+8	4.1719+8	2.7891+8	2.8217+8	5.9389+3	3.2992–1	2.0103–1	1.2889–1	4.9521–6
	2.2368–4	3.8404–5	6.9753+6	3.4251–4	9.7064+8	4.1393+8	2.7696+8	2.7975+8	5.9404+3	3.2852–1	2.0070–1	1.2781–1	5.0227–6
	2.2500–4	3.8525–5	6.9534+6	3.4654–4	9.6759+8	4.1262+8	2.7618+8	2.7878+8	5.9410+3	3.2795–1	2.0057–1	1.2738–1	5.0514–6
	2.3037–4	3.9015–5	6.8662+6	3.6298–4	9.5545+8	4.0744+8	2.7307+8	2.7494+8	5.9435+3	3.2569–1	2.0002–1	1.2567–1	5.1681–6
	2.4276–4	4.0121–5	6.6768+6	4.0129–4	9.2910+8	3.9616+8	2.6633+8	2.6659+8	5.9490+3	3.2103–1	1.9906–1	1.2196–1	5.4373–6
	2.4778–4	4.0561–5	6.6043+6	4.1697–4	9.1901+8	3.9184+8	2.6376+8	2.6340+8	5.9512+3	3.1933–1	1.9878–1	1.2054–1	5.5465–6
	2.5000–4	4.0755–5	6.5730+6	4.2393–4	9.1466+8	3.8997+8	2.6265+8	2.6202+8	5.9521+3	3.1861–1	1.9867–1	1.1993–1	5.5948–6
	2.5707–4	4.1366–5	6.4759+6	4.4620–4	9.0114+8	3.8419+8	2.5918+8	2.5776+8	5.9551+3	3.1627–1	1.9823–1	1.1803–1	5.7486–6
	2.6250–4	4.1830–5	6.4040+6	4.6342–4	8.9114+8	3.7991+8	2.5661+8	2.5461+8	5.9573+3	3.1459–1	1.9795–1	1.1664–1	5.8669–6
	2.7389–4	4.2790–5	6.2604+6	4.9981–4	8.7116+8	3.7136+8	2.5146+8	2.4833+8	5.9618+3	3.1125–1	1.9740–1	1.1385–1	6.1149–6
M1	2.7817–4	4.3145–5	6.2089+6	5.1359–4	8.6398+8	3.6829+8	2.4962+8	2.4607+8	5.9634+3	3.1010–1	1.9725–1	1.1285–1	6.2082–6
	2.8090–4	4.3374–5	6.1761+6	5.2240–4	8.5942+8	3.6637+8	2.4839+8	2.4466+8	5.9645+3	3.0925–1	1.9703–1	1.1222–1	6.2677–6
	2.8567–4	4.3772–5	6.1199+6	5.3788–4	8.5161+8	3.6308+8	2.4629+8	2.4223+8	5.9662+3	3.0782–1	1.9668–1	1.1114–1	6.3718–6
	2.9284–4	4.4363–5	6.0384+6	5.6123–4	8.4026+8	3.5829+8	2.4325+8	2.3871+8	5.9689+3	3.0579–1	1.9621–1	1.0958–1	6.5280–6
	3.0000–4	4.4947–5	5.9599+6	5.8472–4	8.2935+8	3.5368+8	2.4033+8	2.3533+8	5.9714+3	3.0391–1	1.9583–1	1.0807–1	6.6843–6
	3.2500–4	4.7082–5	5.6896+6	6.6819–4	7.9173+8	3.3895+8	2.2989+8	2.2289+8	5.9723+3	2.9516–1	1.9268–1	1.0247–1	7.2218–6
	3.5000–4	4.9144–5	5.4509+6	7.5395–4	7.5852+8	3.2585+8	2.2070+8	2.1196+8	5.9732+3	2.8791–1	1.9035–1	9.7557–2	7.7594–6
	3.6250–4	5.0154–5	5.3412+6	7.9763–4	7.4324+8	3.1983+8	2.1643+8	2.0698+8	5.9736+3	2.8447–1	1.8914–1	9.5314–2	8.0282–6
	4.0000–4	5.3093–5	5.0455+6	9.3154–4	7.0210+8	3.0352+8	2.0497+8	1.9360+8	5.9747+3	2.7564–1	1.8633–1	8.9303–2	8.8348–6
	4.5000–4	5.6981–5	4.7013+6	1.1172–3	6.5420+8	2.8513+8	1.9093+8	1.7813+8	5.9122+3	2.6311–1	1.8080–1	8.2303–2	9.8115–6
	5.0000–4	6.0689–5	4.4140+6	1.3109–3	6.1423+8	2.6962+8	1.7925+8	1.6534+8	5.8568+3	2.5322–1	1.7669–1	7.6520–2	1.0779–5
	6.0000–4	6.7799–5	3.9511+6	1.7205–3	5.4981+8	2.4476+8	1.5969+8	1.4536+8	5.7621+3	2.3526–1	1.6780–1	6.7447–2	1.2689–5
	7.0000–4	7.4773–5	3.5826+6	2.1611–3	4.9853+8	2.2553+8	1.4400+8	1.2899+8	5.6208+3	2.1884–1	1.5885–1	5.9972–2	1.4296–5
	8.0000–4	8.1368–5	3.2922+6	2.6316–3	4.5812+8	2.1010+8	1.3170+8	1.1631+8	5.5012+3	2.0639–1	1.5219–1	5.4184–2	1.5869–5
	1.0000–3	9.4004–5	2.8497+6	3.6543–3	3.9654+8	1.8664+8	1.1268+8	9.7214+7	5.2427+3	1.8512–1	1.3967–1	4.5428–2	1.8493–5
	1.2500–3	1.0893–4	2.4592+6	5.0881–3	3.4220+8	1.6573+8	9.5743+7	8.0729+7	4.9208+3	1.6404–1	1.2619–1	3.7822–2	2.0754–5
	1.5000–3	1.2279–4	2.1817+6	6.6842–3	3.0359+8	1.5040+8	8.3832+7	6.9357+7	4.6725+3	1.4945–1	1.1685–1	3.2578–2	2.2932–5
L3	1.6734–3	1.3216–4	2.0269+6	7.8818–3	2.8205+8	1.4177+8	7.7183+7	6.3102+7	4.5191+3	1.4024–1	1.1054–1	2.9678–2	2.4233–5
	1.6938–3	1.3325–4	2.0104+6	8.0278–3	2.7976+8	1.4083+8	7.6481+7	6.2441+7	4.5021+3	1.3928–1	1.0988–1	2.9372–2	2.4380–5
L2	1.7283–3	1.3507–4	1.9833+6	8.2768–3	2.7599+8	1.3930+8	7.5326+7	6.1357+7	4.4740+3	1.3771–1	1.0882–1	2.8871–2	2.4628–5
	1.7321–3	1.3527–4	1.9804+6	8.3044–3	2.7558+8	1.3913+8	7.5201+7	6.1241+7	4.4709+3	1.3754–1	1.0870–1	2.8817–2	2.4655–5
	1.7962–3	1.3862–4	1.9325+6	8.7755–3	2.6891+8	1.3641+8	7.3149+7	5.9345+7	4.4207+3	1.3476–1	1.0679–1	2.7937–2	2.5113–5

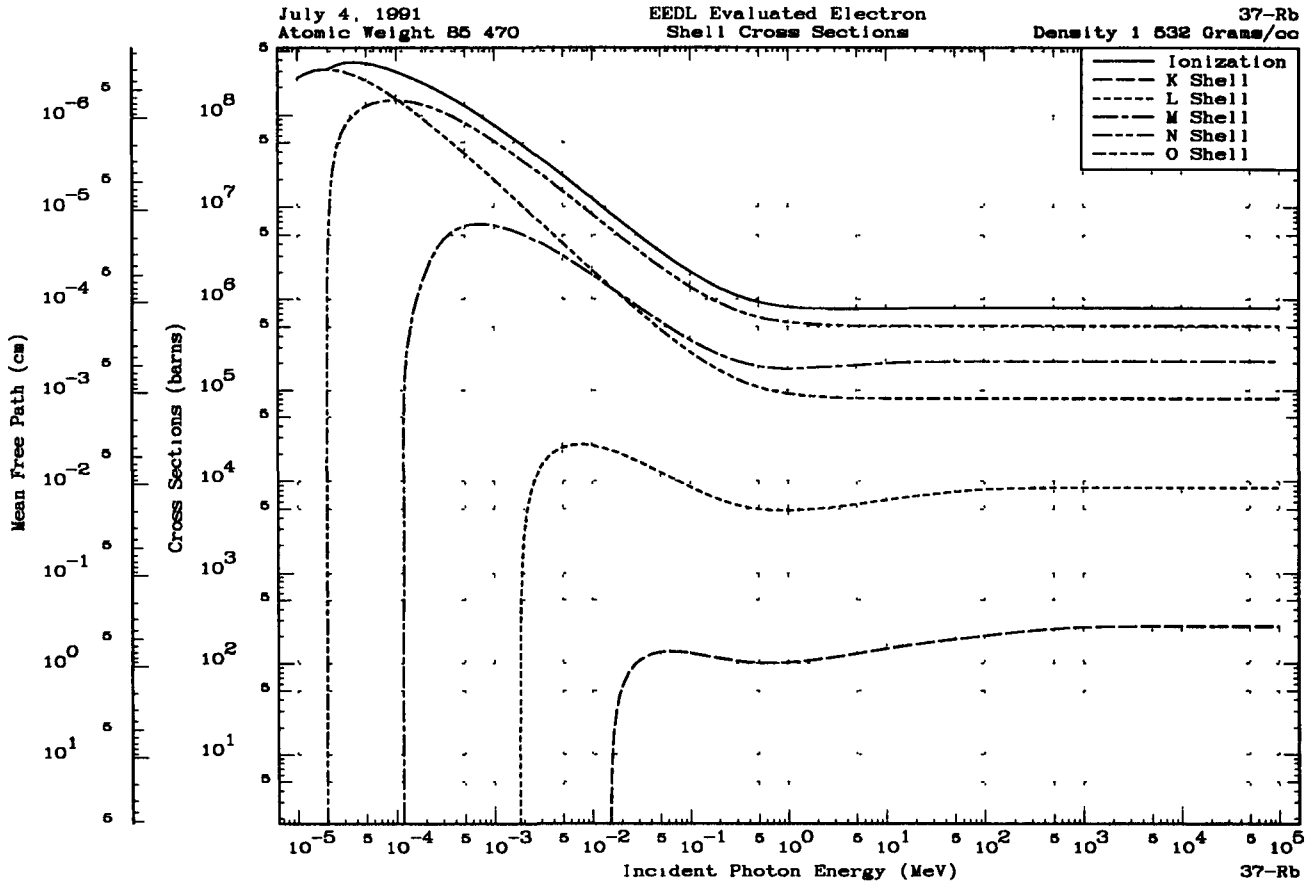
Atomic Weight 83.800 — Density 3.7330– 3 Grams/cc

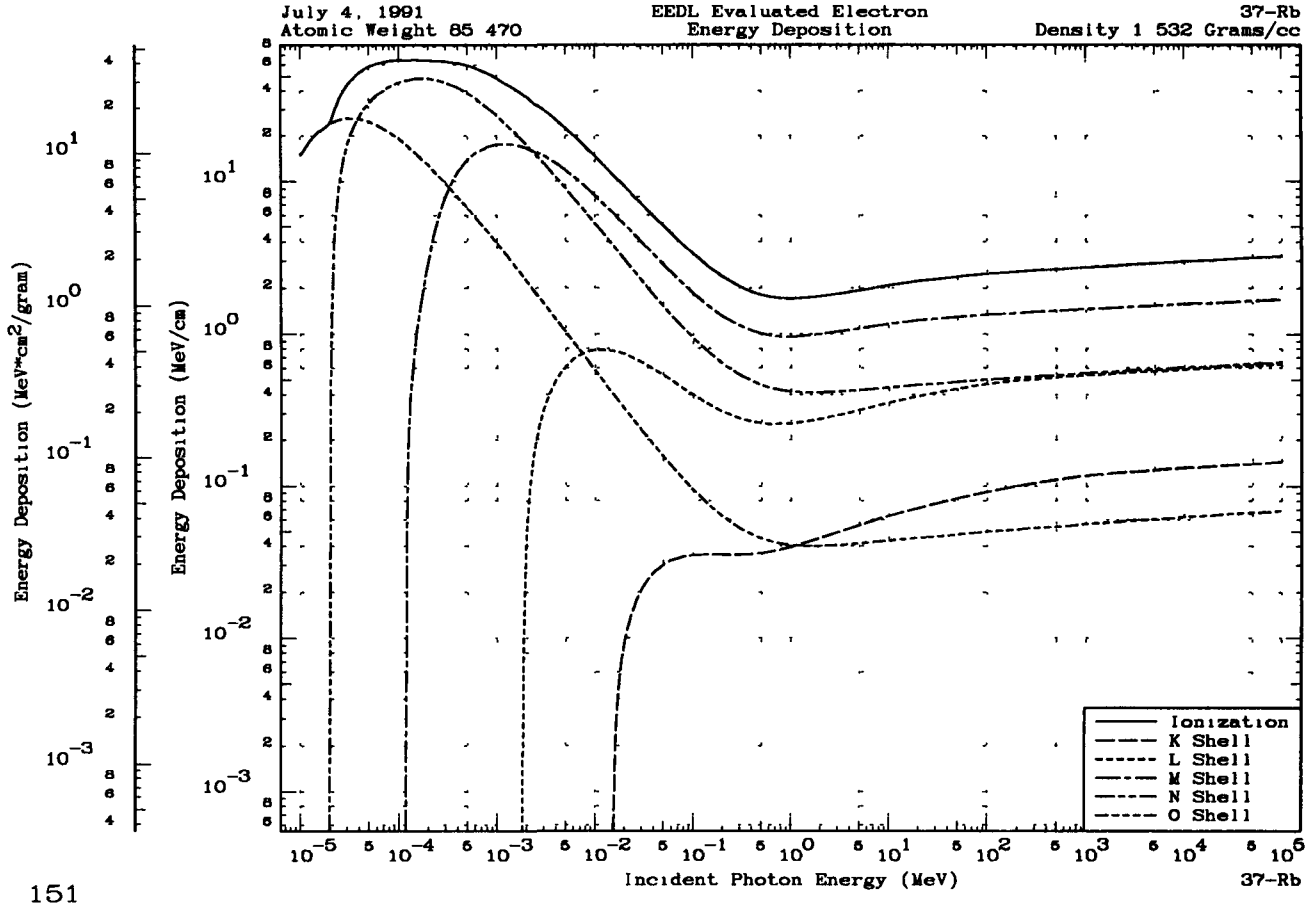
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.8660–3	1.4223–4	1.8835+6	9.2990–3	2.6209+8	1.3361+8	7.1059+7	5.7421+7	4.3686+3	1.3195–1	1.0488–1	2.7044–2	2.5608–5
	1.8981–3	1.4387–4	1.8620+6	9.5432–3	2.5911+8	1.3238+8	7.0145+7	5.6581+7	4.3455+3	1.3072–1	1.0404–1	2.6654–2	2.5834–5
L1	1.9023–3	1.4408–4	1.8593+6	9.5753–3	2.5872+8	1.3222+8	7.0027+7	5.6473+7	4.3425+3	1.3056–1	1.0393–1	2.6604–2	2.5863–5
	2.0000–3	1.4902–4	1.7976+6	1.0334–2	2.5014+8	1.2866+8	6.7410+7	5.4074+7	4.2754+3	1.2708–1	1.0156–1	2.5491–2	2.6547–5
	2.1250–3	1.5549–4	1.7228+6	1.1336–2	2.3974+8	1.2424+8	6.4289+7	5.1207+7	4.1854+3	1.2237–1	9.8190–2	2.4155–2	2.7262–5
	2.3438–3	1.6651–4	1.6088+6	1.3178–2	2.2386+8	1.1742+8	5.9551+7	4.6891+7	4.0439+3	1.1527–1	9.3096–2	2.2143–2	2.8496–5
	2.5000–3	1.7418–4	1.5379+6	1.4560–2	2.1401+8	1.1313+8	5.6624+7	4.4249+7	3.9533+3	1.1090–1	8.9957–2	2.0911–2	2.9363–5
	2.5078–3	1.7456–4	1.5346+6	1.4630–2	2.1354+8	1.1293+8	5.6486+7	4.4125+7	3.9490+3	1.1069–1	8.9809–2	2.0853–2	2.9406–5
	2.6719–3	1.8244–4	1.4683+6	1.6140–2	2.0432+8	1.0888+8	5.3760+7	4.1682+7	3.8621+3	1.0664–1	8.6900–2	1.9715–2	3.0303–5
	2.7539–3	1.8632–4	1.4378+6	1.6916–2	2.0007+8	1.0700+8	5.2506+7	4.0565+7	3.8214+3	1.0479–1	8.5561–2	1.9194–2	3.0746–5
	3.0000–3	1.9772–4	1.3548+6	1.9322–2	1.8853+8	1.0185+8	4.9116+7	3.7561+7	3.7083+3	9.9793–2	8.1966–2	1.7795–2	3.2060–5
	3.5000–3	2.2093–4	1.2125+6	2.4586–2	1.6872+8	9.2883+7	4.3417+7	3.2419+7	3.4914+3	9.0348–2	7.4928–2	1.5386–2	3.4209–5
	4.0000–3	2.4313–4	1.1018+6	3.0354–2	1.5332+8	8.5758+7	3.9021+7	2.8537+7	3.3138+3	8.3119–2	6.9515–2	1.3568–2	3.6289–5
	5.0000–3	2.8634–4	9.3555+5	4.3287–2	1.3018+8	7.4662+7	3.2566+7	2.2953+7	3.0144+3	7.1799–2	6.0817–2	1.0943–2	3.9643–5
	6.0000–3	3.2819–4	8.1623+5	5.8094–2	1.1358+8	6.6514+7	2.8066+7	1.8999+7	2.7767+3	6.3443–2	5.4323–2	9.0775–3	4.2397–5
	8.0000–3	4.0747–4	6.5743+5	9.2848–2	9.1483+7	5.5233+7	2.2148+7	1.4099+7	2.4254+3	5.2028–2	4.5222–2	6.7595–3	4.6766–5
	1.0000–2	4.8358–4	5.5396+5	1.3440–1	7.7085+7	4.7558+7	1.8411+7	1.1113+7	2.1642+3	4.4427–2	3.9034–2	5.3425–3	5.0038–5
K	1.4280–2	6.3971–4	4.1875+5	2.4366–1	5.8271+7	3.7119+7	1.3700+7	7.4502+6	1.7791+3	3.4352–2	3.0701–2	3.5969–3	5.4802–5
	1.4460–2	6.4608–4	4.1463+5	2.4892–1	5.7697+7	3.6791+7	1.3558+7	7.3459+6	1.7666+3	3.4045–2	3.0443–2	3.5472–3	5.4968–5
	1.4730–2	6.5559–4	4.0861+5	2.5691–1	5.6859+7	3.6311+7	1.3352+7	7.1946+6	1.7482+3	3.3598–2	3.0068–2	3.4750–3	5.5217–5
	1.5000–2	6.6506–4	4.0279+5	2.6500–1	5.6049+7	3.5846+7	1.3152+7	7.0490+6	1.7303+3	3.3166–2	2.9705–2	3.4056–3	5.5466–5
	1.5625–2	6.8734–4	3.8974+5	2.8412–1	5.4233+7	3.4787+7	1.2716+7	6.7295+6	1.6894+3	3.2187–2	2.8878–2	3.2527–3	5.5893–5
	1.6719–2	7.2586–4	3.6905+5	3.1895–1	5.1355+7	3.3098+7	1.2024+7	6.2315+6	1.6238+3	3.0639–2	2.7567–2	3.0144–3	5.6643–5
	1.8359–2	7.8264–4	3.4228+5	3.7432–1	4.7629+7	3.0897+7	1.1128+7	5.6027+6	1.5373+3	2.8642–2	2.5870–2	2.7135–3	5.7770–5
	2.0000–2	8.3833–4	3.1954+5	4.3336–1	4.4465+7	2.9013+7	1.0367+7	5.0834+6	1.4622+3	2.6953–2	2.4429–2	2.4650–3	5.8891–5
	2.2500–2	9.2372–4	2.9000+5	5.3020–1	4.0355+7	2.6526+7	9.4154+6	4.4118+6	1.3614+3	2.4710–2	2.2508–2	2.1421–3	5.9942–5
	2.4375–2	9.8650–4	2.7155+5	6.0832–1	3.7787+7	2.4960+7	8.8189+6	4.0067+6	1.2970+3	2.3311–2	2.1303–2	1.9474–3	6.0753–5
	2.7188–2	1.0789–3	2.4829+5	7.3376–1	3.4550+7	2.2970+7	8.0657+6	3.5134+6	1.2139+3	2.1551–2	1.9779–2	1.7101–3	6.1986–5
	3.0000–2	1.1694–3	2.2908+5	8.6886–1	3.1877+7	2.1313+7	7.4420+6	3.1209+6	1.1436+3	2.0101–2	1.8517–2	1.5214–3	6.3223–5
	3.5000–2	1.3257–3	2.0207+5	1.1316+0	2.8119+7	1.8956+7	6.5777+6	2.5835+6	1.0403+3	1.8001–2	1.6674–2	1.2618–3	6.4594–5
	4.0000–2	1.4774–3	1.8132+5	1.4226+0	2.5232+7	1.7127+7	5.9107+6	2.1934+6	9.5840+2	1.6389–2	1.5249–2	1.0733–3	6.6032–5
	5.0000–2	1.7685–3	1.5147+5	2.0813+0	2.1078+7	1.4462+7	4.9650+6	1.6502+6	8.3646+2	1.4036–2	1.3158–2	8.0997–4	6.8123–5
	6.0000–2	2.0408–3	1.3126+5	2.8385+0	1.8265+7	1.2635+7	4.3212+6	1.3079+6	7.5533+2	1.2410–2	1.1696–2	6.4354–4	6.9935–5
	8.0000–2	2.5410–3	1.0542+5	4.6045+0	1.4670+7	1.0263+7	3.4996+6	9.0665+5	6.4090+2	1.0306–2	9.7850–3	4.4790–4	7.2783–5
	1.0000–1	2.9823–3	8.9824+4	6.6788+0	1.2499+7	8.7940+6	2.9969+6	7.0785+5	5.6582+2	9.0067–3	8.5808–3	3.5078–4	7.5151–5
	1.2500–1	3.4558–3	7.7517+4	9.6280+0	1.0787+7	7.6194+6	2.6013+6	5.6547+5	5.0192+2	7.9683–3	7.6096–3	2.8104–4	7.7649–5
	1.5000–1	3.8902–3	6.8860+4	1.2919+1	9.5822+6	6.7772+6	2.3172+6	4.8730+5	4.5510+2	7.2364–3	6.9131–3	2.4289–4	8.0367–5
	2.0000–1	4.6115–3	5.8090+4	2.0294+1	8.0835+6	5.7144+6	1.9732+6	3.9553+5	3.9577+2	6.3423–3	6.0588–3	1.9797–4	8.5517–5
	3.0000–1	5.7343–3	4.6716+4	3.7262+1	6.5007+6	4.5589+6	1.6311+6	3.1029+5	3.3615+2	5.4667–3	5.2138–3	1.5626–4	9.6566–5
	4.0000–1	6.6125–3	4.0511+4	5.6268+1	5.6373+6	3.9048+6	1.4641+6	2.6807+5	3.0758+2	5.0611–3	4.8167–3	1.3560–4	1.0886–4
	5.0000–1	7.3281–3	3.6555+4	7.6450+1	5.0868+6	3.4756+6	1.3673+6	2.4361+5	2.9148+2	4.8506–3	4.6050–3	1.2368–4	1.2195–4
	6.0000–1	7.9197–3	3.3825+4	9.7322+1	4.7068+6	3.1731+6	1.3053+6	2.2809+5	2.8226+2	4.7318–3	4.4794–3	1.1615–4	1.3622–4
	8.0000–1	8.8685–3	3.0206+4	1.3999+2	4.2033+6	2.7612+6	1.2329+6	2.0890+5	2.7337+2	4.6432–3	4.3686–3	1.0689–4	1.6762–4
	1.0000+0	9.5947–3	2.7920+4	1.8311+2	3.8851+6	2.4924+6	1.1934+6	1.9903+5	2.6987+2	4.6340–3	4.3306–3	1.0224–4	2.0118–4
	1.5000+0	1.0851–2	2.4687+4	2.8939+2	3.4353+6	2.1002+6	1.1515+6	1.8339+5	2.6979+2	4.7757–3	4.3872–3	9.4869–5	2.9371–4
	2.0000+0	1.1658–2	2.2978+4	3.9233+2	3.1974+6	1.8809+6	1.1389+6	1.7731+5	2.7302+2	4.9393–3	4.4534–3	9.2074–5	3.9379–4
	3.0000+0	1.2674–2	2.1136+4	5.8762+2	2.9412+6	1.6443+6	1.1246+6	1.7201+5	2.8002+2	5.3064–3	4.6052–3	9.0027–5	6.1120–4
	4.0000+0	1.3263–2	2.0197+4	7.7002+2	2.8105+6	1.5156+6	1.1248+6	1.6981+5	2.8473+2	5.6620–3	4.7279–3	8.9075–5	8.4497–4
	5.0000+0	1.3650–2	1.9626+4	9.4149+2	2.7310+6	1.4369+6	1.1251+6	1.6870+5	2.8843+2	6.0057–3	4.8346–3	8.8691–5	1.0824–3
	6.0000+0	1.3911–2	1.9256+4	1.1036+3	2.6796+6	1.3861+6	1.1249+6	1.6830+5	2.9170+2	6.3382–3	4.9162–3	8.8680–5	1.3334–3
	8.0000+0	1.4252–2	1.8796+4	1.4039+3	2.6155+6	1.3228+6	1.1249+6	1.6751+5	2.9693+2	6.9888–3	5.0567–3	8.8661–5	1.8434–3
	1.0000+1	1.4434–2	1.8559+4	1.6777+3	2.5826+6	1.2889+6	1.1269+6	1.6653+5	3.0113+2	7.6321–3	5.1716–3	8.8546–5	2.3720–3
	1.5000+1	1.4561–2	1.8397+4	2.2749+3	2.5601+6	1.2650+6	1.1292+6	1.6559+5	3.0894+2	9.1593–3	5.3329–3	8.8131–5	3.7383–3
	2.0000+1	1.4569–2	1.8387+4	2.7792+3	2.5587+6	1.2627+6	1.1308+6	1.6489+5	3.1391+2	1.0709–2	5.4670–3	8.7835–5	5.1539–3
	3.0000+1	1.4573–2	1.8382+4	3.6006+3	2.5580+6	1.2623+6	1.1315+6	1.6381+5	3.2037+2	1.3770–2	5.6118–3	8.7422–5	8.0703–3
	4.0000+1	1.4574–2	1.8380+4	4.2556+3	2.5577+6	1.2621+6	1.1323+6	1.6297+5	3.2531+2	1.6867–2	5.7201–3	8.7132–5	1.1060–2
	5.0000+1	1.4577–2	1.8377+4	4.7996+3	2.5573+6	1.2619+6	1.1328+6	1.6224+5	3.2909+2	1.9988–2	5.8052–3	8.6904–5	1.4096–2
	6.0000+1	1.4579–2	1.8374+4	5.2643+3	2.5568+6	1.2618+6	1.1331+6	1.6160+5	3.3222+2	2.3125–2	5.8734–3	8.6722–5	1.7165–2
	8.0000+1	1.4582–2	1.8370+4	6.0283+3	2.5563+6	1.2615+6	1.1334+6	1.6100+5	3.3728+2	2.9490–2	5.9736–3	8.6427–5	2.3430–2
	1.0000+2	1.4585–2	1.8367+4	6.6420+3	2.5558+6	1.2613+6	1.1336+6	1.6051+5	3.4118+2	3.5897–2	6.0502–3	8.6197–5	2.9760–2
	1.5000+2	1.4590–2	1.8360+4	7.7927+3	2.5549+6	1.2610+6	1.1338+6	1.5974+5	3.4816+2	5.1998–2	6.1380–3	8.5783–5	4.5774–2
	2.0000+2	1.4594–2	1.8355+4	8.6298+3	2.5542+6	1.2608+6	1.1339+6	1.5919+5	3.5279+2	6.8204–2	6.2194–3	8.5491–5	6.1899–2
	3.0000+2	1.4600–2	1.8348+4	9.8300+3	2.5531+6	1.2604+6	1.1339+6	1.5841+5	3.5761+2	1.0051–1	6.3427–3	8.5081–5	9.4078–2
	4.0000+2	1.4604–2	1.8342+4	1.0692+4	2.5524+6	1.2602+6	1.1340+6	1.5786+5	3.6067+2	1.3297–1	6.4198–3	8.4790–5	1.2647–1
	5.0000+2	1.4605–2	1.8341+4	1.1365+4	2.5522+6	1.2600+6	1.1340+6	1.5788+5	3.6298+2	1.6563–1	6.4709–3	8.4806–5	1.5907–1
	6.0000+2	1.4606–2	1.8340+4	1.1916+4	2.5521+6	1.2599+6	1.1340+6	1.5790+5	3.6515+2	1.9792–1	6.5213–3	8.4823–5	1.9132–1
	8.0000+2	1.4607–2	1.8339+4	1.2790+4	2.5519+6	1.2596+6	1.1340+6	1.5792+5	3.6875+2	2.6274–1	6.6025–3	8.4845–5	2.5605–1
	1.0000+3	1.4608–2	1.8338+4	1.3470+4	2.5518+6	1.2594+6	1.1340+6	1.5793+5	3.7172+2	3.2782–1	6.6782–3	8.4863–5	3.2106–1
	1.5000+3	1.4616–2	1.8328+4	1.4708+4	2.5504+6	1.2591+6	1.1340+6	1.5686+5	3.7735+2	4.9105–1	6.7443–3	8.4289–5	4.8422–1
	2.0000+3	1.4623–2	1.8320+4	1.5588+4	2.5492+6	1.2589+6	1.1340+6	1.5596+5	3.8147+2	6.5377–1	6.8100–3	8.3806–5	6.4687–1
	3.0000+3	1.4628–2	1.8313+4	1.6828+4	2.5484+6	1.2586+6	1.1340+6	1.5541+5	3.8742+2	9.8054–1	6.9407–3	8.3511–5	9.7351–1
	4.0000+3	1.4632–2	1.8308+4	1.7708+4	2.5477+6	1.2583+6	1.1340+6	1.5491+5	3.9186+2	1.3071+0	7.0035–3	8.3243–5	1.3001+0
	5.0000+3	1.4639–2	1.8299+4	1.8391+4	2.5464+6	1.2581+6	1.1340+6	1.5387+5	3.9537+2	1.6361+0	7.0450–3	8.2679–5	1.6290+0
	6.0000+3	1.4639–2	1.8300+4	1.8948+4	2.5465+6	1.2580+6	1.1340+6	1.5407+5	3.9816+2	1.9601+0	7.0865–3	8.2787–5	1.9529+0
	8.0000+3	1.4639–2	1.8299+4	1.9829+4	2.5463+6	1.2577+6	1.1340+6	1.5416+5	4.0261+2	2.6138+0	7.1695–3	8.2840–5	2.6065+0
	1.0000+4	1.4640–2	1.8298+4	2.0511+4	2.5462+6	1.2576+6	1.1340+6	1.5416+5	4.0610+2	3.2737+0	7.2499–3	8.2840–5	3.2664+0
	1.5000+4	1.4642–2	1.8296+4	2.1753+4	2.5459+6	1.2572+6	1.1340+6	1.5426+5	4.1266+2	4.8872+0	7.3089–3	8.2894–5	4.8797+0
	2.0000+4	1.4644–2	1.8293+4	2.2636+4	2.5456+6	1.2570+6	1.1340+6	1.5411+5	4.1737+2	6.5214+0	7.3680–3	8.2814–5	6.5140+0
	3.0000+4	1.4644–2	1.8292+4	2.3881+4	2.5454+6	1.2567+6	1.1340+6	1.5431+5	4.2400+2	9.7579+0	7.4862–3	8.2921–5	9.7503+0
	4.0000+4	1.4647–2	1.8289+4	2.4765+4	2.5450+6	1.2564+6	1.1340+6	1.5411+5	4.2876+2	1.3029+1	7.5685–3	8.2814–5	1.3022+1

Atomic Weight 83.800												Density 3.7330– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+4	1.4653–2	1.8281+4	2.5450+4	2.5439+6	1.2563+6	1.1340+6	1.5322+5	4.3242+2	1.6271+1	7.6254–3	8.2330–5	1.6263+1
6.0000+4	1.4651–2	1.8284+4	2.6010+4	2.5442+6	1.2561+6	1.1340+6	1.5366+5	4.3540+2	1.9509+1	7.6642–3	8.2572–5	1.9501+1
8.0000+4	1.4652–2	1.8283+4	2.6895+4	2.5441+6	1.2559+6	1.1340+6	1.5381+5	4.4015+2	2.6043+1	7.7419–3	8.2652–5	2.6035+1
1.0000+5	1.4653–2	1.8282+4	2.7580+4	2.5440+6	1.2557+6	1.1340+6	1.5386+5	4.4385+2	3.2588+1	7.8170–3	8.2679–5	3.2580+1


July 4 1991
Atomic Weight 85 470
EEDL Evaluated Electron
Cross Sections
37-Rb
Density 1 532 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
37-Rb


July 4, 1991
Atomic Weight 85 470
EEDL Evaluated Electron
Energy Deposition
37-Rb
Density 1 532 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
37-Rb


July 4, 1991
Atomic Weight 85 470
EEDL Evaluated Electron
Shell Cross Sections
37-Rb
Density 1 532 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
37-Rb


July 4, 1991
Atomic Weight 85 470
EEDL Evaluated Electron
Energy Deposition
37-Rb
Density 1 532 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
37-Rb

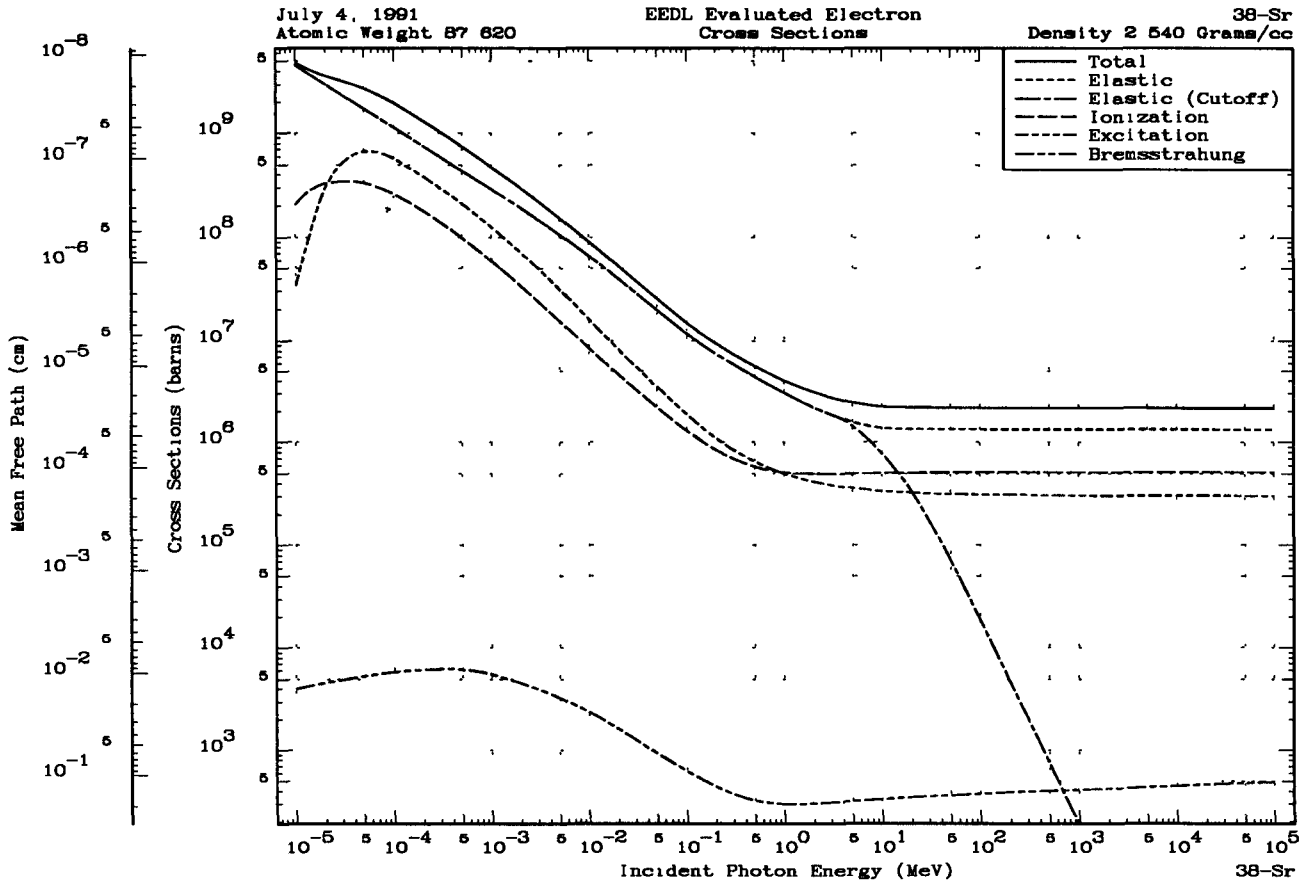
Atomic Weight 85.470 Density 1.532 Grams/cc

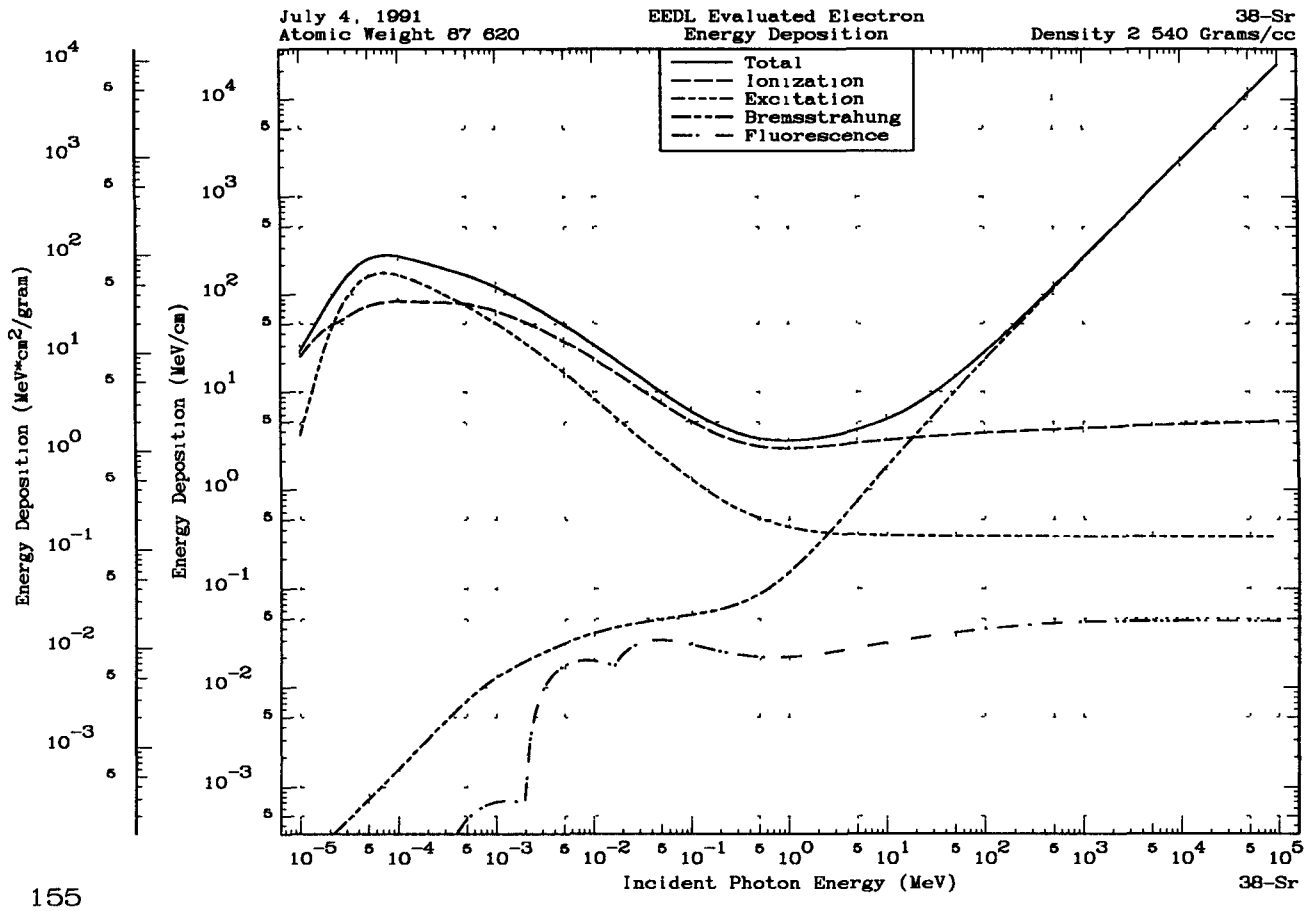
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	2.4248–8	2.6919+7		3.8206+9	3.5425+9	2.5361+8	2.4434+7	3.9551+3	1.6281+1	1.4926+1	1.3551+0	9.2084–5
	1.1250–5	2.5604–8	2.5494+7		3.6182+9	3.3071+9	2.7125+8	3.9873+7	4.0477+3	1.8971+1	1.6699+1	2.2716+0	1.0309–4
	1.2500–5	2.6830–8	2.4329+7		3.4529+9	3.1098+9	2.8806+8	5.5031+7	4.1323+3	2.1733+1	1.8515+1	3.2183+0	1.1429–4
	1.5000–5	2.8972–8	2.2530+7		3.1976+9	2.7958+9	3.0570+8	9.6104+7	4.2829+3	2.7027+1	2.1116+1	5.9107+0	1.3719–4
	1.7500–5	3.0790–8	2.1200+7		3.0088+9	2.5551+9	3.1010+8	1.4355+8	4.4145+3	3.1843+1	2.2700+1	9.1428+0	1.6072–4
N3	1.9750–5	3.2092–8	2.0340+7		2.8868+9	2.3809+9	3.1360+8	1.9224+8	4.5206+3	3.6744+1	2.4121+1	1.2623+1	1.8238–4
	2.0000–5	3.2200–8	2.0272+7		2.8771+9	2.3635+9	3.1539+8	1.9818+8	4.5318+3	3.7664+1	2.4612+1	1.3051+1	1.8481–4
	2.0625–5	3.2467–8	2.0105+7		2.8534+9	2.3214+9	3.1854+8	2.1345+8	4.5593+3	3.9866+1	2.5705+1	1.4160+1	1.9092–4
N2	2.0730–5	3.2512–8	2.0077+7		2.8495+9	2.3145+9	3.1883+8	2.1608+8	4.5638+3	4.0192+1	2.5839+1	1.4352+1	1.9195–4
	2.1309–5	3.2721–8	1.9948+7		2.8312+9	2.2776+9	3.2283+8	2.3078+8	4.5846+3	4.2520+1	2.7106+1	1.5413+1	1.9706–4
	2.1797–5	3.2871–8	1.9858+7		2.8184+9	2.2477+9	3.2703+8	2.4360+8	4.6016+3	4.4705+1	2.8361+1	1.6343+1	2.0138–4
	2.2396–5	3.3039–8	1.9757+7		2.8040+9	2.2124+9	3.3169+8	2.5989+8	4.6222+3	4.7342+1	2.9807+1	1.7534+1	2.0670–4
	2.2822–5	3.3146–8	1.9693+7		2.7949+9	2.1882+9	3.3487+8	2.7187+8	4.6365+3	4.9225+1	3.0809+1	1.8415+1	2.1050–4
	2.4297–5	3.3439–8	1.9520+7		2.7705+9	2.1096+9	3.4510+8	3.1573+8	4.6845+3	5.5818+1	3.4139+1	2.1679+1	2.2371–4
	2.4617–5	3.3484–8	1.9494+7		2.7668+9	2.0936+9	3.4742+8	3.2575+8	4.6946+3	5.7322+1	3.4890+1	2.2432+1	2.2659–4
	2.5000–5	3.3537–8	1.9464+7		2.7624+9	2.0748+9	3.4961+8	3.3800+8	4.7065+3	5.9011+1	3.5654+1	2.3357+1	2.3005–4
	2.5693–5	3.3618–8	1.9416+7		2.7557+9	2.0419+9	3.5296+8	3.6081+8	4.7277+3	6.2085+1	3.6994+1	2.5091+1	2.3631–4
	2.5723–5	3.3622–8	1.9414+7		2.7554+9	2.0406+9	3.5311+8	3.6172+8	4.7286+3	6.2215+1	3.7054+1	2.5161+1	2.3658–4
	2.5963–5	3.3652–8	1.9397+7		2.7529+9	2.0295+9	3.5419+8	3.6917+8	4.7359+3	6.3232+1	3.7498+1	2.5734+1	2.3876–4
	2.7861–5	3.3810–8	1.9306+7		2.7401+9	1.9476+9	3.6149+8	4.3099+8	4.7911+3	7.1296+1	4.0738+1	3.0558+1	2.5607–4
	2.7981–5	3.3814–8	1.9304+7		2.7397+9	1.9427+9	3.6194+8	4.3507+8	4.7945+3	7.1820+1	4.0940+1	3.0880+1	2.5717–4
	3.0000–5	3.3809–8	1.9307+7		2.7402+9	1.8653+9	3.6799+8	5.0690+8	4.8497+3	8.0578+1	4.3957+1	3.6621+1	2.7577–4
	3.2500–5	3.3817–8	1.9302+7		2.7395+9	1.7803+9	3.7063+8	5.8855+8	4.9139+3	8.9912+1	4.6773+1	4.3139+1	2.9904–4
	3.6250–5	3.3520–8	1.9473+7		2.7638+9	1.6705+9	3.7171+8	7.2155+8	5.0029+3	1.0414+2	5.0116+1	5.4027+1	3.3442–4
N1	3.6720–5	3.3455–8	1.9511+7		2.7691+9	1.6580+9	3.7197+8	7.3910+8	5.0135+3	1.0603+2	5.0546+1	5.5487+1	3.3889–4
	3.7130–5	3.3438–8	1.9521+7		2.7705+9	1.6473+9	3.7190+8	7.5128+8	5.0227+3	1.0738+2	5.0856+1	5.6528+1	3.4279–4
	3.7848–5	3.3400–8	1.9543+7		2.7737+9	1.6291+9	3.7182+8	7.7277+8	5.0385+3	1.0977+2	5.1402+1	5.8370+1	3.4965–4
	3.8924–5	3.3326–8	1.9586+7		2.7798+9	1.6027+9	3.7177+8	8.0536+8	5.0618+3	1.1341+2	5.2225+1	6.1184+1	3.5996–4
	4.0000–5	3.3233–8	1.9641+7		2.7876+9	1.5775+9	3.7180+8	8.3837+8	5.0845+3	1.1712+2	5.3054+1	6.4060+1	3.7032–4
	4.2500–5	3.2972–8	1.9797+7		2.8097+9	1.5227+9	3.6977+8	9.1715+8	5.1285+3	1.2533+2	5.4535+1	7.0796+1	3.9306–4
	4.5000–5	3.2952–8	1.9809+7		2.8114+9	1.4729+9	3.6825+8	9.7024+8	5.1703+3	1.3170+2	5.6046+1	7.5652+1	4.1596–4
	4.6250–5	3.2930–8	1.9822+7		2.8133+9	1.4496+9	3.6691+8	9.9676+8	5.1905+3	1.3474+2	5.6627+1	7.8109+1	4.2747–4
	5.0000–5	3.2794–8	1.9904+7		2.8249+9	1.3852+9	3.6340+8	1.0763+9	5.2483+3	1.4397+2	5.8370+1	8.5601+1	4.6221–4
	5.5000–5	3.3248–8	1.9633+7		2.7864+9	1.3105+9	3.5607+8	1.1199+9	5.3145+3	1.5004+2	5.9788+1	9.0256+1	5.0769–4
	6.0000–5	3.3602–8	1.9425+7		2.7570+9	1.2457+9	3.5009+8	1.1612+9	5.3756+3	1.5610+2	6.1283+1	9.4819+1	5.5364–4
	7.0000–5	3.4920–8	1.8692+7		2.6529+9	1.1388+9	3.3429+8	1.1799+9	5.4856+3	1.6153+2	6.2529+1	9.9000+1	6.4683–4
	8.0000–5	3.6588–8	1.7840+7		2.5320+9	1.0536+9	3.2218+8	1.1563+9	5.5827+3	1.6363+2	6.4009+1	9.9619+1	7.4159–4
	9.0000–5	3.8261–8	1.7060+7		2.4213+9	9.8373+8	3.0850+8	1.1291+9	5.6551+3	1.6348+2	6.4337+1	9.9145+1	8.3405–4
	1.0000–4	4.0198–8	1.6238+7	0.0000+0	2.3047+9	9.2519+8	2.9729+8	1.0822+9	5.7206+3	1.6171+2	6.4897+1	9.6813+1	9.2753–4
M5	1.1757–4	4.3733–8	1.4926+7	1.1059–7	2.1184+9	8.4240+8	2.7777+8	9.9819+8	5.8033+3	1.5607+2	6.4697+1	9.1376+1	1.0879–3
M4	1.1920–4	4.4051–8	1.4818+7	1.2105–7	2.1030+9	8.3571+8	2.7624+8	9.9110+8	5.8103+3	1.5567+2	6.4738+1	9.0927+1	1.1029–3
	1.1960–4	4.4131–8	1.4791+7	1.2360–7	2.0992+9	8.3410+8	2.7582+8	9.8930+8	5.8120+3	1.5555+2	6.4733+1	9.0814+1	1.1066–3
	1.2113–4	4.4439–8	1.4688+7	1.3344–7	2.0847+9	8.2799+8	2.7425+8	9.8243+8	5.8186+3	1.5510+2	6.4710+1	9.0384+1	1.1206–3
	1.2340–4	4.4893–8	1.4540+7	1.4811–7	2.0636+9	8.1912+8	2.7199+8	9.7247+8	5.8282+3	1.5446+2	6.4697+1	8.9762+1	1.1416–3
	1.2473–4	4.5159–8	1.4454+7	1.5678–7	2.0515+9	8.1403+8	2.7069+8	9.6674+8	5.8337+3	1.5410+2	6.4690+1	8.9405+1	1.1539–3
	1.3005–4	4.6200–8	1.4129+7	1.9142–7	2.0052+9	7.9459+8	2.6574+8	9.4487+8	5.8553+3	1.5275+2	6.4692+1	8.8052+1	1.2030–3
	1.3105–4	4.6395–8	1.4069+7	1.9799–7	1.9968+9	7.9106+8	2.6485+8	9.4089+8	5.8593+3	1.5250+2	6.4694+1	8.7808+1	1.2123–3
	1.5000–4	4.9937–8	1.3071+7	3.2379–7	1.8552+9	7.3154+8	2.4992+8	8.7372+8	5.9298+3	1.4876+2	6.5011+1	8.3747+1	1.3889–3
	1.6250–4	5.2397–8	1.2458+7	4.0887–7	1.7681+9	6.9840+8	2.4001+8	8.2966+8	5.9632+3	1.4511+2	6.4572+1	8.0534+1	1.5044–3
	1.7188–4	5.4189–8	1.2046+7	4.7400–7	1.7096+9	6.7608+8	2.3341+8	8.0012+8	5.9867+3	1.4278+2	6.4382+1	7.8397+1	1.5914–3
	1.8594–4	5.6797–8	1.1493+7	5.7350–7	1.6311+9	6.4597+8	2.2465+8	7.6045+8	6.0198+3	1.3989+2	6.4337+1	7.5553+1	1.7224–3
	2.0000–4	5.9322–8	1.1003+7	6.7489–7	1.5617+9	6.1926+8	2.1696+8	7.2545+8	6.0506+3	1.3751+2	6.4440+1	7.3069+1	1.8541–3
	2.2500–4	6.3861–8	1.0221+7	8.6007–7	1.4507+9	5.7843+8	2.0376+8	6.6848+8	6.0655+3	1.3253+2	6.4091+1	6.8434+1	2.0783–3
M3	2.3729–4	6.6020–8	9.8871+6	9.5354–7	1.4032+9	5.6088+8	1.9811+8	6.4425+8	6.0722+3	1.3045+2	6.3972+1	6.6476+1	2.1887–3
	2.4121–4	6.6726–8	9.7825+6	9.8366–7	1.3884+9	5.5559+8	1.9642+8	6.3637+8	6.0743+3	1.2982+2	6.3974+1	6.5841+1	2.2240–3
M2	2.4669–4	6.7706–8	9.6408+6	1.0260–6	1.3683+9	5.4840+8	1.9414+8	6.2573+8	6.0771+3	1.2898+2	6.3993+1	6.4983+1	2.2733–3
	2.4856–4	6.8051–8	9.5920+6	1.0405–6	1.3614+9	5.4601+8	1.9332+8	6.2202+8	6.0780+3	1.2866+2	6.3965+1	6.4689+1	2.2901–3
	2.5335–4	6.8930–8	9.4696+6	1.0779–6	1.3440+9	5.4000+8	1.9126+8	6.1272+8	6.0805+3	1.2785+2	6.3893+1	6.3954+1	2.3332–3
	2.6142–4	7.0395–8	9.2726+6	1.1413–6	1.3160+9	5.3029+8	1.8796+8	5.9777+8	6.0844+3	1.2660+2	6.3823+1	6.2774+1	2.4059–3
	2.6250–4	7.0590–8	9.2469+6	1.1498–6	1.3124+9	5.2902+8	1.8753+8	5.9583+8	6.0850+3	1.2644+2	6.3816+1	6.2621+1	2.4156–3
	2.6502–4	7.1043–8	9.1879+6	1.1698–6	1.3040+9	5.2611+8	1.8653+8	5.9136+8	6.0862+3	1.2605+2	6.3773+1	6.2269+1	2.4383–3
	2.8071–4	7.3839–8	8.8401+6	1.2954–6	1.2546+9	5.0887+8	1.8063+8	5.6514+8	6.0935+3	1.2380+2	6.3586+1	6.0209+1	2.5797–3
	2.8251–4	7.4156–8	8.8023+6	1.3099–6	1.2493+9	5.0699+8	1.7999+8	5.6230+8	6.0943+3	1.2356+2	6.3573+1	5.9986+1	2.5960–3
	3.0000–4	7.7196–8	8.4557+6	1.4527–6	1.2001+9	4.8965+8	1.7414+8	5.3629+8	6.1019+3	1.2148+2	6.3530+1	5.7952+1	2.7538–3
M1	3.1318–4	7.9378–8	8.2232+6	1.5620–6	1.1671+9	4.7761+8	1.6967+8	5.1981+8	6.1074+3	1.1965+2	6.3135+1	5.6510+1	2.8729–3
	3.1861–4	8.0320–8	8.1267+6	1.6075–6	1.1534+9	4.7291+8	1.6792+8	5.1256+8	6.1077+3	1.1888+2	6.2998+1	5.5878+1	2.9212–3
	3.2500–4	8.1424–8	8.0166+6	1.6615–6	1.1378+9	4.6754+8	1.6593+8	5.0429+8	6.1080+3	1.1802+2	6.2853+1	5.5159+1	2.9780–3
	3.2878–4	8.2072–8	7.9533+6	1.6936–6	1.1288+9	4.6445+8	1.6478+8	4.9955+8	6.1082+3	1.1752+2	6.2773+1	5.4746+1	3.0116–3
	3.4659–4	8.5091–8	7.6711+6	1.8465–6	1.0887+9	4.5058+8	1.5969+8	4.7846+8	6.1090+3	1.1538+2	6.2463+1	5.2915+1	3.1699–3
	3.5000–4	8.5664–8	7.6198+6	1.8762–6	1.0814+9	4.4805+8	1.5876+8	4.7463+8	6.1092+3	1.1500+2	6.2416+1	5.2584+1	3.2002–3
	3.6250–4	8.7747–8	7.4389+6	1.9855–6	1.0558+9	4.3910+8	1.5547+8	4.6120+8	6.1097+3	1.1361+2	6.2189+1	5.1421+1	3.3114–3
	3.7329–4	8.9525–8	7.2912+6	2.0810–6	1.0348+9	4.3176+8	1.5277+8	4.5027+8	6.1102+3	1.1250+2	6.2020+1	5.0476+1	3.4074–3
	4.0000–4	9.3848–8	6.9553+6	2.3210–6	9.8715+8	4.1495+8	1.4667+8	4.2552+8	6.1113+3	1.1008+2	6.1733+1	4.8343+1	3.6449–3
	4.5000–4	1.0188–7	6.4069+6	2.7859–6	9.0931+8	3.8780+8	1.3602+8	3.8548+8	6.0509+3	1.0504+2	6.0382+1	4.4656+1	4.0514–3
	5.0000–4	1.0961–7	5.9549+6	3.2709–6	8.4516+8	3.6502+8	1.2727+8	3.5286+8	5.9973+3	1.0115+2	5.9479+1	4.1667+1	4.4542–3
	6.0000–4	1.2458–7	5.2393+6	4.2964–6	7.4360+8	3.2872+8	1.1276+8	3.0212+8	5.9058+3	9.3974+1	5.7151+1	3.6817+1	5.2501–3
	7.0000–4	1.3899–7	4.6964+6	5.3982–6	6.6654+8	3.0086+8	1.0127+8	2.6441+8	5.7661+3	8.7628+1	5.4582+1	3.3040+1	5.9222–3
	8.0000–4	1.5273–7	4.2738+6	6.5713–6	6.0656+8	2.7864+8	9.2347+7	2.3557+8	5.6477+3	8.2899+1	5.2728+1	3.0165+1	6.5807–3
	1.0000–3	1.7886–7	3.6494+6	9.1100–6	5.1795+8	2.4511+8	7.8616+7	1.9422+8	5.3898+3	7.4802+1	4.8958+1	2.5836+1	7.6820–3
	1.2500–3	2.1095–7	3.0942+6	1.2658–5	4.3915+8	2.1555+8	6.6462+7	1.5714+8	5.0658+3	6.6306+1	4.4652+1	2.1646+1	8.6366–3

Atomic Weight 85.470 — Density 1.532 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.5000–3	2.4112–7	2.7072+6	1.6602–5	3.8422+8	1.9406+8	5.7990+7	1.3216+8	4.8156+3	6.0541+1	4.1702+1	1.8830+1	9.5564–3
L3	1.8051–3	2.7617–7	2.3636+6	2.1908–5	3.3545+8	1.7416+8	5.0237+7	1.1105+8	4.5539+3	5.4559+1	3.8286+1	1.6263+1	1.0506–2
	1.8538–3	2.8170–7	2.3171+6	2.2808–5	3.2886+8	1.7146+8	4.9205+7	1.0819+8	4.5170+3	5.3766+1	3.7832+1	1.5923+1	1.0652–2
L2	1.8671–3	2.8321–7	2.3048+6	2.3055–5	3.2712+8	1.7074+8	4.8932+7	1.0744+8	4.5071+3	5.3555+1	3.7711+1	1.5833+1	1.0692–2
	1.9335–3	2.9075–7	2.2451+6	2.4308–5	3.1863+8	1.6726+8	4.7618+7	1.0375+8	4.4593+3	5.2550+1	3.7140+1	1.5399+1	1.0890–2
	2.0000–3	2.9821–7	2.1889+6	2.5584–5	3.1066+8	1.6397+8	4.6383+7	1.0030+8	4.4135+3	5.1619+1	3.6615+1	1.4993+1	1.1086–2
L1	2.0480–3	3.0348–7	2.1509+6	2.6520–5	3.0526+8	1.6161+8	4.5518+7	9.8128+7	4.3782+3	5.0904+1	3.6178+1	1.4715+1	1.1208–2
	2.1075–3	3.1014–7	2.1047+6	2.7699–5	2.9871+8	1.5878+8	4.4486+7	9.5437+7	4.3349+3	5.0018+1	3.5637+1	1.4370+1	1.1352–2
	2.1250–3	3.1209–7	2.0915+6	2.8050–5	2.9684+8	1.5797+8	4.4193+7	9.4673+7	4.3225+3	4.9767+1	3.5484+1	1.4272+1	1.1395–2
	2.2191–3	3.2248–7	2.0241+6	2.9965–5	2.8728+8	1.5381+8	4.2689+7	9.0774+7	4.2580+3	4.8476+1	3.4692+1	1.3772+1	1.1621–2
	2.2344–3	3.2416–7	2.0136+6	3.0282–5	2.8579+8	1.5316+8	4.2455+7	9.0170+7	4.2479+3	4.8275+1	3.4569+1	1.3695+1	1.1657–2
	2.3438–3	3.3607–7	1.9423+6	3.2580–5	2.7566+8	1.4871+8	4.0865+7	8.6082+7	4.1780+3	4.6921+1	3.3738+1	1.3171+1	1.1917–2
	2.4143–3	3.4367–7	1.8993+6	3.4096–5	2.6956+8	1.4601+8	3.9909+7	8.3638+7	4.1352+3	4.6109+1	3.3240+1	1.2858+1	1.2084–2
	2.4258–3	3.4490–7	1.8925+6	3.4346–5	2.6860+8	1.4558+8	3.9759+7	8.3254+7	4.1284+3	4.5982+1	3.3161+1	1.2808+1	1.2111–2
	2.5000–3	3.5282–7	1.8501+6	3.5974–5	2.6257+8	1.4290+8	3.8815+7	8.0853+7	4.0855+3	4.5182+1	3.2669+1	1.2501+1	1.2284–2
	2.5078–3	3.5365–7	1.8457+6	3.6147–5	2.6196+8	1.4263+8	3.8718+7	8.0608+7	4.0811+3	4.5101+1	3.2619+1	1.2469+1	1.2303–2
	2.5607–3	3.5925–7	1.8170+6	3.7327–5	2.5787+8	1.4080+8	3.8079+7	7.8991+7	4.0516+3	4.4559+1	3.2284+1	1.2262+1	1.2426–2
	2.7129–3	3.7517–7	1.7399+6	4.0799–5	2.4693+8	1.3587+8	3.6368+7	7.4685+7	3.9713+3	4.3117+1	3.1393+1	1.1711+1	1.2777–2
	2.7539–3	3.7942–7	1.7204+6	4.1754–5	2.4417+8	1.3462+8	3.5936+7	7.3605+7	3.9507+3	4.2754+1	3.1169+1	1.1572+1	1.2871–2
	2.7804–3	3.8215–7	1.7081+6	4.2375–5	2.4242+8	1.3383+8	3.5664+7	7.2925+7	3.9376+3	4.2526+1	3.1027+1	1.1485+1	1.2931–2
	3.0000–3	4.0453–7	1.6136+6	4.7648–5	2.2901+8	1.2770+8	3.3573+7	6.7735+7	3.8351+3	4.0780+1	2.9945+1	1.0821+1	1.3427–2
	3.2500–3	4.2992–7	1.5183+6	5.3935–5	2.1549+8	1.2140+8	3.1452+7	6.2628+7	3.7183+3	3.8775+1	2.8637+1	1.0124+1	1.3888–2
	3.6250–3	4.6701–7	1.3977+6	6.3934–5	1.9837+8	1.1331+8	2.8777+7	5.6277+7	3.5648+3	3.6258+1	2.6987+1	9.2574+0	1.4565–2
	4.0000–3	5.0306–7	1.2975+6	7.4583–5	1.8415+8	1.0648+8	2.6564+7	5.1106+7	3.4318+3	3.4191+1	2.5623+1	8.5519+0	1.5226–2
	4.5000–3	5.5072–7	1.1853+6	8.9767–5	1.6822+8	9.8613+7	2.4109+7	4.5494+7	3.2668+3	3.1700+1	2.3933+1	7.7502+0	1.5950–2
	5.0000–3	5.9700–7	1.0934+6	1.0607–4	1.5518+8	9.2068+7	2.2109+7	4.0998+7	3.1259+3	2.9678+1	2.2553+1	7.1082+0	1.6655–2
	6.0000–3	6.8797–7	9.4879+5	1.4182–4	1.3466+8	8.1601+7	1.8999+7	3.4056+7	2.8824+3	2.6319+1	2.0226+1	6.0757+0	1.7818–2
	7.0000–3	7.7720–7	8.3987+5	1.8187–4	1.1920+8	7.3524+7	1.6707+7	2.8965+7	2.6824+3	2.3669+1	1.8366+1	5.2839+0	1.8753–2
	8.0000–3	8.6336–7	7.5605+5	2.2603–4	1.0730+8	6.7177+7	1.4949+7	2.5175+7	2.5204+3	2.1652+1	1.6938+1	4.6936+0	1.9660–2
	1.0000–2	1.0345–6	6.3100+5	3.2582–4	8.9556+7	5.7401+7	1.2405+7	1.9748+7	2.2566+3	1.8517+1	1.4685+1	3.8106+0	2.1072–2
	1.1250–2	1.1407–6	5.7225+5	3.9633–4	8.1218+7	5.2774+7	1.1240+7	1.7202+7	2.1169+3	1.6962+1	1.3569+1	3.3712+0	2.1669–2
	1.2500–2	1.2345–6	5.2876+5	4.7261–4	7.5045+7	4.8952+7	1.0292+7	1.5799+7	1.9992+3	1.5825+1	1.2659+1	3.1440+0	2.2261–2
	1.3125–2	1.2858–6	5.0766+5	5.1281–4	7.2050+7	4.7277+7	9.8801+6	1.4890+7	1.9469+3	1.5271+1	1.2263+1	2.9856+0	2.2554–2
	1.5000–2	1.4261–6	4.5773+5	6.4111–4	6.4963+7	4.2981+7	8.8368+6	1.3144+7	1.8108+3	1.3976+1	1.1257+1	2.6949+0	2.3418–2
K	1.5159–2	1.4389–6	4.5364+5	6.5253–4	6.4383+7	4.2657+7	8.7594+6	1.2965+7	1.8000+3	1.3862+1	1.1177+1	2.6617+0	2.3477–2
	1.5462–2	1.4623–6	4.4639+5	6.7452–4	6.3354+7	4.2056+7	8.6167+6	1.2679+7	1.7796+3	1.3662+1	1.1028+1	2.6097+0	2.3569–2
	1.6029–2	1.5058–6	4.3347+5	7.1660–4	6.1521+7	4.0984+7	8.3623+6	1.2173+7	1.7430+3	1.3305+1	1.0763+1	2.5178+0	2.3743–2
	1.6525–2	1.5437–6	4.2285+5	7.5430–4	6.0014+7	4.0097+7	8.1531+6	1.1762+7	1.7126+3	1.3012+1	1.0545+1	2.4428+0	2.3896–2
	1.7394–2	1.6041–6	4.0691+5	8.2223–4	5.7752+7	3.8650+7	7.8131+6	1.1287+7	1.6627+3	1.2576+1	1.0190+1	2.3614+0	2.4162–2
	1.7500–2	1.6115–6	4.0506+5	8.3068–4	5.7489+7	3.8482+7	7.7738+6	1.1232+7	1.6569+3	1.2525+1	1.0149+1	2.3520+0	2.4194–2
	1.8697–2	1.7015–6	3.8362+5	9.2857–4	5.4446+7	3.6699+7	7.3580+6	1.0387+7	1.5948+3	1.1936+1	9.7146+0	2.1971+0	2.4560–2
	2.0000–2	1.7913–6	3.6439+5	1.0402–3	5.1717+7	3.4968+7	6.9575+6	9.7904+6	1.5340+3	1.1414+1	9.2958+0	2.0932+0	2.4956–2
	2.1250–2	1.8847–6	3.4634+5	1.1523–3	4.9155+7	3.3458+7	6.6204+6	9.0748+6	1.4790+3	1.0898+1	8.9185+0	1.9546+0	2.5182–2
	2.2500–2	1.9769–6	3.3018+5	1.2695–3	4.6861+7	3.2094+7	6.3176+6	8.4482+6	1.4289+3	1.0437+1	8.5789+0	1.8329+0	2.5413–2
	2.3438–2	2.0386–6	3.2020+5	1.3605–3	4.5444+7	3.1154+7	6.1098+6	8.1791+6	1.3942+3	1.0156+1	8.3458+0	1.7842+0	2.5588–2
	2.5000–2	2.1399–6	3.0503+5	1.5177–3	4.3292+7	2.9724+7	5.7953+6	7.7710+6	1.3410+3	9.7287+0	7.9923+0	1.7105+0	2.5883–2
	2.6719–2	2.2613–6	2.8865+5	1.6987–3	4.0967+7	2.8320+7	5.4883+6	7.1582+6	1.2883+3	9.2644+0	7.6471+0	1.5911+0	2.6209–2
	2.7187–2	2.2941–6	2.8453+5	1.7496–3	4.0382+7	2.7964+7	5.4109+6	7.0062+6	1.2749+3	9.1476+0	7.5598+0	1.5615+0	2.6298–2
	3.0000–2	2.4718–6	2.6407+5	2.0671–3	3.7479+7	2.6029+7	4.9920+6	6.4561+6	1.2015+3	8.5764+0	7.0878+0	1.4618+0	2.6833–2
	3.5000–2	2.8022–6	2.3294+5	2.6823–3	3.3060+7	2.3130+7	4.4133+6	5.5159+6	1.0932+3	7.6955+0	6.3939+0	1.2742+0	2.7412–2
	4.0000–2	3.1233–6	2.0899+5	3.3624–3	2.9661+7	2.0881+7	3.9667+6	4.8129+6	1.0074+3	7.0188+0	5.8569+0	1.1338+0	2.8020–2
	4.5000–2	3.4543–6	1.8896+5	4.1058–3	2.6819+7	1.9062+7	3.6189+6	4.1371+6	9.3775+2	6.4407+0	5.4227+0	9.8946–1	2.8468–2
	5.0000–2	3.7433–6	1.7437+5	4.9081–3	2.4748+7	1.7569+7	3.3339+6	3.8442+6	8.7953+2	6.0285+0	5.0664+0	9.3317–1	2.8938–2
	6.0000–2	4.3356–6	1.5056+5	6.6696–3	2.1368+7	1.5258+7	2.9047+6	3.2046+6	7.9432+2	5.3390+0	4.5123+0	7.9695–1	2.9730–2
	8.0000–2	5.4261–6	1.2030+5	1.0771–2	1.7073+7	1.2297+7	2.3564+6	2.4189+6	6.7433+2	4.4412+0	3.7859+0	6.2433–1	3.0978–2
	1.0000–1	6.4126–6	1.0179+5	1.5587–2	1.4447+7	1.0470+7	2.0209+6	1.9556+6	5.9560+2	3.8780+0	3.3268+0	5.1925–1	3.2036–2
	1.5000–1	8.5379–6	7.6452+4	2.9973–2	1.0851+7	7.9307+6	1.5665+6	1.3530+6	4.8017+2	3.1020+0	2.6899+0	3.7776–1	3.4278–2
	2.0000–1	1.0338–5	6.3141+4	4.7217–2	8.9614+6	6.5651+6	1.3375+6	1.0583+6	4.1807+2	2.7060+0	2.3635+0	3.0597–1	3.6495–2
	3.0000–1	1.3260–5	4.9228+4	8.7115–2	6.9867+6	5.1002+6	1.1106+6	7.7557+5	3.5494+2	2.3169+0	2.0403+0	2.3542–1	4.1238–2
	4.0000–1	1.5583–5	4.1887+4	1.3203–1	5.9449+6	4.2989+6	1.0005+6	6.4519+5	3.2477+2	2.1386+0	1.8893+0	2.0281–1	4.6447–2
	5.0000–1	1.7493–5	3.7314+4	1.7983–1	5.2959+6	3.7868+6	9.3731+5	5.7145+5	3.0821+2	2.0461+0	1.8095+0	1.8458–1	5.2095–2
	6.0000–1	1.9127–5	3.4127+4	2.2937–1	4.8436+6	3.4287+6	8.9713+5	5.1744+5	2.9831+2	1.9914+0	1.7624+0	1.7092–1	5.8154–2
	8.0000–1	2.1749–5	3.0012+4	3.3085–1	4.2595+6	2.9517+6	8.5083+5	4.5673+5	2.8846+2	1.9503+0	1.7224+0	1.5646–1	7.1402–2
	1.0000+0	2.3829–5	2.7393+4	4.3360–1	3.8878+6	2.6458+6	8.2628+5	4.1541+5	2.8477+2	1.9425+0	1.7104+0	1.4639–1	8.5706–2
	1.5000+0	2.7413–5	2.3811+4	6.8705–1	3.3794+6	2.2077+6	8.0375+5	3.6769+5	2.8431+2	2.0033+0	1.7430+0	1.3530–1	1.2504–1
	2.0000+0	2.9863–5	2.1858+4	9.3242–1	3.1022+6	1.9662+6	7.9873+5	3.3693+5	2.8733+2	2.0726+0	1.7757+0	1.2938–1	1.6749–1
	3.0000+0	3.2915–5	1.9831+4	1.3982+0	2.8146+6	1.7101+6	7.9290+5	3.1129+5	2.9430+2	2.2230+0	1.8391+0	1.2430–1	2.5951–1
	4.0000+0	3.4870–5	1.8719+4	1.8338+0	2.6568+6	1.5709+6	7.9301+5	2.9255+5	2.9909+2	2.3703+0	1.8904+0	1.2130–1	3.5864–1
	5.0000+0	3.6077–5	1.8093+4	2.2434+0	2.5679+6	1.4868+6	7.9447+5	2.8632+5	3.0286+2	2.5131+0	1.9333+0	1.2056–1	4.5926–1
	6.0000+0	3.6937–5	1.7672+4	2.6305+0	2.5081+6	1.4312+6	7.9597+5	2.8061+5	3.0626+2	2.6554+0	1.9697+0	1.1997–1	5.6580–1
	8.0000+0	3.8082–5	1.7140+4	3.3471+0	2.4327+6	1.3624+6	7.9969+5	2.7028+5	3.1170+2	2.9313+0	2.0300+0	1.1903–1	7.8222–1
	1.0000+1	3.8690–5	1.6871+4	3.9994+0	2.3945+6	1.3270+6	8.0265+5	2.6449+5	3.1622+2	3.2047+0	2.0810+0	1.1831–1	1.0054+0
	1.5000+1	3.9168–5	1.6665+4	5.4197+0	2.3652+6	1.2993+6	8.0628+5	2.5934+5	3.2503+2	3.8560+0	2.1542+0	1.1819–1	1.5837+0
	2.0000+1	3.9256–5	1.6628+4	6.6165+0	2.3599+6	1.2962+6	8.0891+5	2.5447+5	3.2985+2	4.5169+0	2.2143+0	1.1810–1	2.1846+0
	3.0000+1	3.9273–5	1.6621+4	8.5634+0	2.3589+6	1.2959+6	8.1054+5	2.5217+5	3.3692+2	5.8103+0	2.2732+0	1.1797–1	3.4191+0
	4.0000+1	3.9292–5	1.6612+4	1.0115+1	2.3577+6	1.2956+6	8.1172+5	2.5008+5	3.4213+2	7.1253+0	2.3223+0	1.1792–1	4.6851+0
	5.0000+1	3.9311–5	1.6604+4	1.1402+1	2.3566+6	1.2954+6	8.1241+5	2.4844+5	3.4610+2	8.4467+0	2.3578+0	1.1807–1	5.9709+0
	6.0000+1	3.9332–5	1.6596+4	1.2502+1	2.3553+6	1.2953+6	8.1297+5	2.4677+5	3.4937+2	9.7784+0	2.3898+0	1.1819–1	7.2705+0
	8.0000+1	3.9336–5	1.6594+4	1.4308+1	2.3551+6	1.2950+6	8.1344+5	2.4631+5	3.5464+2	1.2473+1	2.4310+0	1.1837–1	9.9235+0
	1.0000+2	3.9343–5	1.6591+4	1.5759+1	2.3547+6	1.2948+6	8.1376+5	2.4575+5	3.5871+2	1.5188+1	2.4657+0	1.1851–1	1.2603+1

Atomic Weight 85.470												Density 1.532 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000+2	3.9338–5	1.6593+4	1.8478+1	2.3550+6	1.2945+6	8.1397+5	2.4618+5	3.6595+2	2.2004+1	2.5038+0	1.1878–1	1.9381+1
2.0000+2	3.9360–5	1.6584+4	2.0456+1	2.3537+6	1.2942+6	8.1412+5	2.4498+5	3.7071+2	2.8861+1	2.5387+0	1.1826–1	2.6204+1
3.0000+2	3.9383–5	1.6574+4	2.3292+1	2.3523+6	1.2939+6	8.1424+5	2.4381+5	3.7597+2	4.2552+1	2.5915+0	1.1782–1	3.9842+1
4.0000+2	3.9397–5	1.6568+4	2.5328+1	2.3514+6	1.2936+6	8.1431+5	2.4316+5	3.7935+2	5.6331+1	2.6241+0	1.1763–1	5.3589+1
5.0000+2	3.9414–5	1.6561+4	2.6917+1	2.3505+6	1.2934+6	8.1433+5	2.4233+5	3.8200+2	7.0049+1	2.6462+0	1.1735–1	6.7285+1
6.0000+2	3.9421–5	1.6558+4	2.8220+1	2.3501+6	1.2933+6	8.1435+5	2.4206+5	3.8420+2	8.3839+1	2.6666+0	1.1733–1	8.1055+1
8.0000+2	3.9437–5	1.6552+4	3.0284+1	2.3491+6	1.2930+6	8.1437+5	2.4134+5	3.8809+2	1.1121+2	2.7012+0	1.1723–1	1.0840+2
1.0000+3	3.9452–5	1.6545+4	3.1891+1	2.3482+6	1.2928+6	8.1438+5	2.4062+5	3.9113+2	1.3882+2	2.7324+0	1.1712–1	1.3597+2
1.5000+3	3.9467–5	1.6539+4	3.4813+1	2.3473+6	1.2925+6	8.1439+5	2.4008+5	3.9707+2	2.0796+2	2.7606+0	1.1686–1	2.0508+2
2.0000+3	3.9478–5	1.6534+4	3.6890+1	2.3467+6	1.2922+6	8.1439+5	2.3965+5	4.0153+2	2.7689+2	2.7884+0	1.1665–1	2.7398+2
3.0000+3	3.9490–5	1.6529+4	3.9818+1	2.3460+6	1.2919+6	8.1440+5	2.3929+5	4.0808+2	4.1539+2	2.8410+0	1.1648–1	4.1244+2
4.0000+3	3.9498–5	1.6526+4	4.1896+1	2.3454+6	1.2916+6	8.1440+5	2.3901+5	4.1292+2	5.5383+2	2.8673+0	1.1635–1	5.5085+2
5.0000+3	3.9511–5	1.6521+4	4.3507+1	2.3447+6	1.2914+6	8.1440+5	2.3847+5	4.1674+2	6.9329+2	2.8850+0	1.1609–1	6.9029+2
6.0000+3	3.9512–5	1.6520+4	4.4823+1	2.3446+6	1.2913+6	8.1440+5	2.3854+5	4.1956+2	8.3051+2	2.9027+0	1.1614–1	8.2749+2
8.0000+3	3.9517–5	1.6518+4	4.6901+1	2.3443+6	1.2910+6	8.1440+5	2.3850+5	4.2406+2	1.1073+3	2.9362+0	1.1613–1	1.1042+3
1.0000+4	3.9521–5	1.6516+4	4.8512+1	2.3441+6	1.2908+6	8.1440+5	2.3845+5	4.2758+2	1.3866+3	2.9698+0	1.1611–1	1.3835+3
1.5000+4	3.9526–5	1.6514+4	5.1443+1	2.3438+6	1.2905+6	8.1440+5	2.3850+5	4.3449+2	2.0704+3	2.9943+0	1.1614–1	2.0673+3
2.0000+4	3.9531–5	1.6512+4	5.3526+1	2.3435+6	1.2902+6	8.1440+5	2.3843+5	4.3945+2	2.7631+3	3.0188+0	1.1610–1	2.7599+3
3.0000+4	3.9536–5	1.6510+4	5.6465+1	2.3432+6	1.2899+6	8.1440+5	2.3847+5	4.4643+2	4.1344+3	3.0679+0	1.1613–1	4.1312+3
4.0000+4	3.9541–5	1.6508+4	5.8551+1	2.3429+6	1.2896+6	8.1440+5	2.3845+5	4.5144+2	5.5206+3	3.1014+0	1.1611–1	5.5173+3
5.0000+4	3.9551–5	1.6504+4	6.0169+1	2.3423+6	1.2895+6	8.1440+5	2.3801+5	4.5530+2	6.8939+3	3.1246+0	1.1590–1	6.8906+3
6.0000+4	3.9551–5	1.6504+4	6.1492+1	2.3423+6	1.2893+6	8.1440+5	2.3819+5	4.5844+2	8.2660+3	3.1405+0	1.1599–1	8.2628+3
8.0000+4	3.9553–5	1.6503+4	6.3578+1	2.3422+6	1.2890+6	8.1440+5	2.3827+5	4.6344+2	1.1034+4	3.1724+0	1.1603–1	1.1031+4
1.0000+5	3.9556–5	1.6502+4	6.5195+1	2.3420+6	1.2888+6	8.1440+5	2.3830+5	4.6733+2	1.3807+4	3.2043+0	1.1604–1	1.3804+4


July 4, 1991
Atomic Weight 87 620
EEDL Evaluated Electron
Cross Sections
38-Sr
Density 2 540 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
38-Sr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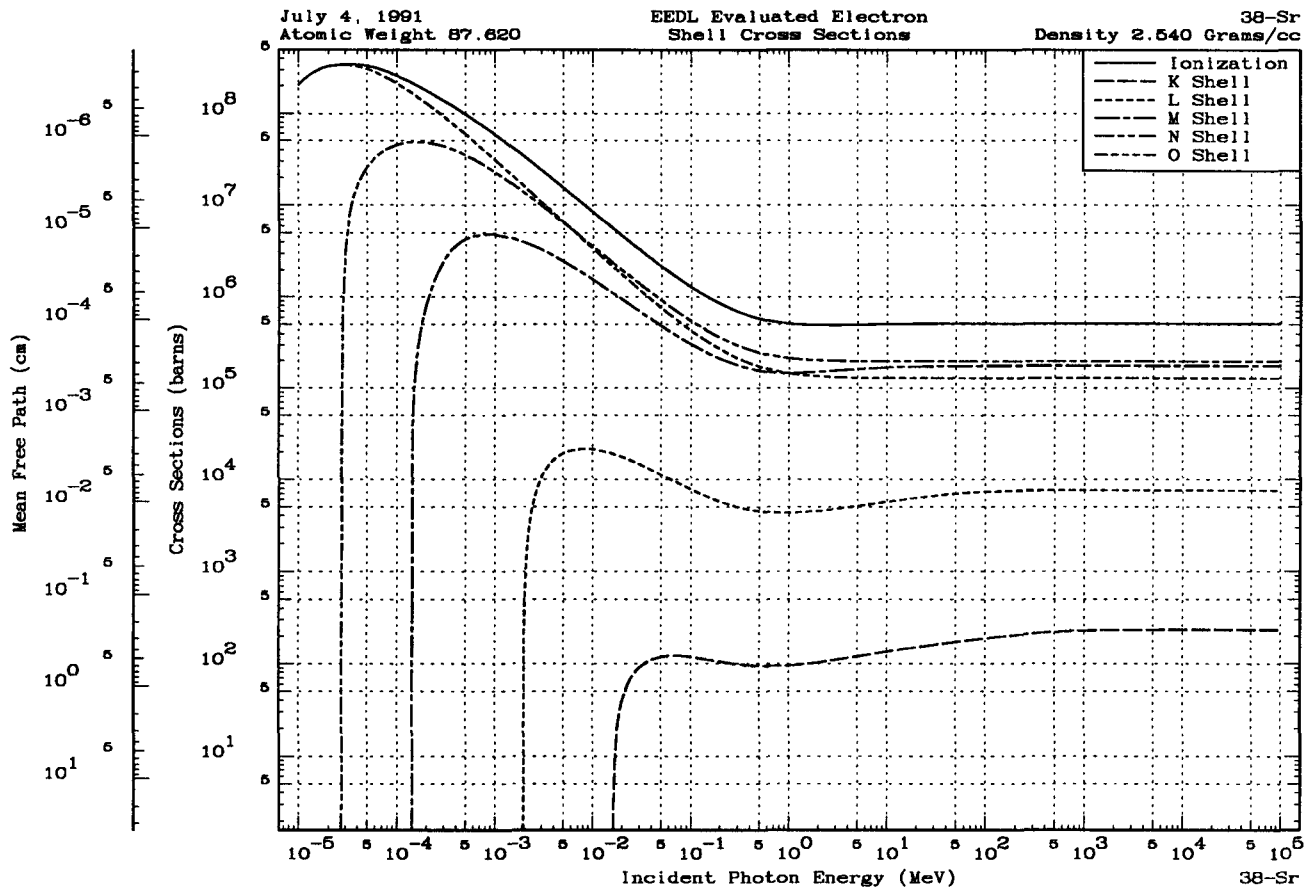
Atomic Weight 87 620
EEDL Evaluated Electron
Energy Deposition
38-Sr
Density 2 540 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
38-Sr

155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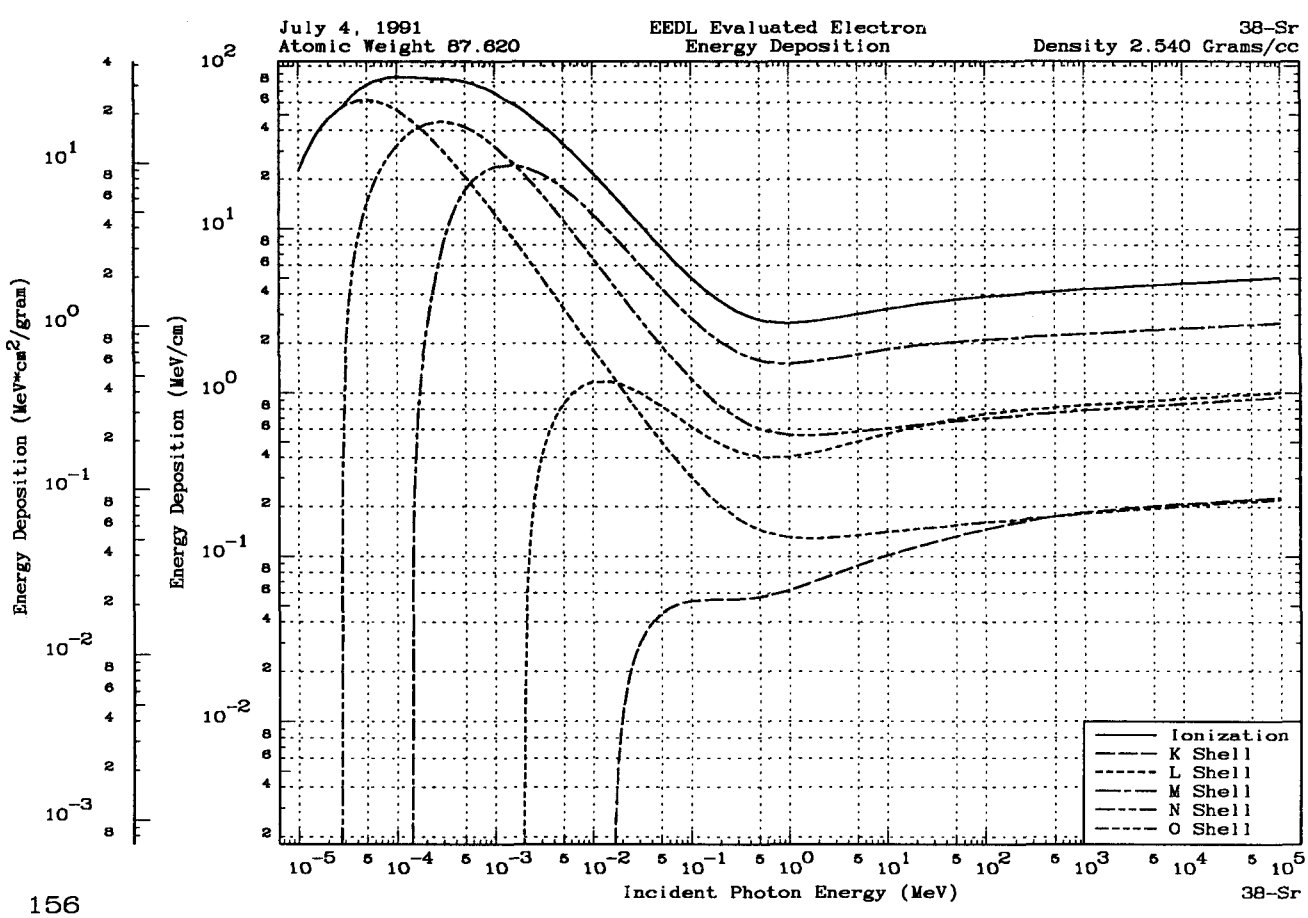
Atomic Weight 87.620
EEDL Evaluated Electron
Shell Cross Sections
38-Sr
Density 2.540 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
38-Sr


July 4, 1991
Atomic Weight 87.620
EEDL Evaluated Electron
Energy Deposition
38-Sr
Density 2.540 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
38-Sr

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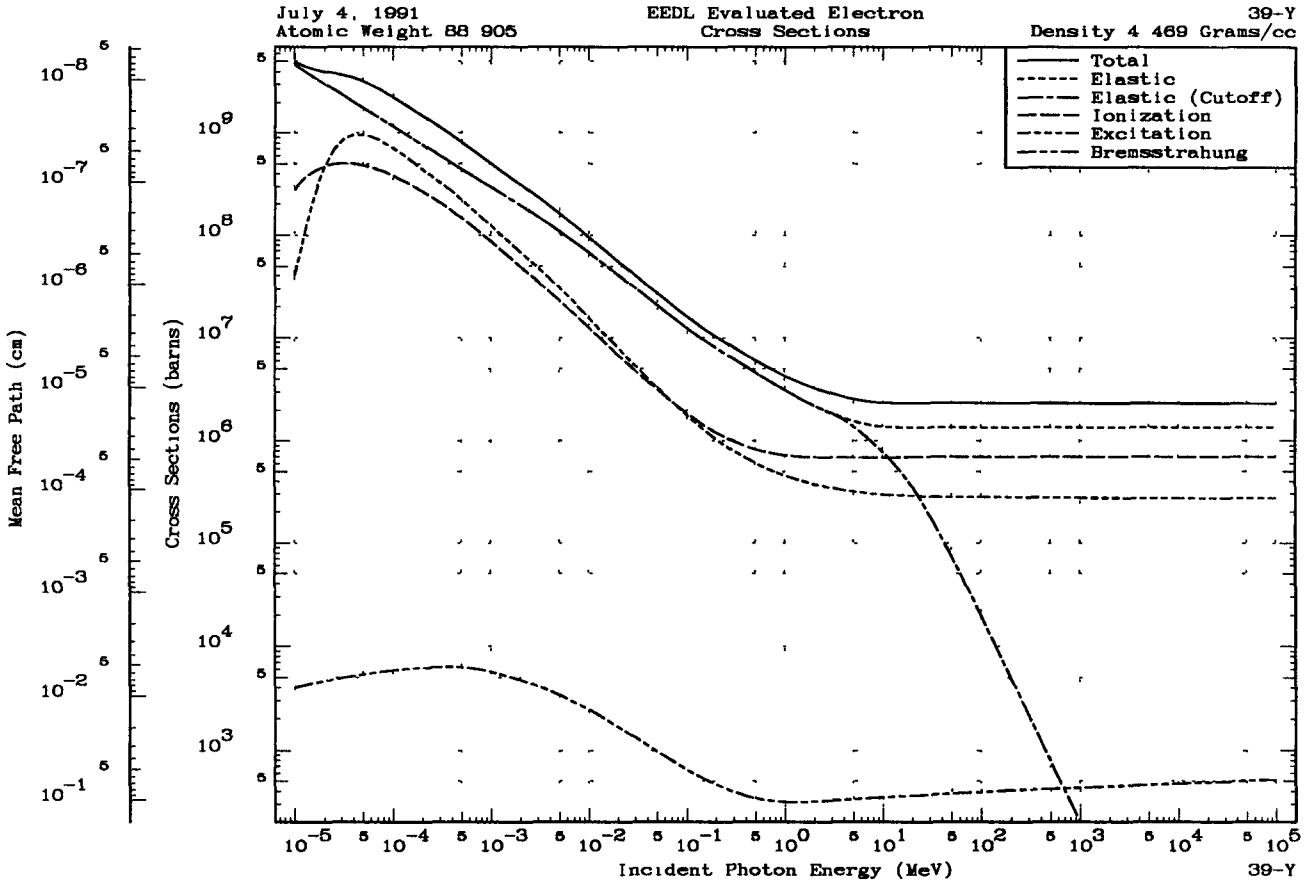
Atomic Weight 87.620 — Density 2.540 Grams/cc

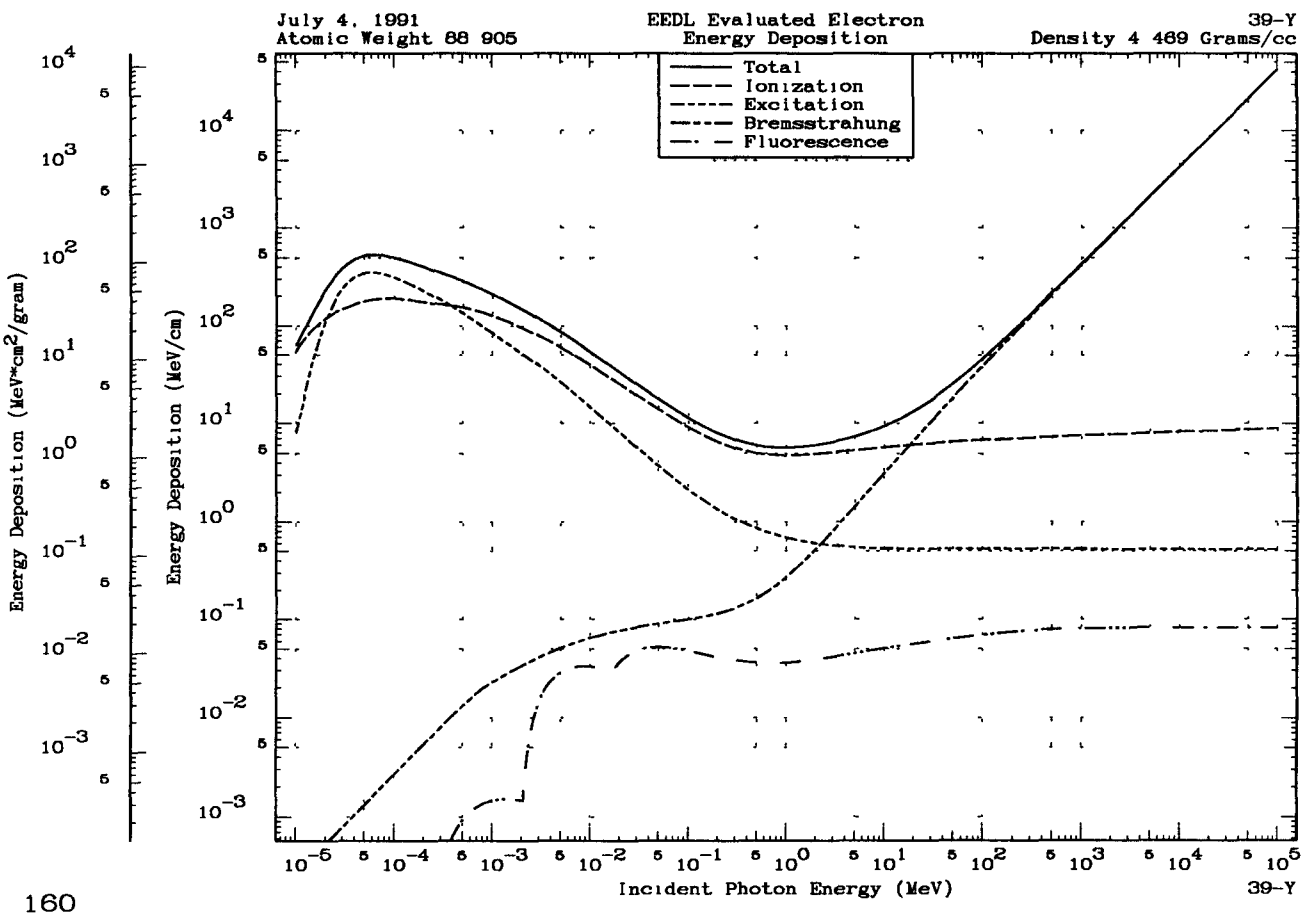
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.1957–8	3.2927+7		4.7907+9	4.5505+9	2.0613+8	3.4063+7	4.0107+3	2.6347+1	2.2709+1	3.6380+0	1.5103–4
	1.1250–5	1.2655–8	3.1109+7		4.5263+9	4.2391+9	2.3405+8	5.3159+7	4.1047+3	3.2763+1	2.6910+1	5.8531+0	1.6909–4
	1.3125–5	1.3591–8	2.8967+7		4.2147+9	3.8634+9	2.6726+8	8.3989+7	4.2310+3	4.2319+1	3.2656+1	9.6636+0	1.9676–4
	1.5000–5	1.4362–8	2.7413+7		3.9885+9	3.5650+9	2.9098+8	1.3250+8	4.3435+3	5.3387+1	3.7485+1	1.5902+1	2.2504–4
	1.7500–5	1.5174–8	2.5946+7		3.7750+9	3.2491+9	3.1367+8	2.1229+8	4.4771+3	6.9744+1	4.2874+1	2.6869+1	2.6366–4
	2.0000–5	1.5826–8	2.4877+7		3.6195+9	2.9981+9	3.2724+8	2.9414+8	4.5962+3	8.7246+1	4.7303+1	3.9943+1	3.0320–4
	2.5000–5	1.6928–8	2.3257+7		3.3839+9	2.6213+9	3.3648+8	4.2608+8	4.7724+3	1.2076+2	5.2956+1	6.7803+1	3.7709–4
N3	2.7200–5	1.7351–8	2.2690+7		3.3013+9	2.4915+9	3.4004+8	4.6976+8	4.8407+3	1.3501+2	5.5436+1	7.9578+1	4.1028–4
	2.7900–5	1.7474–8	2.2531+7		3.2781+9	2.4537+9	3.4096+8	4.8347+8	4.8610+3	1.3969+2	5.6348+1	8.3340+1	4.2079–4
N2	2.8470–5	1.7570–8	2.2407+7		3.2602+9	2.4240+9	3.4146+8	4.9467+8	4.8772+3	1.4345+2	5.6980+1	8.6470+1	4.2938–4
	2.9235–5	1.7707–8	2.2234+7		3.2349+9	2.3856+9	3.4270+8	5.0658+8	4.8986+3	1.4813+2	5.8116+1	9.0019+1	4.4095–4
	3.0000–5	1.7836–8	2.2074+7		3.2117+9	2.3488+9	3.4438+8	5.1845+8	4.9195+3	1.5310+2	5.9469+1	9.3631+1	4.5255–4
	3.2500–5	1.8288–8	2.1528+7		3.1323+9	2.2385+9	3.4406+8	5.4970+8	4.9848+3	1.6561+2	6.2226+1	1.0339+2	4.9077–4
	3.6250–5	1.8871–8	2.0863+7		3.0355+9	2.0964+9	3.4377+8	5.9538+8	5.0753+3	1.8498+2	6.6319+1	1.1866+2	5.4887–4
	4.0000–5	1.9434–8	2.0258+7		2.9475+9	1.9760+9	3.4344+8	6.2805+8	5.1583+3	2.0247+2	7.0245+1	1.3222+2	6.0783–4
	4.5000–5	2.0235–8	1.9456+7		2.8308+9	1.8410+9	3.3722+8	6.5258+8	5.2491+3	2.1758+2	7.3480+1	1.4410+2	6.8402–4
N1	4.6390–5	2.0441–8	1.9260+7		2.8023+9	1.8077+9	3.3552+8	6.5907+8	5.2728+3	2.2171+2	7.4291+1	1.4742+2	7.0540–4
	4.6841–5	2.0513–8	1.9193+7		2.7925+9	1.7972+9	3.3504+8	6.6026+8	5.2796+3	2.2283+2	7.4595+1	1.4823+2	7.1206–4
	4.7631–5	2.0636–8	1.9078+7		2.7758+9	1.7792+9	3.3422+8	6.6231+8	5.2913+3	2.2479+2	7.5135+1	1.4965+2	7.2374–4
	4.8815–5	2.0818–8	1.8912+7		2.7516+9	1.7532+9	3.3307+8	6.6535+8	5.3085+3	2.2774+2	7.5960+1	1.5178+2	7.4129–4
	5.0000–5	2.0995–8	1.8753+7		2.7284+9	1.7281+9	3.3200+8	6.6832+8	5.3254+3	2.3071+2	7.6804+1	1.5391+2	7.5889–4
	5.2500–5	2.1421–8	1.8380+7		2.6742+9	1.6782+9	3.2778+8	6.6817+8	5.3598+3	2.3401+2	7.7757+1	1.5625+2	7.9619–4
	5.6250–5	2.2030–8	1.7871+7		2.6002+9	1.6101+9	3.2215+8	6.6795+8	5.4090+3	2.3907+2	7.9307+1	1.5976+2	8.5251–4
	6.0000–5	2.2607–8	1.7415+7		2.5339+9	1.5489+9	3.1726+8	6.6775+8	5.4554+3	2.4426+2	8.0992+1	1.6327+2	9.0926–4
	6.5000–5	2.3413–8	1.6815+7		2.4466+9	1.4762+9	3.0836+8	6.6205+8	5.5135+3	2.4701+2	8.1865+1	1.6515+2	9.8556–4
	7.0000–5	2.4176–8	1.6285+7		2.3693+9	1.4119+9	3.0063+8	6.5682+8	5.5678+3	2.5001+2	8.2918+1	1.6709+2	1.0625–3
	7.2500–5	2.4593–8	1.6009+7		2.3292+9	1.3824+9	2.9691+8	6.4988+8	5.5937+3	2.5030+2	8.3372+1	1.6693+2	1.1013–3
	8.0000–5	2.5793–8	1.5264+7		2.2208+9	1.3031+9	2.8696+8	6.3081+8	5.6670+3	2.5158+2	8.4878+1	1.6670+2	1.2184–3
	9.0000–5	2.7435–8	1.4350+7		2.0879+9	1.2141+9	2.7245+8	6.0136+8	5.7414+3	2.4834+2	8.5289+1	1.6305+2	1.3707–3
	1.0000–4	2.8984–8	1.3583+7	0.0000+0	1.9763+9	1.1396+9	2.6050+8	5.7620+8	5.8088+3	2.4629+2	8.6105+1	1.6019+2	1.5247–3
	1.1250–4	3.1027–8	1.2689+7	5.1558–8	1.8462+9	1.0621+9	2.4519+8	5.3891+8	5.8710+3	2.3864+2	8.5594+1	1.5304+2	1.7126–3
	1.2500–4	3.2969–8	1.1942+7	1.0460–7	1.7375+9	9.9726+8	2.3258+8	5.0761+8	5.9272+3	2.3273+2	8.5543+1	1.4718+2	1.9023–3
	1.3125–4	3.3913–8	1.1609+7	1.3161–7	1.6891+9	9.6858+8	2.2678+8	4.9374+8	5.9534+3	2.3007+2	8.5435+1	1.4463+2	1.9977–3
M5	1.4301–4	3.5637–8	1.1048+7	1.8321–7	1.6074+9	9.2014+8	2.1699+8	4.7025+8	5.9997+3	2.2577+2	8.5375+1	1.4040+2	2.1782–3
M4	1.4493–4	3.5917–8	1.0961+7	1.9172–7	1.5948+9	9.1283+8	2.1547+8	4.6653+8	6.0070+3	2.2504+2	8.5383+1	1.3966+2	2.2078–3
	1.4651–4	3.6144–8	1.0893+7	1.9873–7	1.5848+9	9.0695+8	2.1427+8	4.6363+8	6.0128+3	2.2452+2	8.5420+1	1.3909+2	2.2321–3
	1.4747–4	3.6281–8	1.0851+7	2.0301–7	1.5788+9	9.0341+8	2.1354+8	4.6188+8	6.0164+3	2.2419+2	8.5439+1	1.3875+2	2.2469–3
	1.5000–4	3.6642–8	1.0744+7	2.1434–7	1.5633+9	8.9425+8	2.1167+8	4.5735+8	6.0257+3	2.2339+2	8.5515+1	1.3788+2	2.2861–3
	1.6250–4	3.8438–8	1.0242+7	2.7097–7	1.4902+9	8.5245+8	2.0193+8	4.3585+8	6.0606+3	2.1808+2	8.4906+1	1.3317+2	2.4768–3
	1.7188–4	3.9747–8	9.9052+6	3.1430–7	1.4412+9	8.2433+8	1.9545+8	4.2138+8	6.0853+3	2.1466+2	8.4628+1	1.3003+2	2.6206–3
	1.7500–4	4.0176–8	9.7994+6	3.2889–7	1.4258+9	8.1550+8	1.9343+8	4.1684+8	6.0932+3	2.1363+2	8.4571+1	1.2906+2	2.6686–3
	1.8125–4	4.1025–8	9.5967+6	3.5828–7	1.3963+9	7.9857+8	1.8958+8	4.0813+8	6.1087+3	2.1170+2	8.4506+1	1.2719+2	2.7648–3
	1.8594–4	4.1653–8	9.4519+6	3.8050–7	1.3752+9	7.8646+8	1.8684+8	4.0191+8	6.1200+3	2.1036+2	8.4491+1	1.2586+2	2.8372–3
	2.0000–4	4.3497–8	9.0511+6	4.4791–7	1.3169+9	7.5291+8	1.7933+8	3.8466+8	6.1524+3	2.0687+2	8.4641+1	1.2222+2	3.0549–3
	2.2500–4	4.6754–8	8.4207+6	5.7107–7	1.2252+9	7.0171+8	1.6654+8	3.5693+8	6.1701+3	1.9913+2	8.3715+1	1.1541+2	3.4268–3
	2.6250–4	5.1367–8	7.6645+6	7.6336–7	1.1152+9	6.3991+8	1.5159+8	3.2364+8	6.1933+3	1.9097+2	8.3605+1	1.0736+2	3.9864–3
M3	2.6953–4	5.2201–8	7.5420+6	8.0030–7	1.0973+9	6.2988+8	1.4920+8	3.1826+8	6.1973+3	1.8973+2	8.3660+1	1.0607+2	4.0916–3
	2.7715–4	5.3126–8	7.4108+6	8.4060–7	1.0782+9	6.1947+8	1.4658+8	3.1218+8	6.2015+3	1.8820+2	8.3589+1	1.0461+2	4.2056–3
M2	2.8032–4	5.3508–8	7.3578+6	8.5749–7	1.0705+9	6.1527+8	1.4553+8	3.0973+8	6.2032+3	1.8759+2	8.3570+1	1.0402+2	4.2531–3
	2.8524–4	5.4100–8	7.2772+6	8.8378–7	1.0588+9	6.0890+8	1.4395+8	3.0595+8	6.2059+3	1.8669+2	8.3578+1	1.0311+2	4.3267–3
	2.8857–4	5.4500–8	7.2239+6	9.0167–7	1.0510+9	6.0468+8	1.4291+8	3.0346+8	6.2076+3	1.8611+2	8.3598+1	1.0251+2	4.3767–3
	3.0000–4	5.5854–8	7.0488+6	9.6336–7	1.0256+9	5.9080+8	1.3951+8	2.9525+8	6.2135+3	1.8429+2	8.3734+1	1.0055+2	4.5480–3
	3.2500–4	5.8664–8	6.7111+6	1.1007–6	9.7644+8	5.6331+8	1.3225+8	2.8088+8	6.2256+3	1.7972+2	8.3147+1	9.6570+1	4.9233–3
M1	3.5032–4	6.1419–8	6.4100+6	1.2431–6	9.3264+8	5.3870+8	1.2590+8	2.6803+8	6.2370+3	1.7598+2	8.2929+1	9.3041+1	5.3041–3
	3.5653–4	6.2092–8	6.3406+6	1.2785–6	9.2253+8	5.3311+8	1.2443+8	2.6499+8	6.2361+3	1.7505+2	8.2836+1	9.2213+1	5.3948–3
	3.6250–4	6.2735–8	6.2756+6	1.3127–6	9.1308+8	5.2787+8	1.2306+8	2.6214+8	6.2352+3	1.7421+2	8.2762+1	9.1440+1	5.4820–3
	3.6740–4	6.3259–8	6.2236+6	1.3408–6	9.0552+8	5.2368+8	1.2197+8	2.5986+8	6.2345+3	1.7353+2	8.2706+1	9.0823+1	5.5535–3
	3.8370–4	6.4983–8	6.0585+6	1.4353–6	8.8150+8	5.1035+8	1.1852+8	2.5263+8	6.2322+3	1.7146+2	8.2588+1	8.8867+1	5.7916–3
	4.0000–4	6.6676–8	5.9047+6	1.5309–6	8.5911+8	4.9789+8	1.1533+8	2.4588+8	6.2300+3	1.6964+2	8.2578+1	8.7051+1	6.0295–3
	4.5000–4	7.1911–8	5.4749+6	1.8314–6	7.9657+8	4.6424+8	1.0624+8	2.2608+8	6.1728+3	1.6318+2	8.1396+1	8.1781+1	6.7092–3
	5.0000–4	7.6932–8	5.1175+6	2.1428–6	7.4458+8	4.3608+8	9.8767+7	2.0973+8	6.1220+3	1.5803+2	8.0541+1	7.7478+1	7.3830–3
	5.5000–4	8.1793–8	4.8134+6	2.4650–6	7.0033+8	4.1207+8	9.2179+7	1.9607+8	6.0765+3	1.5232+2	7.9101+1	7.3211+1	8.0517–3
	6.0000–4	8.6489–8	4.5520+6	2.7984–6	6.6231+8	3.9132+8	8.6612+7	1.8437+8	6.0352+3	1.4767+2	7.8086+1	6.9578+1	8.7156–3
	7.0000–4	9.5755–8	4.1115+6	3.4974–6	5.9821+8	3.5707+8	7.7149+7	1.6398+8	5.8989+3	1.3855+2	7.5118+1	6.3421+1	9.8455–3
	8.0000–4	1.0455–7	3.7656+6	4.2373–6	5.4789+8	3.2984+8	6.9884+7	1.4815+8	5.7833+3	1.3182+2	7.3120+1	5.8687+1	1.0953–2
	1.0000–3	1.2099–7	3.2540+6	5.8271–6	4.7345+8	2.8890+8	5.8828+7	1.2572+8	5.5290+3	1.1996+2	6.8548+1	5.1403+1	1.2813–2
	1.2500–3	1.4066–7	2.7990+6	8.0301–6	4.0724+8	2.5296+8	4.9200+7	1.0508+8	5.2068+3	1.0724+2	6.3026+1	4.4197+1	1.4434–2
	1.5000–3	1.5899–7	2.4762+6	1.0461–5	3.6028+8	2.2694+8	4.2573+7	9.0758+7	4.9576+3	9.8584+1	5.9330+1	3.9237+1	1.5998–2
L3	1.9424–3	1.8978–7	2.0745+6	1.5265–5	3.0184+8	1.9418+8	3.4438+7	7.3214+7	4.5938+3	8.5901+1	5.3165+1	3.2717+1	1.8312–2
	2.0000–3	1.9372–7	2.0323+6	1.5940–5	2.9569+8	1.9077+8	3.3623+7	7.1292+7	4.5540+3	8.4590+1	5.2558+1	3.2013+1	1.8601–2
L2	2.0121–3	1.9455–7	2.0236+6	1.6084–5	2.9443+8	1.9005+8	3.3453+7	7.0925+7	4.5450+3	8.4291+1	5.2404+1	3.1869+1	1.8654–2
	2.0738–3	1.9874–7	1.9810+6	1.6822–5	2.8823+8	1.8650+8	3.2617+7	6.9109+7	4.4996+3	8.2832+1	5.1657+1	3.1157+1	1.8920–2
	2.1250–3	2.0218–7	1.9473+6	1.7444–5	2.8332+8	1.8368+8	3.1959+7	6.7679+7	4.4634+3	8.1690+1	5.1075+1	3.0596+1	1.9139–2
	2.1896–3	2.0649–7	1.9067+6	1.8242–5	2.7741+8	1.8028+8	3.1169+7	6.5962+7	4.4193+3	8.0318+1	5.0375+1	2.9923+1	1.9414–2
L1	2.2001–3	2.0718–7	1.9003+6	1.8373–5	2.7648+8	1.7974+8	3.1045+7	6.5692+7	4.4123+3	8.0102+1	5.0265+1	2.9817+1	1.9459–2
	2.2344–3	2.0948–7	1.8794+6	1.8803–5	2.7345+8	1.7799+8	3.0643+7	6.4807+7	4.3889+3	7.9368+1	4.9880+1	2.9468+1	1.9597–2
	2.3001–3	2.1386–7	1.8410+6	1.9638–5	2.6785+8	1.7477+8	2.9903+7	6.3181+7	4.3454+3	7.8016+1	4.9170+1	2.8826+1	1.9861–2
	2.3922–3	2.1993–7	1.7901+6	2.0832–5	2.6046+8	1.7048+8	2.8930+7	6.1042+7	4.2872+3	7.6246+1	4.8244+1	2.7982+1	2.0228–2
	2.4258–3	2.2212–7	1.7725+6	2.1274–5	2.5789+8	1.6899+8	2.8593+7	6.0300+7	4.2667+3	7.5634+1	4.7924+1	2.7689+1	2.0361–2
	2.4751–3	2.2532–7	1.7473+6	2.1930–5	2.5422+8	1.6686+8	2.8113+7	5.9246+7	4.2374+3	7.4760+1	4.7466+1	2.7274+1	2.0556–2

Atomic Weight 87.620 Density 2.540 Grams/cc

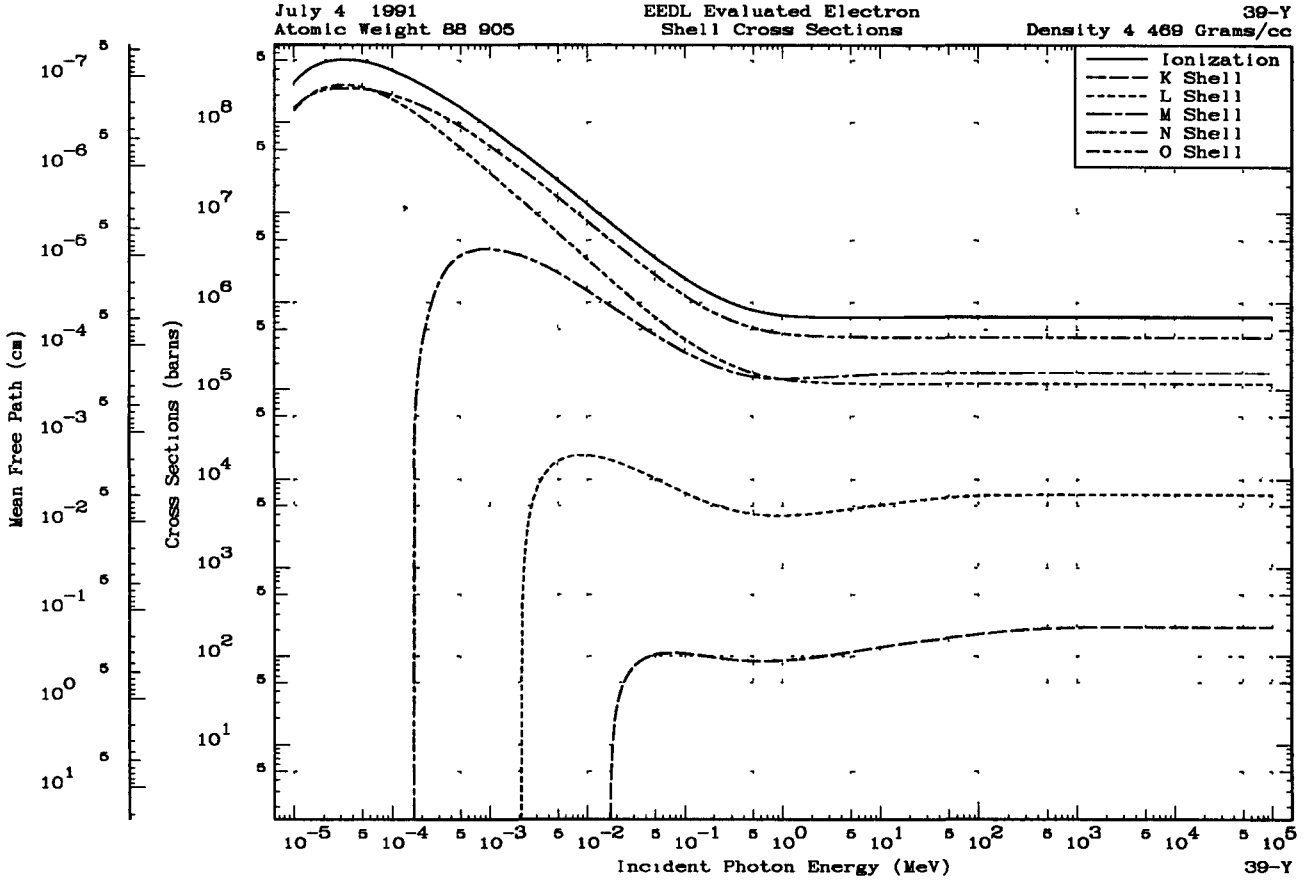
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.6961–3	2.3946–7	1.6441+6	2.4958–5	2.3922+8	1.5808+8	2.6165+7	5.4964+7	4.1147+3	7.1231+1	4.5622+1	2.5588+1	2.1419–2
2.7129–3	2.4052–7	1.6369+6	2.5194–5	2.3816+8	1.5746+8	2.6029+7	5.4665+7	4.1060+3	7.0986+1	4.5495+1	2.5470+1	2.1484–2
2.7375–3	2.4207–7	1.6264+6	2.5542–5	2.3664+8	1.5657+8	2.5833+7	5.4234+7	4.0932+3	7.0631+1	4.5309+1	2.5300+1	2.1579–2
3.0000–3	2.5832–7	1.5241+6	2.9352–5	2.2175+8	1.4777+8	2.3928+7	5.0049+7	3.9665+3	6.7200+1	4.3521+1	2.3657+1	2.2580–2
3.2500–3	2.7383–7	1.4377+6	3.3166–5	2.0919+8	1.4031+8	2.2343+7	4.6530+7	3.8469+3	6.3914+1	4.1701+1	2.2190+1	2.3363–2
3.6250–3	2.9647–7	1.3280+6	3.9231–5	1.9322+8	1.3074+8	2.0353+7	4.2124+7	3.6896+3	5.9794+1	3.9413+1	2.0356+1	2.4513–2
4.0000–3	3.1842–7	1.2364+6	4.5687–5	1.7990+8	1.2267+8	1.8716+7	3.8511+7	3.5532+3	5.6412+1	3.7532+1	1.8854+1	2.5635–2
4.5000–3	3.4761–7	1.1326+6	5.4891–5	1.6479+8	1.1339+8	1.6908+7	3.4489+7	3.3860+3	5.2282+1	3.5144+1	1.7112+1	2.6870–2
5.0000–3	3.7591–7	1.0473+6	6.4774–5	1.5238+8	1.0569+8	1.5442+7	3.1249+7	3.2431+3	4.8937+1	3.3199+1	1.5710+1	2.8075–2
6.0000–3	4.3076–7	9.1396+5	8.6439–5	1.3298+8	9.3418+7	1.3185+7	2.6372+7	2.9953+3	4.3486+1	2.9914+1	1.3542+1	3.0067–2
7.0000–3	4.8417–7	8.1315+5	1.1067–4	1.1831+8	8.4047+7	1.1528+7	2.2733+7	2.7909+3	3.9142+1	2.7243+1	1.1867+1	3.1678–2
8.0000–3	5.3561–7	7.3505+5	1.3736–4	1.0695+8	7.6692+7	1.0264+7	1.9989+7	2.6251+3	3.5839+1	2.5201+1	1.0605+1	3.3243–2
1.0000–2	6.3665–7	6.1840+5	1.9761–4	8.9975+7	6.5513+7	8.4501+6	1.6009+7	2.3518+3	3.0683+1	2.1944+1	8.7034+0	3.5632–2
1.2500–2	7.5676–7	5.2025+5	2.8566–4	7.5694+7	5.5769+7	6.9583+6	1.2965+7	2.0860+3	2.6217+1	1.8975+1	7.2044+0	3.7695–2
1.5000–2	8.7126–7	4.5188+5	3.8705–4	6.5746+7	4.8893+7	5.9390+6	1.0912+7	1.8914+3	2.3163+1	1.6928+1	6.1953+0	3.9699–2
K 1.6067–2	9.2048–7	4.2771+5	4.3430–4	6.2231+7	4.6488+7	5.5964+6	1.0144+7	1.8200+3	2.2012+1	1.6175+1	5.7964+0	4.0376–2
1.6313–2	9.3157–7	4.2262+5	4.4552–4	6.1490+7	4.5962+7	5.5235+6	1.0003+7	1.8041+3	2.1778+1	1.6014+1	5.7242+0	4.0500–2
1.6774–2	9.5227–7	4.1344+5	4.6689–4	6.0153+7	4.5011+7	5.3923+6	9.7485+6	1.7754+3	2.1357+1	1.5722+1	5.5943+0	4.0735–2
1.7580–2	9.8819–7	3.9841+5	5.0528–4	5.7967+7	4.3452+7	5.1782+6	9.3348+6	1.7280+3	2.0669+1	1.5245+1	5.3829+0	4.1144–2
1.8790–2	1.0414–6	3.7805+5	5.6517–4	5.5005+7	4.1335+7	4.8895+6	8.7784+6	1.6631+3	1.9741+1	1.4601+1	5.0987+0	4.1758–2
2.0000–2	1.0939–6	3.5991+5	6.2777–4	5.2366+7	3.9444+7	4.6335+6	8.2869+6	1.6043+3	1.8918+1	1.4028+1	4.8478+0	4.2369–2
2.2500–2	1.2036–6	3.2712+5	7.6579–4	4.7594+7	3.6078+7	4.1927+6	7.3221+6	1.4951+3	1.7332+1	1.2960+1	4.3280+0	4.3155–2
2.3438–2	1.2440–6	3.1647+5	8.2073–4	4.6045+7	3.4979+7	4.0499+6	7.0144+6	1.4589+3	1.6819+1	1.2613+1	4.1622+0	4.3457–2
2.4375–2	1.2830–6	3.0685+5	8.7720–4	4.4646+7	3.3956+7	3.9175+6	6.7708+6	1.4251+3	1.6368+1	1.2291+1	4.0332+0	4.3760–2
2.6250–2	1.3601–6	2.8946+5	9.9470–4	4.2116+7	3.2103+7	3.6790+6	6.3332+6	1.3632+3	1.5554+1	1.1708+1	3.8015+0	4.4371–2
2.7188–2	1.3981–6	2.8160+5	1.0557–3	4.0971+7	3.1261+7	3.5712+6	6.1381+6	1.3349+3	1.5188+1	1.1445+1	3.6984+0	4.4678–2
3.0000–2	1.5104–6	2.6065+5	1.2471–3	3.7924+7	2.9015+7	3.2856+6	5.6223+6	1.2584+3	1.4216+1	1.0744+1	3.4262+0	4.5597–2
3.5000–2	1.7061–6	2.3076+5	1.6182–3	3.3575+7	2.5823+7	2.8924+6	4.8587+6	1.1458+3	1.2757+1	9.7070+0	3.0036+0	4.6654–2
4.0000–2	1.8957–6	2.0768+5	2.0284–3	3.0216+7	2.3343+7	2.5903+6	4.2816+6	1.0565+3	1.1638+1	8.9055+0	2.6844+0	4.7752–2
4.5000–2	2.0847–6	1.8885+5	2.4766–3	2.7477+7	2.1357+7	2.3557+6	3.7629+6	9.8386+2	1.0687+1	8.2534+0	2.3850+0	4.8538–2
5.0000–2	2.2582–6	1.7434+5	2.9603–3	2.5366+7	1.9725+7	2.1640+6	3.4769+6	9.2316+2	9.9957+0	7.7187+0	2.2276+0	4.9360–2
6.0000–2	2.6031–6	1.5124+5	4.0228–3	2.2005+7	1.7189+7	1.8761+6	2.9397+6	8.3402+2	8.8505+0	6.8831+0	1.9167+0	5.0740–2
8.0000–2	3.2457–6	1.2130+5	6.4970–3	1.7648+7	1.3865+7	1.5115+6	2.2715+6	7.0885+2	7.3620+0	5.7878+0	1.5213+0	5.2917–2
1.0000–1	3.8378–6	1.0259+5	9.4026–3	1.4926+7	1.1771+7	1.2898+6	1.8642+6	6.2673+2	6.4255+0	5.0962+0	1.2746+0	5.4718–2
1.5000–1	5.0715–6	7.7629+4	1.8079–2	1.1295+7	8.9550+6	9.9130+5	1.3480+6	5.0554+2	5.1467+0	4.1318+0	9.5625–1	5.8642–2
2.0000–1	6.0723–6	6.4836+4	2.8471–2	9.4334+6	7.5031+6	8.4175+5	1.0881+6	4.4033+2	4.4914+0	3.6369+0	7.9205–1	6.2479–2
3.0000–1	7.6755–6	5.1293+4	5.2473–2	7.4630+6	5.9221+6	6.9409+5	8.4643+5	3.7372+2	3.8572+0	3.1476+0	6.3893–1	7.0646–2
4.0000–1	8.9950–6	4.3769+4	7.9434–2	6.3682+6	5.0154+6	6.2281+5	7.2969+5	3.4184+2	3.5647+0	2.9197+0	5.6548–1	7.9589–2
5.0000–1	1.0144–5	3.8812+4	1.0814–1	5.6471+6	4.4133+6	5.8206+5	6.5135+5	3.2441+2	3.4036+0	2.7999+0	5.1437–1	8.9278–2
6.0000–1	1.1135–5	3.5355+4	1.3791–1	5.1441+6	3.9846+6	5.5634+5	6.0283+5	3.1375+2	3.3154+0	2.7301+0	4.8570–1	9.9556–2
8.0000–1	1.2808–5	3.0739+4	1.9892–1	4.4724+6	3.4057+6	5.2711+5	5.3929+5	3.0380+2	3.2409+0	2.6731+0	4.4551–1	1.2235–1
1.0000+0	1.4186–5	2.7752+4	2.6077–1	4.0379+6	3.0286+6	5.1186+5	4.9711+5	2.9952+2	3.2261+0	2.6583+0	4.2141–1	1.4640–1
1.5000+0	1.6736–5	2.3524+4	4.1359–1	3.4226+6	2.4791+6	4.9935+5	4.4390+5	2.9930+2	3.3184+0	2.7152+0	3.8977–1	2.1338–1
2.0000+0	1.8562–5	2.1210+4	5.6173–1	3.0860+6	2.1744+6	4.9709+5	4.1422+5	3.0266+2	3.4325+0	2.7700+0	3.7657–1	2.8593–1
3.0000+0	2.1001–5	1.8747+4	8.4304–1	2.7276+6	1.8470+6	4.9498+5	3.8529+5	3.0980+2	3.6799+0	2.8751+0	3.6181–1	4.4299–1
4.0000+0	2.2589–5	1.7429+4	1.1061+0	2.5358+6	1.6721+6	4.9640+5	3.6699+5	3.1488+2	3.9270+0	2.9594+0	3.5559–1	6.1202–1
5.0000+0	2.3643–5	1.6652+4	1.3532+0	2.4228+6	1.5645+6	4.9811+5	3.5986+5	3.1887+2	4.1664+0	3.0296+0	3.5323–1	7.8361–1
6.0000+0	2.4398–5	1.6137+4	1.5866+0	2.3478+6	1.4946+6	4.9957+5	3.5337+5	3.2233+2	4.4046+0	3.0877+0	3.5133–1	9.6556–1
8.0000+0	2.5414–5	1.5491+4	2.0184+0	2.2540+6	1.4091+6	5.0279+5	3.4170+5	3.2786+2	4.8672+0	3.1839+0	3.4833–1	1.3350+0
1.0000+1	2.5975–5	1.5157+4	2.4111+0	2.2053+6	1.3638+6	5.0535+5	3.3577+5	3.3245+2	5.3273+0	3.2656+0	3.4679–1	1.7149+0
1.5000+1	2.6383–5	1.4923+4	3.2646+0	2.1712+6	1.3317+6	5.0820+5	3.3098+5	3.4139+2	6.4227+0	3.3810+0	3.4561–1	2.6961+0
2.0000+1	2.6435–5	1.4893+4	3.9824+0	2.1669+6	1.3297+6	5.1026+5	3.2662+5	3.4636+2	7.5388+0	3.4766+0	3.4477–1	3.7175+0
3.0000+1	2.6522–5	1.4844+4	5.1469+0	2.1598+6	1.3293+6	5.1149+5	3.1867+5	3.5373+2	9.7287+0	3.5695+0	3.4360–1	5.8157+0
4.0000+1	2.6533–5	1.4838+4	6.0724+0	2.1589+6	1.3290+6	5.1237+5	3.1718+5	3.5924+2	1.1958+1	3.6478+0	3.4295–1	7.9673+0
5.0000+1	2.6541–5	1.4833+4	6.8385+0	2.1582+6	1.3288+6	5.1294+5	3.1614+5	3.6347+2	1.4213+1	3.7089+0	3.4279–1	1.0161+1
6.0000+1	2.6551–5	1.4828+4	7.4913+0	2.1574+6	1.3286+6	5.1334+5	3.1514+5	3.6716+2	1.6478+1	3.7555+0	3.4267–1	1.2380+1
8.0000+1	2.6574–5	1.4815+4	8.5627+0	2.1556+6	1.3283+6	5.1367+5	3.1320+5	3.7305+2	2.1043+1	3.8208+0	3.4248–1	1.6879+1
1.0000+2	2.6598–5	1.4802+4	9.4222+0	2.1537+6	1.3281+6	5.1387+5	3.1132+5	3.7698+2	2.5649+1	3.8761+0	3.4232–1	2.1431+1
1.5000+2	2.6605–5	1.4798+4	1.1031+1	2.1531+6	1.3277+6	5.1403+5	3.1095+5	3.8451+2	3.7233+1	3.9388+0	3.4204–1	3.2953+1
2.0000+2	2.6620–5	1.4790+4	1.2200+1	2.1518+6	1.3274+6	5.1413+5	3.0989+5	3.8948+2	4.8854+1	3.9970+0	3.4101–1	4.4516+1
3.0000+2	2.6636–5	1.4781+4	1.3873+1	2.1506+6	1.3270+6	5.1422+5	3.0894+5	3.9526+2	7.2159+1	4.0874+0	3.4023–1	6.7731+1
4.0000+2	2.6647–5	1.4775+4	1.5073+1	2.1497+6	1.3267+6	5.1425+5	3.0826+5	3.9871+2	9.5558+1	4.1268+0	3.3974–1	9.1092+1
5.0000+2	2.6660–5	1.4767+4	1.6010+1	2.1486+6	1.3265+6	5.1427+5	3.0742+5	4.0143+2	1.1879+2	4.1634+0	3.3908–1	1.1429+2
6.0000+2	2.6666–5	1.4764+4	1.6779+1	2.1481+6	1.3263+6	5.1428+5	3.0710+5	4.0369+2	1.4216+2	4.1976+0	3.3897–1	1.3762+2
8.0000+2	2.6680–5	1.4757+4	1.7995+1	2.1470+6	1.3261+6	5.1430+5	3.0626+5	4.0787+2	1.8878+2	4.2563+0	3.3857–1	1.8419+2
1.0000+3	2.6692–5	1.4750+4	1.8941+1	2.1461+6	1.3259+6	5.1431+5	3.0551+5	4.1115+2	2.3582+2	4.3096+0	3.3826–1	2.3117+2
1.5000+3	2.6702–5	1.4744+4	2.0662+1	2.1452+6	1.3254+6	5.1431+5	3.0505+5	4.1739+2	3.5335+2	4.3552+0	3.3775–1	3.4866+2
2.0000+3	2.6710–5	1.4740+4	2.1884+1	2.1446+6	1.3252+6	5.1431+5	3.0471+5	4.2208+2	4.7054+2	4.4005+0	3.3738–1	4.6580+2
3.0000+3	2.6717–5	1.4736+4	2.3607+1	2.1440+6	1.3248+6	5.1431+5	3.0450+5	4.2898+2	7.0602+2	4.4906+0	3.3716–1	7.0119+2
4.0000+3	2.6723–5	1.4733+4	2.4829+1	2.1435+6	1.3245+6	5.1431+5	3.0430+5	4.3409+2	9.4140+2	4.5335+0	3.3695–1	9.3652+2
5.0000+3	2.6730–5	1.4729+4	2.5777+1	2.1430+6	1.3243+6	5.1431+5	3.0392+5	4.3812+2	1.1785+3	4.5625+0	3.3654–1	1.1736+3
6.0000+3	2.6732–5	1.4728+4	2.6551+1	2.1428+6	1.3241+6	5.1431+5	3.0399+5	4.4106+2	1.4119+3	4.5915+0	3.3663–1	1.4069+3
8.0000+3	2.6735–5	1.4726+4	2.7773+1	2.1425+6	1.3238+6	5.1431+5	3.0397+5	4.4575+2	1.8825+3	4.6495+0	3.3663–1	1.8775+3
1.0000+4	2.6738–5	1.4724+4	2.8721+1	2.1423+6	1.3236+6	5.1431+5	3.0393+5	4.4942+2	2.3574+3	4.7026+0	3.3661–1	2.3523+3
1.5000+4	2.6743–5	1.4722+4	3.0445+1	2.1419+6	1.3232+6	5.1431+5	3.0396+5	4.5667+2	3.5200+3	4.7472+0	3.3665–1	3.5149+3
2.0000+4	2.6747–5	1.4719+4	3.1670+1	2.1416+6	1.3229+6	5.1431+5	3.0390+5	4.6189+2	4.6976+3	4.7917+0	3.3658–1	4.6925+3
3.0000+4	2.6751–5	1.4717+4	3.3399+1	2.1413+6	1.3225+6	5.1431+5	3.0396+5	4.6923+2	7.0292+3	4.8808+0	3.3665–1	7.0239+3
4.0000+4	2.6755–5	1.4715+4	3.4626+1	2.1410+6	1.3223+6	5.1431+5	3.0391+5	4.7449+2	9.3860+3	4.9231+0	3.3660–1	9.3807+3
5.0000+4	2.6762–5	1.4711+4	3.5577+1	2.1405+6	1.3220+6	5.1431+5	3.0361+5	4.7854+2	1.1721+4	4.9515+0	3.3627–1	1.1716+4
6.0000+4	2.6762–5	1.4711+4	3.6355+1	2.1404+6	1.3219+6	5.1431+5	3.0374+5	4.8185+2	1.4054+4	4.9800+0	3.3641–1	1.4049+4

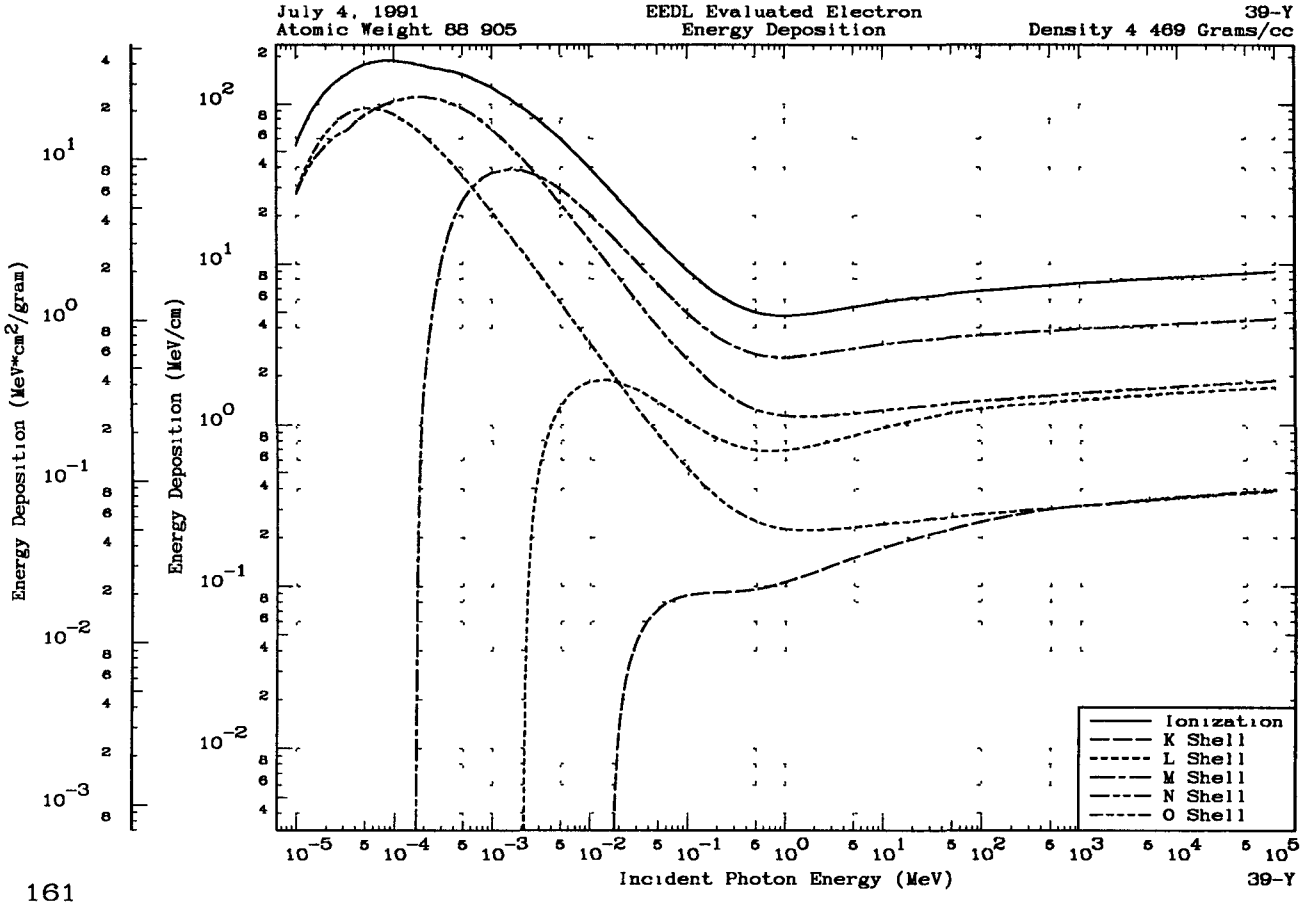
Atomic Weight 87.620												Density 2.540 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+4	2.6765–5	1.4710+4	3.7583+1	2.1402+6	1.3216+6	5.1431+5	3.0380+5	4.8710+2	1.8761+4	5.0369+0	3.3648–1	1.8755+4
1.0000+5	2.6767–5	1.4708+4	3.8534+1	2.1400+6	1.3214+6	5.1431+5	3.0383+5	4.9119+2	2.3476+4	5.0922+0	3.3651–1	2.3470+4


July 4, 1991
Atomic Weight 88 905
EEDL Evaluated Electron
Cross Sections
39-Y
Density 4 469 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
39-Y


July 4, 1991
Atomic Weight 88 905
EEDL Evaluated Electron
Energy Deposition
39-Y
Density 4 469 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
39-Y

160


July 4 1991
Atomic Weight 88 905
EEDL Evaluated Electron
Shell Cross Sections
39-Y
Density 4 469 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
39-Y


July 4, 1991
Atomic Weight 88 905
EEDL Evaluated Electron
Energy Deposition
39-Y
Density 4 469 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
39-Y

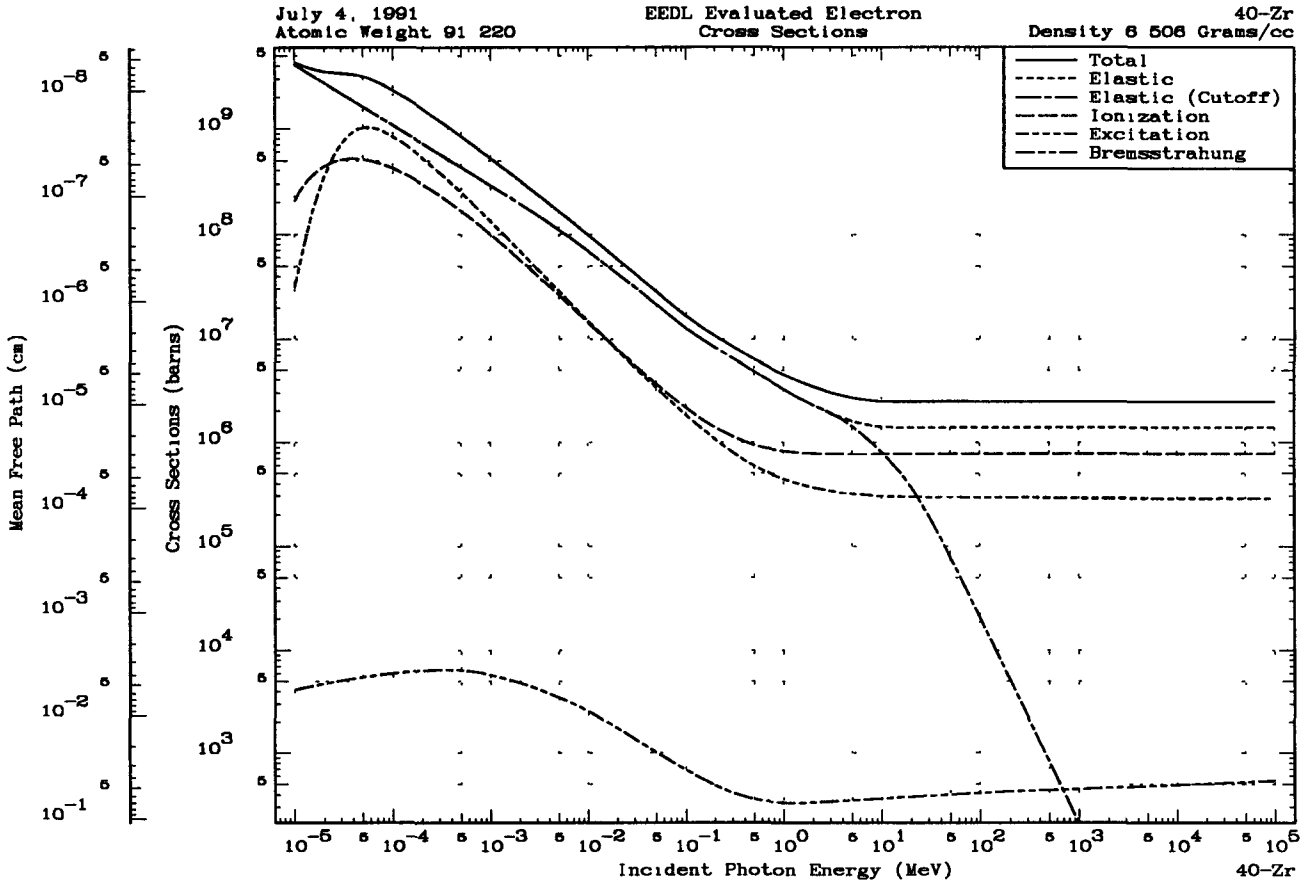
Atomic Weight 88.905 Density 4.469 Grams/cc

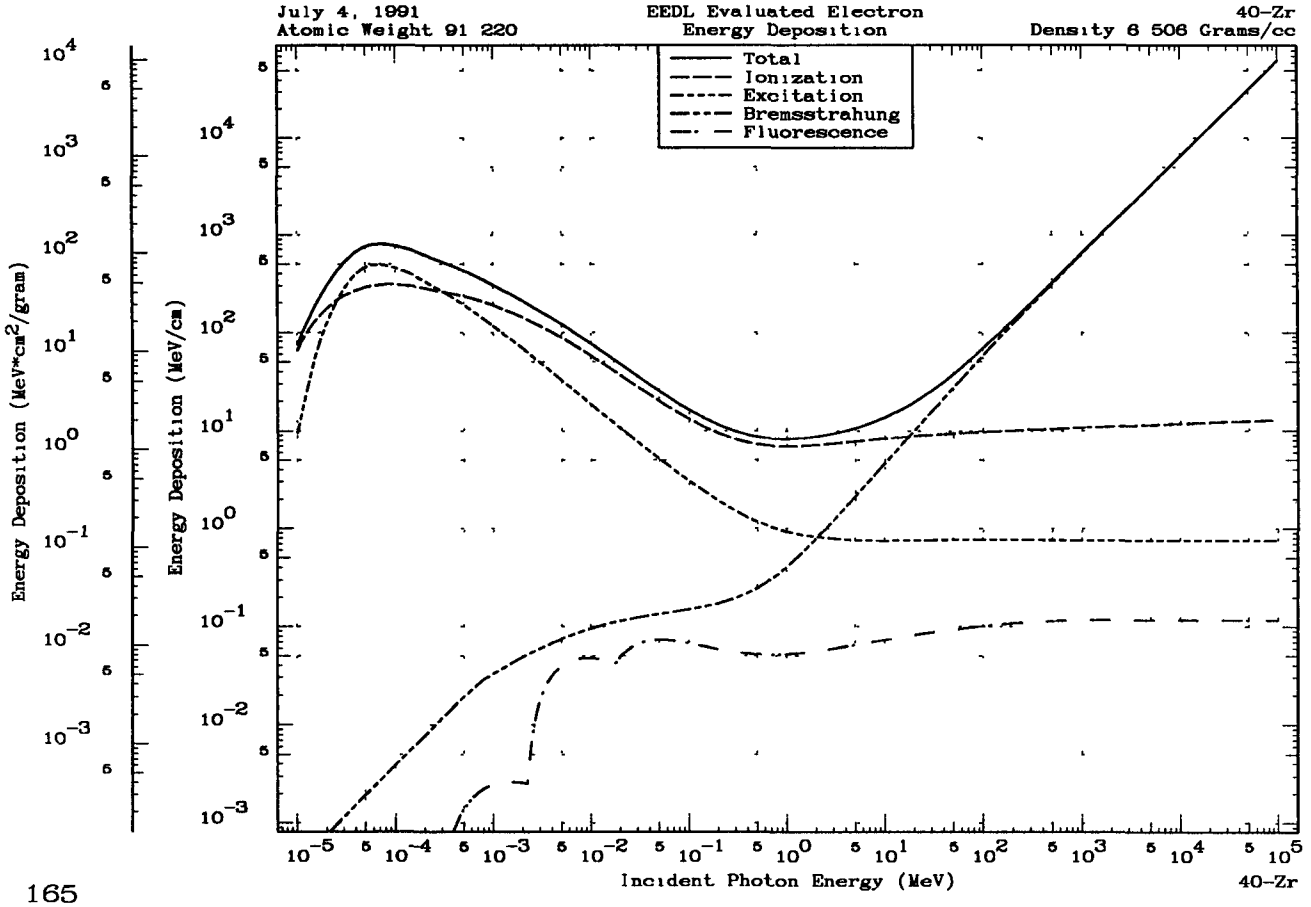
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.6580–9	3.3608+7		4.9616+9	4.6424+9	2.7903+8	4.0138+7	4.0111+3	6.2946+1	5.4911+1	8.0356+0	2.6194–4
	1.1250–5	7.0112–9	3.1915+7		4.7116+9	4.3254+9	3.2235+8	6.3879+7	4.1054+3	7.9168+1	6.5994+1	1.3173+1	2.9330–4
	1.3125–5	7.4421–9	3.0067+7		4.4388+9	3.9429+9	3.7326+8	1.2261+8	4.2320+3	1.0725+2	8.0855+1	2.6392+1	3.4131–4
	1.5000–5	7.7662–9	2.8812+7		4.2536+9	3.6391+9	4.1176+8	2.0272+8	4.3449+3	1.3917+2	9.3698+1	4.5468+1	3.9042–4
	1.7500–5	8.0798–9	2.7694+7		4.0885+9	3.3173+9	4.4531+8	3.2587+8	4.4790+3	1.8383+2	1.0719+2	7.6643+1	4.5746–4
	2.0000–5	8.2831–9	2.7014+7		3.9882+9	3.0617+9	4.7165+8	4.5481+8	4.5985+3	2.3160+2	1.1967+2	1.1193+2	5.2612–4
	2.5000–5	8.5634–9	2.6130+7		3.8576+9	2.6777+9	4.9655+8	6.8334+8	4.7749+3	3.2036+2	1.3714+2	1.8322+2	6.5412–4
	3.0000–5	8.8369–9	2.5322+7		3.7382+9	2.4000+9	5.0554+8	8.3269+8	4.9240+3	3.9073+2	1.4914+2	2.4159+2	7.8575–4
N3	3.2140–5	8.9711–9	2.4943+7		3.6823+9	2.3027+9	5.0437+8	8.7519+8	4.9807+3	4.1439+2	1.5221+2	2.6218+2	8.4258–4
N2	3.3710–5	9.0541–9	2.4714+7		3.6485+9	2.2378+9	5.0446+8	9.0625+8	5.0202+3	4.3270+2	1.5535+2	2.7735+2	8.8463–4
	3.6070–5	9.2263–9	2.4253+7		3.5805+9	2.1488+9	5.0351+8	9.2810+8	5.0769+3	4.5224+2	1.5984+2	2.9240+2	9.4835–4
	3.6855–5	9.2804–9	2.4111+7		3.5596+9	2.1213+9	5.0313+8	9.3517+8	5.0951+3	4.5867+2	1.6125+2	2.9742+2	9.6968–4
	4.0000–5	9.4807–9	2.3602+7		3.4844+9	2.0196+9	5.0222+8	9.6252+8	5.1648+3	4.8507+2	1.6740+2	3.1767+2	1.0558–3
	4.5000–5	9.8929–9	2.2619+7		3.3392+9	1.8819+9	4.9379+8	9.6348+8	5.2536+3	5.0577+2	1.7312+2	3.3264+2	1.1865–3
	5.0000–5	1.0267–8	2.1793+7		3.2174+9	1.7667+9	4.8633+8	9.6433+8	5.3343+3	5.2636+2	1.7875+2	3.4761+2	1.3189–3
N1	5.3350–5	1.0545–8	2.1221+7		3.1328+9	1.6993+9	4.7869+8	9.5482+8	5.3811+3	5.3237+2	1.8062+2	3.5176+2	1.4062–3
	5.4181–5	1.0620–8	2.1071+7		3.1107+9	1.6837+9	4.7692+8	9.5009+8	5.3923+3	5.3297+2	1.8115+2	3.5182+2	1.4279–3
	5.5636–5	1.0750–8	2.0816+7		3.0731+9	1.6571+9	4.7393+8	9.4204+8	5.4115+3	5.3408+2	1.8211+2	3.5198+2	1.4661–3
	5.7818–5	1.0940–8	2.0453+7		3.0195+9	1.6193+9	4.6970+8	9.3048+8	5.4396+3	5.3593+2	1.8363+2	3.5230+2	1.5235–3
	6.0000–5	1.1127–8	2.0111+7		2.9690+9	1.5838+9	4.6573+8	9.1948+8	5.4668+3	5.3797+2	1.8525+2	3.5272+2	1.5812–3
	6.5000–5	1.1567–8	1.9344+7		2.8558+9	1.5095+9	4.5353+8	8.9271+8	5.5260+3	5.3616+2	1.8621+2	3.4995+2	1.7143–3
	7.0000–5	1.1989–8	1.8664+7		2.7553+9	1.4439+9	4.4277+8	8.6863+8	5.5814+3	5.3538+2	1.8758+2	3.4779+2	1.8486–3
	7.2500–5	1.2194–8	1.8350+7		2.7090+9	1.4139+9	4.3766+8	8.5745+8	5.6078+3	5.3510+2	1.8818+2	3.4692+2	1.9162–3
	8.0000–5	1.2884–8	1.7368+7		2.5640+9	1.3328+9	4.2382+8	8.0740+8	5.6826+3	5.2716+2	1.9033+2	3.3683+2	2.1206–3
	9.0000–5	1.3756–8	1.6266+7		2.4014+9	1.2419+9	4.0354+8	7.5594+8	5.7595+3	5.1439+2	1.8984+2	3.2455+2	2.3870–3
	1.0000–4	1.4584–8	1.5344+7	0.0000+0	2.2652+9	1.1659+9	3.8657+8	7.1269+8	5.8292+3	5.0495+2	1.9031+2	3.1464+2	2.6564–3
	1.1250–4	1.5627–8	1.4319+7	2.5201–8	2.1139+9	1.0867+9	3.6444+8	6.6282+8	5.8947+3	4.8717+2	1.8750+2	2.9967+2	2.9859–3
	1.2500–4	1.6621–8	1.3463+7	5.1233–8	1.9875+9	1.0203+9	3.4600+8	6.2117+8	5.9539+3	4.7328+2	1.8583+2	2.8744+2	3.3186–3
	1.3125–4	1.7103–8	1.3083+7	6.4524–8	1.9314+9	9.9100+8	3.3765+8	6.0278+8	5.9815+3	4.6715+2	1.8501+2	2.8214+2	3.4860–3
	1.5000–4	1.8577–8	1.2045+7	1.0549–7	1.7782+9	9.1497+8	3.1600+8	5.4725+8	6.0577+3	4.4838+2	1.8351+2	2.6487+2	3.9924–3
M5	1.6651–4	1.9828–8	1.1285+7	1.4304–7	1.6660+9	8.5961+8	2.9778+8	5.0863+8	6.1180+3	4.3115+2	1.8013+2	2.5102+2	4.4429–3
M4	1.6874–4	1.9993–8	1.1192+7	1.4822–7	1.6523+9	8.5280+8	2.9556+8	5.0390+8	6.1257+3	4.2917+2	1.7983+2	2.4934+2	4.5041–3
	1.7070–4	2.0139–8	1.1111+7	1.5279–7	1.6403+9	8.4695+8	2.9360+8	4.9977+8	6.1304+3	4.2740+2	1.7950+2	2.4789+2	4.5565–3
	1.7265–4	2.0284–8	1.1032+7	1.5736–7	1.6286+9	8.4121+8	2.9167+8	4.9573+8	6.1350+3	4.2564+2	1.7916+2	2.4647+2	4.6088–3
	1.7949–4	2.0786–8	1.0765+7	1.7354–7	1.5893+9	8.2190+8	2.8520+8	4.8216+8	6.1508+3	4.1985+2	1.7811+2	2.4173+2	4.7925–3
	1.8535–4	2.1210–8	1.0550+7	1.8758–7	1.5575+9	8.0627+8	2.8000+8	4.7122+8	6.1639+3	4.1535+2	1.7742+2	2.3793+2	4.9503–3
	2.0000–4	2.2248–8	1.0058+7	2.2328–7	1.4848+9	7.7042+8	2.6813+8	4.4629+8	6.1949+3	4.0538+2	1.7606+2	2.2932+2	5.3460–3
	2.1250–4	2.3140–8	9.6700+6	2.5452–7	1.4276+9	7.4300+8	2.5803+8	4.2655+8	6.2072+3	3.9515+2	1.7370+2	2.2144+2	5.6751–3
	2.2344–4	2.3904–8	9.3609+6	2.8247–7	1.3819+9	7.2104+8	2.5002+8	4.1088+8	6.2174+3	3.8729+2	1.7207+2	2.1521+2	5.9635–3
	2.3301–4	2.4561–8	9.1105+6	3.0738–7	1.3450+9	7.0319+8	2.4357+8	3.9822+8	6.2259+3	3.8116+2	1.7095+2	2.1020+2	6.2163–3
	2.4258–4	2.5208–8	8.8768+6	3.3267–7	1.3105+9	6.8647+8	2.3757+8	3.8644+8	6.2341+3	3.7564+2	1.7008+2	2.0556+2	6.4693–3
	2.5000–4	2.5702–8	8.7060+6	3.5254–7	1.2853+9	6.7422+8	2.3320+8	3.7785+8	6.2402+3	3.7170+2	1.6951+2	2.0218+2	6.6658–3
	2.6650–4	2.6787–8	8.3535+6	3.9743–7	1.2332+9	6.4894+8	2.2403+8	3.6025+8	6.2532+3	3.6360+2	1.6831+2	1.9529+2	7.1033–3
	2.7129–4	2.7096–8	8.2581+6	4.1063–7	1.2191+9	6.4208+8	2.2156+8	3.5550+8	6.2569+3	3.6148+2	1.6803+2	1.9344+2	7.2303–3
M3	2.9992–4	2.8908–8	7.7406+6	4.9107–7	1.1427+9	6.0470+8	2.0817+8	3.2986+8	6.2774+3	3.5043+2	1.6692+2	1.8350+2	7.9917–3
	3.0000–4	2.8913–8	7.7392+6	4.9130–7	1.1425+9	6.0461+8	2.0814+8	3.2979+8	6.2775+3	3.5041+2	1.6692+2	1.8348+2	7.9938–3
	3.0625–4	2.9297–8	7.6377+6	5.0920–7	1.1276+9	5.9720+8	2.0528+8	3.2506+8	6.2817+3	3.4763+2	1.6631+2	1.8132+2	8.1604–3
M2	3.1226–4	2.9664–8	7.5432+6	5.2655–7	1.1136+9	5.9030+8	2.0263+8	3.2067+8	6.2857+3	3.4509+2	1.6577+2	1.7931+2	8.3206–3
	3.1774–4	3.0001–8	7.4586+6	5.4250–7	1.1011+9	5.8422+8	2.0026+8	3.1663+8	6.2890+3	3.4281+2	1.6531+2	1.7749+2	8.4666–3
	3.1797–4	3.0015–8	7.4552+6	5.4316–7	1.1006+9	5.8397+8	2.0017+8	3.1647+8	6.2891+3	3.4272+2	1.6530+2	1.7741+2	8.4726–3
	3.2500–4	3.0442–8	7.3504+6	5.6375–7	1.0851+9	5.7642+8	1.9725+8	3.1147+8	6.2933+3	3.3993+2	1.6476+2	1.7516+2	8.6599–3
	3.2803–4	3.0626–8	7.3064+6	5.7267–7	1.0786+9	5.7325+8	1.9601+8	3.0938+8	6.2950+3	3.3873+2	1.6450+2	1.7421+2	8.7406–3
	3.3848–4	3.1254–8	7.1596+6	6.0371–7	1.0570+9	5.6265+8	1.9192+8	3.0240+8	6.3010+3	3.3479+2	1.6371+2	1.7107+2	9.0194–3
	3.4602–4	3.1702–8	7.0582+6	6.2632–7	1.0420+9	5.5532+8	1.8910+8	2.9759+8	6.3052+3	3.3213+2	1.6322+2	1.6891+2	9.2207–3
	3.6250–4	3.2670–8	6.8493+6	6.7635–7	1.0112+9	5.4015+8	1.8331+8	2.8768+8	6.3140+3	3.2683+2	1.6236+2	1.6447+2	9.6610–3
	3.6924–4	3.3061–8	6.7682+6	6.9703–7	9.9919+8	5.3427+8	1.8107+8	2.8385+8	6.3175+3	3.2476+2	1.6199+2	1.6275+2	9.8412–3
	3.7301–4	3.3279–8	6.7239+6	7.0866–7	9.9265+8	5.3104+8	1.7984+8	2.8176+8	6.3195+3	3.2363+2	1.6180+2	1.6182+2	9.9421–3
M1	3.8579–4	3.4010–8	6.5793+6	7.4838–7	9.7130+8	5.2050+8	1.7585+8	2.7494+8	6.3259+3	3.2001+2	1.6122+2	1.5877+2	1.0284–2
	3.9290–4	3.4420–8	6.5011+6	7.7065–7	9.5975+8	5.1488+8	1.7370+8	2.7116+8	6.3201+3	3.1804+2	1.6092+2	1.5711+2	1.0463–2
	4.0000–4	3.4826–8	6.4252+6	7.9305–7	9.4855+8	5.0942+8	1.7163+8	2.6750+8	6.3144+3	3.1617+2	1.6067+2	1.5549+2	1.0641–2
	4.1250–4	3.5574–8	6.2901+6	8.3285–7	9.2862+8	5.0018+8	1.6793+8	2.6050+8	6.3046+3	3.1200+2	1.5961+2	1.5239+2	1.0955–2
	4.3438–4	3.6863–8	6.0701+6	9.0371–7	8.9613+8	4.8504+8	1.6192+8	2.4916+8	6.2882+3	3.0541+2	1.5803+2	1.4736+2	1.1503–2
	4.5000–4	3.7771–8	5.9243+6	9.5523–7	8.7460+8	4.7495+8	1.5795+8	2.4169+8	6.2770+3	3.0118+2	1.5711+2	1.4406+2	1.1893–2
	5.0000–4	4.0606–8	5.5106+6	1.1246–6	8.1353+8	4.4609+8	1.4671+8	2.2072+8	6.2438+3	2.8927+2	1.5444+2	1.3481+2	1.3138–2
	5.5000–4	4.3348–8	5.1620+6	1.3011–6	7.6207+8	4.2150+8	1.3684+8	2.0372+8	6.1944+3	2.7733+2	1.5089+2	1.2642+2	1.4309–2
	6.0000–4	4.6005–8	4.8639+6	1.4847–6	7.1806+8	4.0024+8	1.2847+8	1.8935+8	6.1496+3	2.6763+2	1.4826+2	1.1936+2	1.5472–2
	7.0000–4	5.1142–8	4.3753+6	1.8719–6	6.4593+8	3.6517+8	1.1434+8	1.6642+8	6.0325+3	2.4911+2	1.4163+2	1.0747+2	1.7607–2
	8.0000–4	5.6034–8	3.9934+6	2.2847–6	5.8955+8	3.3728+8	1.0345+8	1.4881+8	5.9328+3	2.3548+2	1.3706+2	9.8392+1	1.9705–2
	9.0000–4	6.0758–8	3.6829+6	2.7215–6	5.4371+8	3.1446+8	9.4381+7	1.3486+8	5.7776+3	2.2246+2	1.3164+2	9.0796+1	2.1167–2
	1.0000–3	6.5306–8	3.4264+6	3.1818–6	5.0584+8	2.9535+8	8.6987+7	1.2350+8	5.6422+3	2.1214+2	1.2749+2	8.4634+1	2.2602–2
	1.1250–3	7.0860–8	3.1578+6	3.7898–6	4.6619+8	2.7534+8	7.9119+7	1.1173+8	5.4800+3	1.9918+2	1.2135+2	7.7809+1	2.4156–2
	1.2500–3	7.6211–8	2.9361+6	4.4344–6	4.3346+8	2.5858+8	7.2711+7	1.0216+8	5.3389+3	1.8879+2	1.1648+2	7.2276+1	2.5681–2
	1.3125–3	7.8819–8	2.8390+6	4.7694–6	4.1912+8	2.5117+8	6.9927+7	9.8011+7	5.2748+3	1.8428+2	1.1437+2	6.9883+1	2.6433–2
	1.5000–3	8.6404–8	2.5898+6	5.8193–6	3.8233+8	2.3197+8	6.2861+7	8.7495+7	5.1032+3	1.7301+2	1.0915+2	6.3840+1	2.8652–2
	1.7500–3	9.6153–8	2.3272+6	7.3262–6	3.4356+8	2.1142+8	5.5354+7	7.6783+7	4.8830+3	1.5899+2	1.0174+2	5.7223+1	3.1030–2
	2.0000–3	1.0545–7	2.1220+6	8.9537–6	3.1327+8	1.9510+8	4.9600+7	6.8570+7	4.7000+3	1.4836+2	9.6150+1	5.2173+1	3.3346–2
L3	2.0815–3	1.0843–7	2.0637+6	9.5094–6	3.0466+8	1.9034+8	4.7963+7	6.6359+7	4.6434+3	1.4495+2	9.4190+1	5.0729+1	3.4046–2
	2.1389–3	1.1051–7	2.0248+6	9.9086–6	2.9892+8	1.8716+8	4.6880+7	6.4878+7	4.6051+3	1.4272+2	9.2919+1	4.9767+1	3.4535–2
L2	2.1597–3	1.1126–7	2.0112+6	1.0055–5	2.9691+8	1.8605+8	4.6501+7	6.4360+7	4.5916+3	1.4194+2	9.2471+1	4.9430+1	3.4712–2
	2.2122–3	1.1315–7	1.9775+6	1.0427–5	2.9194+8	1.8330+8	4.5573+7	6.3066+7	4.5560+3	1.4002+2	9.1390+1	4.8599+1	3.5122–2

Atomic Weight 88.905 Density 4.469 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.2465–3	1.1438–7	1.9563+6	1.0673–5	2.8881+8	1.8157+8	4.4989+7	6.2251+7	4.5333+3	1.3883+2	9.0715+1	4.8075+1	3.5389–2
	2.3107–3	1.1666–7	1.9180+6	1.1139–5	2.8316+8	1.7843+8	4.3940+7	6.0787+7	4.4920+3	1.3667+2	8.9496+1	4.7135+1	3.5886–2
L1	2.3549–3	1.1822–7	1.8927+6	1.1464–5	2.7943+8	1.7635+8	4.3248+7	5.9821+7	4.4645+3	1.3525+2	8.8694+1	4.6515+1	3.6227–2
	2.4349–3	1.2106–7	1.8484+6	1.2062–5	2.7287+8	1.7271+8	4.2045+7	5.8120+7	4.4138+3	1.3267+2	8.7239+1	4.5393+1	3.6801–2
	2.4355–3	1.2108–7	1.8480+6	1.2066–5	2.7282+8	1.7268+8	4.2036+7	5.8108+7	4.4135+3	1.3265+2	8.7227+1	4.5385+1	3.6805–2
	2.4830–3	1.2275–7	1.8229+6	1.2426–5	2.6911+8	1.7060+8	4.1356+7	5.7147+7	4.3844+3	1.3119+2	8.6403+1	4.4752+1	3.7144–2
	2.5762–3	1.2600–7	1.7759+6	1.3144–5	2.6217+8	1.6672+8	4.0092+7	5.5359+7	4.3297+3	1.2849+2	8.4874+1	4.3574+1	3.7804–2
	2.5766–3	1.2602–7	1.7756+6	1.3147–5	2.6214+8	1.6670+8	4.0085+7	5.5351+7	4.3294+3	1.2847+2	8.4867+1	4.3568+1	3.7807–2
	2.7415–3	1.3168–7	1.6993+6	1.4453–5	2.5087+8	1.6036+8	3.8045+7	5.2466+7	4.2387+3	1.2412+2	8.2411+1	4.1670+1	3.8963–2
	2.7881–3	1.3326–7	1.6792+6	1.4830–5	2.4790+8	1.5867+8	3.7509+7	5.1709+7	4.2144+3	1.2298+2	8.1771+1	4.1172+1	3.9287–2
	2.7883–3	1.3327–7	1.6791+6	1.4832–5	2.4788+8	1.5867+8	3.7506+7	5.1705+7	4.2142+3	1.2298+2	8.1767+1	4.1170+1	3.9289–2
	3.0000–3	1.4034–7	1.5944+6	1.6587–5	2.3538+8	1.5157+8	3.5269+7	4.8541+7	4.1102+3	1.1823+2	7.9100+1	3.9093+1	4.0745–2
	3.2500–3	1.4869–7	1.5049+6	1.8754–5	2.2217+8	1.4403+8	3.2929+7	4.5206+7	3.9857+3	1.1253+2	7.5723+1	3.6765+1	4.2159–2
	3.6250–3	1.6085–7	1.3911+6	2.2197–5	2.0537+8	1.3435+8	2.9990+7	4.1024+7	3.8218+3	1.0538+2	7.1486+1	3.3851+1	4.4234–2
	4.0000–3	1.7264–7	1.2961+6	2.5859–5	1.9134+8	1.2618+8	2.7569+7	3.7586+7	3.6799+3	9.9514+1	6.8006+1	3.1461+1	4.6258–2
	4.5000–3	1.8840–7	1.1877+6	3.1074–5	1.7534+8	1.1674+8	2.4901+7	3.3693+7	3.5069+3	9.2306+1	6.3638+1	2.8619+1	4.8540–2
	5.0000–3	2.0368–7	1.0986+6	3.6670–5	1.6219+8	1.0890+8	2.2736+7	3.0554+7	3.3591+3	8.6469+1	6.0089+1	2.6330+1	5.0763–2
	6.0000–3	2.3357–7	9.5803+5	4.8938–5	1.4144+8	9.6359+7	1.9404+7	2.5668+7	3.1044+3	7.6751+1	5.4063+1	2.2634+1	5.4379–2
	7.0000–3	2.6268–7	8.5184+5	6.2669–5	1.2576+8	8.6761+7	1.6959+7	2.2035+7	2.8918+3	6.9043+1	4.9202+1	1.9784+1	5.7332–2
	8.0000–3	2.9073–7	7.6966+5	7.7804–5	1.1363+8	7.9223+7	1.5094+7	1.9306+7	2.7195+3	6.3185+1	4.5481+1	1.7643+1	6.0194–2
	1.0000–2	3.4583–7	6.4703+5	1.1200–4	9.5522+7	6.7741+7	1.2413+7	1.5365+7	2.4443+3	5.4039+1	3.9549+1	1.4426+1	6.4668–2
	1.2500–2	4.1098–7	5.4446+5	1.6198–4	8.0379+7	5.7734+7	1.0210+7	1.2432+7	2.1701+3	4.6199+1	3.4173+1	1.1957+1	6.8449–2
	1.5000–2	4.7307–7	4.7300+5	2.1950–4	6.9829+7	5.0665+7	8.7054+6	1.0457+7	1.9691+3	4.0839+1	3.0470+1	1.0297+1	7.2120–2
K	1.7000–2	5.2216–7	4.2853+5	2.7070–4	6.3264+7	4.6224+7	7.8072+6	9.2318+6	1.8357+3	3.7341+1	2.8050+1	9.2168+0	7.4231–2
	1.7375–2	5.3118–7	4.2126+5	2.8082–4	6.2191+7	4.5482+7	7.6608+6	9.0461+6	1.8131+3	3.6776+1	2.7649+1	9.0529+0	7.4570–2
	1.8031–2	5.4685–7	4.0919+5	2.9889–4	6.0408+7	4.4249+7	7.4184+6	8.7391+6	1.7752+3	3.5840+1	2.6983+1	8.7820+0	7.5165–2
	1.9016–2	5.7012–7	3.9249+5	3.2686–4	5.7943+7	4.2540+7	7.0843+6	8.3170+6	1.7223+3	3.4550+1	2.6064+1	8.4097+0	7.6055–2
	2.0000–2	5.9312–7	3.7726+5	3.5585–4	5.5696+7	4.0978+7	6.7811+6	7.9351+6	1.6735+3	3.3378+1	2.5228+1	8.0731+0	7.6943–2
	2.1250–2	6.2253–7	3.5944+5	3.9413–4	5.3065+7	3.9155+7	6.4376+6	7.4706+6	1.6150+3	3.1933+1	2.4212+1	7.6439+0	7.7681–2
	2.3438–2	6.7312–7	3.3243+5	4.6509–4	4.9076+7	3.6379+7	5.9191+6	6.7767+6	1.5248+3	2.9754+1	2.2672+1	7.0026+0	7.9004–2
	2.5078–2	7.1041–7	3.1498+5	5.2156–4	4.6501+7	3.4578+7	5.5858+6	6.3356+6	1.4654+3	2.8353+1	2.1678+1	6.5950+0	8.0011–2
	2.7539–2	7.6538–7	2.9236+5	6.1125–4	4.3161+7	3.2232+7	5.1555+6	5.7722+6	1.3871+3	2.6547+1	2.0391+1	6.0744+0	8.1530–2
	3.0000–2	8.1787–7	2.7359+5	7.0658–4	4.0391+7	3.0226+7	4.7912+6	5.3719+6	1.3192+3	2.5095+1	1.9298+1	5.7144+0	8.3049–2
	3.5000–2	9.2399–7	2.4217+5	9.1677–4	3.5752+7	2.6900+7	4.2120+6	4.6388+6	1.2026+3	2.2527+1	1.7430+1	5.0117+0	8.5033–2
	4.0000–2	1.0269–6	2.1790+5	1.1490–3	3.2169+7	2.4316+7	3.7674+6	4.0851+6	1.1100+3	2.0556+1	1.5988+1	4.4814+0	8.7090–2
	4.5000–2	1.1293–6	1.9814+5	1.4027–3	2.9252+7	2.2241+7	3.4227+6	3.5869+6	1.0336+3	1.8883+1	1.4814+1	3.9805+0	8.8575–2
	5.0000–2	1.2238–6	1.8284+5	1.6765–3	2.6993+7	2.0536+7	3.1413+6	3.3144+6	9.6972+2	1.7663+1	1.3852+1	3.7204+0	9.0118–2
	6.0000–2	1.4102–6	1.5868+5	2.2776–3	2.3426+7	1.7906+7	2.7191+6	2.7996+6	8.7214+2	1.5648+1	1.2353+1	3.2018+0	9.2639–2
	8.0000–2	1.7548–6	1.2751+5	3.6770–3	1.8825+7	1.4481+7	2.1846+6	2.1586+6	7.3706+2	1.3018+1	1.0380+1	2.5411+0	9.6722–2
	1.0000–1	2.0676–6	1.0822+5	5.3195–3	1.5977+7	1.2340+7	1.8603+6	1.7761+6	6.4990+2	1.1372+1	9.1348+0	2.1372+0	1.0020–1
	1.5000–1	2.7174–6	8.2344+4	1.0220–2	1.2156+7	9.4483+6	1.4247+6	1.2830+6	5.2707+2	9.1163+0	7.4044+0	1.6045+0	1.0744–1
	2.0000–1	3.2467–6	6.8921+4	1.6087–2	1.0175+7	7.9361+6	1.2065+6	1.0317+6	4.6217+2	7.9550+0	6.5146+0	1.3260+0	1.1452–1
	3.0000–1	4.1067–6	5.4488+4	2.9643–2	8.0440+6	6.2570+6	9.9085+5	7.9573+5	3.9421+2	6.8273+0	5.6350+0	1.0627+0	1.2959–1
	4.0000–1	4.8234–6	4.6391+4	4.4882–2	6.8488+6	5.2830+6	8.8590+5	6.7952+5	3.6055+2	6.3039+0	5.2251+0	9.3285–1	1.4600–1
	5.0000–1	5.4452–6	4.1094+4	6.1106–2	6.0667+6	4.6331+6	8.2563+5	6.0764+5	3.4212+2	6.0252+0	5.0089+0	8.5245–1	1.6380–1
	6.0000–1	6.0004–6	3.7292+4	7.7938–2	5.5054+6	4.1634+6	7.8723+5	5.5446+5	3.3067+2	5.8578+0	4.8832+0	7.9196–1	1.8257–1
	8.0000–1	6.9234–6	3.2320+4	1.1242–1	4.7714+6	3.5320+6	7.4340+5	4.9572+5	3.1976+2	5.7427+0	4.7901+0	7.2858–1	2.2404–1
	1.0000+0	7.6926–6	2.9088+4	1.4737–1	4.2943+6	3.1200+6	7.1862+5	4.5534+5	3.1506+2	5.7036+0	4.7511+0	6.8438–1	2.6812–1
	1.5000+0	9.1157–6	2.4547+4	2.3382–1	3.6239+6	2.5245+6	6.9485+5	4.0424+5	3.1418+2	5.8634+0	4.8445+0	6.2868–1	3.9027–1
	2.0000+0	1.0138–5	2.2072+4	3.1771–1	3.2584+6	2.1978+6	6.8849+5	3.7184+5	3.1738+2	6.0587+0	4.9378+0	5.9835–1	5.2258–1
	3.0000+0	1.1477–5	1.9497+4	4.7706–1	2.8783+6	1.8537+6	6.8057+5	3.4374+5	3.2504+2	6.4976+0	5.1193+0	5.7013–1	8.0817–1
	4.0000+0	1.2332–5	1.8145+4	6.2596–1	2.6787+6	1.6709+6	6.8098+5	3.2650+5	3.3090+2	6.9385+0	5.2641+0	5.5775–1	1.1167+0
	5.0000+0	1.2890–5	1.7359+4	7.6582–1	2.5627+6	1.5637+6	6.8148+5	3.1725+5	3.3553+2	7.3662+0	5.3876+0	5.4831–1	1.4303+0
	6.0000+0	1.3282–5	1.6847+4	8.9782–1	2.4871+6	1.4957+6	6.8177+5	3.0928+5	3.3940+2	7.7887+0	5.4869+0	5.4074–1	1.7611+0
	8.0000+0	1.3781–5	1.6238+4	1.1419+0	2.3972+6	1.4151+6	6.8313+5	2.9863+5	3.4559+2	8.6169+0	5.6497+0	5.3405–1	2.4332+0
	1.0000+1	1.4009–5	1.5973+4	1.3635+0	2.3581+6	1.3790+6	6.8486+5	2.9387+5	3.5060+2	9.4456+0	5.7882+0	5.3169–1	3.1258+0
	1.5000+1	1.4117–5	1.5851+4	1.8440+0	2.3401+6	1.3627+6	6.8677+5	2.9026+5	3.6012+2	1.1427+1	5.9793+0	5.3018–1	4.9173+0
	2.0000+1	1.4133–5	1.5833+4	2.2469+0	2.3374+6	1.3620+6	6.8815+5	2.8698+5	3.6498+2	1.3447+1	6.1398+0	5.2912–1	6.7777+0
	3.0000+1	1.4168–5	1.5794+4	2.8984+0	2.3316+6	1.3615+6	6.8879+5	2.8093+5	3.7211+2	1.7426+1	6.3009+0	5.2763–1	1.0597+1
	4.0000+1	1.4171–5	1.5790+4	3.4145+0	2.3310+6	1.3612+6	6.8941+5	2.8002+5	3.7736+2	2.1469+1	6.4309+0	5.2715–1	1.4511+1
	5.0000+1	1.4172–5	1.5789+4	3.8409+0	2.3310+6	1.3610+6	6.8982+5	2.7976+5	3.8152+2	2.5552+1	6.5350+0	5.2788–1	1.8489+1
	6.0000+1	1.4174–5	1.5787+4	4.2039+0	2.3307+6	1.3608+6	6.9008+5	2.7942+5	3.8496+2	2.9648+1	6.6119+0	5.2845–1	2.2508+1
	8.0000+1	1.4179–5	1.5782+4	4.7985+0	2.3298+6	1.3605+6	6.9031+5	2.7862+5	3.9058+2	3.7965+1	6.7260+0	5.2936–1	3.0710+1
	1.0000+2	1.4185–5	1.5775+4	5.2745+0	2.3289+6	1.3603+6	6.9045+5	2.7774+5	3.9509+2	4.6347+1	6.8203+0	5.3009–1	3.8997+1
	1.5000+2	1.4183–5	1.5777+4	6.1636+0	2.3292+6	1.3599+6	6.9055+5	2.7833+5	4.0349+2	6.7438+1	6.9272+0	5.3139–1	5.9979+1
	2.0000+2	1.4189–5	1.5770+4	6.8082+0	2.3281+6	1.3596+6	6.9062+5	2.7748+5	4.0903+2	8.8668+1	7.0275+0	5.2993–1	8.1111+1
	3.0000+2	1.4197–5	1.5762+4	7.7302+0	2.3269+6	1.3592+6	6.9068+5	2.7661+5	4.1476+2	1.3100+2	7.1845+0	5.2860–1	1.2328+2
	4.0000+2	1.4203–5	1.5755+4	8.3913+0	2.3259+6	1.3589+6	6.9069+5	2.7594+5	4.1838+2	1.7352+2	7.2547+0	5.2763–1	1.6574+2
	5.0000+2	1.4209–5	1.5748+4	8.9064+0	2.3249+6	1.3586+6	6.9071+5	2.7508+5	4.2112+2	2.1631+2	7.3176+0	5.2633–1	2.0847+2
	6.0000+2	1.4212–5	1.5744+4	9.3286+0	2.3243+6	1.3585+6	6.9072+5	2.7474+5	4.2369+2	2.5862+2	7.3798+0	5.2600–1	2.5071+2
	8.0000+2	1.4219–5	1.5737+4	9.9974+0	2.3233+6	1.3582+6	6.9072+5	2.7400+5	4.2794+2	3.4352+2	7.4826+0	5.2524–1	3.3551+2
	1.0000+3	1.4224–5	1.5732+4	1.0517+1	2.3224+6	1.3579+6	6.9073+5	2.7336+5	4.3147+2	4.2877+2	7.5763+0	5.2467–1	4.2067+2
	1.5000+3	1.4229–5	1.5726+4	1.1464+1	2.3216+6	1.3575+6	6.9073+5	2.7295+5	4.3807+2	6.4183+2	7.6567+0	5.2388–1	6.3365+2
	2.0000+3	1.4232–5	1.5722+4	1.2136+1	2.3211+6	1.3572+6	6.9073+5	2.7266+5	4.4289+2	8.5610+2	7.7367+0	5.2333–1	8.4784+2
	3.0000+3	1.4236–5	1.5718+4	1.3083+1	2.3205+6	1.3568+6	6.9073+5	2.7248+5	4.5024+2	1.2847+3	7.8962+0	5.2300–1	1.2763+3
	4.0000+3	1.4239–5	1.5715+4	1.3755+1	2.3201+6	1.3565+6	6.9074+5	2.7235+5	4.5562+2	1.7131+3	7.9748+0	5.2276–1	1.7046+3
	5.0000+3	1.4242–5	1.5711+4	1.4276+1	2.3194+6	1.3563+6	6.9074+5	2.7196+5	4.5984+2	2.1447+3	8.0270+0	5.2203–1	2.1362+3
	6.0000+3	1.4243–5	1.5710+4	1.4701+1	2.3193+6	1.3561+6	6.9074+5	2.7203+5	4.6297+2	2.5694+3	8.0793+0	5.2218–1	2.5608+3
	8.0000+3	1.4245–5	1.5709+4	1.5373+1	2.3191+6	1.3558+6	6.9074+5	2.7206+5	4.6794+2	3.4260+3	8.1837+0	5.2228–1	3.4173+3
	1.0000+4	1.4246–5	1.5707+4	1.5893+1	2.3188+6	1.3556+6	6.9074+5	2.7205+5	4.7183+2	4.2904+3	8.2741+0	5.2228–1	4.2816+3

Atomic Weight 88.905												Density 4.469 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000+4	1.4248–5	1.5704+4	1.6841+1	2.3184+6	1.3552+6	6.9074+5	2.7207+5	4.7945+2	6.4066+3	8.3529+0	5.2231–1	6.3977+3
2.0000+4	1.4250–5	1.5702+4	1.7514+1	2.3181+6	1.3549+6	6.9074+5	2.7202+5	4.8493+2	8.5501+3	8.4317+0	5.2221–1	8.5412+3
3.0000+4	1.4253–5	1.5700+4	1.8464+1	2.3177+6	1.3544+6	6.9074+5	2.7207+5	4.9263+2	1.2794+4	8.5893+0	5.2231–1	1.2785+4
4.0000+4	1.4255–5	1.5698+4	1.9138+1	2.3174+6	1.3542+6	6.9074+5	2.7203+5	4.9816+2	1.7084+4	8.6657+0	5.2224–1	1.7075+4
5.0000+4	1.4258–5	1.5694+4	1.9660+1	2.3169+6	1.3539+6	6.9074+5	2.7172+5	5.0241+2	2.1334+4	8.7181+0	5.2164–1	2.1324+4
6.0000+4	1.4258–5	1.5694+4	2.0088+1	2.3168+6	1.3537+6	6.9074+5	2.7186+5	5.0588+2	2.5580+4	8.7686+0	5.2191–1	2.5571+4
8.0000+4	1.4260–5	1.5692+4	2.0762+1	2.3166+6	1.3534+6	6.9074+5	2.7191+5	5.1140+2	3.4147+4	8.8694+0	5.2200–1	3.4138+4
1.0000+5	1.4261–5	1.5691+4	2.1285+1	2.3164+6	1.3532+6	6.9074+5	2.7192+5	5.1569+2	4.2730+4	8.9674+0	5.2203–1	4.2720+4


July 4, 1991
Atomic Weight 91 220
EEDL Evaluated Electron
Cross Sections
40-Zr
Density 6 506 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
40-Zr


July 4, 1991
Atomic Weight 91 220
EEDL Evaluated Electron
Energy Deposition
40-Zr
Density 6 506 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
40-Zr

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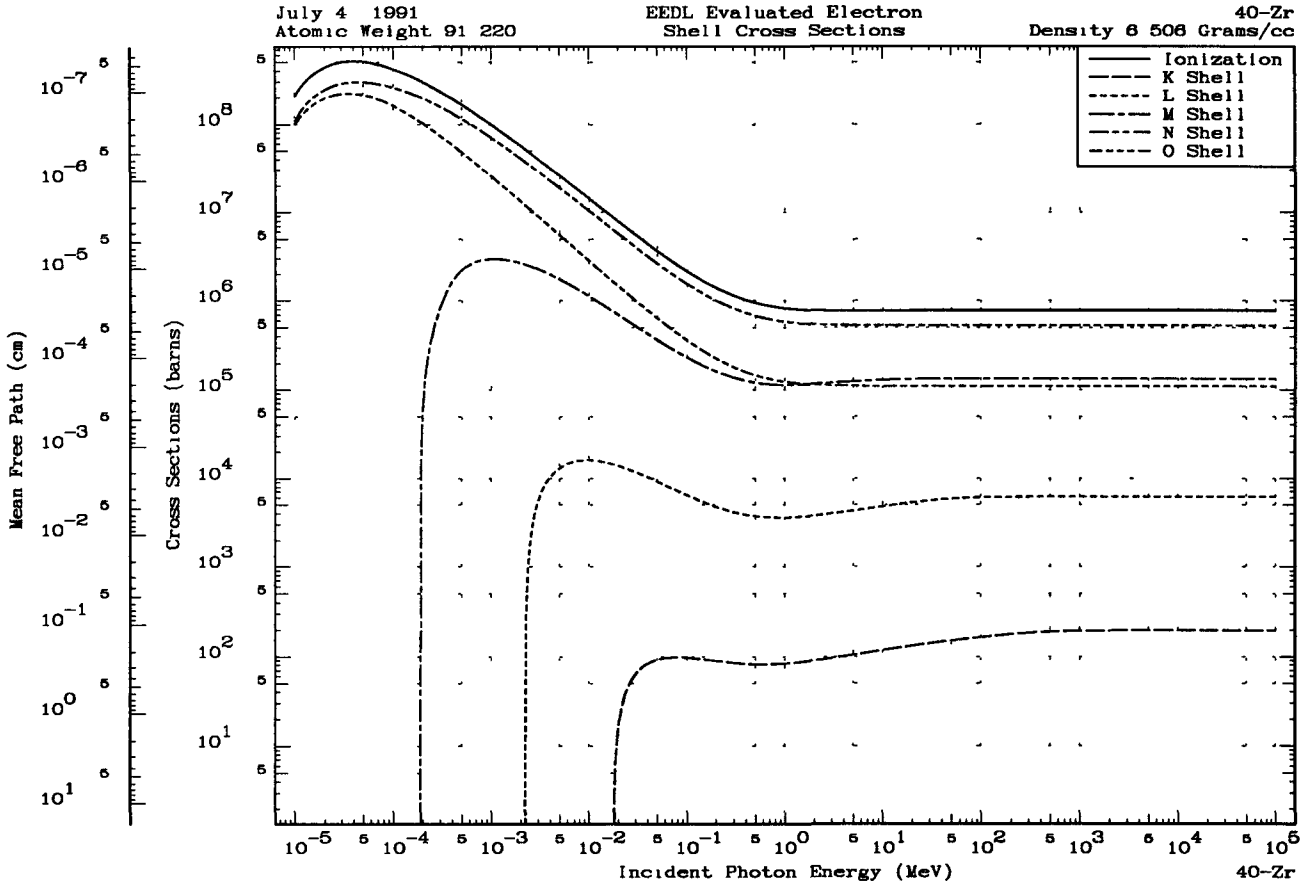
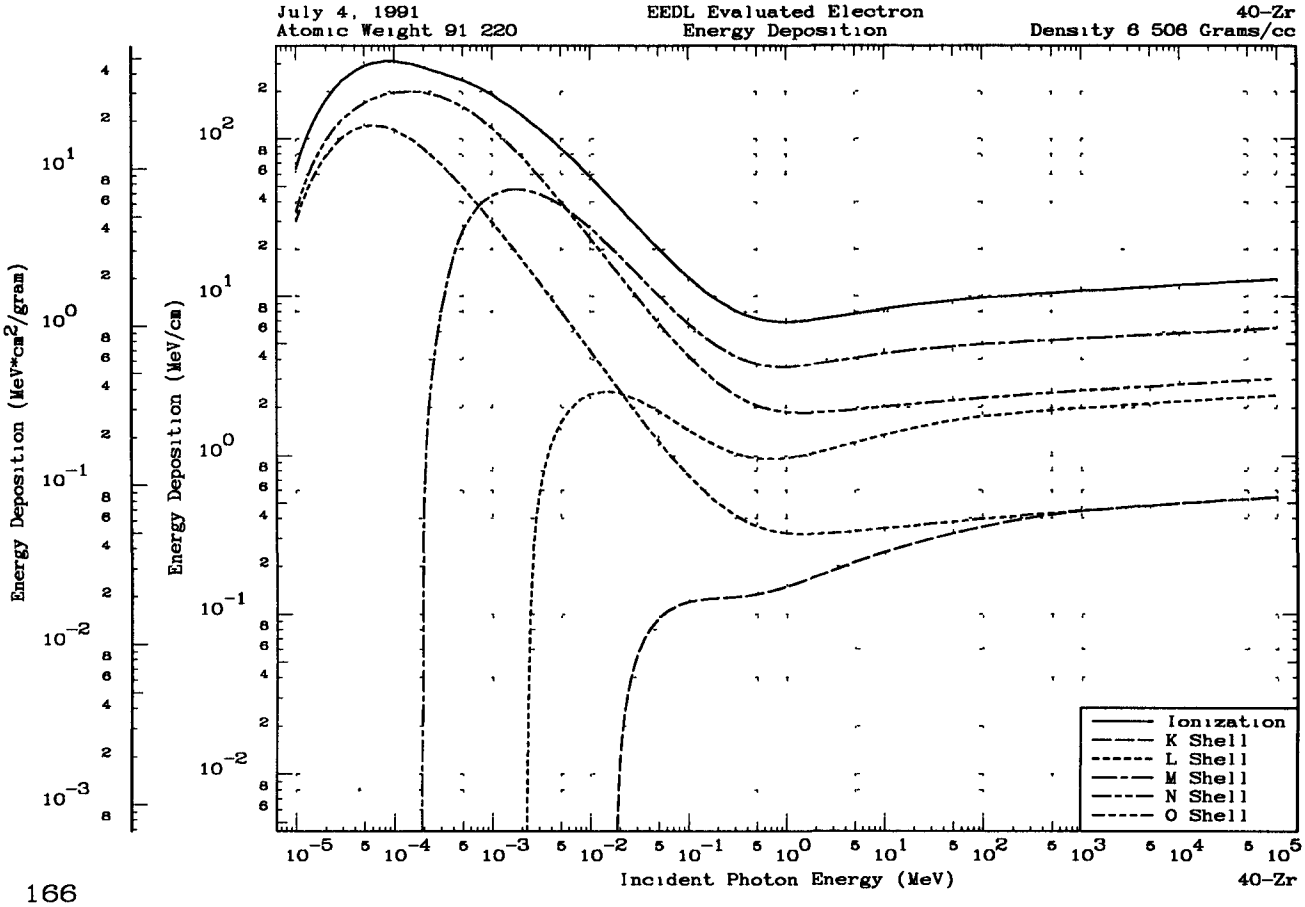

July 4 1991
Atomic Weight 91 220
EEDL Evaluated Electron
Shell Cross Sections
40-Zr
Density 6 506 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
40-Zr


July 4, 1991
Atomic Weight 91 220
EEDL Evaluated Electron
Energy Deposition
40-Zr
Density 6 506 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
40-Zr

166

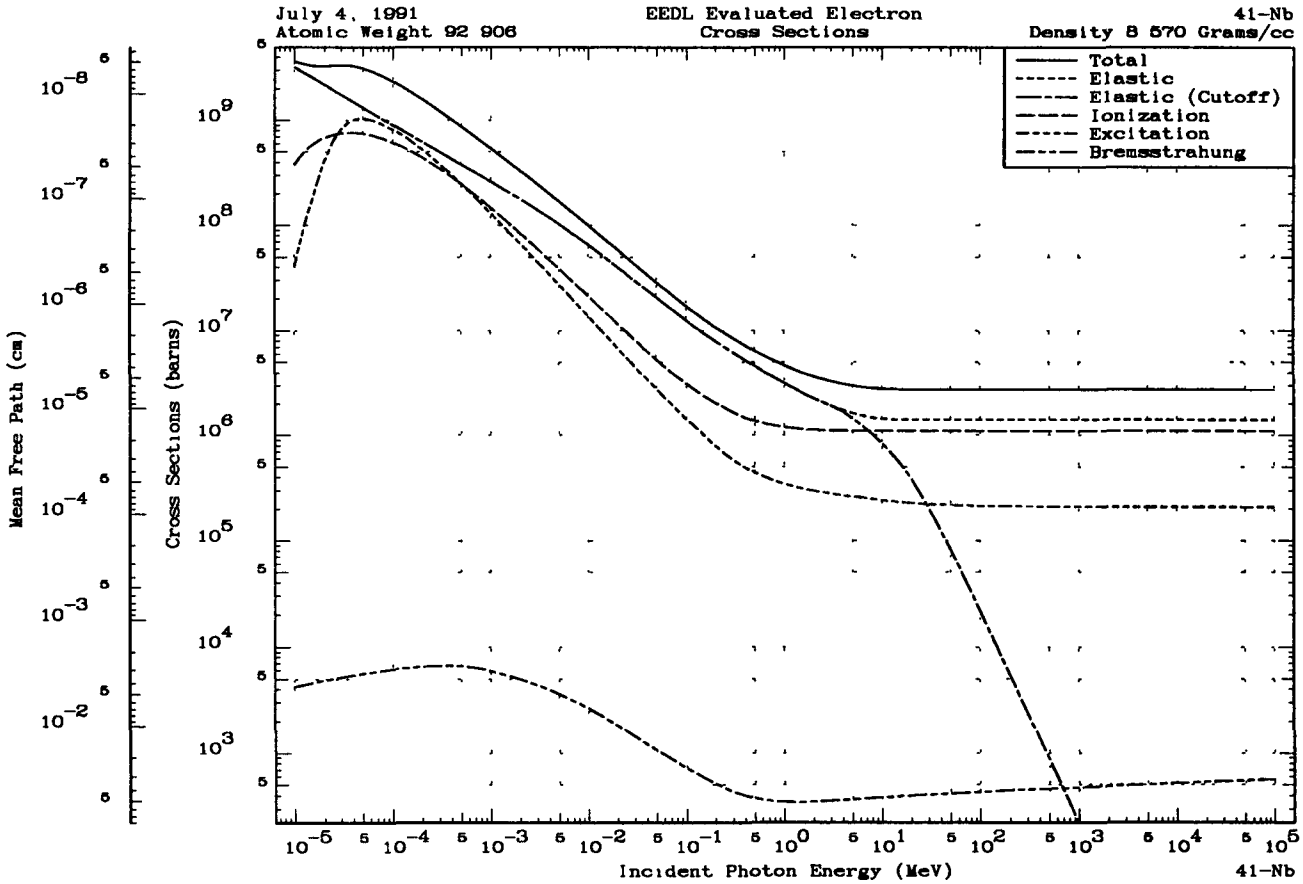
Atomic Weight 91.220 Density 6.506 Grams/cc

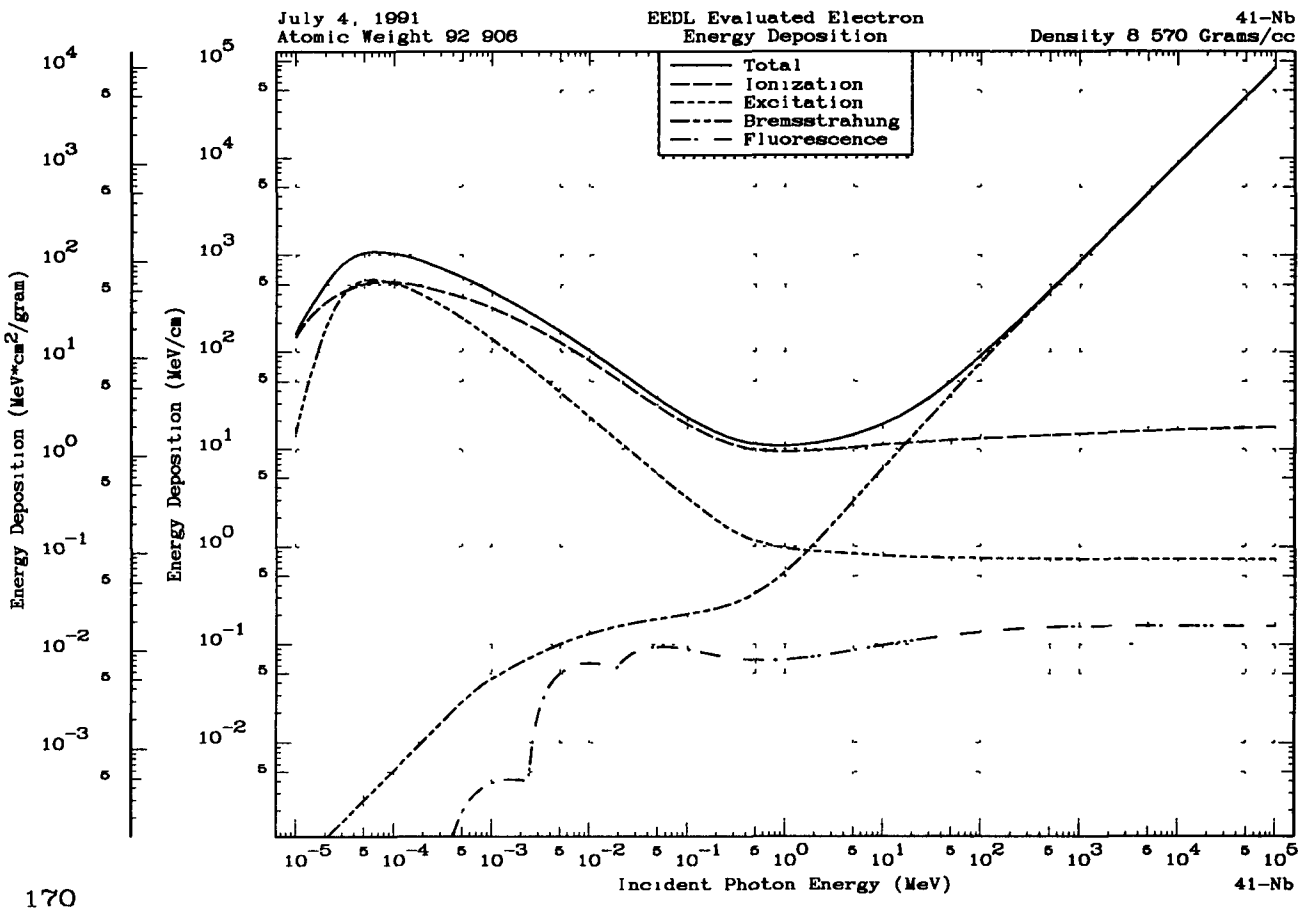
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.3604–9	2.8674+7		4.3433+9	4.1050+9	2.0717+8	3.1182+7	4.1369+3	7.3827+1	6.4477+1	9.3492+0	3.8332–4
	1.1250–5	5.6222–9	2.7339+7		4.1412+9	3.8344+9	2.5475+8	5.2008+7	4.2340+3	9.8404+1	8.2346+1	1.6058+1	4.2919–4
	1.3125–5	5.9469–9	2.5846+7		3.9150+9	3.5070+9	3.1191+8	9.6078+7	4.3645+3	1.3735+2	1.0640+2	3.0952+1	4.9944–4
	1.5000–5	6.1896–9	2.4833+7		3.7615+9	3.2461+9	3.5683+8	1.5858+8	4.4808+3	1.8087+2	1.2766+2	5.3212+1	5.7130–4
	1.7500–5	6.4269–9	2.3916+7		3.6226+9	2.9690+9	4.0341+8	2.5026+8	4.6189+3	2.3917+2	1.5264+2	8.6529+1	6.6937–4
	2.0000–5	6.5867–9	2.3335+7		3.5347+9	2.7481+9	4.3849+8	3.4815+8	4.7420+3	2.9888+2	1.7495+2	1.2393+2	7.6982–4
	2.5000–5	6.7565–9	2.2749+7		3.4459+9	2.4150+9	4.8300+8	5.4788+8	4.9235+3	4.1365+2	2.1028+2	2.0337+2	9.5705–4
	3.0000–5	6.8474–9	2.2447+7		3.4001+9	2.1731+9	5.0644+8	7.2061+8	5.0770+3	5.1480+2	2.3633+2	2.7847+2	1.1496–3
N3	3.6740–5	6.9758–9	2.2034+7		3.3376+9	1.9329+9	5.1693+8	8.8774+8	5.2502+3	6.2359+2	2.5931+2	3.6428+2	1.4140–3
	3.8370–5	7.0169–9	2.1905+7		3.3180+9	1.8851+9	5.1768+8	9.1529+8	5.2880+3	6.4472+2	2.6421+2	3.8052+2	1.4790–3
N2	3.8630–5	7.0230–9	2.1886+7		3.3151+9	1.8777+9	5.1776+8	9.1965+8	5.2940+3	6.4804+2	2.6492+2	3.8312+2	1.4895–3
	4.0000–5	7.0641–9	2.1759+7		3.2959+9	1.8403+9	5.1844+8	9.3711+8	5.3246+3	6.6367+2	2.6914+2	3.9453+2	1.5445–3
	4.2500–5	7.1438–9	2.1516+7		3.2591+9	1.7770+9	5.1641+8	9.6569+8	5.3713+3	6.8821+2	2.7447+2	4.1374+2	1.6397–3
	4.5000–5	7.2142–9	2.1306+7		3.2273+9	1.7193+9	5.1455+8	9.9345+8	5.4157+3	7.1286+2	2.7985+2	4.3301+2	1.7356–3
	4.6250–5	7.2463–9	2.1211+7		3.2130+9	1.6923+9	5.1366+8	1.0070+9	5.4372+3	7.2520+2	2.8253+2	4.4267+2	1.7837–3
	5.0000–5	7.3942–9	2.0787+7		3.1487+9	1.6178+9	5.1110+8	1.0198+9	5.4986+3	7.5012+2	2.9046+2	4.5966+2	1.9292–3
	5.5000–5	7.5784–9	2.0282+7		3.0722+9	1.5312+9	5.0258+8	1.0385+9	5.5692+3	7.7663+2	2.9586+2	4.8076+2	2.1199–3
N1	5.9960–5	7.8189–9	1.9658+7		2.9777+9	1.4567+9	4.9500+8	1.0260+9	5.6339+3	7.8878+2	3.0132+2	4.8746+2	2.3110–3
	6.0000–5	7.8211–9	1.9653+7		2.9769+9	1.4561+9	4.9495+8	1.0258+9	5.6344+3	7.8883+2	3.0137+2	4.8745+2	2.3125–3
	6.1250–5	7.8854–9	1.9492+7		2.9526+9	1.4389+9	4.9211+8	1.0216+9	5.6500+3	7.8963+2	3.0177+2	4.8786+2	2.3610–3
	6.3594–5	8.0034–9	1.9205+7		2.9090+9	1.4080+9	4.8703+8	1.0140+9	5.6784+3	7.9133+2	3.0263+2	4.8869+2	2.4522–3
	6.5644–5	8.1042–9	1.8966+7		2.8729+9	1.3825+9	4.8282+8	1.0076+9	5.7026+3	7.9300+2	3.0350+2	4.8950+2	2.5323–3
	6.9233–5	8.2752–9	1.8574+7		2.8135+9	1.3406+9	4.7593+8	9.9697+8	5.7434+3	7.9633+2	3.0526+2	4.9106+2	2.6732–3
	7.0000–5	8.3109–9	1.8494+7		2.8014+9	1.3321+9	4.7452+8	9.9479+8	5.7518+3	7.9709+2	3.0566+2	4.9142+2	2.7034–3
	7.4617–5	8.5586–9	1.7959+7		2.7204+9	1.2839+9	4.6625+8	9.7023+8	5.8012+3	7.9543+2	3.0772+2	4.8771+2	2.8861–3
	8.0000–5	8.8361–9	1.7395+7		2.6349+9	1.2332+9	4.5752+8	9.4414+8	5.8555+3	7.9467+2	3.1053+2	4.8415+2	3.1009–3
	9.0000–5	9.3939–9	1.6362+7		2.4784+9	1.1521+9	4.3817+8	8.8812+8	5.9340+3	7.7806+2	3.0997+2	4.6809+2	3.4901–3
	1.0000–4	9.9212–9	1.5493+7	0.0000+0	2.3467+9	1.0841+9	4.2177+8	8.4083+8	6.0051+3	7.6577+2	3.1061+2	4.5515+2	3.8837–3
	1.1250–4	1.0587–8	1.4519+7	1.6583–8	2.1992+9	1.0132+9	3.9961+8	7.8639+8	6.0715+3	7.4194+2	3.0593+2	4.3601+2	4.3649–3
	1.2500–4	1.1218–8	1.3701+7	3.3645–8	2.0754+9	9.5367+8	3.8103+8	7.4069+8	6.1316+3	7.2340+2	3.0301+2	4.2039+2	4.8506–3
	1.3125–4	1.1524–8	1.3338+7	4.2333–8	2.0204+9	9.2731+8	3.7263+8	7.2043+8	6.1596+3	7.1530+2	3.0167+2	4.1363+2	5.0951–3
	1.5000–4	1.2483–8	1.2313+7	6.9051–8	1.8651+9	8.5883+8	3.5074+8	6.5549+8	6.2369+3	6.8841+2	2.9916+2	3.8924+2	5.8343–3
M5	1.9049–4	1.4481–8	1.0614+7	1.3050–7	1.6078+9	7.4865+8	3.0810+8	5.5103+8	6.3656+3	6.3028+2	2.8608+2	3.4419+2	7.4451–3
M4	1.9309–4	1.4609–8	1.0521+7	1.3464–7	1.5937+9	7.4284+8	3.0582+8	5.4499+8	6.3682+3	6.2706+2	2.8547+2	3.4157+2	7.5447–3
	1.9525–4	1.4716–8	1.0445+7	1.3808–7	1.5821+9	7.3812+8	3.0398+8	5.4004+8	6.3703+3	6.2448+2	2.8504+2	3.3944+2	7.6273–3
	1.9655–4	1.4780–8	1.0400+7	1.4016–7	1.5753+9	7.3531+8	3.0288+8	5.3710+8	6.3716+3	6.2295+2	2.8478+2	3.3817+2	7.6772–3
	2.0000–4	1.4949–8	1.0282+7	1.4573–7	1.5575+9	7.2798+8	3.0002+8	5.2945+8	6.3750+3	6.1903+2	2.8414+2	3.3488+2	7.8097–3
	2.1250–4	1.5551–8	9.8836+6	1.6619–7	1.4971+9	7.0306+8	2.8917+8	5.0487+8	6.3866+3	6.0260+2	2.7966+2	3.2294+2	8.2897–3
	2.2344–4	1.6068–8	9.5660+6	1.8454–7	1.4490+9	6.8307+8	2.8053+8	4.8539+8	6.3963+3	5.8985+2	2.7633+2	3.1351+2	8.7103–3
	2.3301–4	1.6512–8	9.3088+6	2.0091–7	1.4100+9	6.6681+8	2.7353+8	4.6968+8	6.4044+3	5.7973+2	2.7378+2	3.0594+2	9.0789–3
	2.4258–4	1.6949–8	9.0688+6	2.1754–7	1.3737+9	6.5157+8	2.6702+8	4.5509+8	6.4122+3	5.7056+2	2.7163+2	2.9892+2	9.4479–3
	2.4976–4	1.7272–8	8.8989+6	2.3020–7	1.3480+9	6.4074+8	2.6241+8	4.4480+8	6.4178+3	5.6418+2	2.7018+2	2.9399+2	9.7249–3
	2.5000–4	1.7283–8	8.8933+6	2.3063–7	1.3471+9	6.4038+8	2.6226+8	4.4446+8	6.4180+3	5.6397+2	2.7013+2	2.9382+2	9.7343–3
	2.6232–4	1.7832–8	8.6198+6	2.5267–7	1.3057+9	6.2293+8	2.5473+8	4.2801+8	6.4273+3	5.5357+2	2.6760+2	2.8596+2	1.0210–2
	2.7129–4	1.8225–8	8.4338+6	2.6898–7	1.2775+9	6.1101+8	2.4961+8	4.1688+8	6.4339+3	5.4671+2	2.6604+2	2.8066+2	1.0557–2
	3.0000–4	1.9451–8	7.9021+6	3.2241–7	1.1970+9	5.7669+8	2.3502+8	3.8526+8	6.4534+3	5.2808+2	2.6238+2	2.6569+2	1.1670–2
M3	3.3088–4	2.0725–8	7.4163+6	3.8208–7	1.1234+9	5.4524+8	2.2034+8	3.5780+8	6.4725+3	5.0712+2	2.5606+2	2.5105+2	1.2871–2
	3.3952–4	2.1076–8	7.2927+6	3.9920–7	1.1047+9	5.3728+8	2.1667+8	3.5071+8	6.4776+3	5.0210+2	2.5478+2	2.4731+2	1.3207–2
M2	3.4493–4	2.1295–8	7.2180+6	4.1001–7	1.0933+9	5.3246+8	2.1445+8	3.4643+8	6.4806+3	4.9911+2	2.5404+2	2.4506+2	1.3418–2
	3.5000–4	2.1508–8	7.1464+6	4.2020–7	1.0825+9	5.2805+8	2.1241+8	3.4204+8	6.4812+3	4.9610+2	2.5337+2	2.4272+2	1.3612–2
	3.5181–4	2.1584–8	7.1212+6	4.2386–7	1.0787+9	5.2649+8	2.1168+8	3.4049+8	6.4814+3	4.9500+2	2.5309+2	2.4190+2	1.3682–2
	3.5464–4	2.1703–8	7.0823+6	4.2958–7	1.0728+9	5.2410+8	2.1057+8	3.3812+8	6.4818+3	4.9332+2	2.5268+2	2.4063+2	1.3790–2
	3.6386–4	2.2086–8	6.9593+6	4.4837–7	1.0541+9	5.1648+8	2.0705+8	3.3061+8	6.4828+3	4.8803+2	2.5137+2	2.3664+2	1.4143–2
	3.7732–4	2.2640–8	6.7889+6	4.7615–7	1.0283+9	5.0590+8	2.0217+8	3.2027+8	6.4843+3	4.8090+2	2.4974+2	2.3115+2	1.4659–2
	3.8193–4	2.2829–8	6.7329+6	4.8576–7	1.0199+9	5.0241+8	2.0058+8	3.1688+8	6.4847+3	4.7861+2	2.4924+2	2.2935+2	1.4835–2
	4.0000–4	2.3558–8	6.5245+6	5.2385–7	9.8830+8	4.8934+8	1.9463+8	3.0432+8	6.4866+3	4.7030+2	2.4758+2	2.2270+2	1.5528–2
M1	4.2206–4	2.4430–8	6.2916+6	5.7132–7	9.5301+8	4.7459+8	1.8752+8	2.9090+8	6.4680+3	4.5904+2	2.4415+2	2.1487+2	1.6334–2
	4.2693–4	2.4624–8	6.2421+6	5.8196–7	9.4551+8	4.7149+8	1.8604+8	2.8798+8	6.4641+3	4.5671+2	2.4350+2	2.1320+2	1.6512–2
	4.3607–4	2.4985–8	6.1519+6	6.0206–7	9.3185+8	4.6583+8	1.8335+8	2.8266+8	6.4568+3	4.5250+2	2.4234+2	2.1015+2	1.6845–2
	4.5000–4	2.5531–8	6.0204+6	6.3306–7	9.1193+8	4.5755+8	1.7943+8	2.7494+8	6.4459+3	4.4651+2	2.4076+2	2.0573+2	1.7352–2
	4.5205–4	2.5611–8	6.0016+6	6.3765–7	9.0909+8	4.5637+8	1.7887+8	2.7385+8	6.4444+3	4.4563+2	2.4051+2	2.0510+2	1.7426–2
	4.7602–4	2.6535–8	5.7925+6	6.9204–7	8.7742+8	4.4312+8	1.7262+8	2.6167+8	6.4266+3	4.3601+2	2.3785+2	1.9814+2	1.8297–2
	5.0000–4	2.7443–8	5.6009+6	7.4757–7	8.4839+8	4.3088+8	1.6690+8	2.5060+8	6.4098+3	4.2753+2	2.3569+2	1.9182+2	1.9165–2
	5.5000–4	2.9300–8	5.2459+6	8.6707–7	7.9462+8	4.0809+8	1.5588+8	2.3065+8	6.3573+3	4.0940+2	2.2961+2	1.7977+2	2.0874–2
	6.0000–4	3.1099–8	4.9424+6	9.9151–7	7.4865+8	3.8833+8	1.4648+8	2.1382+8	6.3097+3	3.9431+2	2.2464+2	1.6964+2	2.2569–2
	7.0000–4	3.4679–8	4.4322+6	1.2550–6	6.7137+8	3.5566+8	1.3063+8	1.8507+8	6.1868+3	3.6509+2	2.1410+2	1.5096+2	2.5684–2
	8.0000–4	3.8092–8	4.0351+6	1.5376–6	6.1122+8	3.2959+8	1.1832+8	1.6331+8	6.0822+3	3.4287+2	2.0599+2	1.3685+2	2.8745–2
	9.0000–4	4.1393–8	3.7133+6	1.8383–6	5.6247+8	3.0818+8	1.0806+8	1.4622+8	5.9222+3	3.2241+2	1.9725+2	1.2513+2	3.0897–2
	1.0000–3	4.4572–8	3.4485+6	2.1565–6	5.2235+8	2.9021+8	9.9678+7	1.3246+8	5.7827+3	3.0624+2	1.9050+2	1.1571+2	3.3007–2
	1.1250–3	4.8431–8	3.1737+6	2.5783–6	4.8073+8	2.7132+8	9.0746+7	1.1866+8	5.6159+3	2.8671+2	1.8110+2	1.0557+2	3.5301–2
	1.2500–3	5.2148–8	2.9474+6	3.0267–6	4.4646+8	2.5546+8	8.3457+7	1.0754+8	5.4708+3	2.7104+2	1.7358+2	9.7420+1	3.7550–2
	1.3125–3	5.3961–8	2.8485+6	3.2602–6	4.3147+8	2.4843+8	8.0278+7	1.0275+8	5.4049+3	2.6415+2	1.7020+2	9.3912+1	3.8659–2
	1.5000–3	5.9229–8	2.5951+6	3.9943–6	3.9309+8	2.3018+8	7.2200+7	9.0703+7	5.2285+3	2.4692+2	1.6177+2	8.5103+1	4.1930–2
	2.0000–3	7.2552–8	2.1185+6	6.1876–6	3.2091+8	1.9477+8	5.7061+7	6.9074+7	4.8169+3	2.1000+2	1.4191+2	6.8047+1	4.8878–2
L3	2.2248–3	7.8294–8	1.9632+6	7.2930–6	2.9737+8	1.8263+8	5.2210+7	6.2522+7	4.6665+3	1.9686+2	1.3427+2	6.2545+1	5.1724–2
	2.2732–3	7.9515–8	1.9330+6	7.5407–6	2.9280+8	1.8027+8	5.1281+7	6.1246+7	4.6340+3	1.9437+2	1.3283+2	6.1488+1	5.2266–2
L2	2.3122–3	8.0491–8	1.9096+6	7.7421–6	2.8925+8	1.7843+8	5.0560+7	6.0258+7	4.6086+3	1.9243+2	1.3171+2	6.0668+1	5.2701–2
	2.3641–3	8.1790–8	1.8793+6	8.0135–6	2.8466+8	1.7606+8	4.9633+7	5.8966+7	4.5749+3	1.8996+2	1.3030+2	5.9605+1	5.3259–2
	2.3982–3	8.2638–8	1.8600+6	8.1937–6	2.8174+8	1.7454+8	4.9045+7	5.8148+7	4.5532+3	1.8838+2	1.2939+2	5.8932+1	5.3625–2
L1	2.5146–3	8.5509–8	1.7975+6	8.8202–6	2.7228+8	1.6961+8	4.7146+7	5.5517+7	4.4824+3	1.8332+2	1.2650+2	5.6769+1	5.4867–2

Atomic Weight 91.220 — Density 6.506 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.5231–3	8.5717–8	1.7932+6	8.8664–6	2.7162+8	1.6926+8	4.7013+7	5.5339+7	4.4774+3	1.8295+2	1.2628+2	5.6615+1	5.4956–2
2.5486–3	8.6346–8	1.7801+6	9.0066–6	2.6964+8	1.6821+8	4.6616+7	5.4809+7	4.4625+3	1.8185+2	1.2564+2	5.6157+1	5.5226–2
2.6359–3	8.8479–8	1.7372+6	9.4916–6	2.6314+8	1.6475+8	4.5313+7	5.3074+7	4.4129+3	1.7823+2	1.2352+2	5.4660+1	5.6143–2
2.7615–3	9.1508–8	1.6797+6	1.0206–5	2.5443+8	1.6008+8	4.3574+7	5.0766+7	4.3453+3	1.7344+2	1.2072+2	5.2670+1	5.7450–2
2.7743–3	9.1814–8	1.6741+6	1.0280–5	2.5358+8	1.5963+8	4.3405+7	5.0542+7	4.3386+3	1.7298+2	1.2045+2	5.2477+1	5.7582–2
2.8180–3	9.2856–8	1.6553+6	1.0533–5	2.5074+8	1.5810+8	4.2840+7	4.9794+7	4.3162+3	1.7143+2	1.1954+2	5.1833+1	5.8033–2
3.0000–3	9.7146–8	1.5822+6	1.1614–5	2.3966+8	1.5211+8	4.0647+7	4.6905+7	4.2275+3	1.6543+2	1.1603+2	4.9342+1	5.9898–2
3.2500–3	1.0298–7	1.4925+6	1.3164–5	2.2608+8	1.4465+8	3.7966+7	4.3466+7	4.1045+3	1.5731+2	1.1100+2	4.6248+1	6.2015–2
3.6250–3	1.1149–7	1.3787+6	1.5628–5	2.0884+8	1.3506+8	3.4596+7	3.9178+7	3.9425+3	1.4716+2	1.0471+2	4.2394+1	6.5128–2
4.0000–3	1.1973–7	1.2838+6	1.8251–5	1.9446+8	1.2696+8	3.1819+7	3.5675+7	3.8019+3	1.3886+2	9.9541+1	3.9249+1	6.8168–2
4.5000–3	1.3062–7	1.1768+6	2.1989–5	1.7825+8	1.1760+8	2.8752+7	3.1891+7	3.6281+3	1.2879+2	9.3032+1	3.5681+1	7.1588–2
5.0000–3	1.4116–7	1.0888+6	2.5999–5	1.6493+8	1.0982+8	2.6263+7	2.8848+7	3.4795+3	1.2064+2	8.7751+1	3.2815+1	7.4922–2
6.0000–3	1.6168–7	9.5065+5	3.4784–5	1.4400+8	9.7360+7	2.2429+7	2.4207+7	3.2202+3	1.0730+2	7.8936+1	2.8282+1	8.0417–2
7.0000–3	1.8155–7	8.4661+5	4.4592–5	1.2824+8	8.7751+7	1.9611+7	2.0875+7	3.0050+3	9.6790+1	7.1801+1	2.4905+1	8.4817–2
8.0000–3	2.0067–7	7.6595+5	5.5377–5	1.1602+8	8.0197+7	1.7460+7	1.8363+7	2.8302+3	8.8773+1	6.6324+1	2.2360+1	8.9091–2
1.0000–2	2.3807–7	6.4563+5	7.9646–5	9.7796+7	6.8599+7	1.4367+7	1.4828+7	2.5445+3	7.6355+1	5.7633+1	1.8627+1	9.5640–2
1.2500–2	2.8258–7	5.4394+5	1.1500–4	8.2393+7	5.8571+7	1.1822+7	1.1998+7	2.2629+3	6.5369+1	4.9772+1	1.5496+1	1.0145–1
1.5000–2	3.2494–7	4.7303+5	1.5563–4	7.1652+7	5.1476+7	1.0082+7	1.0092+7	2.0560+3	5.7850+1	4.4353+1	1.3390+1	1.0708–1
K 1.7962–2	3.7303–7	4.1204+5	2.1009–4	6.2414+7	4.5268+7	8.6193+6	8.5248+6	1.8584+3	5.1054+1	3.9364+1	1.1578+1	1.1164–1
1.8217–2	3.7707–7	4.0762+5	2.1511–4	6.1745+7	4.4815+7	8.5147+6	8.4128+6	1.8435+3	5.0559+1	3.9001+1	1.1447+1	1.1198–1
1.8663–2	3.8412–7	4.0015+5	2.2400–4	6.0612+7	4.4049+7	8.3380+6	8.2240+6	1.8182+3	4.9723+1	3.8386+1	1.1225+1	1.1256–1
1.9331–2	3.9461–7	3.8951+5	2.3761–4	5.9001+7	4.2955+7	8.0874+6	7.9566+6	1.7820+3	4.8536+1	3.7513+1	1.0910+1	1.1344–1
2.0000–2	4.0501–7	3.7951+5	2.5155–4	5.7486+7	4.1925+7	7.8526+6	7.7066+6	1.7477+3	4.7424+1	3.6693+1	1.0617+1	1.1432–1
2.1250–2	4.2427–7	3.6228+5	2.7848–4	5.4876+7	4.0136+7	7.4549+6	7.2832+6	1.6864+3	4.5424+1	3.5210+1	1.0099+1	1.1544–1
2.3438–2	4.5733–7	3.3609+5	3.2831–4	5.0909+7	3.7405+7	6.8546+6	6.6476+6	1.5918+3	4.2401+1	3.2962+1	9.3215+0	1.1746–1
2.5078–2	4.8164–7	3.1913+5	3.6792–4	4.8340+7	3.5628+7	6.4686+6	6.2414+6	1.5296+3	4.0456+1	3.1512+1	8.8252+0	1.1898–1
2.7539–2	5.1739–7	2.9708+5	4.3072–4	4.5000+7	3.3308+7	5.9702+6	5.7199+6	1.4475+3	3.7944+1	2.9634+1	8.1886+0	1.2128–1
3.0000–2	5.5236–7	2.7827+5	4.9747–4	4.2150+7	3.1319+7	5.5484+6	5.2814+6	1.3763+3	3.5818+1	2.8040+1	7.6539+0	1.2358–1
3.5000–2	6.2277–7	2.4681+5	6.4458–4	3.7385+7	2.7912+7	4.8767+6	4.5957+6	1.2547+3	3.2222+1	2.5318+1	6.7773+0	1.2661–1
4.0000–2	6.9092–7	2.2246+5	8.0681–4	3.3698+7	2.5261+7	4.3612+6	4.0742+6	1.1581+3	2.9459+1	2.3217+1	6.1119+0	1.2973–1
5.0000–2	8.2215–7	1.8695+5	1.1720–3	2.8319+7	2.1336+7	3.6361+6	3.3461+6	1.0137+3	2.5399+1	2.0113+1	5.1520+0	1.3436–1
6.0000–2	9.4772–7	1.6218+5	1.5897–3	2.4567+7	1.8570+7	3.1458+6	2.8504+6	9.1648+2	2.2550+1	1.7931+1	4.4807+0	1.3831–1
8.0000–2	1.1815–6	1.3009+5	2.5598–3	1.9705+7	1.4964+7	2.5250+6	2.2151+6	7.8055+2	1.8796+1	1.5056+1	3.5946+0	1.4459–1
1.0000–1	1.3922–6	1.1040+5	3.6966–3	1.6723+7	1.2742+7	2.1495+6	1.8313+6	6.9096+2	1.6442+1	1.3248+1	3.0434+0	1.4989–1
1.5000–1	1.8265–6	8.4152+4	7.0827–3	1.2747+7	9.7646+6	1.6441+6	1.3377+6	5.5848+2	1.3209+1	1.0729+1	2.3193+0	1.6098–1
2.0000–1	2.1759–6	7.0640+4	1.1132–2	1.0700+7	8.2367+6	1.3912+6	1.0718+6	4.8697+2	1.1523+1	9.4383+0	1.9126+0	1.7171–1
3.0000–1	2.7514–6	5.5864+4	2.0509–2	8.4620+6	6.5143+6	1.1411+6	8.0622+5	4.1369+2	9.8508+0	8.1579+0	1.4986+0	1.9431–1
4.0000–1	3.2355–6	4.7506+4	3.1091–2	7.1960+6	5.5074+6	1.0195+6	6.6865+5	3.7851+2	9.0605+0	7.5622+0	1.2795+0	2.1883–1
5.0000–1	3.6482–6	4.2131+4	4.2378–2	6.3818+6	4.8348+6	9.4914+5	5.9746+5	3.5920+2	8.6618+0	7.2468+0	1.1696+0	2.4539–1
6.0000–1	4.0168–6	3.8266+4	5.4085–2	5.7963+6	4.3467+6	9.0416+5	5.4509+5	3.4731+2	8.4234+0	7.0631+0	1.0868+0	2.7344–1
8.0000–1	4.6383–6	3.3138+4	7.8080–2	5.0196+6	3.6858+6	8.5225+5	4.8119+5	3.3602+2	8.2469+0	6.9233+0	9.8813–1	3.3543–1
1.0000+0	5.1558–6	2.9812+4	1.0241–1	4.5158+6	3.2513+6	8.2296+5	4.4123+5	3.3102+2	8.1941+0	6.8658+0	9.2710–1	4.0126–1
1.5000+0	6.1143–6	2.5138+4	1.6258–1	3.8078+6	2.6231+6	7.9277+5	3.9164+5	3.3013+2	8.4254+0	6.9904+0	8.5146–1	5.8357–1
2.0000+0	6.7936–6	2.2625+4	2.2090–1	3.4271+6	2.2774+6	7.8408+5	3.6533+5	3.3335+2	8.7240+0	7.1212+0	8.2196–1	7.8083–1
3.0000+0	7.6956–6	1.9973+4	3.3148–1	3.0254+6	1.9128+6	7.7284+5	3.3942+5	3.4071+2	9.3697+0	7.3760+0	7.8644–1	1.2073+0
4.0000+0	8.2674–6	1.8592+4	4.3468–1	2.8162+6	1.7204+6	7.7232+5	3.2312+5	3.4611+2	1.0017+1	7.5810+0	7.7054–1	1.6657+0
5.0000+0	8.6435–6	1.7783+4	5.3151–1	2.6936+6	1.6061+6	7.7209+5	3.1511+5	3.5037+2	1.0646+1	7.7563+0	7.5847–1	2.1308+0
6.0000+0	8.8966–6	1.7277+4	6.2277–1	2.6170+6	1.5338+6	7.7174+5	3.1110+5	3.5413+2	1.1275+1	7.8955+0	7.5577–1	2.6239+0
8.0000+0	9.2145–6	1.6681+4	7.9114–1	2.5267+6	1.4501+6	7.7194+5	3.0432+5	3.6015+2	1.2503+1	8.1247+0	7.5289–1	3.6250+0
1.0000+1	9.3753–6	1.6395+4	9.4377–1	2.4834+6	1.4118+6	7.7312+5	2.9804+5	3.6518+2	1.3724+1	8.3195+0	7.5066–1	4.6540+0
1.5000+1	9.4423–6	1.6278+4	1.2740+0	2.4657+6	1.3944+6	7.7453+5	2.9646+5	3.7505+2	1.6650+1	8.5861+0	7.5319–1	7.3111+0
2.0000+1	9.4456–6	1.6273+4	1.5502+0	2.4649+6	1.3936+6	7.7555+5	2.9539+5	3.8051+2	1.9645+1	8.8116+0	7.5697–1	1.0076+1
3.0000+1	9.4581–6	1.6251+4	1.9952+0	2.4616+6	1.3931+6	7.7592+5	2.9218+5	3.8858+2	2.5558+1	9.0398+0	7.6157–1	1.5756+1
4.0000+1	9.4559–6	1.6255+4	2.3466+0	2.4622+6	1.3928+6	7.7641+5	2.9258+5	3.9459+2	3.1566+1	9.2212+0	7.6419–1	2.1581+1
5.0000+1	9.4548–6	1.6257+4	2.6363+0	2.4625+6	1.3926+6	7.7673+5	2.9277+5	3.9922+2	3.7653+1	9.3719+0	7.6625–1	2.7515+1
6.0000+1	9.4547–6	1.6257+4	2.8824+0	2.4625+6	1.3924+6	7.7693+5	2.9282+5	4.0326+2	4.3771+1	9.4799+0	7.6792–1	3.3523+1
8.0000+1	9.4590–6	1.6250+4	3.2849+0	2.4614+6	1.3921+6	7.7709+5	2.9183+5	4.0971+2	5.6112+1	9.6418+0	7.6844–1	4.5702+1
1.0000+2	9.4637–6	1.6241+4	3.6068+0	2.4602+6	1.3918+6	7.7719+5	2.9075+5	4.1407+2	6.8563+1	9.7761+0	7.6870–1	5.8018+1
1.5000+2	9.4646–6	1.6240+4	4.2076+0	2.4599+6	1.3914+6	7.7726+5	2.9086+5	4.2246+2	9.9835+1	9.9212+0	7.6921–1	8.9145+1
2.0000+2	9.4675–6	1.6235+4	4.6430+0	2.4592+6	1.3911+6	7.7730+5	2.9035+5	4.2803+2	1.3127+2	1.0059+1	7.6805–1	1.2045+2
3.0000+2	9.4720–6	1.6227+4	5.2649+0	2.4580+6	1.3907+6	7.7736+5	2.8958+5	4.3449+2	1.9443+2	1.0306+1	7.6642–1	1.8335+2
4.0000+2	9.4756–6	1.6221+4	5.7101+0	2.4571+6	1.3903+6	7.7737+5	2.8892+5	4.3831+2	2.5778+2	1.0404+1	7.6509–1	2.4661+2
5.0000+2	9.4792–6	1.6215+4	6.0569+0	2.4562+6	1.3901+6	7.7738+5	2.8823+5	4.4123+2	3.2128+2	1.0489+1	7.6367–1	3.1003+2
6.0000+2	9.4821–6	1.6210+4	6.3412+0	2.4554+6	1.3899+6	7.7739+5	2.8765+5	4.4393+2	3.8419+2	1.0574+1	7.6255–1	3.7286+2
8.0000+2	9.4871–6	1.6201+4	6.7913+0	2.4541+6	1.3896+6	7.7739+5	2.8665+5	4.4842+2	5.1047+2	1.0733+1	7.6071–1	4.9898+2
1.0000+3	9.4912–6	1.6194+4	7.1412+0	2.4530+6	1.3894+6	7.7740+5	2.8585+5	4.5213+2	6.3722+2	1.0864+1	7.5942–1	6.2560+2
1.5000+3	9.4941–6	1.6189+4	7.7782+0	2.4523+6	1.3889+6	7.7740+5	2.8549+5	4.5908+2	9.5406+2	1.0980+1	7.5847–1	9.4232+2
2.0000+3	9.4965–6	1.6185+4	8.2303+0	2.4517+6	1.3886+6	7.7740+5	2.8520+5	4.6413+2	1.2727+3	1.1096+1	7.5770–1	1.2608+3
3.0000+3	9.4986–6	1.6182+4	8.8679+0	2.4511+6	1.3882+6	7.7740+5	2.8507+5	4.7188+2	1.9067+3	1.1327+1	7.5736–1	1.8946+3
4.0000+3	9.5004–6	1.6179+4	9.3200+0	2.4507+6	1.3879+6	7.7740+5	2.8491+5	4.7746+2	2.5487+3	1.1443+1	7.5697–1	2.5365+3
5.0000+3	9.5027–6	1.6175+4	9.6705+0	2.4501+6	1.3876+6	7.7740+5	2.8455+5	4.8169+2	3.1810+3	1.1519+1	7.5603–1	3.1687+3
6.0000+3	9.5031–6	1.6174+4	9.9570+0	2.4500+6	1.3874+6	7.7740+5	2.8464+5	4.8518+2	3.8182+3	1.1595+1	7.5628–1	3.8058+3
8.0000+3	9.5042–6	1.6172+4	1.0409+1	2.4497+6	1.3871+6	7.7740+5	2.8466+5	4.9064+2	5.0879+3	1.1746+1	7.5637–1	5.0753+3
1.0000+4	9.5051–6	1.6171+4	1.0760+1	2.4495+6	1.3869+6	7.7740+5	2.8467+5	4.9481+2	6.3504+3	1.1878+1	7.5641–1	6.3377+3
1.5000+4	9.5066–6	1.6168+4	1.1399+1	2.4491+6	1.3865+6	7.7740+5	2.8470+5	5.0251+2	9.5342+3	1.1992+1	7.5650–1	9.5215+3
2.0000+4	9.5080–6	1.6166+4	1.1852+1	2.4487+6	1.3862+6	7.7740+5	2.8463+5	5.0823+2	1.2686+4	1.2106+1	7.5633–1	1.2673+4
3.0000+4	9.5095–6	1.6163+4	1.2490+1	2.4483+6	1.3857+6	7.7740+5	2.8470+5	5.1641+2	1.9071+4	1.2334+1	7.5650–1	1.9058+4
4.0000+4	9.5108–6	1.6161+4	1.2943+1	2.4480+6	1.3854+6	7.7740+5	2.8465+5	5.2212+2	2.5365+4	1.2447+1	7.5637–1	2.5351+4
5.0000+4	9.5130–6	1.6157+4	1.3295+1	2.4474+6	1.3852+6	7.7740+5	2.8431+5	5.2660+2	3.1717+4	1.2526+1	7.5547–1	3.1704+4
6.0000+4	9.5131–6	1.6157+4	1.3582+1	2.4474+6	1.3850+6	7.7740+5	2.8447+5	5.3028+2	3.8117+4	1.2599+1	7.5590–1	3.8104+4

Atomic Weight 91.220													Density 6.506 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+4	9.5140–6	1.6156+4	1.4035+1	2.4471+6	1.3847+6	7.7740+5	2.8454+5	5.3603+2	5.0785+4	1.2745+1	7.5607–1	5.0771+4
1.0000+5	9.5150–6	1.6154+4	1.4387+1	2.4469+6	1.3844+6	7.7740+5	2.8454+5	5.4052+2	6.3542+4	1.2887+1	7.5607–1	6.3528+4


July 4, 1991
Atomic Weight 92 906
EEDL Evaluated Electron
Cross Sections
41-Nb
Density 8 570 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
41-Nb


July 4, 1991
Atomic Weight 92 906
EEDL Evaluated Electron
Energy Deposition
41-Nb
Density 8 570 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
41-Nb

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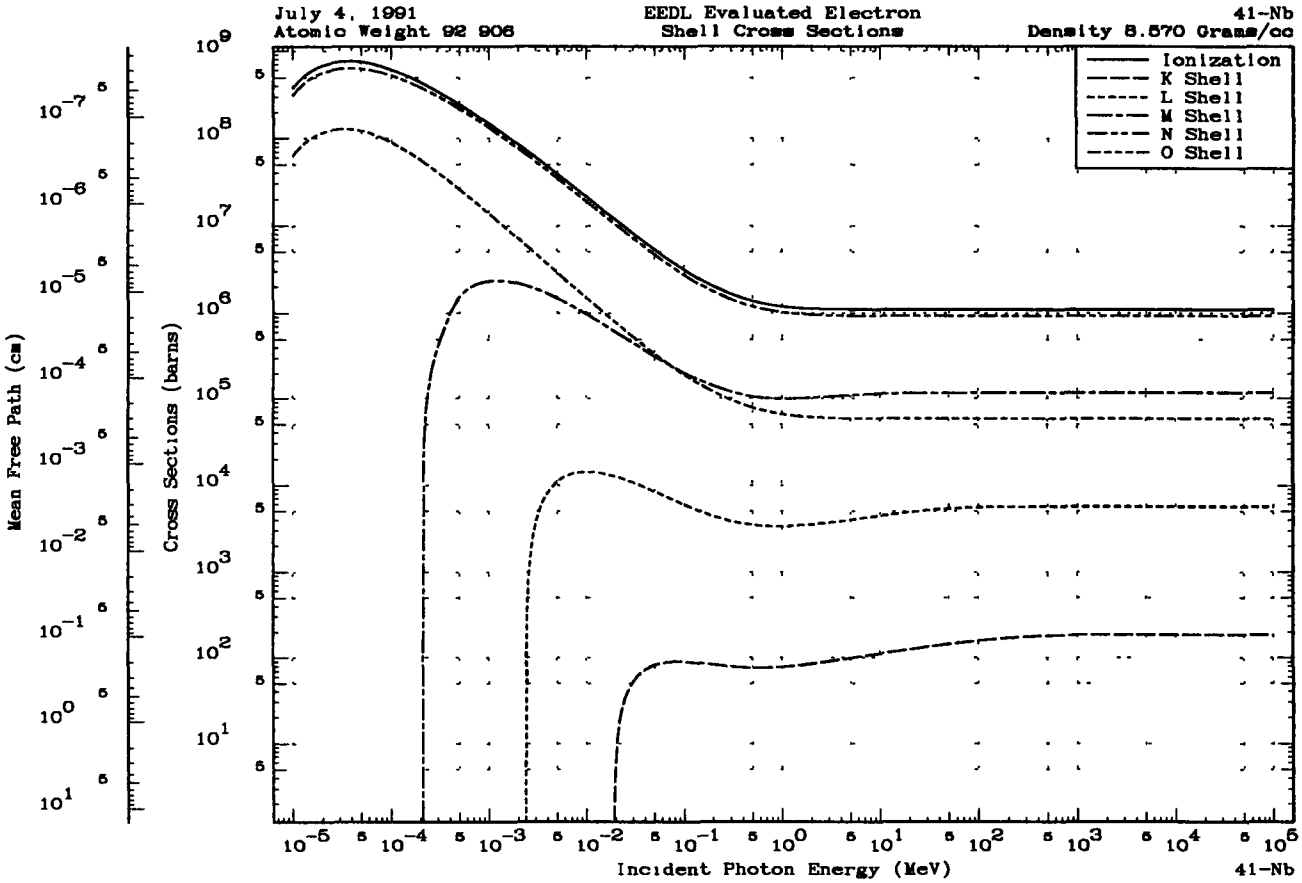
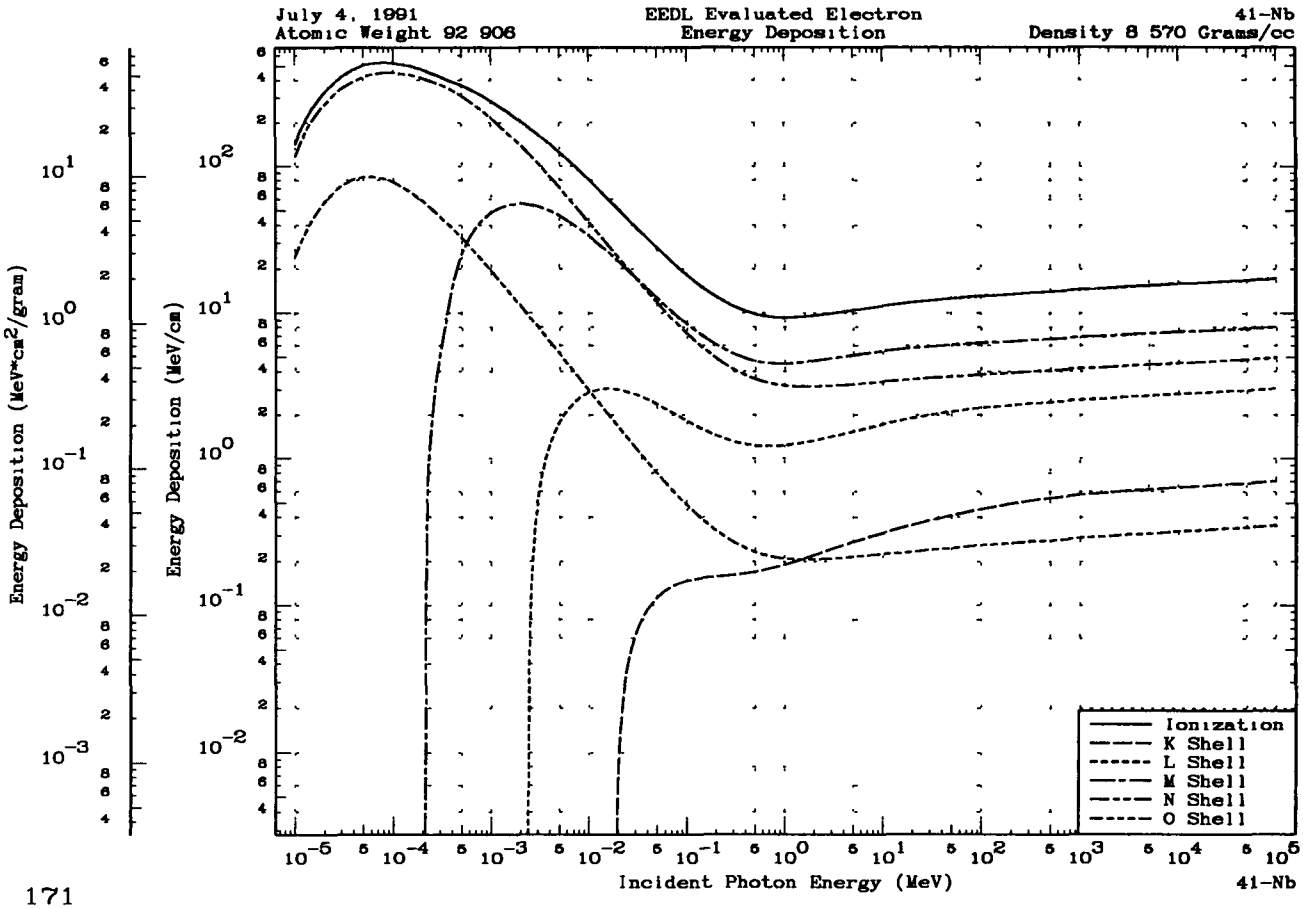

July 4, 1991
Atomic Weight 92 906
EEDL Evaluated Electron
Shell Cross Sections
41-Nb
Density 8.570 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
41-Nb


July 4, 1991
Atomic Weight 92 906
EEDL Evaluated Electron
Energy Deposition
41-Nb
Density 8 570 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
41-Nb

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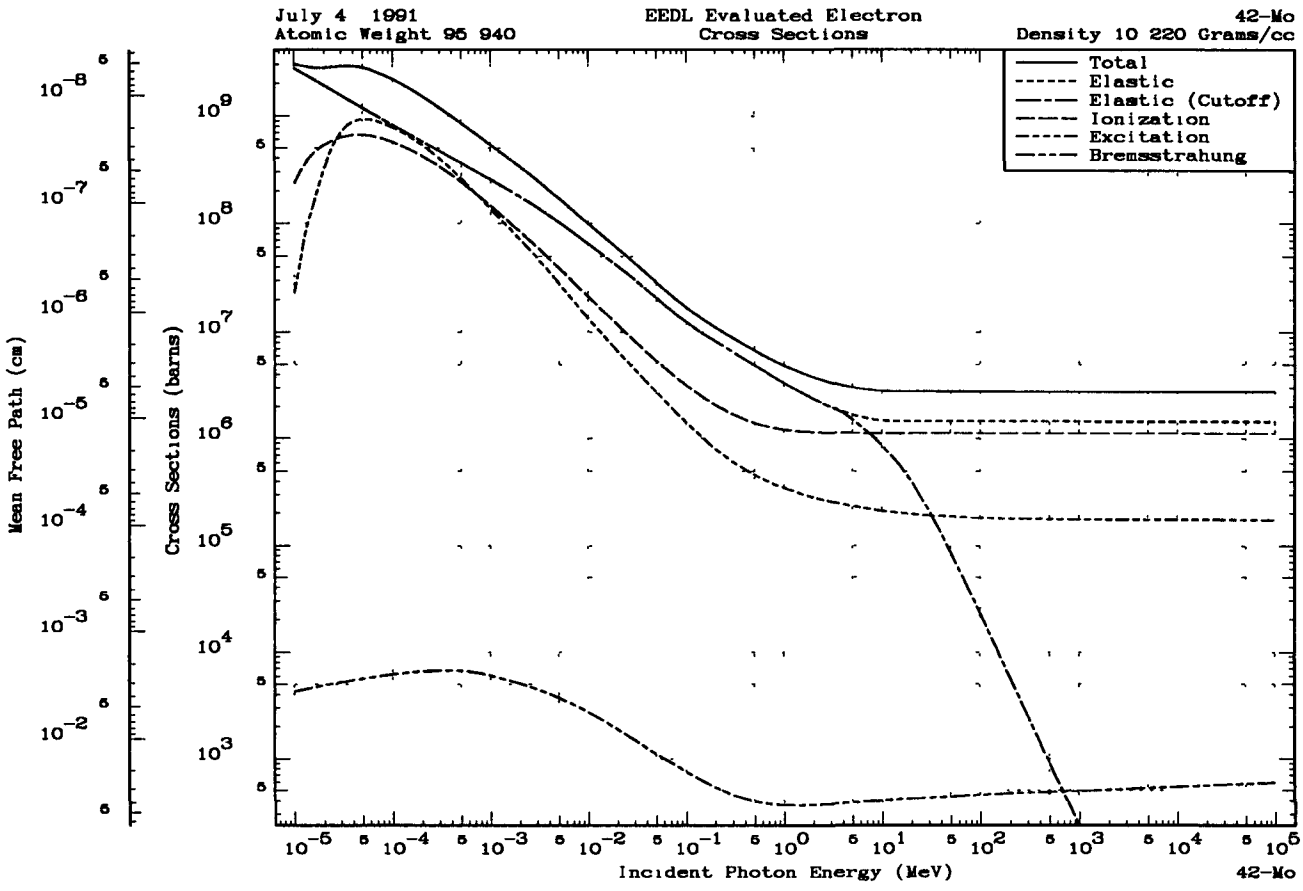
Atomic Weight 92.906 Density 8.570 Grams/cc

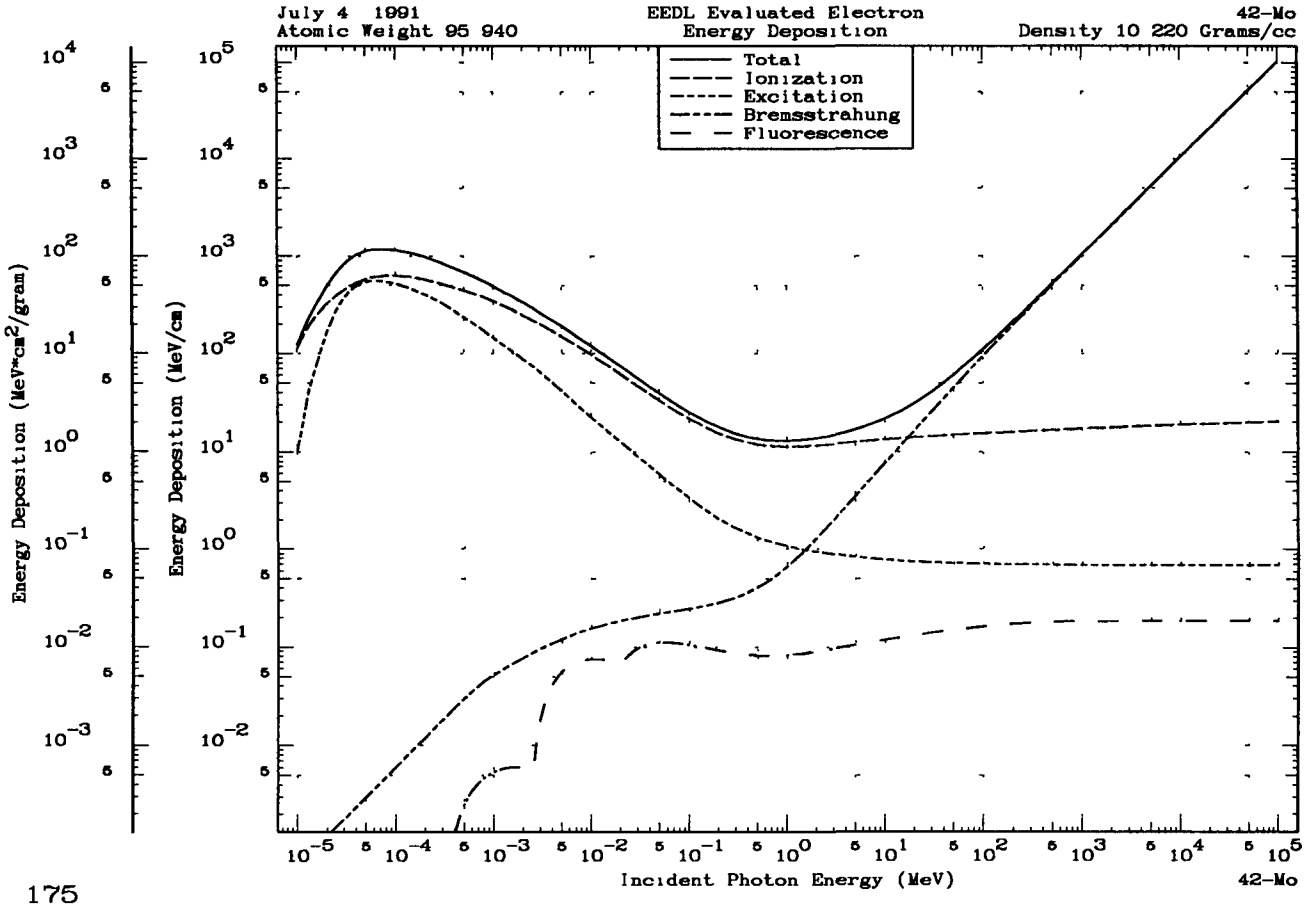
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.9733–9	2.3463+7		3.6197+9	3.2032+9	3.7634+8	4.0189+7	4.2268+3	1.5688+2	1.4202+2	1.4862+1	5.0656–4
	1.1250–5	5.1268–9	2.2760+7		3.5113+9	3.0026+9	4.4362+8	6.5132+7	4.3260+3	1.9851+2	1.7370+2	2.4809+1	5.6719–4
	1.3125–5	5.2992–9	2.2020+7		3.3971+9	2.7589+9	5.2276+8	1.1545+8	4.4593+3	2.6170+2	2.1580+2	4.5897+1	6.6004–4
	1.5000–5	5.4300–9	2.1489+7		3.3152+9	2.5638+9	5.8138+8	1.7005+8	4.5781+3	3.2178+2	2.5135+2	7.0432+1	7.5500–4
	1.7500–5	5.5019–9	2.1208+7		3.2719+9	2.3557+9	6.3912+8	2.7705+8	4.7193+3	4.0965+2	2.9165+2	1.1800+2	8.8462–4
	2.0000–5	5.5035–9	2.1202+7		3.2709+9	2.1891+9	6.7965+8	4.0215+8	4.8450+3	5.0245+2	3.2646+2	1.7599+2	1.0174–3
	2.5000–5	5.4374–9	2.1460+7		3.3107+9	1.9367+9	7.2829+8	6.4576+8	5.0305+3	6.7296+2	3.8085+2	2.9211+2	1.2649–3
	3.0000–5	5.3947–9	2.1630+7		3.3369+9	1.7522+9	7.5357+8	8.3118+8	5.1873+3	8.1015+2	4.2191+2	3.8824+2	1.5193–3
	3.5000–5	5.4261–9	2.1505+7		3.3176+9	1.6102+9	7.5909+8	9.4826+8	5.3213+3	9.0723+2	4.4842+2	4.5881+2	1.7777–3
N3	3.8360–5	5.4674–9	2.1342+7		3.2925+9	1.5313+9	7.6240+8	9.9877+8	5.4027+3	9.6067+2	4.6618+2	4.9448+2	1.9543–3
	4.0000–5	5.5061–9	2.1192+7		3.2694+9	1.4966+9	7.6241+8	1.0104+9	5.4403+3	9.7957+2	4.7405+2	5.0552+2	2.0414–3
N2	4.0580–5	5.5208–9	2.1136+7		3.2607+9	1.4849+9	7.6132+8	1.0145+9	5.4532+3	9.8500+2	4.7564+2	5.0936+2	2.0723–3
	4.2500–5	5.5723–9	2.0940+7		3.2306+9	1.4477+9	7.5833+8	1.0245+9	5.4893+3	1.0023+3	4.8207+2	5.2027+2	2.1687–3
	4.5290–5	5.6419–9	2.0682+7		3.1907+9	1.3982+9	7.5412+8	1.0384+9	5.5393+3	1.0271+3	4.9114+2	5.3600+2	2.3097–3
	4.6250–5	5.6644–9	2.0600+7		3.1780+9	1.3822+9	7.5280+8	1.0430+9	5.5559+3	1.0358+3	4.9440+2	5.4138+2	2.3584–3
	4.6468–5	5.6694–9	2.0582+7		3.1752+9	1.3787+9	7.5248+8	1.0440+9	5.5596+3	1.0377+3	4.9509+2	5.4261+2	2.3695–3
	5.0000–5	5.7787–9	2.0192+7		3.1152+9	1.3245+9	7.4784+8	1.0429+9	5.6180+3	1.0600+3	5.0695+2	5.5302+2	2.5501–3
	5.5000–5	5.9655–9	1.9560+7		3.0176+9	1.2571+9	7.3441+8	1.0261+9	5.6901+3	1.0716+3	5.1464+2	5.5698+2	2.8021–3
	6.0000–5	6.1397–9	1.9005+7		2.9320+9	1.1986+9	7.2237+8	1.0110+9	5.7568+3	1.0840+3	5.2258+2	5.6145+2	3.0569–3
N1	6.3450–5	6.2640–9	1.8628+7		2.8738+9	1.1624+9	7.1093+8	1.0004+9	5.8000+3	1.0853+3	5.2311+2	5.6223+2	3.2341–3
	6.4484–5	6.3082–9	1.8498+7		2.8537+9	1.1522+9	7.0771+8	9.9378+8	5.8125+3	1.0841+3	5.2352+2	5.6055+2	3.2875–3
	6.5000–5	6.3300–9	1.8434+7		2.8438+9	1.1472+9	7.0614+8	9.9052+8	5.8187+3	1.0835+3	5.2371+2	5.5974+2	3.3141–3
	6.6424–5	6.3898–9	1.8261+7		2.8172+9	1.1337+9	7.0186+8	9.8170+8	5.8356+3	1.0819+3	5.2431+2	5.5757+2	3.3878–3
	6.9818–5	6.5292–9	1.7871+7		2.7571+9	1.1032+9	6.9219+8	9.6171+8	5.8747+3	1.0788+3	5.2601+2	5.5277+2	3.5642–3
	7.0000–5	6.5366–9	1.7851+7		2.7540+9	1.1016+9	6.9169+8	9.6068+8	5.8767+3	1.0786+3	5.2610+2	5.5253+2	3.5737–3
	7.2500–5	6.6367–9	1.7582+7		2.7124+9	1.0806+9	6.8489+8	9.4686+8	5.9044+3	1.0766+3	5.2724+2	5.4934+2	3.7043–3
	7.4909–5	6.7313–9	1.7335+7		2.6743+9	1.0615+9	6.7864+8	9.3417+8	5.9303+3	1.0750+3	5.2848+2	5.4650+2	3.8307–3
	8.0000–5	6.9252–9	1.6850+7		2.5995+9	1.0240+9	6.6630+8	9.0916+8	5.9827+3	1.0727+3	5.3149+2	5.4116+2	4.0994–3
	9.0000–5	7.3250–9	1.5930+7		2.4576+9	9.6027+8	6.3851+8	8.5875+8	6.0628+3	1.0533+3	5.2860+2	5.2469+2	4.6142–3
	1.0000–4	7.7011–9	1.5152+7	0.0000+0	2.3375+9	9.0665+8	6.1485+8	8.1604+8	6.1355+3	1.0392+3	5.2777+2	5.1145+2	5.1348–3
	1.1250–4	8.1899–9	1.4248+7	1.2208–8	2.1980+9	8.5023+8	5.8327+8	7.6452+8	6.2033+3	1.0087+3	5.1806+2	4.9065+2	5.7715–3
	1.2500–4	8.6522–9	1.3486+7	2.4748–8	2.0806+9	8.0275+8	5.5662+8	7.2120+8	6.2647+3	9.8498+2	5.1130+2	4.7368+2	6.4143–3
	1.3125–4	8.8754–9	1.3147+7	3.1127–8	2.0283+9	7.8167+8	5.4462+8	7.0198+8	6.2933+3	9.7465+2	5.0831+2	4.6633+2	6.7377–3
	1.5000–4	9.5671–9	1.2197+7	5.0688–8	1.8816+9	7.2676+8	5.1323+8	6.4162+8	6.3723+3	9.4262+2	5.0192+2	4.4070+2	7.7159–3
	1.7500–4	1.0479–8	1.1135+7	7.7920–8	1.7178+9	6.6829+8	4.7312+8	5.7642+8	6.4475+3	8.9388+2	4.8472+2	4.0915+2	9.0168–3
	2.0000–4	1.1337–8	1.0293+7	1.0647–7	1.5879+9	6.2146+8	4.4113+8	5.2532+8	6.5135+3	8.5775+2	4.7280+2	3.8494+2	1.0331–2
M5	2.1181–4	1.1734–8	9.9439+6	1.2039–7	1.5341+9	6.0243+8	4.2669+8	5.0496+8	6.5248+3	8.3857+2	4.6492+2	3.7364+2	1.0932–2
M4	2.1482–4	1.1835–8	9.8597+6	1.2399–7	1.5211+9	5.9783+8	4.2322+8	5.0002+8	6.5276+3	8.3411+2	4.6318+2	3.7092+2	1.1085–2
	2.1732–4	1.1923–8	9.7866+6	1.2700–7	1.5098+9	5.9409+8	4.2030+8	4.9542+8	6.5299+3	8.2997+2	4.6157+2	3.6838+2	1.1213–2
	2.2014–4	1.2022–8	9.7058+6	1.3041–7	1.4974+9	5.8995+8	4.1707+8	4.9034+8	6.5325+3	8.2539+2	4.5978+2	3.6559+2	1.1357–2
	2.2766–4	1.2284–8	9.4992+6	1.3958–7	1.4655+9	5.7931+8	4.0879+8	4.7736+8	6.5391+3	8.1384+2	4.5535+2	3.5848+2	1.1740–2
	2.3013–4	1.2369–8	9.4337+6	1.4262–7	1.4554+9	5.7594+8	4.0617+8	4.7327+8	6.5413+3	8.1020+2	4.5395+2	3.5623+2	1.1866–2
	2.4759–4	1.2962–8	9.0020+6	1.6450–7	1.3888+9	5.5354+8	3.8884+8	4.4639+8	6.5559+3	7.8657+2	4.4499+2	3.4156+2	1.2759–2
	2.5000–4	1.3043–8	8.9465+6	1.6756–7	1.3802+9	5.5064+8	3.8662+8	4.4295+8	6.5578+3	7.8360+2	4.4389+2	3.3969+2	1.2882–2
	2.5931–4	1.3351–8	8.7398+6	1.7952–7	1.3483+9	5.3984+8	3.7828+8	4.3020+8	6.5651+3	7.7255+2	4.3977+2	3.3277+2	1.3359–2
	2.7380–4	1.3823–8	8.4415+6	1.9847–7	1.3023+9	5.2416+8	3.6623+8	4.1191+8	6.5759+3	7.5686+2	4.3397+2	3.2288+2	1.4102–2
	2.7965–4	1.4011–8	8.3284+6	2.0624–7	1.2849+9	5.1818+8	3.6166+8	4.0500+8	6.5802+3	7.5103+2	4.3186+2	3.1916+2	1.4402–2
	3.0000–4	1.4652–8	7.9640+6	2.3367–7	1.2286+9	4.9882+8	3.4692+8	3.8290+8	6.5942+3	7.3279+2	4.2548+2	3.0729+2	1.5448–2
	3.2500–4	1.5444–8	7.5556+6	2.6840–7	1.1656+9	4.7763+8	3.2926+8	3.5873+8	6.6103+3	7.0676+2	4.1431+2	2.9243+2	1.6736–2
M3	3.5928–4	1.6493–8	7.0747+6	3.1794–7	1.0914+9	4.5236+8	3.0848+8	3.3060+8	6.6304+3	6.7741+2	4.0217+2	2.7523+2	1.8507–2
	3.6437–4	1.6650–8	7.0080+6	3.2548–7	1.0811+9	4.4892+8	3.0567+8	3.2655+8	6.6333+3	6.7345+2	4.0066+2	2.7278+2	1.8770–2
M2	3.7522–4	1.6982–8	6.8710+6	3.4169–7	1.0600+9	4.4184+8	2.9991+8	3.1827+8	6.6392+3	6.6544+2	3.9765+2	2.6778+2	1.9332–2
	3.8142–4	1.7172–8	6.7950+6	3.5103–7	1.0483+9	4.3793+8	2.9675+8	3.1360+8	6.6365+3	6.6113+2	3.9612+2	2.6498+2	1.9640–2
	3.8219–4	1.7196–8	6.7857+6	3.5219–7	1.0469+9	4.3745+8	2.9636+8	3.1303+8	6.6362+3	6.6061+2	3.9594+2	2.6464+2	1.9679–2
	4.0000–4	1.7736–8	6.5791+6	3.7940–7	1.0150+9	4.2679+8	2.8778+8	3.0042+8	6.6287+3	6.4915+2	3.9202+2	2.5712+2	2.0564–2
	4.2500–4	1.8471–8	6.3173+6	4.1843–7	9.7459+8	4.1307+8	2.7603+8	2.8548+8	6.6076+3	6.3174+2	3.8446+2	2.4726+2	2.1778–2
M1	4.5598–4	1.9360–8	6.0271+6	4.6820–7	9.2983+8	3.9770+8	2.6306+8	2.6907+8	6.5832+3	6.1324+2	3.7675+2	2.3646+2	2.3277–2
	4.6148–4	1.9519–8	5.9781+6	4.7720–7	9.2227+8	3.9513+8	2.6091+8	2.6622+8	6.5790+3	6.1012+2	3.7547+2	2.3462+2	2.3543–2
	4.6250–4	1.9548–8	5.9691+6	4.7887–7	9.2088+8	3.9466+8	2.6051+8	2.6570+8	6.5783+3	6.0954+2	3.7524+2	2.3429+2	2.3592–2
	4.7111–4	1.9795–8	5.8946+6	4.9305–7	9.0939+8	3.9076+8	2.5725+8	2.6138+8	6.5719+3	6.0482+2	3.7330+2	2.3150+2	2.4007–2
	4.8556–4	2.0206–8	5.7749+6	5.1708–7	8.9091+8	3.8445+8	2.5199+8	2.5446+8	6.5615+3	5.9737+2	3.7029+2	2.2705+2	2.4703–2
	5.0000–4	2.0612–8	5.6611+6	5.4140–7	8.7336+8	3.7842+8	2.4701+8	2.4792+8	6.5514+3	5.9045+2	3.6759+2	2.2284+2	2.5398–2
	5.2500–4	2.1317–8	5.4737+6	5.8424–7	8.4446+8	3.6862+8	2.3855+8	2.3728+8	6.5242+3	5.7687+2	3.6140+2	2.1545+2	2.6537–2
	5.5000–4	2.2011–8	5.3013+6	6.2804–7	8.1785+8	3.5951+8	2.3077+8	2.2757+8	6.4984+3	5.6469+2	3.5595+2	2.0870+2	2.7672–2
	6.0000–4	2.3365–8	4.9940+6	7.1829–7	7.7045+8	3.4307+8	2.1692+8	2.1045+8	6.4505+3	5.4353+2	3.4665+2	1.9685+2	2.9928–2
	6.5000–4	2.4718–8	4.7207+6	8.1219–7	7.2828+8	3.2861+8	2.0442+8	1.9524+8	6.3857+3	5.2155+2	3.3601+2	1.8551+2	3.2015–2
	7.0000–4	2.6035–8	4.4819+6	9.0981–7	6.9144+8	3.1577+8	1.9353+8	1.8214+8	6.3264+3	5.0297+2	3.2718+2	1.7576+2	3.4083–2
	8.0000–4	2.8576–8	4.0833+6	1.1149–6	6.2995+8	2.9388+8	1.7534+8	1.6071+8	6.2208+3	4.7236+2	3.1249+2	1.5983+2	3.8165–2
	9.0000–4	3.1042–8	3.7590+6	1.3332–6	5.7991+8	2.7584+8	1.6020+8	1.4386+8	6.0594+3	4.4405+2	2.9753+2	1.4648+2	4.1054–2
	1.0000–3	3.3415–8	3.4921+6	1.5644–6	5.3874+8	2.6064+8	1.4780+8	1.3029+8	5.9186+3	4.2155+2	2.8576+2	1.3575+2	4.3889–2
	1.1250–3	3.6318–8	3.2129+6	1.8709–6	4.9567+8	2.4460+8	1.3460+8	1.1647+8	5.7506+3	3.9418+2	2.7017+2	1.2396+2	4.6978–2
	1.2500–3	3.9112–8	2.9834+6	2.1972–6	4.6026+8	2.3108+8	1.2381+8	1.0536+8	5.6043+3	3.7233+2	2.5780+2	1.1449+2	5.0007–2
	1.3125–3	4.0474–8	2.8830+6	2.3673–6	4.4477+8	2.2508+8	1.1911+8	1.0058+8	5.5378+3	3.6269+2	2.5222+2	1.1042+2	5.1501–2
	1.5000–3	4.4431–8	2.6262+6	2.9022–6	4.0516+8	2.0944+8	1.0714+8	8.8574+7	5.3598+3	3.3862+2	2.3835+2	1.0021+2	5.5906–2
	1.7500–3	4.9565–8	2.3542+6	3.6743–6	3.6319+8	1.9234+8	9.4436+7	7.6410+7	5.1345+3	3.0938+2	2.2038+2	8.8944+1	6.0666–2
	2.0000–3	5.4457–8	2.1427+6	4.5125–6	3.3057+8	1.7866+8	8.4672+7	6.7231+7	4.9469+3	2.8738+2	2.0686+2	8.0454+1	6.5301–2
L3	2.3691–3	6.1498–8	1.8974+6	5.8640–6	2.9272+8	1.6198+8	7.3517+7	5.7218+7	4.7017+3	2.5934+2	1.8870+2	7.0571+1	7.1306–2
	2.4480–3	6.2980–8	1.8528+6	6.1710–6	2.8583+8	1.5894+8	7.1538+7	5.5349+7	4.6526+3	2.5438+2	1.8555+2	6.8760+1	7.2450–2
L2	2.4666–3	6.3328–8	1.8426+6	6.2444–6	2.8426+8	1.5825+8	7.1088+7	5.4924+7	4.6413+3	2.5325+2	1.8483+2	6.8349+1	7.2719–2
	2.5333–3	6.4566–8	1.8073+6	6.5099–6	2.7881+8	1.5577+8	6.9510+7	5.3526+7	4.6017+3	2.4918+2	1.8219+2	6.6912+1	7.3680–2

Atomic Weight 92.906 Density 8.570 Grams/cc

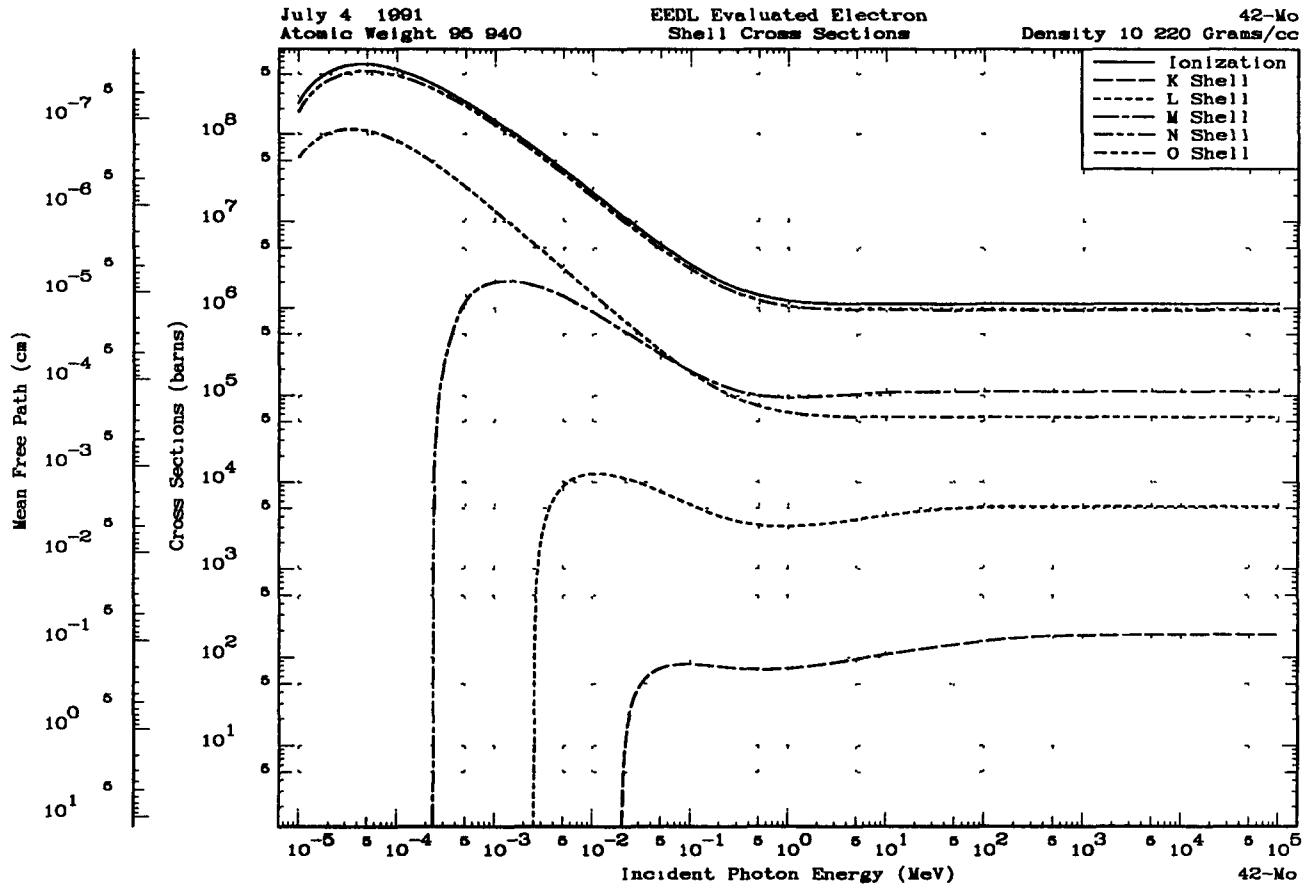
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.5860–3	6.5537–8	1.7805+6	6.7226–6	2.7468+8	1.5389+8	6.8317+7	5.2471+7	4.5714+3	2.4611+2	1.8021+2	6.5827+1	7.4435–2
	2.6500–3	6.6708–8	1.7492+6	6.9845–6	2.6986+8	1.5168+8	6.6927+7	5.1245+7	4.5357+3	2.4255+2	1.7790+2	6.4567+1	7.5349–2
L1	2.6763–3	6.7187–8	1.7367+6	7.0934–6	2.6793+8	1.5080+8	6.6373+7	5.0757+7	4.5213+3	2.4112+2	1.7698+2	6.4066+1	7.5723–2
	2.7572–3	6.8665–8	1.6993+6	7.4321–6	2.6216+8	1.4815+8	6.4729+7	4.9280+7	4.4782+3	2.3687+2	1.7424+2	6.2555+1	7.6862–2
	2.7930–3	6.9314–8	1.6834+6	7.5836–6	2.5971+8	1.4702+8	6.4030+7	4.8655+7	4.4596+3	2.3508+2	1.7308+2	6.1916+1	7.7363–2
	2.8250–3	6.9892–8	1.6695+6	7.7202–6	2.5756+8	1.4603+8	6.3420+7	4.8109+7	4.4433+3	2.3350+2	1.7207+2	6.1357+1	7.7811–2
	2.8786–3	7.0857–8	1.6468+6	7.9511–6	2.5406+8	1.4441+8	6.2424+7	4.7221+7	4.4165+3	2.3094+2	1.7041+2	6.0448+1	7.8558–2
	3.0000–3	7.3021–8	1.5980+6	8.4831–6	2.4653+8	1.4091+8	6.0292+7	4.5327+7	4.3581+3	2.2549+2	1.6689+2	5.8511+1	8.0238–2
	3.2500–3	7.7443–8	1.5067+6	9.6204–6	2.3245+8	1.3422+8	5.6307+7	4.1918+7	4.2361+3	2.1424+2	1.5932+2	5.4831+1	8.3120–2
	3.6250–3	8.3889–8	1.3910+6	1.1431–5	2.1459+8	1.2561+8	5.1296+7	3.7676+7	4.0751+3	2.0017+2	1.4983+2	5.0255+1	8.7363–2
	4.0000–3	9.0136–8	1.2946+6	1.3360–5	1.9972+8	1.1833+8	4.7165+7	3.4221+7	3.9353+3	1.8867+2	1.4205+2	4.6530+1	9.1511–2
	4.5000–3	9.8417–8	1.1856+6	1.6113–5	1.8291+8	1.0985+8	4.2611+7	3.0447+7	3.7594+3	1.7478+2	1.3246+2	4.2224+1	9.6168–2
	5.0000–3	1.0644–7	1.0963+6	1.9070–5	1.6913+8	1.0278+8	3.8914+7	2.7425+7	3.6087+3	1.6356+2	1.2468+2	3.8778+1	1.0071–1
	5.5000–3	1.1435–7	1.0204+6	2.2225–5	1.5743+8	9.6683+7	3.5822+7	2.4921+7	3.4674+3	1.5351+2	1.1761+2	3.5787+1	1.0450–1
	6.0000–3	1.2206–7	9.5599+5	2.5575–5	1.4749+8	9.1431+7	3.3216+7	2.2835+7	3.3432+3	1.4508+2	1.1167+2	3.3296+1	1.0821–1
	7.0000–3	1.3713–7	8.5094+5	3.2835–5	1.3128+8	8.2684+7	2.9034+7	1.9557+7	3.1197+3	1.3065+2	1.0132+2	2.9218+1	1.1420–1
	8.0000–3	1.5162–7	7.6962+5	4.0830–5	1.1873+8	7.5787+7	2.5841+7	1.7100+7	2.9382+3	1.1967+2	9.3387+1	2.6161+1	1.2001–1
	1.0000–2	1.7980–7	6.4899+5	5.8854–5	1.0012+8	6.5199+7	2.1248+7	1.3672+7	2.6427+3	1.0269+2	8.0877+1	2.1686+1	1.2897–1
	1.2500–2	2.1368–7	5.4608+5	8.5169–5	8.4246+7	5.5838+7	1.7468+7	1.0937+7	2.3514+3	8.7705+1	6.9654+1	1.7913+1	1.3694–1
	1.5000–2	2.4593–7	4.7447+5	1.1548–4	7.3199+7	4.9196+7	1.4886+7	9.1136+6	2.1374+3	7.7445+1	6.1901+1	1.5399+1	1.4465–1
K	1.8948–2	2.9543–7	3.9498+5	1.7078–4	6.0935+7	4.1571+7	1.2137+7	7.2240+6	1.8759+3	6.5681+1	5.2896+1	1.2632+1	1.5289–1
	1.9211–2	2.9866–7	3.9070+5	1.7480–4	6.0276+7	4.1157+7	1.1992+7	7.1240+6	1.8611+3	6.5052+1	5.2414+1	1.2485+1	1.5331–1
	1.9606–2	3.0348–7	3.8449+5	1.8091–4	5.9317+7	4.0554+7	1.1782+7	6.9790+6	1.8395+3	6.4137+1	5.1712+1	1.2272+1	1.5396–1
	2.0000–2	3.0829–7	3.7850+5	1.8710–4	5.8393+7	3.9972+7	1.1579+7	6.8398+6	1.8185+3	6.3257+1	5.1035+1	1.2067+1	1.5460–1
	2.0625–2	3.1582–7	3.6947+5	1.9709–4	5.7000+7	3.9088+7	1.1276+7	6.6347+6	1.7861+3	6.1867+1	4.9963+1	1.1748+1	1.5538–1
	2.1797–2	3.2980–7	3.5380+5	2.1641–4	5.4583+7	3.7548+7	1.0751+7	6.2816+6	1.7294+3	5.9458+1	4.8102+1	1.1200+1	1.5686–1
	2.2822–2	3.4190–7	3.4129+5	2.3394–4	5.2652+7	3.6314+7	1.0333+7	6.0022+6	1.6835+3	5.7541+1	4.6617+1	1.0766+1	1.5816–1
	2.4617–2	3.6278–7	3.2164+5	2.6597–4	4.9621+7	3.4371+7	9.6802+6	5.5691+6	1.6107+3	5.4547+1	4.4293+1	1.0094+1	1.6047–1
	2.7308–2	3.9346–7	2.9656+5	3.1712–4	4.5752+7	3.1873+7	8.8517+6	5.0256+6	1.5160+3	5.0748+1	4.1334+1	9.2499+0	1.6395–1
	3.0000–2	4.2346–7	2.7556+5	3.7188–4	4.2511+7	2.9768+7	8.1627+6	4.5791+6	1.4349+3	4.7589+1	3.8865+1	8.5570+0	1.6741–1
	3.2500–2	4.5036–7	2.5909+5	4.2591–4	3.9971+7	2.8106+7	7.6308+6	4.2331+6	1.3683+3	4.4981+1	3.6822+1	7.9894+0	1.6950–1
	3.6250–2	4.8981–7	2.3823+5	5.1248–4	3.6752+7	2.5988+7	6.9608+6	3.8028+6	1.2824+3	4.1694+1	3.4238+1	7.2837+0	1.7271–1
	4.0000–2	5.2828–7	2.2088+5	6.0548–4	3.4076+7	2.4215+7	6.4075+6	3.4524+6	1.2096+3	3.8981+1	3.2096+1	6.7094+0	1.7597–1
	5.0000–2	6.2638–7	1.8629+5	8.8211–4	2.8739+7	2.0644+7	5.3337+6	2.7605+6	1.0602+3	3.3458+1	2.7752+1	5.5235+0	1.8242–1
	6.0000–2	7.1906–7	1.6228+5	1.1996–3	2.5035+7	1.8121+7	4.6127+6	2.3006+6	9.5969+2	2.9609+1	2.4709+1	4.7121+0	1.8795–1
	8.0000–2	8.9232–7	1.3077+5	1.9389–3	2.0174+7	1.4711+7	3.6990+6	1.7633+6	8.1820+2	2.4652+1	2.0713+1	3.7424+0	1.9672–1
	1.0000–1	1.0527–6	1.1084+5	2.8060–3	1.7100+7	1.2510+7	3.1460+6	1.4426+6	7.2465+2	2.1544+1	1.8195+1	3.1448+0	2.0410–1
	1.5000–1	1.3905–6	8.3919+4	5.3945–3	1.2946+7	9.5234+6	2.4030+6	1.0196+6	5.8594+2	1.7248+1	1.4700+1	2.3284+0	2.1948–1
	2.0000–1	1.6663–6	7.0028+4	8.4985–3	1.0804+7	7.9772+6	2.0314+6	7.9441+5	5.1064+2	1.5020+1	1.2912+1	1.8737+0	2.3415–1
	2.5000–1	1.8993–6	6.1438+4	1.1978–2	9.4783+6	6.9945+6	1.8200+6	6.6333+5	4.6713+2	1.3739+1	1.1889+1	1.6004+0	2.4959–1
	3.0000–1	2.1096–6	5.5311+4	1.5740–2	8.5330+6	6.2821+6	1.6638+6	5.8671+5	4.3435+2	1.2850+1	1.1138+1	1.4472+0	2.6498–1
	4.0000–1	2.4704–6	4.7234+4	2.3835–2	7.2870+6	5.3067+6	1.4847+6	4.9516+5	3.9750+2	1.1869+1	1.0310+1	1.2606+0	2.9874–1
	5.0000–1	2.7790–6	4.1988+4	3.2449–2	6.4776+6	4.6558+6	1.3809+6	4.4053+5	3.7693+2	1.1353+1	9.8696+0	1.1491+0	3.3481–1
	6.0000–1	3.0412–6	3.8369+4	4.1367–2	5.9193+6	4.1951+6	1.3141+6	4.0969+5	3.6434+2	1.1075+1	9.6115+0	1.0903+0	3.7291–1
	8.0000–1	3.4802–6	3.3529+4	5.9598–2	5.1726+6	3.5706+6	1.2361+6	3.6553+5	3.5239+2	1.0867+1	9.4052+0	1.0041+0	4.5722–1
	1.0000+0	3.8289–6	3.0475+4	7.8030–2	4.7015+6	3.1650+6	1.1922+6	3.4408+5	3.4743+2	1.0835+1	9.3185+0	9.6847–1	5.4761–1
	1.5000+0	4.4612–6	2.6156+4	1.2347–1	4.0352+6	2.5775+6	1.1438+6	3.1348+5	3.4603+2	1.1175+1	9.4665+0	9.1447–1	7.9412–1
	2.0000+0	4.8906–6	2.3859+4	1.6739–1	3.6809+6	2.2549+6	1.1291+6	2.9658+5	3.4964+2	1.1596+1	9.6341+0	8.9681–1	1.0651+0
	3.0000+0	5.4488–6	2.1415+4	2.5054–1	3.3038+6	1.9145+6	1.1091+6	2.7985+5	3.5630+2	1.2467+1	9.9525+0	8.7242–1	1.6420+0
	4.0000+0	5.7930–6	2.0143+4	3.2809–1	3.1075+6	1.7332+6	1.1067+6	2.6719+5	3.6174+2	1.3334+1	1.0217+1	8.5820–1	2.2590+0
	5.0000+0	6.0134–6	1.9404+4	4.0077–1	2.9936+6	1.6267+6	1.1051+6	2.6142+5	3.6640+2	1.4190+1	1.0443+1	8.4759–1	2.8998+0
	6.0000+0	6.1663–6	1.8923+4	4.6928–1	2.9194+6	1.5590+6	1.1036+6	2.5637+5	3.7025+2	1.5013+1	1.0626+1	8.3898–1	3.5484+0
	8.0000+0	6.3665–6	1.8328+4	5.9571–1	2.8275+6	1.4785+6	1.1017+6	2.4688+5	3.7630+2	1.6652+1	1.0923+1	8.2292–1	4.9066+0
	1.0000+1	6.4660–6	1.8046+4	7.1034–1	2.7840+6	1.4423+6	1.1023+6	2.3907+5	3.8106+2	1.8270+1	1.1173+1	8.1137–1	6.2854+0
	1.5000+1	6.5205–6	1.7895+4	9.5813–1	2.7608+6	1.4254+6	1.1032+6	2.3177+5	3.9179+2	2.2215+1	1.1517+1	7.9359–1	9.9048+0
	2.0000+1	6.5316–6	1.7865+4	1.1650+0	2.7561+6	1.4245+6	1.1039+6	2.2729+5	3.9757+2	2.6243+1	1.1809+1	7.8509–1	1.3650+1
	3.0000+1	6.5470–6	1.7823+4	1.4977+0	2.7496+6	1.4240+6	1.1039+6	2.2125+5	4.0612+2	3.4225+1	1.2107+1	7.7754–1	2.1341+1
	4.0000+1	6.5506–6	1.7813+4	1.7599+0	2.7481+6	1.4237+6	1.1043+6	2.1967+5	4.1247+2	4.2341+1	1.2340+1	7.7360–1	2.9227+1
	5.0000+1	6.5542–6	1.7803+4	1.9757+0	2.7466+6	1.4235+6	1.1046+6	2.1814+5	4.1742+2	5.0563+1	1.2533+1	7.6976–1	3.7260+1
	6.0000+1	6.5565–6	1.7797+4	2.1589+0	2.7456+6	1.4233+6	1.1047+6	2.1722+5	4.2165+2	5.8833+1	1.2673+1	7.6810–1	4.5392+1
	8.0000+1	6.5612–6	1.7784+4	2.4581+0	2.7436+6	1.4229+6	1.1048+6	2.1545+5	4.2841+2	7.5525+1	1.2884+1	7.6493–1	6.1877+1
	1.0000+2	6.5652–6	1.7773+4	2.6972+0	2.7420+6	1.4227+6	1.1049+6	2.1397+5	4.3296+2	9.2373+1	1.3062+1	7.6276–1	7.8548+1
	1.5000+2	6.5681–6	1.7766+4	3.1428+0	2.7408+6	1.4222+6	1.1049+6	2.1316+5	4.4173+2	1.3469+2	1.3251+1	7.6010–1	1.2068+2
	2.0000+2	6.5699–6	1.7761+4	3.4654+0	2.7400+6	1.4219+6	1.1050+6	2.1267+5	4.4758+2	1.7724+2	1.3431+1	7.5854–1	1.6305+2
	3.0000+2	6.5719–6	1.7755+4	3.9259+0	2.7392+6	1.4215+6	1.1050+6	2.1223+5	4.5438+2	2.6270+2	1.3754+1	7.5737–1	2.4818+2
	4.0000+2	6.5739–6	1.7750+4	4.2553+0	2.7384+6	1.4211+6	1.1050+6	2.1175+5	4.5841+2	3.4844+2	1.3893+1	7.5604–1	3.3379+2
	5.0000+2	6.5761–6	1.7744+4	4.5118+0	2.7374+6	1.4209+6	1.1050+6	2.1107+5	4.6149+2	4.3439+2	1.4005+1	7.5399–1	4.1963+2
	6.0000+2	6.5770–6	1.7741+4	4.7220+0	2.7371+6	1.4207+6	1.1050+6	2.1087+5	4.6434+2	5.1953+2	1.4116+1	7.5365–1	5.0466+2
	8.0000+2	6.5789–6	1.7736+4	5.0548+0	2.7362+6	1.4203+6	1.1050+6	2.1038+5	4.6907+2	6.9043+2	1.4327+1	7.5271–1	6.7534+2
	1.0000+3	6.5806–6	1.7732+4	5.3136+0	2.7356+6	1.4201+6	1.1050+6	2.0994+5	4.7298+2	8.6197+2	1.4495+1	7.5188–1	8.4672+2
	1.5000+3	6.5823–6	1.7727+4	5.7844+0	2.7348+6	1.4196+6	1.1050+6	2.0965+5	4.8028+2	1.2908+3	1.4648+1	7.5088–1	1.2754+3
	2.0000+3	6.5837–6	1.7724+4	6.1186+0	2.7343+6	1.4193+6	1.1050+6	2.0942+5	4.8558+2	1.7220+3	1.4800+1	7.5004–1	1.7065+3
	3.0000+3	6.5850–6	1.7720+4	6.5898+0	2.7338+6	1.4189+6	1.1050+6	2.0934+5	4.9370+2	2.5800+3	1.5104+1	7.4976–1	2.5642+3
	4.0000+3	6.5861–6	1.7717+4	6.9239+0	2.7333+6	1.4186+6	1.1050+6	2.0919+5	4.9953+2	3.4490+3	1.5265+1	7.4926–1	3.4330+3
	5.0000+3	6.5875–6	1.7713+4	7.1829+0	2.7327+6	1.4183+6	1.1050+6	2.0885+5	5.0396+2	4.3047+3	1.5365+1	7.4804–1	4.2886+3
	6.0000+3	6.5878–6	1.7713+4	7.3946+0	2.7326+6	1.4181+6	1.1050+6	2.0894+5	5.0761+2	5.1671+3	1.5465+1	7.4838–1	5.1509+3
	8.0000+3	6.5884–6	1.7711+4	7.7288+0	2.7323+6	1.4178+6	1.1050+6	2.0899+5	5.1333+2	6.8855+3	1.5665+1	7.4860–1	6.8690+3
	1.0000+4	6.5890–6	1.7709+4	7.9882+0	2.7321+6	1.4175+6	1.1050+6	2.0897+5	5.1770+2	8.5943+3	1.5839+1	7.4854–1	8.5777+3
	1.5000+4	6.5900–6	1.7707+4	8.4598+0	2.7317+6	1.4171+6	1.1050+6	2.0903+5	5.2576+2	1.2904+4	1.5988+1	7.4876–1	1.2887+4
	2.0000+4	6.5908–6	1.7704+4	8.7946+0	2.7313+6	1.4168+6	1.1050+6	2.0897+5	5.3175+2	1.7169+4	1.6137+1	7.4854–1	1.7152+4

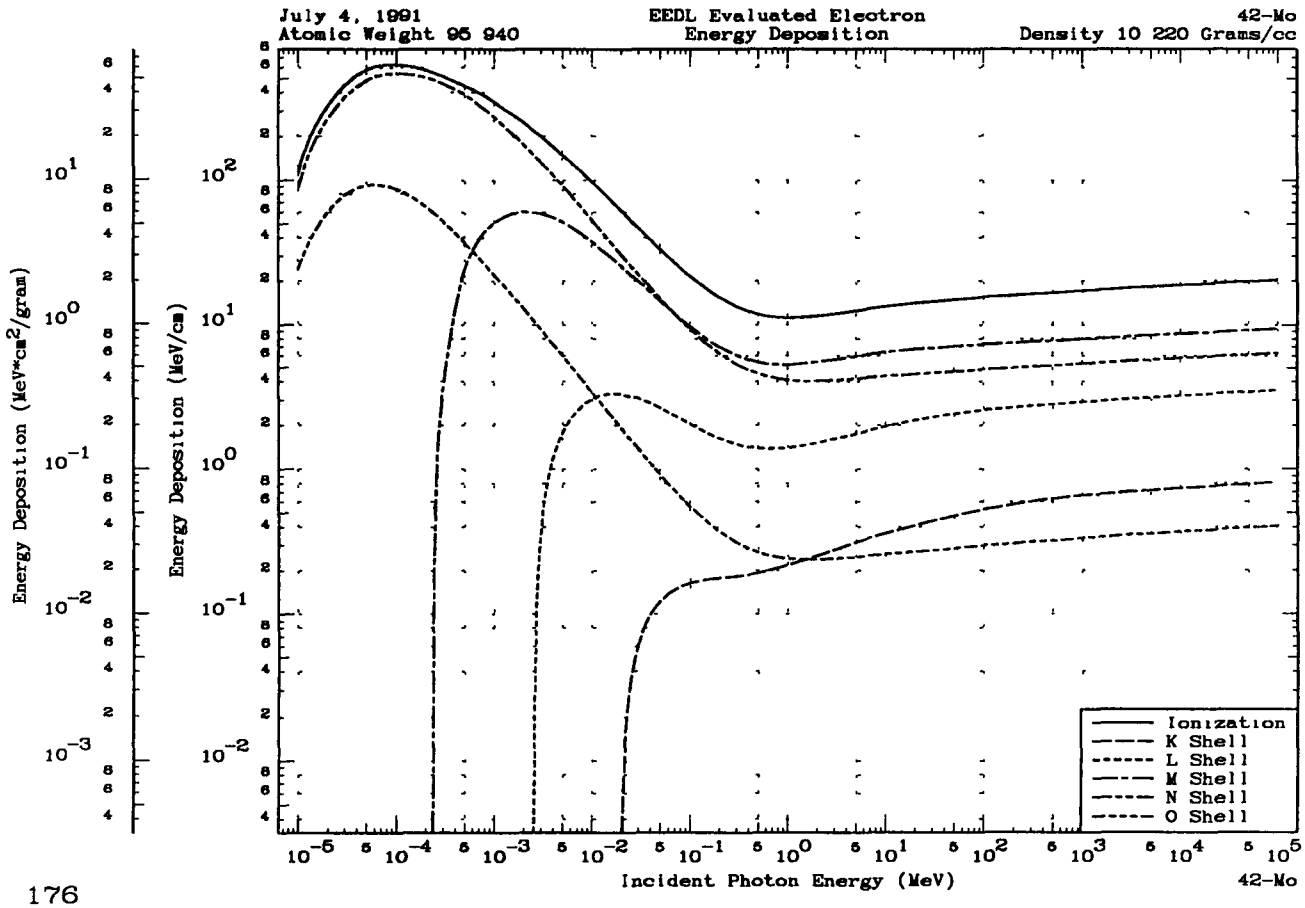
Atomic Weight 92.906												Density 8.570 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+4	6.5918–6	1.7702+4	9.2663+0	2.7309+6	1.4163+6	1.1050+6	2.0903+5	5.4030+2	2.5811+4	1.6436+1	7.4876–1	2.5794+4
4.0000+4	6.5927–6	1.7699+4	9.6011+0	2.7305+6	1.4160+6	1.1050+6	2.0897+5	5.4628+2	3.4329+4	1.6591+1	7.4854–1	3.4312+4
5.0000+4	6.5941–6	1.7696+4	9.8611+0	2.7300+6	1.4157+6	1.1050+6	2.0866+5	5.5097+2	4.2927+4	1.6701+1	7.4743–1	4.2909+4
6.0000+4	6.5943–6	1.7695+4	1.0073+1	2.7299+6	1.4155+6	1.1050+6	2.0878+5	5.5483+2	5.1589+4	1.6797+1	7.4788–1	5.1571+4
8.0000+4	6.5948–6	1.7694+4	1.0408+1	2.7297+6	1.4152+6	1.1050+6	2.0884+5	5.6084+2	6.8734+4	1.6989+1	7.4810–1	6.8716+4
1.0000+5	6.5954–6	1.7692+4	1.0668+1	2.7294+6	1.4150+6	1.1050+6	2.0884+5	5.6554+2	8.6000+4	1.7176+1	7.4810–1	8.5982+4


July 4 1991
Atomic Weight 95 940
EEDL Evaluated Electron
Cross Sections
42-Mo
Density 10 220 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
42-Mo


July 4 1991
Atomic Weight 95 940
EEDL Evaluated Electron
Energy Deposition
42-Mo
Density 10 220 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
42-Mo

175


July 4 1991
Atomic Weight 95 940
EEDL Evaluated Electron
Shell Cross Sections
42-Mo
Density 10 220 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
42-Mo

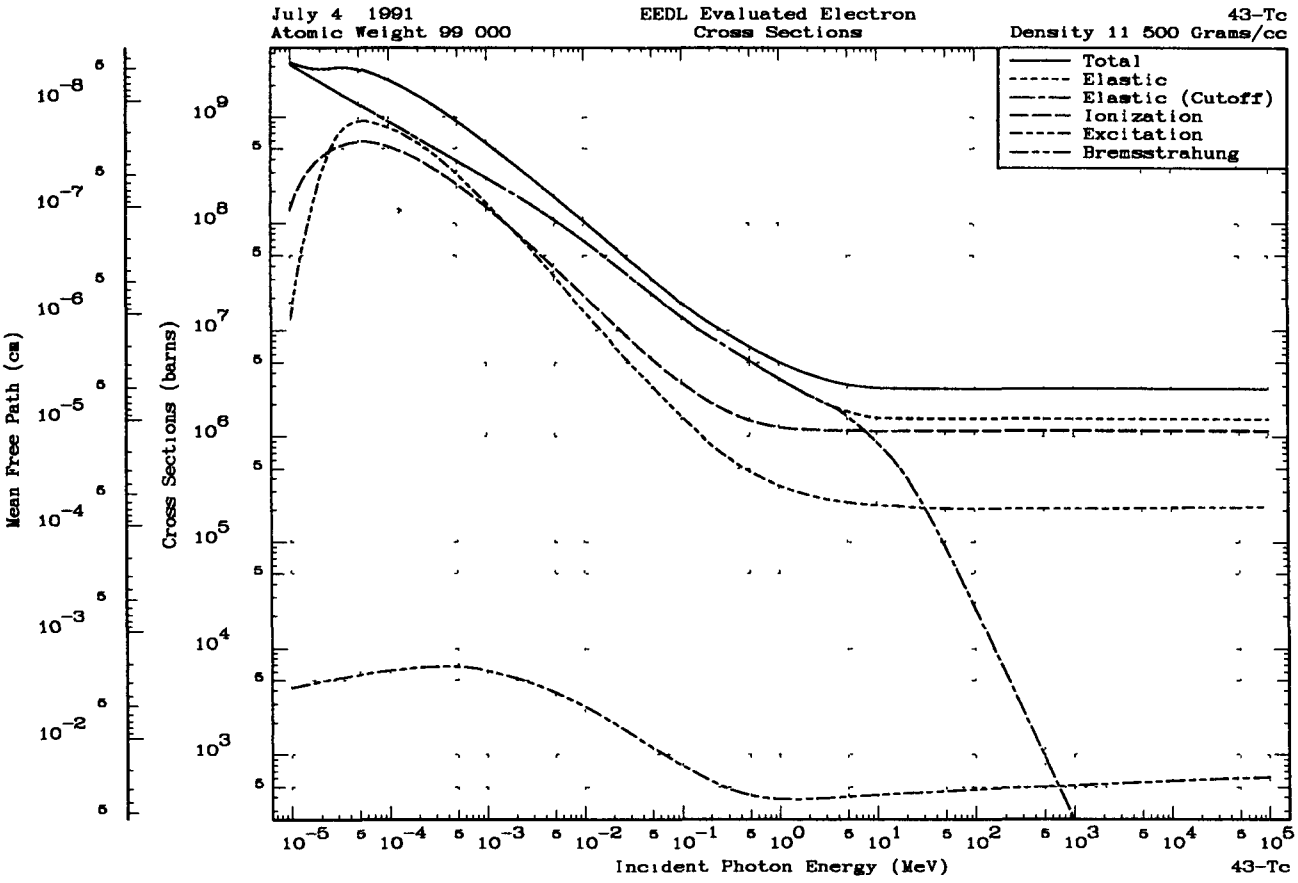

July 4, 1991
Atomic Weight 95 940
EEDL Evaluated Electron
Energy Deposition
42-Mo
Density 10 220 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
42-Mo

Atomic Weight 95.940 — Density 10.220 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.1689–9	1.8930+7		3.0158+9	2.7582+9	2.3459+8	2.2988+7	4.2769+3	1.2240+2	1.1228+2	1.0113+1	5.9195–4
	1.1250–5	5.3217–9	1.8386+7		2.9292+9	2.5934+9	2.9528+8	4.0529+7	4.3773+3	1.6502+2	1.4666+2	1.8360+1	6.6281–4
	1.3125–5	5.4718–9	1.7882+7		2.8489+9	2.3924+9	3.6744+8	8.8991+7	4.5124+3	2.3433+2	1.9228+2	4.2056+1	7.7134–4
	1.5000–5	5.5911–9	1.7501+7		2.7881+9	2.2310+9	4.2494+8	1.3217+8	4.6327+3	2.9798+2	2.3292+2	6.5049+1	8.8234–4
	1.7500–5	5.6465–9	1.7329+7		2.7607+9	2.0581+9	4.8501+8	2.1763+8	4.7756+3	3.9020+2	2.8094+2	1.0926+2	1.0339–3
	2.0000–5	5.6195–9	1.7412+7		2.7740+9	1.9192+9	5.3123+8	3.2355+8	4.9029+3	4.8985+2	3.2421+2	1.6564+2	1.1890–3
	2.5000–5	5.4948–9	1.7807+7		2.8369+9	1.7077+9	5.9257+8	5.3664+8	5.0909+3	6.7503+2	3.9492+2	2.8011+2	1.4784–3
	3.0000–5	5.3921–9	1.8147+7		2.8910+9	1.5523+9	6.3091+8	7.0774+8	5.2498+3	8.2852+2	4.5199+2	3.7653+2	1.7760–3
	3.5000–5	5.3699–9	1.8222+7		2.9029+9	1.4323+9	6.4807+8	8.2252+8	5.3857+3	9.3960+2	4.9167+2	4.4792+2	2.0781–3
	4.0000–5	5.3916–9	1.8148+7		2.8912+9	1.3359+9	6.6340+8	8.9194+8	5.5063+3	1.0283+3	5.3134+2	4.9693+2	2.3865–3
N3	4.2460–5	5.4396–9	1.7988+7		2.8657+9	1.2949+9	6.6333+8	9.0739+8	5.5610+3	1.0531+3	5.4218+2	5.1089+2	2.5403–3
	4.4345–5	5.4739–9	1.7875+7		2.8478+9	1.2659+9	6.6372+8	9.1810+8	5.5952+3	1.0728+3	5.5168+2	5.2108+2	2.6512–3
N2	4.5070–5	5.4865–9	1.7834+7		2.8412+9	1.2553+9	6.6383+8	9.2212+8	5.6080+3	1.0802+3	5.5520+2	5.2497+2	2.6940–3
	4.7172–5	5.5300–9	1.7694+7		2.8189+9	1.2258+9	6.6451+8	9.2860+8	5.6425+3	1.0999+3	5.6652+2	5.3338+2	2.8162–3
	4.7535–5	5.5372–9	1.7671+7		2.8152+9	1.2209+9	6.6460+8	9.2969+8	5.6483+3	1.1032+3	5.6840+2	5.3483+2	2.8374–3
	5.0000–5	5.5844–9	1.7522+7		2.7914+9	1.1891+9	6.6533+8	9.3694+8	5.6868+3	1.1261+3	5.8154+2	5.4458+2	2.9816–3
	5.5000–5	5.7217–9	1.7101+7		2.7244+9	1.1314+9	6.5880+8	9.3417+8	5.7601+3	1.1489+3	5.9616+2	5.5274+2	3.2766–3
	6.0000–5	5.8475–9	1.6733+7		2.6658+9	1.0812+9	6.5291+8	9.3165+8	5.8279+3	1.1719+3	6.1087+2	5.6098+2	3.5748–3
N1	6.9630–5	6.1629–9	1.5877+7		2.5294+9	1.0006+9	6.3159+8	8.9723+8	5.9456+3	1.1740+3	6.1948+2	5.5454+2	4.1571–3
	7.0926–5	6.2070–9	1.5764+7		2.5114+9	9.9100+8	6.2901+8	8.9140+8	5.9604+3	1.1738+3	6.2081+2	5.5297+2	4.2362–3
	7.3195–5	6.2828–9	1.5574+7		2.4811+9	9.7489+8	6.2465+8	8.8155+8	5.9856+3	1.1736+3	6.2325+2	5.5036+2	4.3752–3
	7.6597–5	6.3937–9	1.5304+7		2.4381+9	9.5210+8	6.1846+8	8.6752+8	6.0223+3	1.1739+3	6.2715+2	5.4677+2	4.5845–3
	8.0000–5	6.5012–9	1.5051+7		2.3978+9	9.3080+8	6.1265+8	8.5430+8	6.0576+3	1.1749+3	6.3132+2	5.4354+2	4.7950–3
	8.5000–5	6.6669–9	1.4677+7		2.3382+9	9.0203+8	6.0099+8	8.3514+8	6.0996+3	1.1678+3	6.3069+2	5.3711+2	5.0956–3
	9.0000–5	6.8266–9	1.4333+7		2.2835+9	8.7571+8	5.9028+8	8.1747+8	6.1394+3	1.1621+3	6.3074+2	5.3139+2	5.3981–3
	9.2500–5	6.9045–9	1.4171+7		2.2577+9	8.6337+8	5.8519+8	8.0913+8	6.1586+3	1.1596+3	6.3081+2	5.2876+2	5.5499–3
	1.0000–4	7.1307–9	1.3722+7	0.0000+0	2.1861+9	8.2920+8	5.7100+8	7.8586+8	6.2136+3	1.1534+3	6.3172+2	5.2170+2	6.0080–3
	1.1250–4	7.5362–9	1.2984+7	1.0966–8	2.0684+9	7.8012+8	5.4445+8	7.4388+8	6.2832+3	1.1265+3	6.2268+2	5.0386+2	6.7545–3
	1.3125–4	8.1014–9	1.2078+7	2.7836–8	1.9241+9	7.2026+8	5.1159+8	6.9229+8	6.3755+3	1.0963+3	6.1341+2	4.8293+2	7.8875–3
	1.5000–4	8.6828–9	1.1269+7	4.5179–8	1.7953+9	6.7212+8	4.8477+8	6.3841+8	6.4566+3	1.0661+3	6.0778+2	4.5826+2	9.0347–3
	1.7500–4	9.4450–9	1.0360+7	6.9176–8	1.6504+9	6.2054+8	4.4933+8	5.8053+8	6.5345+3	1.0180+3	5.8898+2	4.2897+2	1.0562–2
	2.0000–4	1.0157–8	9.6332+6	9.4173–8	1.5347+9	5.7907+8	4.2095+8	5.3466+8	6.6027+3	9.8250+2	5.7612+2	4.0636+2	1.2105–2
M5	2.3700–4	1.1217–8	8.7229+6	1.3297–7	1.3897+9	5.3033+8	3.8362+8	4.7572+8	6.6397+3	9.2536+2	5.5158+2	3.7377+2	1.4325–2
M4	2.4045–4	1.1314–8	8.6482+6	1.3671–7	1.3778+9	5.2638+8	3.8062+8	4.7075+8	6.6429+3	9.2096+2	5.4986+2	3.7109+2	1.4533–2
	2.4094–4	1.1328–8	8.6374+6	1.3724–7	1.3760+9	5.2583+8	3.8017+8	4.7004+8	6.6433+3	9.2023+2	5.4954+2	3.7067+2	1.4562–2
	2.4417–4	1.1421–8	8.5673+6	1.4076–7	1.3649+9	5.2223+8	3.7724+8	4.6540+8	6.6463+3	9.1538+2	5.4739+2	3.6798+2	1.4757–2
	2.5115–4	1.1619–8	8.4211+6	1.4843–7	1.3416+9	5.1471+8	3.7114+8	4.5573+8	6.6524+3	9.0538+2	5.4299+2	3.6237+2	1.5177–2
	2.6336–4	1.1961–8	8.1806+6	1.6204–7	1.3033+9	5.0227+8	3.6110+8	4.3989+8	6.6629+3	8.8937+2	5.3612+2	3.5323+2	1.5914–2
	2.7047–4	1.2156–8	8.0490+6	1.7007–7	1.2823+9	4.9543+8	3.5562+8	4.3125+8	6.6687+3	8.8090+2	5.3262+2	3.4826+2	1.6343–2
	2.8523–4	1.2556–8	7.7927+6	1.8699–7	1.2415+9	4.8204+8	3.4491+8	4.1451+8	6.6804+3	8.6443+2	5.2574+2	3.3867+2	1.7236–2
	3.0000–4	1.2948–8	7.5572+6	2.0421–7	1.2040+9	4.6967+8	3.3507+8	3.9921+8	6.6915+3	8.4985+2	5.1988+2	3.2996+2	1.8130–2
	3.3438–4	1.3885–8	7.0471+6	2.4564–7	1.1227+9	4.4426+8	3.1297+8	3.6545+8	6.7108+3	8.1017+2	5.0167+2	3.0848+2	2.0207–2
	3.6719–4	1.4744–8	6.6364+6	2.8690–7	1.0573+9	4.2344+8	2.9519+8	3.3862+8	6.7275+3	7.8024+2	4.8870+2	2.9152+2	2.2196–2
	3.7539–4	1.4954–8	6.5433+6	2.9746–7	1.0424+9	4.1867+8	2.9115+8	3.3258+8	6.7314+3	7.7374+2	4.8600+2	2.8771+2	2.2694–2
M3	3.9163–4	1.5364–8	6.3685+6	3.1861–7	1.0146+9	4.0968+8	2.8359+8	3.2131+8	6.7390+3	7.6181+2	4.8116+2	2.8063+2	2.3680–2
	3.9582–4	1.5475–8	6.3231+6	3.2412–7	1.0073+9	4.0745+8	2.8173+8	3.1816+8	6.7356+3	7.5874+2	4.8005+2	2.7866+2	2.3921–2
	4.0000–4	1.5585–8	6.2784+6	3.2964–7	1.0002+9	4.0526+8	2.7989+8	3.1507+8	6.7322+3	7.5576+2	4.7900+2	2.7673+2	2.4162–2
M2	4.0964–4	1.5831–8	6.1807+6	3.4247–7	9.8466+8	4.0035+8	2.7548+8	3.0883+8	6.7245+3	7.4757+2	4.7515+2	2.7240+2	2.4717–2
	4.1529–4	1.5977–8	6.1241+6	3.5005–7	9.7564+8	3.9755+8	2.7298+8	3.0511+8	6.7201+3	7.4294+2	4.7304+2	2.6987+2	2.5041–2
	4.2500–4	1.6227–8	6.0298+6	3.6319–7	9.6061+8	3.9287+8	2.6881+8	2.9893+8	6.7127+3	7.3533+2	4.6965+2	2.6565+2	2.5599–2
	4.3647–4	1.6520–8	5.9231+6	3.7887–7	9.4362+8	3.8755+8	2.6409+8	2.9197+8	6.7041+3	7.2685+2	4.6592+2	2.6091+2	2.6257–2
	4.5000–4	1.6861–8	5.8032+6	3.9761–7	9.2452+8	3.8153+8	2.5880+8	2.8418+8	6.6943+3	7.1755+2	4.6191+2	2.5561+2	2.7032–2
	4.6250–4	1.7173–8	5.6978+6	4.1513–7	9.0773+8	3.7621+8	2.5413+8	2.7738+8	6.6855+3	7.0923+2	4.5821+2	2.5099+2	2.7747–2
	4.6823–4	1.7315–8	5.6511+6	4.2324–7	9.0029+8	3.7385+8	2.5206+8	2.7437+8	6.6816+3	7.0557+2	4.5660+2	2.4894+2	2.8074–2
M1	4.9409–4	1.7947–8	5.4520+6	4.6029–7	8.6857+8	3.6369+8	2.4325+8	2.6162+8	6.6644+3	6.9036+2	4.5003+2	2.4030+2	2.9550–2
	5.0000–4	1.8093–8	5.4081+6	4.6887–7	8.6157+8	3.6148+8	2.4134+8	2.5874+8	6.6606+3	6.8712+2	4.4871+2	2.3838+2	2.9886–2
	5.1250–4	1.8398–8	5.3182+6	4.8716–7	8.4726+8	3.5694+8	2.3723+8	2.5308+8	6.6475+3	6.7919+2	4.4482+2	2.3433+2	3.0564–2
	5.3438–4	1.8927–8	5.1699+6	5.1968–7	8.2362+8	3.4938+8	2.3045+8	2.4379+8	6.6255+3	6.6634+2	4.3862+2	2.2769+2	3.1746–2
	5.5000–4	1.9299–8	5.0701+6	5.4328–7	8.0773+8	3.4426+8	2.2589+8	2.3758+8	6.6103+3	6.5789+2	4.3460+2	2.2326+2	3.2588–2
	5.6719–4	1.9704–8	4.9659+6	5.6958–7	7.9112+8	3.3887+8	2.2112+8	2.3113+8	6.5941+3	6.4894+2	4.3025+2	2.1865+2	3.3512–2
	6.0000–4	2.0465–8	4.7812+6	6.2076–7	7.6171+8	3.2925+8	2.1267+8	2.1979+8	6.5646+3	6.3349+2	4.2288+2	2.1057+2	3.5270–2
	7.0000–4	2.2736–8	4.3037+6	7.8460–7	6.8563+8	3.0431+8	1.9020+8	1.9112+8	6.4448+3	5.8780+2	3.9887+2	1.8890+2	4.0226–2
	8.0000–4	2.4891–8	3.9311+6	9.5994–7	6.2627+8	2.8424+8	1.7269+8	1.6933+8	6.3428+3	5.5317+2	3.8063+2	1.7249+2	4.5102–2
	9.0000–4	2.7006–8	3.6231+6	1.1463–6	5.7721+8	2.6773+8	1.5803+8	1.5144+8	6.1843+3	5.2022+2	3.6214+2	1.5803+2	4.8581–2
	1.0000–3	2.9038–8	3.3697+6	1.3436–6	5.3683+8	2.5377+8	1.4601+8	1.3705+8	6.0459+3	4.9404+2	3.4757+2	1.4642+2	5.1997–2
	1.1250–3	3.1520–8	3.1042+6	1.6051–6	4.9454+8	2.3892+8	1.3313+8	1.2248+8	5.8799+3	4.6221+2	3.2840+2	1.3376+2	5.5718–2
	1.2500–3	3.3905–8	2.8859+6	1.8832–6	4.5976+8	2.2638+8	1.2260+8	1.1077+8	5.7352+3	4.3682+2	3.1317+2	1.2359+2	5.9370–2
	1.3125–3	3.5066–8	2.7904+6	2.0282–6	4.4454+8	2.2080+8	1.1801+8	1.0574+8	5.6694+3	4.2559+2	3.0631+2	1.1922+2	6.1171–2
	1.5000–3	3.8431–8	2.5460+6	2.4839–6	4.0561+8	2.0621+8	1.0630+8	9.3093+7	5.4932+3	3.9758+2	2.8924+2	1.0827+2	6.6486–2
	1.7500–3	4.2769–8	2.2878+6	3.1411–6	3.6448+8	1.9012+8	9.3831+7	8.0523+7	5.2681+3	3.6376+2	2.6719+2	9.6491+1	7.2230–2
	2.0000–3	4.6889–8	2.0868+6	3.8536–6	3.3245+8	1.7719+8	8.4235+7	7.1016+7	5.0805+3	3.3828+2	2.5059+2	8.7604+1	7.7826–2
L3	2.5210–3	5.5233–8	1.7715+6	5.5024–6	2.8223+8	1.5573+8	6.9590+7	5.6904+7	4.7404+3	2.9471+2	2.2113+2	7.3498+1	8.7731–2
	2.5809–3	5.6158–8	1.7424+6	5.7070–6	2.7758+8	1.5363+8	6.8239+7	5.5709+7	4.7055+3	2.9063+2	2.1829+2	7.2243+1	8.8769–2
L2	2.6295–3	5.6904–8	1.7195+6	5.8752–6	2.7394+8	1.5198+8	6.7184+7	5.4776+7	4.6779+3	2.8743+2	2.1608+2	7.1265+1	8.9607–2
	2.6857–3	5.7776–8	1.6936+6	6.0718–6	2.6981+8	1.5013+8	6.6009+7	5.3665+7	4.6469+3	2.8383+2	2.1364+2	7.0103+1	9.0573–2
	2.7221–3	5.8339–8	1.6772+6	6.2008–6	2.6720+8	1.4896+8	6.5271+7	5.2968+7	4.6272+3	2.8157+2	2.1210+2	6.9373+1	9.1197–2
L1	2.8465–3	6.0241–8	1.6243+6	6.6484–6	2.5877+8	1.4516+8	6.2882+7	5.0722+7	4.5626+3	2.7428+2	2.0716+2	6.7025+1	9.3314–2
	2.8611–3	6.0467–8	1.6182+6	6.7015–6	2.5780+8	1.4473+8	6.2615+7	5.0448+7	4.5552+3	2.7344+2	2.0661+2	6.6740+1	9.3557–2
	3.0000–3	6.2608–8	1.5629+6	7.2168–6	2.4898+8	1.4081+8	6.0188+7	4.7980+7	4.4871+3	2.6590+2	2.0164+2	6.4164+1	9.5866–2
	3.2500–3	6.6419–8	1.4732+6	8.1815–6	2.3470+8	1.3421+8	5.6242+7	4.4241+7	4.3624+3	2.5252+2	1.9241+2	6.0014+1	9.9345–2

Atomic Weight 95.940 — Density 10.220 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.4375–3	6.9219–8	1.4136+6	8.9372–6	2.2520+8	1.2977+8	5.3634+7	4.1796+7	4.2772+3	2.4372+2	1.8632+2	5.7299+1	1.0192–1
3.6250–3	7.1973–8	1.3595+6	9.7193–6	2.1658+8	1.2570+8	5.1277+7	3.9606+7	4.1980+3	2.3583+2	1.8086+2	5.4867+1	1.0446–1
3.7188–3	7.3334–8	1.3343+6	1.0120–5	2.1257+8	1.2379+8	5.0181+7	3.8594+7	4.1604+3	2.3216+2	1.7831+2	5.3744+1	1.0573–1
4.0000–3	7.7354–8	1.2649+6	1.1358–5	2.0152+8	1.1849+8	4.7181+7	3.5844+7	4.0550+3	2.2219+2	1.7139+2	5.0690+1	1.0947–1
4.5000–3	8.4569–8	1.1570+6	1.3697–5	1.8433+8	1.1000+8	4.2658+7	3.1665+7	3.8788+3	2.0560+2	1.5974+2	4.5751+1	1.1514–1
5.0000–3	9.1562–8	1.0687+6	1.6211–5	1.7025+8	1.0292+8	3.8984+7	2.8342+7	3.7277+3	1.9224+2	1.5030+2	4.1817+1	1.2067–1
6.0000–3	1.0533–7	9.2898+5	2.1738–5	1.4800+8	9.1444+7	3.3314+7	2.3238+7	3.4586+3	1.7010+2	1.3451+2	3.5465+1	1.2980–1
7.0000–3	1.1867–7	8.2454+5	2.7936–5	1.3136+8	8.2566+7	2.9144+7	1.9646+7	3.2351+3	1.5290+2	1.2198+2	3.0788+1	1.3714–1
8.0000–3	1.3152–7	7.4397+5	3.4772–5	1.1852+8	7.5576+7	2.5958+7	1.6986+7	3.0531+3	1.3983+2	1.1237+2	2.7317+1	1.4428–1
1.0000–2	1.5631–7	6.2597+5	5.0204–5	9.9725+7	6.4946+7	2.1376+7	1.3401+7	2.7423+3	1.1989+2	9.7324+1	2.2411+1	1.5516–1
1.2500–2	1.8536–7	5.2788+5	7.2734–5	8.4098+7	5.5805+7	1.7593+7	1.0698+7	2.4425+3	1.0249+2	8.3794+1	1.8534+1	1.6490–1
1.5000–2	2.1293–7	4.5952+5	9.8664–5	7.3207+7	4.9300+7	1.5006+7	8.8989+6	2.2220+3	9.0579+1	7.4451+1	1.5954+1	1.7431–1
K 1.9965–2	2.6452–7	3.6991+5	1.5914–4	5.8930+7	4.0547+7	1.1699+7	6.6828+6	1.8945+3	7.4166+1	6.1426+1	1.2554+1	1.8643–1
2.0000–2	2.6487–7	3.6941+5	1.5961–4	5.8852+7	4.0498+7	1.1681+7	6.6710+6	1.8926+3	7.4077+1	6.1355+1	1.2536+1	1.8650–1
2.0625–2	2.7117–7	3.6084+5	1.6814–4	5.7485+7	3.9635+7	1.1377+7	6.4717+6	1.8592+3	7.2460+1	6.0062+1	1.2211+1	1.8746–1
2.1797–2	2.8285–7	3.4594+5	1.8464–4	5.5112+7	3.8131+7	1.0851+7	6.1287+6	1.8005+3	6.9661+1	5.7820+1	1.1652+1	1.8929–1
2.2822–2	2.9294–7	3.3402+5	1.9960–4	5.3213+7	3.6923+7	1.0431+7	5.8573+6	1.7532+3	6.7431+1	5.6031+1	1.1209+1	1.9090–1
2.4617–2	3.1033–7	3.1530+5	2.2692–4	5.0231+7	3.5017+7	9.7766+6	5.4363+6	1.6779+3	6.3947+1	5.3231+1	1.0523+1	1.9375–1
2.7308–2	3.3583–7	2.9136+5	2.7054–4	4.6418+7	3.2563+7	8.9451+6	4.9078+6	1.5799+3	5.9526+1	4.9666+1	9.6616+0	1.9804–1
3.0000–2	3.6070–7	2.7127+5	3.1721–4	4.3217+7	3.0489+7	8.2532+6	4.4736+6	1.4961+3	5.5849+1	4.6692+1	8.9542+0	2.0230–1
3.2500–2	3.8435–7	2.5458+5	3.6324–4	4.0558+7	2.8700+7	7.7178+6	4.1389+6	1.4272+3	5.2812+1	4.4233+1	8.3740+0	2.0489–1
3.6250–2	4.1911–7	2.3346+5	4.3695–4	3.7194+7	2.6427+7	7.0431+6	3.7223+6	1.3382+3	4.8985+1	4.1124+1	7.6522+0	2.0888–1
4.0000–2	4.5311–7	2.1594+5	5.1609–4	3.4403+7	2.4533+7	6.4857+6	3.3829+6	1.2628+3	4.5824+1	3.8546+1	7.0643+0	2.1292–1
4.5000–2	4.9758–7	1.9665+5	6.2962–4	3.1328+7	2.2417+7	5.8905+6	3.0194+6	1.1784+3	4.2299+1	3.5676+1	6.4061+0	2.1686–1
5.0000–2	5.4102–7	1.8086+5	7.5204–4	2.8813+7	2.0680+7	5.4047+6	2.7274+6	1.1078+3	3.9423+1	3.3325+1	5.8779+0	2.2093–1
6.0000–2	6.2479–7	1.5661+5	1.0213–3	2.4950+7	1.7985+7	4.6750+6	2.2885+6	1.0013+3	3.4946+1	2.9661+1	5.0580+0	2.2759–1
8.0000–2	7.7744–7	1.2586+5	1.6475–3	2.0051+7	1.4551+7	3.7514+6	1.7477+6	8.5556+2	2.9108+1	2.4856+1	4.0137+0	2.3860–1
1.0000–1	9.1161–7	1.0734+5	2.3818–3	1.7100+7	1.2483+7	3.1907+6	1.4257+6	7.5814+2	2.5447+1	2.1830+1	3.3695+0	2.4771–1
1.5000–1	1.1842–6	8.2626+4	4.5711–3	1.3163+7	9.7128+6	2.4390+6	1.0110+6	6.1355+2	2.0414+1	1.7635+1	2.5117+0	2.6664–1
2.0000–1	1.4013–6	6.9827+4	7.1899–3	1.1124+7	8.2593+6	2.0622+6	8.0234+5	5.3484+2	1.7830+1	1.5483+1	2.0628+0	2.8469–1
3.0000–1	1.7498–6	5.5919+4	1.3234–2	8.9086+6	6.6068+6	1.6896+6	6.1180+5	4.5525+2	1.5323+1	1.3352+1	1.6489+0	3.2243–1
4.0000–1	2.0385–6	4.7999+4	2.0018–2	7.6469+6	5.6160+6	1.5082+6	5.2227+5	4.1676+2	1.4174+1	1.2356+1	1.4549+0	3.6345–1
5.0000–1	2.2879–6	4.2767+4	2.7232–2	6.8133+6	4.9476+6	1.4029+6	4.6244+5	3.9481+2	1.3554+1	1.1825+1	1.3216+0	4.0717–1
6.0000–1	2.5051–6	3.9060+4	3.4705–2	6.2227+6	4.4610+6	1.3352+6	4.2613+5	3.8205+2	1.3210+1	1.1514+1	1.2427+0	4.5386–1
8.0000–1	2.8744–6	3.4041+4	4.9995–2	5.4232+6	3.7907+6	1.2560+6	3.7611+5	3.6939+2	1.2952+1	1.1263+1	1.1330+0	5.5601–1
1.0000+0	3.1720–6	3.0848+4	6.5468–2	4.9144+6	3.3540+6	1.2115+6	3.4850+5	3.6408+2	1.2900+1	1.1158+1	1.0764+0	6.6531–1
1.5000+0	3.7264–6	2.6258+4	1.0368–1	4.1831+6	2.7144+6	1.1622+6	3.0624+5	3.6240+2	1.3271+1	1.1326+1	9.8080–1	9.6370–1
2.0000+0	4.1124–6	2.3793+4	1.4069–1	3.7906+6	2.3609+6	1.1470+6	2.8230+5	3.6587+2	1.3752+1	1.1523+1	9.3776–1	1.2918+0
3.0000+0	4.6245–6	2.1158+4	2.1084–1	3.3708+6	1.9853+6	1.1264+6	2.5874+5	3.7279+2	1.4768+1	1.1891+1	8.8605–1	1.9906+0
4.0000+0	4.9438–6	1.9792+4	2.7632–1	3.1531+6	1.7876+6	1.1239+6	2.4123+5	3.7876+2	1.5789+1	1.2200+1	8.5115–1	2.7378+0
5.0000+0	5.1522–6	1.8992+4	3.3771–1	3.0256+6	1.6701+6	1.1222+6	2.3291+5	3.8381+2	1.6801+1	1.2457+1	8.3094–1	3.5135+0
6.0000+0	5.2970–6	1.8472+4	3.9553–1	2.9428+6	1.5955+6	1.1208+6	2.2614+5	3.8798+2	1.7798+1	1.2684+1	8.1568–1	4.2990+0
8.0000+0	5.4797–6	1.7856+4	5.0204–1	2.8447+6	1.5099+6	1.1190+6	2.1546+5	3.9417+2	1.9792+1	1.3051+1	7.9412–1	5.9468+0
1.0000+1	5.5669–6	1.7577+4	5.9842–1	2.8002+6	1.4717+6	1.1192+6	2.0893+5	3.9944+2	2.1742+1	1.3329+1	7.7821–1	7.6347+0
1.5000+1	5.6128–6	1.7433+4	8.0653–1	2.7773+6	1.4561+6	1.1200+6	2.0074+5	4.0993+2	2.6465+1	1.3730+1	7.5422–1	1.1981+1
2.0000+1	5.6229–6	1.7402+4	9.8000–1	2.7723+6	1.4555+6	1.1206+6	1.9576+5	4.1576+2	3.1318+1	1.4072+1	7.4184–1	1.6503+1
3.0000+1	5.6366–6	1.7359+4	1.2584+0	2.7655+6	1.4550+6	1.1206+6	1.8952+5	4.2445+2	4.0942+1	1.4422+1	7.3042–1	2.5789+1
4.0000+1	5.6409–6	1.7346+4	1.4774+0	2.7635+6	1.4546+6	1.1210+6	1.8743+5	4.3095+2	5.0730+1	1.4697+1	7.2381–1	3.5309+1
5.0000+1	5.6449–6	1.7334+4	1.6575+0	2.7615+6	1.4543+6	1.1212+6	1.8552+5	4.3594+2	6.0639+1	1.4918+1	7.1785–1	4.5004+1
6.0000+1	5.6475–6	1.7326+4	1.8102+0	2.7602+6	1.4541+6	1.1213+6	1.8437+5	4.4041+2	7.0617+1	1.5083+1	7.1483–1	5.4819+1
8.0000+1	5.6522–6	1.7311+4	2.0593+0	2.7579+6	1.4538+6	1.1214+6	1.8229+5	4.4755+2	9.0760+1	1.5331+1	7.0957–1	7.4719+1
1.0000+2	5.6559–6	1.7300+4	2.2582+0	2.7561+6	1.4535+6	1.1215+6	1.8071+5	4.5230+2	1.1109+2	1.5545+1	7.0624–1	9.4842+1
1.5000+2	5.6592–6	1.7290+4	2.6285+0	2.7545+6	1.4530+6	1.1215+6	1.7955+5	4.6146+2	1.6217+2	1.5766+1	7.0187–1	1.4570+2
2.0000+2	5.6613–6	1.7284+4	2.8963+0	2.7535+6	1.4526+6	1.1216+6	1.7887+5	4.6756+2	2.1353+2	1.5977+1	6.9937–1	1.9685+2
3.0000+2	5.6636–6	1.7276+4	3.2784+0	2.7524+6	1.4521+6	1.1216+6	1.7819+5	4.7471+2	3.1668+2	1.6357+1	6.9706–1	2.9963+2
4.0000+2	5.6656–6	1.7270+4	3.5516+0	2.7514+6	1.4517+6	1.1216+6	1.7759+5	4.7899+2	4.2021+2	1.6525+1	6.9507–1	4.0298+2
5.0000+2	5.6678–6	1.7264+4	3.7643+0	2.7503+6	1.4514+6	1.1216+6	1.7675+5	4.8225+2	5.2395+2	1.6658+1	6.9212–1	5.0660+2
6.0000+2	5.6688–6	1.7261+4	3.9386+0	2.7498+6	1.4512+6	1.1216+6	1.7652+5	4.8525+2	6.2673+2	1.6790+1	6.9155–1	6.0925+2
8.0000+2	5.6706–6	1.7255+4	4.2144+0	2.7490+6	1.4509+6	1.1216+6	1.7599+5	4.9021+2	8.3303+2	1.7040+1	6.9013–1	8.1530+2
1.0000+3	5.6721–6	1.7251+4	4.4289+0	2.7483+6	1.4506+6	1.1216+6	1.7557+5	4.9430+2	1.0401+3	1.7235+1	6.8917–1	1.0222+3
1.5000+3	5.6738–6	1.7246+4	4.8190+0	2.7474+6	1.4500+6	1.1216+6	1.7524+5	5.0194+2	1.5577+3	1.7415+1	6.8789–1	1.5396+3
2.0000+3	5.6750–6	1.7242+4	5.0960+0	2.7468+6	1.4497+6	1.1216+6	1.7499+5	5.0750+2	2.0783+3	1.7595+1	6.8693–1	2.0600+3
3.0000+3	5.6763–6	1.7238+4	5.4864+0	2.7462+6	1.4492+6	1.1216+6	1.7489+5	5.1601+2	3.1140+3	1.7953+1	6.8654–1	3.0953+3
4.0000+3	5.6773–6	1.7235+4	5.7631+0	2.7457+6	1.4488+6	1.1216+6	1.7474+5	5.2213+2	4.1629+3	1.8147+1	6.8596–1	4.1441+3
5.0000+3	5.6787–6	1.7231+4	5.9777+0	2.7451+6	1.4485+6	1.1216+6	1.7436+5	5.2677+2	5.1959+3	1.8265+1	6.8449–1	5.1770+3
6.0000+3	5.6789–6	1.7230+4	6.1531+0	2.7450+6	1.4483+6	1.1216+6	1.7449+5	5.3059+2	6.2369+3	1.8383+1	6.8500–1	6.2179+3
8.0000+3	5.6796–6	1.7228+4	6.4300+0	2.7446+6	1.4480+6	1.1216+6	1.7451+5	5.3657+2	8.3114+3	1.8618+1	6.8513–1	8.2921+3
1.0000+4	5.6801–6	1.7226+4	6.6449+0	2.7443+6	1.4477+6	1.1216+6	1.7451+5	5.4113+2	1.0374+4	1.8824+1	6.8513–1	1.0355+4
1.5000+4	5.6811–6	1.7223+4	7.0356+0	2.7439+6	1.4472+6	1.1216+6	1.7456+5	5.4956+2	1.5577+4	1.9000+1	6.8532–1	1.5557+4
2.0000+4	5.6819–6	1.7221+4	7.3129+0	2.7435+6	1.4468+6	1.1216+6	1.7449+5	5.5582+2	2.0725+4	1.9176+1	6.8507–1	2.0705+4
3.0000+4	5.6828–6	1.7218+4	7.7037+0	2.7431+6	1.4463+6	1.1216+6	1.7457+5	5.6476+2	3.1158+4	1.9527+1	6.8539–1	3.1138+4
4.0000+4	5.6837–6	1.7216+4	7.9811+0	2.7426+6	1.4459+6	1.1216+6	1.7451+5	5.7101+2	4.1441+4	1.9712+1	6.8513–1	4.1421+4
5.0000+4	5.6850–6	1.7211+4	8.1964+0	2.7420+6	1.4456+6	1.1216+6	1.7415+5	5.7591+2	5.1820+4	1.9847+1	6.8372–1	5.1800+4
6.0000+4	5.6851–6	1.7211+4	8.3722+0	2.7419+6	1.4454+6	1.1216+6	1.7429+5	5.7994+2	6.2277+4	1.9960+1	6.8430–1	6.2256+4
8.0000+4	5.6857–6	1.7209+4	8.6494+0	2.7417+6	1.4451+6	1.1216+6	1.7438+5	5.8623+2	8.2974+4	2.0186+1	6.8462–1	8.2953+4
1.0000+5	5.6863–6	1.7208+4	8.8645+0	2.7414+6	1.4448+6	1.1216+6	1.7438+5	5.9114+2	1.0382+5	2.0407+1	6.8462–1	1.0380+5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EEDL Evaluated Electron
Cross Sections
43-Tc
Density 11 500 Grams/cc
Total
Elastic
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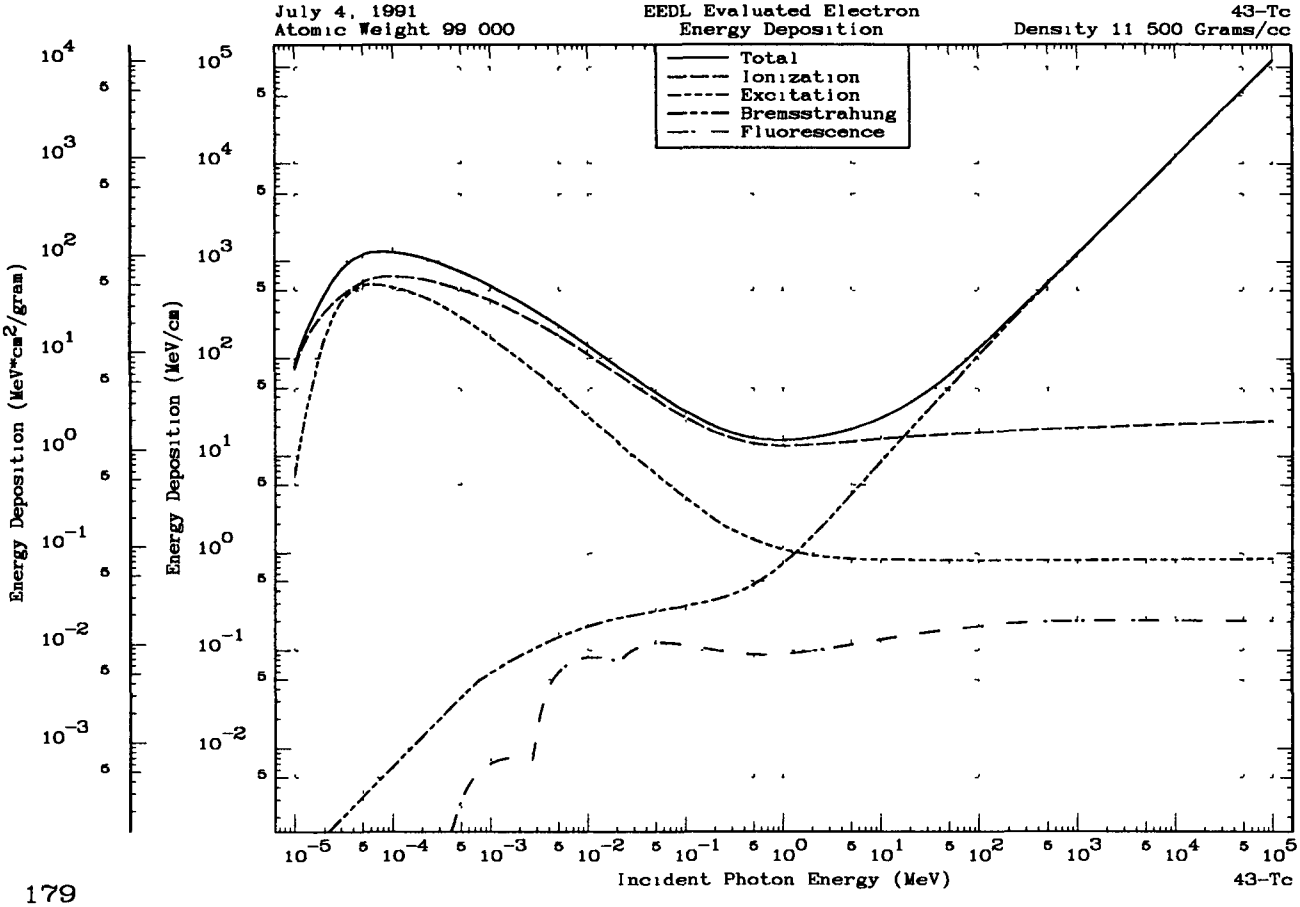
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
43-Tc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Energy Deposition (MeV*cm2/gram)
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Incident Photon Energy (MeV)
43-Tc

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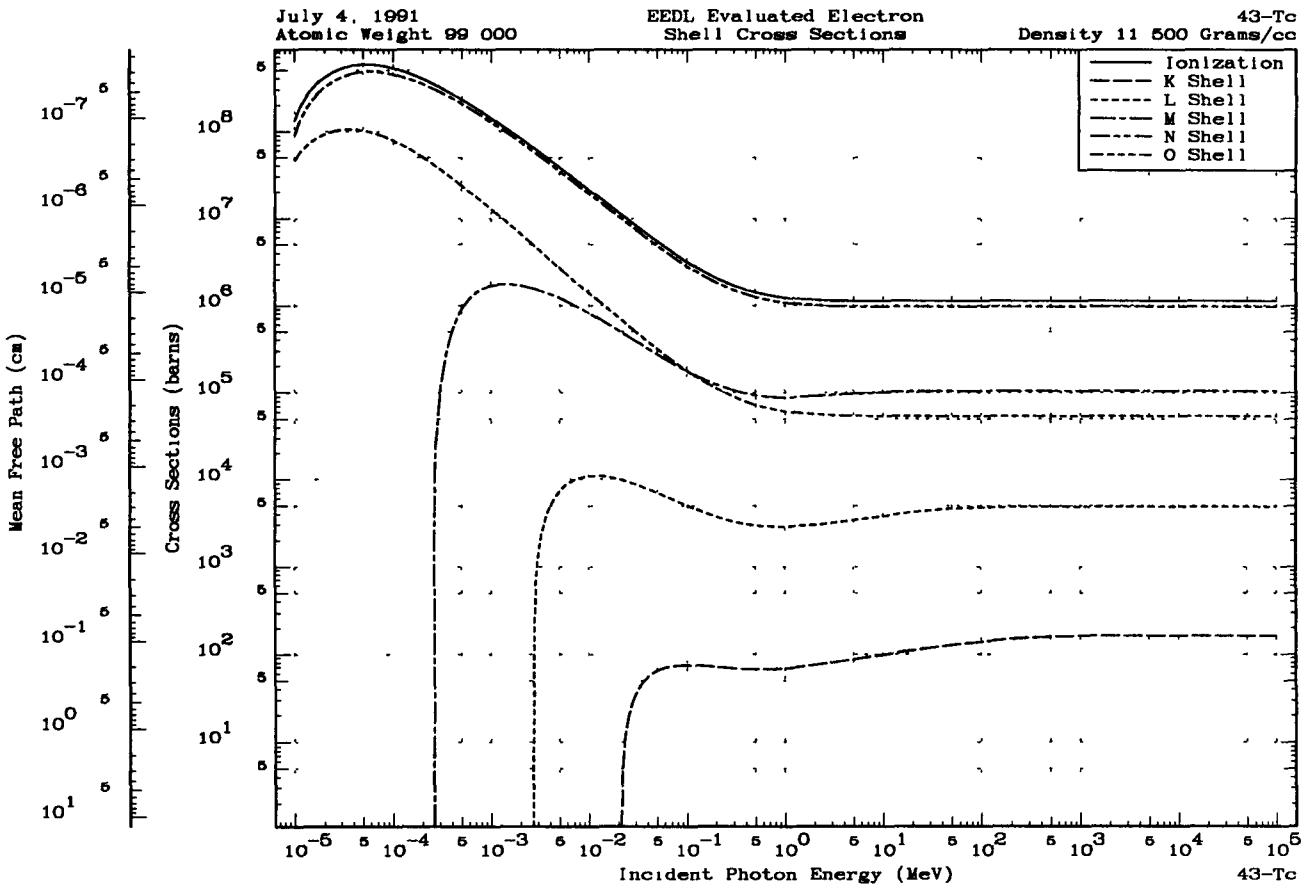
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EEDL Evaluated Electron
Shell Cross Sections
43-Tc
Density 11 500 Grams/cc
Ionization
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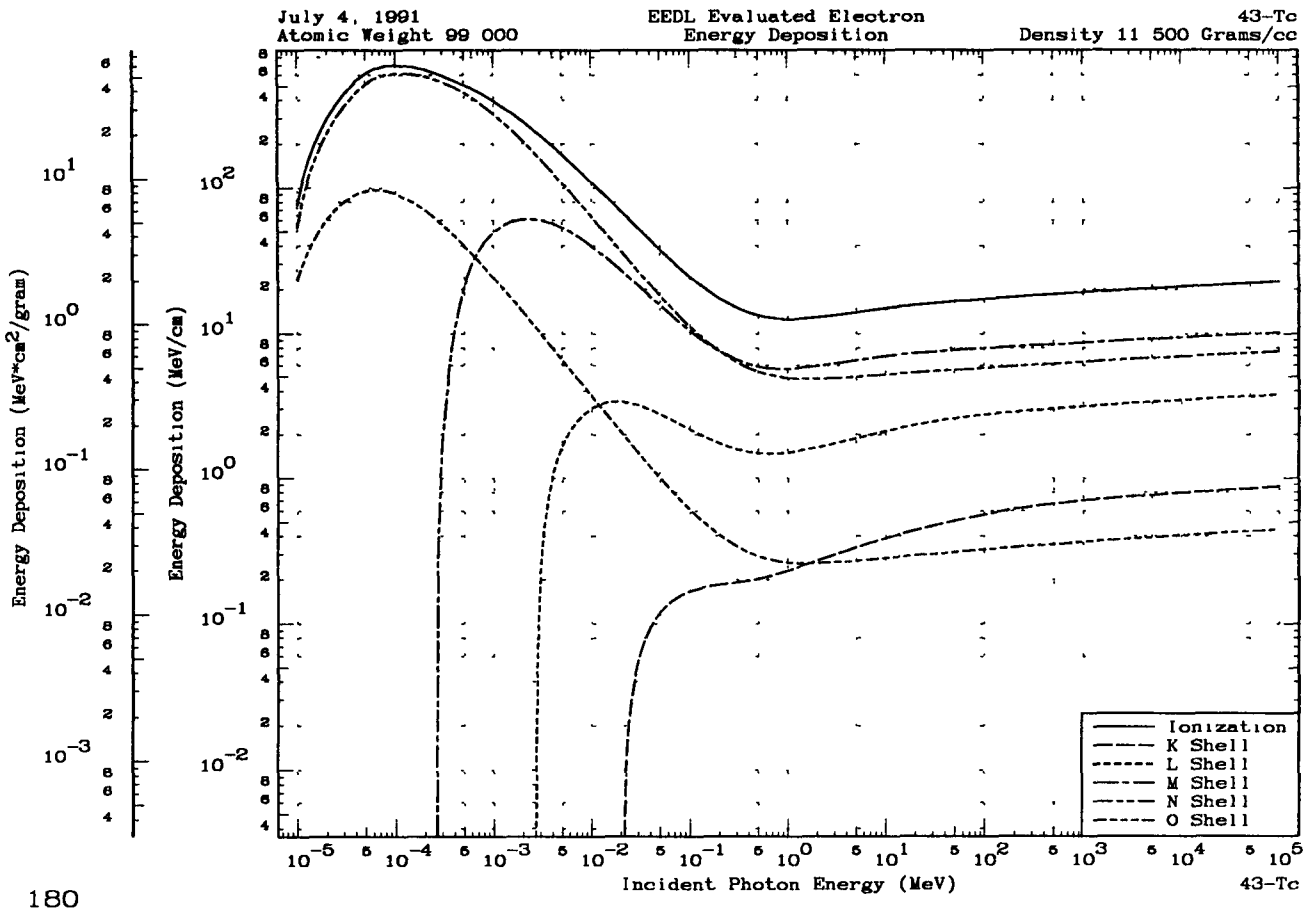
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
43-Tc


July 4, 1991
Atomic Weight 99 000
EEDL Evaluated Electron
Energy Deposition
43-Tc
Density 11 500 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
43-Tc

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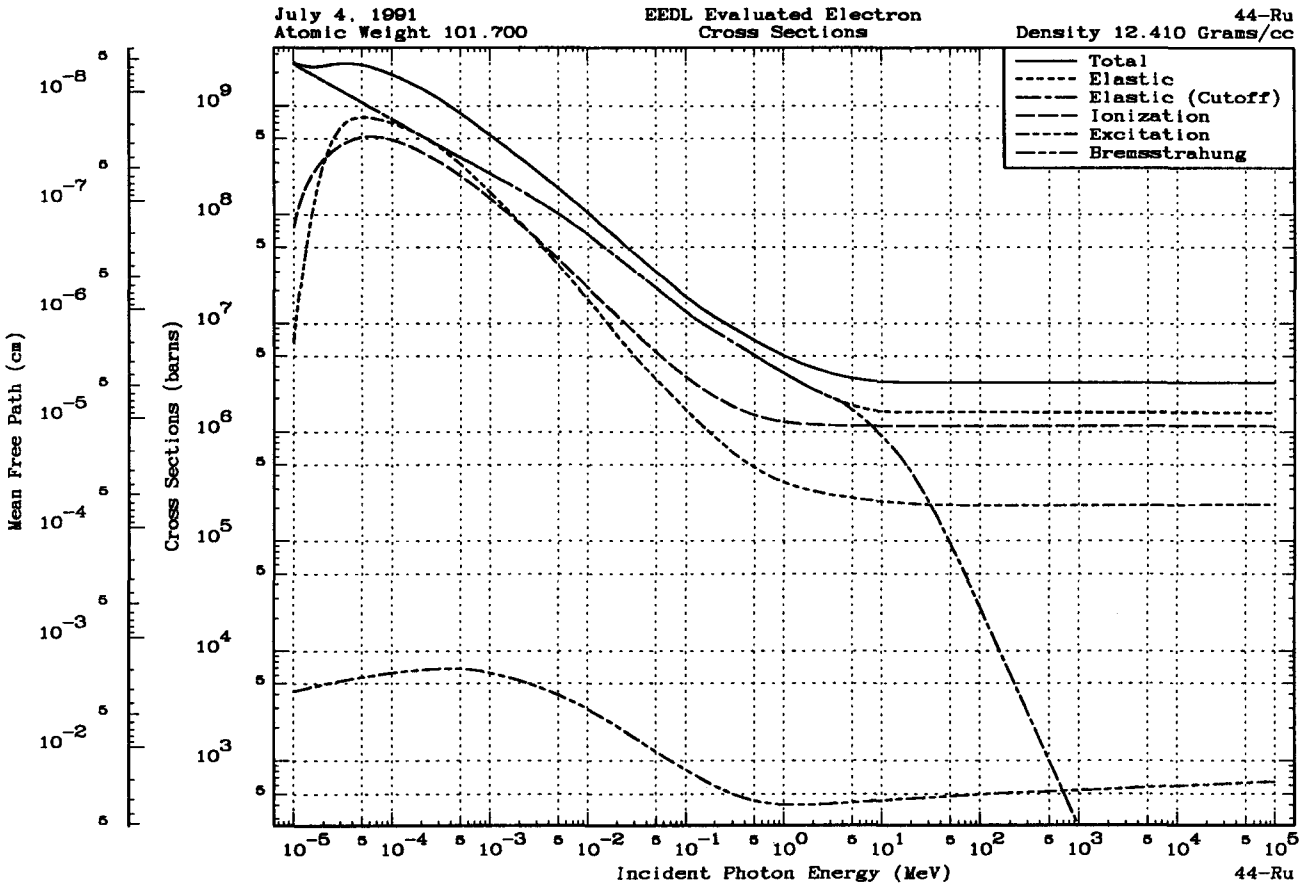
Atomic Weight 99.000 Density 11.500 Grams/cc

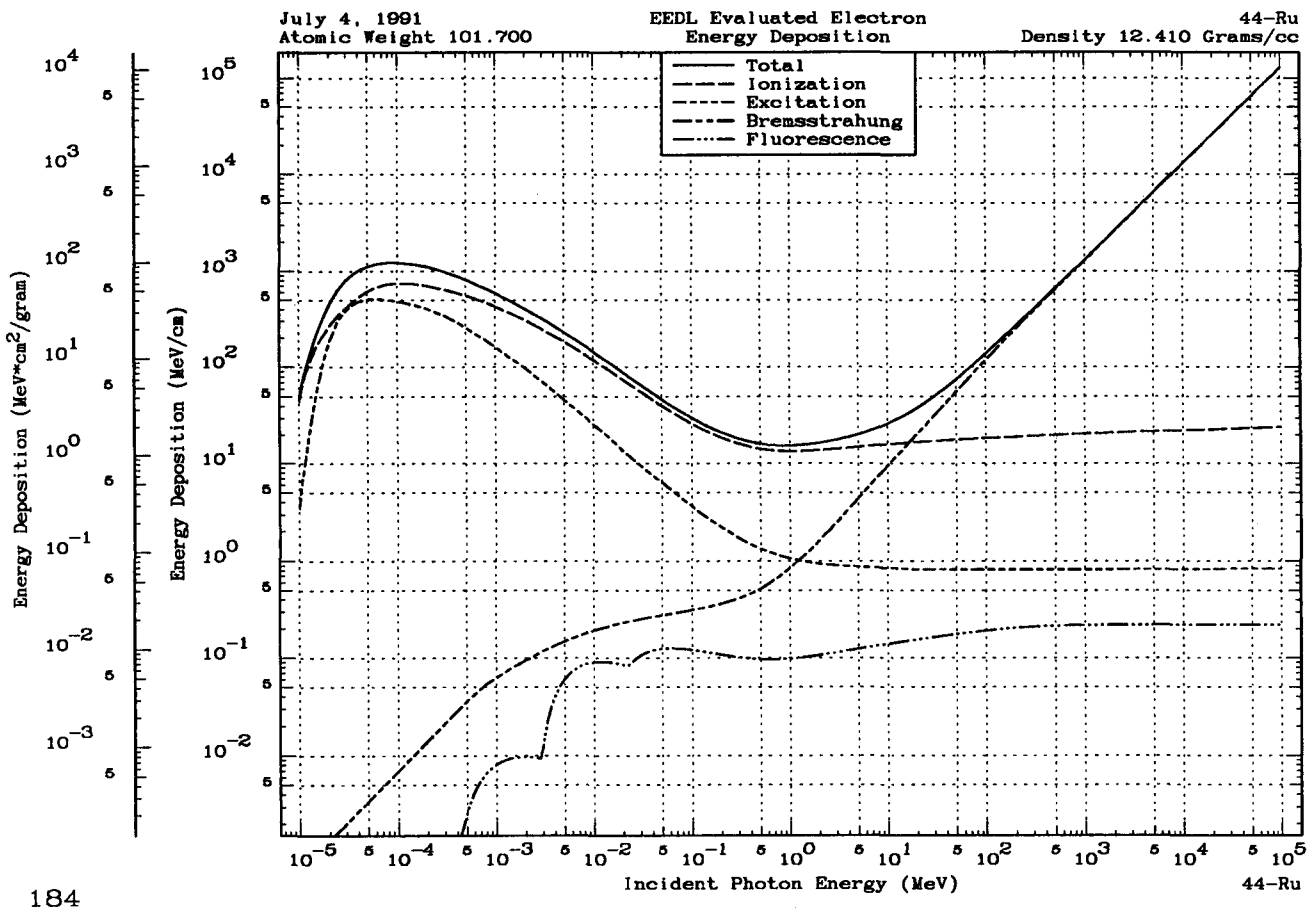
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.3743–9	1.9879+7		3.2680+9	3.1179+9	1.3692+8	1.3132+7	4.2569+3	8.2858+1	7.6390+1	6.4675+0	6.4252–4
	1.1250–5	4.5509–9	1.9107+7		3.1411+9	2.9267+9	1.8858+8	2.5829+7	4.3572+3	1.2282+2	1.0973+2	1.3090+1	7.1951–4
	1.3125–5	4.7603–9	1.8267+7		3.0030+9	2.6941+9	2.5205+8	5.6850+7	4.4920+3	1.8494+2	1.5491+2	3.0030+1	8.3743–4
	1.5000–5	4.9188–9	1.7678+7		2.9062+9	2.5075+9	3.0495+8	9.3734+7	4.6122+3	2.4824+2	1.9671+2	5.1525+1	9.5805–4
	1.7500–5	5.0311–9	1.7284+7		2.8414+9	2.3082+9	3.6253+8	1.7067+8	4.7549+3	3.4270+2	2.4750+2	9.5198+1	1.1227–3
	2.0000–5	5.0583–9	1.7191+7		2.8261+9	2.1484+9	4.0824+8	2.6950+8	4.8821+3	4.4647+2	2.9396+2	1.5251+2	1.2913–3
	2.5000–5	4.9973–9	1.7401+7		2.8606+9	1.9056+9	4.7493+8	4.8006+8	5.0707+3	6.4934+2	3.7428+2	2.7506+2	1.6062–3
	3.0000–5	4.9220–9	1.7667+7		2.9044+9	1.7278+9	5.1919+8	6.5741+8	5.2302+3	8.2240+2	4.4110+2	3.8129+2	1.9301–3
	3.5000–5	4.9072–9	1.7720+7		2.9131+9	1.5907+9	5.4510+8	7.7731+8	5.3667+3	9.5041+2	4.9231+2	4.5809+2	2.2589–3
	4.0000–5	4.9251–9	1.7656+7		2.9025+9	1.4808+9	5.6880+8	8.5292+8	5.4878+3	1.0548+3	5.4417+2	5.1062+2	2.5947–3
N3	4.6550–5	5.0243–9	1.7307+7		2.8452+9	1.3652+9	5.7955+8	9.0040+8	5.6152+3	1.1373+3	5.8792+2	5.4934+2	3.0238–3
	4.8275–5	5.0535–9	1.7207+7		2.8287+9	1.3389+9	5.8249+8	9.0735+8	5.6432+3	1.1568+3	6.0041+2	5.5637+2	3.1336–3
N2	4.9600–5	5.0749–9	1.7135+7		2.8168+9	1.3196+9	5.8467+8	9.1256+8	5.6642+3	1.1717+3	6.0995+2	5.6173+2	3.2183–3
	5.0000–5	5.0811–9	1.7114+7		2.8134+9	1.3139+9	5.8537+8	9.1406+8	5.6704+3	1.1763+3	6.1300+2	5.6331+2	3.2439–3
	5.2500–5	5.1454–9	1.6900+7		2.7782+9	1.2800+9	5.8501+8	9.1316+8	5.7085+3	1.1909+3	6.2396+2	5.6696+2	3.4045–3
	5.5000–5	5.2065–9	1.6702+7		2.7456+9	1.2485+9	5.8482+8	9.1231+8	5.7449+3	1.2060+3	6.3540+2	5.7063+2	3.5660–3
	5.6250–5	5.2360–9	1.6608+7		2.7302+9	1.2336+9	5.8470+8	9.1189+8	5.7627+3	1.2135+3	6.4099+2	5.7248+2	3.6471–3
	6.0000–5	5.3206–9	1.6343+7		2.6868+9	1.1916+9	5.8442+8	9.1070+8	5.8138+3	1.2359+3	6.5789+2	5.7803+2	3.8917–3
	6.5000–5	5.4709–9	1.5894+7		2.6129+9	1.1417+9	5.7735+8	8.9392+8	5.8779+3	1.2406+3	6.6704+2	5.7354+2	4.2205–3
	7.2500–5	5.6810–9	1.5306+7		2.5163+9	1.0769+9	5.6789+8	8.7152+8	5.9665+3	1.2493+3	6.8116+2	5.6817+2	4.7196–3
N1	7.5850–5	5.7698–9	1.5071+7		2.4776+9	1.0511+9	5.6400+8	8.6242+8	6.0035+3	1.2537+3	6.8744+2	5.6622+2	4.9446–3
	7.6888–5	5.7982–9	1.4997+7		2.4654+9	1.0435+9	5.6287+8	8.5901+8	6.0147+3	1.2549+3	6.8955+2	5.6530+2	5.0145–3
	7.8444–5	5.8403–9	1.4889+7		2.4476+9	1.0324+9	5.6122+8	8.5402+8	6.0312+3	1.2567+3	6.9276+2	5.6398+2	5.1196–3
	8.0000–5	5.8818–9	1.4784+7		2.4304+9	1.0216+9	5.5960+8	8.4915+8	6.0475+3	1.2587+3	6.9597+2	5.6272+2	5.2250–3
	8.2500–5	5.9552–9	1.4602+7		2.4004+9	1.0050+9	5.5504+8	8.4035+8	6.0694+3	1.2559+3	6.9659+2	5.5931+2	5.3894–3
	8.6875–5	6.0803–9	1.4301+7		2.3510+9	9.7774+8	5.4751+8	8.2579+8	6.1065+3	1.2518+3	6.9802+2	5.5377+2	5.6783–3
	9.0000–5	6.1672–9	1.4100+7		2.3179+9	9.5952+8	5.4245+8	8.1597+8	6.1319+3	1.2494+3	6.9930+2	5.5012+2	5.8856–3
	9.3438–5	6.2606–9	1.3889+7		2.2833+9	9.4056+8	5.3708+8	8.0568+8	6.1590+3	1.2470+3	7.0066+2	5.4637+2	6.1146–3
	1.0000–4	6.4331–9	1.3517+7	0.0000+0	2.2221+9	9.0717+8	5.2757+8	7.8739+8	6.2085+3	1.2438+3	7.0384+2	5.3991+2	6.5541–3
	1.1250–4	6.7714–9	1.2842+7	1.0141–8	2.1111+9	8.5202+8	5.0526+8	7.5380+8	6.2817+3	1.2215+3	6.9602+2	5.2545+2	7.3743–3
	1.3125–4	7.2401–9	1.2010+7	2.5647–8	1.9744+9	7.8488+8	4.7754+8	7.1201+8	6.3789+3	1.1970+3	6.8854+2	5.0845+2	8.6199–3
	1.5000–4	7.7335–9	1.1244+7	4.1496–8	1.8485+9	7.3101+8	4.5482+8	6.6263+8	6.4643+3	1.1693+3	6.8478+2	4.8449+2	9.8819–3
	1.7500–4	8.3697–9	1.0389+7	6.3303–8	1.7079+9	6.7340+8	4.2387+8	6.1067+8	6.5475+3	1.1239+3	6.6628+2	4.5761+2	1.1567–2
	2.0000–4	8.9616–9	9.7032+6	8.5882–8	1.5951+9	6.2719+8	3.9898+8	5.6896+8	6.6204+3	1.0907+3	6.5394+2	4.3671+2	1.3270–2
M5	2.6307–4	1.0468–8	8.3072+6	1.4634–7	1.3657+9	5.4209+8	3.4547+8	4.7808+8	6.6908+3	9.9726+2	6.1232+2	3.8492+2	1.7481–2
M4	2.6701–4	1.0559–8	8.2351+6	1.5030–7	1.3538+9	5.3785+8	3.4261+8	4.7333+8	6.6946+3	9.9195+2	6.0986+2	3.8208+2	1.7746–2
	2.6769–4	1.0575–8	8.2226+6	1.5098–7	1.3517+9	5.3713+8	3.4213+8	4.7248+8	6.6953+3	9.9104+2	6.0946+2	3.8157+2	1.7791–2
	2.7113–4	1.0657–8	8.1596+6	1.5447–7	1.3414+9	5.3350+8	3.3969+8	4.6818+8	6.6986+3	9.8644+2	6.0742+2	3.7900+2	1.8022–2
	2.7576–4	1.0766–8	8.0770+6	1.5918–7	1.3278+9	5.2874+8	3.3650+8	4.6256+8	6.7030+3	9.8046+2	6.0479+2	3.7565+2	1.8334–2
	2.8788–4	1.1047–8	7.8712+6	1.7163–7	1.2940+9	5.1684+8	3.2853+8	4.4859+8	6.7141+3	9.6574+2	5.9837+2	3.6735+2	1.9149–2
	3.0000–4	1.1324–8	7.6790+6	1.8426–7	1.2624+9	5.0569+8	3.2110+8	4.3558+8	6.7248+3	9.5248+2	5.9280+2	3.5966+2	1.9965–2
	3.1250–4	1.1617–8	7.4852+6	1.9750–7	1.2305+9	4.9491+8	3.1325+8	4.2234+8	6.7326+3	9.3597+2	5.8477+2	3.5117+2	2.0802–2
	3.3301–4	1.2088–8	7.1935+6	2.1970–7	1.1826+9	4.7859+8	3.0145+8	4.0252+8	6.7448+3	9.1184+2	5.7332+2	3.3851+2	2.2178–2
	3.4976–4	1.2464–8	6.9766+6	2.3824–7	1.1469+9	4.6636+8	2.9268+8	3.8786+8	6.7543+3	8.9457+2	5.6536+2	3.2918+2	2.3304–2
	3.6650–4	1.2833–8	6.7762+6	2.5713–7	1.1140+9	4.5499+8	2.8458+8	3.7438+8	6.7633+3	8.7916+2	5.5850+2	3.2064+2	2.4430–2
	3.7488–4	1.3014–8	6.6815+6	2.6669–7	1.0984+9	4.4960+8	2.8076+8	3.6803+8	6.7676+3	8.7205+2	5.5539+2	3.1663+2	2.4994–2
	4.0000–4	1.3550–8	6.4175+6	2.9582–7	1.0550+9	4.3447+8	2.7009+8	3.5042+8	6.7802+3	8.5272+2	5.4714+2	3.0555+2	2.6689–2
M3	4.2495–4	1.4088–8	6.1724+6	3.2547–7	1.0147+9	4.2083+8	2.5974+8	3.3413+8	6.7681+3	8.3052+2	5.3619+2	2.9430+2	2.8300–2
	4.2964–4	1.4189–8	6.1285+6	3.3113–7	1.0075+9	4.1840+8	2.5791+8	3.3117+8	6.7659+3	8.2669+2	5.3438+2	2.9228+2	2.8602–2
	4.3844–4	1.4377–8	6.0484+6	3.4182–7	9.9432+8	4.1396+8	2.5457+8	3.2579+8	6.7618+3	8.1978+2	5.3115+2	2.8860+2	2.9170–2
M2	4.4524–4	1.4521–8	5.9883+6	3.5014–7	9.8443+8	4.1061+8	2.5206+8	3.2176+8	6.7587+3	8.1464+2	5.2876+2	2.8585+2	2.9608–2
	4.5209–4	1.4668–8	5.9282+6	3.5857–7	9.7456+8	4.0732+8	2.4960+8	3.1763+8	6.7557+3	8.0943+2	5.2633+2	2.8307+2	3.0049–2
	4.6406–4	1.4924–8	5.8267+6	3.7345–7	9.5786+8	4.0174+8	2.4544+8	3.1068+8	6.7505+3	8.0079+2	5.2234+2	2.7841+2	3.0820–2
	4.6922–4	1.5033–8	5.7843+6	3.7990–7	9.5091+8	3.9941+8	2.4371+8	3.0779+8	6.7483+3	7.9724+2	5.2073+2	2.7648+2	3.1152–2
	5.0000–4	1.5676–8	5.5472+6	4.1899–7	9.1192+8	3.8625+8	2.3399+8	2.9168+8	6.7356+3	7.7785+2	5.1211+2	2.6571+2	3.3130–2
M1	5.3342–4	1.6356–8	5.3166+6	4.6257–7	8.7402+8	3.7329+8	2.2399+8	2.7673+8	6.7228+3	7.5585+2	5.0083+2	2.5499+2	3.5274–2
	5.4174–4	1.6528–8	5.2611+6	4.7362–7	8.6489+8	3.7026+8	2.2166+8	2.7297+8	6.7142+3	7.5059+2	4.9825+2	2.5231+2	3.5768–2
	5.5000–4	1.6699–8	5.2074+6	4.8466–7	8.5607+8	3.6732+8	2.1941+8	2.6933+8	6.7058+3	7.4556+2	4.9579+2	2.4973+2	3.6258–2
	5.5631–4	1.6828–8	5.1674+6	4.9314–7	8.4948+8	3.6512+8	2.1773+8	2.6663+8	6.6995+3	7.4180+2	4.9396+2	2.4781+2	3.6631–2
	5.7815–4	1.7272–8	5.0345+6	5.2284–7	8.2763+8	3.5778+8	2.1216+8	2.5769+8	6.6783+3	7.2952+2	4.8801+2	2.4146+2	3.7922–2
	6.0000–4	1.7710–8	4.9099+6	5.5302–7	8.0716+8	3.5085+8	2.0694+8	2.4937+8	6.6579+3	7.1829+2	4.8269+2	2.3556+2	3.9209–2
	6.5000–4	1.8718–8	4.6456+6	6.2404–7	7.6371+8	3.3638+8	1.9551+8	2.3181+8	6.6015+3	6.8993+2	4.6762+2	2.2227+2	4.2025–2
	7.0000–4	1.9698–8	4.4145+6	6.9780–7	7.2571+8	3.2353+8	1.8552+8	2.1666+8	6.5496+3	6.6593+2	4.5506+2	2.1083+2	4.4818–2
	7.2500–4	2.0179–8	4.3093+6	7.3566–7	7.0842+8	3.1761+8	1.8096+8	2.0984+8	6.5252+3	6.5491+2	4.4918+2	2.0568+2	4.6207–2
	8.0000–4	2.1587–8	4.0282+6	8.5275–7	6.6221+8	3.0159+8	1.6880+8	1.9182+8	6.4572+3	6.2633+2	4.3417+2	1.9211+2	5.0345–2
	9.0000–4	2.3423–8	3.7124+6	1.0173–6	6.1029+8	2.8355+8	1.5470+8	1.7203+8	6.3041+3	5.8921+2	4.1289+2	1.7627+2	5.4273–2
	1.0000–3	2.5188–8	3.4523+6	1.1915–6	5.6754+8	2.6834+8	1.4313+8	1.5607+8	6.1702+3	5.5971+2	3.9613+2	1.6352+2	5.8132–2
	1.1250–3	2.7354–8	3.1789+6	1.4223–6	5.2259+8	2.5220+8	1.3067+8	1.3972+8	6.0079+3	5.2377+2	3.7416+2	1.4955+2	6.2336–2
	1.2500–3	2.9438–8	2.9539+6	1.6677–6	4.8561+8	2.3858+8	1.2047+8	1.2655+8	5.8664+3	4.9498+2	3.5659+2	1.3832+2	6.6464–2
	1.3125–3	3.0452–8	2.8555+6	1.7956–6	4.6943+8	2.3253+8	1.1602+8	1.2088+8	5.8020+3	4.8234+2	3.4877+2	1.3349+2	6.8502–2
	1.5000–3	3.3397–8	2.6037+6	2.1977–6	4.2803+8	2.1673+8	1.0467+8	1.0662+8	5.6294+3	4.5066+2	3.2921+2	1.2138+2	7.4519–2
	1.7500–3	3.7222–8	2.3362+6	2.7777–6	3.8405+8	1.9939+8	9.2545+7	9.2110+7	5.4054+3	4.1209+2	3.0399+2	1.0802+2	8.1033–2
	2.0000–3	4.0861–8	2.1281+6	3.4068–6	3.4984+8	1.8549+8	8.3199+7	8.1146+7	5.2187+3	3.8302+2	2.8499+2	9.7943+1	8.7384–2
L3	2.6776–3	5.0361–8	1.7267+6	5.3350–6	2.8385+8	1.5699+8	6.5500+7	6.1354+7	4.7856+3	3.2158+2	2.4302+2	7.8461+1	1.0176–1
	2.7582–3	5.1458–8	1.6899+6	5.5879–6	2.7780+8	1.5429+8	6.3909+7	5.9597+7	4.7418+3	3.1591+2	2.3914+2	7.6663+1	1.0333–1
L2	2.7979–3	5.1994–8	1.6724+6	5.7141–6	2.7494+8	1.5301+8	6.3157+7	5.8769+7	4.7209+3	3.1323+2	2.3731+2	7.5816+1	1.0411–1
	2.8791–3	5.3109–8	1.6373+6	5.9756–6	2.6916+8	1.5047+8	6.1678+7	5.7014+7	4.6789+3	3.0788+2	2.3375+2	7.4025+1	1.0566–1
	2.8989–3	5.3381–8	1.6290+6	6.0402–6	2.6780+8	1.4986+8	6.1328+7	5.6601+7	4.6688+3	3.0662+2	2.3291+2	7.3603+1	1.0604–1
	3.0000–3	5.4752–8	1.5882+6	6.3731–6	2.6109+8	1.4689+8	5.9612+7	5.4583+7	4.6191+3	3.0045+2	2.2880+2	7.1542+1	1.0796–1
L1	3.0224–3	5.5044–8	1.5798+6	6.4479–6	2.5970+8	1.4625+8	5.9242+7	5.4205+7	4.6073+3	2.9904+2	2.2779+2	7.1136+1	1.0833–1

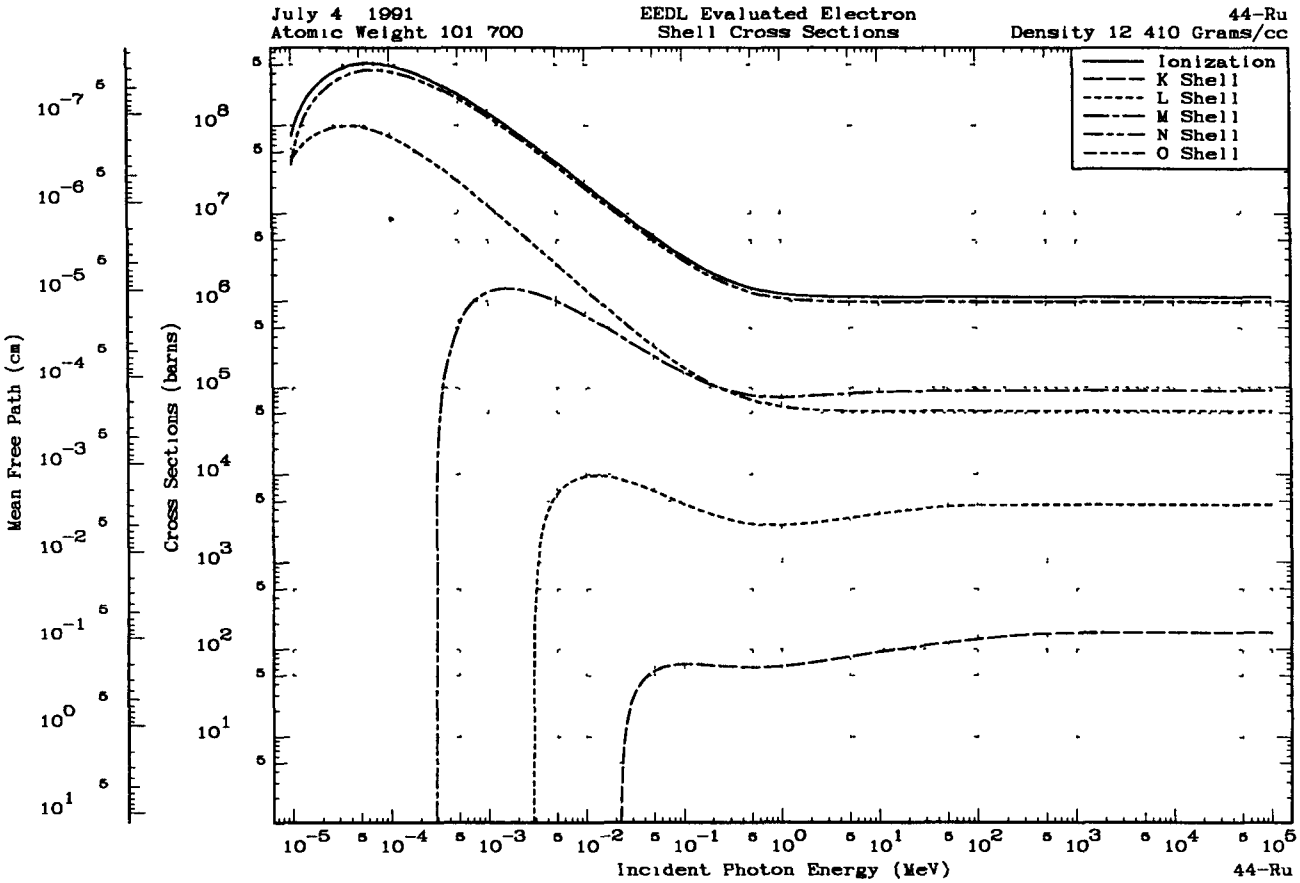
Atomic Weight 99.000 — Density 11.500 Grams/cc

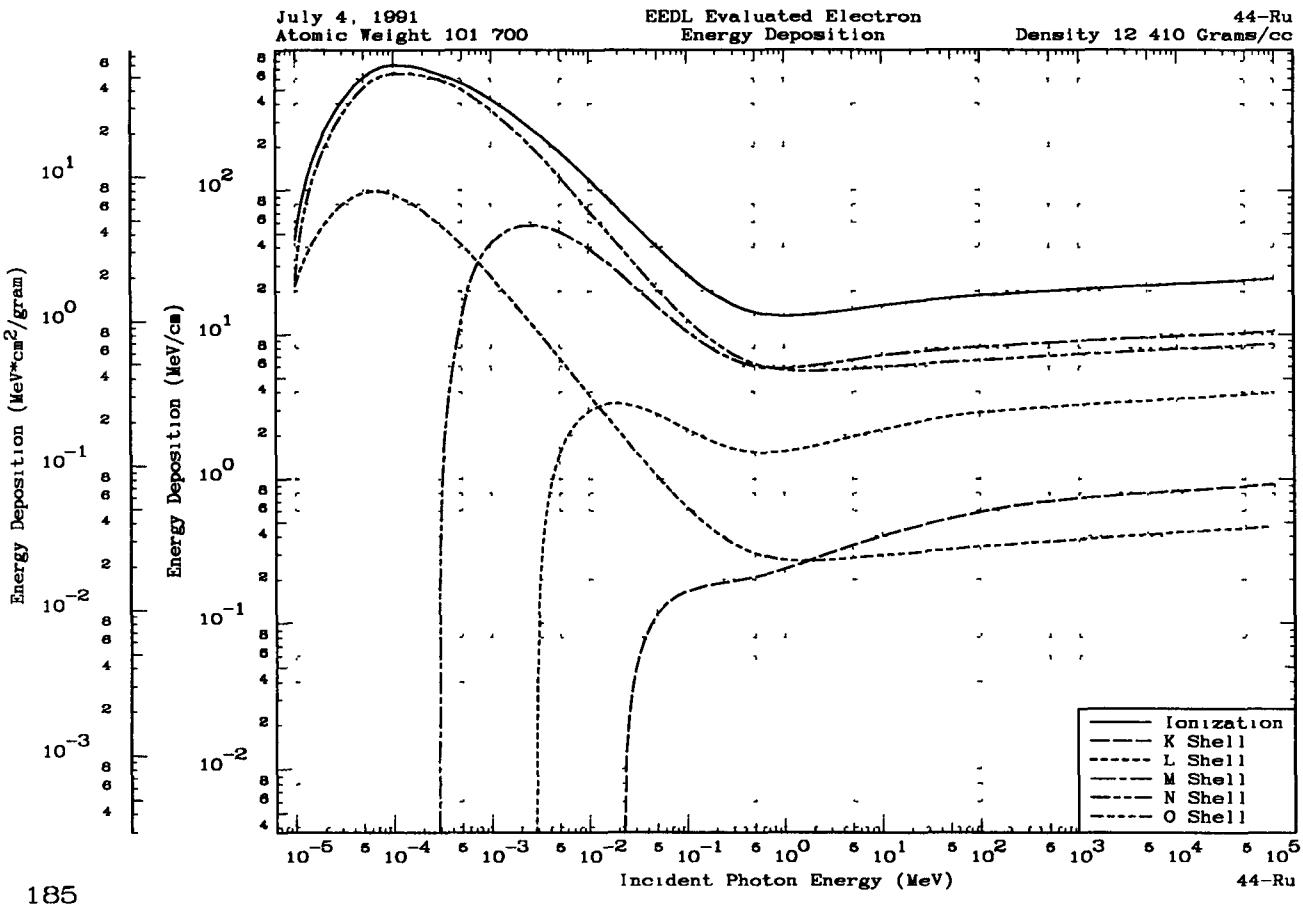
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.1446–3	5.6691–8	1.5339+6	6.8618–6	2.5216+8	1.4281+8	5.7302+7	5.2038+7	4.5440+3	2.9140+2	2.2250+2	6.8785+1	1.1029–1
3.2500–3	5.8096–8	1.4968+6	7.2274–6	2.4606+8	1.4002+8	5.5738+7	5.0301+7	4.4920+3	2.8527+2	2.1826+2	6.6900+1	1.1196–1
3.3584–3	5.9527–8	1.4608+6	7.6115–6	2.4015+8	1.3729+8	5.4224+7	4.8629+7	4.4408+3	2.7934+2	2.1414+2	6.5086+1	1.1367–1
3.6250–3	6.2986–8	1.3806+6	8.5888–6	2.2696+8	1.3114+8	5.0859+7	4.4952+7	4.3240+3	2.6627+2	2.0506+2	6.1093+1	1.1783–1
3.6792–3	6.3681–8	1.3655+6	8.7934–6	2.2448+8	1.2998+8	5.0229+7	4.4270+7	4.3016+3	2.6383+2	2.0336+2	6.0353+1	1.1866–1
4.0000–3	6.7725–8	1.2840+6	1.0040–5	2.1108+8	1.2362+8	4.6830+7	4.0620+7	4.1779+3	2.5075+2	1.9424+2	5.6386+1	1.2356–1
4.5000–3	7.4002–8	1.1751+6	1.2113–5	1.9317+8	1.1491+8	4.2372+7	3.5890+7	3.9960+3	2.3203+2	1.8097+2	5.0934+1	1.3005–1
5.0000–3	8.0080–8	1.0859+6	1.4341–5	1.7851+8	1.0763+8	3.8747+7	3.2127+7	3.8400+3	2.1694+2	1.7021+2	4.6591+1	1.3638–1
5.5000–3	8.6105–8	1.0099+6	1.6721–5	1.6602+8	1.0135+8	3.5712+7	2.8955+7	3.6962+3	2.0336+2	1.6048+2	4.2744+1	1.4171–1
6.0000–3	9.1978–8	9.4541+5	1.9251–5	1.5542+8	9.5932+7	3.3150+7	2.6333+7	3.5696+3	1.9199+2	1.5228+2	3.9559+1	1.4693–1
7.0000–3	1.0345–7	8.4054+5	2.4742–5	1.3818+8	8.6900+7	2.9021+7	2.2255+7	3.3378+3	1.7258+2	1.3806+2	3.4370+1	1.5536–1
8.0000–3	1.1448–7	7.5958+5	3.0799–5	1.2487+8	7.9766+7	2.5864+7	1.9237+7	3.1493+3	1.5784+2	1.2716+2	3.0518+1	1.6353–1
1.0000–2	1.3593–7	6.3970+5	4.4478–5	1.0516+8	6.8772+7	2.1322+7	1.5066+7	2.8411+3	1.3517+2	1.1007+2	2.4926+1	1.7612–1
1.2500–2	1.6116–7	5.3956+5	6.4446–5	8.8700+7	5.9011+7	1.7567+7	1.2119+7	2.5349+3	1.1573+2	9.4731+1	2.0810+1	1.8733–1
1.3125–2	1.6726–7	5.1988+5	6.9937–5	8.5466+7	5.7068+7	1.6838+7	1.1556+7	2.4724+3	1.1195+2	9.1738+1	2.0024+1	1.9008–1
1.5000–2	1.8513–7	4.6971+5	8.7443–5	7.7217+7	5.2073+7	1.4996+7	1.0145+7	2.3093+3	1.0240+2	8.4149+1	1.8055+1	1.9817–1
1.7500–2	2.0886–7	4.1633+5	1.1322–4	6.8442+7	4.6651+7	1.3126+7	8.6626+6	2.1213+3	9.1780+1	7.5765+1	1.5809+1	2.0523–1
2.0000–2	2.3240–7	3.7417+5	1.4178–4	6.1511+7	4.2413+7	1.1697+7	7.4000+6	1.9708+3	8.3390+1	6.9337+1	1.3841+1	2.1222–1
K 2.1012–2	2.4182–7	3.5960+5	1.5414–4	5.9115+7	4.0935+7	1.1212+7	6.9666+6	1.9166+3	8.0362+1	6.7030+1	1.3118+1	2.1456–1
2.1293–2	2.4433–7	3.5590+5	1.5766–4	5.8508+7	4.0547+7	1.1085+7	6.8745+6	1.9019+3	7.9602+1	6.6418+1	1.2969+1	2.1505–1
2.1837–2	2.4916–7	3.4899+5	1.6455–4	5.7372+7	3.9818+7	1.0849+7	6.7029+6	1.8744+3	7.8183+1	6.5274+1	1.2693+1	2.1600–1
2.2857–2	2.5816–7	3.3684+5	1.7782–4	5.5374+7	3.8533+7	1.0435+7	6.4031+6	1.8256+3	7.5690+1	6.3263+1	1.2210+1	2.1779–1
2.3750–2	2.6595–7	3.2697+5	1.8977–4	5.3751+7	3.7487+7	1.0100+7	6.1620+6	1.7857+3	7.3674+1	6.1633+1	1.1822+1	2.1937–1
2.5313–2	2.7942–7	3.1120+5	2.1146–4	5.1160+7	3.5810+7	9.5666+6	5.7809+6	1.7212+3	7.0464+1	5.9034+1	1.1208+1	2.2215–1
2.7656–2	2.9926–7	2.9057+5	2.4574–4	4.7768+7	3.3604+7	8.8716+6	5.2902+6	1.6354+3	6.6288+1	5.5644+1	1.0417+1	2.2634–1
3.0000–2	3.1820–7	2.7328+5	2.8204–4	4.4925+7	3.1697+7	8.2777+6	4.9496+6	1.5604+3	6.2870+1	5.2742+1	9.8971+0	2.3051–1
3.2500–2	3.3880–7	2.5666+5	3.2299–4	4.2193+7	2.9955+7	7.7425+6	4.4934+6	1.4887+3	5.9282+1	4.9960+1	9.0886+0	2.3353–1
3.5000–2	3.5779–7	2.4304+5	3.6620–4	3.9953+7	2.8428+7	7.2779+6	4.2457+6	1.4253+3	5.6461+1	4.7539+1	8.6855+0	2.3662–1
3.6250–2	3.6744–7	2.3665+5	3.8860–4	3.8904+7	2.7733+7	7.0678+6	4.1023+6	1.3962+3	5.5121+1	4.6443+1	8.4395+0	2.3817–1
4.0000–2	3.9590–7	2.1964+5	4.5893–4	3.6108+7	2.5871+7	6.5102+6	3.7253+6	1.3177+3	5.1564+1	4.3528+1	7.7929+0	2.4286–1
4.5000–2	4.3251–7	2.0105+5	5.5984–4	3.3051+7	2.3817+7	5.9158+6	3.3174+6	1.2299+3	4.7588+1	4.0282+1	7.0586+0	2.4747–1
5.0000–2	4.6808–7	1.8577+5	6.6866–4	3.0540+7	2.2118+7	5.4303+6	2.9904+6	1.1563+3	4.4345+1	3.7623+1	6.4704+0	2.5222–1
6.0000–2	5.3643–7	1.6210+5	9.0799–4	2.6649+7	1.9439+7	4.7001+6	2.5089+6	1.0472+3	3.9322+1	3.3486+1	5.5756+0	2.6022–1
8.0000–2	6.6655–7	1.3046+5	1.4646–3	2.1446+7	1.5763+7	3.7751+6	1.9073+6	8.9379+2	3.2738+1	2.8051+1	4.4145+0	2.7297–1
1.0000–1	7.8750–7	1.1042+5	2.1176–3	1.8153+7	1.3388+7	3.2137+6	1.5498+6	7.9238+2	2.8616+1	2.4635+1	3.6972+0	2.8368–1
1.5000–1	1.0356–6	8.3964+4	4.0659–3	1.3803+7	1.0263+7	2.4576+6	1.0821+6	6.4226+2	2.2920+1	1.9893+1	2.7211+0	3.0592–1
2.0000–1	1.2292–6	7.0742+4	6.4000–3	1.1630+7	8.7052+6	2.0796+6	8.4419+5	5.6097+2	1.9990+1	1.7462+1	2.2010+0	3.2692–1
2.5000–1	1.3908–6	6.2524+4	9.0113–3	1.0279+7	7.7007+6	1.8644+6	7.1300+5	5.1307+2	1.8328+1	1.6074+1	1.9060+0	3.4830–1
3.0000–1	1.5359–6	5.6615+4	1.1830–2	9.3071+6	6.9666+6	1.7053+6	6.3477+5	4.7699+2	1.7163+1	1.5055+1	1.7387+0	3.6963–1
4.0000–1	1.7944–6	4.8459+4	1.7893–2	7.9663+6	5.9145+6	1.5226+6	5.2867+5	4.3664+2	1.5843+1	1.3927+1	1.4987+0	4.1709–1
5.0000–1	2.0163–6	4.3126+4	2.4343–2	7.0897+6	5.2036+6	1.4169+6	4.6873+5	4.1415+2	1.5170+1	1.3338+1	1.3642+0	4.6738–1
6.0000–1	2.2122–6	3.9308+4	3.1025–2	6.4620+6	4.6866+6	1.3485+6	4.2648+5	4.0049+2	1.4761+1	1.2972+1	1.2683+0	5.2071–1
8.0000–1	2.5444–6	3.4175+4	4.4709–2	5.6182+6	3.9748+6	1.2686+6	3.7437+5	3.8673+2	1.4473+1	1.2684+1	1.1516+0	6.3686–1
1.0000+0	2.8174–6	3.0864+4	5.8561–2	5.0738+6	3.5082+6	1.2234+6	3.4186+5	3.8119+2	1.4403+1	1.2563+1	1.0785+0	7.6212–1
1.5000+0	3.3254–6	2.6149+4	9.2764–2	4.2987+6	2.8248+6	1.1735+6	3.0009+5	3.7958+2	1.4836+1	1.2742+1	9.9006–1	1.1038+0
2.0000+0	3.6813–6	2.3621+4	1.2587–1	3.8831+6	2.4475+6	1.1581+6	2.7717+5	3.8241+2	1.5372+1	1.2961+1	9.3529–1	1.4765+0
3.0000+0	4.1591–6	2.0907+4	1.8858–1	3.4370+6	2.0473+6	1.1371+6	2.5233+5	3.8895+2	1.6534+1	1.3370+1	8.9024–1	2.2735+0
4.0000+0	4.4461–6	1.9558+4	2.4702–1	3.2152+6	1.8370+6	1.1346+6	2.4317+5	3.9516+2	1.7706+1	1.3709+1	8.7275–1	3.1243+0
5.0000+0	4.6387–6	1.8746+4	3.0172–1	3.0817+6	1.7122+6	1.1328+6	2.3628+5	4.0049+2	1.8865+1	1.3995+1	8.6246–1	4.0068+0
6.0000+0	4.7731–6	1.8218+4	3.5319–1	2.9950+6	1.6331+6	1.1313+6	2.3014+5	4.0490+2	2.0005+1	1.4250+1	8.5421–1	4.9006+0
8.0000+0	4.9339–6	1.7624+4	4.4789–1	2.8973+6	1.5424+6	1.1293+6	2.2516+5	4.1132+2	2.2275+1	1.4657+1	8.4714–1	6.7711+0
1.0000+1	5.0091–6	1.7360+4	5.3351–1	2.8538+6	1.5020+6	1.1295+6	2.2195+5	4.1636+2	2.4478+1	1.4963+1	8.4630–1	8.6690+0
1.5000+1	5.0405–6	1.7252+4	7.1802–1	2.8361+6	1.4857+6	1.1302+6	2.1969+5	4.2786+2	2.9900+1	1.5406+1	8.4484–1	1.3650+1
2.0000+1	5.0471–6	1.7229+4	8.7147–1	2.8324+6	1.4851+6	1.1308+6	2.1604+5	4.3398+2	3.5424+1	1.5785+1	8.3784–1	1.8801+1
3.0000+1	5.0563–6	1.7198+4	1.1174+0	2.8272+6	1.4846+6	1.1308+6	2.1140+5	4.4308+2	4.6392+1	1.6176+1	8.3364–1	2.9382+1
4.0000+1	5.0578–6	1.7193+4	1.3106+0	2.8263+6	1.4842+6	1.1311+6	2.1060+5	4.4988+2	5.7541+1	1.6479+1	8.3210–1	4.0230+1
5.0000+1	5.0597–6	1.7186+4	1.4693+0	2.8253+6	1.4839+6	1.1313+6	2.0963+5	4.5525+2	6.8797+1	1.6722+1	8.2987–1	5.1245+1
6.0000+1	5.0607–6	1.7183+4	1.6039+0	2.8247+6	1.4836+6	1.1314+6	2.0919+5	4.5969+2	8.0118+1	1.6906+1	8.2973–1	6.2382+1
8.0000+1	5.0630–6	1.7175+4	1.8233+0	2.8234+6	1.4833+6	1.1315+6	2.0816+5	4.6712+2	1.0312+2	1.7182+1	8.2882–1	8.5110+1
1.0000+2	5.0650–6	1.7168+4	1.9982+0	2.8223+6	1.4830+6	1.1316+6	2.0728+5	4.7266+2	1.2633+2	1.7421+1	8.2847–1	1.0808+2
1.5000+2	5.0656–6	1.7166+4	2.3237+0	2.8220+6	1.4824+6	1.1316+6	2.0742+5	4.8222+2	1.8465+2	1.7666+1	8.2924–1	1.6615+2
2.0000+2	5.0660–6	1.7165+4	2.5588+0	2.8218+6	1.4821+6	1.1317+6	2.0758+5	4.8859+2	2.4336+2	1.7900+1	8.3008–1	2.2463+2
3.0000+2	5.0660–6	1.7165+4	2.8942+0	2.8218+6	1.4815+6	1.1317+6	2.0804+5	4.9559+2	3.6051+2	1.8323+1	8.3231–1	3.4136+2
4.0000+2	5.0665–6	1.7163+4	3.1343+0	2.8215+6	1.4812+6	1.1317+6	2.0815+5	5.0016+2	4.7819+2	1.8514+1	8.3315–1	4.5884+2
5.0000+2	5.0675–6	1.7160+4	3.3211+0	2.8209+6	1.4808+6	1.1317+6	2.0784+5	5.0364+2	5.9663+2	1.8660+1	8.3231–1	5.7714+2
6.0000+2	5.0676–6	1.7159+4	3.4742+0	2.8209+6	1.4806+6	1.1317+6	2.0804+5	5.0682+2	7.1376+2	1.8805+1	8.3350–1	6.9412+2
8.0000+2	5.0680–6	1.7158+4	3.7164+0	2.8206+6	1.4802+6	1.1317+6	2.0815+5	5.1205+2	9.4884+2	1.9082+1	8.3476–1	9.2892+2
1.0000+3	5.0686–6	1.7156+4	3.9046+0	2.8203+6	1.4799+6	1.1317+6	2.0816+5	5.1633+2	1.1847+3	1.9304+1	8.3560–1	1.1646+3
1.5000+3	5.0684–6	1.7156+4	4.2471+0	2.8204+6	1.4794+6	1.1317+6	2.0875+5	5.2434+2	1.7745+3	1.9505+1	8.3798–1	1.7541+3
2.0000+3	5.0684–6	1.7156+4	4.4902+0	2.8204+6	1.4790+6	1.1317+6	2.0911+5	5.3018+2	2.3676+3	1.9704+1	8.3945–1	2.3470+3
3.0000+3	5.0680–6	1.7158+4	4.8329+0	2.8206+6	1.4785+6	1.1317+6	2.0987+5	5.3909+2	3.5475+3	2.0103+1	8.4253–1	3.5266+3
4.0000+3	5.0678–6	1.7159+4	5.0759+0	2.8207+6	1.4781+6	1.1317+6	2.1034+5	5.4549+2	4.7426+3	2.0323+1	8.4442–1	4.7214+3
5.0000+3	5.0683–6	1.7157+4	5.2642+0	2.8205+6	1.4778+6	1.1317+6	2.1039+5	5.5034+2	5.9196+3	2.0454+1	8.4463–1	5.8983+3
6.0000+3	5.0678–6	1.7159+4	5.4182+0	2.8208+6	1.4776+6	1.1317+6	2.1091+5	5.5434+2	7.1056+3	2.0586+1	8.4672–1	7.0842+3
8.0000+3	5.0673–6	1.7160+4	5.6612+0	2.8211+6	1.4772+6	1.1317+6	2.1156+5	5.6059+2	9.4691+3	2.0848+1	8.4938–1	9.4474+3
1.0000+4	5.0669–6	1.7162+4	5.8499+0	2.8213+6	1.4769+6	1.1317+6	2.1204+5	5.6537+2	1.1819+4	2.1078+1	8.5134–1	1.1797+4
1.5000+4	5.0662–6	1.7164+4	6.1927+0	2.8216+6	1.4764+6	1.1317+6	2.1295+5	5.7418+2	1.7746+4	2.1273+1	8.5498–1	1.7724+4
2.0000+4	5.0659–6	1.7165+4	6.4362+0	2.8218+6	1.4760+6	1.1317+6	2.1349+5	5.8073+2	2.3612+4	2.1468+1	8.5715–1	2.3590+4
3.0000+4	5.0652–6	1.7167+4	6.7792+0	2.8222+6	1.4755+6	1.1317+6	2.1441+5	5.9007+2	3.5498+4	2.1858+1	8.6086–1	3.5475+4
4.0000+4	5.0649–6	1.7169+4	7.0226+0	2.8224+6	1.4751+6	1.1317+6	2.1497+5	5.9660+2	4.7214+4	2.2068+1	8.6309–1	4.7191+4

Atomic Weight 99.000												Density 11.500 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+4	5.0652–6	1.7167+4	7.2116+0	2.8222+6	1.4748+6	1.1317+6	2.1507+5	6.0171+2	5.9039+4	2.2222+1	8.6351–1	5.9015+4
6.0000+4	5.0646–6	1.7169+4	7.3659+0	2.8225+6	1.4746+6	1.1317+6	2.1563+5	6.0592+2	7.0952+4	2.2348+1	8.6575–1	7.0929+4
8.0000+4	5.0641–6	1.7171+4	7.6093+0	2.8228+6	1.4742+6	1.1317+6	2.1631+5	6.1249+2	9.4532+4	2.2599+1	8.6848–1	9.4509+4
1.0000+5	5.0637–6	1.7173+4	7.7981+0	2.8231+6	1.4739+6	1.1317+6	2.1680+5	6.1763+2	1.1828+5	2.2844+1	8.7044–1	1.1826+5


July 4, 1991
Atomic Weight 101.700
EEDL Evaluated Electron
Cross Sections
44-Ru
Density 12.410 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
44-Ru


July 4, 1991
Atomic Weight 101.700
EEDL Evaluated Electron
Energy Deposition
44-Ru
Density 12.410 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
44-Ru


July 4 1991
Atomic Weight 101 700
EEDL Evaluated Electron
Shell Cross Sections
44-Ru
Density 12 410 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
44-Ru


July 4, 1991
Atomic Weight 101 700
EEDL Evaluated Electron
Energy Deposition
44-Ru
Density 12 410 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
44-Ru

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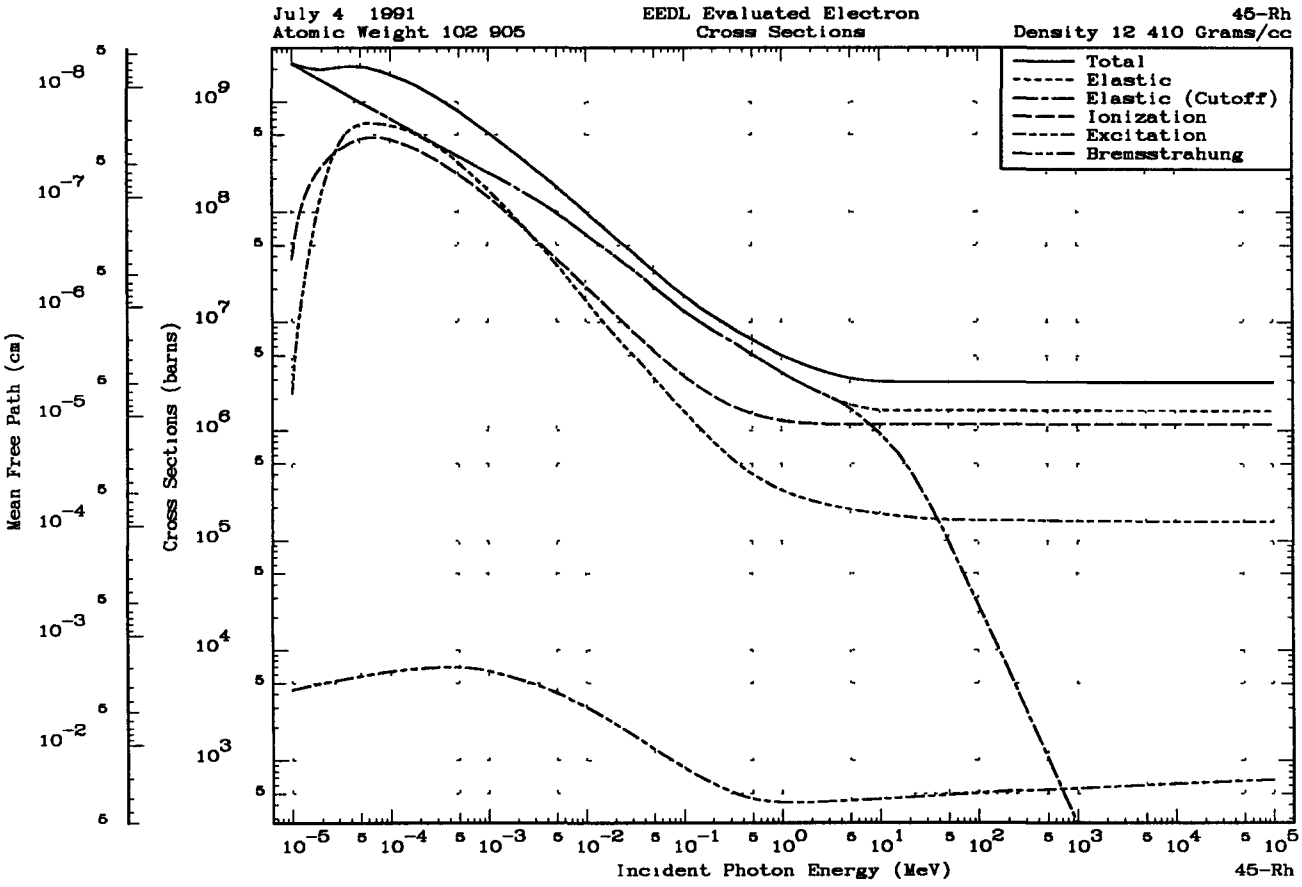
Atomic Weight 101.700 Density 12.410 Grams/cc

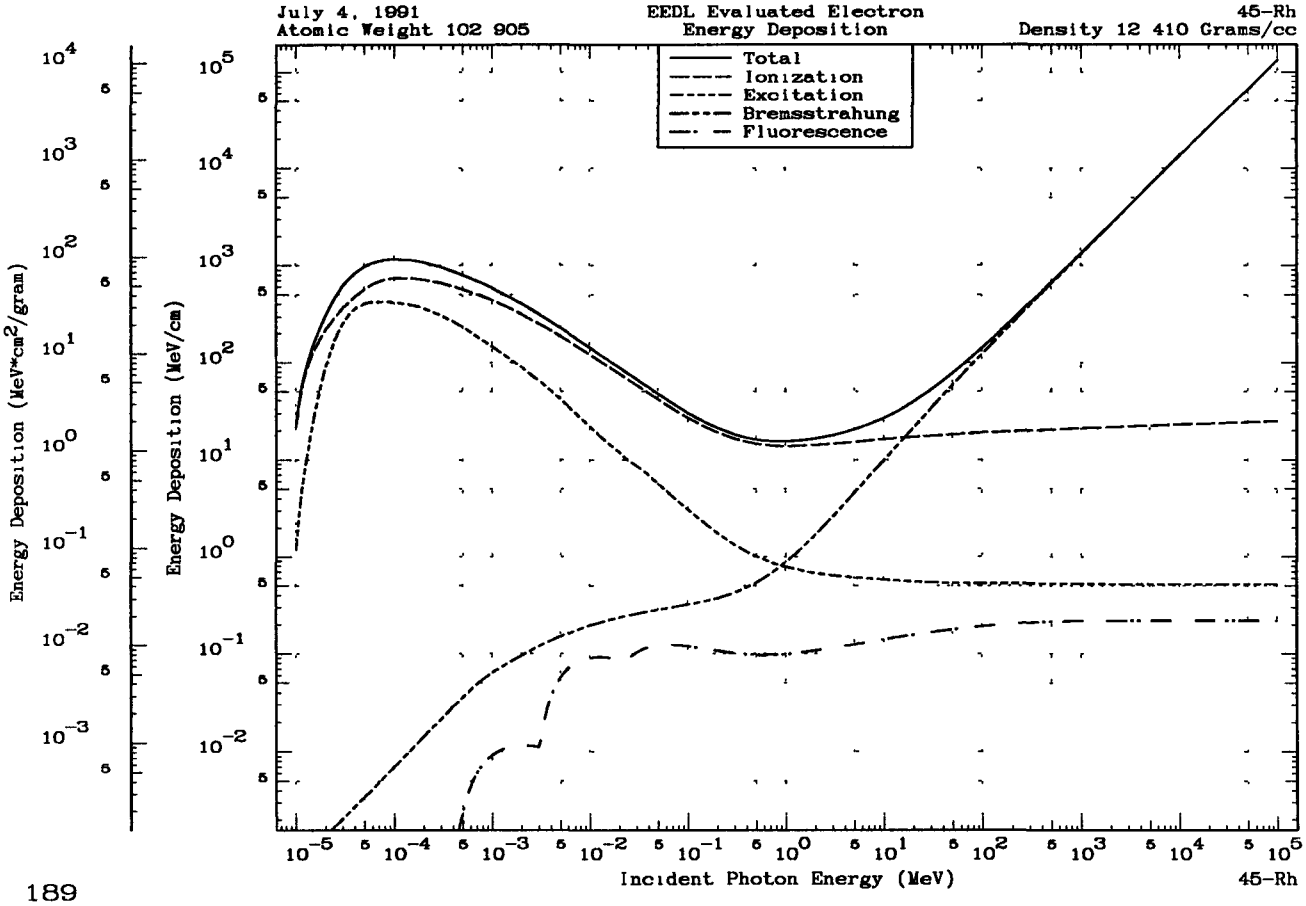
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.4245–9	1.4855+7		2.5086+9	2.4264+9	7.5706+7	6.5462+6	4.2986+3	4.8896+1	4.5434+1	3.4618+0	6.8163–4
	1.0625–5	5.5253–9	1.4584+7		2.4629+9	2.3528+9	9.8373+7	1.1690+7	4.3505+3	6.7479+1	6.1208+1	6.2697+0	7.2230–4
	1.1250–5	5.6213–9	1.4335+7		2.4208+9	2.2855+9	1.1838+8	1.6953+7	4.4000+3	8.4819+1	7.5599+1	9.2193+0	7.6334–4
	1.1719–5	5.6808–9	1.4185+7		2.3955+9	2.2386+9	1.3476+8	2.2108+7	4.4357+3	9.9907+1	8.7759+1	1.2147+1	7.9435–4
	1.3125–5	5.8313–9	1.3819+7		2.3336+9	2.1134+9	1.7555+8	4.4696+7	4.5363+3	1.4506+2	1.1974+2	2.5313+1	8.8848–4
	1.3359–5	5.8476–9	1.3780+7		2.3271+9	2.0945+9	1.8275+8	4.9882+7	4.5522+3	1.5398+2	1.2559+2	2.8390+1	9.0431–4
	1.5000–5	5.9381–9	1.3570+7		2.2917+9	1.9748+9	2.2414+8	9.2714+7	4.6578+3	2.1579+2	1.6119+2	5.4594+1	1.0165–3
	1.7500–5	5.9554–9	1.3531+7		2.2850+9	1.8261+9	2.7633+8	1.8259+8	4.8021+3	3.1960+2	2.1085+2	1.0876+2	1.1913–3
	2.0000–5	5.8726–9	1.3721+7		2.3172+9	1.7063+9	3.2015+8	2.9073+8	4.9307+3	4.3312+2	2.5798+2	1.7515+2	1.3702–3
	2.5000–5	5.6634–9	1.4228+7		2.4028+9	1.5235+9	3.8612+8	4.9315+8	5.1216+3	6.4082+2	3.4112+2	2.9970+2	1.7046–3
	3.0000–5	5.5442–9	1.4534+7		2.4545+9	1.3888+9	4.3254+8	6.3317+8	5.2831+3	8.0085+2	4.1271+2	3.8814+2	2.0485–3
	3.5000–5	5.5303–9	1.4571+7		2.4606+9	1.2844+9	4.6265+8	7.1356+8	5.4213+3	9.1300+2	4.7049+2	4.4251+2	2.3978–3
	4.0000–5	5.5528–9	1.4512+7		2.4507+9	1.2004+9	4.9077+8	7.5952+8	5.5439+3	1.0063+3	5.2989+2	4.7643+2	2.7545–3
	5.0000–5	5.7341–9	1.4053+7		2.3732+9	1.0721+9	5.1695+8	7.8413+8	5.7293+3	1.1160+3	6.1301+2	5.0300+2	3.4445–3
N3	5.0660–5	5.7495–9	1.4015+7		2.3668+9	1.0650+9	5.1746+8	7.8433+8	5.7397+3	1.1205+3	6.1661+2	5.0389+2	3.4895–3
	5.2995–5	5.8021–9	1.3888+7		2.3454+9	1.0410+9	5.1953+8	7.8486+8	5.7754+3	1.1374+3	6.3047+2	5.0695+2	3.6493–3
N2	5.4190–5	5.8280–9	1.3826+7		2.3349+9	1.0293+9	5.2052+8	7.8512+8	5.7932+3	1.1459+3	6.3740+2	5.0850+2	3.7313–3
	5.5642–5	5.8626–9	1.3745+7		2.3212+9	1.0156+9	5.2184+8	7.8373+8	5.8144+3	1.1557+3	6.4634+2	5.0934+2	3.8314–3
	5.6498–5	5.8824–9	1.3698+7		2.3133+9	1.0078+9	5.2262+8	7.8294+8	5.8266+3	1.1615+3	6.5165+2	5.0985+2	3.8904–3
	6.0000–5	5.9605–9	1.3519+7		2.2830+9	9.7755+8	5.2568+8	7.7980+8	5.8751+3	1.1852+3	6.7324+2	5.1197+2	4.1334–3
	6.5000–5	6.1060–9	1.3197+7		2.2286+9	9.3871+8	5.2244+8	7.6747+8	5.9402+3	1.1974+3	6.8979+2	5.0758+2	4.4832–3
	7.0000–5	6.2428–9	1.2908+7		2.1798+9	9.0414+8	5.1945+8	7.5624+8	6.0012+3	1.2100+3	7.0617+2	5.0380+2	4.8363–3
	7.2500–5	6.3079–9	1.2774+7		2.1573+9	8.8821+8	5.1812+8	7.5097+8	6.0303+3	1.2149+3	7.1280+2	5.0210+2	5.0140–3
	8.0000–5	6.4932–9	1.2410+7		2.0957+9	8.4501+8	5.1432+8	7.3640+8	6.1126+3	1.2299+3	7.3217+2	4.9770+2	5.5516–3
N1	8.2140–5	6.5515–9	1.2299+7		2.0771+9	8.3379+8	5.1132+8	7.3199+8	6.1349+3	1.2298+3	7.3347+2	4.9636+2	5.7062–3
	8.3256–5	6.5825–9	1.2242+7		2.0673+9	8.2811+8	5.0981+8	7.2940+8	6.1446+3	1.2298+3	7.3432+2	4.9553+2	5.7842–3
	8.5349–5	6.6397–9	1.2136+7		2.0495+9	8.1776+8	5.0707+8	7.2467+8	6.1624+3	1.2300+3	7.3598+2	4.9403+2	5.9308–3
	8.9012–5	6.7374–9	1.1960+7		2.0198+9	8.0054+8	5.0250+8	7.1673+8	6.1926+3	1.2307+3	7.3912+2	4.9159+2	6.1883–3
	9.0000–5	6.7633–9	1.1914+7		2.0121+9	7.9608+8	5.0131+8	7.1466+8	6.2006+3	1.2310+3	7.4000+2	4.9097+2	6.2579–3
	9.4506–5	6.8790–9	1.1714+7		1.9782+9	7.7662+8	4.9603+8	7.0556+8	6.2359+3	1.2322+3	7.4386+2	4.8833+2	6.5765–3
	1.0000–4	7.0147–9	1.1487+7	0.0000+0	1.9399+9	7.5471+8	4.9004+8	6.9518+8	6.2771+3	1.2345+3	7.4900+2	4.8547+2	6.9671–3
	1.1250–4	7.3545–9	1.0957+7	1.0203–8	1.8503+9	7.1125+8	4.7127+8	6.6780+8	6.3524+3	1.2159+3	7.4329+2	4.7263+2	7.8416–3
	1.3125–4	7.8226–9	1.0301+7	2.5750–8	1.7396+9	6.5812+8	4.4787+8	6.3359+8	6.4524+3	1.1961+3	7.3875+2	4.5735+2	9.1699–3
	1.5000–4	8.2508–9	9.7664+6	4.1511–8	1.6493+9	6.1532+8	4.2863+8	6.0537+8	6.5402+3	1.1832+3	7.3771+2	4.4551+2	1.0516–2
	1.7500–4	8.8574–9	9.0975+6	6.2986–8	1.5364+9	5.6936+8	4.0125+8	5.6573+8	6.6264+3	1.1453+3	7.2031+2	4.2493+2	1.2315–2
	2.0000–4	9.4177–9	8.5563+6	8.5083–8	1.4450+9	5.3233+8	3.7911+8	5.3351+8	6.7020+3	1.1176+3	7.0872+2	4.0883+2	1.4135–2
	2.2500–4	1.0022–8	8.0403+6	1.0787–7	1.3578+9	5.0167+8	3.5704+8	4.9909+8	6.7350+3	1.0766+3	6.8796+2	3.8858+2	1.5918–2
	2.5000–4	1.0595–8	7.6057+6	1.3146–7	1.2844+9	4.7575+8	3.3847+8	4.7020+8	6.7647+3	1.0435+3	6.7168+2	3.7184+2	1.7708–2
M5	2.9005–4	1.1459–8	7.0322+6	1.7063–7	1.1876+9	4.4145+8	3.1385+8	4.3226+8	6.8068+3	1.0015+3	6.5114+2	3.5034+2	2.0591–2
M4	2.9453–4	1.1559–8	6.9712+6	1.7512–7	1.1773+9	4.3805+8	3.1131+8	4.2792+8	6.8111+3	9.9666+2	6.4889+2	3.4776+2	2.0915–2
	2.9503–4	1.1570–8	6.9646+6	1.7561–7	1.1762+9	4.3769+8	3.1103+8	4.2744+8	6.8116+3	9.9615+2	6.4865+2	3.4747+2	2.0951–2
	3.0000–4	1.1681–8	6.8985+6	1.8062–7	1.1650+9	4.3401+8	3.0829+8	4.2269+8	6.8164+3	9.9103+2	6.4634+2	3.4467+2	2.1310–2
	3.1250–4	1.1967–8	6.7337+6	1.9334–7	1.1372+9	4.2524+8	3.0102+8	4.1090+8	6.8253+3	9.7489+2	6.3778+2	3.3709+2	2.2209–2
	3.2500–4	1.2248–8	6.5793+6	2.0626–7	1.1111+9	4.1698+8	2.9422+8	3.9988+8	6.8338+3	9.6012+2	6.3007+2	3.3003+2	2.3109–2
	3.3438–4	1.2455–8	6.4696+6	2.1608–7	1.0926+9	4.1110+8	2.8939+8	3.9207+8	6.8400+3	9.4975+2	6.2468+2	3.2505+2	2.3784–2
	3.4375–4	1.2660–8	6.3648+6	2.2600–7	1.0749+9	4.0545+8	2.8477+8	3.8463+8	6.8460+3	9.3993+2	6.1960+2	3.2031+2	2.4460–2
	3.5781–4	1.2964–8	6.2158+6	2.4107–7	1.0497+9	3.9740+8	2.7822+8	3.7409+8	6.8548+3	9.2624+2	6.1260+2	3.1361+2	2.5475–2
	3.6719–4	1.3163–8	6.1217+6	2.5124–7	1.0338+9	3.9229+8	2.7408+8	3.6744+8	6.8605+3	9.1776+2	6.0833+2	3.0941+2	2.6153–2
	3.7891–4	1.3409–8	6.0095+6	2.6408–7	1.0149+9	3.8618+8	2.6914+8	3.5953+8	6.8674+3	9.0780+2	6.0336+2	3.0441+2	2.7000–2
	4.0000–4	1.3843–8	5.8208+6	2.8752–7	9.8300+8	3.7586+8	2.6086+8	3.4628+8	6.8792+3	8.9157+2	5.9545+2	2.9609+2	2.8528–2
	4.5000–4	1.4913–8	5.4034+6	3.4503–7	9.1251+8	3.5439+8	2.4229+8	3.1583+8	6.8592+3	8.4781+2	5.7267+2	2.7511+2	3.2004–2
M3	4.5929–4	1.5106–8	5.3343+6	3.5603–7	9.0084+8	3.5079+8	2.3921+8	3.1082+8	6.8558+3	8.4076+2	5.6906+2	2.7168+2	3.2649–2
	4.6438–4	1.5214–8	5.2965+6	3.6210–7	8.9446+8	3.4887+8	2.3757+8	3.0801+8	6.8539+3	8.3699+2	5.6718+2	2.6978+2	3.3002–2
	4.7328–4	1.5401–8	5.2321+6	3.7278–7	8.8358+8	3.4557+8	2.3477+8	3.0323+8	6.8507+3	8.3062+2	5.6404+2	2.6655+2	3.3620–2
M2	4.8206–4	1.5584–8	5.1706+6	3.8338–7	8.7320+8	3.4242+8	2.3210+8	2.9867+8	6.8476+3	8.2460+2	5.6108+2	2.6348+2	3.4228–2
	4.9103–4	1.5772–8	5.1090+6	3.9430–7	8.6279+8	3.3928+8	2.2945+8	2.9405+8	6.8444+3	8.1872+2	5.5828+2	2.6040+2	3.4850–2
	5.0000–4	1.5959–8	5.0493+6	4.0529–7	8.5270+8	3.3623+8	2.2689+8	2.8958+8	6.8414+3	8.1312+2	5.5566+2	2.5743+2	3.5471–2
	5.5000–4	1.6975–8	4.7470+6	4.6806–7	8.0166+8	3.2060+8	2.1307+8	2.6798+8	6.8118+3	7.8017+2	5.3812+2	2.4201+2	3.8826–2
M1	5.7403–4	1.7451–8	4.6176+6	4.9914–7	7.7981+8	3.1383+8	2.0716+8	2.5882+8	6.7985+3	7.6623+2	5.3068+2	2.3550+2	4.0434–2
	5.8052–4	1.7580–8	4.5835+6	5.0764–7	7.7405+8	3.1207+8	2.0563+8	2.5634+8	6.7910+3	7.6265+2	5.2884+2	2.3377+2	4.0835–2
	6.0000–4	1.7967–8	4.4850+6	5.3335–7	7.5740+8	3.0697+8	2.0122+8	2.4921+8	6.7690+3	7.5248+2	5.2365+2	2.2880+2	4.2037–2
	6.2500–4	1.8461–8	4.3648+6	5.6690–7	7.3711+8	3.0078+8	1.9559+8	2.4073+8	6.7413+3	7.3761+2	5.1506+2	2.2251+2	4.3563–2
	6.5000–4	1.8949–8	4.2525+6	6.0111–7	7.1816+8	2.9494+8	1.9034+8	2.3286+8	6.7147+3	7.2397+2	5.0725+2	2.1668+2	4.5083–2
	6.6875–4	1.9309–8	4.1731+6	6.2718–7	7.0474+8	2.9079+8	1.8663+8	2.2732+8	6.6955+3	7.1448+2	5.0186+2	2.1257+2	4.6219–2
	7.0000–4	1.9902–8	4.0488+6	6.7137–7	6.8375+8	2.8423+8	1.8082+8	2.1869+8	6.6649+3	6.9990+2	4.9365+2	2.0620+2	4.8106–2
	7.2500–4	2.0370–8	3.9559+6	7.0738–7	6.6806+8	2.7929+8	1.7648+8	2.1229+8	6.6414+3	6.8882+2	4.8729+2	2.0147+2	4.9610–2
	7.3438–4	2.0543–8	3.9225+6	7.2103–7	6.6241+8	2.7751+8	1.7491+8	2.0999+8	6.6328+3	6.8486+2	4.8504+2	1.9978+2	5.0172–2
	8.0000–4	2.1736–8	3.7072+6	8.1863–7	6.2606+8	2.6590+8	1.6486+8	1.9530+8	6.5759+3	6.6005+2	4.7102+2	1.8898+2	5.4090–2
	9.0000–4	2.3548–8	3.4220+6	9.7470–7	5.7789+8	2.5071+8	1.5134+8	1.7584+8	6.4185+3	6.2181+2	4.4796+2	1.7379+2	5.8164–2
	1.0000–3	2.5287–8	3.1866+6	1.1396–6	5.3815+8	2.3786+8	1.4020+8	1.6008+8	6.2810+3	5.9117+2	4.2958+2	1.6154+2	6.2170–2
	1.1250–3	2.7427–8	2.9380+6	1.3581–6	4.9616+8	2.2424+8	1.2818+8	1.4373+8	6.1237+3	5.5371+2	4.0571+2	1.4794+2	6.6839–2
	1.2500–3	2.9482–8	2.7332+6	1.5902–6	4.6157+8	2.1272+8	1.1832+8	1.3053+8	5.9863+3	5.2332+2	3.8627+2	1.3698+2	7.1426–2
	1.3125–3	3.0482–8	2.6435+6	1.7112–6	4.4643+8	2.0759+8	1.1401+8	1.2483+8	5.9237+3	5.1012+2	3.7778+2	1.3227+2	7.3690–2
	1.5000–3	3.3380–8	2.4140+6	2.0912–6	4.0767+8	1.9416+8	1.0302+8	1.1048+8	5.7558+3	4.7697+2	3.5648+2	1.2041+2	8.0379–2
	1.7500–3	3.7133–8	2.1701+6	2.6390–6	3.6647+8	1.7949+8	9.1190+7	9.5784+7	5.5334+3	4.3651+2	3.2901+2	1.0742+2	8.7534–2
	2.0000–3	4.0695–8	1.9801+6	3.2327–6	3.3439+8	1.6768+8	8.2063+7	8.4643+7	5.3477+3	4.0598+2	3.0829+2	9.7596+1	9.4513–2
	2.5000–3	4.7670–8	1.6904+6	4.5499–6	2.8546+8	1.4869+8	6.8426+7	6.8339+7	5.0101+3	3.5436+2	2.7220+2	8.2054+1	1.0612–1
L3	2.8387–3	5.2124–8	1.5459+6	5.5413–6	2.6107+8	1.3886+8	6.1708+7	6.0501+7	4.8274+3	3.2923+2	2.5452+2	7.4595+1	1.1373–1
	2.9193–3	5.3205–8	1.5145+6	5.7884–6	2.5577+8	1.3674+8	6.0302+7	5.8726+7	4.7866+3	3.2363+2	2.5066+2	7.2857+1	1.1543–1
L2	2.9718–3	5.3902–8	1.4949+6	5.9514–6	2.5246+8	1.3541+8	5.9426+7	5.7625+7	4.7608+3	3.2014+2	2.4825+2	7.1779+1	1.1654–1

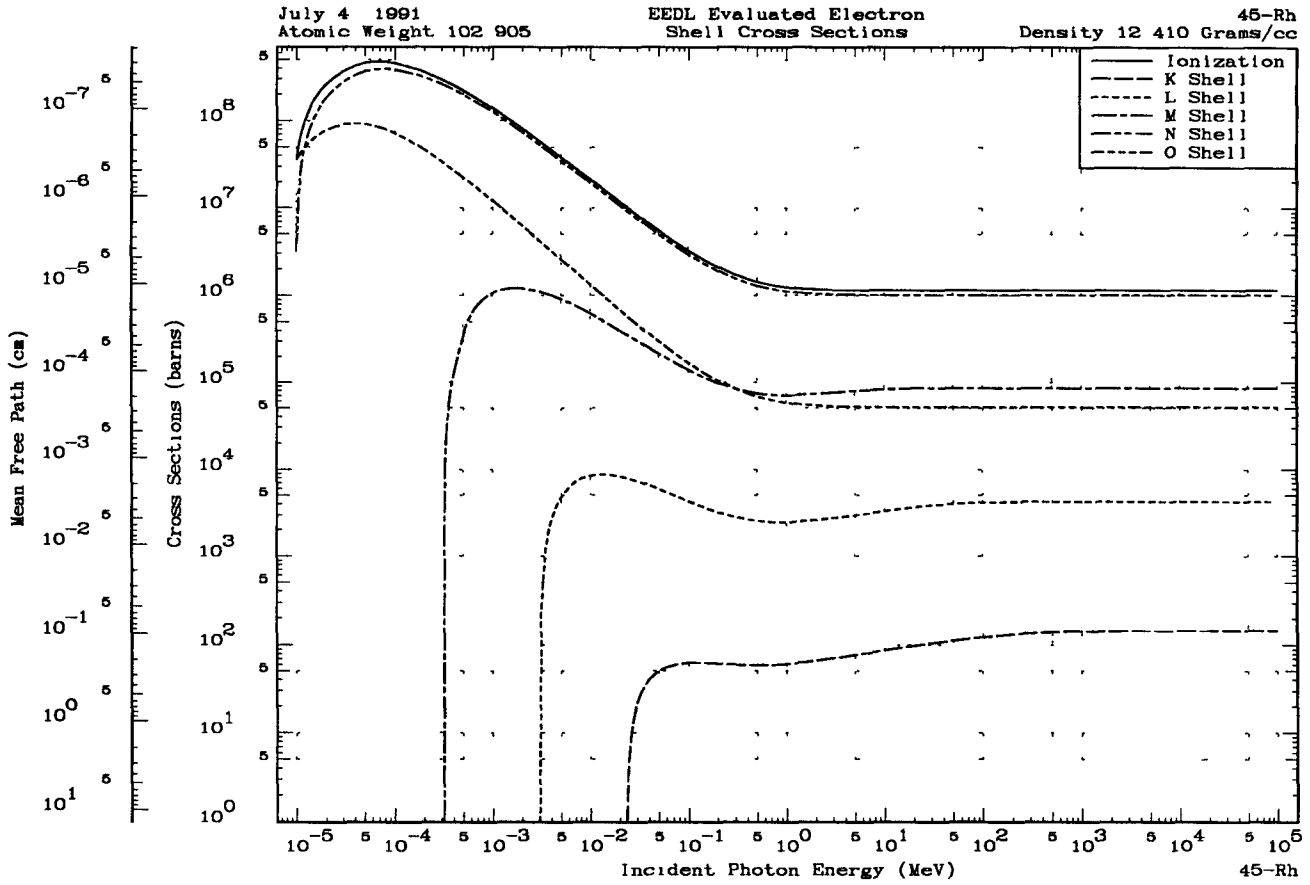
Atomic Weight 101.700 Density 12.410 Grams/cc

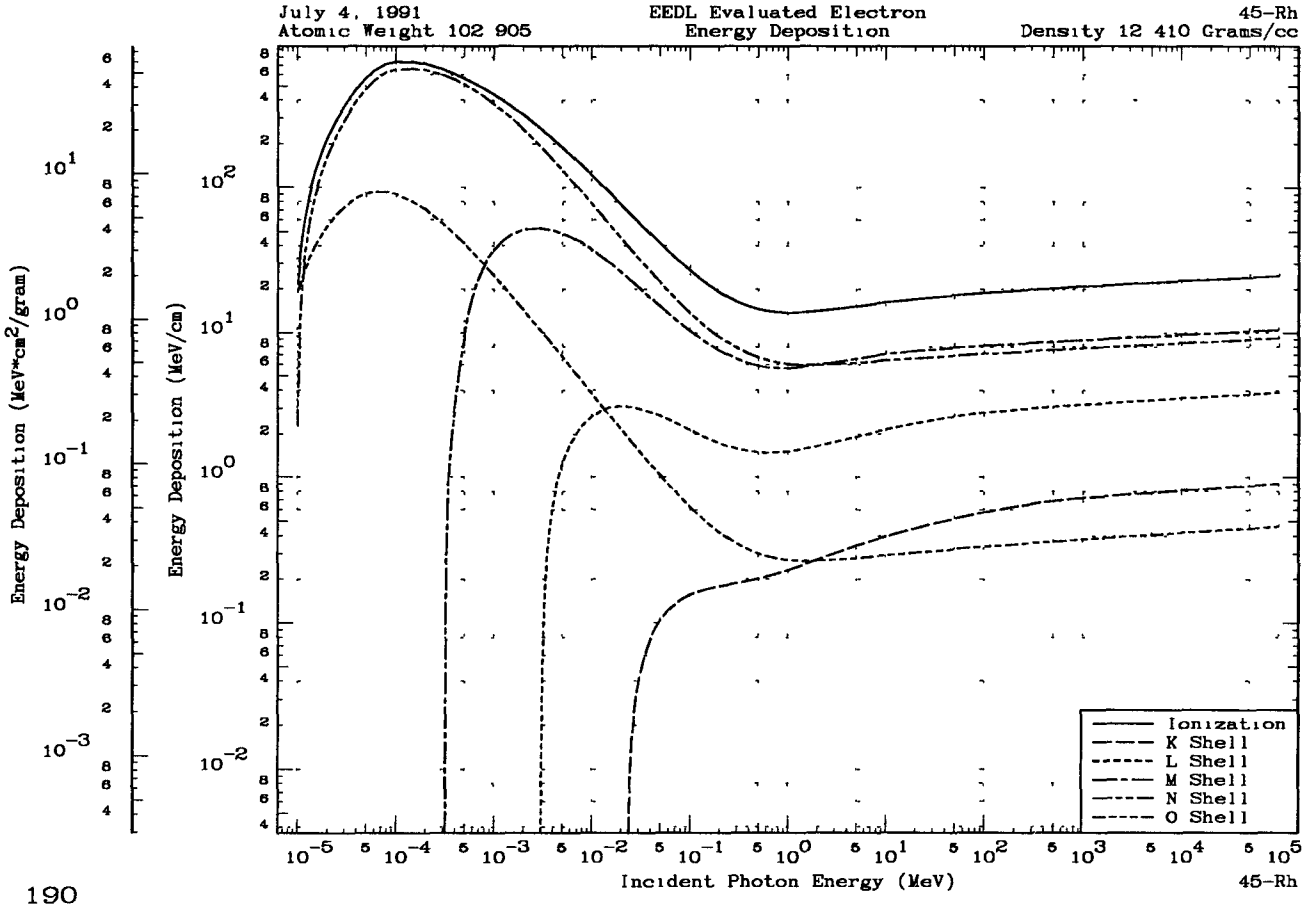
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000–3	5.4280–8	1.4845+6	6.0397–6	2.5070+8	1.3471+8	5.8966+7	5.7028+7	4.7464+3	3.1830+2	2.4699+2	7.1195+1	1.1709–1
3.1250–3	5.5877–8	1.4421+6	6.4375–6	2.4354+8	1.3170+8	5.6996+7	5.4836+7	4.6813+3	3.1021+2	2.4114+2	6.8947+1	1.1934–1
L1 3.2039–3	5.6874–8	1.4168+6	6.6938–6	2.3927+8	1.2990+8	5.5826+7	5.3539+7	4.6420+3	3.0539+2	2.3765+2	6.7617+1	1.2075–1
3.3034–3	5.8170–8	1.3852+6	7.0229–6	2.3394+8	1.2766+8	5.4419+7	5.1848+7	4.5935+3	2.9939+2	2.3341+2	6.5856+1	1.2248–1
3.3437–3	5.8692–8	1.3729+6	7.1582–6	2.3186+8	1.2679+8	5.3870+7	5.1192+7	4.5744+3	2.9706+2	2.3176+2	6.5172+1	1.2317–1
3.4776–3	6.0409–8	1.3339+6	7.6143–6	2.2527+8	1.2400+8	5.2134+7	4.9127+7	4.5131+3	2.8968+2	2.2653+2	6.3020+1	1.2547–1
3.6719–3	6.2865–8	1.2818+6	8.2967–6	2.1646+8	1.2023+8	4.9822+7	4.6403+7	4.4296+3	2.7992+2	2.1961+2	6.0180+1	1.2877–1
3.7388–3	6.3701–8	1.2650+6	8.5371–6	2.1363+8	1.1901+8	4.9078+7	4.5533+7	4.4022+3	2.7678+2	2.1738+2	5.9272+1	1.2990–1
4.0000–3	6.6919–8	1.2041+6	9.5005–6	2.0335+8	1.1454+8	4.6391+7	4.2418+7	4.3013+3	2.6554+2	2.0938+2	5.6021+1	1.3426–1
4.5000–3	7.2990–8	1.1040+6	1.1457–5	1.8644+8	1.0681+8	4.2001+7	3.7624+7	4.1171+3	2.4595+2	1.9502+2	5.0790+1	1.4141–1
5.0000–3	7.8856–8	1.0219+6	1.3558–5	1.7257+8	1.0034+8	3.8429+7	3.3797+7	3.9591+3	2.3014+2	1.8338+2	4.6611+1	1.4838–1
5.5000–3	8.4644–8	9.5199+5	1.5799–5	1.6077+8	9.4665+7	3.5439+7	3.0662+7	3.8131+3	2.1611+2	1.7291+2	4.3044+1	1.5426–1
6.0000–3	9.0278–8	8.9258+5	1.8179–5	1.5074+8	8.9764+7	3.2914+7	2.8055+7	3.6845+3	2.0432+2	1.6409+2	4.0076+1	1.6002–1
7.0000–3	1.0135–7	7.9503+5	2.3333–5	1.3426+8	8.1469+7	2.8843+7	2.3947+7	3.4485+3	1.8406+2	1.4871+2	3.5184+1	1.6933–1
8.0000–3	1.1199–7	7.1955+5	2.9007–5	1.2151+8	7.4905+7	2.5728+7	2.0879+7	3.2563+3	1.6864+2	1.3693+2	3.1527+1	1.7835–1
1.0000–2	1.3274–7	6.0705+5	4.1793–5	1.0252+8	6.4714+7	2.1232+7	1.6567+7	2.9413+3	1.4480+2	1.1851+2	2.6089+1	1.9229–1
1.1250–2	1.4540–7	5.5420+5	5.0794–5	9.3591+7	5.9750+7	1.9180+7	1.4659+7	2.7712+3	1.3312+2	1.0939+2	2.3529+1	1.9854–1
1.2500–2	1.5771–7	5.1095+5	6.0534–5	8.6288+7	5.5633+7	1.7514+7	1.3139+7	2.6273+3	1.2367+2	1.0197+2	2.1489+1	2.0471–1
1.3125–2	1.6374–7	4.9212+5	6.5674–5	8.3108+7	5.3824+7	1.6792+7	1.2490+7	2.5632+3	1.1957+2	9.8742+1	2.0616+1	2.0776–1
1.5000–2	1.8182–7	4.4319+5	8.2096–5	7.4844+7	4.9168+7	1.4966+7	1.0709+7	2.3957+3	1.0895+2	9.0568+1	1.8164+1	2.1672–1
2.0000–2	2.2848–7	3.5268+5	1.3291–4	5.9559+7	4.0186+7	1.1687+7	7.6835+6	2.0472+3	8.8540+1	7.4594+1	1.3713+1	2.3234–1
K 2.2087–2	2.4678–7	3.2653+5	1.5733–4	5.5144+7	3.7470+7	1.0736+7	6.9354+6	1.9363+3	8.2505+1	6.9708+1	1.2559+1	2.3771–1
2.2334–2	2.4892–7	3.2372+5	1.6034–4	5.4668+7	3.7177+7	1.0636+7	6.8538+6	1.9240+3	8.1847+1	6.9175+1	1.2433+1	2.3817–1
2.2813–2	2.5306–7	3.1842+5	1.6623–4	5.3773+7	3.6625+7	1.0446+7	6.7009+6	1.9006+3	8.0610+1	6.8174+1	1.2197+1	2.3907–1
2.3712–2	2.6077–7	3.0900+5	1.7753–4	5.2184+7	3.5641+7	1.0110+7	6.4314+6	1.8589+3	7.8417+1	6.6396+1	1.1780+1	2.4076–1
2.5284–2	2.7410–7	2.9398+5	1.9804–4	4.9647+7	3.4063+7	9.5744+6	6.0072+6	1.7914+3	7.4932+1	6.3564+1	1.1124+1	2.4375–1
2.7642–2	2.9372–7	2.7435+5	2.3050–4	4.6331+7	3.1988+7	8.8777+6	5.4640+6	1.7018+3	7.0403+1	5.9872+1	1.0283+1	2.4825–1
3.0000–2	3.1293–7	2.5750+5	2.6495–4	4.3486+7	3.0193+7	8.2829+6	5.0086+6	1.6235+3	6.6546+1	5.6716+1	9.5766+0	2.5276–1
3.2500–2	3.3237–7	2.4244+5	3.0358–4	4.0943+7	2.8565+7	7.7501+6	4.6257+6	1.5494+3	6.2929+1	5.3723+1	8.9497+0	2.5615–1
3.6250–2	3.6082–7	2.2333+5	3.6543–4	3.7715+7	2.6485+7	7.0782+6	4.1502+6	1.4538+3	5.8372+1	4.9940+1	8.1711+0	2.6135–1
4.0000–2	3.8850–7	2.0741+5	4.3184–4	3.5027+7	2.4740+7	6.5227+6	3.7635+6	1.3726+3	5.4609+1	4.6804+1	7.5381+0	2.6660–1
4.5000–2	4.2378–7	1.9015+5	5.2708–4	3.2111+7	2.2812+7	5.9275+6	3.3707+6	1.2816+3	5.0446+1	4.3303+1	6.8709+0	2.7179–1
5.0000–2	4.5801–7	1.7594+5	6.2969–4	2.9712+7	2.1215+7	5.4414+6	3.0543+6	1.2054+3	4.7046+1	4.0435+1	6.3341+0	2.7712–1
6.0000–2	5.2436–7	1.5367+5	8.5517–4	2.5952+7	1.8661+7	4.7123+6	2.5774+6	1.0906+3	4.1761+1	3.5980+1	5.4946+0	2.8593–1
8.0000–2	6.5116–7	1.2375+5	1.3790–3	2.0898+7	1.5140+7	3.7860+6	1.9711+6	9.3298+2	3.4811+1	3.0129+1	4.3817+0	3.0049–1
1.0000–1	7.6958–7	1.0471+5	1.9930–3	1.7682+7	1.2861+7	3.2233+6	1.5971+6	8.2763+2	3.0429+1	2.6454+1	3.6630+0	3.1256–1
1.2500–1	8.9482–7	9.0051+4	2.8667–3	1.5208+7	1.1123+7	2.7825+6	1.3016+6	7.3765+2	2.6872+1	2.3479+1	3.0685+0	3.2467–1
1.5000–1	1.0103–6	7.9757+4	3.8425–3	1.3469+7	9.8783+6	2.4675+6	1.1227+6	6.7144+2	2.4409+1	2.1353+1	2.7186+0	3.3750–1
2.0000–1	1.1946–6	6.7454+4	6.0319–3	1.1392+7	8.4125+6	2.0881+6	8.9028+5	5.8657+2	2.1336+1	1.8738+1	2.2363+0	3.6090–1
3.0000–1	1.4888–6	5.4125+4	1.1091–2	9.1405+6	6.7766+6	1.7125+6	6.5090+5	4.9912+2	1.8276+1	1.6148+1	1.7202+0	4.0821–1
4.0000–1	1.7326–6	4.6508+4	1.6783–2	7.8542+6	5.7829+6	1.5294+6	5.4143+5	4.5697+2	1.6879+1	1.4936+1	1.4824+0	4.6067–1
5.0000–1	1.9426–6	4.1481+4	2.2840–2	7.0052+6	5.1082+6	1.4232+6	4.7344+5	4.3344+2	1.6146+1	1.4298+1	1.3317+0	5.1612–1
6.0000–1	2.1258–6	3.7906+4	2.9117–2	6.4015+6	4.6158+6	1.3545+6	4.3083+5	4.1912+2	1.5718+1	1.3904+1	1.2387+0	5.7489–1
8.0000–1	2.4358–6	3.3081+4	4.1966–2	5.5867+6	3.9350+6	1.2743+6	3.7694+5	4.0466+2	1.5415+1	1.3590+1	1.1218+0	7.0274–1
1.0000+0	2.6881–6	2.9977+4	5.4965–2	5.0624+6	3.4865+6	1.2292+6	3.4637+5	3.9878+2	1.5357+1	1.3459+1	1.0582+0	8.4052–1
1.5000+0	3.1567–6	2.5527+4	8.7026–2	4.3109+6	2.8261+6	1.1785+6	3.0597+5	3.9692+2	1.5835+1	1.3641+1	9.7787–1	1.2161+0
2.0000+0	3.4810–6	2.3148+4	1.1802–1	3.9092+6	2.4593+6	1.1629+6	2.8665+5	3.9975+2	1.6433+1	1.3871+1	9.3723–1	1.6255+0
3.0000+0	3.9170–6	2.0572+4	1.7663–1	3.4741+6	2.0684+6	1.1415+6	2.6382+5	4.0638+2	1.7706+1	1.4303+1	9.0247–1	2.5004+0
4.0000+0	4.1790–6	1.9282+4	2.3116–1	3.2563+6	1.8619+6	1.1387+6	2.5526+5	4.1271+2	1.8988+1	1.4666+1	8.8837–1	3.4338+0
5.0000+0	4.3558–6	1.8500+4	2.8215–1	3.1242+6	1.7390+6	1.1368+6	2.4793+5	4.1815+2	2.0249+1	1.4969+1	8.7764–1	4.4017+0
6.0000+0	4.4788–6	1.7991+4	3.3008–1	3.0383+6	1.6613+6	1.1352+6	2.4137+5	4.2265+2	2.1490+1	1.5239+1	8.6889–1	5.3816+0
8.0000+0	4.6290–6	1.7408+4	4.1816–1	2.9397+6	1.5712+6	1.1331+6	2.3504+5	4.2918+2	2.3968+1	1.5678+1	8.5780–1	7.4325+0
1.0000+1	4.7012–6	1.7140+4	4.9769–1	2.8946+6	1.5312+6	1.1332+6	2.2973+5	4.3431+2	2.6369+1	1.6006+1	8.4986–1	9.5128+0
1.5000+1	4.7365–6	1.7012+4	6.6876–1	2.8730+6	1.5146+6	1.1339+6	2.2397+5	4.4610+2	3.2286+1	1.6479+1	8.3560–1	1.4972+1
2.0000+1	4.7449–6	1.6982+4	8.1072–1	2.8679+6	1.5140+6	1.1345+6	2.1904+5	4.5240+2	3.8326+1	1.6883+1	8.2407–1	2.0618+1
3.0000+1	4.7536–6	1.6951+4	1.0377+0	2.8627+6	1.5134+6	1.1344+6	2.1438+5	4.6178+2	5.0349+1	1.7315+1	8.2002–1	3.2214+1
4.0000+1	4.7549–6	1.6947+4	1.2155+0	2.8619+6	1.5130+6	1.1347+6	2.1366+5	4.6880+2	6.2552+1	1.7630+1	8.1885–1	4.4103+1
5.0000+1	4.7566–6	1.6941+4	1.3614+0	2.8609+6	1.5127+6	1.1349+6	2.1276+5	4.7439+2	7.4882+1	1.7892+1	8.1694–1	5.6173+1
6.0000+1	4.7575–6	1.6937+4	1.4850+0	2.8603+6	1.5125+6	1.1351+6	2.1233+5	4.7901+2	8.7284+1	1.8089+1	8.1686–1	6.8377+1
8.0000+1	4.7596–6	1.6930+4	1.6863+0	2.8591+6	1.5121+6	1.1351+6	2.1137+5	4.8679+2	1.1248+2	1.8385+1	8.1628–1	9.3282+1
1.0000+2	4.7616–6	1.6923+4	1.8466+0	2.8579+6	1.5118+6	1.1352+6	2.1041+5	4.9257+2	1.3791+2	1.8644+1	8.1569–1	1.1845+2
1.5000+2	4.7625–6	1.6920+4	2.1445+0	2.8574+6	1.5112+6	1.1352+6	2.1040+5	5.0251+2	2.0179+2	1.8910+1	8.1584–1	1.8207+2
2.0000+2	4.7631–6	1.6918+4	2.3596+0	2.8570+6	1.5108+6	1.1353+6	2.1041+5	5.0920+2	2.6612+2	1.9163+1	8.1606–1	2.4614+2
3.0000+2	4.7635–6	1.6916+4	2.6663+0	2.8568+6	1.5103+6	1.1353+6	2.1068+5	5.1657+2	3.9445+2	1.9605+1	8.1753–1	3.7403+2
4.0000+2	4.7642–6	1.6914+4	2.8856+0	2.8563+6	1.5099+6	1.1353+6	2.1062+5	5.2136+2	5.2338+2	1.9819+1	8.1767–1	5.0275+2
5.0000+2	4.7655–6	1.6909+4	3.0563+0	2.8556+6	1.5096+6	1.1353+6	2.1016+5	5.2503+2	6.5315+2	1.9980+1	8.1628–1	6.3236+2
6.0000+2	4.7658–6	1.6908+4	3.1961+0	2.8554+6	1.5093+6	1.1353+6	2.1023+5	5.2834+2	7.8139+2	2.0133+1	8.1694–1	7.6044+2
8.0000+2	4.7666–6	1.6905+4	3.4173+0	2.8549+6	1.5089+6	1.1353+6	2.1012+5	5.3380+2	1.0388+3	2.0424+1	8.1731–1	1.0176+3
1.0000+3	4.7673–6	1.6903+4	3.5893+0	2.8545+6	1.5086+6	1.1353+6	2.0998+5	5.3827+2	1.2973+3	2.0666+1	8.1753–1	1.2758+3
1.5000+3	4.7678–6	1.6901+4	3.9020+0	2.8542+6	1.5081+6	1.1353+6	2.1022+5	5.4666+2	1.9433+3	2.0890+1	8.1848–1	1.9216+3
2.0000+3	4.7683–6	1.6899+4	4.1240+0	2.8539+6	1.5077+6	1.1353+6	2.1033+5	5.5277+2	2.5931+3	2.1112+1	8.1892–1	2.5711+3
3.0000+3	4.7685–6	1.6898+4	4.4369+0	2.8538+6	1.5071+6	1.1353+6	2.1074+5	5.6208+2	3.8856+3	2.1556+1	8.2054–1	3.8632+3
4.0000+3	4.7687–6	1.6898+4	4.6587+0	2.8536+6	1.5067+6	1.1353+6	2.1098+5	5.6877+2	5.1948+3	2.1741+1	8.2149–1	5.1722+3
5.0000+3	4.7696–6	1.6895+4	4.8307+0	2.8531+6	1.5064+6	1.1353+6	2.1079+5	5.7383+2	6.4840+3	2.1886+1	8.2076–1	6.4613+3
6.0000+3	4.7693–6	1.6895+4	4.9712+0	2.8533+6	1.5062+6	1.1353+6	2.1118+5	5.7800+2	7.7831+3	2.2030+1	8.2230–1	7.7603+3
8.0000+3	4.7693–6	1.6896+4	5.1931+0	2.8533+6	1.5058+6	1.1353+6	2.1161+5	5.8452+2	1.0372+4	2.2318+1	8.2399–1	1.0349+4
1.0000+4	4.7692–6	1.6896+4	5.3653+0	2.8533+6	1.5055+6	1.1353+6	2.1190+5	5.8949+2	1.2946+4	2.2573+1	8.2517–1	1.2923+4
1.5000+4	4.7692–6	1.6896+4	5.6783+0	2.8533+6	1.5049+6	1.1353+6	2.1249+5	5.9868+2	1.9438+4	2.2782+1	8.2745–1	1.9414+4
2.0000+4	4.7693–6	1.6895+4	5.9006+0	2.8533+6	1.5045+6	1.1353+6	2.1279+5	6.0550+2	2.5864+4	2.2991+1	8.2862–1	2.5840+4
3.0000+4	4.7692–6	1.6896+4	6.2137+0	2.8533+6	1.5040+6	1.1353+6	2.1341+5	6.1524+2	3.8883+4	2.3408+1	8.3105–1	3.8859+4

Atomic Weight 101.700												Density 12.410 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+4	4.7694–6	1.6895+4	6.4360+0	2.8532+6	1.5036+6	1.1353+6	2.1371+5	6.2205+2	5.1716+4	2.3636+1	8.3222–1	5.1692+4
5.0000+4	4.7701–6	1.6893+4	6.6085+0	2.8528+6	1.5033+6	1.1353+6	2.1356+5	6.2738+2	6.4669+4	2.3805+1	8.3163–1	6.4644+4
6.0000+4	4.7698–6	1.6894+4	6.7494+0	2.8530+6	1.5030+6	1.1353+6	2.1400+5	6.3177+2	7.7718+4	2.3940+1	8.3333–1	7.7693+4
8.0000+4	4.7697–6	1.6894+4	6.9716+0	2.8530+6	1.5026+6	1.1353+6	2.1445+5	6.3862+2	1.0355+5	2.4209+1	8.3509–1	1.0352+5
1.0000+5	4.7697–6	1.6894+4	7.1439+0	2.8531+6	1.5023+6	1.1353+6	2.1475+5	6.4397+2	1.2956+5	2.4472+1	8.3626–1	1.2953+5


July 4 1991
Atomic Weight 102 905
EEDL Evaluated Electron
Cross Sections
45-Rh
Density 12 410 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
45-Rh


July 4, 1991
Atomic Weight 102 905
EEDL Evaluated Electron
Energy Deposition
45-Rh
Density 12 410 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
45-Rh


July 4 1991
Atomic Weight 102 905
EEDL Evaluated Electron
Shell Cross Sections
45-Rh
Density 12 410 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
45-Rh


July 4, 1991
Atomic Weight 102 905
EEDL Evaluated Electron
Energy Deposition
45-Rh
Density 12 410 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
45-Rh

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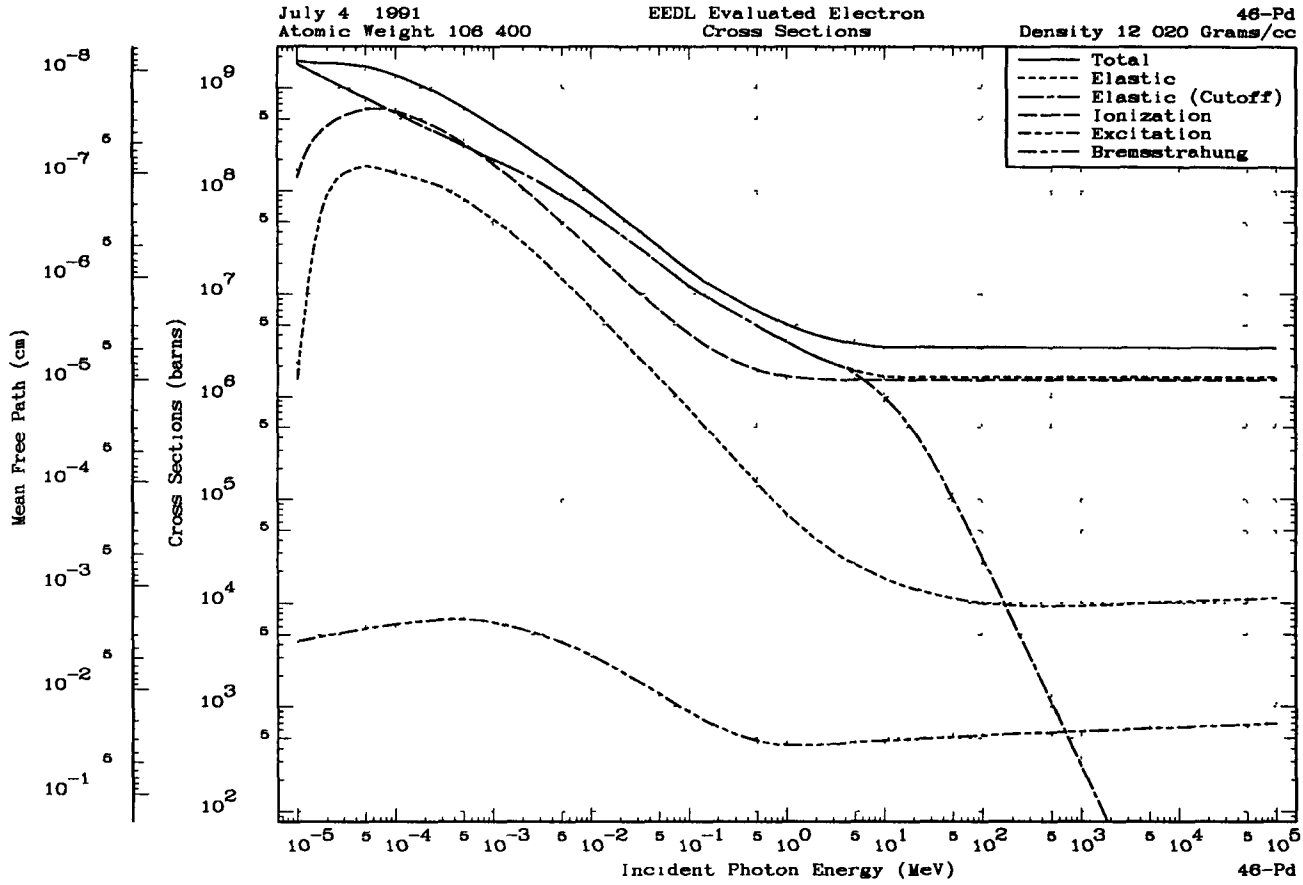
Atomic Weight 102.905 — Density 12.410 Grams/cc

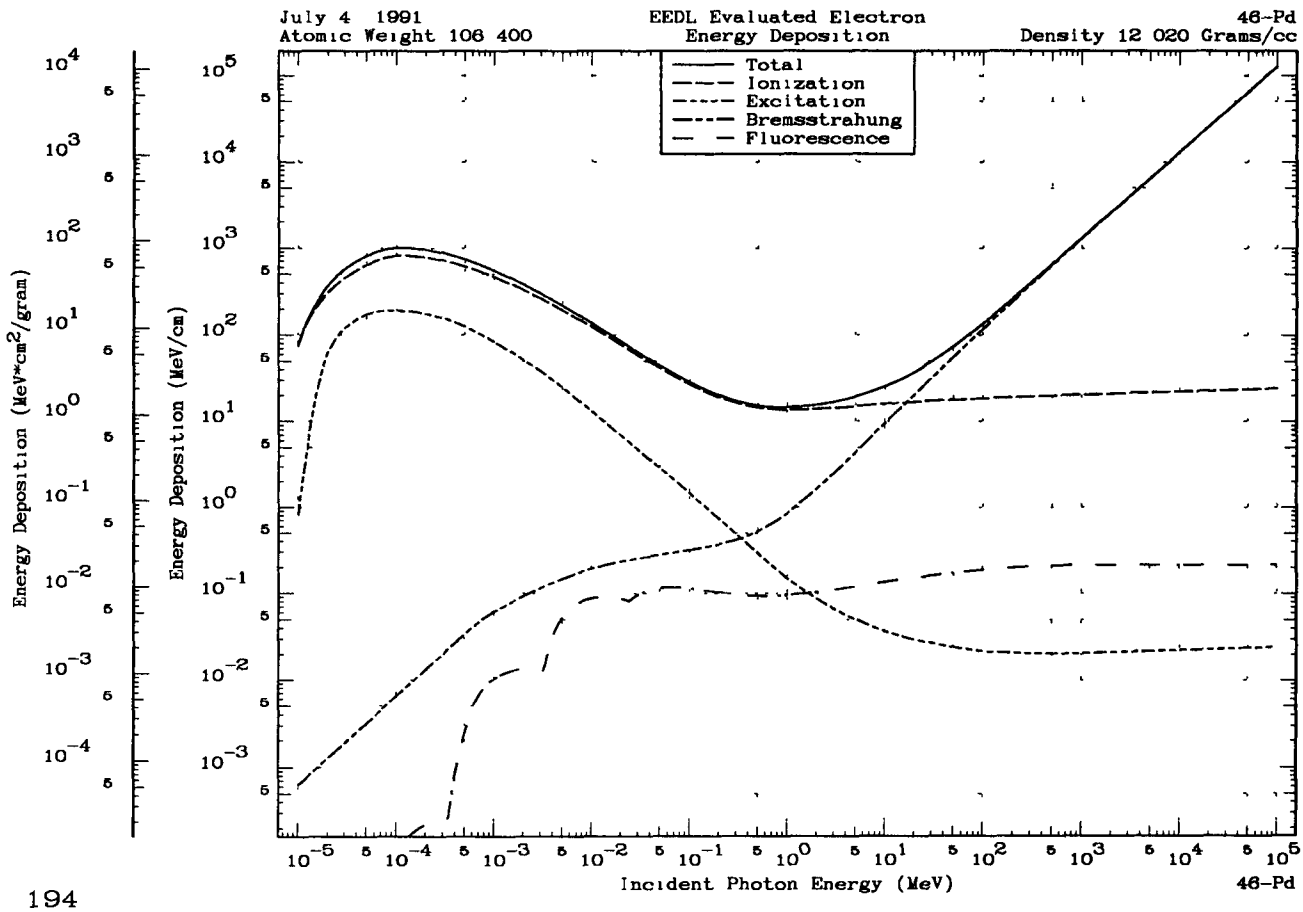
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.0799–9	1.3253+7		2.2647+9	2.2237+9	3.8788+7	2.2253+6	4.3571+3	2.2665+1	2.1478+1	1.1866+0	6.8283–4
N4	1.0240–5	6.1382–9	1.3128+7		2.2432+9	2.1976+9	4.2703+7	2.8864+6	4.3776+3	2.5746+1	2.4188+1	1.5572+0	6.9844–4
	1.0538–5	6.1928–9	1.3012+7		2.2235+9	2.1665+9	5.2846+7	4.0703+6	4.4025+3	3.3694+1	3.1484+1	2.2098+0	7.1786–4
	1.0625–5	6.2071–9	1.2982+7		2.2183+9	2.1576+9	5.6261+7	4.4246+6	4.4097+3	3.6362+1	3.3955+1	2.4066+0	7.2359–4
	1.0898–5	6.2597–9	1.2873+7		2.1997+9	2.1306+9	6.3369+7	5.7141+6	4.4319+3	4.2272+1	3.9146+1	3.1259+0	7.4150–4
	1.1095–5	6.2931–9	1.2805+7		2.1880+9	2.1116+9	6.9696+7	6.6623+6	4.4477+3	4.7490+1	4.3830+1	3.6598+0	7.5449–4
	1.1250–5	6.3200–9	1.2750+7		2.1787+9	2.0972+9	7.4023+7	7.5003+6	4.4599+3	5.1177+1	4.7043+1	4.1335+0	7.6470–4
	1.1719–5	6.3934–9	1.2604+7		2.1537+9	2.0550+9	8.8653+7	1.0011+7	4.4961+3	6.3769+1	5.8197+1	5.5712+0	7.9577–4
	1.2071–5	6.4479–9	1.2497+7		2.1355+9	2.0250+9	9.8171+7	1.2343+7	4.5226+3	7.2563+1	6.5643+1	6.9193+0	8.1924–4
	1.3125–5	6.5932–9	1.2222+7		2.0884+9	1.9424+9	1.2583+8	2.0227+7	4.5982+3	9.9482+1	8.7897+1	1.1584+1	8.9010–4
	1.3359–5	6.6189–9	1.2174+7		2.0803+9	1.9253+9	1.3250+8	2.2454+7	4.6143+3	1.0638+2	9.3461+1	1.2920+1	9.0598–4
	1.3536–5	6.6396–9	1.2136+7		2.0738+9	1.9128+9	1.3676+8	2.4260+7	4.6263+3	1.1109+2	9.7084+1	1.4008+1	9.1796–4
	1.5000–5	6.7830–9	1.1880+7		2.0300+9	1.8175+9	1.7057+8	4.1864+7	4.7214+3	1.5173+2	1.2685+2	2.4879+1	1.0184–3
	1.7500–5	6.9267–9	1.1633+7		1.9879+9	1.6834+9	2.1881+8	8.5668+7	4.8677+3	2.2489+2	1.7330+2	5.1585+1	1.1935–3
	2.0000–5	6.9545–9	1.1587+7		1.9799+9	1.5752+9	2.5951+8	1.4520+8	4.9982+3	3.0594+2	2.1737+2	8.8573+1	1.3729–3
	2.5000–5	6.8334–9	1.1792+7		2.0150+9	1.4097+9	3.2187+8	2.8343+8	5.1920+3	4.6956+2	2.9538+2	1.7418+2	1.7080–3
	3.0000–5	6.6655–9	1.2089+7		2.0658+9	1.2875+9	3.6690+8	4.1137+8	5.3558+3	6.1939+2	3.6472+2	2.5467+2	2.0527–3
	3.5000–5	6.5653–9	1.2274+7		2.0973+9	1.1927+9	3.9780+8	5.0678+8	5.4962+3	7.3833+2	4.2203+2	3.1631+2	2.4029–3
	4.0000–5	6.5102–9	1.2378+7		2.1151+9	1.1162+9	4.2713+8	5.7169+8	5.6206+3	8.4137+2	4.8165+2	3.5973+2	2.7605–3
	5.0000–5	6.5847–9	1.2238+7		2.0911+9	9.9932+8	4.5931+8	6.3249+8	5.8091+3	9.7615+2	5.7157+2	4.0458+2	3.4526–3
N3	5.4780–5	6.6713–9	1.2079+7		2.0640+9	9.5509+8	4.6656+8	6.4230+8	5.8829+3	1.0172+3	6.0296+2	4.1422+2	3.7810–3
	5.6085–5	6.6958–9	1.2034+7		2.0564+9	9.4401+8	4.6861+8	6.4379+8	5.9021+3	1.0282+3	6.1209+2	4.1612+2	3.8713–3
N2	5.8840–5	6.7449–9	1.1947+7		2.0414+9	9.2183+8	4.7277+8	6.4684+8	5.9414+3	1.0513+3	6.3118+2	4.2010+2	4.0627–3
	6.0000–5	6.7687–9	1.1905+7		2.0343+9	9.1294+8	4.7462+8	6.4671+8	5.9574+3	1.0606+3	6.3976+2	4.2088+2	4.1437–3
	6.2500–5	6.8355–9	1.1789+7		2.0144+9	8.9468+8	4.7463+8	6.4508+8	5.9911+3	1.0713+3	6.5032+2	4.2098+2	4.3187–3
	6.5000–5	6.8994–9	1.1679+7		1.9957+9	8.7748+8	4.7472+8	6.4352+8	6.0237+3	1.0822+3	6.6112+2	4.2112+2	4.4946–3
	6.6875–5	6.9459–9	1.1601+7		1.9824+9	8.6521+8	4.7477+8	6.4239+8	6.0475+3	1.0903+3	6.6909+2	4.2125+2	4.6271–3
	7.0000–5	7.0205–9	1.1478+7		1.9613+9	8.4587+8	4.7486+8	6.4058+8	6.0858+3	1.1039+3	6.8236+2	4.2150+2	4.8488–3
	7.2500–5	7.0776–9	1.1385+7		1.9455+9	8.3130+8	4.7500+8	6.3919+8	6.1154+3	1.1134+3	6.9165+2	4.2174+2	5.0272–3
	7.3438–5	7.0985–9	1.1352+7		1.9398+9	8.2603+8	4.7504+8	6.3868+8	6.1262+3	1.1169+3	6.9505+2	4.2183+2	5.0942–3
	8.0000–5	7.2379–9	1.1133+7		1.9024+9	7.9176+8	4.7534+8	6.3531+8	6.1992+3	1.1415+3	7.1889+2	4.2261+2	5.5666–3
N1	8.8520–5	7.4472–9	1.0820+7		1.8489+9	7.5327+8	4.6722+8	6.2843+8	6.2865+3	1.1517+3	7.2938+2	4.2235+2	6.1871–3
	8.9955–5	7.4846–9	1.0766+7		1.8397+9	7.4733+8	4.6596+8	6.2641+8	6.2970+3	1.1531+3	7.3128+2	4.2178+2	6.2868–3
	9.2466–5	7.5488–9	1.0675+7		1.8240+9	7.3727+8	4.6382+8	6.2295+8	6.3152+3	1.1555+3	7.3467+2	4.2082+2	6.4614–3
	9.6233–5	7.6426–9	1.0544+7		1.8017+9	7.2292+8	4.6076+8	6.1798+8	6.3415+3	1.1594+3	7.3993+2	4.1950+2	6.7242–3
	1.0000–4	7.7335–9	1.0420+7	0.0000+0	1.7805+9	7.0938+8	4.5787+8	6.1323+8	6.3670+3	1.1637+3	7.4537+2	4.1831+2	6.9880–3
	1.1250–4	8.0636–9	9.9931+6	1.0790–8	1.7076+9	6.6941+8	4.4194+8	5.9624+8	6.4440+3	1.1533+3	7.4229+2	4.1096+2	7.8667–3
	1.2188–4	8.2951–9	9.7142+6	1.8940–8	1.6599+9	6.4354+8	4.3144+8	5.8496+8	6.4970+3	1.1475+3	7.4114+2	4.0631+2	8.5318–3
	1.3125–4	8.5142–9	9.4642+6	2.7124–8	1.6172+9	6.2048+8	4.2203+8	5.7471+8	6.5463+3	1.1434+3	7.4117+2	4.0225+2	9.2017–3
	1.3594–4	8.6199–9	9.3482+6	3.1227–8	1.5974+9	6.0986+8	4.1762+8	5.6992+8	6.5698+3	1.1418+3	7.4135+2	4.0042+2	9.5383–3
	1.5000–4	8.9531–9	9.0002+6	4.3581–8	1.5379+9	5.8100+8	4.0558+8	5.5135+8	6.6363+3	1.1349+3	7.4307+2	3.9178+2	1.0555–2
	1.7500–4	9.5362–9	8.4500+6	6.5890–8	1.4439+9	5.3854+8	3.8129+8	5.2407+8	6.7249+3	1.1065+3	7.2803+2	3.7842+2	1.2365–2
	2.0000–4	1.0140–8	7.9467+6	8.8772–8	1.3579+9	5.0427+8	3.6148+8	4.9215+8	6.8027+3	1.0789+3	7.1782+2	3.6102+2	1.4196–2
	2.2500–4	1.0751–8	7.4952+6	1.1234–7	1.2808+9	4.7594+8	3.4135+8	4.6346+8	6.8376+3	1.0425+3	6.9818+2	3.4429+2	1.5992–2
	2.5000–4	1.1328–8	7.1137+6	1.3667–7	1.2156+9	4.5195+8	3.2439+8	4.3922+8	6.8689+3	1.0133+3	6.8291+2	3.3037+2	1.7797–2
	2.6250–4	1.1605–8	6.9435+6	1.4908–7	1.1865+9	4.4126+8	3.1679+8	4.2843+8	6.8834+3	1.0004+3	6.7618+2	3.2424+2	1.8703–2
	3.0000–4	1.2400–8	6.4986+6	1.8718–7	1.1105+9	4.1326+8	2.9695+8	4.0023+8	6.9234+3	9.6842+2	6.5992+2	3.0849+2	2.1429–2
M5	3.1796–4	1.2796–8	6.2975+6	2.0592–7	1.0761+9	4.0168+8	2.8741+8	3.8700+8	6.9409+3	9.4797+2	6.4781+2	3.0014+2	2.2740–2
M4	3.2303–4	1.2906–8	6.2435+6	2.1129–7	1.0669+9	3.9860+8	2.8488+8	3.8340+8	6.9457+3	9.4266+2	6.4475+2	2.9789+2	2.3111–2
	3.2784–4	1.3015–8	6.1913+6	2.1640–7	1.0580+9	3.9574+8	2.8252+8	3.7969+8	6.9488+3	9.3752+2	6.4192+2	2.9558+2	2.3460–2
	3.3686–4	1.3217–8	6.0966+6	2.2607–7	1.0418+9	3.9055+8	2.7826+8	3.7298+8	6.9545+3	9.2836+2	6.3691+2	2.9143+2	2.4115–2
	3.4232–4	1.3338–8	6.0413+6	2.3196–7	1.0323+9	3.8750+8	2.7577+8	3.6906+8	6.9579+3	9.2311+2	6.3408+2	2.8900+2	2.4512–2
	3.5265–4	1.3565–8	5.9403+6	2.4321–7	1.0151+9	3.8194+8	2.7122+8	3.6191+8	6.9642+3	9.1348+2	6.2886+2	2.8460+2	2.5262–2
	3.7116–4	1.3964–8	5.7706+6	2.6366–7	9.8606+8	3.7254+8	2.6358+8	3.4994+8	6.9750+3	8.9764+2	6.2038+2	2.7724+2	2.6610–2
	3.8558–4	1.4269–8	5.6474+6	2.7982–7	9.6501+8	3.6569+8	2.5804+8	3.4128+8	6.9831+3	8.8643+2	6.1446+2	2.7194+2	2.7661–2
	4.0000–4	1.4568–8	5.5313+6	2.9619–7	9.4517+8	3.5921+8	2.5283+8	3.3314+8	6.9909+3	8.7616+2	6.0915+2	2.6698+2	2.8713–2
	4.2500–4	1.5112–8	5.3321+6	3.2509–7	9.1115+8	3.4876+8	2.4364+8	3.1874+8	6.9815+3	8.5414+2	5.9661+2	2.5750+2	3.0473–2
	4.4375–4	1.5511–8	5.1949+6	3.4723–7	8.8770+8	3.4150+8	2.3732+8	3.0887+8	6.9748+3	8.3941+2	5.8835+2	2.5102+2	3.1792–2
	4.7188–4	1.6097–8	5.0060+6	3.8113–7	8.5542+8	3.3144+8	2.2864+8	2.9534+8	6.9654+3	8.1980+2	5.7759+2	2.4217+2	3.3767–2
M3	4.9466–4	1.6560–8	4.8660+6	4.0917–7	8.3149+8	3.2391+8	2.2221+8	2.8536+8	6.9581+3	8.0583+2	5.7013+2	2.3567+2	3.5365–2
	5.0000–4	1.6672–8	4.8332+6	4.1580–7	8.2588+8	3.2222+8	2.2078+8	2.8288+8	6.9564+3	8.0268+2	5.6858+2	2.3406+2	3.5739–2
	5.1250–4	1.6931–8	4.7592+6	4.3146–7	8.1324+8	3.1837+8	2.1729+8	2.7757+8	6.9526+3	7.9410+2	5.6367+2	2.3039+2	3.6615–2
M2	5.2015–4	1.7089–8	4.7154+6	4.4113–7	8.0575+8	3.1608+8	2.1523+8	2.7443+8	6.9503+3	7.8906+2	5.6080+2	2.2822+2	3.7151–2
	5.2514–4	1.7193–8	4.6868+6	4.4746–7	8.0087+8	3.1462+8	2.1391+8	2.7233+8	6.9460+3	7.8584+2	5.5901+2	2.2679+2	3.7480–2
	5.3450–4	1.7387–8	4.6344+6	4.5942–7	7.9192+8	3.1192+8	2.1150+8	2.6849+8	6.9381+3	7.8001+2	5.5579+2	2.2418+2	3.8097–2
	5.5000–4	1.7706–8	4.5510+6	4.7941–7	7.7766+8	3.0761+8	2.0766+8	2.6239+8	6.9253+3	7.7089+2	5.5082+2	2.2003+2	3.9117–2
	5.5625–4	1.7834–8	4.5184+6	4.8753–7	7.7210+8	3.0592+8	2.0616+8	2.6001+8	6.9202+3	7.6728+2	5.4881+2	2.1842+2	3.9528–2
	6.0000–4	1.8711–8	4.3066+6	5.4542–7	7.3591+8	2.9485+8	1.9640+8	2.4465+8	6.8863+3	7.4438+2	5.3632+2	2.0801+2	4.2395–2
M1	6.1595–4	1.9026–8	4.2352+6	5.6698–7	7.2370+8	2.9111+8	1.9297+8	2.3961+8	6.8691+3	7.3547+2	5.3097+2	2.0445+2	4.3392–2
	6.2745–4	1.9257–8	4.1845+6	5.8269–7	7.1503+8	2.8850+8	1.9056+8	2.3596+8	6.8568+3	7.2907+2	5.2717+2	2.0186+2	4.4105–2
	6.4902–4	1.9685–8	4.0935+6	6.1250–7	6.9949+8	2.8381+8	1.8624+8	2.2943+8	6.8344+3	7.1779+2	5.2049+2	1.9725+2	4.5440–2
	6.5000–4	1.9704–8	4.0895+6	6.1387–7	6.9880+8	2.8360+8	1.8605+8	2.2915+8	6.8334+3	7.1729+2	5.2020+2	1.9705+2	4.5500–2
	6.8677–4	2.0421–8	3.9460+6	6.6577–7	6.7428+8	2.7613+8	1.7923+8	2.1892+8	6.7970+3	6.9936+2	5.0949+2	1.8983+2	4.7765–2
	7.2500–4	2.1150–8	3.8099+6	7.2110–7	6.5103+8	2.6896+8	1.7277+8	2.0929+8	6.7613+3	6.8284+2	4.9974+2	1.8305+2	5.0109–2
	7.4338–4	2.1496–8	3.7487+6	7.4817–7	6.4057+8	2.6571+8	1.6986+8	2.0499+8	6.7449+3	6.7536+2	4.9529+2	1.8002+2	5.1231–2
	8.0000–4	2.2539–8	3.5752+6	8.3331–7	6.1092+8	2.5641+8	1.6163+8	1.9288+8	6.6970+3	6.5470+2	4.8312+2	1.7152+2	5.4672–2
	9.0000–4	2.4361–8	3.3077+6	9.9053–7	5.6522+8	2.4223+8	1.4859+8	1.7439+8	6.5635+3	6.1775+2	4.5976+2	1.5793+2	5.9499–2
	1.0000–3	2.6107–8	3.0865+6	1.1565–6	5.2742+8	2.3021+8	1.3784+8	1.5936+8	6.4463+3	5.8779+2	4.4080+2	1.4693+2	6.4249–2
	1.1250–3	2.8268–8	2.8506+6	1.3761–6	4.8710+8	2.1739+8	1.2618+8	1.4352+8	6.2743+3	5.5104+2	4.1632+2	1.3465+2	6.8667–2
	1.2500–3	3.0341–8	2.6558+6	1.6093–6	4.5382+8	2.0653+8	1.1659+8	1.3069+8	6.1244+3	5.2119+2	3.9638+2	1.2473+2	7.3011–2

Atomic Weight 102.905 — Density 12.410 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.3125–3	3.1348–8	2.5705+6	1.7307–6	4.3925+8	2.0169+8	1.1241+8	1.2515+8	6.0561+3	5.0823+2	3.8770+2	1.2046+2	7.5157–2
1.5000–3	3.4263–8	2.3518+6	2.1120–6	4.0187+8	1.8901+8	1.0171+8	1.1114+8	5.8733+3	4.7569+2	3.6593+2	1.0968+2	8.1499–2
1.7500–3	3.8069–8	2.1167+6	2.6610–6	3.6169+8	1.7495+8	9.0159+7	9.6575+7	5.6480+3	4.3561+2	3.3777+2	9.7752+1	8.8751–2
2.0000–3	4.1678–8	1.9334+6	3.2559–6	3.3037+8	1.6363+8	8.1232+7	8.5508+7	5.4598+3	4.0522+2	3.1641+2	8.8719+1	9.5828–2
2.5000–3	4.8849–8	1.6496+6	4.5764–6	2.8188+8	1.4514+8	6.7848+7	6.8885+7	5.1197+3	3.5325+2	2.7899+2	7.4149+1	1.0763–1
3.0000–3	5.5542–8	1.4508+6	6.0679–6	2.4791+8	1.3159+8	5.8580+7	5.7733+7	4.8576+3	3.1786+2	2.5335+2	6.4389+1	1.1899–1
L3 3.0045–3	5.5600–8	1.4493+6	6.0821–6	2.4765+8	1.3148+8	5.8508+7	5.7653+7	4.8554+3	3.1756+2	2.5313+2	6.4314+1	1.1908–1
3.1289–3	5.7218–8	1.4083+6	6.4790–6	2.4065+8	1.2860+8	5.6584+7	5.5462+7	4.7945+3	3.0951+2	2.4711+2	6.2271+1	1.2161–1
L2 3.1515–3	5.7509–8	1.4012+6	6.5520–6	2.3943+8	1.2809+8	5.6250+7	5.5083+7	4.7838+3	3.0811+2	2.4607+2	6.1918+1	1.2206–1
3.2576–3	5.8922–8	1.3676+6	6.8999–6	2.3369+8	1.2572+8	5.4737+7	5.3232+7	4.7347+3	3.0169+2	2.4137+2	6.0196+1	1.2419–1
3.3467–3	6.0097–8	1.3408+6	7.1979–6	2.2912+8	1.2381+8	5.3534+7	5.1768+7	4.6951+3	2.9661+2	2.3765+2	5.8834+1	1.2597–1
L1 3.3912–3	6.0680–8	1.3279+6	7.3485–6	2.2692+8	1.2289+8	5.2955+7	5.1067+7	4.6759+3	2.9416+2	2.3586+2	5.8181+1	1.2686–1
3.4432–3	6.1365–8	1.3131+6	7.5261–6	2.2439+8	1.2184+8	5.2292+7	5.0254+7	4.6511+3	2.9130+2	2.3376+2	5.7408+1	1.2772–1
3.5434–3	6.2675–8	1.2857+6	7.8733–6	2.1969+8	1.1987+8	5.1063+7	4.8756+7	4.6047+3	2.8599+2	2.2988+2	5.5981+1	1.2938–1
3.6733–3	6.4357–8	1.2521+6	8.3329–6	2.1395+8	1.1745+8	4.9562+7	4.6939+7	4.5471+3	2.7955+2	2.2517+2	5.4250+1	1.3152–1
3.7216–3	6.4976–8	1.2401+6	8.5062–6	2.1191+8	1.1658+8	4.9030+7	4.6298+7	4.5264+3	2.7727+2	2.2349+2	5.3639+1	1.3231–1
3.7717–3	6.5617–8	1.2280+6	8.6877–6	2.0985+8	1.1570+8	4.8489+7	4.5650+7	4.5053+3	2.7495+2	2.2180+2	5.3021+1	1.3313–1
4.0000–3	6.8502–8	1.1763+6	9.5332–6	2.0101+8	1.1191+8	4.6187+7	4.2906+7	4.4137+3	2.6515+2	2.1461+2	5.0405+1	1.3683–1
4.5000–3	7.4762–8	1.0778+6	1.1493–5	1.8418+8	1.0445+8	4.1835+7	3.7891+7	4.2284+3	2.4525+2	1.9967+2	4.5437+1	1.4422–1
5.0000–3	8.0810–8	9.9715+5	1.3602–5	1.7039+8	9.8191+7	3.8293+7	3.3903+7	4.0692+3	2.2920+2	1.8757+2	4.1482+1	1.5143–1
5.5000–3	8.6811–8	9.2823+5	1.5853–5	1.5861+8	9.2719+7	3.5334+7	3.0558+7	3.9212+3	2.1514+2	1.7696+2	3.8024+1	1.5766–1
6.0000–3	9.2648–8	8.6974+5	1.8243–5	1.4862+8	8.7990+7	3.2833+7	2.7793+7	3.7909+3	2.0334+2	1.6802+2	3.5161+1	1.6376–1
7.0000–3	1.0410–7	7.7406+5	2.3426–5	1.3227+8	8.0007+7	2.8795+7	2.3465+7	3.5507+3	1.8291+2	1.5225+2	3.0494+1	1.7339–1
8.0000–3	1.1508–7	7.0021+5	2.9139–5	1.1965+8	7.3679+7	2.5703+7	2.0264+7	3.3550+3	1.6739+2	1.4017+2	2.7033+1	1.8274–1
9.0000–3	1.2596–7	6.3973+5	3.5363–5	1.0932+8	6.8282+7	2.3239+7	1.7792+7	3.1805+3	1.5416+2	1.2975+2	2.4226+1	1.8997–1
1.0000–2	1.3651–7	5.9029+5	4.2085–5	1.0087+8	6.3791+7	2.1236+7	1.5838+7	3.0320+3	1.4349+2	1.2129+2	2.2002+1	1.9706–1
1.2500–2	1.6204–7	4.9728+5	6.0929–5	8.4974+7	5.5062+7	1.7537+7	1.2372+7	2.7155+3	1.2240+2	1.0436+2	1.7835+1	2.1011–1
1.5000–2	1.8623–7	4.3270+5	8.2659–5	7.3939+7	4.8824+7	1.5000+7	1.0112+7	2.4816+3	1.0800+2	9.2672+1	1.5106+1	2.2274–1
1.7500–2	2.0887–7	3.8580+5	1.0708–4	6.5924+7	4.4080+7	1.3148+7	8.6944+6	2.2833+3	9.6966+1	8.3413+1	1.3322+1	2.3095–1
2.0000–2	2.3063–7	3.4940+5	1.3405–4	5.9704+7	4.0344+7	1.1730+7	7.6279+6	2.1244+3	8.8523+1	7.6301+1	1.1982+1	2.3908–1
K 2.3191–2	2.5819–7	3.1210+5	1.7205–4	5.3331+7	3.6556+7	1.0345+7	6.4292+6	1.9564+3	7.9566+1	6.8987+1	1.0332+1	2.4721–1
2.3617–2	2.6168–7	3.0794+5	1.7744–4	5.2620+7	3.6102+7	1.0187+7	6.3282+6	1.9363+3	7.8581+1	6.8133+1	1.0200+1	2.4802–1
2.4415–2	2.6818–7	3.0047+5	1.8771–4	5.1344+7	3.5288+7	9.9062+6	6.1478+6	1.9000+3	7.6818+1	6.6606+1	9.9628+0	2.4956–1
2.5811–2	2.7942–7	2.8839+5	2.0623–4	4.9279+7	3.3967+7	9.4530+6	5.8572+6	1.8407+3	7.3975+1	6.4141+1	9.5817+0	2.5226–1
2.6858–2	2.8774–7	2.8005+5	2.2058–4	4.7854+7	3.3052+7	9.1417+6	5.6579+6	1.7995+3	7.2022+1	6.2446+1	9.3208+0	2.5429–1
2.8429–2	3.0006–7	2.6855+5	2.4281–4	4.5889+7	3.1788+7	8.7146+6	5.3847+6	1.7421+3	6.9341+1	6.0120+1	8.9637+0	2.5735–1
3.0000–2	3.1219–7	2.5811+5	2.6586–4	4.4105+7	3.0636+7	8.3289+6	5.1384+6	1.6896+3	6.6921+1	5.8018+1	8.6424+0	2.6041–1
3.2500–2	3.3199–7	2.4272+5	3.0426–4	4.1475+7	2.8905+7	7.7960+6	4.7725+6	1.6129+3	6.3341+1	5.4954+1	8.1230+0	2.6397–1
3.6250–2	3.6102–7	2.2320+5	3.6568–4	3.8141+7	2.6700+7	7.1236+6	4.3150+6	1.5139+3	5.8824+1	5.1080+1	7.4744+0	2.6942–1
4.0000–2	3.8987–7	2.0669+5	4.3159–4	3.5318+7	2.4857+7	6.5674+6	3.8920+6	1.4299+3	5.5004+1	4.7870+1	6.8591+0	2.7491–1
4.5000–2	4.2795–7	1.8829+5	5.2621–4	3.2175+7	2.2757+7	5.9728+6	3.4442+6	1.3347+3	5.0745+1	4.4286+1	6.1783+0	2.8041–1
5.0000–2	4.6512–7	1.7325+5	6.2828–4	2.9604+7	2.1028+7	5.4868+6	3.0876+6	1.2550+3	4.7271+1	4.1349+1	5.6356+0	2.8603–1
6.0000–2	5.3671–7	1.5014+5	8.5284–4	2.5655+7	1.8342+7	4.7546+6	2.5576+6	1.1287+3	4.1897+1	3.6802+1	4.7997+0	2.9518–1
8.0000–2	6.6778–7	1.2067+5	1.3754–3	2.0619+7	1.4891+7	3.8249+6	1.9028+6	9.6300+2	3.4859+1	3.0822+1	3.7256+0	3.1068–1
1.0000–1	7.8305–7	1.0291+5	1.9886–3	1.7584+7	1.2789+7	3.2599+6	1.5344+6	8.5286+2	3.0481+1	2.7056+1	3.1012+0	3.2349–1
1.2500–1	9.0512–7	8.9027+4	2.8606–3	1.5213+7	1.1155+7	2.8162+6	1.2412+6	7.6347+2	2.6931+1	2.4015+1	2.5797+0	3.3643–1
1.5000–1	1.0185–6	7.9114+4	3.8351–3	1.3519+7	9.9755+6	2.4989+6	1.0437+6	6.9743+2	2.4419+1	2.1840+1	2.2290+0	3.5012–1
2.0000–1	1.2065–6	6.6789+4	6.0254–3	1.1413+7	8.4982+6	2.1167+6	7.9730+5	6.1343+2	2.1306+1	1.9164+1	1.7681+0	3.7445–1
3.0000–1	1.5085–6	5.3416+4	1.1089–2	9.1276+6	6.8200+6	1.7373+6	5.6983+5	5.2334+2	1.8267+1	1.6512+1	1.3308+0	4.2433–1
4.0000–1	1.7581–6	4.5834+4	1.6783–2	7.8320+6	5.8125+6	1.5524+6	4.6657+5	4.7830+2	1.6877+1	1.5270+1	1.1292+0	4.7786–1
5.0000–1	1.9718–6	4.0867+4	2.2836–2	6.9832+6	5.1316+6	1.4453+6	4.0585+5	4.5311+2	1.6171+1	1.4625+1	1.0100+0	5.3541–1
6.0000–1	2.1584–6	3.7333+4	2.9102–2	6.3794+6	4.6349+6	1.3761+6	3.6788+5	4.3796+2	1.5747+1	1.4215+1	9.3635–1	5.9619–1
8.0000–1	2.4756–6	3.2550+4	4.1921–2	5.5621+6	3.9492+6	1.2948+6	3.1761+5	4.2288+2	1.5457+1	1.3891+1	8.3715–1	7.2845–1
1.0000+0	2.7318–6	2.9497+4	5.4883–2	5.0404+6	3.5019+6	1.2488+6	2.8928+5	4.1666+2	1.5404+1	1.3750+1	7.8304–1	8.7101–1
1.5000+0	3.2060–6	2.5134+4	8.6827–2	4.2949+6	2.8450+6	1.1974+6	2.5208+5	4.1423+2	1.5904+1	1.3930+1	7.1429–1	1.2596+0
2.0000+0	3.5345–6	2.2798+4	1.1767–1	3.8957+6	2.4808+6	1.1816+6	2.3288+5	4.1782+2	1.6520+1	1.4162+1	6.7530–1	1.6823+0
3.0000+0	3.9742–6	2.0276+4	1.7593–1	3.4647+6	2.0928+6	1.1599+6	2.1155+5	4.2521+2	1.7826+1	1.4600+1	6.4221–1	2.5840+0
4.0000+0	4.2402–6	1.9004+4	2.3007–1	3.2473+6	1.8881+6	1.1572+6	2.0162+5	4.3106+2	1.9134+1	1.4967+1	6.2286–1	3.5450+0
5.0000+0	4.4195–6	1.8233+4	2.8064–1	3.1156+6	1.7661+6	1.1552+6	1.9384+5	4.3607+2	2.0425+1	1.5274+1	6.0926–1	4.5417+0
6.0000+0	4.5428–6	1.7738+4	3.2813–1	3.0310+6	1.6890+6	1.1536+6	1.8795+5	4.4022+2	2.1698+1	1.5548+1	6.0089–1	5.5495+0
8.0000+0	4.6951–6	1.7163+4	4.1529–1	2.9327+6	1.5994+6	1.1515+6	1.8137+5	4.4683+2	2.4244+1	1.5995+1	5.8798–1	7.6609+0
1.0000+1	4.7683–6	1.6899+4	4.9386–1	2.8877+6	1.5597+6	1.1516+6	1.7592+5	4.5204+2	2.6708+1	1.6328+1	5.7819–1	9.8017+0
1.5000+1	4.8055–6	1.6768+4	6.6251–1	2.8653+6	1.5429+6	1.1523+6	1.6964+5	4.6431+2	3.2794+1	1.6808+1	5.6230–1	1.5423+1
2.0000+1	4.8123–6	1.6744+4	8.0212–1	2.8613+6	1.5422+6	1.1529+6	1.6573+5	4.7088+2	3.9011+1	1.7218+1	5.5398–1	2.1239+1
3.0000+1	4.8237–6	1.6705+4	1.0248+0	2.8545+6	1.5416+6	1.1528+6	1.5960+5	4.8071+2	5.1380+1	1.7652+1	5.4244–1	3.3186+1
4.0000+1	4.8263–6	1.6696+4	1.1989+0	2.8530+6	1.5412+6	1.1532+6	1.5809+5	4.8809+2	6.3950+1	1.7977+1	5.3836–1	4.5435+1
5.0000+1	4.8286–6	1.6688+4	1.3415+0	2.8516+6	1.5409+6	1.1534+6	1.5686+5	4.9402+2	7.6639+1	1.8239+1	5.3522–1	5.7865+1
6.0000+1	4.8306–6	1.6681+4	1.4622+0	2.8505+6	1.5406+6	1.1535+6	1.5581+5	4.9891+2	8.9404+1	1.8438+1	5.3267–1	7.0433+1
8.0000+1	4.8328–6	1.6674+4	1.6586+0	2.8491+6	1.5402+6	1.1536+6	1.5481+5	5.0696+2	1.1537+2	1.8740+1	5.3129–1	9.6097+1
1.0000+2	4.8342–6	1.6669+4	1.8148+0	2.8483+6	1.5399+6	1.1537+6	1.5427+5	5.1290+2	1.4155+2	1.9004+1	5.3150–1	1.2202+2
1.5000+2	4.8349–6	1.6666+4	2.1050+0	2.8479+6	1.5393+6	1.1537+6	1.5435+5	5.2300+2	2.0731+2	1.9272+1	5.3191–1	1.8750+2
2.0000+2	4.8361–6	1.6662+4	2.3143+0	2.8472+6	1.5389+6	1.1537+6	1.5406+5	5.2967+2	2.7349+2	1.9527+1	5.3103–1	2.5343+2
3.0000+2	4.8373–6	1.6658+4	2.6125+0	2.8465+6	1.5383+6	1.1538+6	1.5384+5	5.3757+2	4.0574+2	1.9973+1	5.3053–1	3.8524+2
4.0000+2	4.8386–6	1.6654+4	2.8257+0	2.8457+6	1.5379+6	1.1538+6	1.5347+5	5.4284+2	5.3880+2	2.0193+1	5.2951–1	5.1808+2
5.0000+2	4.8405–6	1.6647+4	2.9917+0	2.8446+6	1.5376+6	1.1538+6	1.5270+5	5.4695+2	6.7069+2	2.0355+1	5.2711–1	6.4981+2
6.0000+2	4.8411–6	1.6645+4	3.1278+0	2.8442+6	1.5373+6	1.1538+6	1.5256+5	5.5034+2	8.0339+2	2.0516+1	5.2689–1	7.8235+2
8.0000+2	4.8426–6	1.6640+4	3.3429+0	2.8434+6	1.5369+6	1.1538+6	1.5212+5	5.5619+2	1.0684+3	2.0811+1	5.2588–1	1.0471+3
1.0000+3	4.8437–6	1.6636+4	3.5100+0	2.8427+6	1.5366+6	1.1538+6	1.5174+5	5.6077+2	1.3359+3	2.1051+1	5.2508–1	1.3143+3
1.5000+3	4.8453–6	1.6630+4	3.8135+0	2.8418+6	1.5360+6	1.1538+6	1.5136+5	5.6954+2	2.0038+3	2.1276+1	5.2377–1	1.9820+3
2.0000+3	4.8465–6	1.6627+4	4.0289+0	2.8411+6	1.5356+6	1.1538+6	1.5111+5	5.7609+2	2.6698+3	2.1500+1	5.2290–1	2.6478+3

Atomic Weight 102.905												Density 12.410 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+3	4.8477–6	1.6622+4	4.3325+0	2.8404+6	1.5351+6	1.1538+6	1.5096+5	5.8567+2	4.0082+3	2.1948+1	5.2239–1	3.9858+3
4.0000+3	4.8487–6	1.6619+4	4.5478+0	2.8398+6	1.5346+6	1.1538+6	1.5076+5	5.9272+2	5.3459+3	2.2139+1	5.2174–1	5.3232+3
5.0000+3	4.8501–6	1.6614+4	4.7146+0	2.8390+6	1.5343+6	1.1538+6	1.5026+5	5.9826+2	6.6935+3	2.2285+1	5.1999–1	6.6707+3
6.0000+3	4.8503–6	1.6613+4	4.8509+0	2.8389+6	1.5341+6	1.1538+6	1.5040+5	6.0235+2	8.0192+3	2.2430+1	5.2050–1	7.9963+3
8.0000+3	4.8509–6	1.6611+4	5.0662+0	2.8385+6	1.5337+6	1.1538+6	1.5044+5	6.0885+2	1.0694+4	2.2721+1	5.2065–1	1.0670+4
1.0000+4	4.8514–6	1.6610+4	5.2329+0	2.8382+6	1.5333+6	1.1538+6	1.5045+5	6.1394+2	1.3393+4	2.2979+1	5.2072–1	1.3369+4
1.5000+4	4.8522–6	1.6607+4	5.5364+0	2.8377+6	1.5328+6	1.1538+6	1.5054+5	6.2386+2	2.0000+4	2.3189+1	5.2101–1	1.9976+4
2.0000+4	4.8532–6	1.6604+4	5.7521+0	2.8372+6	1.5324+6	1.1538+6	1.5041+5	6.3099+2	2.6692+4	2.3399+1	5.2057–1	2.6668+4
3.0000+4	4.8540–6	1.6601+4	6.0563+0	2.8367+6	1.5318+6	1.1538+6	1.5049+5	6.4101+2	3.9943+4	2.3819+1	5.2087–1	3.9918+4
4.0000+4	4.8548–6	1.6598+4	6.2722+0	2.8362+6	1.5314+6	1.1538+6	1.5039+5	6.4820+2	5.3337+4	2.4051+1	5.2050–1	5.3312+4
5.0000+4	4.8561–6	1.6593+4	6.4396+0	2.8355+6	1.5310+6	1.1538+6	1.4995+5	6.5373+2	6.6607+4	2.4226+1	5.1898–1	6.6582+4
6.0000+4	4.8562–6	1.6593+4	6.5765+0	2.8354+6	1.5308+6	1.1538+6	1.5014+5	6.5825+2	7.9866+4	2.4362+1	5.1963–1	7.9841+4
8.0000+4	4.8568–6	1.6591+4	6.7925+0	2.8351+6	1.5304+6	1.1538+6	1.5020+5	6.6543+2	1.0661+5	2.4633+1	5.1985–1	1.0659+5
1.0000+5	4.8573–6	1.6589+4	6.9598+0	2.8348+6	1.5301+6	1.1538+6	1.5020+5	6.7101+2	1.3341+5	2.4898+1	5.1985–1	1.3339+5


July 4 1991
Atomic Weight 106 400
EEDL Evaluated Electron
Cross Sections
46-Pd
Density 12 020 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
46-Pd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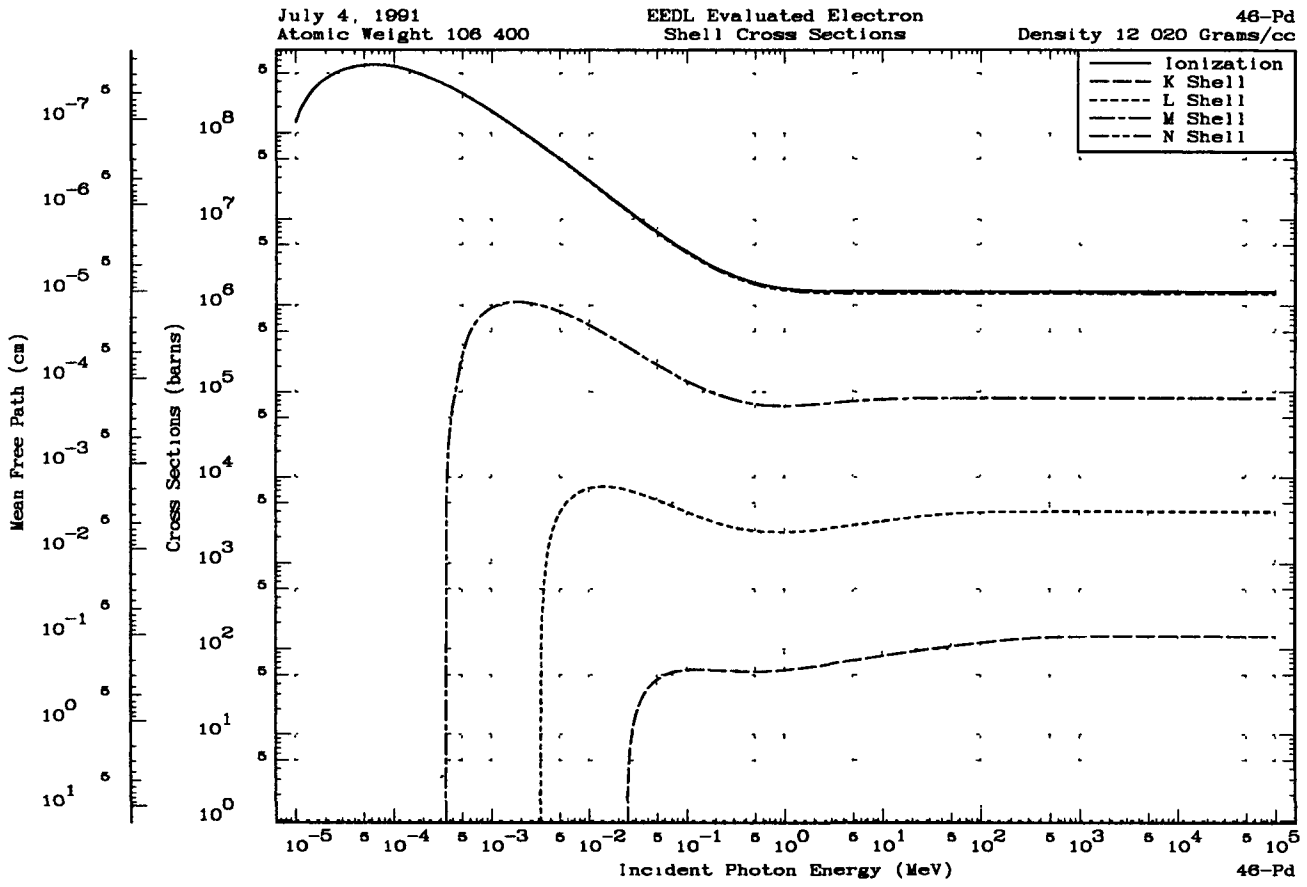
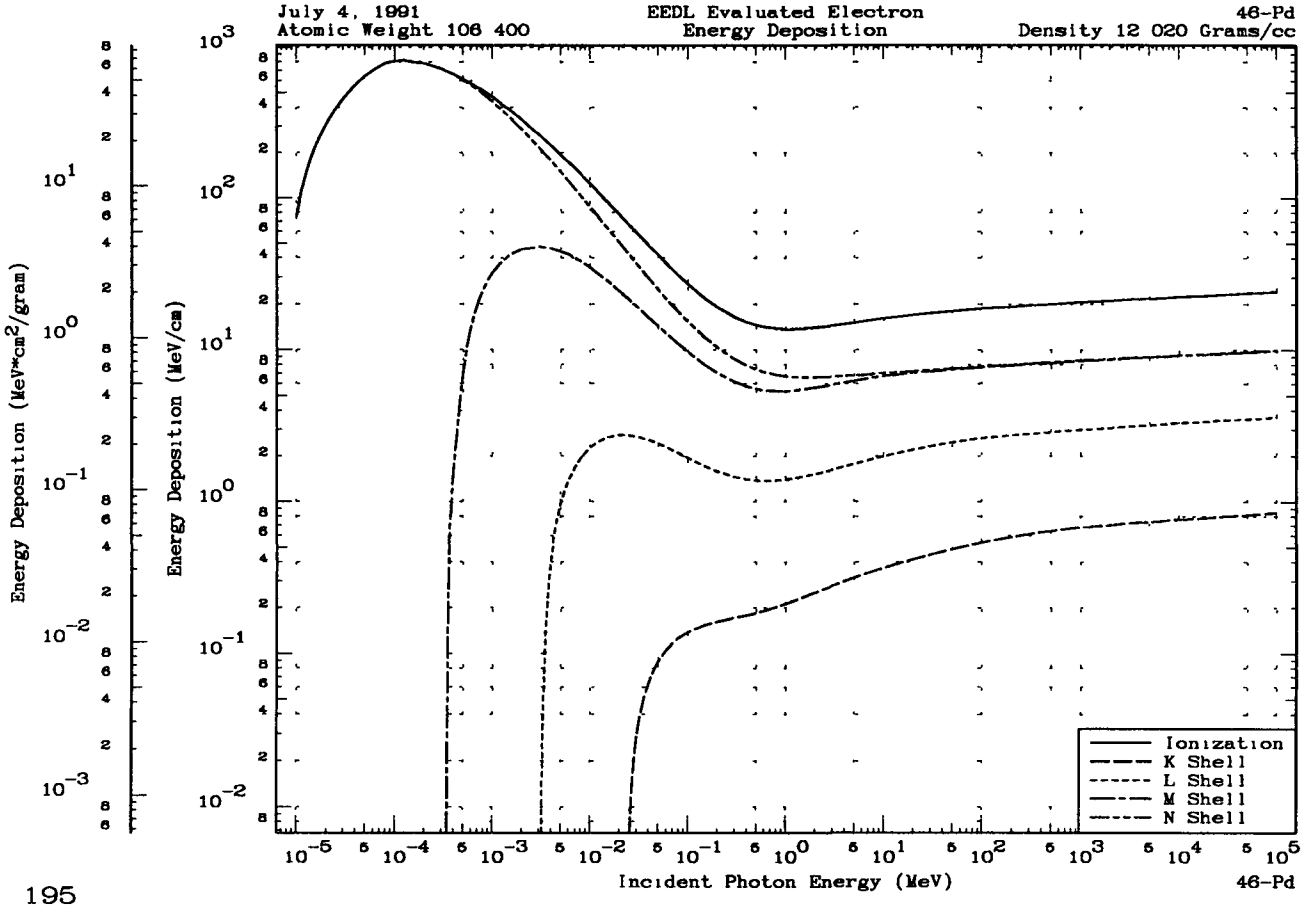
Atomic Weight 106 400
EEDL Evaluated Electron
Energy Deposition
46-Pd
Density 12 020 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
46-Pd


July 4, 1991
Atomic Weight 106 400
EEDL Evaluated Electron
Shell Cross Sections
46-Pd
Density 12 020 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
46-Pd


July 4, 1991
Atomic Weight 106 400
EEDL Evaluated Electron
Energy Deposition
46-Pd
Density 12 020 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
46-Pd

195

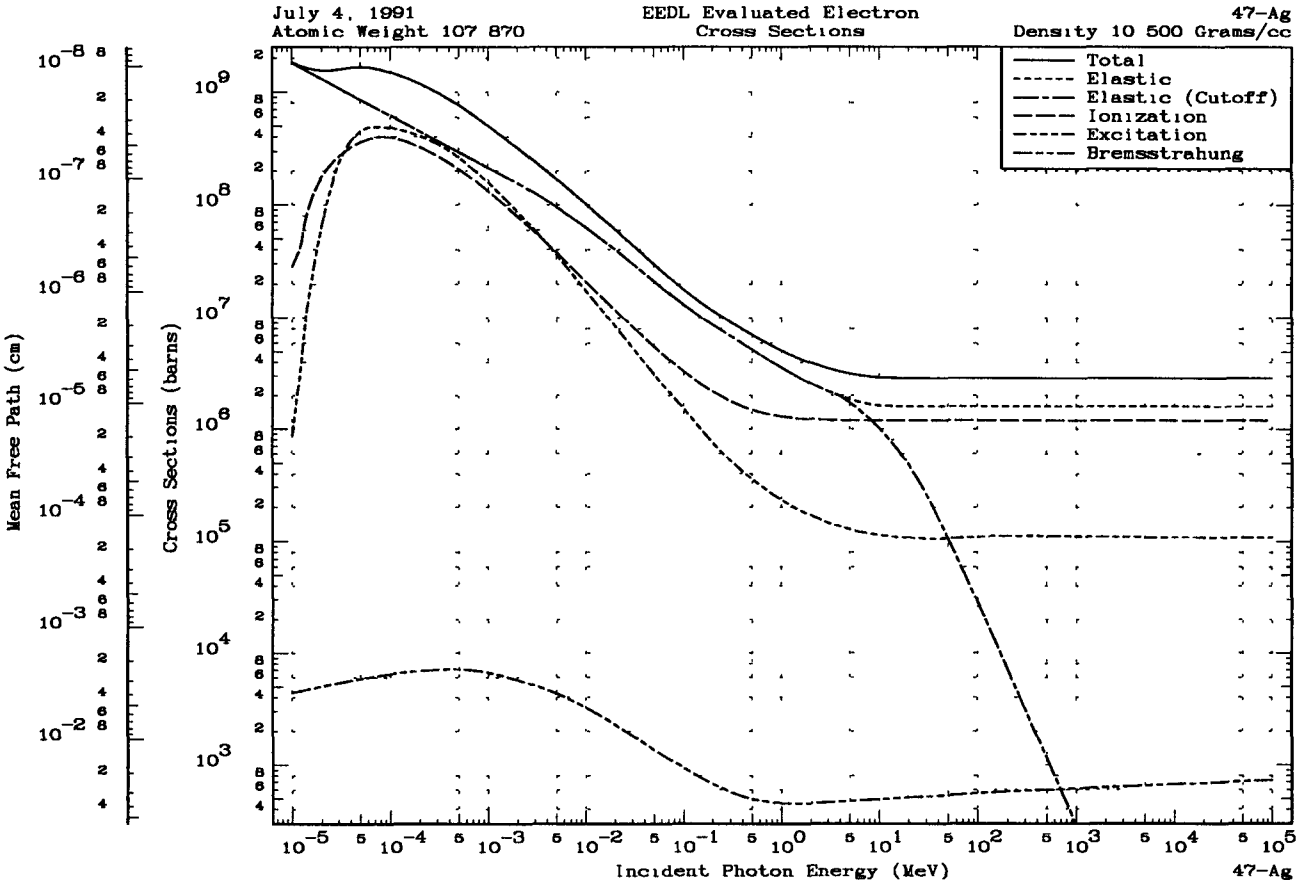
Atomic Weight 106.400 Density 12.020 Grams/cc

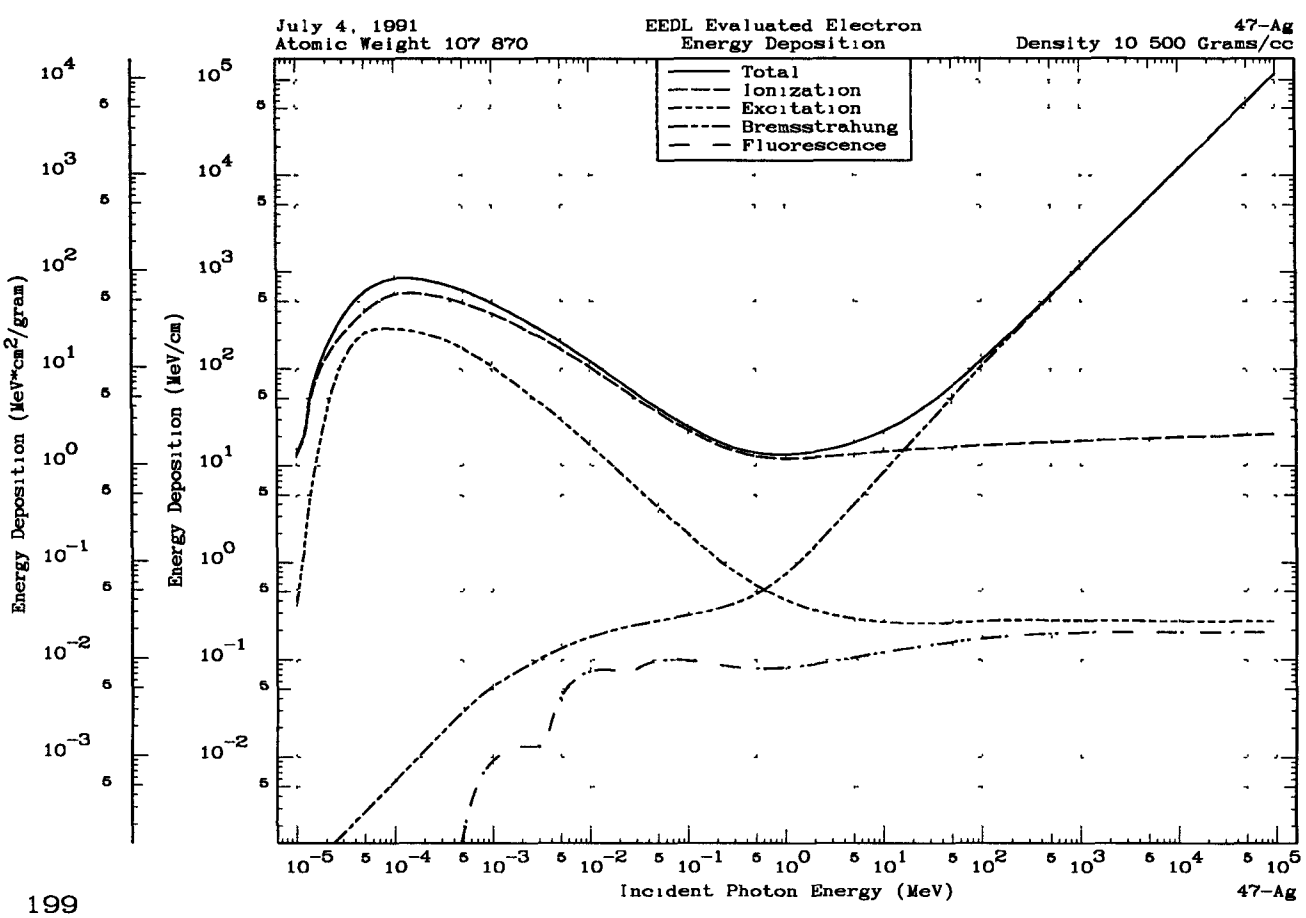
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.1239–9	1.0241+7		1.8093+9	1.6753+9	1.3256+8	1.4658+6	4.2768+3	7.6126+1	7.5305+1	8.2087–1	6.2794–4
	1.1250–5	8.2533–9	1.0080+7		1.7810+9	1.5860+9	1.9097+8	3.9776+6	4.3781+3	1.1457+2	1.1227+2	2.3002+0	7.0333–4
	1.3125–5	8.3949–9	9.9101+6		1.7509+9	1.4763+9	2.6136+8	1.3262+7	4.5145+3	1.6935+2	1.6131+2	8.0331+0	8.1881–4
	1.5000–5	8.4610–9	9.8328+6		1.7373+9	1.3874+9	3.1957+8	3.0278+7	4.6360+3	2.2538+2	2.0621+2	1.9169+1	9.3694–4
	1.7500–5	8.4934–9	9.7953+6		1.7306+9	1.2914+9	3.7975+8	5.9438+7	4.7803+3	2.9804+2	2.5837+2	3.9663+1	1.0982–3
	2.0000–5	8.4996–9	9.7881+6		1.7294+9	1.2137+9	4.2705+8	8.8626+7	4.9090+3	3.6770+2	3.0553+2	6.2170+1	1.2635–3
	2.5000–5	8.5565–9	9.7230+6		1.7179+9	1.0941+9	4.9672+8	1.2708+8	5.1011+3	4.8427+2	3.8742+2	9.6849+1	1.5727–3
	3.0000–5	8.6745–9	9.5908+6		1.6945+9	1.0051+9	5.4213+8	1.4724+8	5.2637+3	5.7561+2	4.5447+2	1.2114+2	1.8909–3
	4.0000–5	8.9531–9	9.2923+6		1.6418+9	8.7960+8	5.9623+8	1.6593+8	5.5267+3	7.1523+2	5.6166+2	1.5356+2	2.5444–3
	5.0000–5	9.2767–9	8.9681+6		1.5845+9	7.9318+8	6.1955+8	1.7177+8	5.7156+3	8.1436+2	6.3976+2	1.7460+2	3.1851–3
N3	5.5090–5	9.4815–9	8.7744+6		1.5503+9	7.5833+8	6.2213+8	1.6982+8	5.7947+3	8.4629+2	6.6675+2	1.7954+2	3.5095–3
	5.7545–5	9.5729–9	8.6907+6		1.5355+9	7.4316+8	6.2355+8	1.6876+8	5.8305+3	8.6249+2	6.8071+2	1.8178+2	3.6673–3
N2	5.9680–5	9.6492–9	8.6220+6		1.5233+9	7.3072+8	6.2473+8	1.6788+8	5.8607+3	8.7655+2	6.9281+2	1.8373+2	3.8052–3
	6.0000–5	9.6603–9	8.6121+6		1.5216+9	7.2891+8	6.2493+8	1.6775+8	5.8652+3	8.7874+2	6.9472+2	1.8401+2	3.8259–3
	6.2500–5	9.7617–9	8.5226+6		1.5058+9	7.1527+8	6.2421+8	1.6629+8	5.8992+3	8.9085+2	7.0583+2	1.8501+2	3.9882–3
	6.5000–5	9.8591–9	8.4383+6		1.4909+9	7.0241+8	6.2358+8	1.6491+8	5.9320+3	9.0321+2	7.1716+2	1.8605+2	4.1514–3
	6.6875–5	9.9301–9	8.3780+6		1.4802+9	6.9323+8	6.2309+8	1.6391+8	5.9560+3	9.1238+2	7.2554+2	1.8684+2	4.2743–3
	7.0000–5	1.0045–8	8.2825+6		1.4634+9	6.7873+8	6.2231+8	1.6232+8	5.9946+3	9.2766+2	7.3946+2	1.8819+2	4.4801–3
	7.2500–5	1.0135–8	8.2085+6		1.4503+9	6.6780+8	6.2177+8	1.6071+8	6.0245+3	9.3815+2	7.4930+2	1.8884+2	4.6456–3
	7.3438–5	1.0169–8	8.1816+6		1.4455+9	6.6385+8	6.2156+8	1.6013+8	6.0355+3	9.4201+2	7.5292+2	1.8909+2	4.7078–3
	8.0000–5	1.0392–8	8.0059+6		1.4145+9	6.3807+8	6.2013+8	1.5628+8	6.1091+3	9.6916+2	7.7820+2	1.9095+2	5.1463–3
N1	9.1010–5	1.0805–8	7.6995+6		1.3604+9	6.0132+8	6.0641+8	1.5262+8	6.2175+3	9.8780+2	7.9517+2	1.9263+2	5.8857–3
	9.2134–5	1.0848–8	7.6692+6		1.3550+9	5.9794+8	6.0513+8	1.5194+8	6.2258+3	9.8945+2	7.9699+2	1.9246+2	5.9584–3
	9.4100–5	1.0921–8	7.6176+6		1.3459+9	5.9216+8	6.0293+8	1.5079+8	6.2401+3	9.9240+2	8.0023+2	1.9216+2	6.0860–3
	9.7050–5	1.1030–8	7.5428+6		1.3327+9	5.8381+8	5.9974+8	1.4912+8	6.2611+3	9.9696+2	8.0517+2	1.9177+2	6.2779–3
	1.0000–4	1.1135–8	7.4712+6	0.0000+0	1.3200+9	5.7582+8	5.9668+8	1.4751+8	6.2816+3	1.0017+3	8.1022+2	1.9143+2	6.4703–3
	1.0625–4	1.1372–8	7.3159+6	6.2401–9	1.2926+9	5.5999+8	5.8702+8	1.4557+8	6.3231+3	1.0015+3	8.1111+2	1.9041+2	6.8798–3
	1.1250–4	1.1599–8	7.1729+6	1.2478–8	1.2673+9	5.4545+8	5.7810+8	1.4375+8	6.3626+3	1.0022+3	8.1264+2	1.8953+2	7.2917–3
	1.1719–4	1.1763–8	7.0724+6	1.7155–8	1.2496+9	5.3531+8	5.7177+8	1.4247+8	6.3909+3	1.0029+3	8.1391+2	1.8895+2	7.6022–3
	1.2500–4	1.2028–8	6.9167+6	2.4937–8	1.2221+9	5.1965+8	5.6193+8	1.4047+8	6.4359+3	1.0047+3	8.1655+2	1.8812+2	8.1223–3
	1.3125–4	1.2260–8	6.7857+6	3.1176–8	1.1989+9	5.0812+8	5.5181+8	1.3898+8	6.4702+3	9.9896+2	8.1139+2	1.8756+2	8.5407–3
	1.3359–4	1.2346–8	6.7387+6	3.3525–8	1.1906+9	5.0399+8	5.4817+8	1.3844+8	6.4826+3	9.9691+2	8.0953+2	1.8737+2	8.6982–3
	1.5000–4	1.2919–8	6.4397+6	5.0080–8	1.1378+9	4.7784+8	5.2495+8	1.3497+8	6.5649+3	9.8512+2	7.9876+2	1.8635+2	9.8079–3
	1.7500–4	1.3741–8	6.0545+6	7.5679–8	1.0697+9	4.4513+8	4.9556+8	1.2902+8	6.6608+3	9.6810+2	7.8740+2	1.8069+2	1.1509–2
	2.0000–4	1.4494–8	5.7398+6	1.0166–7	1.0141+9	4.1861+8	4.7141+8	1.2408+8	6.7451+3	9.5670+2	7.8046+2	1.7623+2	1.3232–2
	2.2500–4	1.5293–8	5.4399+6	1.2817–7	9.6113+8	3.9660+8	4.4548+8	1.1903+8	6.7891+3	9.2947+2	7.5889+2	1.7057+2	1.4935–2
	2.5000–4	1.6044–8	5.1853+6	1.5538–7	9.1615+8	3.7790+8	4.2356+8	1.1469+8	6.8287+3	9.0782+2	7.4200+2	1.6580+2	1.6649–2
	2.6250–4	1.6405–8	5.0713+6	1.6922–7	8.9601+8	3.6954+8	4.1373+8	1.1273+8	6.8471+3	8.9828+2	7.3457+2	1.6369+2	1.7509–2
	3.0000–4	1.7433–8	4.7722+6	2.1153–7	8.4316+8	3.4759+8	3.8801+8	1.0755+8	6.8978+3	8.7475+2	7.1652+2	1.5821+2	2.0103–2
M5	3.4251–4	1.8647–8	4.4616+6	2.6121–7	7.8828+8	3.2723+8	3.6037+8	1.0066+8	6.9485+3	8.3679+2	6.8742+2	1.4934+2	2.3064–2
M4	3.4824–4	1.8805–8	4.4241+6	2.6808–7	7.8166+8	3.2478+8	3.5706+8	9.9816+7	6.9548+3	8.3245+2	6.8416+2	1.4827+2	2.3465–2
	3.4970–4	1.8845–8	4.4147+6	2.6983–7	7.8000+8	3.2416+8	3.5623+8	9.9598+7	6.9559+3	8.3137+2	6.8334+2	1.4800+2	2.3566–2
	3.5471–4	1.8982–8	4.3828+6	2.7587–7	7.7435+8	3.2207+8	3.5342+8	9.8858+7	6.9594+3	8.2766+2	6.8057+2	1.4707+2	2.3913–2
	3.6227–4	1.9188–8	4.3359+6	2.8504–7	7.6607+8	3.1899+8	3.4929+8	9.7771+7	6.9647+3	8.2232+2	6.7658+2	1.4572+2	2.4437–2
	3.6603–4	1.9289–8	4.3131+6	2.8962–7	7.6204+8	3.1750+8	3.4729+8	9.7244+7	6.9673+3	8.1974+2	6.7465+2	1.4506+2	2.4698–2
	4.0000–4	2.0181–8	4.1224+6	3.3159–7	7.2836+8	3.0495+8	3.3058+8	9.2827+7	6.9895+3	7.9874+2	6.5912+2	1.3959+2	2.7057–2
	4.3301–4	2.1051–8	3.9521+6	3.7353–7	6.9827+8	2.9415+8	3.1507+8	8.9050+7	6.9852+3	7.7554+2	6.4090+2	1.3462+2	2.9294–2
	4.4976–4	2.1479–8	3.8733+6	3.9527–7	6.8434+8	2.8912+8	3.0792+8	8.7297+7	6.9831+3	7.6530+2	6.3295+2	1.3232+2	3.0428–2
	4.5604–4	2.1638–8	3.8449+6	4.0349–7	6.7932+8	2.8730+8	3.0535+8	8.6665+7	6.9824+3	7.6169+2	6.3017+2	1.3149+2	3.0853–2
	4.6232–4	2.1795–8	3.8171+6	4.1176–7	6.7441+8	2.8552+8	3.0284+8	8.6046+7	6.9816+3	7.5820+2	6.2750+2	1.3068+2	3.1279–2
	4.7802–4	2.2185–8	3.7501+6	4.3258–7	6.6258+8	2.8122+8	2.9680+8	8.4554+7	6.9798+3	7.4997+2	6.2121+2	1.2873+2	3.2341–2
	5.0000–4	2.2719–8	3.6619+6	4.6210–7	6.4699+8	2.7553+8	2.8887+8	8.2585+7	6.9773+3	7.3955+2	6.1335+2	1.2617+2	3.3829–2
M3	5.2680–4	2.3393–8	3.5564+6	4.9872–7	6.2834+8	2.6906+8	2.7935+8	7.9920+7	6.9745+3	7.2415+2	6.0166+2	1.2246+2	3.5642–2
	5.3595–4	2.3620–8	3.5222+6	5.1140–7	6.2231+8	2.6697+8	2.7629+8	7.9050+7	6.9727+3	7.1933+2	5.9804+2	1.2126+2	3.6254–2
	5.5196–4	2.4012–8	3.4646+6	5.3378–7	6.1214+8	2.6342+8	2.7113+8	7.7586+7	6.9696+3	7.1136+2	5.9209+2	1.1923+2	3.7326–2
M2	5.5525–4	2.4092–8	3.4531+6	5.3841–7	6.1011+8	2.6271+8	2.7010+8	7.7293+7	6.9690+3	7.0980+2	5.9093+2	1.1883+2	3.7545–2
	5.6084–4	2.4228–8	3.4338+6	5.4630–7	6.0668+8	2.6151+8	2.6837+8	7.6795+7	6.9639+3	7.0708+2	5.8889+2	1.1815+2	3.7888–2
	5.8042–4	2.4699–8	3.3683+6	5.7417–7	5.9512+8	2.5746+8	2.6254+8	7.5112+7	6.9463+3	6.9808+2	5.8219+2	1.1585+2	3.9083–2
	6.0000–4	2.5162–8	3.3063+6	6.0238–7	5.8417+8	2.5361+8	2.5703+8	7.3520+7	6.9294+3	6.8982+2	5.7610+2	1.1368+2	4.0276–2
	6.5000–4	2.6338–8	3.1588+6	6.7609–7	5.5810+8	2.4456+8	2.4362+8	6.9910+7	6.8888+3	6.6701+2	5.5836+2	1.0860+2	4.3310–2
M1	6.5494–4	2.6451–8	3.1452+6	6.8351–7	5.5570+8	2.4372+8	2.4239+8	6.9578+7	6.8850+3	6.6496+2	5.5678+2	1.0814+2	4.3609–2
	6.6401–4	2.6662–8	3.1204+6	6.9718–7	5.5131+8	2.4221+8	2.4012+8	6.8973+7	6.8778+3	6.6097+2	5.5365+2	1.0728+2	4.4153–2
	6.8101–4	2.7053–8	3.0753+6	7.2304–7	5.4335+8	2.3945+8	2.3601+8	6.7875+7	6.8646+3	6.5381+2	5.4803+2	1.0573+2	4.5172–2
	7.1075–4	2.7726–8	3.0006+6	7.6895–7	5.3015+8	2.3486+8	2.2923+8	6.6057+7	6.8424+3	6.4219+2	5.3897+2	1.0317+2	4.6951–2
	7.2500–4	2.8044–8	2.9666+6	7.9122–7	5.2414+8	2.3276+8	2.2615+8	6.5230+7	6.8321+3	6.3700+2	5.3495+2	1.0201+2	4.7801–2
	7.5538–4	2.8713–8	2.8975+6	8.3932–7	5.1193+8	2.2847+8	2.1990+8	6.3552+7	6.8108+3	6.2630+2	5.2661+2	9.9647+1	4.9609–2
	8.0000–4	2.9674–8	2.8037+6	9.1138–7	4.9535+8	2.2261+8	2.1146+8	6.1278+7	6.7812+3	6.1219+2	5.1568+2	9.6456+1	5.2255–2
	9.0000–4	3.1806–8	2.6157+6	1.0793–6	4.6214+8	2.1109+8	1.9439+8	5.6648+7	6.6601+3	5.7939+2	4.8959+2	8.9747+1	5.6958–2
	1.0000–3	3.3837–8	2.4587+6	1.2560–6	4.3441+8	2.0131+8	1.8029+8	5.2803+7	6.5536+3	5.5269+2	4.6843+2	8.4196+1	6.1594–2
	1.1250–3	3.6353–8	2.2885+6	1.4893–6	4.0434+8	1.9082+8	1.6499+8	4.8526+7	6.3901+3	5.1921+2	4.4134+2	7.7803+1	6.5864–2
	1.2500–3	3.8751–8	2.1469+6	1.7366–6	3.7931+8	1.8191+8	1.5241+8	4.4994+7	6.2474+3	4.9190+2	4.1929+2	7.2537+1	7.0070–2
	1.3125–3	3.9912–8	2.0845+6	1.8652–6	3.6828+8	1.7792+8	1.4691+8	4.3447+7	6.1823+3	4.7999+2	4.0968+2	7.0234+1	7.2149–2
	1.5000–3	4.3256–8	1.9233+6	2.2686–6	3.3981+8	1.6745+8	1.3288+8	3.9479+7	6.0078+3	4.4997+2	3.8555+2	6.4341+1	7.8301–2
	1.7500–3	4.7652–8	1.7459+6	2.8488–6	3.0846+8	1.5578+8	1.1770+8	3.4982+7	5.7941+3	4.1229+2	3.5476+2	5.7439+1	8.5539–2
	2.0000–3	5.1792–8	1.6063+6	3.4773–6	2.8381+8	1.4633+8	1.0597+8	3.1503+7	5.6152+3	3.8359+2	3.3139+2	5.2111+1	9.2611–2
	2.5000–3	5.9879–8	1.3894+6	4.8709–6	2.4548+8	1.3072+8	8.8391+7	2.6363+7	5.2675+3	3.3508+2	2.9094+2	4.4034+1	1.0399–1
	3.0000–3	6.7354–8	1.2352+6	6.4425–6	2.1823+8	1.1921+8	7.6225+7	2.2792+7	4.9995+3	3.0182+2	2.6327+2	3.8437+1	1.1495–1
L3	3.1706–3	6.9870–8	1.1907+6	7.0177–6	2.1037+8	1.1585+8	7.2805+7	2.1716+7	4.9124+3	2.9133+2	2.5450+2	3.6708+1	1.1821–1
	3.2743–3	7.1401–8	1.1652+6	7.3772–6	2.0586+8	1.1386+8	7.0887+7	2.1109+7	4.8625+3	2.8549+2	2.4963+2	3.5738+1	1.2017–1
L2	3.3326–3	7.2255–8	1.1514+6	7.5827–6	2.0343+8	1.1279+8	6.9856+7	2.0783+7	4.8353+3	2.8235+2	2.4702+2	3.5217+1	1.2127–1

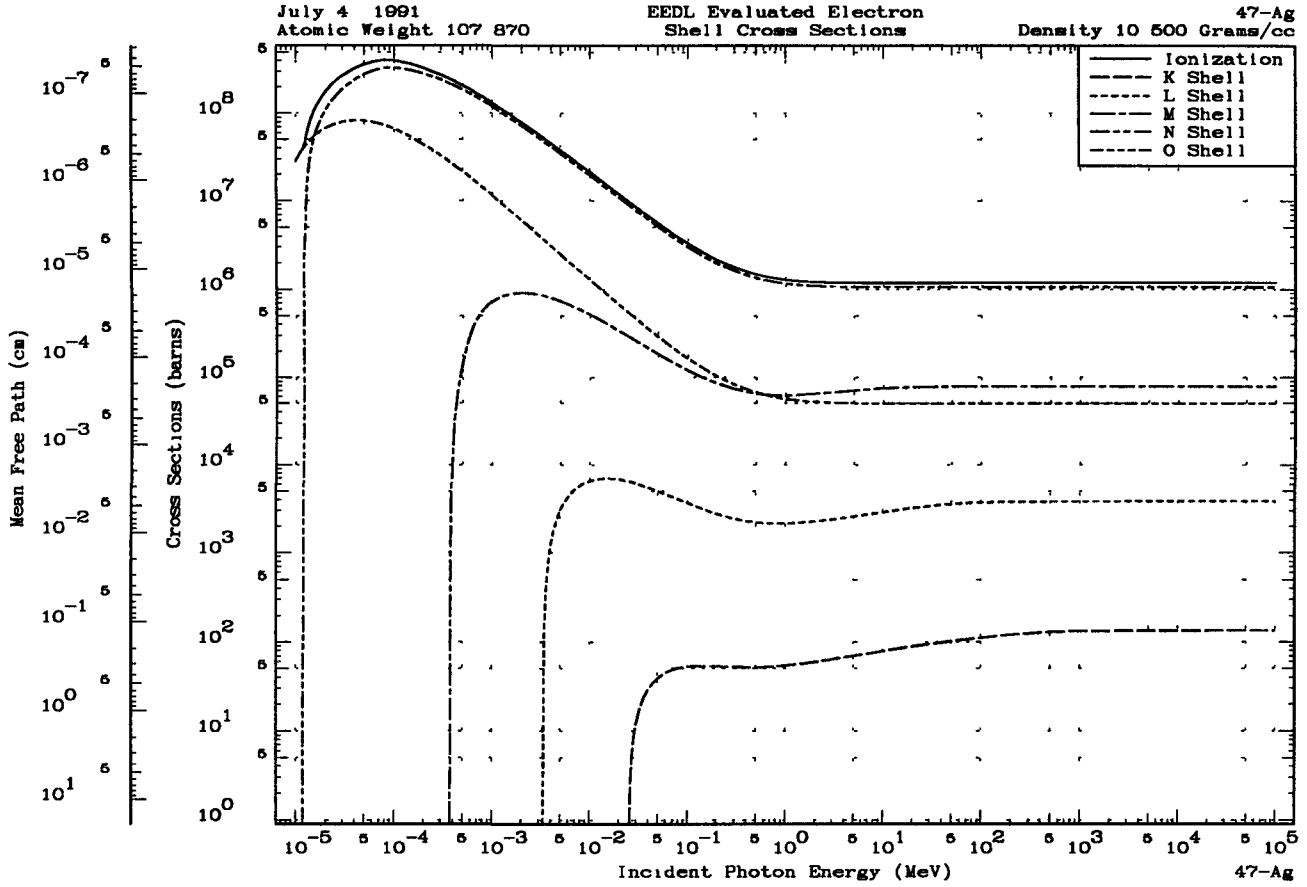
Atomic Weight 106.400 Density 12.020 Grams/cc

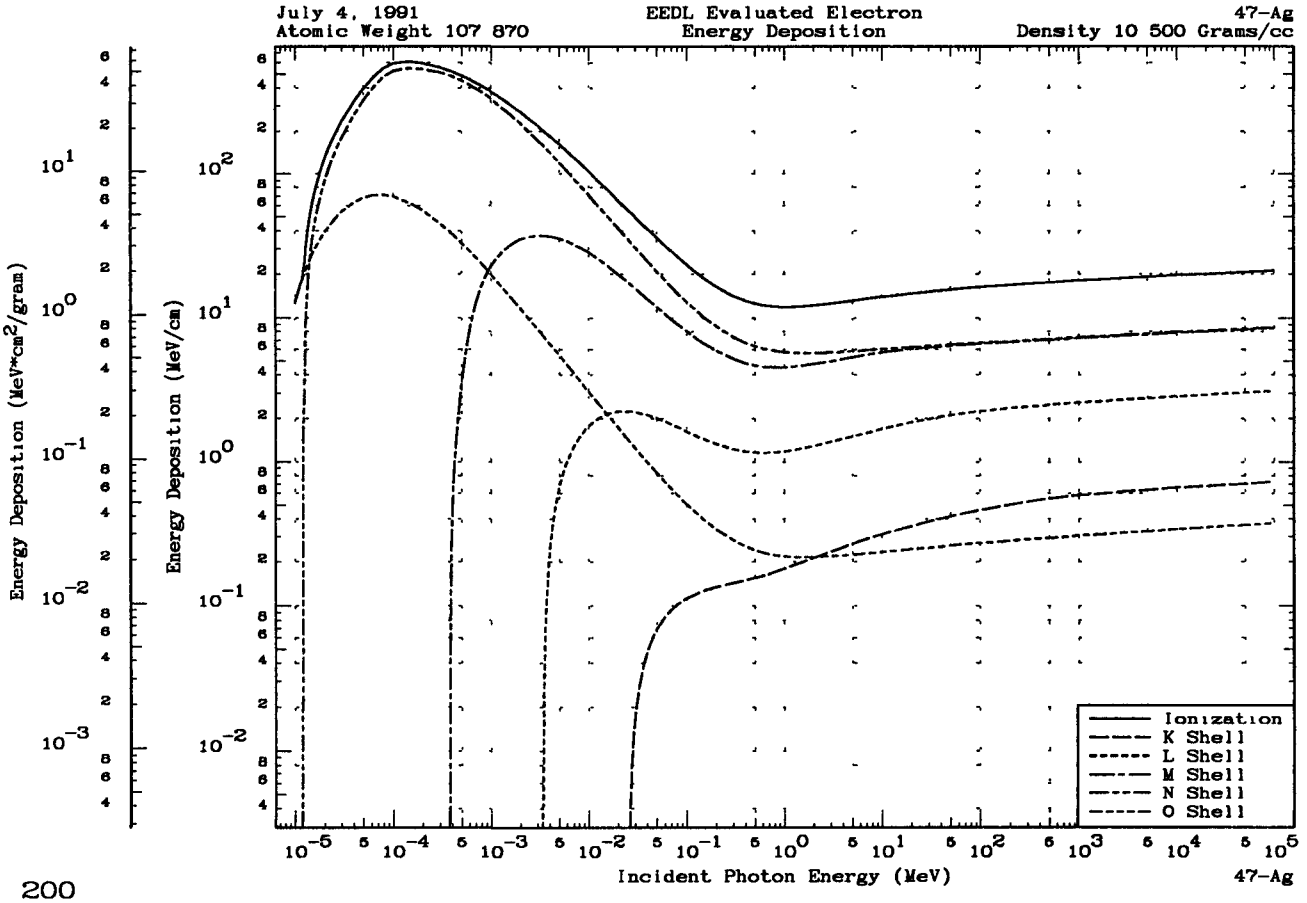
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.4160–3	7.3468–8	1.1324+6	7.8804–6	2.0007+8	1.1130+8	6.8434+7	2.0335+7	4.7970+3	2.7802+2	2.4340+2	3.4499+1	1.2281–1
3.4557–3	7.4041–8	1.1236+6	8.0237–6	1.9852+8	1.1061+8	6.7780+7	2.0129+7	4.7791+3	2.7603+2	2.4174+2	3.4168+1	1.2354–1
3.5620–3	7.5565–8	1.1010+6	8.4124–6	1.9452+8	1.0882+8	6.6093+7	1.9598+7	4.7327+3	2.7090+2	2.3746+2	3.3318+1	1.2548–1
L1 3.5800–3	7.5821–8	1.0972+6	8.4789–6	1.9386+8	1.0853+8	6.5817+7	1.9511+7	4.7250+3	2.7006+2	2.3676+2	3.3179+1	1.2580–1
3.6850–3	7.7312–8	1.0761+6	8.8712–6	1.9013+8	1.0685+8	6.4246+7	1.9022+7	4.6771+3	2.6523+2	2.3271+2	3.2389+1	1.2747–1
3.7278–3	7.7915–8	1.0678+6	9.0334–6	1.8865+8	1.0619+8	6.3628+7	1.8829+7	4.6581+3	2.6333+2	2.3112+2	3.2078+1	1.2815–1
3.7810–3	7.8661–8	1.0576+6	9.2361–6	1.8687+8	1.0538+8	6.2880+7	1.8596+7	4.6350+3	2.6103+2	2.2920+2	3.1702+1	1.2899–1
3.8425–3	7.9518–8	1.0462+6	9.4729–6	1.8485+8	1.0447+8	6.2038+7	1.8335+7	4.6087+3	2.5844+2	2.2703+2	3.1280+1	1.2995–1
4.0000–3	8.1693–8	1.0184+6	1.0090–5	1.7993+8	1.0224+8	5.9990+7	1.7699+7	4.5439+3	2.5218+2	2.2179+2	3.0253+1	1.3241–1
4.2500–3	8.5172–8	9.7678+5	1.1101–5	1.7258+8	9.8817+7	5.6996+7	1.6761+7	4.4444+3	2.4230+2	2.1344+2	2.8722+1	1.3603–1
4.6250–3	9.0263–8	9.2169+5	1.2692–5	1.6285+8	9.4236+7	5.3070+7	1.5536+7	4.3091+3	2.2937+2	2.0251+2	2.6722+1	1.4137–1
5.0000–3	9.5212–8	8.7379+5	1.4367–5	1.5438+8	9.0201+7	4.9692+7	1.4485+7	4.1881+3	2.1829+2	1.9314+2	2.5008+1	1.4661–1
5.5000–3	1.0178–7	8.1739+5	1.6730–5	1.4442+8	8.5361+7	4.5821+7	1.3231+7	4.0362+3	2.0503+2	1.8195+2	2.2934+1	1.5273–1
6.0000–3	1.0815–7	7.6922+5	1.9238–5	1.3591+8	8.1170+7	4.2553+7	1.2181+7	3.9023+3	1.9389+2	1.7253+2	2.1198+1	1.5872–1
7.0000–3	1.2066–7	6.8952+5	2.4671–5	1.2183+8	7.4056+7	3.7280+7	1.0487+7	3.6556+3	1.7455+2	1.5601+2	1.8369+1	1.6816–1
8.0000–3	1.3259–7	6.2745+5	3.0657–5	1.1086+8	6.8399+7	3.3245+7	9.2120+6	3.4544+3	1.5979+2	1.4338+2	1.6239+1	1.7731–1
9.0000–3	1.4443–7	5.7603+5	3.7174–5	1.0177+8	6.3534+7	3.0029+7	8.2062+6	3.2760+3	1.4726+2	1.3254+2	1.4535+1	1.8471–1
1.0000–2	1.5588–7	5.3371+5	4.4210–5	9.4297+7	5.9477+7	2.7417+7	7.3999+6	3.1241+3	1.3711+2	1.2375+2	1.3170+1	1.9195–1
1.2500–2	1.8366–7	4.5298+5	6.3922–5	8.0034+7	5.1484+7	2.2611+7	5.9357+6	2.7960+3	1.1708+2	1.0622+2	1.0656+1	2.0451–1
1.5000–2	2.0988–7	3.9639+5	8.6636–5	7.0035+7	4.5758+7	1.9317+7	4.9572+6	2.5536+3	1.0333+2	9.4142+1	8.9755+0	2.1667–1
2.0000–2	2.5982–7	3.2021+5	1.4009–4	5.6574+7	3.7766+7	1.5077+7	3.7291+6	2.2008+3	8.4392+1	7.7327+1	6.8325+0	2.3303–1
K 2.4321–2	3.0054–7	2.7682+5	1.9490–4	4.8909+7	3.3072+7	1.2760+7	3.0743+6	1.9800+3	7.3526+1	6.7607+1	5.6757+0	2.4338–1
2.4676–2	3.0382–7	2.7383+5	1.9975–4	4.8380+7	3.2743+7	1.2604+7	3.0306+6	1.9643+3	7.2776+1	6.6934+1	5.5980+0	2.4403–1
2.5341–2	3.0994–7	2.6842+5	2.0898–4	4.7425+7	3.2148+7	1.2324+7	2.9518+6	1.9358+3	7.1422+1	6.5719+1	5.4580+0	2.4526–1
2.6506–2	3.2055–7	2.5954+5	2.2555–4	4.5856+7	3.1167+7	1.1864+7	2.8235+6	1.8885+3	6.9204+1	6.3727+1	5.2299+0	2.4742–1
2.8253–2	3.3623–7	2.4743+5	2.5135–4	4.3717+7	2.9824+7	1.1240+7	2.6507+6	1.8234+3	6.6196+1	6.1023+1	4.9229+0	2.5069–1
3.0000–2	3.5166–7	2.3658+5	2.7830–4	4.1799+7	2.8615+7	1.0684+7	2.4979+6	1.7643+3	6.3514+1	5.8608+1	4.6515+0	2.5398–1
3.2500–2	3.7365–7	2.2266+5	3.1877–4	3.9339+7	2.7033+7	9.9962+6	2.3082+6	1.6867+3	6.0050+1	5.5482+1	4.3102+0	2.5746–1
3.6250–2	4.0585–7	2.0499+5	3.8361–4	3.6218+7	2.5015+7	9.1291+6	2.0724+6	1.5864+3	5.5681+1	5.1532+1	3.8860+0	2.6282–1
4.0000–2	4.3722–7	1.9028+5	4.5324–4	3.3619+7	2.3325+7	8.4122+6	1.8806+6	1.5010+3	5.2069+1	4.8260+1	3.5409+0	2.6824–1
4.5000–2	4.7783–7	1.7411+5	5.5317–4	3.0762+7	2.1440+7	7.6437+6	1.6768+6	1.4072+3	4.8053+1	4.4608+1	3.1706+0	2.7391–1
5.0000–2	5.1732–7	1.6082+5	6.6095–4	2.8413+7	1.9883+7	7.0160+6	1.5132+6	1.3282+3	4.4772+1	4.1618+1	2.8736+0	2.7972–1
6.0000–2	5.9274–7	1.4036+5	8.9794–4	2.4799+7	1.7451+7	6.0763+6	1.2701+6	1.1937+3	3.9720+1	3.7002+1	2.4290+0	2.8898–1
7.0000–2	6.6371–7	1.2535+5	1.1623–3	2.2147+7	1.5647+7	5.4047+6	1.0938+6	1.0905+3	3.5996+1	3.3597+1	2.1024+0	2.9652–1
8.0000–2	7.3198–7	1.1366+5	1.4519–3	2.0081+7	1.4236+7	4.8833+6	9.6104+5	1.0084+3	3.3107+1	3.0946+1	1.8565+0	3.0425–1
1.0000–1	8.5706–7	9.7070+4	2.0976–3	1.7150+7	1.2229+7	4.1592+6	7.6176+5	8.8900+2	2.8936+1	2.7137+1	1.4825+0	3.1709–1
1.2500–1	9.9033–7	8.4007+4	3.0160–3	1.4842+7	1.0647+7	3.5907+6	6.0401+5	7.9461+2	2.5574+1	2.4061+1	1.1831+0	3.3004–1
1.5000–1	1.1142–6	7.4670+4	4.0421–3	1.3193+7	9.5079+6	3.1844+6	4.9970+5	7.2498+2	2.3192+1	2.1863+1	9.8510–1	3.4365–1
2.0000–1	1.3164–6	6.3201+4	6.3467–3	1.1166+7	8.0997+6	2.6955+6	3.7056+5	6.3833+2	2.0266+1	1.9160+1	7.3713–1	3.6799–1
3.0000–1	1.6401–6	5.0724+4	1.1668–2	8.9620+6	6.5072+6	2.2107+6	2.4354+5	5.4595+2	1.7390+1	1.6483+1	4.9023–1	4.1636–1
4.0000–1	1.9020–6	4.3740+4	1.7650–2	7.7281+6	5.5719+6	1.9741+6	1.8151+5	4.9990+2	1.6064+1	1.5227+1	3.6836–1	4.6951–1
5.0000–1	2.1235–6	3.9178+4	2.4009–2	6.9221+6	4.9401+6	1.8370+6	1.4452+5	4.7387+2	1.5392+1	1.4571+1	2.9513–1	5.2603–1
6.0000–1	2.3163–6	3.5918+4	3.0592–2	6.3460+6	4.4775+6	1.7480+6	1.1998+5	4.5799+2	1.4987+1	1.4155+1	2.4624–1	5.8564–1
8.0000–1	2.6335–6	3.1590+4	4.4059–2	5.5814+6	3.8480+6	1.6436+6	8.9454+4	4.4178+2	1.4716+1	1.3816+1	1.8503–1	7.1486–1
1.0000+0	2.8892–6	2.8795+4	5.7673–2	5.0875+6	3.4308+6	1.5849+6	7.1247+4	4.3487+2	1.4666+1	1.3664+1	1.4824–1	8.5450–1
1.5000+0	3.3478–6	2.4851+4	9.1203–2	4.3907+6	2.8213+6	1.5180+6	5.0930+4	4.3178+2	1.5160+1	1.3818+1	1.0707–1	1.2349+0
2.0000+0	3.6566–6	2.2752+4	1.2354–1	4.0198+6	2.4813+6	1.4971+6	4.0988+4	4.3524+2	1.5772+1	1.4038+1	8.6605–2	1.6476+0
3.0000+0	4.0653–6	2.0464+4	1.8451–1	3.6157+6	2.1156+6	1.4684+6	3.1158+4	4.4427+2	1.7047+1	1.4453+1	6.6525–2	2.5271+0
4.0000+0	4.3087–6	1.9309+4	2.4108–1	3.4115+6	1.9202+6	1.4645+6	2.6322+4	4.5209+2	1.8324+1	1.4803+1	5.6331–2	3.4644+0
5.0000+0	4.4704–6	1.8610+4	2.9385–1	3.2880+6	1.8025+6	1.4616+6	2.3456+4	4.5840+2	1.9586+1	1.5100+1	5.0313–2	4.4356+0
6.0000+0	4.5812–6	1.8160+4	3.4336–1	3.2085+6	1.7273+6	1.4593+6	2.1456+4	4.6361+2	2.0829+1	1.5364+1	4.6132–2	5.4195+0
8.0000+0	4.7258–6	1.7604+4	4.3405–1	3.1104+6	1.6354+6	1.4558+6	1.8707+4	4.6987+2	2.3319+1	1.5800+1	4.0409–2	7.4786+0
1.0000+1	4.7940–6	1.7354+4	5.1564–1	3.0661+6	1.5929+6	1.4558+6	1.7022+4	4.7392+2	2.5751+1	1.6123+1	3.6941–2	9.5907+0
1.5000+1	4.8316–6	1.7219+4	6.9037–1	3.0422+6	1.5705+6	1.4564+6	1.4843+4	4.8318+2	3.1685+1	1.6585+1	3.2222–2	1.5068+1
2.0000+1	4.8341–6	1.7210+4	8.3481–1	3.0407+6	1.5697+6	1.4569+6	1.3610+4	4.9230+2	3.7725+1	1.6979+1	2.9555–2	2.0716+1
3.0000+1	4.8375–6	1.7198+4	1.0648+0	3.0385+6	1.5691+6	1.4567+6	1.2304+4	5.0048+2	4.9810+1	1.7408+1	2.6737–2	3.2375+1
4.0000+1	4.8389–6	1.7193+4	1.2443+0	3.0377+6	1.5687+6	1.4570+6	1.1504+4	5.0828+2	6.2039+1	1.7717+1	2.5015–2	4.4297+1
5.0000+1	4.8397–6	1.7190+4	1.3913+0	3.0371+6	1.5683+6	1.4572+6	1.1080+4	5.1442+2	7.4379+1	1.7969+1	2.4109–2	5.6387+1
6.0000+1	4.8405–6	1.7187+4	1.5155+0	3.0367+6	1.5681+6	1.4574+6	1.0744+4	5.1932+2	8.6912+1	1.8159+1	2.3393–2	6.8729+1
8.0000+1	4.8417–6	1.7183+4	1.7175+0	3.0359+6	1.5676+6	1.4575+6	1.0281+4	5.2686+2	1.1219+2	1.8452+1	2.2415–2	9.3713+1
1.0000+2	4.8426–6	1.7180+4	1.8782+0	3.0353+6	1.5673+6	1.4575+6	1.0004+4	5.3258+2	1.3773+2	1.8708+1	2.1838–2	1.1900+2
1.5000+2	4.8439–6	1.7175+4	2.1764+0	3.0345+6	1.5667+6	1.4576+6	9.7540+3	5.4310+2	2.0163+2	1.8971+1	2.1293–2	1.8264+2
2.0000+2	4.8448–6	1.7172+4	2.3914+0	3.0340+6	1.5663+6	1.4576+6	9.5807+3	5.5087+2	2.6638+2	1.9221+1	2.0915–2	2.4714+2
3.0000+2	4.8460–6	1.7168+4	2.6976+0	3.0332+6	1.5657+6	1.4576+6	9.3920+3	5.5945+2	3.9528+2	1.9626+1	2.0503–2	3.7564+2
4.0000+2	4.8466–6	1.7165+4	2.9165+0	3.0328+6	1.5652+6	1.4576+6	9.3818+3	5.6489+2	5.2475+2	1.9852+1	2.0482–2	5.0487+2
5.0000+2	4.8472–6	1.7164+4	3.0867+0	3.0325+6	1.5649+6	1.4576+6	9.3742+3	5.6902+2	6.5504+2	2.0014+1	2.0465–2	6.3501+2
6.0000+2	4.8476–6	1.7162+4	3.2261+0	3.0322+6	1.5646+6	1.4576+6	9.3678+3	5.7276+2	7.8340+2	2.0168+1	2.0452–2	7.6320+2
8.0000+2	4.8482–6	1.7160+4	3.4467+0	3.0319+6	1.5642+6	1.4576+6	9.4118+3	5.7871+2	1.0422+3	2.0440+1	2.0548–2	1.0218+3
1.0000+3	4.8486–6	1.7158+4	3.6180+0	3.0316+6	1.5639+6	1.4576+6	9.4620+3	5.8358+2	1.3015+3	2.0674+1	2.0659–2	1.2808+3
1.5000+3	4.8493–6	1.7156+4	3.9295+0	3.0311+6	1.5633+6	1.4576+6	9.6093+3	5.9268+2	1.9535+3	2.0888+1	2.0980–2	1.9326+3
2.0000+3	4.8498–6	1.7154+4	4.1504+0	3.0308+6	1.5629+6	1.4576+6	9.7153+3	5.9936+2	2.6030+3	2.1101+1	2.1212–2	2.5818+3
3.0000+3	4.8505–6	1.7152+4	4.4619+0	3.0304+6	1.5623+6	1.4576+6	9.8667+3	6.0947+2	3.9076+3	2.1528+1	2.1542–2	3.8861+3
4.0000+3	4.8510–6	1.7150+4	4.6827+0	3.0301+6	1.5618+6	1.4576+6	9.9720+3	6.1683+2	5.2117+3	2.1720+1	2.1772–2	5.1899+3
5.0000+3	4.8514–6	1.7149+4	4.8538+0	3.0298+6	1.5615+6	1.4576+6	1.0055+4	6.2262+2	6.5256+3	2.1859+1	2.1953–2	6.5037+3
6.0000+3	4.8517–6	1.7147+4	4.9936+0	3.0296+6	1.5612+6	1.4576+6	1.0121+4	6.2687+2	7.8182+3	2.1997+1	2.2097–2	7.7963+3
8.0000+3	4.8522–6	1.7146+4	5.2144+0	3.0293+6	1.5608+6	1.4576+6	1.0226+4	6.3363+2	1.0426+4	2.2274+1	2.2327–2	1.0404+4
1.0000+4	4.8526–6	1.7144+4	5.3854+0	3.0291+6	1.5605+6	1.4576+6	1.0308+4	6.3893+2	1.3058+4	2.2520+1	2.2505–2	1.3035+4
1.5000+4	4.8533–6	1.7142+4	5.6967+0	3.0287+6	1.5599+6	1.4576+6	1.0456+4	6.4924+2	1.9499+4	2.2719+1	2.2828–2	1.9476+4
2.0000+4	4.8538–6	1.7140+4	5.9179+0	3.0283+6	1.5595+6	1.4576+6	1.0561+4	6.5666+2	2.6024+4	2.2918+1	2.3058–2	2.6001+4
3.0000+4	4.8545–6	1.7138+4	6.2299+0	3.0279+6	1.5589+6	1.4576+6	1.0709+4	6.6709+2	3.8942+4	2.3316+1	2.3382–2	3.8919+4

Atomic Weight 106.400												Density 12.020 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+4	4.8550–6	1.7136+4	6.4513+0	3.0276+6	1.5584+6	1.4576+6	1.0814+4	6.7458+2	5.2001+4	2.3545+1	2.3611–2	5.1978+4
5.0000+4	4.8554–6	1.7135+4	6.6231+0	3.0273+6	1.5581+6	1.4576+6	1.0897+4	6.8034+2	6.4939+4	2.3719+1	2.3791–2	6.4915+4
6.0000+4	4.8557–6	1.7133+4	6.7635+0	3.0271+6	1.5579+6	1.4576+6	1.0963+4	6.8503+2	7.7866+4	2.3848+1	2.3936–2	7.7842+4
8.0000+4	4.8562–6	1.7132+4	6.9850+0	3.0268+6	1.5574+6	1.4576+6	1.1068+4	6.9251+2	1.0395+5	2.4106+1	2.4165–2	1.0392+5
1.0000+5	4.8566–6	1.7130+4	7.1567+0	3.0266+6	1.5571+6	1.4576+6	1.1150+4	6.9832+2	1.3007+5	2.4358+1	2.4343–2	1.3005+5


July 4, 1991
Atomic Weight 107 870
EEDL Evaluated Electron
Cross Sections
47-Ag
Density 10 500 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
47-Ag


July 4, 1991
Atomic Weight 107 870
EEDL Evaluated Electron
Energy Deposition
47-Ag
Density 10 500 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
47-Ag


July 4 1991
Atomic Weight 107 870
EEDL Evaluated Electron
Shell Cross Sections
47-Ag
Density 10 500 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
47-Ag


July 4, 1991
Atomic Weight 107 870
EEDL Evaluated Electron
Energy Deposition
47-Ag
Density 10 500 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
47-Ag

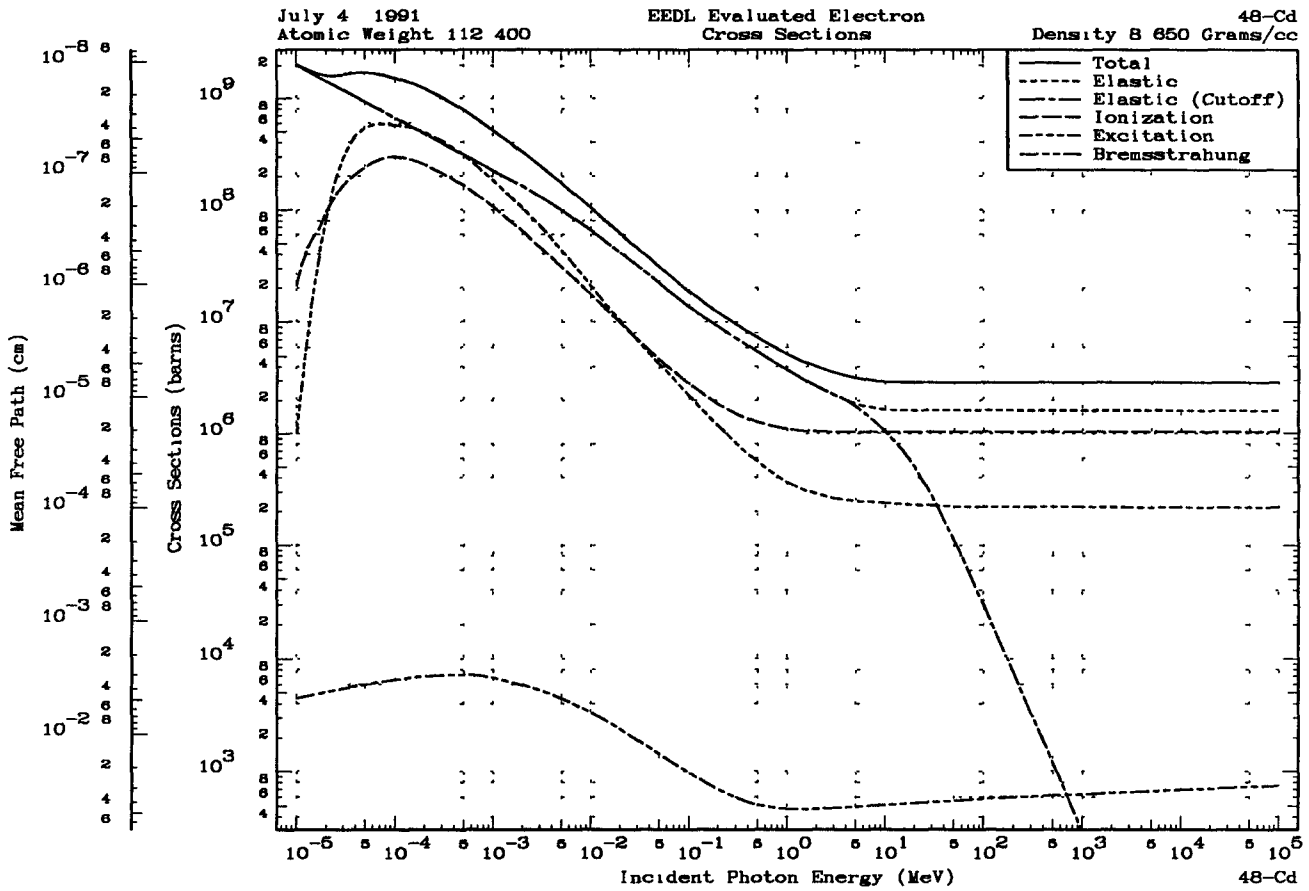
Atomic Weight 107.870 Density 10.500 Grams/cc

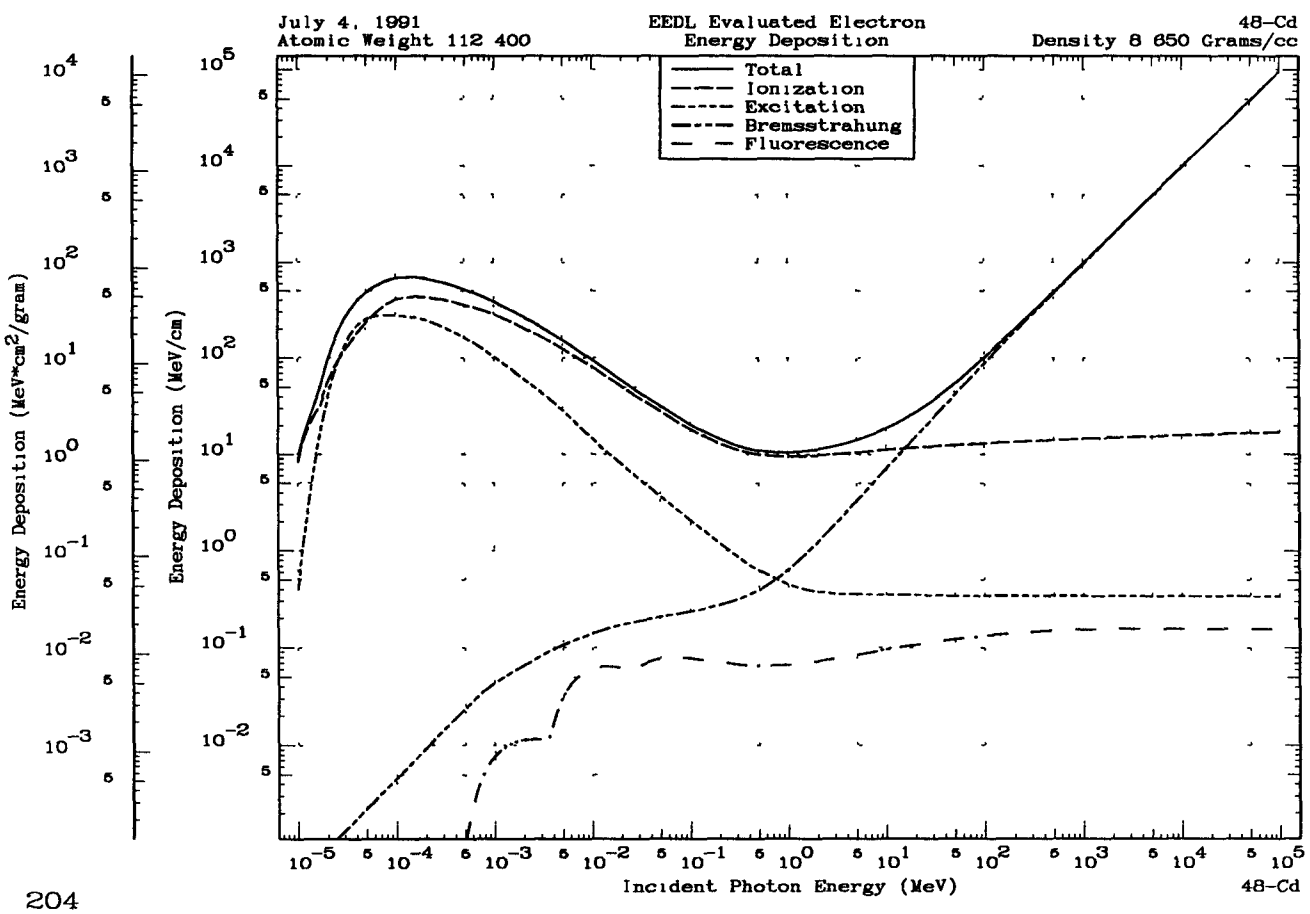
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.2333–9	1.0315+7		1.8476+9	1.8184+9	2.8319+7	8.5465+5	4.4039+3	1.3120+1	1.2738+1	1.8112–1	5.5714–4
	1.1250–5	9.6987–9	9.8197+6		1.7589+9	1.7208+9	3.6015+7	2.0768+6	4.5080+3	1.7803+1	1.6842+1	9.6101–1	6.2400–4
N5	1.1860–5	9.9146–9	9.6058+6		1.7206+9	1.6788+9	3.9035+7	2.7760+6	4.5555+3	1.9901+1	1.8593+1	1.3073+0	6.5704–4
	1.2056–5	9.9670–9	9.5553+6		1.7116+9	1.6660+9	4.2321+7	3.2678+6	4.5704+3	2.2320+1	2.0777+1	1.5429+0	6.6772–4
N4	1.2470–5	1.0083–8	9.4452+6		1.6918+9	1.6398+9	4.7603+7	4.3966+6	4.6011+3	2.6364+1	2.4276+1	2.0873+0	6.9036–4
	1.2786–5	1.0138–8	9.3938+6		1.6826+9	1.6207+9	5.6292+7	5.6061+6	4.6240+3	3.3013+1	3.0336+1	2.6764+0	7.0771–4
	1.2792–5	1.0139–8	9.3929+6		1.6825+9	1.6204+9	5.6479+7	5.6283+6	4.6245+3	3.3155+1	3.0467+1	2.6873+0	7.0805–4
	1.3125–5	1.0211–8	9.3266+6		1.6706+9	1.6010+9	6.2664+7	6.9392+6	4.6481+3	3.8134+1	3.4801+1	3.3326+0	7.2641–4
	1.3340–5	1.0251–8	9.2907+6		1.6642+9	1.5889+9	6.7357+7	7.9205+6	4.6631+3	4.2025+1	3.8206+1	3.8182+0	7.3829–4
	1.3896–5	1.0349–8	9.2029+6		1.6485+9	1.5588+9	7.9280+7	1.0393+7	4.7011+3	5.2008+1	4.6949+1	5.0588+0	7.6922–4
	1.4170–5	1.0395–8	9.1618+6		1.6411+9	1.5446+9	8.4651+7	1.1832+7	4.7193+3	5.6759+1	5.0971+1	5.7864+0	7.8451–4
	1.5000–5	1.0522–8	9.0511+6		1.6213+9	1.5040+9	1.0077+8	1.6524+7	4.7730+3	7.1455+1	6.3257+1	8.1967+0	8.3117–4
	1.6250–5	1.0688–8	8.9104+6		1.5961+9	1.4486+9	1.2201+8	2.5396+7	4.8494+3	9.2968+1	8.0273+1	1.2694+1	9.0222–4
	1.7500–5	1.0819–8	8.8026+6		1.5767+9	1.3992+9	1.4088+8	3.6620+7	4.9213+3	1.1460+2	9.6152+1	1.8443+1	9.7419–4
	1.8125–5	1.0862–8	8.7682+6		1.5706+9	1.3764+9	1.5061+8	4.3549+7	4.9557+3	1.2669+2	1.0467+2	2.2015+1	1.0105–3
	2.0000–5	1.0956–8	8.6927+6		1.5571+9	1.3144+9	1.7575+8	6.6875+7	5.0535+3	1.6214+2	1.2794+2	3.4189+1	1.1207–3
	2.2500–5	1.0984–8	8.6709+6		1.5532+9	1.2439+9	2.0432+8	1.0494+8	5.1565+3	2.1047+2	1.5663+2	5.3840+1	1.2567–3
	2.5000–5	1.0951–8	8.6970+6		1.5578+9	1.1840+9	2.2873+8	1.4505+8	5.2505+3	2.5820+2	1.8351+2	7.4689+1	1.3948–3
	2.6250–5	1.0892–8	8.7442+6		1.5663+9	1.1573+9	2.4049+8	1.6852+8	5.2946+3	2.8412+2	1.9719+2	8.6924+1	1.4645–3
	3.0000–5	1.0731–8	8.8753+6		1.5898+9	1.0871+9	2.6952+8	2.3310+8	5.4171+3	3.5548+2	2.3460+2	1.2088+2	1.6767–3
	3.5000–5	1.0516–8	9.0567+6		1.6222+9	1.0116+9	2.9878+8	3.1183+8	5.5598+3	4.4062+2	2.7818+2	1.6244+2	1.9632–3
	4.0000–5	1.0342–8	9.2090+6		1.6495+9	9.5048+8	3.2555+8	3.7350+8	5.6865+3	5.1798+2	3.2254+2	1.9544+2	2.2557–3
	5.0000–5	1.0192–8	9.3442+6		1.6738+9	8.5648+8	3.6194+8	4.5532+8	5.8793+3	6.3811+2	3.9796+2	2.4014+2	2.8229–3
	6.0000–5	1.0297–8	9.2491+6		1.6567+9	7.8662+8	3.8349+8	4.8660+8	6.0315+3	7.1791+2	4.5909+2	2.5883+2	3.3898–3
N3	6.3140–5	1.0355–8	9.1977+6		1.6475+9	7.6812+8	3.8747+8	4.9193+8	6.0747+3	7.3692+2	4.7452+2	2.6239+2	3.5703–3
	6.5248–5	1.0409–8	9.1496+6		1.6389+9	7.5644+8	3.9022+8	4.9224+8	6.1028+3	7.4853+2	4.8546+2	2.6306+2	3.6921–3
N2	6.8410–5	1.0486–8	9.0824+6		1.6269+9	7.3991+8	3.9426+8	4.9268+8	6.1434+3	7.6595+2	5.0188+2	2.6406+2	3.8757–3
	6.8936–5	1.0500–8	9.0700+6		1.6246+9	7.3727+8	3.9466+8	4.9270+8	6.1500+3	7.6836+2	5.0414+2	2.6421+2	3.9064–3
	7.1308–5	1.0564–8	9.0156+6		1.6149+9	7.2573+8	3.9634+8	4.9282+8	6.1792+3	7.7887+2	5.1397+2	2.6489+2	4.0449–3
	7.4468–5	1.0644–8	8.9476+6		1.6027+9	7.1119+8	3.9857+8	4.9296+8	6.2169+3	7.9305+2	5.2727+2	2.6578+2	4.2305–3
	7.5654–5	1.0673–8	8.9233+6		1.5984+9	7.0596+8	3.9939+8	4.9301+8	6.2307+3	7.9836+2	5.3224+2	2.6612+2	4.3004–3
	8.0000–5	1.0774–8	8.8393+6		1.5833+9	6.8780+8	4.0231+8	4.9320+8	6.2796+3	8.1777+2	5.5041+2	2.6734+2	4.5576–3
	8.5000–5	1.0934–8	8.7105+6		1.5602+9	6.6861+8	4.0114+8	4.9050+8	6.3265+3	8.2790+2	5.6113+2	2.6676+2	4.8473–3
	9.0000–5	1.1084–8	8.5923+6		1.5391+9	6.5101+8	4.0009+8	4.8797+8	6.3710+3	8.3822+2	5.7195+2	2.6626+2	5.1389–3
	9.2500–5	1.1156–8	8.5366+6		1.5291+9	6.4274+8	3.9959+8	4.8676+8	6.3924+3	8.4335+2	5.7731+2	2.6604+2	5.2853–3
	1.0000–4	1.1363–8	8.3817+6	0.0000+0	1.5014+9	6.1978+8	3.9823+8	4.8333+8	6.4538+3	8.5899+2	5.9351+2	2.6547+2	5.7273–3
N1	1.0161–4	1.1413–8	8.3446+6	1.8736–9	1.4947+9	6.1520+8	3.9698+8	4.8251+8	6.4647+3	8.5962+2	5.9440+2	2.6521+2	5.8202–3
	1.0312–4	1.1466–8	8.3059+6	3.6324–9	1.4878+9	6.1101+8	3.9569+8	4.8108+8	6.4749+3	8.5973+2	5.9510+2	2.6463+2	5.9076–3
	1.0605–4	1.1567–8	8.2332+6	7.0398–9	1.4748+9	6.0312+8	3.9326+8	4.7837+8	6.4941+3	8.6005+2	5.9650+2	2.6355+2	6.0773–3
	1.1155–4	1.1752–8	8.1043+6	1.3424–8	1.4517+9	5.8917+8	3.8895+8	4.7353+8	6.5290+3	8.6103+2	5.9940+2	2.6162+2	6.3966–3
	1.1250–4	1.1783–8	8.0828+6	1.4532–8	1.4478+9	5.8684+8	3.8823+8	4.7272+8	6.5349+3	8.6124+2	5.9993+2	2.6131+2	6.4522–3
	1.1635–4	1.1907–8	7.9983+6	1.9003–8	1.4327+9	5.7776+8	3.8538+8	4.6953+8	6.5582+3	8.6201+2	6.0194+2	2.6006+2	6.6772–3
	1.2476–4	1.2169–8	7.8266+6	2.8748–8	1.4019+9	5.5936+8	3.7958+8	4.6297+8	6.6069+3	8.6428+2	6.0673+2	2.5755+2	7.1711–3
	1.2500–4	1.2176–8	7.8220+6	2.9021–8	1.4011+9	5.5887+8	3.7943+8	4.6280+8	6.6083+3	8.6436+2	6.0687+2	2.5748+2	7.1849–3
	1.3125–4	1.2366–8	7.7013+6	3.6256–8	1.3795+9	5.4637+8	3.7483+8	4.5827+8	6.6425+3	8.6347+2	6.0768+2	2.5579+2	7.5541–3
	1.3738–4	1.2548–8	7.5902+6	4.3360–8	1.3596+9	5.3493+8	3.7056+8	4.5407+8	6.6747+3	8.6279+2	6.0853+2	2.5424+2	7.9179–3
	1.5000–4	1.2902–8	7.3818+6	5.7988–8	1.3222+9	5.1358+8	3.6254+8	4.4611+8	6.7372+3	8.6245+2	6.1104+2	2.5140+2	8.6715–3
	1.7500–4	1.3671–8	6.9665+6	8.7270–8	1.2478+9	4.7816+8	3.4326+8	4.2642+8	6.8323+3	8.4511+2	6.0234+2	2.4276+2	1.0170–2
	2.0000–4	1.4372–8	6.6268+6	1.1707–7	1.1870+9	4.4946+8	3.2747+8	4.1007+8	6.9157+3	8.3292+2	5.9711+2	2.3581+2	1.1688–2
	2.2500–4	1.5117–8	6.3001+6	1.4749–7	1.1285+9	4.2558+8	3.1083+8	3.9207+8	6.9571+3	8.1065+2	5.8332+2	2.2731+2	1.3185–2
	2.5000–4	1.5815–8	6.0221+6	1.7867–7	1.0787+9	4.0529+8	2.9676+8	3.7664+8	6.9944+3	7.9294+2	5.7278+2	2.2015+2	1.4691–2
	2.6250–4	1.6149–8	5.8975+6	1.9451–7	1.0564+9	3.9623+8	2.9044+8	3.6970+8	7.0117+3	7.8517+2	5.6819+2	2.1697+2	1.5447–2
	3.0000–4	1.7098–8	5.5700+6	2.4286–7	9.9771+8	3.7245+8	2.7389+8	3.5136+8	7.0593+3	7.6608+2	5.5737+2	2.0870+2	1.7724–2
M5	3.7655–4	1.9137–8	4.9768+6	3.4631–7	8.9145+8	3.3548+8	2.4337+8	3.1259+8	7.1412+3	7.1456+2	5.2535+2	1.8919+2	2.2416–2
	3.8241–4	1.9288–8	4.9377+6	3.5453–7	8.8444+8	3.3311+8	2.4143+8	3.0990+8	7.1468+3	7.1136+2	5.2347+2	1.8787+2	2.2778–2
M4	3.8299–4	1.9303–8	4.9338+6	3.5534–7	8.8376+8	3.3288+8	2.4124+8	3.0964+8	7.1473+3	7.1104+2	5.2328+2	1.8774+2	2.2813–2
	3.8724–4	1.9413–8	4.9059+6	3.6133–7	8.7876+8	3.3120+8	2.3986+8	3.0769+8	7.1466+3	7.0878+2	5.2196+2	1.8679+2	2.3066–2
	4.0000–4	1.9739–8	4.8248+6	3.7941–7	8.6423+8	3.2631+8	2.3586+8	3.0206+8	7.1444+3	7.0234+2	5.1826+2	1.8405+2	2.3826–2
	4.1250–4	2.0070–8	4.7454+6	3.9731–7	8.5000+8	3.2174+8	2.3172+8	2.9654+8	7.1420+3	6.9435+2	5.1314+2	1.8118+2	2.4569–2
	4.2344–4	2.0355–8	4.6789+6	4.1314–7	8.3809+8	3.1790+8	2.2826+8	2.9193+8	7.1399+3	6.8770+2	5.0889+2	1.7878+2	2.5219–2
	4.2500–4	2.0395–8	4.6696+6	4.1542–7	8.3643+8	3.1736+8	2.2778+8	2.9128+8	7.1396+3	6.8679+2	5.0831+2	1.7845+2	2.5311–2
	4.3301–4	2.0602–8	4.6229+6	4.2711–7	8.2806+8	3.1465+8	2.2536+8	2.8805+8	7.1381+3	6.8217+2	5.0537+2	1.7677+2	2.5787–2
	4.4375–4	2.0875–8	4.5622+6	4.4293–7	8.1720+8	3.1113+8	2.2221+8	2.8385+8	7.1362+3	6.7625+2	5.0163+2	1.7460+2	2.6425–2
	4.4976–4	2.1027–8	4.5293+6	4.5183–7	8.1131+8	3.0922+8	2.2051+8	2.8157+8	7.1352+3	6.7308+2	4.9964+2	1.7342+2	2.6782–2
	4.5781–4	2.1229–8	4.4863+6	4.6384–7	8.0359+8	3.0671+8	2.1828+8	2.7859+8	7.1338+3	6.6897+2	4.9706+2	1.7188+2	2.7260–2
	4.6232–4	2.1341–8	4.4627+6	4.7058–7	7.9937+8	3.0534+8	2.1706+8	2.7696+8	7.1330+3	6.6675+2	4.9568+2	1.7104+2	2.7528–2
	4.7891–4	2.1749–8	4.3789+6	4.9561–7	7.8436+8	3.0044+8	2.1273+8	2.7118+8	7.1303+3	6.5895+2	4.9086+2	1.6806+2	2.8512–2
	4.8116–4	2.1804–8	4.3678+6	4.9903–7	7.8238+8	2.9979+8	2.1217+8	2.7042+8	7.1299+3	6.5794+2	4.9024+2	1.6767+2	2.8646–2
	5.0000–4	2.2259–8	4.2786+6	5.2785–7	7.6640+8	2.9455+8	2.0757+8	2.6427+8	7.1269+3	6.4990+2	4.8535+2	1.6451+2	2.9763–2
	5.5000–4	2.3517–8	4.0498+6	6.0624–7	7.2541+8	2.8195+8	1.9585+8	2.4760+8	7.1085+3	6.2583+2	4.7028+2	1.5552+2	3.2661–2
M3	5.6853–4	2.3970–8	3.9733+6	6.3604–7	7.1170+8	2.7769+8	1.9194+8	2.4206+8	7.1022+3	6.1795+2	4.6538+2	1.5254+2	3.3733–2
	5.7640–4	2.4164–8	3.9413+6	6.4880–7	7.0598+8	2.7595+8	1.9034+8	2.3968+8	7.0942+3	6.1477+2	4.6346+2	1.5128+2	3.4155–2
	5.8820–4	2.4453–8	3.8947+6	6.6807–7	6.9763+8	2.7339+8	1.8802+8	2.3621+8	7.0825+3	6.1019+2	4.6072+2	1.4944+2	3.4787–2
	6.0000–4	2.4740–8	3.8496+6	6.8748–7	6.8955+8	2.7091+8	1.8577+8	2.3287+8	7.0711+3	6.0583+2	4.5813+2	1.4767+2	3.5417–2
M2	6.0019–4	2.4744–8	3.8489+6	6.8779–7	6.8942+8	2.7087+8	1.8573+8	2.3281+8	7.0709+3	6.0575+2	4.5807+2	1.4764+2	3.5427–2
	6.0643–4	2.4898–8	3.8251+6	6.9813–7	6.8516+8	2.6959+8	1.8448+8	2.3108+8	7.0650+3	6.0294+2	4.5621+2	1.4669+2	3.5760–2
	6.1853–4	2.5195–8	3.7801+6	7.1828–7	6.7710+8	2.6716+8	1.8212+8	2.2781+8	7.0536+3	5.9767+2	4.5273+2	1.4490+2	3.6405–2
	6.4122–4	2.5744–8	3.6995+6	7.5653–7	6.6265+8	2.6278+8	1.7791+8	2.2196+8	7.0330+3	5.8840+2	4.4665+2	1.4171+2	3.7611–2
	6.5000–4	2.5954–8	3.6695+6	7.7150–7	6.5728+8	2.6114+8	1.7634+8	2.1979+8	7.0252+3	5.8500+2	4.4443+2	1.4053+2	3.8078–2
	7.0000–4	2.7129–8	3.5105+6	8.5831–7	6.2882+8	2.5241+8	1.6806+8	2.0834+8	6.9830+3	5.6704+2	4.3271+2	1.3430+2	4.0722–2

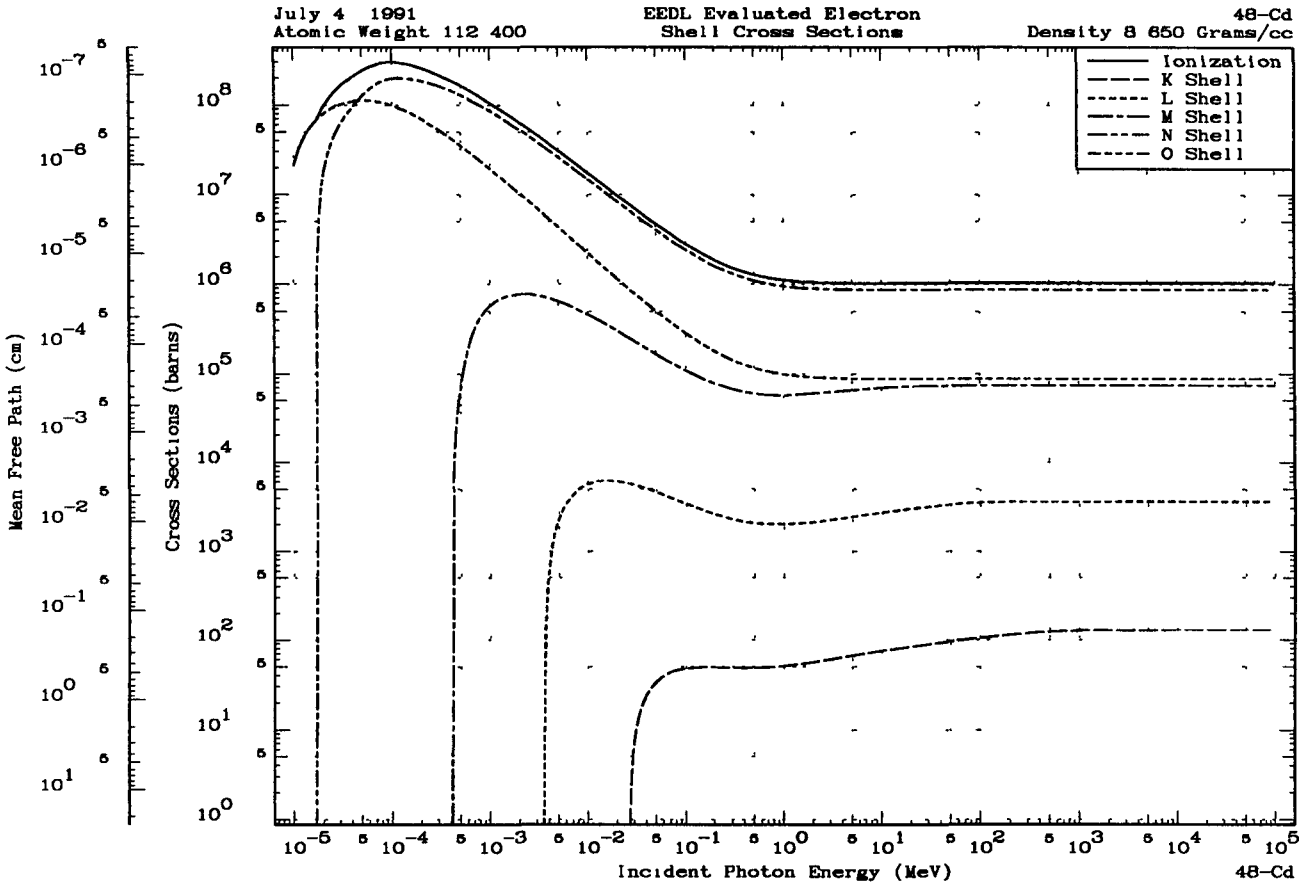
Atomic Weight 107.870 Density 10.500 Grams/cc

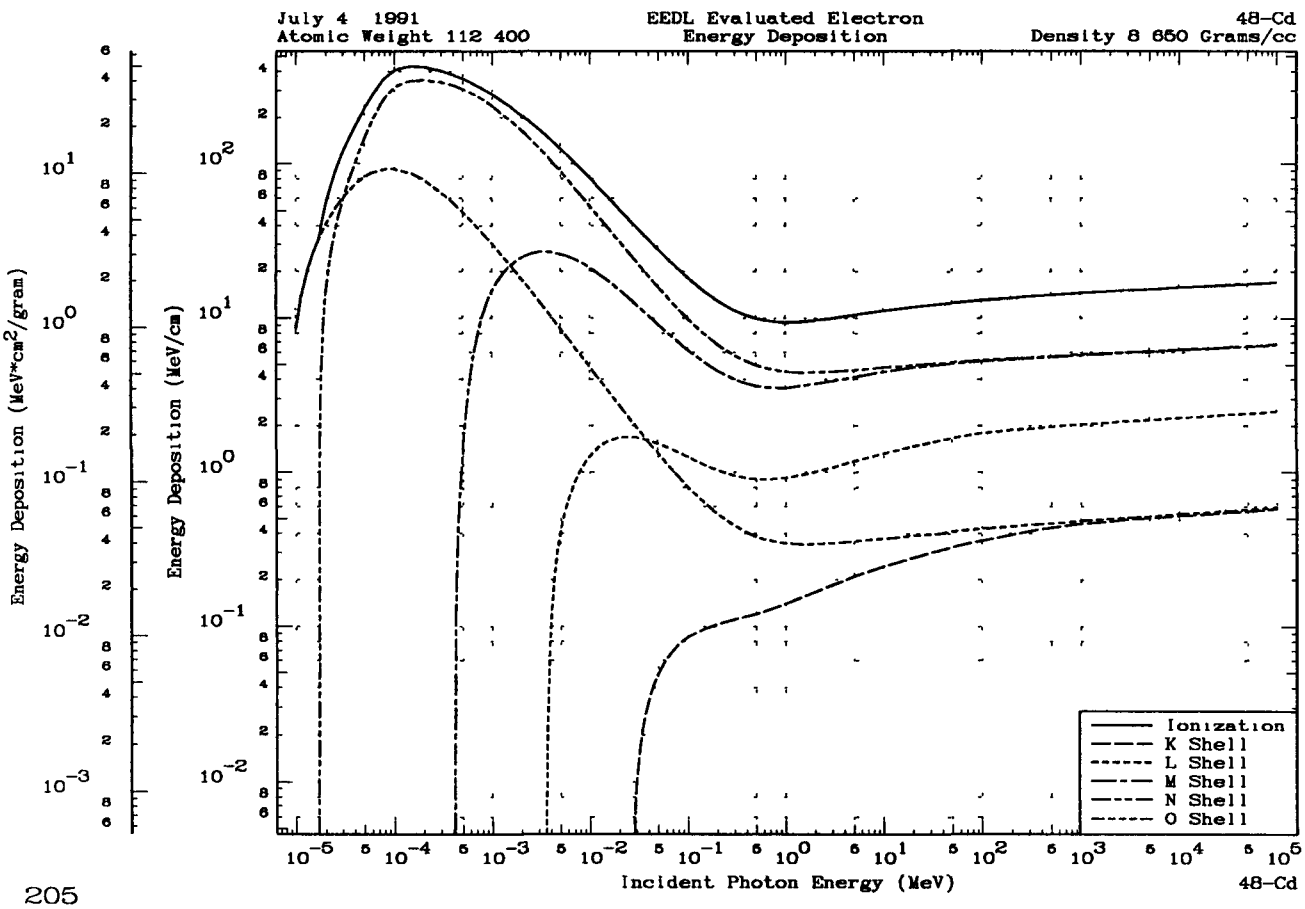
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M1	7.0380–4	2.7217–8	3.4992+6	8.6502–7	6.2679+8	2.5179+8	1.6747+8	2.0753+8	6.9799+3	5.6579+2	4.3189+2	1.3386+2	4.0922–2
	7.1583–4	2.7497–8	3.4636+6	8.8635–7	6.2041+8	2.4984+8	1.6564+8	2.0493+8	6.9698+3	5.6185+2	4.2939+2	1.3242+2	4.1549–2
	7.2061–4	2.7607–8	3.4497+6	8.9487–7	6.1792+8	2.4908+8	1.6492+8	2.0392+8	6.9659+3	5.6032+2	4.2842+2	1.3186+2	4.1798–2
	7.2500–4	2.7709–8	3.4371+6	9.0272–7	6.1566+8	2.4838+8	1.6427+8	2.0300+8	6.9623+3	5.5893+2	4.2754+2	1.3135+2	4.2027–2
	7.3687–4	2.7982–8	3.4036+6	9.2403–7	6.0966+8	2.4654+8	1.6255+8	2.0057+8	6.9527+3	5.5518+2	4.2513+2	1.3001+2	4.2644–2
	7.6843–4	2.8698–8	3.3186+6	9.8137–7	5.9444+8	2.4184+8	1.5819+8	1.9441+8	6.9279+3	5.4581+2	4.1916+2	1.2661+2	4.4282–2
	8.0000–4	2.9402–8	3.2392+6	1.0397–6	5.8021+8	2.3741+8	1.5411+8	1.8868+8	6.9042+3	5.3729+2	4.1379+2	1.2345+2	4.5914–2
	8.5000–4	3.0540–8	3.1184+6	1.1341–6	5.5858+8	2.3090+8	1.4781+8	1.7987+8	6.8393+3	5.2190+2	4.0340+2	1.1845+2	4.8002–2
	9.0000–4	3.1651–8	3.0090+6	1.2312–6	5.3897+8	2.2492+8	1.4211+8	1.7193+8	6.7787+3	5.0830+2	3.9429+2	1.1396+2	5.0073–2
	1.0000–3	3.3800–8	2.8177+6	1.4326–6	5.0472+8	2.1431+8	1.3218+8	1.5822+8	6.6683+3	4.8479+2	3.7852+2	1.0622+2	5.4170–2
	1.1250–3	3.6499–8	2.6093+6	1.6987–6	4.6739+8	2.0300+8	1.2129+8	1.4309+8	6.5022+3	4.5508+2	3.5772+2	9.7299+1	5.7990–2
	1.2500–3	3.9082–8	2.4369+6	1.9809–6	4.3650+8	1.9339+8	1.1232+8	1.3079+8	6.3570+3	4.3091+2	3.4079+2	9.0059+1	6.1751–2
	1.3125–3	4.0334–8	2.3613+6	2.1277–6	4.2295+8	1.8909+8	1.0840+8	1.2546+8	6.2909+3	4.2046+2	3.3347+2	8.6927+1	6.3609–2
	1.5000–3	4.3953–8	2.1668+6	2.5885–6	3.8812+8	1.7782+8	9.8352+7	1.1195+8	6.1135+3	3.9377+2	3.1469+2	7.9013+1	6.9107–2
	1.7500–3	4.8700–8	1.9556+6	3.2513–6	3.5029+8	1.6539+8	8.7403+7	9.7494+7	5.8990+3	3.6100+2	2.9079+2	7.0133+1	7.5590–2
	2.0000–3	5.3188–8	1.7906+6	3.9692–6	3.2074+8	1.5532+8	7.8914+7	8.6491+7	5.7193+3	3.3581+2	2.7234+2	6.3391+1	8.1924–2
	2.5000–3	6.2007–8	1.5359+6	5.5612–6	2.7512+8	1.3881+8	6.6121+7	7.0185+7	5.3777+3	2.9330+2	2.4029+2	5.2919+1	9.2127–2
	3.0000–3	7.0193–8	1.3568+6	7.3571–6	2.4304+8	1.2663+8	5.7231+7	5.9172+7	5.1138+3	2.6402+2	2.1806+2	4.5863+1	1.0196–1
L3	3.3500–3	7.5785–8	1.2567+6	8.7289–6	2.2510+8	1.1945+8	5.2329+7	5.3322+7	4.9451+3	2.4644+2	2.0438+2	4.1949+1	1.0794–1
	3.4312–3	7.7077–8	1.2356+6	9.0611–6	2.2133+8	1.1790+8	5.1319+7	5.2099+7	4.9092+3	2.4283+2	2.0158+2	4.1139+1	1.0931–1
L2	3.5281–3	7.8604–8	1.2116+6	9.4633–6	2.1703+8	1.1614+8	5.0172+7	5.0714+7	4.8678+3	2.3874+2	1.9840+2	4.0223+1	1.1093–1
	3.5734–3	7.9310–8	1.2008+6	9.6540–6	2.1510+8	1.1534+8	4.9649+7	5.0103+7	4.8470+3	2.3683+2	1.9691+2	3.9806+1	1.1159–1
	3.6461–3	8.0437–8	1.1840+6	9.9627–6	2.1208+8	1.1408+8	4.8836+7	4.9156+7	4.8144+3	2.3385+2	1.9458+2	3.9159+1	1.1264–1
L1	3.7834–3	8.2546–8	1.1538+6	1.0557–5	2.0667+8	1.1182+8	4.7378+7	4.7461+7	4.7550+3	2.2854+2	1.9042+2	3.8002+1	1.1462–1
	3.8230–3	8.3155–8	1.1453+6	1.0731–5	2.0515+8	1.1119+8	4.6975+7	4.6982+7	4.7382+3	2.2707+2	1.8928+2	3.7679+1	1.1518–1
	3.8917–3	8.4207–8	1.1310+6	1.1035–5	2.0259+8	1.1012+8	4.6294+7	4.6174+7	4.7098+3	2.2460+2	1.8735+2	3.7136+1	1.1615–1
	4.0000–3	8.5852–8	1.1093+6	1.1521–5	1.9871+8	1.0848+8	4.5265+7	4.4956+7	4.6663+3	2.2087+2	1.8443+2	3.6316+1	1.1767–1
	4.2500–3	8.9727–8	1.0614+6	1.2676–5	1.9012+8	1.0476+8	4.3055+7	4.2301+7	4.5678+3	2.1223+2	1.7765+2	3.4458+1	1.2093–1
	4.5000–3	9.3530–8	1.0183+6	1.3875–5	1.8239+8	1.0138+8	4.1071+7	3.9942+7	4.4769+3	2.0452+2	1.7159+2	3.2807+1	1.2415–1
	4.6250–3	9.5406–8	9.9824+5	1.4492–5	1.7881+8	9.9792+7	4.0153+7	3.8858+7	4.4340+3	2.0097+2	1.6879+2	3.2048+1	1.2575–1
	5.0000–3	1.0094–7	9.4352+5	1.6404–5	1.6901+8	9.5418+7	3.7652+7	3.5932+7	4.3140+3	1.9132+2	1.6119+2	3.0000+1	1.3048–1
	5.5000–3	1.0830–7	8.7939+5	1.9100–5	1.5752+8	9.0157+7	3.4781+7	3.2576+7	4.1625+3	1.7976+2	1.5204+2	2.7583+1	1.3602–1
	6.0000–3	1.1546–7	8.2485+5	2.1959–5	1.4775+8	8.5607+7	3.2352+7	2.9787+7	4.0289+3	1.7005+2	1.4433+2	2.5574+1	1.4144–1
	6.5000–3	1.2256–7	7.7708+5	2.4981–5	1.3919+8	8.1523+7	3.0249+7	2.7416+7	3.8985+3	1.6101+2	1.3706+2	2.3801+1	1.4576–1
	7.0000–3	1.2950–7	7.3544+5	2.8164–5	1.3173+8	7.7917+7	2.8424+7	2.5389+7	3.7815+3	1.5320+2	1.3077+2	2.2285+1	1.5002–1
	7.2500–3	1.3291–7	7.1655+5	2.9815–5	1.2835+8	7.6265+7	2.7599+7	2.4482+7	3.7274+3	1.4968+2	1.2792+2	2.1606+1	1.5213–1
	8.0000–3	1.4295–7	6.6624+5	3.4988–5	1.1934+8	7.1816+7	2.5411+7	2.2107+7	3.5796+3	1.4037+2	1.2038+2	1.9829+1	1.5835–1
	9.0000–3	1.5616–7	6.0988+5	4.2405–5	1.0924+8	6.6699+7	2.3007+7	1.9535+7	3.3956+3	1.2945+2	1.1145+2	1.7828+1	1.6503–1
	1.0000–2	1.6895–7	5.6371+5	5.0407–5	1.0097+8	6.2432+7	2.1050+7	1.7488+7	3.2391+3	1.2058+2	1.0418+2	1.6235+1	1.7156–1
	1.2500–2	1.9983–7	4.7659+5	7.2810–5	8.5368+7	5.4127+7	1.7428+7	1.3810+7	2.9051+3	1.0306+2	8.9637+1	1.3237+1	1.8292–1
	1.5000–2	2.2900–7	4.1589+5	9.8602–5	7.4495+7	4.8168+7	1.4938+7	1.1386+7	2.6579+3	9.1053+1	7.9601+1	1.1258+1	1.9394–1
	2.0000–2	2.8471–7	3.3451+5	1.5924–4	5.9919+7	3.9844+7	1.1718+7	8.3545+6	2.2794+3	7.4413+1	6.5564+1	8.6405+0	2.0865–1
K	2.5489–2	3.4217–7	2.7833+5	2.3947–4	4.9856+7	3.3852+7	9.5684+6	6.4335+6	1.9922+3	6.2760+1	5.5635+1	6.9047+0	2.2037–1
	2.5771–2	3.4505–7	2.7601+5	2.4397–4	4.9440+7	3.3599+7	9.4815+6	6.3575+6	1.9799+3	6.2275+1	5.5220+1	6.8342+0	2.2084–1
	2.6300–2	3.5042–7	2.7178+5	2.5253–4	4.8682+7	3.3138+7	9.3231+6	6.2195+6	1.9573+3	6.1391+1	5.4464+1	6.7060+0	2.2172–1
	2.7225–2	3.5975–7	2.6473+5	2.6778–4	4.7419+7	3.2366+7	9.0594+6	5.9914+6	1.9194+3	5.9922+1	5.3205+1	6.4941+0	2.2327–1
	2.8612–2	3.7360–7	2.5492+5	2.9134–4	4.5662+7	3.1289+7	8.6933+6	5.6781+6	1.8662+3	5.7884+1	5.1456+1	6.2028+0	2.2560–1
	3.0000–2	3.8726–7	2.4593+5	3.1571–4	4.4051+7	3.0296+7	8.3584+6	5.3948+6	1.8168+3	5.6022+1	4.9855+1	5.9393+0	2.2793–1
	3.2500–2	4.1167–7	2.3135+5	3.6159–4	4.1439+7	2.8658+7	7.8301+6	4.9497+6	1.7357+3	5.2965+1	4.7224+1	5.5098+0	2.3118–1
	3.6250–2	4.4740–7	2.1287+5	4.3510–4	3.8130+7	2.6565+7	7.1630+6	4.4011+6	1.6307+3	4.9114+1	4.3898+1	4.9799+0	2.3615–1
	4.0000–2	4.8218–7	1.9752+5	5.1404–4	3.5380+7	2.4809+7	6.6105+6	3.9588+6	1.5416+3	4.5934+1	4.1141+1	4.5522+0	2.4115–1
	4.5000–2	5.2720–7	1.8065+5	6.2733–4	3.2358+7	2.2850+7	6.0182+6	3.4889+6	1.4416+3	4.2384+1	3.8059+1	4.0793+0	2.4618–1
	5.0000–2	5.7093–7	1.6681+5	7.4952–4	2.9880+7	2.1229+7	5.5336+6	3.1161+6	1.3576+3	3.9488+1	3.5533+1	3.7036+0	2.5131–1
	6.0000–2	6.5516–7	1.4537+5	1.0183–3	2.6038+7	1.8672+7	4.8012+6	2.5640+6	1.2308+3	3.5011+1	3.1622+1	3.1290+0	2.5987–1
	7.0000–2	7.3441–7	1.2968+5	1.3182–3	2.3229+7	1.6758+7	4.2794+6	2.1904+6	1.1336+3	3.1735+1	2.8740+1	2.7287+0	2.6684–1
	8.0000–2	8.1063–7	1.1749+5	1.6466–3	2.1045+7	1.5259+7	3.8735+6	1.9110+6	1.0556+3	2.9199+1	2.6496+1	2.4292+0	2.7408–1
	1.0000–1	9.5251–7	9.9987+4	2.3785–3	1.7910+7	1.3083+7	3.3083+6	1.5174+6	9.3792+2	2.5535+1	2.3261+1	1.9891+0	2.8586–1
	1.5000–1	1.2463–6	7.6418+4	4.5612–3	1.3688+7	1.0144+7	2.5422+6	1.0007+6	7.6234+2	2.0465+1	1.8771+1	1.3845+0	3.0996–1
	2.0000–1	1.4786–6	6.4410+4	7.1728–3	1.1537+7	8.6275+6	2.1582+6	7.5091+5	6.6683+2	1.7883+1	1.6473+1	1.0784+0	3.3217–1
	3.0000–1	1.8519–6	5.1428+4	1.3200–2	9.2119+6	6.9094+6	1.7768+6	5.2510+5	5.6796+2	1.5362+1	1.4192+1	7.9370–1	3.7612–1
	4.0000–1	2.1565–6	4.4164+4	1.9968–2	7.9108+6	5.8979+6	1.5905+6	4.2187+5	5.2027+2	1.4207+1	1.3121+1	6.6116–1	4.2402–1
	5.0000–1	2.4178–6	3.9390+4	2.7158–2	7.0556+6	5.2164+6	1.4827+6	3.5604+5	4.9354+2	1.3612+1	1.2563+1	5.7383–1	4.7509–1
	6.0000–1	2.6460–6	3.5993+4	3.4602–2	6.4472+6	4.7185+6	1.4127+6	3.1556+5	4.7712+2	1.3258+1	1.2209+1	5.2021–1	5.2876–1
	8.0000–1	3.0277–6	3.1455+4	4.9824–2	5.6343+6	4.0399+6	1.3307+6	2.6320+5	4.5998+2	1.3021+1	1.1926+1	4.4961–1	6.4471–1
	1.0000+0	3.3403–6	2.8512+4	6.5208–2	5.1071+6	3.5897+6	1.2848+6	2.3218+5	4.5291+2	1.2979+1	1.1801+1	4.0752–1	7.7059–1
	1.5000+0	3.9162–6	2.4319+4	1.0311–1	4.3561+6	2.9335+6	1.2329+6	1.8927+5	4.4982+2	1.3406+1	1.1945+1	3.4827–1	1.1125+0
	2.0000+0	4.3130–6	2.2082+4	1.3968–1	3.9553+6	2.5688+6	1.2172+6	1.6891+5	4.5359+2	1.3944+1	1.2142+1	3.1821–1	1.4837+0
	3.0000+0	4.8490–6	1.9641+4	2.0865–1	3.5181+6	2.1775+6	1.1956+6	1.4449+5	4.6168+2	1.5068+1	1.2508+1	2.8525–1	2.2744+0
	4.0000+0	5.1747–6	1.8405+4	2.7262–1	3.2967+6	1.9688+6	1.1926+6	1.3479+5	4.6808+2	1.6213+1	1.2826+1	2.7096–1	3.1158+0
	5.0000+0	5.3948–6	1.7654+4	3.3226–1	3.1621+6	1.8435+6	1.1909+6	1.2723+5	4.7346+2	1.7333+1	1.3085+1	2.6036–1	3.9876+0
	6.0000+0	5.5501–6	1.7160+4	3.8819–1	3.0737+6	1.7626+6	1.1895+6	1.2107+5	4.7791+2	1.8435+1	1.3314+1	2.5216–1	4.8689+0
	8.0000+0	5.7433–6	1.6582+4	4.9061–1	2.9703+6	1.6658+6	1.1875+6	1.1652+5	4.8479+2	2.0661+1	1.3709+1	2.4620–1	6.7053+0
	1.0000+1	5.8381–6	1.6313+4	5.8263–1	2.9221+6	1.6210+6	1.1879+6	1.1276+5	4.9030+2	2.2845+1	1.4003+1	2.4167–1	8.6009+0
	1.5000+1	5.8912–6	1.6166+4	7.7941–1	2.8957+6	1.5973+6	1.1889+6	1.0906+5	5.0062+2	2.8159+1	1.4421+1	2.3587–1	1.3502+1
	2.0000+1	5.8935–6	1.6160+4	9.4178–1	2.8946+6	1.5965+6	1.1896+6	1.0802+5	5.1068+2	3.3587+1	1.4775+1	2.3573–1	1.8576+1
	3.0000+1	5.8986–6	1.6146+4	1.1998+0	2.8921+6	1.5958+6	1.1897+6	1.0604+5	5.1978+2	4.4423+1	1.5159+1	2.3553–1	2.9028+1
	4.0000+1	5.8989–6	1.6145+4	1.4010+0	2.8919+6	1.5954+6	1.1901+6	1.0594+5	5.2811+2	5.5384+1	1.5437+1	2.3580–1	3.9712+1
	5.0000+1	5.8974–6	1.6149+4	1.5656+0	2.8927+6	1.5951+6	1.1903+6	1.0675+5	5.3466+2	6.6445+1	1.5656+1	2.3810–1	5.0550+1
	6.0000+1	5.8963–6	1.6152+4	1.7047+0	2.8932+6	1.5948+6	1.1905+6	1.0737+5	5.3974+2	7.7678+1	1.5829+1	2.4000–1	6.1609+1
	8.0000+1	5.8951–6	1.6155+4	1.9306+0	2.8938+6	1.5943+6	1.1906+6	1.0827+5	5.4796+2	1.0034+2	1.6091+1	2.4304–1	8.4011+1

Atomic Weight 107.870													Density 10.500 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000+2	5.8943–6	1.6158+4	2.1101+0	2.8942+6	1.5940+6	1.1907+6	1.0891+5	5.5450+2	1.2329+2	1.6320+1	2.4550–1	1.0672+2
1.5000+2	5.8909–6	1.6167+4	2.4430+0	2.8959+6	1.5934+6	1.1908+6	1.1116+5	5.6571+2	1.8074+2	1.6553+1	2.5065–1	1.6394+2
2.0000+2	5.8915–6	1.6165+4	2.6830+0	2.8956+6	1.5929+6	1.1908+6	1.1124+5	5.7331+2	2.3862+2	1.6774+1	2.5089–1	2.2159+2
3.0000+2	5.8918–6	1.6164+4	3.0249+0	2.8954+6	1.5923+6	1.1909+6	1.1167+5	5.8186+2	3.5395+2	1.7133+1	2.5200–1	3.3657+2
4.0000+2	5.8927–6	1.6162+4	3.2692+0	2.8950+6	1.5919+6	1.1909+6	1.1169+5	5.8745+2	4.7032+2	1.7331+1	2.5218–1	4.5274+2
5.0000+2	5.8946–6	1.6157+4	3.4593+0	2.8940+6	1.5915+6	1.1909+6	1.1106+5	5.9181+2	5.8559+2	1.7473+1	2.5089–1	5.6787+2
6.0000+2	5.8949–6	1.6156+4	3.6151+0	2.8939+6	1.5912+6	1.1909+6	1.1118+5	5.9543+2	7.0155+2	1.7613+1	2.5130–1	6.8369+2
8.0000+2	5.8962–6	1.6152+4	3.8615+0	2.8932+6	1.5908+6	1.1909+6	1.1096+5	6.0179+2	9.3308+2	1.7853+1	2.5106–1	9.1497+2
1.0000+3	5.8976–6	1.6149+4	4.0528+0	2.8926+6	1.5905+6	1.1909+6	1.1063+5	6.0677+2	1.1667+3	1.8058+1	2.5060–1	1.1484+3
1.5000+3	5.8996–6	1.6143+4	4.4003+0	2.8916+6	1.5898+6	1.1909+6	1.1027+5	6.1625+2	1.7503+3	1.8247+1	2.4978–1	1.7318+3
2.0000+3	5.9012–6	1.6139+4	4.6469+0	2.8908+6	1.5894+6	1.1909+6	1.0991+5	6.2335+2	2.3322+3	1.8436+1	2.4895–1	2.3135+3
3.0000+3	5.9027–6	1.6135+4	4.9945+0	2.8901+6	1.5888+6	1.1909+6	1.0977+5	6.3377+2	3.5016+3	1.8812+1	2.4866–1	3.4825+3
4.0000+3	5.9041–6	1.6131+4	5.2409+0	2.8894+6	1.5883+6	1.1909+6	1.0951+5	6.4145+2	4.6701+3	1.8980+1	2.4808–1	4.6509+3
5.0000+3	5.9063–6	1.6125+4	5.4318+0	2.8883+6	1.5880+6	1.1909+6	1.0879+5	6.4750+2	5.8475+3	1.9102+1	2.4643–1	5.8281+3
6.0000+3	5.9064–6	1.6125+4	5.5879+0	2.8883+6	1.5877+6	1.1909+6	1.0902+5	6.5191+2	7.0059+3	1.9224+1	2.4696–1	6.9864+3
8.0000+3	5.9072–6	1.6122+4	5.8342+0	2.8879+6	1.5873+6	1.1909+6	1.0904+5	6.5895+2	9.3426+3	1.9468+1	2.4702–1	9.3229+3
1.0000+4	5.9078–6	1.6121+4	6.0251+0	2.8876+6	1.5869+6	1.1909+6	1.0908+5	6.6445+2	1.1701+4	1.9685+1	2.4714–1	1.1681+4
1.5000+4	5.9090–6	1.6118+4	6.3725+0	2.8870+6	1.5863+6	1.1909+6	1.0914+5	6.7518+2	1.7473+4	1.9861+1	2.4726–1	1.7453+4
2.0000+4	5.9102–6	1.6114+4	6.6193+0	2.8864+6	1.5859+6	1.1909+6	1.0898+5	6.8290+2	2.3320+4	2.0036+1	2.4690–1	2.3300+4
3.0000+4	5.9112–6	1.6111+4	6.9675+0	2.8859+6	1.5853+6	1.1909+6	1.0908+5	6.9374+2	3.4897+4	2.0388+1	2.4714–1	3.4876+4
4.0000+4	5.9122–6	1.6109+4	7.2146+0	2.8854+6	1.5848+6	1.1909+6	1.0901+5	7.0153+2	4.6599+4	2.0587+1	2.4696–1	4.6578+4
5.0000+4	5.9143–6	1.6103+4	7.4062+0	2.8844+6	1.5845+6	1.1909+6	1.0831+5	7.0752+2	5.8193+4	2.0740+1	2.4538–1	5.8172+4
6.0000+4	5.9143–6	1.6103+4	7.5630+0	2.8844+6	1.5842+6	1.1909+6	1.0862+5	7.1240+2	6.9777+4	2.0854+1	2.4608–1	6.9756+4
8.0000+4	5.9150–6	1.6101+4	7.8102+0	2.8841+6	1.5838+6	1.1909+6	1.0872+5	7.2018+2	9.3148+4	2.1081+1	2.4632–1	9.3126+4
1.0000+5	5.9157–6	1.6099+4	8.0017+0	2.8837+6	1.5834+6	1.1909+6	1.0869+5	7.2622+2	1.1656+5	2.1303+1	2.4626–1	1.1654+5


July 4 1991
Atomic Weight 112 400
EEDL Evaluated Electron
Cross Sections
48-Cd
Density 8 650 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
48-Cd


July 4, 1991
Atomic Weight 112 400
EEDL Evaluated Electron
Energy Deposition
48-Cd
Density 8 650 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
48-Cd


July 4 1991
Atomic Weight 112 400
EEDL Evaluated Electron
Shell Cross Sections
48-Cd
Density 8 650 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
48-Cd


July 4 1991
Atomic Weight 112 400
EEDL Evaluated Electron
Energy Deposition
48-Cd
Density 8 650 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
48-Cd

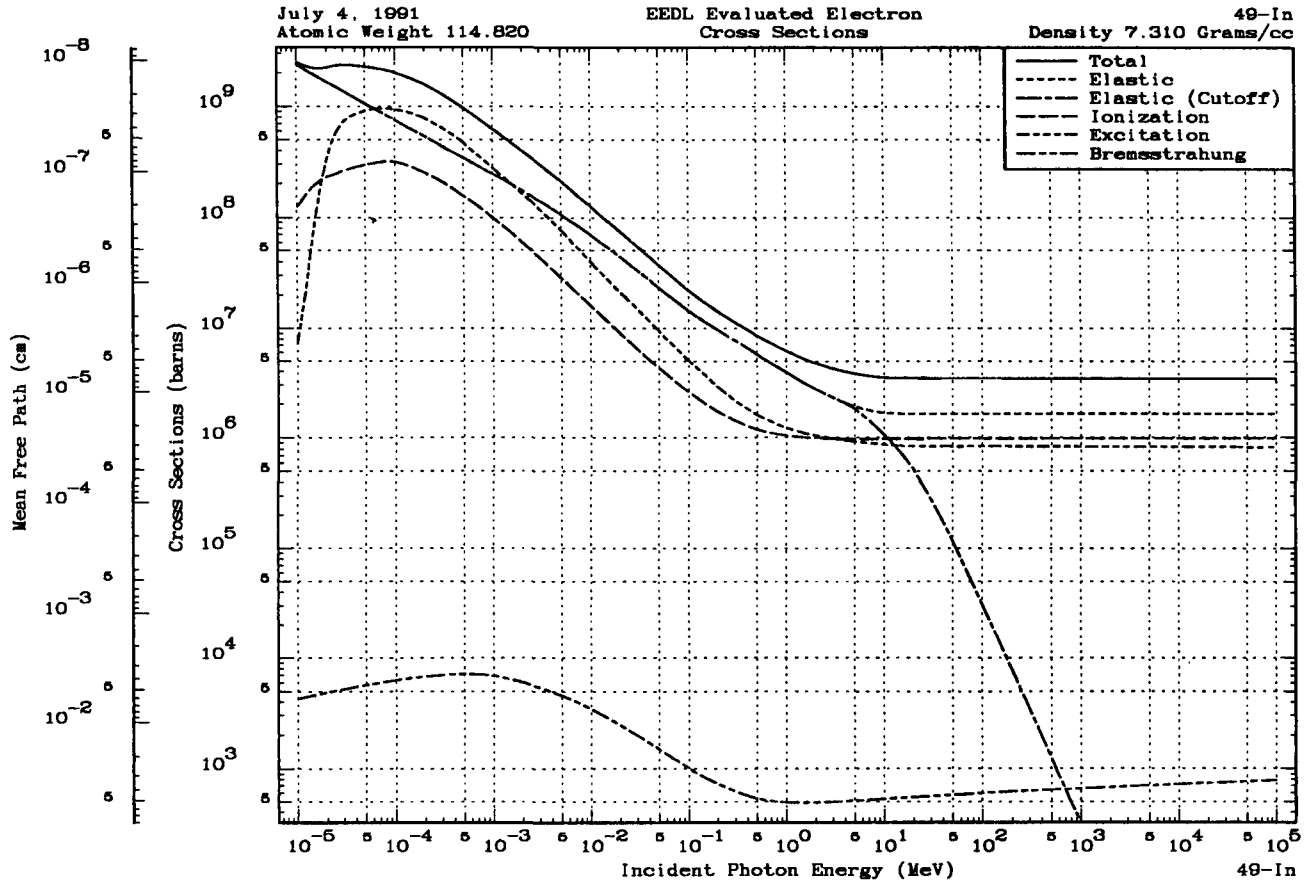
Atomic Weight 112.400 Density 8.650 Grams/cc

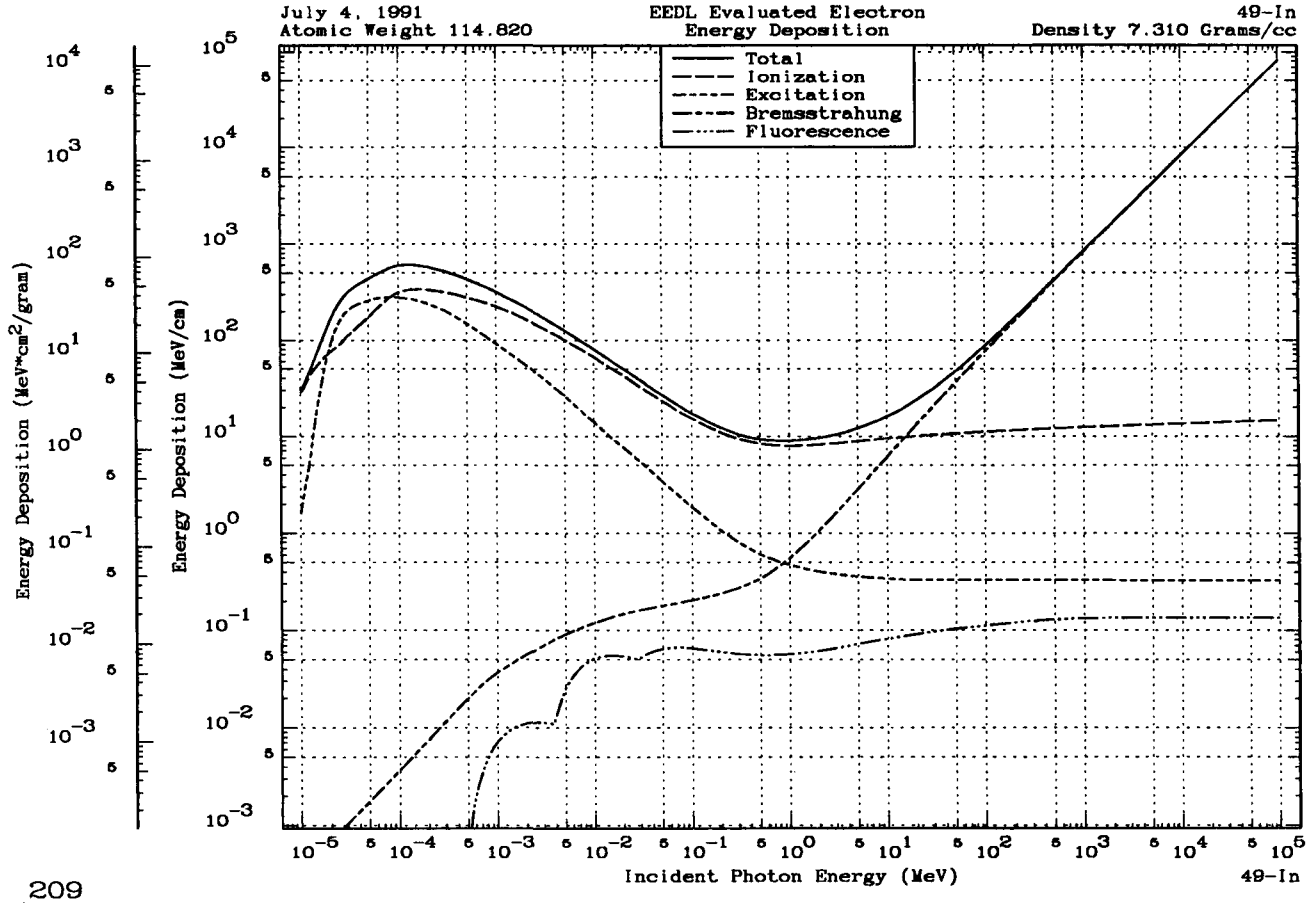
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0595–8	1.0911+7		2.0365+9	2.0146+9	2.0919+7	9.9973+5	4.4289+3	8.8065+0	8.4053+0	4.0079–1	4.4301–4
	1.1250–5	1.1128–8	1.0388+7		1.9389+9	1.9038+9	3.2436+7	2.6706+6	4.5338+3	1.4598+1	1.3497+1	1.1006+0	4.9620–4
	1.2187–5	1.1501–8	1.0052+7		1.8762+9	1.8321+9	3.9127+7	4.9760+6	4.6064+3	1.8793+1	1.6701+1	2.0924+0	5.3666–4
	1.3125–5	1.1837–8	9.7666+6		1.8229+9	1.7680+9	4.6556+7	8.3128+6	4.6748+3	2.3937+1	2.0371+1	3.5654+0	5.7766–4
	1.3594–5	1.1998–8	9.6355+6		1.7984+9	1.7385+9	4.9342+7	1.0599+7	4.7075+3	2.6432+1	2.1841+1	4.5906+0	5.9834–4
	1.5000–5	1.2431–8	9.3001+6		1.7358+9	1.6582+9	5.8074+7	1.9512+7	4.8005+3	3.5178+1	2.6590+1	8.5877+0	6.6100–4
N5	1.6970–5	1.2929–8	8.9415+6		1.6689+9	1.5628+9	6.7558+7	3.8468+7	4.9197+3	4.9496+1	3.2310+1	1.7185+1	7.5041–4
	1.7349–5	1.2997–8	8.8952+6		1.6602+9	1.5464+9	7.0908+7	4.2954+7	4.9413+3	5.3916+1	3.4685+1	1.9230+1	7.6781–4
N4	1.7710–5	1.3057–8	8.8537+6		1.6525+9	1.5311+9	7.3730+7	4.7614+7	4.9616+3	5.8039+1	3.6678+1	2.1361+1	7.8447–4
	1.7996–5	1.3096–8	8.8276+6		1.6476+9	1.5194+9	7.6998+7	5.1209+7	4.9774+3	6.2176+1	3.9175+1	2.3000+1	7.9770–4
	1.8012–5	1.3098–8	8.8262+6		1.6474+9	1.5188+9	7.7170+7	5.1409+7	4.9782+3	6.2399+1	3.9307+1	2.3091+1	7.9841–4
	1.8998–5	1.3213–8	8.7492+6		1.6330+9	1.4804+9	8.7097+7	6.5490+7	5.0313+3	7.6528+1	4.6994+1	2.9532+1	8.4431–4
	1.9006–5	1.3214–8	8.7488+6		1.6329+9	1.4801+9	8.7179+7	6.5611+7	5.0317+3	7.6647+1	4.7058+1	2.9588+1	8.4467–4
	2.0000–5	1.3288–8	8.7000+6		1.6238+9	1.4443+9	9.6773+7	8.2701+7	5.0829+3	9.2130+1	5.4685+1	3.7443+1	8.9134–4
	2.1250–5	1.3368–8	8.6479+6		1.6141+9	1.4029+9	1.0662+8	1.0456+8	5.1361+3	1.1041+2	6.2990+1	4.7418+1	9.4523–4
	2.2500–5	1.3384–8	8.6380+6		1.6122+9	1.3649+9	1.1687+8	1.3044+8	5.1868+3	1.3115+2	7.1895+1	5.9250+1	9.9956–4
	2.3438–5	1.3391–8	8.6333+6		1.6114+9	1.3384+9	1.2381+8	1.4912+8	5.2233+3	1.4594+2	7.8122+1	6.7816+1	1.0406–3
	2.5000–5	1.3346–8	8.6621+6		1.6167+9	1.2976+9	1.3489+8	1.8425+8	5.2815+3	1.7235+2	8.8383+1	8.3965+1	1.1095–3
	2.6250–5	1.3296–8	8.6948+6		1.6228+9	1.2676+9	1.4316+8	2.1212+8	5.3260+3	1.9342+2	9.6600+1	9.6824+1	1.1650–3
	2.6719–5	1.3270–8	8.7120+6		1.6260+9	1.2568+9	1.4596+8	2.2324+8	5.3422+3	2.0144+2	9.9475+1	1.0196+2	1.1860–3
	3.0000–5	1.3101–8	8.8246+6		1.6471+9	1.1889+9	1.6480+8	2.9341+8	5.4495+3	2.5424+2	1.1966+2	1.3458+2	1.3339–3
	3.5000–5	1.2854–8	8.9940+6		1.6787+9	1.1043+9	1.8724+8	3.8715+8	5.5935+3	3.2528+2	1.4723+2	1.7805+2	1.5620–3
	4.0000–5	1.2672–8	9.1227+6		1.7027+9	1.0359+9	2.0774+8	4.5906+8	5.7213+3	3.8691+2	1.7522+2	2.1168+2	1.7949–3
	5.0000–5	1.2607–8	9.1698+6		1.7115+9	9.3101+8	2.4115+8	5.3934+8	5.9162+3	4.7994+2	2.2995+2	2.4999+2	2.2468–3
	6.0000–5	1.2733–8	9.0790+6		1.6946+9	8.5325+8	2.6548+8	5.7582+8	6.0703+3	5.4838+2	2.8001+2	2.6837+2	2.6987–3
N3	7.2190–5	1.3061–8	8.8516+6		1.6521+9	7.8099+8	2.8460+8	5.8651+8	6.2307+3	6.0674+2	3.3141+2	2.7533+2	3.2623–3
	7.4143–5	1.3119–8	8.8119+6		1.6447+9	7.7108+8	2.8683+8	5.8677+8	6.2542+3	6.1446+2	3.3866+2	2.7579+2	3.3537–3
	7.7071–5	1.3203–8	8.7559+6		1.6342+9	7.5693+8	2.9015+8	5.8716+8	6.2885+3	6.2610+2	3.4961+2	2.7649+2	3.4914–3
N2	7.8220–5	1.3235–8	8.7350+6		1.6303+9	7.5159+8	2.9144+8	5.8731+8	6.3016+3	6.3068+2	3.5392+2	2.7676+2	3.5457–3
	8.0000–5	1.3293–8	8.6966+6		1.6232+9	7.4354+8	2.9346+8	5.8617+8	6.3216+3	6.3732+2	3.6078+2	2.7654+2	3.6298–3
	8.5000–5	1.3487–8	8.5720+6		1.5999+9	7.2228+8	2.9494+8	5.8269+8	6.3693+3	6.4802+2	3.7215+2	2.7587+2	3.8611–3
	9.2500–5	1.3755–8	8.4046+6		1.5687+9	6.9365+8	2.9715+8	5.7787+8	6.4363+3	6.6430+2	3.8925+2	2.7504+2	4.2107–3
	1.0000–4	1.4001–8	8.2568+6	0.0000+0	1.5411+9	6.6825+8	2.9936+8	5.7346+8	6.4988+3	6.8081+2	4.0643+2	2.7438+2	4.5636–3
N1	1.1336–4	1.4461–8	7.9945+6	1.9493–8	1.4921+9	6.2961+8	2.9446+8	5.6805+8	6.5872+3	6.8993+2	4.1683+2	2.7310+2	5.1831–3
	1.1451–4	1.4505–8	7.9700+6	2.1153–8	1.4876+9	6.2661+8	2.9389+8	5.6706+8	6.5943+3	6.9020+2	4.1744+2	2.7276+2	5.2365–3
	1.1672–4	1.4590–8	7.9236+6	2.4365–8	1.4789+9	6.2093+8	2.9280+8	5.6515+8	6.6080+3	6.9075+2	4.1864+2	2.7210+2	5.3402–3
	1.2088–4	1.4746–8	7.8397+6	3.0382–8	1.4632+9	6.1069+8	2.9085+8	5.6170+8	6.6329+3	6.9189+2	4.2097+2	2.7092+2	5.5352–3
	1.2452–4	1.4879–8	7.7696+6	3.5639–8	1.4502+9	6.0214+8	2.8922+8	5.5878+8	6.6542+3	6.9300+2	4.2307+2	2.6993+2	5.7063–3
	1.2500–4	1.4897–8	7.7606+6	3.6327–8	1.4485+9	6.0105+8	2.8902+8	5.5841+8	6.6569+3	6.9316+2	4.2334+2	2.6981+2	5.7288–3
	1.3089–4	1.5105–8	7.6536+6	4.4823–8	1.4285+9	5.8804+8	2.8654+8	5.5392+8	6.6900+3	6.9385+2	4.2554+2	2.6831+2	6.0069–3
	1.3125–4	1.5117–8	7.6474+6	4.5339–8	1.4273+9	5.8728+8	2.8640+8	5.5366+8	6.6920+3	6.9390+2	4.2567+2	2.6822+2	6.0239–3
	1.5000–4	1.5734–8	7.3478+6	7.2301–8	1.3714+9	5.5118+8	2.7938+8	5.4085+8	6.7889+3	6.9694+2	4.3283+2	2.6411+2	6.9174–3
	1.7500–4	1.6671–8	6.9347+6	1.0852–7	1.2943+9	5.1226+8	2.6578+8	5.1627+8	6.8870+3	6.8345+2	4.2935+2	2.5409+2	8.1173–3
	2.0000–4	1.7524–8	6.5971+6	1.4536–7	1.2313+9	4.8078+8	2.5465+8	4.9587+8	6.9730+3	6.7386+2	4.2790+2	2.4596+2	9.3326–3
	2.2500–4	1.8463–8	6.2616+6	1.8299–7	1.1687+9	4.5462+8	2.4229+8	4.7178+8	7.0175+3	6.5503+2	4.1955+2	2.3547+2	1.0535–2
	2.5000–4	1.9343–8	5.9766+6	2.2160–7	1.1155+9	4.3242+8	2.3185+8	4.5123+8	7.0575+3	6.3997+2	4.1336+2	2.2660+2	1.1745–2
	2.6250–4	1.9765–8	5.8491+6	2.4124–7	1.0917+9	4.2252+8	2.2716+8	4.4202+8	7.0762+3	6.3337+2	4.1070+2	2.2266+2	1.2352–2
	3.0000–4	2.0965–8	5.5143+6	3.0122–7	1.0292+9	3.9655+8	2.1490+8	4.1776+8	7.1274+3	6.1705+2	4.0467+2	2.1237+2	1.4183–2
	3.5000–4	2.2693–8	5.0944+6	3.8431–7	9.5084+8	3.6879+8	1.9889+8	3.8315+8	7.1771+3	5.8674+2	3.9001+2	1.9672+2	1.6631–2
	4.0000–4	2.4301–8	4.7573+6	4.7124–7	8.8792+8	3.4631+8	1.8610+8	3.5550+8	7.2205+3	5.6373+2	3.7940+2	1.8431+2	1.9094–2
M5	4.1286–4	2.4711–8	4.6784+6	4.9419–7	8.7319+8	3.4120+8	1.8284+8	3.4915+8	7.2192+3	5.5705+2	3.7567+2	1.8136+2	1.9712–2
M4	4.2006–4	2.4939–8	4.6356+6	5.0715–7	8.6522+8	3.3844+8	1.8108+8	3.4569+8	7.2184+3	5.5352+2	3.7374+2	1.7976+2	2.0057–2
	4.2375–4	2.5060–8	4.6132+6	5.1384–7	8.6102+8	3.3705+8	1.8020+8	3.4376+8	7.2180+3	5.5169+2	3.7281+2	1.7887+2	2.0235–2
	4.3005–4	2.5267–8	4.5755+6	5.2529–7	8.5399+8	3.3472+8	1.7873+8	3.4054+8	7.2174+3	5.4862+2	3.7123+2	1.7738+2	2.0537–2
	4.4281–4	2.5680–8	4.5018+6	5.4867–7	8.4024+8	3.3015+8	1.7585+8	3.3423+8	7.2161+3	5.4271+2	3.6821+2	1.7447+2	2.1149–2
	4.4754–4	2.5832–8	4.4754+6	5.5740–7	8.3531+8	3.2851+8	1.7482+8	3.3197+8	7.2157+3	5.4060+2	3.6715+2	1.7343+2	2.1376–2
	4.5711–4	2.6137–8	4.4231+6	5.7517–7	8.2556+8	3.2526+8	1.7278+8	3.2751+8	7.2148+3	5.3645+2	3.6505+2	1.7138+2	2.1835–2
	4.6783–4	2.6475–8	4.3666+6	5.9524–7	8.1501+8	3.2173+8	1.7058+8	3.2270+8	7.2138+3	5.3202+2	3.6284+2	1.6917+2	2.2350–2
	4.7377–4	2.6661–8	4.3362+6	6.0643–7	8.0934+8	3.1983+8	1.6939+8	3.2011+8	7.2132+3	5.2967+2	3.6167+2	1.6798+2	2.2635–2
	4.8392–4	2.6975–8	4.2856+6	6.2565–7	7.9989+8	3.1666+8	1.6742+8	3.1580+8	7.2123+3	5.2577+2	3.5975+2	1.6600+2	2.3121–2
	5.0000–4	2.7468–8	4.2088+6	6.5641–7	7.8555+8	3.1183+8	1.6444+8	3.0927+8	7.2109+3	5.1996+2	3.5693+2	1.6301+2	2.3893–2
	5.2500–4	2.8276–8	4.0886+6	7.0499–7	7.6311+8	3.0476+8	1.5973+8	2.9861+8	7.1977+3	5.0934+2	3.5136+2	1.5796+2	2.5040–2
	5.6250–4	2.9456–8	3.9247+6	7.7965–7	7.3253+8	2.9504+8	1.5333+8	2.8416+8	7.1790+3	4.9533+2	3.4417+2	1.5113+2	2.6758–2
	6.0000–4	3.0602–8	3.7778+6	8.5629–7	7.0510+8	2.8623+8	1.4760+8	2.7127+8	7.1616+3	4.8324+2	3.3815+2	1.4506+2	2.8471–2
M3	6.1263–4	3.0987–8	3.7308+6	8.8255–7	6.9634+8	2.8344+8	1.4567+8	2.6723+8	7.1504+3	4.7871+2	3.3558+2	1.4311+2	2.9018–2
	6.1848–4	3.1165–8	3.7095+6	8.9481–7	6.9235+8	2.8217+8	1.4479+8	2.6538+8	7.1453+3	4.7670+2	3.3445+2	1.4222+2	2.9271–2
	6.2983–4	3.1509–8	3.6690+6	9.1870–7	6.8480+8	2.7977+8	1.4314+8	2.6188+8	7.1355+3	4.7291+2	3.3234+2	1.4054+2	2.9761–2
M2	6.4779–4	3.2048–8	3.6073+6	9.5691–7	6.7329+8	2.7610+8	1.4062+8	2.5656+8	7.1205+3	4.6723+2	3.2921+2	1.3798+2	3.0535–2
	6.5110–4	3.2147–8	3.5961+6	9.6401–7	6.7120+8	2.7544+8	1.4017+8	2.5559+8	7.1177+3	4.6617+2	3.2863+2	1.3751+2	3.0678–2
	6.5730–4	3.2334–8	3.5754+6	9.7734–7	6.6733+8	2.7422+8	1.3933+8	2.5378+8	7.1126+3	4.6422+2	3.2755+2	1.3664+2	3.0945–2
	6.7514–4	3.2866–8	3.5176+6	1.0160–6	6.5653+8	2.7079+8	1.3699+8	2.4876+8	7.0983+3	4.5882+2	3.2457+2	1.3423+2	3.1711–2
	7.0635–4	3.3782–8	3.4222+6	1.0847–6	6.3873+8	2.6510+8	1.3313+8	2.4050+8	7.0742+3	4.5012+2	3.1983+2	1.3026+2	3.3049–2
	7.2500–4	3.4321–8	3.3684+6	1.1263–6	6.2870+8	2.6187+8	1.3096+8	2.3586+8	7.0604+3	4.4534+2	3.1728+2	1.2803+2	3.3846–2
	7.2555–4	3.4337–8	3.3669+6	1.1276–6	6.2841+8	2.6178+8	1.3090+8	2.3572+8	7.0600+3	4.4520+2	3.1720+2	1.2797+2	3.3870–2
M1	7.5537–4	3.5187–8	3.2855+6	1.1951–6	6.1323+8	2.5687+8	1.2762+8	2.2874+8	7.0386+3	4.3785+2	3.1319+2	1.2462+2	3.5141–2
	7.6653–4	3.5504–8	3.2561+6	1.2206–6	6.0774+8	2.5510+8	1.2644+8	2.2619+8	7.0300+3	4.3522+2	3.1179+2	1.2339+2	3.5606–2
	7.8326–4	3.5977–8	3.2133+6	1.2593–6	5.9975+8	2.5253+8	1.2473+8	2.2249+8	7.0174+3	4.3143+2	3.0978+2	1.2161+2	3.6301–2
	8.0000–4	3.6446–8	3.1720+6	1.2982–6	5.9204+8	2.5003+8	1.2308+8	2.1892+8	7.0050+3	4.2784+2	3.0790+2	1.1990+2	3.6996–2
	8.5000–4	3.7862–8	3.0534+6	1.4168–6	5.6990+8	2.4301+8	1.1815+8	2.0874+8	6.9419+3	4.1556+2	3.0063+2	1.1489+2	3.8695–2
	9.0000–4	3.9243–8	2.9459+6	1.5387–6	5.4984+8	2.3657+8	1.1370+8	1.9957+8	6.8830+3	4.0472+2	2.9429+2	1.1039+2	4.0382–2

Atomic Weight 112.400 — Density 8.650 Grams/cc

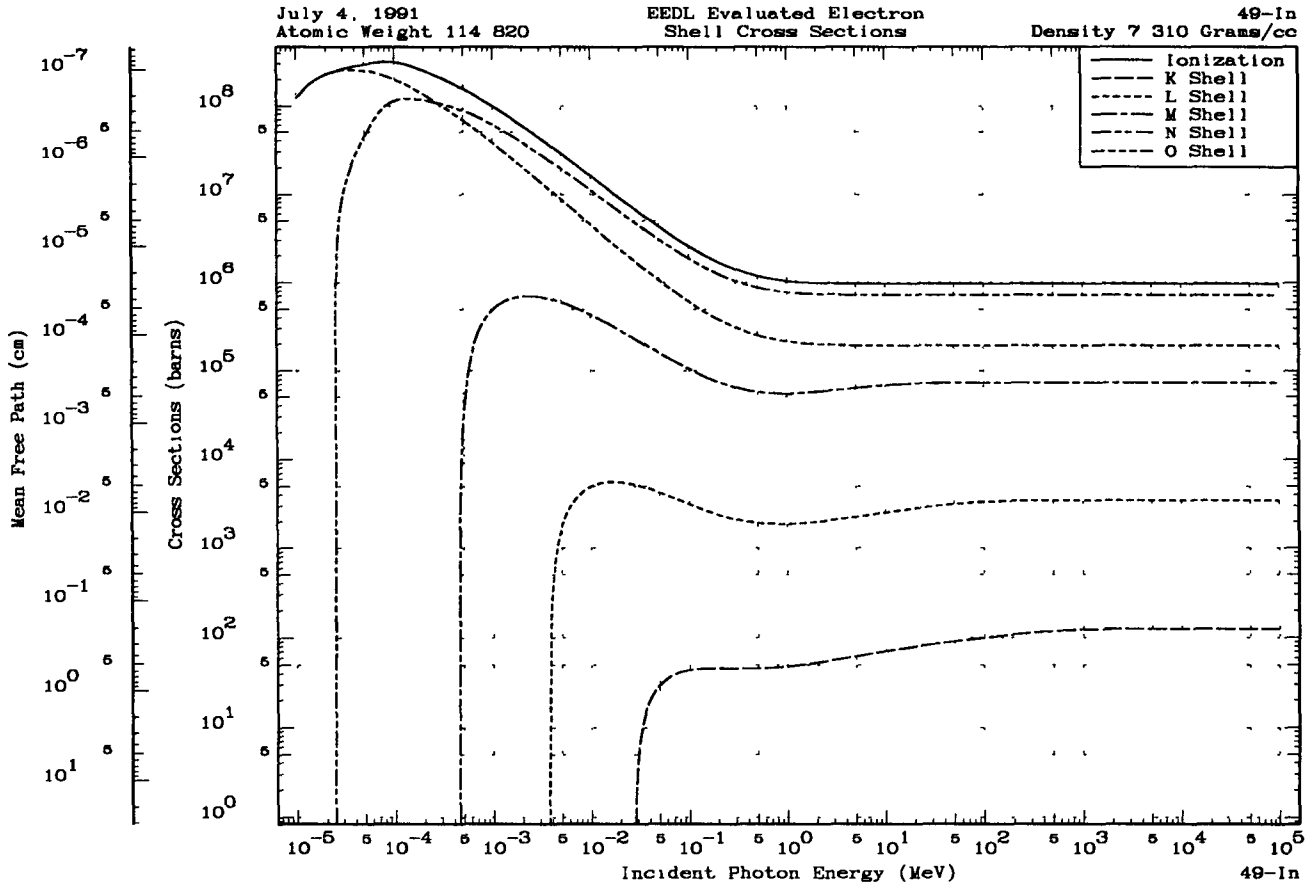
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	9.2500–4	3.9922–8	2.8958+6	1.6009–6	5.4049+8	2.3354+8	1.1162+8	1.9532+8	6.8549+3	3.9963+2	2.9129+2	1.0830+2	4.1220–2
	1.0000–3	4.1915–8	2.7581+6	1.7918–6	5.1479+8	2.2514+8	1.0593+8	1.8371+8	6.7756+3	3.8598+2	2.8332+2	1.0262+2	4.3719–2
	1.1250–3	4.5243–8	2.5552+6	2.1260–6	4.7692+8	2.1297+8	9.7348+7	1.6659+8	6.6122+3	3.6250+2	2.6849+2	9.3957+1	4.6840–2
	1.3125–3	4.9972–8	2.3135+6	2.6638–6	4.3179+8	1.9803+8	8.7174+7	1.4658+8	6.4042+3	3.3508+2	2.5117+2	8.3858+1	5.1433–2
	1.5000–3	5.4435–8	2.1238+6	3.2417–6	3.9639+8	1.8594+8	7.9241+7	1.3120+8	6.2293+3	3.1406+2	2.3788+2	7.6122+1	5.5929–2
	1.7500–3	6.0186–8	1.9208+6	4.0724–6	3.5851+8	1.7263+8	7.0567+7	1.1531+8	6.0173+3	2.8822+2	2.2028+2	6.7876+1	6.1242–2
	2.0000–3	6.5620–8	1.7618+6	4.9708–6	3.2882+8	1.6187+8	6.3842+7	1.0310+8	5.8395+3	2.6858+2	2.0695+2	6.1564+1	6.6435–2
	2.5000–3	7.6365–8	1.5139+6	6.9589–6	2.8256+8	1.4425+8	5.3643+7	8.4655+7	5.4996+3	2.3513+2	1.8342+2	5.1644+1	7.4827–2
	3.0000–3	8.6348–8	1.3389+6	9.1977–6	2.4989+8	1.3129+8	4.6538+7	7.2060+7	5.2366+3	2.1193+2	1.6696+2	4.4893+1	8.2922–2
L3	3.5354–3	9.6887–8	1.1932+6	1.1856–5	2.2271+8	1.2019+8	4.0812+7	6.1696+7	4.9873+3	1.9126+2	1.5205+2	3.9126+1	9.0421–2
	3.6515–3	9.9101–8	1.1666+6	1.2469–5	2.1773+8	1.1810+8	3.9762+7	5.9862+7	4.9345+3	1.8741+2	1.4923+2	3.8087+1	9.1807–2
L2	3.7309–3	1.0060–7	1.1492+6	1.2896–5	2.1449+8	1.1673+8	3.9079+7	5.8673+7	4.8996+3	1.8490+2	1.4740+2	3.7413+1	9.2749–2
	3.8258–3	1.0243–7	1.1286+6	1.3413–5	2.1065+8	1.1515+8	3.8297+7	5.7207+7	4.8590+3	1.8199+2	1.4532+2	3.6585+1	9.3860–2
	3.8654–3	1.0319–7	1.1203+6	1.3631–5	2.0910+8	1.1450+8	3.7980+7	5.6616+7	4.8424+3	1.8082+2	1.4447+2	3.6251+1	9.4323–2
L1	3.9941–3	1.0564–7	1.0943+6	1.4350–5	2.0425+8	1.1248+8	3.6992+7	5.4778+7	4.7901+3	1.7716+2	1.4185+2	3.5214+1	9.5818–2
	4.0000–3	1.0576–7	1.0931+6	1.4384–5	2.0403+8	1.1238+8	3.6948+7	5.4693+7	4.7878+3	1.7700+2	1.4174+2	3.5165+1	9.5886–2
	4.1250–3	1.0816–7	1.0688+6	1.5097–5	1.9949+8	1.1043+8	3.6032+7	5.3022+7	4.7372+3	1.7340+2	1.3911+2	3.4200+1	9.7237–2
	4.2500–3	1.1054–7	1.0458+6	1.5825–5	1.9519+8	1.0857+8	3.5165+7	5.1449+7	4.6885+3	1.7002+2	1.3663+2	3.3292+1	9.8580–2
	4.3437–3	1.1231–7	1.0293+6	1.6380–5	1.9212+8	1.0724+8	3.4545+7	5.0330+7	4.6533+3	1.6760+2	1.3485+2	3.2645+1	9.9582–2
	4.6250–3	1.1756–7	9.8341+5	1.8093–5	1.8355+8	1.0348+8	3.2823+7	4.7244+7	4.5536+3	1.6092+2	1.2995+2	3.0863+1	1.0256–1
	4.6719–3	1.1842–7	9.7625+5	1.8385–5	1.8221+8	1.0288+8	3.2555+7	4.6766+7	4.5377+3	1.5988+2	1.2919+2	3.0587+1	1.0305–1
	5.0000–3	1.2439–7	9.2941+5	2.0482–5	1.7347+8	9.8990+7	3.0804+7	4.3672+7	4.4325+3	1.5313+2	1.2422+2	2.8799+1	1.0647–1
	5.5000–3	1.3350–7	8.6594+5	2.3852–5	1.6162+8	9.3629+7	2.8482+7	3.9510+7	4.2792+3	1.4375+2	1.1730+2	2.6333+1	1.1105–1
	6.0000–3	1.4236–7	8.1206+5	2.7429–5	1.5157+8	8.8988+7	2.6516+7	3.6057+7	4.1439+3	1.3587+2	1.1147+2	2.4286+1	1.1554–1
	7.0000–3	1.5996–7	7.2272+5	3.5189–5	1.3489+8	8.1148+7	2.3333+7	3.0408+7	3.8925+3	1.2212+2	1.0116+2	2.0836+1	1.2263–1
	8.0000–3	1.7680–7	6.5388+5	4.3749–5	1.2204+8	7.4917+7	2.0888+7	2.6235+7	3.6870+3	1.1167+2	9.3261+1	1.8283+1	1.2953–1
	9.0000–3	1.9328–7	5.9814+5	5.3075–5	1.1164+8	6.9607+7	1.8932+7	2.3097+7	3.4994+3	1.0290+2	8.6448+1	1.6315+1	1.3506–1
	1.0000–2	2.0923–7	5.5254+5	6.3145–5	1.0313+8	6.5176+7	1.7340+7	2.0610+7	3.3397+3	9.5791+1	8.0897+1	1.4754+1	1.4046–1
	1.2500–2	2.4771–7	4.6670+5	9.1351–5	8.7108+7	5.6446+7	1.4387+7	1.6272+7	2.9983+3	8.1843+1	6.9747+1	1.1946+1	1.4988–1
	1.5000–2	2.8407–7	4.0697+5	1.2383–4	7.5958+7	5.0188+7	1.2353+7	1.3415+7	2.7454+3	7.2297+1	6.2044+1	1.0094+1	1.5902–1
	2.0000–2	3.5245–7	3.2801+5	2.0008–4	6.1221+7	4.1391+7	9.7197+6	1.0108+7	2.3573+3	5.9282+1	5.1225+1	7.8855+0	1.7124–1
K	2.6688–2	4.3805–7	2.6391+5	3.2453–4	4.9258+7	3.3974+7	7.6617+6	7.6204+6	2.0107+3	4.8557+1	4.2217+1	6.1564+0	1.8293–1
	2.7102–2	4.4319–7	2.6085+5	3.3310–4	4.8686+7	3.3614+7	7.5659+6	7.5048+6	1.9933+3	4.8044+1	4.1785+1	6.0751+0	1.8348–1
	2.7826–2	4.5214–7	2.5569+5	3.4832–4	4.7723+7	3.3006+7	7.4043+6	7.3106+6	1.9639+3	4.7180+1	4.1057+1	5.9387+0	1.8444–1
	2.8913–2	4.6546–7	2.4837+5	3.7166–4	4.6357+7	3.2142+7	7.1759+6	7.0376+6	1.9221+3	4.5959+1	4.0027+1	5.7468+0	1.8588–1
	3.0000–2	4.7864–7	2.4153+5	3.9560–4	4.5080+7	3.1332+7	6.9625+6	6.7844+6	1.8826+3	4.4821+1	3.9065+1	5.5688+0	1.8733–1
	3.2500–2	5.0843–7	2.2738+5	4.5292–4	4.2439+7	2.9622+7	6.5281+6	6.2870+6	1.7991+3	4.2422+1	3.7024+1	5.2079+0	1.9006–1
	3.4375–2	5.3039–7	2.1797+5	4.9797–4	4.0682+7	2.8480+7	6.2400+6	5.9604+6	1.7429+3	4.0833+1	3.5670+1	4.9709+0	1.9213–1
	3.7188–2	5.6276–7	2.0543+5	5.6869–4	3.8342+7	2.6952+7	5.8574+6	5.5308+6	1.6670+3	3.8725+1	3.3870+1	4.6595+0	1.9527–1
	4.0000–2	5.9450–7	1.9446+5	6.4310–4	3.6295+7	2.5609+7	5.5237+6	5.1603+6	1.5996+3	3.6890+1	3.2301+1	4.3910+0	1.9841–1
	4.5000–2	6.4932–7	1.7804+5	7.8404–4	3.3231+7	2.3572+7	5.0361+6	4.6206+6	1.4965+3	3.4097+1	2.9908+1	3.9868+0	2.0264–1
	5.0000–2	7.0257–7	1.6455+5	9.3582–4	3.0712+7	2.1888+7	4.6366+6	4.1859+6	1.4100+3	3.1814+1	2.7945+1	3.6616+0	2.0696–1
	6.0000–2	8.0465–7	1.4367+5	1.2690–3	2.6816+7	1.9253+7	4.0330+6	3.5288+6	1.2791+3	2.8278+1	2.4907+1	3.1565+0	2.1418–1
	7.0000–2	9.0088–7	1.2833+5	1.6402–3	2.3951+7	1.7298+7	3.6005+6	3.0517+6	1.1787+3	2.5650+1	2.2653+1	2.7778+0	2.2007–1
	8.0000–2	9.9337–7	1.1638+5	2.0464–3	2.1721+7	1.5766+7	3.2636+6	2.6909+6	1.0981+3	2.3613+1	2.0895+1	2.4917+0	2.2618–1
	1.0000–1	1.1640–6	9.9319+4	2.9510–3	1.8537+7	1.3561+7	2.7938+6	2.1816+6	9.7625+2	2.0673+1	1.8362+1	2.0741+0	2.3611–1
	1.2500–1	1.3462–6	8.5873+4	4.2357–3	1.6028+7	1.1826+7	2.4234+6	1.7775+6	8.7154+2	1.8294+1	1.6318+1	1.7304+0	2.4600–1
	1.5000–1	1.5156–6	7.6276+4	5.6694–3	1.4237+7	1.0575+7	2.1576+6	1.5036+6	7.9439+2	1.6608+1	1.4854+1	1.4980+0	2.5631–1
	2.0000–1	1.7970–6	6.4335+4	8.8867–3	1.2008+7	9.0090+6	1.8368+6	1.1613+6	6.9444+2	1.4521+1	1.3050+1	1.1954+0	2.7483–1
	3.0000–1	2.2543–6	5.1282+4	1.6315–2	9.5716+6	7.2331+6	1.5171+6	8.2077+5	5.9264+2	1.2456+1	1.1260+1	8.8412–1	3.1145–1
	4.0000–1	2.6374–6	4.3834+4	2.4669–2	8.1814+6	6.1684+6	1.3614+6	6.5110+5	5.4311+2	1.1499+1	1.0423+1	7.2418–1	3.5135–1
	5.0000–1	2.9657–6	3.8982+4	3.3554–2	7.2758+6	5.4484+6	1.2711+6	5.5575+5	5.1450+2	1.1014+1	9.9868+0	6.3386–1	3.9303–1
	6.0000–1	3.2566–6	3.5499+4	4.2757–2	6.6257+6	4.9229+6	1.2128+6	4.8944+5	4.9757+2	1.0719+1	9.7118+0	5.6981–1	4.3744–1
	8.0000–1	3.7502–6	3.0827+4	6.1587–2	5.7537+6	4.1956+6	1.1449+6	4.1272+5	4.8020+2	1.0525+1	9.4947+0	4.9626–1	5.3365–1
	1.0000+0	4.1543–6	2.7828+4	8.0624–2	5.1940+6	3.7224+6	1.1070+6	3.6418+5	4.7245+2	1.0488+1	9.4015+0	4.4885–1	6.3725–1
	1.5000+0	4.9052–6	2.3568+4	1.2751–1	4.3989+6	3.0233+6	1.0647+6	3.1047+5	4.6860+2	1.0844+1	9.5262+0	3.9956–1	9.1873–1
	2.0000+0	5.4264–6	2.1305+4	1.7269–1	3.9764+6	2.6370+6	1.0523+6	2.8665+5	4.7230+2	1.1292+1	9.6905+0	3.7709–1	1.2249+0
	3.0000+0	6.1311–6	1.8856+4	2.5777–1	3.5194+6	2.2225+6	1.0353+6	2.6109+5	4.7993+2	1.2227+1	9.9934+0	3.5886–1	1.8744+0
	4.0000+0	6.5556–6	1.7635+4	3.3654–1	3.2915+6	2.0032+6	1.0333+6	2.5443+5	4.8630+2	1.3174+1	1.0252+1	3.5576–1	2.5666+0
	5.0000+0	6.8403–6	1.6901+4	4.0988–1	3.1545+6	1.8720+6	1.0323+6	2.4969+5	4.9172+2	1.4106+1	1.0467+1	3.5510–1	3.2831+0
	6.0000+0	7.0388–6	1.6424+4	4.7858–1	3.0655+6	1.7883+6	1.0316+6	2.4516+5	4.9619+2	1.5019+1	1.0658+1	3.5456–1	4.0071+0
	8.0000+0	7.2834–6	1.5873+4	6.0421–1	2.9625+6	1.6899+6	1.0308+6	2.4131+5	5.0311+2	1.6854+1	1.0984+1	3.5371–1	5.5164+0
	1.0000+1	7.4075–6	1.5607+4	7.1696–1	2.9129+6	1.6432+6	1.0315+6	2.3768+5	5.0932+2	1.8653+1	1.1228+1	3.5306–1	7.0719+0
	1.5000+1	7.4639–6	1.5489+4	9.5776–1	2.8909+6	1.6235+6	1.0329+6	2.3401+5	5.2226+2	2.3029+1	1.1576+1	3.5198–1	1.1101+1
	2.0000+1	7.4698–6	1.5477+4	1.1562+0	2.8886+6	1.6236+6	1.0339+6	2.3062+5	5.2936+2	2.7502+1	1.1870+1	3.5123–1	1.5281+1
	3.0000+1	7.4811–6	1.5453+4	1.4712+0	2.8843+6	1.6229+6	1.0343+6	2.2655+5	5.4009+2	3.6397+1	1.2191+1	3.4629–1	2.3860+1
	4.0000+1	7.4898–6	1.5435+4	1.7167+0	2.8809+6	1.6224+6	1.0348+6	2.2316+5	5.4822+2	4.5422+1	1.2426+1	3.4236–1	3.2654+1
	5.0000+1	7.4968–6	1.5421+4	1.9174+0	2.8782+6	1.6220+6	1.0351+6	2.2056+5	5.5478+2	5.4504+1	1.2599+1	3.3962–1	4.1565+1
	6.0000+1	7.4970–6	1.5421+4	2.0869+0	2.8782+6	1.6217+6	1.0352+6	2.2063+5	5.6034+2	6.3696+1	1.2734+1	3.4096–1	5.0620+1
	8.0000+1	7.4993–6	1.5416+4	2.3623+0	2.8773+6	1.6212+6	1.0354+6	2.2005+5	5.6946+2	8.2357+1	1.2953+1	3.4253–1	6.9062+1
	1.0000+2	7.4993–6	1.5416+4	2.5810+0	2.8773+6	1.6208+6	1.0355+6	2.2030+5	5.7624+2	1.0117+2	1.3143+1	3.4346–1	8.7687+1
	1.5000+2	7.5000–6	1.5414+4	2.9865+0	2.8770+6	1.6201+6	1.0356+6	2.2063+5	5.8792+2	1.4843+2	1.3337+1	3.4406–1	1.3475+2
	2.0000+2	7.5014–6	1.5411+4	3.2788+0	2.8765+6	1.6197+6	1.0357+6	2.2054+5	5.9577+2	1.9598+2	1.3520+1	3.4402–1	1.8212+2
	3.0000+2	7.5022–6	1.5410+4	3.6949+0	2.8761+6	1.6190+6	1.0357+6	2.2084+5	6.0458+2	2.9083+2	1.3806+1	3.4467–1	2.7668+2
	4.0000+2	7.5037–6	1.5407+4	3.9923+0	2.8756+6	1.6185+6	1.0358+6	2.2075+5	6.1037+2	3.8616+2	1.3969+1	3.4471–1	3.7185+2
	5.0000+2	7.5068–6	1.5400+4	4.2236+0	2.8744+6	1.6181+6	1.0358+6	2.1995+5	6.1480+2	4.8212+2	1.4087+1	3.4365–1	4.6769+2
	6.0000+2	7.5072–6	1.5399+4	4.4130+0	2.8742+6	1.6178+6	1.0358+6	2.2007+5	6.1887+2	5.7665+2	1.4200+1	3.4402–1	5.6210+2
	8.0000+2	7.5093–6	1.5395+4	4.7127+0	2.8734+6	1.6173+6	1.0358+6	2.1974+5	6.2534+2	7.6726+2	1.4391+1	3.4388–1	7.5253+2
	1.0000+3	7.5117–6	1.5390+4	4.9454+0	2.8725+6	1.6169+6	1.0358+6	2.1921+5	6.3064+2	9.5816+2	1.4560+1	3.4341–1	9.4326+2
	1.5000+3	7.5146–6	1.5384+4	5.3685+0	2.8714+6	1.6162+6	1.0358+6	2.1879+5	6.4057+2	1.4382+3	1.4713+1	3.4277–1	1.4231+3

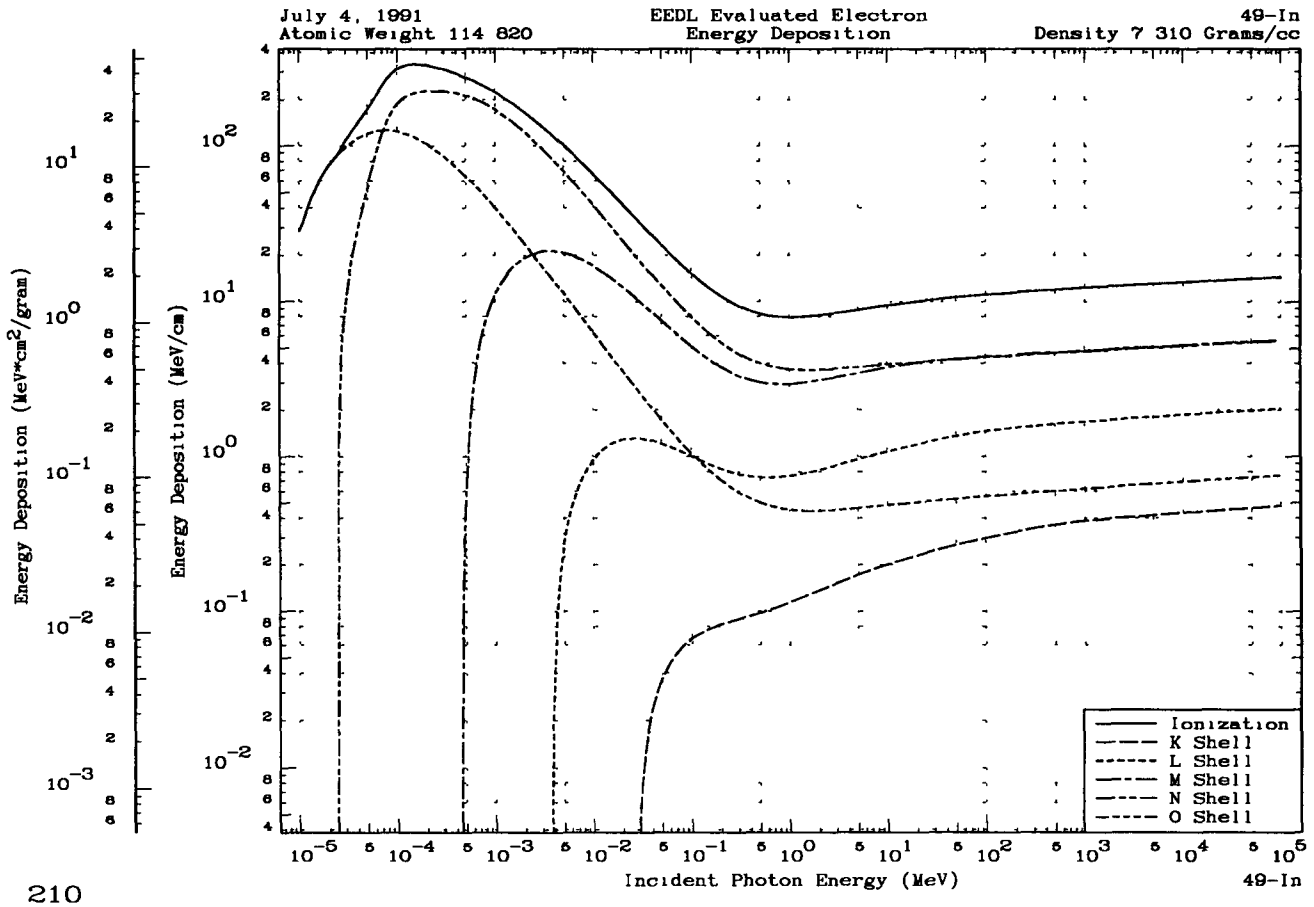
Atomic Weight 112.400												Density 8.650 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000+3	7.5172–6	1.5379+4	5.6687+0	2.8704+6	1.6157+6	1.0358+6	2.1826+5	6.4796+2	1.9155+3	1.4866+1	3.4193–1	1.9003+3
3.0000+3	7.5198–6	1.5374+4	6.0920+0	2.8694+6	1.6150+6	1.0358+6	2.1799+5	6.5875+2	2.8737+3	1.5170+1	3.4151–1	2.8581+3
4.0000+3	7.5220–6	1.5369+4	6.3922+0	2.8686+6	1.6145+6	1.0358+6	2.1762+5	6.6672+2	3.8345+3	1.5305+1	3.4096–1	3.8189+3
5.0000+3	7.5252–6	1.5363+4	6.6247+0	2.8674+6	1.6141+6	1.0358+6	2.1676+5	6.7297+2	4.8052+3	1.5404+1	3.3961–1	4.7895+3
6.0000+3	7.5253–6	1.5362+4	6.8145+0	2.8673+6	1.6138+6	1.0358+6	2.1702+5	6.7759+2	5.7570+3	1.5502+1	3.4003–1	5.7412+3
8.0000+3	7.5266–6	1.5360+4	7.1143+0	2.8668+6	1.6133+6	1.0358+6	2.1704+5	6.8494+2	7.6772+3	1.5699+1	3.4008–1	7.6612+3
1.0000+4	7.5276–6	1.5358+4	7.3466+0	2.8664+6	1.6130+6	1.0358+6	2.1700+5	6.9069+2	9.6151+3	1.5875+1	3.4003–1	9.5989+3
1.5000+4	7.5293–6	1.5354+4	7.7693+0	2.8658+6	1.6123+6	1.0358+6	2.1703+5	7.0184+2	1.4359+4	1.6017+1	3.4008–1	1.4343+4
2.0000+4	7.5311–6	1.5351+4	8.0697+0	2.8651+6	1.6118+6	1.0358+6	2.1685+5	7.0987+2	1.9164+4	1.6159+1	3.3980–1	1.9148+4
3.0000+4	7.5326–6	1.5348+4	8.4934+0	2.8646+6	1.6111+6	1.0358+6	2.1697+5	7.2114+2	2.8678+4	1.6443+1	3.3999–1	2.8661+4
4.0000+4	7.5342–6	1.5344+4	8.7941+0	2.8639+6	1.6106+6	1.0358+6	2.1682+5	7.2924+2	3.8295+4	1.6603+1	3.3975–1	3.8278+4
5.0000+4	7.5372–6	1.5338+4	9.0273+0	2.8628+6	1.6102+6	1.0358+6	2.1605+5	7.3546+2	4.7822+4	1.6726+1	3.3855–1	4.7805+4
6.0000+4	7.5373–6	1.5338+4	9.2180+0	2.8628+6	1.6099+6	1.0358+6	2.1635+5	7.4054+2	5.7342+4	1.6818+1	3.3901–1	5.7325+4
8.0000+4	7.5383–6	1.5336+4	9.5188+0	2.8624+6	1.6094+6	1.0358+6	2.1644+5	7.4862+2	7.6548+4	1.7002+1	3.3915–1	7.6530+4
1.0000+5	7.5393–6	1.5334+4	9.7519+0	2.8620+6	1.6090+6	1.0358+6	2.1644+5	7.5490+2	9.5787+4	1.7182+1	3.3915–1	9.5770+4


July 4, 1991
Atomic Weight 114.820
EEDL Evaluated Electron
Cross Sections
49-In
Density 7.310 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
49-In


July 4, 1991
Atomic Weight 114.820
EEDL Evaluated Electron
Energy Deposition
49-In
Density 7.310 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
49-In

209


July 4, 1991
Atomic Weight 114 820
EEDL Evaluated Electron
Shell Cross Sections
49-In
Density 7 310 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
49-In


July 4, 1991
Atomic Weight 114 820
EEDL Evaluated Electron
Energy Deposition
49-In
Density 7 310 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Incident Photon Energy (MeV)
49-In

210

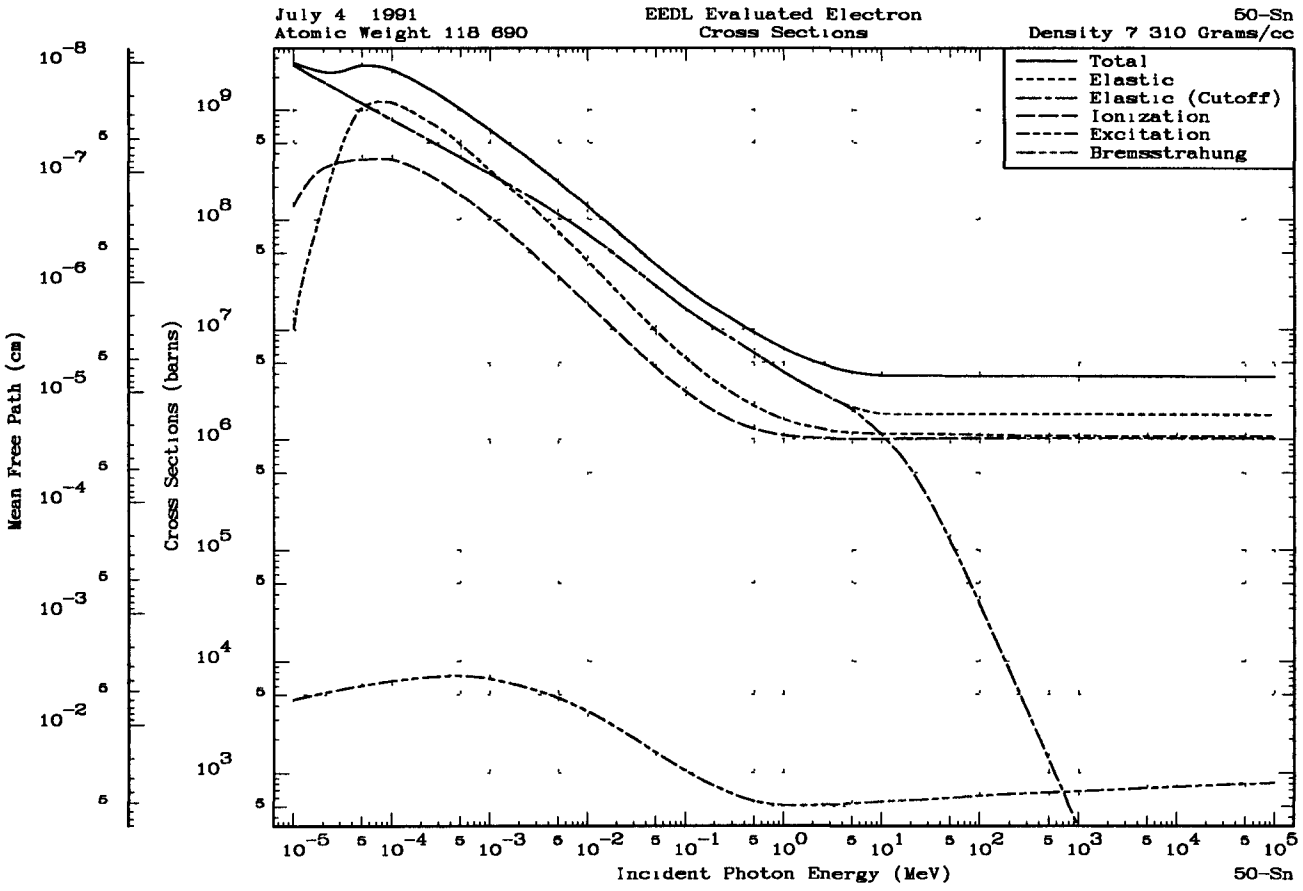
Atomic Weight 114.820 Density 7.310 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0484–8	1.3048+7		2.4878+9	2.3564+9	1.2406+8	7.2949+6	4.2520+3	2.9797+1	2.8208+1	1.5891+0	3.5192–4
O1	1.0830–5	1.0816–8	1.2647+7		2.4114+9	2.2654+9	1.3436+8	1.1633+7	4.3204+3	3.4019+1	3.1423+1	2.5954+0	3.7994–4
	1.1091–5	1.0908–8	1.2541+7		2.3912+9	2.2389+9	1.3895+8	1.3303+7	4.3410+3	3.6034+1	3.3048+1	2.9859+0	3.8881–4
	1.1250–5	1.0963–8	1.2478+7		2.3791+9	2.2232+9	1.4143+8	1.4419+7	4.3534+3	3.7165+1	3.3917+1	3.2481+0	3.9425–4
	1.1579–5	1.1072–8	1.2356+7		2.3557+9	2.1917+9	1.4739+8	1.6608+7	4.3786+3	3.9851+1	3.6081+1	3.7693+0	4.0552–4
	1.1686–5	1.1107–8	1.2316+7		2.3483+9	2.1818+9	1.4904+8	1.7371+7	4.3867+3	4.0625+1	3.6672+1	3.9520+0	4.0919–4
	1.2435–5	1.1329–8	1.2075+7		2.3022+9	2.1159+9	1.6173+8	2.4580+7	4.4415+3	4.7060+1	4.1373+1	5.6866+0	4.3503–4
	1.2500–5	1.1348–8	1.2055+7		2.2985+9	2.1104+9	1.6276+8	2.5312+7	4.4462+3	4.7623+1	4.1758+1	5.8646+0	4.3731–4
	1.2515–5	1.1352–8	1.2051+7		2.2976+9	2.1092+9	1.6296+8	2.5483+7	4.4472+3	4.7743+1	4.1836+1	5.9061+0	4.3783–4
	1.3076–5	1.1493–8	1.1903+7		2.2694+9	2.0640+9	1.7066+8	3.4748+7	4.4864+3	5.3064+1	4.4909+1	8.1536+0	4.5738–4
	1.3125–5	1.1505–8	1.1891+7		2.2671+9	2.0602+9	1.7128+8	3.5682+7	4.4898+3	5.3544+1	4.5161+1	8.3817+0	4.5910–4
	1.3757–5	1.1636–8	1.1756+7		2.2415+9	2.0129+9	1.7886+8	4.9765+7	4.5322+3	6.0209+1	4.8357+1	1.1851+1	4.8130–4
	1.4038–5	1.1687–8	1.1706+7		2.2318+9	1.9929+9	1.8234+8	5.6650+7	4.5506+3	6.3425+1	4.9851+1	1.3573+1	4.9123–4
	1.5000–5	1.1809–8	1.1584+7		2.2087+9	1.9286+9	1.9344+8	8.6650+7	4.6114+3	7.5943+1	5.4754+1	2.1189+1	5.2545–4
	1.7500–5	1.1893–8	1.1502+7		2.1930+9	1.7872+9	2.1356+8	1.9227+8	4.7558+3	1.1359+2	6.4975+1	4.8613+1	6.1606–4
	2.0000–5	1.1709–8	1.1683+7		2.2276+9	1.6731+9	2.2971+8	3.2479+8	4.8845+3	1.5922+2	7.4405+1	8.4812+1	7.0889–4
	2.2500–5	1.1444–8	1.1954+7		2.2791+9	1.5785+9	2.3876+8	4.6184+8	4.9873+3	2.0409+2	8.1432+1	1.2266+2	7.9608–4
N5	2.4580–5	1.1275–8	1.2133+7		2.3133+9	1.5110+9	2.4516+8	5.5709+8	5.0659+3	2.3699+2	8.6967+1	1.5002+2	8.6971–4
	2.5257–5	1.1226–8	1.2186+7		2.3233+9	1.4909+9	2.4780+8	5.8466+8	5.0896+3	2.4749+2	8.9507+1	1.5798+2	8.9348–4
N4	2.5490–5	1.1209–8	1.2205+7		2.3270+9	1.4841+9	2.4858+8	5.9426+8	5.0977+3	2.5103+2	9.0271+1	1.6076+2	9.0166–4
	2.6054–5	1.1187–8	1.2228+7		2.3314+9	1.4682+9	2.5073+8	6.1249+8	5.1169+3	2.5859+2	9.2549+1	1.6604+2	9.2153–4
	2.6443–5	1.1170–8	1.2247+7		2.3350+9	1.4575+9	2.5232+8	6.2517+8	5.1299+3	2.6396+2	9.4241+1	1.6972+2	9.3530–4
	2.7040–5	1.1143–8	1.2277+7		2.3408+9	1.4415+9	2.5453+8	6.4476+8	5.1497+3	2.7206+2	9.6643+1	1.7542+2	9.5646–4
	2.8222–5	1.1078–8	1.2348+7		2.3544+9	1.4113+9	2.5902+8	6.8400+8	5.1876+3	2.8848+2	1.0157+2	1.8690+2	9.9852–4
	2.8520–5	1.1072–8	1.2356+7		2.3558+9	1.4040+9	2.6012+8	6.9168+8	5.1970+3	2.9201+2	1.0281+2	1.8921+2	1.0092–3
	3.0000–5	1.1031–8	1.2401+7		2.3644+9	1.3694+9	2.6524+8	7.2976+8	5.2424+3	3.0936+2	1.0866+2	2.0070+2	1.0623–3
	3.2500–5	1.1072–8	1.2355+7		2.3557+9	1.3164+9	2.7022+8	7.6910+8	5.3150+3	3.2949+2	1.1677+2	2.1272+2	1.1529–3
	3.5000–5	1.1090–8	1.2335+7		2.3518+9	1.2692+9	2.7524+8	8.0742+8	5.3831+3	3.4970+2	1.2512+2	2.2458+2	1.2446–3
	4.0000–5	1.1219–8	1.2193+7		2.3248+9	1.1883+9	2.8536+8	8.5106+8	5.5081+3	3.8192+2	1.4254+2	2.3937+2	1.4308–3
	5.0000–5	1.1487–8	1.1909+7		2.2706+9	1.0646+9	2.9703+8	9.0891+8	5.7015+3	4.3334+2	1.7465+2	2.5868+2	1.7935–3
	6.0000–5	1.1722–8	1.1671+7		2.2251+9	9.7318+8	3.0723+8	9.4473+8	5.8558+3	4.8176+2	2.0937+2	2.7239+2	2.1570–3
	7.0000–5	1.2029–8	1.1372+7		2.1683+9	9.0202+8	3.1418+8	9.5208+8	5.9895+3	5.1844+2	2.4224+2	2.7620+2	2.5285–3
	8.0000–5	1.2288–8	1.1133+7		2.1226+9	8.4459+8	3.1957+8	9.5849+8	6.1078+3	5.5333+2	2.7357+2	2.7976+2	2.9070–3
N3	8.3870–5	1.2394–8	1.1037+7		2.1044+9	8.2516+8	3.1914+8	9.6009+8	6.1502+3	5.6261+2	2.8164+2	2.8097+2	3.0552–3
	8.4878–5	1.2431–8	1.1005+7		2.0982+9	8.2032+8	3.1906+8	9.5881+8	6.1605+3	5.6460+2	2.8381+2	2.8079+2	3.0936–3
	8.8659–5	1.2564–8	1.0888+7		2.0760+9	8.0290+8	3.1890+8	9.5417+8	6.1982+3	5.7225+2	2.9205+2	2.8019+2	3.2380–3
N2	9.0770–5	1.2636–8	1.0826+7		2.0642+9	7.9364+8	3.1890+8	9.5167+8	6.2187+3	5.7659+2	2.9671+2	2.7988+2	3.3190–3
	9.1924–5	1.2677–8	1.0791+7		2.0575+9	7.8872+8	3.1858+8	9.5020+8	6.2280+3	5.7831+2	2.9861+2	2.7969+2	3.3618–3
	9.4329–5	1.2761–8	1.0720+7		2.0439+9	7.7875+8	3.1796+8	9.4719+8	6.2471+3	5.8196+2	3.0263+2	2.7933+2	3.4514–3
	9.5962–5	1.2817–8	1.0673+7		2.0350+9	7.7219+8	3.1758+8	9.4520+8	6.2597+3	5.8446+2	3.0536+2	2.7909+2	3.5123–3
	1.0000–4	1.2952–8	1.0562+7	0.0000+0	2.0139+9	7.5667+8	3.1675+8	9.4043+8	6.2903+3	5.9075+2	3.1220+2	2.7855+2	3.6634–3
	1.0625–4	1.3184–8	1.0376+7	1.0552–8	1.9783+9	7.3454+8	3.1301+8	9.3078+8	6.3356+3	5.9389+2	3.1747+2	2.7642+2	3.8985–3
	1.1250–4	1.3405–8	1.0205+7	2.1044–8	1.9458+9	7.1426+8	3.0973+8	9.2178+8	6.3786+3	5.9743+2	3.2296+2	2.7447+2	4.1352–3
	1.1719–4	1.3570–8	1.0081+7	2.8884–8	1.9220+9	7.0013+8	3.0648+8	9.1539+8	6.4094+3	5.9850+2	3.2540+2	2.7310+2	4.3137–3
	1.2539–4	1.3848–8	9.8788+6	4.2565–8	1.8835+9	6.7731+8	3.0130+8	9.0492+8	6.4609+3	6.0075+2	3.2984+2	2.7091+2	4.6278–3
N1	1.2790–4	1.3929–8	9.8209+6	4.6738–8	1.8725+9	6.7077+8	2.9983+8	9.0187+8	6.4761+3	6.0152+2	3.3124+2	2.7028+2	4.7244–3
	1.2928–4	1.3980–8	9.7852+6	4.9035–8	1.8657+9	6.6725+8	2.9879+8	8.9963+8	6.4843+3	6.0121+2	3.3147+2	2.6974+2	4.7776–3
	1.3125–4	1.4052–8	9.7353+6	5.2311–8	1.8562+9	6.6233+8	2.9734+8	8.9648+8	6.4959+3	6.0079+2	3.3182+2	2.6897+2	4.8536–3
	1.3187–4	1.4074–8	9.7198+6	5.3345–8	1.8532+9	6.6080+8	2.9689+8	8.9550+8	6.4995+3	6.0067+2	3.3192+2	2.6874+2	4.8776–3
	1.3640–4	1.4236–8	9.6095+6	6.0895–8	1.8322+9	6.4996+8	2.9369+8	8.8851+8	6.5255+3	5.9977+2	3.3271+2	2.6706+2	5.0531–3
	1.3770–4	1.4281–8	9.5790+6	6.3050–8	1.8264+9	6.4696+8	2.9281+8	8.8657+8	6.5328+3	5.9955+2	3.3295+2	2.6659+2	5.1032–3
	1.4320–4	1.4471–8	9.4534+6	7.2242–8	1.8024+9	6.3466+8	2.8920+8	8.7855+8	6.5632+3	5.9871+2	3.3403+2	2.6468+2	5.3175–3
	1.5000–4	1.4698–8	9.3076+6	8.3603–8	1.7746+9	6.2041+8	2.8505+8	8.6915+8	6.5993+3	5.9796+2	3.3550+2	2.6246+2	5.5834–3
	1.6250–4	1.5183–8	9.0102+6	1.0465–7	1.7179+9	5.9656+8	2.7596+8	8.4539+8	6.6554+3	5.8989+2	3.3379+2	2.5609+2	6.0740–3
	1.7500–4	1.5644–8	8.7443+6	1.2596–7	1.6672+9	5.7530+8	2.6794+8	8.2397+8	6.7078+3	5.8313+2	3.3273+2	2.5039+2	6.5685–3
	1.8125–4	1.5867–8	8.6213+6	1.3671–7	1.6438+9	5.6550+8	2.6425+8	8.1401+8	6.7327+3	5.8009+2	3.3232+2	2.4776+2	6.8171–3
	2.0000–4	1.6509–8	8.2864+6	1.6925–7	1.5799+9	5.3888+8	2.5429+8	7.8673+8	6.8032+3	5.7234+2	3.3174+2	2.4059+2	7.5679–3
	2.2500–4	1.7461–8	7.8343+6	2.1364–7	1.4937+9	5.0868+8	2.4020+8	7.4484+8	6.8617+3	5.5413+2	3.2538+2	2.2875+2	8.5679–3
	2.5000–4	1.8358–8	7.4518+6	2.5936–7	1.4208+9	4.8310+8	2.2842+8	7.0925+8	6.9144+3	5.3941+2	3.2067+2	2.1874+2	9.5759–3
	2.6250–4	1.8788–8	7.2812+6	2.8268–7	1.3883+9	4.7170+8	2.2320+8	6.9336+8	6.9390+3	5.3302+2	3.1872+2	2.1429+2	1.0083–2
	3.0000–4	2.0015–8	6.8348+6	3.5411–7	1.3031+9	4.4184+8	2.0965+8	6.5165+8	7.0066+3	5.1700+2	3.1433+2	2.0266+2	1.1613–2
	3.5000–4	2.1808–8	6.2728+6	4.5354–7	1.1960+9	4.0994+8	1.9267+8	5.9337+8	7.0767+3	4.8895+2	3.0336+2	1.8558+2	1.3667–2
	4.0000–4	2.3486–8	5.8247+6	5.5810–7	1.1106+9	3.8418+8	1.7925+8	5.4712+8	7.1380+3	4.6764+2	2.9556+2	1.7207+2	1.5741–2
M5	4.5300–4	2.5206–8	5.4273+6	6.7436–7	1.0348+9	3.6167+8	1.6624+8	5.0687+8	7.1538+3	4.4430+2	2.8422+2	1.6006+2	1.7906–2
M4	4.6104–4	2.5461–8	5.3729+6	6.9252–7	1.0244+9	3.5859+8	1.6449+8	5.0133+8	7.1560+3	4.4122+2	2.8278+2	1.5842+2	1.8234–2
	4.7078–4	2.5793–8	5.3037+6	7.1469–7	1.0112+9	3.5497+8	1.6244+8	4.9380+8	7.1587+3	4.3734+2	2.8114+2	1.5618+2	1.8633–2
	4.7650–4	2.5987–8	5.2641+6	7.2780–7	1.0037+9	3.5290+8	1.6127+8	4.8950+8	7.1602+3	4.3513+2	2.8022+2	1.5489+2	1.8867–2
	4.8825–4	2.6383–8	5.1852+6	7.5494–7	9.8862+8	3.4875+8	1.5893+8	4.8093+8	7.1633+3	4.3077+2	2.7840+2	1.5235+2	1.9348–2
	5.0000–4	2.6774–8	5.1094+6	7.8235–7	9.7417+8	3.4475+8	1.5669+8	4.7272+8	7.1663+3	4.2665+2	2.7673+2	1.4990+2	1.9829–2
	5.1250–4	2.7193–8	5.0306+6	8.1181–7	9.5915+8	3.4064+8	1.5435+8	4.6415+8	7.1645+3	4.2214+2	2.7481+2	1.4730+2	2.0320–2
	5.2344–4	2.7557–8	4.9642+6	8.3783–7	9.4649+8	3.3717+8	1.5238+8	4.5694+8	7.1630+3	4.1840+2	2.7326+2	1.4512+2	2.0750–2
	5.3301–4	2.7872–8	4.9080+6	8.6079–7	9.3578+8	3.3422+8	1.5071+8	4.5084+8	7.1617+3	4.1527+2	2.7197+2	1.4327+2	2.1126–2
	5.4258–4	2.8186–8	4.8535+6	8.8392–7	9.2538+8	3.3134+8	1.4909+8	4.4494+8	7.1604+3	4.1229+2	2.7078+2	1.4149+2	2.1501–2
	5.5604–4	2.8622–8	4.7795+6	9.1672–7	9.1127+8	3.2743+8	1.4690+8	4.3693+8	7.1586+3	4.0829+2	2.6920+2	1.3906+2	2.2030–2
	5.7129–4	2.9112–8	4.6991+6	9.5428–7	8.9594+8	3.2316+8	1.4453+8	4.2825+8	7.1566+3	4.0403+2	2.6757+2	1.3644+2	2.2628–2
	5.7802–4	2.9326–8	4.6648+6	9.7097–7	8.8940+8	3.2133+8	1.4351+8	4.2456+8	7.1558+3	4.0222+2	2.6688+2	1.3532+2	2.2892–2
	6.0000–4	3.0019–8	4.5571+6	1.0260–6	8.6887+8	3.1556+8	1.4033+8	4.1297+8	7.1531+3	3.9663+2	2.6479+2	1.3182+2	2.3755–2
	6.5000–4	3.1587–8	4.3309+6	1.1544–6	8.2575+8	3.0354+8	1.3316+8	3.8905+8	7.1283+3	3.8236+2	2.5784+2	1.2450+2	2.5616–2
M3	6.6067–4	3.1915–8	4.2864+6	1.1824–6	8.1725+8	3.0115+8	1.3175+8	3.8435+8	7.1233+3	3.7954+2	2.5645+2	1.2307+2	2.6013–2
	6.6938–4	3.2183–8	4.2506+6	1.2054–6	8.1044+8	2.9924+8	1.3063+8	3.8056+8	7.1192+3	3.7732+2	2.5538+2	1.2192+2	2.6336–2

Atomic Weight 114.820 Density 7.310 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.8571–4	3.2683–8	4.1856+6	1.2489–6	7.9805+8	2.9576+8	1.2859+8	3.7369+8	7.1118+3	3.7332+2	2.5347+2	1.1983+2	2.6942–2
M2	6.9962–4	3.3105–8	4.1323+6	1.2863–6	7.8787+8	2.9289+8	1.2692+8	3.6806+8	7.1056+3	3.7008+2	2.5193+2	1.1811+2	2.7458–2
	7.1217–4	3.3483–8	4.0856+6	1.3204–6	7.7897+8	2.9037+8	1.2545+8	3.6314+8	7.0996+3	3.6723+2	2.5060+2	1.1660+2	2.7918–2
	7.1428–4	3.3547–8	4.0779+6	1.3261–6	7.7750+8	2.8996+8	1.2520+8	3.6233+8	7.0986+3	3.6676+2	2.5038+2	1.1635+2	2.7996–2
	7.2500–4	3.3867–8	4.0393+6	1.3555–6	7.7014+8	2.8787+8	1.2399+8	3.5827+8	7.0937+3	3.6442+2	2.4928+2	1.1511+2	2.8388–2
	7.3413–4	3.4139–8	4.0071+6	1.3806–6	7.6401+8	2.8613+8	1.2298+8	3.5490+8	7.0895+3	3.6243+2	2.4833+2	1.1407+2	2.8723–2
	7.6706–4	3.5108–8	3.8965+6	1.4723–6	7.4292+8	2.8010+8	1.1950+8	3.4332+8	7.0748+3	3.5568+2	2.4514+2	1.1052+2	2.9927–2
	8.0000–4	3.6061–8	3.7935+6	1.5657–6	7.2329+8	2.7444+8	1.1626+8	3.3258+8	7.0608+3	3.4956+2	2.4231+2	1.0722+2	3.1129–2
M1	8.1124–4	3.6384–8	3.7598+6	1.5980–6	7.1686+8	2.7259+8	1.1515+8	3.2912+8	7.0487+3	3.4719+2	2.4101+2	1.0614+2	3.1458–2
	8.2304–4	3.6725–8	3.7249+6	1.6321–6	7.1021+8	2.7068+8	1.1401+8	3.2550+8	7.0362+3	3.4477+2	2.3971+2	1.0503+2	3.1803–2
	8.4516–4	3.7359–8	3.6617+6	1.6966–6	6.9815+8	2.6722+8	1.1195+8	3.1898+8	7.0133+3	3.4042+2	2.3738+2	1.0301+2	3.2448–2
	8.8387–4	3.8453–8	3.5575+6	1.8116–6	6.7829+8	2.6148+8	1.0856+8	3.0825+8	6.9748+3	3.3337+2	2.3365+2	9.9688+1	3.3573–2
	9.0000–4	3.8904–8	3.5163+6	1.8601–6	6.7043+8	2.5919+8	1.0722+8	3.0402+8	6.9593+3	3.3062+2	2.3221+2	9.8380+1	3.4040–2
	9.4193–4	4.0061–8	3.4148+6	1.9883–6	6.5108+8	2.5353+8	1.0392+8	2.9362+8	6.9204+3	3.2376+2	2.2856+2	9.5167+1	3.5251–2
	1.0000–3	4.1630–8	3.2861+6	2.1701–6	6.2654+8	2.4627+8	9.9754+7	2.8050+8	6.8697+3	3.1525+2	2.2410+2	9.1115+1	3.6918–2
	1.1250–3	4.4951–8	3.0433+6	2.5789–6	5.8024+8	2.3255+8	9.1560+7	2.5612+8	6.7212+3	2.9643+2	2.1292+2	8.3466+1	3.9579–2
	1.2500–3	4.8135–8	2.8420+6	3.0120–6	5.4186+8	2.2093+8	8.4818+7	2.3611+8	6.5910+3	2.8099+2	2.0375+2	7.7195+1	4.2204–2
	1.3125–3	4.9681–8	2.7535+6	3.2371–6	5.2500+8	2.1575+8	8.1873+7	2.2738+8	6.5316+3	2.7435+2	1.9985+2	7.4462+1	4.3505–2
	1.5000–3	5.4157–8	2.5260+6	3.9426–6	4.8161+8	2.0217+8	7.4336+7	2.0510+8	6.3718+3	2.5737+2	1.8982+2	6.7493+1	4.7358–2
	1.7500–3	5.9854–8	2.2856+6	4.9554–6	4.3577+8	1.8729+8	6.6110+7	1.8236+8	6.1723+3	2.3660+2	1.7627+2	6.0286+1	5.1916–2
	2.0000–3	6.5245–8	2.0967+6	6.0490–6	3.9976+8	1.7530+8	5.9746+7	1.6472+8	6.0046+3	2.2077+2	1.6602+2	5.4699+1	5.6382–2
	2.5000–3	7.5851–8	1.8035+6	8.4648–6	3.4386+8	1.5587+8	5.0124+7	1.3786+8	5.6551+3	1.9376+2	1.4763+2	4.6070+1	6.3600–2
	3.0000–3	8.5724–8	1.5958+6	1.1179–5	3.0426+8	1.4161+8	4.3438+7	1.1921+8	5.3847+3	1.7493+2	1.3477+2	4.0084+1	7.0556–2
L3	3.7284–3	9.9766–8	1.3712+6	1.5628–5	2.6144+8	1.2573+8	3.6453+7	9.9251+7	5.0300+3	1.5305+2	1.1938+2	3.3588+1	7.8969–2
	3.8642–3	1.0229–7	1.3373+6	1.6525–5	2.5498+8	1.2327+8	3.5411+7	9.6287+7	4.9696+3	1.4975+2	1.1705+2	3.2622+1	8.0338–2
L2	3.9425–3	1.0374–7	1.3187+6	1.7051–5	2.5143+8	1.2192+8	3.4840+7	9.4663+7	4.9361+3	1.4795+2	1.1577+2	3.2092+1	8.1122–2
	4.0000–3	1.0480–7	1.3053+6	1.7441–5	2.4888+8	1.2093+8	3.4434+7	9.3503+7	4.9120+3	1.4667+2	1.1487+2	3.1715+1	8.1696–2
L1	4.2138–3	1.0874–7	1.2580+6	1.8923–5	2.3986+8	1.1736+8	3.2994+7	8.9500+7	4.8264+3	1.4184+2	1.1136+2	3.0394+1	8.3815–2
	4.2500–3	1.0943–7	1.2501+6	1.9179–5	2.3835+8	1.1678+8	3.2764+7	8.8800+7	4.8118+3	1.4105+2	1.1080+2	3.0164+1	8.4143–2
	4.4103–3	1.1245–7	1.2165+6	2.0330–5	2.3194+8	1.1432+8	3.1784+7	8.5835+7	4.7491+3	1.3769+2	1.0842+2	2.9189+1	8.5587–2
	4.4375–3	1.1296–7	1.2110+6	2.0527–5	2.3090+8	1.1392+8	3.1624+7	8.5354+7	4.7388+3	1.3715+2	1.0803+2	2.9031+1	8.5830–2
	4.6250–3	1.1645–7	1.1747+6	2.1913–5	2.2398+8	1.1123+8	3.0570+7	8.2175+7	4.6699+3	1.3355+2	1.0547+2	2.7986+1	8.7503–2
	4.7052–3	1.1793–7	1.1600+6	2.2517–5	2.2117+8	1.1013+8	3.0142+7	8.0890+7	4.6415+3	1.3209+2	1.0444+2	2.7563+1	8.8213–2
	4.7187–3	1.1818–7	1.1576+6	2.2619–5	2.2071+8	1.0995+8	3.0071+7	8.0677+7	4.6368+3	1.3185+2	1.0427+2	2.7493+1	8.8333–2
	5.0000–3	1.2330–7	1.1095+6	2.4792–5	2.1153+8	1.0634+8	2.8679+7	7.6505+7	4.5427+3	1.2712+2	1.0091+2	2.6122+1	9.0803–2
	5.5000–3	1.3239–7	1.0333+6	2.8849–5	1.9702+8	1.0052+8	2.6508+7	6.9986+7	4.3846+3	1.1944+2	9.5383+1	2.3960+1	9.4738–2
	6.0000–3	1.4123–7	9.6859+5	3.3153–5	1.8468+8	9.5479+7	2.4671+7	6.4521+7	4.2450+3	1.1298+2	9.0730+1	2.2148+1	9.8592–2
	7.0000–3	1.5855–7	8.6283+5	4.2473–5	1.6451+8	8.6981+7	2.1697+7	5.5827+7	3.9871+3	1.0181+2	8.2461+1	1.9245+1	1.0468–1
	8.0000–3	1.7517–7	7.8096+5	5.2730–5	1.4890+8	8.0234+7	1.9415+7	4.9248+7	3.7764+3	9.3286+1	7.6127+1	1.7049+1	1.1060–1
	9.0000–3	1.9150–7	7.1436+5	6.3887–5	1.3620+8	7.4505+7	1.7592+7	4.4103+7	3.5884+3	8.6072+1	7.0642+1	1.5315+1	1.1539–1
	1.0000–2	2.0734–7	6.5979+5	7.5920–5	1.2580+8	6.9728+7	1.6108+7	3.9957+7	3.4283+3	8.0212+1	6.6174+1	1.3919+1	1.2008–1
	1.1250–2	2.2674–7	6.0334+5	9.2157–5	1.1503+8	6.4605+7	1.4593+7	3.5834+7	3.2388+3	7.3847+1	6.1207+1	1.2516+1	1.2421–1
	1.2500–2	2.4557–7	5.5706+5	1.0971–4	1.0621+8	6.0341+7	1.3360+7	3.2507+7	3.0782+3	6.8675+1	5.7163+1	1.1384+1	1.2828–1
	1.3125–2	2.5480–7	5.3688+5	1.1896–4	1.0236+8	5.8463+7	1.2825+7	3.1072+7	3.0066+3	6.6427+1	5.5400+1	1.0897+1	1.3029–1
	1.5000–2	2.8181–7	4.8542+5	1.4847–4	9.2552+7	5.3618+7	1.1469+7	2.7463+7	2.8190+3	6.0736+1	5.0931+1	9.6693+0	1.3621–1
	2.0000–2	3.4999–7	3.9087+5	2.3918–4	7.4524+7	4.4195+7	9.0223+6	2.1304+7	2.4394+3	4.9855+1	4.2153+1	7.5553+0	1.4699–1
K	2.7921–2	4.4870–7	3.0488+5	4.1683–4	5.8129+7	3.5151+7	6.8545+6	1.6121+7	2.0442+3	3.9705+1	3.3784+1	5.7617+0	1.5870–1
	2.8441–2	4.5512–7	3.0058+5	4.3001–4	5.7309+7	3.4705+7	6.7520+6	1.5850+7	2.0238+3	3.9204+1	3.3377+1	5.6674+0	1.5926–1
	2.9220–2	4.6469–7	2.9439+5	4.5008–4	5.6128+7	3.4061+7	6.6045+6	1.5460+7	1.9944+3	3.8484+1	3.2792+1	5.5319+0	1.6010–1
	3.0000–2	4.7420–7	2.8848+5	4.7052–4	5.5003+7	3.3446+7	6.4641+6	1.5091+7	1.9661+3	3.7798+1	3.2234+1	5.4032+0	1.6094–1
	3.1250–2	4.8938–7	2.7954+5	5.0406–4	5.3297+7	3.2504+7	6.2554+6	1.4536+7	1.9225+3	3.6741+1	3.1370+1	5.2089+0	1.6212–1
	3.3438–2	5.1559–7	2.6533+5	5.6500–4	5.0588+7	3.1000+7	5.9242+6	1.3662+7	1.8525+3	3.5065+1	2.9999+1	4.9023+0	1.6420–1
	3.5078–2	5.3497–7	2.5571+5	6.1256–4	4.8755+7	2.9978+7	5.7004+6	1.3075+7	1.8044+3	3.3933+1	2.9071+1	4.6965+0	1.6577–1
	3.7539–2	5.6365–7	2.4270+5	6.8677–4	4.6274+7	2.8588+7	5.3981+6	1.2287+7	1.7386+3	3.2405+1	2.7817+1	4.4203+0	1.6815–1
	4.0000–2	5.9187–7	2.3113+5	7.6434–4	4.4068+7	2.7345+7	5.1297+6	1.1592+7	1.6790+3	3.1049+1	2.6702+1	4.1767+0	1.7054–1
	4.5000–2	6.4784–7	2.1116+5	9.3187–4	4.0261+7	2.5174+7	4.6778+6	1.0408+7	1.5762+3	2.8675+1	2.4742+1	3.7584+0	1.7436–1
	5.0000–2	7.0231–7	1.9479+5	1.1124–3	3.7138+7	2.3378+7	4.3075+6	9.4515+6	1.4896+3	2.6732+1	2.3133+1	3.4207+0	1.7826–1
	6.0000–2	8.0707–7	1.6950+5	1.5093–3	3.2317+7	2.0568+7	3.7483+6	7.9998+6	1.3424+3	2.3722+1	2.0632+1	2.9057+0	1.8452–1
	7.0000–2	9.0556–7	1.5106+5	1.9518–3	2.8802+7	1.8483+7	3.3478+6	6.9705+6	1.2289+3	2.1513+1	1.8785+1	2.5386+0	1.8964–1
	8.0000–2	1.0004–6	1.3674+5	2.4362–3	2.6072+7	1.6848+7	3.0358+6	6.1865+6	1.1384+3	1.9798+1	1.7344+1	2.2591+0	1.9486–1
	1.0000–1	1.1752–6	1.1640+5	3.5152–3	2.2194+7	1.4497+7	2.6005+6	5.0950+6	1.0063+3	1.7328+1	1.5257+1	1.8678+0	2.0366–1
	1.2500–1	1.3622–6	1.0042+5	5.0475–3	1.9147+7	1.2650+7	2.2575+6	4.2384+6	8.9914+2	1.5343+1	1.3571+1	1.5590+0	2.1238–1
	1.5000–1	1.5364–6	8.9039+4	6.7569–3	1.6976+7	1.1318+7	2.0113+6	3.6466+6	8.2011+2	1.3930+1	1.2363+1	1.3459+0	2.2145–1
	2.0000–1	1.8311–6	7.4708+4	1.0592–2	1.4244+7	9.6519+6	1.7145+6	2.8770+6	7.2128+2	1.2181+1	1.0877+1	1.0667+0	2.3762–1
	3.0000–1	2.3056–6	5.9333+4	1.9438–2	1.1313+7	7.7475+6	1.4199+6	2.1447+6	6.1814+2	1.0473+1	9.4029+0	8.0008–1	2.6949–1
	4.0000–1	2.6932–6	5.0794+4	2.9358–2	9.6846+6	6.5893+6	1.2763+6	1.8184+6	5.6655+2	9.6986+0	8.7135+0	6.8130–1	3.0374–1
	5.0000–1	3.0303–6	4.5143+4	3.9886–2	8.6072+6	5.8047+6	1.1935+6	1.6084+6	5.3668+2	9.3009+0	8.3561+0	6.0458–1	3.4027–1
	6.0000–1	3.3184–6	4.1224+4	5.0772–2	7.8599+6	5.2336+6	1.1402+6	1.4856+6	5.1890+2	9.0726+0	8.1340+0	5.5995–1	3.7866–1
	8.0000–1	3.8084–6	3.5920+4	7.3005–2	6.8486+6	4.4449+6	1.0782+6	1.3250+6	5.0056+2	8.9190+0	7.9559+0	5.0145–1	4.6167–1
	1.0000+0	4.2037–6	3.2542+4	9.5447–2	6.2046+6	3.9282+6	1.0439+6	1.2320+6	4.9222+2	8.9049+0	7.8862+0	4.6782–1	5.5089–1
	1.5000+0	4.9404–6	2.7690+4	1.5063–1	5.2794+6	3.1654+6	1.0062+6	1.1074+6	4.8755+2	9.2174+0	8.0012+0	4.2297–1	7.9326–1
	2.0000+0	5.4500–6	2.5101+4	2.0378–1	4.7858+6	2.7450+6	9.9674+5	1.0435+6	4.9132+2	9.6023+0	8.1457+0	3.9977–1	1.0568+0
	3.0000+0	6.1172–6	2.2363+4	3.0379–1	4.2638+6	2.2953+6	9.8415+5	9.8384+5	4.9978+2	1.0406+1	8.4102+0	3.7927–1	1.6161+0
	4.0000+0	6.5492–6	2.0888+4	3.9633–1	3.9825+6	2.0579+6	9.7793+5	9.4617+5	5.0697+2	1.1217+1	8.6397+0	3.6536–1	2.2120+0
	5.0000+0	6.8313–6	2.0025+4	4.8246–1	3.8181+6	1.9164+6	9.7811+5	9.2311+5	5.1303+2	1.2011+1	8.8253+0	3.5706–1	2.8289+0
	6.0000+0	7.0223–6	1.9481+4	5.6313–1	3.7143+6	1.8261+6	9.7830+5	9.0936+5	5.1803+2	1.2790+1	8.9847+0	3.5233–1	3.4526+0
	8.0000+0	7.2732–6	1.8809+4	7.1066–1	3.5861+6	1.7192+6	9.7892+5	8.8745+5	5.2538+2	1.4354+1	9.2577+0	3.4501–1	4.7516+0
	1.0000+1	7.4092–6	1.8463+4	8.4295–1	3.5203+6	1.6702+6	9.7944+5	8.7013+5	5.3181+2	1.5908+1	9.4783+0	3.3943–1	6.0901+0
	1.5000+1	7.4947–6	1.8253+4	1.1251+0	3.4801+6	1.6488+6	9.8117+5	8.4955+5	5.4493+2	1.9668+1	9.7821+0	3.3153–1	9.5544+0
	2.0000+1	7.5023–6	1.8234+4	1.3573+0	3.4766+6	1.6490+6	9.8243+5	8.4464+5	5.5169+2	2.3514+1	1.0036+1	3.2974–1	1.3148+1

Atomic Weight 114.820												Density 7.310 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+1	7.5177–6	1.8197+4	1.7255+0	3.4695+6	1.6483+6	9.8305+5	8.3757+5	5.6196+2	3.1167+1	1.0320+1	3.2723–1	2.0520+1
4.0000+1	7.5097–6	1.8216+4	2.0120+0	3.4732+6	1.6478+6	9.8368+5	8.4113+5	5.6980+2	3.8924+1	1.0522+1	3.2888–1	2.8073+1
5.0000+1	7.5166–6	1.8199+4	2.2461+0	3.4700+6	1.6474+6	9.8406+5	8.3794+5	5.7634+2	4.6754+1	1.0675+1	3.2788–1	3.5751+1
6.0000+1	7.5142–6	1.8205+4	2.4438+0	3.4711+6	1.6471+6	9.8420+5	8.3926+5	5.8173+2	5.4619+1	1.0780+1	3.2865–1	4.3510+1
8.0000+1	7.5131–6	1.8208+4	2.7648+0	3.4716+6	1.6466+6	9.8443+5	8.4003+5	5.9134+2	7.0668+1	1.0969+1	3.2945–1	5.9369+1
1.0000+2	7.5139–6	1.8206+4	3.0196+0	3.4713+6	1.6461+6	9.8459+5	8.3991+5	5.9808+2	8.6839+1	1.1134+1	3.2991–1	7.5375+1
1.5000+2	7.5152–6	1.8203+4	3.4921+0	3.4706+6	1.6454+6	9.8468+5	8.3989+5	6.1018+2	1.2740+2	1.1298+1	3.2992–1	1.1577+2
2.0000+2	7.5179–6	1.8196+4	3.8325+0	3.4694+6	1.6449+6	9.8475+5	8.3909+5	6.1838+2	1.6827+2	1.1452+1	3.2961–1	1.5649+2
3.0000+2	7.5185–6	1.8195+4	4.3171+0	3.4691+6	1.6442+6	9.8481+5	8.3944+5	6.2764+2	2.4977+2	1.1703+1	3.2976–1	2.3774+2
4.0000+2	7.5201–6	1.8191+4	4.6634+0	3.4684+6	1.6437+6	9.8483+5	8.3920+5	6.3372+2	3.3168+2	1.1839+1	3.2968–1	3.1951+2
5.0000+2	7.5263–6	1.8176+4	4.9327+0	3.4655+6	1.6433+6	9.8484+5	8.3673+5	6.3838+2	4.1414+2	1.1939+1	3.2873–1	4.0187+2
6.0000+2	7.5252–6	1.8179+4	5.1531+0	3.4660+6	1.6430+6	9.8485+5	8.3756+5	6.4263+2	4.9536+2	1.2032+1	3.2907–1	4.8300+2
8.0000+2	7.5275–6	1.8173+4	5.5020+0	3.4650+6	1.6425+6	9.8486+5	8.3699+5	6.4938+2	6.5917+2	1.2199+1	3.2888–1	6.4664+2
1.0000+3	7.5306–6	1.8166+4	5.7729+0	3.4635+6	1.6421+6	9.8486+5	8.3594+5	6.5491+2	8.2320+2	1.2339+1	3.2850–1	8.1053+2
1.5000+3	7.5358–6	1.8153+4	6.2652+0	3.4612+6	1.6414+6	9.8487+5	8.3428+5	6.6521+2	1.2358+3	1.2471+1	3.2784–1	1.2230+3
2.0000+3	7.5407–6	1.8141+4	6.6145+0	3.4589+6	1.6408+6	9.8487+5	8.3252+5	6.7276+2	1.6468+3	1.2601+1	3.2715–1	1.6338+3
3.0000+3	7.5448–6	1.8132+4	7.1067+0	3.4570+6	1.6401+6	9.8487+5	8.3135+5	6.8418+2	2.4723+3	1.2852+1	3.2669–1	2.4591+3
4.0000+3	7.5484–6	1.8123+4	7.4558+0	3.4554+6	1.6396+6	9.8487+5	8.3018+5	6.9248+2	3.2975+3	1.2968+1	3.2623–1	3.2842+3
5.0000+3	7.5557–6	1.8105+4	7.7262+0	3.4520+6	1.6392+6	9.8487+5	8.2725+5	6.9901+2	4.1289+3	1.3053+1	3.2508–1	4.1155+3
6.0000+3	7.5549–6	1.8107+4	7.9472+0	3.4524+6	1.6389+6	9.8487+5	8.2793+5	7.0378+2	4.9468+3	1.3138+1	3.2535–1	4.9334+3
8.0000+3	7.5557–6	1.8105+4	8.2961+0	3.4520+6	1.6384+6	9.8487+5	8.2803+5	7.1139+2	6.5968+3	1.3301+1	3.2539–1	6.5832+3
1.0000+4	7.5568–6	1.8103+4	8.5664+0	3.4515+6	1.6380+6	9.8487+5	8.2793+5	7.1735+2	8.2620+3	1.3451+1	3.2535–1	8.2482+3
1.5000+4	7.5582–6	1.8100+4	9.0583+0	3.4509+6	1.6373+6	9.8487+5	8.2803+5	7.2893+2	1.2338+4	1.3573+1	3.2539–1	1.2324+4
2.0000+4	7.5605–6	1.8094+4	9.4079+0	3.4498+6	1.6368+6	9.8487+5	8.2744+5	7.3726+2	1.6467+4	1.3696+1	3.2516–1	1.6453+4
3.0000+4	7.5614–6	1.8092+4	9.9010+0	3.4494+6	1.6361+6	9.8487+5	8.2773+5	7.4897+2	2.4642+4	1.3942+1	3.2528–1	2.4627+4
4.0000+4	7.5636–6	1.8086+4	1.0251+1	3.4484+6	1.6356+6	9.8487+5	8.2725+5	7.5738+2	3.2905+4	1.4084+1	3.2508–1	3.2891+4
5.0000+4	7.5698–6	1.8072+4	1.0522+1	3.4456+6	1.6351+6	9.8487+5	8.2481+5	7.6384+2	4.1092+4	1.4163+1	3.2413–1	4.1077+4
6.0000+4	7.5684–6	1.8075+4	1.0744+1	3.4463+6	1.6348+6	9.8487+5	8.2578+5	7.6911+2	4.9271+4	1.4242+1	3.2451–1	4.9257+4
8.0000+4	7.5686–6	1.8075+4	1.1094+1	3.4462+6	1.6343+6	9.8487+5	8.2617+5	7.7751+2	6.5774+4	1.4400+1	3.2466–1	6.5759+4
1.0000+5	7.5692–6	1.8073+4	1.1366+1	3.4459+6	1.6339+6	9.8487+5	8.2627+5	7.8403+2	8.2306+4	1.4554+1	3.2470–1	8.2291+4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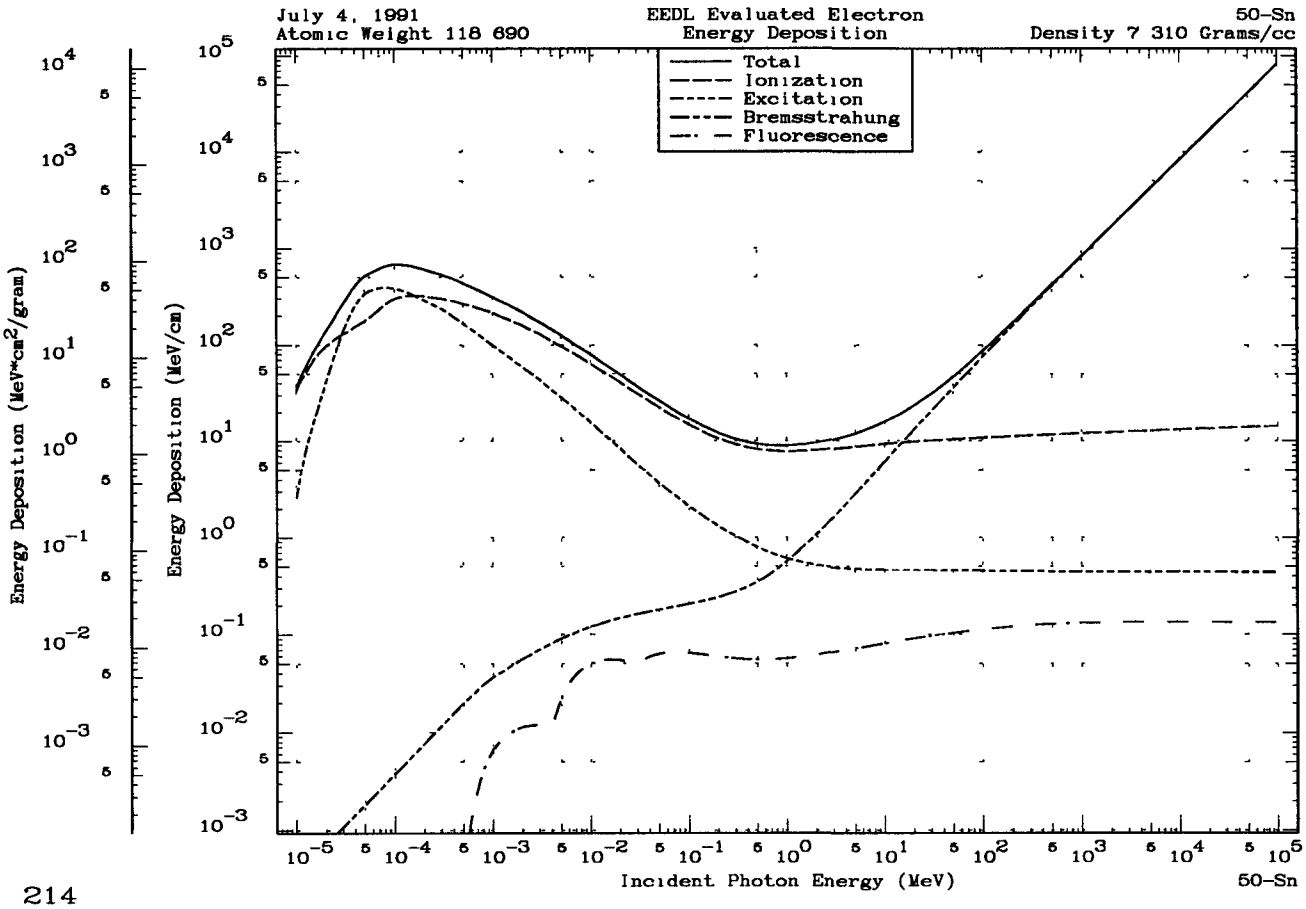
EEDL Evaluated Electron
Cross Sections
50-Sn
Density 7 310 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
50-Sn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Density 7 310 Grams/cc
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Ionization
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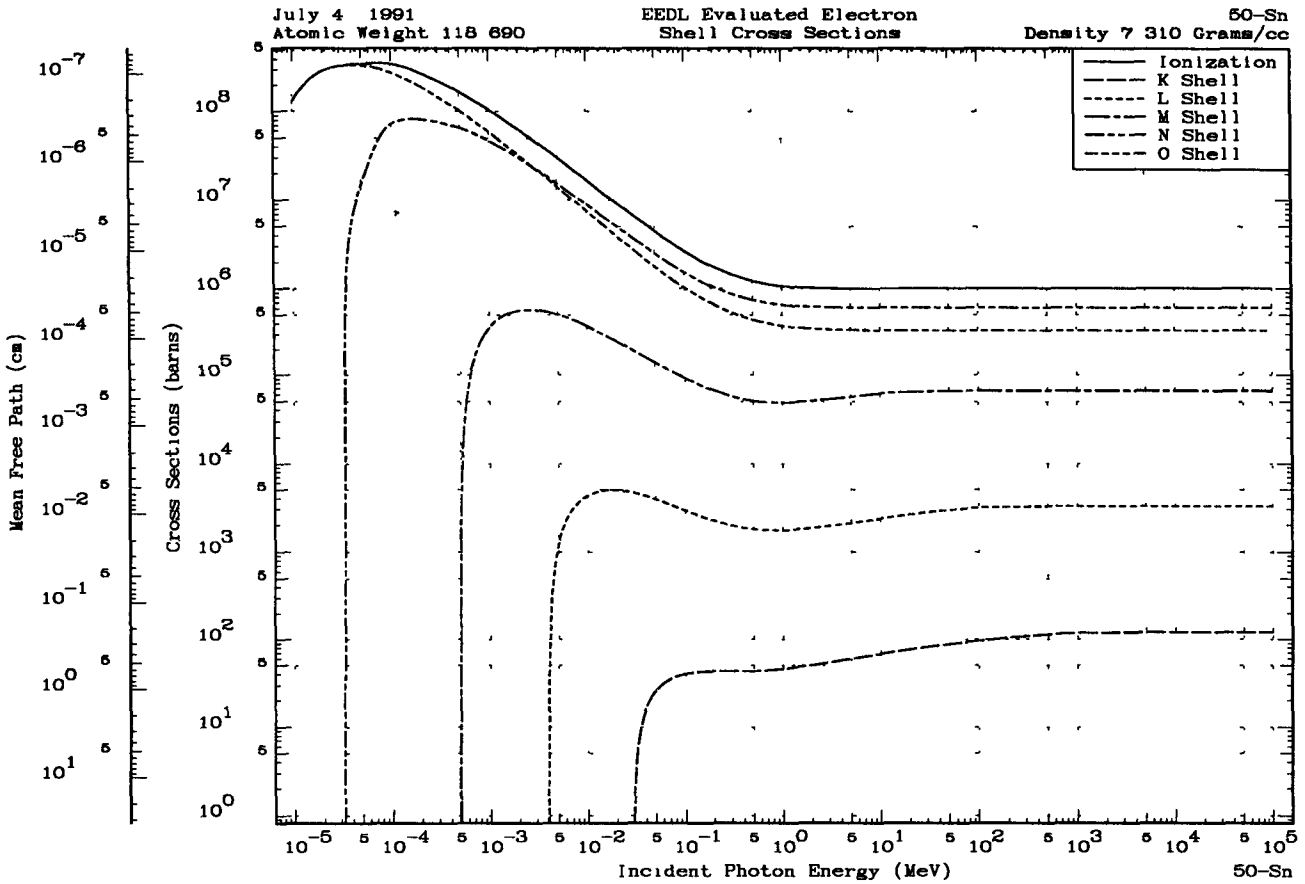
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
50-Sn

214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Atomic Weight 118 690
EEDL Evaluated Electron
Shell Cross Sections
50-Sn
Density 7 310 Grams/cc
Ionization
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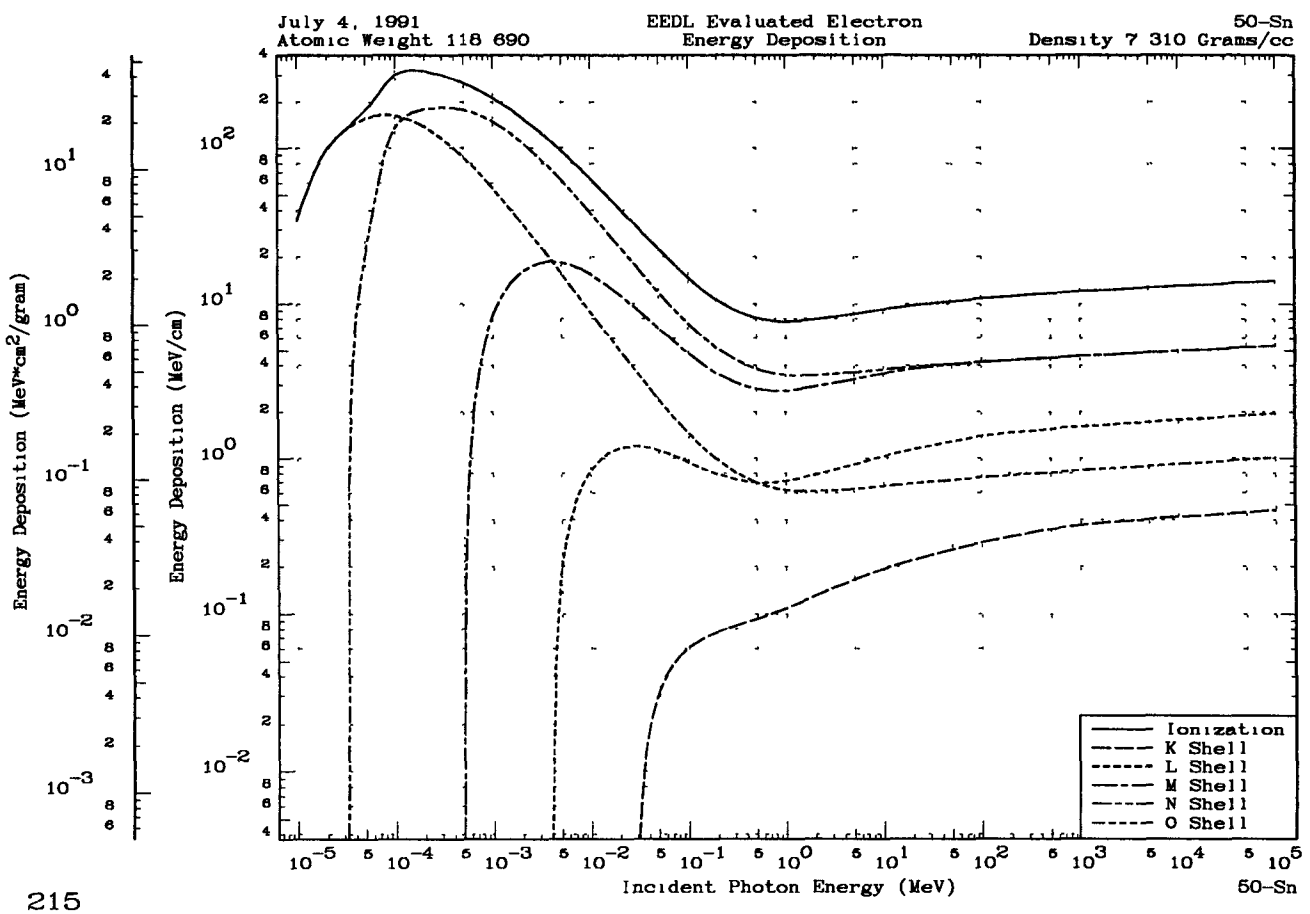
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
50-Sn


July 4, 1991
Atomic Weight 118 690
EEDL Evaluated Electron
Energy Deposition
50-Sn
Density 7 310 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
50-Sn

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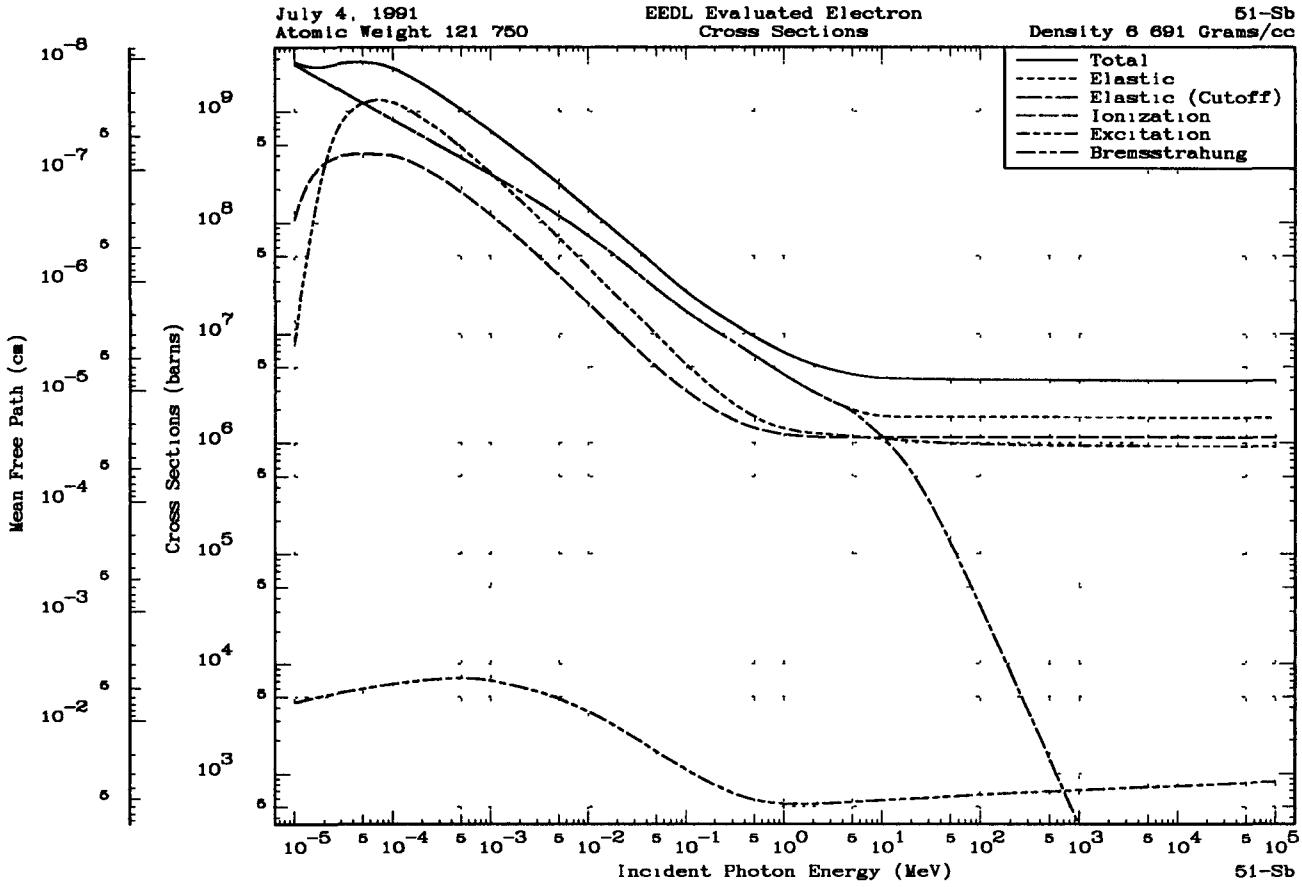
Atomic Weight 118.690 Density 7.310 Grams/cc

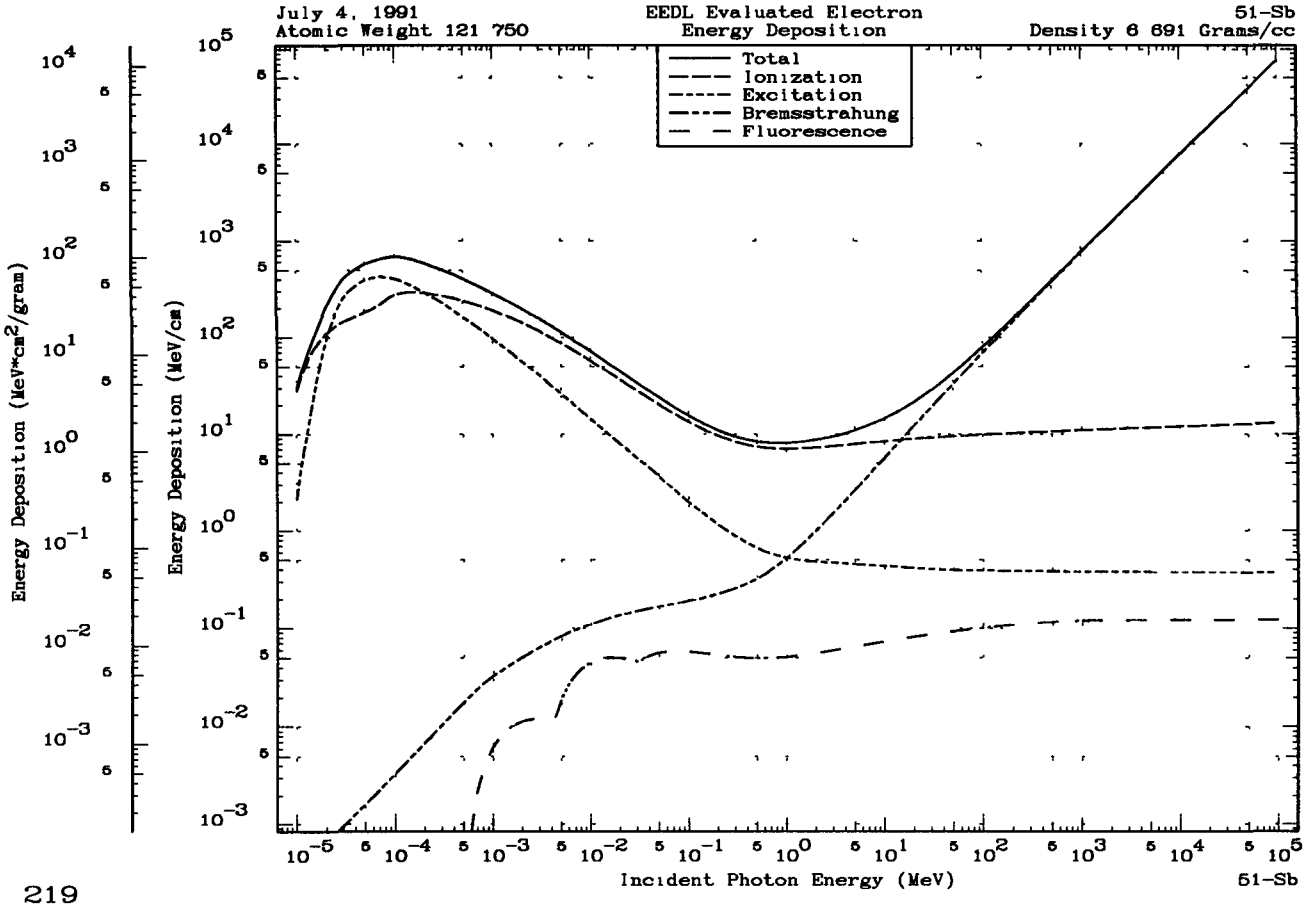
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0026–8	1.3645+7		2.6892+9	2.5464+9	1.3252+8	1.0315+7	4.5268+3	3.6440+1	3.3876+1	2.5633+0	3.6243–4
	1.1250–5	1.0435–8	1.3110+7		2.5838+9	2.4011+9	1.6301+8	1.9708+7	4.6341+3	4.8308+1	4.3249+1	5.0586+0	4.0595–4
	1.3125–5	1.0962–8	1.2479+7		2.4595+9	2.2233+9	1.9990+8	3.6250+7	4.7784+3	6.5673+1	5.5925+1	9.7481+0	4.7263–4
O1	1.3390–5	1.1026–8	1.2407+7		2.4452+9	2.2013+9	2.0526+8	3.8649+7	4.7974+3	6.8304+1	5.7844+1	1.0460+1	4.8217–4
	1.3591–5	1.1074–8	1.2353+7		2.4346+9	2.1850+9	2.0903+8	4.0585+7	4.8116+3	7.0361+1	5.9332+1	1.1029+1	4.8945–4
	1.3943–5	1.1155–8	1.2263+7		2.4170+9	2.1573+9	2.1558+8	4.4136+7	4.8362+3	7.4021+1	6.1942+1	1.2079+1	5.0222–4
	1.4472–5	1.1268–8	1.2141+7		2.3928+9	2.1176+9	2.2532+8	4.9859+7	4.8721+3	7.9672+1	6.5883+1	1.3789+1	5.2147–4
	1.5000–5	1.1371–8	1.2031+7		2.3711+9	2.0801+9	2.3499+8	5.6078+7	4.9070+3	8.5527+1	6.9856+1	1.5670+1	5.4084–4
	1.5625–5	1.1495–8	1.1900+7		2.3454+9	2.0381+9	2.4358+8	6.3701+7	4.9470+3	9.1556+1	7.3616+1	1.7939+1	5.6389–4
	1.6719–5	1.1685–8	1.1707+7		2.3073+9	1.9705+9	2.5816+8	7.8683+7	5.0140+3	1.0263+2	8.0167+1	2.2458+1	6.0460–4
	1.7500–5	1.1799–8	1.1594+7		2.2850+9	1.9261+9	2.6818+8	9.0742+7	5.0597+3	1.1093+2	8.4785+1	2.6147+1	6.3396–4
	1.8359–5	1.1916–8	1.1480+7		2.2626+9	1.8806+9	2.7662+8	1.0539+8	5.1082+3	1.1985+2	8.9168+1	3.0684+1	6.6651–4
	2.0000–5	1.2083–8	1.1322+7		2.2314+9	1.8020+9	2.9174+8	1.3768+8	5.1959+3	1.3820+2	9.7326+1	4.0869+1	7.2937–4
	2.2500–5	1.2232–8	1.1183+7		2.2041+9	1.6991+9	3.0615+8	1.9882+8	5.3023+3	1.6635+2	1.0660+2	5.9752+1	8.1800–4
	2.5000–5	1.2246–8	1.1171+7		2.2017+9	1.6121+9	3.1910+8	2.7044+8	5.3993+3	1.9788+2	1.1560+2	8.2278+1	9.0802–4
	2.6250–5	1.2209–8	1.1205+7		2.2084+9	1.5734+9	3.2312+8	3.1186+8	5.4448+3	2.1456+2	1.1911+2	9.5453+1	9.5351–4
	3.0000–5	1.1985–8	1.1414+7		2.2495+9	1.4720+9	3.3371+8	4.4384+8	5.5714+3	2.6743+2	1.2912+2	1.3831+2	1.0918–3
N5	3.2390–5	1.1809–8	1.1584+7		2.2831+9	1.4168+9	3.3600+8	5.3026+8	5.6442+3	2.9937+2	1.3340+2	1.6597+2	1.1806–3
	3.3341–5	1.1718–8	1.1674+7		2.3009+9	1.3966+9	3.3746+8	5.6684+8	5.6720+3	3.1354+2	1.3580+2	1.7773+2	1.2162–3
N4	3.3490–5	1.1703–8	1.1689+7		2.3038+9	1.3935+9	3.3764+8	5.7269+8	5.6762+3	3.1574+2	1.3612+2	1.7962+2	1.2218–3
	3.5117–5	1.1540–8	1.1854+7		2.3364+9	1.3610+9	3.4020+8	6.3521+8	5.7220+3	3.4031+2	1.4046+2	1.9985+2	1.2831–3
	3.6671–5	1.1414–8	1.1985+7		2.3622+9	1.3320+9	3.4296+8	6.8727+8	5.7642+3	3.6194+2	1.4507+2	2.1687+2	1.3420–3
	4.0000–5	1.1099–8	1.2326+7		2.4293+9	1.2756+9	3.4862+8	8.0502+8	5.8497+3	4.1056+2	1.5493+2	2.5563+2	1.4694–3
	4.5000–5	1.0759–8	1.2715+7		2.5059+9	1.2030+9	3.5050+8	9.5243+8	5.9544+3	4.6977+2	1.6594+2	3.0383+2	1.6533–3
	5.0000–5	1.0590–8	1.2918+7		2.5459+9	1.1416+9	3.5315+8	1.0512+9	6.0497+3	5.1491+2	1.7803+2	3.3687+2	1.8399–3
	5.5000–5	1.0565–8	1.2948+7		2.5519+9	1.0887+9	3.5337+8	1.1098+9	6.1319+3	5.4665+2	1.8919+2	3.5745+2	2.0243–3
	6.0000–5	1.0622–8	1.2879+7		2.5383+9	1.0426+9	3.5527+8	1.1404+9	6.2080+3	5.7192+2	2.0275+2	3.6917+2	2.2107–3
	6.5000–5	1.0695–8	1.2791+7		2.5209+9	1.0019+9	3.5548+8	1.1635+9	6.2788+3	5.9324+2	2.1576+2	3.7748+2	2.3990–3
	7.0000–5	1.0753–8	1.2722+7		2.5075+9	9.6566+8	3.5657+8	1.1852+9	6.3451+3	6.1547+2	2.3006+2	3.8540+2	2.5892–3
	7.2500–5	1.0810–8	1.2655+7		2.4941+9	9.4895+8	3.5745+8	1.1877+9	6.3767+3	6.2455+2	2.3790+2	3.8664+2	2.6849–3
	8.0000–5	1.0971–8	1.2469+7		2.4576+9	9.0360+8	3.5934+8	1.1946+9	6.4662+3	6.5052+2	2.6029+2	3.9022+2	2.9746–3
	9.0000–5	1.1291–8	1.2116+7		2.3878+9	8.5218+8	3.5684+8	1.1788+9	6.5650+3	6.6896+2	2.8186+2	3.8710+2	3.3582–3
N3	9.5800–5	1.1468–8	1.1928+7		2.3509+9	8.2611+8	3.5432+8	1.1705+9	6.6179+3	6.7731+2	2.9176+2	3.8555+2	3.5830–3
	9.6850–5	1.1504–8	1.1891+7		2.3437+9	8.2165+8	3.5394+8	1.1681+9	6.6258+3	6.7859+2	2.9360+2	3.8499+2	3.6226–3
	1.0000–4	1.1608–8	1.1784+7	0.0000+0	2.3226+9	8.0867+8	3.5292+8	1.1610+9	6.6489+3	6.8257+2	2.9921+2	3.8336+2	3.7419–3
N2	1.0364–4	1.1737–8	1.1655+7	5.3294–9	2.2971+9	7.9449+8	3.4996+8	1.1526+9	6.6749+3	6.8343+2	3.0245+2	3.8099+2	3.8801–3
	1.0509–4	1.1802–8	1.1591+7	7.4505–9	2.2845+9	7.8906+8	3.4878+8	1.1467+9	6.6850+3	6.8282+2	3.0364+2	3.7918+2	3.9353–3
	1.0625–4	1.1853–8	1.1541+7	9.1514–9	2.2746+9	7.8478+8	3.4786+8	1.1420+9	6.6930+3	6.8237+2	3.0462+2	3.7775+2	3.9795–3
	1.0790–4	1.1925–8	1.1471+7	1.1565–8	2.2609+9	7.7884+8	3.4658+8	1.1355+9	6.7042+3	6.8174+2	3.0597+2	3.7577+2	4.0423–3
	1.1250–4	1.2123–8	1.1284+7	1.8325–8	2.2240+9	7.6291+8	3.4321+8	1.1179+9	6.7348+3	6.8029+2	3.0984+2	3.7044+2	4.2186–3
	1.1316–4	1.2152–8	1.1258+7	1.9294–8	2.2188+9	7.6071+8	3.4259+8	1.1155+9	6.7391+3	6.7983+2	3.1012+2	3.6971+2	4.2438–3
	1.1719–4	1.2324–8	1.1100+7	2.5233–8	2.1876+9	7.4766+8	3.3897+8	1.1010+9	6.7649+3	6.7716+2	3.1183+2	3.6533+2	4.3987–3
	1.2237–4	1.2541–8	1.0908+7	3.2901–8	2.1498+9	7.3183+8	3.3459+8	1.0834+9	6.7969+3	6.7411+2	3.1409+2	3.6002+2	4.5987–3
	1.2539–4	1.2665–8	1.0801+7	3.7389–8	2.1288+9	7.2305+8	3.3217+8	1.0736+9	6.8149+3	6.7252+2	3.1546+2	3.5706+2	4.7157–3
	1.2928–4	1.2821–8	1.0670+7	4.3175–8	2.1029+9	7.1222+8	3.2919+8	1.0615+9	6.8376+3	6.7065+2	3.1724+2	3.5341+2	4.8666–3
	1.3125–4	1.2899–8	1.0605+7	4.6119–8	2.0901+9	7.0691+8	3.2774+8	1.0555+9	6.8489+3	6.6977+2	3.1816+2	3.5162+2	4.9434–3
	1.3770–4	1.3152–8	1.0402+7	5.5769–8	2.0501+9	6.9034+8	3.2294+8	1.0368+9	6.8848+3	6.6602+2	3.2000+2	3.4602+2	5.1951–3
	1.3964–4	1.3226–8	1.0343+7	5.8689–8	2.0385+9	6.8557+8	3.2156+8	1.0314+9	6.8953+3	6.6497+2	3.2057+2	3.4440+2	5.2712–3
N1	1.4281–4	1.3346–8	1.0250+7	6.3465–8	2.0202+9	6.7800+8	3.1937+8	1.0228+9	6.9122+3	6.6334+2	3.2150+2	3.4183+2	5.3957–3
	1.4461–4	1.3428–8	1.0187+7	6.6177–8	2.0078+9	6.7382+8	3.1801+8	1.0160+9	6.9217+3	6.6154+2	3.2181+2	3.3972+2	5.4663–3
	1.4730–4	1.3550–8	1.0096+7	7.0262–8	1.9898+9	6.6769+8	3.1602+8	1.0060+9	6.9356+3	6.5894+2	3.2230+2	3.3663+2	5.5725–3
	1.5000–4	1.3671–8	1.0007+7	7.4361–8	1.9722+9	6.6173+8	3.1408+8	9.9636+8	6.9493+3	6.5645+2	3.2282+2	3.3363+2	5.6788–3
	1.5625–4	1.3954–8	9.8033+6	8.3939–8	1.9321+9	6.4850+8	3.0861+8	9.7500+8	6.9763+3	6.4867+2	3.2181+2	3.2686+2	5.9248–3
	1.6719–4	1.4436–8	9.4759+6	1.0096–7	1.8676+9	6.2716+8	2.9983+8	9.4061+8	7.0211+3	6.3644+2	3.2046+2	3.1597+2	6.3574–3
	1.7500–4	1.4771–8	9.2615+6	1.1331–7	1.8254+9	6.1315+8	2.9410+8	9.1809+8	7.0515+3	6.2865+2	3.1979+2	3.0885+2	6.6680–3
	1.8359–4	1.5130–8	9.0418+6	1.2707–7	1.7821+9	5.9879+8	2.8824+8	8.9502+8	7.0835+3	6.2075+2	3.1918+2	3.0157+2	7.0111–3
	2.0000–4	1.5791–8	8.6631+6	1.5378–7	1.7074+9	5.7397+8	2.7817+8	8.5527+8	7.1411+3	6.0764+2	3.1858+2	2.8905+2	7.6700–3
	2.2500–4	1.6794–8	8.1456+6	1.9575–7	1.6054+9	5.4149+8	2.6200+8	8.0192+8	7.1888+3	5.8396+2	3.1211+2	2.7184+2	8.6651–3
	2.5000–4	1.7744–8	7.7097+6	2.3928–7	1.5195+9	5.1399+8	2.4849+8	7.5702+8	7.2317+3	5.6464+2	3.0723+2	2.5740+2	9.6663–3
	2.6250–4	1.8201–8	7.5161+6	2.6159–7	1.4814+9	5.0174+8	2.4252+8	7.3709+8	7.2516+3	5.5629+2	3.0528+2	2.5100+2	1.0169–2
	3.0000–4	1.9511–8	7.0115+6	3.3031–7	1.3819+9	4.6967+8	2.2704+8	6.8518+8	7.3065+3	5.3516+2	3.0077+2	2.3438+2	1.1685–2
	3.5000–4	2.1354–8	6.4064+6	4.2669–7	1.2626+9	4.3543+8	2.0795+8	6.1923+8	7.3606+3	5.0280+2	2.9011+2	2.1268+2	1.3714–2
	4.0000–4	2.3084–8	5.9260+6	5.2865–7	1.1680+9	4.0779+8	1.9290+8	5.6726+8	7.4078+3	4.7811+2	2.8248+2	1.9562+2	1.5757–2
M5	4.9462–4	2.6435–8	5.1750+6	7.3662–7	1.0199+9	3.6748+8	1.6915+8	4.8330+8	7.4047+3	4.3262+2	2.6500+2	1.6760+2	1.9541–2
	5.0000–4	2.6619–8	5.1392+6	7.4908–7	1.0129+9	3.6553+8	1.6803+8	4.7931+8	7.4046+3	4.3055+2	2.6424+2	1.6628+2	1.9756–2
M4	5.0357–4	2.6740–8	5.1159+6	7.5739–7	1.0083+9	3.6426+8	1.6727+8	4.7675+8	7.4045+3	4.2912+2	2.6368+2	1.6542+2	1.9899–2
	5.1250–4	2.7043–8	5.0586+6	7.7828–7	9.9700+8	3.6114+8	1.6543+8	4.7043+8	7.4000+3	4.2565+2	2.6234+2	1.6329+2	2.0241–2
	5.1562–4	2.7148–8	5.0390+6	7.8563–7	9.9313+8	3.6006+8	1.6480+8	4.6827+8	7.3985+3	4.2446+2	2.6188+2	1.6257+2	2.0361–2
	5.1797–4	2.7227–8	5.0244+6	7.9116–7	9.9025+8	3.5926+8	1.6433+8	4.6666+8	7.3973+3	4.2358+2	2.6154+2	1.6203+2	2.0450–2
	5.2617–4	2.7502–8	4.9741+6	8.1060–7	9.8035+8	3.5650+8	1.6271+8	4.6113+8	7.3933+3	4.2057+2	2.6038+2	1.6017+2	2.0764–2
	5.2790–4	2.7560–8	4.9637+6	8.1471–7	9.7829+8	3.5593+8	1.6238+8	4.5998+8	7.3925+3	4.1995+2	2.6015+2	1.5978+2	2.0831–2
	5.3691–4	2.7860–8	4.9103+6	8.3626–7	9.6776+8	3.5299+8	1.6066+8	4.5411+8	7.3882+3	4.1678+2	2.5895+2	1.5781+2	2.1175–2
	5.4463–4	2.8115–8	4.8657+6	8.5482–7	9.5899+8	3.5053+8	1.5923+8	4.4922+8	7.3846+3	4.1416+2	2.5797+2	1.5617+2	2.1470–2
	5.5269–4	2.8380–8	4.8203+6	8.7434–7	9.5003+8	3.4801+8	1.5777+8	4.4424+8	7.3809+3	4.1152+2	2.5700+2	1.5450+2	2.1778–2
	5.5847–4	2.8569–8	4.7884+6	8.8843–7	9.4374+8	3.4624+8	1.5675+8	4.4075+8	7.3782+3	4.0966+2	2.5631+2	1.5332+2	2.1999–2
	5.6885–4	2.8906–8	4.7325+6	9.1387–7	9.3272+8	3.4313+8	1.5495+8	4.3463+8	7.3736+3	4.0644+2	2.5515+2	1.5127+2	2.2395–2
	5.7634–4	2.9149–8	4.6932+6	9.3235–7	9.2497+8	3.4094+8	1.5370+8	4.3034+8	7.3703+3	4.0421+2	2.5436+2	1.4983+2	2.2681–2
	5.8443–4	2.9408–8	4.6517+6	9.5241–7	9.1680+8	3.3861+8	1.5237+8	4.2581+8	7.3667+3	4.0185+2	2.5352+2	1.4831+2	2.2990–2
	6.0000–4	2.9905–8	4.5745+6	9.9137–7	9.0158+8	3.3428+8	1.4990+8	4.1740+8	7.3601+3	3.9753+2	2.5202+2	1.4549+2	2.3583–2
	6.5000–4	3.1489–8	4.3444+6	1.1196–6	8.5623+8	3.2141+8	1.4207+8	3.9274+8	7.3189+3	3.8238+2	2.4520+2	1.3716+2	2.5393–2

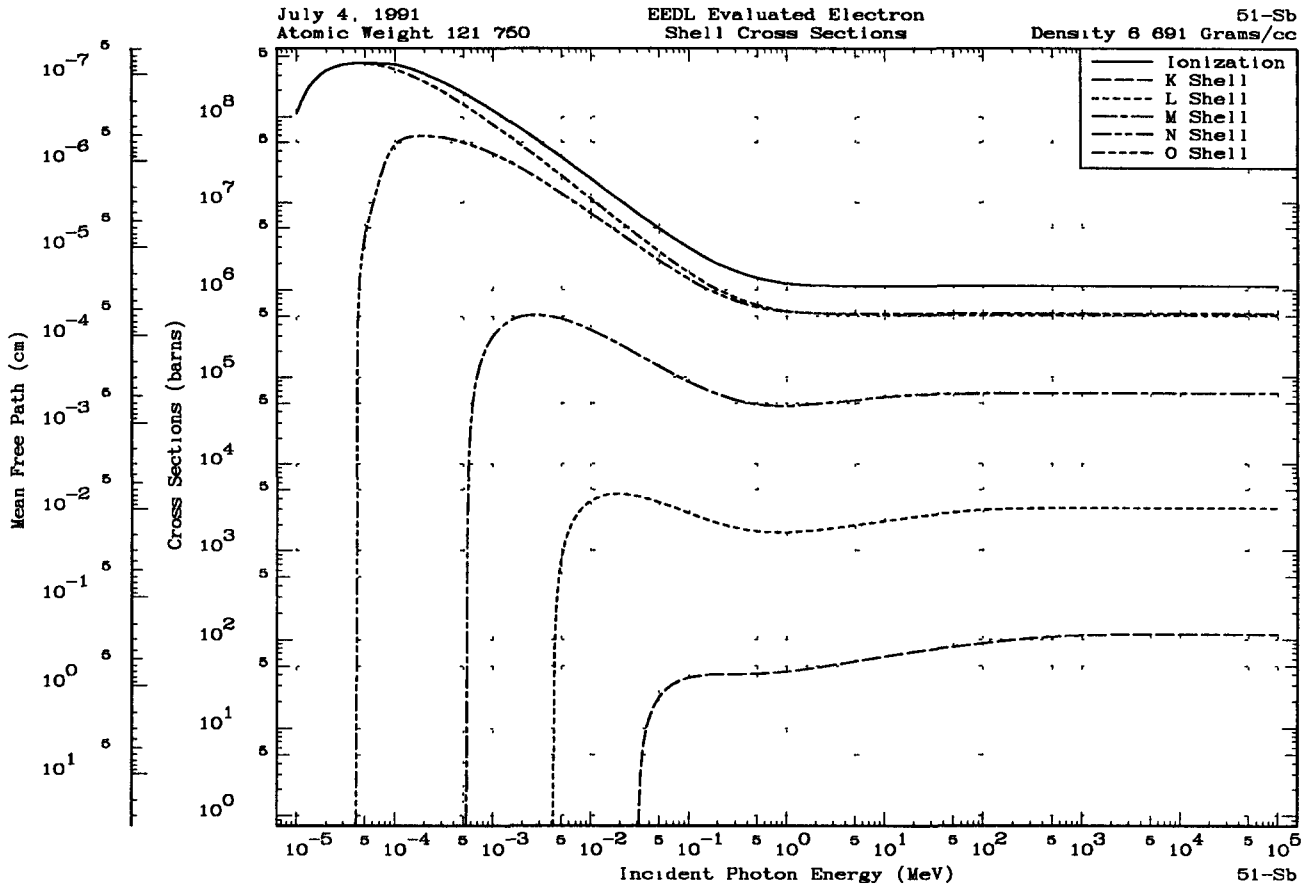
Atomic Weight 118.690 Density 7.310 Grams/cc

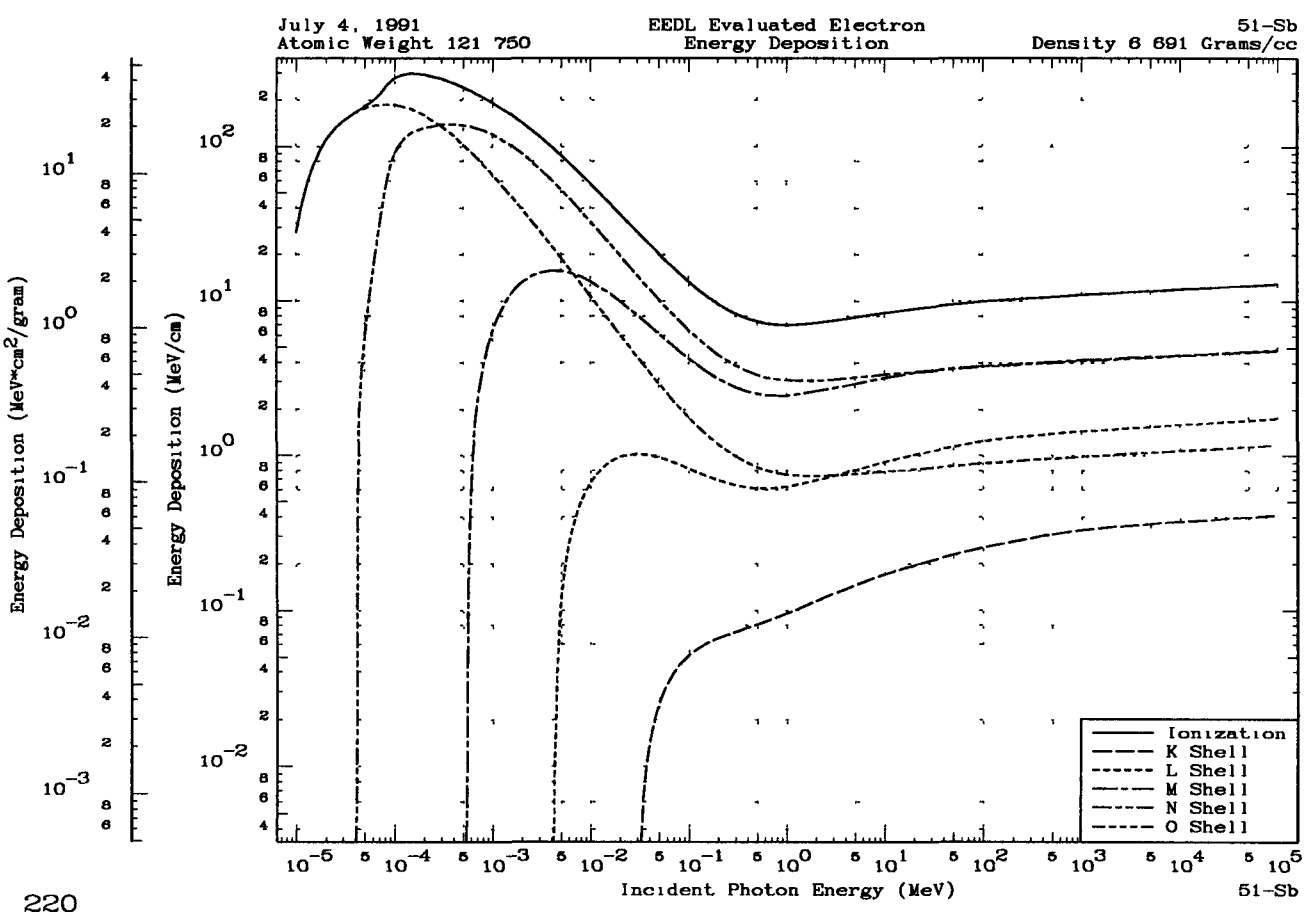
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M3	7.1032–4	3.3338–8	4.1034+6	1.2806–6	8.0874+8	3.0773+8	1.3391+8	3.6710+8	7.2735+3	3.6686+2	2.3834+2	1.2850+2	2.7564–2
	7.2153–4	3.3675–8	4.0623+6	1.3113–6	8.0064+8	3.0537+8	1.3250+8	3.6275+8	7.2655+3	3.6426+2	2.3722+2	1.2702+2	2.7966–2
	7.2500–4	3.3779–8	4.0498+6	1.3209–6	7.9817+8	3.0466+8	1.3208+8	3.6143+8	7.2630+3	3.6348+2	2.3688+2	1.2657+2	2.8091–2
	7.4115–4	3.4261–8	3.9928+6	1.3655–6	7.8695+8	3.0138+8	1.3013+8	3.5542+8	7.2518+3	3.5983+2	2.3527+2	1.2453+2	2.8669–2
M2	7.5336–4	3.4623–8	3.9511+6	1.3996–6	7.7873+8	2.9898+8	1.2872+8	3.5103+8	7.2435+3	3.5718+2	2.3411+2	1.2304+2	2.9106–2
	7.6502–4	3.4967–8	3.9122+6	1.4323–6	7.7106+8	2.9674+8	1.2740+8	3.4692+8	7.2349+3	3.5474+2	2.3306+2	1.2165+2	2.9513–2
	7.7057–4	3.5130–8	3.8941+6	1.4480–6	7.6748+8	2.9568+8	1.2678+8	3.4501+8	7.2308+3	3.5361+2	2.3258+2	1.2100+2	2.9708–2
	7.8251–4	3.5479–8	3.8557+6	1.4819–6	7.5992+8	2.9346+8	1.2548+8	3.4097+8	7.2222+3	3.5123+2	2.3157+2	1.1964+2	3.0124–2
	8.0000–4	3.5987–8	3.8013+6	1.5319–6	7.4920+8	2.9030+8	1.2364+8	3.3525+8	7.2098+3	3.4790+2	2.3017+2	1.1770+2	3.0734–2
	8.5000–4	3.7430–8	3.6548+6	1.6778–6	7.2032+8	2.8180+8	1.1849+8	3.2002+8	7.1474+3	3.3753+2	2.2500+2	1.1249+2	3.2167–2
M1	8.6905–4	3.7971–8	3.6027+6	1.7346–6	7.1005+8	2.7875+8	1.1667+8	3.1463+8	7.1247+3	3.3389+2	2.2321+2	1.1065+2	3.2710–2
	8.8542–4	3.8437–8	3.5590+6	1.7838–6	7.0144+8	2.7622+8	1.1516+8	3.1007+8	7.1057+3	3.3088+2	2.2175+2	1.0909+2	3.3175–2
	9.0000–4	3.8850–8	3.5212+6	1.8280–6	6.9400+8	2.7401+8	1.1385+8	3.0613+8	7.0891+3	3.2830+2	2.2051+2	1.0775+2	3.3589–2
	9.1406–4	3.9245–8	3.4857+6	1.8710–6	6.8700+8	2.7194+8	1.1262+8	3.0244+8	7.0733+3	3.2584+2	2.1931+2	1.0650+2	3.3987–2
	9.5703–4	4.0440–8	3.3828+6	2.0044–6	6.6672+8	2.6588+8	1.0907+8	2.9176+8	7.0269+3	3.1880+2	2.1591+2	1.0286+2	3.5199–2
	1.0000–3	4.1613–8	3.2874+6	2.1405–6	6.4791+8	2.6022+8	1.0578+8	2.8190+8	6.9829+3	3.1242+2	2.1287+2	9.9508+1	3.6404–2
	1.0625–3	4.3306–8	3.1589+6	2.3439–6	6.2258+8	2.5258+8	1.0116+8	2.6884+8	6.8987+3	3.0232+2	2.0727+2	9.5011+1	3.7734–2
	1.1250–3	4.4962–8	3.0426+6	2.5537–6	5.9966+8	2.4558+8	9.6998+7	2.5708+8	6.8203+3	2.9335+2	2.0234+2	9.0963+1	3.9054–2
	1.1719–3	4.6181–8	2.9622+6	2.7153–6	5.8382+8	2.4070+8	9.4130+7	2.4899+8	6.7648+3	2.8711+2	1.9889+2	8.8181+1	4.0038–2
	1.2500–3	4.8173–8	2.8398+6	2.9919–6	5.5969+8	2.3318+8	8.9778+7	2.3672+8	6.6781+3	2.7775+2	1.9374+2	8.3963+1	4.1665–2
	1.3125–3	4.9732–8	2.7507+6	3.2197–6	5.4214+8	2.2765+8	8.6627+7	2.2785+8	6.6132+3	2.7105+2	1.9009+2	8.0914+1	4.2957–2
	1.3359–3	5.0309–8	2.7192+6	3.3065–6	5.3592+8	2.2568+8	8.5510+7	2.2472+8	6.5899+3	2.6864+2	1.8876+2	7.9836+1	4.3439–2
	1.5000–3	5.4249–8	2.5217+6	3.9346–6	4.9700+8	2.1319+8	7.8567+7	2.0524+8	6.4390+3	2.5389+2	1.8070+2	7.3145+1	4.6778–2
	1.7500–3	5.9948–8	2.2820+6	4.9615–6	4.4975+8	1.9736+8	6.9800+7	1.8259+8	6.2296+3	2.3334+2	1.6800+2	6.5287+1	5.1320–2
	2.0000–3	6.5342–8	2.0936+6	6.0707–6	4.1262+8	1.8460+8	6.3020+7	1.6500+8	6.0537+3	2.1760+2	1.5835+2	5.9192+1	5.5762–2
	2.2500–3	7.0699–8	1.9350+6	7.2602–6	3.8136+8	1.7342+8	5.7401+7	1.5053+8	5.8761+3	2.0291+2	1.4873+2	5.4124+1	5.9420–2
	2.5000–3	7.5845–8	1.8037+6	8.5299–6	3.5548+8	1.6400+8	5.2811+7	1.3867+8	5.7217+3	1.9101+2	1.4098+2	4.9972+1	6.3013–2
	2.6250–3	7.8349–8	1.7460+6	9.1935–6	3.4412+8	1.5982+8	5.0810+7	1.3349+8	5.6515+3	1.8576+2	1.3753+2	4.8162+1	6.4786–2
	3.0000–3	8.5613–8	1.5979+6	1.1288–5	3.1492+8	1.4890+8	4.5724+7	1.2030+8	5.4639+3	1.7248+2	1.2886+2	4.3551+1	7.0019–2
L3	3.9268–3	1.0354–7	1.3213+6	1.7125–5	2.6041+8	1.2838+8	3.6740+7	9.5277+7	5.0506+3	1.4584+2	1.1107+2	3.4697+1	8.0568–2
	4.0000–3	1.0490–7	1.3041+6	1.7629–5	2.5702+8	1.2707+8	3.6190+7	9.3757+7	5.0214+3	1.4421+2	1.0997+2	3.4159+1	8.1309–2
L2	4.1608–3	1.0790–7	1.2678+6	1.8759–5	2.4987+8	1.2421+8	3.5033+7	9.0623+7	4.9597+3	1.4054+2	1.0742+2	3.3040+1	8.2928–2
	4.2500–3	1.0955–7	1.2487+6	1.9398–5	2.4610+8	1.2270+8	3.4426+7	8.8974+7	4.9267+3	1.3863+2	1.0610+2	3.2452+1	8.3820–2
	4.2657–3	1.0984–7	1.2454+6	1.9511–5	2.4546+8	1.2244+8	3.4321+7	8.8690+7	4.9210+3	1.3830+2	1.0587+2	3.2351+1	8.3977–2
L1	4.4403–3	1.1304–7	1.2102+6	2.0790–5	2.3851+8	1.1964+8	3.3205+7	8.5664+7	4.8595+3	1.3478+2	1.0343+2	3.1271+1	8.5711–2
	4.4493–3	1.1320–7	1.2084+6	2.0857–5	2.3817+8	1.1950+8	3.3150+7	8.5513+7	4.8561+3	1.3461+2	1.0330+2	3.1218+1	8.5790–2
	4.5802–3	1.1558–7	1.1836+6	2.1839–5	2.3327+8	1.1752+8	3.2366+7	8.3378+7	4.8082+3	1.3214+2	1.0160+2	3.0460+1	8.6932–2
	4.6250–3	1.1639–7	1.1753+6	2.2179–5	2.3165+8	1.1686+8	3.2108+7	8.2674+7	4.7922+3	1.3133+2	1.0103+2	3.0210+1	8.7320–2
	4.7246–3	1.1818–7	1.1575+6	2.2942–5	2.2814+8	1.1543+8	3.1548+7	8.1153+7	4.7574+3	1.2957+2	9.9816+1	2.9670+1	8.8183–2
	4.7901–3	1.1935–7	1.1462+6	2.3450–5	2.2590+8	1.1452+8	3.1193+7	8.0185+7	4.7351+3	1.2846+2	9.9042+1	2.9326+1	8.8748–2
	5.0000–3	1.2307–7	1.1116+6	2.5106–5	2.1908+8	1.1172+8	3.0110+7	7.7243+7	4.6662+3	1.2506+2	9.6692+1	2.8282+1	9.0549–2
	5.5000–3	1.3182–7	1.0377+6	2.9228–5	2.0453+8	1.0560+8	2.7816+7	7.1103+7	4.5112+3	1.1762+2	9.1440+1	2.6085+1	9.4541–2
	6.0000–3	1.4034–7	9.7477+5	3.3596–5	1.9212+8	1.0031+8	2.5878+7	6.5924+7	4.3741+3	1.1135+2	8.7017+1	2.4233+1	9.8457–2
	6.5000–3	1.4874–7	9.1970+5	3.8208–5	1.8126+8	9.5576+7	2.4197+7	6.1486+7	4.2372+3	1.0553+2	8.2792+1	2.2637+1	1.0156–1
	7.0000–3	1.5696–7	8.7158+5	4.3063–5	1.7178+8	9.1391+7	2.2740+7	5.7643+7	4.1142+3	1.0050+2	7.9135+1	2.1256+1	1.0463–1
	7.2500–3	1.6100–7	8.4971+5	4.5579–5	1.6747+8	8.9474+7	2.2082+7	5.5908+7	4.0572+3	9.8220+1	7.7481+1	2.0632+1	1.0614–1
	8.0000–3	1.7287–7	7.9133+5	5.3459–5	1.5596+8	8.4309+7	2.0335+7	5.1316+7	3.9015+3	9.2194+1	7.3101+1	1.8982+1	1.1062–1
	9.0000–3	1.8888–7	7.2428+5	6.4749–5	1.4275+8	7.8295+7	1.8413+7	4.6036+7	3.7081+3	8.5054+1	6.7869+1	1.7070+1	1.1545–1
	1.0000–2	2.0440–7	6.6927+5	7.6926–5	1.3191+8	7.3280+7	1.6849+7	4.1775+7	3.5432+3	7.9254+1	6.3607+1	1.5527+1	1.2018–1
	1.2500–2	2.4217–7	5.6490+5	1.1100–4	1.1134+8	6.3423+7	1.3956+7	3.3953+7	3.1904+3	6.7786+1	5.4984+1	1.2674+1	1.2849–1
	1.5000–2	2.7797–7	4.9213+5	1.5021–4	9.6994+7	5.6362+7	1.1967+7	2.8663+7	2.9285+3	5.9901+1	4.9019+1	1.0745+1	1.3656–1
	2.0000–2	3.4648–7	3.9483+5	2.4230–4	7.7816+7	4.6468+7	9.3991+6	2.1947+7	2.5223+3	4.9046+1	4.0624+1	8.2747+0	1.4729–1
	2.5000–2	4.1177–7	3.3222+5	3.5250–4	6.5477+7	3.9874+7	7.8092+6	1.7792+7	2.2334+3	4.1890+1	3.4999+1	6.7356+0	1.5459–1
K	2.9184–2	4.6396–7	2.9485+5	4.5779–4	5.8112+7	3.5859+7	6.8684+6	1.5383+7	2.0528+3	3.7658+1	3.1654+1	5.8431+0	1.6067–1
	2.9592–2	4.6887–7	2.9176+5	4.6868–4	5.7504+7	3.5516+7	6.7903+6	1.5195+7	2.0370+3	3.7304+1	3.1369+1	5.7736+0	1.6112–1
	3.0000–2	4.7376–7	2.8875+5	4.7967–4	5.6910+7	3.5182+7	6.7142+6	1.5013+7	2.0215+3	3.6959+1	3.1091+1	5.7059+0	1.6158–1
	3.1250–2	4.8867–7	2.7994+5	5.1397–4	5.5174+7	3.4192+7	6.4957+6	1.4484+7	1.9757+3	3.5932+1	3.0261+1	5.5086+0	1.6279–1
	3.2344–2	5.0159–7	2.7273+5	5.4477–4	5.3752+7	3.3380+7	6.3172+6	1.4053+7	1.9378+3	3.5094+1	2.9582+1	5.3478+0	1.6386–1
	3.4258–2	5.2395–7	2.6109+5	6.0038–4	5.1458+7	3.2065+7	6.0299+6	1.3362+7	1.8763+3	3.3743+1	2.8487+1	5.0897+0	1.6575–1
	3.7129–2	5.5691–7	2.4564+5	6.8781–4	4.8412+7	3.0311+7	5.6495+6	1.2450+7	1.7934+3	3.1955+1	2.7037+1	4.7496+0	1.6859–1
	4.0000–2	5.8924–7	2.3216+5	7.7991–4	4.5756+7	2.8774+7	5.3190+6	1.1662+7	1.7199+3	3.0402+1	2.5774+1	4.4556+0	1.7143–1
	4.5000–2	6.4410–7	2.1239+5	9.5097–4	4.1859+7	2.6493+7	4.8472+6	1.0518+7	1.6090+3	2.8091+1	2.3890+1	4.0259+0	1.7525–1
	5.0000–2	6.9744–7	1.9614+5	1.1352–3	3.8658+7	2.4606+7	4.4609+6	9.5895+6	1.5158+3	2.6199+1	2.2343+1	3.6774+0	1.7913–1
	5.5000–2	7.4924–7	1.8258+5	1.3321–3	3.5986+7	2.3015+7	4.1462+6	8.8223+6	1.4365+3	2.4614+1	2.1044+1	3.3884+0	1.8232–1
	6.0000–2	7.9984–7	1.7103+5	1.5410–3	3.3709+7	2.1653+7	3.8784+6	8.1757+6	1.3677+3	2.3267+1	1.9936+1	3.1448+0	1.8556–1
	7.0000–2	8.9365–7	1.5308+5	1.9917–3	3.0170+7	1.9459+7	3.4618+6	7.2479+6	1.2581+3	2.1145+1	1.8160+1	2.7943+0	1.9088–1
	8.0000–2	9.8374–7	1.3906+5	2.4841–3	2.7407+7	1.7739+7	3.1374+6	6.5297+6	1.1702+3	1.9493+1	1.6774+1	2.5231+0	1.9634–1
	1.0000–1	1.1505–6	1.1891+5	3.5788–3	2.3435+7	1.5263+7	2.6858+6	5.4858+6	1.0418+3	1.7100+1	1.4768+1	2.1269+0	2.0554–1
	1.2500–1	1.3272–6	1.0307+5	5.1301–3	2.0315+7	1.3319+7	2.3301+6	4.6648+6	9.3469+2	1.5169+1	1.3141+1	1.8139+0	2.1455–1
	1.5000–1	1.4914–6	9.1724+4	6.8578–3	1.8078+7	1.1916+7	2.0749+6	4.0861+6	8.5539+2	1.3792+1	1.1974+1	1.5934+0	2.2393–1
	2.0000–1	1.7635–6	7.7570+4	1.0726–2	1.5288+7	1.0163+7	1.7677+6	3.3571+6	7.5317+2	1.2095+1	1.0541+1	1.3143+0	2.4045–1
	3.0000–1	2.2056–6	6.2024+4	1.9626–2	1.2224+7	8.1498+6	1.4633+6	2.6105+6	6.4459+2	1.0420+1	9.1195+0	1.0275+0	2.7261–1
	4.0000–1	2.5758–6	5.3108+4	2.9599–2	1.0467+7	6.9208+6	1.3154+6	2.2303+6	5.8984+2	9.6447+0	8.4564+0	8.8103–1	3.0727–1
	5.0000–1	2.8960–6	4.7237+4	4.0187–2	9.3098+6	6.0886+6	1.2301+6	1.9907+6	5.5790+2	9.2470+0	8.1146+0	7.8864–1	3.4382–1
	6.0000–1	3.1737–6	4.3104+4	5.1142–2	8.4953+6	5.4798+6	1.1752+6	1.8397+6	5.3908+2	9.0109+0	7.8978+0	7.3059–1	3.8249–1
	8.0000–1	3.6536–6	3.7443+4	7.3541–2	7.3795+6	4.6406+6	1.1114+6	1.6270+6	5.1997+2	8.8475+0	7.7328+0	6.4855–1	4.6617–1
	1.0000+0	4.0439–6	3.3828+4	9.6176–2	6.6672+6	4.0871+6	1.0760+6	1.5035+6	5.1149+2	8.8238+0	7.6669+0	6.0100–1	5.5594–1
	1.5000+0	4.7672–6	2.8696+4	1.5192–1	5.6556+6	3.2754+6	1.0370+6	1.3426+6	5.0711+2	9.1186+0	7.7786+0	5.3943–1	8.0050–1
	2.0000+0	5.2551–6	2.6032+4	2.0564–1	5.1305+6	2.8303+6	1.0268+6	1.2729+6	5.1054+2	9.4979+0	7.9196+0	5.1277–1	1.0656+0
	3.0000+0	5.9191–6	2.3111+4	3.0676–1	4.5550+6	2.3555+6	1.0132+6	1.1857+6	5.1898+2	1.0290+1	8.1838+0	4.8028–1	1.6260+0

Atomic Weight 118.690												Density 7.310 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+0	6.3097–6	2.1681+4	4.0032–1	4.2730+6	2.1032+6	1.0080+6	1.1613+6	5.2660+2	1.1099+1	8.4082+0	4.7108–1	2.2193+0
5.0000+0	6.5564–6	2.0865+4	4.8736–1	4.1122+6	1.9553+6	1.0079+6	1.1486+6	5.3284+2	1.1888+1	8.5904+0	4.6659–1	2.8309+0
6.0000+0	6.7312–6	2.0323+4	5.6878–1	4.0055+6	1.8591+6	1.0078+6	1.1380+6	5.3778+2	1.2684+1	8.7487+0	4.6299–1	3.4724+0
8.0000+0	6.9549–6	1.9669+4	7.1747–1	3.8766+6	1.7472+6	1.0080+6	1.1208+6	5.4567+2	1.4248+1	9.0184+0	4.5735–1	4.7719+0
1.0000+1	7.0587–6	1.9380+4	8.5068–1	3.8196+6	1.6960+6	1.0087+6	1.1144+6	5.5164+2	1.5806+1	9.2364+0	4.5610–1	6.1136+0
1.5000+1	7.0976–6	1.9274+4	1.1344+0	3.7987+6	1.6736+6	1.0104+6	1.1142+6	5.6223+2	1.9571+1	9.5363+0	4.5617–1	9.5783+0
2.0000+1	7.0953–6	1.9280+4	1.3677+0	3.7999+6	1.6737+6	1.0116+6	1.1140+6	5.7008+2	2.3418+1	9.7866+0	4.5624–1	1.3175+1
3.0000+1	7.0965–6	1.9277+4	1.7369+0	3.7993+6	1.6730+6	1.0122+6	1.1135+6	5.8038+2	3.1118+1	1.0070+1	4.5632–1	2.0591+1
4.0000+1	7.1030–6	1.9259+4	2.0236+0	3.7958+6	1.6725+6	1.0129+6	1.1099+6	5.9029+2	3.8914+1	1.0269+1	4.5517–1	2.8190+1
5.0000+1	7.1105–6	1.9239+4	2.2577+0	3.7918+6	1.6720+6	1.0133+6	1.1059+6	5.9779+2	4.6787+1	1.0421+1	4.5383–1	3.5913+1
6.0000+1	7.1172–6	1.9221+4	2.4551+0	3.7882+6	1.6717+6	1.0134+6	1.1025+6	6.0375+2	5.4710+1	1.0526+1	4.5275–1	4.3731+1
8.0000+1	7.1283–6	1.9191+4	2.7757+0	3.7823+6	1.6712+6	1.0137+6	1.0969+6	6.1322+2	7.0758+1	1.0714+1	4.5105–1	5.9593+1
1.0000+2	7.1377–6	1.9166+4	3.0301+0	3.7773+6	1.6708+6	1.0138+6	1.0921+6	6.2064+2	8.7017+1	1.0877+1	4.4971–1	7.5691+1
1.5000+2	7.1578–6	1.9112+4	3.5015+0	3.7668+6	1.6700+6	1.0139+6	1.0822+6	6.3324+2	1.2774+2	1.1041+1	4.4563–1	1.1626+2
2.0000+2	7.1645–6	1.9094+4	3.8409+0	3.7632+6	1.6695+6	1.0140+6	1.0791+6	6.4170+2	1.6877+2	1.1196+1	4.4437–1	1.5713+2
3.0000+2	7.1700–6	1.9079+4	4.3241+0	3.7604+6	1.6688+6	1.0141+6	1.0769+6	6.5127+2	2.5053+2	1.1448+1	4.4348–1	2.3864+2
4.0000+2	7.1741–6	1.9068+4	4.6691+0	3.7582+6	1.6682+6	1.0141+6	1.0752+6	6.5757+2	3.3301+2	1.1570+1	4.4281–1	3.2100+2
5.0000+2	7.1811–6	1.9050+4	4.9376+0	3.7545+6	1.6678+6	1.0141+6	1.0719+6	6.6254+2	4.1473+2	1.1669+1	4.4148–1	4.0262+2
6.0000+2	7.1816–6	1.9048+4	5.1576+0	3.7542+6	1.6675+6	1.0141+6	1.0720+6	6.6666+2	4.9694+2	1.1763+1	4.4152–1	4.8474+2
8.0000+2	7.1856–6	1.9038+4	5.5054+0	3.7522+6	1.6670+6	1.0141+6	1.0704+6	6.7392+2	6.6105+2	1.1929+1	4.4092–1	6.4868+2
1.0000+3	7.1891–6	1.9029+4	5.7754+0	3.7503+6	1.6666+6	1.0141+6	1.0690+6	6.7961+2	8.2666+2	1.2069+1	4.4037–1	8.1415+2
1.5000+3	7.1950–6	1.9013+4	6.2658+0	3.7473+6	1.6658+6	1.0141+6	1.0667+6	6.9037+2	1.2404+3	1.2199+1	4.3940–1	1.2278+3
2.0000+3	7.2000–6	1.9000+4	6.6137+0	3.7447+6	1.6653+6	1.0141+6	1.0646+6	6.9839+2	1.6530+3	1.2329+1	4.3855–1	1.6402+3
3.0000+3	7.2039–6	1.8989+4	7.1040+0	3.7426+6	1.6645+6	1.0141+6	1.0632+6	7.1010+2	2.4821+3	1.2577+1	4.3799–1	2.4691+3
4.0000+3	7.2072–6	1.8981+4	7.4517+0	3.7409+6	1.6640+6	1.0141+6	1.0621+6	7.1871+2	3.3106+3	1.2690+1	4.3751–1	3.2975+3
5.0000+3	7.2135–6	1.8964+4	7.7211+0	3.7376+6	1.6636+6	1.0141+6	1.0592+6	7.2549+2	4.1453+3	1.2774+1	4.3632–1	4.1321+3
6.0000+3	7.2130–6	1.8966+4	7.9412+0	3.7379+6	1.6633+6	1.0141+6	1.0598+6	7.3045+2	4.9666+3	1.2858+1	4.3658–1	4.9533+3
8.0000+3	7.2140–6	1.8963+4	8.2887+0	3.7374+6	1.6628+6	1.0141+6	1.0598+6	7.3834+2	6.6232+3	1.3019+1	4.3658–1	6.6098+3
1.0000+4	7.2149–6	1.8961+4	8.5579+0	3.7369+6	1.6623+6	1.0141+6	1.0597+6	7.4452+2	8.2951+3	1.3167+1	4.3655–1	8.2815+3
1.5000+4	7.2162–6	1.8957+4	9.0479+0	3.7363+6	1.6616+6	1.0141+6	1.0598+6	7.5654+2	1.2387+4	1.3288+1	4.3658–1	1.2374+4
2.0000+4	7.2182–6	1.8952+4	9.3961+0	3.7352+6	1.6611+6	1.0141+6	1.0593+6	7.6519+2	1.6532+4	1.3409+1	4.3636–1	1.6519+4
3.0000+4	7.2191–6	1.8950+4	9.8872+0	3.7348+6	1.6603+6	1.0141+6	1.0595+6	7.7734+2	2.4740+4	1.3651+1	4.3647–1	2.4726+4
4.0000+4	7.2209–6	1.8945+4	1.0236+1	3.7338+6	1.6598+6	1.0141+6	1.0591+6	7.8607+2	3.3036+4	1.3793+1	4.3629–1	3.3022+4
5.0000+4	7.2262–6	1.8931+4	1.0506+1	3.7311+6	1.6594+6	1.0141+6	1.0568+6	7.9277+2	4.1256+4	1.3871+1	4.3532–1	4.1241+4
6.0000+4	7.2251–6	1.8934+4	1.0727+1	3.7317+6	1.6591+6	1.0141+6	1.0576+6	7.9825+2	4.9468+4	1.3949+1	4.3569–1	4.9454+4
8.0000+4	7.2256–6	1.8933+4	1.1076+1	3.7314+6	1.6586+6	1.0141+6	1.0579+6	8.0696+2	6.6037+4	1.4104+1	4.3580–1	6.6022+4
1.0000+5	7.2264–6	1.8930+4	1.1346+1	3.7310+6	1.6581+6	1.0141+6	1.0579+6	8.1372+2	8.2635+4	1.4256+1	4.3580–1	8.2620+4


July 4, 1991
Atomic Weight 121 750
EEDL Evaluated Electron
Cross Sections
51-Sb
Density 6 691 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
51-Sb


July 4, 1991
Atomic Weight 121 750
EEDL Evaluated Electron
Energy Deposition
51-Sb
Density 6 691 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
51-Sb


July 4, 1991
Atomic Weight 121 750
EEDL Evaluated Electron
Shell Cross Sections
51-Sb
Density 6 691 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
51-Sb


July 4, 1991
Atomic Weight 121 750
EEDL Evaluated Electron
Energy Deposition
51-Sb
Density 6 691 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
51-Sb

220

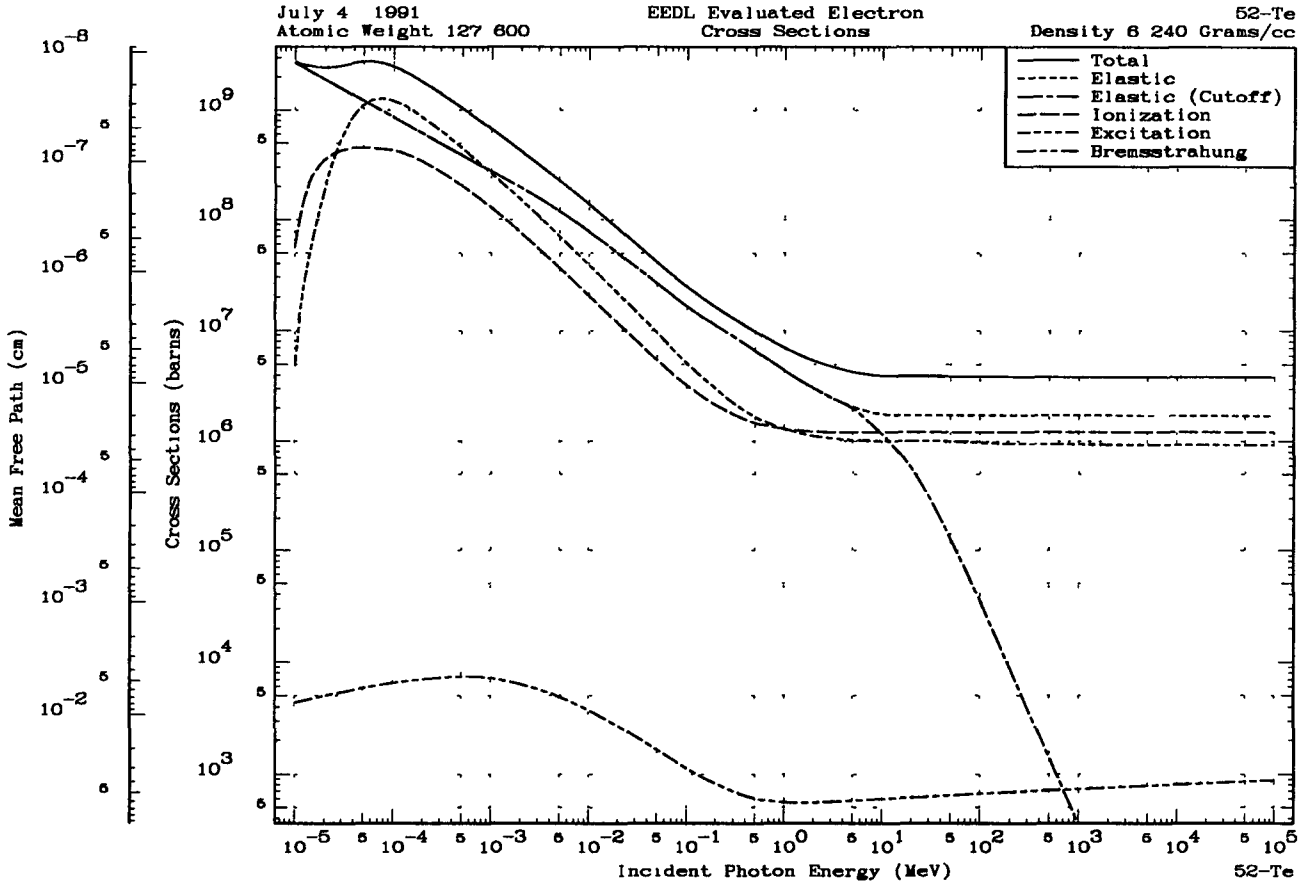
Atomic Weight 121.750 Density 6.691 Grams/cc

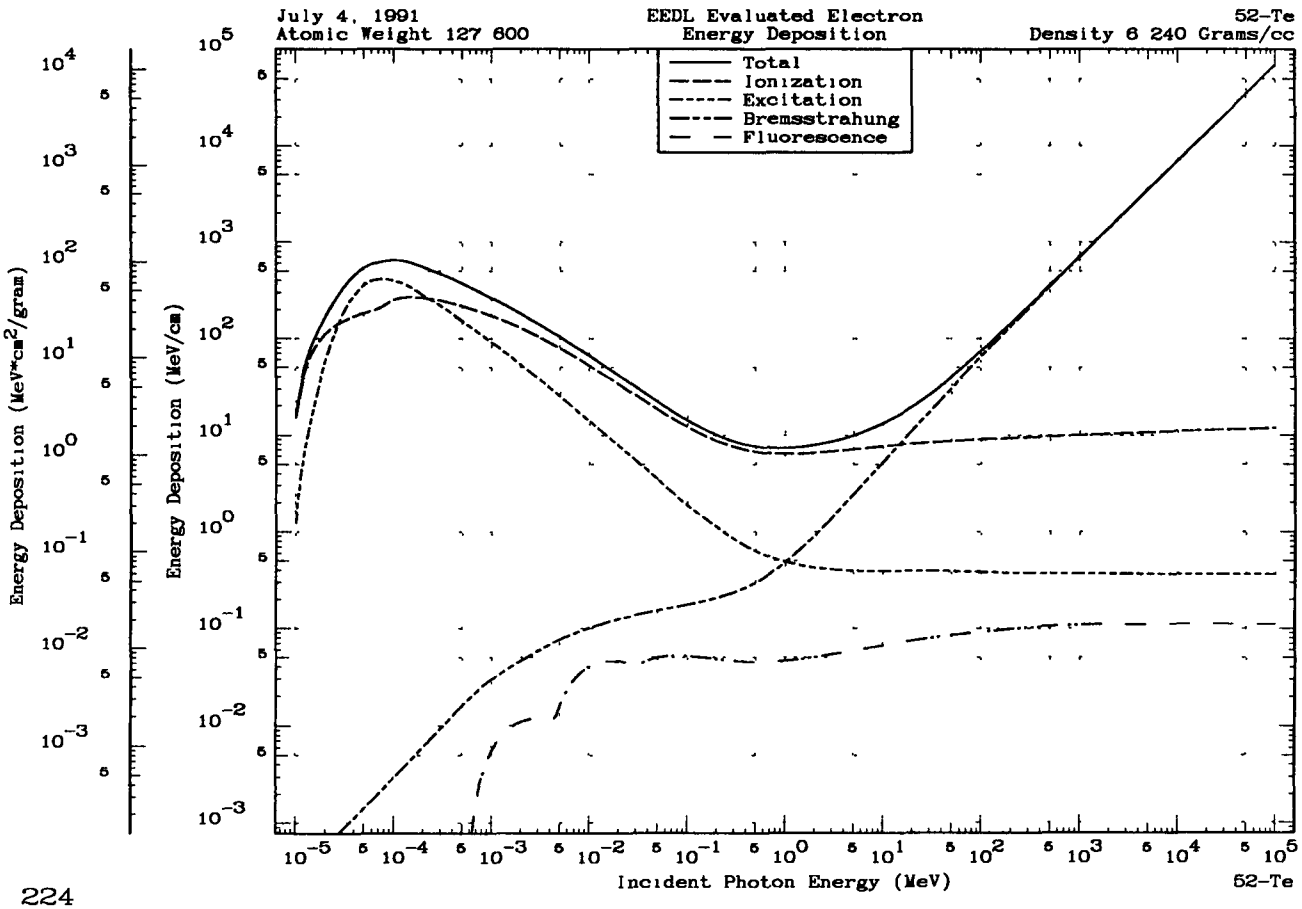
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0870–8	1.3750+7		2.7798+9	2.6646+9	1.0682+8	8.3759+6	4.4604+3	2.9999+1	2.7860+1	2.1382+0	3.1869–4
	1.1250–5	1.1262–8	1.3270+7		2.6828+9	2.5121+9	1.5213+8	1.8627+7	4.5665+3	4.6019+1	4.1121+1	4.8976+0	3.5701–4
	1.3125–5	1.1713–8	1.2759+7		2.5796+9	2.3256+9	2.1155+8	4.2432+7	4.7091+3	7.1717+1	6.0073+1	1.1644+1	4.1570–4
	1.5000–5	1.1979–8	1.2477+7		2.5225+9	2.1752+9	2.5828+8	8.8928+7	4.8362+3	1.0181+2	7.6389+1	2.5423+1	4.7575–4
O1	1.5920–5	1.2054–8	1.2399+7		2.5067+9	2.1114+9	2.7472+8	1.2055+8	4.8940+3	1.1756+2	8.2603+1	3.4956+1	5.0567–4
	1.6175–5	1.2066–8	1.2386+7		2.5041+9	2.0947+9	2.7975+8	1.2964+8	4.9095+3	1.2230+2	8.4598+1	3.7696+1	5.1402–4
	1.6653–5	1.2078–8	1.2374+7		2.5016+9	2.0644+9	2.8917+8	1.4811+8	4.9382+3	1.3166+2	8.8360+1	4.3295+1	5.2972–4
	1.7490–5	1.2061–8	1.2392+7		2.5052+9	2.0143+9	3.0556+8	1.8534+8	4.9867+3	1.4969+2	9.5016+1	5.4671+1	5.5740–4
	1.7500–5	1.2060–8	1.2392+7		2.5053+9	2.0137+9	3.0576+8	1.8583+8	4.9873+3	1.4992+2	9.5095+1	5.4823+1	5.5774–4
	1.8745–5	1.2020–8	1.2434+7		2.5137+9	1.9457+9	3.2242+8	2.4561+8	5.0561+3	1.7598+2	1.0255+2	7.3432+1	5.9932–4
	2.0000–5	1.1924–8	1.2534+7		2.5339+9	1.8836+9	3.3873+8	3.1161+8	5.1219+3	2.0449+2	1.1007+2	9.4412+1	6.4174–4
	2.2500–5	1.1699–8	1.2774+7		2.5826+9	1.7758+9	3.5888+8	4.4798+8	5.2275+3	2.5810+2	1.2079+2	1.3731+2	7.1987–4
	2.5000–5	1.1435–8	1.3070+7		2.6424+9	1.6846+9	3.7736+8	5.8051+8	5.3238+3	3.1120+2	1.3122+2	1.7998+2	7.9923–4
	2.6250–5	1.1332–8	1.3188+7		2.6663+9	1.6439+9	3.8297+8	6.3939+8	5.3690+3	3.3446+2	1.3509+2	1.9937+2	8.3935–4
	3.0000–5	1.1039–8	1.3538+7		2.7370+9	1.5376+9	3.9811+8	8.0126+8	5.4947+3	4.0027+2	1.4618+2	2.5409+2	9.6132–4
	3.5000–5	1.0850–8	1.3774+7		2.7847+9	1.4237+9	4.0643+8	9.5457+8	5.6412+3	4.6128+2	1.5599+2	3.0529+2	1.1261–3
	4.0000–5	1.0799–8	1.3840+7		2.7981+9	1.3319+9	4.1346+8	1.0527+9	5.7713+3	5.0497+2	1.6544+2	3.3953+2	1.2944–3
N5	4.0560–5	1.0791–8	1.3850+7		2.8001+9	1.3226+9	4.1332+8	1.0641+9	5.7850+3	5.0937+2	1.6603+2	3.4334+2	1.3135–3
	4.1740–5	1.0772–8	1.3874+7		2.8050+9	1.3038+9	4.1341+8	1.0877+9	5.8134+3	5.1905+2	1.6778+2	3.5127+2	1.3537–3
N4	4.1870–5	1.0770–8	1.3877+7		2.8056+9	1.3018+9	4.1341+8	1.0903+9	5.8165+3	5.2010+2	1.6796+2	3.5214+2	1.3582–3
	4.3805–5	1.0769–8	1.3879+7		2.8059+9	1.2728+9	4.1395+8	1.1191+9	5.8555+3	5.3335+2	1.7136+2	3.6198+2	1.4204–3
	4.5935–5	1.0762–8	1.3888+7		2.8077+9	1.2430+9	4.1448+8	1.1502+9	5.8969+3	5.4766+2	1.7501+2	3.7265+2	1.4893–3
	4.6902–5	1.0756–8	1.3894+7		2.8090+9	1.2301+9	4.1478+8	1.1641+9	5.9151+3	5.5419+2	1.7674+2	3.7744+2	1.5207–3
	5.0000–5	1.0772–8	1.3875+7		2.8050+9	1.1915+9	4.1579+8	1.1978+9	5.9714+3	5.7165+2	1.8238+2	3.8927+2	1.6219–3
	5.2500–5	1.0828–8	1.3803+7		2.7906+9	1.1628+9	4.1462+8	1.2132+9	6.0136+3	5.8086+2	1.8576+2	3.9510+2	1.7032–3
	5.6250–5	1.0900–8	1.3711+7		2.7720+9	1.1234+9	4.1329+8	1.2353+9	6.0737+3	5.9481+2	1.9126+2	4.0356+2	1.8260–3
	6.0000–5	1.0960–8	1.3636+7		2.7568+9	1.0878+9	4.1266+8	1.2563+9	6.1305+3	6.0933+2	1.9761+2	4.1171+2	1.9499–3
	7.0156–5	1.1181–8	1.3367+7		2.7025+9	1.0061+9	4.0770+8	1.2886+9	6.2703+3	6.3899+2	2.1516+2	4.2382+2	2.2903–3
	7.5078–5	1.1370–8	1.3145+7		2.6575+9	9.7263+8	4.0712+8	1.2778+9	6.3319+3	6.4715+2	2.2617+2	4.2097+2	2.4576–3
	8.0000–5	1.1543–8	1.2948+7		2.6177+9	9.4229+8	4.0775+8	1.2676+9	6.3901+3	6.5755+2	2.3918+2	4.1836+2	2.6264–3
	9.0000–5	1.1937–8	1.2520+7		2.5312+9	8.8848+8	4.0396+8	1.2387+9	6.4876+3	6.7040+2	2.5984+2	4.1056+2	2.9648–3
	1.0000–4	1.2305–8	1.2145+7	0.0000+0	2.4555+9	8.4296+8	3.9904+8	1.2134+9	6.5762+3	6.7967+2	2.7580+2	4.0387+2	3.3077–3
N3	1.0812–4	1.2668–8	1.1798+7	1.1974–8	2.3851+9	8.1089+8	3.9138+8	1.1828+9	6.6349+3	6.7655+2	2.8215+2	3.9440+2	3.5829–3
	1.0943–4	1.2726–8	1.1744+7	1.3910–8	2.3742+9	8.0606+8	3.9014+8	1.1780+9	6.6440+3	6.7591+2	2.8298+2	3.9292+2	3.6274–3
	1.1196–4	1.2837–8	1.1642+7	1.7664–8	2.3537+9	7.9695+8	3.8781+8	1.1689+9	6.6614+3	6.7475+2	2.8462+2	3.9013+2	3.7139–3
	1.1672–4	1.3041–8	1.1460+7	2.4720–8	2.3170+9	7.8065+8	3.8369+8	1.1526+9	6.6930+3	6.7292+2	2.8781+2	3.8511+2	3.8766–3
N2	1.1702–4	1.3054–8	1.1449+7	2.5168–8	2.3147+9	7.7965+8	3.8344+8	1.1516+9	6.6950+3	6.7281+2	2.8801+2	3.8480+2	3.8870–3
	1.1908–4	1.3159–8	1.1357+7	2.8237–8	2.2961+9	7.7292+8	3.8134+8	1.1419+9	6.7083+3	6.7039+2	2.8868+2	3.8171+2	3.9577–3
	1.2295–4	1.3354–8	1.1192+7	3.4020–8	2.2626+9	7.6075+8	3.7758+8	1.1243+9	6.7327+3	6.6615+2	2.9001+2	3.7613+2	4.0908–3
	1.2504–4	1.3458–8	1.1105+7	3.7167–8	2.2451+9	7.5440+8	3.7563+8	1.1151+9	6.7457+3	6.6399+2	2.9077+2	3.7322+2	4.1630–3
	1.2971–4	1.3687–8	1.0920+7	4.4226–8	2.2076+9	7.4078+8	3.7146+8	1.0954+9	6.7739+3	6.5947+2	2.9249+2	3.6697+2	4.3247–3
	1.3125–4	1.3761–8	1.0861+7	4.6564–8	2.1957+9	7.3645+8	3.7013+8	1.0891+9	6.7830+3	6.5806+2	2.9307+2	3.6499+2	4.3781–3
	1.3752–4	1.4063–8	1.0628+7	5.6140–8	2.1486+9	7.1958+8	3.6433+8	1.0647+9	6.8192+3	6.5142+2	2.9415+2	3.5726+2	4.5964–3
	1.3986–4	1.4173–8	1.0545+7	5.9731–8	2.1319+9	7.1359+8	3.6226+8	1.0560+9	6.8323+3	6.4910+2	2.9457+2	3.5452+2	4.6780–3
	1.5000–4	1.4641–8	1.0208+7	7.5471–8	2.0637+9	6.8919+8	3.5388+8	1.0207+9	6.8870+3	6.3998+2	2.9660+2	3.4337+2	5.0340–3
N1	1.5827–4	1.5021–8	9.9497+6	8.8493–8	2.0115+9	6.7106+8	3.4574+8	9.9474+8	6.9292+3	6.3018+2	2.9518+2	3.3500+2	5.3261–3
	1.6088–4	1.5150–8	9.8648+6	9.2643–8	1.9944+9	6.6564+8	3.4332+8	9.8542+8	6.9403+3	6.2682+2	2.9483+2	3.3198+2	5.4181–3
	1.6250–4	1.5230–8	9.8131+6	9.5235–8	1.9839+9	6.6233+8	3.4184+8	9.7975+8	6.9471+3	6.2478+2	2.9462+2	3.3015+2	5.4755–3
	1.6577–4	1.5390–8	9.7112+6	1.0048–7	1.9633+9	6.5581+8	3.3893+8	9.6858+8	6.9606+3	6.2079+2	2.9424+2	3.2654+2	5.5912–3
	1.7005–4	1.5597–8	9.5825+6	1.0740–7	1.9373+9	6.4756+8	3.3526+8	9.5447+8	6.9779+3	6.1579+2	2.9379+2	3.2199+2	5.7430–3
	1.7500–4	1.5833–8	9.4396+6	1.1548–7	1.9084+9	6.3839+8	3.3119+8	9.3882+8	6.9975+3	6.1030+2	2.9336+2	3.1694+2	5.9192–3
	1.7753–4	1.5952–8	9.3688+6	1.1965–7	1.8941+9	6.3384+8	3.2917+8	9.3108+8	7.0073+3	6.0759+2	2.9315+2	3.1444+2	6.0095–3
	1.8125–4	1.6126–8	9.2679+6	1.2578–7	1.8737+9	6.2736+8	3.2629+8	9.2004+8	7.0215+3	6.0375+2	2.9286+2	3.1088+2	6.1421–3
	1.8877–4	1.6472–8	9.0732+6	1.3831–7	1.8343+9	6.1482+8	3.2074+8	8.9877+8	7.0494+3	5.9643+2	2.9241+2	3.0402+2	6.4113–3
	2.0000–4	1.6976–8	8.8036+6	1.5730–7	1.7798+9	5.9742+8	3.1306+8	8.6935+8	7.0893+3	5.8655+2	2.9199+2	2.9455+2	6.8152–3
	2.2500–4	1.8108–8	8.2534+6	2.0088–7	1.6686+9	5.6347+8	2.9470+8	8.1042+8	7.1441+3	5.6086+2	2.8562+2	2.7523+2	7.7112–3
	2.5000–4	1.9182–8	7.7914+6	2.4631–7	1.5752+9	5.3474+8	2.7936+8	7.6109+8	7.1935+3	5.3994+2	2.8084+2	2.5910+2	8.6135–3
	2.6250–4	1.9700–8	7.5866+6	2.6966–7	1.5338+9	5.2194+8	2.7257+8	7.3928+8	7.2165+3	5.3085+2	2.7887+2	2.5197+2	9.0670–3
	3.0000–4	2.1187–8	7.0540+6	3.4187–7	1.4261+9	4.8844+8	2.5495+8	6.8272+8	7.2798+3	5.0791+2	2.7437+2	2.3353+2	1.0435–2
	3.5000–4	2.3285–8	6.4186+6	4.4378–7	1.2977+9	4.5265+8	2.3319+8	6.1181+8	7.3440+3	4.7376+2	2.6383+2	2.0992+2	1.2271–2
	4.0000–4	2.5261–8	5.9163+6	5.5235–7	1.1961+9	4.2378+8	2.1597+8	5.5636+8	7.4001+3	4.4754+2	2.5605+2	1.9148+2	1.4121–2
	4.5000–4	2.7215–8	5.4915+6	6.6724–7	1.1102+9	3.9987+8	2.0079+8	5.0957+8	7.4074+3	4.2308+2	2.4729+2	1.7578+2	1.5944–2
	5.0000–4	2.9085–8	5.1386+6	7.8828–7	1.0389+9	3.7963+8	1.8819+8	4.7105+8	7.4139+3	4.0327+2	2.4038+2	1.6287+2	1.7768–2
M5	5.3785–4	3.0459–8	4.9068+6	8.8380–7	9.9201+8	3.6622+8	1.7959+8	4.4620+8	7.4184+3	3.8931+2	2.3482+2	1.5447+2	1.9150–2
M4	5.4779–4	3.0813–8	4.8503+6	9.0944–7	9.8059+8	3.6292+8	1.7750+8	4.4016+8	7.4196+3	3.8599+2	2.3353+2	1.5244+2	1.9513–2
	5.5242–4	3.0978–8	4.8245+6	9.2145–7	9.7538+8	3.6142+8	1.7655+8	4.3740+8	7.4166+3	3.8449+2	2.3296+2	1.5151+2	1.9669–2
	5.5432–4	3.1045–8	4.8141+6	9.2639–7	9.7326+8	3.6081+8	1.7616+8	4.3628+8	7.4154+3	3.8388+2	2.3273+2	1.5113+2	1.9733–2
	5.5836–4	3.1189–8	4.7919+6	9.3695–7	9.6879+8	3.5952+8	1.7535+8	4.3392+8	7.4129+3	3.8260+2	2.3224+2	1.5033+2	1.9870–2
	5.6003–4	3.1248–8	4.7829+6	9.4130–7	9.6697+8	3.5899+8	1.7501+8	4.3295+8	7.4118+3	3.8207+2	2.3205+2	1.5001+2	1.9926–2
	5.6812–4	3.1533–8	4.7397+6	9.6256–7	9.5822+8	3.5646+8	1.7342+8	4.2833+8	7.4068+3	3.7959+2	2.3111+2	1.4845+2	2.0199–2
	5.7002–4	3.1599–8	4.7297+6	9.6756–7	9.5620+8	3.5588+8	1.7305+8	4.2726+8	7.4056+3	3.7902+2	2.3090+2	1.4810+2	2.0263–2
	5.7751–4	3.1861–8	4.6908+6	9.8740–7	9.4833+8	3.5359+8	1.7162+8	4.2311+8	7.4010+3	3.7681+2	2.3009+2	1.4670+2	2.0515–2
	5.7908–4	3.1916–8	4.6827+6	9.9156–7	9.4671+8	3.5312+8	1.7133+8	4.2226+8	7.4001+3	3.7636+2	2.2993+2	1.4641+2	2.0568–2
	5.8314–4	3.2057–8	4.6621+6	1.0023–6	9.4255+8	3.5191+8	1.7057+8	4.2006+8	7.3977+3	3.7520+2	2.2951+2	1.4567+2	2.0704–2
	5.8954–4	3.2279–8	4.6301+6	1.0195–6	9.3606+8	3.5002+8	1.6939+8	4.1664+8	7.3938+3	3.7342+2	2.2888+2	1.4452+2	2.0920–2
	5.9157–4	3.2349–8	4.6200+6	1.0249–6	9.3403+8	3.4943+8	1.6903+8	4.1558+8	7.3926+3	3.7286+2	2.2868+2	1.4416+2	2.0988–2
	6.0000–4	3.2640–8	4.5789+6	1.0476–6	9.2572+8	3.4700+8	1.6752+8	4.1120+8	7.3877+3	3.7060+2	2.2789+2	1.4269+2	2.1271–2
	6.2500–4	3.3500–8	4.4613+6	1.1157–6	9.0195+8	3.4008+8	1.6296+8	3.9889+8	7.3719+3	3.6316+2	2.2462+2	1.3852+2	2.2105–2
	6.6875–4	3.4974–8	4.2733+6	1.2382–6	8.6394+8	3.2893+8	1.5571+8	3.7930+8	7.3457+3	3.5144+2	2.1954+2	1.3188+2	2.3558–2
	7.3438–4	3.7115–8	4.0268+6	1.4290–6	8.1410+8	3.1409+8	1.4623+8	3.5377+8	7.3097+3	3.3640+2	2.1314+2	1.2323+2	2.5730–2

Atomic Weight 121.750 Density 6.691 Grams/cc

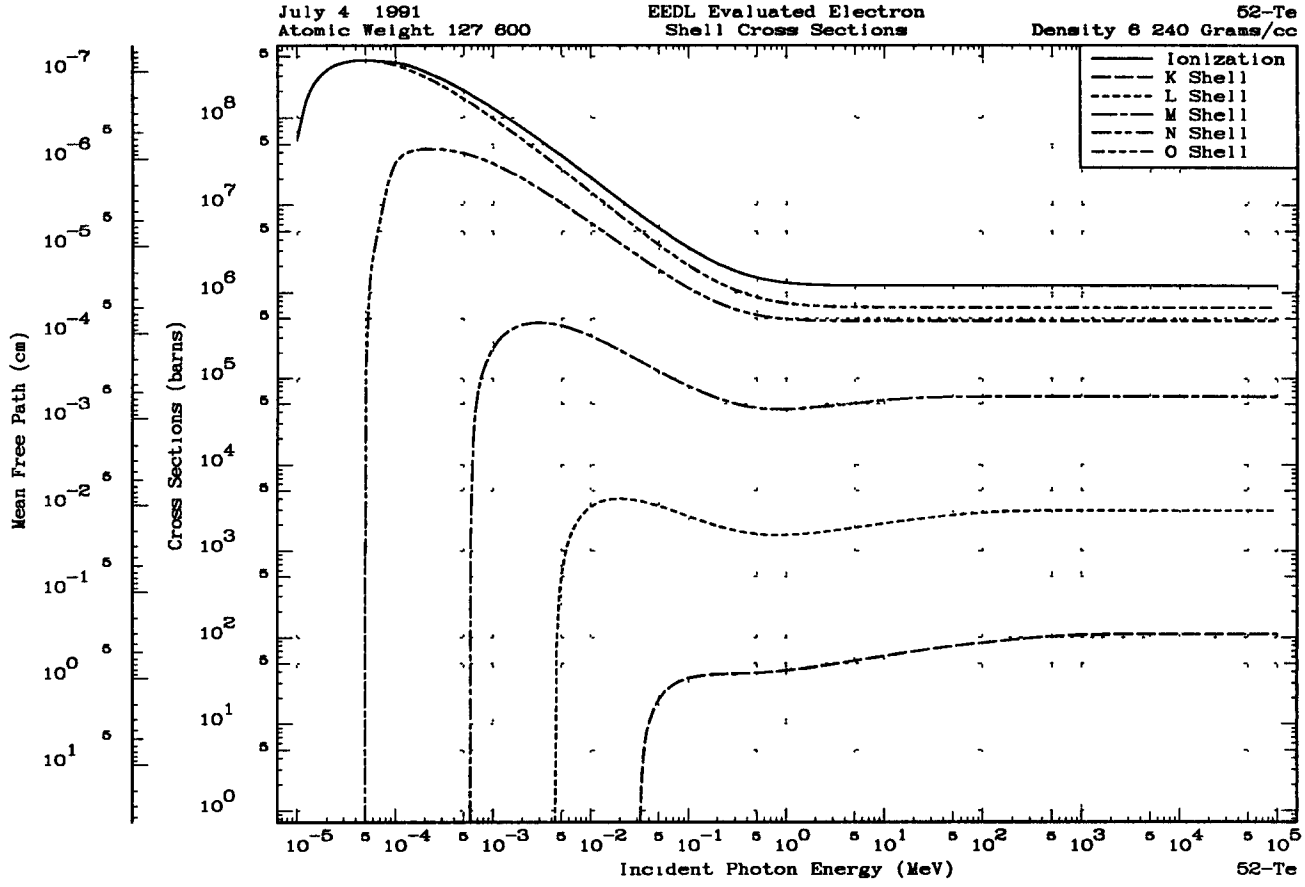
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M3	7.6169–4	3.7984–8	3.9347+6	1.5109–6	7.9548+8	3.0849+8	1.4270+8	3.4428+8	7.2958+3	3.3084+2	2.1080+2	1.2002+2	2.6630–2
	7.7127–4	3.8290–8	3.9033+6	1.5399–6	7.8913+8	3.0660+8	1.4150+8	3.4103+8	7.2901+3	3.2894+2	2.1001+2	1.1891+2	2.6938–2
	8.0000–4	3.9198–8	3.8128+6	1.6280–6	7.7084+8	3.0112+8	1.3805+8	3.3166+8	7.2735+3	3.2356+2	2.0780+2	1.1574+2	2.7859–2
M2	8.0916–4	3.9495–8	3.7842+6	1.6564–6	7.6505+8	2.9943+8	1.3695+8	3.2866+8	7.2628+3	3.2161+2	2.0688+2	1.1471+2	2.8101–2
	8.2109–4	3.9880–8	3.7476+6	1.6936–6	7.5766+8	2.9728+8	1.3554+8	3.2483+8	7.2491+3	3.1915+2	2.0572+2	1.1340+2	2.8416–2
	8.4345–4	4.0596–8	3.6815+6	1.7642–6	7.4429+8	2.9337+8	1.3300+8	3.1792+8	7.2241+3	3.1473+2	2.0367+2	1.1103+2	2.9004–2
	8.5000–4	4.0805–8	3.6627+6	1.7850–6	7.4049+8	2.9225+8	1.3227+8	3.1596+8	7.2169+3	3.1348+2	2.0309+2	1.1036+2	2.9177–2
	8.8259–4	4.1833–8	3.5727+6	1.8900–6	7.2229+8	2.8688+8	1.2882+8	3.0658+8	7.1820+3	3.0754+2	2.0035+2	1.0716+2	3.0031–2
	9.0000–4	4.2376–8	3.5269+6	1.9469–6	7.1303+8	2.8413+8	1.2707+8	3.0183+8	7.1639+3	3.0455+2	1.9899+2	1.0553+2	3.0486–2
M1	9.2898–4	4.3272–8	3.4538+6	2.0428–6	6.9826+8	2.7973+8	1.2427+8	2.9426+8	7.1347+3	2.9975+2	1.9677+2	1.0294+2	3.1241–2
	9.3786–4	4.3545–8	3.4322+6	2.0725–6	6.9388+8	2.7842+8	1.2344+8	2.9202+8	7.1260+3	2.9834+2	1.9613+2	1.0218+2	3.1472–2
	9.6893–4	4.4494–8	3.3590+6	2.1775–6	6.7908+8	2.7398+8	1.2065+8	2.8445+8	7.0962+3	2.9362+2	1.9398+2	9.9601+1	3.2278–2
	1.0000–3	4.5432–8	3.2897+6	2.2841–6	6.6507+8	2.6975+8	1.1801+8	2.7730+8	7.0674+3	2.8921+2	1.9201+2	9.7169+1	3.3081–2
	1.0313–3	4.6371–8	3.2230+6	2.3931–6	6.5159+8	2.6568+8	1.1536+8	2.7055+8	7.0269+3	2.8427+2	1.8940+2	9.4845+1	3.3693–2
	1.0898–3	4.8106–8	3.1068+6	2.6023–6	6.2810+8	2.5852+8	1.1075+8	2.5883+8	6.9548+3	2.7578+2	1.8493+2	9.0814+1	3.4836–2
	1.1250–3	4.9129–8	3.0421+6	2.7309–6	6.1501+8	2.5450+8	1.0819+8	2.5233+8	6.9137+3	2.7111+2	1.8250+2	8.8578+1	3.5519–2
	1.1924–3	5.1059–8	2.9271+6	2.9833–6	5.9177+8	2.4729+8	1.0364+8	2.4083+8	6.8390+3	2.6276+2	1.7810+2	8.4626+1	3.6819–2
	1.2500–3	5.2677–8	2.8372+6	3.2054–6	5.7359+8	2.4159+8	1.0011+8	2.3189+8	6.7790+3	2.5633+2	1.7473+2	8.1553+1	3.7923–2
	1.3125–3	5.4401–8	2.7473+6	3.4523–6	5.5541+8	2.3583+8	9.6577+7	2.2300+8	6.7175+3	2.4995+2	1.7141+2	7.8497+1	3.9113–2
	1.5000–3	5.9397–8	2.5162+6	4.2280–6	5.0870+8	2.2077+8	8.7554+7	2.0037+8	6.5521+3	2.3369+2	1.6292+2	7.0722+1	4.2639–2
	1.7500–3	6.5864–8	2.2692+6	5.3452–6	4.5876+8	2.0433+8	7.7796+7	1.7662+8	6.3503+3	2.1412+2	1.5157+2	6.2498+1	4.6830–2
	2.0000–3	7.1998–8	2.0758+6	6.5559–6	4.1967+8	1.9109+8	7.0243+7	1.5834+8	6.1806+3	1.9907+2	1.4285+2	5.6170+1	5.0935–2
	2.2500–3	7.7973–8	1.9167+6	7.8568–6	3.8751+8	1.7956+8	6.3976+7	1.4397+8	6.0044+3	1.8543+2	1.3421+2	5.1164+1	5.4317–2
	2.5000–3	8.3718–8	1.7852+6	9.2470–6	3.6092+8	1.6983+8	5.8855+7	1.3223+8	5.8510+3	1.7436+2	1.2723+2	4.7073+1	5.7641–2
	2.6250–3	8.6513–8	1.7275+6	9.9741–6	3.4926+8	1.6551+8	5.6624+7	1.2712+8	5.7814+3	1.6949+2	1.2414+2	4.5294+1	5.9282–2
	3.0000–3	9.4626–8	1.5794+6	1.2271–5	3.1931+8	1.5423+8	5.0949+7	1.1413+8	5.5949+3	1.5717+2	1.1634+2	4.0771+1	6.4126–2
	3.5000–3	1.0554–7	1.4161+6	1.5611–5	2.8628+8	1.4172+8	4.4950+7	9.9612+7	5.3509+3	1.4246+2	1.0672+2	3.5674+1	6.9430–2
	4.0000–3	1.1595–7	1.2889+6	1.9267–5	2.6058+8	1.3170+8	4.0336+7	8.8540+7	5.1481+3	1.3125+2	9.9391+1	3.1787+1	7.4593–2
L3	4.1305–3	1.1865–7	1.2596+6	2.0271–5	2.5465+8	1.2929+8	3.9283+7	8.6077+7	5.0971+3	1.2852+2	9.7526+1	3.0915+1	7.5813–2
	4.2392–3	1.2088–7	1.2364+6	2.1124–5	2.4996+8	1.2737+8	3.8451+7	8.4132+7	5.0562+3	1.2637+2	9.6065+1	3.0228+1	7.6823–2
L2	4.3860–3	1.2387–7	1.2066+6	2.2299–5	2.4394+8	1.2490+8	3.7387+7	8.1649+7	5.0030+3	1.2363+2	9.4198+1	2.9351+1	7.8179–2
	4.4294–3	1.2474–7	1.1981+6	2.2651–5	2.4222+8	1.2419+8	3.7085+7	8.0943+7	4.9872+3	1.2285+2	9.3672+1	2.9102+1	7.8559–2
	4.5395–3	1.2696–7	1.1772+6	2.3554–5	2.3800+8	1.2245+8	3.6342+7	7.9207+7	4.9479+3	1.2094+2	9.2373+1	2.8490+1	7.9522–2
L1	4.6737–3	1.2963–7	1.1529+6	2.4674–5	2.3309+8	1.2041+8	3.5480+7	7.7197+7	4.9017+3	1.1873+2	9.0870+1	2.7781+1	8.0689–2
	4.7147–3	1.3044–7	1.1457+6	2.5020–5	2.3164+8	1.1981+8	3.5225+7	7.6602+7	4.8868+3	1.1808+2	9.0430+1	2.7572+1	8.1003–2
	4.7697–3	1.3153–7	1.1363+6	2.5488–5	2.2972+8	1.1901+8	3.4890+7	7.5818+7	4.8670+3	1.1722+2	8.9847+1	2.7296+1	8.1424–2
	4.8368–3	1.3285–7	1.1250+6	2.6063–5	2.2743+8	1.1805+8	3.4490+7	7.4885+7	4.8432+3	1.1620+2	8.9153+1	2.6968+1	8.1935–2
	5.0000–3	1.3604–7	1.0986+6	2.7482–5	2.2210+8	1.1582+8	3.3560+7	7.2716+7	4.7873+3	1.1383+2	8.7545+1	2.6205+1	8.3174–2
	5.5000–3	1.4574–7	1.0255+6	3.2012–5	2.0733+8	1.0947+8	3.1002+7	6.6850+7	4.6294+3	1.0696+2	8.2743+1	2.4129+1	8.6886–2
	6.0000–3	1.5516–7	9.6321+5	3.6818–5	1.9473+8	1.0398+8	2.8839+7	6.1909+7	4.4898+3	1.0117+2	7.8697+1	2.2381+1	9.0527–2
	6.5000–3	1.6447–7	9.0869+5	4.1895–5	1.8371+8	9.9057+7	2.6965+7	5.7684+7	4.3502+3	9.5866+1	7.4892+1	2.0880+1	9.3423–2
	7.2500–3	1.7805–7	8.3941+5	5.0004–5	1.6970+8	9.2715+7	2.4605+7	5.2380+7	4.1666+3	8.9197+1	7.0102+1	1.8997+1	9.7689–2
	8.0000–3	1.9121–7	7.8164+5	5.8682–5	1.5802+8	8.7346+7	2.2656+7	4.8018+7	4.0078+3	8.3704+1	6.6153+1	1.7449+1	1.0186–1
	9.0000–3	2.0855–7	7.1662+5	7.1111–5	1.4488+8	8.1073+7	2.0511+7	4.3292+7	3.8106+3	7.7294+1	6.1426+1	1.5761+1	1.0637–1
	1.0000–2	2.2536–7	6.6318+5	8.4506–5	1.3407+8	7.5845+7	1.8767+7	3.9459+7	3.6424+3	7.2079+1	5.7575+1	1.4394+1	1.1078–1
	1.1250–2	2.4604–7	6.0745+5	1.0257–4	1.2281+8	7.0243+7	1.6984+7	3.5578+7	3.4455+3	6.6402+1	5.3287+1	1.3000+1	1.1469–1
	1.2500–2	2.6609–7	5.6166+5	1.2208–4	1.1355+8	6.5584+7	1.5534+7	3.2431+7	3.2784+3	6.1781+1	4.9791+1	1.1870+1	1.1854–1
	1.3125–2	2.7591–7	5.4167+5	1.3237–4	1.0951+8	6.3532+7	1.4906+7	3.1069+7	3.2037+3	5.9773+1	4.8271+1	1.1382+1	1.2044–1
	1.5000–2	3.0464–7	4.9059+5	1.6515–4	9.9184+7	5.8239+7	1.3314+7	2.7628+7	3.0081+3	5.4683+1	4.4410+1	1.0147+1	1.2604–1
	2.0000–2	3.7798–7	3.9540+5	2.6593–4	7.9939+7	4.8035+7	1.0445+7	2.1455+7	2.6011+3	4.4866+1	3.6812+1	7.9182+0	1.3616–1
	2.5000–2	4.4646–7	3.3475+5	3.8621–4	6.7677+7	4.1251+7	8.6737+6	1.7750+7	2.3039+3	3.8440+1	3.1725+1	6.5724+0	1.4289–1
	3.0000–2	5.1141–7	2.9224+5	5.2444–4	5.9083+7	3.6426+7	7.4527+6	1.5202+7	2.0864+3	3.3994+1	2.8197+1	5.6478+0	1.4958–1
K	3.0479–2	5.1744–7	2.8884+5	5.3861–4	5.8394+7	3.6032+7	7.3567+6	1.5003+7	2.0681+3	3.3629+1	2.7903+1	5.5750+0	1.5009–1
	3.1074–2	5.2496–7	2.8470+5	5.5642–4	5.7558+7	3.5552+7	7.2420+6	1.4762+7	2.0460+3	3.3187+1	2.7549+1	5.4869+0	1.5063–1
	3.2190–2	5.3895–7	2.7731+5	5.9045–4	5.6063+7	3.4692+7	7.0373+6	1.4332+7	2.0062+3	3.2398+1	2.6917+1	5.3298+0	1.5164–1
	3.4142–2	5.6314–7	2.6540+5	6.5193–4	5.3655+7	3.3302+7	6.7084+6	1.3643+7	1.9414+3	3.1130+1	2.5899+1	5.0778+0	1.5344–1
	3.7071–2	5.9875–7	2.4961+5	7.4863–4	5.0464+7	3.1453+7	6.2746+6	1.2734+7	1.8544+3	2.9456+1	2.4554+1	4.7459+0	1.5614–1
	4.0000–2	6.3364–7	2.3587+5	8.5060–4	4.7685+7	2.9836+7	5.8988+6	1.1948+7	1.7775+3	2.8004+1	2.3386+1	4.4590+0	1.5885–1
	4.5000–2	6.9312–7	2.1563+5	1.0364–3	4.3593+7	2.7489+7	5.3728+6	1.0730+7	1.6650+3	2.5850+1	2.1677+1	4.0112+0	1.6244–1
	5.0000–2	7.5096–7	1.9902+5	1.2367–3	4.0236+7	2.5545+7	4.9424+6	9.7462+6	1.5703+3	2.4089+1	2.0273+1	3.6495+0	1.6609–1
	5.5000–2	8.0716–7	1.8516+5	1.4509–3	3.7434+7	2.3906+7	4.5921+6	8.9342+6	1.4909+3	2.2618+1	1.9099+1	3.3499+0	1.6909–1
	6.0000–2	8.6208–7	1.7336+5	1.6783–3	3.5049+7	2.2502+7	4.2941+6	8.2521+6	1.4220+3	2.1368+1	1.8098+1	3.0983+0	1.7214–1
	7.0000–2	9.6719–7	1.5452+5	2.1697–3	3.1240+7	2.0239+7	3.8307+6	7.1697+6	1.3147+3	1.9361+1	1.6487+1	2.6974+0	1.7725–1
	8.0000–2	1.0684–6	1.3989+5	2.7082–3	2.8282+7	1.8463+7	3.4701+6	6.3476+6	1.2284+3	1.7804+1	1.5229+1	2.3930+0	1.8251–1
	1.0000–1	1.2523–6	1.1935+5	3.9077–3	2.4128+7	1.5904+7	2.9682+6	5.2550+6	1.0956+3	1.5590+1	1.3412+1	1.9871+0	1.9117–1
	1.2500–1	1.4489–6	1.0315+5	5.6108–3	2.0855+7	1.3890+7	2.5736+6	4.3905+6	9.7997+2	1.3805+1	1.1940+1	1.6646+0	1.9966–1
	1.5000–1	1.6318–6	9.1590+4	7.5107–3	1.8517+7	1.2435+7	2.2906+6	3.7908+6	8.9465+2	1.2534+1	1.0885+1	1.4410+0	2.0845–1
	2.0000–1	1.9386–6	7.7093+4	1.1773–2	1.5586+7	1.0609+7	1.9500+6	3.0264+6	7.8331+2	1.0963+1	9.5840+0	1.1546+0	2.2399–1
	3.0000–1	2.4381–6	6.1301+4	2.1602–2	1.2393+7	8.5007+6	1.6130+6	2.2789+6	6.6900+2	9.4243+0	8.2965+0	8.7360–1	2.5414–1
	4.0000–1	2.8528–6	5.2389+4	3.2628–2	1.0591+7	7.2156+6	1.4495+6	1.9258+6	6.1288+2	8.7236+0	7.6966+0	7.4078–1	2.8623–1
	5.0000–1	3.2141–6	4.6499+4	4.4332–2	9.4007+6	6.3334+6	1.3552+6	1.7116+6	5.8038+2	8.3676+0	7.3870+0	6.6016–1	3.2043–1
	6.0000–1	3.5300–6	4.2339+4	5.6435–2	8.5596+6	5.6921+6	1.2946+6	1.5724+6	5.6095+2	8.1575+0	7.1933+0	6.0780–1	3.5639–1
	8.0000–1	4.0495–6	3.6907+4	8.1142–2	7.4615+6	4.8098+6	1.2243+6	1.4269+6	5.4083+2	8.0325+0	7.0449+0	5.5346–1	4.3414–1
	1.0000+0	4.4728–6	3.3414+4	1.0605–1	6.7553+6	4.2251+6	1.1854+6	1.3443+6	5.3173+2	8.0283+0	6.9880+0	5.2282–1	5.1749–1
	1.5000+0	5.2390–6	2.8527+4	1.6716–1	5.7674+6	3.3728+6	1.1456+6	1.2485+6	5.2696+2	8.3372+0	7.1050+0	4.8786–1	7.4433–1
	2.0000+0	5.7530–6	2.5979+4	2.2589–1	5.2521+6	2.9052+6	1.1281+6	1.2183+6	5.3021+2	8.6929+0	7.2269+0	4.7724–1	9.8871–1
	3.0000+0	6.4206–6	2.3277+4	3.3624–1	4.7060+6	2.4088+6	1.1148+6	1.1819+6	5.3910+2	9.4407+0	7.4661+0	4.6533–1	1.5093+0
	4.0000+0	6.8397–6	2.1851+4	4.3819–1	4.4177+6	2.1460+6	1.1119+6	1.1592+6	5.4693+2	1.0186+1	7.6688+0	4.5702–1	2.0606+0
	5.0000+0	7.1231–6	2.0982+4	5.3293–1	4.2419+6	1.9909+6	1.1100+6	1.1405+6	5.5332+2	1.0933+1	7.8537+0	4.5024–1	2.6295+0
	6.0000+0	7.3224–6	2.0411+4	6.2148–1	4.1264+6	1.8910+6	1.1098+6	1.1251+6	5.5843+2	1.1660+1	7.9990+0	4.4478–1	3.2160+0

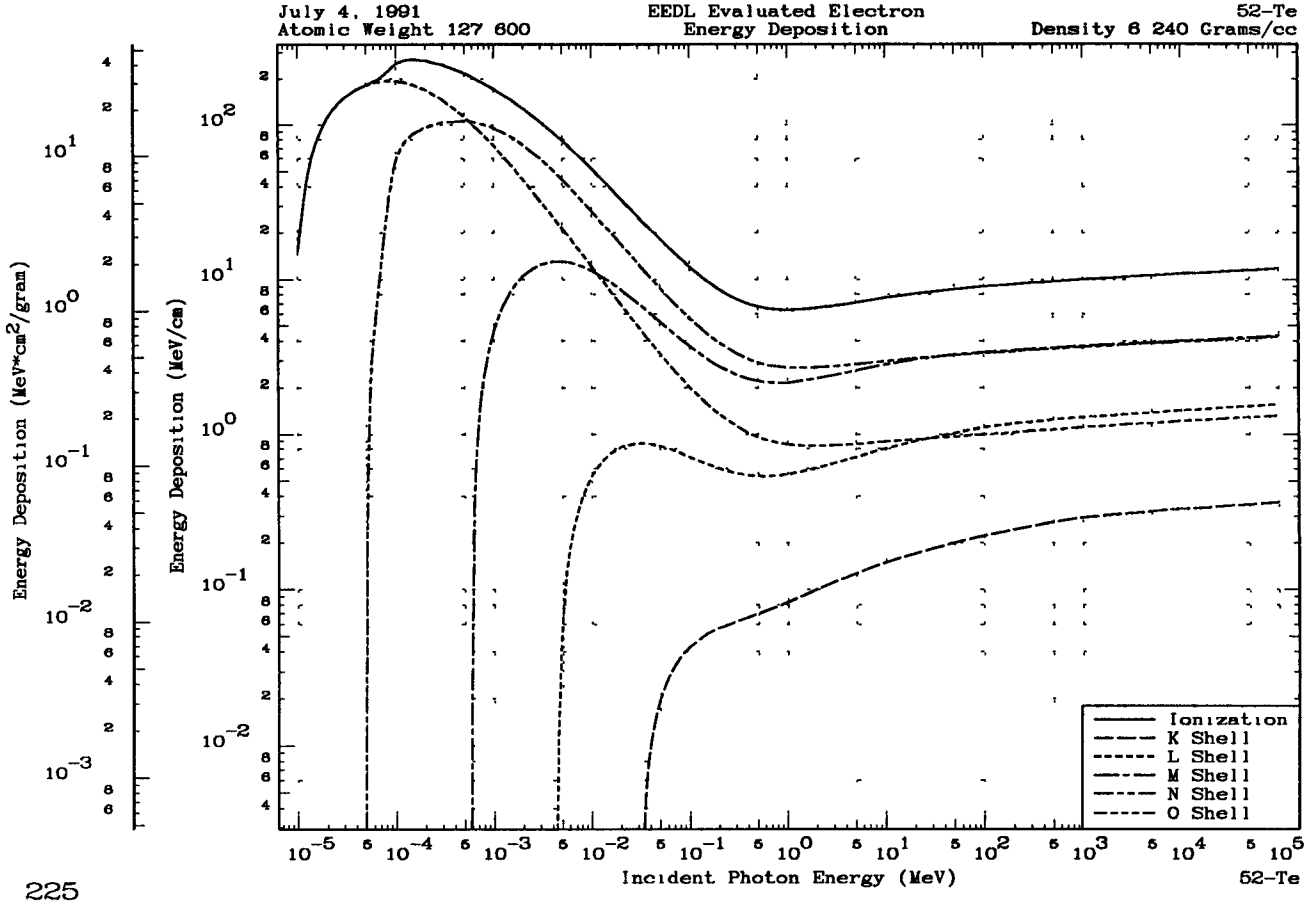
Atomic Weight 121.750												Density 6.691 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+0	7.5811–6	1.9714+4	7.8319–1	3.9856+6	1.7744+6	1.1098+6	1.1009+6	5.6632+2	1.3104+1	8.2428+0	4.3643–1	4.4247+0
1.0000+1	7.7191–6	1.9362+4	9.2813–1	3.9144+6	1.7208+6	1.1107+6	1.0823+6	5.7252+2	1.4519+1	8.4394+0	4.3025–1	5.6492+0
1.2500+1	7.7518–6	1.9280+4	1.0907+0	3.8979+6	1.7080+6	1.1117+6	1.0776+6	5.7851+2	1.6273+1	8.5866+0	4.2845–1	7.2578+0
1.5000+1	7.8177–6	1.9117+4	1.2366+0	3.8650+6	1.6976+6	1.1126+6	1.0543+6	5.8345+2	1.8020+1	8.7181+0	4.1926–1	8.8825+0
2.0000+1	7.8559–6	1.9025+4	1.4899+0	3.8462+6	1.6977+6	1.1139+6	1.0340+6	5.9114+2	2.1575+1	8.9496+0	4.1131–1	1.2214+1
3.0000+1	7.9057–6	1.8905+4	1.8905+0	3.8220+6	1.6970+6	1.1146+6	1.0098+6	6.0188+2	2.8680+1	9.2146+0	4.0195–1	1.9063+1
4.0000+1	7.9323–6	1.8841+4	2.2016+0	3.8092+6	1.6964+6	1.1153+6	9.9680+5	6.1206+2	3.5890+1	9.3979+0	3.9705–1	2.6095+1
5.0000+1	7.9511–6	1.8797+4	2.4552+0	3.8001+6	1.6960+6	1.1158+6	9.8776+5	6.1977+2	4.3174+1	9.5392+0	3.9371–1	3.3241+1
6.0000+1	7.9593–6	1.8777+4	2.6692+0	3.7963+6	1.6957+6	1.1159+6	9.8405+5	6.2589+2	5.0502+1	9.6341+0	3.9248–1	4.0475+1
8.0000+1	7.9725–6	1.8746+4	3.0163+0	3.7900+6	1.6951+6	1.1162+6	9.7804+5	6.3565+2	6.5354+1	9.8088+0	3.9060–1	5.5154+1
1.0000+2	7.9840–6	1.8719+4	3.2918+0	3.7845+6	1.6947+6	1.1164+6	9.7279+5	6.4329+2	8.0397+1	9.9567+0	3.8901–1	7.0052+1
1.5000+2	7.9985–6	1.8685+4	3.8018+0	3.7776+6	1.6939+6	1.1165+6	9.6656+5	6.5635+2	1.1809+2	1.0112+1	3.8653–1	1.0759+2
2.0000+2	8.0094–6	1.8660+4	4.1689+0	3.7725+6	1.6934+6	1.1166+6	9.6191+5	6.6516+2	1.5605+2	1.0256+1	3.8467–1	1.4541+2
3.0000+2	8.0188–6	1.8638+4	4.6913+0	3.7680+6	1.6926+6	1.1166+6	9.5814+5	6.7515+2	2.3177+2	1.0487+1	3.8318–1	2.2090+2
4.0000+2	8.0251–6	1.8623+4	5.0644+0	3.7651+6	1.6921+6	1.1166+6	9.5570+5	6.8176+2	3.0783+2	1.0586+1	3.8222–1	2.9686+2
5.0000+2	8.0337–6	1.8604+4	5.3545+0	3.7611+6	1.6916+6	1.1167+6	9.5210+5	6.8683+2	3.8444+2	1.0679+1	3.8080–1	3.7338+2
6.0000+2	8.0352–6	1.8600+4	5.5920+0	3.7604+6	1.6913+6	1.1167+6	9.5173+5	6.9143+2	4.5990+2	1.0764+1	3.8067–1	4.4875+2
8.0000+2	8.0404–6	1.8588+4	5.9677+0	3.7580+6	1.6908+6	1.1167+6	9.4982+5	6.9875+2	6.1208+2	1.0915+1	3.7994–1	6.0078+2
1.0000+3	8.0448–6	1.8578+4	6.2595+0	3.7559+6	1.6903+6	1.1167+6	9.4817+5	7.0471+2	7.6448+2	1.1047+1	3.7931–1	7.5305+2
1.5000+3	8.0522–6	1.8561+4	6.7896+0	3.7524+6	1.6896+6	1.1167+6	9.4544+5	7.1583+2	1.1478+3	1.1166+1	3.7822–1	1.1363+3
2.0000+3	8.0580–6	1.8547+4	7.1656+0	3.7497+6	1.6890+6	1.1167+6	9.4329+5	7.2397+2	1.5297+3	1.1284+1	3.7736–1	1.5180+3
3.0000+3	8.0630–6	1.8536+4	7.6955+0	3.7474+6	1.6883+6	1.1167+6	9.4171+5	7.3630+2	2.2967+3	1.1510+1	3.7673–1	2.2848+3
4.0000+3	8.0670–6	1.8527+4	8.0712+0	3.7455+6	1.6877+6	1.1167+6	9.4039+5	7.4527+2	3.0634+3	1.1612+1	3.7620–1	3.0514+3
5.0000+3	8.0738–6	1.8511+4	8.3623+0	3.7424+6	1.6873+6	1.1167+6	9.3766+5	7.5232+2	3.8360+3	1.1689+1	3.7511–1	3.8239+3
6.0000+3	8.0735–6	1.8512+4	8.6001+0	3.7425+6	1.6869+6	1.1167+6	9.3815+5	7.5747+2	4.5960+3	1.1765+1	3.7531–1	4.5838+3
8.0000+3	8.0748–6	1.8509+4	8.9757+0	3.7419+6	1.6864+6	1.1167+6	9.3807+5	7.6568+2	6.1292+3	1.1912+1	3.7527–1	6.1169+3
1.0000+4	8.0759–6	1.8506+4	9.2666+0	3.7414+6	1.6860+6	1.1167+6	9.3799+5	7.7211+2	7.6764+3	1.2047+1	3.7524–1	7.6640+3
1.5000+4	8.0777–6	1.8502+4	9.7961+0	3.7406+6	1.6852+6	1.1167+6	9.3790+5	7.8457+2	1.1464+4	1.2157+1	3.7521–1	1.1451+4
2.0000+4	8.0797–6	1.8497+4	1.0172+1	3.7397+6	1.6847+6	1.1167+6	9.3749+5	7.9354+2	1.5300+4	1.2267+1	3.7504–1	1.5287+4
3.0000+4	8.0810–6	1.8495+4	1.0703+1	3.7391+6	1.6839+6	1.1167+6	9.3765+5	8.0614+2	2.2896+4	1.2486+1	3.7511–1	2.2883+4
4.0000+4	8.0832–6	1.8490+4	1.1080+1	3.7380+6	1.6834+6	1.1167+6	9.3716+5	8.1519+2	3.0574+4	1.2617+1	3.7491–1	3.0561+4
5.0000+4	8.0889–6	1.8476+4	1.1372+1	3.7354+6	1.6830+6	1.1167+6	9.3492+5	8.2215+2	3.8181+4	1.2688+1	3.7402–1	3.8168+4
6.0000+4	8.0877–6	1.8479+4	1.1611+1	3.7360+6	1.6826+6	1.1167+6	9.3583+5	8.2782+2	4.5781+4	1.2759+1	3.7438–1	4.5768+4
8.0000+4	8.0883–6	1.8478+4	1.1987+1	3.7357+6	1.6821+6	1.1167+6	9.3608+5	8.3686+2	6.1115+4	1.2900+1	3.7448–1	6.1102+4
1.0000+5	8.0890–6	1.8476+4	1.2279+1	3.7353+6	1.6817+6	1.1167+6	9.3617+5	8.4388+2	7.6476+4	1.3039+1	3.7451–1	7.6463+4


July 4 1991
Atomic Weight 127 600
EEDL Evaluated Electron
Cross Sections
52-Te
Density 6 240 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
52-Te


July 4, 1991
Atomic Weight 127 600
EEDL Evaluated Electron
Energy Deposition
52-Te
Density 6 240 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
52-Te

224


July 4 1991
Atomic Weight 127 600
EEDL Evaluated Electron
Shell Cross Sections
52-Te
Density 6 240 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
52-Te


July 4, 1991
Atomic Weight 127 600
EEDL Evaluated Electron
Energy Deposition
52-Te
Density 6 240 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
52-Te

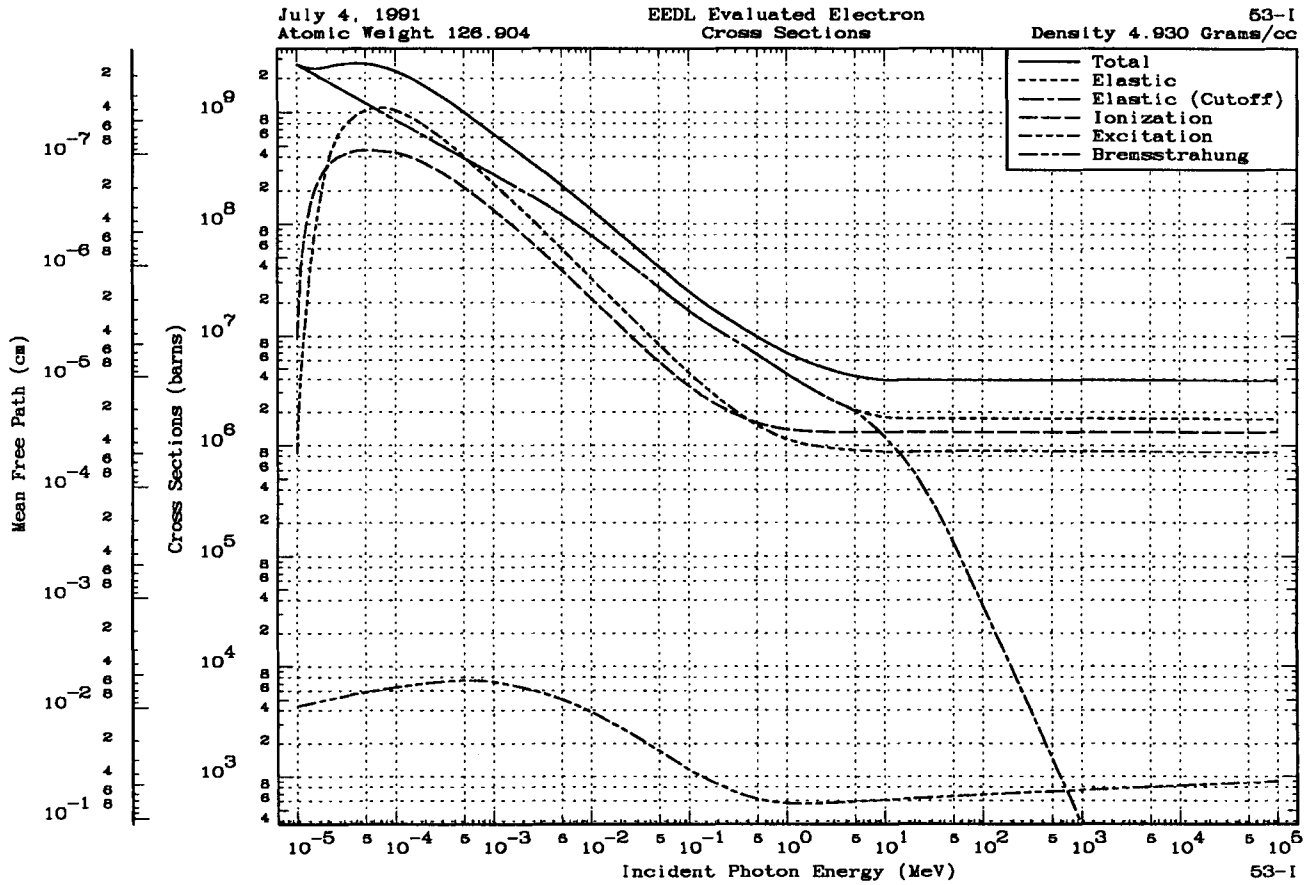
Atomic Weight 127.600 Density 6.240 Grams/cc

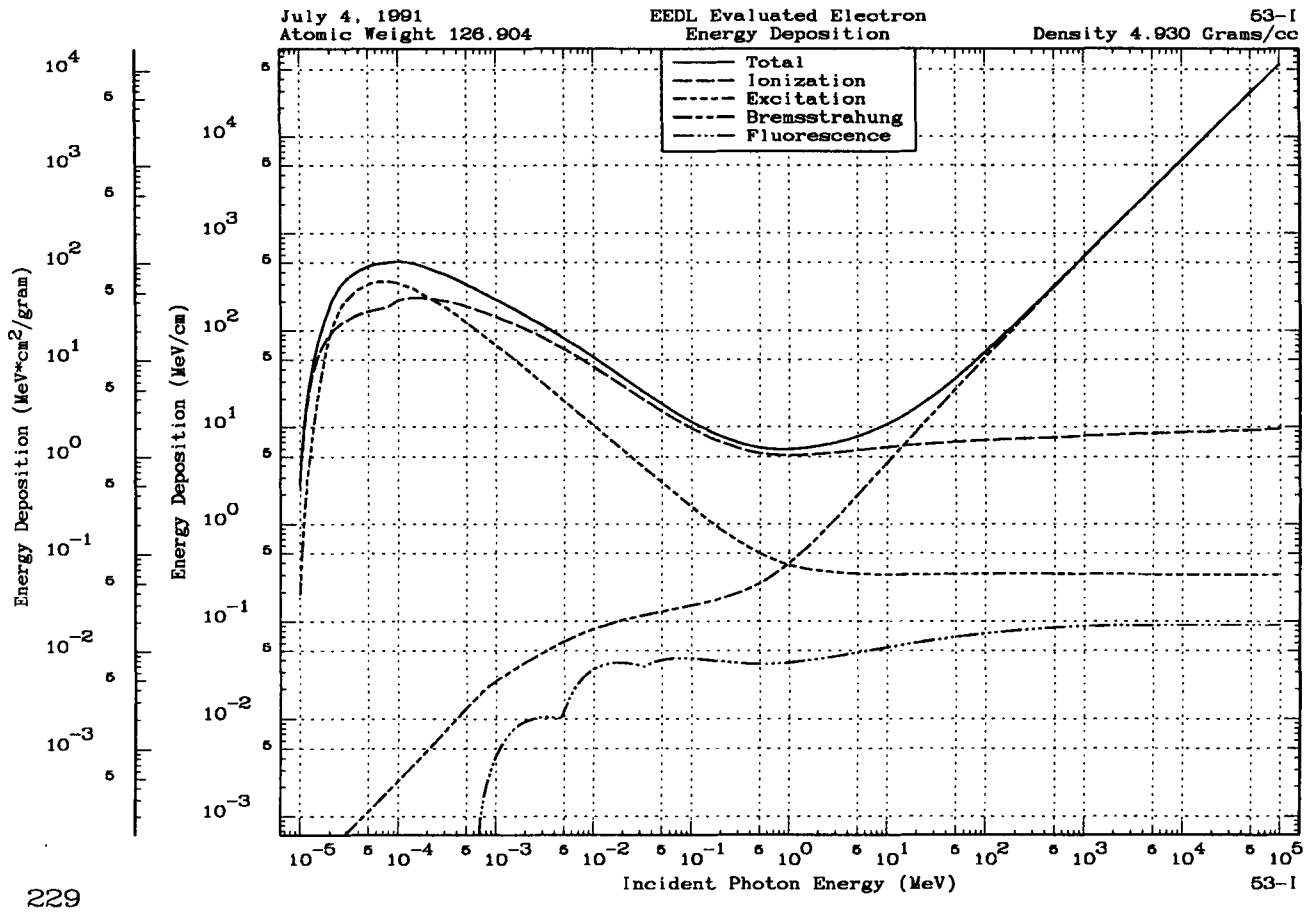
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2348–8	1.2979+7		2.7500+9	2.6872+9	5.7970+7	4.8316+6	4.3570+3	1.6324+1	1.5083+1	1.2408+0	2.7705–4
	1.0625–5	1.2592–8	1.2726+7		2.6965+9	2.6073+9	8.0714+7	8.5114+6	4.4102+3	2.3656+1	2.1440+1	2.2155+0	2.9364–4
	1.1250–5	1.2791–8	1.2528+7		2.6546+9	2.5342+9	1.0590+8	1.4516+7	4.4610+3	3.2449+1	2.8620+1	3.8291+0	3.1039–4
	1.1719–5	1.2907–8	1.2417+7		2.6309+9	2.4832+9	1.2874+8	1.8953+7	4.4976+3	4.0291+1	3.5241+1	5.0489+0	3.2305–4
	1.2187–5	1.3003–8	1.2324+7		2.6113+9	2.4352+9	1.5161+8	2.4481+7	4.5331+3	4.8544+1	4.1959+1	6.5853+0	3.3577–4
	1.2500–5	1.3082–8	1.2250+7		2.5956+9	2.4047+9	1.6281+8	2.8124+7	4.5562+3	5.2994+1	4.5380+1	7.6144+0	3.4431–4
	1.3359–5	1.3257–8	1.2089+7		2.5614+9	2.3264+9	1.9638+8	3.8632+7	4.6173+3	6.6451+1	5.5806+1	1.0645+1	3.6795–4
	1.3594–5	1.3299–8	1.2051+7		2.5533+9	2.3063+9	2.0505+8	4.1978+7	4.6334+3	7.0170+1	5.8548+1	1.1621+1	3.7444–4
	1.3750–5	1.3330–8	1.2022+7		2.5473+9	2.2932+9	2.0970+8	4.4331+7	4.6440+3	7.2368+1	6.0056+1	1.2311+1	3.7878–4
	1.5000–5	1.3531–8	1.1844+7		2.5096+9	2.1960+9	2.4886+8	6.4680+7	4.7257+3	9.1383+1	7.2970+1	1.8413+1	4.1375–4
	1.6250–5	1.3704–8	1.1695+7		2.4779+9	2.1102+9	2.7884+8	8.8806+7	4.8021+3	1.0904+2	8.3385+1	2.5655+1	4.4921–4
	1.7500–5	1.3805–8	1.1608+7		2.4597+9	2.0338+9	3.0675+8	1.1910+8	4.8739+3	1.2838+2	9.3468+1	3.4908+1	4.8514–4
	1.8125–5	1.3852–8	1.1569+7		2.4513+9	1.9986+9	3.1774+8	1.3494+8	4.9083+3	1.3757+2	9.7736+1	3.9835+1	5.0326–4
O1	1.8450–5	1.3870–8	1.1554+7		2.4482+9	1.9810+9	3.2346+8	1.4375+8	4.9258+3	1.4256+2	9.9963+1	4.2593+1	5.1274–4
	1.8644–5	1.3879–8	1.1547+7		2.4466+9	1.9707+9	3.2682+8	1.4906+8	4.9361+3	1.4555+2	1.0131+2	4.4240+1	5.1840–4
	1.8983–5	1.3891–8	1.1537+7		2.4445+9	1.9531+9	3.3267+8	1.5867+8	4.9540+3	1.5091+2	1.0368+2	4.7232+1	5.2832–4
	1.9491–5	1.3900–8	1.1529+7		2.4429+9	1.9276+9	3.4142+8	1.7392+8	4.9803+3	1.5924+2	1.0724+2	5.1997+1	5.4327–4
	2.0000–5	1.3898–8	1.1531+7		2.4432+9	1.9030+9	3.5002+8	1.9018+8	5.0060+3	1.6787+2	1.1077+2	5.7106+1	5.5828–4
	2.0625–5	1.3910–8	1.1521+7		2.4411+9	1.8741+9	3.5784+8	2.0919+8	5.0331+3	1.7717+2	1.1417+2	6.3004+1	5.7521–4
	2.1797–5	1.3897–8	1.1532+7		2.4435+9	1.8232+9	3.7201+8	2.4822+8	5.0819+3	1.9558+2	1.2040+2	7.5184+1	6.0714–4
	2.2500–5	1.3867–8	1.1557+7		2.4488+9	1.7946+9	3.8027+8	2.7385+8	5.1102+3	2.0732+2	1.2409+2	8.3229+1	6.2642–4
	2.3848–5	1.3836–8	1.1583+7		2.4542+9	1.7434+9	3.9145+8	3.1931+8	5.1625+3	2.2746+2	1.2979+2	9.7671+1	6.6360–4
	2.6250–5	1.3672–8	1.1722+7		2.4836+9	1.6621+9	4.1016+8	4.1139+8	5.2499+3	2.6697+2	1.3969+2	1.2728+2	7.3062–4
	2.6719–5	1.3631–8	1.1757+7		2.4911+9	1.6475+9	4.1250+8	4.3108+8	5.2662+3	2.7478+2	1.4111+2	1.3366+2	7.4381–4
	2.6924–5	1.3618–8	1.1768+7		2.4934+9	1.6412+9	4.1352+8	4.3863+8	5.2732+3	2.7787+2	1.4174+2	1.3614+2	7.4958–4
	3.0000–5	1.3348–8	1.2006+7		2.5440+9	1.5552+9	4.2776+8	5.6105+8	5.3739+3	3.2737+2	1.5073+2	1.7665+2	8.3702–4
	3.5000–5	1.2928–8	1.2396+7		2.6265+9	1.4405+9	4.4199+8	7.4395+8	5.5187+3	3.9812+2	1.6185+2	2.3627+2	9.8081–4
	4.0000–5	1.2586–8	1.2733+7		2.6980+9	1.3481+9	4.5164+8	8.9826+8	5.6472+3	4.5924+2	1.7151+2	2.8773+2	1.1277–3
N5	4.9180–5	1.2279–8	1.3051+7		2.7653+9	1.2166+9	4.5369+8	1.0949+9	5.8325+3	5.3516+2	1.8208+2	3.5308+2	1.3910–3
	5.0000–5	1.2259–8	1.3073+7		2.7699+9	1.2067+9	4.5402+8	1.1092+9	5.8467+3	5.4116+2	1.8325+2	3.5790+2	1.4142–3
N4	5.0710–5	1.2244–8	1.3089+7		2.7733+9	1.1982+9	4.5354+8	1.1215+9	5.8589+3	5.4583+2	1.8377+2	3.6206+2	1.4344–3
	5.3033–5	1.2241–8	1.3092+7		2.7740+9	1.1719+9	4.5238+8	1.1497+9	5.8977+3	5.5788+2	1.8605+2	3.7183+2	1.5007–3
	5.5000–5	1.2233–8	1.3100+7		2.7757+9	1.1509+9	4.5171+8	1.1731+9	5.9295+3	5.6837+2	1.8837+2	3.8000+2	1.5571–3
	5.6516–5	1.2225–8	1.3109+7		2.7775+9	1.1354+9	4.5116+8	1.1909+9	5.9534+3	5.7629+2	1.9006+2	3.8622+2	1.6008–3
	5.7500–5	1.2219–8	1.3115+7		2.7790+9	1.1258+9	4.5082+8	1.2024+9	5.9685+3	5.8140+2	1.9116+2	3.9023+2	1.6292–3
	5.8258–5	1.2222–8	1.3112+7		2.7783+9	1.1185+9	4.5056+8	1.2093+9	5.9801+3	5.8472+2	1.9202+2	3.9271+2	1.6511–3
	6.0000–5	1.2227–8	1.3107+7		2.7772+9	1.1022+9	4.5003+8	1.2250+9	6.0061+3	5.9239+2	1.9405+2	3.9834+2	1.7017–3
	6.2500–5	1.2306–8	1.3022+7		2.7592+9	1.0801+9	4.4742+8	1.2317+9	6.0424+3	5.9675+2	1.9590+2	4.0085+2	1.7746–3
	6.6602–5	1.2426–8	1.2897+7		2.7326+9	1.0465+9	4.4382+8	1.2423+9	6.0994+3	6.0447+2	1.9964+2	4.0482+2	1.8950–3
	7.6232–5	1.2657–8	1.2661+7		2.6827+9	9.7865+8	4.3901+8	1.2650+9	6.2222+3	6.2658+2	2.1306+2	4.1352+2	2.1814–3
	7.6703–5	1.2667–8	1.2652+7		2.6807+9	9.7566+8	4.3892+8	1.2661+9	6.2278+3	6.2784+2	2.1392+2	4.1392+2	2.1955–3
	8.0000–5	1.2792–8	1.2528+7		2.6544+9	9.5548+8	4.3841+8	1.2605+9	6.2666+3	6.3271+2	2.2017+2	4.1253+2	2.2948–3
	8.5000–5	1.3012–8	1.2316+7		2.6096+9	9.2715+8	4.3564+8	1.2468+9	6.3176+3	6.3742+2	2.2860+2	4.0881+2	2.4432–3
	9.2500–5	1.3321–8	1.2030+7		2.5491+9	8.8902+8	4.3217+8	1.2279+9	6.3894+3	6.4544+2	2.4168+2	4.0376+2	2.6677–3
	9.5000–5	1.3421–8	1.1941+7		2.5300+9	8.7732+8	4.3072+8	1.2220+9	6.4123+3	6.4734+2	2.4514+2	4.0219+2	2.7431–3
	1.0000–4	1.3668–8	1.1725+7	0.0000+0	2.4843+9	8.5526+8	4.2831+8	1.2008+9	6.4564+3	6.4861+2	2.5265+2	3.9595+2	2.8945–3
	1.0625–4	1.3972–8	1.1470+7	9.6497–9	2.4304+9	8.3002+8	4.2271+8	1.1776+9	6.5037+3	6.4677+2	2.5802+2	3.8874+2	3.0813–3
	1.1719–4	1.4483–8	1.1065+7	2.6628–8	2.3445+9	7.9079+8	4.1247+8	1.1412+9	6.5810+3	6.4173+2	2.6431+2	3.7741+2	3.4112–3
N3	1.2092–4	1.4652–8	1.0938+7	3.2451–8	2.3176+9	7.7864+8	4.0916+8	1.1298+9	6.6060+3	6.4008+2	2.6621+2	3.7387+2	3.5245–3
	1.2274–4	1.4752–8	1.0864+7	3.5294–8	2.3019+9	7.7292+8	4.0729+8	1.1216+9	6.6178+3	6.3802+2	2.6672+2	3.7130+2	3.5798–3
	1.2614–4	1.4937–8	1.0729+7	4.0651–8	2.2733+9	7.6253+8	4.0390+8	1.1068+9	6.6397+3	6.3435+2	2.6770+2	3.6664+2	3.6839–3
N2	1.3097–4	1.5195–8	1.0547+7	4.8286–8	2.2347+9	7.4852+8	3.9935+8	1.0869+9	6.6698+3	6.2953+2	2.6917+2	3.6035+2	3.8317–3
	1.3211–4	1.5257–8	1.0504+7	5.0098–8	2.2256+9	7.4533+8	3.9815+8	1.0821+9	6.6768+3	6.2816+2	2.6929+2	3.5887+2	3.8667–3
	1.3335–4	1.5324–8	1.0458+7	5.2074–8	2.2158+9	7.4189+8	3.9686+8	1.0770+9	6.6843+3	6.2669+2	2.6941+2	3.5727+2	3.9048–3
	1.3751–4	1.5549–8	1.0307+7	5.8742–8	2.1839+9	7.3071+8	3.9267+8	1.0605+9	6.7091+3	6.2195+2	2.6985+2	3.5209+2	4.0331–3
	1.4105–4	1.5736–8	1.0184+7	6.4454–8	2.1578+9	7.2159+8	3.8926+8	1.0470+9	6.7298+3	6.1817+2	2.7030+2	3.4786+2	4.1426–3
	1.4376–4	1.5878–8	1.0093+7	6.8835–8	2.1386+9	7.1485+8	3.8674+8	1.0370+9	6.7452+3	6.1541+2	2.7065+2	3.4475+2	4.2263–3
	1.5000–4	1.6199–8	9.8932+6	7.9031–8	2.0962+9	6.9999+8	3.8120+8	1.0150+9	6.7798+3	6.0945+2	2.7157+2	3.3788+2	4.4205–3
	1.6250–4	1.6918–8	9.4724+6	9.9846–8	2.0071+9	6.7285+8	3.6849+8	9.6571+8	6.8456+3	5.9166+2	2.6972+2	3.2193+2	4.8119–3
N1	1.7433–4	1.7575–8	9.1184+6	1.2009–7	1.9321+9	6.4988+8	3.5777+8	9.2440+8	6.9038+3	5.7700+2	2.6842+2	3.0858+2	5.1856–3
	1.7754–4	1.7753–8	9.0272+6	1.2567–7	1.9127+9	6.4405+8	3.5506+8	9.1361+8	6.9159+3	5.7330+2	2.6818+2	3.0511+2	5.2871–3
	1.8125–4	1.7956–8	8.9250+6	1.3217–7	1.8911+9	6.3750+8	3.5202+8	9.0154+8	6.9296+3	5.6917+2	2.6795+2	3.0122+2	5.4048–3
	1.8315–4	1.8060–8	8.8738+6	1.3552–7	1.8802+9	6.3422+8	3.5050+8	8.9550+8	6.9366+3	5.6711+2	2.6783+2	2.9928+2	5.4652–3
	1.9158–4	1.8512–8	8.6570+6	1.5049–7	1.8343+9	6.2029+8	3.4403+8	8.6997+8	6.9666+3	5.5847+2	2.6739+2	2.9108+2	5.7333–3
	2.0000–4	1.8954–8	8.4549+6	1.6568–7	1.7915+9	6.0724+8	3.3799+8	8.4622+8	6.9954+3	5.5058+2	2.6713+2	2.8345+2	6.0026–3
	2.1250–4	1.9615–8	8.1703+6	1.8867–7	1.7312+9	5.8932+8	3.2774+8	8.1408+8	7.0283+3	5.3690+2	2.6393+2	2.7296+2	6.4026–3
	2.2500–4	2.0257–8	7.9111+6	2.1222–7	1.6762+9	5.7291+8	3.1842+8	7.8491+8	7.0595+3	5.2462+2	2.6117+2	2.6345+2	6.8044–3
	2.3438–4	2.0729–8	7.7312+6	2.3023–7	1.6381+9	5.6147+8	3.1193+8	7.6471+8	7.0819+3	5.1617+2	2.5930+2	2.5686+2	7.1069–3
	2.6250–4	2.2093–8	7.2537+6	2.8591–7	1.5369+9	5.3089+8	2.9473+8	7.1132+8	7.1444+3	4.9424+2	2.5476+2	2.3948+2	8.0198–3
	2.6719–4	2.2314–8	7.1819+6	2.9543–7	1.5217+9	5.2627+8	2.9214+8	7.0333+8	7.1542+3	4.9100+2	2.5412+2	2.3687+2	8.1727–3
	3.0000–4	2.3812–8	6.7302+6	3.6365–7	1.4260+9	4.9700+8	2.7584+8	6.5318+8	7.2186+3	4.7105+2	2.5047+2	2.2057+2	9.2486–3
	3.5000–4	2.6150–8	6.1283+6	4.7367–7	1.2985+9	4.6076+8	2.5228+8	5.8545+8	7.2968+3	4.3830+2	2.4006+2	1.9823+2	1.0902–2
	4.0000–4	2.8353–8	5.6522+6	5.9116–7	1.1976+9	4.3152+8	2.3361+8	5.3249+8	7.3652+3	4.1312+2	2.3232+2	1.8078+2	1.2571–2
	4.5000–4	3.0526–8	5.2498+6	7.1558–7	1.1123+9	4.0730+8	2.1751+8	4.8753+8	7.3876+3	3.9079+2	2.2492+2	1.6586+2	1.4228–2
	5.0000–4	3.2604–8	4.9153+6	8.4657–7	1.0415+9	3.8679+8	2.0414+8	4.5054+8	7.4077+3	3.7278+2	2.1918+2	1.5359+2	1.5890–2
M5	5.8274–4	3.5910–8	4.4627+6	1.0770–6	9.4559+8	3.5881+8	1.8497+8	4.0181+8	7.4213+3	3.4564+2	2.0830+2	1.3733+2	1.8602–2
	5.9137–4	3.6244–8	4.4216+6	1.1021–6	9.3686+8	3.5623+8	1.8323+8	3.9739+8	7.4198+3	3.4325+2	2.0737+2	1.3586+2	1.8877–2
M4	5.9374–4	3.6336–8	4.4104+6	1.1090–6	9.3450+8	3.5553+8	1.8276+8	3.9620+8	7.4195+3	3.4260+2	2.0712+2	1.3546+2	1.8953–2
	5.9569–4	3.6411–8	4.4013+6	1.1147–6	9.3258+8	3.5496+8	1.8238+8	3.9523+8	7.4191+3	3.4208+2	2.0692+2	1.3514+2	1.9015–2
	6.0000–4	3.6577–8	4.3814+6	1.1273–6	9.2835+8	3.5371+8	1.8154+8	3.9309+8	7.4184+3	3.4094+2	2.0649+2	1.3443+2	1.9152–2

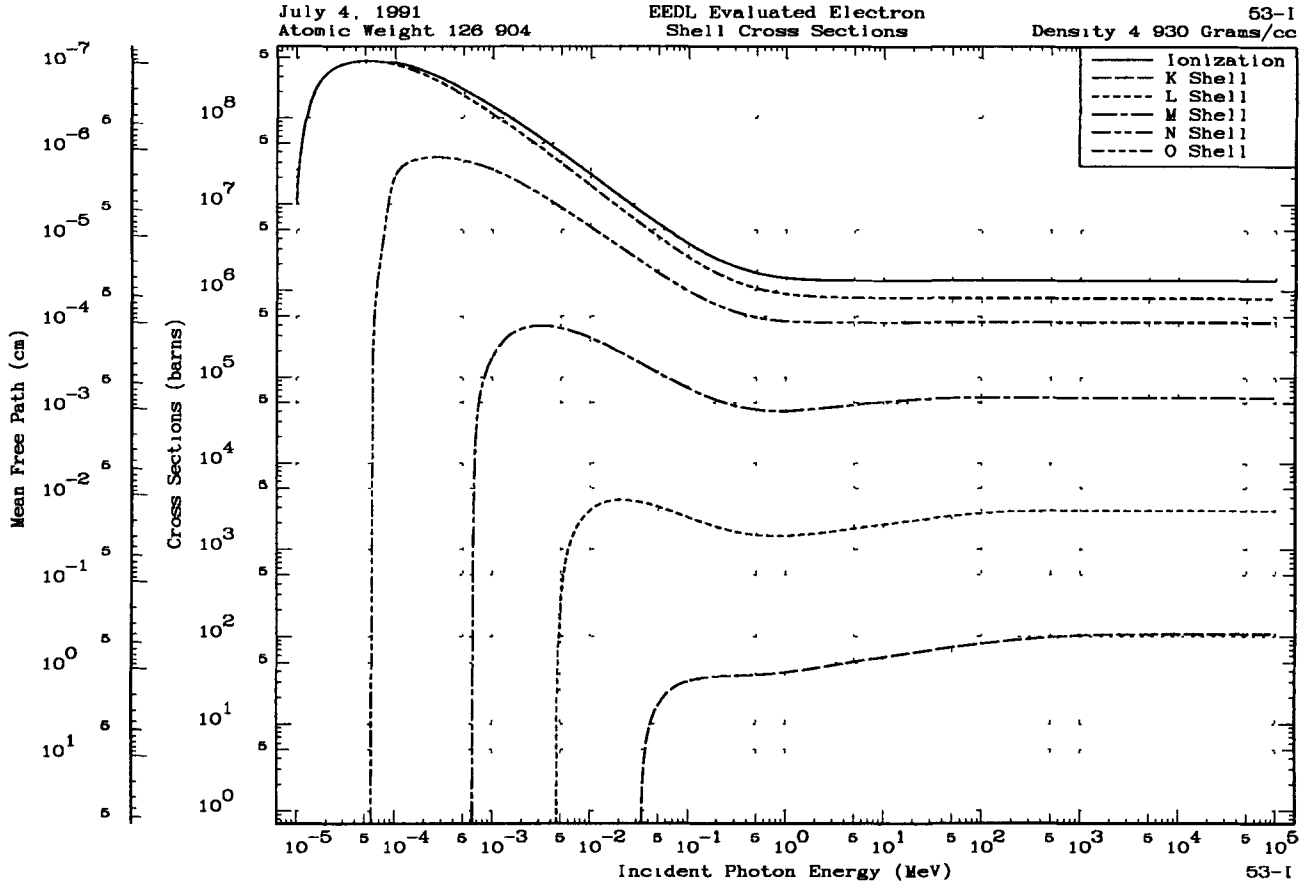
Atomic Weight 127.600 Density 6.240 Grams/cc

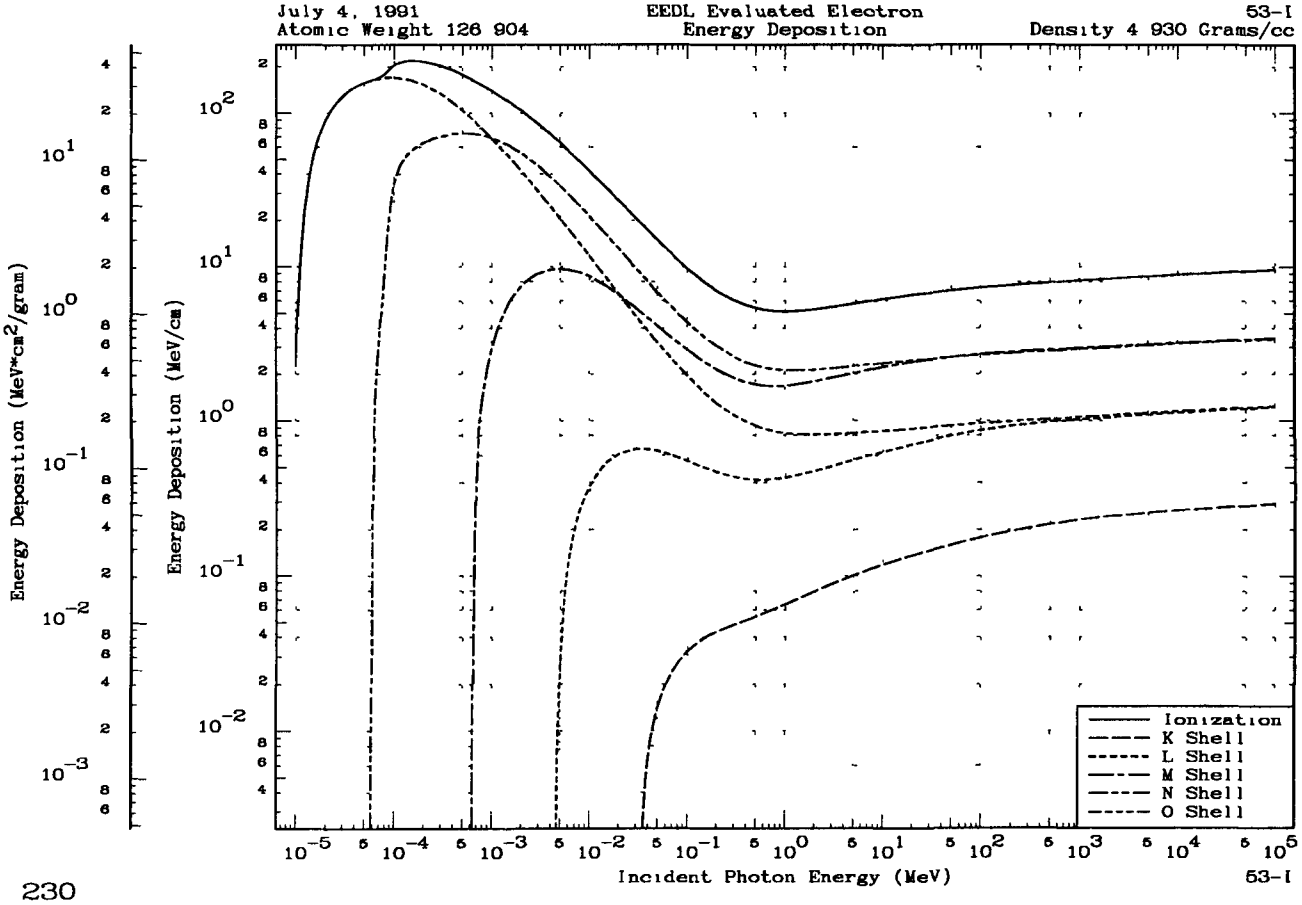
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.0620–4	3.6817–8	4.3528+6	1.1455–6	9.2229+8	3.5193+8	1.8028+8	3.9007+8	7.4154+3	3.3910+2	2.0567+2	1.3342+2	1.9339–2
	6.0625–4	3.6819–8	4.3526+6	1.1457–6	9.2224+8	3.5192+8	1.8027+8	3.9004+8	7.4153+3	3.3909+2	2.0566+2	1.3341+2	1.9341–2
	6.1231–4	3.7052–8	4.3251+6	1.1636–6	9.1643+8	3.5021+8	1.7907+8	3.8715+8	7.4124+3	3.3735+2	2.0489+2	1.3244+2	1.9523–2
	6.1812–4	3.7276–8	4.2992+6	1.1809–6	9.1093+8	3.4858+8	1.7793+8	3.8441+8	7.4096+3	3.3571+2	2.0417+2	1.3152+2	1.9699–2
	6.1817–4	3.7278–8	4.2990+6	1.1810–6	9.1089+8	3.4857+8	1.7792+8	3.8439+8	7.4096+3	3.3570+2	2.0417+2	1.3151+2	1.9700–2
	6.2385–4	3.7495–8	4.2740+6	1.1980–6	9.0561+8	3.4701+8	1.7683+8	3.8176+8	7.4069+3	3.3414+2	2.0349+2	1.3063+2	1.9871–2
	6.2949–4	3.7710–8	4.2497+6	1.2149–6	9.0044+8	3.4548+8	1.7576+8	3.7919+8	7.4043+3	3.3263+2	2.0284+2	1.2977+2	2.0041–2
	6.3486–4	3.7914–8	4.2268+6	1.2311–6	8.9559+8	3.4405+8	1.7476+8	3.7678+8	7.4018+3	3.3121+2	2.0223+2	1.2896+2	2.0203–2
	6.5081–4	3.8516–8	4.1607+6	1.2795–6	8.8160+8	3.3989+8	1.7187+8	3.6983+8	7.3945+3	3.2714+2	2.0049+2	1.2663+2	2.0682–2
	6.5550–4	3.8693–8	4.1418+6	1.2939–6	8.7758+8	3.3869+8	1.7104+8	3.6784+8	7.3924+3	3.2598+2	1.9999+2	1.2597+2	2.0823–2
	6.8810–4	3.9902–8	4.0162+6	1.3951–6	8.5098+8	3.3073+8	1.6556+8	3.5469+8	7.3781+3	3.1830+2	1.9672+2	1.2156+2	2.1802–2
	7.0000–4	4.0338–8	3.9728+6	1.4326–6	8.4179+8	3.2796+8	1.6367+8	3.5016+8	7.3731+3	3.1567+2	1.9560+2	1.2004+2	2.2159–2
	7.2775–4	4.1343–8	3.8763+6	1.5214–6	8.2132+8	3.2176+8	1.5946+8	3.4009+8	7.3617+3	3.0988+2	1.9319+2	1.1667+2	2.2990–2
	7.4405–4	4.1926–8	3.8223+6	1.5742–6	8.0989+8	3.1829+8	1.5712+8	3.3448+8	7.3552+3	3.0668+2	1.9186+2	1.1479+2	2.3478–2
	8.0000–4	4.3891–8	3.6513+6	1.7597–6	7.7364+8	3.0717+8	1.4969+8	3.1678+8	7.3340+3	2.9661+2	1.8773+2	1.0886+2	2.5148–2
M3	8.1485–4	4.4428–8	3.6071+6	1.8100–6	7.6430+8	3.0441+8	1.4776+8	3.1212+8	7.3192+3	2.9365+2	1.8634+2	1.0728+2	2.5508–2
	8.2642–4	4.4843–8	3.5737+6	1.8496–6	7.5721+8	3.0231+8	1.4630+8	3.0859+8	7.3079+3	2.9143+2	1.8532+2	1.0609+2	2.5789–2
	8.4812–4	4.5617–8	3.5131+6	1.9246–6	7.4436+8	2.9850+8	1.4366+8	3.0220+8	7.2872+3	2.8744+2	1.8349+2	1.0393+2	2.6313–2
M2	8.6709–4	4.6288–8	3.4622+6	1.9909–6	7.3358+8	2.9527+8	1.4144+8	2.9686+8	7.2695+3	2.8412+2	1.8197+2	1.0213+2	2.6771–2
	8.7540–4	4.6580–8	3.4404+6	2.0203–6	7.2898+8	2.9390+8	1.4050+8	2.9457+8	7.2619+3	2.8272+2	1.8133+2	1.0136+2	2.6971–2
	8.8609–4	4.6955–8	3.4130+6	2.0582–6	7.2316+8	2.9215+8	1.3930+8	2.9169+8	7.2522+3	2.8095+2	1.8054+2	1.0038+2	2.7228–2
	9.0000–4	4.7440–8	3.3781+6	2.1079–6	7.1576+8	2.8993+8	1.3779+8	2.8804+8	7.2398+3	2.7872+2	1.7954+2	9.9152+1	2.7562–2
	9.0655–4	4.7668–8	3.3619+6	2.1314–6	7.1235+8	2.8890+8	1.3709+8	2.8635+8	7.2341+3	2.7767+2	1.7906+2	9.8584+1	2.7719–2
	9.4305–4	4.8924–8	3.2756+6	2.2642–6	6.9405+8	2.8336+8	1.3334+8	2.7734+8	7.2028+3	2.7212+2	1.7655+2	9.5548+1	2.8593–2
	9.5327–4	4.9273–8	3.2524+6	2.3019–6	6.8914+8	2.8187+8	1.3234+8	2.7492+8	7.1943+3	2.7065+2	1.7588+2	9.4735+1	2.8837–2
M1	9.9108–4	5.0550–8	3.1703+6	2.4429–6	6.7173+8	2.7654+8	1.2878+8	2.6640+8	7.1636+3	2.6546+2	1.7357+2	9.1863+1	2.9738–2
	1.0000–3	5.0849–8	3.1516+6	2.4766–6	6.6778+8	2.7533+8	1.2798+8	2.6446+8	7.1566+3	2.6430+2	1.7306+2	9.1212+1	2.9950–2
	1.0313–3	5.1898–8	3.0879+6	2.5959–6	6.5428+8	2.7120+8	1.2511+8	2.5797+8	7.1192+3	2.5972+2	1.7069+2	8.9007+1	3.0512–2
	1.0898–3	5.3833–8	2.9769+6	2.8250–6	6.3077+8	2.6393+8	1.2013+8	2.4670+8	7.0526+3	2.5185+2	1.6664+2	8.5183+1	3.1560–2
	1.1250–3	5.4975–8	2.9151+6	2.9658–6	6.1766+8	2.5984+8	1.1736+8	2.4045+8	7.0146+3	2.4753+2	1.6444+2	8.3062+1	3.2186–2
	1.1411–3	5.5494–8	2.8878+6	3.0311–6	6.1188+8	2.5803+8	1.1614+8	2.3770+8	6.9976+3	2.4561+2	1.6345+2	8.2130+1	3.2472–2
	1.2188–3	5.7957–8	2.7651+6	3.3528–6	5.8588+8	2.4982+8	1.1067+8	2.2539+8	6.9197+3	2.3709+2	1.5911+2	7.7952+1	3.3845–2
	1.2308–3	5.8335–8	2.7472+6	3.4039–6	5.8209+8	2.4861+8	1.0987+8	2.2360+8	6.9080+3	2.3584+2	1.5846+2	7.7344+1	3.4057–2
	1.2500–3	5.8932–8	2.7194+6	3.4856–6	5.7619+8	2.4673+8	1.0864+8	2.2082+8	6.8899+3	2.3390+2	1.5746+2	7.6403+1	3.4394–2
	1.3125–3	6.0855–8	2.6334+6	3.7563–6	5.5798+8	2.4088+8	1.0481+8	2.1228+8	6.8329+3	2.2789+2	1.5434+2	7.3507+1	3.5488–2
	1.3594–3	6.2274–8	2.5734+6	3.9639–6	5.4526+8	2.3676+8	1.0215+8	2.0635+8	6.7922+3	2.2373+2	1.5220+2	7.1494+1	3.6305–2
	1.3654–3	6.2456–8	2.5659+6	3.9909–6	5.4368+8	2.3625+8	1.0182+8	2.0561+8	6.7871+3	2.2321+2	1.5193+2	7.1244+1	3.6410–2
	1.5000–3	6.6424–8	2.4126+6	4.6083–6	5.1120+8	2.2558+8	9.5047+7	1.9057+8	6.6794+3	2.1281+2	1.4662+2	6.6144+1	3.8733–2
	1.7500–3	7.3608–8	2.1772+6	5.8356–6	4.6131+8	2.0887+8	8.4492+7	1.6794+8	6.4857+3	1.9485+2	1.3639+2	5.8417+1	4.2592–2
	2.0000–3	8.0417–8	1.9928+6	7.1663–6	4.2225+8	1.9540+8	7.6318+7	1.5053+8	6.3225+3	1.8106+2	1.2854+2	5.2471+1	4.6376–2
	2.2500–3	8.7031–8	1.8414+6	8.5968–6	3.9016+8	1.8368+8	6.9544+7	1.3693+8	6.1417+3	1.6863+2	1.2078+2	4.7804+1	4.9466–2
	2.5000–3	9.3385–8	1.7161+6	1.0126–5	3.6361+8	1.7379+8	6.4005+7	1.2582+8	5.9843+3	1.5853+2	1.1449+2	4.3989+1	5.2503–2
	2.6250–3	9.6475–8	1.6611+6	1.0925–5	3.5197+8	1.6939+8	6.1592+7	1.2098+8	5.9128+3	1.5410+2	1.1172+2	4.2330+1	5.4002–2
	3.0000–3	1.0544–7	1.5199+6	1.3452–5	3.2204+8	1.5792+8	5.5449+7	1.0867+8	5.7215+3	1.4288+2	1.0472+2	3.8108+1	5.8426–2
	3.5000–3	1.1727–7	1.3666+6	1.7124–5	2.8955+8	1.4521+8	4.8951+7	9.5387+7	5.4729+3	1.2966+2	9.6075+1	3.3522+1	6.3386–2
	4.0000–3	1.2853–7	1.2468+6	2.1138–5	2.6419+8	1.3503+8	4.3948+7	8.5202+7	5.2664+3	1.1956+2	8.9490+1	3.0007+1	6.8209–2
L3	4.3397–3	1.3606–7	1.1778+6	2.4055–5	2.4956+8	1.2892+8	4.1103+7	7.9539+7	5.1336+3	1.1343+2	8.5318+1	2.8040+1	7.1126–2
	4.5048–3	1.3965–7	1.1475+6	2.5528–5	2.4314+8	1.2621+8	3.9863+7	7.7067+7	5.0731+3	1.1077+2	8.3515+1	2.7184+1	7.2503–2
L2	4.6182–3	1.4210–7	1.1278+6	2.6560–5	2.3896+8	1.2443+8	3.9058+7	7.5463+7	5.0333+3	1.0905+2	8.2345+1	2.6628+1	7.3443–2
	4.7524–3	1.4497–7	1.1055+6	2.7801–5	2.3423+8	1.2242+8	3.8151+7	7.3652+7	4.9830+3	1.0711+2	8.1037+1	2.6001+1	7.4395–2
	4.8091–3	1.4617–7	1.0964+6	2.8333–5	2.3230+8	1.2160+8	3.7782+7	7.2914+7	4.9624+3	1.0632+2	8.0504+1	2.5746+1	7.4796–2
L1	4.9142–3	1.4839–7	1.0800+6	2.9328–5	2.2883+8	1.2012+8	3.7118+7	7.1589+7	4.9250+3	1.0491+2	7.9547+1	2.5288+1	7.5536–2
	5.0000–3	1.5019–7	1.0670+6	3.0150–5	2.2608+8	1.1894+8	3.6595+7	7.0543+7	4.8952+3	1.0380+2	7.8798+1	2.4927+1	7.6137–2
	5.2500–3	1.5545–7	1.0309+6	3.2597–5	2.1844+8	1.1560+8	3.5144+7	6.7691+7	4.8119+3	1.0055+2	7.6533+1	2.3935+1	7.7862–2
	5.5000–3	1.6063–7	9.9769+5	3.5121–5	2.1140+8	1.1250+8	3.3814+7	6.5079+7	4.7338+3	9.7576+1	7.4469+1	2.3028+1	7.9570–2
	5.6250–3	1.6319–7	9.8203+5	3.6411–5	2.0808+8	1.1103+8	3.3190+7	6.3854+7	4.6965+3	9.6181+1	7.3499+1	2.2602+1	8.0417–2
	6.0000–3	1.7076–7	9.3848+5	4.0390–5	1.9885+8	1.0692+8	3.1462+7	6.0461+7	4.5911+3	9.2328+1	7.0823+1	2.1423+1	8.2935–2
	6.5000–3	1.8081–7	8.8634+5	4.5952–5	1.8780+8	1.0191+8	2.9425+7	5.6461+7	4.4496+3	8.7519+1	6.7406+1	2.0027+1	8.5619–2
	7.2500–3	1.9543–7	8.2000+5	5.4832–5	1.7375+8	9.5455+7	2.6860+7	5.1428+7	4.2635+3	8.1467+1	6.3106+1	1.8272+1	8.9572–2
	8.0000–3	2.0960–7	7.6459+5	6.4332–5	1.6201+8	8.9986+7	2.4740+7	4.7276+7	4.1025+3	7.6478+1	5.9560+1	1.6825+1	9.3436–2
	9.0000–3	2.2839–7	7.0169+5	7.7934–5	1.4868+8	8.3558+7	2.2404+7	4.2712+7	3.9032+3	7.0635+1	5.5311+1	1.5227+1	9.7627–2
	1.0000–2	2.4658–7	6.4993+5	9.2591–5	1.3771+8	7.8198+7	2.0503+7	3.9004+7	3.7331+3	6.5880+1	5.1850+1	1.3928+1	1.0172–1
	1.1250–2	2.6898–7	5.9579+5	1.1235–4	1.2624+8	7.2436+7	1.8561+7	3.5238+7	3.5347+3	6.0705+1	4.7997+1	1.2603+1	1.0537–1
	1.3125–2	3.0134–7	5.3182+5	1.4489–4	1.1268+8	6.5531+7	1.6296+7	3.0854+7	3.2909+3	5.4656+1	4.3484+1	1.1061+1	1.1073–1
	1.5000–2	3.3243–7	4.8208+5	1.8074–4	1.0215+8	6.0084+7	1.4559+7	2.7499+7	3.0933+3	5.0008+1	4.0011+1	9.8810+0	1.1596–1
	1.7500–2	3.7324–7	4.2937+5	2.3347–4	9.0976+7	5.4181+7	1.2785+7	2.4007+7	2.8691+3	4.4911+1	3.6145+1	8.6454+0	1.2075–1
	2.0000–2	4.1255–7	3.8846+5	2.9171–4	8.2308+7	4.9538+7	1.1425+7	2.1343+7	2.6881+3	4.1001+1	3.3172+1	7.7029+0	1.2549–1
	2.5000–2	4.8821–7	3.2826+5	4.2343–4	6.9553+7	4.2538+7	9.4869+6	1.7526+7	2.3930+3	3.5069+1	2.8593+1	6.3448+0	1.3167–1
	3.0000–2	5.6004–7	2.8615+5	5.7504–4	6.0631+7	3.7559+7	8.1508+6	1.4919+7	2.1761+3	3.0973+1	2.5418+1	5.4179+0	1.3789–1
K	3.1805–2	5.8520–7	2.7385+5	6.3450–4	5.8025+7	3.6081+7	7.7698+6	1.4171+7	2.1094+3	2.9749+1	2.4459+1	5.1502+0	1.3965–1
	3.2317–2	5.9234–7	2.7055+5	6.5182–4	5.7326+7	3.5684+7	7.6694+6	1.3970+7	2.0912+3	2.9421+1	2.4203+1	5.0780+0	1.4007–1
	3.3278–2	6.0564–7	2.6461+5	6.8479–4	5.6066+7	3.4968+7	7.4888+6	1.3607+7	2.0583+3	2.8832+1	2.3743+1	4.9482+0	1.4087–1
	3.4958–2	6.2870–7	2.5490+5	7.4407–4	5.4010+7	3.3795+7	7.1944+6	1.3018+7	2.0041+3	2.7872+1	2.2992+1	4.7374+0	1.4227–1
	3.7479–2	6.6276–7	2.4180+5	8.3668–4	5.1234+7	3.2205+7	6.7981+6	1.2229+7	1.9299+3	2.6580+1	2.1980+1	4.4551+0	1.4438–1
	4.0000–2	6.9625–7	2.3017+5	9.3362–4	4.8769+7	3.0786+7	6.4474+6	1.1535+7	1.8630+3	2.5436+1	2.1083+1	4.2066+0	1.4651–1
	4.5000–2	7.6117–7	2.1054+5	1.1382–3	4.4610+7	2.8374+7	5.8717+6	1.0363+7	1.7501+3	2.3481+1	1.9545+1	3.7856+0	1.4999–1
	5.0000–2	8.2426–7	1.9442+5	1.3587–3	4.1196+7	2.6377+7	5.4006+6	9.4165+6	1.6550+3	2.1881+1	1.8282+1	3.4453+0	1.5351–1
	5.5000–2	8.8552–7	1.8098+5	1.5945–3	3.8346+7	2.4692+7	5.0170+6	8.6355+6	1.5680+3	2.0544+1	1.7224+1	3.1637+0	1.5638–1
	6.0000–2	9.4534–7	1.6952+5	1.8449–3	3.5919+7	2.3248+7	4.6908+6	7.9792+6	1.4926+3	1.9408+1	1.6321+1	2.9270+0	1.5927–1
	7.0000–2	1.0597–6	1.5123+5	2.3860–3	3.2043+7	2.0922+7	4.1832+6	6.9367+6	1.3673+3	1.7582+1	1.4868+1	2.5497+0	1.6404–1

Atomic Weight 127.600												Density 6.240 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000–2	1.1697–6	1.3701+5	2.9790–3	2.9030+7	1.9096+7	3.7882+6	6.1444+6	1.2674+3	1.6166+1	1.3734+1	2.2630+0	1.6885–1
1.0000–1	1.3694–6	1.1703+5	4.3000–3	2.4796+7	1.6463+7	3.2387+6	5.0933+6	1.1214+3	1.4157+1	1.2098+1	1.8814+0	1.7688–1
1.2500–1	1.5802–6	1.0141+5	6.1745–3	2.1488+7	1.4384+7	2.8068+6	4.2959+6	1.0056+3	1.2550+1	1.0774+1	1.5911+0	1.8489–1
1.5000–1	1.7761–6	9.0231+4	8.2634–3	1.9118+7	1.2882+7	2.4972+6	3.7381+6	9.1988+2	1.1405+1	9.8237+0	1.3881+0	1.9317–1
2.0000–1	2.1064–6	7.6080+4	1.2947–2	1.6120+7	1.0993+7	2.1248+6	3.0018+6	8.1190+2	9.9784+0	8.6519+0	1.1187+0	2.0775–1
2.5000–1	2.3947–6	6.6923+4	1.8178–2	1.4180+7	9.7338+6	1.9132+6	2.5322+6	7.4611+2	9.1513+0	7.9834+0	9.4610–1	2.2182–1
3.0000–1	2.6495–6	6.0486+4	2.3823–2	1.2816+7	8.8128+6	1.7562+6	2.2463+6	6.9633+2	8.5684+0	7.4912+0	8.4138–1	2.3586–1
4.0000–1	3.1038–6	5.1632+4	3.5958–2	1.0940+7	7.4864+6	1.5772+6	1.8759+6	6.3796+2	7.9220+0	6.9510+0	7.0512–1	2.6582–1
5.0000–1	3.4935–6	4.5873+4	4.8844–2	9.7198+6	6.5773+6	1.4743+6	1.6676+6	6.0381+2	7.6007+0	6.6745+0	6.2855–1	2.9764–1
6.0000–1	3.8280–6	4.1864+4	6.2164–2	8.8703+6	5.9156+6	1.4081+6	1.5461+6	5.8349+2	7.4148+0	6.4998+0	5.8405–1	3.3100–1
8.0000–1	4.4030–6	3.6397+4	8.9360–2	7.7121+6	5.0042+6	1.3313+6	1.3760+6	5.6252+2	7.2935+0	6.3688+0	5.2165–1	4.0300–1
1.0000+0	4.8671–6	3.2927+4	1.1679–1	6.9766+6	4.3970+6	1.2889+6	1.2901+6	5.5287+2	7.2893+0	6.3189+0	4.9043–1	4.7999–1
1.5000+0	5.7279–6	2.7978+4	1.8414–1	5.9282+6	3.5147+6	1.2444+6	1.1685+6	5.4705+2	7.5589+0	6.4236+0	4.4637–1	6.8899–1
2.0000+0	6.3352–6	2.5296+4	2.4895–1	5.3598+6	3.0251+6	1.2266+6	1.1076+6	5.5008+2	7.8741+0	6.5346+0	4.2417–1	9.1535–1
3.0000+0	7.1082–6	2.2545+4	3.7072–1	4.7770+6	2.5047+6	1.2109+6	1.0610+6	5.5949+2	8.5604+0	6.7558+0	4.0844–1	1.3961+0
4.0000+0	7.5927–6	2.1107+4	4.8310–1	4.4722+6	2.2286+6	1.2080+6	1.0350+6	5.6804+2	9.2437+0	6.9395+0	3.9902–1	1.9052+0
5.0000+0	7.9186–6	2.0238+4	5.8745–1	4.2881+6	2.0603+6	1.2063+6	1.0209+6	5.7504+2	9.9326+0	7.1077+0	3.9416–1	2.4307+0
6.0000+0	8.1288–6	1.9715+4	6.8486–1	4.1772+6	1.9539+6	1.2058+6	1.0170+6	5.8070+2	1.0605+1	7.2416+0	3.9319–1	2.9702+0
8.0000+0	8.4060–6	1.9065+4	8.6253–1	4.0395+6	1.8237+6	1.2052+6	1.0100+6	5.8952+2	1.1935+1	7.4654+0	3.9163–1	4.0783+0
1.0000+1	8.5534–6	1.8736+4	1.0214+0	3.9699+6	1.7590+6	1.2062+6	1.0041+6	5.9382+2	1.3271+1	7.6458+0	3.9045–1	5.2345+0
1.5000+1	8.6281–6	1.8574+4	1.3586+0	3.9355+6	1.7213+6	1.2082+6	1.0055+6	6.0554+2	1.6496+1	7.9067+0	3.9112–1	8.1979+0
2.0000+1	8.6233–6	1.8584+4	1.6350+0	3.9377+6	1.7211+6	1.2096+6	1.0064+6	6.1466+2	1.9790+1	8.1231+0	3.9163–1	1.1276+1
3.0000+1	8.6211–6	1.8589+4	2.0717+0	3.9387+6	1.7203+6	1.2104+6	1.0074+6	6.2466+2	2.6317+1	8.3532+0	3.9230–1	1.7571+1
4.0000+1	8.6275–6	1.8575+4	2.4105+0	3.9358+6	1.7197+6	1.2111+6	1.0043+6	6.3453+2	3.2969+1	8.5263+0	3.9136–1	2.4051+1
5.0000+1	8.6415–6	1.8545+4	2.6866+0	3.9294+6	1.7193+6	1.2116+6	9.9788+5	6.4228+2	3.9674+1	8.6618+0	3.8912–1	3.0623+1
6.0000+1	8.6535–6	1.8519+4	2.9193+0	3.9239+6	1.7189+6	1.2118+6	9.9258+5	6.4852+2	4.6457+1	8.7547+0	3.8733–1	3.7315+1
8.0000+1	8.6732–6	1.8477+4	3.2965+0	3.9151+6	1.7184+6	1.2121+6	9.8396+5	6.5808+2	6.0158+1	8.9108+0	3.8450–1	5.0862+1
1.0000+2	8.6891–6	1.8443+4	3.5958+0	3.9079+6	1.7179+6	1.2123+6	9.7703+5	6.6528+2	7.3998+1	9.0414+0	3.8232–1	6.4574+1
1.5000+2	8.7213–6	1.8375+4	4.1500+0	3.8934+6	1.7171+6	1.2124+6	9.6323+5	6.7842+2	1.0864+2	9.1820+0	3.7693–1	9.9079+1
2.0000+2	8.7349–6	1.8347+4	4.5488+0	3.8874+6	1.7166+6	1.2125+6	9.5764+5	6.8816+2	1.4374+2	9.3128+0	3.7475–1	1.3405+2
3.0000+2	8.7481–6	1.8319+4	5.1159+0	3.8815+6	1.7158+6	1.2126+6	9.5247+5	6.9924+2	2.1357+2	9.5289+0	3.7275–1	2.0367+2
4.0000+2	8.7562–6	1.8302+4	5.5205+0	3.8779+6	1.7152+6	1.2126+6	9.4942+5	7.0637+2	2.8397+2	9.6171+0	3.7157–1	2.7398+2
5.0000+2	8.7661–6	1.8281+4	5.8354+0	3.8736+6	1.7148+6	1.2126+6	9.4546+5	7.1184+2	3.5371+2	9.7005+0	3.7004–1	3.4364+2
6.0000+2	8.7683–6	1.8277+4	6.0934+0	3.8726+6	1.7144+6	1.2126+6	9.4481+5	7.1636+2	4.2387+2	9.7764+0	3.6980–1	4.1373+2
8.0000+2	8.7745–6	1.8264+4	6.5010+0	3.8698+6	1.7139+6	1.2126+6	9.4262+5	7.2419+2	5.6394+2	9.9164+0	3.6898–1	5.5366+2
1.0000+3	8.7796–6	1.8253+4	6.8175+0	3.8676+6	1.7134+6	1.2126+6	9.4080+5	7.3033+2	7.0530+2	1.0036+1	3.6830–1	6.9490+2
1.5000+3	8.7884–6	1.8235+4	7.3922+0	3.8637+6	1.7126+6	1.2126+6	9.3771+5	7.4194+2	1.0585+3	1.0144+1	3.6709–1	1.0479+3
2.0000+3	8.7946–6	1.8222+4	7.8000+0	3.8610+6	1.7121+6	1.2126+6	9.3553+5	7.5059+2	1.4106+3	1.0251+1	3.6624–1	1.4000+3
3.0000+3	8.8005–6	1.8210+4	8.3746+0	3.8584+6	1.7113+6	1.2126+6	9.3372+5	7.6325+2	2.1182+3	1.0457+1	3.6553–1	2.1074+3
4.0000+3	8.8048–6	1.8201+4	8.7819+0	3.8565+6	1.7107+6	1.2127+6	9.3237+5	7.7253+2	2.8254+3	1.0550+1	3.6500–1	2.8145+3
5.0000+3	8.8115–6	1.8187+4	9.0976+0	3.8536+6	1.7103+6	1.2127+6	9.2989+5	7.7984+2	3.5379+3	1.0619+1	3.6403–1	3.5270+3
6.0000+3	8.8112–6	1.8188+4	9.3554+0	3.8537+6	1.7099+6	1.2127+6	9.3034+5	7.8516+2	4.2389+3	1.0688+1	3.6421–1	4.2278+3
8.0000+3	8.8128–6	1.8184+4	9.7626+0	3.8530+6	1.7094+6	1.2127+6	9.3018+5	7.9364+2	5.6528+3	1.0822+1	3.6415–1	5.6416+3
1.0000+4	8.8142–6	1.8182+4	1.0078+1	3.8524+6	1.7089+6	1.2127+6	9.3003+5	8.0028+2	7.0798+3	1.0944+1	3.6409–1	7.0685+3
1.5000+4	8.8163–6	1.8177+4	1.0652+1	3.8515+6	1.7082+6	1.2127+6	9.2988+5	8.1320+2	1.0573+4	1.1044+1	3.6403–1	1.0562+4
2.0000+4	8.8184–6	1.8173+4	1.1060+1	3.8506+6	1.7076+6	1.2127+6	9.2950+5	8.2249+2	1.4111+4	1.1143+1	3.6388–1	1.4100+4
3.0000+4	8.8200–6	1.8170+4	1.1635+1	3.8499+6	1.7068+6	1.2127+6	9.2958+5	8.3555+2	2.1117+4	1.1342+1	3.6391–1	2.1105+4
4.0000+4	8.8223–6	1.8165+4	1.2044+1	3.8489+6	1.7062+6	1.2127+6	9.2913+5	8.4493+2	2.8199+4	1.1462+1	3.6374–1	2.8187+4
5.0000+4	8.8281–6	1.8153+4	1.2361+1	3.8463+5	1.7058+6	1.2127+6	9.2702+5	8.5214+2	3.5215+4	1.1526+1	3.6291–1	3.5203+4
6.0000+4	8.8270–6	1.8155+4	1.2619+1	3.8468+6	1.7055+6	1.2127+6	9.2785+5	8.5802+2	4.2225+4	1.1590+1	3.6324–1	4.2213+4
8.0000+4	8.8277–6	1.8154+4	1.3028+1	3.8465+6	1.7049+6	1.2127+6	9.2808+5	8.6739+2	5.6367+4	1.1718+1	3.6332–1	5.6355+4
1.0000+5	8.8287–6	1.8152+4	1.3345+1	3.8461+6	1.7045+6	1.2127+6	9.2808+5	8.7466+2	7.0535+4	1.1844+1	3.6332–1	7.0523+4


July 4, 1991
Atomic Weight 126.904
EEDL Evaluated Electron
Cross Sections
53-I
Density 4.930 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
53-I


July 4, 1991
Atomic Weight 126.904
EEDL Evaluated Electron
Energy Deposition
53-I
Density 4.930 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
53-I


July 4, 1991
Atomic Weight 126 904
EEDL Evaluated Electron
Shell Cross Sections
53-I
Density 4 930 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
53-I


July 4, 1991
Atomic Weight 126 904
EEDL Evaluated Electron
Energy Deposition
53-I
Density 4 930 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
53-I

Atomic Weight 126.904 Density 4.930 Grams/cc

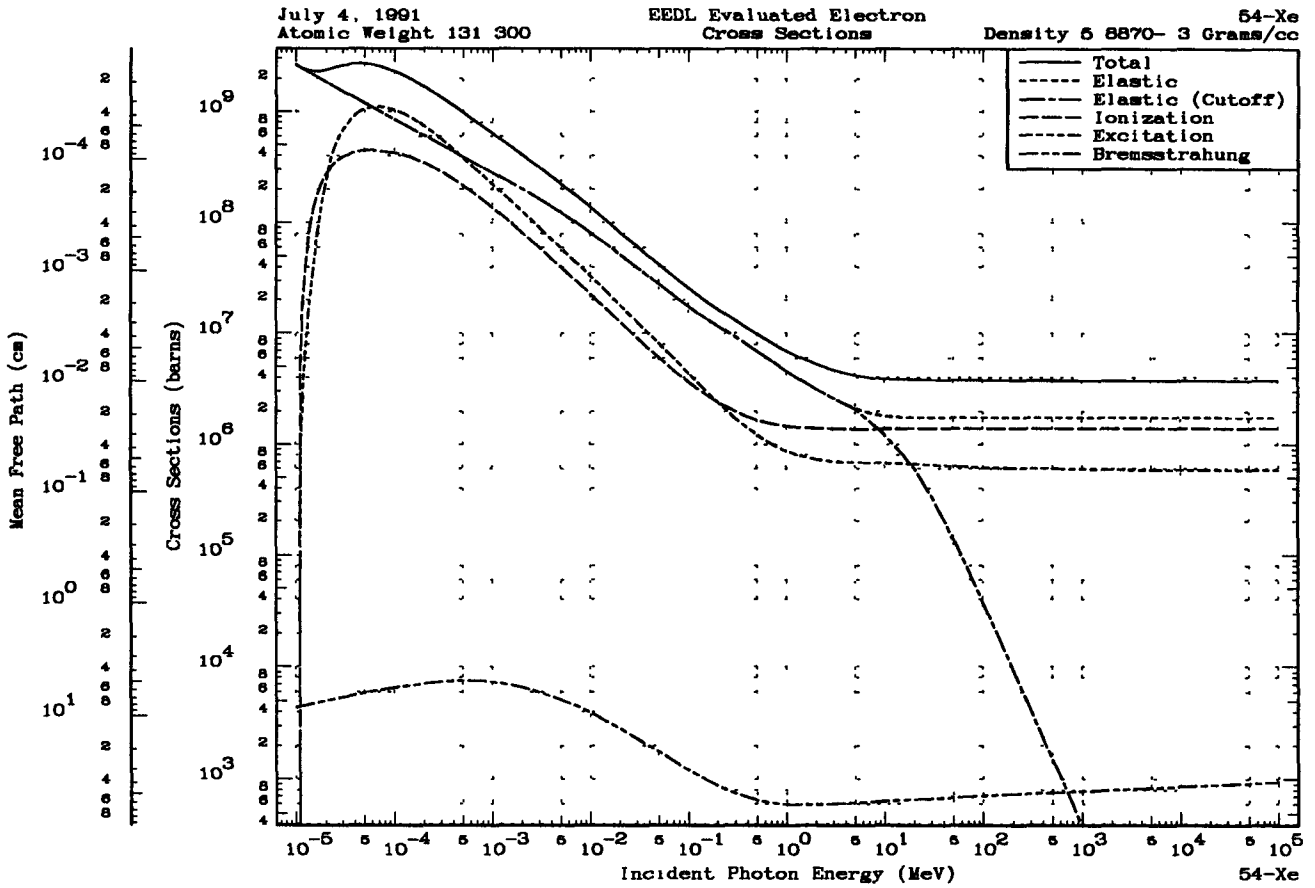
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.5919–8	1.2742+7		2.6852+9	2.6744+9	9.9125+6	8.4294+5	4.3643+3	2.4468+0	2.2548+0	1.9174–1	2.2047–4
	1.0312–5	1.6100–8	1.2599+7		2.6549+9	2.6341+9	1.8968+7	1.8221+6	4.3912+3	4.7670+0	4.3488+0	4.1800–1	2.2705–4
O2	1.0770–5	1.6353–8	1.2404+7		2.6139+9	2.5781+9	3.2028+7	3.6941+6	4.4297+3	8.2855+0	7.4273+0	8.5799–1	2.3676–4
	1.0898–5	1.6404–8	1.2365+7		2.6057+9	2.5631+9	3.8189+7	4.4523+6	4.4402+3	9.9448+0	8.9079+0	1.0367+0	2.3950–4
	1.0902–5	1.6406–8	1.2364+7		2.6054+9	2.5627+9	3.8308+7	4.4755+6	4.4405+3	9.9795+0	8.9372+0	1.0421+0	2.3957–4
	1.1158–5	1.6523–8	1.2276+7		2.5870+9	2.5334+9	4.7387+7	6.1766+6	4.4612+3	1.2613+1	1.1168+1	1.4454+0	2.4504–4
	1.1398–5	1.6622–8	1.2203+7		2.5716+9	2.5069+9	5.6860+7	7.8220+6	4.4804+3	1.5350+1	1.3510+1	1.8389+0	2.5020–4
	1.1639–5	1.6712–8	1.2137+7		2.5576+9	2.4811+9	6.6637+7	9.8588+6	4.4992+3	1.8266+1	1.5937+1	2.3284+0	2.5537–4
	1.1924–5	1.6801–8	1.2073+7		2.5442+9	2.4517+9	8.0211+7	1.2310+7	4.5210+3	2.2257+1	1.9333+1	2.9231+0	2.6151–4
	1.2299–5	1.6923–8	1.1986+7		2.5258+9	2.4144+9	9.4959+7	1.6359+7	4.5492+3	2.7047+1	2.3134+1	3.9123+0	2.6964–4
	1.2949–5	1.7097–8	1.1864+7		2.5001+9	2.3538+9	1.2007+8	2.6258+7	4.5965+3	3.6043+1	2.9686+1	6.3563+0	2.8383–4
	1.3462–5	1.7178–8	1.1808+7		2.4883+9	2.3090+9	1.4348+8	3.5761+7	4.6324+3	4.4624+1	3.5884+1	8.7394+0	2.9509–4
	1.3649–5	1.7210–8	1.1786+7		2.4837+9	2.2933+9	1.5050+8	3.9919+7	4.6453+3	4.7585+1	3.7796+1	9.7892+0	2.9923–4
	1.3975–5	1.7261–8	1.1751+7		2.4763+9	2.2667+9	1.6144+8	4.8150+7	4.6673+3	5.2677+1	4.0799+1	1.1878+1	3.0644–4
	1.5000–5	1.7327–8	1.1707+7		2.4670+9	2.1888+9	1.9946+8	7.8710+7	4.7340+3	7.1186+1	5.1405+1	1.9780+1	3.2930–4
	1.6250–5	1.7315–8	1.1715+7		2.4686+9	2.1039+9	2.3794+8	1.2677+8	4.8106+3	9.4893+1	6.2575+1	3.2318+1	3.5754–4
	1.8125–5	1.7114–8	1.1852+7		2.4976+9	1.9934+9	2.8548+8	2.1873+8	4.9172+3	1.3420+2	7.7244+1	5.6956+1	4.0057–4
	2.0000–5	1.6789–8	1.2082+7		2.5460+9	1.8987+9	3.2228+8	3.2496+8	5.0152+3	1.7569+2	8.9300+1	8.6388+1	4.4438–4
O1	2.1010–5	1.6635–8	1.2193+7		2.5695+9	1.8531+9	3.3684+8	3.7960+8	5.0632+3	1.9608+2	9.4374+1	1.0170+2	4.6766–4
	2.1291–5	1.6582–8	1.2233+7		2.5778+9	1.8409+9	3.4111+8	3.9573+8	5.0748+3	2.0207+2	9.5893+1	1.0617+2	4.7372–4
	2.1835–5	1.6467–8	1.2318+7		2.5958+9	1.8181+9	3.4934+8	4.2830+8	5.0970+3	2.1407+2	9.8846+1	1.1522+2	4.8547–4
	2.2500–5	1.6380–8	1.2383+7		2.6095+9	1.7914+9	3.5930+8	4.5886+8	5.1235+3	2.2629+2	1.0244+2	1.2385+2	4.9990–4
	2.2856–5	1.6337–8	1.2416+7		2.6164+9	1.7775+9	3.6311+8	4.7571+8	5.1374+3	2.3256+2	1.0394+2	1.2862+2	5.0764–4
	2.4642–5	1.6072–8	1.2621+7		2.6596+9	1.7127+9	3.8147+8	5.6549+8	5.2047+3	2.6552+2	1.1129+2	1.5423+2	5.4675–4
	2.6250–5	1.5878–8	1.2775+7		2.6920+9	1.6600+9	3.9739+8	6.3467+8	5.2619+3	2.9230+2	1.1784+2	1.7446+2	5.8231–4
	2.7321–5	1.5846–8	1.2801+7		2.6975+9	1.6275+9	4.0374+8	6.6628+8	5.2984+3	3.0491+2	1.2082+2	1.8409+2	6.0617–4
	3.0000–5	1.5720–8	1.2904+7		2.7192+9	1.5540+9	4.1869+8	7.4650+8	5.3848+3	3.3696+2	1.2805+2	2.0891+2	6.6643–4
	3.5000–5	1.5588–8	1.3012+7		2.7421+9	1.4402+9	4.4035+8	8.6154+8	5.5302+3	3.8249+2	1.3937+2	2.4312+2	7.8100–4
	4.0000–5	1.5579–8	1.3020+7		2.7438+9	1.3484+9	4.5273+8	9.4262+8	5.6593+3	4.1635+2	1.4815+2	2.6820+2	8.9806–4
	5.0000–5	1.5738–8	1.2889+7		2.7160+9	1.2079+9	4.6050+8	1.0476+9	5.8604+3	4.6048+2	1.5903+2	3.0145+2	1.1265–3
N5	5.8260–5	1.6002–8	1.2676+7		2.6712+9	1.1202+9	4.5773+8	1.0933+9	5.9950+3	4.7984+2	1.6418+2	3.1567+2	1.3156–3
	6.0000–5	1.6065–8	1.2626+7		2.6607+9	1.1041+9	4.5741+8	1.0991+9	6.0212+3	4.8316+2	1.6555+2	3.1761+2	1.3559–3
N4	6.0040–5	1.6068–8	1.2624+7		2.6602+9	1.1037+9	4.5737+8	1.0991+9	6.0218+3	4.8317+2	1.6556+2	3.1761+2	1.3568–3
	6.2535–5	1.6216–8	1.2508+7		2.6358+9	1.0818+9	4.5507+8	1.0990+9	6.0583+3	4.8462+2	1.6668+2	3.1794+2	1.4148–3
	6.4718–5	1.6341–8	1.2413+7		2.6158+9	1.0636+9	4.5330+8	1.0989+9	6.0893+3	4.8611+2	1.6788+2	3.1823+2	1.4659–3
	6.5000–5	1.6356–8	1.2401+7		2.6133+9	1.0614+9	4.5309+8	1.0988+9	6.0932+3	4.8632+2	1.6805+2	3.1827+2	1.4725–3
	6.6628–5	1.6446–8	1.2334+7		2.5990+9	1.0485+9	4.5179+8	1.0987+9	6.1157+3	4.8741+2	1.6892+2	3.1849+2	1.5107–3
	6.8300–5	1.6536–8	1.2267+7		2.5850+9	1.0358+9	4.5055+8	1.0986+9	6.1382+3	4.8860+2	1.6989+2	3.1871+2	1.5501–3
	6.8516–5	1.6547–8	1.2258+7		2.5832+9	1.0342+9	4.5040+8	1.0986+9	6.1411+3	4.8876+2	1.7002+2	3.1874+2	1.5552–3
	7.2322–5	1.6741–8	1.2117+7		2.5533+9	1.0070+9	4.4794+8	1.0984+9	6.1906+3	4.9182+2	1.7256+2	3.1926+2	1.6454–3
	7.5054–5	1.6871–8	1.2023+7		2.5335+9	9.8871+8	4.4652+8	1.0983+9	6.2248+3	4.9438+2	1.7475+2	3.1963+2	1.7105–3
	7.7841–5	1.6997–8	1.1934+7		2.5148+9	9.7110+8	4.4553+8	1.0982+9	6.2586+3	4.9762+2	1.7761+2	3.2001+2	1.7772–3
	8.0000–5	1.7089–8	1.1869+7		2.5012+9	9.5809+8	4.4508+8	1.0981+9	6.2841+3	5.0059+2	1.8029+2	3.2030+2	1.8292–3
	8.2500–5	1.7248–8	1.1760+7		2.4783+9	9.4366+8	4.4346+8	1.0911+9	6.3102+3	5.0151+2	1.8303+2	3.1848+2	1.8884–3
	8.6875–5	1.7512–8	1.1583+7		2.4409+9	9.1992+8	4.4141+8	1.0796+9	6.3545+3	5.0430+2	1.8882+2	3.1547+2	1.9924–3
	9.3438–5	1.7885–8	1.1341+7		2.3899+9	8.8748+8	4.3892+8	1.0635+9	6.4173+3	5.0934+2	1.9803+2	3.1130+2	2.1497–3
	1.0000–4	1.8243–8	1.1119+7	0.0000+0	2.3430+9	8.5827+8	4.3601+8	1.0487+9	6.4764+3	5.1334+2	2.0583+2	3.0750+2	2.3083–3
	1.0625–4	1.8683–8	1.0857+7	1.2208–8	2.2878+9	8.3312+8	4.3029+8	1.0244+9	6.5247+3	5.1056+2	2.0987+2	3.0068+2	2.4578–3
	1.1719–4	1.9424–8	1.0443+7	3.3752–8	2.2005+9	7.9401+8	4.2023+8	9.8631+8	6.6034+3	5.0489+2	2.1488+2	2.9001+2	2.7217–3
N3	1.3421–4	2.0509–8	9.8904+6	6.7778–8	2.0842+9	7.4288+8	4.0541+8	9.3590+8	6.7140+3	4.9567+2	2.1972+2	2.7594+2	3.1379–3
	1.3618–4	2.0636–8	9.8296+6	7.1766–8	2.0714+9	7.3758+8	4.0347+8	9.3034+8	6.7260+3	4.9428+2	2.1987+2	2.7441+2	3.1866–3
	1.3964–4	2.0855–8	9.7264+6	7.8770–8	2.0496+9	7.2857+8	4.0018+8	9.2088+8	6.7467+3	4.9195+2	2.2015+2	2.7179+2	3.2719–3
	1.4482–4	2.1177–8	9.5782+6	8.9337–8	2.0184+9	7.1566+8	3.9546+8	9.0729+8	6.7768+3	4.8869+2	2.2064+2	2.6804+2	3.4004–3
N2	1.4553–4	2.1221–8	9.5585+6	9.0792–8	2.0143+9	7.1394+8	3.9483+8	9.0548+8	6.7809+3	4.8826+2	2.2071+2	2.6754+2	3.4181–3
	1.4776–4	2.1358–8	9.4973+6	9.5376–8	2.0013+9	7.0862+8	3.9289+8	8.9983+8	6.7936+3	4.8696+2	2.2096+2	2.6600+2	3.4737–3
	1.5000–4	2.1493–8	9.4374+6	9.9971–8	1.9887+9	7.0342+8	3.9100+8	8.9431+8	6.8061+3	4.8571+2	2.2123+2	2.6448+2	3.5294–3
	1.5625–4	2.1951–8	9.2404+6	1.1293–7	1.9472+9	6.8947+8	3.8463+8	8.7311+8	6.8386+3	4.7897+2	2.2058+2	2.5839+2	3.6858–3
	1.6250–4	2.2400–8	9.0552+6	1.2606–7	1.9082+9	6.7632+8	3.7865+8	8.5322+8	6.8700+3	4.7274+2	2.2006+2	2.5268+2	3.8428–3
	1.6719–4	2.2731–8	8.9234+6	1.3603–7	1.8804+9	6.6695+8	3.7438+8	8.3908+8	6.8929+3	4.6835+2	2.1972+2	2.4862+2	3.9610–3
	1.7500–4	2.3272–8	8.7159+6	1.5283–7	1.8367+9	6.5217+8	3.6766+8	8.1686+8	6.9298+3	4.6153+2	2.1928+2	2.4225+2	4.1588–3
	1.8125–4	2.3698–8	8.5593+6	1.6645–7	1.8037+9	6.4104+8	3.6247+8	8.0019+8	6.9582+3	4.5626+2	2.1879+2	2.3747+2	4.3178–3
	1.8359–4	2.3856–8	8.5028+6	1.7160–7	1.7918+9	6.3701+8	3.6059+8	7.9417+8	6.9687+3	4.5436+2	2.1862+2	2.3574+2	4.3775–3
N1	1.9104–4	2.4350–8	8.3301+6	1.8809–7	1.7554+9	6.2470+8	3.5484+8	7.7583+8	7.0011+3	4.4863+2	2.1814+2	2.3049+2	4.5680–3
	1.9328–4	2.4498–8	8.2798+6	1.9309–7	1.7448+9	6.2114+8	3.5317+8	7.7048+8	7.0077+3	4.4697+2	2.1800+2	2.2896+2	4.6253–3
	2.0000–4	2.4936–8	8.1344+6	2.0821–7	1.7142+9	6.1081+8	3.4833+8	7.5501+8	7.0272+3	4.4221+2	2.1765+2	2.2456+2	4.7975–3
	2.0625–4	2.5358–8	7.9989+6	2.2243–7	1.6856+9	6.0165+8	3.4316+8	7.4078+8	7.0447+3	4.3688+2	2.1645+2	2.2043+2	4.9580–3
	2.1797–4	2.6134–8	7.7614+6	2.4954–7	1.6356+9	5.8556+8	3.3409+8	7.1591+8	7.0763+3	4.2767+2	2.1445+2	2.1321+2	5.2601–3
	2.2500–4	2.6590–8	7.6284+6	2.6608–7	1.6075+9	5.7651+8	3.2901+8	7.0199+8	7.0945+3	4.2257+2	2.1339+2	2.0918+2	5.4419–3
	2.3848–4	2.7446–8	7.3906+6	2.9831–7	1.5574+9	5.6028+8	3.1993+8	6.7720+8	7.1280+3	4.1355+2	2.1155+2	2.0200+2	5.7918–3
	2.5000–4	2.8159–8	7.2034+6	3.2642–7	1.5180+9	5.4745+8	3.1278+8	6.5773+8	7.1554+3	4.0656+2	2.1020+2	1.9636+2	6.0922–3
	2.6250–4	2.8920–8	7.0139+6	3.5745–7	1.4780+9	5.3450+8	3.0533+8	6.3819+8	7.1837+3	3.9911+2	2.0840+2	1.9070+2	6.4193–3
	2.6924–4	2.9323–8	6.9174+6	3.7441–7	1.4577+9	5.2790+8	3.0153+8	6.2827+8	7.1985+3	3.9533+2	2.0749+2	1.8783+2	6.5962–3
	3.0000–4	3.1106–8	6.5209+6	4.5376–7	1.3741+9	5.0060+8	2.8591+8	5.8763+8	7.2618+3	3.8013+2	2.0404+2	1.7608+2	7.4080–3
	3.5000–4	3.4106–8	5.9473+6	5.8992–7	1.2533+9	4.6433+8	2.6228+8	5.2665+8	7.3447+3	3.5459+2	1.9637+2	1.5820+2	8.7394–3
	4.0000–4	3.6926–8	5.4931+6	7.3497–7	1.1576+9	4.3505+8	2.4354+8	4.7897+8	7.4173+3	3.3504+2	1.9079+2	1.4424+2	1.0085–2
	5.0000–4	4.2612–8	4.7602+6	1.0507–6	1.0031+9	3.9023+8	2.1271+8	4.0017+8	7.4688+3	2.9915+2	1.7818+2	1.2096+2	1.2769–2
	6.0000–4	4.7902–8	4.2344+6	1.4004–6	8.9232+8	3.5705+8	1.8968+8	3.4557+8	7.4873+3	2.7317+2	1.6840+2	1.0476+2	1.5413–2
M5	6.2931–4	4.9401–8	4.1060+6	1.5091–6	8.6524+8	3.4885+8	1.8378+8	3.3261+8	7.4848+3	2.6619+2	1.6528+2	1.0089+2	1.6170–2
	6.3464–4	4.9671–8	4.0836+6	1.5291–6	8.6054+8	3.4742+8	1.8276+8	3.3036+8	7.4843+3	2.6499+2	1.6475+2	1.0022+2	1.6308–2
	6.3981–4	4.9932–8	4.0623+6	1.5487–6	8.5605+8	3.4605+8	1.8178+8	3.2821+8	7.4839+3	2.6385+2	1.6425+2	9.9581+1	1.6442–2

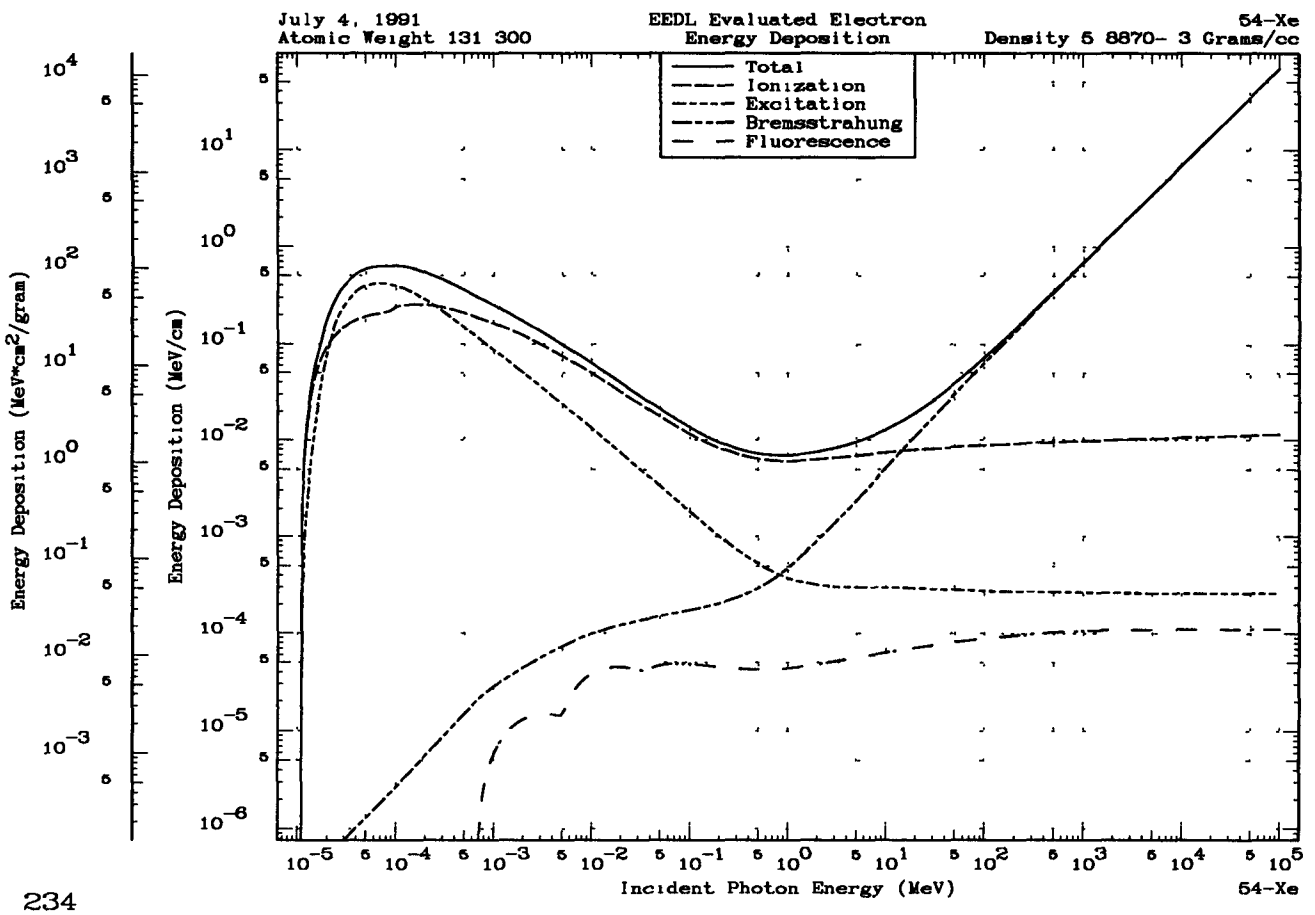
Atomic Weight 126.904 Density 4.930 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M4	6.4146–4	5.0015–8	4.0556+6	1.5549–6	8.5463+8	3.4562+8	1.8147+8	3.2753+8	7.4837+3	2.6349+2	1.6409+2	9.9379+1	1.6484–2
	6.4482–4	5.0184–8	4.0419+6	1.5677–6	8.5174+8	3.4474+8	1.8084+8	3.2616+8	7.4821+3	2.6275+2	1.6377+2	9.8970+1	1.6565–2
	6.5137–4	5.0514–8	4.0155+6	1.5927–6	8.4619+8	3.4304+8	1.7962+8	3.2352+8	7.4790+3	2.6134+2	1.6314+2	9.8183+1	1.6723–2
	6.5437–4	5.0664–8	4.0036+6	1.6042–6	8.4368+8	3.4228+8	1.7906+8	3.2233+8	7.4776+3	2.6071+2	1.6287+2	9.7827+1	1.6795–2
	6.5601–4	5.0747–8	3.9971+6	1.6105–6	8.4231+8	3.4186+8	1.7876+8	3.2168+8	7.4768+3	2.6037+2	1.6272+2	9.7633+1	1.6835–2
	6.5892–4	5.0892–8	3.9857+6	1.6217–6	8.3991+8	3.4112+8	1.7824+8	3.2054+8	7.4754+3	2.5977+2	1.6246+2	9.7293+1	1.6905–2
	6.6487–4	5.1189–8	3.9626+6	1.6446–6	8.3503+8	3.3963+8	1.7717+8	3.1823+8	7.4727+3	2.5856+2	1.6193+2	9.6605+1	1.7048–2
	6.6773–4	5.1331–8	3.9516+6	1.6557–6	8.3272+8	3.3892+8	1.7666+8	3.1713+8	7.4713+3	2.5799+2	1.6169+2	9.6277+1	1.7117–2
	6.6910–4	5.1399–8	3.9464+6	1.6610–6	8.3162+8	3.3859+8	1.7642+8	3.1661+8	7.4707+3	2.5772+2	1.6158+2	9.6123+1	1.7150–2
	6.7319–4	5.1602–8	3.9309+6	1.6769–6	8.2835+8	3.3758+8	1.7570+8	3.1506+8	7.4688+3	2.5691+2	1.6123+2	9.5661+1	1.7248–2
	6.8111–4	5.1993–8	3.9013+6	1.7078–6	8.2211+8	3.3566+8	1.7433+8	3.1211+8	7.4652+3	2.5539+2	1.6059+2	9.4781+1	1.7438–2
	6.8427–4	5.2149–8	3.8897+6	1.7202–6	8.1966+8	3.3491+8	1.7380+8	3.1095+8	7.4638+3	2.5479+2	1.6034+2	9.4436+1	1.7514–2
	6.9597–4	5.2723–8	3.8473+6	1.7664–6	8.1074+8	3.3215+8	1.7184+8	3.0674+8	7.4585+3	2.5261+2	1.5941+2	9.3180+1	1.7796–2
	7.1320–4	5.3561–8	3.7871+6	1.8350–6	7.9805+8	3.2822+8	1.6906+8	3.0077+8	7.4510+3	2.4953+2	1.5811+2	9.1401+1	1.8209–2
	7.2198–4	5.3985–8	3.7574+6	1.8703–6	7.9179+8	3.2627+8	1.6769+8	2.9782+8	7.4473+3	2.4801+2	1.5747+2	9.0523+1	1.8420–2
	7.5660–4	5.5637–8	3.6458+6	2.0115–6	7.6827+8	3.1890+8	1.6254+8	2.8681+8	7.4329+3	2.4235+2	1.5509+2	8.7242+1	1.9249–2
	7.6099–4	5.5845–8	3.6322+6	2.0296–6	7.6541+8	3.1801+8	1.6192+8	2.8548+8	7.4311+3	2.4167+2	1.5481+2	8.6846+1	1.9354–2
	8.0000–4	5.7667–8	3.5174+6	2.1930–6	7.4122+8	3.1035+8	1.5663+8	2.7423+8	7.4158+3	2.3593+2	1.5242+2	8.3494+1	2.0287–2
M3	8.6981–4	6.0873–8	3.3322+6	2.4955–6	7.0219+8	2.9796+8	1.4777+8	2.5646+8	7.3520+3	2.2564+2	1.4746+2	7.8162+1	2.1662–2
	8.8608–4	6.1607–8	3.2925+6	2.5680–6	6.9383+8	2.9528+8	1.4588+8	2.5266+8	7.3379+3	2.2349+2	1.4645+2	7.7027+1	2.1981–2
	9.0000–4	6.2229–8	3.2595+6	2.6305–6	6.8688+8	2.9304+8	1.4431+8	2.4952+8	7.3261+3	2.2172+2	1.4562+2	7.6086+1	2.2254–2
	9.1456–4	6.2878–8	3.2260+6	2.6965–6	6.7980+8	2.9076+8	1.4271+8	2.4632+8	7.3140+3	2.1990+2	1.4475+2	7.5129+1	2.2539–2
M2	9.2720–4	6.3437–8	3.1975+6	2.7541–6	6.7381+8	2.8882+8	1.4136+8	2.4362+8	7.3036+3	2.1836+2	1.4402+2	7.4321+1	2.2786–2
	9.3630–4	6.3838–8	3.1774+6	2.7959–6	6.6957+8	2.8745+8	1.4040+8	2.4171+8	7.2962+3	2.1728+2	1.4351+2	7.3750+1	2.2963–2
	9.5728–4	6.4758–8	3.1323+6	2.8930–6	6.6007+8	2.8436+8	1.3826+8	2.3743+8	7.2796+3	2.1488+2	1.4238+2	7.2471+1	2.3372–2
	9.6815–4	6.5231–8	3.1096+6	2.9437–6	6.5528+8	2.8280+8	1.3719+8	2.3528+8	7.2711+3	2.1368+2	1.4182+2	7.1829+1	2.3583–2
	1.0000–3	6.6605–8	3.0454+6	3.0940–6	6.4175+8	2.7838+8	1.3415+8	2.2922+8	7.2468+3	2.1031+2	1.4027+2	7.0019+1	2.4202–2
M1	1.0554–3	6.8943–8	2.9422+6	3.3612–6	6.2000+8	2.7114+8	1.2905+8	2.1979+8	7.1845+3	2.0430+2	1.3710+2	6.7181+1	2.5030–2
	1.0625–3	6.9240–8	2.9295+6	3.3960–6	6.1733+8	2.7026+8	1.2843+8	2.1864+8	7.1766+3	2.0355+2	1.3669+2	6.6835+1	2.5133–2
	1.0693–3	6.9524–8	2.9175+6	3.4295–6	6.1481+8	2.6942+8	1.2783+8	2.1756+8	7.1691+3	2.0284+2	1.3630+2	6.6508+1	2.5233–2
	1.0962–3	7.0643–8	2.8713+6	3.5631–6	6.0508+8	2.6617+8	1.2553+8	2.1337+8	7.1399+3	2.0010+2	1.3482+2	6.5248+1	2.5625–2
	1.1250–3	7.1827–8	2.8240+6	3.7080–6	5.9510+8	2.6282+8	1.2319+8	2.0909+8	7.1096+3	1.9731+2	1.3333+2	6.3960+1	2.6043–2
	1.1467–3	7.2711–8	2.7897+6	3.8185–6	5.8786+8	2.6038+8	1.2149+8	2.0599+8	7.0874+3	1.9528+2	1.3222+2	6.3028+1	2.6357–2
	1.1909–3	7.4492–8	2.7230+6	4.0469–6	5.7381+8	2.5562+8	1.1819+8	1.9999+8	7.0435+3	1.9136+2	1.3010+2	6.1224+1	2.6995–2
	1.2500–3	7.6837–8	2.6399+6	4.3600–6	5.5630+8	2.4964+8	1.1410+8	1.9255+8	6.9877+3	1.8654+2	1.2753+2	5.8988+1	2.7845–2
	1.2681–3	7.7547–8	2.6157+6	4.4576–6	5.5121+8	2.4789+8	1.1291+8	1.9040+8	6.9712+3	1.8514+2	1.2678+2	5.8339+1	2.8105–2
	1.2813–3	7.8058–8	2.5986+6	4.5286–6	5.4760+8	2.4665+8	1.1207+8	1.8887+8	6.9595+3	1.8416+2	1.2625+2	5.7881+1	2.8292–2
	1.3125–3	7.9267–8	2.5589+6	4.6993–6	5.3924+8	2.4376+8	1.1013+8	1.8535+8	6.9320+3	1.8188+2	1.2503+2	5.6821+1	2.8738–2
	1.3750–3	8.1653–8	2.4842+6	5.0471–6	5.2349+8	2.3829+8	1.0647+8	1.7873+8	6.8793+3	1.7756+2	1.2270+2	5.4831+1	2.9626–2
	1.3841–3	8.1995–8	2.4738+6	5.0983–6	5.2130+8	2.3752+8	1.0596+8	1.7781+8	6.8718+3	1.7697+2	1.2238+2	5.4555+1	2.9755–2
	1.5000–3	8.6298–8	2.3505+6	5.7666–6	4.9531+8	2.2837+8	9.9958+7	1.6697+8	6.7817+3	1.7000+2	1.1867+2	5.1298+1	3.1389–2
	1.7500–3	9.5473–8	2.1246+6	7.3028–6	4.4771+8	2.1158+8	8.8940+7	1.4719+8	6.5920+3	1.5568+2	1.1034+2	4.5308+1	3.4552–2
	2.0000–3	1.0416–7	1.9475+6	8.9682–6	4.1038+8	1.9803+8	8.0399+7	1.3195+8	6.4320+3	1.4469+2	1.0396+2	4.0698+1	3.7657–2
	2.2500–3	1.1284–7	1.7976+6	1.0760–5	3.7880+8	1.8626+8	7.3323+7	1.1922+8	6.2533+3	1.3453+2	9.7670+1	3.6822+1	4.0197–2
	2.5000–3	1.2118–7	1.6739+6	1.2677–5	3.5273+8	1.7632+8	6.7532+7	1.0888+8	6.0977+3	1.2630+2	9.2580+1	3.3674+1	4.2694–2
	2.6250–3	1.2524–7	1.6196+6	1.3681–5	3.4131+8	1.7190+8	6.5007+7	1.0440+8	6.0269+3	1.2269+2	9.0340+1	3.2311+1	4.3927–2
	3.0000–3	1.3700–7	1.4805+6	1.6857–5	3.1199+8	1.6036+8	5.8576+7	9.3054+7	5.8375+3	1.1358+2	8.4669+1	2.8860+1	4.7569–2
	3.5000–3	1.5221–7	1.3327+6	2.1477–5	2.8083+8	1.4757+8	5.1762+7	8.1490+7	5.5900+3	1.0305+2	7.7679+1	2.5321+1	5.1658–2
	4.0000–3	1.6666–7	1.2171+6	2.6529–5	2.5648+8	1.3732+8	4.6510+7	7.2641+7	5.3840+3	9.5016+1	7.2347+1	2.2613+1	5.5636–2
L3	4.5545–3	1.8233–7	1.1125+6	3.2611–5	2.3444+8	1.2761+8	4.1849+7	6.4972+7	5.1740+3	8.7405+1	6.7089+1	2.0257+1	5.9548–2
	4.6659–3	1.8540–7	1.0941+6	3.3895–5	2.3055+8	1.2588+8	4.1035+7	6.3632+7	5.1317+3	8.6086+1	6.6180+1	1.9846+1	6.0217–2
L2	4.8575–3	1.9063–7	1.0641+6	3.6150–5	2.2423+8	1.2305+8	3.9714+7	6.1461+7	5.0621+3	8.3946+1	6.4704+1	1.9180+1	6.1359–2
	5.0000–3	1.9447–7	1.0430+6	3.7862–5	2.1980+8	1.2105+8	3.8791+7	5.9944+7	5.0120+3	8.2464+1	6.3686+1	1.8716+1	6.2187–2
L1	5.1619–3	1.9885–7	1.0201+6	3.9846–5	2.1496+8	1.1883+8	3.7791+7	5.8325+7	4.9574+3	8.0761+1	6.2481+1	1.8217+1	6.3121–2
	5.2500–3	2.0122–7	1.0080+6	4.0943–5	2.1243+8	1.1767+8	3.7270+7	5.7481+7	4.9285+3	7.9878+1	6.1857+1	1.7957+1	6.3621–2
	5.3714–3	2.0446–7	9.9206+5	4.2474–5	2.0906+8	1.1611+8	3.6577+7	5.6360+7	4.8896+3	7.8705+1	6.1029+1	1.7612+1	6.4308–2
	5.5000–3	2.0787–7	9.7579+5	4.4120–5	2.0563+8	1.1452+8	3.5875+7	5.5223+7	4.8498+3	7.7518+1	6.0190+1	1.7262+1	6.5031–2
	5.6250–3	2.1116–7	9.6060+5	4.5745–5	2.0243+8	1.1304+8	3.5220+7	5.4164+7	4.8122+3	7.6410+1	5.9408+1	1.6936+1	6.5731–2
	5.6857–3	2.1275–7	9.5342+5	4.6542–5	2.0091+8	1.1233+8	3.4911+7	5.3665+7	4.7944+3	7.5889+1	5.9040+1	1.6783+1	6.6069–2
	6.0000–3	2.2089–7	9.1830+5	5.0754–5	1.9351+8	1.0887+8	3.3406+7	5.1235+7	4.7060+3	7.3352+1	5.7249+1	1.6035+1	6.7810–2
	6.5000–3	2.3375–7	8.6776+5	5.7754–5	1.8286+8	1.0378+8	3.1261+7	4.7822+7	4.5630+3	6.9540+1	5.4488+1	1.4982+1	7.0033–2
	7.2500–3	2.5247–7	8.0341+5	6.8929–5	1.6930+8	9.7209+7	2.8558+7	4.3530+7	4.3749+3	6.4742+1	5.1012+1	1.3657+1	7.3306–2
	8.0000–3	2.7059–7	7.4962+5	8.0883–5	1.5797+8	9.1647+7	2.6323+7	3.9991+7	4.2120+3	6.0789+1	4.8148+1	1.2565+1	7.6508–2
	9.0000–3	2.9463–7	6.8847+5	9.7993–5	1.4508+8	8.5084+7	2.3859+7	3.6133+7	4.0098+3	5.6162+1	4.4712+1	1.1370+1	7.9981–2
	1.0000–2	3.1788–7	6.3810+5	1.1642–4	1.3447+8	7.9613+7	2.1851+7	3.2999+7	3.8372+3	5.2397+1	4.1914+1	1.0399+1	8.3377–2
	1.1250–2	3.4646–7	5.8547+5	1.4126–4	1.2337+8	7.3748+7	1.9797+7	2.9827+7	3.6353+3	4.8300+1	3.8801+1	9.4125+0	8.6398–2
	1.3125–2	3.8770–7	5.2319+5	1.8215–4	1.1025+8	6.6719+7	1.7399+7	2.6131+7	3.3871+3	4.3509+1	3.5155+1	8.2634+0	9.0851–2
	1.5000–2	4.2728–7	4.7472+5	2.2717–4	1.0004+8	6.1175+7	1.5558+7	2.3301+7	3.1858+3	3.9829+1	3.2350+1	7.3842+0	9.5188–2
	1.7500–2	4.7854–7	4.2388+5	2.9333–4	8.9323+7	5.5217+7	1.3677+7	2.0427+7	2.9569+3	3.5816+1	2.9231+1	6.4862+0	9.9164–2
	2.0000–2	5.2779–7	3.8432+5	3.6632–4	8.0987+7	5.0527+7	1.2232+7	1.8225+7	2.7720+3	3.2734+1	2.6832+1	5.7987+0	1.0310–1
	2.5000–2	6.2191–7	3.2616+5	5.3118–4	6.8731+7	4.3497+7	1.0169+7	1.5062+7	2.4699+3	2.8045+1	2.3131+1	4.8060+0	1.0826–1
	3.0000–2	7.1094–7	2.8531+5	7.2065–4	6.0123+7	3.8486+7	8.7456+6	1.2889+7	2.2476+3	2.4799+1	2.0561+1	4.1245+0	1.1344–1
K	3.3164–2	7.6553–7	2.6496+5	8.5266–4	5.5836+7	3.5942+7	8.0592+6	1.1832+7	2.1314+3	2.3157+1	1.9250+1	3.7912+0	1.1602–1
	3.3591–2	7.7283–7	2.6246+5	8.7119–4	5.5309+7	3.5627+7	7.9764+6	1.1703+7	2.1167+3	2.2957+1	1.9090+1	3.7505+0	1.1631–1
	3.4392–2	7.8645–7	2.5792+5	9.0636–4	5.4351+7	3.5053+7	7.8261+6	1.1470+7	2.0899+3	2.2593+1	1.8799+1	3.6769+0	1.1685–1
	3.5794–2	8.1007–7	2.5040+5	9.6926–4	5.2766+7	3.4101+7	7.5777+6	1.1085+7	2.0453+3	2.1991+1	1.8318+1	3.5554+0	1.1779–1
	3.7897–2	8.4505–7	2.4003+5	1.0667–3	5.0582+7	3.2786+7	7.2366+6	1.0557+7	1.9832+3	2.1165+1	1.7657+1	3.3890+0	1.1922–1
	4.0000–2	8.7952–7	2.3063+5	1.1679–3	4.8600+7	3.1589+7	6.9280+6	1.0081+7	1.9262+3	2.0418+1	1.7058+1	3.2388+0	1.2065–1
	4.2500–2	9.1975–7	2.2054+5	1.2928–3	4.6474+7	3.0296+7	6.6037+6	9.5718+6	1.8655+3	1.9605+1	1.6405+1	3.0777+0	1.2210–1
	4.6250–2	9.7894–7	2.0720+5	1.4895–3	4.3664+7	2.8581+7	6.1767+6	8.9048+6	1.7842+3	1.8535+1	1.5544+1	2.8666+0	1.2430–1

Atomic Weight 126.904 Density 4.930 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000–2	1.0368–6	1.9563+5	1.6971–3	4.1226+7	2.7085+7	5.8076+6	8.3310+6	1.7123+3	1.7609+1	1.4798+1	2.6850+0	1.2652–1
5.5000–2	1.1120–6	1.8242+5	1.9899–3	3.8441+7	2.5363+7	5.3964+6	7.6799+6	1.6228+3	1.6546+1	1.3939+1	2.4783+0	1.2892–1
6.0000–2	1.1852–6	1.7114+5	2.3007–3	3.6064+7	2.3886+7	5.0466+6	7.1300+6	1.5451+3	1.5641+1	1.3206+1	2.3038+0	1.3134–1
7.0000–2	1.3249–6	1.5310+5	2.9717–3	3.2262+7	2.1508+7	4.5022+6	6.2507+6	1.4162+3	1.4190+1	1.2031+1	2.0236+0	1.3535–1
8.0000–2	1.4590–6	1.3903+5	3.7060–3	2.9297+7	1.9640+7	4.0786+6	5.5771+6	1.3132+3	1.3063+1	1.1114+1	1.8091+0	1.3939–1
1.0000–1	1.7041–6	1.1903+5	5.3403–3	2.5083+7	1.6945+7	3.4884+6	4.6485+6	1.1627+3	1.1448+1	9.7899+0	1.5124+0	1.4613–1
1.2500–1	1.9667–6	1.0314+5	7.6590–3	2.1734+7	1.4816+7	3.0239+6	3.8928+6	1.0431+3	1.0142+1	8.7188+0	1.2699+0	1.5286–1
1.5000–1	2.2105–6	9.1760+4	1.0245–2	1.9337+7	1.3277+7	2.6909+6	3.3675+6	9.5452+2	9.2107+0	7.9494+0	1.1015+0	1.5981–1
2.0000–1	2.6182–6	7.7473+4	1.6043–2	1.6326+7	1.1342+7	2.2902+6	2.6928+6	8.4277+2	8.0607+0	7.0048+0	8.8405–1	1.7189–1
3.0000–1	3.2833–6	6.1780+4	2.9404–2	1.3019+7	9.0818+6	1.8932+6	2.0432+6	7.2312+2	6.9363+0	6.0666+0	6.7429–1	1.9540–1
4.0000–1	3.8451–6	5.2753+4	4.4391–2	1.1117+7	7.7091+6	1.7002+6	1.7066+6	6.6246+2	6.4158+0	5.6303+0	5.6527–1	2.2023–1
5.0000–1	4.3335–6	4.6807+4	6.0305–2	9.8636+6	6.7663+6	1.5891+6	1.5075+6	6.2697+2	6.1534+0	5.4061+0	5.0077–1	2.4656–1
6.0000–1	4.7578–6	4.2633+4	7.6761–2	8.9840+6	6.0804+6	1.5178+6	1.3852+6	6.0580+2	6.0007+0	5.2654+0	4.6123–1	2.7414–1
8.0000–1	5.4855–6	3.6977+4	1.1037–1	7.7922+6	5.1367+6	1.4352+6	1.2197+6	5.8388+2	5.9014+0	5.1601+0	4.0766–1	3.3359–1
1.0000+0	6.0808–6	3.3357+4	1.4427–1	7.0294+6	4.5087+6	1.3899+6	1.1302+6	5.7370+2	5.8973+0	5.1213+0	3.7886–1	3.9713–1
1.5000+0	7.1612–6	2.8325+4	2.2746–1	5.9689+6	3.5955+6	1.3416+6	1.0312+6	5.6719+2	6.1246+0	5.2078+0	3.4749–1	5.6935–1
2.0000+0	7.9118–6	2.5638+4	3.0739–1	5.4026+6	3.0892+6	1.3237+6	9.8909+5	5.7030+2	6.3895+0	5.2988+0	3.3419–1	7.5650–1
3.0000+0	8.9032–6	2.2783+4	4.5738–1	4.8010+6	2.5512+6	1.3063+6	9.4297+5	5.7938+2	6.9520+0	5.4798+0	3.2042–1	1.1518+0
4.0000+0	9.5250–6	2.1296+4	5.9573–1	4.4876+6	2.2664+6	1.3039+6	9.1668+5	5.8797+2	7.5112+0	5.6294+0	3.1197–1	1.5698+0
5.0000+0	9.9324–6	2.0422+4	7.2407–1	4.3035+6	2.0929+6	1.3024+6	9.0763+5	5.9505+2	8.0794+0	5.7697+0	3.0937–1	2.0004+0
6.0000+0	1.0212–5	1.9864+4	8.4377–1	4.1858+6	1.9834+6	1.3018+6	9.0003+5	6.0061+2	8.6352+0	5.8787+0	3.0727–1	2.4492+0
8.0000+0	1.0584–5	1.9165+4	1.0619+0	4.0386+6	1.8494+6	1.3010+6	8.8750+5	6.0950+2	9.7228+0	6.0605+0	3.0395–1	3.3583+0
1.0000+1	1.0786–5	1.8806+4	1.2568+0	3.9629+6	1.7827+6	1.3023+6	8.7733+5	6.1400+2	1.0820+1	6.2092+0	3.0142–1	4.3092+0
1.5000+1	1.0892–5	1.8622+4	1.6701+0	3.9242+6	1.7439+6	1.3045+6	8.7519+5	6.2618+2	1.3477+1	6.4290+0	3.0084–1	6.7467+0
2.0000+1	1.0877–5	1.8649+4	2.0081+0	3.9299+6	1.7437+6	1.3062+6	8.7938+5	6.3565+2	1.6191+1	6.6104+0	3.0243–1	9.2780+0
3.0000+1	1.0861–5	1.8676+4	2.5415+0	3.9356+6	1.7429+6	1.3071+6	8.8497+5	6.4615+2	2.1561+1	6.7997+0	3.0465–1	1.4457+1
4.0000+1	1.0850–5	1.8695+4	2.9547+0	3.9397+6	1.7423+6	1.3081+6	8.8864+5	6.5648+2	2.7043+1	6.9499+0	3.0622–1	1.9787+1
5.0000+1	1.0842–5	1.8708+4	3.2913+0	3.9423+6	1.7418+6	1.3084+6	8.9135+5	6.6461+2	3.2552+1	7.0500+0	3.0746–1	2.5195+1
6.0000+1	1.0837–5	1.8717+4	3.5748+0	3.9443+6	1.7415+6	1.3087+6	8.9345+5	6.7079+2	3.8136+1	7.1320+0	3.0849–1	3.0695+1
8.0000+1	1.0836–5	1.8720+4	4.0343+0	3.9448+6	1.7409+6	1.3091+6	8.9418+5	6.8074+2	4.9405+1	7.2623+0	3.0935–1	4.1833+1
1.0000+2	1.0833–5	1.8725+4	4.3985+0	3.9459+6	1.7405+6	1.3093+6	8.9542+5	6.8864+2	6.0797+1	7.3684+0	3.0984–1	5.3118+1
1.5000+2	1.0827–5	1.8734+4	5.0729+0	3.9478+6	1.7396+6	1.3095+6	8.9796+5	7.0277+2	8.9312+1	7.4856+0	3.1073–1	8.1516+1
2.0000+2	1.0824–5	1.8740+4	5.5580+0	3.9492+6	1.7391+6	1.3096+6	8.9983+5	7.1237+2	1.1817+2	7.5939+0	3.1139–1	1.1026+2
3.0000+2	1.0819–5	1.8749+4	6.2477+0	3.9510+6	1.7382+6	1.3097+6	9.0235+5	7.2362+2	1.7561+2	7.7686+0	3.1228–1	1.6753+2
4.0000+2	1.0826–5	1.8737+4	6.7400+0	3.9484+6	1.7377+6	1.3097+6	9.0027+5	7.3109+2	2.3334+2	7.8425+0	3.1157–1	2.2519+2
5.0000+2	1.0838–5	1.8715+4	7.1227+0	3.9438+6	1.7372+6	1.3097+6	8.9609+5	7.3683+2	2.9151+2	7.9125+0	3.1015–1	2.8329+2
6.0000+2	1.0842–5	1.8708+4	7.4359+0	3.9423+6	1.7368+6	1.3097+6	8.9496+5	7.4182+2	3.4874+2	7.9716+0	3.0977–1	3.4046+2
8.0000+2	1.0851–5	1.8693+4	7.9313+0	3.9392+6	1.7363+6	1.3098+6	8.9249+5	7.4978+2	4.6418+2	8.0843+0	3.0895–1	4.5579+2
1.0000+3	1.0858–5	1.8681+4	8.3160+0	3.9367+6	1.7358+6	1.3098+6	8.9036+5	7.5622+2	5.7979+2	8.1828+0	3.0825–1	5.7130+2
1.5000+3	1.0869–5	1.8661+4	9.0149+0	3.9325+6	1.7350+6	1.3098+6	8.8698+5	7.6822+2	8.7064+2	8.2708+0	3.0708–1	8.6207+2
2.0000+3	1.0878–5	1.8647+4	9.5107+0	3.9295+6	1.7344+6	1.3098+6	8.8454+5	7.7702+2	1.1603+3	8.3579+0	3.0624–1	1.1517+3
3.0000+3	1.0886–5	1.8634+4	1.0209+1	3.9267+6	1.7336+6	1.3098+6	8.8252+5	7.9026+2	1.7423+3	8.5248+0	3.0554–1	1.7335+3
4.0000+3	1.0891–5	1.8624+4	1.0704+1	3.9247+6	1.7330+6	1.3098+6	8.8110+5	7.9988+2	2.3240+3	8.5996+0	3.0505–1	2.3151+3
5.0000+3	1.0899–5	1.8610+4	1.1088+1	3.9218+6	1.7326+6	1.3098+6	8.7859+5	8.0743+2	2.9100+3	8.6558+0	3.0418–1	2.9010+3
6.0000+3	1.0900–5	1.8610+4	1.1402+1	3.9216+6	1.7322+6	1.3098+6	8.7880+5	8.1297+2	3.4866+3	8.7119+0	3.0425–1	3.4775+3
8.0000+3	1.0902–5	1.8606+4	1.1897+1	3.9208+6	1.7316+6	1.3098+6	8.7859+5	8.2180+2	4.6496+3	8.8200+0	3.0418–1	4.6405+3
1.0000+4	1.0903–5	1.8603+4	1.2280+1	3.9203+6	1.7312+6	1.3098+6	8.7845+5	8.2871+2	5.8234+3	8.9194+0	3.0413–1	5.8142+3
1.5000+4	1.0906–5	1.8599+4	1.2978+1	3.9194+6	1.7304+6	1.3098+6	8.7839+5	8.4208+2	8.6966+3	8.9999+0	3.0411–1	8.6873+3
2.0000+4	1.0909–5	1.8594+4	1.3474+1	3.9183+6	1.7298+6	1.3098+6	8.7785+5	8.5171+2	1.1607+4	9.0804+0	3.0392–1	1.1598+4
3.0000+4	1.0911–5	1.8590+4	1.4174+1	3.9176+6	1.7290+6	1.3098+6	8.7791+5	8.6524+2	1.7369+4	9.2413+0	3.0395–1	1.7360+4
4.0000+4	1.0913–5	1.8586+4	1.4670+1	3.9167+6	1.7284+6	1.3098+6	8.7758+5	8.7495+2	2.3194+4	9.3394+0	3.0383–1	2.3185+4
5.0000+4	1.0921–5	1.8574+4	1.5055+1	3.9141+6	1.7280+6	1.3098+6	8.7548+5	8.8241+2	2.8965+4	9.3912+0	3.0311–1	2.8955+4
6.0000+4	1.0919–5	1.8577+4	1.5370+1	3.9146+6	1.7276+6	1.3098+6	8.7636+5	8.8850+2	3.4731+4	9.4430+0	3.0341–1	3.4721+4
8.0000+4	1.0920–5	1.8575+4	1.5867+1	3.9142+6	1.7270+6	1.3098+6	8.7649+5	8.9820+2	4.6364+4	9.5466+0	3.0346–1	4.6354+4
1.0000+5	1.0922–5	1.8573+4	1.6251+1	3.9138+6	1.7266+6	1.3098+6	8.7649+5	9.0574+2	5.8017+4	9.6481+0	3.0346–1	5.8008+4


July 4, 1991
Atomic Weight 131 300
EEDL Evaluated Electron
Cross Sections
54-Xe
Density 5 8870- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
54-Xe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EEDL Evaluated Electron
Energy Deposition
54-Xe
Density 5 8870- 3 Grams/cc
Total
Ionization
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Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
54-Xe

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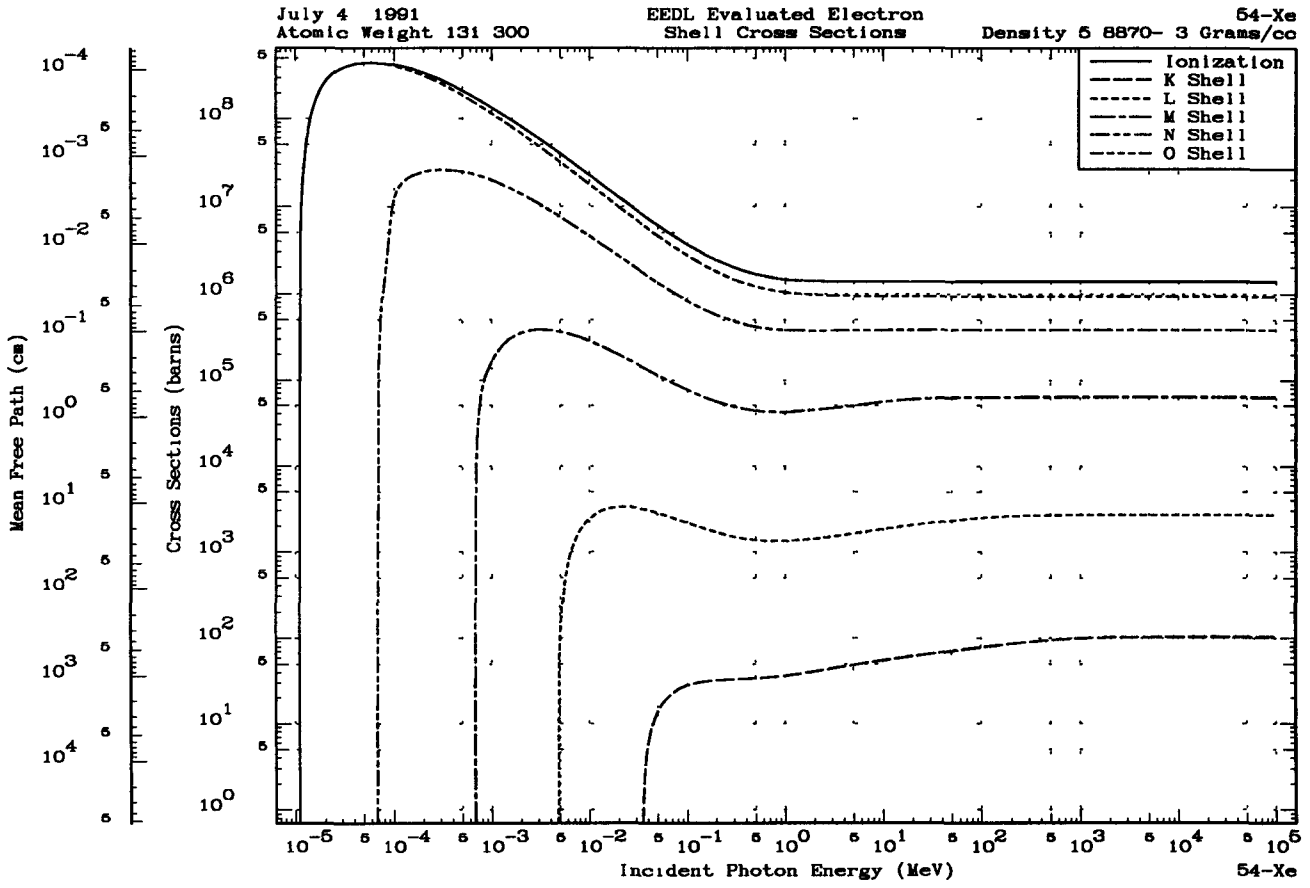
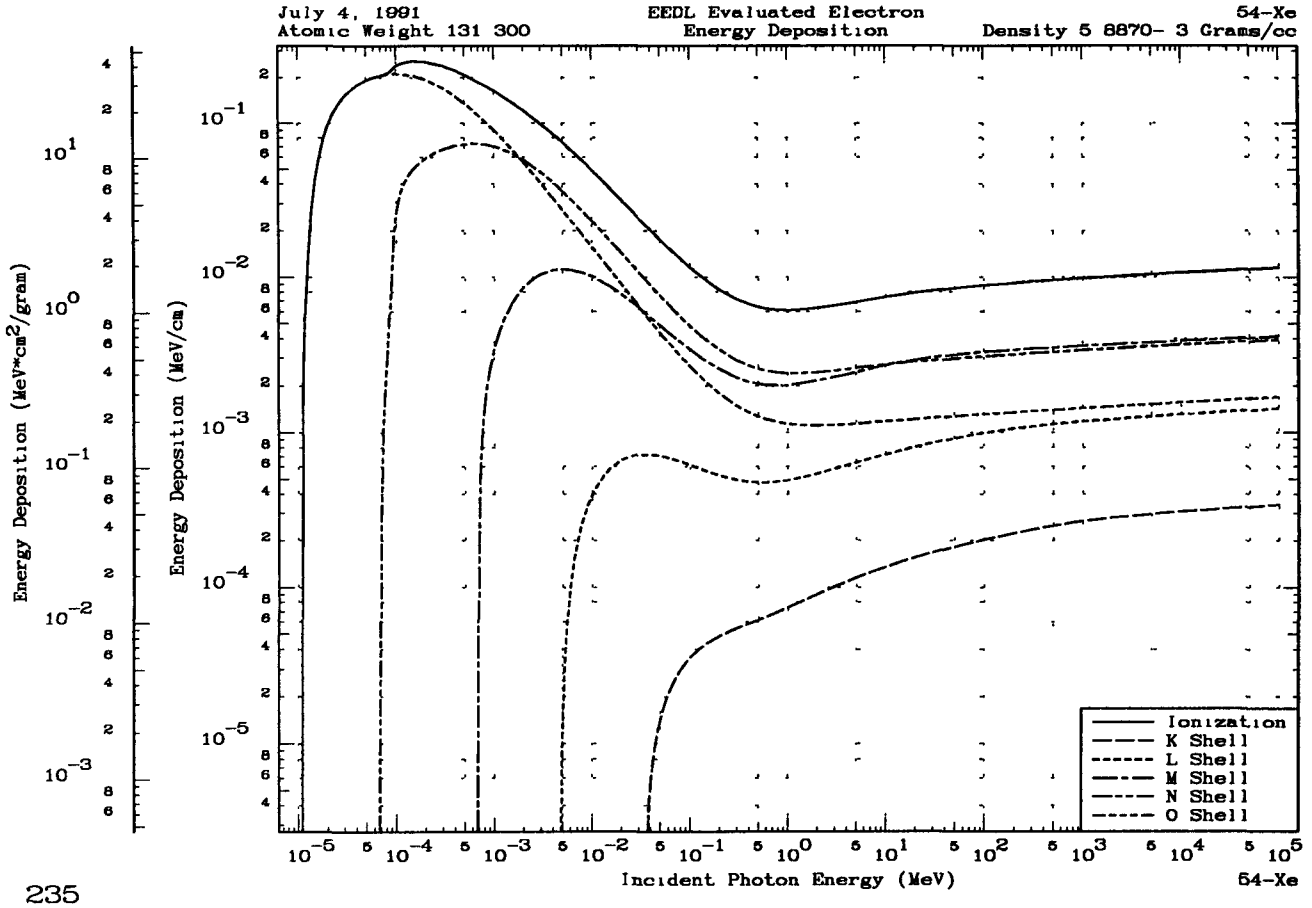

July 4 1991
Atomic Weight 131 300
EEDL Evaluated Electron
Shell Cross Sections
54-Xe
Density 5 8870- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
54-Xe


July 4, 1991
Atomic Weight 131 300
EEDL Evaluated Electron
Energy Deposition
54-Xe
Density 5 8870- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
54-Xe

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Atomic Weight 131.300 Density 5.8870– 3 Grams/cc

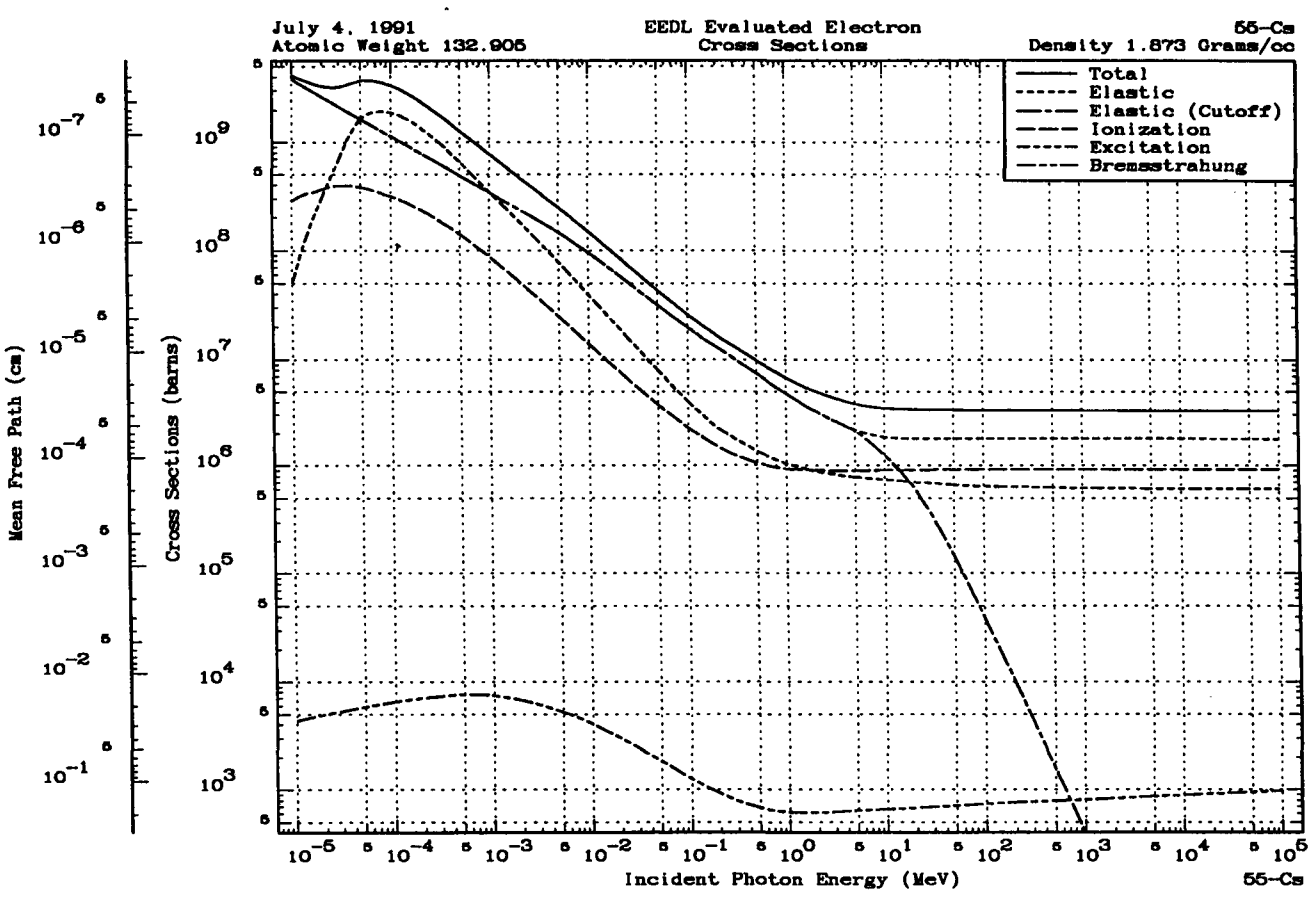
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	1.4082–5	1.2062+7		2.6300+9	2.6300+9			4.3641+3	2.5446–7			2.5446–7
O3 1.0960–5	1.4729–5	1.1533+7		2.5145+9	2.5145+9	0.0000+0	0.0000+0	4.4452+3	2.7795–7	0.0000+0	0.0000+0	2.7795–7
1.1086–5	1.4792–5	1.1484+7		2.5038+9	2.5005+9	2.9532+6	3.4601+5	4.4554+3	9.7947–4	8.7649–4	1.0270–4	2.8106–7
1.1331–5	1.4910–5	1.1393+7		2.4839+9	2.4739+9	8.9327+6	1.1214+6	4.4750+3	3.0008–3	2.6658–3	3.3476–4	2.8711–7
1.1789–5	1.5116–5	1.1237+7		2.4500+9	2.4263+9	2.0790+7	2.9418+6	4.5107+3	7.1560–3	6.2680–3	8.8768–4	2.9849–7
O2 1.2350–5	1.5354–5	1.1063+7		2.4121+9	2.3717+9	3.4627+7	5.8073+6	4.5531+3	1.2341–2	1.0566–2	1.7752–3	3.1252–7
1.2516–5	1.5401–5	1.1029+7		2.4047+9	2.3563+9	4.1432+7	6.9708+6	4.5652+3	1.4860–2	1.2723–2	2.1371–3	3.1668–7
1.2592–5	1.5422–5	1.1014+7		2.4015+9	2.3493+9	4.4624+7	7.5782+6	4.5708+3	1.6060–2	1.3734–2	2.3265–3	3.1861–7
1.2826–5	1.5497–5	1.0961+7		2.3898+9	2.3282+9	5.2192+7	9.4462+6	4.5878+3	1.9107–2	1.6195–2	2.9120–3	3.2451–7
1.2894–5	1.5518–5	1.0946+7		2.3866+9	2.3221+9	5.4339+7	1.0061+7	4.5926+3	1.9999–2	1.6894–2	3.1051–3	3.2622–7
1.3098–5	1.5577–5	1.0905+7		2.3776+9	2.3044+9	6.1479+7	1.1728+7	4.6071+3	2.2863–2	1.9230–2	3.6328–3	3.3138–7
1.3573–5	1.5686–5	1.0829+7		2.3610+9	2.2645+9	7.9925+7	1.6619+7	4.6403+3	3.0501–2	2.5310–2	5.1908–3	3.4347–7
1.3796–5	1.5726–5	1.0801+7		2.3550+9	2.2465+9	8.8989+7	1.9483+7	4.6554+3	3.4422–2	2.8313–2	6.1089–3	3.4915–7
1.5000–5	1.5900–5	1.0684+7		2.3293+9	2.1563+9	1.3308+8	3.9907+7	4.7343+3	5.6225–2	4.3451–2	1.2774–2	3.8013–7
1.6250–5	1.5974–5	1.0634+7		2.3185+9	2.0735+9	1.7275+8	7.2313+7	4.8110+3	8.1146–2	5.7634–2	2.3511–2	4.1273–7
1.7500–5	1.5934–5	1.0660+7		2.3243+9	1.9995+9	2.0996+8	1.1475+8	4.8832+3	1.0939–1	7.1504–2	3.7888–2	4.4576–7
1.8125–5	1.5858–5	1.0712+7		2.3355+9	1.9655+9	2.2718+8	1.4280+8	4.9177+3	1.2556–1	7.8056–2	4.7507–2	4.6243–7
2.0000–5	1.5589–5	1.0897+7		2.3758+9	1.8730+9	2.7116+8	2.3166+8	5.0159+3	1.7433–1	9.5507–2	7.8824–2	5.1301–7
2.2500–5	1.5125–5	1.1231+7		2.4486+9	1.7680+9	3.1444+8	3.6620+8	5.1230+3	2.4065–1	1.1370–1	1.2695–1	5.7657–7
O1 2.3610–5	1.4943–5	1.1367+7		2.4784+9	1.7268+9	3.2822+8	4.2337+8	5.1674+3	2.6802–1	1.2004–1	1.4797–1	6.0513–7
2.4009–5	1.4891–5	1.1407+7		2.4871+9	1.7127+9	3.3302+8	4.4142+8	5.1825+3	2.7684–1	1.2227–1	1.5458–1	6.1524–7
2.4758–5	1.4781–5	1.1492+7		2.5056+9	1.6871+9	3.4196+8	4.7649+8	5.2101+3	2.9389–1	1.2644–1	1.6745–1	6.3426–7
2.6069–5	1.4556–5	1.1669+7		2.5443+9	1.6450+9	3.5746+8	5.4176+8	5.2569+3	3.2535–1	1.3378–1	1.9157–1	6.6774–7
2.6250–5	1.4522–5	1.1697+7		2.5502+9	1.6395+9	3.5957+8	5.5119+8	5.2632+3	3.2985–1	1.3479–1	1.9507–1	6.7239–7
2.7188–5	1.4446–5	1.1759+7		2.5638+9	1.6115+9	3.6790+8	5.8438+8	5.2954+3	3.4681–1	1.3909–1	2.0772–1	6.9652–7
2.8034–5	1.4372–5	1.1819+7		2.5770+9	1.5875+9	3.7442+8	6.1502+8	5.3236+3	3.6207–1	1.4259–1	2.1948–1	7.1841–7
3.0000–5	1.4172–5	1.1986+7		2.6133+9	1.5357+9	3.8903+8	6.8853+8	5.3865+3	3.9856–1	1.5060–1	2.4796–1	7.6960–7
3.2500–5	1.4053–5	1.2087+7		2.6354+9	1.4768+9	4.0072+8	7.5792+8	5.4618+3	4.3206–1	1.5765–1	2.7441–1	8.3542–7
3.5000–5	1.3900–5	1.2220+7		2.6644+9	1.4242+9	4.1177+8	8.2838+8	5.5324+3	4.6606–1	1.6455–1	3.0151–1	9.0201–7
3.6250–5	1.3817–5	1.2294+7		2.6805+9	1.4000+9	4.1647+8	8.6400+8	5.5662+3	4.8303–1	1.6772–1	3.1530–1	9.3557–7
4.0000–5	1.3674–5	1.2423+7		2.7085+9	1.3342+9	4.2977+8	9.4455+8	5.6620+3	5.2442–1	1.7699–1	3.4742–1	1.0373–6
4.5000–5	1.3644–5	1.2450+7		2.7144+9	1.2596+9	4.3684+8	1.0180+9	5.7678+3	5.6081–1	1.8446–1	3.7635–1	1.1684–6
5.0000–5	1.3704–5	1.2396+7		2.7026+9	1.1964+9	4.4321+8	1.0631+9	5.8642+3	5.8678–1	1.9175–1	3.9502–1	1.3016–6
6.0000–5	1.4025–5	1.2112+7		2.6408+9	1.0944+9	4.4450+8	1.1019+9	6.0263+3	6.1186–1	2.0061–1	4.1125–1	1.5670–6
N5 6.7780–5	1.4341–5	1.1845+7		2.5825+9	1.0311+9	4.3924+8	1.1121+9	6.1371+3	6.2045–1	2.0388–1	4.1657–1	1.7776–6
N4 6.9840–5	1.4417–5	1.1782+7		2.5688+9	1.0161+9	4.3812+8	1.1146+9	6.1647+3	6.2296–1	2.0506–1	4.1790–1	1.8340–6
7.3126–5	1.4591–5	1.1642+7		2.5382+9	9.9352+8	4.3648+8	1.1082+9	6.2072+3	6.2333–1	2.0715–1	4.1618–1	1.9243–6
7.4285–5	1.4651–5	1.1594+7		2.5279+9	9.8592+8	4.3593+8	1.1060+9	6.2218+3	6.2350–1	2.0790–1	4.1560–1	1.9563–6
7.4845–5	1.4679–5	1.1572+7		2.5230+9	9.8231+8	4.3566+8	1.1050+9	6.2288+3	6.2359–1	2.0827–1	4.1532–1	1.9717–6
7.7143–5	1.4794–5	1.1482+7		2.5034+9	9.6790+8	4.3465+8	1.1008+9	6.2570+3	6.2406–1	2.0984–1	4.1423–1	2.0354–6
7.7422–5	1.4808–5	1.1471+7		2.5010+9	9.6619+8	4.3453+8	1.1003+9	6.2604+3	6.2413–1	2.1004–1	4.1409–1	2.0432–6
8.0000–5	1.4933–5	1.1376+7		2.4802+9	9.5085+8	4.3352+8	1.0958+9	6.2911+3	6.2487–1	2.1194–1	4.1293–1	2.1150–6
8.3520–5	1.5145–5	1.1216+7		2.4454+9	9.3104+8	4.3045+8	1.0839+9	6.3283+3	6.2252–1	2.1372–1	4.0880–1	2.2116–6
8.4688–5	1.5213–5	1.1166+7		2.4344+9	9.2475+8	4.2957+8	1.0801+9	6.3403+3	6.2200–1	2.1451–1	4.0748–1	2.2437–6
8.6421–5	1.5313–5	1.1093+7		2.4186+9	9.1564+8	4.2844+8	1.0746+9	6.3579+3	6.2157–1	2.1600–1	4.0557–1	2.2916–6
8.8276–5	1.5416–5	1.1019+7		2.4024+9	9.0618+8	4.2748+8	1.0688+9	6.3763+3	6.2161–1	2.1803–1	4.0358–1	2.3429–6
8.9604–5	1.5487–5	1.0968+7		2.3914+9	8.9960+8	4.2702+8	1.0647+9	6.3893+3	6.2212–1	2.1993–1	4.0219–1	2.3797–6
9.2203–5	1.5623–5	1.0873+7		2.3706+9	8.8712+8	4.2649+8	1.0570+9	6.4144+3	6.2390–1	2.2436–1	3.9954–1	2.4520–6
9.3268–5	1.5677–5	1.0836+7		2.3625+9	8.8215+8	4.2634+8	1.0540+9	6.4244+3	6.2480–1	2.2631–1	3.9849–1	2.4817–6
9.6101–5	1.5819–5	1.0738+7		2.3412+9	8.6934+8	4.2588+8	1.0460+9	6.4507+3	6.2705–1	2.3130–1	3.9575–1	2.5609–6
9.6634–5	1.5845–5	1.0720+7		2.3373+9	8.6700+8	4.2580+8	1.0445+9	6.4556+3	6.2748–1	2.3223–1	3.9525–1	2.5758–6
1.0000–4	1.6012–5	1.0609+7	0.0000+0	2.3130+9	8.5261+8	4.2488+8	1.0355+9	6.4859+3	6.2930–1	2.3713–1	3.9216–1	2.6704–6
1.0625–4	1.6368–5	1.0378+7	9.9512–6	2.2627+9	8.2782+8	4.1971+8	1.0151+9	6.5350+3	6.2684–1	2.4199–1	3.8485–1	2.8438–6
1.1172–4	1.6672–5	1.0189+7	1.8696–5	2.2214+9	8.0784+8	4.1498+8	9.9858+8	6.5759+3	6.2391–1	2.4499–1	3.7892–1	2.9965–6
1.2129–4	1.7186–5	9.8842+6	3.4105–5	2.1551+9	7.7617+8	4.0681+8	9.7206+8	6.6435+3	6.1828–1	2.4884–1	3.6944–1	3.2659–6
1.2500–4	1.7379–5	9.7743+6	4.0118–5	2.1311+9	7.6487+8	4.0368+8	9.6252+8	6.6685+3	6.1589–1	2.4986–1	3.6603–1	3.3709–6
1.3564–4	1.8022–5	9.4254+6	5.7556–5	2.0550+9	7.3504+8	3.9528+8	9.2470+8	6.7367+3	6.0505–1	2.5279–1	3.5226–1	3.6744–6
N3 1.4798–4	1.8735–5	9.0666+6	7.8141–5	1.9768+9	7.0455+8	3.8618+8	8.8605+8	6.8100+3	5.9346–1	2.5524–1	3.3821–1	4.0295–6
1.5000–4	1.8850–5	9.0116+6	8.1549–5	1.9648+9	6.9992+8	3.8481+8	8.8005+8	6.8215+3	5.9178–1	2.5572–1	3.3605–1	4.0880–6
1.5313–4	1.9033–5	8.9246+6	8.6846–5	1.9458+9	6.9293+8	3.8180+8	8.7108+8	6.8390+3	5.8814–1	2.5540–1	3.3273–1	4.1787–6
1.5898–4	1.9372–5	8.7685+6	9.6863–5	1.9118+9	6.8038+8	3.7642+8	8.5499+8	6.8711+3	5.8168–1	2.5491–1	3.2677–1	4.3493–6
N2 1.6069–4	1.9470–5	8.7247+6	9.9801–5	1.9022+9	6.7685+8	3.7490+8	8.5047+8	6.8802+3	5.7987–1	2.5477–1	3.2509–1	4.3991–6
1.6315–4	1.9626–5	8.6552+6	1.0405–4	1.8871+9	6.7187+8	3.7273+8	8.4248+8	6.8917+3	5.7668–1	2.5455–1	3.2212–1	4.4710–6
1.6775–4	1.9916–5	8.5293+6	1.1208–4	1.8596+9	6.6283+8	3.6880+8	8.2801+8	6.9129+3	5.7094–1	2.5418–1	3.1675–1	4.6062–6
1.6924–4	2.0008–5	8.4899+6	1.1468–4	1.8511+9	6.5999+8	3.6757+8	8.2348+8	6.9196+3	5.6915–1	2.5408–1	3.1507–1	4.6498–6
1.7582–4	2.0413–5	8.3215+6	1.2632–4	1.8143+9	6.4786+8	3.6228+8	8.0418+8	6.9487+3	5.6156–1	2.5365–1	3.0791–1	4.8436–6
1.8462–4	2.0943–5	8.1109+6	1.4212–4	1.7684+9	6.3264+8	3.5566+8	7.8010+8	6.9862+3	5.5225–1	2.5326–1	2.9898–1	5.1043–6
1.8791–4	2.1138–5	8.0361+6	1.4810–4	1.7521+9	6.2722+8	3.5331+8	7.7158+8	6.9998+3	5.4898–1	2.5316–1	2.9582–1	5.2020–6
2.0000–4	2.1839–5	7.7780+6	1.7035–4	1.6958+9	6.0847+8	3.4515+8	7.4222+8	7.0481+3	5.3790–1	2.5296–1	2.8494–1	5.5628–6
N1 2.0837–4	2.2324–5	7.6090+6	1.8603–4	1.6590+9	5.9645+8	3.3882+8	7.2371+8	7.0726+3	5.2940–1	2.5139–1	2.7800–1	5.8137–6
2.1123–4	2.2499–5	7.5499+6	1.9146–4	1.6461+9	5.9250+8	3.3664+8	7.1694+8	7.0808+3	5.2626–1	2.5079–1	2.7546–1	5.8997–6
2.1678–4	2.2835–5	7.4389+6	2.0206–4	1.6219+9	5.8507+8	3.3254+8	7.0427+8	7.0964+3	5.2041–1	2.4970–1	2.7070–1	6.0666–6
2.2500–4	2.3325–5	7.2826+6	2.1798–4	1.5878+9	5.7457+8	3.2677+8	6.8648+8	7.1188+3	5.1224–1	2.4823–1	2.6401–1	6.3146–6
2.2718–4	2.3454–5	7.2426+6	2.2225–4	1.5791+9	5.7187+8	3.2529+8	6.8193+8	7.1246+3	5.1016–1	2.4785–1	2.6230–1	6.3806–6
2.4539–4	2.4506–5	6.9316+6	2.5851–4	1.5113+9	5.5082+8	3.1374+8	6.4672+8	7.1713+3	4.9414–1	2.4506–1	2.4907–1	6.9330–6
2.5000–4	2.4767–5	6.8586+6	2.6787–4	1.4954+9	5.4585+8	3.1102+8	6.3849+8	7.1826+3	4.9044–1	2.4445–1	2.4598–1	7.0735–6
2.6250–4	2.5465–5	6.6705+6	2.9362–4	1.4544+9	5.3304+8	3.0390+8	6.1742+8	7.2124+3	4.8065–1	2.4257–1	2.3807–1	7.4554–6
2.7269–4	2.6024–5	6.5274+6	3.1499–4	1.4232+9	5.2325+8	2.9846+8	6.0145+8	7.2357+3	4.7326–1	2.4117–1	2.3208–1	7.7679–6
3.0000–4	2.7473–5	6.1829+6	3.7378–4	1.3481+9	4.9950+8	2.8531+8	5.6324+8	7.2944+3	4.5586–1	2.3811–1	2.1775–1	8.6100–6
3.5000–4	3.0150–5	5.6341+6	4.8751–4	1.2284+9	4.6357+8	2.6224+8	5.0257+8	7.3823+3	4.2381–1	2.2905–1	1.9475–1	1.0166–5

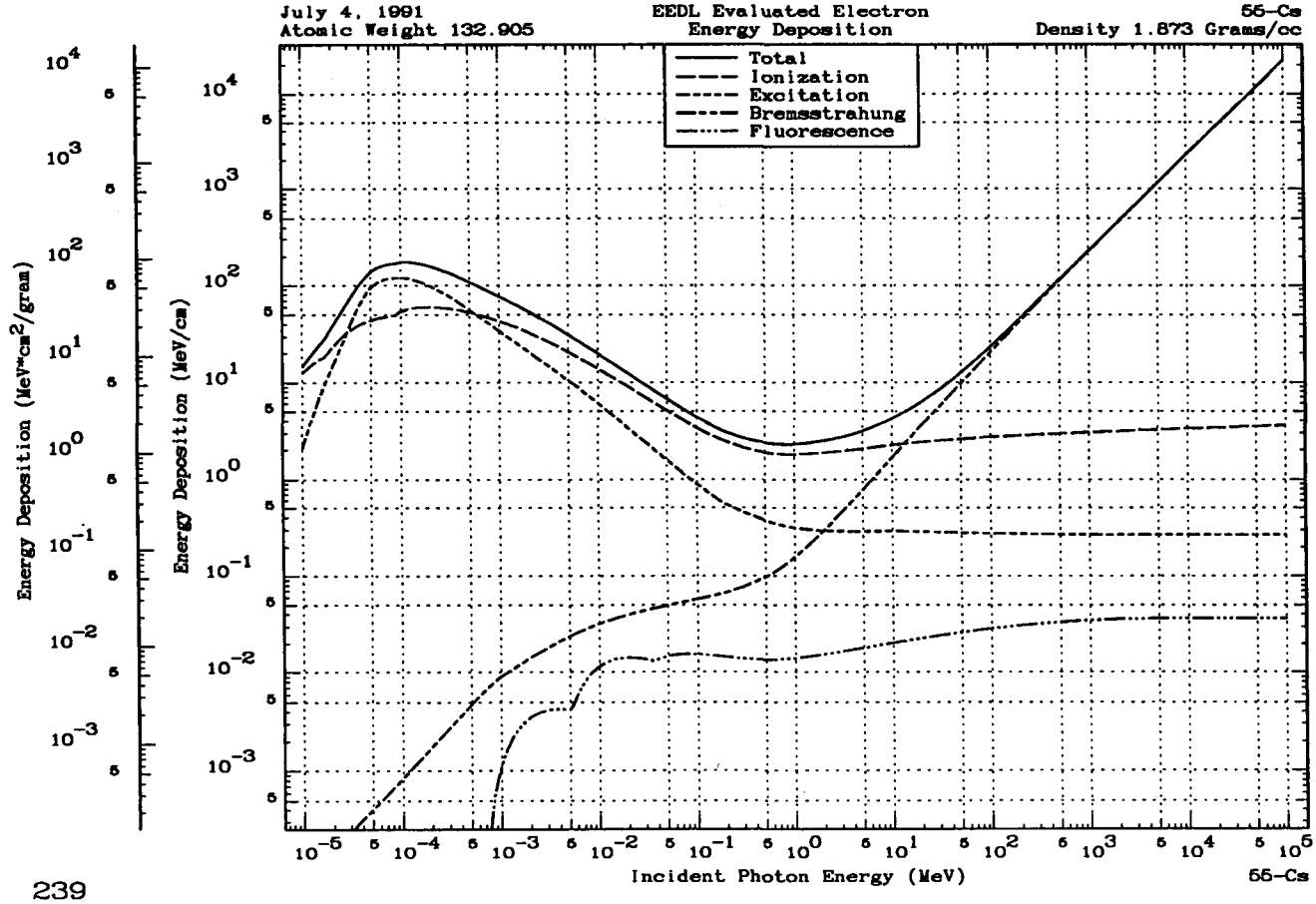
Atomic Weight 131.300 — Density 5.8870– 3 Grams/cc

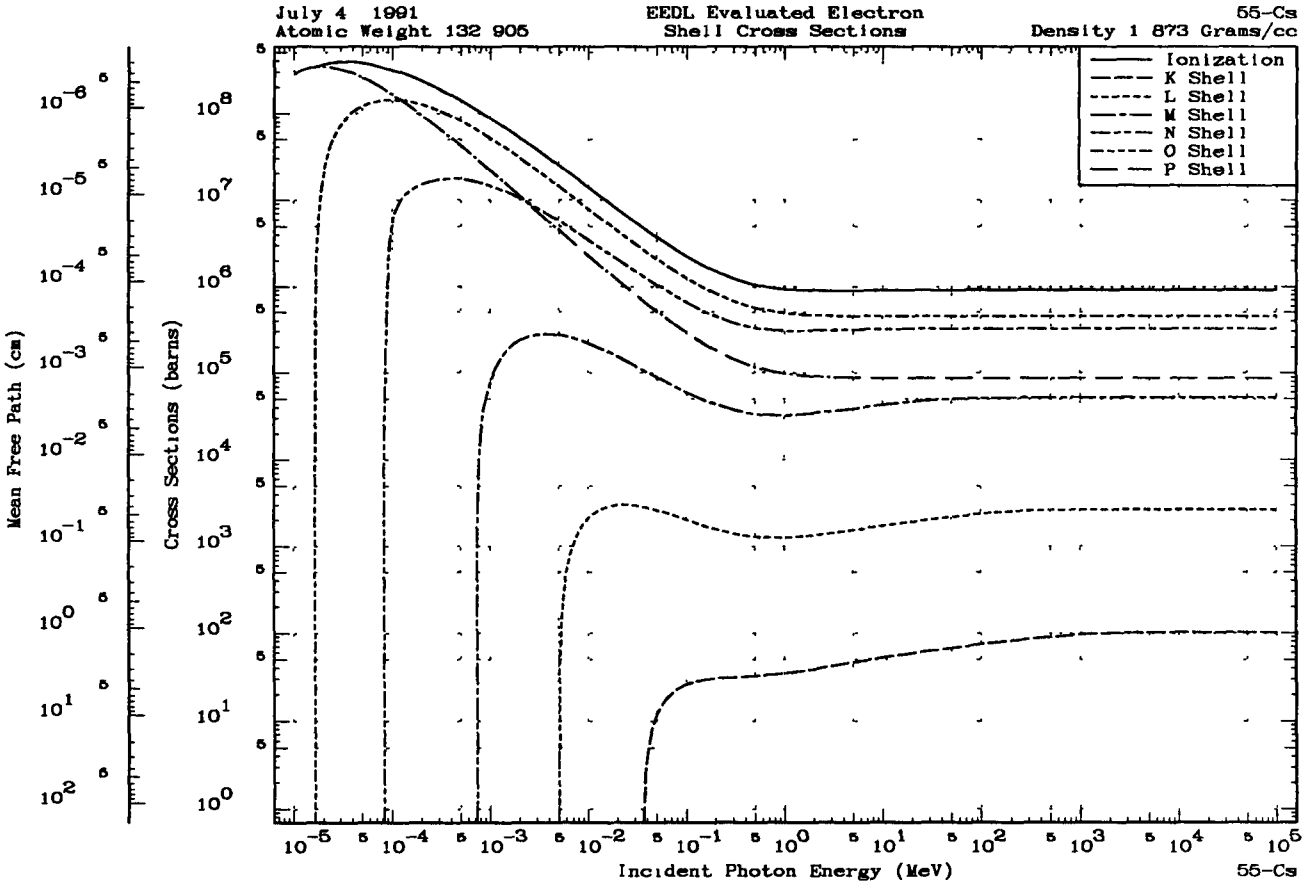
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.0000–4	3.2666–5	5.2000+6	6.0903–4	1.1338+9	4.3454+8	2.4389+8	4.5532+8	7.4592+3	3.9930–1	2.2244–1	1.7685–1	1.1740–5
	4.5000–4	3.5181–5	4.8284+6	7.3810–4	1.0527+9	4.1048+8	2.2735+8	4.1488+8	7.4914+3	3.7576–1	2.1432–1	1.6142–1	1.3313–5
	5.0000–4	3.7584–5	4.5197+6	8.7465–4	9.8542+8	3.9008+8	2.1357+8	3.8176+8	7.5204+3	3.5670–1	2.0789–1	1.4880–1	1.4892–5
	6.0000–4	4.2187–5	4.0265+6	1.1680–3	8.7790+8	3.5715+8	1.9078+8	3.2996+8	7.5474+3	3.2546–1	1.9648–1	1.2896–1	1.8003–5
M5	6.7752–4	4.5584–5	3.7265+6	1.4141–3	8.1248+8	3.3677+8	1.7625+8	2.9945+8	7.5404+3	3.0481–1	1.8755–1	1.1724–1	2.0331–5
	6.8135–4	4.5747–5	3.7131+6	1.4267–3	8.0957+8	3.3585+8	1.7561+8	2.9810+8	7.5388+3	3.0394–1	1.8720–1	1.1672–1	2.0439–5
M4	6.9091–4	4.6155–5	3.6803+6	1.4583–3	8.0242+8	3.3359+8	1.7403+8	2.9479+8	7.5348+3	3.0180–1	1.8632–1	1.1545–1	2.0709–5
	6.9618–4	4.6379–5	3.6625+6	1.4758–3	7.9854+8	3.3237+8	1.7316+8	2.9301+8	7.5325+3	3.0066–1	1.8587–1	1.1477–1	2.0857–5
	6.9773–4	4.6445–5	3.6574+6	1.4809–3	7.9741+8	3.3201+8	1.7290+8	2.9249+8	7.5318+3	3.0032–1	1.8573–1	1.1457–1	2.0900–5
	7.0412–4	4.6716–5	3.6362+6	1.5022–3	7.9279+8	3.3055+8	1.7186+8	2.9036+8	7.5290+3	2.9893–1	1.8516–1	1.1375–1	2.1079–5
	7.0916–4	4.6928–5	3.6197+6	1.5191–3	7.8919+8	3.2942+8	1.7106+8	2.8872+8	7.5268+3	2.9788–1	1.8474–1	1.1311–1	2.1220–5
	7.1011–4	4.6969–5	3.6166+6	1.5223–3	7.8852+8	3.2920+8	1.7091+8	2.8840+8	7.5264+3	2.9768–1	1.8466–1	1.1299–1	2.1247–5
	7.1483–4	4.7167–5	3.6013+6	1.5382–3	7.8520+8	3.2815+8	1.7016+8	2.8688+8	7.5244+3	2.9670–1	1.8426–1	1.1241–1	2.1379–5
	7.1573–4	4.7205–5	3.5985+6	1.5412–3	7.8457+8	3.2795+8	1.7002+8	2.8659+8	7.5240+3	2.9651–1	1.8419–1	1.1230–1	2.1404–5
	7.2100–4	4.7426–5	3.5817+6	1.5590–3	7.8091+8	3.2679+8	1.6920+8	2.8492+8	7.5217+3	2.9542–1	1.8375–1	1.1165–1	2.1551–5
	7.3087–4	4.7839–5	3.5508+6	1.5926–3	7.7418+8	3.2464+8	1.6769+8	2.8184+8	7.5176+3	2.9344–1	1.8295–1	1.1047–1	2.1827–5
	7.3613–4	4.8057–5	3.5347+6	1.6105–3	7.7066+8	3.2352+8	1.6690+8	2.8023+8	7.5154+3	2.9240–1	1.8253–1	1.0985–1	2.1974–5
	7.4816–4	4.8555–5	3.4984+6	1.6518–3	7.6275+8	3.2099+8	1.6512+8	2.7663+8	7.5104+3	2.9007–1	1.8159–1	1.0846–1	2.2310–5
	7.7408–4	4.9618–5	3.4235+6	1.7419–3	7.4642+8	3.1575+8	1.6146+8	2.6920+8	7.5000+3	2.8530–1	1.7967–1	1.0560–1	2.3034–5
	8.0000–4	5.0666–5	3.3526+6	1.8335–3	7.3097+8	3.1076+8	1.5800+8	2.6221+8	7.4900+3	2.8085–1	1.7791–1	1.0291–1	2.3756–5
	8.5000–4	5.2670–5	3.2251+6	2.0144–3	7.0317+8	3.0178+8	1.5155+8	2.4983+8	7.4464+3	2.7195–1	1.7379–1	9.8128–2	2.4923–5
	8.8750–4	5.4142–5	3.1374+6	2.1539–3	6.8405+8	2.9554+8	1.4712+8	2.4138+8	7.4156+3	2.6586–1	1.7098–1	9.4861–2	2.5794–5
M3	9.2656–4	5.5649–5	3.0525+6	2.3024–3	6.6552+8	2.8945+8	1.4284+8	2.3323+8	7.3849+3	2.6002–1	1.6828–1	9.1712–2	2.6698–5
	9.3574–4	5.6000–5	3.0333+6	2.3378–3	6.6135+8	2.8807+8	1.4187+8	2.3140+8	7.3779+3	2.5872–1	1.6769–1	9.1005–2	2.6910–5
	9.6787–4	5.7218–5	2.9687+6	2.4631–3	6.4727+8	2.8340+8	1.3863+8	2.2523+8	7.3540+3	2.5435–1	1.6570–1	8.8626–2	2.7651–5
M2	9.8947–4	5.8028–5	2.9273+6	2.5485–3	6.3823+8	2.8039+8	1.3655+8	2.2128+8	7.3384+3	2.5159–1	1.6445–1	8.7105–2	2.8148–5
	1.0000–3	5.8421–5	2.9076+6	2.5904–3	6.3394+8	2.7896+8	1.3557+8	2.1941+8	7.3310+3	2.5029–1	1.6388–1	8.6384–2	2.8390–5
	1.0313–3	5.9586–5	2.8507+6	2.7163–3	6.2155+8	2.7483+8	1.3262+8	2.1408+8	7.2965+3	2.4611–1	1.6176–1	8.4315–2	2.8945–5
	1.0898–3	6.1734–5	2.7516+6	2.9580–3	5.9992+8	2.6757+8	1.2751+8	2.0484+8	7.2352+3	2.3890–1	1.5815–1	8.0726–2	2.9981–5
M1	1.1220–3	6.2893–5	2.7009+6	3.0936–3	5.8886+8	2.6383+8	1.2490+8	2.0013+8	7.2031+3	2.3527–1	1.5634–1	7.8900–2	3.0547–5
	1.1411–3	6.3583–5	2.6716+6	3.1752–3	5.8248+8	2.6167+8	1.2338+8	1.9742+8	7.1839+3	2.3305–1	1.5517–1	7.7845–2	3.0875–5
	1.1456–3	6.3745–5	2.6648+6	3.1946–3	5.8100+8	2.6118+8	1.2303+8	1.9679+8	7.1794+3	2.3253–1	1.5490–1	7.7601–2	3.0952–5
	1.1899–3	6.5323–5	2.6004+6	3.3871–3	5.6696+8	2.5642+8	1.1969+8	1.9084+8	7.1366+3	2.2768–1	1.5236–1	7.5292–2	3.1709–5
	1.1924–3	6.5410–5	2.5969+6	3.3979–3	5.6621+8	2.5616+8	1.1952+8	1.9052+8	7.1343+3	2.2742–1	1.5222–1	7.5168–2	3.1751–5
	1.2287–3	6.6685–5	2.5473+6	3.5589–3	5.5538+8	2.5246+8	1.1695+8	1.8596+8	7.1006+3	2.2372–1	1.5029–1	7.3395–2	3.2369–5
	1.2308–3	6.6760–5	2.5444+6	3.5685–3	5.5476+8	2.5225+8	1.1680+8	1.8570+8	7.0987+3	2.2351–1	1.5018–1	7.3293–2	3.2405–5
	1.2965–3	6.9028–5	2.4608+6	3.8665–3	5.3653+8	2.4597+8	1.1250+8	1.7805+8	7.0407+3	2.1736–1	1.4700–1	7.0325–2	3.3518–5
	1.3125–3	6.9573–5	2.4415+6	3.9403–3	5.3232+8	2.4452+8	1.1151+8	1.7629+8	7.0271+3	2.1596–1	1.4628–1	6.9643–2	3.3788–5
	1.3462–3	7.0714–5	2.4022+6	4.0973–3	5.2374+8	2.4153+8	1.0949+8	1.7272+8	6.9991+3	2.1306–1	1.4477–1	6.8255–2	3.4355–5
	1.3654–3	7.1360–5	2.3804+6	4.1879–3	5.1900+8	2.3988+8	1.0837+8	1.7075+8	6.9834+3	2.1147–1	1.4394–1	6.7490–2	3.4678–5
	1.3983–3	7.2454–5	2.3445+6	4.3442–3	5.1116+8	2.3713+8	1.0653+8	1.6750+8	6.9573+3	2.0884–1	1.4258–1	6.6229–2	3.5229–5
	1.5000–3	7.5781–5	2.2415+6	4.8402–3	4.8872+8	2.2919+8	1.0127+8	1.5825+8	6.8807+3	2.0146–1	1.3878–1	6.2640–2	3.6926–5
	1.7500–3	8.3708–5	2.0293+6	6.1362–3	4.4244+8	2.1249+8	9.0218+7	1.3972+8	6.6957+3	1.8458–1	1.2913–1	5.5411–2	4.0692–5
	2.0000–3	9.1200–5	1.8626+6	7.5405–3	4.0609+8	1.9901+8	8.1639+7	1.2544+8	6.5395+3	1.7162–1	1.2174–1	4.9839–2	4.4390–5
	2.2500–3	9.8512–5	1.7243+6	9.0495–3	3.7595+8	1.8734+8	7.4515+7	1.1409+8	6.3633+3	1.5987–1	1.1443–1	4.5387–2	4.7423–5
	2.5000–3	1.0552–4	1.6098+6	1.0662–2	3.5098+8	1.7749+8	6.8678+7	1.0481+8	6.2097+3	1.5032–1	1.0852–1	4.1747–2	5.0405–5
	2.6250–3	1.0892–4	1.5595+6	1.1505–2	3.4001+8	1.7310+8	6.6133+7	1.0077+8	6.1399+3	1.4613–1	1.0592–1	4.0164–2	5.1879–5
	3.0000–3	1.1878–4	1.4301+6	1.4169–2	3.1179+8	1.6165+8	5.9644+7	9.0498+7	5.9527+3	1.3552–1	9.9330–2	3.6138–2	5.6231–5
	3.5000–3	1.3157–4	1.2911+6	1.8038–2	2.8149+8	1.4896+8	5.2776+7	7.9748+7	5.7064+3	1.2318–1	9.1219–2	3.1900–2	6.1126–5
	4.0000–3	1.4369–4	1.1821+6	2.2261–2	2.5774+8	1.3879+8	4.7475+7	7.1473+7	5.5014+3	1.1371–1	8.5006–2	2.8640–2	6.5891–5
L3	4.7747–3	1.6208–4	1.0480+6	2.9466–2	2.2850+8	1.2580+8	4.1169+7	6.1523+7	5.2091+3	1.0158–1	7.6808–2	2.4702–2	7.2175–5
	4.8873–3	1.6467–4	1.0316+6	3.0583–2	2.2491+8	1.2418+8	4.0403+7	6.0315+7	5.1683+3	1.0012–1	7.5826–2	2.4226–2	7.2963–5
	5.0000–3	1.6724–4	1.0157+6	3.1716–2	2.2146+8	1.2262+8	3.9670+7	5.9157+7	5.1287+3	9.8728–2	7.4885–2	2.3769–2	7.3747–5
L2	5.1039–3	1.6962–4	1.0015+6	3.2775–2	2.1835+8	1.2120+8	3.9012+7	5.8138+7	5.0932+3	9.7409–2	7.3971–2	2.3364–2	7.4468–5
	5.2159–3	1.7217–4	9.8664+5	3.3933–2	2.1512+8	1.1970+8	3.8329+7	5.7080+7	5.0560+3	9.6047–2	7.3028–2	2.2944–2	7.5241–5
	5.2500–3	1.7294–4	9.8223+5	3.4289–2	2.1416+8	1.1926+8	3.8127+7	5.6766+7	5.0449+3	9.5644–2	7.2749–2	2.2820–2	7.5475–5
	5.4119–3	1.7659–4	9.6195+5	3.5998–2	2.0973+8	1.1720+8	3.7197+7	5.5325+7	4.9934+3	9.3788–2	7.1464–2	2.2248–2	7.6586–5
L1	5.4169–3	1.7670–4	9.6134+5	3.6051–2	2.0960+8	1.1714+8	3.7169+7	5.5282+7	4.9919+3	9.3733–2	7.1425–2	2.2231–2	7.6620–5
	5.5627–3	1.7995–4	9.4396+5	3.7620–2	2.0581+8	1.1538+8	3.6376+7	5.4050+7	4.9469+3	9.2154–2	7.0334–2	2.1743–2	7.7597–5
	5.6250–3	1.8133–4	9.3676+5	3.8299–2	2.0424+8	1.1465+8	3.6048+7	5.3541+7	4.9281+3	9.1503–2	6.9884–2	2.1541–2	7.8013–5
	5.7060–3	1.8312–4	9.2762+5	3.9188–2	2.0225+8	1.1372+8	3.5632+7	5.2895+7	4.9042+3	9.0676–2	6.9312–2	2.1286–2	7.8553–5
	6.0000–3	1.8954–4	8.9619+5	4.2482–2	1.9540+8	1.1050+8	3.4207+7	5.0687+7	4.8209+3	8.7852–2	6.7361–2	2.0411–2	8.0498–5
	6.5000–3	2.0039–4	8.4769+5	4.8326–2	1.8482+8	1.0542+8	3.2033+7	4.7362+7	4.6765+3	8.3302–2	6.4130–2	1.9089–2	8.3169–5
	7.2500–3	2.1615–4	7.8586+5	5.7654–2	1.7134+8	9.8873+7	2.9289+7	4.3175+7	4.4864+3	7.7572–2	6.0061–2	1.7424–2	8.7103–5
	8.0000–3	2.3139–4	7.3412+5	6.7629–2	1.6006+8	9.3318+7	2.7018+7	3.9719+7	4.3217+3	7.2847–2	5.6706–2	1.6050–2	9.0950–5
	9.0000–3	2.5165–4	6.7500+5	8.1908–2	1.4717+8	8.6767+7	2.4515+7	3.5883+7	4.1167+3	6.7297–2	5.2681–2	1.4520–2	9.5129–5
	1.0000–2	2.7124–4	6.2626+5	9.7290–2	1.3654+8	8.1297+7	2.2474+7	3.2767+7	3.9417+3	6.2778–2	4.9401–2	1.3278–2	9.9213–5
	1.1250–2	2.9544–4	5.7495+5	1.1802–1	1.2536+8	7.5371+7	2.0384+7	2.9597+7	3.7364+3	5.7865–2	4.5754–2	1.2008–2	1.0285–4
	1.3125–2	3.3034–4	5.1422+5	1.5215–1	1.1211+8	6.8262+7	1.7941+7	2.5907+7	3.4839+3	5.2120–2	4.1481–2	1.0531–2	1.0822–4
	1.5000–2	3.6381–4	4.6691+5	1.8974–1	1.0180+8	6.2648+7	1.6064+7	2.3084+7	3.2790+3	4.7705–2	3.8190–2	9.4015–3	1.1345–4
	1.7500–2	4.0749–4	4.1686+5	2.4499–1	9.0887+7	5.6550+7	1.4144+7	2.0190+7	3.0454+3	4.2879–2	3.4523–2	8.2379–3	1.1821–4
	2.0000–2	4.4947–4	3.7792+5	3.0597–1	8.2398+7	5.1750+7	1.2667+7	1.7978+7	2.8566+3	3.9173–2	3.1701–2	7.3488–3	1.2293–4
	2.5000–2	5.3021–4	3.2038+5	4.4376–1	6.9852+7	4.4498+7	1.0552+7	1.4799+7	2.5475+3	3.3546–2	2.7352–2	6.0654–3	1.2921–4
	3.0000–2	6.0665–4	2.8000+5	6.0221–1	6.1049+7	3.9334+7	9.0890+6	1.2624+7	2.3200+3	2.9645–2	2.4322–2	5.1874–3	1.3550–4
K	3.4556–2	6.7364–4	2.5216+5	7.6345–1	5.4978+7	3.5707+7	8.1103+6	1.1159+7	2.1533+3	2.6911–2	2.2177–2	4.5942–3	1.3988–4
	3.5237–2	6.8344–4	2.4855+5	7.8891–1	5.4190+7	3.5232+7	7.9851+6	1.0971+7	2.1308+3	2.6557–2	2.1899–2	4.5179–3	1.4042–4
	3.6427–2	7.0047–4	2.4250+5	8.3426–1	5.2873+7	3.4437+7	7.7762+6	1.0658+7	2.0930+3	2.5966–2	2.1434–2	4.3907–3	1.4137–4
	3.8214–2	7.2574–4	2.3406+5	9.0417–1	5.1032+7	3.3323+7	7.4849+6	1.0222+7	2.0397+3	2.5142–2	2.0786–2	4.2140–3	1.4280–4
	4.0000–2	7.5069–4	2.2628+5	9.7630–1	4.9336+7	3.2294+7	7.2171+6	9.8230+6	1.9901+3	2.4386–2	2.0189–2	4.0521–3	1.4424–4
	4.2500–2	7.8502–4	2.1639+5	1.0809+0	4.7178+7	3.0976+7	6.8826+6	9.3175+6	1.9270+3	2.3412–2	1.9419–2	3.8464–3	1.4597–4

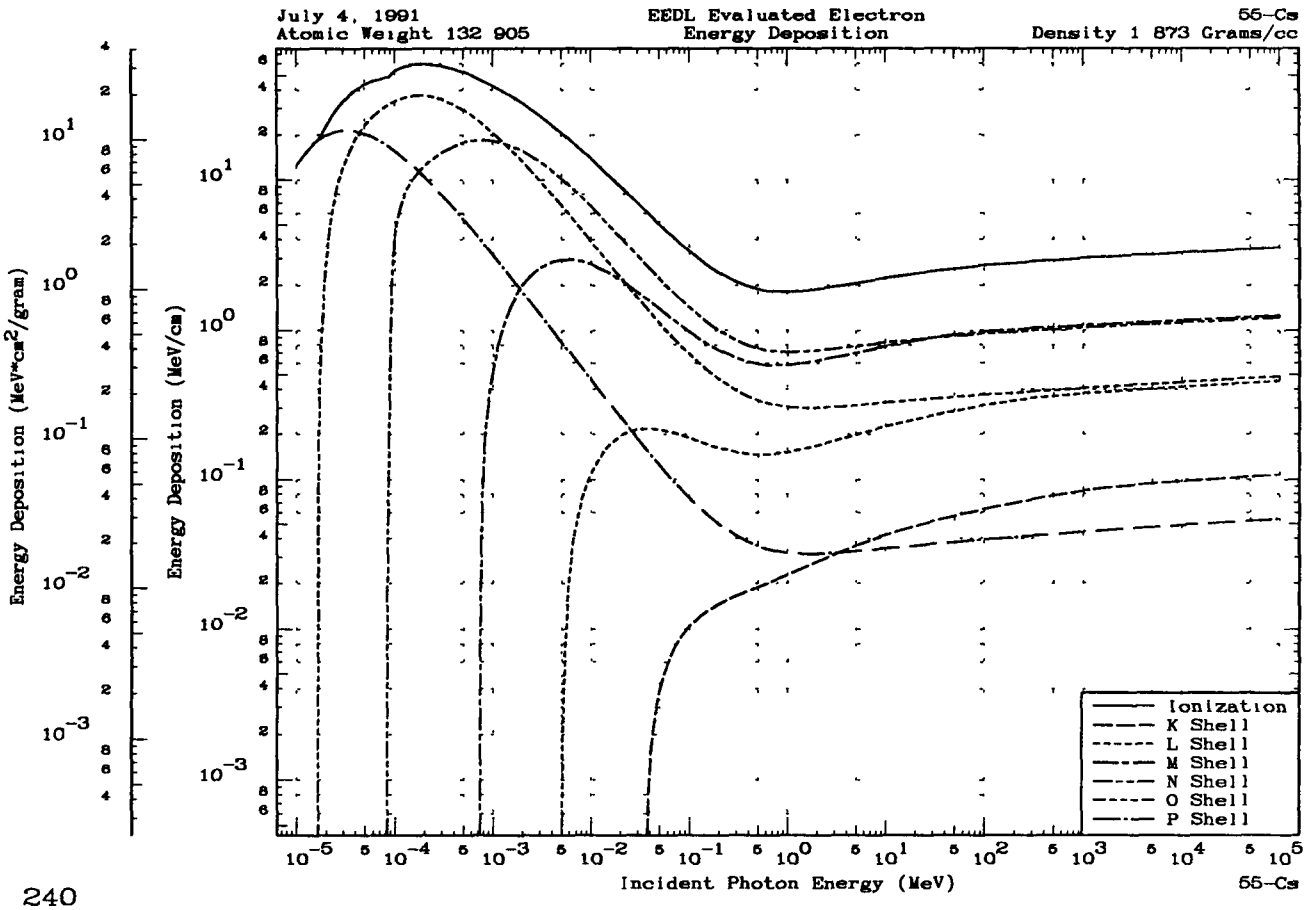
Atomic Weight 131.300 Density 5.8870– 3 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.6250–2	8.3551–4	2.0331+5	1.2457+0	4.4327+7	2.9228+7	6.4418+6	8.6557+6	1.8424+3	2.2129–2	1.8404–2	3.5772–3	1.4861–4
5.0000–2	8.8490–4	1.9196+5	1.4195+0	4.1853+7	2.7703+7	6.0606+6	8.0871+6	1.7677+3	2.1020–2	1.7523–2	3.3460–3	1.5126–4
5.5000–2	9.4898–4	1.7900+5	1.6649+0	3.9027+7	2.5947+7	5.6354+6	7.4424+6	1.6770+3	1.9747–2	1.6510–2	3.0830–3	1.5424–4
6.0000–2	1.0115–3	1.6794+5	1.9253+0	3.6616+7	2.4442+7	5.2735+6	6.8988+6	1.5982+3	1.8664–2	1.5645–2	2.8613–3	1.5724–4
7.0000–2	1.1304–3	1.5028+5	2.4877+0	3.2765+7	2.2021+7	4.7094+6	6.0329+6	1.4654+3	1.6929–2	1.4259–2	2.5070–3	1.6213–4
8.0000–2	1.2444–3	1.3650+5	3.1032+0	2.9761+7	2.0118+7	4.2700+6	5.3713+6	1.3593+3	1.5580–2	1.3177–2	2.2364–3	1.6705–4
1.0000–1	1.4557–3	1.1669+5	4.4747+0	2.5442+7	1.7372+7	3.6563+6	4.4128+6	1.2042+3	1.3629–2	1.1611–2	1.8429–3	1.7529–4
1.2500–1	1.6844–3	1.0084+5	6.4248+0	2.1987+7	1.5194+7	3.1729+6	3.6190+6	1.0808+3	1.2043–2	1.0344–2	1.5155–3	1.8350–4
1.5000–1	1.8970–3	8.9545+4	8.6042+0	1.9524+7	1.3619+7	2.8260+6	3.0776+6	9.8944+2	1.0918–2	9.4336–3	1.2923–3	1.9194–4
2.0000–1	2.2529–3	7.5400+4	1.3502+1	1.6439+7	1.1629+7	2.4070+6	2.4024+6	8.7403+2	9.5327–3	8.3134–3	1.0127–3	2.0661–4
3.0000–1	2.8422–3	5.9766+4	2.4818+1	1.3031+7	9.3049+6	1.9916+6	1.7336+6	7.5027+2	8.1751–3	7.2053–3	7.3486–4	2.3500–4
4.0000–1	3.3368–3	5.0906+4	3.7538+1	1.1099+7	7.8940+6	1.7897+6	1.4147+6	6.8742+2	7.5559–3	6.6891–3	6.0204–4	2.6481–4
5.0000–1	3.7666–3	4.5098+4	5.1050+1	9.8327+6	6.9255+6	1.6733+6	1.2331+6	6.5064+2	7.2482–3	6.4252–3	5.2644–4	2.9654–4
6.0000–1	4.1506–3	4.0925+4	6.5027+1	8.9229+6	6.2212+6	1.5988+6	1.1022+6	6.2869+2	7.0622–3	6.2607–3	4.7176–4	3.2964–4
8.0000–1	4.7947–3	3.5428+4	9.3570+1	7.7242+6	5.2527+6	1.5129+6	9.5810+5	6.0592+2	6.9520–3	6.1393–3	4.1180–4	4.0091–4
1.0000+0	5.3325–3	3.1855+4	1.2235+2	6.9453+6	4.6084+6	1.4659+6	8.7039+5	5.9531+2	6.9486–3	6.0964–3	3.7531–4	4.7688–4
1.5000+0	6.3151–3	2.6898+4	1.9289+2	5.8646+6	3.6716+6	1.4165+6	7.7592+5	5.8842+2	7.2280–3	6.2082–3	3.3654–4	6.8327–4
2.0000+0	7.0062–3	2.4245+4	2.6058+2	5.2861+6	3.1524+6	1.3996+6	7.3356+5	5.9147+2	7.5491–3	6.3227–3	3.1915–4	9.0716–4
3.0000+0	7.9129–3	2.1467+4	3.8741+2	4.6804+6	2.6003+6	1.3819+6	6.9764+5	6.0060+2	8.2291–3	6.5439–3	3.0546–4	1.3798–3
4.0000+0	8.4551–3	2.0090+4	5.0419+2	4.3803+6	2.3078+6	1.3807+6	6.9121+5	6.0928+2	8.9069–3	6.7244–3	3.0319–4	1.8793–3
5.0000+0	8.8203–3	1.9258+4	6.1236+2	4.1989+6	2.1293+6	1.3801+6	6.8886+5	6.1644+2	9.5902–3	6.8937–3	3.0271–4	2.3937–3
6.0000+0	9.0695–3	1.8729+4	7.1311+2	4.0835+6	2.0164+6	1.3798+6	6.8675+5	6.2207+2	1.0269–2	7.0370–3	3.0233–4	2.9301–3
8.0000+0	9.3986–3	1.8074+4	8.9642+2	3.9406+6	1.8777+6	1.3794+6	6.8285+5	6.3106+2	1.1577–2	7.2589–3	3.0171–4	4.0163–3
1.0000+1	9.5725–3	1.7745+4	1.0600+3	3.8690+6	1.8079+6	1.3811+6	6.7933+5	6.3554+2	1.2893–2	7.4390–3	3.0125–4	5.1523–3
1.5000+1	9.6947–3	1.7521+4	1.4066+3	3.8202+6	1.7648+6	1.3844+6	6.7038+5	6.4793+2	1.6082–2	7.7203–3	2.9752–4	8.0639–3
2.0000+1	9.7042–3	1.7504+4	1.6899+3	3.8165+6	1.7656+6	1.3862+6	6.6399+5	6.5765+2	1.9311–2	7.9281–3	2.9493–4	1.1088–2
3.0000+1	9.7254–3	1.7466+4	2.1368+3	3.8082+6	1.7648+6	1.3880+6	6.5472+5	6.6840+2	2.5748–2	8.1833–3	2.9129–4	1.7273–2
4.0000+1	9.7475–3	1.7427+4	2.4830+3	3.7995+6	1.7642+6	1.3890+6	6.4566+5	6.7908+2	3.2278–2	8.3507–3	2.8772–4	2.3640–2
5.0000+1	9.7664–3	1.7393+4	2.7649+3	3.7921+6	1.7637+6	1.3896+6	6.3808+5	6.8748+2	3.8868–2	8.4852–3	2.8481–4	3.0099–2
6.0000+1	9.7823–3	1.7365+4	3.0023+3	3.7860+6	1.7634+6	1.3901+6	6.3179+5	6.9393+2	4.5543–2	8.5962–3	2.8246–4	3.6664–2
8.0000+1	9.8046–3	1.7325+4	3.3871+3	3.7774+6	1.7628+6	1.3905+6	6.2335+5	7.0427+2	5.9007–2	8.7498–3	2.7879–4	4.9979–2
1.0000+2	9.8221–3	1.7294+4	3.6922+3	3.7706+6	1.7623+6	1.3908+6	6.1679+5	7.1235+2	7.2555–2	8.8695–3	2.7595–4	6.3410–2
1.5000+2	9.8369–3	1.7268+4	4.2571+3	3.7650+6	1.7615+6	1.3910+6	6.1176+5	7.2703+2	1.0666–1	9.0120–3	2.7371–4	9.7372–2
2.0000+2	9.8474–3	1.7250+4	4.6633+3	3.7610+6	1.7609+6	1.3912+6	6.0817+5	7.3691+2	1.4111–1	9.1424–3	2.7212–4	1.3170–1
3.0000+2	9.8547–3	1.7237+4	5.2407+3	3.7582+6	1.7600+6	1.3913+6	6.0607+5	7.4856+2	2.0978–1	9.3534–3	2.7120–4	2.0015–1
4.0000+2	9.8582–3	1.7231+4	5.6529+3	3.7569+6	1.7594+6	1.3914+6	6.0530+5	7.5632+2	2.7870–1	9.4424–3	2.7087–4	2.6898–1
5.0000+2	9.8608–3	1.7226+4	5.9733+3	3.7558+6	1.7590+6	1.3914+6	6.0470+5	7.6228+2	3.4812–1	9.5231–3	2.7063–4	3.3833–1
6.0000+2	9.8659–3	1.7217+4	6.2356+3	3.7539+6	1.7586+6	1.3914+6	6.0315+5	7.6748+2	4.1648–1	9.5936–3	2.6996–4	4.0661–1
8.0000+2	9.8753–3	1.7201+4	6.6504+3	3.7503+6	1.7580+6	1.3914+6	6.0016+5	7.7575+2	5.5437–1	9.7278–3	2.6866–4	5.4437–1
1.0000+3	9.8822–3	1.7189+4	6.9725+3	3.7477+6	1.7575+6	1.3914+6	5.9795+5	7.8243+2	6.9246–1	9.8454–3	2.6772–4	6.8235–1
1.5000+3	9.8944–3	1.7168+4	7.5577+3	3.7431+6	1.7567+6	1.3915+6	5.9415+5	7.9488+2	1.0398+0	9.9498–3	2.6601–4	1.0296+0
2.0000+3	9.9032–3	1.7153+4	7.9728+3	3.7398+6	1.7561+6	1.3915+6	5.9143+5	8.0401+2	1.3858+0	1.0053–2	2.6480–4	1.3755+0
3.0000+3	9.9116–3	1.7138+4	8.5577+3	3.7366+6	1.7553+6	1.3915+6	5.8908+5	8.1774+2	2.0808+0	1.0250–2	2.6375–4	2.0703+0
4.0000+3	9.9176–3	1.7128+4	8.9723+3	3.7343+6	1.7547+6	1.3915+6	5.8739+5	8.2771+2	2.7756+0	1.0338–2	2.6299–4	2.7650+0
5.0000+3	9.9255–3	1.7114+4	9.2936+3	3.7314+6	1.7542+6	1.3915+6	5.8486+5	8.3554+2	3.4757+0	1.0404–2	2.6186–4	3.4650+0
6.0000+3	9.9259–3	1.7113+4	9.5561+3	3.7312+6	1.7538+6	1.3915+6	5.8510+5	8.4127+2	4.1643+0	1.0470–2	2.6196–4	4.1536+0
8.0000+3	9.9284–3	1.7109+4	9.9706+3	3.7303+6	1.7532+6	1.3915+6	5.8473+5	8.5040+2	5.5535+0	1.0597–2	2.6180–4	5.5427+0
1.0000+4	9.9304–3	1.7106+4	1.0292+4	3.7295+6	1.7528+6	1.3915+6	5.8443+5	8.5755+2	6.9555+0	1.0714–2	2.6167–4	6.9446+0
1.5000+4	9.9329–3	1.7101+4	1.0876+4	3.7286+6	1.7519+6	1.3915+6	5.8431+5	8.7140+2	1.0387+1	1.0809–2	2.6161–4	1.0376+1
2.0000+4	9.9358–3	1.7096+4	1.1291+4	3.7275+6	1.7514+6	1.3915+6	5.8383+5	8.8135+2	1.3863+1	1.0903–2	2.6140–4	1.3852+1
3.0000+4	9.9381–3	1.7092+4	1.1877+4	3.7266+6	1.7505+6	1.3915+6	5.8376+5	8.9535+2	2.0746+1	1.1092–2	2.6137–4	2.0734+1
4.0000+4	9.9406–3	1.7088+4	1.2293+4	3.7257+6	1.7499+6	1.3915+6	5.8340+5	9.0540+2	2.7703+1	1.1209–2	2.6121–4	2.7692+1
5.0000+4	9.9467–3	1.7078+4	1.2615+4	3.7234+6	1.7495+6	1.3915+6	5.8159+5	9.1313+2	3.4596+1	1.1270–2	2.6040–4	3.4584+1
6.0000+4	9.9455–3	1.7080+4	1.2879+4	3.7239+6	1.7491+6	1.3915+6	5.8238+5	9.1943+2	4.1482+1	1.1330–2	2.6075–4	4.1471+1
8.0000+4	9.9466–3	1.7078+4	1.3294+4	3.7234+6	1.7485+6	1.3915+6	5.8256+5	9.2946+2	5.5377+1	1.1452–2	2.6083–4	5.5365+1
1.0000+5	9.9478–3	1.7076+4	1.3617+4	3.7230+6	1.7480+6	1.3915+6	5.8256+5	9.3726+2	6.9295+1	1.1571–2	2.6083–4	6.9283+1


July 4, 1991
Atomic Weight 132.905
EEDL Evaluated Electron
Cross Sections
55-Cs
Density 1.873 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
55-Cs


July 4, 1991
Atomic Weight 132.905
EEDL Evaluated Electron
Energy Deposition
55-Cs
Density 1.873 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
55-Cs


July 4 1991
Atomic Weight 132 905
EEDL Evaluated Electron
Shell Cross Sections
55-Cs
Density 1 873 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
55-Cs


July 4, 1991
Atomic Weight 132 905
EEDL Evaluated Electron
Energy Deposition
55-Cs
Density 1 873 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
55-Cs

240

Atomic Weight 132.905 Density 1.873 Grams/cc

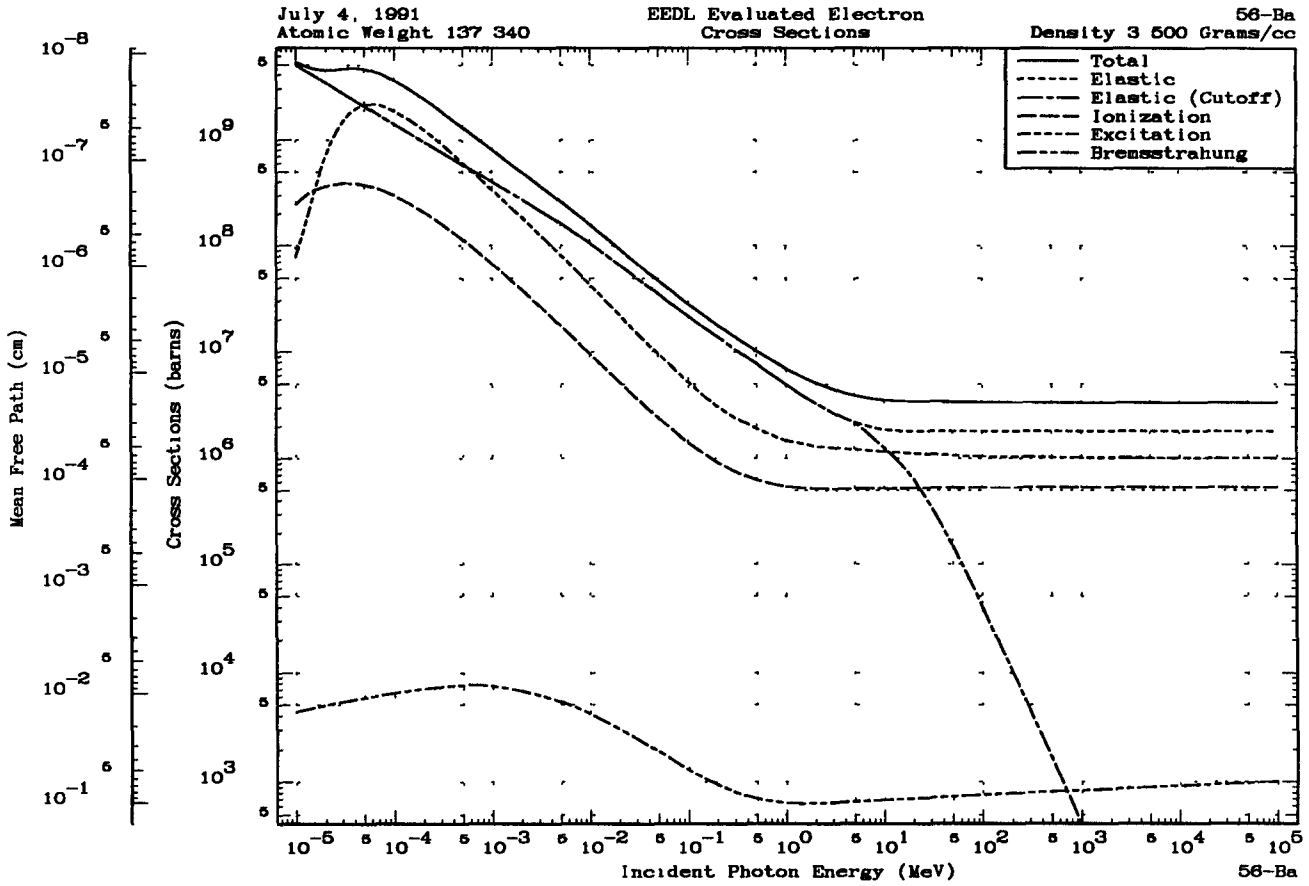
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	2.8400–8	1.8799+7		4.1489+9	3.8114+9	2.8688+8	5.0633+7	4.3653+3	1.4664+1	1.2594+1	2.0694+0	8.0007–5
	1.2500–5	3.0909–8	1.7274+7		3.8122+9	3.3912+9	3.2049+8	1.0046+8	4.5656+3	1.9692+1	1.5372+1	4.3192+0	9.9458–5
	1.5000–5	3.2914–8	1.6221+7		3.5799+9	3.0826+9	3.3756+8	1.5975+8	4.7360+3	2.4625+1	1.7417+1	7.2075+0	1.1954–4
O3	1.6430–5	3.3878–8	1.5759+7		3.4780+9	2.9391+9	3.4140+8	1.9749+8	4.8235+3	2.7345+1	1.8249+1	9.0954+0	1.3128–4
	1.6542–5	3.3946–8	1.5728+7		3.4711+9	2.9287+9	3.4197+8	2.0038+8	4.8301+3	2.7604+1	1.8363+1	9.2413+0	1.3221–4
	1.6758–5	3.4074–8	1.5669+7		3.4581+9	2.9089+9	3.4313+8	2.0603+8	4.8427+3	2.8117+1	1.8589+1	9.5279+0	1.3400–4
	1.6960–5	3.4190–8	1.5616+7		3.4463+9	2.8907+9	3.4427+8	2.1141+8	4.8544+3	2.8612+1	1.8810+1	9.8016+0	1.3568–4
	1.7340–5	3.4397–8	1.5522+7		3.4255+9	2.8573+9	3.4652+8	2.2170+8	4.8761+3	2.9570+1	1.9243+1	1.0327+1	1.3885–4
	1.7673–5	3.4569–8	1.5445+7		3.4085+9	2.8291+9	3.4856+8	2.3091+8	4.8948+3	3.0436+1	1.9635+1	1.0801+1	1.4163–4
O2	1.8270–5	3.4859–8	1.5316+7		3.3802+9	2.7803+9	3.5193+8	2.4797+8	4.9276+3	3.1991+1	2.0306+1	1.1685+1	1.4665–4
	1.8378–5	3.4909–8	1.5294+7		3.3754+9	2.7717+9	3.5262+8	2.5103+8	4.9334+3	3.2296+1	2.0452+1	1.1843+1	1.4756–4
	1.8581–5	3.4999–8	1.5255+7		3.3667+9	2.7558+9	3.5403+8	2.5682+8	4.9443+3	3.2887+1	2.0743+1	1.2144+1	1.4927–4
	1.8836–5	3.5106–8	1.5208+7		3.3564+9	2.7362+9	3.5599+8	2.6422+8	4.9579+3	3.3668+1	2.1138+1	1.2530+1	1.5144–4
	1.8936–5	3.5148–8	1.5190+7		3.3524+9	2.7287+9	3.5660+8	2.6712+8	4.9632+3	3.3952+1	2.1270+1	1.2681+1	1.5228–4
	1.9468–5	3.5359–8	1.5099+7		3.3323+9	2.6894+9	3.5997+8	2.8295+8	4.9909+3	3.5511+1	2.1998+1	1.3513+1	1.5680–4
	2.0000–5	3.5546–8	1.5020+7		3.3149+9	2.6517+9	3.6388+8	2.9927+8	5.0180+3	3.7189+1	2.2813+1	1.4377+1	1.6134–4
	2.1250–5	3.5950–8	1.4851+7		3.2776+9	2.5689+9	3.6894+8	3.3977+8	5.0719+3	4.0794+1	2.4306+1	1.6488+1	1.7117–4
	2.2500–5	3.6239–8	1.4733+7		3.2514+9	2.4932+9	3.7527+8	3.8296+8	5.1233+3	4.4771+1	2.5999+1	1.8771+1	1.8108–4
	2.3438–5	3.6401–8	1.4667+7		3.2370+9	2.4405+9	3.7938+8	4.1713+8	5.1603+3	4.7787+1	2.7188+1	2.0599+1	1.8856–4
	2.4375–5	3.6513–8	1.4622+7		3.2271+9	2.3909+9	3.8334+8	4.5283+8	5.1961+3	5.0876+1	2.8349+1	2.2527+1	1.9609–4
	2.5000–5	3.6567–8	1.4601+7		3.2223+9	2.3594+9	3.8540+8	4.7748+8	5.2193+3	5.2905+1	2.9034+1	2.3870+1	2.0113–4
	2.6719–5	3.6627–8	1.4577+7		3.2170+9	2.2787+9	3.8949+8	5.4880+8	5.2808+3	5.8608+1	3.0804+1	2.7804+1	2.1509–4
	2.7188–5	3.6619–8	1.4580+7		3.2177+9	2.2581+9	3.9051+8	5.6915+8	5.2970+3	6.0206+1	3.1267+1	2.8939+1	2.1892–4
	2.7500–5	3.6610–8	1.4583+7		3.2185+9	2.2446+9	3.9093+8	5.8293+8	5.3077+3	6.1244+1	3.1533+1	2.9711+1	2.2148–4
	3.0000–5	3.6235–8	1.4735+7		3.2518+9	2.1447+9	3.9515+8	7.1199+8	5.3898+3	7.0778+1	3.3794+1	3.6984+1	2.4211–4
O1	3.0970–5	3.6016–8	1.4824+7		3.2716+9	2.1093+9	3.9460+8	7.6772+8	5.4197+3	7.4441+1	3.4364+1	4.0077+1	2.5012–4
	3.1534–5	3.5924–8	1.4862+7		3.2799+9	2.0894+9	3.9451+8	7.9602+8	5.4367+3	7.6416+1	3.4746+1	4.1670+1	2.5480–4
	3.2593–5	3.5721–8	1.4946+7		3.2986+9	2.0536+9	3.9450+8	8.5045+8	5.4680+3	8.0226+1	3.5474+1	4.4752+1	2.6360–4
	3.4444–5	3.5278–8	1.5134+7		3.3400+9	1.9950+9	3.9491+8	9.5005+8	5.5208+3	8.7241+1	3.6794+1	5.0447+1	2.7911–4
	3.5000–5	3.5125–8	1.5200+7		3.3545+9	1.9784+9	3.9512+8	9.8101+8	5.5361+3	8.9429+1	3.7197+1	5.2232+1	2.8379–4
	3.5833–5	3.4889–8	1.5303+7		3.3773+9	1.9541+9	3.9476+8	1.0284+9	5.5588+3	9.2647+1	3.7672+1	5.4975+1	2.9083–4
	3.7222–5	3.4456–8	1.5495+7		3.4197+9	1.9156+9	3.9423+8	1.1098+9	5.5957+3	9.8179+1	3.8453+1	5.9726+1	3.0262–4
	4.0000–5	3.3790–8	1.5800+7		3.4871+9	1.8448+9	3.9385+8	1.2484+9	5.6661+3	1.0818+2	4.0100+1	6.8082+1	3.2639–4
	4.5000–5	3.2658–8	1.6348+7		3.6080+9	1.7344+9	3.8592+8	1.4876+9	5.7726+3	1.2429+2	4.1794+1	8.2496+1	3.6771–4
	5.0000–5	3.1771–8	1.6804+7		3.7086+9	1.6413+9	3.7961+8	1.6877+9	5.8695+3	1.3865+2	4.3501+1	9.5146+1	4.0967–4
	6.0000–5	3.1621–8	1.6884+7		3.7263+9	1.4919+9	3.6652+8	1.8679+9	6.0327+3	1.5488+2	4.6066+1	1.0882+2	4.9334–4
	7.0000–5	3.2174–8	1.6594+7		3.6622+9	1.3762+9	3.4946+8	1.9366+9	6.1742+3	1.6238+2	4.7178+1	1.1520+2	5.7890–4
	8.0000–5	3.2977–8	1.6190+7		3.5730+9	1.2832+9	3.3641+8	1.9534+9	6.2995+3	1.6709+2	4.8498+1	1.1860+2	6.6612–4
N5	8.3240–5	3.3314–8	1.6026+7		3.5369+9	1.2568+9	3.3134+8	1.9487+9	6.3373+3	1.6773+2	4.8603+1	1.1913+2	6.9471–4
	8.3764–5	3.3369–8	1.6000+7		3.5311+9	1.2527+9	3.3058+8	1.9478+9	6.3432+3	1.6785+2	4.8637+1	1.1921+2	6.9935–4
	8.4271–5	3.3421–8	1.5975+7		3.5256+9	1.2487+9	3.2985+8	1.9470+9	6.3490+3	1.6796+2	4.8671+1	1.1929+2	7.0385–4
	8.4763–5	3.3471–8	1.5951+7		3.5203+9	1.2450+9	3.2915+8	1.9462+9	6.3546+3	1.6808+2	4.8706+1	1.1937+2	7.0821–4
	8.5239–5	3.3519–8	1.5928+7		3.5153+9	1.2413+9	3.2847+8	1.9455+9	6.3599+3	1.6819+2	4.8741+1	1.1944+2	7.1243–4
N4	8.5610–5	3.3557–8	1.5910+7		3.5113+9	1.2385+9	3.2796+8	1.9449+9	6.3641+3	1.6827+2	4.8770+1	1.1950+2	7.1573–4
	8.6060–5	3.3608–8	1.5886+7		3.5059+9	1.2351+9	3.2736+8	1.9435+9	6.3685+3	1.6835+2	4.8817+1	1.1954+2	7.1962–4
	8.6495–5	3.3658–8	1.5862+7		3.5008+9	1.2318+9	3.2678+8	1.9421+9	6.3728+3	1.6844+2	4.8868+1	1.1957+2	7.2339–4
	8.6580–5	3.3668–8	1.5858+7		3.4997+9	1.2312+9	3.2667+8	1.9419+9	6.3736+3	1.6845+2	4.8878+1	1.1958+2	7.2413–4
	8.7339–5	3.3754–8	1.5818+7		3.4908+9	1.2256+9	3.2571+8	1.9395+9	6.3810+3	1.6862+2	4.8981+1	1.1963+2	7.3071–4
	8.8131–5	3.3843–8	1.5776+7		3.4817+9	1.2198+9	3.2476+8	1.9371+9	6.3886+3	1.6881+2	4.9114+1	1.1970+2	7.3758–4
	8.8872–5	3.3925–8	1.5738+7		3.4733+9	1.2145+9	3.2392+8	1.9349+9	6.3957+3	1.6903+2	4.9270+1	1.1975+2	7.4403–4
	9.0831–5	3.4135–8	1.5641+7		3.4519+9	1.2007+9	3.2211+8	1.9291+9	6.4142+3	1.6985+2	4.9933+1	1.1991+2	7.6108–4
	9.0889–5	3.4141–8	1.5638+7		3.4512+9	1.2003+9	3.2207+8	1.9289+9	6.4148+3	1.6988+2	4.9960+1	1.1992+2	7.6158–4
	9.2028–5	3.4259–8	1.5584+7		3.4394+9	1.1925+9	3.2134+8	1.9256+9	6.4254+3	1.7056+2	5.0551+1	1.2001+2	7.7152–4
	9.3024–5	3.4361–8	1.5538+7		3.4292+9	1.1858+9	3.2068+8	1.9227+9	6.4346+3	1.7114+2	5.1046+1	1.2010+2	7.8023–4
	9.3803–5	3.4440–8	1.5502+7		3.4213+9	1.1806+9	3.2013+8	1.9205+9	6.4417+3	1.7156+2	5.1398+1	1.2016+2	7.8704–4
	9.3896–5	3.4450–8	1.5498+7		3.4203+9	1.1800+9	3.2007+8	1.9202+9	6.4425+3	1.7161+2	5.1441+1	1.2017+2	7.8785–4
	9.5352–5	3.4598–8	1.5432+7		3.4057+9	1.1705+9	3.1901+8	1.9162+9	6.4557+3	1.7235+2	5.2046+1	1.2030+2	8.0061–4
	9.5422–5	3.4605–8	1.5429+7		3.4050+9	1.1701+9	3.1896+8	1.9160+9	6.4563+3	1.7238+2	5.2074+1	1.2031+2	8.0122–4
	9.7676–5	3.4831–8	1.5328+7		3.3829+9	1.1559+9	3.1722+8	1.9098+9	6.4763+3	1.7338+2	5.2868+1	1.2051+2	8.2102–4
	9.7711–5	3.4834–8	1.5327+7		3.3826+9	1.1556+9	3.1719+8	1.9097+9	6.4766+3	1.7339+2	5.2879+1	1.2051+2	8.2133–4
	1.0000–4	3.5061–8	1.5228+7	0.0000+0	3.3607+9	1.1417+9	3.1538+8	1.9036+9	6.4965+3	1.7432+2	5.3590+1	1.2073+2	8.4149–4
	1.0313–4	3.5468–8	1.5053+7	1.7923–8	3.3221+9	1.1234+9	3.1200+8	1.8866+9	6.5218+3	1.7439+2	5.4193+1	1.2019+2	8.6885–4
	1.0605–4	3.5843–8	1.4896+7	3.4721–8	3.2874+9	1.1071+9	3.0898+8	1.8713+9	6.5449+3	1.7447+2	5.4743+1	1.1972+2	8.9459–4
	1.0625–4	3.5868–8	1.4885+7	3.5839–8	3.2851+9	1.1060+9	3.0878+8	1.8703+9	6.5465+3	1.7447+2	5.4776+1	1.1969+2	8.9631–4
	1.1155–4	3.6529–8	1.4616+7	6.6203–8	3.2257+9	1.0781+9	3.0348+8	1.8440+9	6.5868+3	1.7449+2	5.5579+1	1.1891+2	9.4308–4
	1.1635–4	3.7110–8	1.4387+7	9.3740–8	3.1751+9	1.0546+9	2.9903+8	1.8215+9	6.6220+3	1.7456+2	5.6288+1	1.1827+2	9.8572–4
	1.1719–4	3.7209–8	1.4349+7	9.8518–8	3.1667+9	1.0506+9	2.9828+8	1.8178+9	6.6279+3	1.7457+2	5.6405+1	1.1817+2	9.9315–4
	1.2477–4	3.8091–8	1.4017+7	1.4192–7	3.0934+9	1.0167+9	2.9177+8	1.7849+9	6.6806+3	1.7463+2	5.7354+1	1.1728+2	1.0609–3
	1.2500–4	3.8118–8	1.4007+7	1.4326–7	3.0912+9	1.0157+9	2.9158+8	1.7839+9	6.6822+3	1.7464+2	5.7383+1	1.1725+2	1.0630–3
	1.2539–4	3.8178–8	1.3985+7	1.4550–7	3.0863+9	1.0140+9	2.9121+8	1.7811+9	6.6848+3	1.7454+2	5.7412+1	1.1713+2	1.0665–3
	1.3738–4	3.9990–8	1.3351+7	2.1474–7	2.9464+9	9.6660+8	2.8069+8	1.6992+9	6.7623+3	1.7184+2	5.8212+1	1.1362+2	1.1747–3
	1.3770–4	4.0036–8	1.3336+7	2.1656–7	2.9431+9	9.6545+8	2.8044+8	1.6972+9	6.7643+3	1.7177+2	5.8233+1	1.1354+2	1.1775–3
	1.5000–4	4.1812–8	1.2769+7	2.8868–7	2.8181+9	9.2309+8	2.7106+8	1.6239+9	6.8378+3	1.6947+2	5.8991+1	1.1048+2	1.2898–3
N3	1.6776–4	4.4163–8	1.2089+7	3.9462–7	2.6681+9	8.7049+8	2.5733+8	1.5402+9	6.9351+3	1.6580+2	5.9149+1	1.0665+2	1.4537–3
	1.6977–4	4.4472–8	1.2005+7	4.0680–7	2.6495+9	8.6506+8	2.5591+8	1.5286+9	6.9455+3	1.6525+2	5.9175+1	1.0607+2	1.4724–3
	1.7355–4	4.5046–8	1.1852+7	4.2973–7	2.6157+9	8.5514+8	2.5332+8	1.5073+9	6.9648+3	1.6424+2	5.9230+1	1.0501+2	1.5076–3
	1.8017–4	4.6039–8	1.1597+7	4.7019–7	2.5593+9	8.3854+8	2.4903+8	1.4718+9	6.9978+3	1.6259+2	5.9348+1	1.0324+2	1.5694–3
N2	1.8197–4	4.6307–8	1.1530+7	4.8131–7	2.5445+9	8.3417+8	2.4791+8	1.4624+9	7.0066+3	1.6216+2	5.9382+1	1.0278+2	1.5863–3
	1.8422–4	4.6670–8	1.1440+7	4.9524–7	2.5247+9	8.2880+8	2.4650+8	1.4494+9	7.0148+3	1.6153+2	5.9412+1	1.0212+2	1.6076–3
	1.8817–4	4.7301–8	1.1287+7	5.1973–7	2.4911+9	8.1965+8	2.4410+8	1.4273+9	7.0288+3	1.6047+2	5.9472+1	1.0100+2	1.6448–3

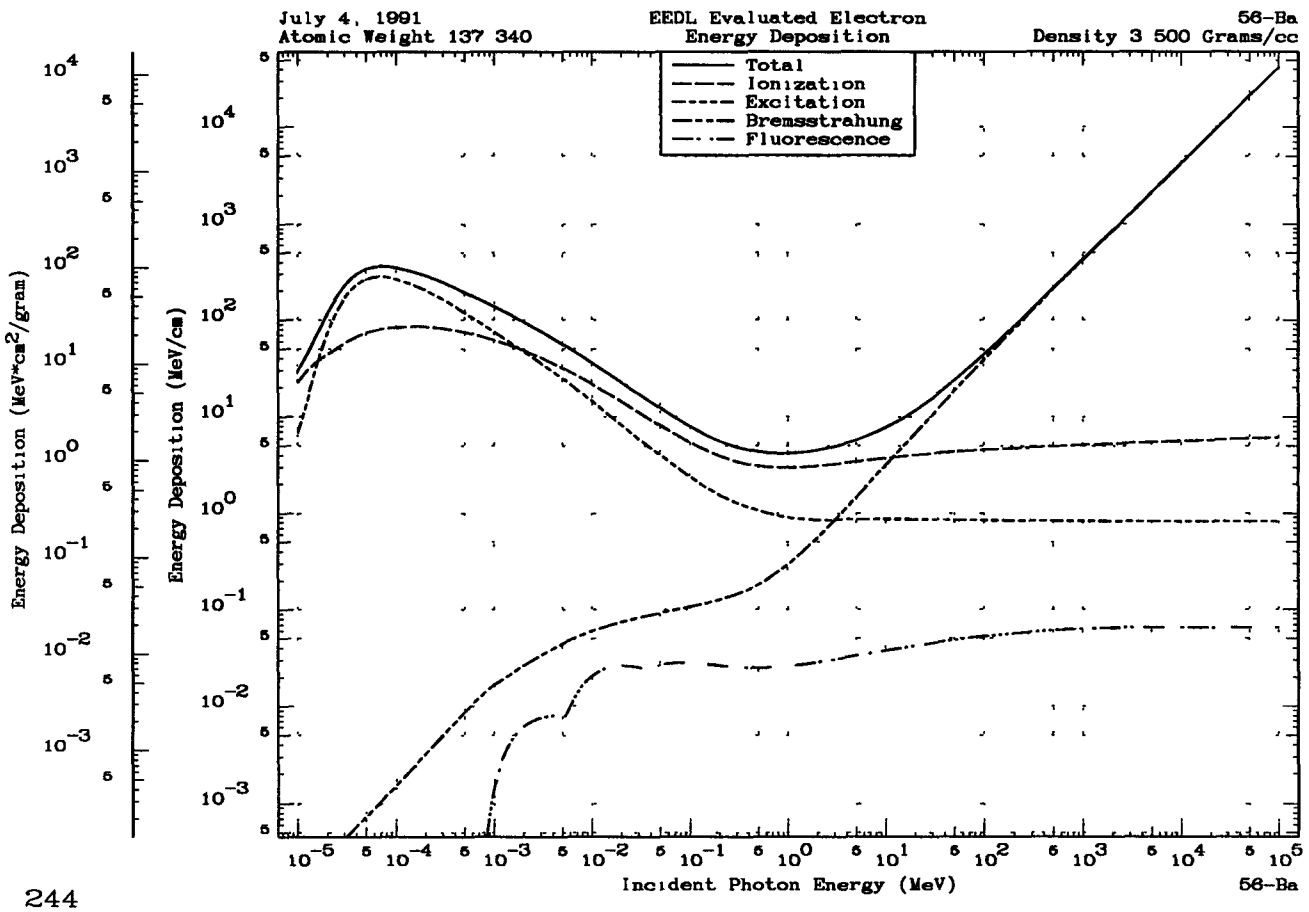
Atomic Weight 132.905 — Density 1.873 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.9008–4	4.7605–8	1.1215+7	5.3168–7	2.4752+9	8.1531+8	2.4297+8	1.4169+9	7.0356+3	1.5997+2	5.9505+1	1.0047+2	1.6629–3
	1.9408–4	4.8237–8	1.1068+7	5.5677–7	2.4427+9	8.0646+8	2.4067+8	1.3956+9	7.0495+3	1.5897+2	5.9576+1	9.9393+1	1.7007–3
	2.0000–4	4.9161–8	1.0860+7	5.9415–7	2.3968+9	7.9386+8	2.3742+8	1.3655+9	7.0695+3	1.5758+2	5.9697+1	9.7879+1	1.7569–3
	2.1250–4	5.0997–8	1.0469+7	6.7432–7	2.3105+9	7.6903+8	2.3003+8	1.3114+9	7.1074+3	1.5427+2	5.9442+1	9.4829+1	1.8760–3
	2.2344–4	5.2566–8	1.0157+7	7.4582–7	2.2415+9	7.4906+8	2.2417+8	1.2683+9	7.1389+3	1.5170+2	5.9294+1	9.2408+1	1.9807–3
	2.2500–4	5.2788–8	1.0114+7	7.5613–7	2.2321+9	7.4633+8	2.2337+8	1.2624+9	7.1433+3	1.5136+2	5.9277+1	9.2079+1	1.9957–3
N1	2.3186–4	5.3753–8	9.9325+6	8.0167–7	2.1920+9	7.3467+8	2.1998+8	1.2374+9	7.1623+3	1.4989+2	5.9206+1	9.0682+1	2.0616–3
	2.3612–4	5.4398–8	9.8147+6	8.3019–7	2.1660+9	7.2769+8	2.1779+8	1.2206+9	7.1738+3	1.4884+2	5.9083+1	8.9758+1	2.1027–3
	2.4410–4	5.5596–8	9.6032+6	8.8417–7	2.1194+9	7.1512+8	2.1388+8	1.1904+9	7.1949+3	1.4698+2	5.8877+1	8.8104+1	2.1798–3
	2.5808–4	5.7657–8	9.2600+6	9.8021–7	2.0436+9	6.9455+8	2.0754+8	1.1415+9	7.2303+3	1.4403+2	5.8589+1	8.5438+1	2.3152–3
	2.6172–4	5.8187–8	9.1757+6	1.0056–6	2.0250+9	6.8947+8	2.0598+8	1.1296+9	7.2392+3	1.4332+2	5.8526+1	8.4786+1	2.3506–3
	2.6250–4	5.8300–8	9.1578+6	1.0110–6	2.0211+9	6.8839+8	2.0565+8	1.1270+9	7.2411+3	1.4316+2	5.8513+1	8.4649+1	2.3582–3
	2.7904–4	6.0670–8	8.8001+6	1.1278–6	1.9421+9	6.6669+8	1.9905+8	1.0764+9	7.2802+3	1.4017+2	5.8265+1	8.1903+1	2.5196–3
	3.0000–4	6.3598–8	8.3950+6	1.2791–6	1.8527+9	6.4185+8	1.9161+8	1.0193+9	7.3269+3	1.3690+2	5.8072+1	7.8828+1	2.7254–3
	3.2500–4	6.7129–8	7.9534+6	1.4648–6	1.7553+9	6.1544+8	1.8267+8	9.5715+8	7.3748+3	1.3227+2	5.7192+1	7.5076+1	2.9723–3
	3.5000–4	7.0563–8	7.5663+6	1.6567–6	1.6698+9	5.9196+8	1.7485+8	9.0303+8	7.4194+3	1.2831+2	5.6489+1	7.1823+1	3.2208–3
	4.0000–4	7.7948–8	6.8494+6	2.0585–6	1.5116+9	5.5189+8	1.6177+8	7.9797+8	7.5004+3	1.2068+2	5.5456+1	6.5219+1	3.7221–3
	4.5000–4	8.4992–8	6.2818+6	2.4850–6	1.3863+9	5.1879+8	1.5013+8	7.1742+8	7.5376+3	1.1384+2	5.3896+1	5.9935+1	4.2246–3
	5.0000–4	9.1788–8	5.8167+6	2.9351–6	1.2837+9	4.9087+8	1.4055+8	6.5228+8	7.5709+3	1.0841+2	5.2727+1	5.5675+1	4.7295–3
	6.0000–4	1.0487–7	5.0909+6	3.8991–6	1.1235+9	4.4606+8	1.2471+8	5.5276+8	7.6060+3	9.9196+1	5.0273+1	4.8918+1	5.7259–3
M5	7.3298–4	1.2113–7	4.4075+6	5.3092–6	9.7272+8	4.0155+8	1.0869+8	4.6247+8	7.5860+3	8.9579+1	4.7134+1	4.2438+1	6.9759–3
	7.4136–4	1.2215–7	4.3708+6	5.4029–6	9.6461+8	3.9916+8	1.0784+8	4.5760+8	7.5833+3	8.9081+1	4.6977+1	4.2096+1	7.0517–3
M4	7.4770–4	1.2292–7	4.3435+6	5.4743–6	9.5859+8	3.9738+8	1.0721+8	4.5399+8	7.5812+3	8.8707+1	4.6857+1	4.1843+1	7.1091–3
	7.6078–4	1.2452–7	4.2878+6	5.6223–6	9.4629+8	3.9378+8	1.0595+8	4.4656+8	7.5764+3	8.7968+1	4.6634+1	4.1327+1	7.2255–3
	7.7068–4	1.2572–7	4.2467+6	5.7352–6	9.3723+8	3.9111+8	1.0501+8	4.4110+8	7.5728+3	8.7432+1	4.6476+1	4.0948+1	7.3136–3
	8.0000–4	1.2926–7	4.1306+6	6.0735–6	9.1159+8	3.8352+8	1.0236+8	4.2570+8	7.5624+3	8.5921+1	4.6033+1	3.9881+1	7.5743–3
	8.5000–4	1.3506–7	3.9530+6	6.6647–6	8.7240+8	3.7150+8	9.8008+7	4.0288+8	7.5215+3	8.3239+1	4.5064+1	3.8167+1	7.9498–3
	9.2500–4	1.4357–7	3.7189+6	7.5851–6	8.2073+8	3.5537+8	9.2266+7	3.7309+8	7.4649+3	7.9766+1	4.3825+1	3.5933+1	8.5099–3
M3	9.9068–4	1.5083–7	3.5399+6	8.4222–6	7.8122+8	3.4280+8	8.7876+7	3.5054+8	7.4193+3	7.7166+1	4.2911+1	3.4245+1	8.9974–3
	1.0000–3	1.5187–7	3.5154+6	8.5433–6	7.7583+8	3.4111+8	8.7295+7	3.4742+8	7.4131+3	7.6823+1	4.2797+1	3.4017+1	9.0664–3
	1.0313–3	1.5522–7	3.4396+6	8.9534–6	7.5910+8	3.3568+8	8.5338+7	3.3807+8	7.3799+3	7.5576+1	4.2296+1	3.3271+1	9.2456–3
M2	1.0595–3	1.5822–7	3.3744+6	9.3298–6	7.4472+8	3.3098+8	8.3657+7	3.3008+8	7.3509+3	7.4513+1	4.1871+1	3.2633+1	9.4070–3
	1.0733–3	1.5970–7	3.3432+6	9.5152–6	7.3782+8	3.2876+8	8.2867+7	3.2619+8	7.3371+3	7.4013+1	4.1675+1	3.2328+1	9.4856–3
	1.0898–3	1.6147–7	3.3065+6	9.7400–6	7.2972+8	3.2614+8	8.1939+7	3.2163+8	7.3207+3	7.3429+1	4.1448+1	3.1971+1	9.5800–3
	1.0999–3	1.6255–7	3.2846+6	9.8779–6	7.2489+8	3.2457+8	8.1386+7	3.1892+8	7.3109+3	7.3082+1	4.1314+1	3.1758+1	9.6374–3
	1.1250–3	1.6520–7	3.2318+6	1.0223–5	7.1323+8	3.2078+8	8.0053+7	3.1240+8	7.2869+3	7.2249+1	4.0993+1	3.1247+1	9.7798–3
	1.1411–3	1.6690–7	3.1989+6	1.0447–5	7.0598+8	3.1841+8	7.9222+7	3.0835+8	7.2718+3	7.1726+1	4.0787+1	3.0929+1	9.8712–3
	1.1499–3	1.6783–7	3.1813+6	1.0570–5	7.0208+8	3.1713+8	7.8776+7	3.0617+8	7.2637+3	7.1446+1	4.0677+1	3.0759+1	9.9212–3
M1	1.1964–3	1.7266–7	3.0921+6	1.1227–5	6.8242+8	3.1064+8	7.6524+7	2.9524+8	7.2219+3	7.0041+1	4.0127+1	2.9903+1	1.0184–2
	1.2154–3	1.7464–7	3.0572+6	1.1499–5	6.7471+8	3.0810+8	7.5623+7	2.9098+8	7.2046+3	6.9444+1	3.9874+1	2.9559+1	1.0287–2
	1.2509–3	1.7831–7	2.9943+6	1.2015–5	6.6083+8	3.0350+8	7.3999+7	2.8332+8	7.1731+3	6.8376+1	3.9424+1	2.8941+1	1.0482–2
	1.2703–3	1.8028–7	2.9614+6	1.2299–5	6.5357+8	3.0108+8	7.3152+7	2.7934+8	7.1564+3	6.7822+1	3.9192+1	2.8620+1	1.0587–2
	1.3125–3	1.8457–7	2.8926+6	1.2927–5	6.3839+8	2.9598+8	7.1379+7	2.7102+8	7.1209+3	6.6673+1	3.8713+1	2.7949+1	1.0816–2
	1.3132–3	1.8464–7	2.8915+6	1.2937–5	6.3814+8	2.9590+8	7.1350+7	2.7088+8	7.1203+3	6.6655+1	3.8705+1	2.7938+1	1.0820–2
	1.3206–3	1.8539–7	2.8800+6	1.3048–5	6.3559+8	2.9504+8	7.1052+7	2.6949+8	7.1143+3	6.6459+1	3.8623+1	2.7826+1	1.0860–2
	1.4066–3	1.9397–7	2.7525+6	1.4364–5	6.0747+8	2.8548+8	6.7769+7	2.5422+8	7.0464+3	6.4327+1	3.7720+1	2.6596+1	1.1324–2
	1.5000–3	2.0308–7	2.6290+6	1.5839–5	5.8021+8	2.7606+8	6.4592+7	2.3955+8	6.9779+3	6.2306+1	3.6877+1	2.5417+1	1.1825–2
	1.6250–3	2.1498–7	2.4835+6	1.7890–5	5.4810+8	2.6477+8	6.0712+7	2.2261+8	6.8838+3	5.9578+1	3.5601+1	2.3964+1	1.2437–2
	1.7500–3	2.2656–7	2.3565+6	2.0031–5	5.2007+8	2.5472+8	5.7337+7	2.0800+8	6.7979+3	5.7239+1	3.4514+1	2.2712+1	1.3044–2
	1.8125–3	2.3225–7	2.2988+6	2.1133–5	5.0734+8	2.5010+8	5.5807+7	2.0142+8	6.7576+3	5.6179+1	3.4016+1	2.2150+1	1.3345–2
	2.0000–3	2.4891–7	2.1449+6	2.4556–5	4.7337+8	2.3758+8	5.1739+7	1.8405+8	6.6457+3	5.3401+1	3.2721+1	2.0666+1	1.4242–2
	2.2500–3	2.7049–7	1.9738+6	2.9404–5	4.3561+8	2.2357+8	4.7107+7	1.6493+8	6.4722+3	4.9782+1	3.0867+1	1.8900+1	1.5227–2
	2.5000–3	2.9123–7	1.8332+6	3.4578–5	4.0459+8	2.1174+8	4.3327+7	1.4951+8	6.3209+3	4.6870+1	2.9374+1	1.7480+1	1.6196–2
	2.6250–3	3.0132–7	1.7719+6	3.7282–5	3.9104+8	2.0648+8	4.1683+7	1.4287+8	6.2520+3	4.5605+1	2.8720+1	1.6868+1	1.6675–2
	3.0000–3	3.3061–7	1.6149+6	4.5805–5	3.5640+8	1.9274+8	3.7503+7	1.2616+8	6.0673+3	4.2427+1	2.7075+1	1.5333+1	1.8090–2
	3.5000–3	3.6867–7	1.4482+6	5.8154–5	3.1961+8	1.7752+8	3.3090+7	1.0899+8	5.8226+3	3.8614+1	2.4972+1	1.3622+1	1.9684–2
	4.0000–3	4.0486–7	1.3187+6	7.1613–5	2.9104+8	1.6531+8	2.9698+7	9.6019+7	5.6187+3	3.5724+1	2.3370+1	1.2332+1	2.1237–2
	5.0000–3	4.7503–7	1.1239+6	1.0157–4	2.4805+8	1.4559+8	2.4723+7	7.7731+7	5.2457+3	3.1143+1	2.0704+1	1.0415+1	2.3801–2
L3	5.0061–3	4.7543–7	1.1230+6	1.0177–4	2.4784+8	1.4549+8	2.4698+7	7.7647+7	5.2435+3	3.1119+1	2.0690+1	1.0406+1	2.3814–2
	5.1303–3	4.8388–7	1.1034+6	1.0579–4	2.4351+8	1.4339+8	2.4201+7	7.5911+7	5.2011+3	3.0639+1	2.0401+1	1.0213+1	2.4095–2
	5.3477–3	4.9852–7	1.0710+6	1.1298–4	2.3636+8	1.3991+8	2.3383+7	7.3060+7	5.1300+3	2.9850+1	1.9927+1	9.8976+0	2.4584–2
L2	5.3632–3	4.9955–7	1.0688+6	1.1350–4	2.3587+8	1.3967+8	2.3327+7	7.2865+7	5.1251+3	2.9796+1	1.9895+1	9.8762+0	2.4619–2
	5.5224–3	5.1025–7	1.0464+6	1.1889–4	2.3093+8	1.3727+8	2.2769+7	7.0878+7	5.0757+3	2.9257+1	1.9573+1	9.6592+0	2.4974–2
L1	5.6849–3	5.2107–7	1.0246+6	1.2449–4	2.2613+8	1.3494+8	2.2229+7	6.8961+7	5.0271+3	2.8738+1	1.9262+1	9.4501+0	2.5334–2
	5.7612–3	5.2619–7	1.0147+6	1.2716–4	2.2393+8	1.3388+8	2.1985+7	6.8064+7	5.0045+3	2.8502+1	1.9123+1	9.3535+0	2.5497–2
	5.8424–3	5.3162–7	1.0043+6	1.3002–4	2.2164+8	1.3277+8	2.1732+7	6.7134+7	4.9809+3	2.8256+1	1.8977+1	9.2532+0	2.5671–2
	6.0000–3	5.4209–7	9.8489+5	1.3564–4	2.1736+8	1.3069+8	2.1259+7	6.5403+7	4.9363+3	2.7800+1	1.8707+1	9.0665+0	2.6006–2
	6.5000–3	5.7555–7	9.2764+5	1.5411–4	2.0473+8	1.2447+8	1.9888+7	6.0367+7	4.7905+3	2.6349+1	1.7841+1	8.4815+0	2.6879–2
	7.2500–3	6.2433–7	8.5516+5	1.8361–4	1.8873+8	1.1645+8	1.8161+7	5.4116+7	4.5984+3	2.4535+1	1.6751+1	7.7554+0	2.8166–2
	8.0000–3	6.7163–7	7.9493+5	2.1514–4	1.7544+8	1.0966+8	1.6734+7	4.9038+7	4.4319+3	2.3050+1	1.5855+1	7.1654+0	2.9424–2
	9.0000–3	7.3381–7	7.2757+5	2.6026–4	1.6057+8	1.0180+8	1.5164+7	4.3597+7	4.2242+3	2.1296+1	1.4764+1	6.5011+0	3.0792–2
	1.0000–2	7.9405–7	6.7238+5	3.0885–4	1.4839+8	9.5257+7	1.3887+7	3.9244+7	4.0466+3	1.9879+1	1.3877+1	5.9697+0	3.2129–2
	1.1250–2	8.6830–7	6.1488+5	3.7434–4	1.3570+8	8.8204+7	1.2584+7	3.4909+7	3.8379+3	1.8319+1	1.2878+1	5.4081+0	3.3323–2
	1.3125–2	9.7561–7	5.4725+5	4.8210–4	1.2077+8	7.9757+7	1.1063+7	2.9951+7	3.5809+3	1.6510+1	1.1709+1	4.7660+0	3.5081–2
	1.5000–2	1.0788–6	4.9492+5	6.0069–4	1.0922+8	7.3096+7	9.8970+6	2.6228+7	3.3722+3	1.5131+1	1.0810+1	4.2840+0	3.6794–2
	1.7500–2	1.2146–6	4.3957+5	7.7485–4	9.7010+7	6.5780+7	8.7067+6	2.2520+7	3.1343+3	1.3606+1	9.7966+0	3.7707+0	3.8370–2
	2.0000–2	1.3456–6	3.9678+5	9.6694–4	8.7568+7	6.0037+7	7.7929+6	1.9734+7	2.9419+3	1.2441+1	9.0160+0	3.3853+0	3.9929–2
	2.5000–2	1.6010–6	3.3349+5	1.4009–3	7.3599+7	5.1324+7	6.4906+6	1.5782+7	2.6257+3	1.0648+1	7.8045+0	2.8011+0	4.1984–2
	3.0000–2	1.8442–6	2.8951+5	1.8999–3	6.3892+7	4.5152+7	5.5908+6	1.3147+7	2.3927+3	9.4167+0	6.9608+0	2.4118+0	4.4043–2
K	3.5985–2	2.1204–6	2.5180+5	2.5760–3	5.5571+7	3.9773+7	4.8323+6	1.0963+7	2.1743+3	8.3117+0	6.1961+0	2.0697+0	4.5862–2

Atomic Weight 132.905 Density 1.873 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.6487–2	2.1429–6	2.4915+5	2.6367–3	5.4985+7	3.9392+7	4.7794+6	1.0812+7	2.1583+3	8.2340+0	6.1424+0	2.0455+0	4.5995–2
3.7365–2	2.1822–6	2.4466+5	2.7442–3	5.3994+7	3.8746+7	4.6900+6	1.0556+7	2.1310+3	8.1026+0	6.0515+0	2.0049+0	4.6227–2
3.8683–2	2.2408–6	2.3827+5	2.9087–3	5.2584+7	3.7824+7	4.5628+6	1.0195+7	2.0918+3	7.9159+0	5.9221+0	1.9473+0	4.6575–2
4.0000–2	2.2988–6	2.3225+5	3.0770–3	5.1257+7	3.6953+7	4.4431+6	9.8582+6	2.0547+3	7.7407+0	5.8003+0	1.8935+0	4.6925–2
4.2500–2	2.4071–6	2.2180+5	3.4066–3	4.8950+7	3.5429+7	4.2380+6	9.2805+6	1.9900+3	7.4288+0	5.5831+0	1.7982+0	4.7499–2
4.6250–2	2.5666–6	2.0802+5	3.9259–3	4.5908+7	3.3408+7	3.9678+6	8.5308+6	1.9031+3	7.0194+0	5.2965+0	1.6746+0	4.8370–2
5.0000–2	2.7228–6	1.9609+5	4.4740–3	4.3276+7	3.1646+7	3.7340+6	7.8933+6	1.8264+3	6.6669+0	5.0482+0	1.5695+0	4.9246–2
5.5000–2	2.9241–6	1.8258+5	5.2479–3	4.0295+7	2.9639+7	3.4737+6	7.1802+6	1.7332+3	6.2592+0	4.7612+0	1.4478+0	5.0233–2
6.0000–2	3.1207–6	1.7109+5	6.0696–3	3.7758+7	2.7919+7	3.2520+6	6.5856+6	1.6522+3	5.9140+0	4.5165+0	1.3463+0	5.1225–2
7.0000–2	3.4944–6	1.5279+5	7.8456–3	3.3719+7	2.5156+7	2.9067+6	5.6545+6	1.5156+3	5.3565+0	4.1226+0	1.1810+0	5.2849–2
8.0000–2	3.8532–6	1.3856+5	9.7917–3	3.0580+7	2.2985+7	2.6376+6	4.9551+6	1.4064+3	4.9264+0	3.8149+0	1.0570+0	5.4481–2
1.0000–1	4.5104–6	1.1837+5	1.4126–2	2.6124+7	1.9827+7	2.2619+6	4.0342+6	1.2467+3	4.3150+0	3.3689+0	8.8883–1	5.7214–2
1.2500–1	5.2317–6	1.0205+5	2.0280–2	2.2522+7	1.7232+7	1.9662+6	3.3225+6	1.1195+3	3.8208+0	3.0074+0	7.5344–1	5.9940–2
1.5000–1	5.9042–6	9.0428+4	2.7142–2	1.9957+7	1.5367+7	1.7536+6	2.8353+6	1.0254+3	3.4714+0	2.7475+0	6.6122–1	6.2739–2
1.7500–1	6.5070–6	8.2051+4	3.4612–2	1.8108+7	1.4015+7	1.6111+6	2.4815+6	9.5971+2	3.2247+0	2.5693+0	5.9021–1	6.5147–2
2.0000–1	7.0585–6	7.5640+4	4.2593–2	1.6693+7	1.2939+7	1.4971+6	2.2556+6	9.0626+2	3.0418+0	2.4273+0	5.4693–1	6.7585–2
3.0000–1	8.9581–6	5.9600+4	7.7850–2	1.3153+7	1.0142+7	1.2433+6	1.7669+6	7.7831+2	2.6404+0	2.1109+0	4.5257–1	7.6920–2
4.0000–1	1.0583–5	5.0448+4	1.1710–1	1.1134+7	8.4853+6	1.1205+6	1.5271+6	7.1321+2	2.4574+0	1.9639+0	4.0679–1	8.6688–2
5.0000–1	1.2029–5	4.4384+4	1.5862–1	9.7954+6	7.3808+6	1.0503+6	1.3635+6	6.7505+2	2.3607+0	1.8891+0	3.7449–1	9.7067–2
6.0000–1	1.3317–5	4.0093+4	2.0149–1	8.8483+6	6.5860+6	1.0058+6	1.2558+6	6.5223+2	2.3046+0	1.8431+0	3.5362–1	1.0788–1
8.0000–1	1.5548–5	3.4339+4	2.8891–1	7.5785+6	5.5029+6	9.5549+5	1.1195+6	6.2845+2	2.2708+0	1.8115+0	3.2810–1	1.3114–1
1.0000+0	1.7417–5	3.0655+4	3.7699–1	6.7653+6	4.8012+6	9.2915+5	1.0343+6	6.1728+2	2.2709+0	1.8022+0	3.1273–1	1.5592–1
1.5000+0	2.0909–5	2.5534+4	5.9272–1	5.6353+6	3.7879+6	9.0661+5	9.4016+5	6.0973+2	2.3652+0	1.8438+0	2.9821–1	2.2316–1
2.0000+0	2.3503–5	2.2716+4	7.9954–1	5.0134+6	3.2344+6	9.0075+5	8.7758+5	6.1254+2	2.4707+0	1.8829+0	2.9174–1	2.9606–1
3.0000+0	2.6881–5	1.9862+4	1.1871+0	4.3834+6	2.6543+6	8.9382+5	8.3465+5	6.2147+2	2.6935+0	1.9540+0	2.8971–1	4.4980–1
4.0000+0	2.9178–5	1.8298+4	1.5440+0	4.0383+6	2.3461+6	8.9465+5	7.9691+5	6.3010+2	2.9119+0	2.0114+0	2.8828–1	6.1225–1
5.0000+0	3.0656–5	1.7416+4	1.8751+0	3.8437+6	2.1629+6	8.9567+5	7.8440+5	6.3726+2	3.1325+0	2.0644+0	2.8864–1	7.7945–1
6.0000+0	3.1718–5	1.6833+4	2.1836+0	3.7150+6	2.0445+6	8.9661+5	7.7321+5	6.4296+2	3.3528+0	2.1097+0	2.8932–1	9.5380–1
8.0000+0	3.3150–5	1.6105+4	2.7454+0	3.5544+6	1.9027+6	8.9979+5	7.5123+5	6.5206+2	3.7759+0	2.1787+0	2.9038–1	1.3068+0
1.0000+1	3.3918–5	1.5741+4	3.2471+0	3.4740+6	1.8309+6	9.0229+5	7.4013+5	6.5680+2	4.2038+0	2.2365+0	2.9120–1	1.6760+0
1.5000+1	3.4545–5	1.5455+4	4.3104+0	3.4109+6	1.7858+6	9.0618+5	7.1822+5	6.6967+2	5.2389+0	2.3279+0	2.8860–1	2.6225+0
2.0000+1	3.4699–5	1.5387+4	5.1799+0	3.3958+6	1.7869+6	9.0903+5	6.9912+5	6.7973+2	6.2938+0	2.4016+0	2.8678–1	3.6054+0
3.0000+1	3.4816–5	1.5335+4	6.5521+0	3.3843+6	1.7860+6	9.1142+5	6.8616+5	6.9092+2	8.3812+0	2.4804+0	2.8422–1	5.6165+0
4.0000+1	3.4937–5	1.5282+4	7.6152+0	3.3726+6	1.7854+6	9.1320+5	6.7331+5	7.0205+2	1.0512+1	2.5444+0	2.8161–1	7.6865+0
5.0000+1	3.5054–5	1.5231+4	8.4809+0	3.3614+6	1.7850+6	9.1403+5	6.6165+5	7.1080+2	1.2655+1	2.5891+0	2.7940–1	9.7865+0
6.0000+1	3.5153–5	1.5188+4	9.2104+0	3.3519+6	1.7846+6	9.1450+5	6.5213+5	7.1753+2	1.4821+1	2.6210+0	2.7800–1	1.1922+1
8.0000+1	3.5229–5	1.5155+4	1.0393+1	3.3447+6	1.7839+6	9.1528+5	6.4472+5	7.2833+2	1.9200+1	2.6740+0	2.7606–1	1.6250+1
1.0000+2	3.5287–5	1.5130+4	1.1330+1	3.3391+6	1.7835+6	9.1582+5	6.3910+5	7.3672+2	2.3609+1	2.7178+0	2.7487–1	2.0616+1
1.5000+2	3.5339–5	1.5108+4	1.3067+1	3.3342+6	1.7826+6	9.1614+5	6.3473+5	7.5188+2	3.4698+1	2.7676+0	2.7318–1	3.1657+1
2.0000+2	3.5375–5	1.5092+4	1.4315+1	3.3308+6	1.7820+6	9.1638+5	6.3168+5	7.6212+2	4.5903+1	2.8123+0	2.7206–1	4.2819+1
3.0000+2	3.5425–5	1.5071+4	1.6091+1	3.3262+6	1.7811+6	9.1661+5	6.2767+5	7.7423+2	6.8224+1	2.8790+0	2.7071–1	6.5075+1
4.0000+2	3.5461–5	1.5056+4	1.7358+1	3.3228+6	1.7805+6	9.1667+5	6.2480+5	7.8230+2	9.0635+1	2.9103+0	2.6986–1	8.7455+1
5.0000+2	3.5494–5	1.5042+4	1.8343+1	3.3197+6	1.7801+6	9.1671+5	6.2220+5	7.8850+2	1.1321+2	2.9356+0	2.6911–1	1.1000+2
6.0000+2	3.5513–5	1.5034+4	1.9150+1	3.3180+6	1.7797+6	9.1673+5	6.2077+5	7.9389+2	1.3543+2	2.9603+0	2.6886–1	1.3220+2
8.0000+2	3.5548–5	1.5019+4	2.0425+1	3.3147+6	1.7790+6	9.1677+5	6.1808+5	8.0247+2	1.8027+2	3.0026+0	2.6845–1	1.7700+2
1.0000+3	3.5578–5	1.5007+4	2.1416+1	3.3119+6	1.7786+6	9.1679+5	6.1568+5	8.0940+2	2.2517+2	3.0413+0	2.6815–1	2.2186+2
1.5000+3	3.5599–5	1.4998+4	2.3216+1	3.3099+6	1.7777+6	9.1680+5	6.1452+5	8.2230+2	3.3812+2	3.0763+0	2.6766–1	3.3478+2
2.0000+3	3.5616–5	1.4990+4	2.4492+1	3.3083+6	1.7771+6	9.1680+5	6.1356+5	8.3176+2	4.5063+2	3.1105+0	2.6725–1	4.4725+2
3.0000+3	3.5637–5	1.4982+4	2.6291+1	3.3063+6	1.7762+6	9.1681+5	6.1245+5	8.4601+2	6.7663+2	3.1762+0	2.6679–1	6.7319+2
4.0000+3	3.5652–5	1.4975+4	2.7566+1	3.3050+6	1.7756+6	9.1681+5	6.1170+5	8.5634+2	9.0254+2	3.1982+0	2.6649–1	8.9908+2
5.0000+3	3.5667–5	1.4969+4	2.8554+1	3.3036+6	1.7752+6	9.1681+5	6.1077+5	8.6445+2	1.1302+3	3.2201+0	2.6611–1	1.1267+3
6.0000+3	3.5672–5	1.4967+4	2.9361+1	3.3031+6	1.7748+6	9.1681+5	6.1068+5	8.7036+2	1.3541+3	3.2410+0	2.6609–1	1.3506+3
8.0000+3	3.5682–5	1.4963+4	3.0636+1	3.3022+6	1.7742+6	9.1681+5	6.1034+5	8.7978+2	1.8059+3	3.2828+0	2.6599–1	1.8023+3
1.0000+4	3.5690–5	1.4959+4	3.1624+1	3.3015+6	1.7737+6	9.1681+5	6.1006+5	8.8715+2	2.2618+3	3.3214+0	2.6591–1	2.2582+3
1.5000+4	3.5701–5	1.4955+4	3.3420+1	3.3004+6	1.7728+6	9.1681+5	6.0990+5	9.0147+2	3.3777+3	3.3517+0	2.6584–1	3.3741+3
2.0000+4	3.5709–5	1.4951+4	3.4697+1	3.2997+6	1.7722+6	9.1681+5	6.0972+5	9.1177+2	4.5080+3	3.3820+0	2.6577–1	4.5044+3
3.0000+4	3.5719–5	1.4947+4	3.6499+1	3.2988+6	1.7714+6	9.1681+5	6.0970+5	9.2626+2	6.7461+3	3.4427+0	2.6576–1	6.7424+3
4.0000+4	3.5727–5	1.4944+4	3.7777+1	3.2980+6	1.7708+6	9.1681+5	6.0952+5	9.3665+2	9.0084+3	3.4796+0	2.6568–1	9.0046+3
5.0000+4	3.5738–5	1.4939+4	3.8768+1	3.2970+6	1.7703+6	9.1681+5	6.0896+5	9.4464+2	1.1250+4	3.4991+0	2.6544–1	1.1246+4
6.0000+4	3.5741–5	1.4938+4	3.9579+1	3.2968+6	1.7699+6	9.1681+5	6.0913+5	9.5116+2	1.3489+4	3.5186+0	2.6551–1	1.3485+4
8.0000+4	3.5747–5	1.4936+4	4.0858+1	3.2962+6	1.7693+6	9.1681+5	6.0918+5	9.6154+2	1.8007+4	3.5576+0	2.6554–1	1.8003+4
1.0000+5	3.5752–5	1.4934+4	4.1848+1	3.2958+6	1.7688+6	9.1681+5	6.0918+5	9.6961+2	2.2533+4	3.5959+0	2.6554–1	2.2529+4


July 4, 1991
Atomic Weight 137 340
EEDL Evaluated Electron
Cross Sections
56-Ba
Density 3 500 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
56-Ba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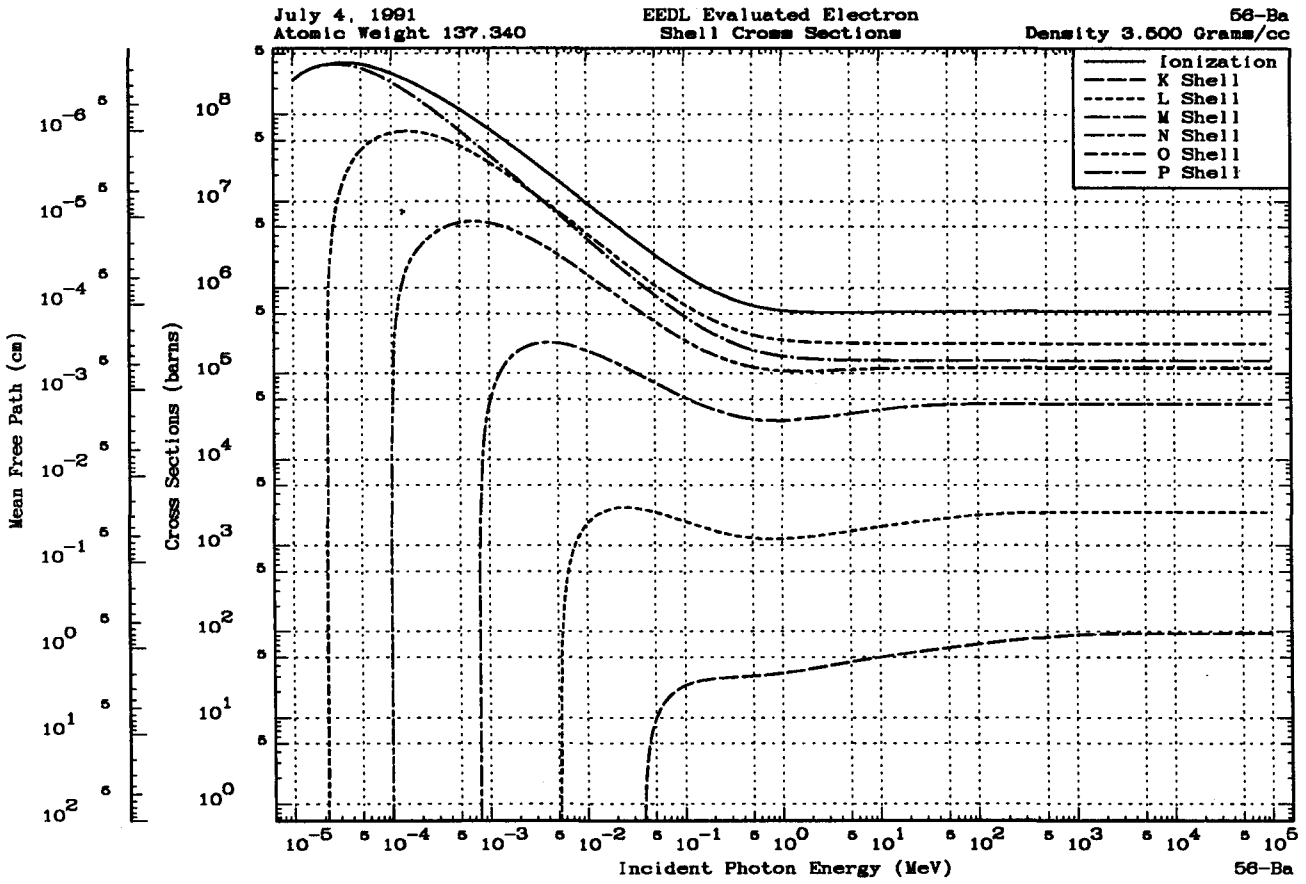
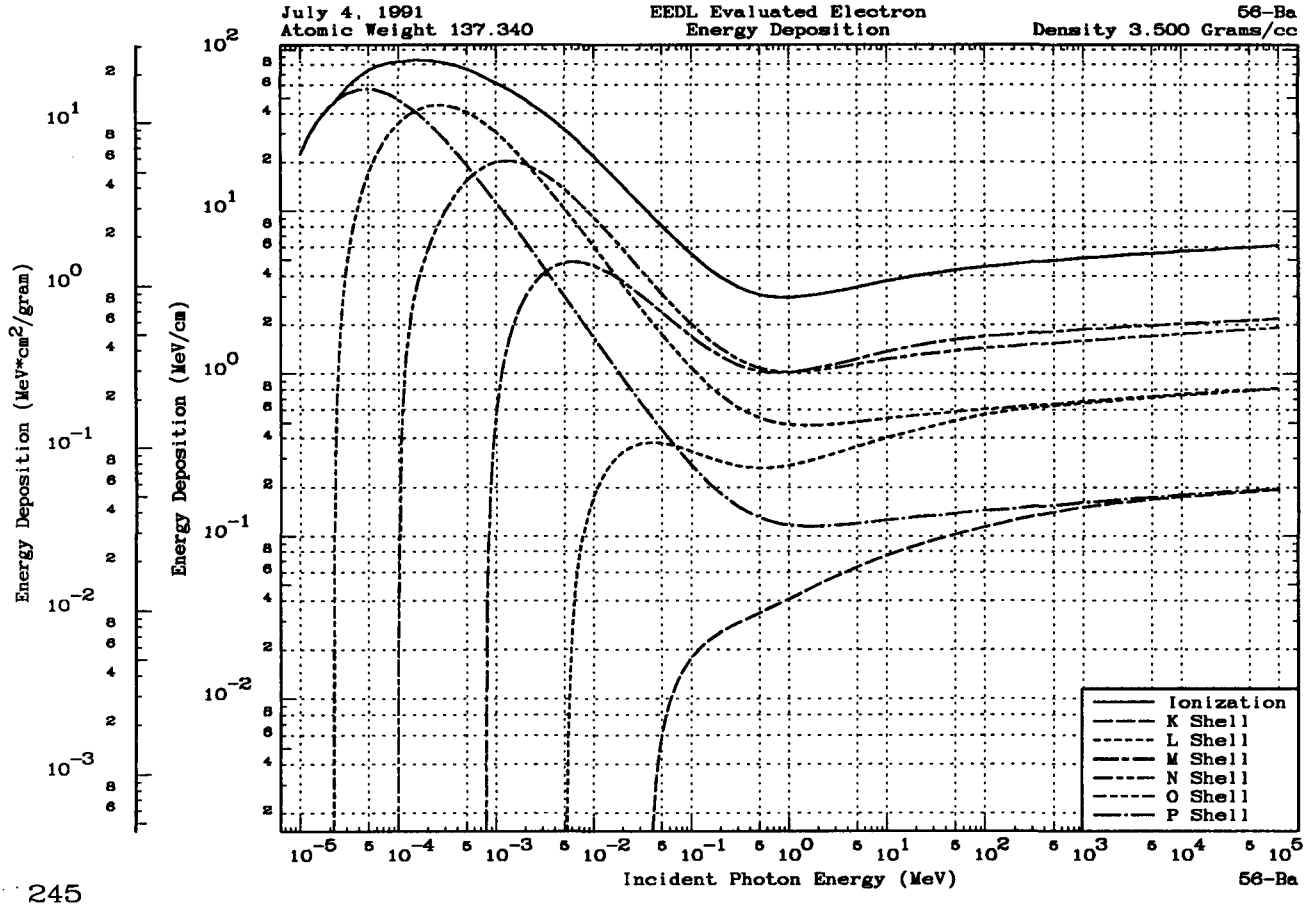
EEDL Evaluated Electron
Energy Deposition
56-Ba
Density 3 500 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
56-Ba

244


July 4, 1991
Atomic Weight 137.340
EEDL Evaluated Electron
Shell Cross Sections
56-Ba
Density 3.500 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
56-Ba


July 4, 1991
Atomic Weight 137.340
EEDL Evaluated Electron
Energy Deposition
56-Ba
Density 3.500 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
56-Ba

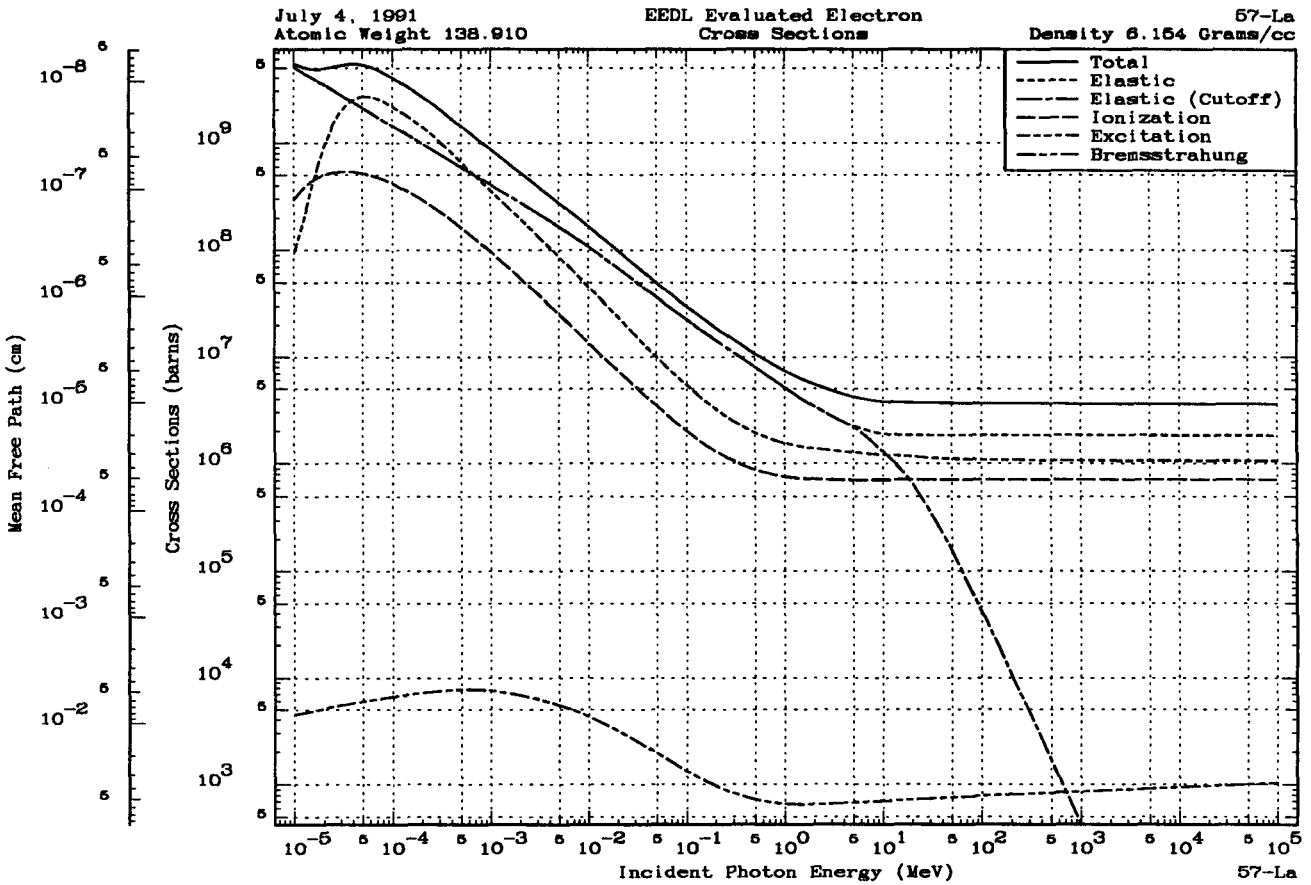
Atomic Weight 137.340 — Density 3.500 Grams/cc

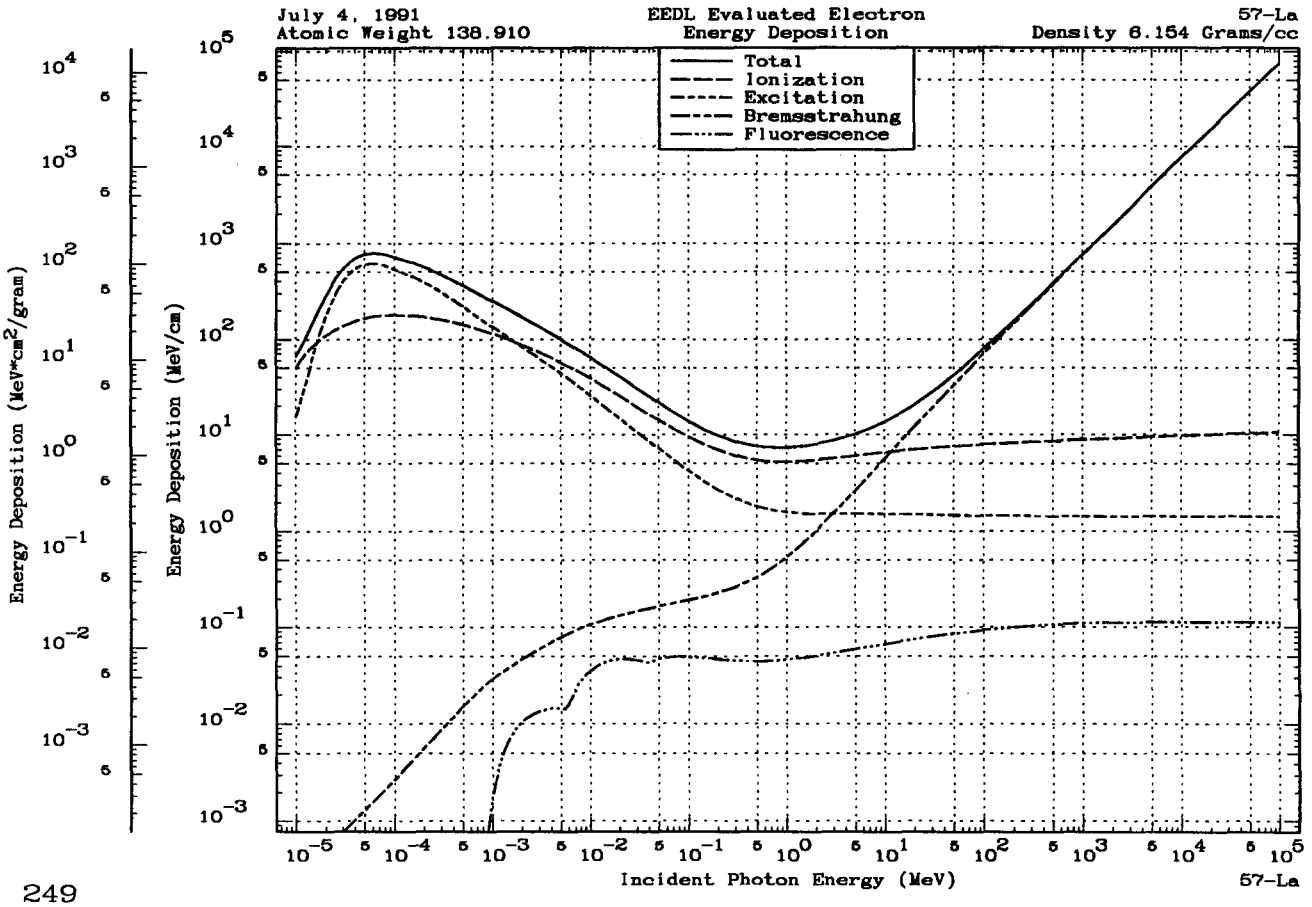
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2256–8	2.3312+7		5.3165+9	4.9928+9	2.4587+8	7.7878+7	4.3564+3	2.9248+1	2.2425+1	6.8228+0	1.4440–4
	1.1250–5	1.2867–8	2.2205+7		5.0641+9	4.6803+9	2.7227+8	1.1156+8	4.4609+3	3.6000+1	2.5949+1	1.0051+1	1.6180–4
	1.2500–5	1.3368–8	2.1373+7		4.8743+9	4.4174+9	2.9827+8	1.5863+8	4.5565+3	4.4339+1	2.9650+1	1.4689+1	1.7952–4
	1.3125–5	1.3591–8	2.1023+7		4.7944+9	4.3007+9	3.0697+8	1.8672+8	4.6015+3	4.8614+1	3.1091+1	1.7523+1	1.8848–4
	1.5000–5	1.4074–8	2.0301+7		4.6298+9	3.9969+9	3.3211+8	3.0076+8	4.7269+3	6.4858+1	3.5508+1	2.9349+1	2.1578–4
	1.7500–5	1.4441–8	1.9785+7		4.5122+9	3.6727+9	3.5048+8	4.8900+8	4.8758+3	8.9120+1	3.9773+1	4.9347+1	2.5306–4
	2.0000–5	1.4550–8	1.9636+7		4.4782+9	3.4133+9	3.6721+8	6.9769+8	5.0087+3	1.1681+2	4.4083+1	7.2731+1	2.9127–4
O3	2.2000–5	1.4515–8	1.9684+7		4.4890+9	3.2394+9	3.7187+8	8.7778+8	5.0975+3	1.3958+2	4.6309+1	9.3268+1	3.2061–4
	2.2250–5	1.4513–8	1.9686+7		4.4896+9	3.2194+9	3.7277+8	8.9747+8	5.1076+3	1.4227+2	4.6705+1	9.5567+1	3.2417–4
	2.2734–5	1.4505–8	1.9698+7		4.4922+9	3.1815+9	3.7449+8	9.3623+8	5.1268+3	1.4758+2	4.7466+1	1.0011+2	3.3109–4
	2.3643–5	1.4472–8	1.9743+7		4.5025+9	3.1139+9	3.7758+8	1.0111+9	5.1620+3	1.5784+2	4.8875+1	1.0896+2	3.4412–4
O2	2.4300–5	1.4435–8	1.9793+7		4.5141+9	3.0674+9	3.7971+8	1.0670+9	5.1867+3	1.6551+2	4.9874+1	1.1564+2	3.5359–4
	2.4437–5	1.4430–8	1.9800+7		4.5155+9	3.0579+9	3.8001+8	1.0775+9	5.1918+3	1.6697+2	5.0073+1	1.1689+2	3.5558–4
	2.4656–5	1.4423–8	1.9810+7		4.5179+9	3.0430+9	3.8043+8	1.0945+9	5.1999+3	1.6928+2	5.0369+1	1.1892+2	3.5874–4
	2.5324–5	1.4392–8	1.9852+7		4.5274+9	2.9987+9	3.8181+8	1.1469+9	5.2242+3	1.7650+2	5.1308+1	1.2519+2	3.6843–4
	2.5828–5	1.4364–8	1.9892+7		4.5364+9	2.9664+9	3.8290+8	1.1871+9	5.2421+3	1.8208+2	5.2039+1	1.3004+2	3.7575–4
	2.6493–5	1.4319–8	1.9954+7		4.5507+9	2.9253+9	3.8423+8	1.2411+9	5.2654+3	1.8956+2	5.2975+1	1.3659+2	3.8546–4
	2.7370–5	1.4279–8	2.0009+7		4.5632+9	2.8736+9	3.8604+8	1.3036+9	5.2954+3	1.9858+2	5.4238+1	1.4434+2	3.9831–4
	2.7914–5	1.4249–8	2.0051+7		4.5728+9	2.8427+9	3.8721+8	1.3429+9	5.3136+3	2.0430+2	5.5042+1	1.4926+2	4.0632–4
	3.0000–5	1.4101–8	2.0263+7		4.6210+9	2.7325+9	3.9128+8	1.4973+9	5.3808+3	2.2683+2	5.8026+1	1.6880+2	4.3722–4
	3.2500–5	1.4038–8	2.0353+7		4.6417+9	2.6152+9	3.9065+8	1.6358+9	5.4564+3	2.4760+2	6.0509+1	1.8709+2	4.7467–4
	3.5000–5	1.3932–8	2.0508+7		4.6771+9	2.5111+9	3.9043+8	1.7755+9	5.5273+3	2.6904+2	6.3074+1	2.0596+2	5.1255–4
	3.6250–5	1.3943–8	2.0491+7		4.6732+9	2.4633+9	3.9009+8	1.8197+9	5.5613+3	2.7682+2	6.4245+1	2.1257+2	5.3165–4
O1	3.8390–5	1.3950–8	2.0482+7		4.6711+9	2.3871+9	3.8955+8	1.8944+9	5.6171+3	2.9017+2	6.6228+1	2.2394+2	5.6458–4
	3.8793–5	1.3950–8	2.0481+7		4.6710+9	2.3735+9	3.8955+8	1.9079+9	5.6274+3	2.9267+2	6.6650+1	2.2602+2	5.7081–4
	4.0000–5	1.3947–8	2.0485+7		4.6718+9	2.3340+9	3.8963+8	1.9482+9	5.6575+3	3.0020+2	6.7939+1	2.3226+2	5.8955–4
	4.1250–5	1.3974–8	2.0446+7		4.6629+9	2.2950+9	3.8784+8	1.9801+9	5.6852+3	3.0612+2	6.8740+1	2.3738+2	6.0812–4
	4.3438–5	1.4010–8	2.0393+7		4.6508+9	2.2309+9	3.8504+8	2.0348+9	5.7321+3	3.1652+2	7.0201+1	2.4631+2	6.4081–4
	4.5000–5	1.4029–8	2.0366+7		4.6445+9	2.1881+9	3.8326+8	2.0731+9	5.7644+3	3.2395+2	7.1278+1	2.5267+2	6.6430–4
	4.6719–5	1.4100–8	2.0263+7		4.6212+9	2.1437+9	3.8108+8	2.0965+9	5.7988+3	3.2976+2	7.2320+1	2.5744+2	6.9027–4
	5.0000–5	1.4220–8	2.0092+7		4.5822+9	2.0654+9	3.7735+8	2.1394+9	5.8617+3	3.4081+2	7.4358+1	2.6645+2	7.4020–4
	5.5000–5	1.4543–8	1.9647+7		4.4806+9	1.9604+9	3.6870+8	2.1515+9	5.9470+3	3.4902+2	7.6331+1	2.7269+2	8.1548–4
	6.0000–5	1.4833–8	1.9262+7		4.3929+9	1.8691+9	3.6114+8	2.1627+9	6.0259+3	3.5718+2	7.8329+1	2.7885+2	8.9166–4
	7.0000–5	1.5547–8	1.8377+7		4.1910+9	1.7178+9	3.4293+8	2.1303+9	6.1682+3	3.6256+2	8.0268+1	2.8229+2	1.0466–3
	8.0000–5	1.6408–8	1.7413+7		3.9711+9	1.5966+9	3.2787+8	2.0466+9	6.2943+3	3.6072+2	8.2215+1	2.7850+2	1.2045–3
N5	9.9460–5	1.8186–8	1.5710+7		3.5829+9	1.4171+9	2.9919+8	1.8666+9	6.4889+3	3.4799+2	8.3469+1	2.6452+2	1.5139–3
	1.0000–4	1.8235–8	1.5668+7	0.0000+0	3.5733+9	1.4129+9	2.9855+8	1.8618+9	6.4935+3	3.4770+2	8.3546+1	2.6415+2	1.5225–3
N4	1.0216–4	1.8418–8	1.5513+7	6.2258–9	3.5378+9	1.3965+9	2.9543+8	1.8458+9	6.5113+3	3.4619+2	8.3494+1	2.6269+2	1.5568–3
	1.0515–4	1.8699–8	1.5280+7	1.4895–8	3.4847+9	1.3747+9	2.9124+8	1.8187+9	6.5354+3	3.4364+2	8.3540+1	2.6009+2	1.6044–3
	1.0625–4	1.8801–8	1.5197+7	1.8100–8	3.4658+9	1.3669+9	2.8978+8	1.8091+9	6.5442+3	3.4278+2	8.3606+1	2.5917+2	1.6220–3
	1.1076–4	1.9214–8	1.4870+7	3.1313–8	3.3912+9	1.3363+9	2.8394+8	1.7710+9	6.5792+3	3.3928+2	8.3722+1	2.5555+2	1.6942–3
	1.1719–4	1.9789–8	1.4438+7	5.0394–8	3.2927+9	1.2957+9	2.7636+8	1.7206+9	6.6270+3	3.3491+2	8.4085+1	2.5082+2	1.7978–3
	1.2057–4	2.0085–8	1.4225+7	6.0515–8	3.2442+9	1.2758+9	2.7266+8	1.6957+9	6.6512+3	3.3282+2	8.4301+1	2.4851+2	1.8526–3
	1.2500–4	2.0467–8	1.3960+7	7.3886–8	3.1836+9	1.2509+9	2.6807+8	1.6647+9	6.6821+3	3.3027+2	8.4606+1	2.4566+2	1.9246–3
	1.3359–4	2.1192–8	1.3482+7	1.0009–7	3.0747+9	1.2063+9	2.5944+8	1.6090+9	6.7394+3	3.2557+2	8.4956+1	2.4062+2	2.0652–3
	1.3528–4	2.1332–8	1.3394+7	1.0529–7	3.0545+9	1.1980+9	2.5785+8	1.5987+9	6.7503+3	3.2473+2	8.5032+1	2.3969+2	2.0930–3
	1.4043–4	2.1753–8	1.3135+7	1.2120–7	2.9955+9	1.1739+9	2.5320+8	1.5684+9	6.7827+3	3.2229+2	8.5269+1	2.3701+2	2.1779–3
	1.4180–4	2.1874–8	1.3062+7	1.2545–7	2.9789+9	1.1677+9	2.5202+8	1.5592+9	6.7912+3	3.2146+2	8.5346+1	2.3611+2	2.2005–3
	1.5000–4	2.2590–8	1.2648+7	1.5115–7	2.8845+9	1.1324+9	2.4529+8	1.5068+9	6.8404+3	3.1681+2	8.5794+1	2.3102+2	2.3366–3
	1.6250–4	2.3685–8	1.2063+7	1.9115–7	2.7511+9	1.0840+9	2.3444+8	1.4326+9	6.9094+3	3.0819+2	8.5421+1	2.2277+2	2.5460–3
	1.7500–4	2.4745–8	1.1546+7	2.3221–7	2.6332+9	1.0410+9	2.2493+8	1.3673+9	6.9739+3	3.0077+2	8.5192+1	2.1557+2	2.7574–3
N3	1.8835–4	2.5843–8	1.1056+7	2.7710–7	2.5214+9	1.0000+9	2.1601+8	1.3054+9	7.0385+3	2.9400+2	8.5152+1	2.0884+2	2.9851–3
	1.9126–4	2.6085–8	1.0953+7	2.8703–7	2.4980+9	9.9169+8	2.1416+8	1.2922+9	7.0485+3	2.9261+2	8.5154+1	2.0745+2	3.0354–3
	1.9563–4	2.6445–8	1.0804+7	3.0201–7	2.4640+9	9.7954+8	2.1148+8	1.2730+9	7.0633+3	2.9061+2	8.5176+1	2.0543+2	3.1109–3
	2.0000–4	2.6802–8	1.0660+7	3.1710–7	2.4312+9	9.6780+8	2.0891+8	1.2545+9	7.0777+3	2.8871+2	8.5210+1	2.0350+2	3.1866–3
N2	2.0421–4	2.7142–8	1.0527+7	3.3174–7	2.4007+9	9.5686+8	2.0626+8	1.2375+9	7.0913+3	2.8638+2	8.5007+1	2.0137+2	3.2597–3
	2.0625–4	2.7313–8	1.0461+7	3.3887–7	2.3857+9	9.5168+8	2.0500+8	1.2290+9	7.0979+3	2.8522+2	8.4918+1	2.0030+2	3.2952–3
	2.0720–4	2.7392–8	1.0431+7	3.4222–7	2.3788+9	9.4929+8	2.0442+8	1.2251+9	7.1009+3	2.8469+2	8.4873+1	1.9981+2	3.3117–3
	2.1300–4	2.7872–8	1.0251+7	3.6271–7	2.3378+9	9.3509+8	2.0099+8	1.2018+9	7.1190+3	2.8154+2	8.4629+1	1.9690+2	3.4128–3
	2.1797–4	2.8278–8	1.0104+7	3.8043–7	2.3042+9	9.2339+8	1.9818+8	1.1826+9	7.1342+3	2.7898+2	8.4452+1	1.9453+2	3.4995–3
	2.2388–4	2.8757–8	9.9353+6	4.0172–7	2.2658+9	9.1001+8	1.9499+8	1.1608+9	7.1519+3	2.7609+2	8.4268+1	1.9182+2	3.6029–3
	2.2500–4	2.8848–8	9.9042+6	4.0578–7	2.2587+9	9.0753+8	1.9440+8	1.1568+9	7.1551+3	2.7556+2	8.4236+1	1.9132+2	3.6226–3
	2.3848–4	2.9921–8	9.5490+6	4.5524–7	2.1777+9	8.7916+8	1.8767+8	1.1109+9	7.1937+3	2.6953+2	8.3869+1	1.8565+2	3.8595–3
	2.4291–4	3.0268–8	9.4394+6	4.7173–7	2.1527+9	8.7037+8	1.8560+8	1.0967+9	7.2060+3	2.6770+2	8.3777+1	1.8392+2	3.9377–3
N1	2.5635–4	3.1307–8	9.1261+6	5.2243–7	2.0813+9	8.4515+8	1.7972+8	1.0564+9	7.2419+3	2.6255+2	8.3574+1	1.7898+2	4.1756–3
	2.5908–4	3.1531–8	9.0614+6	5.3285–7	2.0665+9	8.4028+8	1.7850+8	1.0477+9	7.2490+3	2.6139+2	8.3453+1	1.7794+2	4.2241–3
	2.6419–4	3.1948–8	8.9431+6	5.5249–7	2.0396+9	8.3136+8	1.7628+8	1.0319+9	7.2621+3	2.5929+2	8.3242+1	1.7604+2	4.3150–3
	2.6924–4	3.2356–8	8.8302+6	5.7203–7	2.0138+9	8.2282+8	1.7416+8	1.0168+9	7.2748+3	2.5729+2	8.3053+1	1.7424+2	4.4049–3
	2.7145–4	3.2535–8	8.7818+6	5.8065–7	2.0028+9	8.1915+8	1.7325+8	1.0103+9	7.2804+3	2.5644+2	8.2974+1	1.7346+2	4.4444–3
	2.7315–4	3.2671–8	8.7453+6	5.8726–7	1.9944+9	8.1637+8	1.7257+8	1.0055+9	7.2845+3	2.5580+2	8.2915+1	1.7288+2	4.4746–3
	2.8657–4	3.3739–8	8.4683+6	6.4025–7	1.9313+9	7.9526+8	1.6739+8	9.6861+8	7.3169+3	2.5100+2	8.2505+1	1.6849+2	4.7148–3
	3.0000–4	3.4790–8	8.2126+6	6.9421–7	1.8730+9	7.7563+8	1.6264+8	9.3469+8	7.3479+3	2.4669+2	8.2207+1	1.6447+2	4.9560–3
	3.2500–4	3.6770–8	7.7703+6	7.9753–7	1.7721+9	7.4260+8	1.5403+8	8.7543+8	7.3986+3	2.3727+2	8.0918+1	1.5635+2	5.4078–3
	3.5000–4	3.8699–8	7.3831+6	9.0471–7	1.6838+9	7.1328+8	1.4656+8	8.2393+8	7.4459+3	2.2928+2	7.9950+1	1.4932+2	5.8627–3
	3.6250–4	3.9645–8	7.2068+6	9.5966–7	1.6436+9	6.9980+8	1.4316+8	8.0061+8	7.4684+3	2.2570+2	7.9547+1	1.4615+2	6.0912–3
	4.0000–4	4.2418–8	6.7357+6	1.1293–6	1.5361+9	6.6333+8	1.3415+8	7.3865+8	7.5318+3	2.1642+2	7.8662+1	1.3775+2	6.7807–3
	4.5000–4	4.6106–8	6.1970+6	1.3673–6	1.4133+9	6.2223+8	1.2342+8	6.6762+8	7.5749+3	2.0398+2	7.6621+1	1.2735+2	7.7043–3
	5.0000–4	4.9658–8	5.7537+6	1.6185–6	1.3122+9	5.8762+8	1.1466+8	6.0988+8	7.6136+3	1.9416+2	7.5203+1	1.1895+2	8.6330–3
	6.0000–4	5.6459–8	5.0605+6	2.1570–6	1.1541+9	5.3222+8	1.0037+8	5.2150+8	7.6568+3	1.7745+2	7.1954+1	1.0549+2	1.0455–2
	7.0000–4	6.2900–8	4.5423+6	2.7435–6	1.0359+9	4.8947+8	8.9305+7	4.5714+8	7.6437+3	1.6378+2	6.8616+1	9.5154+1	1.2160–2

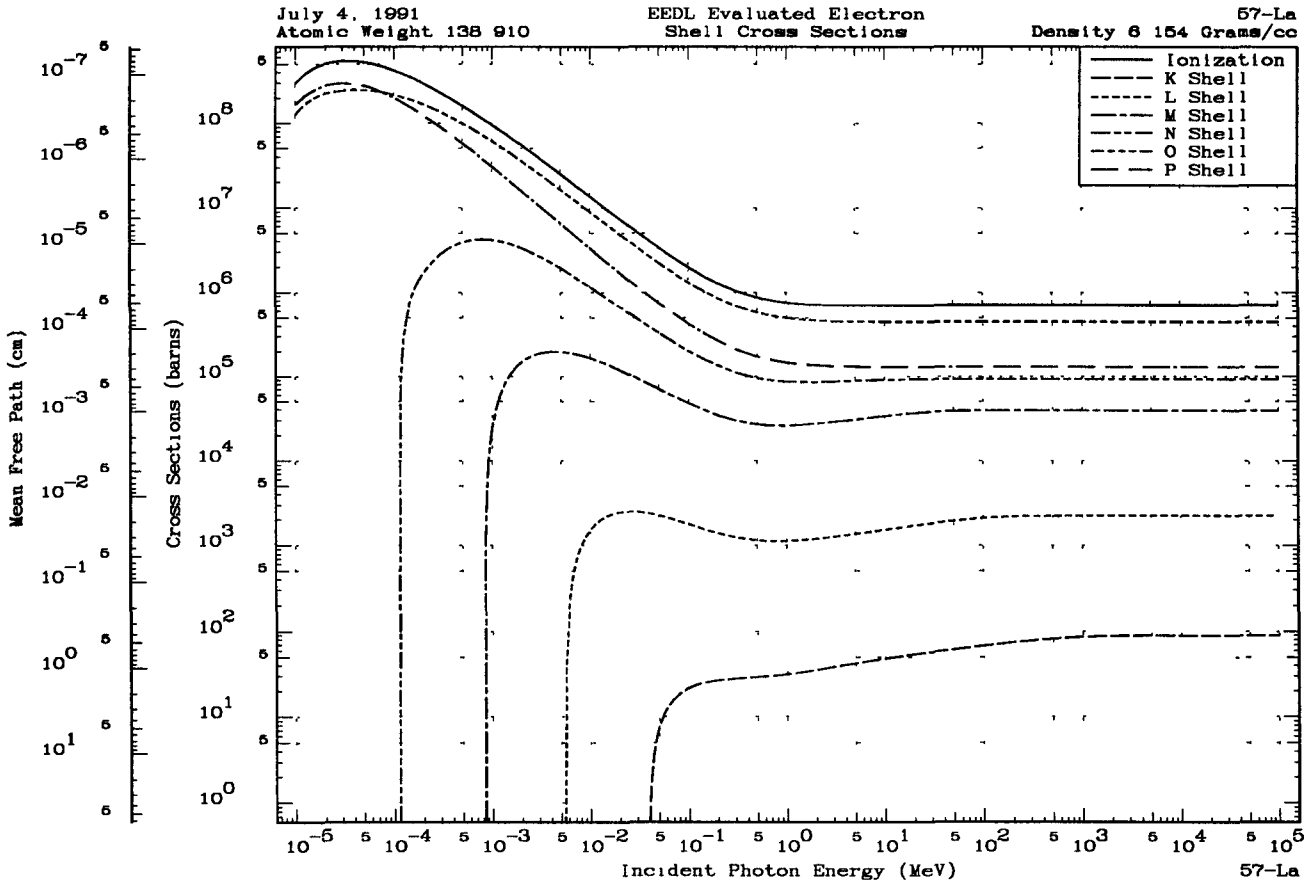
Atomic Weight 137.340 Density 3.500 Grams/cc

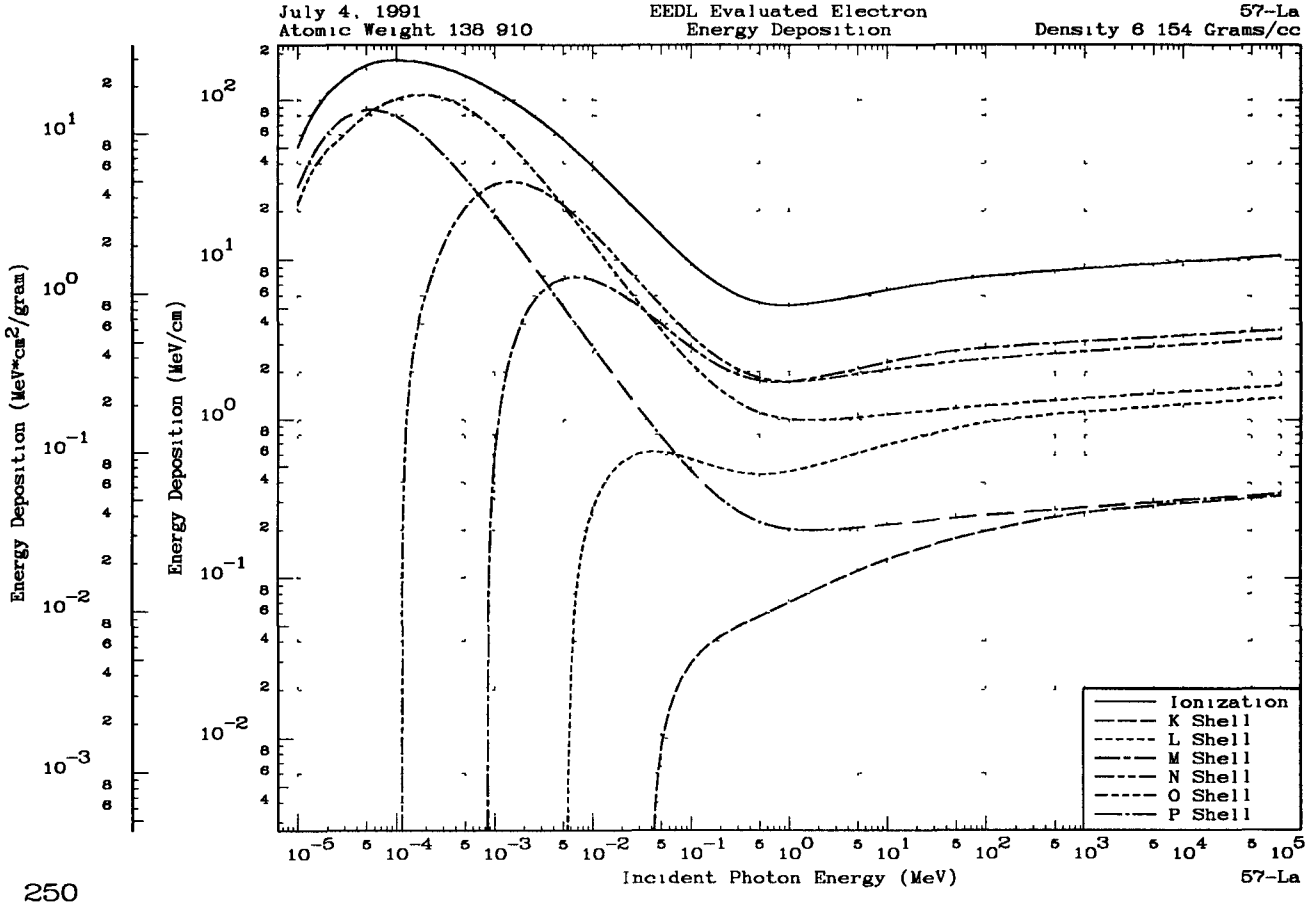
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M5	7.9049–4	6.8463–8	4.1733+6	3.3124–6	9.5176+8	4.5820+8	8.1519+7	4.1203+8	7.6334+3	1.5444+2	6.6469+1	8.7955+1	1.3701–2
	7.9525–4	6.8759–8	4.1553+6	3.3432–6	9.4765+8	4.5670+8	8.1154+7	4.0978+8	7.6310+3	1.5400+2	6.6378+1	8.7607+1	1.3774–2
	8.0000–4	6.9056–8	4.1375+6	3.3741–6	9.4358+8	4.5523+8	8.0793+7	4.0755+8	7.6286+3	1.5357+2	6.6289+1	8.7263+1	1.3847–2
M4	8.0664–4	6.9446–8	4.1142+6	3.4174–6	9.3828+8	4.5319+8	8.0271+7	4.0481+8	7.6237+3	1.5290+2	6.6094+1	8.6788+1	1.3941–2
	8.1250–4	6.9798–8	4.0934+6	3.4558–6	9.3355+8	4.5141+8	7.9817+7	4.0231+8	7.6194+3	1.5231+2	6.5935+1	8.6365+1	1.4024–2
	8.1873–4	7.0171–8	4.0717+6	3.4968–6	9.2858+8	4.4954+8	7.9341+7	3.9969+8	7.6149+3	1.5170+2	6.5763+1	8.5921+1	1.4112–2
	8.5938–4	7.2583–8	3.9364+6	3.7681–6	8.9773+8	4.3787+8	7.6393+7	3.8346+8	7.5862+3	1.4793+2	6.4745+1	8.3174+1	1.4685–2
	8.6404–4	7.2857–8	3.9216+6	3.7997–6	8.9435+8	4.3658+8	7.6071+7	3.8169+8	7.5830+3	1.4753+2	6.4638+1	8.2874+1	1.4751–2
	9.2969–4	7.6664–8	3.7268+6	4.2529–6	8.4994+8	4.1956+8	7.1860+7	3.5851+8	7.5399+3	1.4224+2	6.3260+1	7.8962+1	1.5673–2
	9.3202–4	7.6798–8	3.7203+6	4.2693–6	8.4846+8	4.1899+8	7.1720+7	3.5774+8	7.5384+3	1.4206+2	6.3216+1	7.8833+1	1.5705–2
	1.0000–3	8.0640–8	3.5431+6	4.7559–6	8.0803+8	4.0327+8	6.7918+7	3.3683+8	7.4972+3	1.3738+2	6.2049+1	7.5315+1	1.6655–2
M3	1.0570–3	8.3741–8	3.4119+6	5.1768–6	7.7811+8	3.9129+8	6.4973+7	3.2184+8	7.4406+3	1.3346+2	6.0833+1	7.2609+1	1.7261–2
	1.0708–3	8.4496–8	3.3814+6	5.2809–6	7.7116+8	3.8853+8	6.4302+7	3.1832+8	7.4274+3	1.3257+2	6.0569+1	7.1980+1	1.7408–2
	1.0977–3	8.5951–8	3.3242+6	5.4845–6	7.5811+8	3.8333+8	6.3047+7	3.1172+8	7.4024+3	1.3090+2	6.0083+1	7.0803+1	1.7692–2
M2	1.1322–3	8.7804–8	3.2540+6	5.7504–6	7.4210+8	3.7693+8	6.1514+7	3.0365+8	7.3712+3	1.2889+2	5.9507+1	6.9365+1	1.8057–2
	1.1480–3	8.8659–8	3.2226+6	5.8731–6	7.3495+8	3.7411+8	6.0837+7	3.0000+8	7.3573+3	1.2797+2	5.9238+1	6.8717+1	1.8223–2
	1.1552–3	8.9050–8	3.2085+6	5.9297–6	7.3172+8	3.7283+8	6.0532+7	2.9835+8	7.3510+3	1.2756+2	5.9117+1	6.8426+1	1.8300–2
	1.1920–3	9.1025–8	3.1389+6	6.2202–6	7.1584+8	3.6653+8	5.9036+7	2.9027+8	7.3196+3	1.2555+2	5.8534+1	6.6995+1	1.8686–2
	1.1983–3	9.1363–8	3.1272+6	6.2707–6	7.1320+8	3.6547+8	5.8787+7	2.8893+8	7.3143+3	1.2521+2	5.8439+1	6.6757+1	1.8753–2
	1.2188–3	9.2451–8	3.0905+6	6.4348–6	7.0480+8	3.6212+8	5.7999+7	2.8467+8	7.2974+3	1.2416+2	5.8138+1	6.6005+1	1.8967–2
	1.2360–3	9.3363–8	3.0602+6	6.5742–6	6.9792+8	3.5936+8	5.7353+7	2.8119+8	7.2834+3	1.2329+2	5.7886+1	6.5389+1	1.9148–2
M1	1.2734–3	9.5327–8	2.9972+6	6.8798–6	6.8354+8	3.5358+8	5.6008+7	2.7394+8	7.2539+3	1.2150+2	5.7372+1	6.4109+1	1.9538–2
	1.3017–3	9.6792–8	2.9518+6	7.1143–6	6.7319+8	3.4938+8	5.5013+7	2.6879+8	7.2307+3	1.2009+2	5.6913+1	6.3154+1	1.9822–2
	1.3020–3	9.6806–8	2.9514+6	7.1166–6	6.7309+8	3.4934+8	5.5004+7	2.6874+8	7.2305+3	1.2007+2	5.6909+1	6.3145+1	1.9824–2
	1.3513–3	9.9330–8	2.8764+6	7.5310–6	6.5599+8	3.4235+8	5.3368+7	2.6027+8	7.1915+3	1.1777+2	5.6169+1	6.1576+1	2.0316–2
	1.3594–3	9.9741–8	2.8646+6	7.5998–6	6.5329+8	3.4124+8	5.3110+7	2.5893+8	7.1852+3	1.1740+2	5.6055+1	6.1329+1	2.0397–2
	1.4256–3	1.0308–7	2.7718+6	8.1712–6	6.3214+8	3.3251+8	5.1099+7	2.4852+8	7.1356+3	1.1457+2	5.5150+1	5.9404+1	2.1054–2
	1.5000–3	1.0676–7	2.6763+6	8.8284–6	6.1035+8	3.2344+8	4.9041+7	2.3786+8	7.0830+3	1.1172+2	5.4265+1	5.7437+1	2.1788–2
	1.6250–3	1.1282–7	2.5324+6	9.9721–6	5.7753+8	3.0952+8	4.5882+7	2.2213+8	6.9920+3	1.0689+2	5.2506+1	5.4366+1	2.2930–2
	1.7500–3	1.1873–7	2.4064+6	1.1165–5	5.4880+8	2.9716+8	4.3149+7	2.0848+8	6.9088+3	1.0278+2	5.1044+1	5.1711+1	2.4062–2
	1.8125–3	1.2163–7	2.3491+6	1.1778–5	5.3572+8	2.9148+8	4.1914+7	2.0232+8	6.8698+3	1.0091+2	5.0372+1	5.0515+1	2.4624–2
	2.0000–3	1.3012–7	2.1958+6	1.3683–5	5.0076+8	2.7613+8	3.8643+7	1.8599+8	6.7614+3	9.6030+1	4.8653+1	4.7351+1	2.6297–2
	2.2500–3	1.4131–7	2.0220+6	1.6377–5	4.6112+8	2.5823+8	3.4957+7	1.6793+8	6.5892+3	8.9643+1	4.6064+1	4.3551+1	2.8135–2
	2.5000–3	1.5208–7	1.8787+6	1.9249–5	4.2845+8	2.4321+8	3.1968+7	1.5327+8	6.4390+3	8.4497+1	4.3992+1	4.0475+1	2.9944–2
	2.6250–3	1.5733–7	1.8160+6	2.0748–5	4.1415+8	2.3655+8	3.0673+7	1.4692+8	6.3706+3	8.2271+1	4.3093+1	3.9147+1	3.0838–2
	3.0000–3	1.7260–7	1.6553+6	2.5469–5	3.7751+8	2.1925+8	2.7399+7	1.3086+8	6.1870+3	7.6672+1	4.0840+1	3.5798+1	3.3481–2
	3.5000–3	1.9255–7	1.4838+6	3.2300–5	3.3840+8	2.0050+8	2.3980+7	1.1392+8	5.9420+3	6.9829+1	3.7836+1	3.1956+1	3.6459–2
	4.0000–3	2.1158–7	1.3504+6	3.9739–5	3.0796+8	1.8555+8	2.1374+7	1.0103+8	5.7377+3	6.4660+1	3.5578+1	2.9043+1	3.9361–2
	5.0000–3	2.4799–7	1.1521+6	5.6275–5	2.6275+8	1.6243+8	1.7596+7	8.2719+7	5.3630+3	5.6468+1	3.1734+1	2.4690+1	4.4157–2
L3	5.2434–3	2.5645–7	1.1141+6	6.0650–5	2.5408+8	1.5782+8	1.6877+7	7.9378+7	5.2806+3	5.4810+1	3.0913+1	2.3852+1	4.5186–2
	5.4325–3	2.6300–7	1.0864+6	6.4139–5	2.4775+8	1.5447+8	1.6360+7	7.6918+7	5.2200+3	5.3618+1	3.0330+1	2.3243+1	4.5979–2
L2	5.6303–3	2.6978–7	1.0591+6	6.7868–5	2.4153+8	1.5116+8	1.5855+7	7.4513+7	5.1595+3	5.2454+1	2.9760+1	2.2647+1	4.6802–2
	5.7163–3	2.7281–7	1.0473+6	6.9515–5	2.3884+8	1.4978+8	1.5646+7	7.3418+7	5.1340+3	5.1950+1	2.9527+1	2.2376+1	4.7155–2
	5.8151–3	2.7628–7	1.0341+6	7.1429–5	2.3584+8	1.4823+8	1.5413+7	7.2197+7	5.1052+3	5.1387+1	2.9266+1	2.2074+1	4.7560–2
L1	5.9608–3	2.8137–7	1.0154+6	7.4285–5	2.3158+8	1.4602+8	1.5082+7	7.0472+7	5.0640+3	5.0593+1	2.8898+1	2.1647+1	4.8154–2
	6.0000–3	2.8274–7	1.0105+6	7.5062–5	2.3046+8	1.4544+8	1.4996+7	7.0016+7	5.0520+3	5.0385+1	2.8802+1	2.1535+1	4.8287–2
	6.2500–3	2.9137–7	9.8059+5	8.0092–5	2.2363+8	1.4184+8	1.4466+7	6.7326+7	4.9766+3	4.9011+1	2.8132+1	2.0830+1	4.9109–2
	6.5000–3	2.9990–7	9.5270+5	8.5260–5	2.1727+8	1.3845+8	1.3974+7	6.4840+7	4.9051+3	4.7742+1	2.7514+1	2.0179+1	4.9925–2
	6.6875–3	3.0623–7	9.3301+5	8.9225–5	2.1278+8	1.3605+8	1.3628+7	6.3095+7	4.8540+3	4.6850+1	2.7078+1	1.9722+1	5.0534–2
	6.8750–3	3.1251–7	9.1426+5	9.3263–5	2.0851+8	1.3376+8	1.3300+7	6.1443+7	4.8048+3	4.6006+1	2.6665+1	1.9289+1	5.1139–2
	7.2500–3	3.2491–7	8.7936+5	1.0156–4	2.0055+8	1.2946+8	1.2693+7	5.8390+7	4.7117+3	4.4446+1	2.5904+1	1.8490+1	5.2339–2
	7.3437–3	3.2798–7	8.7113+5	1.0367–4	1.9867+8	1.2844+8	1.2550+7	5.7675+7	4.6894+3	4.4081+1	2.5725+1	1.8303+1	5.2637–2
	7.4375–3	3.3104–7	8.6308+5	1.0581–4	1.9683+8	1.2744+8	1.2411+7	5.6977+7	4.6675+3	4.3724+1	2.5551+1	1.8120+1	5.2935–2
	8.0000–3	3.4915–7	8.1831+5	1.1897–4	1.8662+8	1.2185+8	1.1641+7	5.3128+7	4.5438+3	4.1757+1	2.4589+1	1.7113+1	5.4702–2
	9.0000–3	3.8109–7	7.4973+5	1.4388–4	1.7098+8	1.1302+8	1.0491+7	4.7463+7	4.3337+3	3.8575+1	2.2955+1	1.5562+1	5.7273–2
	1.0000–2	4.1202–7	6.9344+5	1.7071–4	1.5815+8	1.0567+8	9.5598+6	4.2910+7	4.1540+3	3.6011+1	2.1635+1	1.4317+1	5.9788–2
	1.1250–2	4.5012–7	6.3475+5	2.0686–4	1.4476+8	9.7794+7	8.6169+6	3.8346+7	3.9416+3	3.3177+1	2.0115+1	1.3000+1	6.2041–2
	1.3125–2	5.0516–7	5.6559+5	2.6637–4	1.2899+8	8.8364+7	7.5231+6	3.3098+7	3.6800+3	2.9898+1	1.8346+1	1.1487+1	6.5359–2
	1.5000–2	5.5805–7	5.1199+5	3.3185–4	1.1676+8	8.0933+7	6.6895+6	2.9137+7	3.4674+3	2.7409+1	1.6993+1	1.0347+1	6.8590–2
	1.7500–2	6.2743–7	4.5537+5	4.2801–4	1.0385+8	7.2855+7	5.8464+6	2.5147+7	3.2247+3	2.4636+1	1.5440+1	9.1243+0	7.1576–2
	2.0000–2	6.9426–7	4.1154+5	5.3410–4	9.3854+7	6.6513+7	5.2030+6	2.2135+7	3.0283+3	2.2524+1	1.4247+1	8.2028+0	7.4528–2
	2.5000–2	8.2362–7	3.4690+5	7.7380–4	7.9113+7	5.6910+7	4.2941+6	1.7906+7	2.7058+3	1.9279+1	1.2367+1	6.8337+0	7.8437–2
	3.0000–2	9.4661–7	3.0183+5	1.0493–3	6.8835+7	5.0103+7	3.6713+6	1.5058+7	2.4679+3	1.7061+1	1.1065+1	5.9133+0	8.2348–2
K	3.7449–2	1.1197–6	2.5516+5	1.5190–3	5.8192+7	4.2797+7	3.0470+6	1.2346+7	2.1976+3	1.4714+1	9.6334+0	4.9945+0	8.6544–2
	3.8087–2	1.1342–6	2.5192+5	1.5626–3	5.7452+7	4.2285+7	3.0045+6	1.2160+7	2.1781+3	1.4553+1	9.5345+0	4.9313+0	8.6865–2
	3.9043–2	1.1557–6	2.4723+5	1.6289–3	5.6382+7	4.1544+7	2.9431+6	1.1893+7	2.1496+3	1.4319+1	9.3916+0	4.8402+0	8.7347–2
	4.0000–2	1.1771–6	2.4273+5	1.6962–3	5.5357+7	4.0833+7	2.8844+6	1.1638+7	2.1221+3	1.4096+1	9.2549+0	4.7532+0	8.7829–2
	4.2500–2	1.2322–6	2.3188+5	1.8771–3	5.2882+7	3.9106+7	2.7452+6	1.1029+7	2.0557+3	1.3542+1	8.9142+0	4.5390+0	8.8921–2
	4.4375–2	1.2730–6	2.2445+5	2.0176–3	5.1188+7	3.7920+7	2.6501+6	1.0616+7	2.0097+3	1.3165+1	8.6814+0	4.3934+0	8.9745–2
	4.7188–2	1.3333–6	2.1429+5	2.2355–3	4.8870+7	3.6294+7	2.5206+6	1.0053+7	1.9460+3	1.2650+1	8.3634+0	4.1957+0	9.0988–2
	5.0000–2	1.3928–6	2.0514+5	2.4620–3	4.6783+7	3.4826+7	2.4043+6	9.5509+6	1.8878+3	1.2189+1	8.0778+0	4.0194+0	9.2234–2
	5.5000–2	1.4954–6	1.9106+5	2.8849–3	4.3573+7	3.2562+7	2.2291+6	8.7795+6	1.7918+3	1.1461+1	7.6271+0	3.7397+0	9.4103–2
	6.0000–2	1.5956–6	1.7906+5	3.3334–3	4.0836+7	3.0624+7	2.0803+6	8.1298+6	1.7084+3	1.0844+1	7.2437+0	3.5046+0	9.5979–2
	7.0000–2	1.7853–6	1.6004+5	4.3012–3	3.6498+7	2.7547+7	1.8492+6	7.1005+6	1.5674+3	9.8380+0	6.6208+0	3.1181+0	9.9056–2
	8.0000–2	1.9675–6	1.4522+5	5.3599–3	3.3118+7	2.5132+7	1.6700+6	6.3148+6	1.4548+3	9.0624+0	6.1362+0	2.8240+0	1.0214–1
	9.0000–2	2.1433–6	1.3331+5	6.5051–3	3.0402+7	2.3229+7	1.5337+6	5.6381+6	1.3653+3	8.4109+0	5.7494+0	2.5568+0	1.0473–1
	1.0000–1	2.3030–6	1.2406+5	7.7287–3	2.8293+7	2.1648+7	1.4212+6	5.2220+6	1.2899+3	7.9382+0	5.4300+0	2.4009+0	1.0732–1
	1.2500–1	2.6760–6	1.0677+5	1.1074–2	2.4349+7	1.8751+7	1.2259+6	4.3716+6	1.1589+3	7.0260+0	4.8533+0	2.0602+0	1.1252–1
	1.5000–1	3.0248–6	9.4457+4	1.4805–2	2.1542+7	1.6674+7	1.0865+6	3.7806+6	1.0618+3	6.3844+0	4.4414+0	1.8252+0	1.1785–1
	2.0000–1	3.6407–6	7.8478+4	2.3166–2	1.7898+7	1.3904+7	9.1913+5	3.0731+6	9.3903+2	5.5946+0	3.9331+0	1.5345+0	1.2704–1

Atomic Weight 137.340												Density 3.500 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000–1	4.6765–6	6.1095+4	4.2348–2	1.3933+7	1.0743+7	7.5372+5	2.4360+6	8.0664+2	4.8494+0	3.4295+0	1.2752+0	1.4473–1
4.0000–1	5.5647–6	5.1344+4	6.3726–2	1.1710+7	8.9104+6	6.7353+5	2.1248+6	7.3908+2	4.5101+0	3.1966+0	1.1504+0	1.6316–1
5.0000–1	6.3624–6	4.4906+4	8.6368–2	1.0241+7	7.7020+6	6.2746+5	1.9111+6	6.9945+2	4.3241+0	3.0794+0	1.0620+0	1.8273–1
6.0000–1	7.0776–6	4.0369+4	1.0979–1	9.2065+6	6.8374+6	5.9794+5	1.7705+6	6.7575+2	4.2159+0	3.0075+0	1.0054+0	2.0306–1
8.0000–1	8.3104–6	3.4380+4	1.5763–1	7.8407+6	5.6811+6	5.6402+5	1.5949+6	6.5102+2	4.1454+0	2.9616+0	9.3708–1	2.4670–1
1.0000+0	9.3499–6	3.0558+4	2.0591–1	6.9690+6	4.9370+6	5.4552+5	1.4859+6	6.3930+2	4.1399+0	2.9501+0	8.9672–1	2.9311–1
1.5000+0	1.1282–5	2.5324+4	3.2435–1	5.7754+6	3.8722+6	5.2693+5	1.3757+6	6.3106+2	4.3038+0	3.0205+0	8.6435–1	4.1898–1
2.0000+0	1.2742–5	2.2422+4	4.3807–1	5.1136+6	3.2960+6	5.2117+5	1.2958+6	6.3375+2	4.4916+0	3.0887+0	8.4749–1	5.5542–1
3.0000+0	1.4586–5	1.9588+4	6.5085–1	4.4673+6	2.6943+6	5.1595+5	1.2564+6	6.4155+2	4.9138+0	3.2183+0	8.5185–1	8.4365–1
4.0000+0	1.5839–5	1.8039+4	8.4627–1	4.1139+6	2.3790+6	5.1646+5	1.2177+6	6.4892+2	5.3260+0	3.3222+0	8.5495–1	1.1489+0
5.0000+0	1.6653–5	1.7157+4	1.0271+0	3.9128+6	2.1907+6	5.1719+5	1.2043+6	6.5534+2	5.7381+0	3.4171+0	8.5751–1	1.4635+0
6.0000+0	1.7237–5	1.6576+4	1.1955+0	3.7802+6	2.0702+6	5.1784+5	1.1915+6	6.6125+2	6.1454+0	3.4979+0	8.6030–1	1.7872+0
8.0000+0	1.8047–5	1.5832+4	1.5016+0	3.6105+6	1.9241+6	5.2012+5	1.1656+6	6.7165+2	6.9397+0	3.6205+0	8.6474–1	2.4545+0
1.0000+1	1.8466–5	1.5472+4	1.7746+0	3.5286+6	1.8524+6	5.2189+5	1.1536+6	6.7984+2	7.7219+0	3.7225+0	8.6818–1	3.1313+0
1.5000+1	1.8801–5	1.5196+4	2.3524+0	3.4657+6	1.8066+6	5.2484+5	1.1336+6	6.9293+2	9.6578+0	3.8846+0	8.6782–1	4.9054+0
2.0000+1	1.8917–5	1.5103+4	2.8238+0	3.4444+6	1.8075+6	5.2664+5	1.1096+6	7.0169+2	1.1615+1	4.0076+0	8.6387–1	6.7436+0
3.0000+1	1.9003–5	1.5035+4	3.5660+0	3.4289+6	1.8066+6	5.2864+5	1.0929+6	7.1510+2	1.5523+1	4.1492+0	8.5711–1	1.0517+1
4.0000+1	1.9079–5	1.4975+4	4.1397+0	3.4152+6	1.8060+6	5.2962+5	1.0788+6	7.2540+2	1.9488+1	4.2516+0	8.5218–1	1.4384+1
5.0000+1	1.9148–5	1.4921+4	4.6063+0	3.4029+6	1.8055+6	5.3029+5	1.0664+6	7.3421+2	2.3497+1	4.3349+0	8.4837–1	1.8313+1
6.0000+1	1.9205–5	1.4877+4	4.9991+0	3.3928+6	1.8051+6	5.3075+5	1.0562+6	7.4149+2	2.7530+1	4.3966+0	8.4629–1	2.2287+1
8.0000+1	1.9248–5	1.4844+4	5.6352+0	3.3853+6	1.8045+6	5.3120+5	1.0489+6	7.5277+2	3.5705+1	4.4848+0	8.4324–1	3.0377+1
1.0000+2	1.9283–5	1.4817+4	6.1392+0	3.3791+6	1.8040+6	5.3150+5	1.0429+6	7.6161+2	4.3944+1	4.5580+0	8.4123–1	3.8545+1
1.5000+2	1.9313–5	1.4794+4	7.0712+0	3.3739+6	1.8031+6	5.3171+5	1.0383+6	7.7770+2	6.4695+1	4.6433+0	8.3799–1	5.9214+1
2.0000+2	1.9334–5	1.4778+4	7.7407+0	3.3702+6	1.8025+6	5.3186+5	1.0351+6	7.8862+2	8.5633+1	4.7211+0	8.3579–1	8.0076+1
3.0000+2	1.9362–5	1.4757+4	8.6921+0	3.3654+6	1.8016+6	5.3202+5	1.0310+6	8.0086+2	1.2733+2	4.8439+0	8.3335–1	1.2165+2
4.0000+2	1.9381–5	1.4742+4	9.3711+0	3.3621+6	1.8010+6	5.3206+5	1.0282+6	8.0889+2	1.6922+2	4.8976+0	8.3194–1	1.6349+2
5.0000+2	1.9399–5	1.4729+4	9.8987+0	3.3590+6	1.8005+6	5.3208+5	1.0256+6	8.1503+2	2.1142+2	4.9463+0	8.3067–1	2.0565+2
6.0000+2	1.9410–5	1.4720+4	1.0330+1	3.3571+6	1.8001+6	5.3210+5	1.0241+6	8.2063+2	2.5298+2	4.9894+0	8.3028–1	2.4716+2
8.0000+2	1.9430–5	1.4705+4	1.1013+1	3.3535+6	1.7994+6	5.3212+5	1.0211+6	8.2954+2	3.3680+2	5.0688+0	8.2955–1	3.3091+2
1.0000+3	1.9449–5	1.4690+4	1.1544+1	3.3502+6	1.7989+6	5.3213+5	1.0183+6	8.3675+2	4.2074+2	5.1359+0	8.2893–1	4.1477+2
1.5000+3	1.9461–5	1.4681+4	1.2507+1	3.3481+6	1.7981+6	5.3214+5	1.0171+6	8.5020+2	6.3183+2	5.1993+0	8.2795–1	6.2580+2
2.0000+3	1.9471–5	1.4674+4	1.3190+1	3.3466+6	1.7974+6	5.3214+5	1.0161+6	8.6014+2	8.4174+2	5.2619+0	8.2720–1	8.3565+2
3.0000+3	1.9481–5	1.4666+4	1.4153+1	3.3448+6	1.7965+6	5.3215+5	1.0152+6	8.7465+2	1.2632+3	5.3821+0	8.2649–1	1.2570+3
4.0000+3	1.9488–5	1.4661+4	1.4836+1	3.3435+6	1.7959+6	5.3215+5	1.0146+6	8.8536+2	1.6858+3	5.4223+0	8.2604–1	1.6795+3
5.0000+3	1.9496–5	1.4655+4	1.5365+1	3.3421+6	1.7954+6	5.3215+5	1.0137+6	8.9376+2	2.1128+3	5.4624+0	8.2534–1	2.1065+3
6.0000+3	1.9499–5	1.4653+4	1.5797+1	3.3418+6	1.7950+6	5.3215+5	1.0137+6	8.9987+2	2.5314+3	5.5008+0	8.2539–1	2.5251+3
8.0000+3	1.9504–5	1.4649+4	1.6478+1	3.3409+6	1.7944+6	5.3215+5	1.0134+6	9.0960+2	3.3760+3	5.5776+0	8.2528–1	3.3696+3
1.0000+4	1.9508–5	1.4646+4	1.7007+1	3.3402+6	1.7939+6	5.3215+5	1.0132+6	9.1722+2	4.2283+3	5.6487+0	8.2519–1	4.2219+3
1.5000+4	1.9514–5	1.4642+4	1.7968+1	3.3392+6	1.7930+6	5.3215+5	1.0131+6	9.3203+2	6.3146+3	5.7073+0	8.2509–1	6.3081+3
2.0000+4	1.9518–5	1.4638+4	1.8651+1	3.3384+6	1.7924+6	5.3215+5	1.0129+6	9.4268+2	8.4279+3	5.7659+0	8.2497–1	8.4213+3
3.0000+4	1.9523–5	1.4635+4	1.9614+1	3.3376+6	1.7915+6	5.3215+5	1.0129+6	9.5766+2	1.2612+4	5.8831+0	8.2498–1	1.2605+4
4.0000+4	1.9528–5	1.4631+4	2.0298+1	3.3368+6	1.7909+6	5.3215+5	1.0128+6	9.6841+2	1.6842+4	5.9324+0	8.2485–1	1.6835+4
5.0000+4	1.9534–5	1.4627+4	2.0828+1	3.3358+6	1.7904+6	5.3215+5	1.0122+6	9.7667+2	2.1032+4	5.9696+0	8.2439–1	2.1025+4
6.0000+4	1.9535–5	1.4626+4	2.1262+1	3.3356+6	1.7900+6	5.3215+5	1.0124+6	9.8341+2	2.5219+4	6.0067+0	8.2456–1	2.5212+4
8.0000+4	1.9538–5	1.4623+4	2.1946+1	3.3350+6	1.7894+6	5.3215+5	1.0124+6	9.9414+2	3.3666+4	6.0810+0	8.2459–1	3.3659+4
1.0000+5	1.9541–5	1.4621+4	2.2476+1	3.3345+6	1.7889+6	5.3215+5	1.0124+6	1.0025+3	4.2127+4	6.1539+0	8.2459–1	4.2120+4


July 4, 1991
Atomic Weight 138.910
EEDL Evaluated Electron
Cross Sections
57-La
Density 6.154 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
57-La


July 4, 1991
Atomic Weight 138.910
EEDL Evaluated Electron
Energy Deposition
57-La
Density 6.154 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
57-La


July 4, 1991
Atomic Weight 138 910
EEDL Evaluated Electron
Shell Cross Sections
57-La
Density 6 154 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
57-La


July 4, 1991
Atomic Weight 138 910
EEDL Evaluated Electron
Energy Deposition
57-La
Density 6 154 Grams/cc
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Incident Photon Energy (MeV)
57-La

250

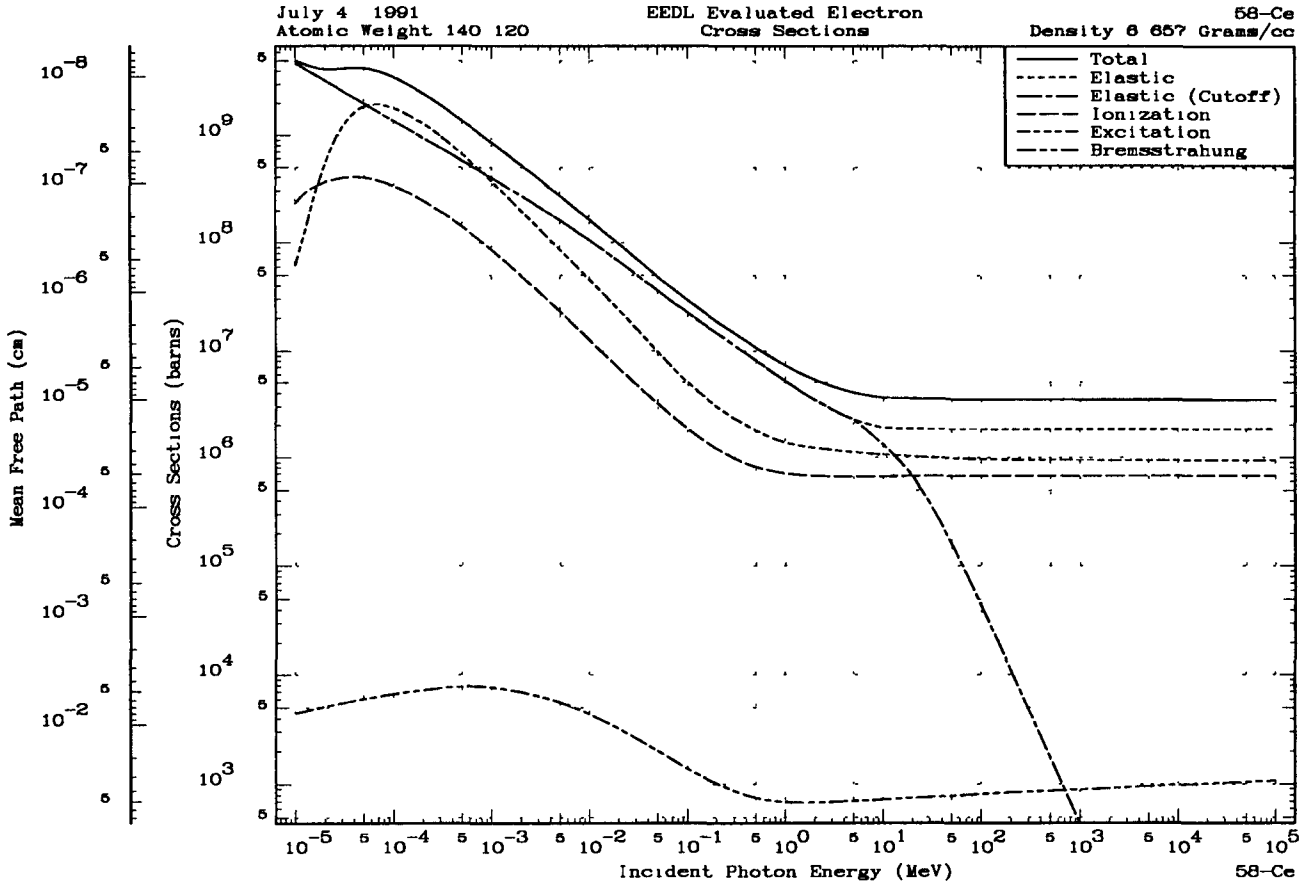
Atomic Weight 138.910 Density 6.154 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.8908–9	2.3582+7		5.4395+9	5.0506+9	2.9569+8	9.3196+7	4.4602+3	6.5696+1	5.0404+1	1.5292+1	2.5700–4
	1.1250–5	7.1907–9	2.2598+7		5.2126+9	4.7359+9	3.3968+8	1.3703+8	4.5671+3	8.3402+1	6.0260+1	2.3141+1	2.8798–4
	1.2500–5	7.4317–9	2.1865+7		5.0436+9	4.4710+9	3.7910+8	1.9346+8	4.6648+3	1.0347+2	6.9868+1	3.3597+1	3.1949–4
	1.3125–5	7.5325–9	2.1573+7		4.9761+9	4.3534+9	3.9567+8	2.2696+8	4.7108+3	1.1418+2	7.4221+1	3.9958+1	3.3543–4
	1.5000–5	7.7180–9	2.1054+7		4.8565+9	4.0472+9	4.3790+8	3.7142+8	4.8390+3	1.5432+2	8.6264+1	6.8059+1	3.8400–4
	1.7500–5	7.7852–9	2.0873+7		4.8146+9	3.7204+9	4.7693+8	6.1730+8	4.9912+3	2.1576+2	9.9172+1	1.1658+2	4.5033–4
	2.0000–5	7.7206–9	2.1047+7		4.8549+9	3.4586+9	5.0282+8	8.9340+8	5.1270+3	2.8380+2	1.1006+2	1.7375+2	5.1830–4
O3	2.5590–5	7.3730–9	2.2039+7		5.0837+9	3.0230+9	5.2943+8	1.5313+9	5.3566+3	4.3539+2	1.2655+2	3.0884+2	6.6237–4
	2.5866–5	7.3601–9	2.2078+7		5.0926+9	3.0053+9	5.3015+8	1.5571+9	5.3666+3	4.4175+2	1.2727+2	3.1448+2	6.6950–4
	2.6382–5	7.3345–9	2.2155+7		5.1104+9	2.9730+9	5.3148+8	1.6059+9	5.3851+3	4.5380+2	1.2862+2	3.2517+2	6.8291–4
	2.7287–5	7.2850–9	2.2305+7		5.1451+9	2.9188+9	5.3374+8	1.6926+9	5.4167+3	4.7524+2	1.3096+2	3.4428+2	7.0646–4
O2	2.8330–5	7.2216–9	2.2502+7		5.1903+9	2.8596+9	5.3618+8	1.7946+9	5.4521+3	5.0052+2	1.3360+2	3.6692+2	7.3377–4
	2.8643–5	7.2085–9	2.2542+7		5.1997+9	2.8425+9	5.3706+8	1.8202+9	5.4625+3	5.0722+2	1.3451+2	3.7272+2	7.4200–4
	2.8748–5	7.2041–9	2.2556+7		5.2029+9	2.8368+9	5.3732+8	1.8287+9	5.4660+3	5.0944+2	1.3479+2	3.7465+2	7.4474–4
	2.9374–5	7.1767–9	2.2642+7		5.2228+9	2.8036+9	5.3891+8	1.8802+9	5.4865+3	5.2285+2	1.3650+2	3.8634+2	7.6124–4
	3.0000–5	7.1475–9	2.2735+7		5.2441+9	2.7715+9	5.4053+8	1.9321+9	5.5066+3	5.3642+2	1.3826+2	3.9816+2	7.7779–4
	3.1250–5	7.1125–9	2.2847+7		5.2699+9	2.7104+9	5.4029+8	2.0192+9	5.5458+3	5.5889+2	1.4046+2	4.1842+2	8.1098–4
	3.2500–5	7.0723–9	2.2976+7		5.2999+9	2.6530+9	5.4022+8	2.1066+9	5.5837+3	5.8172+2	1.4278+2	4.3894+2	8.4437–4
	3.3438–5	7.0395–9	2.3084+7		5.3246+9	2.6122+9	5.4006+8	2.1723+9	5.6114+3	5.9893+2	1.4443+2	4.5450+2	8.6954–4
	3.5000–5	6.9800–9	2.3280+7		5.3700+9	2.5479+9	5.3986+8	2.2822+9	5.6561+3	6.2795+2	1.4720+2	4.8075+2	9.1172–4
	3.6250–5	6.9714–9	2.3309+7		5.3766+9	2.4995+9	5.3991+8	2.3371+9	5.6907+3	6.4455+2	1.4956+2	4.9499+2	9.4567–4
	4.0000–5	6.9319–9	2.3442+7		5.4072+9	2.3688+9	5.4004+8	2.4984+9	5.7888+3	6.9428+2	1.5658+2	5.3769+2	1.0486–3
O1	4.3650–5	6.9357–9	2.3429+7		5.4043+9	2.2586+9	5.3309+8	2.6126+9	5.8753+3	7.2977+2	1.6011+2	5.6966+2	1.1489–3
	4.4444–5	6.9521–9	2.3373+7		5.3915+9	2.2365+9	5.3184+8	2.6232+9	5.8912+3	7.3461+2	1.6104+2	5.7357+2	1.1697–3
	4.5000–5	6.9634–9	2.3336+7		5.3828+9	2.2213+9	5.3098+8	2.6305+9	5.9022+3	7.3799+2	1.6169+2	5.7630+2	1.1843–3
	4.5833–5	6.9798–9	2.3281+7		5.3701+9	2.1992+9	5.2961+8	2.6413+9	5.9185+3	7.4296+2	1.6259+2	5.8037+2	1.2061–3
	4.7916–5	7.0184–9	2.3153+7		5.3406+9	2.1465+9	5.2636+8	2.6677+9	5.9582+3	7.5533+2	1.6485+2	5.9048+2	1.2610–3
	5.0000–5	7.0537–9	2.3037+7		5.3139+9	2.0972+9	5.2340+8	2.6932+9	5.9964+3	7.6768+2	1.6721+2	6.0047+2	1.3162–3
	5.5000–5	7.2260–9	2.2488+7		5.1871+9	1.9909+9	5.1327+8	2.6829+9	6.0829+3	7.7623+2	1.7074+2	6.0549+2	1.4499–3
	6.0000–5	7.3831–9	2.2009+7		5.0768+9	1.8986+9	5.0462+8	2.6736+9	6.1630+3	7.8533+2	1.7467+2	6.1066+2	1.5852–3
	7.0000–5	7.8023–9	2.0827+7		4.8040+9	1.7454+9	4.8103+8	2.5775+9	6.3075+3	7.8101+2	1.7731+2	6.0369+2	1.8601–3
	8.0000–5	8.2854–9	1.9612+7		4.5239+9	1.6228+9	4.6149+8	2.4396+9	6.4353+3	7.6584+2	1.8028+2	5.8556+2	2.1405–3
	9.0000–5	8.8102–9	1.8444+7		4.2544+9	1.5218+9	4.4044+8	2.2922+9	6.5406+3	7.4027+2	1.8028+2	5.5999+2	2.4204–3
	1.0000–4	9.3067–9	1.7460+7	0.0000+0	4.0275+9	1.4367+9	4.2281+8	2.1679+9	6.6363+3	7.2001+2	1.8111+2	5.3890+2	2.7044–3
N5	1.1376–4	9.9810–9	1.6281+7	1.9527–8	3.7554+9	1.3393+9	3.9820+8	2.0178+9	6.7450+3	6.8954+2	1.7938+2	5.1016+2	3.0942–3
N4	1.1683–4	1.0125–8	1.6049+7	2.3997–8	3.7020+9	1.3200+9	3.9340+8	1.9885+9	6.7677+3	6.8402+2	1.7930+2	5.0472+2	3.1820–3
	1.1829–4	1.0197–8	1.5936+7	2.6136–8	3.6759+9	1.3111+9	3.9102+8	1.9737+9	6.7783+3	6.8111+2	1.7915+2	5.0197+2	3.2238–3
	1.1890–4	1.0227–8	1.5889+7	2.7037–8	3.6650+9	1.3075+9	3.9003+8	1.9675+9	6.7828+3	6.7991+2	1.7908+2	5.0083+2	3.2414–3
	1.2279–4	1.0416–8	1.5600+7	3.2785–8	3.5984+9	1.2847+9	3.8395+8	1.9297+9	6.8103+3	6.7257+2	1.7872+2	4.9384+2	3.3531–3
	1.2622–4	1.0581–8	1.5357+7	3.7905–8	3.5424+9	1.2656+9	3.7887+8	1.8979+9	6.8340+3	6.6653+2	1.7853+2	4.8800+2	3.4520–3
	1.2959–4	1.0741–8	1.5128+7	4.2990–8	3.4896+9	1.2476+9	3.7407+8	1.8679+9	6.8568+3	6.6088+2	1.7836+2	4.8251+2	3.5497–3
	1.3125–4	1.0819–8	1.5019+7	4.5502–8	3.4644+9	1.2390+9	3.7178+8	1.8537+9	6.8678+3	6.5820+2	1.7829+2	4.7991+2	3.5977–3
	1.3811–4	1.1137–8	1.4590+7	5.6006–8	3.3654+9	1.2051+9	3.6281+8	1.7975+9	6.9120+3	6.4791+2	1.7818+2	4.6973+2	3.7974–3
	1.3980–4	1.1215–8	1.4490+7	5.8614–8	3.3423+9	1.1971+9	3.6071+8	1.7844+9	6.9226+3	6.4553+2	1.7817+2	4.6736+2	3.8467–3
	1.5000–4	1.1673–8	1.3921+7	7.4584–8	3.2111+9	1.1521+9	3.4886+8	1.7101+9	6.9843+3	6.3241+2	1.7835+2	4.5406+2	4.1464–3
	1.6250–4	1.2263–8	1.3251+7	9.4678–8	3.0566+9	1.1029+9	3.3362+8	1.6200+9	7.0494+3	6.1188+2	1.7631+2	4.3556+2	4.5177–3
	1.8125–4	1.3114–8	1.2391+7	1.2598–7	2.8581+9	1.0393+9	3.1409+8	1.5047+9	7.1391+3	5.8632+2	1.7419+2	4.1213+2	5.0806–3
	2.0000–4	1.3931–8	1.1664+7	1.5854–7	2.6905+9	9.8502+8	2.9767+8	1.4078+9	7.2209+3	5.6562+2	1.7295+2	3.9267+2	5.6500–3
N3	2.0707–4	1.4236–8	1.1415+7	1.7113–7	2.6330+9	9.6656+8	2.9146+8	1.3750+9	7.2431+3	5.5698+2	1.7175+2	3.8522+2	5.8669–3
	2.0997–4	1.4361–8	1.1315+7	1.7636–7	2.6100+9	9.5925+8	2.8902+8	1.3617+9	7.2521+3	5.5359+2	1.7134+2	3.8225+2	5.9562–3
	2.1560–4	1.4602–8	1.1128+7	1.8659–7	2.5670+9	9.4554+8	2.8445+8	1.3370+9	7.2690+3	5.4729+2	1.7059+2	3.7669+2	6.1296–3
N2	2.2473–4	1.4987–8	1.0842+7	2.0341–7	2.5009+9	9.2443+8	2.7747+8	1.2990+9	7.2958+3	5.3774+2	1.6953+2	3.6820+2	6.4117–3
	2.2615–4	1.5051–8	1.0797+7	2.0606–7	2.4904+9	9.2126+8	2.7638+8	1.2928+9	7.2998+3	5.3614+2	1.6932+2	3.6681+2	6.4556–3
	2.2708–4	1.5092–8	1.0767+7	2.0780–7	2.4835+9	9.1920+8	2.7567+8	1.2887+9	7.3025+3	5.3509+2	1.6918+2	3.6590+2	6.4845–3
	2.3164–4	1.5294–8	1.0625+7	2.1636–7	2.4507+9	9.0930+8	2.7228+8	1.2691+9	7.3153+3	5.3009+2	1.6851+2	3.6157+2	6.6258–3
	2.4019–4	1.5669–8	1.0370+7	2.3261–7	2.3921+9	8.9154+8	2.6623+8	1.2343+9	7.3388+3	5.2126+2	1.6738+2	3.5387+2	6.8915–3
	2.4461–4	1.5861–8	1.0245+7	2.4114–7	2.3631+9	8.8272+8	2.6324+8	1.2171+9	7.3507+3	5.1693+2	1.6686+2	3.5007+2	7.0295–3
	2.5514–4	1.6314–8	9.9607+6	2.6170–7	2.2976+9	8.6270+8	2.5649+8	1.1784+9	7.3781+3	5.0725+2	1.6571+2	3.4153+2	7.3583–3
	2.6250–4	1.6626–8	9.7735+6	2.7630–7	2.2544+9	8.4944+8	2.5204+8	1.1529+9	7.3967+3	5.0095+2	1.6502+2	3.3593+2	7.5891–3
	2.7231–4	1.7037–8	9.5376+6	2.9603–7	2.2000+9	8.3264+8	2.4645+8	1.1209+9	7.4208+3	4.9312+2	1.6421+2	3.2891+2	7.8973–3
	2.7757–4	1.7256–8	9.4168+6	3.0674–7	2.1721+9	8.2400+8	2.4358+8	1.1045+9	7.4333+3	4.8915+2	1.6381+2	3.2532+2	8.0631–3
N1	2.7913–4	1.7320–8	9.3817+6	3.0994–7	2.1640+9	8.2149+8	2.4275+8	1.0998+9	7.4370+3	4.8800+2	1.6370+2	3.2429+2	8.1124–3
	2.8435–4	1.7550–8	9.2588+6	3.2068–7	2.1357+9	8.1325+8	2.3992+8	1.0825+9	7.4492+3	4.8374+2	1.6318+2	3.2054+2	8.2771–3
	2.9217–4	1.7893–8	9.0816+6	3.3696–7	2.0948+9	8.0131+8	2.3584+8	1.0576+9	7.4671+3	4.7765+2	1.6247+2	3.1517+2	8.5248–3
	3.0000–4	1.8232–8	8.9125+6	3.5344–7	2.0558+9	7.8986+8	2.3195+8	1.0340+9	7.4846+3	4.7191+2	1.6184+2	3.1007+2	8.7730–3
	3.1250–4	1.8767–8	8.6584+6	3.8022–7	1.9972+9	7.7254+8	2.2563+8	9.9902+8	7.5096+3	4.6172+2	1.6011+2	3.0160+2	9.1707–3
	3.3438–4	1.9687–8	8.2539+6	4.2844–7	1.9039+9	7.4466+8	2.1560+8	9.4364+8	7.5513+3	4.4577+2	1.5754+2	2.8822+2	9.8699–3
	3.5000–4	2.0332–8	7.9922+6	4.6389–7	1.8435+9	7.2641+8	2.0911+8	9.0800+8	7.5795+3	4.3566+2	1.5602+2	2.7963+2	1.0372–2
	3.6719–4	2.1030–8	7.7268+6	5.0382–7	1.7823+9	7.0774+8	2.0252+8	8.7204+8	7.6093+3	4.2544+2	1.5446+2	2.7098+2	1.0926–2
	4.0000–4	2.2334–8	7.2757+6	5.8251–7	1.6782+9	6.7559+8	1.9132+8	8.1133+8	7.6627+3	4.0853+2	1.5209+2	2.5642+2	1.1989–2
	4.5000–4	2.4319–8	6.6818+6	7.0887–7	1.5413+9	6.3374+8	1.7601+8	7.3150+8	7.7017+3	3.8318+2	1.4710+2	2.3607+2	1.3615–2
	5.0000–4	2.6234–8	6.1940+6	8.4291–7	1.4287+9	5.9851+8	1.6346+8	6.6677+8	7.7368+3	3.6304+2	1.4339+2	2.1963+2	1.5249–2
	6.0000–4	2.9910–8	5.4328+6	1.1318–6	1.2531+9	5.4211+8	1.4320+8	5.6783+8	7.7731+3	3.2979+2	1.3629+2	1.9348+2	1.8457–2
	7.0000–4	3.3415–8	4.8630+6	1.4482–6	1.1217+9	4.9859+8	1.2745+8	4.9568+8	7.7513+3	3.0273+2	1.2919+2	1.7353+2	2.1447–2
	8.0000–4	3.6760–8	4.4205+6	1.7901–6	1.0196+9	4.6372+8	1.1529+8	4.4063+8	7.7325+3	2.8248+2	1.2408+2	1.5837+2	2.4431–2
M5	8.4728–4	3.8274–8	4.2456+6	1.9602–6	9.7932+8	4.4949+8	1.1024+8	4.1958+8	7.6960+3	2.7349+2	1.2131+2	1.5215+2	2.5610–2
	8.5205–4	3.8426–8	4.2288+6	1.9777–6	9.7544+8	4.4812+8	1.0976+8	4.1755+8	7.6924+3	2.7265+2	1.2106+2	1.5156+2	2.5728–2
	8.6130–4	3.8720–8	4.1967+6	2.0117–6	9.6804+8	4.4550+8	1.0884+8	4.1368+8	7.6856+3	2.7104+2	1.2059+2	1.5043+2	2.5958–2
M4	8.6496–4	3.8836–8	4.1842+6	2.0252–6	9.6514+8	4.4448+8	1.0848+8	4.1217+8	7.6829+3	2.7041+2	1.2040+2	1.4998+2	2.6049–2
	8.7340–4	3.9108–8	4.1550+6	2.0565–6	9.5842+8	4.4214+8	1.0767+8	4.0860+8	7.6767+3	2.6897+2	1.1999+2	1.4896+2	2.6259–2

Atomic Weight 138.910 Density 6.154 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	8.7864–4	3.9277–8	4.1372+6	2.0760–6	9.5431+8	4.4071+8	1.0717+8	4.0642+8	7.6730+3	2.6809+2	1.1974+2	1.4833+2	2.6389–2
	8.8923–4	3.9617–8	4.1017+6	2.1156–6	9.4612+8	4.3785+8	1.0617+8	4.0209+8	7.6654+3	2.6635+2	1.1924+2	1.4708+2	2.6652–2
	9.0898–4	4.0247–8	4.0374+6	2.1902–6	9.3130+8	4.3266+8	1.0438+8	3.9426+8	7.6515+3	2.6322+2	1.1837+2	1.4483+2	2.7141–2
	9.1692–4	4.0499–8	4.0123+6	2.2205–6	9.2550+8	4.3062+8	1.0367+8	3.9120+8	7.6460+3	2.6200+2	1.1802+2	1.4395+2	2.7338–2
	9.5846–4	4.1807–8	3.8868+6	2.3809–6	8.9655+8	4.2039+8	1.0017+8	3.7598+8	7.6181+3	2.5595+2	1.1635+2	1.3957+2	2.8364–2
	1.0000–3	4.3096–8	3.7705+6	2.5449–6	8.6973+8	4.1082+8	9.6936+7	3.6197+8	7.5915+3	2.5049+2	1.1490+2	1.3555+2	2.9387–2
M3	1.1227–3	4.6746–8	3.4761+6	3.0505–6	8.0182+8	3.8571+8	8.8401+7	3.2770+8	7.4701+3	2.3508+2	1.0998+2	1.2506+2	3.1704–2
	1.1463–3	4.7443–8	3.4251+6	3.1514–6	7.9004+8	3.8137+8	8.6950+7	3.2172+8	7.4485+3	2.3247+2	1.0917+2	1.2327+2	3.2147–2
	1.1905–3	4.8738–8	3.3341+6	3.3435–6	7.6906+8	3.7358+8	8.4372+7	3.1110+8	7.4093+3	2.2789+2	1.0776+2	1.2010+2	3.2974–2
M2	1.2048–3	4.9153–8	3.3059+6	3.4064–6	7.6256+8	3.7116+8	8.3576+7	3.0782+8	7.3970+3	2.2649+2	1.0734+2	1.1912+2	3.3241–2
	1.2232–3	4.9683–8	3.2707+6	3.4882–6	7.5443+8	3.6810+8	8.2557+7	3.0377+8	7.3814+3	2.2460+2	1.0670+2	1.1786+2	3.3585–2
	1.2292–3	4.9852–8	3.2595+6	3.5147–6	7.5186+8	3.6713+8	8.2236+7	3.0249+8	7.3764+3	2.2400+2	1.0650+2	1.1747+2	3.3695–2
	1.2578–3	5.0669–8	3.2070+6	3.6434–6	7.3975+8	3.6255+8	8.0722+7	2.9647+8	7.3528+3	2.2120+2	1.0557+2	1.1560+2	3.4228–2
	1.2969–3	5.1771–8	3.1388+6	3.8214–6	7.2400+8	3.5656+8	7.8759+7	2.8867+8	7.3215+3	2.1760+2	1.0438+2	1.1319+2	3.4952–2
	1.3184–3	5.2373–8	3.1027+6	3.9206–6	7.1568+8	3.5338+8	7.7724+7	2.8457+8	7.3048+3	2.1572+2	1.0376+2	1.1192+2	3.5350–2
M1	1.3504–3	5.3263–8	3.0508+6	4.0699–6	7.0372+8	3.4879+8	7.6240+7	2.7868+8	7.2804+3	2.1303+2	1.0290+2	1.1010+2	3.5940–2
	1.3691–3	5.3785–8	3.0212+6	4.1580–6	6.9689+8	3.4619+8	7.5394+7	2.7530+8	7.2653+3	2.1144+2	1.0236+2	1.0905+2	3.6265–2
	1.3984–3	5.4599–8	2.9761+6	4.2976–6	6.8649+8	3.4221+8	7.4110+7	2.7017+8	7.2420+3	2.0904+2	1.0155+2	1.0745+2	3.6773–2
	1.4018–3	5.4693–8	2.9710+6	4.3138–6	6.8532+8	3.4176+8	7.3964+7	2.6959+8	7.2393+3	2.0876+2	1.0145+2	1.0727+2	3.6832–2
	1.4092–3	5.4896–8	2.9601+6	4.3491–6	6.8278+8	3.4079+8	7.3651+7	2.6834+8	7.2336+3	2.0818+2	1.0126+2	1.0688+2	3.6959–2
	1.4509–3	5.6041–8	2.8996+6	4.5511–6	6.6883+8	3.3541+8	7.1932+7	2.6148+8	7.2017+3	2.0498+2	1.0019+2	1.0475+2	3.7679–2
	1.5000–3	5.7375–8	2.8322+6	4.7927–6	6.5329+8	3.2939+8	7.0023+7	2.5387+8	7.1656+3	2.0147+2	9.9037+1	1.0239+2	3.8523–2
	1.5625–3	5.9042–8	2.7522+6	5.1066–6	6.3484+8	3.2214+8	6.7695+7	2.4500+8	7.1187+3	1.9677+2	9.7255+1	9.9475+1	3.9544–2
	1.6719–3	6.1907–8	2.6248+6	5.6731–6	6.0546+8	3.1048+8	6.4010+7	2.3096+8	7.0417+3	1.8941+2	9.4506+1	9.4867+1	4.1320–2
	1.7500–3	6.3915–8	2.5424+6	6.0907–6	5.8644+8	3.0285+8	6.1642+7	2.2195+8	6.9902+3	1.8475+2	9.2794+1	9.1912+1	4.2580–2
	1.8359–3	6.6088–8	2.4588+6	6.5619–6	5.6716+8	2.9504+8	5.9251+7	2.1286+8	6.9365+3	1.8001+2	9.1032+1	8.8938+1	4.3959–2
	2.0000–3	7.0143–8	2.3167+6	7.4938–6	5.3437+8	2.8159+8	5.5218+7	1.9756+8	6.8417+3	1.7215+2	8.8163+1	8.3941+1	4.6570–2
	2.2500–3	7.6239–8	2.1314+6	8.9977–6	4.9164+8	2.6357+8	4.9973+7	1.7809+8	6.6737+3	1.6045+2	8.3313+1	7.7084+1	4.9867–2
	2.5000–3	8.2115–8	1.9789+6	1.0604–5	4.5646+8	2.4843+8	4.5712+7	1.6231+8	6.5270+3	1.5098+2	7.9387+1	7.1541+1	5.3113–2
	2.6250–3	8.4980–8	1.9122+6	1.1443–5	4.4107+8	2.4171+8	4.3866+7	1.5549+8	6.4602+3	1.4692+2	7.7715+1	6.9150+1	5.4719–2
	3.0000–3	9.3312–8	1.7414+6	1.4089–5	4.0169+8	2.2425+8	3.9192+7	1.3824+8	6.2807+3	1.3667+2	7.3484+1	6.3123+1	5.9467–2
	3.5000–3	1.0418–7	1.5598+6	1.7923–5	3.5978+8	2.0517+8	3.4312+7	1.2029+8	6.0420+3	1.2435+2	6.7930+1	5.6350+1	6.4834–2
	4.0000–3	1.1456–7	1.4185+6	2.2102–5	3.2719+8	1.8996+8	3.0585+7	1.0664+8	5.8426+3	1.1505+2	6.3762+1	5.1216+1	7.0070–2
	5.0000–3	1.3455–7	1.2077+6	3.1401–5	2.7858+8	1.6611+8	2.5187+7	8.7274+7	5.4744+3	1.0037+2	5.6740+1	4.3546+1	7.8741–2
L3	5.4838–3	1.4380–7	1.1300+6	3.6363–5	2.6066+8	1.5696+8	2.3227+7	8.0466+7	5.3171+3	9.4698+1	5.3901+1	4.0715+1	8.2425–2
	5.6128–3	1.4628–7	1.1109+6	3.7736–5	2.5624+8	1.5473+8	2.2759+7	7.8743+7	5.2782+3	9.3323+1	5.3230+1	4.0010+1	8.3397–2
L2	5.9025–3	1.5178–7	1.0706+6	4.0888–5	2.4695+8	1.5002+8	2.1777+7	7.5141+7	5.1951+3	9.0449+1	5.1828+1	3.8536+1	8.5562–2
	6.0000–3	1.5366–7	1.0575+6	4.1972–5	2.4393+8	1.4852+8	2.1467+7	7.3936+7	5.1664+3	8.9522+1	5.1391+1	3.8045+1	8.6217–2
L1	6.2418–3	1.5817–7	1.0273+6	4.4708–5	2.3697+8	1.4496+8	2.0733+7	7.1272+7	5.0944+3	8.7207+1	5.0235+1	3.6884+1	8.7697–2
	6.2500–3	1.5833–7	1.0263+6	4.4802–5	2.3674+8	1.4484+8	2.0709+7	7.1183+7	5.0920+3	8.7130+1	5.0197+1	3.6845+1	8.7745–2
	6.3517–3	1.6024–7	1.0141+6	4.5976–5	2.3392+8	1.4340+8	2.0417+7	7.0098+7	5.0624+3	8.6190+1	4.9729+1	3.6374+1	8.8345–2
	6.5000–3	1.6300–7	9.9688+5	4.7710–5	2.2995+8	1.4136+8	2.0006+7	6.8575+7	5.0204+3	8.4872+1	4.9072+1	3.5711+1	8.9217–2
	6.6875–3	1.6648–7	9.7607+5	4.9940–5	2.2515+8	1.3889+8	1.9511+7	6.6743+7	4.9691+3	8.3286+1	4.8281+1	3.4915+1	9.0313–2
	6.7638–3	1.6788–7	9.6790+5	5.0859–5	2.2326+8	1.3791+8	1.9317+7	6.6027+7	4.9488+3	8.2666+1	4.7972+1	3.4603+1	9.0758–2
	7.2500–3	1.7674–7	9.1942+5	5.6875–5	2.1208+8	1.3210+8	1.8171+7	6.1805+7	4.8263+3	7.9012+1	4.6149+1	3.2769+1	9.3570–2
	7.3437–3	1.7842–7	9.1073+5	5.8066–5	2.1007+8	1.3105+8	1.7967+7	6.1054+7	4.8039+3	7.8362+1	4.5825+1	3.2443+1	9.4107–2
	7.3819–3	1.7911–7	9.0725+5	5.8554–5	2.0927+8	1.3063+8	1.7885+7	6.0754+7	4.7949+3	7.8102+1	4.5695+1	3.2312+1	9.4326–2
	8.0000–3	1.9006–7	8.5497+5	6.6671–5	1.9721+8	1.2427+8	1.6663+7	5.6278+7	4.6577+3	7.4230+1	4.3763+1	3.0369+1	9.7832–2
	9.0000–3	2.0746–7	7.8325+5	8.0681–5	1.8067+8	1.1531+8	1.5015+7	5.0344+7	4.4460+3	6.8596+1	4.0825+1	2.7668+1	1.0249–1
	1.0000–2	2.2432–7	7.2439+5	9.5764–5	1.6709+8	1.0784+8	1.3680+7	4.5568+7	4.2649+3	6.4056+1	3.8452+1	2.5497+1	1.0704–1
	1.1250–2	2.4488–7	6.6358+5	1.1609–4	1.5307+8	9.9948+7	1.2327+7	4.0785+7	4.0497+3	5.9036+1	3.5727+1	2.3198+1	1.1111–1
	1.3125–2	2.7455–7	5.9187+5	1.4952–4	1.3652+8	9.0486+7	1.0757+7	3.5276+7	3.7844+3	5.3229+1	3.2559+1	2.0553+1	1.1711–1
	1.5000–2	3.0303–7	5.3623+5	1.8629–4	1.2369+8	8.3016+7	9.5612+6	3.1109+7	3.5687+3	4.8821+1	3.0143+1	1.8556+1	1.2295–1
	1.7500–2	3.4040–7	4.7737+5	2.4026–4	1.1011+8	7.4851+7	8.3502+6	2.6907+7	3.3208+3	4.3909+1	2.7368+1	1.6413+1	1.2835–1
	2.0000–2	3.7637–7	4.3175+5	2.9977–4	9.9589+7	6.8430+7	7.4264+6	2.3730+7	3.1200+3	4.0169+1	2.5240+1	1.4795+1	1.3368–1
	2.5000–2	4.4640–7	3.6402+5	4.3417–4	8.3966+7	5.8632+7	6.1211+6	1.9210+7	2.7885+3	3.4382+1	2.1890+1	1.2351+1	1.4076–1
	3.0000–2	5.1295–7	3.1679+5	5.8866–4	7.3072+7	5.1677+7	5.2274+6	1.6164+7	2.5439+3	3.0431+1	1.9575+1	1.0708+1	1.4783–1
K	3.8943–2	6.2621–7	2.5949+5	9.0940–4	5.9855+7	4.3007+7	4.1918+6	1.2655+7	2.2191+3	2.5479+1	1.6626+1	8.6963+0	1.5681–1
	3.9471–2	6.3273–7	2.5682+5	9.3024–4	5.9239+7	4.2600+7	4.1446+6	1.2493+7	2.2033+3	2.5251+1	1.6490+1	8.6034+0	1.5730–1
	4.0000–2	6.3922–7	2.5421+5	9.5126–4	5.8637+7	4.2201+7	4.0986+6	1.2335+7	2.1878+3	2.5028+1	1.6357+1	8.5129+0	1.5778–1
	4.1250–2	6.5440–7	2.4831+5	1.0017–3	5.7277+7	4.1294+7	3.9960+6	1.1985+7	2.1529+3	2.4509+1	1.6046+1	8.3036+0	1.5878–1
	4.3438–2	6.8069–7	2.3872+5	1.0926–3	5.5065+7	3.9814+7	3.8294+6	1.1419+7	2.0954+3	2.3668+1	1.5541+1	7.9657+0	1.6052–1
	4.6719–2	7.1952–7	2.2584+5	1.2346–3	5.2094+7	3.7818+7	3.6065+6	1.0667+7	2.0171+3	2.2544+1	1.4864+1	7.5167+0	1.6316–1
	5.0000–2	7.5766–7	2.1447+5	1.3834–3	4.9471+7	3.6048+7	3.4104+6	1.0011+7	1.9467+3	2.1559+1	1.4268+1	7.1252+0	1.6581–1
	5.5000–2	8.1400–7	1.9963+5	1.6227–3	4.6047+7	3.3726+7	3.1594+6	9.1596+6	1.8482+3	2.0238+1	1.3469+1	6.6005+0	1.6923–1
	6.0000–2	8.6902–7	1.8699+5	1.8769–3	4.3131+7	3.1737+7	2.9465+6	8.4458+6	1.7626+3	1.9123+1	1.2789+1	6.1611+0	1.7266–1
	7.0000–2	9.7201–7	1.6718+5	2.4258–3	3.8562+7	2.8575+7	2.6162+6	7.3685+6	1.6182+3	1.7340+1	1.1684+1	5.4784+0	1.7831–1
	8.0000–2	1.0709–6	1.5174+5	3.0266–3	3.5001+7	2.6092+7	2.3603+6	6.5470+6	1.5027+3	1.5968+1	1.0824+1	4.9594+0	1.8398–1
	9.0000–2	1.1660–6	1.3936+5	3.6765–3	3.2147+7	2.4132+7	2.1659+6	5.8469+6	1.4109+3	1.4821+1	1.0140+1	4.4920+0	1.8874–1
	1.0000–1	1.2524–6	1.2975+5	4.3709–3	2.9929+7	2.2505+7	2.0056+6	5.4172+6	1.3336+3	1.3990+1	9.5763+0	4.2201+0	1.9352–1
	1.2500–1	1.4540–6	1.1175+5	6.2691–3	2.5778+7	1.9514+7	1.7278+6	4.5353+6	1.1989+3	1.2383+1	8.5555+0	3.6242+0	2.0310–1
	1.5000–1	1.6425–6	9.8934+4	8.3861–3	2.2821+7	1.7368+7	1.5297+6	3.9225+6	1.0991+3	1.1254+1	7.8275+0	3.2133+0	2.1288–1
	2.0000–1	1.9747–6	8.2291+4	1.3129–2	1.8982+7	1.4500+7	1.2918+6	3.1892+6	9.7189+2	9.8613+0	6.9279+0	2.7037+0	2.2971–1
	3.0000–1	2.5421–6	6.3922+4	2.4042–2	1.4744+7	1.1213+7	1.0567+6	2.4743+6	8.3561+2	8.4989+0	6.0372+0	2.2000+0	2.6168–1
	4.0000–1	3.0300–6	5.3630+4	3.6257–2	1.2371+7	9.2941+6	9.4238+5	2.1332+6	7.6561+2	7.8822+0	5.6257+0	1.9618+0	2.9474–1
	5.0000–1	3.4623–6	4.6933+4	4.9210–2	1.0826+7	8.0280+6	8.7630+5	1.9208+6	7.2455+2	7.5604+0	5.4172+0	1.8132+0	3.3004–1
	6.0000–1	3.8430–6	4.2283+4	6.2589–2	9.7533+6	7.1227+6	8.3370+5	1.7962+6	6.9994+2	7.3891+0	5.2899+0	1.7324+0	3.6683–1
	8.0000–1	4.5107–6	3.6024+4	8.9868–2	8.3096+6	5.8980+6	7.8411+5	1.6269+6	6.7415+2	7.2745+0	5.2059+0	1.6231+0	4.4552–1
	1.0000+0	5.0513–6	3.2169+4	1.1731–1	7.4203+6	5.1137+6	7.5666+5	1.5493+6	6.6186+2	7.2995+0	5.1842+0	1.5861+0	5.2920–1
	1.5000+0	6.0940–6	2.6665+4	1.8453–1	6.1507+6	3.9930+6	7.2674+5	1.4303+6	6.5299+2	7.5791+0	5.3022+0	1.5210+0	7.5588–1

Atomic Weight 138.910												Density 6.154 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000+0	6.8459–6	2.3736+4	2.4900–1	5.4752+6	3.3870+6	7.1717+5	1.3703+6	6.5488+2	7.9344+0	5.4206+0	1.5139+0	9.9992–1
3.0000+0	7.8346–6	2.0741+4	3.6952–1	4.7842+6	2.7576+6	7.0620+5	1.3197+6	6.6414+2	8.6717+0	5.6452+0	1.5073+0	1.5193+0
4.0000+0	8.5039–6	1.9108+4	4.8028–1	4.4076+6	2.4258+6	7.0537+5	1.2758+6	6.7264+2	9.3954+0	5.8266+0	1.5053+0	2.0635+0
5.0000+0	8.9332–6	1.8190+4	5.8279–1	4.1958+6	2.2295+6	7.0500+5	1.2606+6	6.7997+2	1.0123+1	5.9919+0	1.5062+0	2.6249+0
6.0000+0	9.2457–6	1.7575+4	6.7824–1	4.0540+6	2.1030+6	7.0470+5	1.2456+6	6.8598+2	1.0839+1	6.1218+0	1.5069+0	3.2105+0
8.0000+0	9.6739–6	1.6797+4	8.5178–1	3.8746+6	1.9520+6	7.0539+5	1.2164+6	6.9557+2	1.2238+1	6.3344+0	1.5080+0	4.3959+0
1.0000+1	9.9080–6	1.6400+4	1.0064+0	3.7830+6	1.8758+6	7.0657+5	1.2000+6	7.0246+2	1.3651+1	6.5108+0	1.5065+0	5.6342+0
1.5000+1	1.0087–5	1.6109+4	1.3331+0	3.7158+6	1.8289+6	7.0875+5	1.1774+6	7.1575+2	1.7091+1	6.7818+0	1.4935+0	8.8154+0
2.0000+1	1.0135–5	1.6032+4	1.5995+0	3.6981+6	1.8290+6	7.0999+5	1.1584+6	7.2575+2	2.0554+1	6.9870+0	1.4844+0	1.2082+1
3.0000+1	1.0233–5	1.5880+4	2.0180+0	3.6629+6	1.8280+6	7.1122+5	1.1229+6	7.3849+2	2.7581+1	7.2273+0	1.4681+0	1.8885+1
4.0000+1	1.0258–5	1.5842+4	2.3406+0	3.6541+6	1.8274+6	7.1192+5	1.1141+6	7.4905+2	3.4678+1	7.3971+0	1.4603+0	2.5821+1
5.0000+1	1.0278–5	1.5810+4	2.6027+0	3.6468+6	1.8268+6	7.1238+5	1.1068+6	7.5844+2	4.1865+1	7.5342+0	1.4545+0	3.2876+1
6.0000+1	1.0293–5	1.5787+4	2.8230+0	3.6414+6	1.8263+6	7.1269+5	1.1016+6	7.6587+2	4.9120+1	7.6380+0	1.4514+0	4.0030+1
8.0000+1	1.0320–5	1.5745+4	3.1793+0	3.6319+6	1.8256+6	7.1298+5	1.0925+6	7.7728+2	6.3784+1	7.7894+0	1.4468+0	5.4547+1
1.0000+2	1.0344–5	1.5709+4	3.4612+0	3.6236+6	1.8251+6	7.1317+5	1.0845+6	7.8629+2	7.8612+1	7.9136+0	1.4435+0	6.9255+1
1.5000+2	1.0359–5	1.5686+4	3.9820+0	3.6183+6	1.8241+6	7.1331+5	1.0800+6	8.0252+2	1.1577+2	8.0559+0	1.4381+0	1.0628+2
2.0000+2	1.0370–5	1.5670+4	4.3560+0	3.6146+6	1.8234+6	7.1341+5	1.0769+6	8.1347+2	1.5337+2	8.1875+0	1.4346+0	1.4375+2
3.0000+2	1.0382–5	1.5651+4	4.8869+0	3.6102+6	1.8224+6	7.1351+5	1.0734+6	8.2658+2	2.2830+2	8.4022+0	1.4310+0	2.1847+2
4.0000+2	1.0391–5	1.5638+4	5.2656+0	3.6071+6	1.8217+6	7.1353+5	1.0710+6	8.3532+2	3.0337+2	8.4958+0	1.4289+0	2.9344+2
5.0000+2	1.0399–5	1.5625+4	5.5600+0	3.6042+6	1.8212+6	7.1355+5	1.0687+6	8.4204+2	3.7896+2	8.5825+0	1.4269+0	3.6895+2
6.0000+2	1.0405–5	1.5618+4	5.8008+0	3.6025+6	1.8207+6	7.1356+5	1.0673+6	8.4781+2	4.5369+2	8.6568+0	1.4262+0	4.4360+2
8.0000+2	1.0414–5	1.5603+4	6.1814+0	3.5991+6	1.8201+6	7.1357+5	1.0647+6	8.5701+2	6.0446+2	8.7990+0	1.4249+0	5.9423+2
1.0000+3	1.0423–5	1.5590+4	6.4768+0	3.5961+6	1.8195+6	7.1358+5	1.0622+6	8.6443+2	7.5525+2	8.9102+0	1.4238+0	7.4492+2
1.5000+3	1.0429–5	1.5581+4	7.0133+0	3.5939+6	1.8185+6	7.1358+5	1.0610+6	8.7826+2	1.1344+3	9.0209+0	1.4222+0	1.1239+3
2.0000+3	1.0434–5	1.5574+4	7.3939+0	3.5924+6	1.8178+6	7.1359+5	1.0601+6	8.8857+2	1.5113+3	9.1306+0	1.4210+0	1.5008+3
3.0000+3	1.0439–5	1.5566+4	7.9303+0	3.5906+6	1.8168+6	7.1359+5	1.0593+6	9.0359+2	2.2682+3	9.3414+0	1.4201+0	2.2574+3
4.0000+3	1.0443–5	1.5561+4	8.3106+0	3.5894+6	1.8161+6	7.1359+5	1.0587+6	9.1465+2	3.0272+3	9.4140+0	1.4194+0	3.0164+3
5.0000+3	1.0447–5	1.5555+4	8.6050+0	3.5880+6	1.8156+6	7.1359+5	1.0579+6	9.2332+2	3.7941+3	9.4843+0	1.4183+0	3.7832+3
6.0000+3	1.0448–5	1.5553+4	8.8455+0	3.5876+6	1.8152+6	7.1359+5	1.0579+6	9.2968+2	4.5460+3	9.5546+0	1.4184+0	4.5351+3
8.0000+3	1.0450–5	1.5550+4	9.2251+0	3.5867+6	1.8145+6	7.1359+5	1.0577+6	9.3979+2	6.0630+3	9.6904+0	1.4183+0	6.0519+3
1.0000+4	1.0452–5	1.5546+4	9.5192+0	3.5860+6	1.8139+6	7.1359+5	1.0575+6	9.4770+2	7.5939+3	9.8138+0	1.4181+0	7.5827+3
1.5000+4	1.0455–5	1.5542+4	1.0054+1	3.5850+6	1.8129+6	7.1359+5	1.0575+6	9.6300+2	1.1341+4	9.9172+0	1.4181+0	1.1330+4
2.0000+4	1.0458–5	1.5538+4	1.0435+1	3.5841+6	1.8122+6	7.1359+5	1.0573+6	9.7401+2	1.5136+4	1.0021+1	1.4178+0	1.5125+4
3.0000+4	1.0461–5	1.5534+4	1.0971+1	3.5832+6	1.8113+6	7.1359+5	1.0573+6	9.8947+2	2.2651+4	1.0227+1	1.4178+0	2.2640+4
4.0000+4	1.0463–5	1.5530+4	1.1352+1	3.5823+6	1.8106+6	7.1359+5	1.0572+6	1.0006+3	3.0248+4	1.0316+1	1.4176+0	3.0236+4
5.0000+4	1.0466–5	1.5525+4	1.1647+1	3.5812+6	1.8100+6	7.1359+5	1.0565+6	1.0091+3	3.7774+4	1.0382+1	1.4168+0	3.7762+4
6.0000+4	1.0467–5	1.5524+4	1.1889+1	3.5810+6	1.8096+6	7.1359+5	1.0568+6	1.0161+3	4.5293+4	1.0448+1	1.4171+0	4.5282+4
8.0000+4	1.0469–5	1.5522+4	1.2269+1	3.5803+6	1.8089+6	7.1359+5	1.0568+6	1.0272+3	6.0464+4	1.0579+1	1.4172+0	6.0452+4
1.0000+5	1.0470–5	1.5520+4	1.2564+1	3.5798+6	1.8084+6	7.1359+5	1.0568+6	1.0358+3	7.5662+4	1.0708+1	1.4172+0	7.5650+4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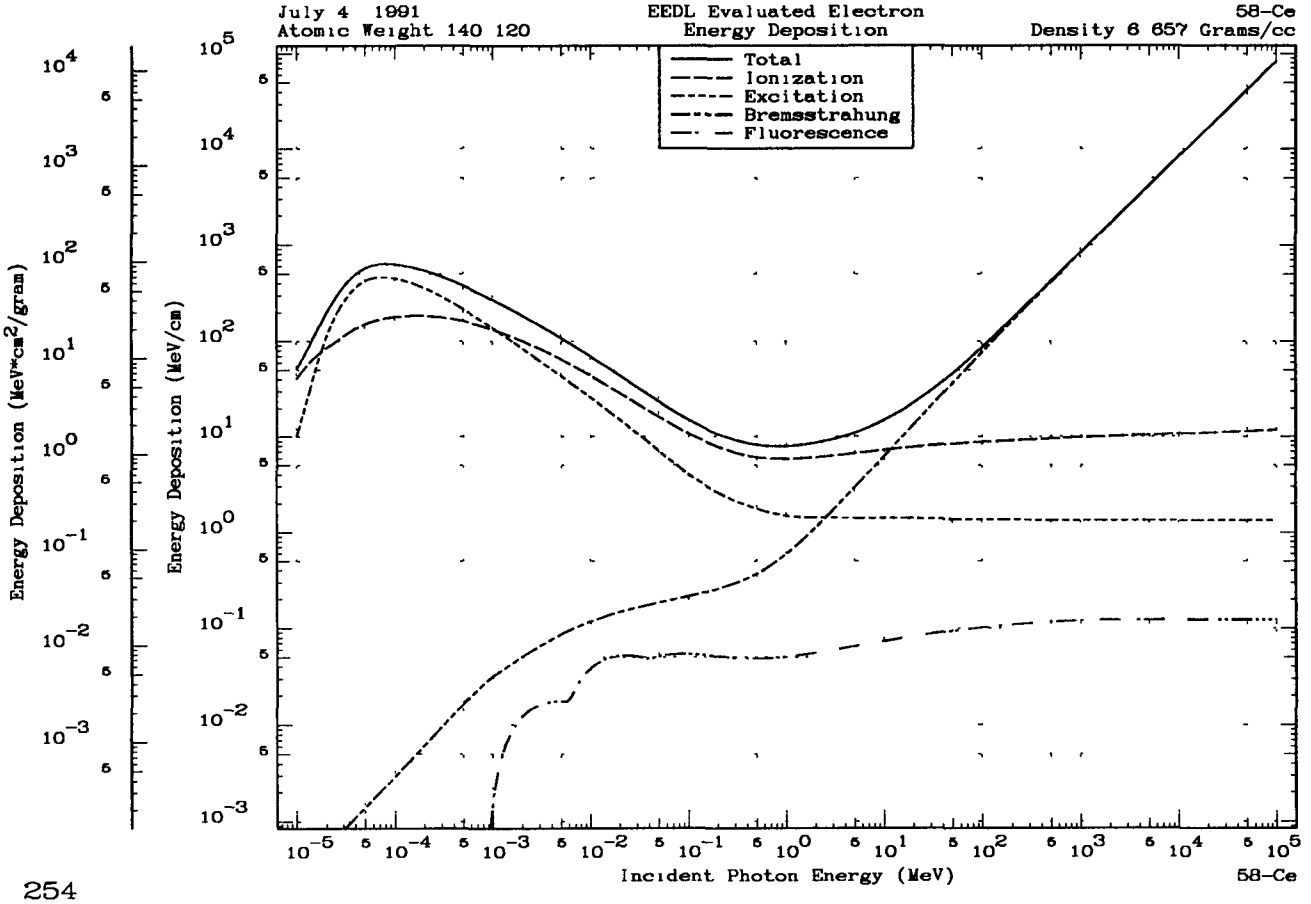
Atomic Weight 140 120
EEDL Evaluated Electron
Cross Sections
58-Ce
Density 6 657 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
58-Ce


July 4 1991
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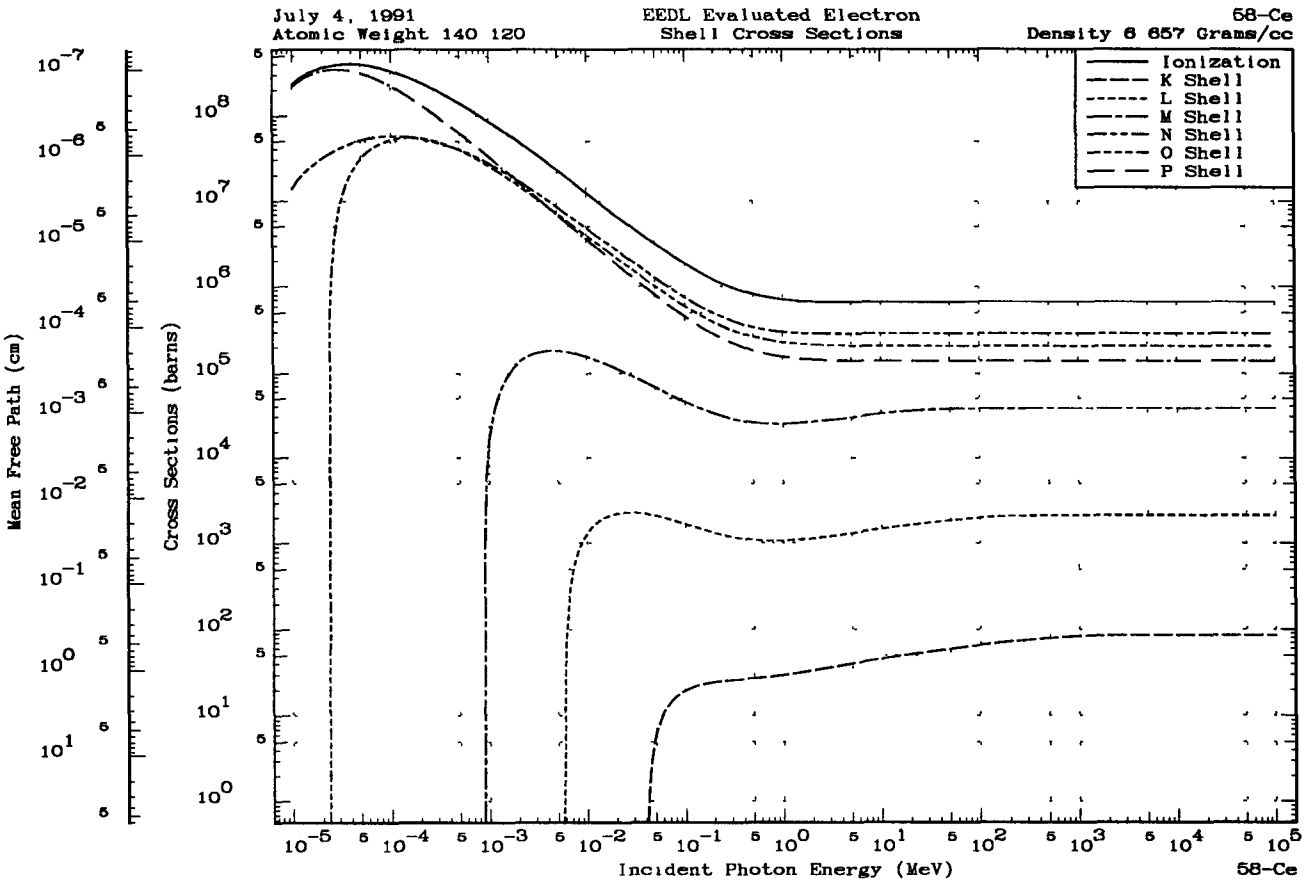
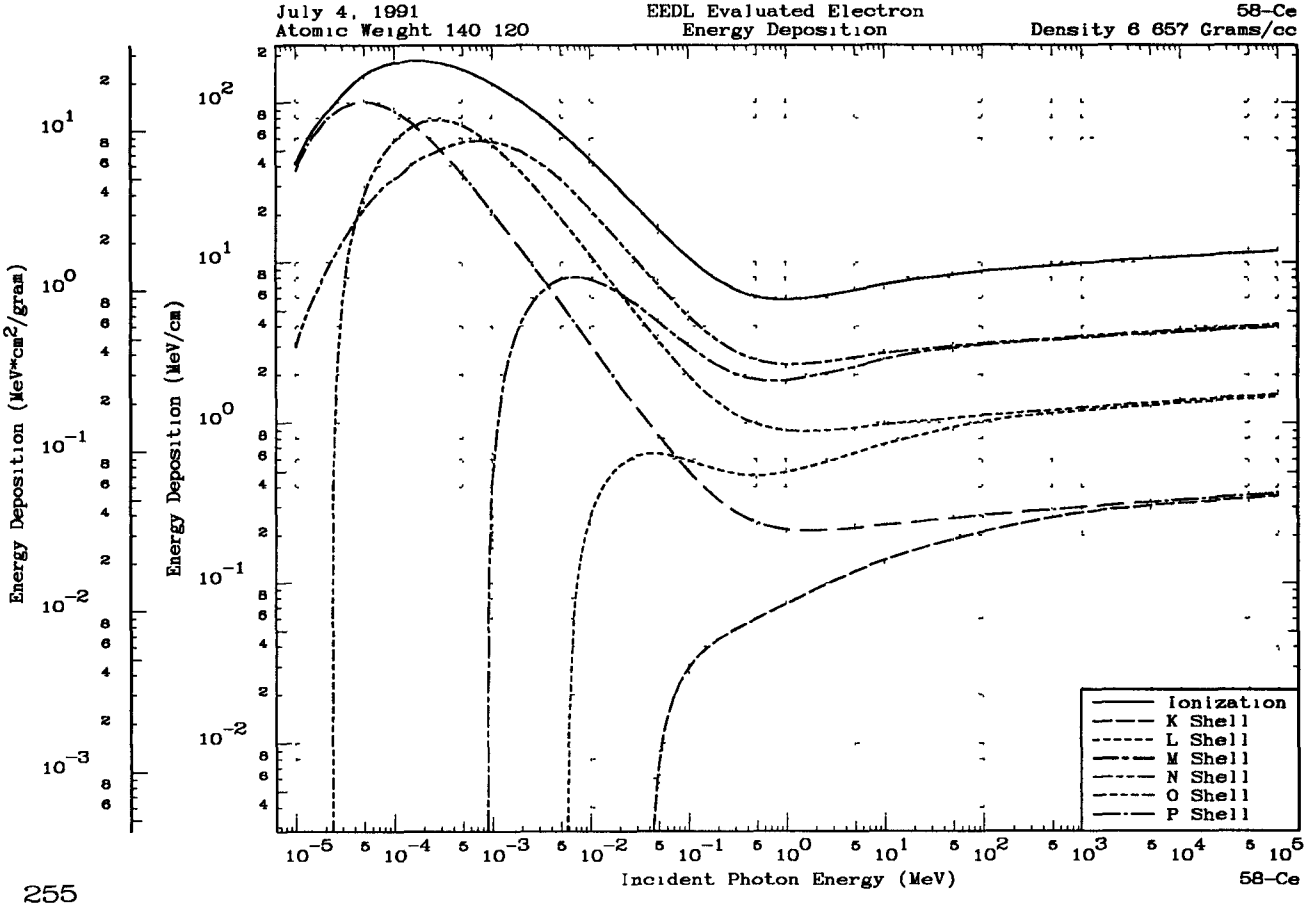
EEDL Evaluated Electron
Energy Deposition
58-Ce
Density 6 657 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
58-Ce


July 4, 1991
Atomic Weight 140 120
EEDL Evaluated Electron
Shell Cross Sections
58-Ce
Density 6 657 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
58-Ce


July 4, 1991
Atomic Weight 140 120
EEDL Evaluated Electron
Energy Deposition
58-Ce
Density 6 657 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
58-Ce

255

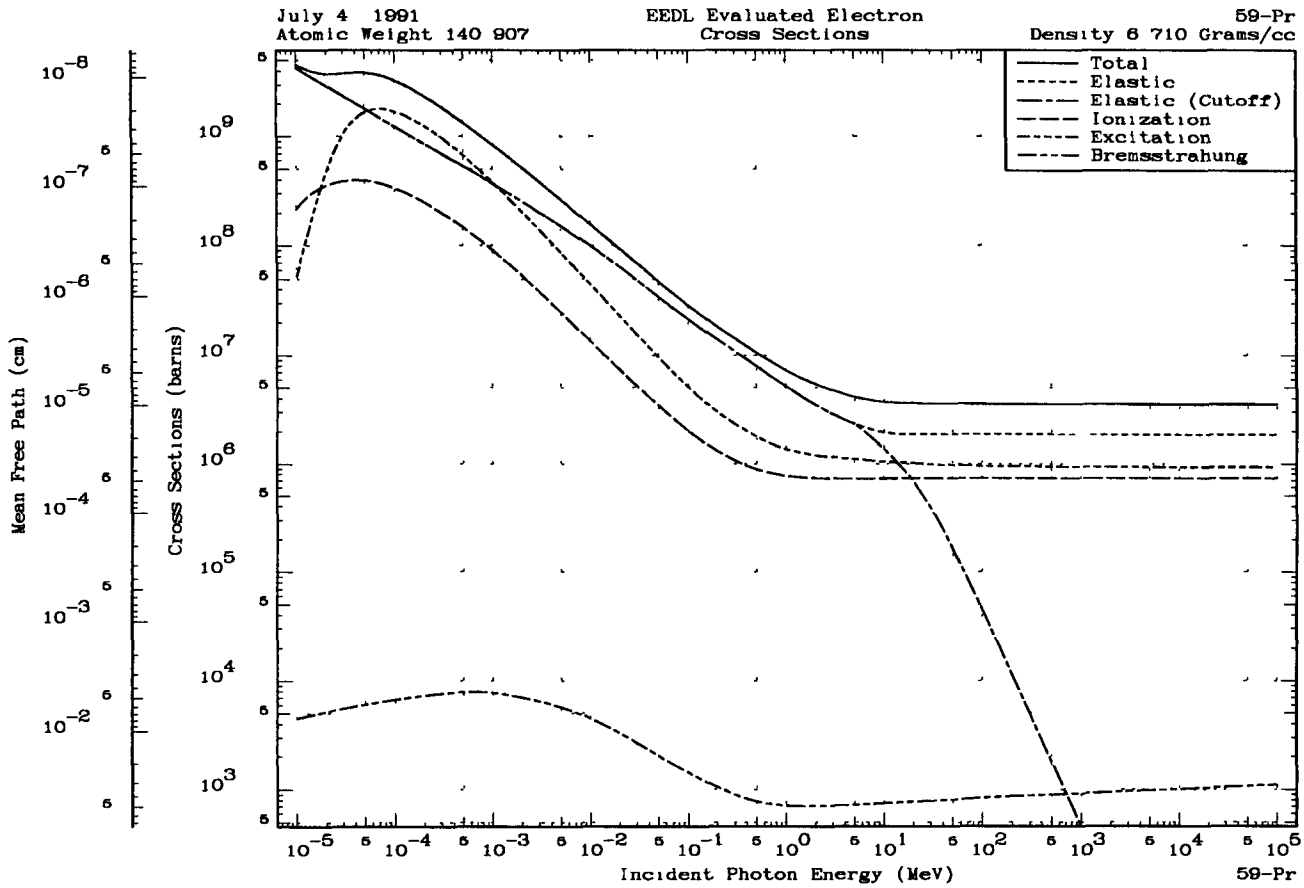
Atomic Weight 140.120 Density 6.657 Grams/cc

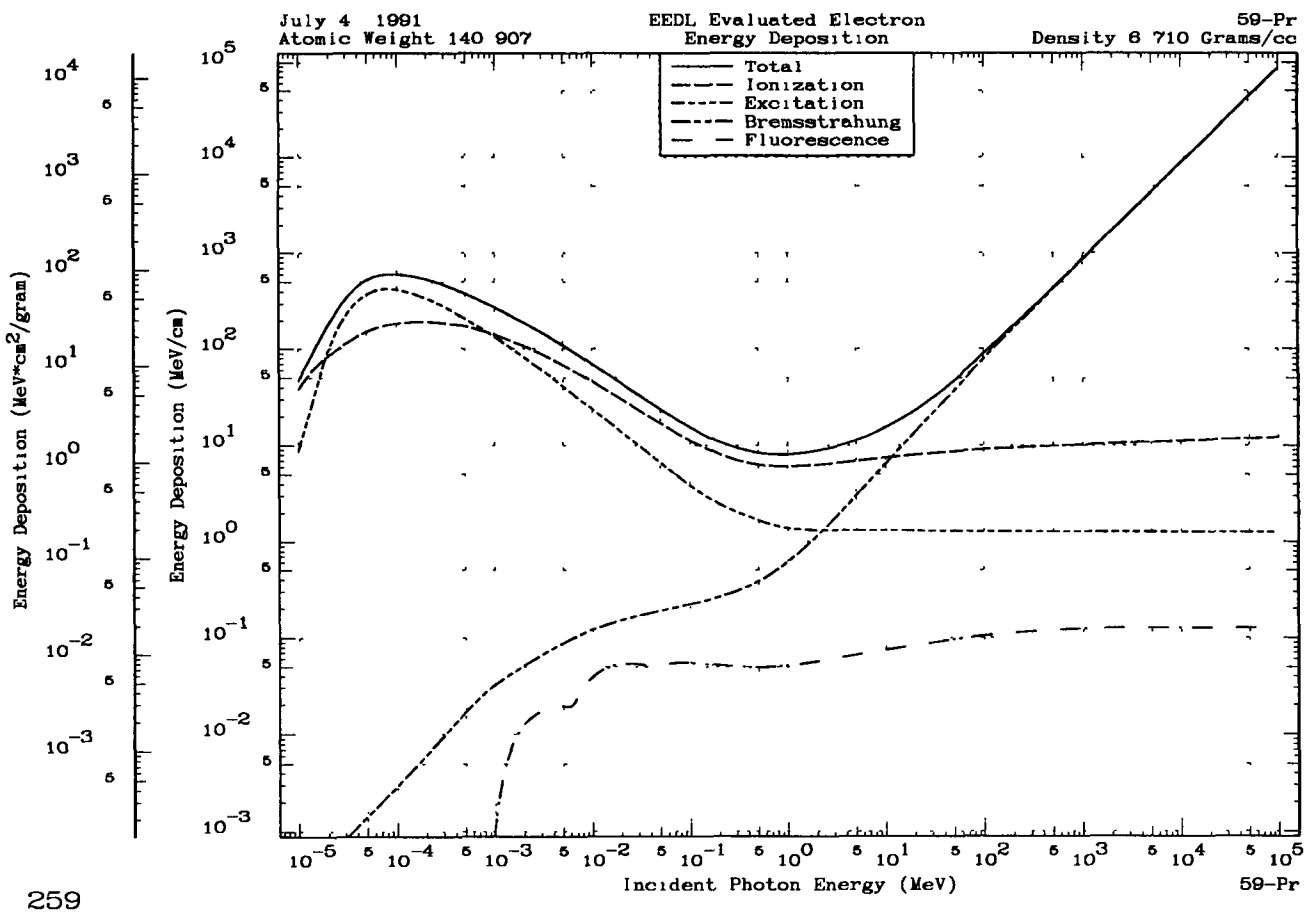
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.9587–9	2.1587+7		5.0228+9	4.7313+9	2.3031+8	6.1171+7	4.4662+3	5.0853+1	4.0595+1	1.0257+1	2.7600–4
	1.1250–5	7.2959–9	2.0589+7		4.7906+9	4.4400+9	2.6075+8	8.9868+7	4.5733+3	6.3530+1	4.8026+1	1.5504+1	3.0927–4
	1.3125–5	7.7149–9	1.9471+7		4.5304+9	4.0856+9	2.9608+8	1.4868+8	4.7173+3	8.4744+1	5.8014+1	2.6730+1	3.6026–4
	1.5000–5	8.0153–9	1.8741+7		4.3607+9	3.8017+9	3.2266+8	2.3633+8	4.8458+3	1.1089+2	6.6685+1	4.4204+1	4.1243–4
	1.7500–5	8.2732–9	1.8157+7		4.2247+9	3.4983+9	3.4474+8	3.8169+8	4.9984+3	1.4930+2	7.5694+1	7.3603+1	4.8369–4
	2.0000–5	8.3903–9	1.7904+7		4.1657+9	3.2551+9	3.6521+8	5.4543+8	5.1345+3	1.9324+2	8.4900+1	1.0834+2	5.5671–4
O3	2.3590–5	8.4200–9	1.7841+7		4.1511+9	2.9777+9	3.7842+8	7.9495+8	5.2894+3	2.5596+2	9.4090+1	1.6187+2	6.5627–4
	2.3991–5	8.4183–9	1.7844+7		4.1519+9	2.9508+9	3.7986+8	8.2126+8	5.3050+3	2.6288+2	9.5276+1	1.6760+2	6.6729–4
	2.4742–5	8.4094–9	1.7863+7		4.1563+9	2.9021+9	3.8250+8	8.7171+8	5.3335+3	2.7613+2	9.7484+1	1.7865+2	6.8804–4
	2.5399–5	8.3956–9	1.7892+7		4.1631+9	2.8613+9	3.8475+8	9.1704+8	5.3579+3	2.8803+2	9.9401+1	1.8863+2	7.0626–4
O2	2.6350–5	8.3663–9	1.7955+7		4.1777+9	2.8051+9	3.8797+8	9.8459+8	5.3923+3	3.0580+2	1.0221+2	2.0359+2	7.3274–4
	2.6549–5	8.3648–9	1.7958+7		4.1784+9	2.7938+9	3.8858+8	9.9610+8	5.3994+3	3.0898+2	1.0282+2	2.0616+2	7.3831–4
	3.0000–5	8.2893–9	1.8122+7		4.2165+9	2.6155+9	3.9824+8	1.2028+9	5.5155+3	3.6598+2	1.1307+2	2.5290+2	8.3565–4
	3.5000–5	8.2051–9	1.8308+7		4.2598+9	2.4070+9	4.0186+8	1.4509+9	5.6655+3	4.3557+2	1.2425+2	3.1132+2	9.7962–4
	3.6250–5	8.1690–9	1.8389+7		4.2786+9	2.3619+9	4.0252+8	1.5142+9	5.7002+3	4.5337+2	1.2684+2	3.2653+2	1.0161–3
	4.0000–5	8.1659–9	1.8396+7		4.2802+9	2.2399+9	4.0523+8	1.6351+9	5.7988+3	4.9306+2	1.3517+2	3.5789+2	1.1268–3
O1	4.1750–5	8.1617–9	1.8405+7		4.2824+9	2.1888+9	4.0381+8	1.6898+9	5.8422+3	5.0943+2	1.3766+2	3.7177+2	1.1790–3
	4.2266–5	8.1597–9	1.8410+7		4.2835+9	2.1744+9	4.0350+8	1.7056+9	5.8533+3	5.1430+2	1.3848+2	3.7582+2	1.1935–3
	4.3232–5	8.1548–9	1.8421+7		4.2860+9	2.1480+9	4.0296+8	1.7351+9	5.8738+3	5.2345+2	1.4005+2	3.8340+2	1.2209–3
	4.4924–5	8.1426–9	1.8448+7		4.2925+9	2.1041+9	4.0219+8	1.7862+9	5.9088+3	5.3956+2	1.4287+2	3.9669+2	1.2690–3
	4.5000–5	8.1419–9	1.8450+7		4.2928+9	2.1021+9	4.0216+8	1.7885+9	5.9104+3	5.4028+2	1.4299+2	3.9728+2	1.2711–3
	4.6193–5	8.1655–9	1.8397+7		4.2805+9	2.0727+9	4.0140+8	1.8063+9	5.9343+3	5.4741+2	1.4476+2	4.0265+2	1.3052–3
	5.0000–5	8.2299–9	1.8253+7		4.2469+9	1.9861+9	3.9942+8	1.8614+9	6.0075+3	5.7013+2	1.5058+2	4.1955+2	1.4147–3
	5.5000–5	8.3070–9	1.8083+7		4.2075+9	1.8867+9	3.9365+8	1.9272+9	6.0946+3	5.9696+2	1.5615+2	4.4082+2	1.5585–3
	6.0000–5	8.4669–9	1.7742+7		4.1281+9	1.8003+9	3.8811+8	1.9397+9	6.1753+3	6.1139+2	1.6123+2	4.5016+2	1.7041–3
	7.0000–5	8.7535–9	1.7161+7		3.9929+9	1.6568+9	3.7330+8	1.9628+9	6.3207+3	6.3139+2	1.6753+2	4.6386+2	2.0001–3
	8.0000–5	9.1346–9	1.6445+7		3.8263+9	1.5418+9	3.6106+8	1.9235+9	6.4495+3	6.3628+2	1.7355+2	4.6272+2	2.3019–3
	1.0000–4	9.9919–9	1.5034+7	0.0000+0	3.4980+9	1.3671+9	3.3488+8	1.7960+9	6.6526+3	6.2847+2	1.7942+2	4.4905+2	2.9096–3
N5	1.1244–4	1.0498–8	1.4309+7	1.9956–8	3.3294+9	1.2837+9	3.1926+8	1.7265+9	6.7529+3	6.1829+2	1.8043+2	4.3786+2	3.2896–3
N4	1.1579–4	1.0638–8	1.4120+7	2.5387–8	3.2855+9	1.2636+9	3.1560+8	1.7063+9	6.7782+3	6.1549+2	1.8103+2	4.3445+2	3.3928–3
	1.1714–4	1.0698–8	1.4041+7	2.7575–8	3.2671+9	1.2558+9	3.1402+8	1.6973+9	6.7882+3	6.1405+2	1.8113+2	4.3292+2	3.4343–3
	1.2007–4	1.0828–8	1.3874+7	3.2360–8	3.2280+9	1.2392+9	3.1065+8	1.6782+9	6.8096+3	6.1098+2	1.8130+2	4.2968+2	3.5250–3
	1.2500–4	1.1042–8	1.3605+7	4.0467–8	3.1655+9	1.2127+9	3.0530+8	1.6475+9	6.8447+3	6.0624+2	1.8171+2	4.2453+2	3.6783–3
	1.2755–4	1.1150–8	1.3472+7	4.4681–8	3.1346+9	1.1996+9	3.0268+8	1.6323+9	6.8624+3	6.0401+2	1.8201+2	4.2200+2	3.7578–3
	1.3357–4	1.1402–8	1.3174+7	5.4684–8	3.0653+9	1.1702+9	2.9686+8	1.5982+9	6.9028+3	5.9926+2	1.8288+2	4.1638+2	3.9462–3
	1.3878–4	1.1615–8	1.2933+7	6.3400–8	3.0091+9	1.1465+9	2.9214+8	1.5705+9	6.9366+3	5.9548+2	1.8361+2	4.1186+2	4.1100–3
	1.5000–4	1.2061–8	1.2455+7	8.2359–8	2.8980+9	1.0995+9	2.8298+8	1.5155+9	7.0058+3	5.8867+2	1.8557+2	4.0310+2	4.4656–3
	1.6250–4	1.2596–8	1.1926+7	1.0384–7	2.7748+9	1.0532+9	2.7185+8	1.4497+9	7.0720+3	5.7524+2	1.8499+2	3.9024+2	4.8667–3
	1.8125–4	1.3364–8	1.1241+7	1.3691–7	2.6154+9	9.9322+8	2.5764+8	1.3645+9	7.1635+3	5.5873+2	1.8486+2	3.7387+2	5.4750–3
	2.0000–4	1.4094–8	1.0658+7	1.7087–7	2.4798+9	9.4206+8	2.4571+8	1.2921+9	7.2470+3	5.4558+2	1.8536+2	3.6021+2	6.0904–3
N3	2.0935–4	1.4472–8	1.0380+7	1.8815–7	2.4151+9	9.1921+8	2.3955+8	1.2563+9	7.2773+3	5.3691+2	1.8433+2	3.5257+2	6.4013–3
	2.1218–4	1.4587–8	1.0298+7	1.9344–7	2.3961+9	9.1260+8	2.3778+8	1.2457+9	7.2862+3	5.3444+2	1.8409+2	3.5034+2	6.4957–3
	2.1767–4	1.4807–8	1.0145+7	2.0375–7	2.3605+9	9.0016+8	2.3447+8	1.2259+9	7.3032+3	5.2985+2	1.8367+2	3.4617+2	6.6790–3
	2.2796–4	1.5213–8	9.8743+6	2.2332–7	2.2975+9	8.7810+8	2.2863+8	1.1908+9	7.3341+3	5.2188+2	1.8304+2	3.3883+2	7.0239–3
N2	2.2858–4	1.5237–8	9.8586+6	2.2450–7	2.2939+9	8.7682+8	2.2830+8	1.1887+9	7.3359+3	5.2142+2	1.8301+2	3.3841+2	7.0447–3
	2.3081–4	1.5328–8	9.8002+6	2.2879–7	2.2803+9	8.7225+8	2.2704+8	1.1810+9	7.3424+3	5.1951+2	1.8278+2	3.3672+2	7.1196–3
	2.3514–4	1.5503–8	9.6897+6	2.3714–7	2.2546+9	8.6360+8	2.2467+8	1.1663+9	7.3549+3	5.1593+2	1.8239+2	3.3354+2	7.2651–3
	2.4324–4	1.5827–8	9.4912+6	2.5296–7	2.2084+9	8.4801+8	2.2042+8	1.1399+9	7.3777+3	5.0960+2	1.8175+2	3.2785+2	7.5386–3
	2.4597–4	1.5935–8	9.4268+6	2.5832–7	2.1934+9	8.4295+8	2.1904+8	1.1314+9	7.3852+3	5.0757+2	1.8156+2	3.2601+2	7.6308–3
	2.5743–4	1.6384–8	9.1686+6	2.8108–7	2.1333+9	8.2257+8	2.1354+8	1.0972+9	7.4160+3	4.9951+2	1.8085+2	3.1865+2	8.0192–3
	2.6250–4	1.6580–8	9.0603+6	2.9126–7	2.1081+9	8.1400+8	2.1124+8	1.0829+9	7.4292+3	4.9619+2	1.8059+2	3.1559+2	8.1914–3
	2.7299–4	1.6980–8	8.8467+6	3.1253–7	2.0584+9	7.9705+8	2.0670+8	1.0546+9	7.4558+3	4.8968+2	1.8010+2	3.0957+2	8.5487–3
	2.7872–4	1.7196–8	8.7355+6	3.2428–7	2.0325+9	7.8820+8	2.0434+8	1.0400+9	7.4700+3	4.8634+2	1.7988+2	3.0645+2	8.7445–3
N1	2.8501–4	1.7432–8	8.6176+6	3.3726–7	2.0051+9	7.7880+8	2.0185+8	1.0244+9	7.4852+3	4.8284+2	1.7967+2	3.0316+2	8.9600–3
	2.8876–4	1.7576–8	8.5465+6	3.4504–7	1.9886+9	7.7335+8	2.0037+8	1.0148+9	7.4942+3	4.8057+2	1.7949+2	3.0107+2	9.0885–3
	2.9438–4	1.7792–8	8.4428+6	3.5678–7	1.9644+9	7.6538+8	1.9821+8	1.0008+9	7.5074+3	4.7730+2	1.7926+2	2.9803+2	9.2816–3
	3.0000–4	1.8007–8	8.3423+6	3.6859–7	1.9410+9	7.5764+8	1.9612+8	9.8727+8	7.5203+3	4.7416+2	1.7906+2	2.9509+2	9.4749–3
	3.1250–4	1.8501–8	8.1192+6	3.9520–7	1.8891+9	7.4126+8	1.9119+8	9.5668+8	7.5464+3	4.6545+2	1.7760+2	2.8784+2	9.9060–3
	3.3438–4	1.9350–8	7.7632+6	4.4290–7	1.8063+9	7.1489+8	1.8336+8	9.0805+8	7.5898+3	4.5183+2	1.7547+2	2.7635+2	1.0664–2
	3.5000–4	1.9943–8	7.5322+6	4.7782–7	1.7526+9	6.9762+8	1.7830+8	8.7663+8	7.6192+3	4.4321+2	1.7425+2	2.6895+2	1.1208–2
	3.6719–4	2.0585–8	7.2973+6	5.1699–7	1.6979+9	6.7994+8	1.7313+8	8.4481+8	7.6502+3	4.3448+2	1.7299+2	2.6148+2	1.1808–2
	4.0000–4	2.1781–8	6.8968+6	5.9379–7	1.6047+9	6.4948+8	1.6437+8	7.9086+8	7.7058+3	4.2006+2	1.7116+2	2.4889+2	1.2962–2
	4.5000–4	2.3587–8	6.3685+6	7.1608–7	1.4818+9	6.0981+8	1.5208+8	7.1989+8	7.7479+3	3.9782+2	1.6648+2	2.3132+2	1.4719–2
	5.0000–4	2.5324–8	5.9319+6	8.4465–7	1.3802+9	5.7639+8	1.4199+8	6.6182+8	7.7858+3	3.8015+2	1.6308+2	2.1705+2	1.6487–2
	6.0000–4	2.8640–8	5.2450+6	1.1187–6	1.2204+9	5.2282+8	1.2541+8	5.7215+8	7.8275+3	3.5004+2	1.5599+2	1.9403+2	1.9965–2
	7.0000–4	3.1892–8	4.7103+6	1.4158–6	1.0960+9	4.8143+8	1.1227+8	5.0225+8	7.8118+3	3.2357+2	1.4851+2	1.7504+2	2.3227–2
	8.0000–4	3.4988–8	4.2934+6	1.7347–6	9.9897+8	4.4823+8	1.0209+8	4.4865+8	7.7982+3	3.0373+2	1.4315+2	1.6056+2	2.6483–2
M5	8.8614–4	3.7555–8	3.9999+6	2.0260–6	9.3068+8	4.2437+8	9.4544+7	4.1176+8	7.7376+3	2.8776+2	1.3785+2	1.4988+2	2.8821–2
	8.9326–4	3.7766–8	3.9776+6	2.0508–6	9.2548+8	4.2255+8	9.3981+7	4.0894+8	7.7329+3	2.8658+2	1.3748+2	1.4907+2	2.9013–2
M4	9.0549–4	3.8128–8	3.9398+6	2.0936–6	9.1670+8	4.1949+8	9.3030+7	4.0417+8	7.7249+3	2.8459+2	1.3685+2	1.4771+2	2.9344–2
	9.0660–4	3.8161–8	3.9364+6	2.0975–6	9.1590+8	4.1922+8	9.2945+7	4.0374+8	7.7241+3	2.8441+2	1.3680+2	1.4759+2	2.9374–2
	9.2912–4	3.8832–8	3.8684+6	2.1772–6	9.0007+8	4.1375+8	9.1258+7	3.9506+8	7.7097+3	2.8091+2	1.3574+2	1.4514+2	2.9982–2
	9.2995–4	3.8857–8	3.8659+6	2.1802–6	8.9950+8	4.1355+8	9.1198+7	3.9474+8	7.7092+3	2.8078+2	1.3570+2	1.4505+2	3.0004–2
	1.0000–3	4.0911–8	3.6718+6	2.4341–6	8.5435+8	3.9779+8	8.6401+7	3.7015+8	7.6665+3	2.7098+2	1.3280+2	1.3814+2	3.1888–2
	1.1250–3	4.4395–8	3.3837+6	2.9098–6	7.8730+8	3.7346+8	7.8902+7	3.3493+8	7.5484+3	2.5471+2	1.2713+2	1.2754+2	3.4509–2
M3	1.1705–3	4.5629–8	3.2921+6	3.0903–6	7.6600+8	3.6562+8	7.6535+7	3.2384+8	7.5091+3	2.4964+2	1.2539+2	1.2422+2	3.5456–2
	1.1911–3	4.6196–8	3.2518+6	3.1731–6	7.5661+8	3.6222+8	7.5513+7	3.1887+8	7.4918+3	2.4744+2	1.2465+2	1.2276+2	3.5884–2
	1.2188–3	4.6951–8	3.1994+6	3.2855–6	7.4443+8	3.5779+8	7.4191+7	3.1244+8	7.4692+3	2.4460+2	1.2370+2	1.2086+2	3.6457–2
	1.2297–3	4.7249–8	3.1793+6	3.3305–6	7.3974+8	3.5608+8	7.3681+7	3.0997+8	7.4604+3	2.4351+2	1.2333+2	1.2014+2	3.6683–2
M2	1.2599–3	4.8065–8	3.1253+6	3.4552–6	7.2718+8	3.5148+8	7.2319+7	3.0337+8	7.4365+3	2.4059+2	1.2235+2	1.1820+2	3.7307–2

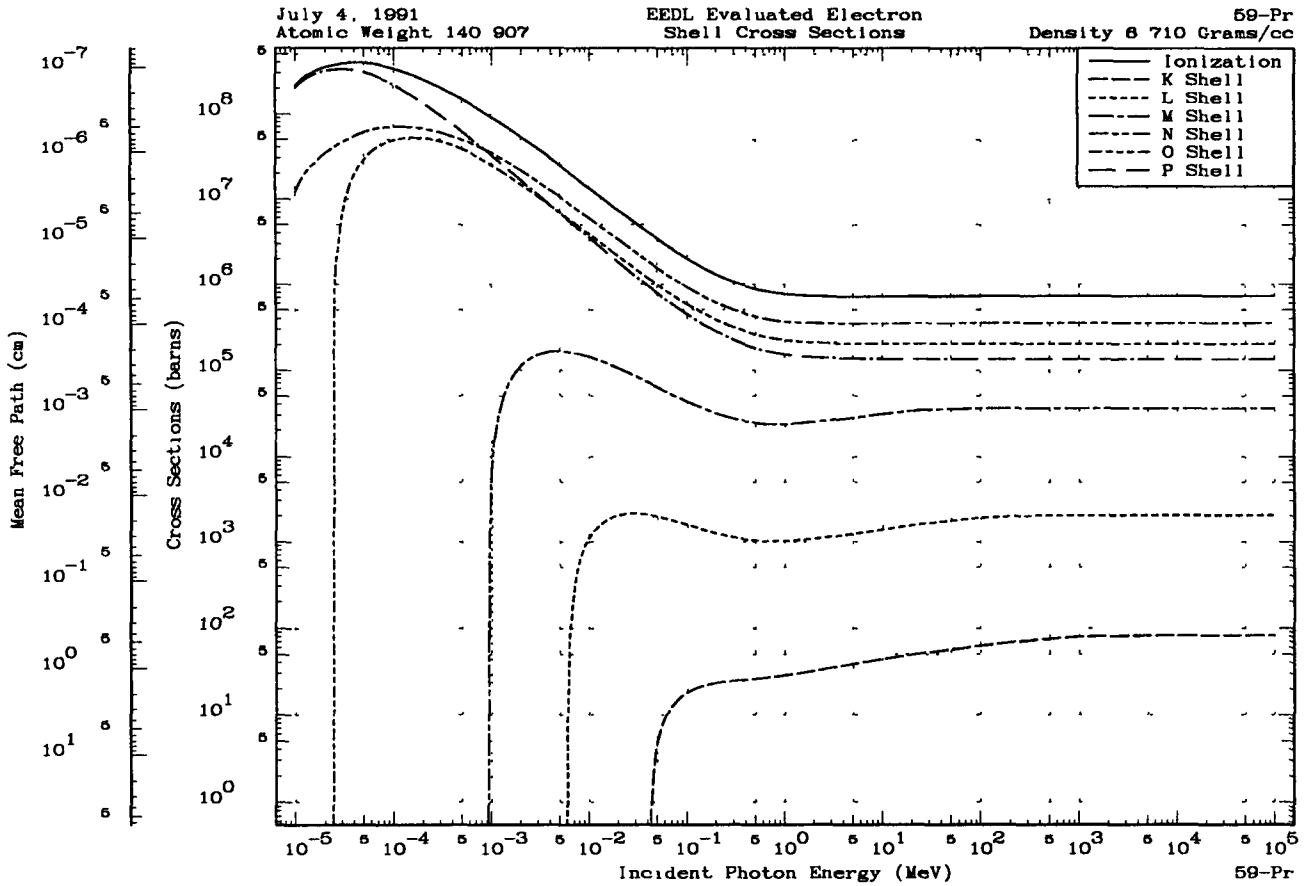
Atomic Weight 140.120 Density 6.657 Grams/cc

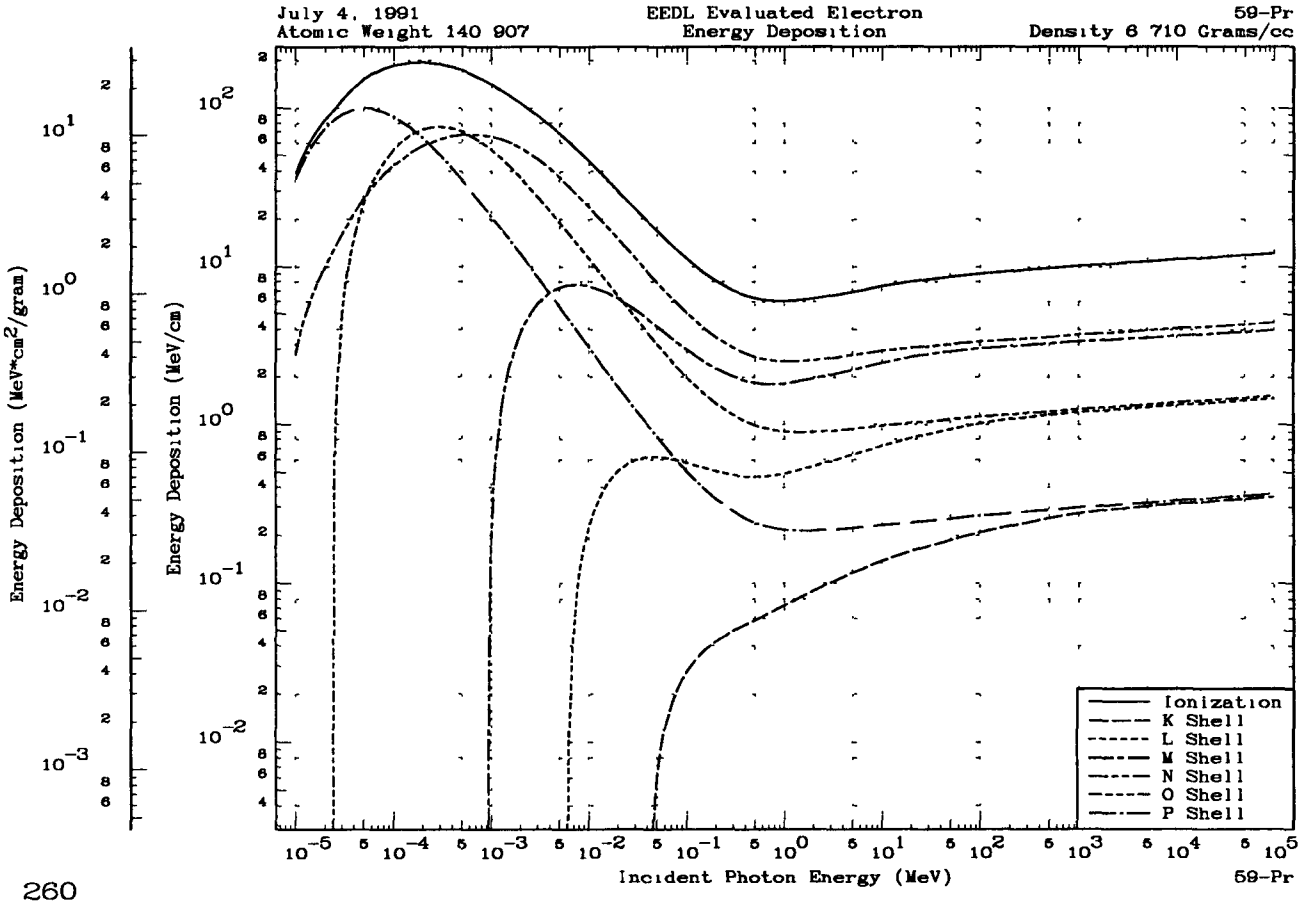
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.2899–3	4.8855–8	3.0747+6	3.5807–6	7.1541+8	3.4707+8	7.0985+7	2.9735+8	7.4135+3	2.3757+2	2.1121+2	1.1631+2	3.7925–2
	1.2973–3	4.9049–8	3.0626+6	3.6118–6	7.1260+8	3.4602+8	7.0666+7	2.9591+8	7.4079+3	2.3685+2	2.1094+2	1.1586+2	3.8077–2
	1.3424–3	5.0223–8	2.9910+6	3.8041–6	6.9593+8	3.3973+8	6.8782+7	2.8741+8	7.3746+3	2.3261+2	1.1936+2	1.1321+2	3.9004–2
	1.3594–3	5.0661–8	2.9652+6	3.8772–6	6.8992+8	3.3746+8	6.8104+7	2.8435+8	7.3624+3	2.3110+2	1.1880+2	1.1226+2	3.9351–2
	1.3818–3	5.1237–8	2.9318+6	3.9748–6	6.8216+8	3.3451+8	6.7230+7	2.8041+8	7.3465+3	2.2914+2	1.1807+2	1.1103+2	3.9810–2
	1.3986–3	5.1667–8	2.9074+6	4.0484–6	6.7648+8	3.3235+8	6.6592+7	2.7754+8	7.3348+3	2.2771+2	1.1754+2	1.1013+2	4.0153–2
M1	1.4099–3	5.1954–8	2.8914+6	4.0979–6	6.7275+8	3.3092+8	6.6172+7	2.7565+8	7.3271+3	2.2677+2	1.1719+2	1.0955+2	4.0383–2
	1.4324–3	5.2537–8	2.8593+6	4.1977–6	6.6528+8	3.2813+8	6.5351+7	2.7180+8	7.3093+3	2.2492+2	1.1651+2	1.0837+2	4.0794–2
	1.4662–3	5.3407–8	2.8127+6	4.3488–6	6.5445+8	3.2405+8	6.4161+7	2.6623+8	7.2832+3	2.2226+2	1.1555+2	1.0667+2	4.1409–2
	1.5000–3	5.4269–8	2.7680+6	4.5017–6	6.4405+8	3.2012+8	6.3022+7	2.6090+8	7.2578+3	2.1973+2	1.1464+2	1.0505+2	4.2023–2
	1.5625–3	5.5882–8	2.6881+6	4.7895–6	6.2546+8	3.1313+8	6.0965+7	2.5135+8	7.2122+3	2.1452+2	1.1258+2	1.0191+2	4.3148–2
	1.6250–3	5.7474–8	2.6137+6	5.0842–6	6.0814+8	3.0657+8	5.9056+7	2.4251+8	7.1686+3	2.0973+2	1.1069+2	9.8995+1	4.4268–2
	1.6719–3	5.8654–8	2.5611+6	5.3095–6	5.9590+8	3.0189+8	5.7710+7	2.3629+8	7.1372+3	2.0638+2	1.0938+2	9.6950+1	4.5105–2
	1.7500–3	6.0597–8	2.4790+6	5.6929–6	5.7679+8	2.9453+8	5.5616+7	2.2664+8	7.0870+3	2.0121+2	1.0739+2	9.3778+1	4.6494–2
	1.8125–3	6.2131–8	2.4178+6	6.0065–6	5.6255+8	2.8900+8	5.4060+7	2.1949+8	7.0487+3	1.9736+2	1.0588+2	9.1432+1	4.7600–2
	1.8359–3	6.2701–8	2.3958+6	6.1257–6	5.5743+8	2.8700+8	5.3502+7	2.1693+8	7.0347+3	1.9598+2	1.0534+2	9.0591+1	4.8014–2
	2.0000–3	6.6628–8	2.2546+6	6.9819–6	5.2458+8	2.7402+8	4.9932+7	2.0062+8	6.9423+3	1.8730+2	1.0201+2	8.5246+1	5.0893–2
	2.2500–3	7.2510–8	2.0717+6	8.3647–6	4.8203+8	2.5661+8	4.5245+7	1.8017+8	6.7773+3	1.7443+2	9.6321+1	7.8049+1	5.4540–2
	2.5000–3	7.8181–8	1.9214+6	9.8425–6	4.4706+8	2.4197+8	4.1433+7	1.6366+8	6.6331+3	1.6403+2	9.1719+1	7.2248+1	5.8133–2
	2.6250–3	8.0947–8	1.8558+6	1.0615–5	4.3179+8	2.3547+8	3.9781+7	1.5653+8	6.5673+3	1.5957+2	8.9758+1	6.9750+1	5.9910–2
	2.7500–3	8.3669–8	1.7954+6	1.1409–5	4.1774+8	2.2944+8	3.8268+7	1.5002+8	6.5052+3	1.5547+2	8.7938+1	6.7471+1	6.1675–2
	3.0000–3	8.8993–8	1.6880+6	1.3055–5	3.9275+8	2.1858+8	3.5595+7	1.3857+8	6.3906+3	1.4832+2	8.4786+1	6.3467+1	6.5168–2
	3.5000–3	9.9377–8	1.5116+6	1.6588–5	3.5171+8	2.0020+8	3.1200+7	1.2031+8	6.1543+3	1.3495+2	7.8299+1	5.6577+1	7.1124–2
	4.0000–3	1.0929–7	1.3745+6	2.0439–5	3.1982+8	1.8553+8	2.7841+7	1.0644+8	5.9565+3	1.2486+2	7.3425+1	5.1362+1	7.6937–2
	5.0000–3	1.2835–7	1.1704+6	2.9008–5	2.7231+8	1.6263+8	2.2955+7	8.6727+7	5.5894+3	1.0889+2	6.5231+1	4.3577+1	8.6576–2
L3	5.7128–3	1.4125–7	1.0635+6	3.5832–5	2.4744+8	1.5012+8	2.0437+7	7.6884+7	5.3637+3	1.0015+2	6.0553+1	3.9503+1	9.2588–2
	6.0000–3	1.4639–7	1.0261+6	3.8743–5	2.3876+8	1.4576+8	1.9583+7	7.3409+7	5.2810+3	9.7185+1	5.8989+1	3.8101+1	9.4891–2
L2	6.1653–3	1.4925–7	1.0065+6	4.0458–5	2.3418+8	1.4340+8	1.9122+7	7.1652+7	5.2311+3	9.5497+1	5.8058+1	3.7343+1	9.6018–2
	6.3946–3	1.5322–7	9.8038+5	4.2888–5	2.2811+8	1.4026+8	1.8520+7	6.9329+7	5.1647+3	9.3299+1	5.6851+1	3.6351+1	9.7572–2
	6.5000–3	1.5503–7	9.6894+5	4.4023–5	2.2545+8	1.3887+8	1.8256+7	6.8315+7	5.1353+3	9.2341+1	5.6325+1	3.5917+1	9.8283–2
L1	6.5133–3	1.5526–7	9.6751+5	4.4167–5	2.2512+8	1.3870+8	1.8224+7	6.8189+7	5.1316+3	9.2222+1	5.6260+1	3.5864+1	9.8372–2
	6.6062–3	1.5688–7	9.5752+5	4.5180–5	2.2279+8	1.3750+8	1.7999+7	6.7286+7	5.1058+3	9.1367+1	5.5795+1	3.5473+1	9.8974–2
	6.7960–3	1.6017–7	9.3786+5	4.7276–5	2.1822+8	1.3514+8	1.7557+7	6.5518+7	5.0545+3	8.9692+1	5.4885+1	3.4707+1	1.0020–1
	6.9547–3	1.6290–7	9.2215+5	4.9058–5	2.1456+8	1.3324+8	1.7205+7	6.4111+7	5.0130+3	8.8361+1	5.4162+1	3.4098+1	1.0122–1
	7.2500–3	1.6793–7	8.9454+5	5.2445–5	2.0814+8	1.2989+8	1.6589+7	6.1651+7	4.9392+3	8.6036+1	5.2900+1	3.3033+1	1.0310–1
	7.3980–3	1.7042–7	8.8144+5	5.4177–5	2.0509+8	1.2829+8	1.6298+7	6.0491+7	4.9037+3	8.4939+1	5.2303+1	3.2531+1	1.0404–1
	7.4773–3	1.7176–7	8.7460+5	5.5114–5	2.0350+8	1.2746+8	1.6146+7	5.9887+7	4.8851+3	8.4368+1	5.1993+1	3.2270+1	1.0454–1
	8.0000–3	1.8043–7	8.3257+5	6.1440–5	1.9372+8	1.2229+8	1.5218+7	5.6200+7	4.7688+3	8.0884+1	5.0100+1	3.0676+1	1.0782–1
	9.0000–3	1.9681–7	7.6328+5	7.4291–5	1.7760+8	1.1353+8	1.3720+7	5.0345+7	4.5547+3	7.4832+1	4.6698+1	2.8021+1	1.1300–1
	1.0000–2	2.1266–7	7.0637+5	8.8110–5	1.6435+8	1.0622+8	1.2506+7	4.5627+7	4.3715+3	6.9952+1	4.3949+1	2.5885+1	1.1807–1
	1.1250–2	2.3210–7	6.4721+5	1.0671–4	1.5059+8	9.8427+7	1.1276+7	4.0882+7	4.1530+3	6.4527+1	4.0805+1	2.3600+1	1.2260–1
	1.3125–2	2.6016–7	5.7741+5	1.3728–4	1.3435+8	8.9088+7	9.8472+6	3.5410+7	3.8835+3	5.8248+1	3.7149+1	2.0969+1	1.2928–1
	1.5000–2	2.8709–7	5.2324+5	1.7086–4	1.2174+8	8.1718+7	8.7579+6	3.1265+7	3.6642+3	5.3479+1	3.4362+1	1.8982+1	1.3580–1
	1.7500–2	3.2264–7	4.6559+5	2.2015–4	1.0833+8	7.3714+7	7.6552+6	2.6957+7	3.4117+3	4.8073+1	3.1175+1	1.6756+1	1.4182–1
	2.0000–2	3.5686–7	4.2094+5	2.7451–4	9.7943+7	6.7418+7	6.8134+6	2.3709+7	3.2072+3	4.3959+1	2.8732+1	1.5080+1	1.4777–1
	2.5000–2	4.2297–7	3.5515+5	3.9732–4	8.2635+7	5.7862+7	5.6229+6	1.9146+7	2.8687+3	3.7631+1	2.4895+1	1.2581+1	1.5569–1
	3.0000–2	4.8573–7	3.0926+5	5.3846–4	7.1958+7	5.1070+7	4.8071+6	1.6078+7	2.6189+3	3.3311+1	2.2245+1	1.0903+1	1.6360–1
	4.0000–2	6.0640–7	2.4772+5	8.6953–4	5.7638+7	4.1781+7	3.7761+6	1.2078+7	2.2545+3	2.7297+1	1.8565+1	8.5575+0	1.7477–1
K	4.0456–2	6.1168–7	2.4558+5	8.8630–4	5.7141+7	4.1451+7	3.7412+6	1.1947+7	2.2411+3	2.7083+1	1.8433+1	8.4751+0	1.7524–1
	4.1053–2	6.1861–7	2.4283+5	9.0844–4	5.6500+7	4.1029+7	3.6967+6	1.1773+7	2.2241+3	2.6809+1	1.8265+1	8.3684+0	1.7577–1
	4.2171–2	6.3155–7	2.3785+5	9.5054–4	5.5343+7	4.0264+7	3.6164+6	1.1460+7	2.1933+3	2.6315+1	1.7962+1	8.1766+0	1.7677–1
	4.4128–2	6.5400–7	2.2969+5	1.0261–3	5.3443+7	3.9005+7	3.4848+6	1.0951+7	2.1422+3	2.5507+1	1.7465+1	7.8642+0	1.7852–1
	4.7064–2	6.8720–7	2.1859+5	1.1437–3	5.0861+7	3.7286+7	3.3061+6	1.0267+7	2.0716+3	2.4414+1	1.6789+1	7.4445+0	1.8117–1
	5.0000–2	7.1989–7	2.0867+5	1.2664–3	4.8552+7	3.5739+7	3.1467+6	9.6634+6	2.0075+3	2.3443+1	1.6185+1	7.0740+0	1.8381–1
	5.5000–2	7.7392–7	1.9410+5	1.4867–3	4.5162+7	3.3455+7	2.9168+6	8.7887+6	1.9064+3	2.1979+1	1.5273+1	6.5184+0	1.8768–1
	6.0000–2	8.2668–7	1.8171+5	1.7208–3	4.2280+7	3.1497+7	2.7217+6	8.0595+6	1.8186+3	2.0745+1	1.4498+1	6.0552+0	1.9155–1
	7.0000–2	9.2538–7	1.6233+5	2.2272–3	3.7770+7	2.8378+7	2.4189+6	6.9717+6	1.6703+3	1.8782+1	1.3240+1	5.3445+0	1.9795–1
	8.0000–2	1.0201–6	1.4725+5	2.7822–3	3.4262+7	2.5927+7	2.1840+6	6.1489+6	1.5516+3	1.7274+1	1.2262+1	4.8077+0	2.0435–1
	9.0000–2	1.1107–6	1.3524+5	3.3829–3	3.1467+7	2.3994+7	2.0054+6	5.4668+6	1.4573+3	1.6034+1	1.1485+1	4.3395+0	2.0974–1
	1.0000–1	1.1924–6	1.2598+5	4.0247–3	2.9313+7	2.2387+7	1.8581+6	5.0664+6	1.3778+3	1.5140+1	1.0843+1	4.0819+0	2.1514–1
	1.2500–1	1.3828–6	1.0863+5	5.7786–3	2.5276+7	1.9447+7	1.6022+6	4.2256+6	1.2393+3	1.3403+1	9.6815+0	3.4956+0	2.2593–1
	1.5000–1	1.5605–6	9.6261+4	7.7343–3	2.2397+7	1.7333+7	1.4197+6	3.6432+6	1.1365+3	1.2183+1	8.8532+0	3.0925+0	2.3693–1
	2.0000–1	1.8730–6	8.0203+4	1.2115–2	1.8661+7	1.4516+7	1.2002+6	2.9444+6	1.0056+3	1.0679+1	7.8316+0	2.5913+0	2.5582–1
	3.0000–1	2.3992–6	6.2613+4	2.2167–2	1.4568+7	1.1272+7	9.8325+5	2.3120+6	8.6495+2	9.2511+0	6.8198+0	2.1396+0	2.9163–1
	4.0000–1	2.8552–6	5.2613+4	3.3377–2	1.2242+7	9.3620+6	8.7788+5	2.0010+6	7.9256+2	8.5983+0	6.3512+0	1.9186+0	3.2853–1
	5.0000–1	3.2654–6	4.6002+4	4.5254–2	1.0704+7	8.0970+6	8.1706+5	1.7888+6	7.5001+2	8.2433+0	6.1125+0	1.7629+0	3.6786–1
	6.0000–1	3.6329–6	4.1349+4	5.7537–2	9.6209+6	7.1913+6	7.7807+5	1.6508+6	7.2441+2	8.0407+0	5.9679+0	1.6639+0	4.0878–1
	8.0000–1	4.2740–6	3.5147+4	8.2614–2	8.1778+6	5.9645+6	7.3283+5	1.4798+6	6.9746+2	7.9104+0	5.8688+0	1.5454+0	4.9621–1
	1.0000+0	4.8140–6	3.1204+4	1.0790–1	7.2605+6	5.1747+6	7.0810+5	1.3770+6	6.8454+2	7.9085+0	5.8421+0	1.4773+0	5.8912–1
	1.5000+0	5.8264–6	2.5782+4	1.6987–1	5.9989+6	4.0428+6	6.8177+5	1.2736+6	6.7498+2	8.2300+0	5.9675+0	1.4219+0	8.4058–1
	2.0000+0	6.5639–6	2.2885+4	2.2921–1	5.3249+6	3.4296+6	6.7358+5	1.2210+6	6.7663+2	8.6261+0	6.0963+0	1.4187+0	1.1111+0
	3.0000+0	7.5449–6	1.9910+4	3.3997–1	4.6325+6	2.7915+6	6.6451+5	1.1759+6	6.8581+2	9.4423+0	6.3416+0	1.4143+0	1.6865+0
	4.0000+0	8.2167–6	1.8282+4	4.4165–1	4.2538+6	2.4547+6	6.6404+5	1.1343+6	6.9435+2	1.0239+1	6.5389+0	1.4111+0	2.2890+0
	5.0000+0	8.6551–6	1.7356+4	5.3569–1	4.0383+6	2.2554+6	6.6395+5	1.1183+6	7.0171+2	1.1039+1	6.7190+0	1.4094+0	2.9105+0
	6.0000+0	8.9752–6	1.6737+4	6.2319–1	3.8943+6	2.1269+6	6.6388+5	1.1028+6	7.0623+2	1.1827+1	6.8612+0	1.4080+0	3.5580+0
	8.0000+0	9.4141–6	1.5957+4	7.8216–1	3.7127+6	1.9735+6	6.6507+5	1.0735+6	7.1342+2	1.3365+1	7.0950+0	1.4058+0	4.8646+0
	1.0000+1	9.6520–6	1.5563+4	9.2370–1	3.6212+6	1.8959+6	6.6631+5	1.0582+6	7.2327+2	1.4924+1	7.2865+0	1.4040+0	6.2334+0
	1.5000+1	9.8195–6	1.5298+4	1.2221+0	3.5594+6	1.8482+6	6.6849+5	1.0420+6	7.3888+2	1.8737+1	7.5794+0	1.3975+0	9.7606+0
	2.0000+1	9.8556–6	1.5242+4	1.4648+0	3.5464+6	1.8484+6	6.6975+5	1.0275+6	7.4827+2	2.2572+1	7.8017+0	1.3928+0	1.3377+1
	3.0000+1	9.9390–6	1.5114+4	1.8455+0	3.5166+6	1.8473+6	6.7104+5	9.9749+5	7.6129+2	3.0349+1	8.0620+0	1.3807+0	2.0906+1

Atomic Weight 140.120												Density 6.657 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+1	9.9603–6	1.5082+4	2.1386+0	3.5091+6	1.8466+6	6.7169+5	9.9004+5	7.7218+2	3.8204+1	8.2491+0	1.3740+0	2.8581+1
5.0000+1	9.9784–6	1.5054+4	2.3763+0	3.5027+6	1.8461+6	6.7213+5	9.8378+5	7.8193+2	4.6155+1	8.3966+0	1.3690+0	3.6389+1
6.0000+1	9.9913–6	1.5035+4	2.5761+0	3.4982+6	1.8456+6	6.7244+5	9.7939+5	7.8968+2	5.4184+1	8.5115+0	1.3665+0	4.4306+1
8.0000+1	1.0015–5	1.5000+4	2.8990+0	3.4901+6	1.8449+6	6.7273+5	9.7166+5	8.0162+2	7.0409+1	8.6759+0	1.3628+0	6.0370+1
1.0000+2	1.0036–5	1.4969+4	3.1543+0	3.4828+6	1.8443+6	6.7292+5	9.6475+5	8.1102+2	8.6816+1	8.8106+0	1.3603+0	7.6645+1
1.5000+2	1.0048–5	1.4950+4	3.6257+0	3.4785+6	1.8433+6	6.7306+5	9.6132+5	8.2846+2	1.2797+2	8.9645+0	1.3559+0	1.1765+2
2.0000+2	1.0057–5	1.4937+4	3.9640+0	3.4754+6	1.8426+6	6.7315+5	9.5881+5	8.4021+2	1.6961+2	9.1071+0	1.3529+0	1.5915+2
3.0000+2	1.0068–5	1.4920+4	4.4441+0	3.4716+6	1.8416+6	6.7325+5	9.5589+5	8.5332+2	2.5246+2	9.3409+0	1.3498+0	2.4177+2
4.0000+2	1.0076–5	1.4909+4	4.7864+0	3.4689+6	1.8409+6	6.7328+5	9.5385+5	8.6189+2	3.3571+2	9.4451+0	1.3480+0	3.2492+2
5.0000+2	1.0083–5	1.4897+4	5.0523+0	3.4662+6	1.8403+6	6.7329+5	9.5177+5	8.6844+2	4.1957+2	9.5407+0	1.3460+0	4.0868+2
6.0000+2	1.0088–5	1.4891+4	5.2699+0	3.4648+6	1.8399+6	6.7330+5	9.5073+5	8.7441+2	5.0211+2	9.6224+0	1.3456+0	4.9114+2
8.0000+2	1.0096–5	1.4878+4	5.6139+0	3.4618+6	1.8391+6	6.7331+5	9.4850+5	8.8391+2	6.6864+2	9.7788+0	1.3445+0	6.5752+2
1.0000+3	1.0104–5	1.4867+4	5.8809+0	3.4592+6	1.8386+6	6.7332+5	9.4640+5	8.9162+2	8.3538+2	9.8965+0	1.3435+0	8.2414+2
1.5000+3	1.0110–5	1.4858+4	6.3660+0	3.4571+6	1.8376+6	6.7332+5	9.4527+5	9.0600+2	1.2548+3	1.0017+1	1.3420+0	1.2434+3
2.0000+3	1.0115–5	1.4851+4	6.7100+0	3.4555+6	1.8369+6	6.7333+5	9.4443+5	9.1664+2	1.6719+3	1.0135+1	1.3408+0	1.6605+3
3.0000+3	1.0120–5	1.4844+4	7.1949+0	3.4539+6	1.8359+6	6.7333+5	9.4376+5	9.3214+2	2.5093+3	1.0364+1	1.3399+0	2.4976+3
4.0000+3	1.0123–5	1.4839+4	7.5386+0	3.4526+6	1.8351+6	6.7333+5	9.4319+5	9.4357+2	3.3490+3	1.0444+1	1.3392+0	3.3372+3
5.0000+3	1.0128–5	1.4833+4	7.8048+0	3.4511+6	1.8346+6	6.7333+5	9.4229+5	9.5254+2	4.1974+3	1.0524+1	1.3379+0	4.1856+3
6.0000+3	1.0129–5	1.4831+4	8.0221+0	3.4508+6	1.8341+6	6.7333+5	9.4235+5	9.5909+2	5.0293+3	1.0601+1	1.3381+0	5.0174+3
8.0000+3	1.0131–5	1.4827+4	8.3653+0	3.4499+6	1.8334+6	6.7333+5	9.4218+5	9.6951+2	6.7076+3	1.0748+1	1.3380+0	6.6955+3
1.0000+4	1.0133–5	1.4824+4	8.6311+0	3.4492+6	1.8329+6	6.7333+5	9.4200+5	9.7768+2	8.4013+3	1.0882+1	1.3378+0	8.3891+3
1.5000+4	1.0137–5	1.4819+4	9.1149+0	3.4481+6	1.8319+6	6.7333+5	9.4192+5	9.9347+2	1.2547+4	1.0994+1	1.3377+0	1.2535+4
2.0000+4	1.0139–5	1.4816+4	9.4586+0	3.4472+6	1.8311+6	6.7333+5	9.4176+5	1.0048+3	1.6746+4	1.1107+1	1.3375+0	1.6734+4
3.0000+4	1.0142–5	1.4811+4	9.9435+0	3.4462+6	1.8301+6	6.7333+5	9.4173+5	1.0208+3	2.5061+4	1.1331+1	1.3374+0	2.5048+4
4.0000+4	1.0145–5	1.4808+4	1.0288+1	3.4454+6	1.8294+6	6.7333+5	9.4161+5	1.0322+3	3.3465+4	1.1429+1	1.3373+0	3.3452+4
5.0000+4	1.0148–5	1.4803+4	1.0554+1	3.4442+6	1.8289+6	6.7333+5	9.4096+5	1.0411+3	4.1791+4	1.1504+1	1.3364+0	4.1779+4
6.0000+4	1.0149–5	1.4802+4	1.0773+1	3.4440+6	1.8284+6	6.7333+5	9.4118+5	1.0482+3	5.0111+4	1.1575+1	1.3367+0	5.0098+4
8.0000+4	1.0151–5	1.4799+4	1.1117+1	3.4433+6	1.8277+6	6.7333+5	9.4122+5	1.0597+3	6.6895+4	1.1718+1	1.3367+0	6.6882+4
1.0000+5	1.0152–5	1.4796+4	1.1384+1	3.4427+6	1.8271+6	6.7333+5	9.4119+5	1.0686+3	8.3709+4	1.1858+1	1.3367+0	8.3696+4


July 4 1991
Atomic Weight 140 907
EEDL Evaluated Electron
Cross Sections
59-Pr
Density 6 710 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
59-Pr


July 4 1991
Atomic Weight 140 907
EEDL Evaluated Electron
Energy Deposition
59-Pr
Density 6 710 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
59-Pr


July 4, 1991
Atomic Weight 140 907
EEDL Evaluated Electron
Shell Cross Sections
59-Pr
Density 6 710 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
59-Pr


July 4, 1991
Atomic Weight 140 907
EEDL Evaluated Electron
Energy Deposition
59-Pr
Density 6 710 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
59-Pr

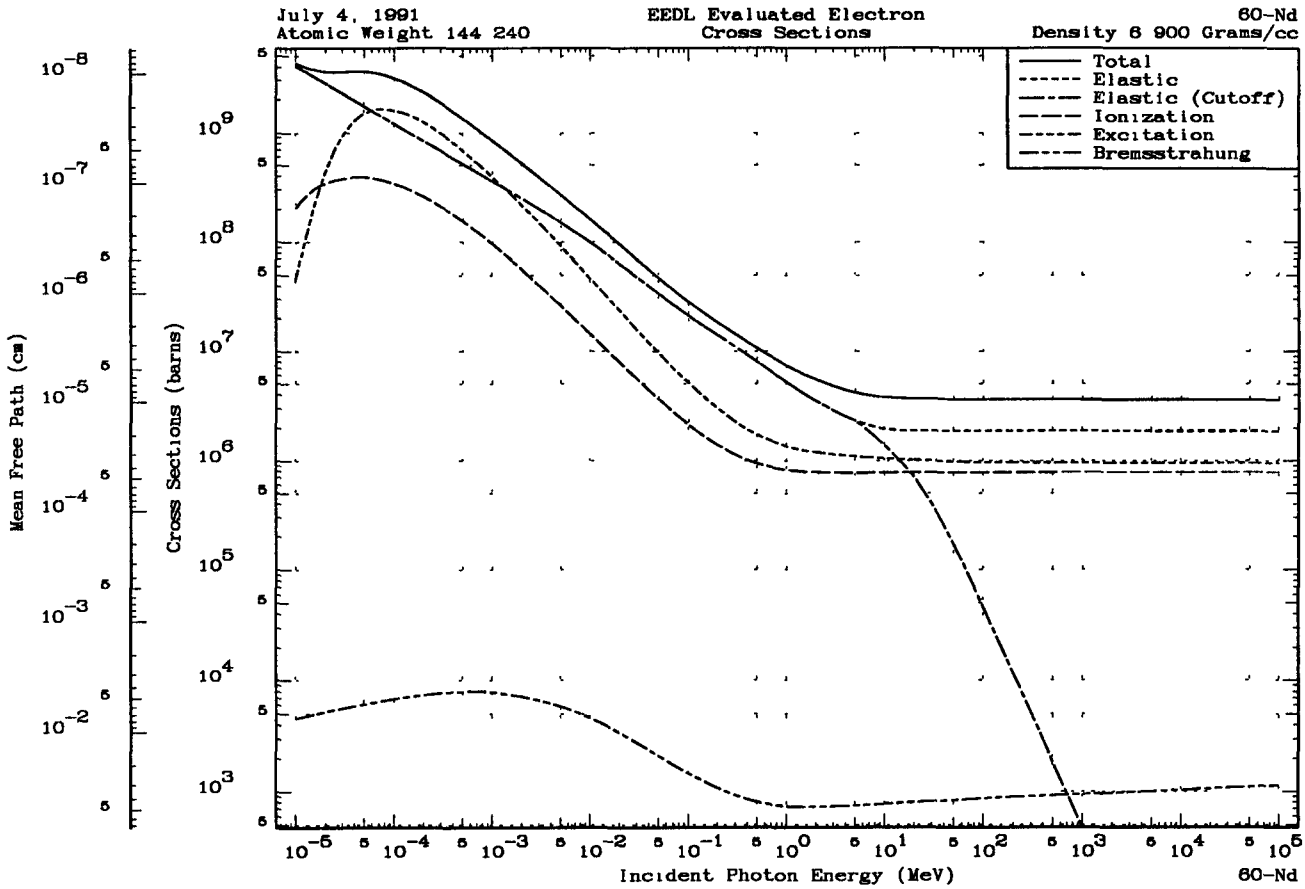
Atomic Weight 140.907 Density 6.710 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.6501–9	1.9481+7		4.5582+9	4.2895+9	2.1648+8	5.2137+7	4.5235+3	4.7652+1	3.8782+1	8.8694+0	2.8020–4
	1.1250–5	8.0114–9	1.8602+7		4.3526+9	4.0280+9	2.4701+8	7.7595+7	4.6319+3	5.9889+1	4.6305+1	1.3583+1	3.1397–4
	1.2188–5	8.2538–9	1.8056+7		4.2248+9	3.8594+9	2.6498+8	1.0039+8	4.7071+3	6.9238+1	5.1293+1	1.7944+1	3.3969–4
	1.3125–5	8.4645–9	1.7607+7		4.1196+9	3.7097+9	2.8256+8	1.2742+8	4.7778+3	7.9651+1	5.6403+1	2.3248+1	3.6573–4
	1.5000–5	8.7940–9	1.6947+7		3.9653+9	3.4543+9	3.0952+8	2.0144+8	4.9078+3	1.0348+2	6.5234+1	3.8244+1	4.1869–4
	1.7500–5	9.0737–9	1.6425+7		3.8431+9	3.1813+9	3.3621+8	3.2554+8	5.0623+3	1.3897+2	7.5338+1	6.3632+1	4.9103–4
	2.0000–5	9.2171–9	1.6169+7		3.7833+9	2.9623+9	3.5431+8	4.6665+8	5.2001+3	1.7795+2	8.4110+1	9.3835+1	5.6516–4
O3	2.4260–5	9.2579–9	1.6098+7		3.7666+9	2.6720+9	3.7155+8	7.2300+8	5.3830+3	2.4477+2	9.5588+1	1.4918+2	6.8494–4
	2.4619–5	9.2565–9	1.6100+7		3.7671+9	2.6512+9	3.7272+8	7.4324+8	5.3967+3	2.5021+2	9.6607+1	1.5360+2	6.9500–4
	2.5291–5	9.2494–9	1.6113+7		3.7701+9	2.6133+9	3.7487+8	7.8190+8	5.4221+3	2.6058+2	9.8506+1	1.6208+2	7.1391–4
	2.5880–5	9.2383–9	1.6132+7		3.7746+9	2.5814+9	3.7671+8	8.1649+8	5.4438+3	2.6985+2	1.0016+2	1.6969+2	7.3052–4
	2.6910–5	9.2085–9	1.6184+7		3.7868+9	2.5281+9	3.7997+8	8.7869+8	5.4809+3	2.8657+2	1.0313+2	1.8345+2	7.5972–4
O2	2.7260–5	9.1958–9	1.6206+7		3.7920+9	2.5107+9	3.8098+8	9.0031+8	5.4932+3	2.9233+2	1.0408+2	1.8825+2	7.6968–4
	2.7603–5	9.1911–9	1.6215+7		3.7939+9	2.4940+9	3.8194+8	9.1796+8	5.5051+3	2.9725+2	1.0505+2	1.9220+2	7.7944–4
	2.8202–5	9.1804–9	1.6234+7		3.7984+9	2.4656+9	3.8365+8	9.4915+8	5.5258+3	3.0599+2	1.0680+2	1.9919+2	7.9657–4
	3.0000–5	9.1292–9	1.6325+7		3.8197+9	2.3855+9	3.8923+8	1.0449+9	5.5855+3	3.3328+2	1.1246+2	2.2082+2	8.4827–4
	3.2500–5	9.0555–9	1.6458+7		3.8508+9	2.2858+9	3.9187+8	1.1731+9	5.6638+3	3.6838+2	1.1833+2	2.5005+2	9.2092–4
	3.6250–5	8.9823–9	1.6592+7		3.8821+9	2.1565+9	3.9580+8	1.3299+9	5.7723+3	4.1426+2	1.2714+2	2.8712+2	1.0315–3
	4.0000–5	8.9468–9	1.6658+7		3.8976+9	2.0461+9	3.9949+8	1.4519+9	5.8720+3	4.5330+2	1.3584+2	3.1746+2	1.1437–3
O1	4.3300–5	8.9301–9	1.6689+7		3.9049+9	1.9614+9	3.9796+8	1.5454+9	5.9526+3	4.8174+2	1.4106+2	3.4069+2	1.2433–3
	4.4138–5	8.9317–9	1.6686+7		3.9041+9	1.9415+9	3.9778+8	1.5648+9	5.9698+3	4.8824+2	1.4255+2	3.4569+2	1.2672–3
	4.5000–5	8.9323–9	1.6685+7		3.9039+9	1.9216+9	3.9762+8	1.5847+9	5.9872+3	4.9492+2	1.4409+2	3.5083+2	1.2918–3
	4.5603–5	8.9323–9	1.6685+7		3.9039+9	1.9080+9	3.9743+8	1.5985+9	5.9992+3	4.9952+2	1.4511+2	3.5441+2	1.3091–3
	4.7802–5	8.9281–9	1.6692+7		3.9057+9	1.8607+9	3.9681+8	1.6482+9	6.0419+3	5.1623+2	1.4878+2	3.6745+2	1.3723–3
	4.7939–5	8.9276–9	1.6693+7		3.9059+9	1.8578+9	3.9678+8	1.6513+9	6.0445+3	5.1727+2	1.4901+2	3.6826+2	1.3763–3
	5.0000–5	8.9579–9	1.6637+7		3.8927+9	1.8166+9	3.9640+8	1.6797+9	6.0830+3	5.2906+2	1.5256+2	3.7651+2	1.4359–3
	5.5000–5	9.0577–9	1.6453+7		3.8498+9	1.7266+9	3.9147+8	1.7318+9	6.1710+3	5.5158+2	1.5849+2	3.9309+2	1.5819–3
	6.0000–5	9.1381–9	1.6309+7		3.8160+9	1.6483+9	3.8696+8	1.7807+9	6.2524+3	5.7343+2	1.6417+2	4.0926+2	1.7297–3
	7.0000–5	9.4164–9	1.5827+7		3.7032+9	1.5182+9	3.7386+8	1.8111+9	6.3993+3	5.9428+2	1.7155+2	4.2272+2	2.0300–3
	8.0000–5	9.7417–9	1.5298+7		3.5795+9	1.4139+9	3.6311+8	1.8025+9	6.5293+3	6.0581+2	1.7863+2	4.2718+2	2.3362–3
	9.0000–5	1.0157–8	1.4673+7		3.4331+9	1.3278+9	3.4986+8	1.7554+9	6.6367+3	6.0519+2	1.8209+2	4.2309+2	2.6423–3
	1.0000–4	1.0539–8	1.4140+7	0.0000+0	3.3086+9	1.2553+9	3.3899+8	1.7144+9	6.7342+3	6.0628+2	1.8618+2	4.2010+2	2.9527–3
N5	1.1859–4	1.1267–8	1.3227+7	3.0919–8	3.0949+9	1.1465+9	3.1790+8	1.6305+9	6.8814+3	5.9624+2	1.8908+2	4.0716+2	3.5307–3
N4	1.2228–4	1.1413–8	1.3058+7	3.7117–8	3.0554+9	1.1280+9	3.1444+8	1.6130+9	6.9082+3	5.9442+2	1.9004+2	4.0438+2	3.6467–3
	1.2252–4	1.1423–8	1.3047+7	3.7514–8	3.0526+9	1.1268+9	3.1419+8	1.6116+9	6.9099+3	5.9422+2	1.9006+2	4.0416+2	3.6541–3
	1.2575–4	1.1562–8	1.2890+7	4.2960–8	3.0161+9	1.1113+9	3.1078+8	1.5939+9	6.9327+3	5.9155+2	1.9032+2	4.0123+2	3.7560–3
	1.3181–4	1.1816–8	1.2612+7	5.3250–8	2.9511+9	1.0839+9	3.0481+8	1.5624+9	6.9743+3	5.8709+2	1.9104+2	3.9605+2	3.9483–3
	1.3626–4	1.1999–8	1.2421+7	6.0847–8	2.9062+9	1.0649+9	3.0075+8	1.5405+9	7.0037+3	5.8428+2	1.9177+2	3.9251+2	4.0899–3
	1.4090–4	1.2186–8	1.2230+7	6.8817–8	2.8616+9	1.0461+9	2.9673+8	1.5188+9	7.0336+3	5.8152+2	1.9250+2	3.8902+2	4.2385–3
	1.5000–4	1.2542–8	1.1883+7	8.4521–8	2.7803+9	1.0119+9	2.8949+8	1.4790+9	7.0896+3	5.7694+2	1.9418+2	3.8276+2	4.5311–3
	1.6250–4	1.3066–8	1.1406+7	1.0641–7	2.6689+9	9.6971+8	2.7864+8	1.4205+9	7.1563+3	5.6540+2	1.9387+2	3.7153+2	4.9379–3
	1.8125–4	1.3814–8	1.0788+7	1.3999–7	2.5242+9	9.1502+8	2.6478+8	1.3444+9	7.2482+3	5.5134+2	1.9415+2	3.5717+2	5.5549–3
	2.0000–4	1.4524–8	1.0261+7	1.7434–7	2.4008+9	8.6837+8	2.5314+8	1.2793+9	7.3321+3	5.4023+2	1.9507+2	3.4516+2	6.1790–3
N3	2.1956–4	1.5304–8	9.7381+6	2.1110–7	2.2785+9	8.2635+8	2.4090+8	1.2113+9	7.3941+3	5.2428+2	1.9331+2	3.3097+2	6.8403–3
	2.2207–4	1.5404–8	9.6746+6	2.1590–7	2.2637+9	8.2136+8	2.3946+8	1.2028+9	7.4017+3	5.2239+2	1.9315+2	3.2924+2	6.9257–3
	2.2694–4	1.5598–8	9.5547+6	2.2525–7	2.2356+9	8.1195+8	2.3675+8	1.1869+9	7.4163+3	5.1887+2	1.9288+2	3.2599+2	7.0914–3
	2.3608–4	1.5955–8	9.3407+6	2.4296–7	2.1856+9	7.9509+8	2.3194+8	1.1585+9	7.4427+3	5.1268+2	1.9247+2	3.2020+2	7.4029–3
N2	2.4064–4	1.6131–8	9.2387+6	2.5189–7	2.1617+9	7.8704+8	2.2965+8	1.1450+9	7.4556+3	5.0978+2	1.9231+2	3.1746+2	7.5590–3
	2.4435–4	1.6279–8	9.1551+6	2.5918–7	2.1421+9	7.8067+8	2.2773+8	1.1337+9	7.4659+3	5.0705+2	1.9200+2	3.1504+2	7.6861–3
	2.5131–4	1.6552–8	9.0038+6	2.7297–7	2.1067+9	7.6911+8	2.2426+8	1.1133+9	7.4849+3	5.0220+2	1.9150+2	3.1069+2	7.9249–3
	2.5206–4	1.6581–8	8.9878+6	2.7446–7	2.1030+9	7.6789+8	2.2390+8	1.1112+9	7.4869+3	5.0169+2	1.9145+2	3.1024+2	7.9507–3
	2.6250–4	1.6986–8	8.7740+6	2.9542–7	2.0529+9	7.5149+8	2.1902+8	1.0824+9	7.5144+3	4.9494+2	1.9082+2	3.0411+2	8.3103–3
	2.6348–4	1.7023–8	8.7546+6	2.9740–7	2.0484+9	7.5001+8	2.1858+8	1.0798+9	7.5170+3	4.9433+2	1.9076+2	3.0356+2	8.3441–3
	2.6404–4	1.7045–8	8.7435+6	2.9854–7	2.0458+9	7.4915+8	2.1833+8	1.0783+9	7.5184+3	4.9398+2	1.9073+2	3.0325+2	8.3636–3
	2.8174–4	1.7713–8	8.4138+6	3.3474–7	1.9687+9	7.2376+8	2.1082+8	1.0341+9	7.5626+3	4.8376+2	1.8986+2	2.9389+2	8.9763–3
	2.8202–4	1.7723–8	8.4088+6	3.3532–7	1.9675+9	7.2338+8	2.1071+8	1.0334+9	7.5633+3	4.8361+2	1.8985+2	2.9375+2	8.9861–3
N1	2.9925–4	1.8356–8	8.1188+6	3.7127–7	1.8997+9	7.0093+8	2.0415+8	9.9457+8	7.6039+3	4.7492+2	1.8931+2	2.8560+2	9.5860–3
	3.0000–4	1.8384–8	8.1065+6	3.7285–7	1.8968+9	7.0000+8	2.0388+8	9.9289+8	7.6056+3	4.7455+2	1.8929+2	2.8526+2	9.6121–3
	3.0625–4	1.8630–8	7.9995+6	3.8608–7	1.8717+9	6.9240+8	2.0136+8	9.7797+8	7.6187+3	4.7035+2	1.8853+2	2.8181+2	9.8304–3
	3.1797–4	1.9086–8	7.8084+6	4.1120–7	1.8270+9	6.7876+8	1.9687+8	9.5138+8	7.6427+3	4.6293+2	1.8724+2	2.7569+2	1.0241–2
	3.2500–4	1.9357–8	7.6993+6	4.2645–7	1.8015+9	6.7095+8	1.9431+8	9.3623+8	7.6566+3	4.5874+2	1.8653+2	2.7220+2	1.0487–2
	3.3848–4	1.9869–8	7.5008+6	4.5607–7	1.7551+9	6.5667+8	1.8966+8	9.0872+8	7.6827+3	4.5123+2	1.8533+2	2.6589+2	1.0962–2
	3.5000–4	2.0300–8	7.3413+6	4.8178–7	1.7177+9	6.4513+8	1.8594+8	8.8667+8	7.7042+3	4.4530+2	1.8445+2	2.6084+2	1.1368–2
	3.5386–4	2.0444–8	7.2899+6	4.9046–7	1.7057+9	6.4139+8	1.8474+8	8.7956+8	7.7112+3	4.4338+2	1.8415+2	2.5922+2	1.1505–2
	3.6250–4	2.0763–8	7.1779+6	5.1005–7	1.6795+9	6.3325+8	1.8212+8	8.6412+8	7.7268+3	4.3921+2	1.8350+2	2.5569+2	1.1811–2
	3.7693–4	2.1289–8	7.0005+6	5.4314–7	1.6380+9	6.2029+8	1.7797+8	8.3971+8	7.7520+3	4.3271+2	1.8256+2	2.5014+2	1.2323–2
	4.0000–4	2.2114–8	6.7392+6	5.9704–7	1.5769+9	6.0108+8	1.7189+8	8.0388+8	7.7906+3	4.2338+2	1.8134+2	2.4202+2	1.3146–2
	4.5000–4	2.3962–8	6.2194+6	7.1839–7	1.4552+9	5.6477+8	1.5944+8	7.3100+8	7.8312+3	4.0095+2	1.7663+2	2.2431+2	1.4922–2
	5.0000–4	2.5739–8	5.7900+6	8.4594–7	1.3548+9	5.3415+8	1.4919+8	6.7142+8	7.8676+3	3.8314+2	1.7321+2	2.0991+2	1.6708–2
	6.0000–4	2.9149–8	5.1127+6	1.1180–6	1.1963+9	4.8503+8	1.3216+8	5.7910+8	7.9099+3	3.5239+2	1.6557+2	1.8680+2	2.0255–2
	7.0000–4	3.2400–8	4.5998+6	1.4127–6	1.0763+9	4.4704+8	1.1861+8	5.1060+8	7.8952+3	3.2665+2	1.5767+2	1.6896+2	2.3593–2
	8.0000–4	3.5492–8	4.1990+6	1.7283–6	9.8250+8	4.1655+8	1.0809+8	4.5785+8	7.8824+3	3.0733+2	1.5198+2	1.5532+2	2.6926–2
M5	9.3486–4	3.9458–8	3.7769+6	2.1844–6	8.8373+8	3.8359+8	9.6433+7	4.0371+8	7.7887+3	2.8431+2	1.4377+2	1.4051+2	3.0629–2
	9.4300–4	3.9696–8	3.7543+6	2.2131–6	8.7844+8	3.8183+8	9.5823+7	4.0077+8	7.7836+3	2.8313+2	1.4337+2	1.3972+2	3.0851–2
M4	9.5598–4	4.0074–8	3.7189+6	2.2591–6	8.7015+8	3.7908+8	9.4871+7	3.9619+8	7.7754+3	2.8128+2	1.4275+2	1.3850+2	3.1205–2
	9.5725–4	4.0111–8	3.7154+6	2.2636–6	8.6934+8	3.7881+8	9.4779+7	3.9574+8	7.7746+3	2.8111+2	1.4269+2	1.3838+2	3.1240–2
	9.6699–4	4.0396–8	3.6892+6	2.2983–6	8.6321+8	3.7679+8	9.4082+7	3.9233+8	7.7686+3	2.7976+2	1.4225+2	1.3748+2	3.1505–2
	9.7863–4	4.0736–8	3.6585+6	2.3400–6	8.5602+8	3.7441+8	9.3265+7	3.8833+8	7.7614+3	2.7820+2	1.4174+2	1.3642+2	3.1822–2
	9.8349–4	4.0877–8	3.6458+6	2.3575–6	8.5306+8	3.7343+8	9.2929+7	3.8669+8	7.7585+3	2.7755+2	1.4154+2	1.3599+2	3.1955–2
	1.0000–3	4.1356–8	3.6037+6	2.4172–6	8.4319+8	3.7016+8	9.1809+7	3.8122+8	7.7486+3	2.7543+2	1.4085+2	1.3454+2	3.2404–2

Atomic Weight 140.907 Density 6.710 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0625–3	4.3167–8	3.4524+6	2.6479–6	8.0780+8	3.5846+8	8.7676+7	3.6166+8	7.6880+3	2.6654+2	1.3759+2	1.2892+2	3.3758–2
	1.1719–3	4.6254–8	3.2220+6	3.0688–6	7.5389+8	3.4032+8	8.1409+7	3.3215+8	7.5911+3	2.5331+2	1.3282+2	1.2045+2	3.6110–2
M3	1.2284–3	4.7811–8	3.1171+6	3.2946–6	7.2934+8	3.3193+8	7.8566+7	3.1883+8	7.5450+3	2.4740+2	1.3072+2	1.1664+2	3.7317–2
	1.2454–3	4.8279–8	3.0869+6	3.3634–6	7.2227+8	3.2953+8	7.7736+7	3.1500+8	7.5316+3	2.4556+2	1.3002+2	1.1550+2	3.7679–2
	1.2539–3	4.8513–8	3.0720+6	3.3983–6	7.1878+8	3.2834+8	7.7326+7	3.1311+8	7.5250+3	2.4465+2	1.2967+2	1.1494+2	3.7861–2
	1.2772–3	4.9150–8	3.0322+6	3.4939–6	7.0947+8	3.2515+8	7.6233+7	3.0808+8	7.5071+3	2.4224+2	1.2876+2	1.1344+2	3.8355–2
M2	1.3257–3	5.0464–8	2.9532+6	3.6961–6	6.9100+8	3.1879+8	7.4069+7	2.9813+8	7.4710+3	2.3750+2	1.2697+2	1.1049+2	3.9383–2
	1.3329–3	5.0660–8	2.9418+6	3.7265–6	6.8833+8	3.1788+8	7.3757+7	2.9668+8	7.4654+3	2.3680+2	1.2670+2	1.1007+2	3.9528–2
	1.3475–3	5.1056–8	2.9190+6	3.7883–6	6.8299+8	3.1605+8	7.3134+7	2.9380+8	7.4541+3	2.3541+2	1.2616+2	1.0921+2	3.9822–2
	1.3769–3	5.1851–8	2.8742+6	3.9142–6	6.7252+8	3.1245+8	7.1912+7	2.8815+8	7.4319+3	2.3268+2	1.2511+2	1.0753+2	4.0414–2
	1.3856–3	5.2084–8	2.8614+6	3.9515–6	6.6951+8	3.1141+8	7.1562+7	2.8653+8	7.4255+3	2.3190+2	1.2481+2	1.0706+2	4.0588–2
	1.4164–3	5.2908–8	2.8168+6	4.0852–6	6.5908+8	3.0780+8	7.0347+7	2.8093+8	7.4029+3	2.2921+2	1.2377+2	1.0539+2	4.1206–2
	1.4428–3	5.3607–8	2.7801+6	4.2008–6	6.5048+8	3.0481+8	6.9346+7	2.7632+8	7.3841+3	2.2700+2	1.2293+2	1.0403+2	4.1733–2
M1	1.4801–3	5.4590–8	2.7300+6	4.3661–6	6.3877+8	3.0071+8	6.7985+7	2.7006+8	7.3581+3	2.2402+2	1.2180+2	1.0218+2	4.2477–2
	1.5000–3	5.5120–8	2.7038+6	4.4553–6	6.3263+8	2.9859+8	6.7285+7	2.6675+8	7.3433+3	2.2248+2	1.2123+2	1.0121+2	4.2847–2
	1.5312–3	5.5937–8	2.6643+6	4.5966–6	6.2339+8	2.9532+8	6.6179+7	2.6188+8	7.3205+3	2.1984+2	1.2009+2	9.9697+1	4.3427–2
	1.5898–3	5.7455–8	2.5939+6	4.8660–6	6.0692+8	2.8944+8	6.4214+7	2.5326+8	7.2793+3	2.1516+2	1.1810+2	9.7013+1	4.4511–2
	1.6250–3	5.8357–8	2.5538+6	5.0304–6	5.9754+8	2.8607+8	6.3097+7	2.4836+8	7.2553+3	2.1252+2	1.1698+2	9.5492+1	4.5160–2
	1.6924–3	6.0067–8	2.4811+6	5.3510–6	5.8052+8	2.7992+8	6.1076+7	2.3952+8	7.2111+3	2.0778+2	1.1498+2	9.2745+1	4.6398–2
	1.7500–3	6.1512–8	2.4228+6	5.6309–6	5.6689+8	2.7495+8	5.9462+7	2.3247+8	7.1748+3	2.0402+2	1.1342+2	9.0557+1	4.7453–2
	1.8125–3	6.3061–8	2.3633+6	5.9401–6	5.5296+8	2.6984+8	5.7816+7	2.2531+8	7.1370+3	2.0018+2	1.1180+2	8.8336+1	4.8593–2
	1.8462–3	6.3889–8	2.3327+6	6.1093–6	5.4580+8	2.6719+8	5.6972+7	2.2163+8	7.1173+3	1.9823+2	1.1098+2	8.7198+1	4.9206–2
	2.0000–3	6.7604–8	2.2045+6	6.9014–6	5.1581+8	2.5599+8	5.3449+7	2.0636+8	7.0320+3	1.9016+2	1.0764+2	8.2474+1	5.1986–2
	2.2500–3	7.3575–8	2.0256+6	8.2631–6	4.7395+8	2.3985+8	4.8473+7	1.8562+8	6.8714+3	1.7718+2	1.0154+2	7.5583+1	5.5744–2
	2.5000–3	7.9334–8	1.8785+6	9.7176–6	4.3954+8	2.2628+8	4.4424+7	1.6883+8	6.7308+3	1.6670+2	9.6619+1	7.0023+1	5.9447–2
	2.6250–3	8.2142–8	1.8143+6	1.0478–5	4.2452+8	2.2026+8	4.2668+7	1.6158+8	6.6667+3	1.6221+2	9.4519+1	6.7626+1	6.1280–2
	3.0000–3	9.0315–8	1.6501+6	1.2874–5	3.8610+8	2.0458+8	3.8214+7	1.4330+8	6.4943+3	1.5087+2	8.9205+1	6.1594+1	6.6706–2
	3.5000–3	1.0124–7	1.4721+6	1.6354–5	3.4445+8	1.8755+8	3.3523+7	1.2337+8	6.2641+3	1.3679+2	8.2291+1	5.4426+1	7.2857–2
	4.0000–3	1.1168–7	1.3345+6	2.0158–5	3.1225+8	1.7394+8	2.9936+7	1.0836+8	6.0713+3	1.2621+2	7.7095+1	4.9032+1	7.8867–2
	5.0000–3	1.3174–7	1.1313+6	2.8655–5	2.6470+8	1.5279+8	2.4707+7	8.7198+7	5.7124+3	1.0956+2	6.8395+1	4.1075+1	8.8859–2
L3	5.9544–3	1.4988–7	9.9433+5	3.7867–5	2.3265+8	1.3781+8	2.1233+7	7.3603+7	5.4236+3	9.7879+1	6.2032+1	3.5749+1	9.7179–2
	6.0000–3	1.5074–7	9.8867+5	3.8334–5	2.3133+8	1.3719+8	2.1093+7	7.3039+7	5.4097+3	9.7412+1	6.1780+1	3.5534+1	9.7504–2
	6.2500–3	1.5531–7	9.5956+5	4.0935–5	2.2452+8	1.3391+8	2.0355+7	7.0249+7	5.3357+3	9.4813+1	6.0316+1	3.4397+1	9.9278–2
L2	6.4429–3	1.5880–7	9.3847+5	4.2990–5	2.1959+8	1.3152+8	1.9823+7	6.8242+7	5.2813+3	9.2939+1	5.9260+1	3.3578+1	1.0064–1
	6.6375–3	1.6235–7	9.1798+5	4.5104–5	2.1479+8	1.2919+8	1.9315+7	6.6283+7	5.2285+3	9.1155+1	5.8261+1	3.2792+1	1.0200–1
	6.6875–3	1.6325–7	9.1289+5	4.5654–5	2.1360+8	1.2861+8	1.9189+7	6.5799+7	5.2153+3	9.0714+1	5.8014+1	3.2597+1	1.0235–1
L1	6.7998–3	1.6528–7	9.0169+5	4.6898–5	2.1098+8	1.2733+8	1.8913+7	6.4735+7	5.1861+3	8.9742+1	5.7469+1	3.2170+1	1.0314–1
	6.8748–3	1.6663–7	8.9439+5	4.7737–5	2.0927+8	1.2649+8	1.8732+7	6.4047+7	5.1664+3	8.9091+1	5.7101+1	3.1887+1	1.0363–1
	6.9781–3	1.6848–7	8.8457+5	4.8903–5	2.0697+8	1.2536+8	1.8489+7	6.3121+7	5.1397+3	8.8217+1	5.6607+1	3.1506+1	1.0432–1
	7.1561–3	1.7165–7	8.6825+5	5.0937–5	2.0316+8	1.2347+8	1.8087+7	6.1590+7	5.0950+3	8.6771+1	5.5789+1	3.0876+1	1.0549–1
	7.3437–3	1.7496–7	8.5181+5	5.3118–5	1.9931+8	1.2157+8	1.7682+7	6.0054+7	5.0495+3	8.5321+1	5.4969+1	3.0245+1	1.0672–1
	7.4891–3	1.7751–7	8.3958+5	5.4832–5	1.9645+8	1.2014+8	1.7382+7	5.8917+7	5.0153+3	8.4245+1	5.4361+1	2.9777+1	1.0767–1
	7.5780–3	1.7906–7	8.3230+5	5.5892–5	1.9474+8	1.1929+8	1.7204+7	5.8243+7	4.9947+3	8.3607+1	5.4000+1	2.9499+1	1.0825–1
	8.0000–3	1.8635–7	7.9974+5	6.1026–5	1.8712+8	1.1547+8	1.6409+7	5.5244+7	4.9017+3	8.0772+1	5.2395+1	2.8267+1	1.1099–1
	9.0000–3	2.0343–7	7.3260+5	7.3902–5	1.7141+8	1.0731+8	1.4799+7	4.9300+7	4.6871+3	7.4639+1	4.8802+1	2.5721+1	1.1639–1
	1.0000–2	2.1996–7	6.7754+5	8.7764–5	1.5853+8	1.0050+8	1.3494+7	4.4527+7	4.5032+3	6.9700+1	4.5901+1	2.3678+1	1.2169–1
	1.1250–2	2.4024–7	6.2035+5	1.0644–4	1.4515+8	9.3226+7	1.2170+7	3.9751+7	4.2808+3	6.4237+1	4.2596+1	2.1514+1	1.2638–1
	1.2188–2	2.5503–7	5.8438+5	1.2143–4	1.3673+8	8.8583+7	1.1345+7	3.6802+7	4.1360+3	6.0844+1	4.0536+1	2.0178+1	1.2985–1
	1.2500–2	2.5988–7	5.7345+5	1.2661–4	1.3418+8	8.7163+7	1.1096+7	3.5915+7	4.0912+3	5.9822+1	3.9914+1	1.9777+1	1.3100–1
	1.3125–2	2.6950–7	5.5300+5	1.3723–4	1.2939+8	8.4490+7	1.0632+7	3.4267+7	4.0062+3	5.7919+1	3.8755+1	1.9031+1	1.3329–1
	1.3594–2	2.7662–7	5.3876+5	1.4542–4	1.2606+8	8.2619+7	1.0310+7	3.3128+7	3.9462+3	5.6600+1	3.7949+1	1.8516+1	1.3499–1
	1.5000–2	2.9758–7	5.0081+5	1.7106–4	1.1718+8	7.7587+7	9.4585+6	3.0131+7	3.7827+3	5.3124+1	3.5823+1	1.7161+1	1.4003–1
	1.7500–2	3.3425–7	4.4587+5	2.2065–4	1.0432+8	7.0057+7	8.2703+6	2.5994+7	3.5162+3	4.7791+1	3.2482+1	1.5163+1	1.4649–1
	2.0000–2	3.6952–7	4.0331+5	2.7532–4	9.4366+7	6.4128+7	7.3629+6	2.2872+7	3.3006+3	4.3733+1	2.9923+1	1.3657+1	1.5283–1
	2.5000–2	4.3744–7	3.4069+5	3.9866–4	7.9715+7	5.5107+7	6.0799+6	1.8526+7	2.9421+3	3.7505+1	2.5911+1	1.1433+1	1.6117–1
	3.0000–2	5.0185–7	2.9697+5	5.4017–4	6.9485+7	4.8687+7	5.2000+6	1.5595+7	2.6782+3	3.3248+1	2.3141+1	9.9370+0	1.6942–1
	3.5000–2	5.6414–7	2.6418+5	6.9859–4	6.1813+7	4.3759+7	4.5702+6	1.3481+7	2.4671+3	2.9934+1	2.0972+1	8.7865+0	1.7533–1
	4.0000–2	6.2417–7	2.3877+5	8.7311–4	5.5867+7	3.9896+7	4.0868+6	1.1882+7	2.2977+3	2.7401+1	1.9301+1	7.9181+0	1.8124–1
K	4.2010–2	6.4753–7	2.3015+5	9.4768–4	5.3852+7	3.8560+7	3.9256+6	1.1364+7	2.2379+3	2.6515+1	1.8715+1	7.6176+0	1.8318–1
	4.2509–2	6.5334–7	2.2811+5	9.6659–4	5.3373+7	3.8245+7	3.8879+6	1.1237+7	2.2237+3	2.6307+1	1.8577+1	7.5459+0	1.8364–1
	4.3446–2	6.6420–7	2.2438+5	1.0024–3	5.2501+7	3.7671+7	3.8194+6	1.1008+7	2.1978+3	2.5928+1	1.8327+1	7.4159+0	1.8450–1
	4.5084–2	6.8305–7	2.1819+5	1.0664–3	5.1052+7	3.6715+7	3.7058+6	1.0629+7	2.1546+3	2.5299+1	1.7912+1	7.2011+0	1.8600–1
	4.7542–2	7.1099–7	2.0961+5	1.1653–3	4.9045+7	3.5386+7	3.5487+6	1.0108+7	2.0939+3	2.4433+1	1.7339+1	6.9060+0	1.8827–1
	5.0000–2	7.3857–7	2.0178+5	1.2675–3	4.7214+7	3.4169+7	3.4057+6	9.6368+6	2.0380+3	2.3646+1	1.6816+1	6.6394+0	1.9053–1
	5.5000–2	7.9298–7	1.8794+5	1.4856–3	4.3974+7	3.2000+7	3.1575+6	8.8146+6	1.9368+3	2.2216+1	1.5866+1	6.1549+0	1.9442–1
	6.0000–2	8.4608–7	1.7614+5	1.7171–3	4.1214+7	3.0140+7	2.9468+6	8.1253+6	1.8488+3	2.1006+1	1.5059+1	5.7493+0	1.9834–1
	7.0000–2	9.4597–7	1.5754+5	2.2166–3	3.6862+7	2.7174+7	2.6198+6	7.0669+6	1.7094+3	1.9059+1	1.3749+1	5.1044+0	2.0514–1
	8.0000–2	1.0418–6	1.4305+5	2.7631–3	3.3471+7	2.4841+7	2.3662+6	6.2622+6	1.5972+3	1.7560+1	1.2732+1	4.6153+0	2.1200–1
	9.0000–2	1.1319–6	1.3167+5	3.3531–3	3.0808+7	2.3001+7	2.1730+6	5.6330+6	1.5057+3	1.6355+1	1.1921+1	4.2163+0	2.1761–1
	1.0000–1	1.2188–6	1.2227+5	3.9837–3	2.8610+7	2.1471+7	2.0136+6	5.1239+6	1.4283+3	1.5369+1	1.1252+1	3.8941+0	2.2326–1
	1.2500–1	1.4126–6	1.0550+5	5.7114–3	2.4685+7	1.8685+7	1.7369+6	4.2618+6	1.2863+3	1.3607+1	1.0044+1	3.3286+0	2.3450–1
	1.5000–1	1.5933–6	9.3539+4	7.6377–3	2.1886+7	1.6680+7	1.5394+6	3.6662+6	1.1808+3	1.2369+1	9.1828+0	2.9406+0	2.4596–1
	2.0000–1	1.9080–6	7.8110+4	1.1952–2	1.8276+7	1.4020+7	1.3022+6	2.9529+6	1.0425+3	1.0844+1	8.1206+0	2.4577+0	2.6571–1
	3.0000–1	2.4313–6	6.1298+4	2.1852–2	1.4343+7	1.0967+7	1.0672+6	2.3080+6	8.9477+2	9.3924+0	7.0666+0	2.0225+0	3.0340–1
	4.0000–1	2.8790–6	5.1765+4	3.2893–2	1.2112+7	9.1667+6	9.5323+5	1.9914+6	8.1929+2	8.7305+0	6.5794+0	1.8091+0	3.4208–1
	5.0000–1	3.2794–6	4.5445+4	4.4588–2	1.0633+7	7.9692+6	8.8757+5	1.7757+6	7.7523+2	8.3725+0	6.3304+0	1.6592+0	3.8294–1
	6.0000–1	3.6363–6	4.0984+4	5.6679–2	9.5896+6	7.1078+6	8.4541+5	1.6357+6	7.4880+2	8.1691+0	6.1794+0	1.5638+0	4.2596–1
	8.0000–1	4.2556–6	3.5020+4	8.1357–2	8.1940+6	5.9346+6	7.9653+5	1.4621+6	7.2094+2	8.0402+0	6.0741+0	1.4493+0	5.1685–1
	1.0000+0	4.7747–6	3.1213+4	1.0623–1	7.3032+6	5.1751+6	7.6979+5	1.3577+6	7.0756+2	8.0412+0	6.0448+0	1.3834+0	6.1300–1
	1.5000+0	5.7374–6	2.5976+4	1.6715–1	6.0778+6	4.0792+6	7.4110+5	1.2568+6	6.9759+2	8.3768+0	6.1702+0	1.3335+0	8.7307–1

Atomic Weight 140.907												Density 6.710 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000+0	6.4505–6	2.3104+4	2.2547–1	5.4059+6	3.4804+6	7.3293+5	1.1918+6	6.9919+2	8.7711+0	6.3012+0	1.3169+0	1.1529+0
3.0000+0	7.3805–6	2.0193+4	3.3433–1	4.7247+6	2.8482+6	7.2376+5	1.1521+6	7.0687+2	9.6153+0	6.5513+0	1.3184+0	1.7456+0
4.0000+0	8.0183–6	1.8586+4	4.3405–1	4.3489+6	2.5131+6	7.2125+5	1.1138+6	7.1384+2	1.0451+1	6.7555+0	1.3190+0	2.3767+0
5.0000+0	8.4429–6	1.7652+4	5.2612–1	4.1302+6	2.3092+6	7.2131+5	1.0989+6	7.1999+2	1.1283+1	6.9372+0	1.3189+0	3.0269+0
6.0000+0	8.7496–6	1.7033+4	6.1170–1	3.9854+6	2.1790+6	7.2134+5	1.0844+6	7.2561+2	1.2095+1	7.0814+0	1.3188+0	3.6947+0
8.0000+0	9.1825–6	1.6230+4	7.6695–1	3.7975+6	2.0176+6	7.2268+5	1.0565+6	7.3590+2	1.3704+1	7.3184+0	1.3187+0	5.0665+0
1.0000+1	9.4217–6	1.5818+4	9.0496–1	3.7011+6	1.9341+6	7.2370+5	1.0426+6	7.4504+2	1.5310+1	7.5155+0	1.3186+0	6.4761+0
1.5000+1	9.6255–6	1.5483+4	1.1957+0	3.6228+6	1.8696+6	7.2579+5	1.0266+6	7.6022+2	1.9237+1	7.8091+0	1.3125+0	1.0115+1
2.0000+1	9.6673–6	1.5416+4	1.4320+0	3.6071+6	1.8670+6	7.2719+5	1.0121+6	7.6995+2	2.3207+1	8.0438+0	1.3078+0	1.3856+1
3.0000+1	9.7385–6	1.5303+4	1.8020+0	3.5807+6	1.8660+6	7.2833+5	9.8559+5	7.8360+2	3.1235+1	8.3000+0	1.3005+0	2.1634+1
4.0000+1	9.7567–6	1.5275+4	2.0866+0	3.5740+6	1.8653+6	7.2908+5	9.7886+5	7.9499+2	3.9354+1	8.5010+0	1.2952+0	2.9558+1
5.0000+1	9.7732–6	1.5249+4	2.3175+0	3.5680+6	1.8647+6	7.2948+5	9.7301+5	8.0517+2	4.7548+1	8.6441+0	1.2910+0	3.7612+1
6.0000+1	9.7849–6	1.5231+4	2.5113+0	3.5637+6	1.8642+6	7.2976+5	9.6894+5	8.1361+2	5.5842+1	8.7608+0	1.2892+0	4.5792+1
8.0000+1	9.8060–6	1.5198+4	2.8244+0	3.5561+6	1.8635+6	7.3008+5	9.6167+5	8.2717+2	7.2656+1	8.9312+0	1.2865+0	6.2438+1
1.0000+2	9.8250–6	1.5169+4	3.0718+0	3.5492+6	1.8629+6	7.3029+5	9.5511+5	8.3674+2	8.9601+1	9.0712+0	1.2847+0	7.9245+1
1.5000+2	9.8353–6	1.5153+4	3.5285+0	3.5455+6	1.8619+6	7.3043+5	9.5232+5	8.5369+2	1.3214+2	9.2277+0	1.2815+0	1.2163+2
2.0000+2	9.8431–6	1.5141+4	3.8561+0	3.5426+6	1.8611+6	7.3052+5	9.5013+5	8.6521+2	1.7507+2	9.3725+0	1.2790+0	1.6442+2
3.0000+2	9.8529–6	1.5126+4	4.3212+0	3.5391+6	1.8601+6	7.3062+5	9.4752+5	8.7868+2	2.6065+2	9.6108+0	1.2765+0	2.4977+2
4.0000+2	9.8601–6	1.5115+4	4.6527+0	3.5365+6	1.8594+6	7.3065+5	9.4563+5	8.8769+2	3.4664+2	9.7190+0	1.2750+0	3.3564+2
5.0000+2	9.8673–6	1.5104+4	4.9102+0	3.5340+6	1.8588+6	7.3067+5	9.4360+5	8.9462+2	4.3326+2	9.8185+0	1.2733+0	4.2217+2
6.0000+2	9.8713–6	1.5097+4	5.1209+0	3.5325+6	1.8583+6	7.3067+5	9.4261+5	9.0079+2	5.1852+2	9.8994+0	1.2730+0	5.0734+2
8.0000+2	9.8795–6	1.5085+4	5.4540+0	3.5296+6	1.8576+6	7.3069+5	9.4041+5	9.1061+2	6.9053+2	1.0059+1	1.2720+0	6.7920+2
1.0000+3	9.8869–6	1.5074+4	5.7126+0	3.5270+6	1.8570+6	7.3070+5	9.3832+5	9.1855+2	8.6275+2	1.0180+1	1.2712+0	8.5130+2
1.5000+3	9.8926–6	1.5065+4	6.1822+0	3.5249+6	1.8560+6	7.3070+5	9.3730+5	9.3337+2	1.2959+3	1.0301+1	1.2699+0	1.2844+3
2.0000+3	9.8969–6	1.5058+4	6.5153+0	3.5234+6	1.8553+6	7.3070+5	9.3648+5	9.4436+2	1.7267+3	1.0422+1	1.2688+0	1.7150+3
3.0000+3	9.9018–6	1.5051+4	6.9848+0	3.5217+6	1.8542+6	7.3070+5	9.3576+5	9.6037+2	2.5916+3	1.0654+1	1.2679+0	2.5796+3
4.0000+3	9.9054–6	1.5045+4	7.3177+0	3.5203+6	1.8535+6	7.3070+5	9.3519+5	9.7216+2	3.4587+3	1.0738+1	1.2672+0	3.4467+3
5.0000+3	9.9097–6	1.5039+4	7.5754+0	3.5189+6	1.8529+6	7.3070+5	9.3424+5	9.8141+2	4.3349+3	1.0821+1	1.2659+0	4.3228+3
6.0000+3	9.9109–6	1.5037+4	7.7859+0	3.5184+6	1.8525+6	7.3070+5	9.3426+5	9.8813+2	5.1934+3	1.0898+1	1.2660+0	5.1813+3
8.0000+3	9.9135–6	1.5033+4	8.1182+0	3.5175+6	1.8517+6	7.3070+5	9.3407+5	9.9883+2	6.9254+3	1.1048+1	1.2659+0	6.9131+3
1.0000+4	9.9154–6	1.5030+4	8.3757+0	3.5168+6	1.8512+6	7.3070+5	9.3392+5	1.0072+3	8.6733+3	1.1185+1	1.2658+0	8.6608+3
1.5000+4	9.9186–6	1.5025+4	8.8443+0	3.5157+6	1.8501+6	7.3070+5	9.3384+5	1.0235+3	1.2951+4	1.1299+1	1.2657+0	1.2938+4
2.0000+4	9.9212–6	1.5022+4	9.1774+0	3.5148+6	1.8494+6	7.3070+5	9.3362+5	1.0352+3	1.7284+4	1.1413+1	1.2654+0	1.7271+4
3.0000+4	9.9241–6	1.5017+4	9.6471+0	3.5137+6	1.8484+6	7.3070+5	9.3362+5	1.0516+3	2.5865+4	1.1640+1	1.2654+0	2.5852+4
4.0000+4	9.9267–6	1.5013+4	9.9805+0	3.5128+6	1.8476+6	7.3070+5	9.3343+5	1.0634+3	3.4540+4	1.1741+1	1.2651+0	3.4527+4
5.0000+4	9.9301–6	1.5008+4	1.0239+1	3.5116+6	1.8471+6	7.3070+5	9.3275+5	1.0725+3	4.3133+4	1.1820+1	1.2642+0	4.3121+4
6.0000+4	9.9308–6	1.5007+4	1.0451+1	3.5113+6	1.8466+6	7.3070+5	9.3296+5	1.0799+3	5.1720+4	1.1892+1	1.2645+0	5.1707+4
8.0000+4	9.9327–6	1.5004+4	1.0784+1	3.5107+6	1.8459+6	7.3070+5	9.3304+5	1.0917+3	6.9044+4	1.2037+1	1.2646+0	6.9030+4
1.0000+5	9.9344–6	1.5002+4	1.1042+1	3.5101+6	1.8453+6	7.3070+5	9.3299+5	1.1008+3	8.6397+4	1.2179+1	1.2646+0	8.6384+4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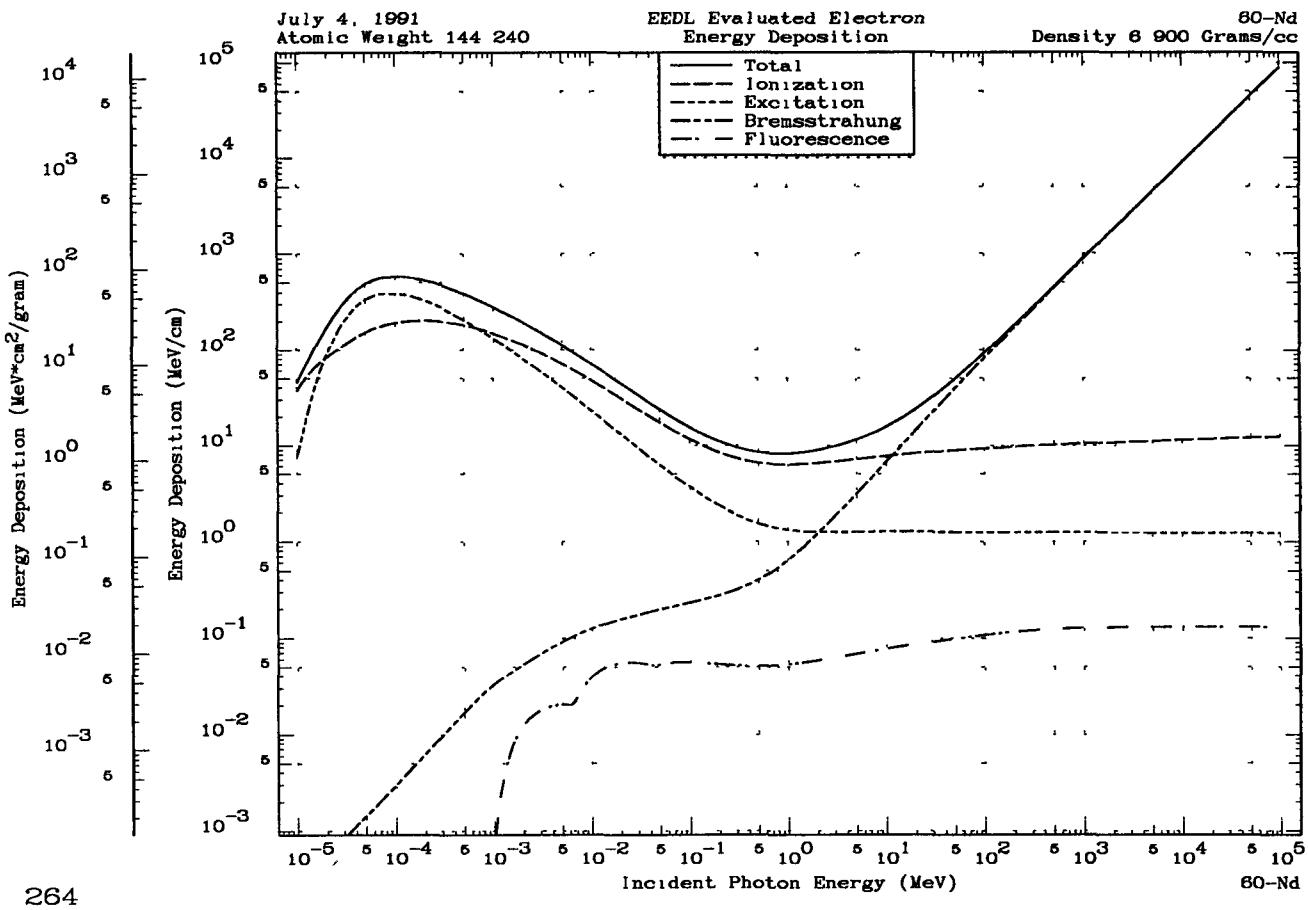
EEDL Evaluated Electron
Cross Sections
60-Nd
Density 6 900 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
60-Nd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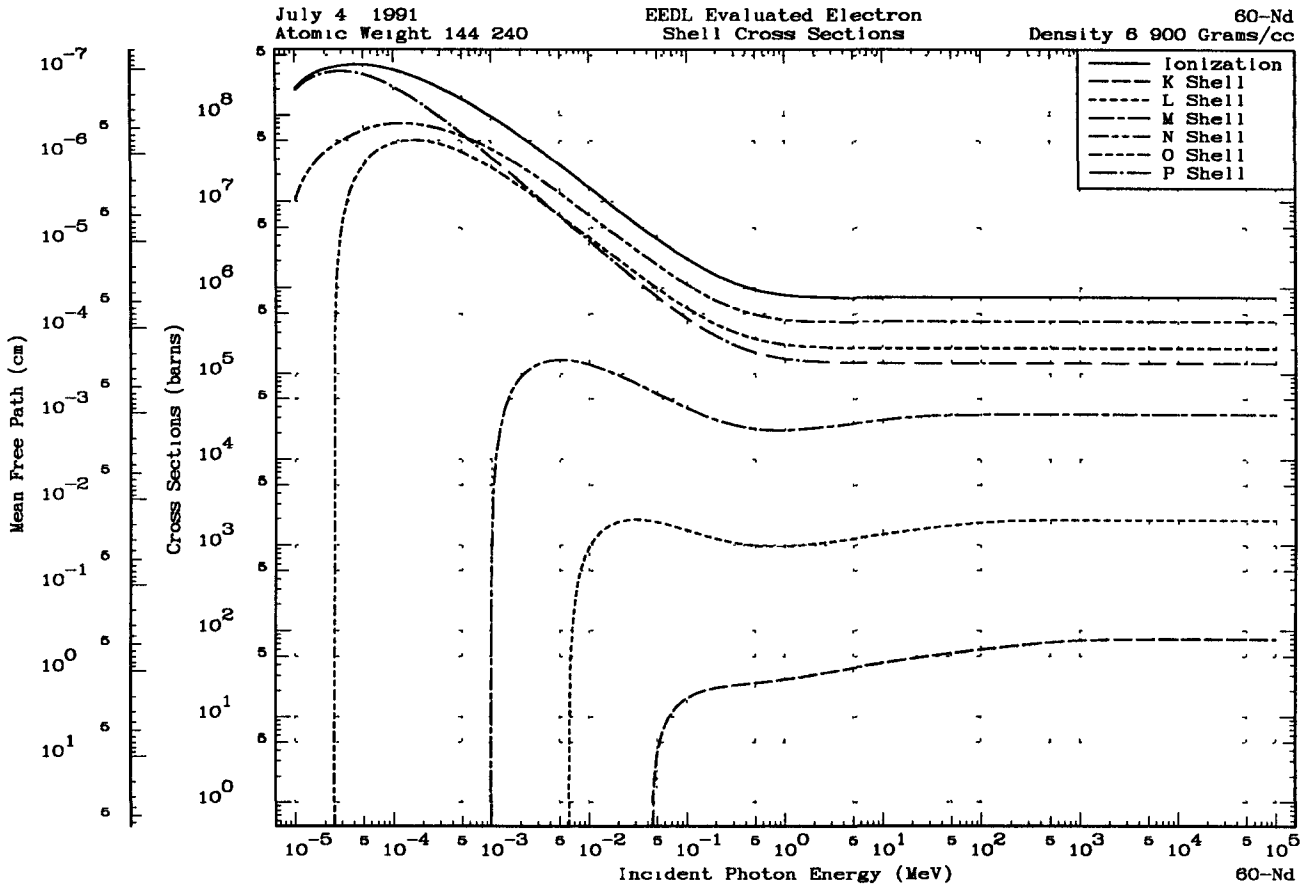
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
60-Nd

264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EEDL Evaluated Electron
Shell Cross Sections
60-Nd
Density 6 900 Grams/cc
Ionization
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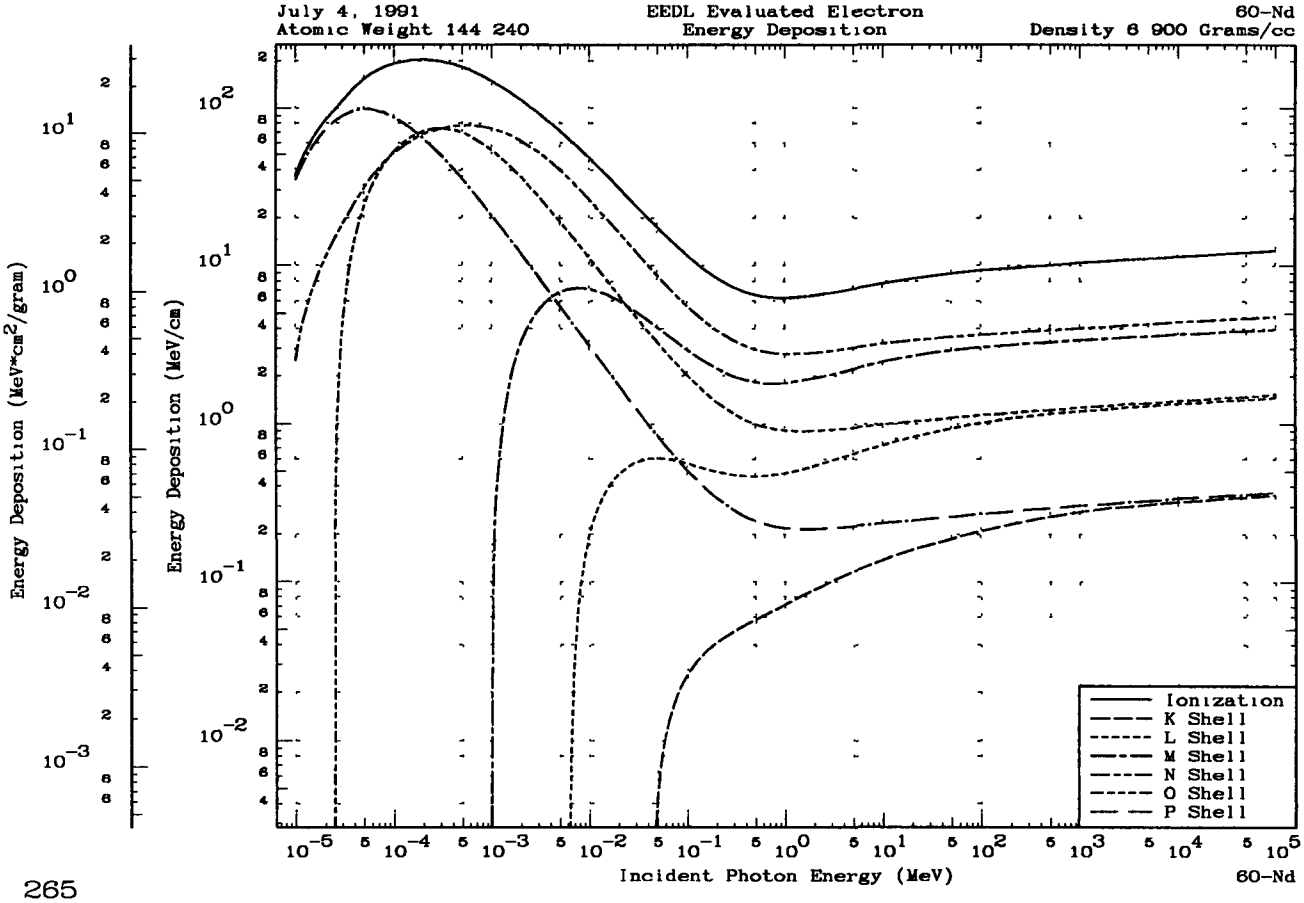
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
60-Nd


July 4, 1991
Atomic Weight 144 240
EEDL Evaluated Electron
Energy Deposition
60-Nd
Density 6 900 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
60-Nd

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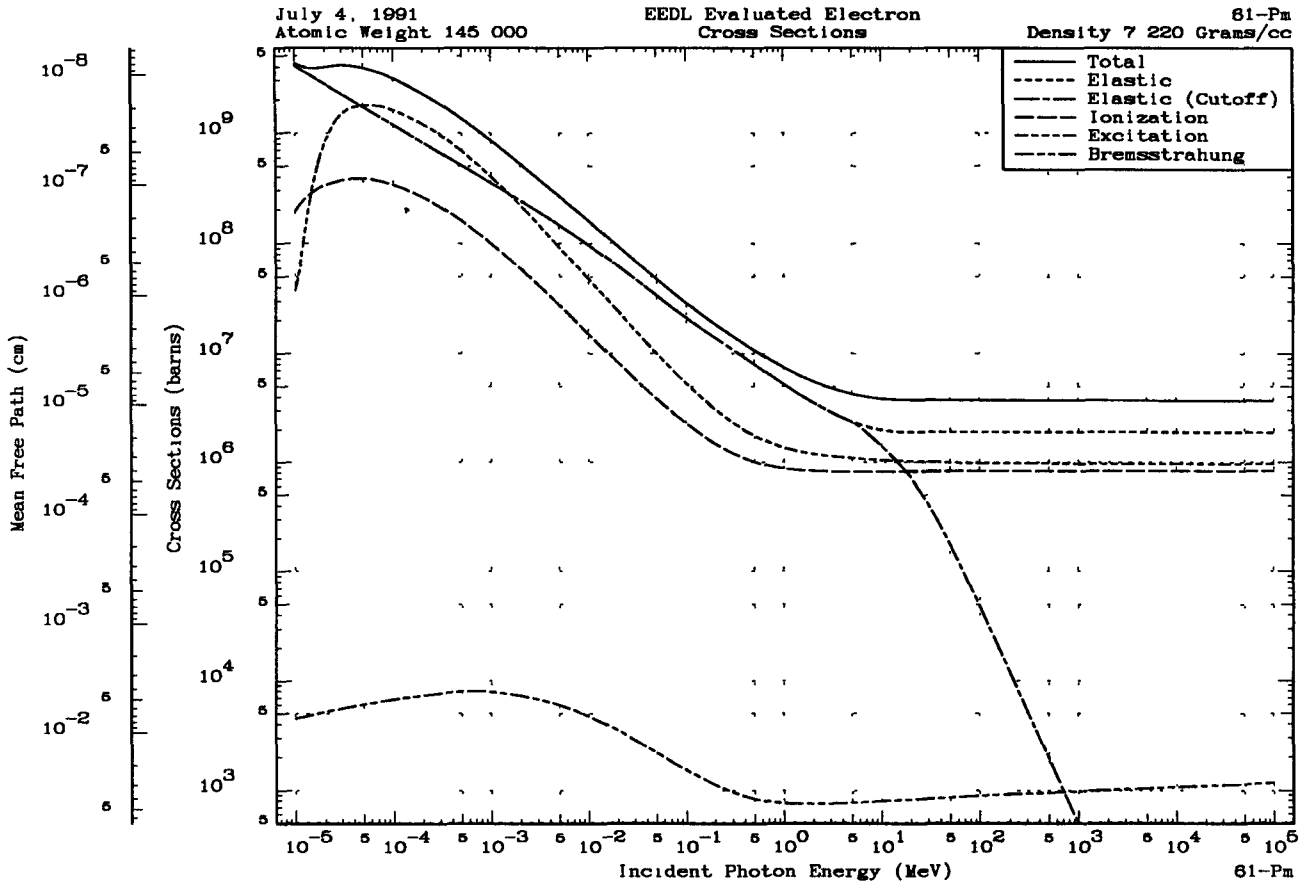
Atomic Weight 144.240 Density 6.900 Grams/cc

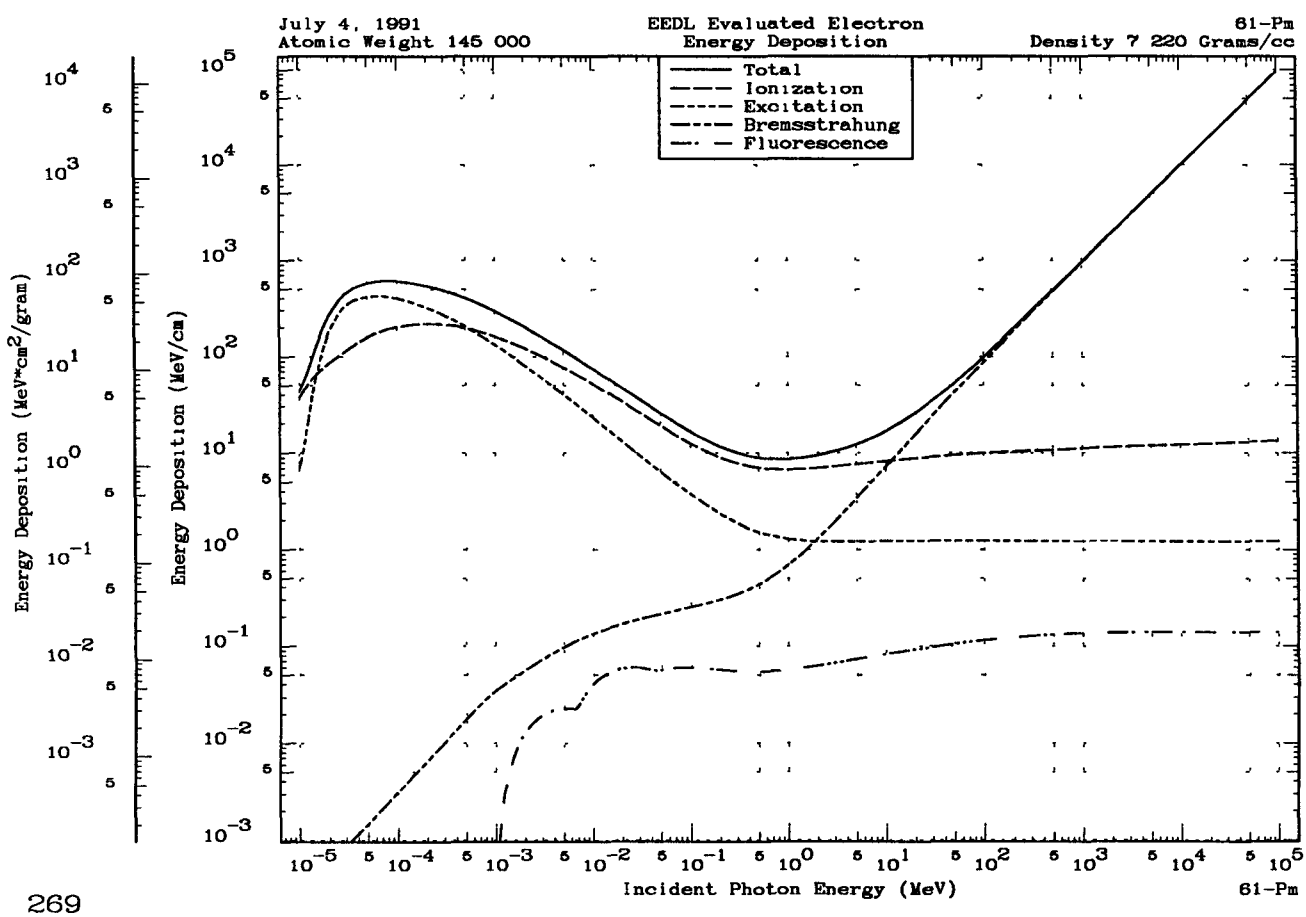
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.9870–9	1.8145+7		4.3461+9	4.0965+9	2.0438+8	4.5237+7	4.5573+3	4.4971+1	3.7159+1	7.8116+0	2.8359–4
	1.0625–5	8.1815–9	1.7714+7		4.2428+9	3.9669+9	2.1963+8	5.6268+7	4.6132+3	5.0763+1	4.0905+1	9.8578+0	3.0061–4
	1.1250–5	8.3547–9	1.7347+7		4.1548+9	3.8484+9	2.3493+8	7.1461+7	4.6665+3	5.7480+1	4.4780+1	1.2699+1	3.1778–4
	1.1719–5	8.4769–9	1.7097+7		4.0950+9	3.7660+9	2.4418+8	8.4766+7	4.7050+3	6.2560+1	4.7336+1	1.5224+1	3.3076–4
	1.2188–5	8.5932–9	1.6865+7		4.0395+9	3.6885+9	2.5324+8	9.7808+7	4.7422+3	6.7652+1	4.9901+1	1.7750+1	3.4381–4
	1.3125–5	8.7983–9	1.6472+7		3.9454+9	3.5463+9	2.7085+8	1.2818+8	4.8134+3	7.8808+1	5.5063+1	2.3746+1	3.7017–4
	1.3359–5	8.8454–9	1.6385+7		3.9244+9	3.5133+9	2.7440+8	1.3672+8	4.8305+3	8.1642+1	5.6185+1	2.5456+1	3.7679–4
	1.5000–5	9.1311–9	1.5872+7		3.8016+9	3.3039+9	2.9845+8	1.9925+8	4.9444+3	1.0255+2	6.4132+1	3.8416+1	4.2378–4
	1.7500–5	9.4248–9	1.5377+7		3.6831+9	3.0445+9	3.2577+8	3.1283+8	5.1001+3	1.3645+2	7.4483+1	6.1966+1	4.9700–4
	2.0000–5	9.5977–9	1.5100+7		3.6168+9	2.8363+9	3.4449+8	4.3593+8	5.2389+3	1.7214+2	8.3481+1	8.8654+1	5.7203–4
O3	2.4880–5	9.6773–9	1.4976+7		3.5870+9	2.5262+9	3.6537+8	6.9541+8	5.4470+3	2.4225+2	9.7115+1	1.4513+2	7.1091–4
	2.5200–5	9.6798–9	1.4972+7		3.5861+9	2.5092+9	3.6633+8	7.1058+8	5.4591+3	2.4646+2	9.7994+1	1.4847+2	7.2003–4
	2.6400–5	9.6787–9	1.4974+7		3.5865+9	2.4480+9	3.6983+8	7.6865+8	5.5035+3	2.6256+2	1.0127+2	1.6129+2	7.5435–4
O2	2.8120–5	9.6494–9	1.5019+7		3.5974+9	2.3674+9	3.7486+8	8.5510+8	5.5642+3	2.8664+2	1.0611+2	1.8052+2	8.0395–4
	2.8200–5	9.6491–9	1.5020+7		3.5975+9	2.3638+9	3.7515+8	8.5849+8	5.5670+3	2.8767+2	1.0638+2	1.8128+2	8.0627–4
	2.8590–5	9.6476–9	1.5022+7		3.5981+9	2.3467+9	3.7633+8	8.7504+8	5.5803+3	2.9257+2	1.0755+2	1.8502+2	8.1758–4
	2.9295–5	9.6416–9	1.5031+7		3.6003+9	2.3166+9	3.7852+8	9.0520+8	5.6040+3	3.0156+2	1.0972+2	1.9185+2	8.3808–4
	3.0000–5	9.6317–9	1.5047+7		3.6040+9	2.2875+9	3.8079+8	9.3564+8	5.6272+3	3.1074+2	1.1197+2	1.9876+2	8.5866–4
	3.0625–5	9.6313–9	1.5047+7		3.6041+9	2.2627+9	3.8140+8	9.6004+8	5.6475+3	3.1766+2	1.1334+2	2.0432+2	8.7697–4
	3.1797–5	9.6239–9	1.5059+7		3.6069+9	2.2181+9	3.8269+8	1.0061+9	5.6845+3	3.3089+2	1.1602+2	2.1487+2	9.1144–4
	3.5000–5	9.5643–9	1.5153+7		3.6294+9	2.1082+9	3.8704+8	1.1342+9	5.7802+3	3.6854+2	1.2404+2	2.4450+2	1.0066–3
	3.5762–5	9.5435–9	1.5186+7		3.6373+9	2.0842+9	3.8796+8	1.1651+9	5.8019+3	3.7759+2	1.2587+2	2.5172+2	1.0295–3
	3.5898–5	9.5427–9	1.5187+7		3.6376+9	2.0800+9	3.8814+8	1.1694+9	5.8057+3	3.7896+2	1.2621+2	2.5275+2	1.0336–3
	4.0000–5	9.4932–9	1.5266+7		3.6565+9	1.9642+9	3.9317+8	1.2992+9	5.9160+3	4.2036+2	1.3621+2	2.8415+2	1.1578–3
O1	4.4800–5	9.5085–9	1.5242+7		3.6507+9	1.8498+9	3.9222+8	1.4087+9	6.0280+3	4.5568+2	1.4444+2	3.1124+2	1.3020–3
	4.5450–5	9.5125–9	1.5235+7		3.6491+9	1.8357+9	3.9212+8	1.4213+9	6.0411+3	4.6004+2	1.4557+2	3.1447+2	1.3208–3
	4.6588–5	9.5180–9	1.5227+7		3.6470+9	1.8119+9	3.9200+8	1.4432+9	6.0637+3	4.6767+2	1.4757+2	3.2009+2	1.3539–3
	4.8294–5	9.5226–9	1.5219+7		3.6453+9	1.7777+9	3.9192+8	1.4757+9	6.0967+3	4.7914+2	1.5064+2	3.2850+2	1.4037–3
	5.0000–5	9.5233–9	1.5218+7		3.6450+9	1.7453+9	3.9196+8	1.5078+9	6.1286+3	4.9062+2	1.5377+2	3.3685+2	1.4537–3
	5.2500–5	9.5776–9	1.5132+7		3.6243+9	1.7008+9	3.8988+8	1.5337+9	6.1739+3	5.0150+2	1.5699+2	3.4451+2	1.5274–3
	5.5000–5	9.6255–9	1.5057+7		3.6063+9	1.6594+9	3.8809+8	1.5588+9	6.2173+3	5.1237+2	1.6031+2	3.5206+2	1.6016–3
	5.6250–5	9.6477–9	1.5022+7		3.5980+9	1.6398+9	3.8714+8	1.5711+9	6.2384+3	5.1767+2	1.6187+2	3.5579+2	1.6388–3
	6.0000–5	9.7065–9	1.4931+7		3.5762+9	1.5847+9	3.8462+8	1.6069+9	6.2994+3	5.3350+2	1.6666+2	3.6684+2	1.7512–3
	7.0000–5	9.9399–9	1.4580+7		3.4922+9	1.4604+9	3.7271+8	1.6591+9	6.4475+3	5.5849+2	1.7467+2	3.8382+2	2.0554–3
	8.0000–5	1.0265–8	1.4119+7		3.3818+9	1.3607+9	3.6297+8	1.6581+9	6.5786+3	5.7125+2	1.8259+2	3.8865+2	2.3656–3
	9.0000–5	1.0663–8	1.3592+7		3.2555+9	1.2785+9	3.5069+8	1.6263+9	6.6869+3	5.7366+2	1.8680+2	3.8685+2	2.6758–3
	1.0000–4	1.1026–8	1.3144+7	0.0000+0	3.1482+9	1.2091+9	3.4067+8	1.5984+9	6.7853+3	5.7741+2	1.9164+2	3.8577+2	2.9904–3
N5	1.2462–4	1.1875–8	1.2205+7	4.2725–8	2.9232+9	1.0764+9	3.1542+8	1.5314+9	6.9777+3	5.7509+2	1.9724+2	3.7785+2	3.7687–3
	1.2779–4	1.2005–8	1.2073+7	4.8250–8	2.8916+9	1.0623+9	3.1229+8	1.5170+9	7.0001+3	5.7308+2	1.9763+2	3.7545+2	3.8704–3
N4	1.2868–4	1.2041–8	1.2036+7	4.9800–8	2.8829+9	1.0584+9	3.1144+8	1.5131+9	7.0062+3	5.7252+2	1.9773+2	3.7479+2	3.8989–3
	1.3135–4	1.2150–8	1.1928+7	5.4462–8	2.8571+9	1.0470+9	3.0890+8	1.5012+9	7.0245+3	5.7094+2	1.9807+2	3.7287+2	3.9847–3
	1.3890–4	1.2451–8	1.1640+7	6.7732–8	2.7880+9	1.0165+9	3.0224+8	1.4692+9	7.0746+3	5.6711+2	1.9934+2	3.6776+2	4.2287–3
	1.4067–4	1.2520–8	1.1575+7	7.0867–8	2.7725+9	1.0098+9	3.0076+8	1.4620+9	7.0860+3	5.6631+2	1.9967+2	3.6663+2	4.2864–3
	1.5000–4	1.2876–8	1.1255+7	8.7391–8	2.6958+9	9.7610+8	2.9350+8	1.4262+9	7.1441+3	5.6261+2	2.0152+2	3.6108+2	4.5905–3
	1.6250–4	1.3381–8	1.0830+7	1.0980–7	2.5941+9	9.3571+8	2.8297+8	1.3754+9	7.2115+3	5.5301+2	2.0154+2	3.5146+2	5.0032–3
	1.8125–4	1.4101–8	1.0278+7	1.4407–7	2.4618+9	8.8329+8	2.6952+8	1.3089+9	7.3044+3	5.4145+2	2.0232+2	3.3912+2	5.6290–3
	2.0000–4	1.4780–8	9.8056+6	1.7898–7	2.3486+9	8.3856+8	2.5823+8	1.2518+9	7.3892+3	5.3253+2	2.0376+2	3.2876+2	6.2622–3
N3	2.2972–4	1.5918–8	9.1045+6	2.3590–7	2.1807+9	7.7942+8	2.4073+8	1.1605+9	7.4831+3	5.1201+2	2.0188+2	3.1012+2	7.2850–3
	2.3411–4	1.6086–8	9.0097+6	2.4450–7	2.1580+9	7.7166+8	2.3844+8	1.1479+9	7.4960+3	5.0928+2	2.0170+2	3.0757+2	7.4372–3
	2.4235–4	1.6396–8	8.8391+6	2.6075–7	2.1171+9	7.5771+8	2.3434+8	1.1251+9	7.5197+3	5.0447+2	2.0145+2	3.0301+2	7.7233–3
	2.4956–4	1.6664–8	8.6973+6	2.7509–7	2.0831+9	7.4607+8	2.3094+8	1.1061+9	7.5398+3	5.0055+2	2.0131+2	2.9924+2	7.9744–3
N2	2.5276–4	1.6781–8	8.6362+6	2.8150–7	2.0685+9	7.4107+8	2.2948+8	1.0980+9	7.5486+3	4.9889+2	2.0127+2	2.9762+2	8.0863–3
	2.5571–4	1.6893–8	8.5791+6	2.8743–7	2.0548+9	7.3653+8	2.2804+8	1.0902+9	7.5566+3	4.9698+2	2.0100+2	2.9597+2	8.1895–3
	2.6125–4	1.7101–8	8.4747+6	2.9861–7	2.0298+9	7.2825+8	2.2542+8	1.0761+9	7.5713+3	4.9354+2	2.0055+2	2.9298+2	8.3832–3
	2.6217–4	1.7136–8	8.4577+6	3.0047–7	2.0258+9	7.2691+8	2.2500+8	1.0739+9	7.5737+3	4.9298+2	2.0048+2	2.9249+2	8.4154–3
	2.7094–4	1.7461–8	8.3002+6	3.1835–7	1.9880+9	7.1439+8	2.2106+8	1.0526+9	7.5965+3	4.8786+2	1.9986+2	2.8799+2	8.7232–3
	2.8108–4	1.7831–8	8.1278+6	3.3927–7	1.9467+9	7.0066+8	2.1677+8	1.0293+9	7.6220+3	4.8236+2	1.9927+2	2.8309+2	9.0804–3
	2.8547–4	1.7989–8	8.0563+6	3.4838–7	1.9296+9	6.9495+8	2.1499+8	1.0197+9	7.6327+3	4.8012+2	1.9905+2	2.8106+2	9.2352–3
	3.0000–4	1.8506–8	7.8314+6	3.7887–7	1.8758+9	6.7697+8	2.0943+8	9.8934+8	7.6674+3	4.7320+2	1.9847+2	2.7472+2	9.7496–3
N1	3.1358–4	1.9001–8	7.6272+6	4.0781–7	1.8268+9	6.6133+8	2.0414+8	9.6136+8	7.6983+3	4.6528+2	1.9695+2	2.6832+2	1.0232–2
	3.1898–4	1.9205–8	7.5462+6	4.1946–7	1.8074+9	6.5543+8	2.0213+8	9.4986+8	7.7093+3	4.6214+2	1.9639+2	2.6575+2	1.0425–2
	3.2500–4	1.9431–8	7.4585+6	4.3253–7	1.7864+9	6.4902+8	1.9996+8	9.3744+8	7.7213+3	4.5877+2	1.9580+2	2.6296+2	1.0639–2
	3.2911–4	1.9584–8	7.4001+6	4.4151–7	1.7725+9	6.4475+8	1.9852+8	9.2918+8	7.7294+3	4.5655+2	1.9542+2	2.6111+2	1.0786–2
	3.4683–4	2.0237–8	7.1617+6	4.8071–7	1.7153+9	6.2722+8	1.9263+8	8.9548+8	7.7631+3	4.4757+2	1.9397+2	2.5359+2	1.1421–2
	3.5000–4	2.0352–8	7.1211+6	4.8780–7	1.7056+9	6.2423+8	1.9163+8	8.8976+8	7.7690+3	4.4607+2	1.9374+2	2.5232+2	1.1535–2
	3.6250–4	2.0802–8	6.9670+6	5.1601–7	1.6687+9	6.1282+8	1.8784+8	8.6804+8	7.7917+3	4.4039+2	1.9289+2	2.4749+2	1.1984–2
	3.7342–4	2.1190–8	6.8394+6	5.4092–7	1.6381+9	6.0334+8	1.8471+8	8.5009+8	7.8110+3	4.3577+2	1.9224+2	2.4351+2	1.2378–2
	4.0000–4	2.2117–8	6.5529+6	6.0265–7	1.5695+9	5.8192+8	1.7769+8	8.0990+8	7.8558+3	4.2568+2	1.9102+2	2.3464+2	1.3341–2
	4.5000–4	2.3889–8	6.0668+6	7.2315–7	1.4531+9	5.4699+8	1.6502+8	7.4108+8	7.8981+3	4.0434+2	1.8590+2	2.1843+2	1.5149–2
	5.0000–4	2.5588–8	5.6638+6	8.4948–7	1.3566+9	5.1753+8	1.5456+8	6.8449+8	7.9360+3	3.8735+2	1.8214+2	2.0519+2	1.6967–2
	6.0000–4	2.8838–8	5.0255+6	1.1177–6	1.2037+9	4.7025+8	1.3758+8	5.9587+8	7.9813+3	3.5870+2	1.7486+2	1.8382+2	2.0582–2
	7.0000–4	3.2022–8	4.5259+6	1.4070–6	1.0840+9	4.3366+8	1.2376+8	5.2659+8	7.9694+3	3.3297+2	1.6664+2	1.6631+2	2.3990–2
	8.0000–4	3.5048–8	4.1351+6	1.7164–6	9.9043+8	4.0427+8	1.1302+8	4.7313+8	7.9592+3	3.1365+2	1.6074+2	1.5288+2	2.7394–2
M5	9.8432–4	4.0472–8	3.5809+6	2.3353–6	8.5769+8	3.6254+8	9.7372+7	3.9777+8	7.8384+3	2.8254+2	1.4958+2	1.3293+2	3.2572–2
	9.9216–4	4.0701–8	3.5607+6	2.3631–6	8.5286+8	3.6103+8	9.6822+7	3.9500+8	7.8338+3	2.8147+2	1.4922+2	1.3222+2	3.2790–2
	1.0000–3	4.0930–8	3.5409+6	2.3910–6	8.4809+8	3.5954+8	9.6279+7	3.9226+8	7.8292+3	2.8042+2	1.4887+2	1.3151+2	3.3009–2
M4	1.0073–3	4.1133–8	3.5234+6	2.4170–6	8.4391+8	3.5817+8	9.5756+7	3.8997+8	7.8221+3	2.7933+2	1.4843+2	1.3087+2	3.3172–2
	1.0156–3	4.1370–8	3.5032+6	2.4469–6	8.3907+8	3.5662+8	9.5164+7	3.8728+8	7.8141+3	2.7809+2	1.4793+2	1.3013+2	3.3358–2
	1.0381–3	4.2006–8	3.4502+6	2.5282–6	8.2638+8	3.5254+8	9.3612+7	3.8022+8	7.7929+3	2.7483+2	1.4662+2	1.2818+2	3.3858–2
	1.0459–3	4.2225–8	3.4322+6	2.5567–6	8.2207+8	3.5115+8	9.3086+7	3.7783+8	7.7856+3	2.7373+2	1.4618+2	1.2752+2	3.4032–2

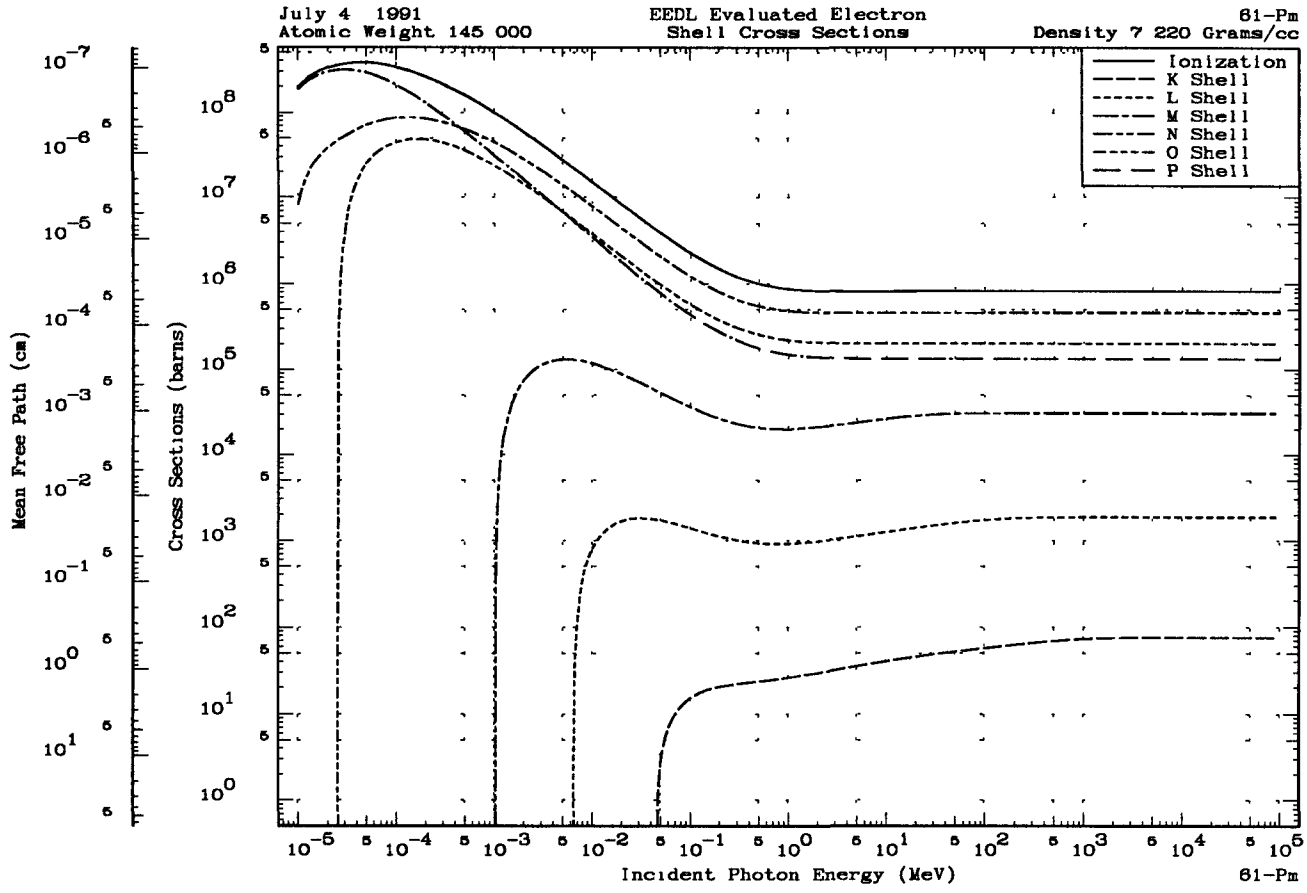
Atomic Weight 144.240 Density 6.900 Grams/cc

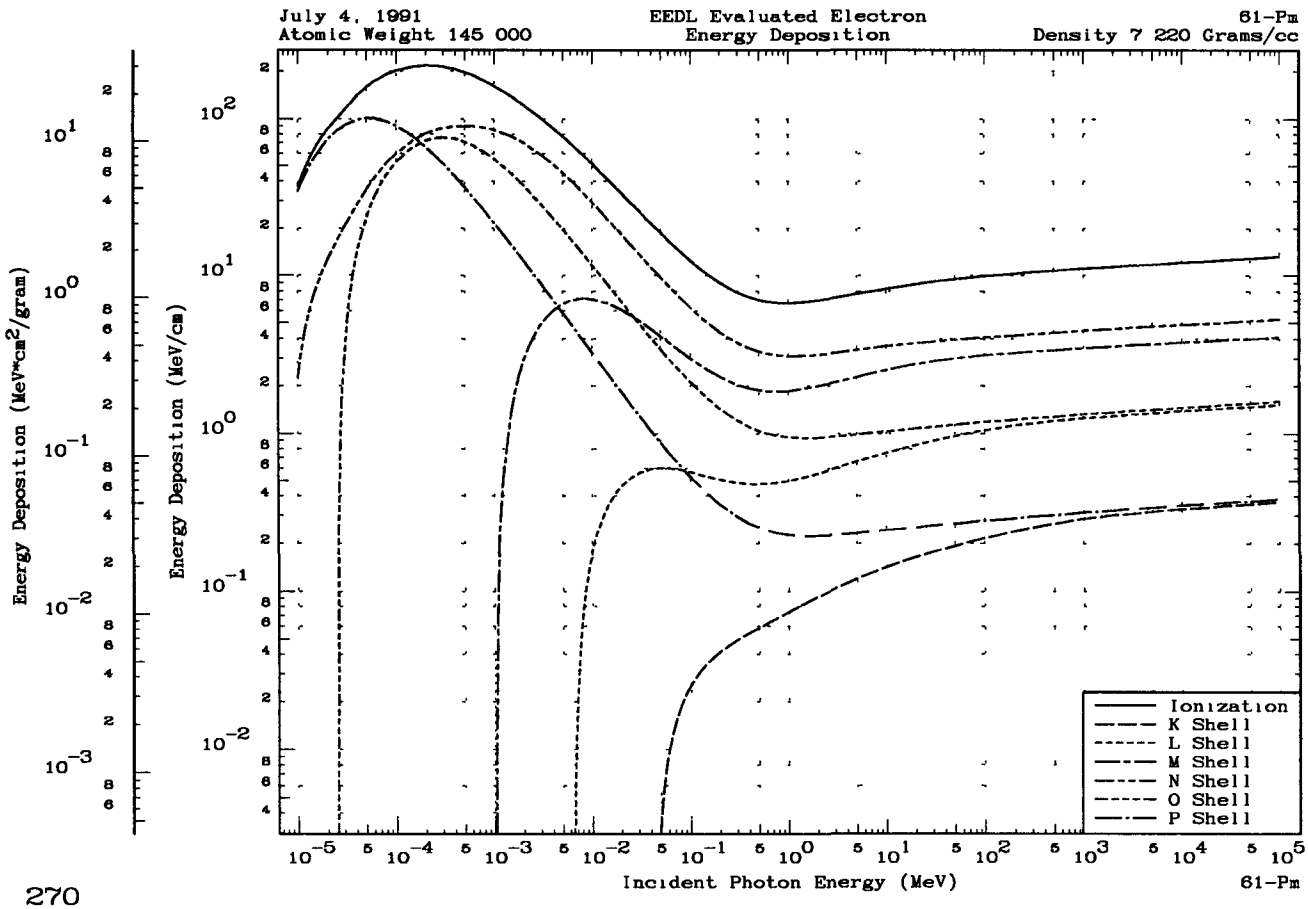
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0958–3	4.3618–8	3.3226+6	2.7413–6	7.9583+8	3.4264+8	8.9885+7	3.6330+8	7.7405+3	2.6709+2	1.4355+2	1.2350+2	3.5139–2
	1.1027–3	4.3807–8	3.3083+6	2.7669–6	7.9240+8	3.4152+8	8.9467+7	3.6140+8	7.7345+3	2.6623+2	1.4321+2	1.2298+2	3.5291–2
	1.2020–3	4.6510–8	3.1161+6	3.1483–6	7.4635+8	3.2636+8	8.3876+7	3.3610+8	7.6518+3	2.5479+2	1.3873+2	1.1602+2	3.7480–2
M3	1.2871–3	4.8764–8	2.9720+6	3.4879–6	7.1184+8	3.1482+8	7.9708+7	3.1731+8	7.5869+3	2.4645+2	1.3554+2	1.1086+2	3.9342–2
	1.2979–3	4.9048–8	2.9548+6	3.5319–6	7.0773+8	3.1344+8	7.9195+7	3.1509+8	7.5790+3	2.4536+2	1.3509+2	1.1023+2	3.9578–2
	1.3137–3	4.9460–8	2.9302+6	3.5965–6	7.0183+8	3.1145+8	7.8461+7	3.1191+8	7.5675+3	2.4379+2	1.3443+2	1.0933+2	3.9922–2
	1.3510–3	5.0428–8	2.8740+6	3.7505–6	6.8836+8	3.0690+8	7.6790+7	3.0467+8	7.5412+3	2.4025+2	1.3294+2	1.0727+2	4.0733–2
	1.3603–3	5.0667–8	2.8604+6	3.7892–6	6.8511+8	3.0579+8	7.6386+7	3.0293+8	7.5348+3	2.3939+2	1.3258+2	1.0677+2	4.0934–2
M2	1.3928–3	5.1501–8	2.8141+6	3.9259–6	6.7401+8	3.0202+8	7.5011+7	2.9698+8	7.5126+3	2.3648+2	1.3135+2	1.0509+2	4.1639–2
	1.4196–3	5.2197–8	2.7766+6	4.0398–6	6.6504+8	2.9900+8	7.3921+7	2.9211+8	7.4925+3	2.3416+2	1.3039+2	1.0373+2	4.2168–2
	1.4301–3	5.2469–8	2.7622+6	4.0849–6	6.6158+8	2.9784+8	7.3502+7	2.9024+8	7.4846+3	2.3328+2	1.3003+2	1.0321+2	4.2376–2
	1.4598–3	5.3231–8	2.7226+6	4.2127–6	6.5211+8	2.9464+8	7.2353+7	2.8511+8	7.4630+3	2.3086+2	1.2904+2	1.0178+2	4.2960–2
	1.5000–3	5.4257–8	2.6711+6	4.3880–6	6.3978+8	2.9046+8	7.0861+7	2.7846+8	7.4344+3	2.2775+2	1.2778+2	9.9929+1	4.3749–2
M1	1.5518–3	5.5536–8	2.6096+6	4.6176–6	6.2504+8	2.8531+8	6.8990+7	2.7073+8	7.3978+3	2.2357+2	1.2587+2	9.7654+1	4.4739–2
	1.5625–3	5.5814–8	2.5966+6	4.6655–6	6.2193+8	2.8427+8	6.8615+7	2.6904+8	7.3904+3	2.2267+2	1.2548+2	9.7147+1	4.4943–2
	1.5798–3	5.6263–8	2.5759+6	4.7435–6	6.1697+8	2.8261+8	6.8017+7	2.6634+8	7.3786+3	2.2125+2	1.2486+2	9.6342+1	4.5273–2
	1.6250–3	5.7426–8	2.5237+6	4.9494–6	6.0448+8	2.7840+8	6.6511+7	2.5956+8	7.3484+3	2.1769+2	1.2332+2	9.4317+1	4.6133–2
	1.6323–3	5.7614–8	2.5155+6	4.9832–6	6.0250+8	2.7773+8	6.6273+7	2.5849+8	7.3435+3	2.1712+2	1.2308+2	9.3999+1	4.6272–2
	1.6719–3	5.8622–8	2.4723+6	5.1666–6	5.9215+8	2.7422+8	6.5026+7	2.5289+8	7.3180+3	2.1417+2	1.2179+2	9.2329+1	4.7021–2
	1.7242–3	5.9944–8	2.4177+6	5.4132–6	5.7908+8	2.6976+8	6.3455+7	2.4586+8	7.2853+3	2.1047+2	1.2019+2	9.0232+1	4.8011–2
	1.8125–3	6.2144–8	2.3321+6	5.8384–6	5.5858+8	2.6269+8	6.0996+7	2.3489+8	7.2325+3	2.0474+2	1.1772+2	8.6963+1	4.9672–2
	1.8359–3	6.2723–8	2.3106+6	5.9532–6	5.5343+8	2.6090+8	6.0379+7	2.3214+8	7.2190+3	2.0330+2	1.1710+2	8.6146+1	5.0111–2
	1.8621–3	6.3366–8	2.2871+6	6.0826–6	5.4781+8	2.5894+8	5.9707+7	2.2916+8	7.2042+3	2.0174+2	1.1643+2	8.5257+1	5.0602–2
	2.0000–3	6.6705–8	2.1727+6	6.7790–6	5.2039+8	2.4928+8	5.6432+7	2.1467+8	7.1297+3	1.9423+2	1.1323+2	8.0947+1	5.3171–2
	2.2500–3	7.2672–8	1.9943+6	8.1127–6	4.7766+8	2.3368+8	5.1220+7	1.9275+8	6.9723+3	1.8082+2	1.0676+2	7.4001+1	5.7056–2
	2.5000–3	7.8432–8	1.8478+6	9.5385–6	4.4258+8	2.2056+8	4.6976+7	1.7504+8	6.8344+3	1.6998+2	1.0152+2	6.8402+1	6.0887–2
	2.6250–3	8.1242–8	1.7839+6	1.0284–5	4.2727+8	2.1473+8	4.5133+7	1.6741+8	6.7715+3	1.6533+2	9.9277+1	6.5991+1	6.2783–2
	3.0000–3	8.9422–8	1.6207+6	1.2637–5	3.8819+8	1.9956+8	4.0458+7	1.4816+8	6.6023+3	1.5360+2	9.3603+1	5.9926+1	6.8400–2
	3.5000–3	1.0001–7	1.4491+6	1.6049–5	3.4708+8	1.8306+8	3.5520+7	1.2849+8	6.3761+3	1.3971+2	8.6319+1	5.3314+1	7.4801–2
	4.0000–3	1.1013–7	1.3160+6	1.9770–5	3.1520+8	1.6988+8	3.1739+7	1.1357+8	6.1864+3	1.2916+2	8.0764+1	4.8314+1	8.1060–2
	5.0000–3	1.3005–7	1.1144+6	2.8075–5	2.6693+8	1.4937+8	2.6215+7	9.1339+7	5.8260+3	1.1206+2	7.1568+1	4.0400+1	9.1320–2
	6.0000–3	1.4894–7	9.7309+5	3.7536–5	2.3307+8	1.3424+8	2.2396+7	7.6433+7	5.5258+3	9.9587+1	6.4588+1	3.4898+1	1.0039–1
L3	6.2007–3	1.5257–7	9.4989+5	3.9573–5	2.2752+8	1.3167+8	2.1765+7	7.4073+7	5.4659+3	9.7419+1	6.3330+1	3.3988+1	1.0187–1
	6.4256–3	1.5667–7	9.2506+5	4.1909–5	2.2157+8	1.2892+8	2.1101+7	7.1544+7	5.4017+3	9.5146+1	6.2018+1	3.3025+1	1.0353–1
L2	6.7274–3	1.6210–7	8.9408+5	4.5129–5	2.1415+8	1.2545+8	2.0277+7	6.8414+7	5.3201+3	9.2328+1	6.0389+1	3.1833+1	1.0573–1
	6.8192–3	1.6375–7	8.8507+5	4.6128–5	2.1199+8	1.2444+8	2.0039+7	6.7501+7	5.2962+3	9.1513+1	5.9920+1	3.1486+1	1.0640–1
	7.0455–3	1.6779–7	8.6374+5	4.8628–5	2.0688+8	1.2205+8	1.9479+7	6.5353+7	5.2392+3	8.9586+1	5.8808+1	3.0670+1	1.0803–1
L1	7.0933–3	1.6864–7	8.5940+5	4.9162–5	2.0584+8	1.2155+8	1.9365+7	6.4917+7	5.2274+3	8.9195+1	5.8582+1	3.0505+1	1.0837–1
	7.2066–3	1.7064–7	8.4934+5	5.0439–5	2.0343+8	1.2041+8	1.9099+7	6.3917+7	5.1989+3	8.8264+1	5.8040+1	3.0115+1	1.0914–1
	7.4096–3	1.7419–7	8.3201+5	5.2760–5	1.9928+8	1.1843+8	1.8643+7	6.2202+7	5.1494+3	8.6668+1	5.7111+1	2.9446+1	1.1050–1
	7.5228–3	1.7616–7	8.2270+5	5.4072–5	1.9705+8	1.1736+8	1.8398+7	6.1285+7	5.1225+3	8.5815+1	5.6615+1	2.9089+1	1.1126–1
	7.6033–3	1.7756–7	8.1624+5	5.5014–5	1.9550+8	1.1662+8	1.8228+7	6.0649+7	5.1037+3	8.5222+1	5.6270+1	2.8841+1	1.1180–1
	8.0000–3	1.8437–7	7.8608+5	5.9745–5	1.8828+8	1.1313+8	1.7439+7	5.7703+7	5.0150+3	8.2477+1	5.4671+1	2.7692+1	1.1443–1
	8.5000–3	1.9293–7	7.5118+5	6.5933–5	1.7992+8	1.0898+8	1.6539+7	5.4395+7	4.9022+3	7.9150+1	5.2676+1	2.6357+1	1.1727–1
	9.0000–3	2.0135–7	7.1976+5	7.2372–5	1.7240+8	1.0521+8	1.5733+7	5.1450+7	4.7983+3	7.6186+1	5.0898+1	2.5168+1	1.2007–1
	9.2500–3	2.0551–7	7.0520+5	7.5683–5	1.6891+8	1.0345+8	1.5360+7	5.0095+7	4.7492+3	7.4819+1	5.0076+1	2.4621+1	1.2146–1
	1.0000–2	2.1780–7	6.6542+5	8.5963–5	1.5938+8	9.8591+7	1.4349+7	4.6433+7	4.6123+3	7.1122+1	4.7852+1	2.3144+1	1.2559–1
	1.1250–2	2.3797–7	6.0901+5	1.0427–4	1.4587+8	9.1512+7	1.2945+7	4.1406+7	4.3868+3	6.5518+1	4.4384+1	2.1003+1	1.3048–1
	1.2500–2	2.5752–7	5.6278+5	1.2404–4	1.3479+8	8.5612+7	1.1806+7	3.7372+7	4.1944+3	6.0992+1	4.1570+1	1.9286+1	1.3531–1
	1.3125–2	2.6709–7	5.4262+5	1.3445–4	1.2997+8	8.3010+7	1.1314+7	3.5640+7	4.1082+3	5.9041+1	4.0354+1	1.8549+1	1.3770–1
	1.5000–2	2.9503–7	4.9123+5	1.6761–4	1.1766+8	7.6286+7	1.0069+7	3.1298+7	3.8812+3	5.4127+1	3.7279+1	1.6703+1	1.4474–1
	1.7500–2	3.3143–7	4.3727+5	2.1629–4	1.0473+8	6.8946+7	8.8065+6	2.6978+7	3.6099+3	4.8688+1	3.3786+1	1.4751+1	1.5149–1
	2.0000–2	3.6644–7	3.9550+5	2.6995–4	9.4728+7	6.3161+7	7.8423+6	2.3721+7	3.3903+3	4.4550+1	3.1112+1	1.3280+1	1.5811–1
	2.5000–2	4.3537–7	3.3289+5	3.9129–4	7.9732+7	5.4349+7	6.4784+6	1.8901+7	3.0243+3	3.8034+1	2.6924+1	1.0942+1	1.6684–1
	3.0000–2	5.0079–7	2.8940+5	5.3107–4	6.9315+7	4.8071+7	5.5426+6	1.5699+7	2.7548+3	3.3600+1	2.4036+1	9.3885+0	1.7547–1
	3.5000–2	5.6353–7	2.5718+5	6.8797–4	6.1598+7	4.3255+7	4.8725+6	1.3468+7	2.5388+3	3.0195+1	2.1774+1	8.2399+0	1.8168–1
	4.0000–2	6.2400–7	2.3226+5	8.6111–4	5.5629+7	3.9475+7	4.3581+6	1.1793+7	2.3655+3	2.7599+1	2.0033+1	7.3778+0	1.8788–1
K	4.3597–2	6.6527–7	2.1785+5	9.9521–4	5.2178+7	3.7209+7	4.0624+6	1.0904+7	2.2591+3	2.6064+1	1.8975+1	6.8975+0	1.9154–1
	4.4397–2	6.7442–7	2.1489+5	1.0261–3	5.1470+7	3.6747+7	4.0027+6	1.0718+7	2.2372+3	2.5753+1	1.8762+1	6.7991+0	1.9230–1
	4.5798–2	6.9033–7	2.0994+5	1.0810–3	5.0284+7	3.5972+7	3.9029+6	1.0407+7	2.2004+3	2.5233+1	1.8404+1	6.6350+0	1.9363–1
	4.7899–2	7.1396–7	2.0299+5	1.1655–3	4.8620+7	3.4881+7	3.7631+6	9.9732+6	2.1482+3	2.4506+1	1.7904+1	6.4065+0	1.9564–1
	5.0000–2	7.3732–7	1.9656+5	1.2525–3	4.7080+7	3.3868+7	3.6340+6	9.5753+6	2.0995+3	2.3836+1	1.7442+1	6.1969+0	1.9764–1
	5.2500–2	7.6458–7	1.8955+5	1.3590–3	4.5401+7	3.2752+7	3.4959+6	9.1505+6	2.0458+3	2.3089+1	1.6926+1	5.9626+0	1.9969–1
	5.6250–2	8.0482–7	1.8007+5	1.5251–3	4.3131+7	3.1237+7	3.3096+6	8.5818+6	1.9721+3	2.2083+1	1.6231+1	5.6491+0	2.0278–1
	6.0000–2	8.4435–7	1.7164+5	1.6984–3	4.1111+7	2.9883+7	3.1444+6	8.0818+6	1.9056+3	2.1193+1	1.5613+1	5.3739+0	2.0588–1
	6.5000–2	8.9485–7	1.6196+5	1.9404–3	3.8791+7	2.8326+7	2.9584+6	7.5049+6	1.8299+3	2.0139+1	1.4886+1	5.0429+0	2.0945–1
	7.2500–2	9.6855–7	1.4963+5	2.3257–3	3.5840+7	2.6332+7	2.7222+6	6.7838+6	1.7316+3	1.8808+1	1.3963+1	4.6297+0	2.1486–1
	8.0000–2	1.0401–6	1.3935+5	2.7366–3	3.3375+7	2.4655+7	2.5257+6	6.1932+6	1.6474+3	1.7706+1	1.3194+1	4.2918+0	2.2027–1
	9.0000–2	1.1278–6	1.2851+5	3.3210–3	3.0780+7	2.2841+7	2.3197+6	5.6168+6	1.5535+3	1.6532+1	1.2352+1	3.9540+0	2.2619–1
	1.0000–1	1.2124–6	1.1954+5	3.9443–3	2.8631+7	2.1333+7	2.1499+6	5.1467+6	1.4741+3	1.5568+1	1.1657+1	3.6797+0	2.3215–1
	1.2500–1	1.4031–6	1.0329+5	5.6488–3	2.4740+7	1.8591+7	1.8548+6	4.2929+6	1.3281+3	1.3801+1	1.0401+1	3.1558+0	2.4401–1
	1.5000–1	1.5806–6	9.1691+4	7.5471–3	2.1962+7	1.6615+7	1.6442+6	3.7016+6	1.2196+3	1.2558+1	9.5060+0	2.7957+0	2.5609–1
	2.0000–1	1.8884–6	7.6748+4	1.1793–2	1.8382+7	1.3997+7	1.3910+6	2.9933+6	1.0773+3	1.1027+1	8.4027+0	2.3476+0	2.7686–1
	3.0000–1	2.4124–6	6.0077+4	2.1557–2	1.4389+7	1.0984+7	1.1406+6	2.2639+6	9.2503+2	9.4954+0	7.3080+0	1.8711+0	3.1633–1
	4.0000–1	2.8576–6	5.0716+4	3.2485–2	1.2147+7	9.1966+6	1.0192+6	1.9307+6	8.4706+2	8.8142+0	6.8016+0	1.6559+0	3.5674–1
	5.0000–1	3.2441–6	4.4674+4	4.4050–2	1.0700+7	8.0042+6	9.4917+5	1.7459+6	8.0147+2	8.4820+0	6.5419+0	1.5408+0	3.9932–1
	6.0000–1	3.5939–6	4.0326+4	5.5980–2	9.6586+6	7.1457+6	9.0432+5	1.6078+6	7.7406+2	8.2821+0	6.3853+0	1.4527+0	4.4410–1
	8.0000–1	4.1871–6	3.4613+4	8.0274–2	8.2904+6	5.9750+6	8.5230+5	1.4624+6	7.4503+2	8.1832+0	6.2740+0	1.3708+0	5.3849–1
	1.0000+0	4.6896–6	3.0904+4	1.0470–1	7.4020+6	5.2145+6	8.2388+5	1.3628+6	7.3100+2	8.1945+0	6.2429+0	1.3132+0	6.3841–1
	1.5000+0	5.6396–6	2.5698+4	1.6447–1	6.1551+6	4.1144+6	7.9320+5	1.2468+6	7.2027+2	8.5367+0	6.3658+0	1.2626+0	9.0835–1

Atomic Weight 144.240												Density 6.900 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000+0	6.3029–6	2.2994+4	2.2166–1	5.5074+6	3.5122+6	7.8464+5	1.2098+6	7.2161+2	8.9529+0	6.4974+0	1.2569+0	1.1986+0
3.0000+0	7.2366–6	2.0027+4	3.2830–1	4.7968+6	2.8754+6	7.7482+5	1.1459+6	7.2915+2	9.8155+0	6.7504+0	1.2522+0	1.8129+0
4.0000+0	7.8358–6	1.8496+4	4.2594–1	4.4300+6	2.5375+6	7.7192+5	1.1198+6	7.3609+2	1.0679+1	6.9633+0	1.2490+0	2.4666+0
5.0000+0	8.2494–6	1.7568+4	5.1599–1	4.2079+6	2.3318+6	7.7193+5	1.1034+6	7.4225+2	1.1543+1	7.1468+0	1.2557+0	3.1401+0
6.0000+0	8.5528–6	1.6945+4	5.9961–1	4.0586+6	2.2002+6	7.7191+5	1.0857+6	7.4792+2	1.2385+1	7.2929+0	1.2601+0	3.8318+0
8.0000+0	8.9384–6	1.6214+4	7.5116–1	3.8835+6	2.0373+6	7.7315+5	1.0724+6	7.5871+2	1.4045+1	7.5333+0	1.2654+0	5.2462+0
1.0000+1	9.1680–6	1.5808+4	8.8578–1	3.7863+6	1.9529+6	7.7411+5	1.0585+6	7.6856+2	1.5699+1	7.7348+0	1.2694+0	6.6950+0
1.5000+1	9.3680–6	1.5470+4	1.1689+0	3.7054+6	1.8877+6	7.7618+5	1.0408+6	7.8271+2	1.9777+1	8.0364+0	1.2678+0	1.0473+1
2.0000+1	9.4227–6	1.5381+4	1.3985+0	3.6839+6	1.8851+6	7.7742+5	1.0206+6	7.9245+2	2.3914+1	8.2657+0	1.2626+0	1.4385+1
3.0000+1	9.4602–6	1.5320+4	1.7575+0	3.6693+6	1.8840+6	7.7867+5	1.0058+6	8.0752+2	3.2200+1	8.5387+0	1.2525+0	2.2409+1
4.0000+1	9.4842–6	1.5281+4	2.0334+0	3.6600+6	1.8833+6	7.7930+5	9.9664+5	8.1919+2	4.0617+1	8.7364+0	1.2491+0	3.0632+1
5.0000+1	9.5075–6	1.5244+4	2.2570+0	3.6511+6	1.8827+6	7.7975+5	9.8781+5	8.2936+2	4.9118+1	8.8898+0	1.2461+0	3.8982+1
6.0000+1	9.5265–6	1.5213+4	2.4446+0	3.6438+6	1.8822+6	7.8006+5	9.8069+5	8.3776+2	5.7682+1	9.0097+0	1.2451+0	4.7428+1
8.0000+1	9.5381–6	1.5195+4	2.7477+0	3.6393+6	1.8815+6	7.8034+5	9.7669+5	8.5163+2	7.5060+1	9.1798+0	1.2436+0	6.4637+1
1.0000+2	9.5485–6	1.5178+4	2.9872+0	3.6354+6	1.8809+6	7.8053+5	9.7315+5	8.6187+2	9.2578+1	9.3212+0	1.2427+0	8.2013+1
1.5000+2	9.5554–6	1.5167+4	3.4289+0	3.6328+6	1.8798+6	7.8067+5	9.7143+5	8.7937+2	1.3665+2	9.4806+0	1.2411+0	1.2593+2
2.0000+2	9.5615–6	1.5157+4	3.7457+0	3.6304+6	1.8790+6	7.8076+5	9.6973+5	8.9121+2	1.8110+2	9.6279+0	1.2394+0	1.7023+2
3.0000+2	9.5697–6	1.5144+4	4.1953+0	3.6273+6	1.8780+6	7.8086+5	9.6759+5	9.0508+2	2.6967+2	9.8706+0	1.2377+0	2.5856+2
4.0000+2	9.5761–6	1.5134+4	4.5157+0	3.6249+6	1.8772+6	7.8089+5	9.6587+5	9.1440+2	3.5867+2	9.9821+0	1.2366+0	3.4745+2
5.0000+2	9.5829–6	1.5124+4	4.7646+0	3.6223+6	1.8766+6	7.8091+5	9.6386+5	9.2158+2	4.4833+2	1.0085+1	1.2350+0	4.3701+2
6.0000+2	9.5865–6	1.5118+4	4.9682+0	3.6210+6	1.8762+6	7.8092+5	9.6294+5	9.2797+2	5.3658+2	1.0169+1	1.2349+0	5.2517+2
8.0000+2	9.5942–6	1.5106+4	5.2901+0	3.6181+6	1.8754+6	7.8093+5	9.6081+5	9.3814+2	7.1463+2	1.0331+1	1.2342+0	7.0307+2
1.0000+3	9.6012–6	1.5095+4	5.5399+0	3.6154+6	1.8748+6	7.8094+5	9.5872+5	9.4634+2	8.9289+2	1.0454+1	1.2336+0	8.8120+2
1.5000+3	9.6063–6	1.5087+4	5.9937+0	3.6135+6	1.8738+6	7.8094+5	9.5783+5	9.6161+2	1.3413+3	1.0578+1	1.2325+0	1.3294+3
2.0000+3	9.6105–6	1.5080+4	6.3155+0	3.6119+6	1.8730+6	7.8094+5	9.5700+5	9.7294+2	1.7872+3	1.0701+1	1.2315+0	1.7753+3
3.0000+3	9.6153–6	1.5073+4	6.7691+0	3.6102+6	1.8720+6	7.8094+5	9.5626+5	9.8944+2	2.6823+3	1.0937+1	1.2306+0	2.6702+3
4.0000+3	9.6189–6	1.5067+4	7.0907+0	3.6088+6	1.8712+6	7.8094+5	9.5561+5	1.0016+3	3.5799+3	1.1024+1	1.2298+0	3.5676+3
5.0000+3	9.6231–6	1.5060+4	7.3397+0	3.6072+6	1.8706+6	7.8094+5	9.5463+5	1.0112+3	4.4868+3	1.1111+1	1.2286+0	4.4744+3
6.0000+3	9.6242–6	1.5059+4	7.5431+0	3.6068+6	1.8701+6	7.8095+5	9.5468+5	1.0181+3	5.3755+3	1.1190+1	1.2287+0	5.3631+3
8.0000+3	9.6267–6	1.5055+4	7.8641+0	3.6058+6	1.8694+6	7.8095+5	9.5448+5	1.0291+3	7.1684+3	1.1342+1	1.2285+0	7.1558+3
1.0000+4	9.6288–6	1.5052+4	8.1129+0	3.6051+6	1.8688+6	7.8095+5	9.5428+5	1.0378+3	8.9778+3	1.1481+1	1.2284+0	8.9650+3
1.5000+4	9.6317–6	1.5047+4	8.5656+0	3.6040+6	1.8678+6	7.8095+5	9.5423+5	1.0545+3	1.3406+4	1.1597+1	1.2283+0	1.3393+4
2.0000+4	9.6343–6	1.5043+4	8.8874+0	3.6030+6	1.8670+6	7.8095+5	9.5400+5	1.0665+3	1.7891+4	1.1713+1	1.2281+0	1.7878+4
3.0000+4	9.6372–6	1.5038+4	9.3412+0	3.6019+6	1.8660+6	7.8095+5	9.5393+5	1.0835+3	2.6774+4	1.1945+1	1.2280+0	2.6761+4
4.0000+4	9.6396–6	1.5035+4	9.6633+0	3.6010+6	1.8652+6	7.8095+5	9.5378+5	1.0956+3	3.5754+4	1.2049+1	1.2278+0	3.5740+4
5.0000+4	9.6432–6	1.5029+4	9.9130+0	3.5997+6	1.8646+6	7.8095+5	9.5301+5	1.1050+3	4.4650+4	1.2131+1	1.2268+0	4.4636+4
6.0000+4	9.6437–6	1.5028+4	1.0117+1	3.5995+6	1.8642+6	7.8095+5	9.5330+5	1.1126+3	5.3538+4	1.2205+1	1.2272+0	5.3525+4
8.0000+4	9.6456–6	1.5025+4	1.0439+1	3.5988+6	1.8634+6	7.8095+5	9.5332+5	1.1248+3	7.1470+4	1.2352+1	1.2272+0	7.1457+4
1.0000+5	9.6472–6	1.5023+4	1.0689+1	3.5982+6	1.8628+6	7.8095+5	9.5329+5	1.1342+3	8.9434+4	1.2497+1	1.2272+0	8.9421+4


July 4, 1991
Atomic Weight 145 000
EEDL Evaluated Electron
Cross Sections
61-Pm
Density 7 220 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
61-Pm


July 4, 1991
Atomic Weight 145 000
EEDL Evaluated Electron
Energy Deposition
61-Pm
Density 7 220 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
61-Pm


July 4 1991
Atomic Weight 145 000
EEDL Evaluated Electron
Shell Cross Sections
61-Pm
Density 7 220 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
61-Pm


July 4, 1991
Atomic Weight 145 000
EEDL Evaluated Electron
Energy Deposition
61-Pm
Density 7 220 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
61-Pm

270

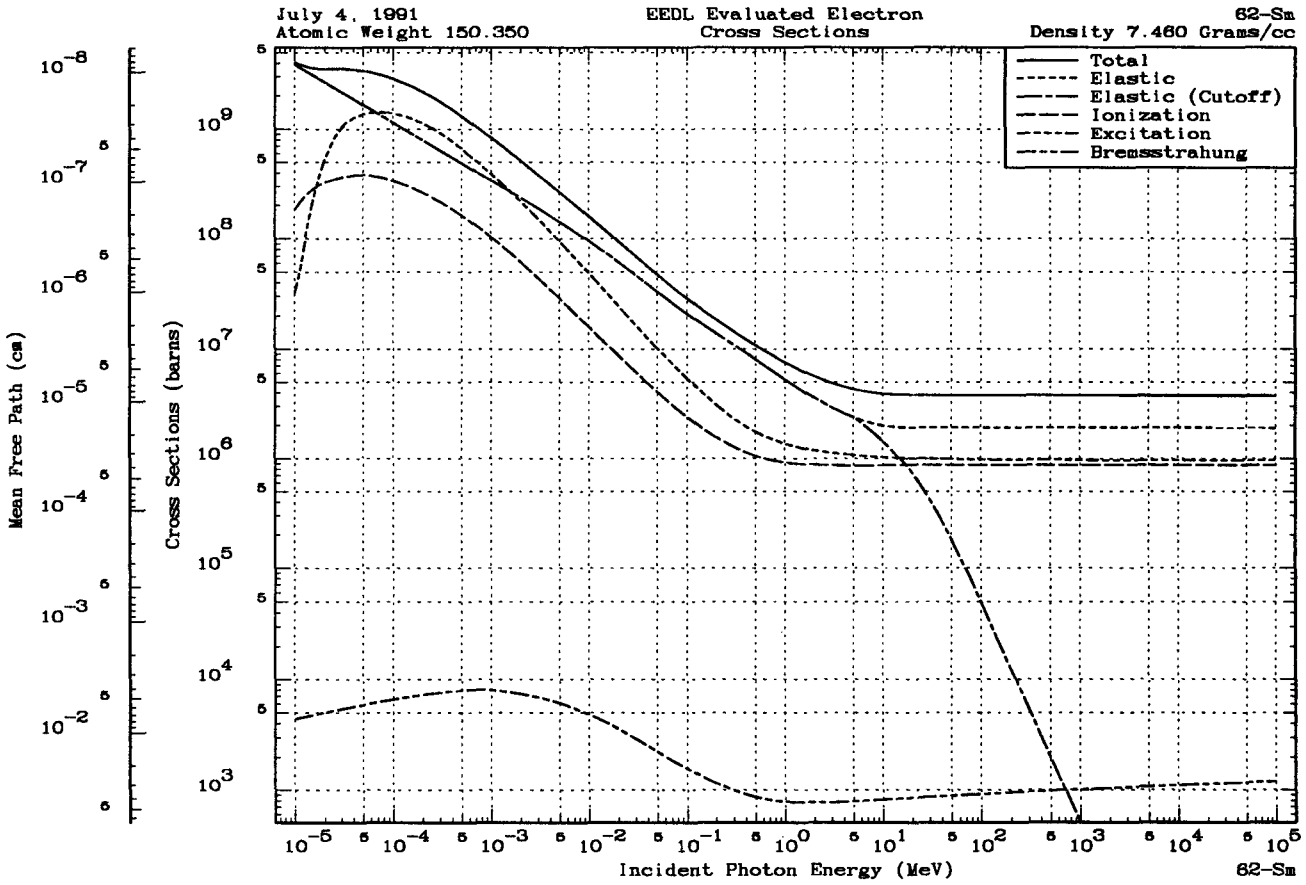
Atomic Weight 145.000 Density 7.220 Grams/cc

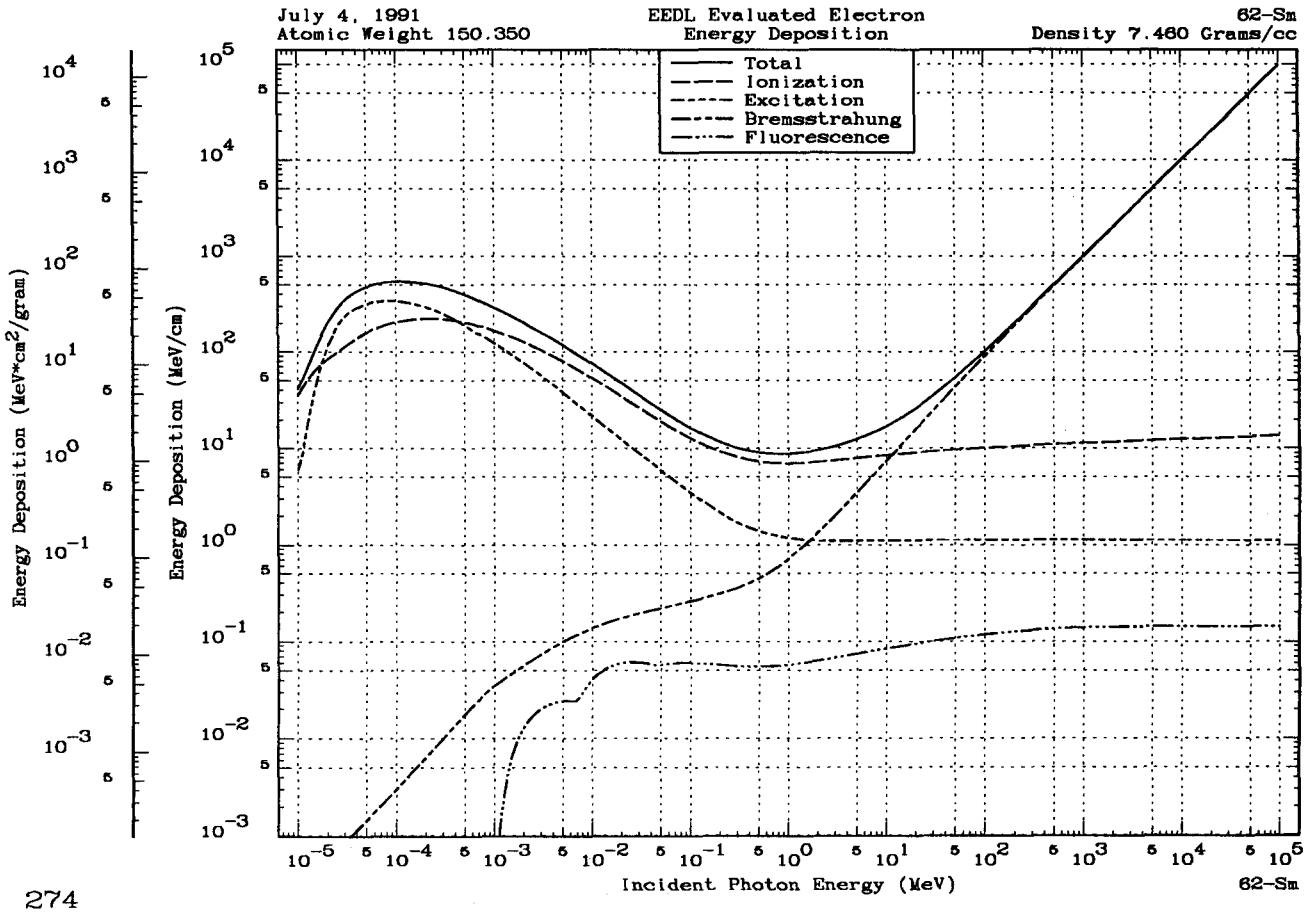
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.7689–9	1.7828+7		4.2926+9	4.0612+9	1.9295+8	3.8477+7	4.4994+3	4.3808+1	3.6821+1	6.9871+0	2.9146–4
	1.0625–5	7.9611–9	1.7398+7		4.1890+9	3.9321+9	2.0850+8	4.8402+7	4.5547+3	4.9748+1	4.0830+1	8.9178+0	3.0897–4
	1.1250–5	8.1322–9	1.7032+7		4.1008+9	3.8141+9	2.2361+8	6.3131+7	4.6075+3	5.6642+1	4.4843+1	1.1799+1	3.2663–4
	1.1719–5	8.2390–9	1.6811+7		4.0477+9	3.7320+9	2.3318+8	8.2500+7	4.6455+3	6.3188+1	4.7604+1	1.5583+1	3.3998–4
	1.3125–5	8.4667–9	1.6359+7		3.9388+9	3.5133+9	2.6022+8	1.6531+8	4.7529+3	8.8000+1	5.5787+1	3.2212+1	3.8052–4
	1.3359–5	8.4889–9	1.6316+7		3.9285+9	3.4804+9	2.6394+8	1.8423+8	4.7699+3	9.3093+1	5.7010+1	3.6083+1	3.8733–4
	1.5000–5	8.5861–9	1.6131+7		3.8840+9	3.2720+9	2.8808+8	3.2399+8	4.8826+3	1.3106+2	6.5348+1	6.5712+1	4.3567–4
	1.7500–5	8.5293–9	1.6239+7		3.9099+9	3.0139+9	3.1574+8	5.8025+8	5.0367+3	1.9705+2	7.6259+1	1.2079+2	5.1099–4
	2.0000–5	8.4014–9	1.6486+7		3.9694+9	2.8069+9	3.3502+8	8.2749+8	5.1741+3	2.6247+2	8.5785+1	1.7668+2	5.8819–4
O3	2.5460–5	8.1381–9	1.7019+7		4.0979+9	2.4681+9	3.5848+8	1.2713+9	5.4024+3	3.8017+2	1.0168+2	2.7849+2	7.4823–4
	2.5744–5	8.1335–9	1.7029+7		4.1002+9	2.4536+9	3.5935+8	1.2873+9	5.4129+3	3.8474+2	1.0250+2	2.8224+2	7.5658–4
	2.6741–5	8.1132–9	1.7072+7		4.1105+9	2.4044+9	3.6234+8	1.3438+9	5.4490+3	4.0089+2	1.0536+2	2.9553+2	7.8605–4
	2.8371–5	8.0677–9	1.7168+7		4.1336+9	2.3298+9	3.6726+8	1.4366+9	5.5057+3	4.2771+2	1.1019+2	3.1752+2	8.3452–4
O2	2.8960–5	8.0483–9	1.7209+7		4.1436+9	2.3044+9	3.6886+8	1.4704+9	5.5255+3	4.3739+2	1.1183+2	3.2556+2	8.5215–4
	2.9480–5	8.0454–9	1.7215+7		4.1451+9	2.2826+9	3.7046+8	1.4920+9	5.5427+3	4.4429+2	1.1344+2	3.3085+2	8.6776–4
	3.0000–5	8.0416–9	1.7223+7		4.1470+9	2.2614+9	3.7204+8	1.5135+9	5.5597+3	4.5120+2	1.1505+2	3.3614+2	8.8340–4
	3.0625–5	8.0509–9	1.7204+7		4.1423+9	2.2367+9	3.7291+8	1.5326+9	5.5798+3	4.5754+2	1.1663+2	3.4091+2	9.0226–4
	3.1797–5	8.0648–9	1.7174+7		4.1351+9	2.1925+9	3.7472+8	1.5679+9	5.6166+3	4.6953+2	1.1973+2	3.4980+2	9.3777–4
	3.2500–5	8.0711–9	1.7161+7		4.1319+9	2.1671+9	3.7594+8	1.5889+9	5.6381+3	4.7681+2	1.2171+2	3.5510+2	9.5917–4
	3.3848–5	8.0806–9	1.7140+7		4.1270+9	2.1207+9	3.7776+8	1.6286+9	5.6783+3	4.9030+2	1.2510+2	3.6520+2	1.0004–3
	3.5000–5	8.0855–9	1.7130+7		4.1245+9	2.0832+9	3.7931+8	1.6620+9	5.7116+3	5.0177+2	1.2800+2	3.7377+2	1.0358–3
	3.6250–5	8.1246–9	1.7048+7		4.1047+9	2.0447+9	3.8117+8	1.6789+9	5.7468+3	5.1007+2	1.3132+2	3.7874+2	1.0745–3
	4.0000–5	8.2265–9	1.6836+7		4.0538+9	1.9402+9	3.8646+8	1.7271+9	5.8466+3	5.3444+2	1.4117+2	3.9327+2	1.1916–3
	4.5000–5	8.3738–9	1.6540+7		3.9825+9	1.8223+9	3.8624+8	1.7740+9	5.9605+3	5.5800+2	1.5036+2	4.0764+2	1.3450–3
O1	4.6270–5	8.4064–9	1.6476+7		3.9671+9	1.7955+9	3.8633+8	1.7852+9	5.9877+3	5.6394+2	1.5277+2	4.1117+2	1.3844–3
	4.6736–5	8.4222–9	1.6445+7		3.9596+9	1.7859+9	3.8636+8	1.7873+9	5.9968+3	5.6567+2	1.5366+2	4.1201+2	1.3984–3
	4.7552–5	8.4493–9	1.6392+7		3.9469+9	1.7695+9	3.8644+8	1.7909+9	6.0127+3	5.6870+2	1.5524+2	4.1346+2	1.4229–3
	4.8776–5	8.4887–9	1.6316+7		3.9286+9	1.7458+9	3.8661+8	1.7962+9	6.0361+3	5.7326+2	1.5763+2	4.1563+2	1.4599–3
	5.0000–5	8.5266–9	1.6244+7		3.9111+9	1.7229+9	3.8683+8	1.8014+9	6.0590+3	5.7784+2	1.6007+2	4.1777+2	1.4970–3
	5.2500–5	8.6340–9	1.6042+7		3.8625+9	1.6787+9	3.8513+8	1.7987+9	6.1043+3	5.8271+2	1.6361+2	4.1910+2	1.5731–3
	5.5000–5	8.7361–9	1.5854+7		3.8174+9	1.6376+9	3.8371+8	1.7960+9	6.1478+3	5.8772+2	1.6726+2	4.2046+2	1.6497–3
	5.6250–5	8.7856–9	1.5765+7		3.7959+9	1.6182+9	3.8294+8	1.7948+9	6.1689+3	5.9014+2	1.6899+2	4.2115+2	1.6882–3
	6.0000–5	8.9274–9	1.5514+7		3.7355+9	1.5635+9	3.8093+8	1.7911+9	6.2300+3	5.9751+2	1.7426+2	4.2325+2	1.8043–3
	6.5000–5	9.1205–9	1.5186+7		3.6565+9	1.4983+9	3.7512+8	1.7831+9	6.3066+3	6.0243+2	1.7863+2	4.2379+2	1.9606–3
	7.0000–5	9.2992–9	1.4894+7		3.5862+9	1.4403+9	3.7022+8	1.7757+9	6.3783+3	6.0776+2	1.8330+2	4.2446+2	2.1186–3
	7.2500–5	9.3844–9	1.4759+7		3.5537+9	1.4136+9	3.6783+8	1.7722+9	6.4126+3	6.1034+2	1.8550+2	4.2484+2	2.1982–3
	8.0000–5	9.6993–9	1.4280+7		3.4383+9	1.3415+9	3.6160+8	1.7352+9	6.5097+3	6.1189+2	1.9235+2	4.1954+2	2.4392–3
	9.0000–5	1.0149–8	1.3647+7		3.2860+9	1.2599+9	3.5018+8	1.6759+9	6.6191+3	6.0780+2	1.9737+2	4.1043+2	2.7604–3
	1.0000–4	1.0565–8	1.3110+7	0.0000+0	3.1566+9	1.1912+9	3.4090+8	1.6245+9	6.7184+3	6.0595+2	2.0302+2	4.0292+2	3.0863–3
	1.1250–4	1.1108–8	1.2469+7	2.0807–8	3.0023+9	1.1189+9	3.2721+8	1.5562+9	6.8228+3	5.9561+2	2.0580+2	3.8980+2	3.4939–3
N5	1.3059–4	1.1830–8	1.1708+7	5.1442–8	2.8189+9	1.0337+9	3.1148+8	1.4738+9	6.9572+3	5.8543+2	2.1102+2	3.7441+2	4.0935–3
N4	1.3505–4	1.2007–8	1.1536+7	5.9077–8	2.7776+9	1.0154+9	3.0756+8	1.4546+9	6.9878+3	5.8275+2	2.1179+2	3.7096+2	4.2429–3
	1.3544–4	1.2023–8	1.1520+7	5.9750–8	2.7737+9	1.0138+9	3.0723+8	1.4526+9	6.9905+3	5.8245+2	2.1187+2	3.7058+2	4.2561–3
	1.3879–4	1.2166–8	1.1384+7	6.5506–8	2.7411+9	1.0008+9	3.0445+8	1.4359+9	7.0128+3	5.7996+2	2.1252+2	3.6744+2	4.3686–3
	1.4439–4	1.2401–8	1.1169+7	7.5205–8	2.6892+9	9.7993+8	3.0006+8	1.4092+9	7.0493+3	5.7620+2	2.1375+2	3.6244+2	4.5580–3
	1.5000–4	1.2631–8	1.0966+7	8.4962–8	2.6403+9	9.6029+8	2.9597+8	1.3840+9	7.0845+3	5.7294+2	2.1517+2	3.5776+2	4.7483–3
	1.6250–4	1.3135–8	1.0544+7	1.0697–7	2.5389+9	9.2030+8	2.8578+8	1.3328+9	7.1539+3	5.6288+2	2.1557+2	3.4731+2	5.1780–3
	1.8125–4	1.3855–8	9.9969+6	1.4065–7	2.4070+9	8.6841+8	2.7275+8	1.2659+9	7.2497+3	5.5076+2	2.1689+2	3.3387+2	5.8299–3
	2.0000–4	1.4535–8	9.5292+6	1.7498–7	2.2944+9	8.2415+8	2.6182+8	1.2085+9	7.3371+3	5.4143+2	2.1889+2	3.2253+2	6.4898–3
	2.2500–4	1.5435–8	8.9733+6	2.2183–7	2.1606+9	7.7415+8	2.4735+8	1.1391+9	7.4221+3	5.2590+2	2.1790+2	3.0799+2	7.3894–3
N3	2.3987–4	1.5947–8	8.6855+6	2.5032–7	2.0913+9	7.4826+8	2.3994+8	1.1031+9	7.4687+3	5.1826+2	2.1770+2	3.0055+2	7.9293–3
	2.4363–4	1.6080–8	8.6136+6	2.5758–7	2.0740+9	7.4211+8	2.3806+8	1.0938+9	7.4800+3	5.1607+2	2.1749+2	2.9857+2	8.0663–3
	2.5067–4	1.6326–8	8.4834+6	2.7129–7	2.0426+9	7.3095+8	2.3468+8	1.0770+9	7.5009+3	5.1216+2	2.1716+2	2.9499+2	8.3237–3
	2.6301–4	1.6750–8	8.2689+6	2.9551–7	1.9910+9	7.1253+8	2.2914+8	1.0493+9	7.5362+3	5.0589+2	2.1676+2	2.8912+2	8.7758–3
N2	2.6501–4	1.6818–8	8.2355+6	2.9948–7	1.9829+9	7.0966+8	2.2828+8	1.0450+9	7.5418+3	5.0493+2	2.1671+2	2.8821+2	8.8494–3
	2.6938–4	1.6973–8	8.1605+6	3.0816–7	1.9649+9	7.0352+8	2.2635+8	1.0350+9	7.5539+3	5.0247+2	2.1642+2	2.8604+2	9.0104–3
	2.7704–4	1.7240–8	8.0337+6	3.2346–7	1.9343+9	6.9312+8	2.2309+8	1.0181+9	7.5746+3	4.9837+2	2.1598+2	2.8238+2	9.2927–3
	2.8150–4	1.7395–8	7.9623+6	3.3244–7	1.9171+9	6.8725+8	2.2126+8	1.0086+9	7.5864+3	4.9610+2	2.1576+2	2.8033+2	9.4578–3
	2.8852–4	1.7636–8	7.8537+6	3.4663–7	1.8910+9	6.7832+8	2.1848+8	9.9417+8	7.6047+3	4.9267+2	2.1545+2	2.7721+2	9.7177–3
	3.0000–4	1.8024–8	7.6845+6	3.7006–7	1.8503+9	6.6440+8	2.1418+8	9.7168+8	7.6338+3	4.8746+2	2.1508+2	2.7238+2	1.0144–2
	3.2500–4	1.8884–8	7.3345+6	4.2208–7	1.7660+9	6.3676+8	2.0474+8	9.2449+8	7.6937+3	4.7366+2	2.1230+2	2.6135+2	1.1079–2
N1	3.2807–4	1.8987–8	7.2945+6	4.2858–7	1.7564+9	6.3359+8	2.0366+8	9.1909+8	7.7008+3	4.7211+2	2.1201+2	2.6009+2	1.1194–2
	3.3257–4	1.9145–8	7.2344+6	4.3812–7	1.7419+9	6.2904+8	2.0211+8	9.1073+8	7.7101+3	4.6977+2	2.1158+2	2.5818+2	1.1363–2
	3.4100–4	1.9439–8	7.1251+6	4.5615–7	1.7156+9	6.2075+8	1.9928+8	8.9553+8	7.7272+3	4.6555+2	2.1082+2	2.5472+2	1.1680–2
	3.5000–4	1.9749–8	7.0132+6	4.7558–7	1.6886+9	6.1224+8	1.9639+8	8.7998+8	7.7451+3	4.6128+2	2.1009+2	2.5118+2	1.2020–2
	3.5575–4	1.9945–8	6.9441+6	4.8807–7	1.6720+9	6.0698+8	1.9461+8	8.7040+8	7.7563+3	4.5867+2	2.0966+2	2.4900+2	1.2237–2
	3.6250–4	2.0175–8	6.8653+6	5.0284–7	1.6530+9	6.0096+8	1.9259+8	8.5947+8	7.7693+3	4.5571+2	2.0918+2	2.4652+2	1.2493–2
	3.7787–4	2.0689–8	6.6945+6	5.3681–7	1.6119+9	5.8787+8	1.8820+8	8.3580+8	7.7979+3	4.4940+2	2.0823+2	2.4116+2	1.3077–2
	4.0000–4	2.1415–8	6.4676+6	5.8650–7	1.5573+9	5.7041+8	1.8239+8	8.0444+8	7.8374+3	4.4127+2	2.0716+2	2.3410+2	1.3921–2
	4.5000–4	2.3079–8	6.0014+6	7.0263–7	1.4450+9	5.3590+8	1.6960+8	7.3950+8	7.8888+3	4.2003+2	2.0151+2	2.1851+2	1.5836–2
	5.0000–4	2.4672–8	5.6139+6	8.2413–7	1.3517+9	5.0680+8	1.5904+8	6.8586+8	7.9350+3	4.0309+2	1.9734+2	2.0573+2	1.7763–2
	6.0000–4	2.7712–8	4.9980+6	1.0812–6	1.2034+9	4.6012+8	1.4212+8	6.0117+8	7.9952+3	3.7535+2	1.9029+2	1.8504+2	2.1603–2
	7.0000–4	3.0730–8	4.5071+6	1.3574–6	1.0852+9	4.2403+8	1.2812+8	5.3306+8	7.9969+3	3.4909+2	1.8146+2	1.6761+2	2.5230–2
	8.0000–4	3.3597–8	4.1225+6	1.6522–6	9.9260+8	3.9506+8	1.1721+8	4.8032+8	7.9983+3	3.2935+2	1.7510+2	1.5421+2	2.8858–2
	1.0000–3	3.9153–8	3.5375+6	2.2931–6	8.5175+8	3.5100+8	1.0012+8	4.0061+8	7.8853+3	2.9538+2	1.6231+2	1.3303+2	3.4835–2
M5	1.0346–3	4.0065–8	3.4570+6	2.4113–6	8.3238+8	3.4471+8	9.7643+7	3.9001+8	7.8544+3	2.9017+2	1.6007+2	1.3007+2	3.5654–2
	1.0419–3	4.0256–8	3.4406+6	2.4364–6	8.2842+8	3.4343+8	9.7140+7	3.8784+8	7.8481+3	2.8912+2	1.5962+2	1.2946+2	3.5825–2
	1.0490–3	4.0444–8	3.4246+6	2.4612–6	8.2458+8	3.4218+8	9.6652+7	3.8573+8	7.8419+3	2.8811+2	1.5919+2	1.2888+2	3.5994–2
	1.0561–3	4.0628–8	3.4091+6	2.4857–6	8.2083+8	3.4097+8	9.6177+7	3.8368+8	7.8358+3	2.8712+2	1.5878+2	1.2831+2	3.6161–2
M4	1.0596–3	4.0720–8	3.4014+6	2.4980–6	8.1898+8	3.4036+8	9.5941+7	3.8266+8	7.8328+3	2.8663+2	1.5857+2	1.2802+2	3.6244–2

Atomic Weight 145.000 Density 7.220 Grams/cc

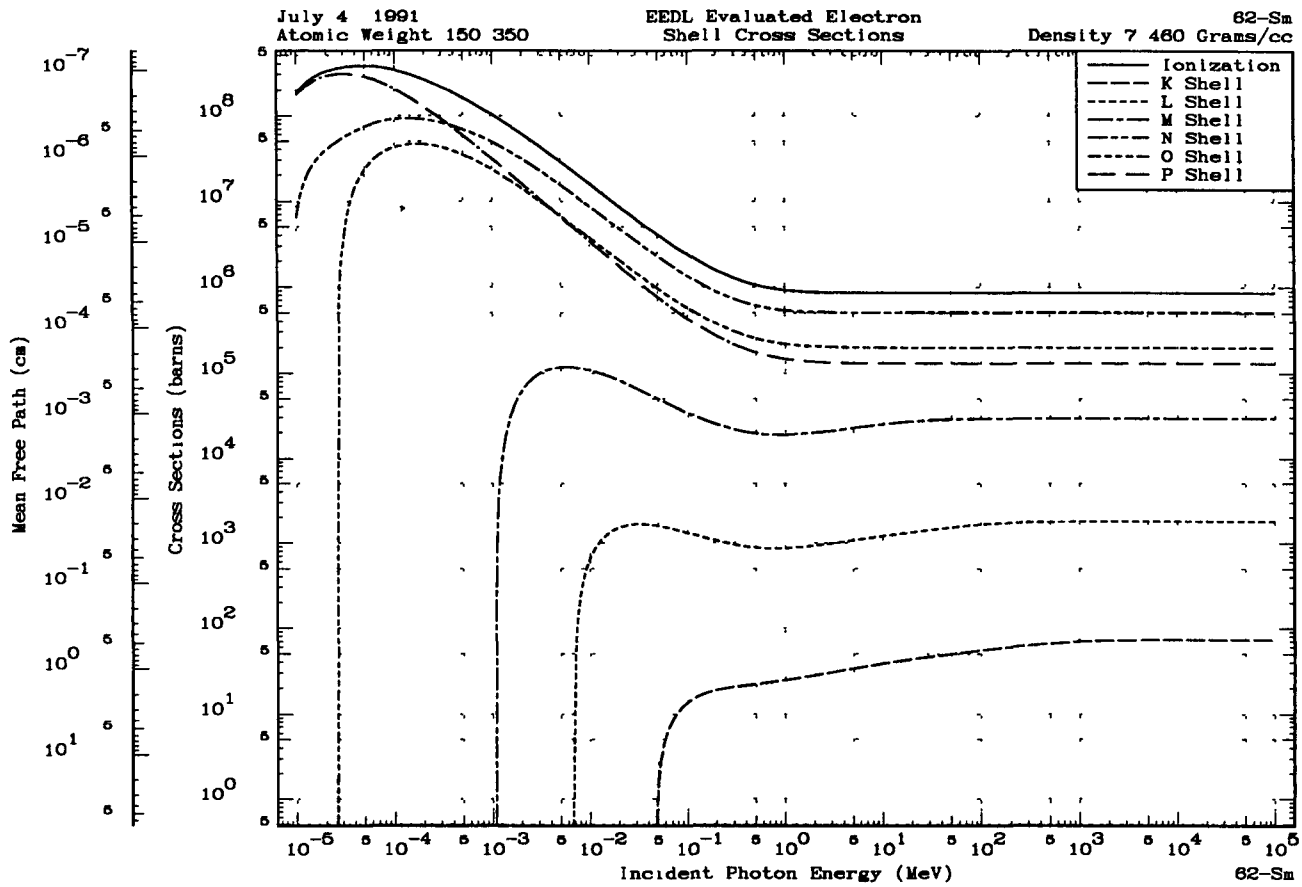
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0699–3	4.0995–8	3.3786+6	2.5342–6	8.1349+8	3.3861+8	9.5249+7	3.7962+8	7.8240+3	2.8515+2	1.5794+2	1.2718+2	3.6487–2
	1.0871–3	4.1449–8	3.3416+6	2.5947–6	8.0458+8	3.3576+8	9.4126+7	3.7469+8	7.8097+3	2.8276+2	1.5691+2	1.2581+2	3.6892–2
	1.0968–3	4.1704–8	3.3211+6	2.6291–6	7.9965+8	3.3417+8	9.3505+7	3.7197+8	7.8017+3	2.8145+2	1.5635+2	1.2506+2	3.7120–2
	1.1387–3	4.2798–8	3.2362+6	2.7794–6	7.7921+8	3.2758+8	9.0933+7	3.6069+8	7.7680+3	2.7603+2	1.5405+2	1.2194+2	3.8103–2
	1.1472–3	4.3018–8	3.2197+6	2.8102–6	7.7522+8	3.2629+8	9.0433+7	3.5850+8	7.7614+3	2.7498+2	1.5361+2	1.2134+2	3.8302–2
	1.2290–3	4.5111–8	3.0703+6	3.1130–6	7.3926+8	3.1455+8	8.5927+7	3.3878+8	7.6999+3	2.6561+2	1.4968+2	1.1590+2	4.0212–2
	1.2354–3	4.5272–8	3.0594+6	3.1370–6	7.3664+8	3.1369+8	8.5598+7	3.3734+8	7.6954+3	2.6494+2	1.4940+2	1.1550+2	4.0360–2
	1.2500–3	4.5639–8	3.0348+6	3.1922–6	7.3071+8	3.1174+8	8.4858+7	3.3411+8	7.6850+3	2.6340+2	1.4875+2	1.1461+2	4.0699–2
M3	1.3469–3	4.8043–8	2.8830+6	3.5668–6	6.9415+8	2.9960+8	8.0301+7	3.1424+8	7.6191+3	2.5410+2	1.4491+2	1.0915+2	4.2944–2
	1.3660–3	4.8526–8	2.8542+6	3.6424–6	6.8723+8	2.9737+8	7.9445+7	3.1041+8	7.6058+3	2.5221+2	1.4410+2	1.0806+2	4.3366–2
	1.3677–3	4.8568–8	2.8517+6	3.6490–6	6.8664+8	2.9717+8	7.9372+7	3.1008+8	7.6047+3	2.5204+2	1.4403+2	1.0797+2	4.3403–2
	1.3995–3	4.9368–8	2.8056+6	3.7760–6	6.7552+8	2.9356+8	7.7999+7	3.0396+8	7.5831+3	2.4901+2	1.4273+2	1.0623+2	4.4104–2
	1.4498–3	5.0617–8	2.7363+6	3.9796–6	6.5885+8	2.8811+8	7.5942+7	2.9479+8	7.5501+3	2.4450+2	1.4081+2	1.0364+2	4.5207–2
M2	1.4616–3	5.0909–8	2.7206+6	4.0281–6	6.5507+8	2.8686+8	7.5476+7	2.9272+8	7.5426+3	2.4348+2	1.4038+2	1.0305+2	4.5466–2
	1.5000–3	5.1893–8	2.6690+6	4.1869–6	6.4265+8	2.8294+8	7.4010+7	2.8569+8	7.5161+3	2.4018+2	1.3906+2	1.0107+2	4.6252–2
	1.5625–3	5.3444–8	2.5916+6	4.4502–6	6.2399+8	2.7686+8	7.1693+7	2.7543+8	7.4747+3	2.3462+2	1.3656+2	9.8008+1	4.7526–2
	1.6172–3	5.4785–8	2.5281+6	4.6855–6	6.0872+8	2.7184+8	6.9799+7	2.6707+8	7.4399+3	2.3012+2	1.3455+2	9.5517+1	4.8637–2
M1	1.6251–3	5.4978–8	2.5193+6	4.7200–6	6.0658+8	2.7114+8	6.9535+7	2.6590+8	7.4350+3	2.2949+2	1.3427+2	9.5170+1	4.8798–2
	1.6485–3	5.5556–8	2.4931+6	4.8225–6	6.0028+8	2.6908+8	6.8756+7	2.6243+8	7.4206+3	2.2760+2	1.3341+2	9.4134+1	4.9272–2
	1.6719–3	5.6128–8	2.4676+6	4.9255–6	5.9415+8	2.6708+8	6.7999+7	2.5907+8	7.4064+3	2.2576+2	1.3258+2	9.3129+1	4.9745–2
	1.6925–3	5.6631–8	2.4457+6	5.0170–6	5.8888+8	2.6535+8	6.7348+7	2.5618+8	7.3942+3	2.2419+2	1.3188+2	9.2265+1	5.0160–2
	1.7129–3	5.7128–8	2.4244+6	5.1084–6	5.8375+8	2.6366+8	6.6716+7	2.5337+8	7.3822+3	2.2267+2	1.3119+2	9.1428+1	5.0573–2
	1.7500–3	5.8027–8	2.3869+6	5.2761–6	5.7471+8	2.6067+8	6.5602+7	2.4843+8	7.3608+3	2.1999+2	1.2999+2	8.9956+1	5.1320–2
	1.7693–3	5.8493–8	2.3679+6	5.3643–6	5.7014+8	2.5915+8	6.5038+7	2.4594+8	7.3498+3	2.1864+2	1.2938+2	8.9211+1	5.1710–2
	1.8125–3	5.9526–8	2.3268+6	5.5630–6	5.6024+8	2.5585+8	6.3819+7	2.4056+8	7.3258+3	2.1573+2	1.2807+2	8.7607+1	5.2576–2
	1.8359–3	6.0084–8	2.3052+6	5.6720–6	5.5504+8	2.5411+8	6.3179+7	2.3774+8	7.3131+3	2.1420+2	1.2738+2	8.6767+1	5.3046–2
	1.8847–3	6.1236–8	2.2618+6	5.9012–6	5.4459+8	2.5059+8	6.1894+7	2.3210+8	7.2872+3	2.1115+2	1.2601+2	8.5084+1	5.4020–2
	2.0000–3	6.3926–8	2.1666+6	6.4561–6	5.2168+8	2.4280+8	5.9082+7	2.1979+8	7.2288+3	2.0455+2	1.2308+2	8.1418+1	5.6317–2
	2.2500–3	6.9709–8	1.9869+6	7.7229–6	4.7840+8	2.2769+8	5.3664+7	1.9704+8	7.0771+3	1.9030+2	1.1600+2	7.4248+1	6.0481–2
	2.5000–3	7.5292–8	1.8396+6	9.0780–6	4.4292+8	2.1497+8	4.9249+7	1.7870+8	6.9441+3	1.7880+2	1.1026+2	6.8474+1	6.4590–2
	2.6250–3	7.8017–8	1.7753+6	9.7869–6	4.2745+8	2.0932+8	4.7332+7	1.7079+8	6.8833+3	1.7387+2	1.0781+2	6.5989+1	6.6625–2
	3.0000–3	8.5954–8	1.6114+6	1.2025–5	3.8798+8	1.9462+8	4.2463+7	1.5090+8	6.7198+3	1.6142+2	1.0160+2	5.9744+1	7.2657–2
	3.5000–3	9.6309–8	1.4381+6	1.5274–5	3.4627+8	1.7866+8	3.7313+7	1.3029+8	6.4930+3	1.4657+2	9.3632+1	5.2863+1	7.9439–2
	4.0000–3	1.0621–7	1.3041+6	1.8823–5	3.1400+8	1.6589+8	3.3365+7	1.1473+8	6.3027+3	1.3532+2	8.7558+1	4.7675+1	8.6075–2
	4.5000–3	1.1587–7	1.1953+6	2.2659–5	2.8781+8	1.5508+8	3.0177+7	1.0254+8	6.1176+3	1.2549+2	8.1979+1	4.3421+1	9.1919–2
	5.0000–3	1.2521–7	1.1062+6	2.6775–5	2.6634+8	1.4600+8	2.7587+7	9.2744+7	5.9566+3	1.1760+2	7.7500+1	4.0004+1	9.7653–2
	6.0000–3	1.4324–7	9.6695+5	3.5782–5	2.3282+8	1.3132+8	2.3586+7	7.7915+7	5.6311+3	1.0468+2	6.9912+1	3.4658+1	1.0670–1
L3	6.4519–3	1.5105–7	9.1692+5	4.0204–5	2.2078+8	1.2586+8	2.2149+7	7.2764+7	5.5064+3	9.9784+1	6.6947+1	3.2727+1	1.1070–1
	6.6454–3	1.5441–7	8.9700+5	4.2162–5	2.1598+8	1.2368+8	2.1589+7	7.0708+7	5.4533+3	9.7883+1	6.5801+1	3.1970+1	1.1225–1
	6.9841–3	1.6021–7	8.6453+5	4.5677–5	2.0816+8	1.2009+8	2.0681+7	6.7380+7	5.3650+3	9.4805+1	6.3944+1	3.0745+1	1.1495–1
L2	7.0192–3	1.6081–7	8.6132+5	4.6048–5	2.0739+8	1.1974+8	2.0591+7	6.7053+7	5.3562+3	9.4501+1	6.3761+1	3.0625+1	1.1523–1
	7.2644–3	1.6490–7	8.3994+5	4.8672–5	2.0224+8	1.1733+8	1.9986+7	6.4919+7	5.2912+3	9.2400+1	6.2478+1	2.9805+1	1.1694–1
L1	7.3941–3	1.6704–7	8.2914+5	5.0084–5	1.9964+8	1.1611+8	1.9682+7	6.3846+7	5.2581+3	9.1343+1	6.1832+1	2.9393+1	1.1784–1
	7.4920–3	1.6868–7	8.2111+5	5.1161–5	1.9771+8	1.1521+8	1.9458+7	6.3038+7	5.2336+3	9.0567+1	6.1361+1	2.9088+1	1.1852–1
	7.5456–3	1.6957–7	8.1680+5	5.1753–5	1.9667+8	1.1472+8	1.9338+7	6.2604+7	5.2203+3	9.0151+1	6.1108+1	2.8924+1	1.1889–1
	7.6322–3	1.7101–7	8.0993+5	5.2718–5	1.9501+8	1.1394+8	1.9147+7	6.1916+7	5.1992+3	8.9489+1	6.0706+1	2.8664+1	1.1948–1
	8.0000–3	1.7706–7	7.8226+5	5.6890–5	1.8835+8	1.1081+8	1.8381+7	5.9158+7	5.1130+3	8.6839+1	5.9094+1	2.7622+1	1.2201–1
	8.5000–3	1.8530–7	7.4746+5	6.2767–5	1.7997+8	1.0678+8	1.7435+7	5.5754+7	4.9975+3	8.3334+1	5.6927+1	2.6282+1	1.2503–1
	9.2500–3	1.9741–7	7.0161+5	7.2023–5	1.6893+8	1.0140+8	1.6197+7	5.1332+7	4.8406+3	7.8767+1	5.4097+1	2.4541+1	1.2950–1
	1.0000–2	2.0924–7	6.6195+5	8.1788–5	1.5938+8	9.6680+7	1.5134+7	4.7565+7	4.7004+3	7.4869+1	5.1676+1	2.3059+1	1.3391–1
	1.1250–2	2.2865–7	6.0574+5	9.9180–5	1.4585+8	8.9799+7	1.3656+7	4.2389+7	4.4719+3	6.8960+1	4.7911+1	2.0910+1	1.3926–1
	1.2500–2	2.4747–7	5.5968+5	1.1796–4	1.3476+8	8.4059+7	1.2457+7	3.8238+7	4.2770+3	6.4188+1	4.4856+1	1.9187+1	1.4454–1
	1.3125–2	2.5668–7	5.3961+5	1.2786–4	1.2993+8	8.1527+7	1.1939+7	3.6456+7	4.1896+3	6.2131+1	4.3536+1	1.8448+1	1.4715–1
	1.5000–2	2.8357–7	4.8843+5	1.5937–4	1.1760+8	7.4980+7	1.0628+7	3.1992+7	3.9595+3	5.6952+1	4.0200+1	1.6597+1	1.5483–1
	1.7500–2	3.1866–7	4.3464+5	2.0564–4	1.0465+8	6.7826+7	9.2969+6	2.7525+7	3.6919+3	5.1204+1	3.6416+1	1.4626+1	1.6218–1
	2.0000–2	3.5241–7	3.9302+5	2.5668–4	9.4630+7	6.2183+7	8.2801+6	2.4163+7	3.4748+3	4.6833+1	3.3521+1	1.3143+1	1.6940–1
	2.5000–2	4.1744–7	3.3179+5	3.7192–4	7.9889+7	5.3577+7	6.8409+6	1.9468+7	3.1039+3	4.0117+1	2.8993+1	1.0946+1	1.7882–1
	3.0000–2	4.7908–7	2.8910+5	5.0427–4	6.9610+7	4.7437+7	5.8534+6	1.6317+7	2.8304+3	3.5532+1	2.5871+1	9.4729+0	1.8814–1
	4.0000–2	5.9547–7	2.3260+5	8.1388–4	5.6005+7	3.9017+7	4.6044+6	1.2380+7	2.4336+3	2.9267+1	2.1548+1	7.5178+0	2.0155–1
K	4.5219–2	6.5266–7	2.1222+5	9.9959–4	5.1097+7	3.5891+7	4.1670+6	1.1036+7	2.2800+3	2.6968+1	1.9948+1	6.8126+0	2.0733–1
	4.5817–2	6.5917–7	2.1012+5	1.0219–3	5.0592+7	3.5572+7	4.1229+6	1.0896+7	2.2641+3	2.6735+1	1.9786+1	6.7405+0	2.0793–1
	4.7908–2	6.8177–7	2.0315+5	1.1012–3	4.8915+7	3.4506+7	3.9763+6	1.0430+7	2.2110+3	2.5962+1	1.9250+1	6.5023+0	2.1006–1
	5.0000–2	7.0411–7	1.9671+5	1.1829–3	4.7363+7	3.3517+7	3.8408+6	1.0003+7	2.1613+3	2.5250+1	1.8754+1	6.2839+0	2.1218–1
	5.2500–2	7.3006–7	1.8972+5	1.2835–3	4.5680+7	3.2421+7	3.6954+6	9.5610+6	2.1061+3	2.4460+1	1.8199+1	6.0473+0	2.1444–1
	5.6250–2	7.6835–7	1.8026+5	1.4403–3	4.3403+7	3.0933+7	3.4990+6	8.9687+6	2.0304+3	2.3398+1	1.7449+1	5.7308+0	2.1783–1
	6.0000–2	8.0596–7	1.7185+5	1.6038–3	4.1378+7	2.9603+7	3.3249+6	8.4479+6	1.9621+3	2.2458+1	1.6784+1	5.4527+0	2.2122–1
	6.5000–2	8.5371–7	1.6224+5	1.8321–3	3.9063+7	2.8071+7	3.1282+6	7.8622+6	1.8815+3	2.1354+1	1.6000+1	5.1283+0	2.2509–1
	7.2500–2	9.2337–7	1.5000+5	2.1954–3	3.6116+7	2.6108+7	2.8786+6	7.1281+6	1.7768+3	1.9959+1	1.5005+1	4.7225+0	2.3093–1
	8.0000–2	9.9094–7	1.3977+5	2.5825–3	3.3654+7	2.4456+7	2.6708+6	6.5252+6	1.6875+3	1.8803+1	1.4177+1	4.3900+0	2.3675–1
	9.0000–2	1.0758–6	1.2875+5	3.1332–3	3.0999+7	2.2669+7	2.4533+6	5.8750+6	1.5950+3	1.7526+1	1.3269+1	4.0143+0	2.4340–1
	1.0000–1	1.1577–6	1.1964+5	3.7215–3	2.8806+7	2.1182+7	2.2739+6	5.3485+6	1.5165+3	1.6481+1	1.2520+1	3.7108+0	2.5008–1
	1.2500–1	1.3395–6	1.0340+5	5.3316–3	2.4897+7	1.8477+7	1.9626+6	4.4565+6	1.3682+3	1.4611+1	1.1168+1	3.1797+0	2.6307–1
	1.5000–1	1.5086–6	9.1810+4	7.1246–3	2.2106+7	1.6525+7	1.7402+6	3.8394+6	1.2578+3	1.3296+1	1.0205+1	2.8149+0	2.7628–1
	2.0000–1	1.8048–6	7.6741+4	1.1142–2	1.8477+7	1.3959+7	1.4722+6	3.0450+6	1.1133+3	1.1635+1	9.0164+0	2.3199+0	2.9888–1
	2.5000–1	2.0612–6	6.7195+4	1.5620–2	1.6179+7	1.2234+7	1.3202+6	2.6235+6	1.0242+3	1.0708+1	8.3344+0	2.0530+0	3.2026–1
	3.0000–1	2.2973–6	6.0289+4	2.0440–2	1.4516+7	1.0985+7	1.2078+6	2.3228+6	9.5674+2	1.0045+1	7.8377+0	1.8658+0	3.4147–1
	4.0000–1	2.7244–6	5.0838+4	3.0783–2	1.2241+7	9.2120+6	1.0795+6	1.9483+6	8.7563+2	9.3018+0	7.2934+0	1.6233+0	3.8508–1
	5.0000–1	3.0896–6	4.4829+4	4.1739–2	1.0794+7	8.0266+6	1.0056+6	1.7609+6	8.2913+2	8.9548+0	7.0135+0	1.5100+0	4.3127–1
	6.0000–1	3.4191–6	4.0509+4	5.3036–2	9.7538+6	7.1722+6	9.5822+5	1.6226+6	8.0077+2	8.7499+0	6.8455+0	1.4246+0	4.7974–1
	8.0000–1	3.9863–6	3.4745+4	7.6050–2	8.3658+6	6.0056+6	9.0324+5	1.4562+6	7.6929+2	8.6315+0	6.7239+0	1.3268+0	5.8082–1

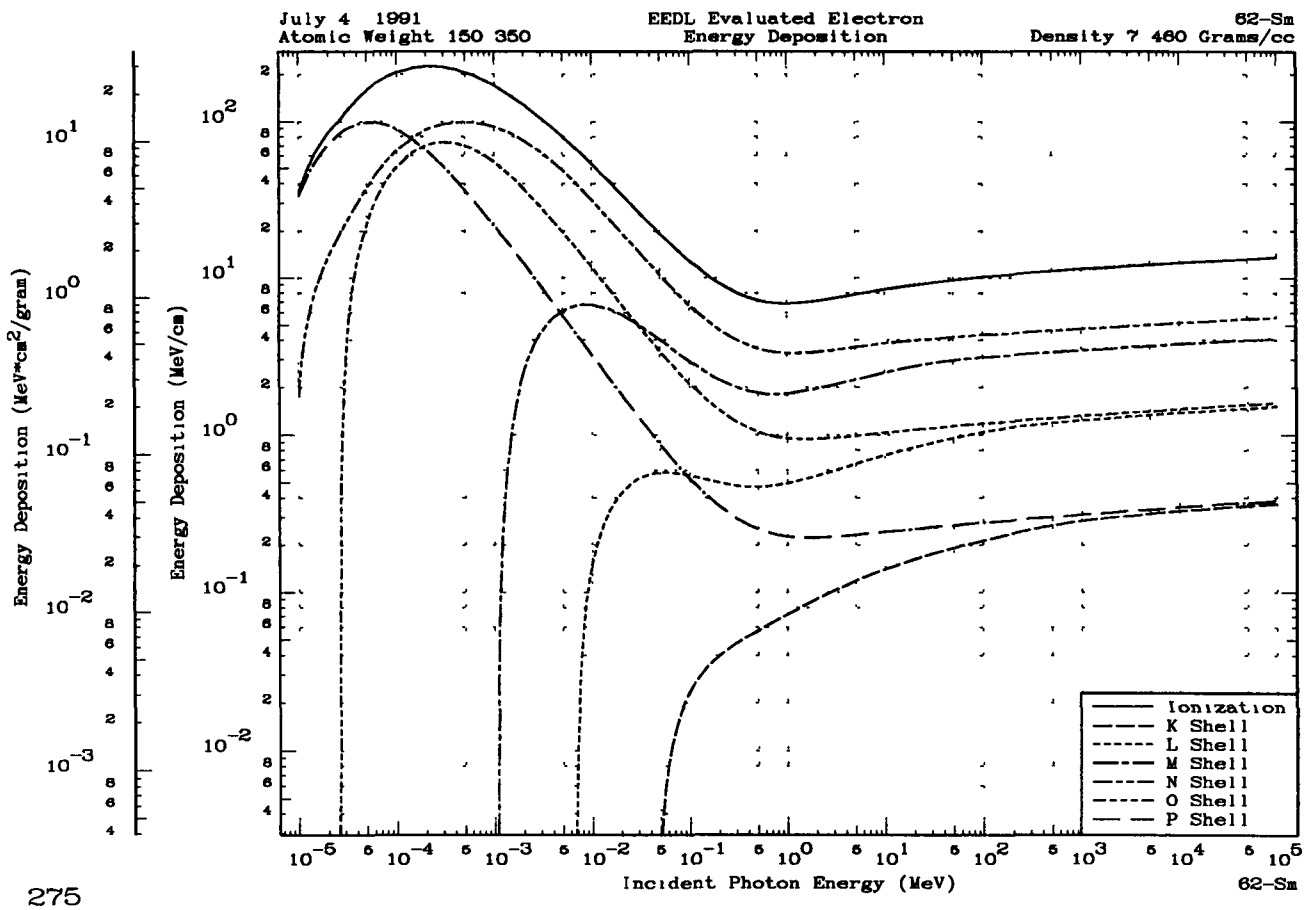
Atomic Weight 145.000												Density 7.220 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000+0	4.4610–6	3.1048+4	9.9199–2	7.4757+6	5.2457+6	8.7324+5	1.3560+6	7.5413+2	8.6473+0	6.6894+0	1.2702+0	6.8773–1
1.5000+0	5.3534–6	2.5872+4	1.5581–1	6.2295+6	4.1438+6	8.4068+5	1.2443+6	7.4329+2	9.0197+0	6.8156+0	1.2252+0	9.7890–1
2.0000+0	5.9968–6	2.3096+4	2.0997–1	5.5611+6	3.5396+6	8.3179+5	1.1890+6	7.4449+2	9.4470+0	6.9541+0	1.2012+0	1.2917+0
3.0000+0	6.8688–6	2.0164+4	3.1094–1	4.8551+6	2.8996+6	8.2146+5	1.1332+6	7.5136+2	1.0376+1	7.2212+0	1.2045+0	1.9499+0
4.0000+0	7.4254–6	1.8653+4	4.0325–1	4.4912+6	2.5598+6	8.1812+5	1.1125+6	7.5834+2	1.1305+1	7.4470+0	1.2067+0	2.6510+0
5.0000+0	7.8214–6	1.7708+4	4.8831–1	4.2638+6	2.3526+6	8.1805+5	1.0923+6	7.6441+2	1.2220+1	7.6390+0	1.2089+0	3.3724+0
6.0000+0	8.1081–6	1.7082+4	5.6727–1	4.1130+6	2.2202+6	8.1797+5	1.0741+6	7.6991+2	1.3117+1	7.7925+0	1.2124+0	4.1125+0
8.0000+0	8.4701–6	1.6352+4	7.1027–1	3.9373+6	2.0559+6	8.1909+5	1.0615+6	7.8057+2	1.4892+1	8.0457+0	1.2179+0	5.6284+0
1.0000+1	8.6851–6	1.5947+4	8.3716–1	3.8398+6	1.9709+6	8.1996+5	1.0482+6	7.9045+2	1.6665+1	8.2589+0	1.2223+0	7.1835+0
1.5000+1	8.8673–6	1.5620+4	1.1036+0	3.7609+6	1.9052+6	8.2196+5	1.0330+6	8.0485+2	2.1033+1	8.5747+0	1.2235+0	1.1235+1
2.0000+1	8.9069–6	1.5550+4	1.3193+0	3.7442+6	1.9025+6	8.2316+5	1.0177+6	8.1499+2	2.5470+1	8.8164+0	1.2241+0	1.5429+1
3.0000+1	8.9224–6	1.5523+4	1.6561+0	3.7376+6	1.9014+6	8.2438+5	1.0110+6	8.3071+2	3.4365+1	9.1073+0	1.2240+0	2.4034+1
4.0000+1	8.9404–6	1.5492+4	1.9144+0	3.7301+6	1.9007+6	8.2501+5	1.0036+6	8.4292+2	4.3394+1	9.3191+0	1.2230+0	3.2852+1
5.0000+1	8.9594–6	1.5459+4	2.1237+0	3.7222+6	1.9001+6	8.2544+5	9.9586+5	8.5359+2	5.2485+1	9.4819+0	1.2214+0	4.1782+1
6.0000+1	8.9751–6	1.5432+4	2.2992+0	3.7157+6	1.8996+6	8.2574+5	9.8954+5	8.6219+2	6.1672+1	9.6009+0	1.2214+0	5.0850+1
8.0000+1	8.9829–6	1.5419+4	2.5826+0	3.7125+6	1.8988+6	8.2602+5	9.8681+5	8.7559+2	8.0296+1	9.7822+0	1.2216+0	6.9292+1
1.0000+2	8.9904–6	1.5406+4	2.8065+0	3.7094+6	1.8982+6	8.2621+5	9.8409+5	8.8604+2	9.9064+1	9.9332+0	1.2218+0	8.7908+1
1.5000+2	8.9933–6	1.5401+4	3.2193+0	3.7082+6	1.8971+6	8.2634+5	9.8383+5	9.0460+2	1.4623+2	1.0101+1	1.2219+0	1.3491+2
2.0000+2	8.9971–6	1.5394+4	3.5152+0	3.7066+6	1.8963+6	8.2644+5	9.8294+5	9.1760+2	1.9399+2	1.0256+1	1.2213+0	1.8251+2
3.0000+2	9.0028–6	1.5385+4	3.9348+0	3.7043+6	1.8952+6	8.2654+5	9.8156+5	9.3197+2	2.8893+2	1.0512+1	1.2206+0	2.7720+2
4.0000+2	9.0077–6	1.5376+4	4.2338+0	3.7023+6	1.8945+6	8.2656+5	9.8029+5	9.4150+2	3.8433+2	1.0632+1	1.2201+0	3.7248+2
5.0000+2	9.0134–6	1.5366+4	4.4661+0	3.6999+6	1.8939+6	8.2658+5	9.7849+5	9.4881+2	4.8043+2	1.0743+1	1.2188+0	4.6847+2
6.0000+2	9.0163–6	1.5361+4	4.6561+0	3.6987+6	1.8934+6	8.2659+5	9.7778+5	9.5541+2	5.7502+2	1.0829+1	1.2190+0	5.6297+2
8.0000+2	9.0226–6	1.5351+4	4.9564+0	3.6962+6	1.8926+6	8.2660+5	9.7597+5	9.6592+2	7.6587+2	1.1000+1	1.2187+0	7.5366+2
1.0000+3	9.0287–6	1.5340+4	5.1896+0	3.6937+6	1.8920+6	8.2661+5	9.7405+5	9.7440+2	9.5695+2	1.1131+1	1.2183+0	9.4460+2
1.5000+3	9.0328–6	1.5333+4	5.6129+0	3.6920+6	1.8909+6	8.2661+5	9.7343+5	9.9020+2	1.4376+3	1.1262+1	1.2176+0	1.4251+3
2.0000+3	9.0364–6	1.5327+4	5.9132+0	3.6905+6	1.8902+6	8.2662+5	9.7271+5	1.0019+3	1.9156+3	1.1391+1	1.2167+0	1.9029+3
3.0000+3	9.0405–6	1.5320+4	6.3364+0	3.6888+6	1.8891+6	8.2662+5	9.7211+5	1.0188+3	2.8750+3	1.1640+1	1.2160+0	2.8622+3
4.0000+3	9.0437–6	1.5315+4	6.6365+0	3.6875+6	1.8883+6	8.2662+5	9.7154+5	1.0313+3	3.8370+3	1.1733+1	1.2154+0	3.8241+3
5.0000+3	9.0478–6	1.5308+4	6.8688+0	3.6859+6	1.8877+6	8.2662+5	9.7049+5	1.0411+3	4.8090+3	1.1827+1	1.2141+0	4.7960+3
6.0000+3	9.0486–6	1.5307+4	7.0585+0	3.6855+6	1.8872+6	8.2662+5	9.7061+5	1.0483+3	5.7615+3	1.1910+1	1.2143+0	5.7484+3
8.0000+3	9.0508–6	1.5303+4	7.3580+0	3.6846+6	1.8865+6	8.2662+5	9.7050+5	1.0598+3	7.6829+3	1.2071+1	1.2143+0	7.6696+3
1.0000+4	9.0526–6	1.5300+4	7.5902+0	3.6839+6	1.8859+6	8.2662+5	9.7034+5	1.0687+3	9.6221+3	1.2218+1	1.2142+0	9.6087+3
1.5000+4	9.0553–6	1.5295+4	8.0126+0	3.6828+6	1.8848+6	8.2662+5	9.7029+5	1.0860+3	1.4368+4	1.2340+1	1.2141+0	1.4355+4
2.0000+4	9.0575–6	1.5292+4	8.3128+0	3.6819+6	1.8840+6	8.2662+5	9.7014+5	1.0984+3	1.9175+4	1.2462+1	1.2140+0	1.9162+4
3.0000+4	9.0601–6	1.5287+4	8.7362+0	3.6809+6	1.8829+6	8.2662+5	9.7019+5	1.1158+3	2.8696+4	1.2707+1	1.2140+0	2.8682+4
4.0000+4	9.0623–6	1.5284+4	9.0367+0	3.6799+6	1.8822+6	8.2662+5	9.7002+5	1.1284+3	3.8320+4	1.2818+1	1.2138+0	3.8306+4
5.0000+4	9.0656–6	1.5278+4	9.2698+0	3.6786+6	1.8816+6	8.2662+5	9.6925+5	1.1380+3	4.7854+4	1.2907+1	1.2128+0	4.7840+4
6.0000+4	9.0660–6	1.5277+4	9.4603+0	3.6785+6	1.8811+6	8.2662+5	9.6958+5	1.1459+3	5.7381+4	1.2984+1	1.2133+0	5.7367+4
8.0000+4	9.0676–6	1.5275+4	9.7609+0	3.6778+6	1.8803+6	8.2662+5	9.6967+5	1.1584+3	7.6600+4	1.3140+1	1.2134+0	7.6586+4
1.0000+5	9.0690–6	1.5272+4	9.9939+0	3.6772+6	1.8797+6	8.2662+5	9.6969+5	1.1681+3	9.5853+4	1.3293+1	1.2134+0	9.5839+4


July 4, 1991
Atomic Weight 150.350
EEDL Evaluated Electron
Cross Sections
62-Sm
Density 7.460 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
62-Sm


July 4, 1991
Atomic Weight 150.350
EEDL Evaluated Electron
Energy Deposition
62-Sm
Density 7.460 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
62-Sm

274


July 4 1991
Atomic Weight 150 350
EEDL Evaluated Electron
Shell Cross Sections
62-Sm
Density 7 460 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
62-Sm


July 4 1991
Atomic Weight 150 350
EEDL Evaluated Electron
Energy Deposition
62-Sm
Density 7 460 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
62-Sm

275

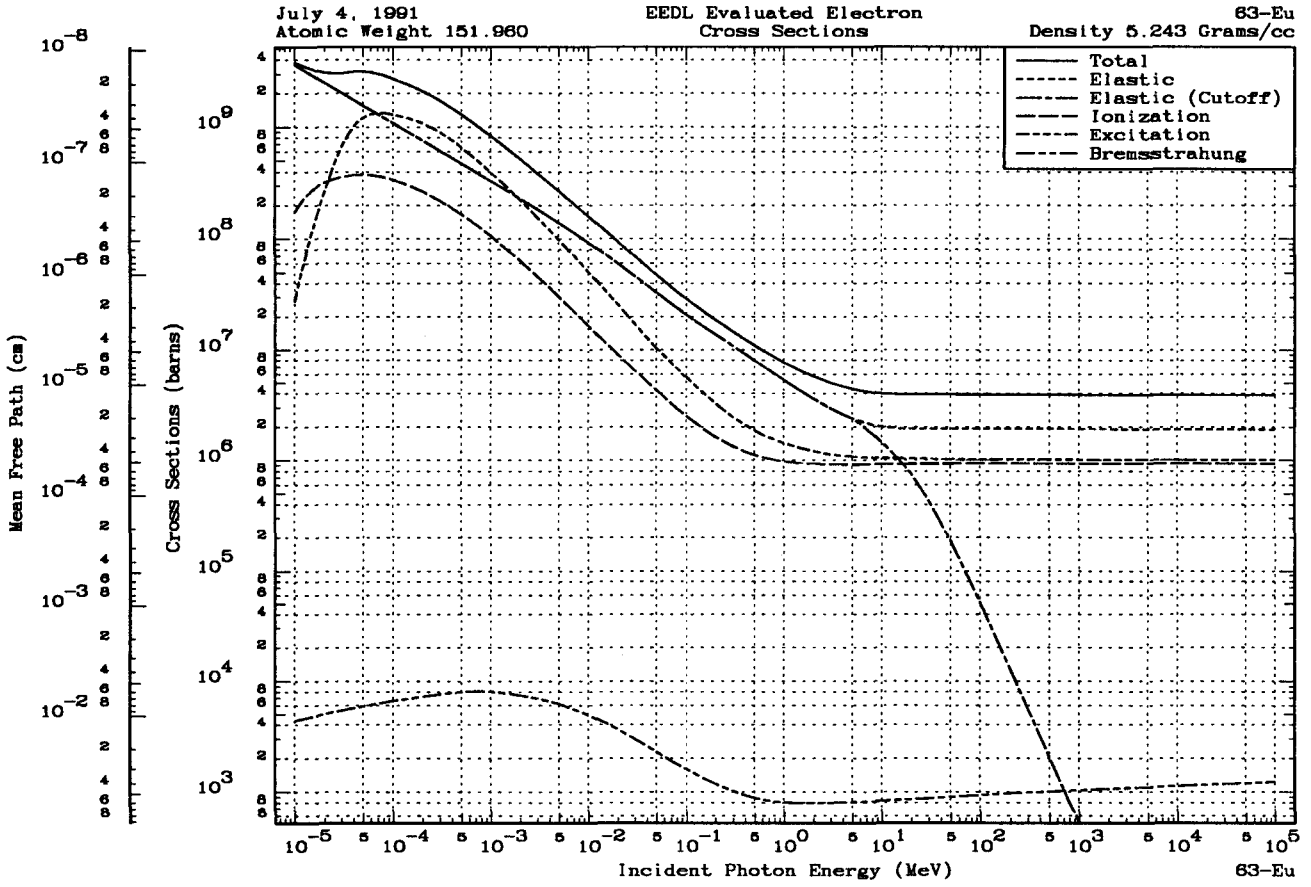
Atomic Weight 150.350 Density 7.460 Grams/cc

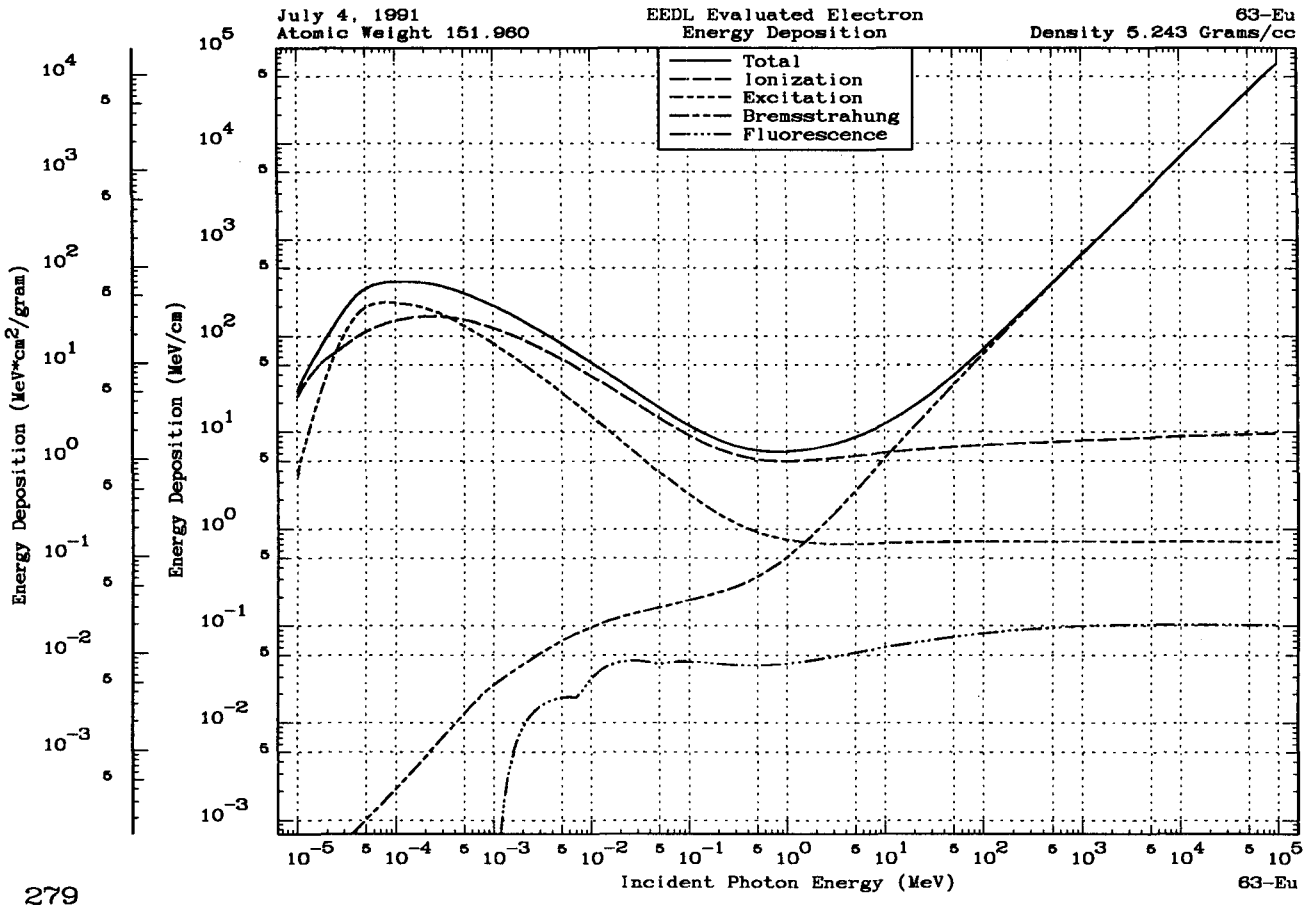
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.1377–9	1.6473+7		4.1126+9	3.8974+9	1.8295+8	3.2231+7	4.3597+3	4.0862+1	3.4979+1	5.8831+0	2.8144–4
	1.0625–5	8.3407–9	1.6072+7		4.0125+9	3.7741+9	1.9758+8	4.0754+7	4.4136+3	4.6407+1	3.8859+1	7.5478+0	2.9836–4
	1.1172–5	8.5060–9	1.5759+7		3.9345+9	3.6751+9	2.0995+8	4.9491+7	4.4587+3	5.1516+1	4.2234+1	9.2819+0	3.1330–4
	1.1250–5	8.5286–9	1.5717+7		3.9241+9	3.6615+9	2.1170+8	5.0843+7	4.4650+3	5.2270+1	4.2718+1	9.5525+0	3.1544–4
	1.1719–5	8.6527–9	1.5492+7		3.8678+9	3.5831+9	2.2235+8	6.2288+7	4.5021+3	5.7533+1	4.5705+1	1.1828+1	3.2835–4
	1.2129–5	8.7504–9	1.5319+7		3.8246+9	3.5184+9	2.3142+8	7.4788+7	4.5336+3	6.2637+1	4.8304+1	1.4333+1	3.3971–4
	1.2500–5	8.8305–9	1.5180+7		3.7899+9	3.4626+9	2.3948+8	8.7787+7	4.5613+3	6.7616+1	5.0652+1	1.6964+1	3.5004–4
	1.3125–5	8.9533–9	1.4972+7		3.7379+9	3.3742+9	2.4989+8	1.1379+8	4.6067+3	7.6266+1	5.3973+1	2.2293+1	3.6756–4
	1.3359–5	8.9975–9	1.4898+7		3.7196+9	3.3427+9	2.5382+8	1.2301+8	4.6232+3	7.9475+1	5.5251+1	2.4223+1	3.7416–4
	1.3564–5	9.0341–9	1.4838+7		3.7045+9	3.3159+9	2.5711+8	1.3155+8	4.6375+3	8.2354+1	5.6334+1	2.6020+1	3.7995–4
	1.5000–5	9.2248–9	1.4531+7		3.6279+9	3.1437+9	2.7937+8	2.0487+8	4.7330+3	1.0572+2	6.3936+1	4.1782+1	4.2089–4
	1.7500–5	9.3907–9	1.4275+7		3.5638+9	2.8971+9	3.0740+8	3.5938+8	4.8832+3	1.5011+2	7.4945+1	7.5168+1	4.9376–4
	2.0000–5	9.4189–9	1.4232+7		3.5532+9	2.6991+9	3.2718+8	5.2688+8	5.0172+3	1.9755+2	8.4598+1	1.1295+2	5.6844–4
	2.5000–5	9.3682–9	1.4309+7		3.5724+9	2.3980+9	3.4872+8	8.2563+8	5.2235+3	2.7980+2	9.8994+1	1.8081+2	7.1006–4
O3	2.6020–5	9.3475–9	1.4341+7		3.5803+9	2.3477+9	3.5283+8	8.7972+8	5.2613+3	2.9546+2	1.0198+2	1.9348+2	7.3950–4
	2.6518–5	9.3512–9	1.4335+7		3.5789+9	2.3243+9	3.5438+8	9.0022+8	5.2790+3	3.0168+2	1.0342+2	1.9826+2	7.5375–4
	2.6953–5	9.3528–9	1.4332+7		3.5783+9	2.3043+9	3.5574+8	9.1821+8	5.2942+3	3.0715+2	1.0469+2	2.0246+2	7.6625–4
	2.7715–5	9.3522–9	1.4333+7		3.5785+9	2.2705+9	3.5812+8	9.4986+8	5.3204+3	3.1682+2	1.0694+2	2.0988+2	7.8820–4
	2.8857–5	9.3435–9	1.4347+7		3.5818+9	2.2224+9	3.6170+8	9.9769+8	5.3586+3	3.3152+2	1.1039+2	2.2113+2	8.2128–4
O2	2.9790–5	9.3309–9	1.4366+7		3.5867+9	2.1853+9	3.6439+8	1.0370+9	5.3889+3	3.4350+2	1.1306+2	2.3043+2	8.4844–4
	3.0000–5	9.3321–9	1.4364+7		3.5862+9	2.1771+9	3.6507+8	1.0440+9	5.3956+3	3.4584+2	1.1373+2	2.3211+2	8.5457–4
	3.0625–5	9.3435–9	1.4347+7		3.5818+9	2.1535+9	3.6596+8	1.0624+9	5.4153+3	3.5178+2	1.1527+2	2.3651+2	8.7285–4
	3.1211–5	9.3526–9	1.4333+7		3.5784+9	2.1320+9	3.6686+8	1.0795+9	5.4335+3	3.5740+2	1.1676+2	2.4064+2	8.9005–4
	3.2310–5	9.3650–9	1.4314+7		3.5736+9	2.0933+9	3.6879+8	1.1115+9	5.4669+3	3.6816+2	1.1978+2	2.4838+2	9.2242–4
	3.2500–5	9.3666–9	1.4311+7		3.5730+9	2.0868+9	3.6914+8	1.1171+9	5.4726+3	3.7004+2	1.2032+2	2.4972+2	9.2805–4
	3.4232–5	9.3769–9	1.4296+7		3.5691+9	2.0302+9	3.7169+8	1.1672+9	5.5232+3	3.8664+2	1.2472+2	2.6192+2	9.7947–4
	3.6250–5	9.4359–9	1.4206+7		3.5467+9	1.9695+9	3.7486+8	1.2024+9	5.5795+3	4.0106+2	1.3006+2	2.7100+2	1.0399–3
	4.0000–5	9.5202–9	1.4080+7		3.5154+9	1.8695+9	3.8058+8	1.2653+9	5.6776+3	4.2754+2	1.4003+2	2.8751+2	1.1535–3
	4.5000–5	9.6748–9	1.3855+7		3.4592+9	1.7564+9	3.8121+8	1.3215+9	5.7891+3	4.5230+2	1.4962+2	3.0268+2	1.3017–3
O1	4.7740–5	9.7443–9	1.3757+7		3.4345+9	1.7023+9	3.8150+8	1.3507+9	5.8459+3	4.6540+2	1.5471+2	3.1070+2	1.3839–3
	4.8305–5	9.7653–9	1.3727+7		3.4271+9	1.6917+9	3.8165+8	1.3537+9	5.8567+3	4.6752+2	1.5584+2	3.1168+2	1.4005–3
	5.0000–5	9.8261–9	1.3642+7		3.4059+9	1.6611+9	3.8214+8	1.3626+9	5.8885+3	4.7388+2	1.5929+2	3.1458+2	1.4505–3
	5.2500–5	9.9184–9	1.3515+7		3.3742+9	1.6188+9	3.8077+8	1.3747+9	5.9338+3	4.8166+2	1.6299+2	3.1867+2	1.5246–3
	5.5000–5	1.0004–8	1.3399+7		3.3453+9	1.5794+9	3.7965+8	1.3863+9	5.9773+3	4.8947+2	1.6678+2	3.2268+2	1.5992–3
	5.6250–5	1.0045–8	1.3345+7		3.3316+9	1.5607+9	3.7903+8	1.3919+9	5.9984+3	4.9325+2	1.6859+2	3.2466+2	1.6367–3
	6.0000–5	1.0160–8	1.3193+7		3.2939+9	1.5083+9	3.7744+8	1.4082+9	6.0595+3	5.0456+2	1.7408+2	3.3048+2	1.7499–3
	6.5000–5	1.0357–8	1.2943+7		3.2314+9	1.4457+9	3.7216+8	1.4135+9	6.1361+3	5.1213+2	1.7874+2	3.3339+2	1.9022–3
	7.0000–5	1.0536–8	1.2722+7		3.1763+9	1.3900+9	3.6775+8	1.4185+9	6.2080+3	5.1991+2	1.8368+2	3.3623+2	2.0562–3
	7.2500–5	1.0621–8	1.2621+7		3.1509+9	1.3645+9	3.6559+8	1.4209+9	6.2422+3	5.2365+2	1.8602+2	3.3762+2	2.1339–3
	8.0000–5	1.0857–8	1.2347+7		3.0826+9	1.2951+9	3.5999+8	1.4275+9	6.3395+3	5.3501+2	1.9330+2	3.4171+2	2.3689–3
	9.0000–5	1.1244–8	1.1921+7		2.9763+9	1.2169+9	3.4932+8	1.4101+9	6.4509+3	5.4023+2	1.9887+2	3.4135+2	2.6833–3
	1.0000–4	1.1595–8	1.1561+7	0.0000+0	2.8863+9	1.1508+9	3.4070+8	1.3947+9	6.5521+3	5.4645+2	2.0506+2	3.4138+2	3.0024–3
	1.2500–4	1.2562–8	1.0671+7	4.5952–8	2.6641+9	1.0228+9	3.1634+8	1.3249+9	6.7589+3	5.4165+2	2.1168+2	3.2997+2	3.8091–3
N5	1.3652–4	1.2960–8	1.0343+7	6.7225–8	2.5824+9	9.7626+8	3.0776+8	1.2983+9	6.8424+3	5.4140+2	2.1549+2	3.2591+2	4.1883–3
N4	1.4140–4	1.3141–8	1.0201+7	7.6248–8	2.5468+9	9.5831+8	3.0395+8	1.2846+9	6.8759+3	5.4026+2	2.1660+2	3.2366+2	4.3502–3
	1.4326–4	1.3207–8	1.0149+7	7.9692–8	2.5339+9	9.5171+8	3.0256+8	1.2796+9	6.8885+3	5.3999+2	2.1708+2	3.2291+2	4.4121–3
	1.4570–4	1.3294–8	1.0083+7	8.4212–8	2.5173+9	9.4326+8	3.0079+8	1.2733+9	6.9047+3	5.3965+2	2.1771+2	3.2193+2	4.4935–3
	1.5000–4	1.3445–8	9.9699+6	9.2183–8	2.4891+9	9.2887+8	2.9780+8	1.2624+9	6.9327+3	5.3921+2	2.1892+2	3.2029+2	4.6373–3
	1.6250–4	1.3916–8	9.6325+6	1.1550–7	2.4049+9	8.9040+8	2.8793+8	1.2265+9	7.0062+3	5.3297+2	2.1960+2	3.1336+2	5.0613–3
	1.8125–4	1.4582–8	9.1925+6	1.5092–7	2.2950+9	8.4047+8	2.7533+8	1.1792+9	7.1078+3	5.2585+2	2.2143+2	3.0442+2	5.7051–3
	2.0000–4	1.5207–8	8.8149+6	1.8675–7	2.2008+9	7.9787+8	2.6476+8	1.1381+9	7.2007+3	5.2080+2	2.2394+2	2.9685+2	6.3575–3
	2.2500–4	1.6104–8	8.3241+6	2.3536–7	2.0782+9	7.4972+8	2.5062+8	1.0779+9	7.2964+3	5.0786+2	2.2344+2	2.8441+2	7.2507–3
N3	2.5006–4	1.6950–8	7.9084+6	2.8520–7	1.9744+9	7.0903+8	2.3883+8	1.0266+9	7.3833+3	4.9775+2	2.2375+2	2.7399+2	8.1574–3
	2.5318–4	1.7060–8	7.8575+6	2.9148–7	1.9617+9	7.0440+8	2.3733+8	1.0200+9	7.3936+3	4.9608+2	2.2351+2	2.7256+2	8.2711–3
	2.5903–4	1.7264–8	7.7647+6	3.0331–7	1.9385+9	6.9594+8	2.3461+8	1.0080+9	7.4125+3	4.9306+2	2.2310+2	2.6995+2	8.4846–3
	2.6250–4	1.7384–8	7.7112+6	3.1036–7	1.9252+9	6.9107+8	2.3304+8	1.0011+9	7.4236+3	4.9134+2	2.2288+2	2.6845+2	8.6114–3
	2.6928–4	1.7615–8	7.6098+6	3.2419–7	1.8999+9	6.8183+8	2.3007+8	9.8796+8	7.4448+3	4.8811+2	2.2249+2	2.6561+2	8.8596–3
N2	2.7743–4	1.7890–8	7.4927+6	3.4096–7	1.8706+9	6.7116+8	2.2666+8	9.7282+8	7.4698+3	4.8444+2	2.2209+2	2.6233+2	9.1594–3
	2.8025–4	1.7988–8	7.4523+6	3.4679–7	1.8606+9	6.6759+8	2.2552+8	9.6744+8	7.4783+3	4.8317+2	2.2198+2	2.6118+2	9.2633–3
	2.8464–4	1.8138–8	7.3905+6	3.5589–7	1.8451+9	6.6213+8	2.2379+8	9.5922+8	7.4913+3	4.8127+2	2.2183+2	2.5943+2	9.4252–3
	2.8519–4	1.8156–8	7.3829+6	3.5703–7	1.8432+9	6.6145+8	2.2357+8	9.5821+8	7.4929+3	4.8104+2	2.2181+2	2.5922+2	9.4455–3
	2.9259–4	1.8407–8	7.2824+6	3.7248–7	1.8181+9	6.5255+8	2.2075+8	9.4482+8	7.5145+3	4.7797+2	2.2159+2	2.5637+2	9.7194–3
	3.0000–4	1.8655–8	7.1857+6	3.8802–7	1.7940+9	6.4399+8	2.1805+8	9.3195+8	7.5356+3	4.7509+2	2.2144+2	2.5365+2	9.9941–3
	3.1250–4	1.9089–8	7.0222+6	4.1451–7	1.7532+9	6.3027+8	2.1322+8	9.0969+8	7.5701+3	4.6859+2	2.2005+2	2.4853+2	1.0459–2
	3.2500–4	1.9515–8	6.8688+6	4.4136–7	1.7149+9	6.1736+8	2.0871+8	8.8881+8	7.6035+3	4.6260+2	2.1885+2	2.4375+2	1.0927–2
	3.3438–4	1.9830–8	6.7598+6	4.6172–7	1.6877+9	6.0817+8	2.0551+8	8.7397+8	7.6278+3	4.5841+2	2.1805+2	2.4035+2	1.1279–2
N1	3.4277–4	2.0109–8	6.6662+6	4.8010–7	1.6643+9	6.0027+8	2.0277+8	8.6124+8	7.6490+3	4.5486+2	2.1740+2	2.3745+2	1.1595–2
	3.4635–4	2.0231–8	6.6258+6	4.8798–7	1.6542+9	5.9700+8	2.0163+8	8.5558+8	7.6572+3	4.5331+2	2.1711+2	2.3619+2	1.1730–2
	3.5305–4	2.0460–8	6.5519+6	5.0282–7	1.6358+9	5.9099+8	1.9953+8	8.4522+8	7.6722+3	4.5051+2	2.1662+2	2.3388+2	1.1985–2
	3.6250–4	2.0778–8	6.4515+6	5.2388–7	1.6107+9	5.8283+8	1.9669+8	8.3117+8	7.6930+3	4.4675+2	2.1598+2	2.3075+2	1.2344–2
	3.6479–4	2.0854–8	6.4278+6	5.2901–7	1.6048+9	5.8090+8	1.9602+8	8.2785+8	7.6980+3	4.4587+2	2.1584+2	2.3002+2	1.2431–2
	3.6719–4	2.0935–8	6.4032+6	5.3439–7	1.5986+9	5.7890+8	1.9533+8	8.2441+8	7.7031+3	4.4496+2	2.1569+2	2.2925+2	1.2523–2
	3.8240–4	2.1437–8	6.2532+6	5.6878–7	1.5612+9	5.6665+8	1.9110+8	8.0344+8	7.7352+3	4.3947+2	2.1485+2	2.2461+2	1.3104–2
	4.0000–4	2.2007–8	6.0911+6	6.0910–7	1.5207+9	5.5337+8	1.8654+8	7.8080+8	7.7709+3	4.3371+2	2.1408+2	2.1962+2	1.3779–2
	4.2500–4	2.2860–8	5.8638+6	6.6747–7	1.4640+9	5.3598+8	1.7982+8	7.4817+8	7.8072+3	4.2292+2	2.1103+2	2.1188+2	1.4751–2
	4.5000–4	2.3694–8	5.6576+6	7.2727–7	1.4125+9	5.2008+8	1.7374+8	7.1865+8	7.8415+3	4.1334+2	2.0843+2	2.0490+2	1.5728–2
	4.6250–4	2.4104–8	5.5614+6	7.5767–7	1.3885+9	5.1262+8	1.7091+8	7.0492+8	7.8580+3	4.0894+2	2.0726+2	2.0166+2	1.6217–2
	5.0000–4	2.5307–8	5.2968+6	8.5072–7	1.3224+9	4.9200+8	1.6316+8	6.6726+8	7.9052+3	3.9710+2	2.0427+2	1.9282+2	1.7693–2
	6.0000–4	2.8513–8	4.7014+6	1.1119–6	1.1738+9	4.4693+8	1.4618+8	5.8063+8	7.9965+3	3.6899+2	1.9729+2	1.7167+2	2.1616–2
	7.0000–4	3.1583–8	4.2443+6	1.3927–6	1.0596+9	4.1207+8	1.3204+8	5.1552+8	8.0240+3	3.4370+2	1.8834+2	1.5533+2	2.5326–2

Atomic Weight 150.350 Density 7.460 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	8.0000–4	3.4496–8	3.8859+6	1.6920–6	9.7015+8	3.8408+8	1.2101+8	4.6505+8	8.0480+3	3.2469+2	1.8190+2	1.4276+2	2.9049–2
	1.0000–3	4.0033–8	3.3484+6	2.3407–6	8.3597+8	3.4148+8	1.0366+8	3.9082+8	7.9636+3	2.9250+2	1.6884+2	1.2362+2	3.5169–2
M5	1.0858–3	4.2281–8	3.1704+6	2.6401–6	7.9153+8	3.2694+8	9.7647+7	3.6694+8	7.8934+3	2.8063+2	1.6337+2	1.1721+2	3.7235–2
	1.0923–3	4.2450–8	3.1578+6	2.6632–6	7.8839+8	3.2591+8	9.7227+7	3.6524+8	7.8883+3	2.7981+2	1.6301+2	1.1676+2	3.7391–2
	1.1050–3	4.2781–8	3.1334+6	2.7089–6	7.8229+8	3.2392+8	9.6414+7	3.6195+8	7.8785+3	2.7822+2	1.6229+2	1.1589+2	3.7696–2
M4	1.1129–3	4.2985–8	3.1185+6	2.7373–6	7.7857+8	3.2270+8	9.5919+7	3.5994+8	7.8725+3	2.7726+2	1.6186+2	1.1536+2	3.7885–2
	1.1174–3	4.3103–8	3.1100+6	2.7534–6	7.7644+8	3.2202+8	9.5635+7	3.5878+8	7.8691+3	2.7668+2	1.6159+2	1.1505+2	3.7992–2
	1.1371–3	4.3622–8	3.0729+6	2.8250–6	7.6719+8	3.1906+8	9.4405+7	3.5373+8	7.8543+3	2.7416+2	1.6043+2	1.1369+2	3.8464–2
	1.1413–3	4.3732–8	3.0652+6	2.8403–6	7.6527+8	3.1844+8	9.4149+7	3.5268+8	7.8512+3	2.7364+2	1.6019+2	1.1341+2	3.8564–2
	1.1825–3	4.4805–8	2.9918+6	2.9922–6	7.4693+8	3.1252+8	9.1715+7	3.4269+8	7.8213+3	2.6870+2	1.5793+2	1.1073+2	3.9548–2
	1.1861–3	4.4900–8	2.9855+6	3.0058–6	7.4536+8	3.1201+8	9.1507+7	3.4183+8	7.8187+3	2.6828+2	1.5774+2	1.1050+2	3.9635–2
	1.2500–3	4.6538–8	2.8804+6	3.2471–6	7.1913+8	3.0348+8	8.8035+7	3.2761+8	7.7747+3	2.6127+2	1.5454+2	1.0669+2	4.1155–2
	1.2618–3	4.6838–8	2.8619+6	3.2925–6	7.1452+8	3.0197+8	8.7425+7	3.2511+8	7.7669+3	2.6005+2	1.5399+2	1.0602+2	4.1435–2
	1.3431–3	4.8873–8	2.7428+6	3.6096–6	6.8477+8	2.9217+8	8.3505+7	3.0909+8	7.7149+3	2.5228+2	1.5049+2	1.0175+2	4.3357–2
M3	1.4077–3	5.0461–8	2.6565+6	3.8687–6	6.6322+8	2.8500+8	8.0672+7	2.9754+8	7.6760+3	2.4672+2	1.4800+2	9.8671+1	4.4879–2
	1.4308–3	5.1047–8	2.6260+6	3.9626–6	6.5560+8	2.8256+8	7.9697+7	2.9334+8	7.6602+3	2.4465+2	1.4708+2	9.7532+1	4.5367–2
	1.4654–3	5.1921–8	2.5818+6	4.1049–6	6.4457+8	2.7901+8	7.8285+7	2.8726+8	7.6369+3	2.4169+2	1.4576+2	9.5887+1	4.6099–2
	1.5000–3	5.2788–8	2.5394+6	4.2490–6	6.3398+8	2.7559+8	7.6932+7	2.8145+8	7.6142+3	2.3888+2	1.4452+2	9.4314+1	4.6828–2
M2	1.5319–3	5.3566–8	2.5025+6	4.3833–6	6.2478+8	2.7254+8	7.5694+7	2.7654+8	7.5936+3	2.3612+2	1.4316+2	9.2913+1	4.7494–2
	1.5612–3	5.4283–8	2.4694+6	4.5079–6	6.1652+8	2.6983+8	7.4599+7	2.7208+8	7.5751+3	2.3368+2	1.4197+2	9.1660+1	4.8103–2
	1.5625–3	5.4316–8	2.4679+6	4.5136–6	6.1615+8	2.6970+8	7.4549+7	2.7188+8	7.5742+3	2.3357+2	1.4191+2	9.1603+1	4.8131–2
	1.6160–3	5.5617–8	2.4102+6	4.7448–6	6.0174+8	2.6495+8	7.2642+7	2.6415+8	7.5414+3	2.2934+2	1.3987+2	8.9425+1	4.9242–2
	1.6250–3	5.5834–8	2.4009+6	4.7841–6	5.9940+8	2.6417+8	7.2333+7	2.6289+8	7.5360+3	2.2866+2	1.3954+2	8.9073+1	4.9429–2
	1.6719–3	5.6959–8	2.3534+6	4.9906–6	5.8756+8	2.6023+8	7.0768+7	2.5656+8	7.5084+3	2.2521+2	1.3787+2	8.7292+1	5.0399–2
M1	1.7001–3	5.7631–8	2.3260+6	5.1165–6	5.8071+8	2.5793+8	6.9864+7	2.5290+8	7.4922+3	2.2322+2	1.3691+2	8.6265+1	5.0982–2
	1.7120–3	5.7916–8	2.3145+6	5.1700–6	5.7785+8	2.5698+8	6.9485+7	2.5138+8	7.4855+3	2.2237+2	1.3649+2	8.5830+1	5.1228–2
	1.7376–3	5.8525–8	2.2904+6	5.2855–6	5.7183+8	2.5498+8	6.8685+7	2.4817+8	7.4712+3	2.2057+2	1.3560+2	8.4915+1	5.1755–2
	1.7500–3	5.8820–8	2.2790+6	5.3418–6	5.6897+8	2.5402+8	6.8305+7	2.4664+8	7.4644+3	2.1972+2	1.3518+2	8.4480+1	5.2011–2
	1.8032–3	6.0075–8	2.2314+6	5.5859–6	5.5709+8	2.5003+8	6.6729+7	2.4032+8	7.4356+3	2.1618+2	1.3345+2	8.2681+1	5.3104–2
	1.8125–3	6.0293–8	2.2233+6	5.6290–6	5.5507+8	2.4935+8	6.6462+7	2.3925+8	7.4307+3	2.1558+2	1.3315+2	8.2377+1	5.3296–2
	1.8359–3	6.0841–8	2.2033+6	5.7381–6	5.5007+8	2.4766+8	6.5800+7	2.3660+8	7.4184+3	2.1410+2	1.3243+2	8.1623+1	5.3776–2
	1.8560–3	6.1308–8	2.1865+6	5.8321–6	5.4588+8	2.4624+8	6.5245+7	2.3439+8	7.4080+3	2.1286+2	1.3182+2	8.0992+1	5.4187–2
	1.9016–3	6.2364–8	2.1495+6	6.0477–6	5.3664+8	2.4310+8	6.4024+7	2.2951+8	7.3848+3	2.1015+2	1.3049+2	7.9605+1	5.5119–2
	2.0000–3	6.4613–8	2.0746+6	6.5221–6	5.1796+8	2.3670+8	6.1562+7	2.1969+8	7.3370+3	2.0472+2	1.2785+2	7.6816+1	5.7123–2
	2.1250–3	6.7482–8	1.9864+6	7.1438–6	4.9594+8	2.2903+8	5.8614+7	2.0829+8	7.2593+3	1.9740+2	1.2394+2	7.3408+1	5.9263–2
	2.2500–3	7.0296–8	1.9069+6	7.7877–6	4.7608+8	2.2203+8	5.5967+7	1.9808+8	7.1868+3	1.9090+2	1.2048+2	7.0361+1	6.1389–2
	2.3438–3	7.2374–8	1.8522+6	8.2847–6	4.6242+8	2.1716+8	5.4152+7	1.9109+8	7.1355+3	1.8644+2	1.1809+2	6.8279+1	6.2973–2
	2.4375–3	7.4425–8	1.8011+6	8.7931–6	4.4967+8	2.1259+8	5.2464+7	1.8462+8	7.0865+3	1.8231+2	1.1590+2	6.6350+1	6.4551–2
	2.5000–3	7.5777–8	1.7690+6	9.1384–6	4.4165+8	2.0968+8	5.1404+7	1.8055+8	7.0551+3	1.7973+2	1.1453+2	6.5140+1	6.5598–2
	2.6250–3	7.8451–8	1.7087+6	9.8434–6	4.2660+8	2.0420+8	4.9419+7	1.7297+8	6.9949+3	1.7491+2	1.1195+2	6.2886+1	6.7683–2
	2.7187–3	8.0428–8	1.6667+6	1.0385–5	4.1611+8	2.0035+8	4.8040+7	1.6772+8	6.9520+3	1.7154+2	1.1015+2	6.1325+1	6.9239–2
	3.0000–3	8.6230–8	1.5545+6	1.2068–5	3.8811+8	1.8992+8	4.4378+7	1.5381+8	6.8329+3	1.6272+2	1.0544+2	5.7203+1	7.3865–2
	3.5000–3	9.6584–8	1.3879+6	1.5290–5	3.4650+8	1.7442+8	3.9027+7	1.3305+8	6.6062+3	1.4785+2	9.7134+1	5.0635+1	8.0824–2
	4.0000–3	1.0648–7	1.2589+6	1.8808–5	3.1430+8	1.6201+8	3.4923+7	1.1736+8	6.4160+3	1.3657+2	9.0810+1	4.5675+1	8.7635–2
	4.5000–3	1.1622–7	1.1534+6	2.2609–5	2.8795+8	1.5151+8	3.1597+7	1.0483+8	6.2304+3	1.2661+2	8.4982+1	4.1534+1	9.3639–2
	5.0000–3	1.2564–7	1.0669+6	2.6689–5	2.6637+8	1.4270+8	2.8895+7	9.4766+7	6.0690+3	1.1861+2	8.0298+1	3.8208+1	9.9529–2
	6.0000–3	1.4383–7	9.3202+5	3.5623–5	2.3269+8	1.2844+8	2.4719+7	7.9526+7	5.7425+3	1.0552+2	7.2398+1	3.3012+1	1.0885–1
L3	6.7079–3	1.5617–7	8.5837+5	4.2581–5	2.1430+8	1.2035+8	2.2452+7	7.1489+7	5.5515+3	9.8038+1	6.7740+1	3.0182+1	1.1527–1
	7.0309–3	1.6171–7	8.2893+5	4.5927–5	2.0695+8	1.1708+8	2.1558+7	6.8312+7	5.4615+3	9.5060+1	6.5883+1	2.9059+1	1.1763–1
L2	7.3182–3	1.6658–7	8.0470+5	4.8988–5	2.0090+8	1.1436+8	2.0824+7	6.5718+7	5.3860+3	9.2625+1	6.4363+1	2.8143+1	1.1971–1
	7.5155–3	1.6989–7	7.8903+5	5.1137–5	1.9699+8	1.1258+8	2.0349+7	6.4051+7	5.3357+3	9.1034+1	6.3367+1	2.7546+1	1.2109–1
	7.6591–3	1.7228–7	7.7807+5	5.2724–5	1.9426+8	1.1134+8	2.0018+7	6.2891+7	5.3002+3	8.9924+1	6.2672+1	2.7130+1	1.2210–1
L1	7.7023–3	1.7300–7	7.7485+5	5.3206–5	1.9345+8	1.1097+8	1.9921+7	6.2550+7	5.2897+3	8.9598+1	6.2468+1	2.7008+1	1.2240–1
	7.8511–3	1.7549–7	7.6386+5	5.4877–5	1.9071+8	1.0973+8	1.9593+7	6.1382+7	5.2541+3	8.8500+1	6.1782+1	2.6595+1	1.2344–1
	8.0000–3	1.7796–7	7.5324+5	5.6569–5	1.8806+8	1.0852+8	1.9277+7	6.0257+7	5.2193+3	8.7444+1	6.1123+1	2.6196+1	1.2447–1
	8.5000–3	1.8622–7	7.1984+5	6.2405–5	1.7972+8	1.0460+8	1.8285+7	5.6824+7	5.1037+3	8.3925+1	5.8867+1	2.4931+1	1.2761–1
	9.2500–3	1.9835–7	6.7583+5	7.1595–5	1.6873+8	9.9376+7	1.6987+7	5.2361+7	4.9466+3	7.9340+1	5.5921+1	2.3286+1	1.3226–1
	1.0000–2	2.1019–7	6.3776+5	8.1290–5	1.5923+8	9.4790+7	1.5873+7	4.8556+7	4.8061+3	7.5424+1	5.3402+1	2.1885+1	1.3683–1
	1.1250–2	2.2972–7	5.8352+5	9.8554–5	1.4568+8	8.8100+7	1.4326+7	4.3253+7	4.5773+3	6.9460+1	4.9492+1	1.9825+1	1.4245–1
	1.2500–2	2.4865–7	5.3910+5	1.1720–4	1.3459+8	8.2516+7	1.3072+7	3.9002+7	4.3818+3	6.4643+1	4.6321+1	1.8174+1	1.4798–1
	1.3125–2	2.5791–7	5.1975+5	1.2703–4	1.2976+8	8.0051+7	1.2529+7	3.7178+7	4.2941+3	6.2569+1	4.4952+1	1.7466+1	1.5071–1
	1.5000–2	2.8496–7	4.7042+5	1.5832–4	1.1745+8	7.3676+7	1.1156+7	3.2610+7	4.0631+3	5.7343+1	4.1491+1	1.5693+1	1.5875–1
	1.7500–2	3.2025–7	4.1857+5	2.0429–4	1.0450+8	6.6703+7	9.7630+6	2.8031+7	3.7893+3	5.1548+1	3.7574+1	1.3807+1	1.6619–1
	2.0000–2	3.5418–7	3.7847+5	2.5498–4	9.4490+7	6.1199+7	8.6987+6	2.4589+7	3.5671+3	4.7143+1	3.4579+1	1.2391+1	1.7351–1
	2.5000–2	4.1963–7	3.1944+5	3.6949–4	7.9753+7	5.2794+7	7.1906+6	1.9765+7	3.1892+3	4.0367+1	2.9895+1	1.0288+1	1.8339–1
	3.0000–2	4.8164–7	2.7832+5	5.0104–4	6.9485+7	4.6791+7	6.1553+6	1.6536+7	2.9103+3	3.5742+1	2.6668+1	8.8813+0	1.9315–1
	4.0000–2	5.9834–7	2.2403+5	8.0879–4	5.5933+7	3.8547+7	4.8438+6	1.2540+7	2.5036+3	2.9448+1	2.2201+1	7.0392+0	2.0710–1
K	4.6876–2	6.7362–7	1.9900+5	1.0548–3	4.9682+7	3.4629+7	4.2582+6	1.0792+7	2.3018+3	2.6501+1	2.0094+1	6.1921+0	2.1484–1
	4.7657–2	6.8207–7	1.9653+5	1.0844–3	4.9066+7	3.4245+7	4.2015+6	1.0618+7	2.2817+3	2.6216+1	1.9891+1	6.1097+0	2.1570–1
	4.8829–2	6.9468–7	1.9296+5	1.1295–3	4.8176+7	3.3688+7	4.1197+6	1.0366+7	2.2526+3	2.5804+1	1.9596+1	5.9910+0	2.1698–1
	5.0000–2	7.0721–7	1.8954+5	1.1752–3	4.7322+7	3.3152+7	4.0413+6	1.0126+7	2.2244+3	2.5411+1	1.9315+1	5.8778+0	2.1825–1
	5.2500–2	7.3335–7	1.8279+5	1.2752–3	4.5635+7	3.2077+7	3.8884+6	9.6676+6	2.1678+3	2.4611+1	1.8740+1	5.6496+0	2.2063–1
	5.6250–2	7.7193–7	1.7365+5	1.4310–3	4.3355+7	3.0617+7	3.6820+6	9.0540+6	2.0901+3	2.3534+1	1.7965+1	5.3446+0	2.2420–1
	6.0000–2	8.0981–7	1.6553+5	1.5937–3	4.1326+7	2.9310+7	3.4990+6	8.5153+6	2.0200+3	2.2582+1	1.7278+1	5.0770+0	2.2777–1
	6.5000–2	8.5754–7	1.5632+5	1.8207–3	3.9027+7	2.7803+7	3.2922+6	7.9291+6	1.9376+3	2.1478+1	1.6469+1	4.7773+0	2.3174–1
	7.2500–2	9.2713–7	1.4458+5	2.1817–3	3.6097+7	2.5872+7	3.0297+6	7.1939+6	1.8304+3	2.0082+1	1.5442+1	4.4021+0	2.3775–1
	8.0000–2	9.9461–7	1.3477+5	2.5664–3	3.3648+7	2.4246+7	2.8111+6	6.5897+6	1.7389+3	1.8926+1	1.4587+1	4.0945+0	2.4374–1
	9.0000–2	1.0794–6	1.2419+5	3.1134–3	3.1006+7	2.2486+7	2.5826+6	5.9363+6	1.6440+3	1.7649+1	1.3652+1	3.7465+0	2.5066–1
	1.0000–1	1.1611–6	1.1545+5	3.6975–3	2.8822+7	2.1020+7	2.3940+6	5.4069+6	1.5634+3	1.6603+1	1.2880+1	3.4652+0	2.5762–1
	1.1250–1	1.2538–6	1.0691+5	4.4748–3	2.6692+7	1.9569+7	2.2152+6	4.9055+6	1.4807+3	1.5571+1	1.2119+1	3.1881+0	2.6431–1

Atomic Weight 150.350													Density 7.460 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.3125–1	1.3862–6	9.6702+4	5.7288–3	2.4143+7	1.7821+7	2.0012+6	4.3187+6	1.3789+3	1.4348+1	1.1209+1	2.8653+0	2.7456–1
1.5000–1	1.5119–6	8.8661+4	7.0809–3	2.2135+7	1.6434+7	1.8327+6	3.8675+6	1.2965+3	1.3397+1	1.0494+1	2.6184+0	2.8485–1
2.0000–1	1.8065–6	7.4204+4	1.1066–2	1.8526+7	1.3908+7	1.5511+6	3.0653+6	1.1473+3	1.1733+1	9.2693+0	2.1554+0	3.0834–1
2.5000–1	2.0634–6	6.4963+4	1.5509–2	1.6219+7	1.2208+7	1.3912+6	2.6187+6	1.0559+3	1.0788+1	8.5662+0	1.8912+0	3.3059–1
3.0000–1	2.3000–6	5.8281+4	2.0295–2	1.4550+7	1.0974+7	1.2730+6	2.3025+6	9.8674+2	1.0114+1	8.0543+0	1.7067+0	3.5265–1
4.0000–1	2.7196–6	4.9289+4	3.0553–2	1.2306+7	9.2172+6	1.1380+6	1.9496+6	9.0385+2	9.3913+0	7.4938+0	1.4995+0	3.9790–1
5.0000–1	3.0832–6	4.3478+4	4.1407–2	1.0855+7	8.0398+6	1.0603+6	1.7538+6	8.5628+2	9.0382+0	7.2041+0	1.3884+0	4.4572–1
6.0000–1	3.4095–6	3.9316+4	5.2598–2	9.8158+6	7.1904+6	1.0104+6	1.6142+6	8.2714+2	8.8347+0	7.0305+0	1.3084+0	4.9579–1
8.0000–1	3.9639–6	3.3817+4	7.5371–2	8.4429+6	6.0294+6	9.5266+5	1.4601+6	7.9425+2	8.7296+0	6.9022+0	1.2277+0	5.9975–1
1.0000+0	4.4303–6	3.0257+4	9.8254–2	7.5542+6	5.2736+6	9.2122+5	1.3585+6	7.7862+2	8.7509+0	6.8659+0	1.1750+0	7.1006–1
1.5000+0	5.3173–6	2.5210+4	1.5421–1	6.2940+6	4.1687+6	8.8704+5	1.2375+6	7.6654+2	9.1233+0	6.9895+0	1.1249+0	1.0089+0
2.0000+0	5.9538–6	2.2515+4	2.0775–1	5.6211+6	3.5643+6	8.7789+5	1.1781+6	7.6665+2	9.5575+0	7.1286+0	1.0988+0	1.3301+0
3.0000+0	6.8165–6	1.9665+4	3.0752–1	4.9097+6	2.9210+6	8.6709+5	1.1208+6	7.7287+2	1.0503+1	7.3981+0	1.0999+0	2.0050+0
4.0000+0	7.3663–6	1.8198+4	3.9864–1	4.5432+6	2.5795+6	8.6357+5	1.0994+6	7.8146+2	1.1461+1	7.6346+0	1.1011+0	2.7250+0
5.0000+0	7.7543–6	1.7287+4	4.8251–1	4.3159+6	2.3731+6	8.6352+5	1.0785+6	7.8837+2	1.2397+1	7.8283+0	1.1020+0	3.4665+0
6.0000+0	8.0409–6	1.6671+4	5.6033–1	4.1620+6	2.2380+6	8.6345+5	1.0598+6	7.9420+2	1.3315+1	7.9839+0	1.1046+0	4.2268+0
8.0000+0	8.3976–6	1.5963+4	7.0110–1	3.9853+6	2.0735+6	8.6456+5	1.0464+6	8.0476+2	1.5140+1	8.2398+0	1.1087+0	5.7912+0
1.0000+1	8.6102–6	1.5569+4	8.2580–1	3.8869+6	1.9880+6	8.6545+5	1.0326+6	8.1404+2	1.6971+1	8.4583+0	1.1120+0	7.4004+0
1.5000+1	8.7898–6	1.5250+4	1.0873+0	3.8075+6	1.9217+6	8.6743+5	1.0175+6	8.3008+2	2.1439+1	8.7767+0	1.1130+0	1.1550+1
2.0000+1	8.8238–6	1.5192+4	1.2990+0	3.7928+6	1.9193+6	8.6864+5	1.0040+6	8.4085+2	2.5950+1	9.0199+0	1.1153+0	1.5815+1
3.0000+1	8.8328–6	1.5176+4	1.6290+0	3.7889+6	1.9182+6	8.6987+5	9.9999+5	8.5552+2	3.5106+1	9.3164+0	1.1182+0	2.4671+1
4.0000+1	8.8463–6	1.5153+4	1.8819+0	3.7831+6	1.9174+6	8.7052+5	9.9435+5	8.6769+2	4.4349+1	9.5325+0	1.1191+0	3.3697+1
5.0000+1	8.8623–6	1.5126+4	2.0865+0	3.7763+6	1.9168+6	8.7097+5	9.8768+5	8.7849+2	5.3693+1	9.6976+0	1.1188+0	4.2876+1
6.0000+1	8.8756–6	1.5103+4	2.2581+0	3.7706+6	1.9163+6	8.7124+5	9.8222+5	8.8721+2	6.3119+1	9.8179+0	1.1198+0	5.2182+1
8.0000+1	8.8809–6	1.5094+4	2.5350+0	3.7684+6	1.9155+6	8.7153+5	9.8049+5	9.0080+2	8.2198+1	1.0001+1	1.1211+0	7.1076+1
1.0000+2	8.8860–6	1.5085+4	2.7536+0	3.7662+6	1.9149+6	8.7173+5	9.7870+5	9.1134+2	1.0142+2	1.0155+1	1.1222+0	9.0145+1
1.5000+2	8.8858–6	1.5086+4	3.1567+0	3.7663+6	1.9138+6	8.7186+5	9.7976+5	9.3026+2	1.4983+2	1.0326+1	1.1239+0	1.3838+2
2.0000+2	8.8877–6	1.5082+4	3.4455+0	3.7655+6	1.9130+6	8.7196+5	9.7962+5	9.4284+2	1.9872+2	1.0484+1	1.1242+0	1.8711+2
3.0000+2	8.8918–6	1.5076+4	3.8550+0	3.7638+6	1.9119+6	8.7205+5	9.7891+5	9.5803+2	2.9615+2	1.0738+1	1.1244+0	2.8429+2
4.0000+2	8.8959–6	1.5069+4	4.1468+0	3.7620+6	1.9111+6	8.7208+5	9.7791+5	9.6829+2	3.9376+2	1.0862+1	1.1242+0	3.8177+2
5.0000+2	8.9014–6	1.5059+4	4.3735+0	3.7597+6	1.9105+6	8.7210+5	9.7618+5	9.7621+2	4.9206+2	1.0977+1	1.1232+0	4.7997+2
6.0000+2	8.9037–6	1.5055+4	4.5590+0	3.7587+6	1.9100+6	8.7211+5	9.7566+5	9.8306+2	5.8921+2	1.1066+1	1.1236+0	5.7702+2
8.0000+2	8.9096–6	1.5045+4	4.8520+0	3.7563+6	1.9092+6	8.7212+5	9.7396+5	9.9398+2	7.8524+2	1.1236+1	1.1235+0	7.7288+2
1.0000+3	8.9155–6	1.5035+4	5.0794+0	3.7538+6	1.9086+6	8.7213+5	9.7208+5	1.0027+3	9.8119+2	1.1369+1	1.1233+0	9.6870+2
1.5000+3	8.9194–6	1.5029+4	5.4923+0	3.7521+6	1.9075+6	8.7213+5	9.7151+5	1.0189+3	1.4738+3	1.1501+1	1.1227+0	1.4612+3
2.0000+3	8.9230–6	1.5023+4	5.7853+0	3.7506+6	1.9067+6	8.7213+5	9.7077+5	1.0309+3	1.9636+3	1.1631+1	1.1218+0	1.9508+3
3.0000+3	8.9272–6	1.5016+4	6.1981+0	3.7489+6	1.9056+6	8.7213+5	9.7010+5	1.0484+3	2.9473+3	1.1883+1	1.1211+0	2.9343+3
4.0000+3	8.9307–6	1.5010+4	6.4907+0	3.7474+6	1.9048+6	8.7213+5	9.6941+5	1.0613+3	3.9342+3	1.1979+1	1.1204+0	3.9211+3
5.0000+3	8.9348–6	1.5003+4	6.7173+0	3.7457+6	1.9042+6	8.7213+5	9.6828+5	1.0714+3	4.9315+3	1.2075+1	1.1191+0	4.9183+3
6.0000+3	8.9358–6	1.5001+4	6.9023+0	3.7452+6	1.9037+6	8.7213+5	9.6834+5	1.0788+3	5.9083+3	1.2159+1	1.1192+0	5.8951+3
8.0000+3	8.9383–6	1.4997+4	7.1944+0	3.7442+6	1.9029+6	8.7213+5	9.6806+5	1.0907+3	7.8790+3	1.2322+1	1.1190+0	7.8655+3
1.0000+4	8.9402–6	1.4994+4	7.4208+0	3.7434+6	1.9023+6	8.7213+5	9.6787+5	1.0999+3	9.8680+3	1.2470+1	1.1189+0	9.8544+3
1.5000+4	8.9431–6	1.4989+4	7.8326+0	3.7422+6	1.9012+6	8.7213+5	9.6774+5	1.1177+3	1.4736+4	1.2594+1	1.1188+0	1.4722+4
2.0000+4	8.9456–6	1.4985+4	8.1253+0	3.7412+6	1.9004+6	8.7213+5	9.6748+5	1.1304+3	1.9667+4	1.2717+1	1.1185+0	1.9653+4
3.0000+4	8.9484–6	1.4980+4	8.5382+0	3.7400+6	1.8993+6	8.7214+5	9.6740+5	1.1484+3	2.9432+4	1.2964+1	1.1184+0	2.9418+4
4.0000+4	8.9508–6	1.4976+4	8.8312+0	3.7390+6	1.8985+6	8.7214+5	9.6716+5	1.1613+3	3.9303+4	1.3078+1	1.1181+0	3.9288+4
5.0000+4	8.9544–6	1.4970+4	9.0584+0	3.7374+6	1.8979+6	8.7214+5	9.6623+5	1.1712+3	4.9081+4	1.3169+1	1.1170+0	4.9067+4
6.0000+4	8.9549–6	1.4969+4	9.2442+0	3.7373+6	1.8974+6	8.7214+5	9.6654+5	1.1793+3	5.8852+4	1.3248+1	1.1174+0	5.8838+4
8.0000+4	8.9566–6	1.4966+4	9.5373+0	3.7365+6	1.8966+6	8.7214+5	9.6656+5	1.1921+3	7.8564+4	1.3405+1	1.1174+0	7.8550+4
1.0000+5	8.9582–6	1.4964+4	9.7644+0	3.7359+6	1.8960+6	8.7214+5	9.6653+5	1.2021+3	9.8312+4	1.3560+1	1.1174+0	9.8297+4


July 4, 1991
Atomic Weight 151.960
EEDL Evaluated Electron
Cross Sections
63-Eu
Density 5.243 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
63-Eu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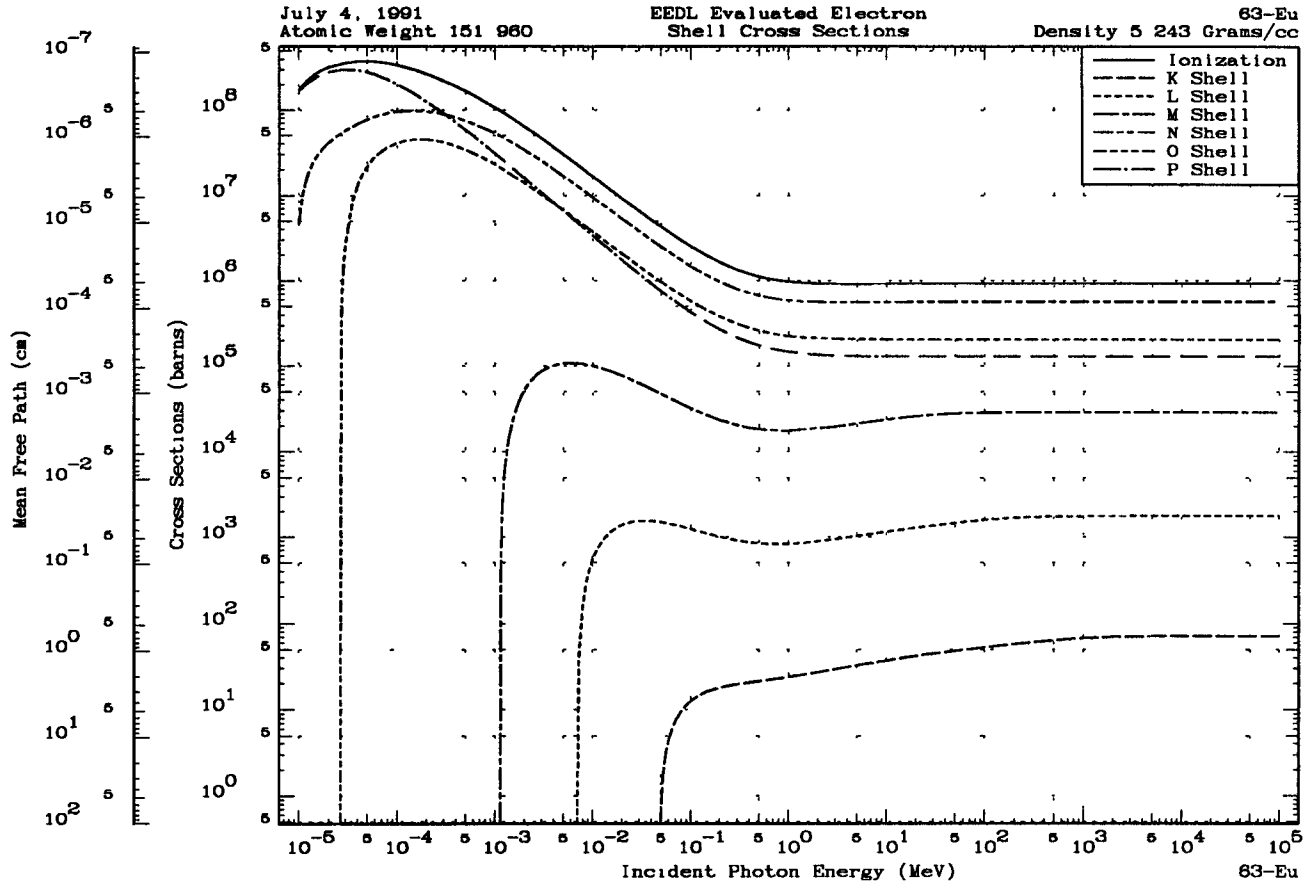
EEDL Evaluated Electron
Energy Deposition
63-Eu
Density 5.243 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
63-Eu

279


July 4, 1991
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EEDL Evaluated Electron
Shell Cross Sections
63-Eu
Density 5 243 Grams/cc
Ionization
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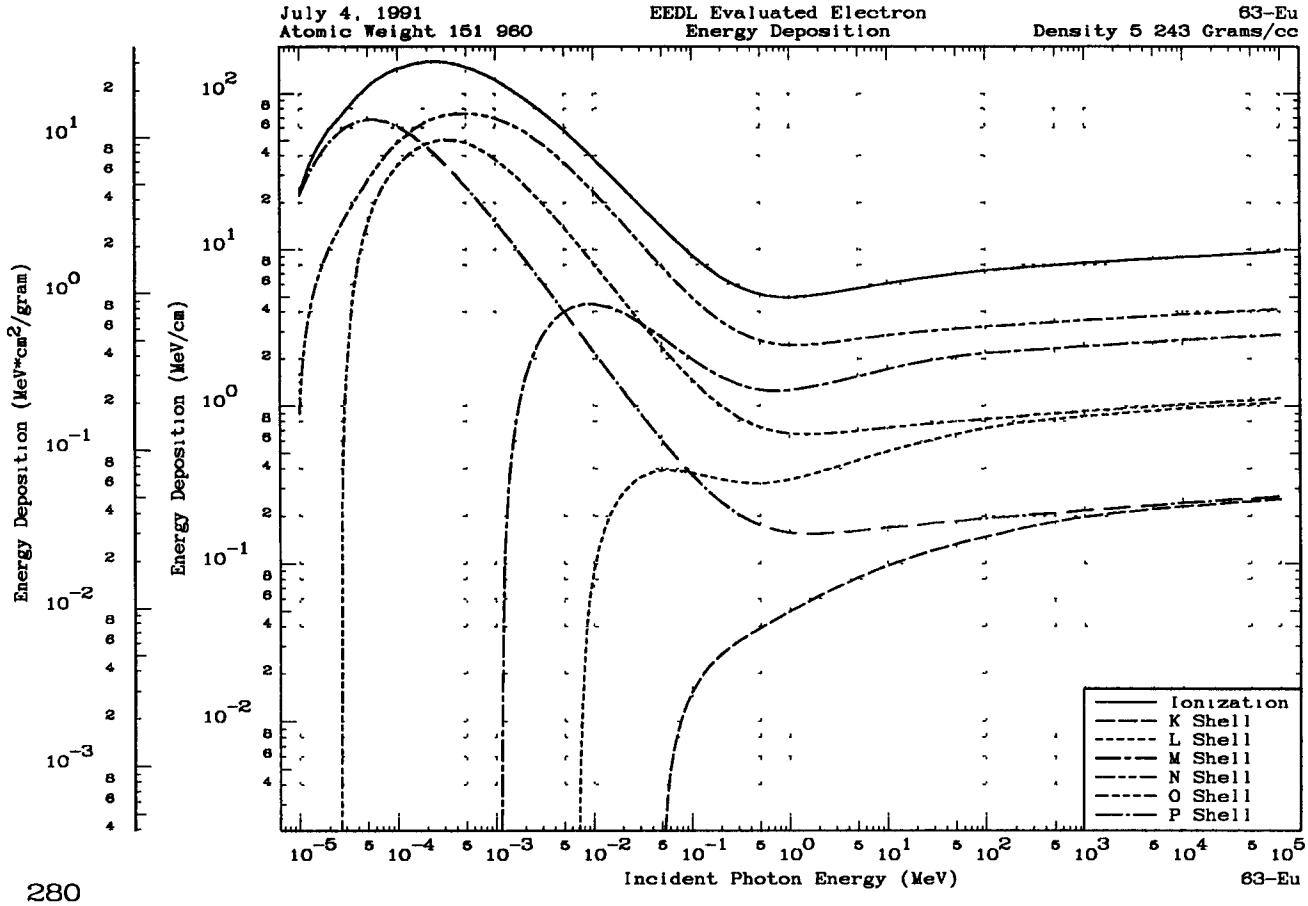
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
63-Eu


July 4, 1991
Atomic Weight 151 960
EEDL Evaluated Electron
Energy Deposition
63-Eu
Density 5 243 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
63-Eu

Atomic Weight 151.960 Density 5.243 Grams/cc

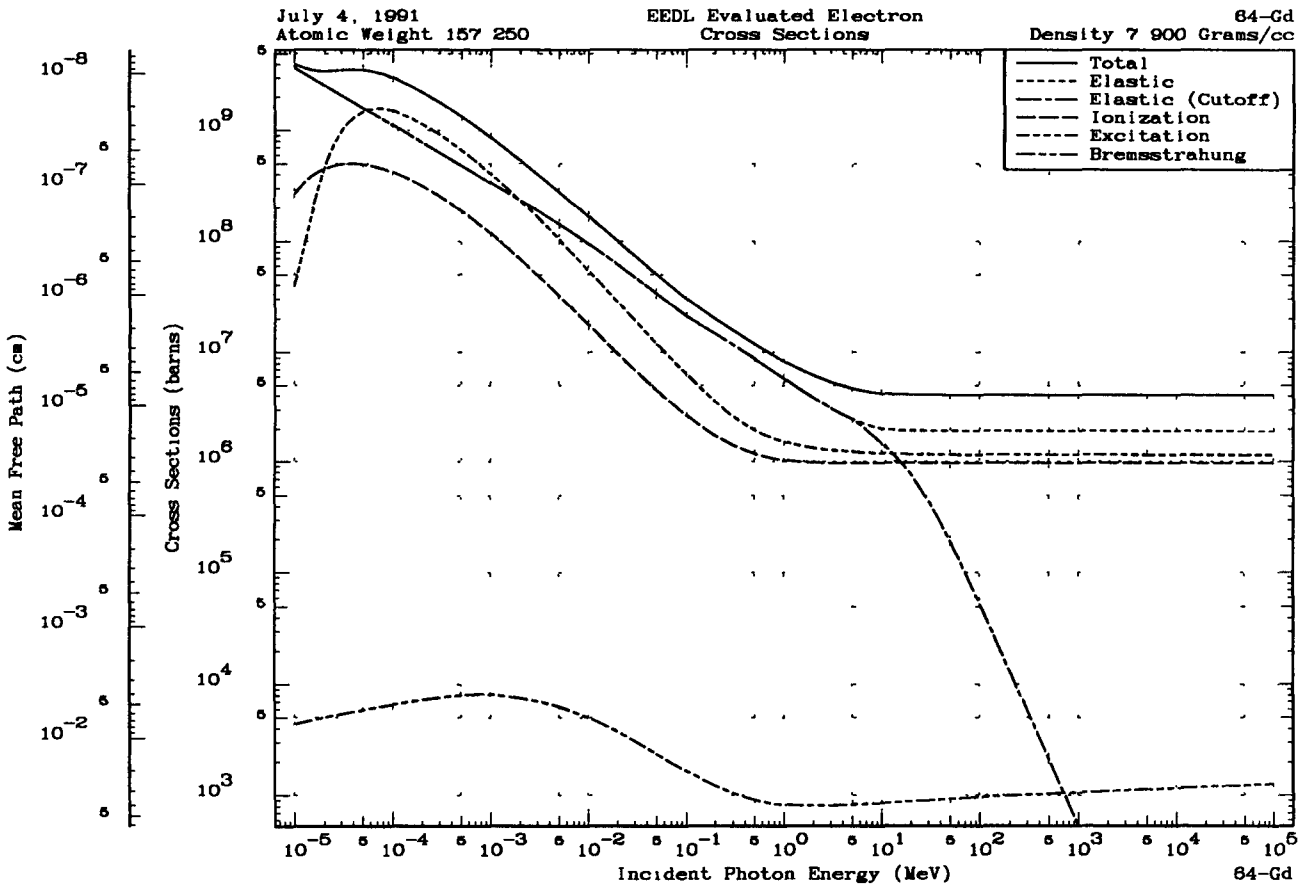
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	1.2657–8	1.5069+7		3.8025+9	3.6026+9	1.7263+8	2.7298+7	4.3663+3	2.6572+1	2.3072+1	3.4994+0	1.9601–4
1.0313–5	1.2812–8	1.4886+7		3.7564+9	3.5453+9	1.7997+8	3.1063+7	4.3937+3	2.8440+1	2.4428+1	4.0113+0	2.0189–4
1.0625–5	1.2961–8	1.4715+7		3.7132+9	3.4907+9	1.8738+8	3.5210+7	4.4203+3	3.0397+1	2.5816+1	4.5800+0	2.0780–4
1.0898–5	1.3086–8	1.4575+7		3.6777+9	3.4448+9	1.9372+8	3.9167+7	4.4431+3	3.2151+1	2.7024+1	5.1270+0	2.1299–4
1.1411–5	1.3313–8	1.4326+7		3.6150+9	3.3633+9	2.0552+8	4.6198+7	4.4848+3	3.5426+1	2.9307+1	6.1189+0	2.2278–4
1.1719–5	1.3442–8	1.4189+7		3.5805+9	3.3170+9	2.1259+8	5.0826+7	4.5090+3	3.7482+1	3.0702+1	6.7791+0	2.2869–4
1.2308–5	1.3678–8	1.3944+7		3.5187+9	3.2333+9	2.2583+8	5.9522+7	4.5542+3	4.1415+1	3.3370+1	8.0448+0	2.4008–4
1.2500–5	1.3751–8	1.3871+7		3.5000+9	3.2074+9	2.3007+8	6.2557+7	4.5684+3	4.2729+1	3.4238+1	8.4912+0	2.4381–4
1.2539–5	1.3766–8	1.3855+7		3.4961+9	3.2022+9	2.3074+8	6.3188+7	4.5713+3	4.2970+1	3.4385+1	8.5844+0	2.4457–4
1.3654–5	1.4174–8	1.3457+7		3.3956+9	3.0633+9	2.4922+8	8.3118+7	4.6510+3	5.0126+1	3.8554+1	1.1572+1	2.6641–4
1.3770–5	1.4212–8	1.3420+7		3.3864+9	3.0499+9	2.5109+8	8.5398+7	4.6590+3	5.0905+1	3.8986+1	1.1919+1	2.6869–4
1.5000–5	1.4585–8	1.3077+7		3.2998+9	2.9169+9	2.7033+8	1.1248+8	4.7405+3	5.9703+1	4.3587+1	1.6116+1	2.9317–4
1.6250–5	1.4920–8	1.2784+7		3.2258+9	2.7979+9	2.8484+8	1.4311+8	4.8181+3	6.8225+1	4.7452+1	2.0773+1	3.1838–4
1.7500–5	1.5185–8	1.2561+7		3.1695+9	2.6920+9	2.9865+8	1.7887+8	4.8911+3	7.7620+1	5.1322+1	2.6297+1	3.4393–4
2.0000–5	1.5584–8	1.2239+7		3.0883+9	2.5112+9	3.1895+8	2.5818+8	5.0253+3	9.7068+1	5.8146+1	3.8921+1	3.9596–4
2.5000–5	1.5879–8	1.2011+7		3.0308+9	2.2357+9	3.4066+8	4.5446+8	5.2320+3	1.3802+2	6.8141+1	6.9877+1	4.9457–4
O3 2.6560–5	1.5875–8	1.2015+7		3.0318+9	2.1664+9	3.4696+8	5.1846+8	5.2895+3	1.5153+2	7.1323+1	8.0205+1	5.2597–4
2.6990–5	1.5875–8	1.2015+7		3.0317+9	2.1483+9	3.4833+8	5.3507+8	5.3046+3	1.5506+2	7.2196+1	8.2865+1	5.3458–4
2.7743–5	1.5867–8	1.2021+7		3.0333+9	2.1178+9	3.5076+8	5.6476+8	5.3305+3	1.6138+2	7.3751+1	8.7629+1	5.4969–4
2.8871–5	1.5835–8	1.2045+7		3.0394+9	2.0742+9	3.5440+8	6.1076+8	5.3684+3	1.7117+2	7.6131+1	9.5038+1	5.7247–4
3.0000–5	1.5781–8	1.2086+7		3.0498+9	2.0332+9	3.5804+8	6.5853+8	5.4050+3	1.8132+2	7.8554+1	1.0276+2	5.9539–4
O2 3.0610–5	1.5760–8	1.2102+7		3.0538+9	2.0120+9	3.5900+8	6.8274+8	5.4244+3	1.8620+2	7.9528+1	1.0667+2	6.0783–4
3.1784–5	1.5725–8	1.2129+7		3.0607+9	1.9731+9	3.6066+8	7.2695+8	5.4607+3	1.9533+2	8.1487+1	1.1384+2	6.3187–4
3.2811–5	1.5679–8	1.2164+7		3.0695+9	1.9407+9	3.6228+8	7.6654+8	5.4916+3	2.0360+2	8.3314+1	1.2028+2	6.5302–4
3.4608–5	1.5570–8	1.2250+7		3.0910+9	1.8876+9	3.6555+8	8.3782+8	5.5438+3	2.1872+2	8.6793+1	1.3193+2	6.9027–4
3.5000–5	1.5542–8	1.2272+7		3.0966+9	1.8766+9	3.6630+8	8.5370+8	5.5549+3	2.2211+2	8.7579+1	1.3453+2	6.9844–4
4.0000–5	1.5319–8	1.2451+7		3.1418+9	1.7507+9	3.7430+8	1.0168+9	5.6880+3	2.5863+2	9.6843+1	1.6179+2	8.0380–4
4.5000–5	1.5239–8	1.2516+7		3.1583+9	1.6468+9	3.7561+8	1.1359+9	5.7993+3	2.8572+2	1.0372+2	1.8201+2	9.0671–4
O1 4.9210–5	1.5247–8	1.2509+7		3.1565+9	1.5719+9	3.7667+8	1.2079+9	5.8852+3	3.0402+2	1.0936+2	1.9466+2	9.9466–4
5.0000–5	1.5248–8	1.2508+7		3.1563+9	1.5590+9	3.7700+8	1.2203+9	5.9000+3	3.0739+2	1.1051+2	1.9688+2	1.0109–3
5.1250–5	1.5293–8	1.2472+7		3.1471+9	1.5391+9	3.7641+8	1.2316+9	5.9230+3	3.1089+2	1.1182+2	1.9906+2	1.0367–3
5.3438–5	1.5364–8	1.2414+7		3.1326+9	1.5060+9	3.7554+8	1.2510+9	5.9622+3	3.1701+2	1.1417+2	2.0284+2	1.0821–3
5.5000–5	1.5410–8	1.2377+7		3.1232+9	1.4836+9	3.7503+8	1.2645+9	5.9893+3	3.2137+2	1.1588+2	2.0549+2	1.1147–3
5.6719–5	1.5457–8	1.2339+7		3.1136+9	1.4601+9	3.7435+8	1.2792+9	6.0184+3	3.2604+2	1.1766+2	2.0838+2	1.1507–3
6.0000–5	1.5537–8	1.2276+7		3.0977+9	1.4180+9	3.7329+8	1.3063+9	6.0720+3	3.3492+2	1.2111+2	2.1380+2	1.2198–3
6.5000–5	1.5807–8	1.2066+7		3.0447+9	1.3602+9	3.6856+8	1.3160+9	6.1491+3	3.4088+2	1.2456+2	2.1631+2	1.3261–3
7.0000–5	1.6051–8	1.1883+7		2.9984+9	1.3088+9	3.6465+8	1.3249+9	6.2214+3	3.4694+2	1.2821+2	2.1872+2	1.4336–3
7.2500–5	1.6166–8	1.1798+7		2.9771+9	1.2852+9	3.6270+8	1.3292+9	6.2559+3	3.4983+2	1.2992+2	2.1990+2	1.4877–3
8.0000–5	1.6482–8	1.1572+7		2.9200+9	1.2211+9	3.5768+8	1.3412+9	6.3537+3	3.5855+2	1.3523+2	2.2332+2	1.6518–3
9.0000–5	1.7108–8	1.1149+7		2.8132+9	1.1485+9	3.4773+8	1.3169+9	6.4660+3	3.6086+2	1.3944+2	2.2142+2	1.8713–3
1.0000–4	1.7678–8	1.0789+7	0.0000+0	2.7226+9	1.0873+9	3.3974+8	1.2955+9	6.5682+3	3.6401+2	1.4407+2	2.1993+2	2.0943–3
1.1250–4	1.8405–8	1.0363+7	3.4393–8	2.6149+9	1.0229+9	3.2704+8	1.2649+9	6.6778+3	3.6289+2	1.4650+2	2.1639+2	2.3742–3
1.2500–4	1.9073–8	1.0000+7	6.8841–8	2.5234+9	9.6859+8	3.1661+8	1.2382+9	6.7774+3	3.6283+2	1.4940+2	2.1343+2	2.6582–3
1.3125–4	1.9389–8	9.8369+6	8.6066–8	2.4822+9	9.4440+8	3.1178+8	1.2260+9	6.8240+3	3.6288+2	1.5074+2	2.1213+2	2.8017–3
N5 1.4244–4	1.9928–8	9.5709+6	1.1688–7	2.4151+9	9.0520+8	3.0403+8	1.2058+9	6.9029+3	3.6336+2	1.5332+2	2.1004+2	3.0607–3
1.4622–4	2.0122–8	9.4786+6	1.2729–7	2.3918+9	8.9300+8	3.0140+8	1.1974+9	6.9283+3	3.6318+2	1.5405+2	2.0912+2	3.1489–3
N4 1.4776–4	2.0200–8	9.4420+6	1.3153–7	2.3826+9	8.8817+8	3.0036+8	1.1940+9	6.9385+3	3.6311+2	1.5435+2	2.0876+2	3.1849–3
1.5000–4	2.0311–8	9.3905+6	1.3770–7	2.3696+9	8.8127+8	2.9889+8	1.1894+9	6.9532+3	3.6313+2	1.5485+2	2.0828+2	3.2373–3
1.5625–4	2.0651–8	9.2360+6	1.5495–7	2.3306+9	8.6282+8	2.9394+8	1.1738+9	6.9911+3	3.6129+2	1.5512+2	2.0617+2	3.3851–3
1.6250–4	2.0982–8	9.0903+6	1.7229–7	2.2938+9	8.4546+8	2.8933+8	1.1590+9	7.0277+3	3.5971+2	1.5552+2	2.0418+2	3.5337–3
1.6719–4	2.1225–8	8.9863+6	1.8534–7	2.2676+9	8.3309+8	2.8606+8	1.1484+9	7.0543+3	3.5863+2	1.5586+2	2.0277+2	3.6456–3
1.8125–4	2.1927–8	8.6983+6	2.2470–7	2.1949+9	7.9895+8	2.7714+8	1.1188+9	7.1306+3	3.5599+2	1.5711+2	1.9887+2	3.9837–3
1.8359–4	2.2041–8	8.6535+6	2.3129–7	2.1836+9	7.9365+8	2.7576+8	1.1142+9	7.1428+3	3.5562+2	1.5735+2	1.9827+2	4.0404–3
2.0000–4	2.2811–8	8.3615+6	2.7755–7	2.1099+9	7.5922+8	2.6693+8	1.0838+9	7.2247+3	3.5354+2	1.5918+2	1.9436+2	4.4398–3
2.2500–4	2.4096–8	7.9155+6	3.4911–7	1.9974+9	7.1427+8	2.5285+8	1.0302+9	7.3220+3	3.4530+2	1.5875+2	1.8654+2	5.0636–3
N3 2.6030–4	2.5780–8	7.3983+6	4.5263–7	1.8669+9	6.6232+8	2.3687+8	9.6767+8	7.4442+3	3.3673+2	1.5916+2	1.7757+2	5.9577–3
2.6526–4	2.6026–8	7.3283+6	4.6740–7	1.8492+9	6.5587+8	2.3469+8	9.5863+8	7.4602+3	3.3519+2	1.5898+2	1.7621+2	6.0845–3
2.7395–4	2.6452–8	7.2105+6	4.9341–7	1.8195+9	6.4501+8	2.3103+8	9.4343+8	7.4876+3	3.3264+2	1.5872+2	1.7392+2	6.3071–3
2.8697–4	2.7076–8	7.0441+6	5.3277–7	1.7775+9	6.2967+8	2.2590+8	9.2192+8	7.5272+3	3.2915+2	1.5845+2	1.7070+2	6.6426–3
N2 2.9005–4	2.7222–8	7.0065+6	5.4213–7	1.7680+9	6.2620+8	2.2474+8	9.1705+8	7.5363+3	3.2838+2	1.5840+2	1.6997+2	6.7221–3
2.9503–4	2.7460–8	6.9457+6	5.5731–7	1.7527+9	6.2071+8	2.2292+8	9.0903+8	7.5509+3	3.2715+2	1.5835+2	1.6879+2	6.8508–3
3.0000–4	2.7696–8	6.8865+6	5.7254–7	1.7377+9	6.1535+8	2.2114+8	9.0121+8	7.5652+3	3.2597+2	1.5833+2	1.6763+2	6.9798–3
3.1250–4	2.8317–8	6.7354+6	6.1114–7	1.6996+9	6.0251+8	2.1636+8	8.8072+8	7.6004+3	3.2177+2	1.5739+2	1.6437+2	7.3049–3
3.2500–4	2.8927–8	6.5936+6	6.5022–7	1.6638+9	5.9043+8	2.1188+8	8.6146+8	7.6344+3	3.1791+2	1.5659+2	1.6131+2	7.6315–3
3.3438–4	2.9377–8	6.4926+6	6.7984–7	1.6383+9	5.8183+8	2.0871+8	8.4777+8	7.6591+3	3.1520+2	1.5605+2	1.5914+2	7.8774–3
N1 3.5770–4	3.0470–8	6.2596+6	7.5456–7	1.5795+9	5.6191+8	2.0143+8	8.1616+8	7.7180+3	3.0911+2	1.5495+2	1.5415+2	8.4926–3
3.6299–4	3.0723–8	6.2082+6	7.7171–7	1.5665+9	5.5768+8	1.9987+8	8.0899+8	7.7295+3	3.0778+2	1.5472+2	1.5304+2	8.6341–3
3.6719–4	3.0922–8	6.1682+6	7.8538–7	1.5565+9	5.5438+8	1.9866+8	8.0340+8	7.7385+3	3.0675+2	1.5455+2	1.5219+2	8.7467–3
3.7224–4	3.1160–8	6.1210+6	8.0188–7	1.5445+9	5.5048+8	1.9723+8	7.9682+8	7.7493+3	3.0554+2	1.5436+2	1.5117+2	8.8823–3
3.8612–4	3.1807–8	5.9965+6	8.4754–7	1.5131+9	5.4019+8	1.9348+8	7.7945+8	7.7782+3	3.0242+2	1.5390+2	1.4851+2	9.2557–3
4.0000–4	3.2444–8	5.8788+6	8.9366–7	1.4834+9	5.3044+8	1.8994+8	7.6305+8	7.8061+3	2.9954+2	1.5353+2	1.4600+2	9.6304–3
4.2500–4	3.3653–8	5.6675+6	9.7811–7	1.4301+9	5.1412+8	1.8329+8	7.3270+8	7.8451+3	2.9255+2	1.5152+2	1.4101+2	1.0318–2
4.5000–4	3.4834–8	5.4755+6	1.0645–6	1.3817+9	4.9918+8	1.7728+8	7.0519+8	7.8820+3	2.8634+2	1.4983+2	1.3651+2	1.1010–2
4.6250–4	3.5413–8	5.3858+6	1.1084–6	1.3590+9	4.9218+8	1.7448+8	6.9237+8	7.8998+3	2.8349+2	1.4907+2	1.3441+2	1.1357–2
5.0000–4	3.7114–8	5.1390+6	1.2425–6	1.2967+9	4.7279+8	1.6680+8	6.5716+8	7.9505+3	2.7582+2	1.4714+2	1.2868+2	1.2402–2
5.5000–4	3.9364–8	4.8453+6	1.4271–6	1.2226+9	4.5011+8	1.5760+8	6.1494+8	8.0021+3	2.6588+2	1.4427+2	1.2160+2	1.3785–2
6.0000–4	4.1531–8	4.5925+6	1.6181–6	1.1589+9	4.3036+8	1.4972+8	5.7877+8	8.0495+3	2.5766+2	1.4208+2	1.1557+2	1.5178–2
7.0000–4	4.5794–8	4.1649+6	2.0194–6	1.0510+9	3.9748+8	1.3551+8	5.1797+8	8.0829+3	2.4095+2	1.3579+2	1.0514+2	1.7801–2
8.0000–4	4.9826–8	3.8279+6	2.4456–6	9.6593+8	3.7103+8	1.2440+8	4.7049+8	8.1119+3	2.2835+2	1.3128+2	9.7056+1	2.0434–2
1.0000–3	5.7778–8	3.3011+6	3.3679–6	8.3299+8	3.3070+8	1.0683+8	3.9545+8	8.0355+3	2.0573+2	1.2197+2	8.3743+1	2.4770–2

Atomic Weight 151.960 Density 5.243 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M5	1.1378–3	6.2937–8	3.0305+6	4.0596–6	7.6471+8	3.0937+8	9.7406+7	3.5792+8	7.9302+3	1.9288+2	1.1598+2	7.6868+1	2.7122–2
	1.1491–3	6.3356–8	3.0104+6	4.1184–6	7.5964+8	3.0779+8	9.6720+7	3.5512+8	7.9221+3	1.9195+2	1.1556+2	7.6362+1	2.7314–2
	1.1601–3	6.3761–8	2.9913+6	4.1756–6	7.5481+8	3.0629+8	9.6066+7	3.5245+8	7.9144+3	1.9107+2	1.1516+2	7.5881+1	2.7500–2
M4	1.1672–3	6.4024–8	2.9791+6	4.2130–6	7.5172+8	3.0532+8	9.5648+7	3.5074+8	7.9095+3	1.9051+2	1.1491+2	7.5573+1	2.7620–2
	1.1707–3	6.4154–8	2.9730+6	4.2314–6	7.5020+8	3.0485+8	9.5437+7	3.4991+8	7.9070+3	1.9021+2	1.1477+2	7.5419+1	2.7679–2
	1.1880–3	6.4791–8	2.9438+6	4.3226–6	7.4282+8	3.0255+8	9.4415+7	3.4585+8	7.8947+3	1.8877+2	1.1407+2	7.4673+1	2.7966–2
	1.1913–3	6.4912–8	2.9383+6	4.3401–6	7.4144+8	3.0212+8	9.4224+7	3.4509+8	7.8924+3	1.8850+2	1.1394+2	7.4533+1	2.8021–2
	1.2299–3	6.6321–8	2.8759+6	4.5465–6	7.2569+8	2.9718+8	9.2046+7	3.3645+8	7.8659+3	1.8545+2	1.1247+2	7.2945+1	2.8661–2
	1.2500–3	6.7049–8	2.8446+6	4.6554–6	7.1781+8	2.9470+8	9.0958+7	3.3214+8	7.8524+3	1.8393+2	1.1175+2	7.2153+1	2.8994–2
	1.2660–3	6.7625–8	2.8204+6	4.7427–6	7.1169+8	2.9277+8	9.0115+7	3.2879+8	7.8418+3	1.8276+2	1.1119+2	7.1540+1	2.9259–2
	1.3649–3	7.1132–8	2.6814+6	5.2941–6	6.7661+8	2.8161+8	8.5292+7	3.0969+8	7.7797+3	1.7612+2	1.0805+2	6.8040+1	3.0889–2
	1.3830–3	7.1762–8	2.6578+6	5.3970–6	6.7067+8	2.7971+8	8.4478+7	3.0647+8	7.7689+3	1.7501+2	1.0752+2	6.7451+1	3.1186–2
M3	1.4696–3	7.4743–8	2.5518+6	5.8990–6	6.4392+8	2.7107+8	8.0820+7	2.9202+8	7.7192+3	1.7006+2	1.0522+2	6.4812+1	3.2603–2
	1.5000–3	7.5793–8	2.5165+6	6.0786–6	6.3499+8	2.6822+8	7.9610+7	2.8716+8	7.6997+3	1.6840+2	1.0443+2	6.3929+1	3.3056–2
	1.5625–3	7.7889–8	2.4488+6	6.4538–6	6.1791+8	2.6261+8	7.7174+7	2.7812+8	7.6611+3	1.6479+2	1.0255+2	6.2205+1	3.3983–2
M2	1.6040–3	7.9264–8	2.4063+6	6.7073–6	6.0719+8	2.5907+8	7.5650+7	2.7246+8	7.6364+3	1.6256+2	1.0139+2	6.1129+1	3.4597–2
	1.6172–3	7.9725–8	2.3924+6	6.7887–6	6.0368+8	2.5797+8	7.5179+7	2.7053+8	7.6287+3	1.6183+2	1.0104+2	6.0758+1	3.4792–2
	1.6250–3	7.9998–8	2.3842+6	6.8370–6	6.0162+8	2.5732+8	7.4903+7	2.6939+8	7.6241+3	1.6141+2	1.0083+2	6.0542+1	3.4908–2
	1.6287–3	8.0128–8	2.3803+6	6.8602–6	6.0064+8	2.5701+8	7.4772+7	2.6885+8	7.6220+3	1.6120+2	1.0073+2	6.0438+1	3.4963–2
	1.6752–3	8.1738–8	2.3334+6	7.1503–6	5.8881+8	2.5326+8	7.3188+7	2.6236+8	7.5956+3	1.5875+2	9.9522+1	5.9197+1	3.5648–2
	1.7129–3	8.3035–8	2.2970+6	7.3894–6	5.7961+8	2.5033+8	7.1957+7	2.5732+8	7.5748+3	1.5687+2	9.8596+1	5.8235+1	3.6203–2
	1.7500–3	8.4302–8	2.2625+6	7.6274–6	5.7090+8	2.4754+8	7.0793+7	2.5256+8	7.5549+3	1.5509+2	9.7729+1	5.7326+1	3.6747–2
	1.7564–3	8.4518–8	2.2567+6	7.6685–6	5.6944+8	2.4707+8	7.0597+7	2.5177+8	7.5515+3	1.5479+2	9.7583+1	5.7174+1	3.6841–2
M1	1.7769–3	8.5214–8	2.2382+6	7.8015–6	5.6479+8	2.4557+8	6.9976+7	2.4923+8	7.5407+3	1.5385+2	9.7119+1	5.6690+1	3.7142–2
	1.8048–3	8.6163–8	2.2136+6	7.9836–6	5.5857+8	2.4358+8	6.9137+7	2.4585+8	7.5262+3	1.5253+2	9.6458+1	5.6031+1	3.7550–2
	1.8125–3	8.6424–8	2.2069+6	8.0342–6	5.5688+8	2.4304+8	6.8909+7	2.4493+8	7.5223+3	1.5217+2	9.6279+1	5.5852+1	3.7663–2
	1.8536–3	8.7810–8	2.1721+6	8.3059–6	5.4809+8	2.4020+8	6.7723+7	2.4016+8	7.5015+3	1.5031+2	9.5346+1	5.4922+1	3.8263–2
	1.8564–3	8.7906–8	2.1697+6	8.3249–6	5.4749+8	2.4001+8	6.7643+7	2.3983+8	7.5001+3	1.5018+2	9.5283+1	5.4859+1	3.8304–2
	1.8782–3	8.8635–8	2.1519+6	8.4701–6	5.4299+8	2.3855+8	6.7036+7	2.3740+8	7.4894+3	1.4923+2	9.4808+1	5.4384+1	3.8621–2
	1.9268–3	9.0255–8	2.1132+6	8.7981–6	5.3325+8	2.3539+8	6.5724+7	2.3213+8	7.4658+3	1.4719+2	9.3787+1	5.3359+1	3.9329–2
	2.0000–3	9.2668–8	2.0582+6	9.3004–6	5.1936+8	2.3084+8	6.3858+7	2.2466+8	7.4316+3	1.4430+2	9.2358+1	5.1905+1	4.0391–2
	2.1250–3	9.6798–8	1.9704+6	1.0183–5	4.9720+8	2.2342+8	6.0823+7	2.1296+8	7.3558+3	1.3911+2	8.9521+1	4.9544+1	4.1920–2
	2.2500–3	1.0085–7	1.8912+6	1.1096–5	4.7723+8	2.1664+8	5.8098+7	2.0249+8	7.2850+3	1.3449+2	8.7012+1	4.7433+1	4.3440–2
	2.3438–3	1.0384–7	1.8368+6	1.1802–5	4.6348+8	2.1192+8	5.6227+7	1.9533+8	7.2349+3	1.3132+2	8.5284+1	4.5990+1	4.4573–2
	2.5000–3	1.0874–7	1.7540+6	1.3014–5	4.4259+8	2.0467+8	5.3396+7	1.8452+8	7.1563+3	1.2656+2	8.2703+1	4.3816+1	4.6450–2
	2.6250–3	1.1259–7	1.6940+6	1.4015–5	4.2746+8	1.9936+8	5.1350+7	1.7675+8	7.0975+3	1.2314+2	8.0838+1	4.2253+1	4.7941–2
	2.6719–3	1.1402–7	1.6728+6	1.4398–5	4.2211+8	1.9746+8	5.0628+7	1.7401+8	7.0763+3	1.2192+2	8.0172+1	4.1703+1	4.8498–2
	3.0000–3	1.2379–7	1.5407+6	1.7174–5	3.8878+8	1.8551+8	4.6151+7	1.5711+8	6.9390+3	1.1449+2	7.6126+1	3.8315+1	5.2364–2
	3.5000–3	1.3841–7	1.3780+6	2.1751–5	3.4772+8	1.7043+8	4.0619+7	1.3667+8	6.7155+3	1.0417+2	7.0102+1	3.4013+1	5.7353–2
	4.0000–3	1.5237–7	1.2518+6	2.6741–5	3.1587+8	1.5837+8	3.6373+7	1.2112+8	6.5277+3	9.6330+1	6.5518+1	3.0749+1	6.2239–2
	4.5000–3	1.6610–7	1.1483+6	3.2127–5	2.8976+8	1.4816+8	3.2929+7	1.0866+8	6.3436+3	8.9407+1	6.1316+1	2.8025+1	6.6550–2
	5.0000–3	1.7936–7	1.0634+6	3.7902–5	2.6833+8	1.3959+8	3.0129+7	9.8603+7	6.1834+3	8.3828+1	5.7928+1	2.5829+1	7.0782–2
	6.0000–3	2.0498–7	9.3050+5	5.0535–5	2.3480+8	1.2572+8	2.5792+7	8.3278+7	5.8568+3	7.4662+1	5.2194+1	2.2390+1	7.7479–2
L3	6.9688–3	2.2907–7	8.3263+5	6.4162–5	2.1010+8	1.1528+8	2.2674+7	7.2147+7	5.5934+3	6.7643+1	4.7744+1	1.9816+1	8.3516–2
	7.2266–3	2.3534–7	8.1043+5	6.8019–5	2.0450+8	1.1286+8	2.1975+7	6.9659+7	5.5232+3	6.6029+1	4.6717+1	1.9227+1	8.4828–2
	7.6133–3	2.4463–7	7.7967+5	7.3977–5	1.9674+8	1.0948+8	2.1011+7	6.6238+7	5.4239+3	6.3807+1	4.5303+1	1.8417+1	8.6782–2
L2	7.6248–3	2.4490–7	7.7880+5	7.4157–5	1.9652+8	1.0939+8	2.0984+7	6.6142+7	5.4211+3	6.3744+1	4.5263+1	1.8394+1	8.6839–2
	8.0000–3	2.5389–7	7.5125+5	8.0135–5	1.8957+8	1.0635+8	2.0134+7	6.3072+7	5.3312+3	6.1788+1	4.4022+1	1.7677+1	8.8717–2
L1	8.0181–3	2.5431–7	7.4999+5	8.0428–5	1.8925+8	1.0621+8	2.0094+7	6.2939+7	5.3270+3	6.1692+1	4.3960+1	1.7644+1	8.8807–2
	8.1420–3	2.5727–7	7.4137+5	8.2447–5	1.8708+8	1.0524+8	1.9829+7	6.2004+7	5.2973+3	6.1046+1	4.3540+1	1.7417+1	8.9368–2
	8.5000–3	2.6574–7	7.1774+5	8.8398–5	1.8111+8	1.0255+8	1.9104+7	5.9452+7	5.2147+3	5.9284+1	4.2393+1	1.6800+1	9.0982–2
	8.6065–3	2.6824–7	7.1105+5	9.0202–5	1.7942+8	1.0179+8	1.8899+7	5.8734+7	5.1910+3	5.8787+1	4.2070+1	1.6626+1	9.1460–2
	9.2500–3	2.8316–7	6.7358+5	1.0141–4	1.6997+8	9.7468+7	1.7756+7	5.4740+7	5.0562+3	5.6021+1	4.0267+1	1.5659+1	9.4323–2
	9.3032–3	2.8438–7	6.7069+5	1.0237–4	1.6924+8	9.7133+7	1.7668+7	5.4434+7	5.0456+3	5.5809+1	4.0129+1	1.5585+1	9.4559–2
	1.0000–2	3.0017–7	6.3541+5	1.1515–4	1.6034+8	9.3007+7	1.6598+7	5.0727+7	4.9143+3	5.3235+1	3.8449+1	1.4688+1	9.7612–2
	1.1250–2	3.2810–7	5.8131+5	1.3961–4	1.4669+8	8.6495+7	1.4986+7	4.5200+7	4.6812+3	4.9020+1	3.5628+1	1.3290+1	1.0165–1
	1.2188–2	3.4848–7	5.4733+5	1.5927–4	1.3811+8	8.2333+7	1.3981+7	4.1792+7	4.5291+3	4.6403+1	3.3871+1	1.2427+1	1.0463–1
	1.2500–2	3.5517–7	5.3701+5	1.6606–4	1.3551+8	8.1058+7	1.3678+7	4.0768+7	4.4820+3	4.5616+1	3.3341+1	1.2168+1	1.0562–1
	1.3125–2	3.6841–7	5.1772+5	1.7998–4	1.3064+8	7.8657+7	1.3112+7	3.8865+7	4.3927+3	4.4147+1	3.2352+1	1.1687+1	1.0758–1
	1.3594–2	3.7822–7	5.0429+5	1.9073–4	1.2725+8	7.6975+7	1.2719+7	3.7552+7	4.3296+3	4.3129+1	3.1665+1	1.1355+1	1.0904–1
	1.5000–2	4.0708–7	4.6854+5	2.2439–4	1.1823+8	7.2444+7	1.1680+7	3.4101+7	4.1573+3	4.0448+1	2.9852+1	1.0483+1	1.1335–1
	1.6250–2	4.3275–7	4.4074+5	2.5617–4	1.1121+8	6.8829+7	1.0900+7	3.1482+7	4.0120+3	3.8236+1	2.8337+1	9.7829+0	1.1605–1
	1.7500–2	4.5788–7	4.1655+5	2.8971–4	1.0511+8	6.5642+7	1.0225+7	2.9238+7	3.8820+3	3.6327+1	2.7026+1	9.1830+0	1.1873–1
	2.0000–2	5.0674–7	3.7639+5	3.6167–4	9.4976+7	6.0269+7	9.1138+6	2.5590+7	3.6584+3	3.3197+1	2.4866+1	8.2081+0	1.2403–1
	2.5000–2	6.0100–7	3.1736+5	5.2438–4	8.0080+7	5.2055+7	7.5375+6	2.0485+7	3.2737+3	2.8389+1	2.1486+1	6.7723+0	1.3117–1
	3.0000–2	6.9031–7	2.7630+5	7.1153–4	6.9719+7	4.6182+7	6.4548+6	1.7079+7	2.9896+3	2.5110+1	1.9157+1	5.8147+0	1.3822–1
	4.0000–2	8.5909–7	2.2201+5	1.1500–3	5.6022+7	3.8103+7	5.0831+6	1.2834+7	2.5746+3	2.0647+1	1.5944+1	4.5553+0	1.4832–1
K	4.8568–2	9.9389–7	1.9190+5	1.5924–3	4.8424+7	3.3454+7	4.3443+6	1.0623+7	2.3243+3	1.8144+1	1.4117+1	3.8726+0	1.5528–1
	4.9284–2	1.0047–6	1.8984+5	1.6320–3	4.7904+7	3.3128+7	4.2932+6	1.0481+7	2.3065+3	1.7977+1	1.3991+1	3.8307+0	1.5585–1
	5.0000–2	1.0154–6	1.8783+5	1.6720–3	4.7397+7	3.2809+7	4.2435+6	1.0342+7	2.2890+3	1.7814+1	1.3868+1	3.7899+0	1.5641–1
	5.2500–2	1.0521–6	1.8129+5	1.8146–3	4.5745+7	3.1753+7	4.0833+6	9.9067+6	2.2309+3	1.7267+1	1.3455+1	3.6536+0	1.5814–1
	5.6250–2	1.1062–6	1.7242+5	2.0365–3	4.3509+7	3.0318+7	3.8670+6	9.3218+6	2.1514+3	1.6530+1	1.2898+1	3.4708+0	1.6073–1
	6.0000–2	1.1592–6	1.6453+5	2.2680–3	4.1518+7	2.9034+7	3.6752+6	8.8060+6	2.0795+3	1.5877+1	1.2404+1	3.3099+0	1.6332–1
	6.5000–2	1.2272–6	1.5542+5	2.5908–3	3.9219+7	2.7552+7	3.4588+6	8.2065+6	1.9948+3	1.5105+1	1.1823+1	3.1159+0	1.6622–1
	7.2500–2	1.3262–6	1.4382+5	3.1041–3	3.6290+7	2.5650+7	3.1841+6	7.4539+6	1.8849+3	1.4128+1	1.1085+1	2.8728+0	1.7059–1
	8.0000–2	1.4222–6	1.3411+5	3.6508–3	3.3841+7	2.4049+7	2.9552+6	6.8347+6	1.7910+3	1.3318+1	1.0470+1	2.6733+0	1.7496–1
	9.0000–2	1.5428–6	1.2363+5	4.4280–3	3.1196+7	2.2315+7	2.7153+6	6.1643+6	1.6935+3	1.2425+1	9.7979+0	2.4476+0	1.8001–1
	1.0000–1	1.6591–6	1.1496+5	5.2575–3	2.9009+7	2.0870+7	2.5173+6	5.6205+6	1.6108+3	1.1693+1	9.2434+0	2.2650+0	1.8508–1
	1.2500–1	1.9168–6	9.9505+4	7.5255–3	2.5109+7	1.8247+7	2.1745+6	4.6858+6	1.4540+3	1.0379+1	8.2427+0	1.9409+0	1.9500–1
	1.5000–1	2.1563–6	8.8454+4	1.0048–2	2.2320+7	1.6351+7	1.9294+6	4.0386+6	1.3373+3	9.4533+0	7.5301+0	1.7181+0	2.0503–1

Atomic Weight 151.960 Density 5.243 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000–1	2.5675–6	7.4287+4	1.5687–2	1.8745+7	1.3863+7	1.6347+6	3.2468+6	1.1844+3	8.3062+0	6.6502+0	1.4338+0	2.2218–1
2.5000–1	2.9265–6	6.5174+4	2.1958–2	1.6446+7	1.2184+7	1.4672+6	2.7931+6	1.0903+3	7.6499+0	6.1453+0	1.2663+0	2.3826–1
3.0000–1	3.2565–6	5.8570+4	2.8703–2	1.4779+7	1.0965+7	1.3433+6	2.4699+6	1.0191+3	7.1808+0	5.7778+0	1.1488+0	2.5419–1
4.0000–1	3.8442–6	4.9615+4	4.3147–2	1.2520+7	9.2228+6	1.2023+6	2.0936+6	9.3342+2	6.6717+0	5.3750+0	1.0099+0	2.8675–1
5.0000–1	4.3533–6	4.3813+4	5.8423–2	1.1056+7	8.0529+6	1.1211+6	1.8805+6	8.8424+2	6.4224+0	5.1676+0	9.3376–1	3.2110–1
6.0000–1	4.8125–6	3.9633+4	7.4174–2	1.0001+7	7.2081+6	1.0693+6	1.7224+6	8.5415+2	6.2761+0	5.0432+0	8.7583–1	3.5706–1
8.0000–1	5.5875–6	3.4135+4	1.0623–1	8.6135+6	6.0521+6	1.0094+6	1.5512+6	8.2019+2	6.2017+0	4.9511+0	8.1892–1	4.3174–1
1.0000+0	6.2441–6	3.0546+4	1.3844–1	7.7078+6	5.2978+6	9.7708+5	1.4321+6	8.0393+2	6.2155+0	4.9264+0	7.7807–1	5.1100–1
1.5000+0	7.4942–6	2.5451+4	2.1725–1	6.4221+6	4.1929+6	9.4200+5	1.2864+6	7.9104+2	6.4764+0	5.0151+0	7.3558–1	7.2566–1
2.0000+0	8.3937–6	2.2723+4	2.9267–1	5.7338+6	3.5875+6	9.3325+5	1.2122+6	7.9152+2	6.7835+0	5.1157+0	7.1193–1	9.5592–1
3.0000+0	9.6337–6	1.9798+4	4.3329–1	4.9958+6	2.9422+6	9.2303+5	1.1298+6	7.9796+2	7.4503+0	5.3114+0	6.9934–1	1.4396+0
4.0000+0	1.0409–5	1.8324+4	5.6170–1	4.6238+6	2.5993+6	9.1987+5	1.1038+6	8.0462+2	8.1348+0	5.4821+0	6.9810–1	1.9546+0
5.0000+0	1.0943–5	1.7430+4	6.7983–1	4.3981+6	2.3919+6	9.2019+5	1.0852+6	8.1079+2	8.8043+0	5.6206+0	7.0099–1	2.4827+0
6.0000+0	1.1341–5	1.6818+4	7.8938–1	4.2438+6	2.2561+6	9.2045+5	1.0665+6	8.1667+2	9.4601+0	5.7334+0	7.0337–1	3.0232+0
8.0000+0	1.1826–5	1.6129+4	9.8740–1	4.0698+6	2.0907+6	9.2205+5	1.0562+6	8.2676+2	1.0768+1	5.9177+0	7.0894–1	4.1413+0
1.0000+1	1.2102–5	1.5760+4	1.1626+0	3.9768+6	2.0047+6	9.2335+5	1.0480+6	8.3525+2	1.2087+1	6.0759+0	7.1563–1	5.2956+0
1.5000+1	1.2301–5	1.5506+4	1.5294+0	3.9126+6	1.9380+6	9.2573+5	1.0481+6	8.5227+2	1.5301+1	6.3089+0	7.2793–1	8.2640+0
2.0000+1	1.2346–5	1.5449+4	1.8257+0	3.8984+6	1.9355+6	9.2726+5	1.0347+6	8.6379+2	1.8560+1	6.4883+0	7.3071–1	1.1341+1
3.0000+1	1.2348–5	1.5447+4	2.2874+0	3.8977+6	1.9344+6	9.2887+5	1.0336+6	8.7778+2	2.5081+1	6.7118+0	7.3520–1	1.7634+1
4.0000+1	1.2359–5	1.5432+4	2.6411+0	3.8941+6	1.9336+6	9.2971+5	1.0299+6	8.9211+2	3.1726+1	6.8587+0	7.3787–1	2.4130+1
5.0000+1	1.2378–5	1.5409+4	2.9271+0	3.8882+6	1.9330+6	9.3029+5	1.0240+6	9.0324+2	3.8406+1	6.9810+0	7.3890–1	3.0686+1
6.0000+1	1.2395–5	1.5388+4	3.1670+0	3.8829+6	1.9324+6	9.3065+5	1.0189+6	9.1224+2	4.5146+1	7.0665+0	7.4040–1	3.7339+1
8.0000+1	1.2399–5	1.5383+4	3.5541+0	3.8817+6	1.9316+6	9.3103+5	1.0181+6	9.2631+2	5.8807+1	7.2020+0	7.4231–1	5.0862+1
1.0000+2	1.2404–5	1.5376+4	3.8596+0	3.8800+6	1.9310+6	9.3130+5	1.0167+6	9.3731+2	7.2572+1	7.3168+0	7.4380–1	6.4512+1
1.5000+2	1.2397–5	1.5385+4	4.4229+0	3.8822+6	1.9299+6	9.3149+5	1.0199+6	9.5728+2	1.0723+2	7.4433+0	7.4648–1	9.9043+1
2.0000+2	1.2395–5	1.5388+4	4.8263+0	3.8829+6	1.9290+6	9.3162+5	1.0212+6	9.7069+2	1.4225+2	7.5589+0	7.4784–1	1.3394+2
3.0000+2	1.2396–5	1.5387+4	5.3986+0	3.8827+6	1.9279+6	9.3174+5	1.0220+6	9.8605+2	2.1187+2	7.7349+0	7.4915–1	2.0339+2
4.0000+2	1.2400–5	1.5382+4	5.8065+0	3.8814+6	1.9271+6	9.3178+5	1.0215+6	9.9622+2	2.8169+2	7.8269+0	7.4948–1	2.7311+2
5.0000+2	1.2407–5	1.5373+4	6.1234+0	3.8792+6	1.9265+6	9.3180+5	1.0199+6	1.0040+3	3.5200+2	7.9094+0	7.4906–1	3.4334+2
6.0000+2	1.2409–5	1.5370+4	6.3827+0	3.8784+6	1.9260+6	9.3182+5	1.0195+6	1.0110+3	4.2150+2	7.9764+0	7.4950–1	4.1277+2
8.0000+2	1.2417–5	1.5361+4	6.7923+0	3.8760+6	1.9252+6	9.3183+5	1.0180+6	1.0222+3	5.6172+2	8.0944+0	7.4982–1	5.5288+2
1.0000+3	1.2425–5	1.5351+4	7.1102+0	3.8736+6	1.9246+6	9.3184+5	1.0162+6	1.0312+3	7.0188+2	8.1900+0	7.4991–1	6.9294+2
1.5000+3	1.2428–5	1.5346+4	7.6874+0	3.8724+6	1.9234+6	9.3185+5	1.0161+6	1.0480+3	1.0544+3	8.2834+0	7.4990–1	1.0453+3
2.0000+3	1.2433–5	1.5341+4	8.0968+0	3.8710+6	1.9226+6	9.3185+5	1.0155+6	1.0601+3	1.4053+3	8.3756+0	7.4948–1	1.3962+3
3.0000+3	1.2438–5	1.5334+4	8.6734+0	3.8693+6	1.9215+6	9.3185+5	1.0149+6	1.0784+3	2.1109+3	8.5535+0	7.4906–1	2.1016+3
4.0000+3	1.2443–5	1.5328+4	9.0821+0	3.8678+6	1.9207+6	9.3185+5	1.0142+6	1.0916+3	2.8165+3	8.6233+0	7.4857–1	2.8071+3
5.0000+3	1.2450–5	1.5320+4	9.3987+0	3.8659+6	1.9201+6	9.3186+5	1.0128+6	1.1020+3	3.5275+3	8.6928+0	7.4763–1	3.5181+3
6.0000+3	1.2451–5	1.5319+4	9.6574+0	3.8654+6	1.9196+6	9.3186+5	1.0129+6	1.1096+3	4.2261+3	8.7503+0	7.4773–1	4.2166+3
8.0000+3	1.2455–5	1.5314+4	1.0066+1	3.8643+6	1.9188+6	9.3186+5	1.0126+6	1.1218+3	5.6355+3	8.8652+0	7.4757–1	5.6259+3
1.0000+4	1.2458–5	1.5310+4	1.0382+1	3.8634+6	1.9181+6	9.3186+5	1.0123+6	1.1313+3	7.0580+3	8.9703+0	7.4742–1	7.0483+3
1.5000+4	1.2462–5	1.5306+4	1.0958+1	3.8621+6	1.9170+6	9.3186+5	1.0121+6	1.1496+3	1.0542+4	9.0564+0	7.4732–1	1.0532+4
2.0000+4	1.2465–5	1.5301+4	1.1367+1	3.8609+6	1.9162+6	9.3186+5	1.0117+6	1.1629+3	1.4071+4	9.1425+0	7.4703–1	1.4061+4
3.0000+4	1.2469–5	1.5296+4	1.1944+1	3.8598+6	1.9151+6	9.3186+5	1.0117+6	1.1813+3	2.1058+4	9.3145+0	7.4702–1	2.1048+4
4.0000+4	1.2473–5	1.5292+4	1.2354+1	3.8587+6	1.9143+6	9.3186+5	1.0114+6	1.1946+3	2.8120+4	9.3946+0	7.4678–1	2.8110+4
5.0000+4	1.2478–5	1.5286+4	1.2671+1	3.8571+6	1.9137+6	9.3186+5	1.0104+6	1.2048+3	3.5116+4	9.4583+0	7.4607–1	3.5106+4
6.0000+4	1.2478–5	1.5285+4	1.2931+1	3.8569+6	1.9131+6	9.3186+5	1.0107+6	1.2131+3	4.2107+4	9.5219+0	7.4626–1	4.2097+4
8.0000+4	1.2481–5	1.5282+4	1.3341+1	3.8561+6	1.9124+6	9.3186+5	1.0107+6	1.2263+3	5.6211+4	9.6320+0	7.4628–1	5.6201+4
1.0000+5	1.2483–5	1.5279+4	1.3658+1	3.8555+6	1.9117+6	9.3186+5	1.0107+6	1.2366+3	7.0340+4	9.7401+0	7.4628–1	7.0329+4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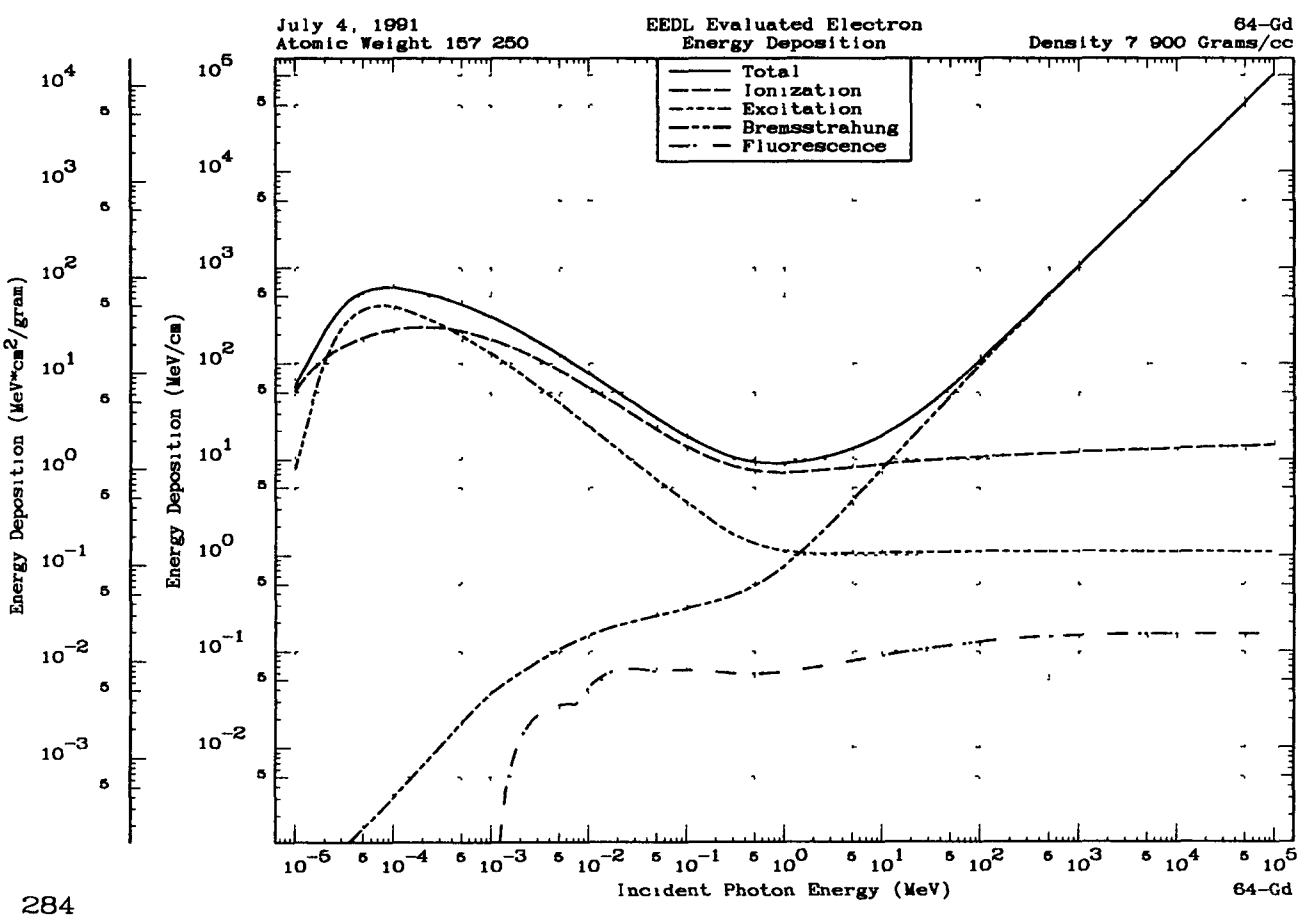
EEDL Evaluated Electron
Cross Sections
64-Gd
Density 7 900 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
64-Gd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EEDL Evaluated Electron
Energy Deposition
64-Gd
Density 7 900 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
64-Gd

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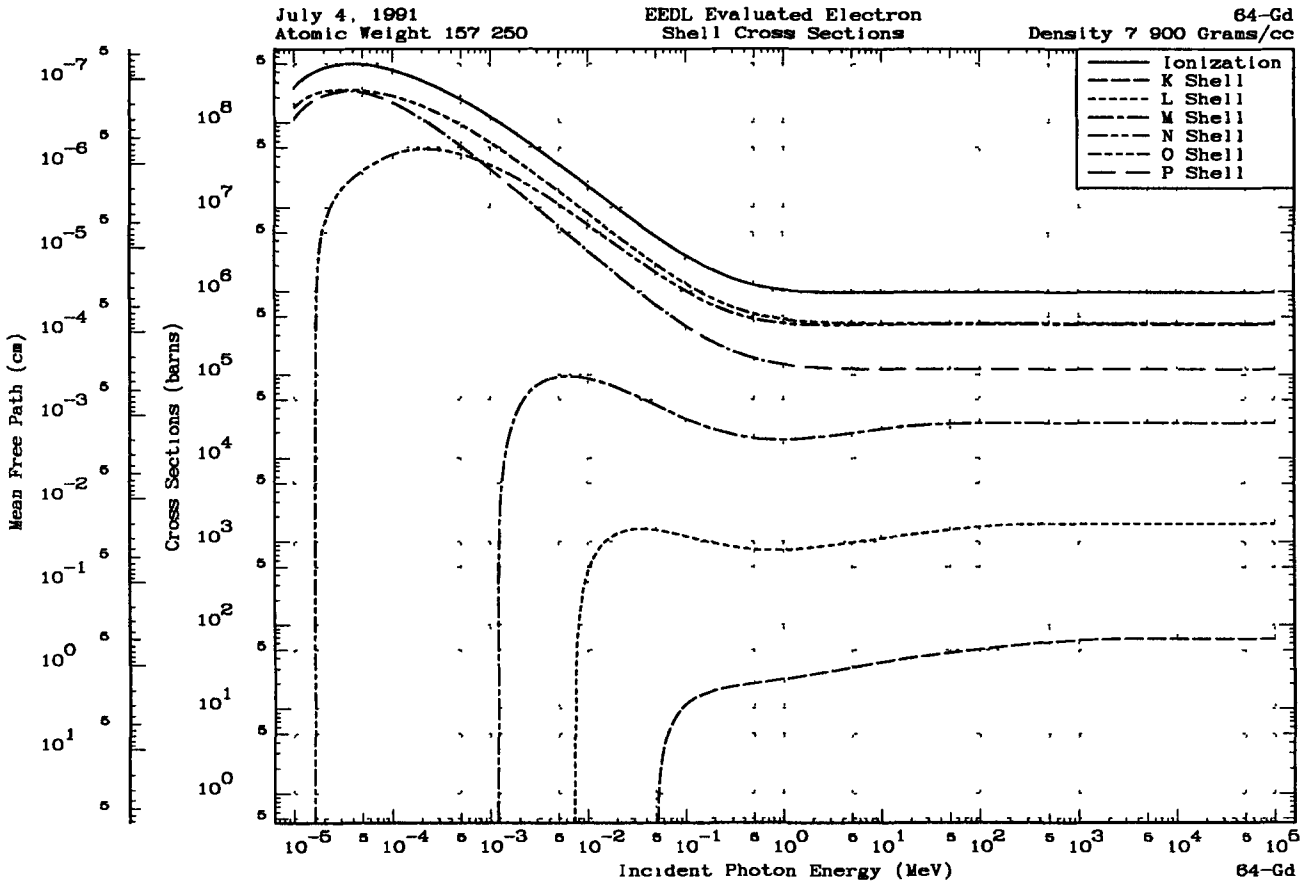
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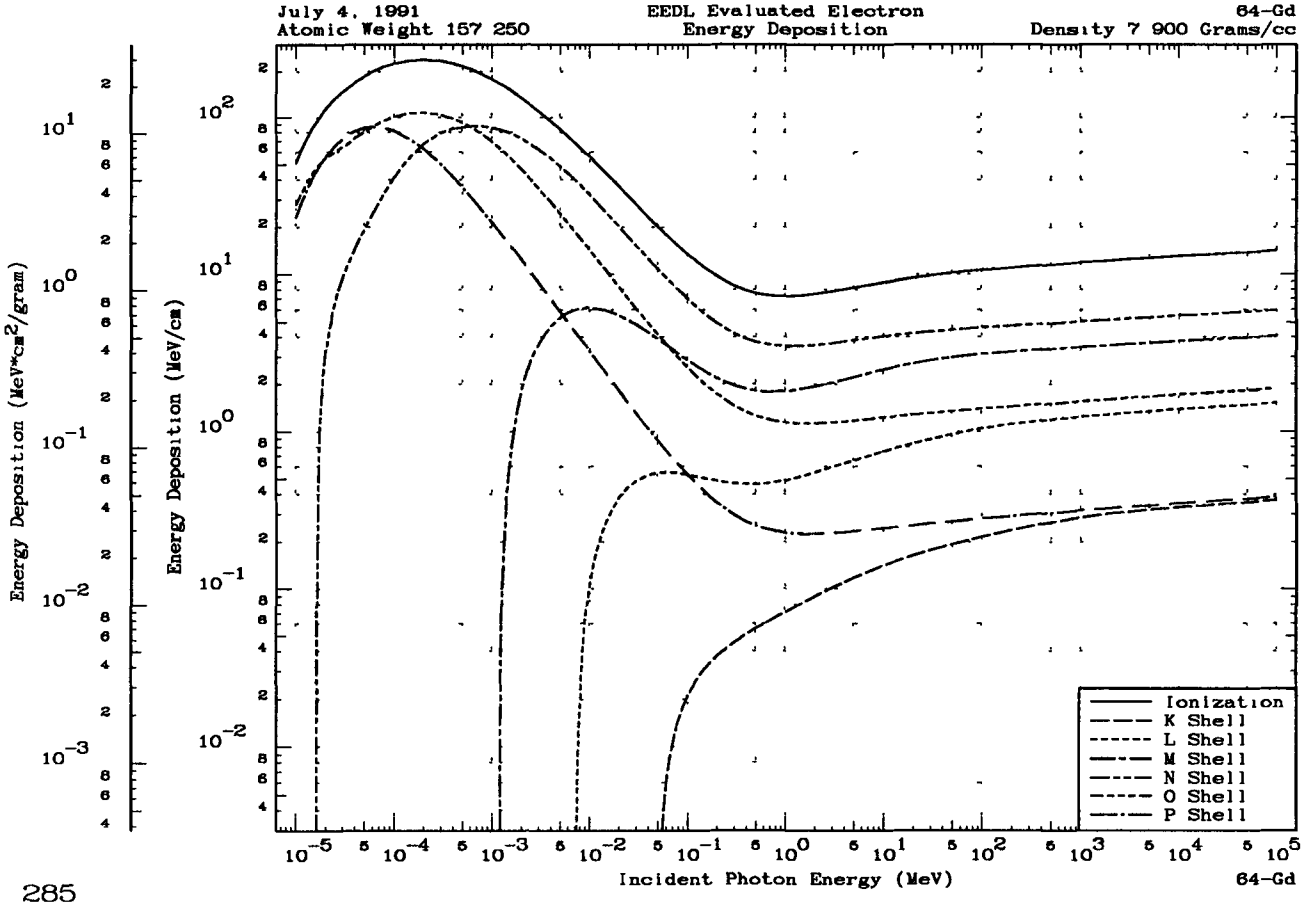
Atomic Weight 157 250
EEDL Evaluated Electron
Shell Cross Sections
64-Gd
Density 7 900 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
64-Gd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Atomic Weight 157 250
EEDL Evaluated Electron
Energy Deposition
64-Gd
Density 7 900 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
64-Gd

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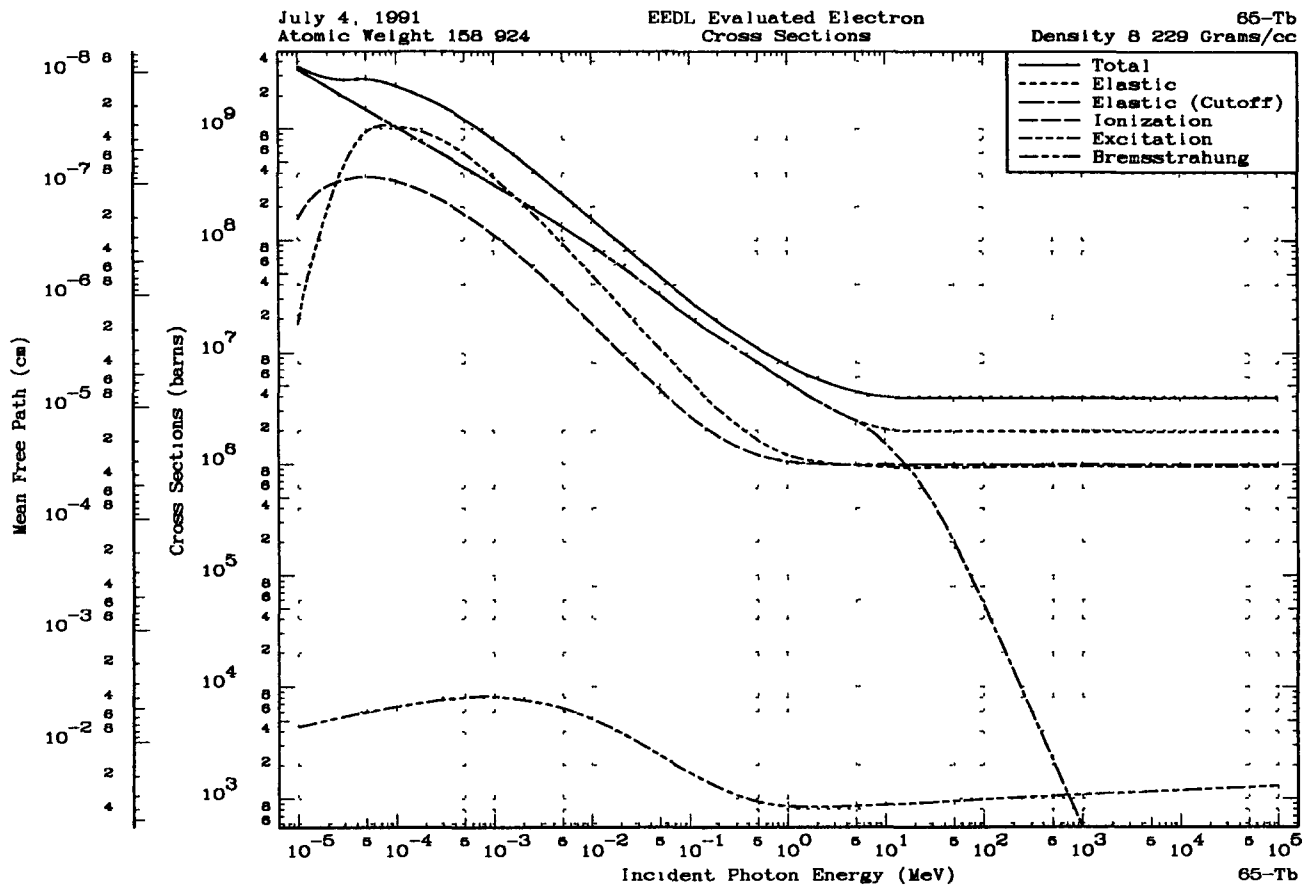
Atomic Weight 157.250 Density 7.900 Grams/cc

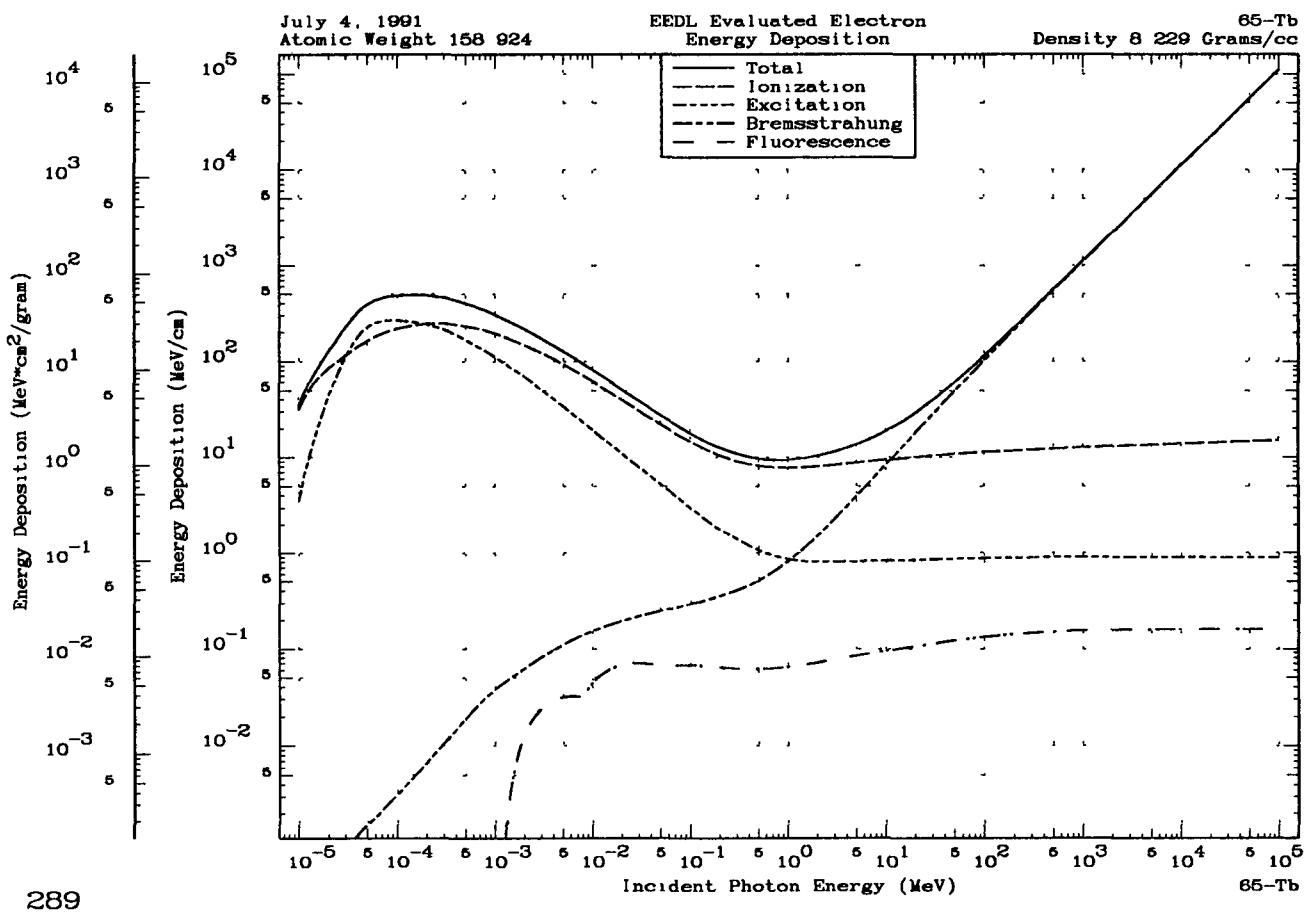
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.2790–9	1.5289+7		3.9922+9	3.6897+9	2.6341+8	3.9053+7	4.3730+3	5.8693+1	5.0849+1	7.8435+0	2.8588–4
	1.1250–5	8.6201–9	1.4684+7		3.8342+9	3.4698+9	3.0372+8	6.0682+7	4.4788+3	7.3543+1	6.0994+1	1.2548+1	3.2044–4
	1.3125–5	9.0295–9	1.4018+7		3.6604+9	3.2016+9	3.5070+8	1.0803+8	4.6211+3	9.7824+1	7.4521+1	2.3303+1	3.7340–4
	1.5000–5	9.3072–9	1.3600+7		3.5512+9	2.9862+9	3.8693+8	1.7805+8	4.7480+3	1.2636+2	8.6359+1	3.9995+1	4.2762–4
N7	1.6200–5	9.4313–9	1.3421+7		3.5045+9	2.8686+9	4.0333+8	2.3248+8	4.8228+3	1.4561+2	9.2573+1	5.3032+1	4.6292–4
	1.6437–5	9.4477–9	1.3397+7		3.4984+9	2.8469+9	4.0681+8	2.4460+8	4.8370+3	1.4988+2	9.3956+1	5.5921+1	4.6997–4
	1.6883–5	9.4723–9	1.3363+7		3.4893+9	2.8075+9	4.1324+8	2.6853+8	4.8633+3	1.5820+2	9.6549+1	6.1647+1	4.8322–4
N6	1.7030–5	9.4787–9	1.3354+7		3.4869+9	2.7948+9	4.1530+8	2.7680+8	4.8719+3	1.6102+2	9.7384+1	6.3631+1	4.8761–4
	1.7216–5	9.4905–9	1.3337+7		3.4826+9	2.7790+9	4.1752+8	2.8600+8	4.8827+3	1.6420+2	9.8373+1	6.5830+1	4.9316–4
	1.7564–5	9.5092–9	1.3311+7		3.4757+9	2.7502+9	4.2174+8	3.0380+8	4.9025+3	1.7037+2	1.0027+2	7.0095+1	5.0359–4
	1.7662–5	9.5137–9	1.3305+7		3.4741+9	2.7422+9	4.2293+8	3.0897+8	4.9081+3	1.7214+2	1.0081+2	7.1334+1	5.0655–4
	1.8173–5	9.5324–9	1.3278+7		3.4673+9	2.7017+9	4.2886+8	3.3672+8	4.9366+3	1.8153+2	1.0352+2	7.8011+1	5.2193–4
	1.8831–5	9.5433–9	1.3263+7		3.4633+9	2.6520+9	4.3645+8	3.7488+8	4.9724+3	1.9431+2	1.0707+2	8.7241+1	5.4188–4
	1.9086–5	9.5437–9	1.3263+7		3.4632+9	2.6335+9	4.3933+8	3.9040+8	4.9859+3	1.9944+2	1.0843+2	9.1010+1	5.4964–4
	2.0000–5	9.5505–9	1.3253+7		3.4607+9	2.5700+9	4.4942+8	4.4133+8	5.0335+3	2.1683+2	1.1331+2	1.0352+2	5.7759–4
	2.1250–5	9.5418–9	1.3265+7		3.4639+9	2.4899+9	4.5711+8	5.1681+8	5.0887+3	2.3986+2	1.1819+2	1.2167+2	6.1299–4
	2.3438–5	9.5143–9	1.3304+7		3.4739+9	2.3658+9	4.6959+8	6.3842+8	5.1792+3	2.7788+2	1.2660+2	1.5127+2	6.7565–4
	2.5000–5	9.4460–9	1.3400+7		3.4990+9	2.2875+9	4.7774+8	7.3378+8	5.2397+3	3.0712+2	1.3246+2	1.7466+2	7.2095–4
	2.6719–5	9.4234–9	1.3432+7		3.5074+9	2.2095+9	4.8364+8	8.1425+8	5.3027+3	3.3242+2	1.3763+2	1.9479+2	7.7126–4
	3.0000–5	9.3112–9	1.3594+7		3.5496+9	2.0799+9	4.9362+8	9.7609+8	5.4144+3	3.8291+2	1.4717+2	2.3574+2	8.6867–4
O3	3.0180–5	9.3087–9	1.3598+7		3.5506+9	2.0734+9	4.9370+8	9.8346+8	5.4201+3	3.8510+2	1.4751+2	2.3758+2	8.7402–4
	3.0487–5	9.3056–9	1.3602+7		3.5518+9	2.0625+9	4.9400+8	9.9526+8	5.4299+3	3.8879+2	1.4824+2	2.4055+2	8.8316–4
	3.2196–5	9.2796–9	1.3640+7		3.5617+9	2.0047+9	4.9564+8	1.0614+9	5.4828+3	4.0952+2	1.5230+2	2.5721+2	9.3431–4
	3.4147–5	9.2338–9	1.3708+7		3.5794+9	1.9441+9	4.9763+8	1.1377+9	5.5404+3	4.3360+2	1.5707+2	2.7652+2	9.9319–4
O2	3.4830–5	9.2144–9	1.3737+7		3.5869+9	1.9242+9	4.9823+8	1.1645+9	5.5599+3	4.4201+2	1.5865+2	2.8335+2	1.0139–3
	3.5476–5	9.2159–9	1.3734+7		3.5863+9	1.9058+9	4.9838+8	1.1821+9	5.5781+3	4.4795+2	1.6002+2	2.8792+2	1.0336–3
	3.7738–5	9.2119–9	1.3741+7		3.5879+9	1.8454+9	4.9917+8	1.2433+9	5.6397+3	4.6891+2	1.6504+2	3.0387+2	1.1029–3
	4.0000–5	9.1947–9	1.3766+7		3.5946+9	1.7903+9	5.0049+8	1.3038+9	5.6983+3	4.9031+2	1.7056+2	3.1974+2	1.1729–3
	4.5000–5	9.2515–9	1.3682+7		3.5725+9	1.6837+9	4.9564+8	1.3932+9	5.8098+3	5.2197+2	1.7840+2	3.4357+2	1.3230–3
	5.0000–5	9.2742–9	1.3648+7		3.5638+9	1.5938+9	4.9174+8	1.4783+9	5.9114+3	5.5299+2	1.8641+2	3.6658+2	1.4754–3
O1	5.4660–5	9.3777–9	1.3498+7		3.5245+9	1.5214+9	4.8573+8	1.5173+9	5.9953+3	5.7022+2	1.9196+2	3.7826+2	1.6167–3
	5.5328–5	9.3922–9	1.3477+7		3.5190+9	1.5118+9	4.8498+8	1.5222+9	6.0068+3	5.7261+2	1.9284+2	3.7977+2	1.6370–3
	5.6496–5	9.4168–9	1.3442+7		3.5099+9	1.4955+9	4.8372+8	1.5307+9	6.0267+3	5.7679+2	1.9439+2	3.8241+2	1.6728–3
	5.8248–5	9.4515–9	1.3392+7		3.4969+9	1.4719+9	4.8195+8	1.5431+9	6.0559+3	5.8308+2	1.9677+2	3.8631+2	1.7266–3
	6.0000–5	9.4841–9	1.3346+7		3.4849+9	1.4493+9	4.8031+8	1.5553+9	6.0843+3	5.8937+2	1.9921+2	3.9015+2	1.7806–3
	6.5000–5	9.6535–9	1.3112+7		3.4238+9	1.3901+9	4.7147+8	1.5622+9	6.1618+3	5.9618+2	2.0293+2	3.9325+2	1.9359–3
	7.0000–5	9.8079–9	1.2906+7		3.3699+9	1.3374+9	4.6381+8	1.5687+9	6.2345+3	6.0329+2	2.0704+2	3.9624+2	2.0930–3
	7.2500–5	9.8807–9	1.2810+7		3.3451+9	1.3132+9	4.6017+8	1.5717+9	6.2692+3	6.0671+2	2.0901+2	3.9770+2	2.1721–3
	8.0000–5	1.0082–8	1.2555+7		3.2783+9	1.2475+9	4.5047+8	1.5803+9	6.3676+3	6.1724+2	2.1529+2	4.0195+2	2.4119–3
	9.0000–5	1.0486–8	1.2071+7		3.1519+9	1.1733+9	4.3436+8	1.5443+9	6.4809+3	6.1538+2	2.1947+2	3.9590+2	2.7330–3
	1.0000–4	1.0856–8	1.1659+7	0.0000+0	3.0444+9	1.1106+9	4.2106+8	1.5128+9	6.5839+3	6.1545+2	2.2457+2	3.9088+2	3.0590–3
	1.2500–4	1.1968–8	1.0576+7	4.1394–8	2.7616+9	9.8895+8	3.8691+8	1.3857+9	6.7953+3	5.9261+2	2.3003+2	3.6257+2	3.8846–3
	1.5000–4	1.2960–8	9.7664+6	8.4150–8	2.5502+9	8.9953+8	3.6081+8	1.2898+9	6.9730+3	5.7688+2	2.3516+2	3.4171+2	4.7326–3
N5	1.5630–4	1.3206–8	9.5848+6	9.5120–8	2.5028+9	8.8050+8	3.5393+8	1.2684+9	7.0138+3	5.7170+2	2.3494+2	3.3675+2	4.9494–3
	1.5903–4	1.3311–8	9.5092+6	9.9906–8	2.4830+9	8.7261+8	3.5110+8	1.2593+9	7.0310+3	5.6966+2	2.3498+2	3.3467+2	5.0438–3
N4	1.6216–4	1.3430–8	9.4248+6	1.0541–7	2.4610+9	8.6381+8	3.4796+8	1.2492+9	7.0504+3	5.6741+2	2.3504+2	3.3236+2	5.1522–3
	1.6415–4	1.3512–8	9.3679+6	1.0893–7	2.4461+9	8.5835+8	3.4600+8	1.2418+9	7.0618+3	5.6577+2	2.3512+2	3.3064+2	5.2220–3
	1.6453–4	1.3527–8	9.3573+6	1.0958–7	2.4434+9	8.5734+8	3.4563+8	1.2404+9	7.0639+3	5.6546+2	2.3513+2	3.3032+2	5.2350–3
	1.6896–4	1.3707–8	9.2346+6	1.1745–7	2.4113+9	8.4557+8	3.4139+8	1.2244+9	7.0888+3	5.6194+2	2.3530+2	3.2663+2	5.3908–3
	1.7311–4	1.3873–8	9.1240+6	1.2487–7	2.3824+9	8.3496+8	3.3760+8	1.2099+9	7.1115+3	5.5886+2	2.3555+2	3.2330+2	5.5372–3
	1.7672–4	1.4015–8	9.0312+6	1.3133–7	2.3582+9	8.2606+8	3.3442+8	1.1977+9	7.1309+3	5.5632+2	2.3580+2	3.2052+2	5.6646–3
	1.8656–4	1.4396–8	8.7922+6	1.4912–7	2.2958+9	8.0312+8	3.2629+8	1.1664+9	7.1821+3	5.5002+2	2.3667+2	3.1335+2	6.0140–3
	1.8836–4	1.4465–8	8.7505+6	1.5240–7	2.2849+9	7.9911+8	3.2488+8	1.1609+9	7.1912+3	5.4896+2	2.3686+2	3.1210+2	6.0783–3
	2.0000–4	1.4900–8	8.4951+6	1.7372–7	2.2182+9	7.7459+8	3.1628+8	1.1273+9	7.2484+3	5.4271+2	2.3824+2	3.0446+2	6.4953–3
	2.2500–4	1.5838–8	7.9920+6	2.2057–7	2.0869+9	7.2859+8	2.9711+8	1.0612+9	7.3480+3	5.2469+2	2.3593+2	2.8875+2	7.4115–3
	2.4375–4	1.6507–8	7.6679+6	2.5668–7	2.0022+9	6.9890+8	2.8492+8	1.0184+9	7.4165+3	5.1368+2	2.3500+2	2.7867+2	8.1067–3
	2.5000–4	1.6725–8	7.5683+6	2.6889–7	1.9762+9	6.8976+8	2.8121+8	1.0053+9	7.4383+3	5.1042+2	2.3483+2	2.7558+2	8.3397–3
	2.6250–4	1.7151–8	7.3801+6	2.9353–7	1.9271+9	6.7249+8	2.7421+8	9.8037+8	7.4805+3	5.0440+2	2.3463+2	2.6976+2	8.8080–3
N3	2.7886–4	1.7694–8	7.1535+6	3.2619–7	1.8679+9	6.5168+8	2.6584+8	9.5039+8	7.5331+3	4.9742+2	2.3463+2	2.6277+2	9.4248–3
	2.8415–4	1.7871–8	7.0829+6	3.3684–7	1.8495+9	6.4535+8	2.6314+8	9.4099+8	7.5496+3	4.9495+2	2.3437+2	2.6057+2	9.6249–3
	2.9207–4	1.8132–8	6.9808+6	3.5291–7	1.8228+9	6.3619+8	2.5925+8	9.2738+8	7.5737+3	4.9144+2	2.3404+2	2.5739+2	9.9260–3
	3.0000–4	1.8390–8	6.8829+6	3.6910–7	1.7973+9	6.2739+8	2.5553+8	9.1432+8	7.5972+3	4.8815+2	2.3380+2	2.5434+2	1.0228–2
N2	3.1130–4	1.8750–8	6.7508+6	3.9238–7	1.7628+9	6.1545+8	2.5003+8	8.9728+8	7.6299+3	4.8255+2	2.3237+2	2.5017+2	1.0660–2
	3.1250–4	1.8792–8	6.7358+6	3.9487–7	1.7588+9	6.1423+8	2.4946+8	8.9515+8	7.6333+3	4.8188+2	2.3222+2	2.4965+2	1.0706–2
	3.1684–4	1.8943–8	6.6821+6	4.0391–7	1.7448+9	6.0985+8	2.4743+8	8.8754+8	7.6455+3	4.7948+2	2.3170+2	2.4777+2	1.0873–2
	3.2724–4	1.9300–8	6.5583+6	4.2571–7	1.7125+9	5.9974+8	2.4276+8	8.6999+8	7.6742+3	4.7402+2	2.3056+2	2.4345+2	1.1273–2
	3.3438–4	1.9543–8	6.4768+6	4.4082–7	1.6912+9	5.9307+8	2.3970+8	8.5846+8	7.6934+3	4.7048+2	2.2985+2	2.4062+2	1.1548–2
	3.4543–4	1.9914–8	6.3561+6	4.6445–7	1.6597+9	5.8316+8	2.3517+8	8.4136+8	7.7225+3	4.6528+2	2.2885+2	2.3642+2	1.1976–2
	3.5000–4	2.0066–8	6.3079+6	4.7429–7	1.6471+9	5.7921+8	2.3336+8	8.3455+8	7.7342+3	4.6323+2	2.2847+2	2.3475+2	1.2153–2
	3.6719–4	2.0630–8	6.1355+6	5.1169–7	1.6021+9	5.6500+8	2.2692+8	8.1016+8	7.7773+3	4.5596+2	2.2716+2	2.2879+2	1.2823–2
	3.7271–4	2.0809–8	6.0827+6	5.2384–7	1.5883+9	5.6065+8	2.2496+8	8.0271+8	7.7908+3	4.5376+2	2.2679+2	2.2697+2	1.3039–2
N1	3.8139–4	2.1087–8	6.0024+6	5.4303–7	1.5674+9	5.5400+8	2.2198+8	7.9136+8	7.8116+3	4.5046+2	2.2624+2	2.2420+2	1.3379–2
	3.8604–4	2.1241–8	5.9589+6	5.5338–7	1.5560+9	5.5054+8	2.2040+8	7.8506+8	7.8201+3	4.4865+2	2.2595+2	2.2268+2	1.3566–2
	3.9302–4	2.1470–8	5.8954+6	5.6898–7	1.5394+9	5.4545+8	2.1810+8	7.7584+8	7.8325+3	4.4603+2	2.2555+2	2.2047+2	1.3847–2
	4.0000–4	2.1698–8	5.8336+6	5.8467–7	1.5233+9	5.4050+8	2.1587+8	7.6688+8	7.8448+3	4.4351+2	2.2518+2	2.1832+2	1.4128–2
	4.1250–4	2.2101–8	5.7271+6	6.1303–7	1.4955+9	5.3196+8	2.1168+8	7.5182+8	7.8655+3	4.3809+2	2.2353+2	2.1455+2	1.4634–2
	4.3438–4	2.2794–8	5.5529+6	6.6347–7	1.4500+9	5.1791+8	2.0486+8	7.2720+8	7.9004+3	4.2935+2	2.2095+2	2.0839+2	1.5524–2
	4.5000–4	2.3281–8	5.4370+6	7.0010–7	1.4197+9	5.0852+8	2.0033+8	7.1083+8	7.9244+3	4.2364+2	2.1932+2	2.0430+2	1.6162–2
	4.6719–4	2.3808–8	5.3166+6	7.4096–7	1.3883+9	4.9875+8	1.9566+8	6.9387+8	7.9499+3	4.1778+2	2.1769+2	2.0007+2	1.6866–2
	5.0000–4	2.4791–8	5.1058+6	8.2045–7	1.3332+9	4.8152+8	1.8752+8	6.6417+8	7.9963+3	4.0776+2	2.1505+2	1.9270+2	1.8216–2

Atomic Weight 157.250 Density 7.900 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.5000–4	2.6258–8	4.8205+6	9.4534–7	1.2587+9	4.5833+8	1.7627+8	6.2411+8	8.0512+3	3.9308+2	2.1049+2	1.8257+2	2.0259–2
	6.0000–4	2.7670–8	4.5744+6	1.0745–6	1.1945+9	4.3814+8	1.6668+8	5.8964+8	8.1016+3	3.8093+2	2.0701+2	1.7390+2	2.2315–2
	7.0000–4	3.0555–8	4.1426+6	1.3463–6	1.0817+9	4.0453+8	1.4992+8	5.2725+8	8.1411+3	3.5525+2	1.9759+2	1.5764+2	2.6197–2
	8.0000–4	3.3285–8	3.8027+6	1.6358–6	9.9297+8	3.7750+8	1.3689+8	4.7857+8	8.1755+3	3.3594+2	1.9088+2	1.4502+2	3.0097–2
	9.0000–4	3.5929–8	3.5229+6	1.9418–6	9.1990+8	3.5516+8	1.2580+8	4.3893+8	8.1397+3	3.1773+2	1.8320+2	1.3450+2	3.3319–2
	1.0000–3	3.8465–8	3.2907+6	2.2640–6	8.5926+8	3.3630+8	1.1669+8	4.0626+8	8.1079+3	3.0311+2	1.7722+2	1.2586+2	3.6530–2
M5	1.1998–3	4.3492–8	2.9103+6	2.9541–6	7.5995+8	3.0590+8	1.0195+8	3.5208+8	7.9667+3	2.7637+2	1.6529+2	1.1103+2	4.1589–2
	1.2092–3	4.3726–8	2.8947+6	2.9881–6	7.5587+8	3.0467+8	1.0137+8	3.4983+8	7.9608+3	2.7531+2	1.6484+2	1.1043+2	4.1825–2
	1.2183–3	4.3953–8	2.8798+6	3.0212–6	7.5198+8	3.0348+8	1.0081+8	3.4768+8	7.9550+3	2.7430+2	1.6441+2	1.0985+2	4.2053–2
	1.2271–3	4.4171–8	2.8656+6	3.0533–6	7.4825+8	3.0235+8	1.0027+8	3.4562+8	7.9495+3	2.7334+2	1.6400+2	1.0930+2	4.2274–2
M4	1.2316–3	4.4284–8	2.8583+6	3.0699–6	7.4636+8	3.0177+8	1.0000+8	3.4458+8	7.9467+3	2.7285+2	1.6379+2	1.0902+2	4.2388–2
	1.2441–3	4.4593–8	2.8385+6	3.1159–6	7.4118+8	3.0019+8	9.9233+7	3.4176+8	7.9384+3	2.7138+2	1.6310+2	1.0824+2	4.2692–2
	1.2651–3	4.5109–8	2.8060+6	3.1937–6	7.3271+8	2.9758+8	9.7976+7	3.3714+8	7.9248+3	2.6896+2	1.6196+2	1.0696+2	4.3202–2
	1.2761–3	4.5377–8	2.7895+6	3.2346–6	7.2838+8	2.9625+8	9.7335+7	3.3479+8	7.9178+3	2.6773+2	1.6138+2	1.0631+2	4.3468–2
	1.3239–3	4.6534–8	2.7201+6	3.4147–6	7.1026+8	2.9064+8	9.4656+7	3.2496+8	7.8880+3	2.6260+2	1.5897+2	1.0359+2	4.4623–2
	1.3881–3	4.8068–8	2.6333+6	3.6621–6	6.8760+8	2.8357+8	9.1316+7	3.1270+8	7.8498+3	2.5629+2	1.5605+2	1.0020+2	4.6170–2
	1.4119–3	4.8632–8	2.6027+6	3.7557–6	6.7963+8	2.8107+8	9.0143+7	3.0841+8	7.8361+3	2.5409+2	1.5503+2	9.9013+1	4.6744–2
	1.5000–3	5.0684–8	2.4973+6	4.1075–6	6.5211+8	2.7236+8	8.6109+7	2.9363+8	7.7876+3	2.4657+2	1.5158+2	9.4937+1	4.8856–2
M3	1.5418–3	5.1639–8	2.4512+6	4.2783–6	6.4005+8	2.6849+8	8.4277+7	2.8727+8	7.7626+3	2.4286+2	1.4969+2	9.3121+1	4.9781–2
	1.5704–3	5.2294–8	2.4205+6	4.3968–6	6.3203+8	2.6594+8	8.3074+7	2.8301+8	7.7459+3	2.4044+2	1.4847+2	9.1918+1	5.0414–2
	1.6241–3	5.3511–8	2.3654+6	4.6222–6	6.1765+8	2.6133+8	8.0921+7	2.7540+8	7.7154+3	2.3612+2	1.4631+2	8.9766+1	5.1598–2
	1.6250–3	5.3531–8	2.3645+6	4.6258–6	6.1743+8	2.6125+8	8.0887+7	2.7528+8	7.7150+3	2.3606+2	1.4627+2	8.9733+1	5.1617–2
M2	1.6869–3	5.4917–8	2.3049+6	4.8907–6	6.0185+8	2.5622+8	7.8562+7	2.6706+8	7.6813+3	2.3141+2	1.4395+2	8.7412+1	5.2978–2
	1.7181–3	5.5611–8	2.2761+6	5.0262–6	5.9433+8	2.5379+8	7.7441+7	2.6309+8	7.6648+3	2.2915+2	1.4281+2	8.6284+1	5.3662–2
	1.7260–3	5.5787–8	2.2689+6	5.0609–6	5.9246+8	2.5318+8	7.7162+7	2.6211+8	7.6607+3	2.2859+2	1.4253+2	8.6002+1	5.3836–2
	1.7500–3	5.6316–8	2.2476+6	5.1661–6	5.8689+8	2.5137+8	7.6333+7	2.5918+8	7.6483+3	2.2692+2	1.4169+2	8.5169+1	5.4361–2
	1.7945–3	5.7293–8	2.2093+6	5.3636–6	5.7688+8	2.4811+8	7.4846+7	2.5392+8	7.6259+3	2.2392+2	1.4019+2	8.3674+1	5.5334–2
	1.8125–3	5.7685–8	2.1942+6	5.4441–6	5.7296+8	2.4683+8	7.4264+7	2.5186+8	7.6170+3	2.2276+2	1.3961+2	8.3089+1	5.5726–2
	1.8459–3	5.8410–8	2.1670+6	5.5947–6	5.6585+8	2.4449+8	7.3210+7	2.4814+8	7.6007+3	2.2064+2	1.3856+2	8.2032+1	5.6454–2
M1	1.8646–3	5.8814–8	2.1521+6	5.6797–6	5.6197+8	2.4322+8	7.2635+7	2.4611+8	7.5918+3	2.1949+2	1.3798+2	8.1455+1	5.6861–2
	1.8984–3	5.9547–8	2.1257+6	5.8347–6	5.5505+8	2.4095+8	7.1618+7	2.4248+8	7.5758+3	2.1743+2	1.3695+2	8.0423+1	5.7597–2
	1.9492–3	6.0637–8	2.0874+6	6.0697–6	5.4507+8	2.3766+8	7.0151+7	2.3725+8	7.5524+3	2.1448+2	1.3549+2	7.8939+1	5.8698–2
	2.0000–3	6.1718–8	2.0509+6	6.3081–6	5.3553+8	2.3450+8	6.8752+7	2.3227+8	7.5297+3	2.1169+2	1.3411+2	7.7525+1	5.9797–2
	2.1250–3	6.4421–8	1.9648+6	6.9093–6	5.1305+8	2.2698+8	6.5446+7	2.2062+8	7.4559+3	2.0414+2	1.3000+2	7.4078+1	6.2084–2
	2.2344–3	6.6744–8	1.8964+6	7.4531–6	4.9520+8	2.2094+8	6.2832+7	2.1142+8	7.3954+3	1.9822+2	1.2680+2	7.1359+1	6.4073–2
	2.2500–3	6.7073–8	1.8871+6	7.5320–6	4.9277+8	2.2011+8	6.2478+7	2.1018+8	7.3870+3	1.9742+2	1.2637+2	7.0991+1	6.4357–2
	2.4258–3	7.0720–8	1.7898+6	8.4418–6	4.6735+8	2.1139+8	5.8780+7	1.9718+8	7.2973+3	1.8907+2	1.2185+2	6.7155+1	6.7529–2
	2.5000–3	7.2234–8	1.7523+6	8.8376–6	4.5756+8	2.0799+8	5.7362+7	1.9220+8	7.2617+3	1.8590+2	1.2015+2	6.5688+1	6.8860–2
	2.6250–3	7.4751–8	1.6933+6	9.5192–6	4.4216+8	2.0261+8	5.5139+7	1.8440+8	7.2043+3	1.8091+2	1.1745+2	6.3392+1	7.1093–2
	2.7129–3	7.6496–8	1.6547+6	1.0009–5	4.3207+8	1.9905+8	5.3687+7	1.7932+8	7.1659+3	1.7765+2	1.1568+2	6.1897+1	7.2655–2
	2.7500–3	7.7227–8	1.6390+6	1.0219–5	4.2798+8	1.9760+8	5.3100+7	1.7727+8	7.1501+3	1.7633+2	1.1497+2	6.1293+1	7.3313–2
	3.0000–3	8.2070–8	1.5423+6	1.1670–5	4.0272+8	1.8857+8	4.9491+7	1.6465+8	7.0497+3	1.6831+2	1.1064+2	5.7589+1	7.7717–2
	3.2500–3	8.6975–8	1.4553+6	1.3193–5	3.8001+8	1.8048+8	4.6292+7	1.5324+8	6.9345+3	1.6011+2	1.0596+2	5.4071+1	8.1477–2
	3.5000–3	9.1762–8	1.3794+6	1.4790–5	3.6019+8	1.7329+8	4.3517+7	1.4337+8	6.8294+3	1.5306+2	1.0194+2	5.1035+1	8.5199–2
	4.0000–3	1.0102–7	1.2530+6	1.8187–5	3.2718+8	1.6106+8	3.8936+7	1.2718+8	6.6442+3	1.4148+2	9.5328+1	4.6058+1	9.2530–2
	4.5000–3	1.1019–7	1.1487+6	2.1855–5	2.9995+8	1.5066+8	3.5237+7	1.1404+8	6.4614+3	1.3122+2	8.9241+1	4.1883+1	9.9004–2
	5.0000–3	1.1905–7	1.0632+6	2.5791–5	2.7762+8	1.4194+8	3.2230+7	1.0345+8	6.3022+3	1.2296+2	8.4337+1	3.8519+1	1.0536–1
	6.0000–3	1.3617–7	9.2957+5	3.4405–5	2.4273+8	1.2781+8	2.7578+7	8.7332+7	5.9747+3	1.0947+2	7.6077+1	3.3278+1	1.1543–1
L3	7.2427–3	1.5641–7	8.0925+5	4.6471–5	2.1131+8	1.1456+8	2.3447+7	7.3300+7	5.6350+3	9.6775+1	6.8045+1	2.8603+1	1.2660–1
	7.4320–3	1.5942–7	7.9398+5	4.8444–5	2.0732+8	1.1285+8	2.2929+7	7.1543+7	5.5853+3	9.5156+1	6.7016+1	2.8012+1	1.2804–1
	7.7160–3	1.6389–7	7.7232+5	5.1465–5	2.0167+8	1.1040+8	2.2199+7	6.9065+7	5.5137+3	9.2873+1	6.5564+1	2.7179+1	1.3020–1
L2	7.9470–3	1.6749–7	7.5573+5	5.3976–5	1.9734+8	1.0851+8	2.1640+7	6.7177+7	5.4581+3	9.1133+1	6.4457+1	2.6544+1	1.3193–1
	8.0000–3	1.6833–7	7.5196+5	5.4558–5	1.9635+8	1.0808+8	2.1516+7	6.6750+7	5.4457+3	9.0748+1	6.4213+1	2.6402+1	1.3233–1
	8.2500–3	1.7218–7	7.3514+5	5.7342–5	1.9196+8	1.0610+8	2.0948+7	6.4906+7	5.3884+3	8.8882+1	6.2993+1	2.5755+1	1.3420–1
L1	8.3498–3	1.7371–7	7.2868+5	5.8469–5	1.9027+8	1.0534+8	2.0730+7	6.4200+7	5.3661+3	8.8167+1	6.2525+1	2.5507+1	1.3494–1
	8.4529–3	1.7530–7	7.2203+5	5.9644–5	1.8854+8	1.0456+8	2.0510+7	6.3459+7	5.3422+3	8.7442+1	6.2054+1	2.5253+1	1.3563–1
	8.6875–3	1.7892–7	7.0745+5	6.2351–5	1.8473+8	1.0286+8	2.0028+7	6.1839+7	5.2891+3	8.5855+1	6.1022+1	2.4696+1	1.3718–1
	8.8397–3	1.8125–7	6.9835+5	6.4134–5	1.8235+8	1.0179+8	1.9728+7	6.0832+7	5.2557+3	8.4870+1	6.0381+1	2.4350+1	1.3818–1
	9.0000–3	1.8369–7	6.8907+5	6.6034–5	1.7993+8	1.0069+8	1.9423+7	5.9808+7	5.2213+3	8.3867+1	5.9729+1	2.3998+1	1.3923–1
	9.3437–3	1.8888–7	6.7013+5	7.0184–5	1.7498+8	9.8451+7	1.8801+7	5.7726+7	5.1504+3	8.1826+1	5.8400+1	2.3284+1	1.4148–1
	9.4198–3	1.9003–7	6.6610+5	7.1116–5	1.7393+8	9.7972+7	1.8669+7	5.7285+7	5.1352+3	8.1394+1	5.8119+1	2.3133+1	1.4198–1
	1.0000–2	1.9865–7	6.3719+5	7.8382–5	1.6638+8	9.4516+7	1.7724+7	5.4139+7	5.0244+3	7.8310+1	5.6111+1	2.2053+1	1.4573–1
	1.1250–2	2.1693–7	5.8349+5	9.5006–5	1.5236+8	8.7910+7	1.5999+7	4.8447+7	4.7883+3	7.2164+1	5.2003+1	2.0009+1	1.5181–1
	1.2188–2	2.3026–7	5.4970+5	1.0835–4	1.4354+8	8.3686+7	1.4923+7	4.4925+7	4.6342+3	6.8345+1	4.9443+1	1.8746+1	1.5631–1
	1.2500–2	2.3464–7	5.3945+5	1.1296–4	1.4086+8	8.2393+7	1.4598+7	4.3864+7	4.5865+3	6.7195+1	4.8671+1	1.8366+1	1.5780–1
	1.3125–2	2.4330–7	5.2024+5	1.2242–4	1.3585+8	7.9957+7	1.3992+7	4.1892+7	4.4959+3	6.5049+1	4.7230+1	1.7658+1	1.6076–1
	1.3594–2	2.4972–7	5.0687+5	1.2971–4	1.3235+8	7.8249+7	1.3572+7	4.0528+7	4.4319+3	6.3562+1	4.6229+1	1.7170+1	1.6296–1
	1.5000–2	2.6860–7	4.7124+5	1.5254–4	1.2305+8	7.3652+7	1.2460+7	3.6935+7	4.2571+3	5.9641+1	4.3588+1	1.5883+1	1.6947–1
	1.7500–2	3.0155–7	4.1975+5	1.9672–4	1.0960+8	6.6763+7	1.0905+7	3.1932+7	3.9774+3	5.3652+1	3.9473+1	1.4002+1	1.7760–1
	2.0000–2	3.3322–7	3.7986+5	2.4541–4	9.9188+7	6.1319+7	9.7155+6	2.8149+7	3.7500+3	4.9093+1	3.6326+1	1.2581+1	1.8561–1
	2.2500–2	3.6417–7	3.4758+5	2.9846–4	9.0759+7	5.6786+7	8.7861+6	2.5183+7	3.5375+3	4.5217+1	3.3612+1	1.1414+1	1.9102–1
	2.5000–2	3.9420–7	3.2110+5	3.5576–4	8.3845+7	5.3017+7	8.0306+6	2.2795+7	3.3577+3	4.2076+1	3.1404+1	1.0476+1	1.9643–1
	2.6250–2	4.0890–7	3.0955+5	3.8596–4	8.0830+7	5.1357+7	7.7032+6	2.1767+7	3.2775+3	4.0715+1	3.0444+1	1.0072+1	1.9912–1
	3.0000–2	4.5191–7	2.8009+5	4.8219–4	7.3137+7	4.7074+7	6.8740+6	1.9185+7	3.0678+3	3.7279+1	2.8013+1	9.0589+0	2.0710–1
	4.0000–2	5.6028–7	2.2591+5	7.7709–4	5.8991+7	3.8893+7	5.4080+6	1.4687+7	2.6438+3	3.0749+1	2.3320+1	7.2066+0	2.2242–1
	5.0000–2	6.6064–7	1.9160+5	1.1266–3	5.0029+7	3.3524+7	4.5120+6	1.1991+7	2.3520+3	2.6579+1	2.0286+1	6.0584+0	2.3471–1
K	5.0303–2	6.6356–7	1.9075+5	1.1380–3	4.9810+7	3.3390+7	4.4905+6	1.1927+7	2.3446+3	2.6475+1	2.0210+1	6.0300+0	2.3503–1
	5.0909–2	6.6941–7	1.8909+5	1.1610–3	4.9374+7	3.3125+7	4.4482+6	1.1799+7	2.3300+3	2.6270+1	2.0061+1	5.9738+0	2.3567–1
	5.3182–2	6.9120–7	1.8313+5	1.2487–3	4.7818+7	3.2176+7	4.2973+6	1.1343+7	2.2773+3	2.5542+1	1.9530+1	5.7742+0	2.3806–1
	5.4886–2	7.0736–7	1.7894+5	1.3161–3	4.6725+7	3.1507+7	4.1915+6	1.1024+7	2.2401+3	2.5032+1	1.9157+1	5.6349+0	2.3985–1

Atomic Weight 157.250												Density 7.900 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.7443–2	7.3135–7	1.7307+5	1.4198–3	4.5192+7	3.0566+7	4.0434+6	1.0580+7	2.1874+3	2.4319+1	1.8635+1	5.4408+0	2.4254–1
6.0000–2	7.5504–7	1.6764+5	1.5263–3	4.3774+7	2.9693+7	3.9067+6	1.0173+7	2.1381+3	2.3662+1	1.8154+1	5.2627+0	2.4522–1
6.5000–2	8.0002–7	1.5822+5	1.7430–3	4.1313+7	2.8169+7	3.6760+6	9.4664+6	2.0517+3	2.2497+1	1.7304+1	4.9430+0	2.4964–1
7.2500–2	8.6565–7	1.4622+5	2.0878–3	3.8181+7	2.6215+7	3.3830+6	8.5813+6	1.9394+3	2.1025+1	1.6226+1	4.5429+0	2.5630–1
8.0000–2	9.2932–7	1.3620+5	2.4553–3	3.5565+7	2.4570+7	3.1391+6	7.8545+6	1.8434+3	1.9806+1	1.5328+1	4.2149+0	2.6294–1
9.0000–2	1.0094–6	1.2539+5	2.9781–3	3.2743+7	2.2789+7	2.8842+6	7.0677+6	1.7437+3	1.8461+1	1.4344+1	3.8462+0	2.7063–1
1.0000–1	1.0868–6	1.1647+5	3.5366–3	3.0413+7	2.1306+7	2.6738+6	6.4309+6	1.6590+3	1.7360+1	1.3533+1	3.5484+0	2.7834–1
1.2500–1	1.2552–6	1.0084+5	5.0675–3	2.6332+7	1.8753+7	2.3090+6	5.2692+6	1.4983+3	1.5343+1	1.2069+1	2.9806+0	2.9342–1
1.5000–1	1.4111–6	8.9700+4	6.7768–3	2.3423+7	1.6895+7	2.0483+6	4.4777+6	1.3787+3	1.3930+1	1.1027+1	2.5951+0	3.0866–1
2.0000–1	1.6672–6	7.5920+4	1.0612–2	1.9824+7	1.4571+7	1.7348+6	3.5170+6	1.2215+3	1.2184+1	9.7399+0	2.1091+0	3.3469–1
2.5000–1	1.8907–6	6.6947+4	1.4896–2	1.7481+7	1.2969+7	1.5568+6	2.9546+6	1.1247+3	1.1175+1	9.0010+0	1.8154+0	3.5908–1
3.0000–1	2.0881–6	6.0618+4	1.9513–2	1.5829+7	1.1791+7	1.4251+6	2.6115+6	1.0513+3	1.0489+1	8.4627+0	1.6431+0	3.8324–1
4.0000–1	2.4450–6	5.1769+4	2.9402–2	1.3518+7	1.0034+7	1.2747+6	2.2085+6	9.6306+2	9.7441+0	7.8742+0	1.4375+0	4.3251–1
5.0000–1	2.7627–6	4.5816+4	3.9863–2	1.1964+7	8.7985+6	1.1882+6	1.9760+6	9.1225+2	9.3764+0	7.5720+0	1.3203+0	4.8417–1
6.0000–1	3.0513–6	4.1483+4	5.0648–2	1.0832+7	7.8807+6	1.1327+6	1.8176+6	8.8109+2	9.1699+0	7.3905+0	1.2411+0	5.3833–1
8.0000–1	3.5460–6	3.5695+4	7.2586–2	9.3207+6	6.6132+6	1.0683+6	1.6384+6	8.4587+2	9.0635+0	7.2551+0	1.1575+0	6.5095–1
1.0000+0	3.9645–6	3.1927+4	9.4609–2	8.3368+6	5.7708+6	1.0332+6	1.5319+6	8.2895+2	9.0989+0	7.2178+0	1.1111+0	7.7002–1
1.5000+0	4.7818–6	2.6471+4	1.4839–1	6.9120+6	4.5216+6	9.9458+5	1.3950+6	8.1549+2	9.4978+0	7.3461+0	1.0596+0	1.0921+0
2.0000+0	5.3722–6	2.3561+4	1.9977–1	6.1523+6	3.8315+6	9.8397+5	1.3360+6	8.1559+2	9.9701+0	7.4935+0	1.0391+0	1.4375+0
3.0000+0	6.1871–6	2.0458+4	2.9531–1	5.3420+6	3.0951+6	9.7099+5	1.2751+6	8.2143+2	1.0979+1	7.7779+0	1.0396+0	2.1619+0
4.0000+0	6.7015–6	1.8888+4	3.8239–1	4.9320+6	2.7060+6	9.6846+5	1.2567+6	8.2809+2	1.2004+1	8.0248+0	1.0441+0	2.9349+0
5.0000+0	7.0698–6	1.7904+4	4.6241–1	4.6750+6	2.4685+6	9.6805+5	1.2377+6	8.3428+2	1.3003+1	8.2260+0	1.0477+0	3.7293+0
6.0000+0	7.3388–6	1.7248+4	5.3655–1	4.5037+6	2.3160+6	9.6769+5	1.2191+6	8.4017+2	1.3984+1	8.3891+0	1.0512+0	4.5439+0
8.0000+0	7.6817–6	1.6477+4	6.7044–1	4.3026+6	2.1263+6	9.6814+5	1.2074+6	8.5029+2	1.5934+1	8.6553+0	1.0570+0	6.2216+0
1.0000+1	7.8830–6	1.6057+4	7.8882–1	4.1927+6	2.0282+6	9.6916+5	1.1945+6	8.5879+2	1.7892+1	8.8835+0	1.0616+0	7.9468+0
1.5000+1	8.0472–6	1.5729+4	1.0365+0	4.1072+6	1.9538+6	9.7106+5	1.1815+6	8.7599+2	2.2671+1	9.2168+0	1.0655+0	1.2389+1
2.0000+1	8.0715–6	1.5682+4	1.2363+0	4.0948+6	1.9511+6	9.7224+5	1.1706+6	8.8780+2	2.7543+1	9.4732+0	1.0708+0	1.6999+1
3.0000+1	8.0679–6	1.5689+4	1.5471+0	4.0967+6	1.9500+6	9.7343+5	1.1724+6	9.0228+2	3.7296+1	9.7924+0	1.0791+0	2.6424+1
4.0000+1	8.0725–6	1.5680+4	1.7848+0	4.0943+6	1.9491+6	9.7408+5	1.1702+6	9.1705+2	4.7239+1	1.0002+1	1.0837+0	3.6154+1
5.0000+1	8.0822–6	1.5661+4	1.9768+0	4.0894+6	1.9485+6	9.7453+5	1.1655+6	9.2859+2	5.7237+1	1.0176+1	1.0859+0	4.5976+1
6.0000+1	8.0908–6	1.5644+4	2.1377+0	4.0851+6	1.9480+6	9.7481+5	1.1614+6	9.3792+2	6.7327+1	1.0297+1	1.0886+0	5.5942+1
8.0000+1	8.0902–6	1.5645+4	2.3971+0	4.0854+6	1.9472+6	9.7510+5	1.1621+6	9.5252+2	8.7782+1	1.0492+1	1.0922+0	7.6197+1
1.0000+2	8.0913–6	1.5644+4	2.6018+0	4.0848+6	1.9465+6	9.7529+5	1.1621+6	9.6390+2	1.0839+2	1.0658+1	1.0950+0	9.6642+1
1.5000+2	8.0843–6	1.5657+4	2.9787+0	4.0883+6	1.9454+6	9.7543+5	1.1666+6	9.8448+2	1.6030+2	1.0836+1	1.0997+0	1.4836+2
2.0000+2	8.0822–6	1.5661+4	3.2485+0	4.0894+6	1.9445+6	9.7553+5	1.1684+6	9.9824+2	2.1273+2	1.1001+1	1.1019+0	2.0063+2
3.0000+2	8.0815–6	1.5662+4	3.6311+0	4.0897+6	1.9434+6	9.7563+5	1.1697+6	1.0140+3	3.1701+2	1.1267+1	1.1040+0	3.0464+2
4.0000+2	8.0836–6	1.5658+4	3.9037+0	4.0887+6	1.9425+6	9.7565+5	1.1695+6	1.0245+3	4.2158+2	1.1400+1	1.1046+0	4.0908+2
5.0000+2	8.0876–6	1.5651+4	4.1154+0	4.0867+6	1.9419+6	9.7567+5	1.1681+6	1.0325+3	5.2689+2	1.1521+1	1.1041+0	5.1427+2
6.0000+2	8.0888–6	1.5648+4	4.2886+0	4.0861+6	1.9414+6	9.7568+5	1.1680+6	1.0398+3	6.3098+2	1.1613+1	1.1049+0	6.1826+2
8.0000+2	8.0930–6	1.5640+4	4.5622+0	4.0840+6	1.9406+6	9.7570+5	1.1667+6	1.0514+3	8.4102+2	1.1791+1	1.1054+0	8.2813+2
1.0000+3	8.0973–6	1.5632+4	4.7745+0	4.0818+6	1.9399+6	9.7570+5	1.1651+6	1.0607+3	1.0510+3	1.1930+1	1.1056+0	1.0380+3
1.5000+3	8.0998–6	1.5627+4	5.1599+0	4.0805+6	1.9388+6	9.7571+5	1.1650+6	1.0779+3	1.5793+3	1.2067+1	1.1055+0	1.5661+3
2.0000+3	8.1027–6	1.5621+4	5.4332+0	4.0791+6	1.9380+6	9.7571+5	1.1643+6	1.0904+3	2.1055+3	1.2203+1	1.1049+0	2.0922+3
3.0000+3	8.1063–6	1.5615+4	5.8181+0	4.0773+6	1.9368+6	9.7571+5	1.1637+6	1.1092+3	3.1623+3	1.2465+1	1.1043+0	3.1487+3
4.0000+3	8.1094–6	1.5608+4	6.0909+0	4.0757+6	1.9360+6	9.7571+5	1.1629+6	1.1228+3	4.2185+3	1.2569+1	1.1036+0	4.2049+3
5.0000+3	8.1135–6	1.5601+4	6.3023+0	4.0736+6	1.9353+6	9.7571+5	1.1615+6	1.1335+3	5.2828+3	1.2672+1	1.1023+0	5.2691+3
6.0000+3	8.1142–6	1.5599+4	6.4750+0	4.0733+6	1.9348+6	9.7571+5	1.1616+6	1.1414+3	6.3292+3	1.2756+1	1.1025+0	6.3154+3
8.0000+3	8.1164–6	1.5595+4	6.7477+0	4.0722+6	1.9340+6	9.7571+5	1.1613+6	1.1538+3	8.4403+3	1.2926+1	1.1023+0	8.4263+3
1.0000+4	8.1182–6	1.5592+4	6.9590+0	4.0713+6	1.9334+6	9.7571+5	1.1610+6	1.1636+3	1.0571+4	1.3081+1	1.1022+0	1.0557+4
1.5000+4	8.1208–6	1.5587+4	7.3435+0	4.0700+6	1.9322+6	9.7571+5	1.1609+6	1.1824+3	1.5785+4	1.3209+1	1.1020+0	1.5771+4
2.0000+4	8.1232–6	1.5582+4	7.6167+0	4.0688+6	1.9314+6	9.7571+5	1.1605+6	1.1959+3	2.1066+4	1.3337+1	1.1017+0	2.1052+4
3.0000+4	8.1256–6	1.5577+4	8.0021+0	4.0676+6	1.9303+6	9.7571+5	1.1604+6	1.2149+3	3.1526+4	1.3593+1	1.1016+0	3.1511+4
4.0000+4	8.1280–6	1.5573+4	8.2757+0	4.0664+6	1.9294+6	9.7571+5	1.1600+6	1.2285+3	4.2099+4	1.3716+1	1.1012+0	4.2084+4
5.0000+4	8.1315–6	1.5566+4	8.4878+0	4.0646+6	1.9288+6	9.7571+5	1.1589+6	1.2390+3	5.2574+4	1.3815+1	1.1002+0	5.2559+4
6.0000+4	8.1318–6	1.5565+4	8.6613+0	4.0644+6	1.9283+6	9.7571+5	1.1592+6	1.2476+3	6.3040+4	1.3898+1	1.1005+0	6.3025+4
8.0000+4	8.1334–6	1.5563+4	8.9349+0	4.0637+6	1.9275+6	9.7571+5	1.1593+6	1.2612+3	8.4156+4	1.4063+1	1.1005+0	8.4141+4
1.0000+5	8.1348–6	1.5560+4	9.1469+0	4.0630+6	1.9268+6	9.7571+5	1.1592+6	1.2718+3	1.0531+5	1.4220+1	1.1004+0	1.0529+5


July 4, 1991
Atomic Weight 158 924
EEDL Evaluated Electron
Cross Sections
65-Tb
Density 8 229 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
65-Tb


July 4, 1991
Atomic Weight 158 924
EEDL Evaluated Electron
Energy Deposition
65-Tb
Density 8 229 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
65-Tb

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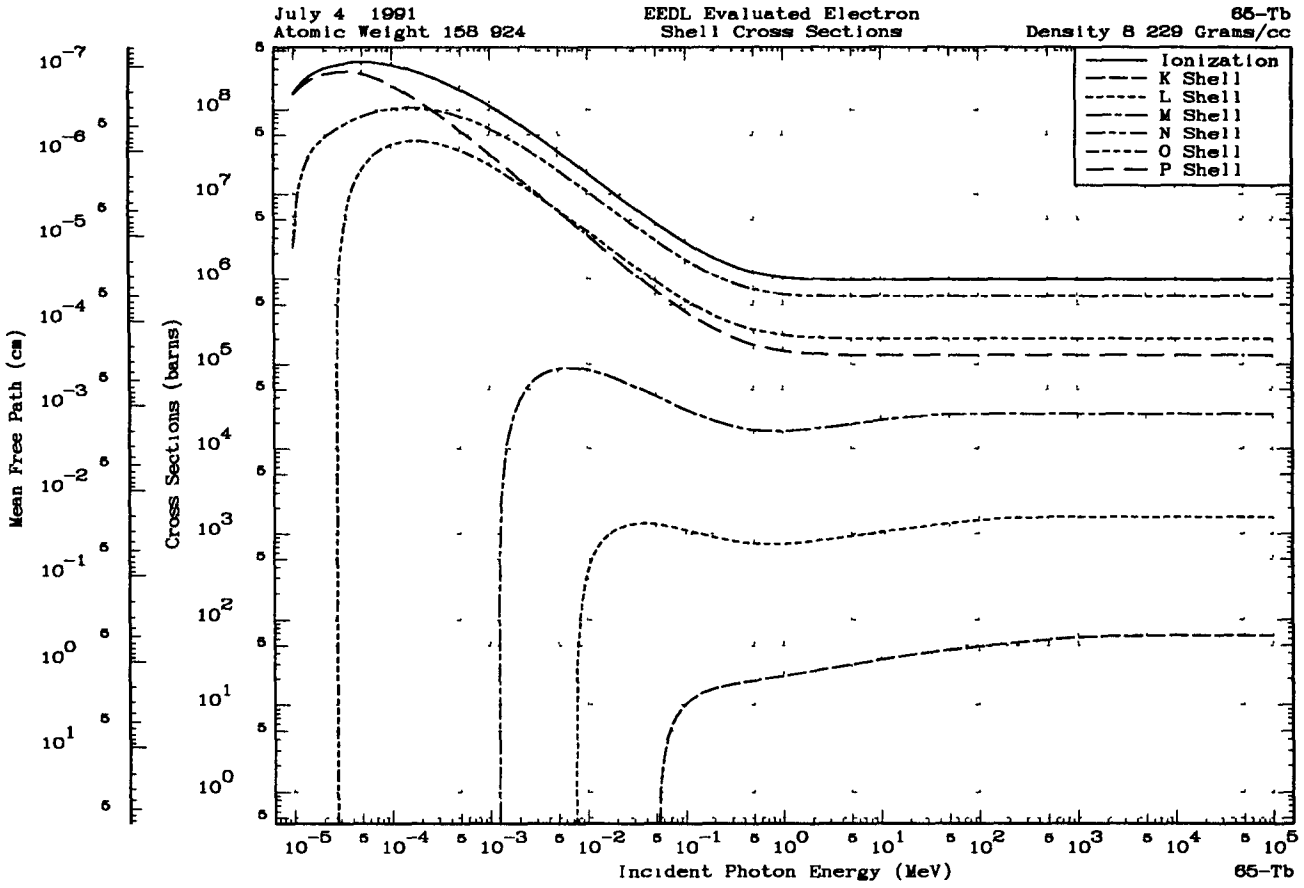
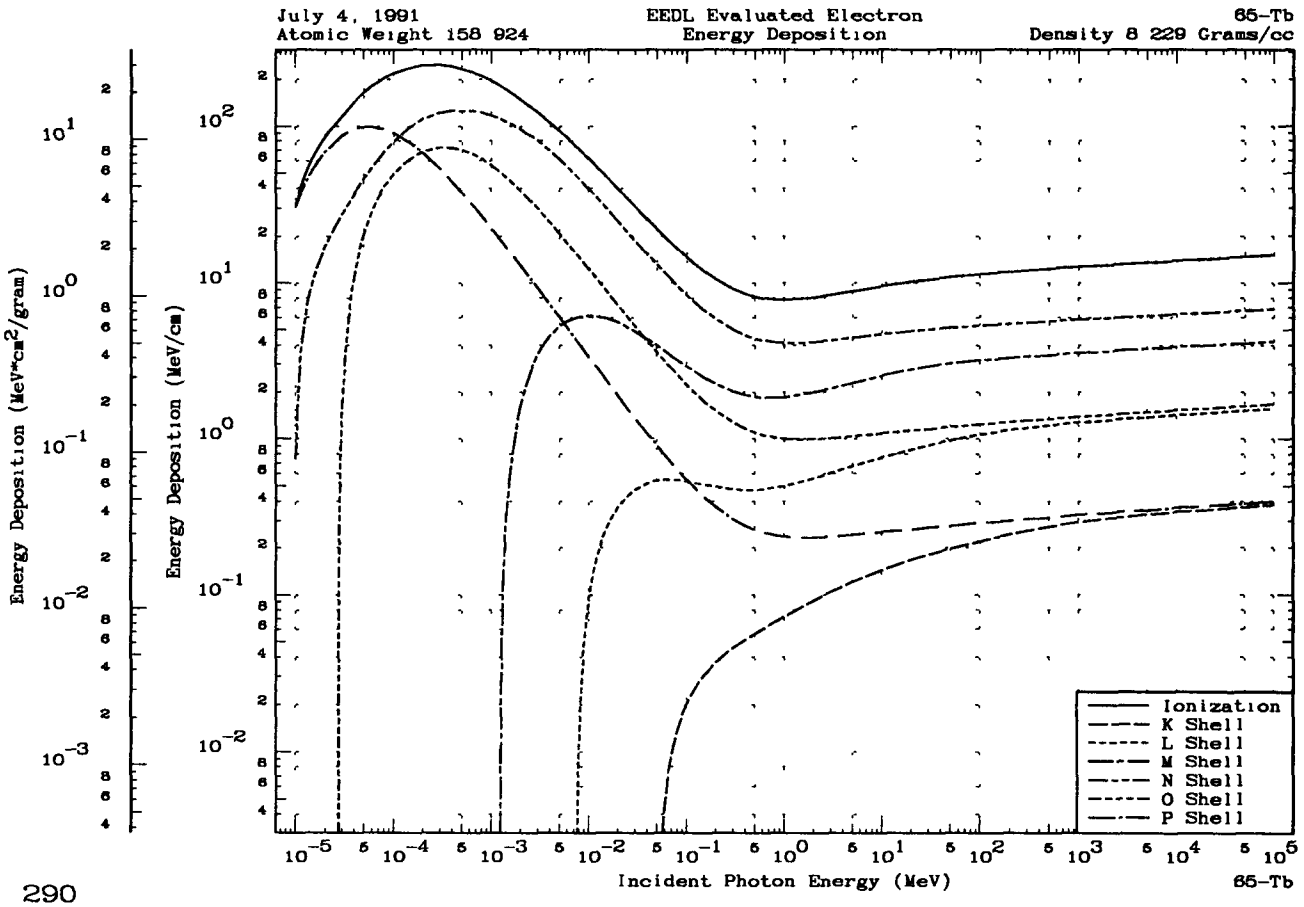

July 4 1991
Atomic Weight 158 924
EEDL Evaluated Electron
Shell Cross Sections
65-Tb
Density 8 229 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
65-Tb


July 4, 1991
Atomic Weight 158 924
EEDL Evaluated Electron
Energy Deposition
65-Tb
Density 8 229 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
65-Tb

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Atomic Weight 158.924 Density 8.229 Grams/cc

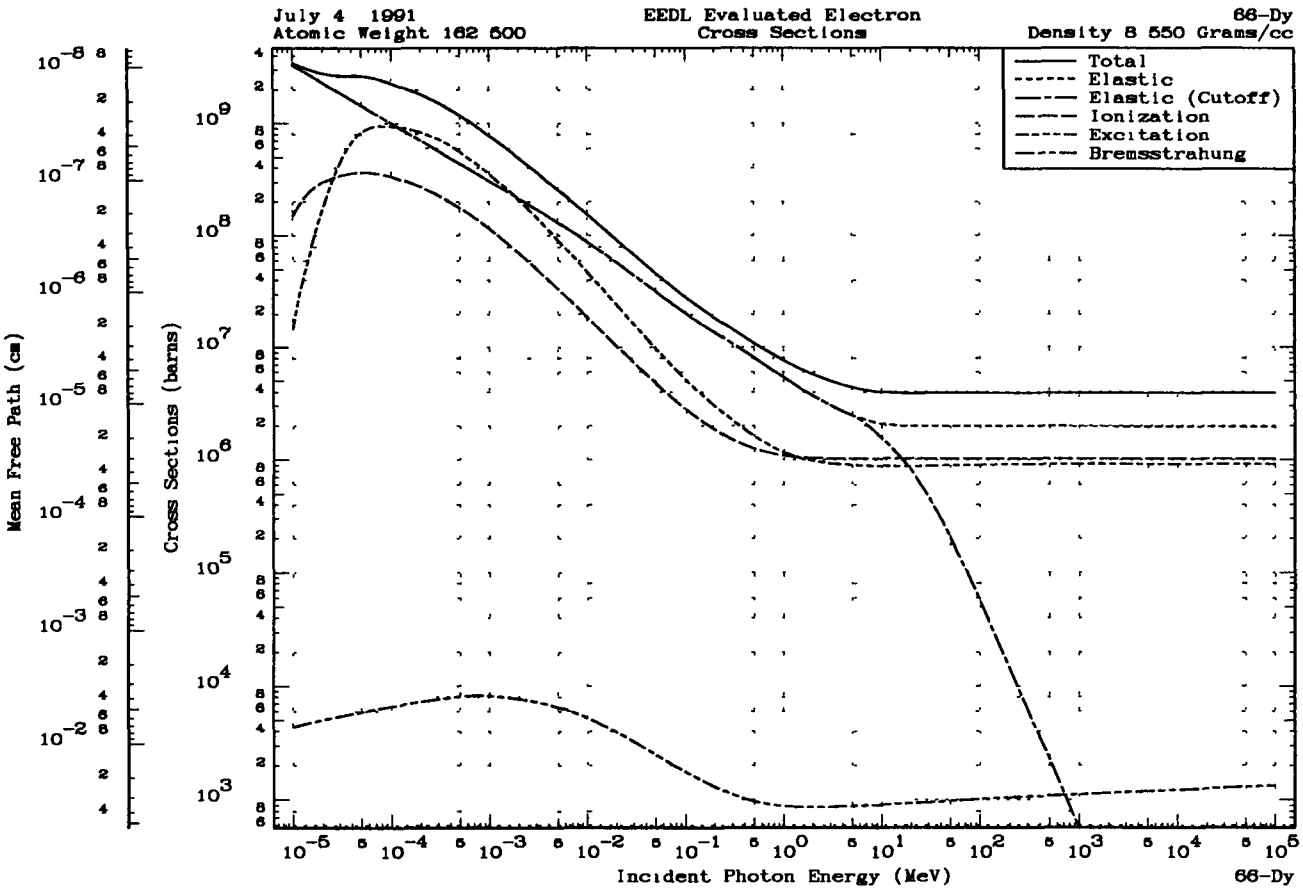
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.8826–9	1.3681+7		3.6104+9	3.4370+9	1.5524+8	1.8160+7	4.3907+3	3.5042+1	3.1484+1	3.5576+0	2.9584–4
	1.0313–5	8.9935–9	1.3512+7		3.5659+9	3.3824+9	1.6247+8	2.1017+7	4.4182+3	3.7617+1	3.3456+1	4.1605+0	3.0472–4
N6	1.0390–5	9.0205–9	1.3472+7		3.5552+9	3.3692+9	1.6417+8	2.1777+7	4.4249+3	3.8243+1	3.3921+1	4.3222+0	3.0693–4
	1.0534–5	9.0689–9	1.3400+7		3.5362+9	3.3452+9	1.6785+8	2.3169+7	4.4373+3	3.9564+1	3.4950+1	4.6133+0	3.1104–4
	1.0813–5	9.1596–9	1.3267+7		3.5012+9	3.3000+9	1.7517+8	2.6060+7	4.4609+3	4.2239+1	3.7017+1	5.2216+0	3.1903–4
	1.0898–5	9.1866–9	1.3228+7		3.4909+9	3.2865+9	1.7738+8	2.6997+7	4.4681+3	4.3064+1	3.7644+1	5.4195+0	3.2148–4
	1.1250–5	9.2953–9	1.3073+7		3.4501+9	3.2327+9	1.8629+8	3.1140+7	4.4970+3	4.6498+1	4.0197+1	6.3003+0	3.3161–4
	1.1337–5	9.3216–9	1.3037+7		3.4403+9	3.2198+9	1.8830+8	3.2232+7	4.5040+3	4.7342+1	4.0808+1	6.5336+0	3.3410–4
	1.1411–5	9.3449–9	1.3004+7		3.4318+9	3.2088+9	1.8994+8	3.3006+7	4.5100+3	4.8004+1	4.1302+1	6.7014+0	3.3626–4
	1.1795–5	9.4619–9	1.2843+7		3.3893+9	3.1541+9	1.9802+8	3.7188+7	4.5403+3	5.1393+1	4.3778+1	7.6144+0	3.4739–4
	1.2308–5	9.6100–9	1.2645+7		3.3371+9	3.0849+9	2.0883+8	4.3377+7	4.5798+3	5.6129+1	4.7147+1	8.9813+0	3.6238–4
	1.2596–5	9.6890–9	1.2542+7		3.3099+9	3.0480+9	2.1471+8	4.7150+7	4.6013+3	5.8838+1	4.9014+1	9.8230+0	3.7082–4
	1.3125–5	9.8306–9	1.2362+7		3.2622+9	2.9835+9	2.2521+8	5.3541+7	4.6399+3	6.3682+1	5.2400+1	1.1281+1	3.8643–4
	1.3654–5	9.9678–9	1.2191+7		3.2173+9	2.9227+9	2.3409+8	6.0494+7	4.6773+3	6.8415+1	5.5525+1	1.2889+1	4.0214–4
	1.3798–5	1.0004–8	1.2147+7		3.2057+9	2.9068+9	2.3640+8	6.2482+7	4.6873+3	6.9706+1	5.6352+1	1.3353+1	4.0642–4
	1.5000–5	1.0282–8	1.1819+7		3.1191+9	2.7832+9	2.5501+8	8.0876+7	4.7674+3	8.0933+1	6.3214+1	1.7719+1	4.4254–4
	1.6250–5	1.0541–8	1.1528+7		3.0423+9	2.6696+9	2.7004+8	1.0260+8	4.8455+3	9.1989+1	6.9229+1	2.2759+1	4.8062–4
	1.7500–5	1.0761–8	1.1293+7		2.9803+9	2.5686+9	2.8372+8	1.2789+8	4.9190+3	1.0374+2	7.5019+1	2.8717+1	5.1920–4
	1.8125–5	1.0861–8	1.1188+7		2.9526+9	2.5222+9	2.8923+8	1.4120+8	4.9541+3	1.0956+2	7.7659+1	3.1898+1	5.3867–4
	2.0000–5	1.1106–8	1.0942+7		2.8876+9	2.3962+9	3.0498+8	1.8641+8	5.0542+3	1.2845+2	8.5577+1	4.2873+1	5.9777–4
	2.2500–5	1.1369–8	1.0689+7		2.8209+9	2.2538+9	3.1677+8	2.5034+8	5.1628+3	1.5131+2	9.3207+1	5.8099+1	6.7155–4
	2.5000–5	1.1508–8	1.0560+7		2.7868+9	2.1335+9	3.2741+8	3.2589+8	5.2621+3	1.7706+2	1.0074+2	7.6315+1	7.4654–4
O3	2.7590–5	1.1578–8	1.0496+7		2.7698+9	2.0268+9	3.3729+8	4.0567+8	5.3566+3	2.0430+2	1.0843+2	9.5876+1	8.2543–4
	2.7741–5	1.1581–8	1.0493+7		2.7691+9	2.0211+9	3.3782+8	4.1013+8	5.3618+3	2.0587+2	1.0891+2	9.6963+1	8.3001–4
	2.8023–5	1.1586–8	1.0488+7		2.7678+9	2.0105+9	3.3881+8	4.1856+8	5.3715+3	2.0883+2	1.0981+2	9.9019+1	8.3860–4
	2.8517–5	1.1593–8	1.0482+7		2.7663+9	1.9923+9	3.4055+8	4.3351+8	5.3882+3	2.1408+2	1.1140+2	1.0267+2	8.5368–4
	2.9259–5	1.1597–8	1.0479+7		2.7654+9	1.9658+9	3.4317+8	4.5644+8	5.4128+3	2.2212+2	1.1383+2	1.0828+2	8.7636–4
	3.0000–5	1.1594–8	1.0482+7		2.7661+9	1.9404+9	3.4578+8	4.7996+8	5.4370+3	2.3036+2	1.1630+2	1.1406+2	8.9913–4
O2	3.2240–5	1.1585–8	1.0489+7		2.7682+9	1.8690+9	3.5034+8	5.4878+8	5.5071+3	2.5323+2	1.2233+2	1.3089+2	9.6845–4
	3.2483–5	1.1586–8	1.0489+7		2.7679+9	1.8618+9	3.5081+8	5.5533+8	5.5144+3	2.5555+2	1.2304+2	1.3251+2	9.7600–4
	3.2500–5	1.1586–8	1.0488+7		2.7679+9	1.8613+9	3.5084+8	5.5581+8	5.5149+3	2.5572+2	1.2309+2	1.3262+2	9.7655–4
	3.2952–5	1.1588–8	1.0487+7		2.7676+9	1.8479+9	3.5152+8	5.6811+8	5.5285+3	2.5991+2	1.2425+2	1.3566+2	9.9065–4
	3.3833–5	1.1586–8	1.0489+7		2.7680+9	1.8228+9	3.5292+8	5.9235+8	5.5545+3	2.6821+2	1.2656+2	1.4165+2	1.0182–3
	3.5375–5	1.1568–8	1.0505+7		2.7723+9	1.7810+9	3.5559+8	6.3566+8	5.5987+3	2.8325+2	1.3086+2	1.5238+2	1.0667–3
	3.6250–5	1.1550–8	1.0521+7		2.7765+9	1.7585+9	3.5720+8	6.6074+8	5.6231+3	2.9203+2	1.3341+2	1.5862+2	1.0944–3
	3.7687–5	1.1513–8	1.0556+7		2.7856+9	1.7234+9	3.5955+8	7.0271+8	5.6621+3	3.0645+2	1.3736+2	1.6909+2	1.1401–3
	4.0000–5	1.1502–8	1.0565+7		2.7882+9	1.6708+9	3.6349+8	7.5389+8	5.7224+3	3.2603+2	1.4395+2	1.8208+2	1.2141–3
	4.5000–5	1.1446–8	1.0617+7		2.8019+9	1.5716+9	3.6597+8	8.6432+8	5.8345+3	3.6469+2	1.5477+2	2.0991+2	1.3696–3
	5.0000–5	1.1467–8	1.0597+7		2.7966+9	1.4878+9	3.6833+8	9.4049+8	5.9367+3	3.9500+2	1.6532+2	2.2968+2	1.5275–3
O1	5.2170–5	1.1517–8	1.0552+7		2.7846+9	1.4553+9	3.6764+8	9.6160+8	5.9768+3	4.0416+2	1.6875+2	2.3541+2	1.5954–3
	5.3149–5	1.1540–8	1.0530+7		2.7789+9	1.4413+9	3.6739+8	9.7022+8	5.9945+3	4.0815+2	1.7036+2	2.3780+2	1.6262–3
	5.4862–5	1.1578–8	1.0496+7		2.7699+9	1.4178+9	3.6702+8	9.8511+8	6.0247+3	4.1515+2	1.7322+2	2.4193+2	1.6802–3
	5.5000–5	1.1581–8	1.0493+7		2.7692+9	1.4159+9	3.6700+8	9.8631+8	6.0271+3	4.1571+2	1.7345+2	2.4226+2	1.6846–3
	5.7431–5	1.1628–8	1.0451+7		2.7580+9	1.3844+9	3.6655+8	1.0070+9	6.0686+3	4.2554+2	1.7750+2	2.4804+2	1.7617–3
	6.0000–5	1.1670–8	1.0413+7		2.7479+9	1.3533+9	3.6625+8	1.0284+9	6.1108+3	4.3594+2	1.8187+2	2.5406+2	1.8436–3
	6.5000–5	1.1851–8	1.0254+7		2.7060+9	1.2981+9	3.6239+8	1.0455+9	6.1889+3	4.4671+2	1.8752+2	2.5919+2	2.0046–3
	7.0000–5	1.2011–8	1.0117+7		2.6700+9	1.2491+9	3.5926+8	1.0617+9	6.2620+3	4.5753+2	1.9344+2	2.6409+2	2.1673–3
	7.2500–5	1.2086–8	1.0055+7		2.6535+9	1.2265+9	3.5767+8	1.0694+9	6.2969+3	4.6268+2	1.9622+2	2.6646+2	2.2493–3
	8.0000–5	1.2385–8	9.8123+6		2.5895+9	1.1653+9	3.5363+8	1.0705+9	6.3960+3	4.7291+2	2.0479+2	2.6811+2	2.4977–3
	9.0000–5	1.2817–8	9.4813+6		2.5021+9	1.0961+9	3.4470+8	1.0613+9	6.5102+3	4.7963+2	2.1173+2	2.6789+2	2.8306–3
	1.0000–4	1.3206–8	9.2019+6	0.0000+0	2.4284+9	1.0377+9	3.3756+8	1.0531+9	6.6140+3	4.8718+2	2.1928+2	2.6790+2	3.1686–3
	1.1250–4	1.3732–8	8.8496+6	2.5623–8	2.3354+9	9.7616+8	3.2583+8	1.0334+9	6.7259+3	4.8852+2	2.2402+2	2.6450+2	3.5936–3
	1.2500–4	1.4212–8	8.5508+6	5.1142–8	2.2565+9	9.2424+8	3.1623+8	1.0161+9	6.8275+3	4.9113+2	2.2948+2	2.6165+2	4.0250–3
	1.3125–4	1.4439–8	8.4163+6	6.3856–8	2.2211+9	9.0114+8	3.1179+8	1.0081+9	6.8751+3	4.9206+2	2.3166+2	2.6040+2	4.2429–3
	1.5000–4	1.5070–8	8.0636+6	1.0181–7	2.1280+9	8.4083+8	3.0040+8	9.8675+8	7.0071+3	4.9599+2	2.3880+2	2.5719+2	4.9048–3
N5	1.5429–4	1.5235–8	7.9762+6	1.1047–7	2.1049+9	8.2862+8	2.9721+8	9.7908+8	7.0353+3	4.9473+2	2.3918+2	2.5555+2	5.0579–3
	1.6000–4	1.5446–8	7.8673+6	1.2203–7	2.0762+9	8.1313+8	2.9322+8	9.6981+8	7.0718+3	4.9357+2	2.3995+2	2.5362+2	5.2626–3
N4	1.6059–4	1.5468–8	7.8564+6	1.2322–7	2.0733+9	8.1159+8	2.9283+8	9.6888+8	7.0755+3	4.9346+2	2.4002+2	2.5343+2	5.2837–3
	1.6305–4	1.5556–8	7.8117+6	1.2821–7	2.0615+9	8.0521+8	2.9115+8	9.6514+8	7.0898+3	4.9305+2	2.4036+2	2.5269+2	5.3731–3
	1.6767–4	1.5720–8	7.7305+6	1.3759–7	2.0401+9	7.9362+8	2.8813+8	9.5832+8	7.1163+3	4.9242+2	2.4106+2	2.5135+2	5.5413–3
	1.7000–4	1.5801–8	7.6908+6	1.4232–7	2.0296+9	7.8796+8	2.8666+8	9.5496+8	7.1294+3	4.9215+2	2.4146+2	2.5069+2	5.6264–3
	1.7575–4	1.5998–8	7.5960+6	1.5402–7	2.0046+9	7.7447+8	2.8317+8	9.4693+8	7.1611+3	4.9156+2	2.4242+2	2.4913+2	5.8370–3
	1.8500–4	1.6305–8	7.4528+6	1.7284–7	1.9668+9	7.5414+8	2.7797+8	9.3468+8	7.2103+3	4.9096+2	2.4418+2	2.4677+2	6.1776–3
	1.8788–4	1.6399–8	7.4104+6	1.7870–7	1.9556+9	7.4813+8	2.7644+8	9.3103+8	7.2252+3	4.9083+2	2.4475+2	2.4607+2	6.2840–3
	2.0000–4	1.6781–8	7.2415+6	2.0340–7	1.9110+9	7.2425+8	2.7040+8	9.1636+8	7.2857+3	4.9065+2	2.4733+2	2.4331+2	6.7347–3
	2.2500–4	1.7667–8	6.8785+6	2.5484–7	1.8152+9	6.8133+8	2.5662+8	8.7729+8	7.3871+3	4.8144+2	2.4682+2	2.3461+2	7.6870–3
	2.5000–4	1.8495–8	6.5707+6	3.0714–7	1.7340+9	6.4508+8	2.4515+8	8.4376+8	7.4791+3	4.7450+2	2.4723+2	2.2726+2	8.6520–3
	2.6250–4	1.8890–8	6.4332+6	3.3356–7	1.6977+9	6.2896+8	2.4009+8	8.2867+8	7.5220+3	4.7173+2	2.4774+2	2.2398+2	9.1388–3
N3	2.8104–4	1.9455–8	6.2462+6	3.7301–7	1.6484+9	6.0708+8	2.3326+8	8.0801+8	7.5826+3	4.6821+2	2.4865+2	2.1954+2	9.8659–3
	2.8578–4	1.9608–8	6.1975+6	3.8315–7	1.6355+9	6.0184+8	2.3149+8	8.0218+8	7.5975+3	4.6688+2	2.4863+2	2.1824+2	1.0053–2
	2.9289–4	1.9835–8	6.1267+6	3.9841–7	1.6168+9	5.9421+8	2.2892+8	7.9369+8	7.6194+3	4.6501+2	2.4864+2	2.1636+2	1.0334–2
	3.0000–4	2.0058–8	6.0585+6	4.1373–7	1.5988+9	5.8687+8	2.2646+8	7.8550+8	7.6409+3	4.6326+2	2.4870+2	2.1454+2	1.0615–2
	3.1250–4	2.0468–8	5.9371+6	4.4085–7	1.5668+9	5.7457+8	2.2181+8	7.7041+8	7.6776+3	4.5847+2	2.4753+2	2.1093+2	1.1113–2
N2	3.1600–4	2.0581–8	5.9044+6	4.4850–7	1.5582+9	5.7126+8	2.2057+8	7.6634+8	7.6876+3	4.5719+2	2.4723+2	2.0995+2	1.1252–2
	3.2125–4	2.0755–8	5.8550+6	4.6001–7	1.5451+9	5.6641+8	2.1873+8	7.5999+8	7.7023+3	4.5526+2	2.4679+2	2.0846+2	1.1462–2
	3.3109–4	2.1077–8	5.7657+6	4.8171–7	1.5216+9	5.5764+8	2.1541+8	7.4850+8	7.7292+3	4.5182+2	2.4606+2	2.0575+2	1.1858–2
	3.3438–4	2.1183–8	5.7368+6	4.8898–7	1.5139+9	5.5480+8	2.1434+8	7.4478+8	7.7380+3	4.5072+2	2.4583+2	2.0488+2	1.1990–2
	3.4832–4	2.1628–8	5.6187+6	5.2007–7	1.4828+9	5.4320+8	2.0999+8	7.2958+8	7.7747+3	4.4631+2	2.4499+2	2.0131+2	1.2553–2
	3.5000–4	2.1681–8	5.6050+6	5.2384–7	1.4791+9	5.4185+8	2.0948+8	7.2781+8	7.7790+3	4.4581+2	2.4490+2	2.0090+2	1.2621–2
	3.6719–4	2.2216–8	5.4700+6	5.6261–7	1.4435+9	5.2858+8	2.0452+8	7.1041+8	7.8222+3	4.4089+2	2.4404+2	1.9684+2	1.3318–2

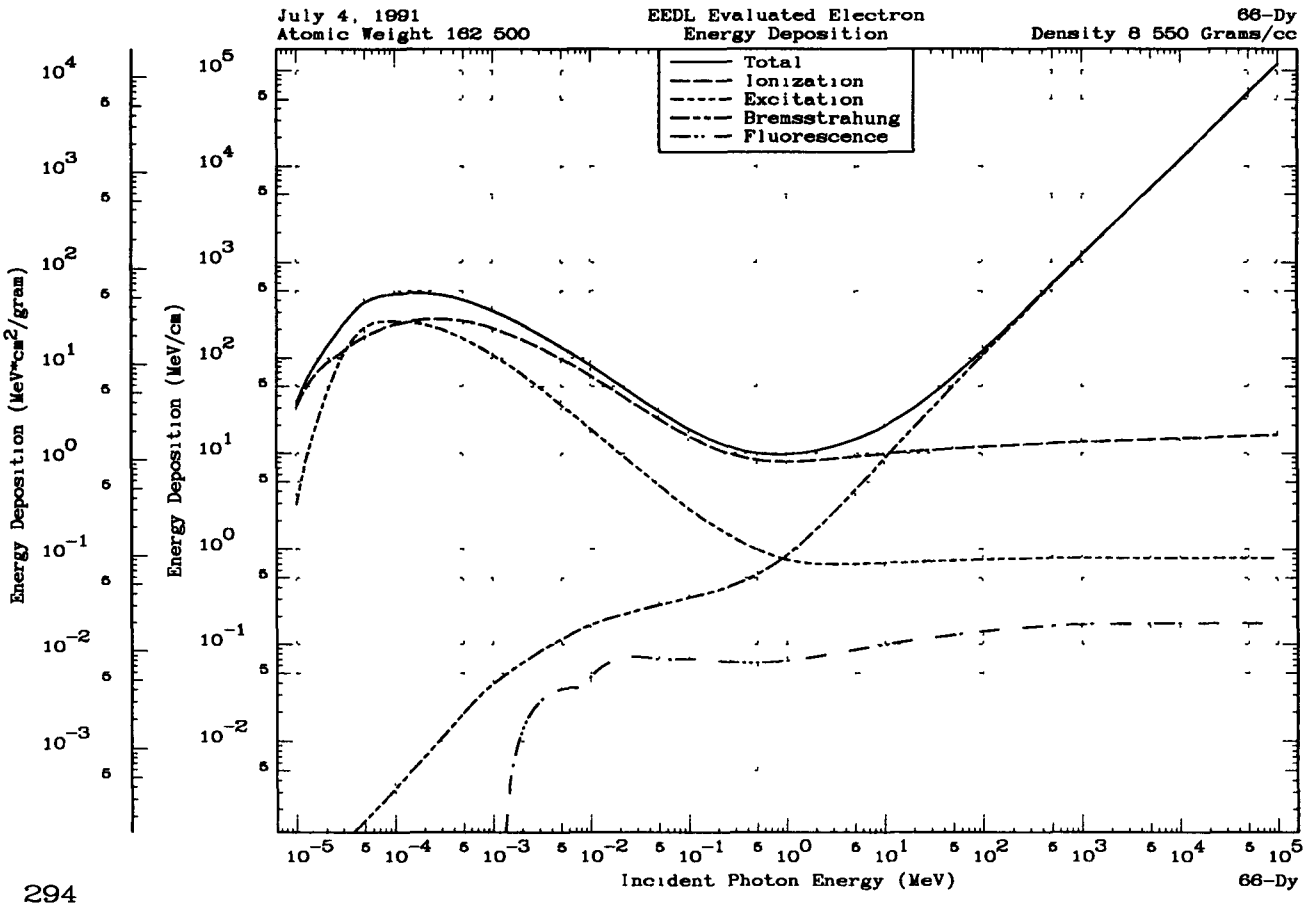
Atomic Weight 158.924 Density 8.229 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.7416–4	2.2429–8	5.4179+6	5.7845–7	1.4298+9	5.2346+8	2.0262+8	7.0370+8	7.8392+3	4.3904+2	2.4375+2	1.9528+2	1.3603–2
N1	3.8839–4	2.2859–8	5.3162+6	6.1100–7	1.4029+9	5.1346+8	1.9892+8	6.9056+8	7.8731+3	4.3550+2	2.4326+2	1.9223+2	1.4184–2
	3.9420–4	2.3037–8	5.2751+6	6.2435–7	1.3921+9	5.0953+8	1.9746+8	6.8510+8	7.8834+3	4.3409+2	2.4309+2	1.9098+2	1.4429–2
	4.0000–4	2.3214–8	5.2349+6	6.3774–7	1.3815+9	5.0569+8	1.9604+8	6.7975+8	7.8936+3	4.3273+2	2.4295+2	1.8977+2	1.4673–2
	4.1250–4	2.3619–8	5.1451+6	6.6678–7	1.3578+9	4.9771+8	1.9266+8	6.6743+8	7.9150+3	4.2818+2	2.4141+2	1.8675+2	1.5201–2
	4.3438–4	2.4314–8	4.9980+6	7.1831–7	1.3190+9	4.8459+8	1.8714+8	6.4724+8	7.9512+3	4.2087+2	2.3903+2	1.8182+2	1.6129–2
	4.5000–4	2.4801–8	4.8999+6	7.5565–7	1.2931+9	4.7581+8	1.8348+8	6.3378+8	7.9760+3	4.1610+2	2.3753+2	1.7855+2	1.6794–2
	4.6719–4	2.5328–8	4.7980+6	7.9720–7	1.2662+9	4.6667+8	1.7969+8	6.1981+8	8.0024+3	4.1122+2	2.3604+2	1.7516+2	1.7528–2
	5.0000–4	2.6309–8	4.6190+6	8.7781–7	1.2189+9	4.5058+8	1.7306+8	5.9529+8	8.0505+3	4.0289+2	2.3365+2	1.6922+2	1.8937–2
	5.5000–4	2.7852–8	4.3631+6	1.0040–6	1.1514+9	4.2891+8	1.6391+8	5.5859+8	8.1079+3	3.8958+2	2.2954+2	1.6002+2	2.1069–2
	6.0000–4	2.9336–8	4.1424+6	1.1342–6	1.0932+9	4.1003+8	1.5606+8	5.2707+8	8.1607+3	3.7863+2	2.2647+2	1.5214+2	2.3216–2
	7.0000–4	3.2229–8	3.7705+6	1.4066–6	9.9504+8	3.7861+8	1.4176+8	4.7466+8	8.2048+3	3.5581+2	2.1698+2	1.3881+2	2.7277–2
	8.0000–4	3.4957–8	3.4763+6	1.6946–6	9.1740+8	3.5335+8	1.3055+8	4.3349+8	8.2433+3	3.3865+2	2.1021+2	1.2841+2	3.1358–2
	9.0000–4	3.7725–8	3.2213+6	1.9979–6	8.5009+8	3.3247+8	1.2073+8	3.9688+8	8.2112+3	3.2096+2	2.0211+2	1.1882+2	3.4739–2
	1.0000–3	4.0378–8	3.0096+6	2.3166–6	7.9423+8	3.1484+8	1.1262+8	3.6677+8	8.1826+3	3.0677+2	1.9577+2	1.1096+2	3.8108–2
M5	1.2446–3	4.6654–8	2.6048+6	3.1561–6	6.8739+8	2.8104+8	9.6752+7	3.0960+8	8.0204+3	2.7645+2	1.8072+2	9.5692+1	4.4622–2
	1.2526–3	4.6851–8	2.5938+6	3.1850–6	6.8450+8	2.8011+8	9.6309+7	3.0808+8	8.0157+3	2.7557+2	1.8025+2	9.5277+1	4.4833–2
	1.2680–3	4.7232–8	2.5729+6	3.2413–6	6.7898+8	2.7833+8	9.5464+7	3.0518+8	8.0067+3	2.7389+2	1.7935+2	9.4487+1	4.5241–2
M4	1.2790–3	4.7501–8	2.5583+6	3.2814–6	6.7513+8	2.7709+8	9.4876+7	3.0316+8	8.0004+3	2.7272+2	1.7873+2	9.3937+1	4.5531–2
	1.2825–3	4.7589–8	2.5536+6	3.2944–6	6.7389+8	2.7669+8	9.4687+7	3.0250+8	7.9982+3	2.7234+2	1.7853+2	9.3758+1	4.5620–2
	1.3066–3	4.8184–8	2.5220+6	3.3832–6	6.6557+8	2.7403+8	9.3421+7	2.9811+8	7.9835+3	2.6979+2	1.7717+2	9.2567+1	4.6230–2
	1.3097–3	4.8260–8	2.5181+6	3.3947–6	6.6452+8	2.7370+8	9.3261+7	2.9755+8	7.9816+3	2.6947+2	1.7700+2	9.2417+1	4.6308–2
	1.3550–3	4.9366–8	2.4616+6	3.5641–6	6.6963+8	2.6891+8	9.0999+7	2.8971+8	7.9548+3	2.6493+2	1.7459+2	9.0292+1	4.7451–2
	1.4049–3	5.0570–8	2.4030+6	3.7541–6	6.3416+8	2.6391+8	8.8656+7	2.8158+8	7.9264+3	2.6029+2	1.7215+2	8.8094+1	4.8708–2
	1.4275–3	5.1111–8	2.3776+6	3.8413–6	6.2745+8	2.6173+8	8.7641+7	2.7807+8	7.9138+3	2.5829+2	1.7109+2	8.7144+1	4.9277–2
	1.5000–3	5.2824–8	2.3005+6	4.1254–6	6.0710+8	2.5509+8	8.4569+7	2.6744+8	7.8751+3	2.5228+2	1.6796+2	8.4274+1	5.1096–2
M3	1.5968–3	5.5062–8	2.2070+6	4.5154–6	5.8242+8	2.4694+8	8.0720+7	2.5475+8	7.8201+3	2.4422+2	1.6342+2	8.0753+1	5.3354–2
	1.6220–3	5.5645–8	2.1839+6	4.6190–6	5.7633+8	2.4494+8	7.9785+7	2.5159+8	7.8065+3	2.4228+2	1.6234+2	7.9887+1	5.3940–2
	1.6250–3	5.5714–8	2.1812+6	4.6313–6	5.7561+8	2.4471+8	7.9676+7	2.5122+8	7.8049+3	2.4205+2	1.6221+2	7.9786+1	5.4010–2
	1.6692–3	5.6728–8	2.1422+6	4.8154–6	5.6532+8	2.4132+8	7.8099+7	2.4590+8	7.7814+3	2.3878+2	1.6040+2	7.8329+1	5.5036–2
M2	1.7534–3	5.8630–8	2.0727+6	5.1721–6	5.4698+8	2.3523+8	7.5298+7	2.3644+8	7.7387+3	2.3303+2	1.5723+2	7.5745+1	5.6983–2
	1.7842–3	5.9331–8	2.0482+6	5.3050–6	5.4052+8	2.3312+8	7.4307+7	2.3309+8	7.7236+3	2.3087+2	1.5601+2	7.4801+1	5.7694–2
	1.8125–3	5.9970–8	2.0264+6	5.4280–6	5.3476+8	2.3122+8	7.3423+7	2.3011+8	7.7100+3	2.2895+2	1.5493+2	7.3960+1	5.8346–2
	1.8382–3	6.0547–8	2.0070+6	5.5405–6	5.2966+8	2.2954+8	7.2643+7	2.2747+8	7.6979+3	2.2726+2	1.5398+2	7.3218+1	5.8936–2
	1.8760–3	6.1392–8	1.9794+6	5.7078–6	5.2237+8	2.2713+8	7.1528+7	2.2371+8	7.6804+3	2.2484+2	1.5262+2	7.2160+1	5.9805–2
	1.9191–3	6.2349–8	1.9491+6	5.9006–6	5.1436+8	2.2447+8	7.0304+7	2.1958+8	7.6609+3	2.2221+2	1.5115+2	7.0999+1	6.0793–2
M1	1.9358–3	6.2718–8	1.9376+6	5.9760–6	5.1133+8	2.2346+8	6.9843+7	2.1802+8	7.6535+3	2.2122+2	1.5060+2	7.0562+1	6.1176–2
	1.9679–3	6.3442–8	1.9155+6	6.1218–6	5.0550+8	2.2155+8	6.8977+7	2.1496+8	7.6394+3	2.1934+2	1.4957+2	6.9707+1	6.1911–2
	2.0000–3	6.4161–8	1.8940+6	6.2687–6	4.9983+8	2.1970+8	6.8136+7	2.1198+8	7.6256+3	2.1752+2	1.4858+2	6.8879+1	6.2644–2
	2.0625–3	6.5571–8	1.8533+6	6.5587–6	4.8908+8	2.1612+8	6.6497+7	2.0646+8	7.5889+3	2.1356+2	1.4622+2	6.7281+1	6.3855–2
	2.1250–3	6.6966–8	1.8147+6	6.8539–6	4.7889+8	2.1271+8	6.4946+7	2.0123+8	7.5535+3	2.0984+2	1.4400+2	6.5772+1	6.5063–2
	2.1797–3	6.8176–8	1.7825+6	7.1165–6	4.7039+8	2.0984+8	6.3655+7	1.9689+8	7.5235+3	2.0675+2	1.4217+2	6.4517+1	6.6116–2
	2.2500–3	6.9717–8	1.7431+6	7.4597–6	4.6000+8	2.0632+8	6.2079+7	1.9160+8	7.4862+3	2.0300+2	1.3994+2	6.2990+1	6.7467–2
	2.3848–3	7.2625–8	1.6733+6	8.1347–6	4.4157+8	2.0001+8	5.9293+7	1.8226+8	7.4183+3	1.9638+2	1.3601+2	6.0298+1	7.0043–2
	2.5000–3	7.5069–8	1.6188+6	8.7292–6	4.2720+8	1.9504+8	5.7129+7	1.7503+8	7.3637+3	1.9129+2	1.3300+2	5.8213+1	7.2233–2
	2.5386–3	7.5879–8	1.6015+6	8.9317–6	4.2264+8	1.9345+8	5.6443+7	1.7274+8	7.3460+3	1.8967+2	1.3204+2	5.7555+1	7.2964–2
	2.5625–3	7.6379–8	1.5910+6	9.0582–6	4.1987+8	1.9249+8	5.6027+7	1.7135+8	7.3353+3	1.8869+2	1.3146+2	5.7157+1	7.3417–2
	2.6250–3	7.7678–8	1.5644+6	9.3916–6	4.1285+8	1.9003+8	5.4973+7	1.6785+8	7.3076+3	1.8621+2	1.2999+2	5.6147+1	7.4596–2
	2.7500–3	8.0245–8	1.5144+6	1.0071–5	3.9964+8	1.8537+8	5.2994+7	1.6127+8	7.2546+3	1.8156+2	1.2722+2	5.4258+1	7.6947–2
	2.7693–3	8.0638–8	1.5070+6	1.0178–5	3.9770+8	1.8468+8	5.2704+7	1.6031+8	7.2466+3	1.8087+2	1.2682+2	5.3981+1	7.7308–2
	3.0000–3	8.5264–8	1.4252+6	1.1480–5	3.7612+8	1.7696+8	4.9488+7	1.4967+8	7.1564+3	1.7341+2	1.2240+2	5.0927+1	8.1610–2
	3.5000–3	9.5217–8	1.2763+6	1.4501–5	3.3680+8	1.6276+8	4.3603+7	1.3044+8	6.9392+3	1.5790+2	1.1266+2	4.5158+1	8.9545–2
	4.0000–3	1.0471–7	1.1605+6	1.7792–5	3.0626+8	1.5138+8	3.9081+7	1.1579+8	6.7564+3	1.4611+2	1.0524+2	4.0774+1	9.7323–2
	4.5000–3	1.1414–7	1.0647+6	2.1343–5	2.8097+8	1.4174+8	3.5419+7	1.0381+8	6.5752+3	1.3564+2	9.8467+1	3.7064+1	1.0420–1
	5.0000–3	1.2324–7	9.8608+5	2.5149–5	2.6023+8	1.3363+8	3.2438+7	9.4149+7	6.4172+3	1.2720+2	9.3013+1	3.4076+1	1.1095–1
	6.0000–3	1.4080–7	8.6307+5	3.3473–5	2.2776+8	1.2052+8	2.7802+7	7.9437+7	6.0897+3	1.1333+2	8.3788+1	2.9418+1	1.2166–1
L3	7.5053–3	1.6580–7	7.3295+5	4.7747–5	1.9343+8	1.0601+8	2.2962+7	6.4452+7	5.6801+3	9.7966+1	7.3287+1	2.4544+1	1.3568–1
	7.7526–3	1.6979–7	7.1570+5	5.0298–5	1.8887+8	1.0404+8	2.2332+7	6.2493+7	5.6180+3	9.5939+1	7.1896+1	2.3905+1	1.3767–1
	8.0000–3	1.7375–7	6.9940+5	5.2902–5	1.8457+8	1.0217+8	2.1739+7	6.0653+7	5.5585+3	9.4034+1	7.0590+1	2.3305+1	1.3965–1
L2	8.2609–3	1.7786–7	6.8323+5	5.5707–5	1.8030+8	1.0025+8	2.1145+7	5.8899+7	5.4984+3	9.2020+1	6.9173+1	2.2705+1	1.4173–1
	8.4783–3	1.8128–7	6.7036+5	5.8090–5	1.7691+8	9.8725+7	2.0677+7	5.7500+7	5.4502+3	9.0434+1	6.8060+1	2.2230+1	1.4345–1
	8.5000–3	1.8162–7	6.6911+5	5.8330–5	1.7658+8	9.8576+7	2.0631+7	5.7364+7	5.4455+3	9.0280+1	6.7952+1	2.2184+1	1.4362–1
L1	8.6731–3	1.8432–7	6.5931+5	6.0260–5	1.7399+8	9.7408+7	2.0275+7	5.6304+7	5.4084+3	8.9076+1	6.7107+1	2.1824+1	1.4498–1
	8.8390–3	1.8692–7	6.5012+5	6.2134–5	1.7157+8	9.6323+7	1.9947+7	5.5290+7	5.3710+3	8.7961+1	6.6328+1	2.1487+1	1.4611–1
	8.8587–3	1.8723–7	6.4904+5	6.2359–5	1.7128+8	9.6196+7	1.9909+7	5.5172+7	5.3666+3	8.7831+1	6.6237+1	2.1448+1	1.4625–1
	9.2500–3	1.9332–7	6.2860+5	6.6878–5	1.6589+8	9.3768+7	1.9181+7	5.2933+7	5.2824+3	8.5364+1	6.4512+1	2.0703+1	1.4890–1
	9.4195–3	1.9593–7	6.2022+5	6.8875–5	1.6368+8	9.2767+7	1.8883+7	5.2020+7	5.2474+3	8.4358+1	6.3809+1	2.0399+1	1.5004–1
	9.4294–3	1.9609–7	6.1974+5	6.8992–5	1.6355+8	9.2709+7	1.8866+7	5.1968+7	5.2453+3	8.4300+1	6.3769+1	2.0382+1	1.5011–1
	1.0000–2	2.0478–7	5.9343+5	7.5890–5	1.5661+8	8.9543+7	1.7935+7	4.9121+7	5.1337+3	8.1162+1	6.1573+1	1.9436+1	1.5392–1
	1.1250–2	2.2352–7	5.4366+5	9.1929–5	1.4347+8	8.3375+7	1.6197+7	4.3896+7	4.8947+3	7.4798+1	5.7027+1	1.7610+1	1.6041–1
	1.2188–2	2.3718–7	5.1236+5	1.0481–4	1.3521+8	7.9428+7	1.5114+7	4.0666+7	4.7386+3	7.0847+1	5.4199+1	1.6483+1	1.6521–1
	1.2500–2	2.4166–7	5.0286+5	1.0925–4	1.3270+8	7.8218+7	1.4787+7	3.9695+7	4.6903+3	6.9656+1	5.3345+1	1.6144+1	1.6680–1
	1.3594–2	2.5709–7	4.7267+5	1.2540–4	1.2474+8	7.4342+7	1.3752+7	3.6639+7	4.5337+3	6.5889+1	5.0638+1	1.5078+1	1.7229–1
	1.5000–2	2.7640–7	4.3966+5	1.4743–4	1.1602+8	7.0037+7	1.2631+7	3.3352+7	4.3566+3	6.1822+1	4.7710+1	1.3933+1	1.7924–1
	1.7500–2	3.1016–7	3.9180+5	1.9004–4	1.0340+8	6.3558+7	1.1060+7	2.8773+7	4.0680+3	5.5611+1	4.3165+1	1.2258+1	1.8788–1
	2.0000–2	3.4257–7	3.5473+5	2.3703–4	9.3613+7	5.8433+7	9.8590+6	2.5318+7	3.8335+3	5.0885+1	3.9692+1	1.0996+1	1.9639–1
	2.2500–2	3.7428–7	3.2468+5	2.8821–4	8.5684+7	5.4146+7	8.9192+6	2.2615+7	3.6200+3	4.6865+1	3.6702+1	9.9612+0	2.0220–1
	2.5000–2	4.0502–7	3.0004+5	3.4349–4	7.9179+7	5.0579+7	8.1549+6	2.0442+7	3.4390+3	4.3609+1	3.4271+1	9.1299+0	2.0800–1
	2.6250–2	4.2007–7	2.8929+5	3.7263–4	7.6343+7	4.9007+7	7.8236+6	1.9508+7	3.3584+3	4.2198+1	3.3215+1	8.7727+0	2.1088–1
	3.0000–2	4.6408–7	2.6186+5	4.6547–4	6.9104+7	4.4952+7	6.9842+6	1.7165+7	3.1471+3	3.8638+1	3.0542+1	7.8770+0	2.1945–1

Atomic Weight 158.924 Density 8.229 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000–2	5.7467–7	2.1146+5	7.4993–4	5.5805+7	3.7196+7	5.4977+6	1.3108+7	2.7146+3	3.1886+1	2.5398+1	6.2527+0	2.3587–1
5.0000–2	6.7683–7	1.7955+5	1.0869–3	4.7382+7	3.2102+7	4.5889+6	1.0689+7	2.4167+3	2.7575+1	2.2072+1	5.2542+0	2.4907–1
K 5.2060–2	6.9692–7	1.7437+5	1.1626–3	4.6016+7	3.1258+7	4.4444+6	1.0312+7	2.3665+3	2.6865+1	2.1522+1	5.0915+0	2.5141–1
5.3053–2	7.0664–7	1.7197+5	1.1997–3	4.5383+7	3.0870+7	4.3784+6	1.0132+7	2.3434+3	2.6539+1	2.1272+1	5.0151+0	2.5253–1
5.4789–2	7.2352–7	1.6796+5	1.2659–3	4.4324+7	3.0221+7	4.2680+6	9.8331+6	2.3044+3	2.5996+1	2.0853+1	4.8880+0	2.5449–1
5.7395–2	7.4856–7	1.6234+5	1.3676–3	4.2842+7	2.9308+7	4.1138+6	9.4172+6	2.2494+3	2.5237+1	2.0268+1	4.7113+0	2.5744–1
6.0000–2	7.7328–7	1.5715+5	1.4723–3	4.1472+7	2.8462+7	3.9716+6	9.0363+6	2.1981+3	2.4539+1	1.9729+1	4.5495+0	2.6037–1
6.5000–2	8.1901–7	1.4838+5	1.6812–3	3.9156+7	2.7028+7	3.7377+6	8.3883+6	2.1098+3	2.3330+1	1.8801+1	4.2632+0	2.6514–1
7.2500–2	8.8567–7	1.3721+5	2.0137–3	3.6209+7	2.5188+7	3.4407+6	7.5785+6	1.9949+3	2.1802+1	1.7624+1	3.9059+0	2.7231–1
8.0000–2	9.5027–7	1.2788+5	2.3681–3	3.3748+7	2.3637+7	3.1933+6	6.9158+6	1.8968+3	2.0537+1	1.6644+1	3.6137+0	2.7945–1
9.0000–2	1.0315–6	1.1781+5	2.8723–3	3.1090+7	2.1955+7	2.9334+6	6.2004+6	1.7946+3	1.9143+1	1.5569+1	3.2864+0	2.8775–1
1.0000–1	1.1098–6	1.0949+5	3.4109–3	2.8895+7	2.0551+7	2.7190+6	5.6235+6	1.7078+3	1.8002+1	1.4683+1	3.0227+0	2.9606–1
1.1250–1	1.1999–6	1.0128+5	4.1283–3	2.6728+7	1.9165+7	2.5162+6	5.0444+6	1.6187+3	1.6860+1	1.3810+1	2.7459+0	3.0416–1
1.3125–1	1.3284–6	9.1483+4	5.2875–3	2.4142+7	1.7491+7	2.2736+6	4.3758+6	1.5090+3	1.5510+1	1.2767+1	2.4267+0	3.1650–1
1.5000–1	1.4503–6	8.3792+4	6.5391–3	2.2113+7	1.6160+7	2.0825+6	3.8686+6	1.4201+3	1.4463+1	1.1949+1	2.1851+0	3.2884–1
1.7500–1	1.5956–6	7.6160+4	8.3312–3	2.0099+7	1.4817+7	1.9050+6	3.3752+6	1.3311+3	1.3450+1	1.1167+1	1.9404+0	3.4286–1
2.0000–1	1.7271–6	7.0360+4	1.0244–2	1.8568+7	1.3744+7	1.7636+6	3.0592+6	1.2585+3	1.2695+1	1.0548+1	1.7895+0	3.5691–1
2.5000–1	1.9658–6	6.1816+4	1.4347–2	1.6313+7	1.2113+7	1.5823+6	2.6168+6	1.1591+3	1.1695+1	9.7428+0	1.5692+0	3.8304–1
3.0000–1	2.1849–6	5.5618+4	1.8758–2	1.4678+7	1.0925+7	1.4482+6	2.3033+6	1.0837+3	1.0981+1	9.1573+0	1.4150+0	4.0892–1
4.0000–1	2.5843–6	4.7023+4	2.8217–2	1.2409+7	9.2300+6	1.2951+6	1.8834+6	9.9289+2	1.0173+1	8.5134+0	1.1979+0	4.6146–1
5.0000–1	2.9323–6	4.1443+4	3.8246–2	1.0937+7	8.0878+6	1.2069+6	1.6411+6	9.4050+2	9.7711+0	8.1820+0	1.0726+0	5.1650–1
6.0000–1	3.2382–6	3.7528+4	4.8596–2	9.9036+6	7.2603+6	1.1506+6	1.4918+6	9.0826+2	9.5544+0	7.9833+0	9.9693–1	5.7413–1
8.0000–1	3.7647–6	3.2279+4	6.9664–2	8.5185+6	6.1238+6	1.0853+6	1.3085+6	8.7173+2	9.4316+0	7.8320+0	9.0572–1	6.9391–1
1.0000+0	4.2007–6	2.8929+4	9.0832–2	7.6343+6	5.3787+6	1.0499+6	1.2048+6	8.5429+2	9.4657+0	7.7885+0	8.5667–1	8.2053–1
1.5000+0	5.0247–6	2.4185+4	1.4250–1	6.3823+6	4.2810+6	1.0112+6	1.0894+6	8.4051+2	9.8935+0	7.9192+0	8.1236–1	1.1619+0
2.0000+0	5.5962–6	2.1715+4	1.9177–1	5.7306+6	3.6762+6	1.0013+6	1.0523+6	8.3926+2	1.0406+1	8.0725+0	8.0419–1	1.5292+0
3.0000+0	6.3830–6	1.9038+4	2.8324–1	5.0242+6	3.0275+6	9.8927+5	1.0065+6	8.4296+2	1.1475+1	8.3706+0	8.0753–1	2.2973+0
4.0000+0	6.8915–6	1.7634+4	3.6652–1	4.6535+6	2.6779+6	9.8481+5	9.8993+5	8.5083+2	1.2558+1	8.6329+0	8.0993–1	3.1150+0
5.0000+0	7.2483–6	1.6766+4	4.4299–1	4.4244+6	2.4644+6	9.8466+5	9.7455+5	8.5741+2	1.3610+1	8.8434+0	8.1289–1	3.9537+0
6.0000+0	7.5090–6	1.6183+4	5.1382–1	4.2708+6	2.3252+6	9.8452+5	9.6026+5	8.6318+2	1.4640+1	9.0119+0	8.1638–1	4.8113+0
8.0000+0	7.8469–6	1.5487+4	6.4164–1	4.0869+6	2.1490+6	9.8549+5	9.5154+5	8.7332+2	1.6699+1	9.2922+0	8.2191–1	6.5850+0
1.0000+1	8.0501–6	1.5096+4	7.5452–1	3.9837+6	2.0549+6	9.8628+5	9.4169+5	8.8203+2	1.8776+1	9.5337+0	8.2621–1	8.4161+0
1.5000+1	8.2264–6	1.4772+4	9.9029–1	3.8983+6	1.9728+6	9.8818+5	9.3641+5	8.9968+2	2.3841+1	9.8817+0	8.3410–1	1.3125+1
2.0000+1	8.2529–6	1.4725+4	1.1801+0	3.8858+6	1.9652+6	9.8940+5	9.3029+5	9.1185+2	2.9002+1	1.0153+1	8.4108–1	1.8008+1
3.0000+1	8.2364–6	1.4754+4	1.4751+0	3.8936+6	1.9650+6	9.9055+5	9.3718+5	9.2677+2	3.9327+1	1.0483+1	8.5274–1	2.7991+1
4.0000+1	8.2321–6	1.4762+4	1.7004+0	3.8956+6	1.9641+6	9.9126+5	9.3932+5	9.4185+2	4.9850+1	1.0707+1	8.6013–1	3.8283+1
5.0000+1	8.2356–6	1.4756+4	1.8823+0	3.8940+6	1.9635+6	9.9168+5	9.3788+5	9.5358+2	6.0469+1	1.0885+1	8.6425–1	4.8720+1
6.0000+1	8.2390–6	1.4750+4	2.0346+0	3.8924+6	1.9629+6	9.9193+5	9.3659+5	9.6315+2	7.1150+1	1.1008+1	8.6849–1	5.9274+1
8.0000+1	8.2328–6	1.4761+4	2.2800+0	3.8953+6	1.9621+6	9.9224+5	9.4003+5	9.7814+2	9.2808+1	1.1215+1	8.7423–1	8.0718+1
1.0000+2	8.2296–6	1.4766+4	2.4735+0	3.8969+6	1.9614+6	9.9245+5	9.4196+5	9.8965+2	1.1463+2	1.1392+1	8.7856–1	1.0236+2
1.5000+2	8.2167–6	1.4790+4	2.8299+0	3.9030+6	1.9603+6	9.9259+5	9.4910+5	1.0101+3	1.6954+2	1.1578+1	8.8558–1	1.5707+2
2.0000+2	8.2109–6	1.4800+4	3.0851+0	3.9057+6	1.9594+6	9.9269+5	9.5259+5	1.0236+3	2.2498+2	1.1749+1	8.8919–1	2.1234+2
3.0000+2	8.2065–6	1.4808+4	3.4466+0	3.9078+6	1.9582+6	9.9278+5	9.5573+5	1.0402+3	3.3547+2	1.2025+1	8.9284–1	3.2256+2
4.0000+2	8.2068–6	1.4807+4	3.7042+0	3.9077+6	1.9574+6	9.9281+5	9.5643+5	1.0516+3	4.4643+2	1.2164+1	8.9422–1	4.3337+2
5.0000+2	8.2098–6	1.4802+4	3.9041+0	3.9063+6	1.9568+6	9.9283+5	9.5563+5	1.0604+3	5.5824+2	1.2294+1	8.9418–1	5.4505+2
6.0000+2	8.2101–6	1.4801+4	4.0676+0	3.9061+6	1.9562+6	9.9284+5	9.5599+5	1.0678+3	6.6824+2	1.2393+1	8.9524–1	6.5495+2
8.0000+2	8.2128–6	1.4797+4	4.3260+0	3.9048+6	1.9554+6	9.9285+5	9.5552+5	1.0797+3	8.9021+2	1.2577+1	8.9624–1	8.7673+2
1.0000+3	8.2162–6	1.4791+4	4.5266+0	3.9032+6	1.9547+6	9.9285+5	9.5453+5	1.0892+3	1.1124+3	1.2722+1	8.9674–1	1.0988+3
1.5000+3	8.2177–6	1.4788+4	4.8907+0	3.9025+6	1.9535+6	9.9286+5	9.5497+5	1.1069+3	1.6713+3	1.2865+1	8.9718–1	1.6576+3
2.0000+3	8.2204–6	1.4783+4	5.1490+0	3.9012+6	1.9527+6	9.9286+5	9.5451+5	1.1201+3	2.2272+3	1.3006+1	8.9677–1	2.2133+3
3.0000+3	8.2238–6	1.4777+4	5.5130+0	3.8996+6	1.9515+6	9.9286+5	9.5404+5	1.1391+3	3.3429+3	1.3279+1	8.9637–1	3.3287+3
4.0000+3	8.2272–6	1.4771+4	5.7710+0	3.8980+6	1.9507+6	9.9286+5	9.5326+5	1.1532+3	4.4614+3	1.3390+1	8.9568–1	4.4472+3
5.0000+3	8.2315–6	1.4763+4	5.9708+0	3.8959+6	1.9500+6	9.9286+5	9.5185+5	1.1641+3	5.5917+3	1.3500+1	8.9440–1	5.5773+3
6.0000+3	8.2324–6	1.4761+4	6.1340+0	3.8955+6	1.9495+6	9.9287+5	9.5194+5	1.1722+3	6.6992+3	1.3589+1	8.9453–1	6.6848+3
8.0000+3	8.2348–6	1.4757+4	6.3916+0	3.8944+6	1.9487+6	9.9287+5	9.5165+5	1.1849+3	8.9335+3	1.3766+1	8.9434–1	8.9189+3
1.0000+4	8.2365–6	1.4754+4	6.5912+0	3.8936+6	1.9480+6	9.9287+5	9.5146+5	1.1949+3	1.1189+4	1.3928+1	8.9425–1	1.1174+4
1.5000+4	8.2394–6	1.4749+4	6.9545+0	3.8922+6	1.9469+6	9.9287+5	9.5129+5	1.2142+3	1.6708+4	1.4061+1	8.9409–1	1.6693+4
2.0000+4	8.2419–6	1.4744+4	7.2127+0	3.8910+6	1.9460+6	9.9287+5	9.5089+5	1.2281+3	2.2298+4	1.4195+1	8.9372–1	2.2283+4
3.0000+4	8.2447–6	1.4739+4	7.5768+0	3.8897+6	1.9448+6	9.9287+5	9.5076+5	1.2476+3	3.3369+4	1.4462+1	8.9359–1	3.3354+4
4.0000+4	8.2472–6	1.4735+4	7.8352+0	3.8885+6	1.9440+6	9.9287+5	9.5039+5	1.2616+3	4.4560+4	1.4592+1	8.9325–1	4.4545+4
5.0000+4	8.2512–6	1.4728+4	8.0356+0	3.8866+6	1.9434+6	9.9287+5	9.4913+5	1.2724+3	5.5648+4	1.4697+1	8.9206–1	5.5632+4
6.0000+4	8.2515–6	1.4727+4	8.1995+0	3.8865+6	1.9428+6	9.9287+5	9.4949+5	1.2812+3	6.6726+4	1.4783+1	8.9241–1	6.6710+4
8.0000+4	8.2531–6	1.4724+4	8.4580+0	3.8858+6	1.9420+6	9.9287+5	9.4958+5	1.2952+3	8.9077+4	1.4956+1	8.9250–1	8.9061+4
1.0000+5	8.2546–6	1.4722+4	8.6583+0	3.8850+6	1.9414+6	9.9287+5	9.4948+5	1.3060+3	1.1147+5	1.5120+1	8.9241–1	1.1145+5


July 4 1991
Atomic Weight 162 500
EEDL Evaluated Electron
Cross Sections
66-Dy
Density 8 550 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
66-Dy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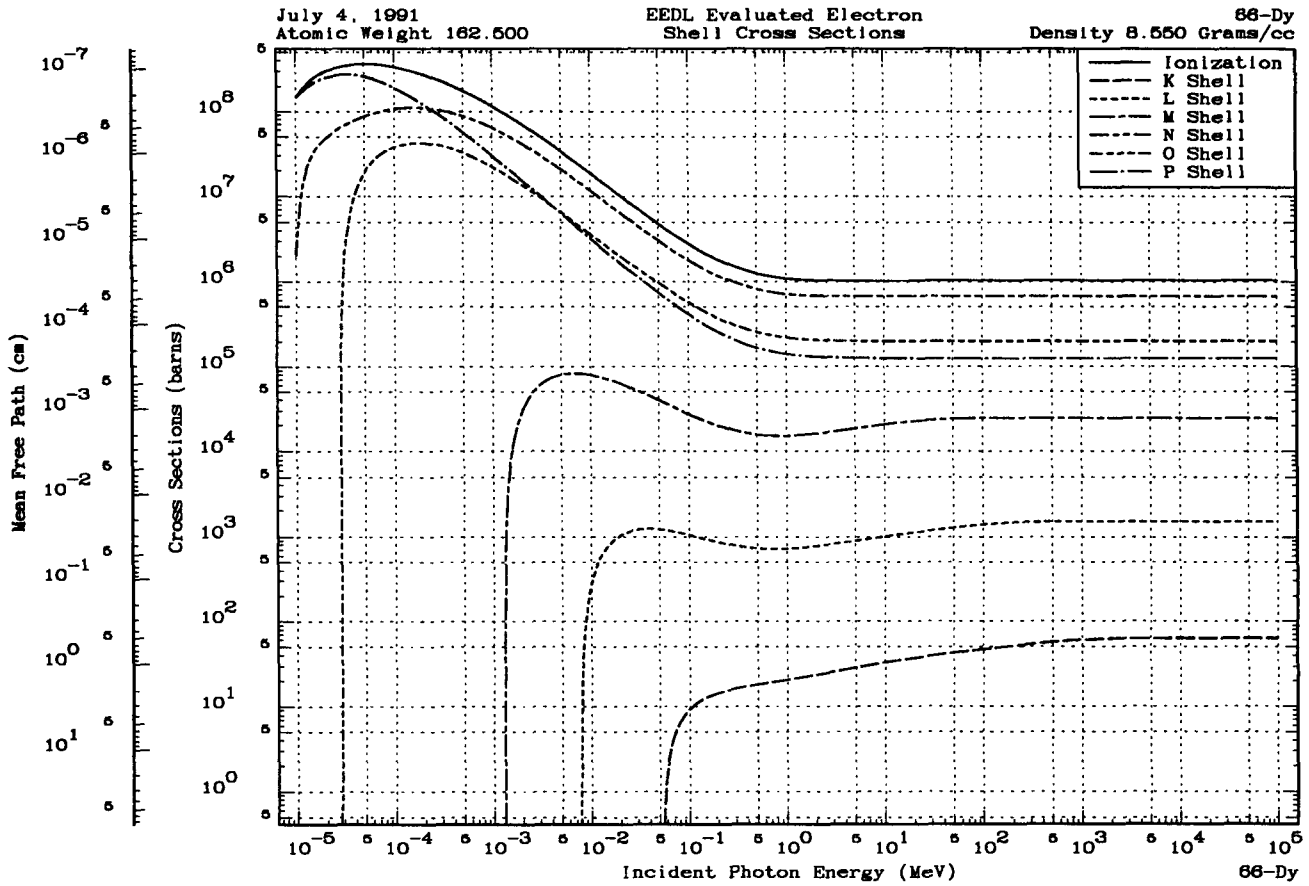
Atomic Weight 162 500
EEDL Evaluated Electron
Energy Deposition
66-Dy
Density 8 550 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
66-Dy

294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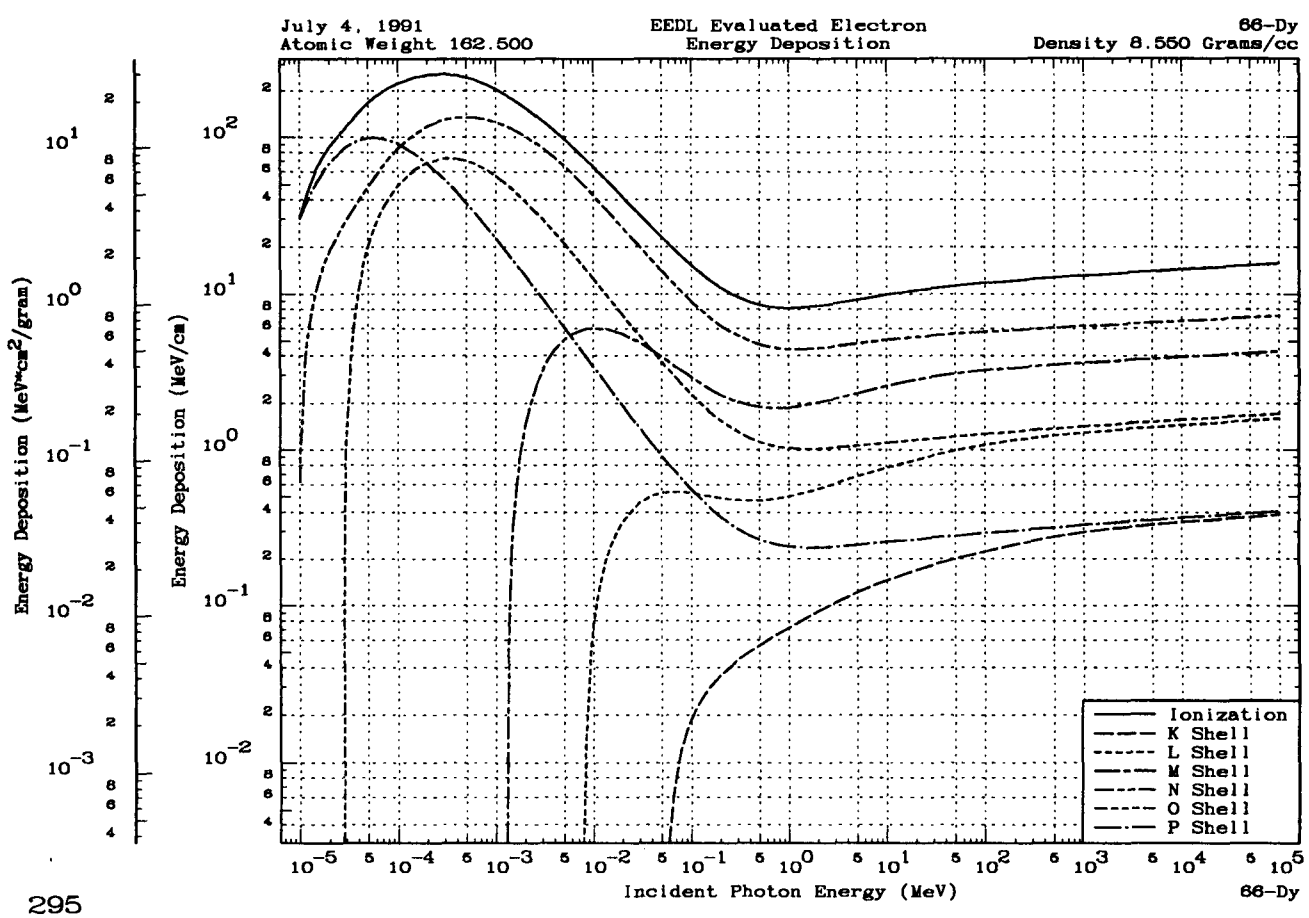
Atomic Weight 162.500
EEDL Evaluated Electron
Shell Cross Sections
66-Dy
Density 8.550 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
66-Dy


July 4, 1991
Atomic Weight 162.500
EEDL Evaluated Electron
Energy Deposition
66-Dy
Density 8.550 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
66-Dy

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Atomic Weight 162.500 Density 8.550 Grams/cc

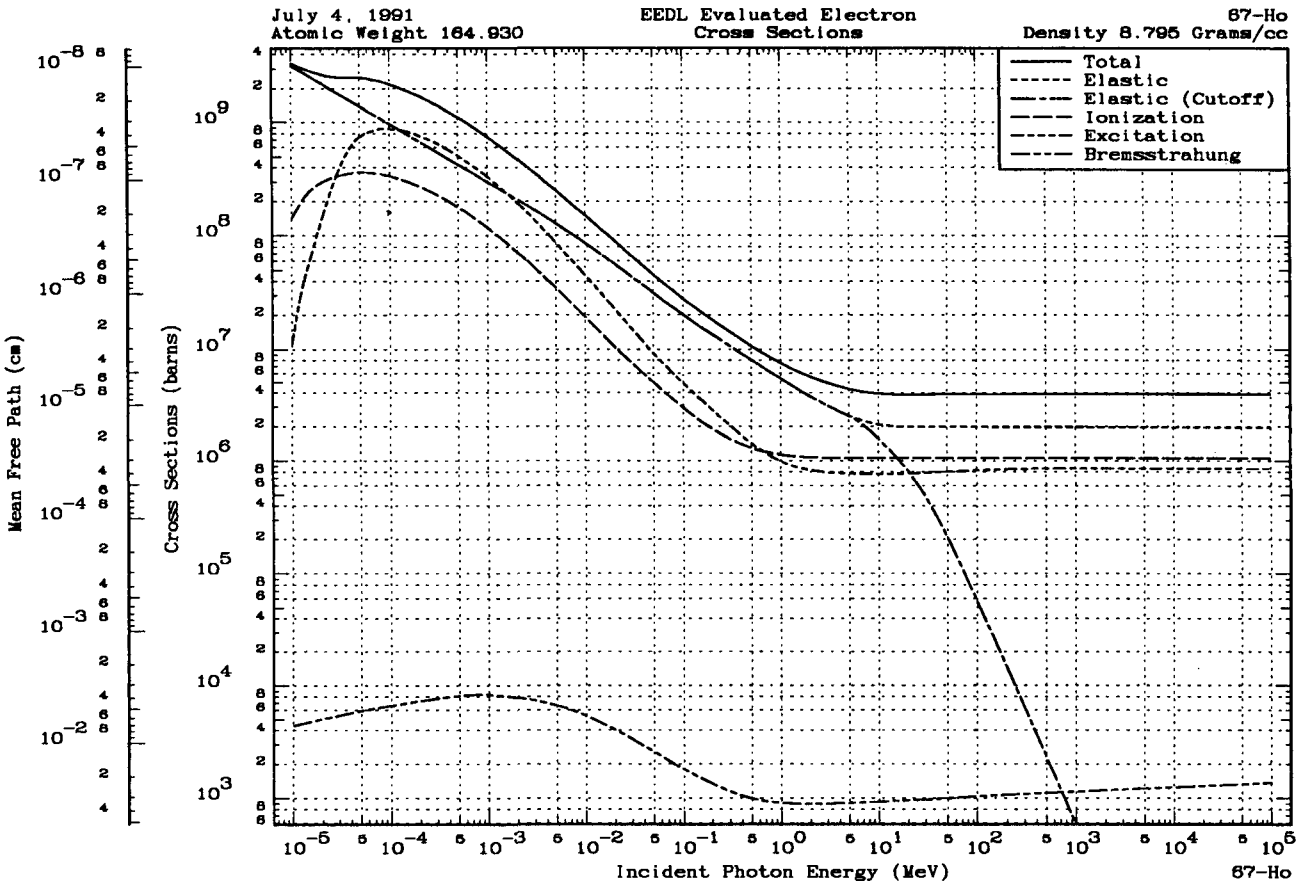
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.1056–9	1.2845+7		3.4660+9	3.3031+9	1.4826+8	1.4600+7	4.3852+3	3.3667+1	3.0736+1	2.9303+0	3.0025–4
	1.0313–5	9.2184–9	1.2688+7		3.4236+9	3.2509+9	1.5557+8	1.7051+7	4.4127+3	3.6232+1	3.2776+1	3.4560+0	3.0927–4
N6	1.0620–5	9.3259–9	1.2541+7		3.3841+9	3.2019+9	1.6245+8	1.9775+7	4.4391+3	3.8760+1	3.4713+1	4.0466+0	3.1818–4
	1.0757–5	9.3708–9	1.2481+7		3.3679+9	3.1807+9	1.6614+8	2.0998+7	4.4507+3	4.0094+1	3.5783+1	4.3099+0	3.2216–4
	1.0898–5	9.4165–9	1.2421+7		3.3516+9	3.1593+9	1.6993+8	2.2324+7	4.4625+3	4.1481+1	3.6885+1	4.5963+0	3.2629–4
	1.1022–5	9.4557–9	1.2369+7		3.3377+9	3.1409+9	1.7323+8	2.3536+7	4.4728+3	4.2710+1	3.7851+1	4.8591+0	3.2990–4
	1.1250–5	9.5269–9	1.2277+7		3.3127+9	3.1078+9	1.7899+8	2.5904+7	4.4914+3	4.4915+1	3.9540+1	5.3748+0	3.3657–4
	1.1411–5	9.5769–9	1.2213+7		3.2954+9	3.0851+9	1.8267+8	2.7687+7	4.5044+3	4.6451+1	4.0686+1	5.7649+0	3.4130–4
	1.1519–5	9.6109–9	1.2169+7		3.2838+9	3.0700+9	1.8507+8	2.8694+7	4.5131+3	4.7426+1	4.1437+1	5.9887+0	3.4448–4
	1.1954–5	9.7438–9	1.2003+7		3.2390+9	3.0117+9	1.9429+8	3.3014+7	4.5472+3	5.1303+1	4.4347+1	6.9555+0	3.5732–4
	1.2308–5	9.8466–9	1.1878+7		3.2052+9	2.9665+9	2.0178+8	3.6865+7	4.5743+3	5.4573+1	4.6747+1	7.8262+0	3.6782–4
	1.2716–5	9.9598–9	1.1743+7		3.1687+9	2.9169+9	2.1008+8	4.1698+7	4.6046+3	5.8386+1	4.9456+1	8.9293+0	3.7997–4
	1.3125–5	1.0070–8	1.1614+7		3.1340+9	2.8695+9	2.1818+8	4.6264+7	4.6344+3	6.2129+1	5.2136+1	9.9929+0	3.9223–4
	1.3654–5	1.0209–8	1.1456+7		3.0914+9	2.8114+9	2.2727+8	5.2669+7	4.6717+3	6.6882+1	5.5379+1	1.1503+1	4.0818–4
	1.3858–5	1.0261–8	1.1399+7		3.0759+9	2.7900+9	2.3060+8	5.5290+7	4.6858+3	6.8719+1	5.6592+1	1.2126+1	4.1435–4
	1.5000–5	1.0526–8	1.1111+7		2.9983+9	2.6779+9	2.4863+8	7.1691+7	4.7618+3	7.9437+1	6.3341+1	1.6095+1	4.4921–4
	1.6250–5	1.0789–8	1.0841+7		2.9252+9	2.5693+9	2.6401+8	9.1935+7	4.8399+3	9.0477+1	6.9580+1	2.0896+1	4.8787–4
	1.7500–5	1.1011–8	1.0622+7		2.8663+9	2.4726+9	2.7794+8	1.1574+8	4.9134+3	1.0219+2	7.5558+1	2.6630+1	5.2704–4
	1.8125–5	1.1113–8	1.0524+7		2.8398+9	2.4281+9	2.8358+8	1.2814+8	4.9486+3	1.0795+2	7.8287+1	2.9661+1	5.4682–4
	2.0000–5	1.1362–8	1.0294+7		2.7776+9	2.3075+9	2.9961+8	1.7046+8	5.0485+3	1.2661+2	8.6437+1	4.0171+1	6.0683–4
	2.5000–5	1.1783–8	9.9264+6		2.6785+9	2.0559+9	3.2257+8	3.0008+8	5.2565+3	1.7434+2	1.0238+2	7.1958+1	7.5787–4
O3	2.8090–5	1.1872–8	9.8514+6		2.6583+9	1.9356+9	3.3431+8	3.8841+8	5.3685+3	2.0544+2	1.1131+2	9.4132+1	8.5356–4
	2.8329–5	1.1879–8	9.8462+6		2.6569+9	1.9271+9	3.3515+8	3.9462+8	5.3766+3	2.0777+2	1.1209+2	9.5687+1	8.6096–4
	2.8747–5	1.1888–8	9.8385+6		2.6548+9	1.9126+9	3.3663+8	4.0560+8	5.3907+3	2.1190+2	1.1346+2	9.8439+1	8.7393–4
	2.9373–5	1.1898–8	9.8300+6		2.6525+9	1.8913+9	3.3885+8	4.2232+8	5.4114+3	2.1818+2	1.1554+2	1.0264+2	8.9343–4
	3.0000–5	1.1904–8	9.8252+6		2.6512+9	1.8708+9	3.4107+8	4.3936+8	5.4318+3	2.2458+2	1.1766+2	1.0693+2	9.1299–4
	3.2500–5	1.1905–8	9.8243+6		2.6510+9	1.7949+9	3.4650+8	5.0956+8	5.5099+3	2.4916+2	1.2467+2	1.2449+2	9.9165–4
O2	3.3060–5	1.1897–8	9.8306+6		2.6527+9	1.7791+9	3.4760+8	5.2594+8	5.5267+3	2.5477+2	1.2616+2	1.2861+2	1.0094–3
	3.3277–5	1.1900–8	9.8284+6		2.6521+9	1.7731+9	3.4794+8	5.3100+8	5.5331+3	2.5661+2	1.2673+2	1.2989+2	1.0163–3
	3.3697–5	1.1904–8	9.8249+6		2.6511+9	1.7617+9	3.4861+8	5.4086+8	5.5455+3	2.6023+2	1.2784+2	1.3238+2	1.0296–3
	3.4485–5	1.1909–8	9.8213+6		2.6502+9	1.7407+9	3.4993+8	5.5950+8	5.5684+3	2.6711+2	1.3000+2	1.3711+2	1.0548–3
	3.5864–5	1.1906–8	9.8238+6		2.6508+9	1.7058+9	3.5244+8	5.9259+8	5.6075+3	2.7954+2	1.3401+2	1.4553+2	1.0989–3
	3.6250–5	1.1903–8	9.8264+6		2.6515+9	1.6964+9	3.5317+8	6.0197+8	5.6182+3	2.8309+2	1.3517+2	1.4792+2	1.1114–3
	3.7932–5	1.1881–8	9.8443+6		2.6564+9	1.6571+9	3.5593+8	6.4335+8	5.6638+3	2.9834+2	1.3985+2	1.5849+2	1.1657–3
	4.0000–5	1.1880–8	9.8454+6		2.6567+9	1.6122+9	3.5951+8	6.8490+8	5.7176+3	3.1513+2	1.4586+2	1.6926+2	1.2331–3
	4.5000–5	1.1876–8	9.8480+6		2.6573+9	1.5170+9	3.6241+8	7.7793+8	5.8302+3	3.5028+2	1.5703+2	1.9324+2	1.3911–3
	5.0000–5	1.1939–8	9.7968+6		2.6435+9	1.4366+9	3.6514+8	8.4180+8	5.9328+3	3.7812+2	1.6794+2	2.1018+2	1.5517–3
O1	5.3670–5	1.2047–8	9.7087+6		2.6198+9	1.3850+9	3.6436+8	8.7045+8	6.0001+3	3.9221+2	1.7403+2	2.1818+2	1.6688–3
	5.4461–5	1.2071–8	9.6895+6		2.6146+9	1.3745+9	3.6422+8	8.7585+8	6.0141+3	3.9508+2	1.7536+2	2.1972+2	1.6942–3
	5.5846–5	1.2111–8	9.6577+6		2.6060+9	1.3568+9	3.6401+8	8.8519+8	6.0382+3	4.0011+2	1.7772+2	2.2239+2	1.7387–3
	5.7923–5	1.2166–8	9.6139+6		2.5942+9	1.3314+9	3.6380+8	8.9896+8	6.0735+3	4.0767+2	1.8131+2	2.2636+2	1.8059–3
	6.0000–5	1.2216–8	9.5744+6		2.5835+9	1.3074+9	3.6370+8	9.1245+8	6.1077+3	4.1525+2	1.8498+2	2.3027+2	1.8733–3
	6.5000–5	1.2413–8	9.4221+6		2.5424+9	1.2544+9	3.6016+8	9.2787+8	6.1861+3	4.2577+2	1.9088+2	2.3489+2	2.0371–3
	7.0000–5	1.2589–8	9.2906+6		2.5070+9	1.2073+9	3.5733+8	9.4237+8	6.2596+3	4.3638+2	1.9707+2	2.3930+2	2.2026–3
	7.2500–5	1.2671–8	9.2305+6		2.4907+9	1.1856+9	3.5587+8	9.4932+8	6.2947+3	4.4140+2	1.9996+2	2.4143+2	2.2861–3
	8.0000–5	1.3009–8	8.9907+6		2.4260+9	1.1267+9	3.5219+8	9.4710+8	6.3942+3	4.5085+2	2.0887+2	2.4198+2	2.5388–3
	9.0000–5	1.3448–8	8.6973+6		2.3469+9	1.0602+9	3.4380+8	9.4286+8	6.5094+3	4.5888+2	2.1626+2	2.4261+2	2.8779–3
	1.0000–4	1.3841–8	8.4502+6	0.0000+0	2.2802+9	1.0040+9	3.3712+8	9.3908+8	6.6141+3	4.6762+2	2.2427+2	2.4335+2	3.2223–3
	1.1250–4	1.4373–8	8.1375+6	2.6651–8	2.1958+9	9.4481+8	3.2578+8	9.2521+8	6.7273+3	4.7043+2	2.2936+2	2.4107+2	3.6557–3
	1.2500–4	1.4856–8	7.8727+6	5.3113–8	2.1244+9	8.9484+8	3.1653+8	9.1297+8	6.8302+3	4.7434+2	2.3516+2	2.3917+2	4.0956–3
	1.3125–4	1.5084–8	7.7537+6	6.6267–8	2.0922+9	8.7261+8	3.1226+8	9.0736+8	6.8783+3	4.7592+2	2.3756+2	2.3835+2	4.3178–3
	1.5000–4	1.5717–8	7.4417+6	1.0543–7	2.0080+9	8.1453+8	3.0134+8	8.9218+8	7.0119+3	4.8160+2	2.4534+2	2.3626+2	4.9931–3
N5	1.6024–4	1.6109–8	7.2604+6	1.2673–7	1.9591+9	7.8725+8	2.9417+8	8.7771+8	7.0789+3	4.7975+2	2.4661+2	2.3314+2	5.3669–3
	1.6521–4	1.6290–8	7.1798+6	1.3710–7	1.9374+9	7.7495+8	2.9100+8	8.7143+8	7.1101+3	4.7931+2	2.4748+2	2.3183+2	5.5495–3
N4	1.6707–4	1.6357–8	7.1506+6	1.4098–7	1.9295+9	7.7049+8	2.8985+8	8.6915+8	7.1216+3	4.7916+2	2.4780+2	2.3135+2	5.6180–3
	1.7119–4	1.6501–8	7.0881+6	1.4957–7	1.9126+9	7.6088+8	2.8731+8	8.6444+8	7.1448+3	4.7897+2	2.4854+2	2.3042+2	5.7719–3
	1.7391–4	1.6595–8	7.0480+6	1.5525–7	1.9018+9	7.5471+8	2.8569+8	8.6140+8	7.1599+3	4.7891+2	2.4907+2	2.2983+2	5.8738–3
	1.7839–4	1.6747–8	6.9839+6	1.6461–7	1.8845+9	7.4487+8	2.8312+8	8.5653+8	7.1843+3	4.7884+2	2.4995+2	2.2888+2	6.0423–3
	1.8695–4	1.7030–8	6.8678+6	1.8250–7	1.8532+9	7.2707+8	2.7850+8	8.4762+8	7.2295+3	4.7896+2	2.5178+2	2.2717+2	6.3656–3
	1.8920–4	1.7103–8	6.8387+6	1.8718–7	1.8453+9	7.2262+8	2.7735+8	8.4537+8	7.2411+3	4.7903+2	2.5228+2	2.2674+2	6.4505–3
	2.0000–4	1.7443–8	6.7051+6	2.0972–7	1.8093+9	7.0221+8	2.7212+8	8.3496+8	7.2950+3	4.7957+2	2.5478+2	2.2478+2	6.8619–3
	2.1250–4	1.7897–8	6.5351+6	2.3589–7	1.7634+9	6.8060+8	2.6497+8	8.1785+8	7.3485+3	4.7564+2	2.5477+2	2.2086+2	7.3474–3
	2.2500–4	1.8334–8	6.3792+6	2.6226–7	1.7214+9	6.6083+8	2.5850+8	8.0203+8	7.3993+3	4.7235+2	2.5508+2	2.1727+2	7.8364–3
	2.3438–4	1.8652–8	6.2705+6	2.8216–7	1.6920+9	6.4706+8	2.5402+8	7.9092+8	7.4357+3	4.7022+2	2.5545+2	2.1476+2	8.2054–3
	2.4375–4	1.8962–8	6.1679+6	3.0213–7	1.6643+9	6.3410+8	2.4983+8	7.8040+8	7.4709+3	4.6835+2	2.5594+2	2.1240+2	8.5761–3
	2.5000–4	1.9165–8	6.1027+6	3.1549–7	1.6467+9	6.2587+8	2.4718+8	7.7368+8	7.4937+3	4.6722+2	2.5631+2	2.1090+2	8.8242–3
	2.6719–4	1.9707–8	5.9350+6	3.5242–7	1.6015+9	6.0477+8	2.4041+8	7.5630+8	7.5540+3	4.6366+2	2.5661+2	2.0704+2	9.5104–3
	2.7188–4	1.9850–8	5.8920+6	3.6254–7	1.5899+9	5.9937+8	2.3868+8	7.5182+8	7.5698+3	4.6281+2	2.5674+2	2.0606+2	9.6985–3
N3	2.9156–4	2.0438–8	5.7226+6	4.0522–7	1.5442+9	5.7815+8	2.3194+8	7.3408+8	7.6338+3	4.5969+2	2.5750+2	2.0217+2	1.0493–2
	2.9578–4	2.0570–8	5.6858+6	4.1441–7	1.5343+9	5.7388+8	2.3047+8	7.2989+8	7.6470+3	4.5881+2	2.5757+2	2.0123+2	1.0664–2
	3.0000–4	2.0701–8	5.6498+6	4.2361–7	1.5245+9	5.6970+8	2.2904+8	7.2579+8	7.6601+3	4.5798+2	2.5766+2	2.0031+2	1.0835–2
	3.1250–4	2.1110–8	5.5404+6	4.5104–7	1.4950+9	5.5785+8	2.2445+8	7.1270+8	7.6979+3	4.5370+2	2.5657+2	1.9712+2	1.1344–2
N2	3.2938–4	2.1648–8	5.4027+6	4.8846–7	1.4578+9	5.4294+8	2.1872+8	6.9617+8	7.7468+3	4.4850+2	2.5537+2	1.9311+2	1.2036–2
	3.3379–4	2.1791–8	5.3673+6	4.9831–7	1.4483+9	5.3924+8	2.1729+8	6.9176+8	7.7586+3	4.4717+2	2.5509+2	1.9206+2	1.2219–2
	3.3438–4	2.1810–8	5.3627+6	4.9961–7	1.4470+9	5.3875+8	2.1710+8	6.9119+8	7.7601+3	4.4699+2	2.5506+2	1.9192+2	1.2243–2
	3.4207–4	2.2056–8	5.3028+6	5.1687–7	1.4309+9	5.3249+8	2.1468+8	6.8372+8	7.7804+3	4.4476+2	2.5460+2	1.9015+2	1.2563–2
	3.5000–4	2.2307–8	5.2432+6	5.3474–7	1.4148+9	5.2625+8	2.1228+8	6.7627+8	7.8008+3	4.4258+2	2.5419+2	1.8838+2	1.2893–2
	3.5655–4	2.2512–8	5.1955+6	5.4958–7	1.4019+9	5.2126+8	2.1036+8	6.7031+8	7.8174+3	4.4084+2	2.5387+2	1.8697+2	1.3167–2
	3.6719–4	2.2840–8	5.1207+6	5.7378–7	1.3818+9	5.1344+8	2.0736+8	6.6096+8	7.8437+3	4.3818+2	2.5341+2	1.8476+2	1.3613–2
	3.7828–4	2.3177–8	5.0463+6	5.9916–7	1.3617+9	5.0565+8	2.0438+8	6.5164+8	7.8705+3	4.3558+2	2.5301+2	1.8256+2	1.4079–2

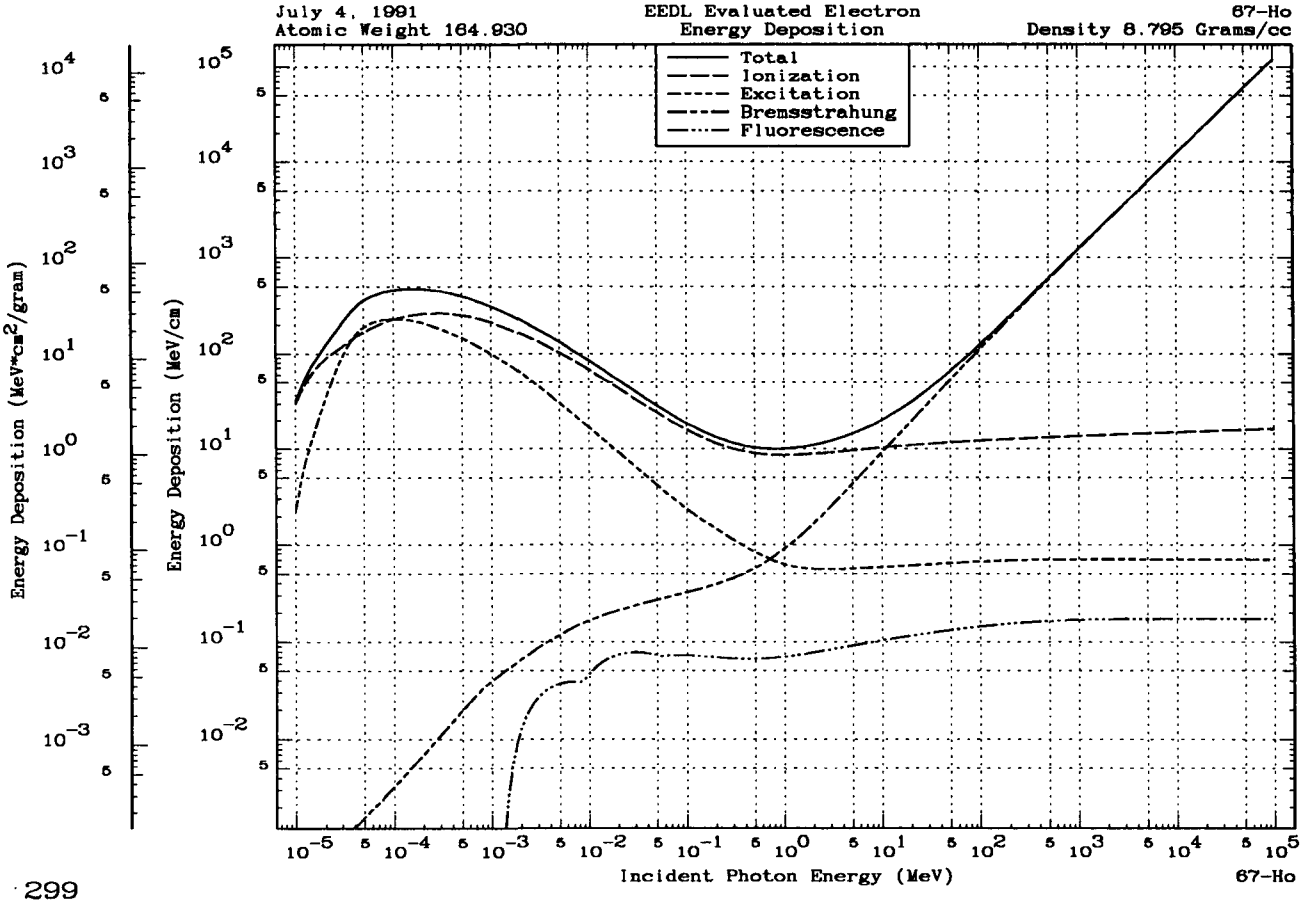
Atomic Weight 162.500 — Density 8.550 Grams/cc

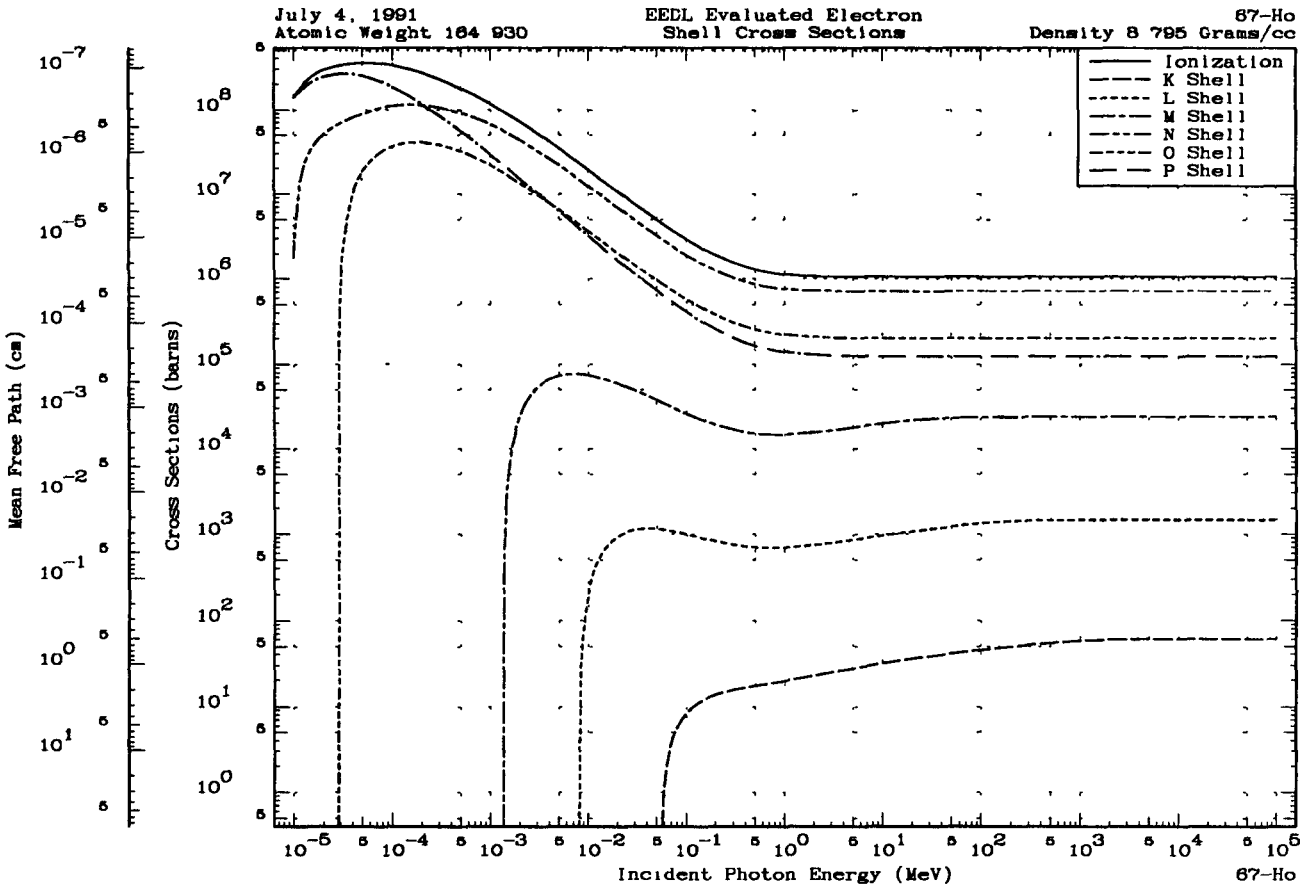
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.0000–4	2.3823–8	4.9096+6	6.4929–7	1.3248+9	4.9134+8	1.9895+8	6.3449+8	7.9209+3	4.3102+2	2.5248+2	1.7853+2	1.4996–2
N1	4.0420–4	2.3953–8	4.8829+6	6.5905–7	1.3176+9	4.8871+8	1.9780+8	6.3105+8	7.9286+3	4.2963+2	2.5194+2	1.7767+2	1.5179–2
	4.1019–4	2.4145–8	4.8440+6	6.7302–7	1.3071+9	4.8503+8	1.9620+8	6.2586+8	7.9394+3	4.2761+2	2.5122+2	1.7638+2	1.5439–2
	4.2141–4	2.4502–8	4.7735+6	6.9939–7	1.2881+9	4.7835+8	1.9330+8	6.1643+8	7.9594+3	4.2400+2	2.4995+2	1.7403+2	1.5927–2
	4.4106–4	2.5114–8	4.6571+6	7.4605–7	1.2566+9	4.6727+8	1.8852+8	6.0085+8	7.9932+3	4.1813+2	2.4795+2	1.7017+2	1.6786–2
	4.5000–4	2.5389–8	4.6067+6	7.6749–7	1.2431+9	4.6248+8	1.8646+8	5.9411+8	8.0081+3	4.1565+2	2.4713+2	1.6850+2	1.7178–2
	4.7053–4	2.6010–8	4.4967+6	8.1721–7	1.2134+9	4.5199+8	1.8198+8	5.7940+8	8.0414+3	4.1028+2	2.4539+2	1.6487+2	1.8080–2
	5.0000–4	2.6879–8	4.3513+6	8.8964–7	1.1741+9	4.3810+8	1.7608+8	5.5996+8	8.0869+3	4.0341+2	2.4331+2	1.6008+2	1.9383–2
	5.5000–4	2.8388–8	4.1200+6	1.0155–6	1.1117+9	4.1715+8	1.6696+8	5.2761+8	8.1485+3	3.9117+2	2.3928+2	1.5187+2	2.1580–2
	6.0000–4	2.9837–8	3.9200+6	1.1450–6	1.0578+9	3.9890+8	1.5913+8	4.9972+8	8.2052+3	3.8113+2	2.3629+2	1.4482+2	2.3794–2
	7.0000–4	3.2656–8	3.5815+6	1.4151–6	9.6643+8	3.6851+8	1.4480+8	4.5311+8	8.2556+3	3.5951+2	2.2667+2	1.3281+2	2.7972–2
	8.0000–4	3.5307–8	3.3127+6	1.6997–6	8.9388+8	3.4407+8	1.3354+8	4.1626+8	8.2994+3	3.4326+2	2.1983+2	1.2339+2	3.2175–2
	9.0000–4	3.8023–8	3.0760+6	1.9986–6	8.3002+8	3.2385+8	1.2366+8	3.8250+8	8.2743+3	3.2608+2	2.1159+2	1.1445+2	3.5686–2
	1.0000–3	4.0623–8	2.8792+6	2.3120–6	7.7691+8	3.0678+8	1.1550+8	3.5462+8	8.2520+3	3.1229+2	2.0516+2	1.0709+2	3.9188–2
M5	1.2995–3	4.8023–8	2.4355+6	3.3302–6	6.5718+8	2.6799+8	9.6422+7	2.9276+8	8.0699+3	2.7672+2	1.8629+2	9.0387+1	4.7451–2
	1.3120–3	4.8320–8	2.4205+6	3.3755–6	6.5314+8	2.6666+8	9.5763+7	2.9071+8	8.0633+3	2.7543+2	1.8556+2	8.9823+1	4.7793–2
	1.3238–3	4.8598–8	2.4067+6	3.4183–6	6.4941+8	2.6544+8	9.5155+7	2.8881+8	8.0572+3	2.7423+2	1.8488+2	8.9303+1	4.8115–2
	1.3348–3	4.8857–8	2.3939+6	3.4585–6	6.4597+8	2.6431+8	9.4594+7	2.8706+8	8.0515+3	2.7314+2	1.8426+2	8.8824+1	4.8416–2
M4	1.3366–3	4.8899–8	2.3918+6	3.4652–6	6.4541+8	2.6412+8	9.4502+7	2.8678+8	8.0506+3	2.7296+2	1.8416+2	8.8745+1	4.8465–2
	1.3554–3	4.9345–8	2.3702+6	3.5344–6	6.3957+8	2.6222+8	9.3562+7	2.8378+8	8.0399+3	2.7112+2	1.8314+2	8.7933+1	4.8952–2
	1.3570–3	4.9383–8	2.3684+6	3.5402–6	6.3909+8	2.6206+8	9.3484+7	2.8353+8	8.0389+3	2.7097+2	1.8305+2	8.7866+1	4.8992–2
	1.3916–3	5.0195–8	2.3301+6	3.6686–6	6.2875+8	2.5869+8	9.1821+7	2.7823+8	8.0196+3	2.6773+2	1.8125+2	8.6430+1	4.9883–2
	1.3928–3	5.0223–8	2.3288+6	3.6730–6	6.2840+8	2.5857+8	9.1765+7	2.7805+8	8.0190+3	2.6762+2	1.8119+2	8.6382+1	4.9914–2
	1.4464–3	5.1468–8	2.2725+6	3.8751–6	6.1320+8	2.5358+8	8.9327+7	2.7028+8	7.9901+3	2.6290+2	1.7857+2	8.4280+1	5.1293–2
	1.5000–3	5.2696–8	2.2195+6	4.0808–6	5.9891+8	2.4886+8	8.7043+7	2.6300+8	7.9623+3	2.5854+2	1.7618+2	8.2313+1	5.2669–2
	1.6250–3	5.5498–8	2.1074+6	4.5741–6	5.6866+8	2.3879+8	8.2044+7	2.4782+8	7.8952+3	2.4832+2	1.7016+2	7.8105+1	5.5697–2
M3	1.6621–3	5.6314–8	2.0769+6	4.7243–6	5.6042+8	2.3602+8	8.0689+7	2.4370+8	7.8764+3	2.4556+2	1.6854+2	7.6965+1	5.6591–2
	1.7043–3	5.7294–8	2.0414+6	4.8975–6	5.5084+8	2.3299+8	7.9197+7	2.3865+8	7.8555+3	2.4232+2	1.6672+2	7.5544+1	5.7608–2
	1.7782–3	5.8989–8	1.9827+6	5.2059–6	5.3502+8	2.2794+8	7.6737+7	2.3033+8	7.8203+3	2.3704+2	1.6377+2	7.3210+1	5.9383–2
	1.8125–3	5.9766–8	1.9570+6	5.3511–6	5.2806+8	2.2571+8	7.5658+7	2.2669+8	7.8045+3	2.3474+2	1.6249+2	7.2188+1	6.0203–2
M2	1.8309–3	6.0181–8	1.9435+6	5.4296–6	5.2442+8	2.2453+8	7.5093+7	2.2479+8	7.7962+3	2.3353+2	1.6182+2	7.1654+1	6.0644–2
	1.8732–3	6.1144–8	1.9128+6	5.6117–6	5.1616+8	2.2190+8	7.3819+7	2.2043+8	7.7774+3	2.3072+2	1.6024+2	7.0422+1	6.1654–2
	1.9366–3	6.2575–8	1.8691+6	5.8890–6	5.0435+8	2.1812+8	7.2001+7	2.1422+8	7.7501+3	2.2675+2	1.5801+2	6.8668+1	6.3166–2
	2.0000–3	6.3990–8	1.8278+6	6.1710–6	4.9320+8	2.1452+8	7.0287+7	2.0838+8	7.7237+3	2.2303+2	1.5595+2	6.7018+1	6.4674–2
M1	2.0182–3	6.4392–8	1.8164+6	6.2528–6	4.9012+8	2.1350+8	6.9795+7	2.0682+8	7.7136+3	2.2188+2	1.5526+2	6.6562+1	6.5049–2
	2.0489–3	6.5084–8	1.7971+6	6.3917–6	4.8491+8	2.1179+8	6.8973+7	2.0414+8	7.6966+3	2.1990+2	1.5405+2	6.5785+1	6.5680–2
	2.1083–3	6.6413–8	1.7611+6	6.6643–6	4.7520+8	2.0860+8	6.7442+7	1.9916+8	7.6646+3	2.1621+2	1.5180+2	6.4339+1	6.6899–2
	2.1250–3	6.6784–8	1.7513+6	6.7416–6	4.7257+8	2.0773+8	6.7026+7	1.9781+8	7.6558+3	2.1521+2	1.5120+2	6.3947+1	6.7240–2
	2.2198–3	6.8873–8	1.6982+6	7.1877–6	4.5823+8	2.0297+8	6.4772+7	1.9049+8	7.6073+3	2.0982+2	1.4793+2	6.1824+1	6.9176–2
	2.2500–3	6.9533–8	1.6821+6	7.3322–6	4.5388+8	2.0151+8	6.4089+7	1.8827+8	7.5923+3	2.0820+2	1.4695+2	6.1183+1	6.9792–2
	2.4148–3	7.3082–8	1.6004+6	8.1400–6	4.3184+8	1.9409+8	6.0637+7	1.7711+8	7.5144+3	1.9998+2	1.4196+2	5.7952+1	7.3134–2
	2.5000–3	7.4884–8	1.5619+6	8.5699–6	4.2145+8	1.9054+8	5.9015+7	1.7189+8	7.4766+3	1.9617+2	1.3965+2	5.6440+1	7.4851–2
	2.5625–3	7.6193–8	1.5350+6	8.8907–6	4.1421+8	1.8806+8	5.7886+7	1.6826+8	7.4497+3	1.9350+2	1.3804+2	5.5390+1	7.6107–2
	2.6250–3	7.7491–8	1.5093+6	9.2159–6	4.0727+8	1.8567+8	5.6805+7	1.6479+8	7.4236+3	1.9097+2	1.3650+2	5.4388+1	7.7361–2
	2.7074–3	7.9188–8	1.4770+6	9.6511–6	3.9855+8	1.8264+8	5.5448+7	1.6045+8	7.3902+3	1.8777+2	1.3456+2	5.3133+1	7.9008–2
	3.0000–3	8.5074–8	1.3748+6	1.1252–5	3.7097+8	1.7295+8	5.1179+7	1.4683+8	7.2805+3	1.7784+2	1.2855+2	4.9205+1	8.4813–2
	3.5000–3	9.5018–8	1.2309+6	1.4197–5	3.3215+8	1.5913+8	4.5129+7	1.2788+8	7.0622+3	1.6195+2	1.1833+2	4.3526+1	9.3039–2
	4.0000–3	1.0451–7	1.1192+6	1.7406–5	3.0199+8	1.4805+8	4.0477+7	1.1346+8	6.8784+3	1.4987+2	1.1055+2	3.9211+1	1.0111–1
	4.5000–3	1.1399–7	1.0260+6	2.0869–5	2.7686+8	1.3866+8	3.6699+7	1.0149+8	6.6896+3	1.3905+2	1.0342+2	3.5514+1	1.0804–1
	5.0000–3	1.2316–7	9.4968+5	2.4582–5	2.5626+8	1.3077+8	3.3622+7	9.1857+7	6.5252+3	1.3034+2	9.7679+1	3.2541+1	1.1486–1
	6.0000–3	1.4086–7	8.3033+5	3.2710–5	2.2405+8	1.1801+8	2.8828+7	7.7214+7	6.2094+3	1.1600+2	8.7955+1	2.7923+1	1.2652–1
	7.0000–3	1.5782–7	7.4109+5	4.1780–5	1.9998+8	1.0808+8	2.5276+7	6.6617+7	5.9206+3	1.0470+2	8.0064+1	2.4500+1	1.3627–1
L3	7.7810–3	1.7055–7	6.8579+5	4.9495–5	1.8505+8	1.0175+8	2.3097+7	6.0199+7	5.7303+3	9.7834+1	7.5261+1	2.2429+1	1.4370–1
	8.0000–3	1.7409–7	6.7182+5	5.1754–5	1.8128+8	1.0014+8	2.2555+7	5.8584+7	5.6773+3	9.6102+1	7.4048+1	2.1909+1	1.4554–1
	8.5000–3	1.8204–7	6.4251+5	5.7064–5	1.7337+8	9.6635+7	2.1409+7	5.5324+7	5.5633+3	9.2234+1	7.1273+1	2.0812+1	1.4971–1
L2	8.5907–3	1.8346–7	6.3752+5	5.8051–5	1.7203+8	9.6034+7	2.1214+7	5.4772+7	5.5436+3	9.1579+1	7.0802+1	2.0626+1	1.5046–1
	8.9430–3	1.8899–7	6.1885+5	6.1950–5	1.6699+8	9.3794+7	2.0493+7	5.2697+7	5.4654+3	8.9152+1	6.9065+1	1.9935+1	1.5310–1
L1	9.0125–3	1.9008–7	6.1532+5	6.2732–5	1.6604+8	9.3368+7	2.0357+7	5.2306+7	5.4505+3	8.8696+1	6.8737+1	1.9805+1	1.5362–1
	9.1359–3	1.9202–7	6.0910+5	6.4130–5	1.6436+8	9.2625+7	2.0120+7	5.1608+7	5.4231+3	8.7899+1	6.8168+1	1.9576+1	1.5447–1
	9.2500–3	1.9380–7	6.0349+5	6.5433–5	1.6284+8	9.1953+7	1.9907+7	5.0979+7	5.3983+3	8.7180+1	6.7655+1	1.9370+1	1.5525–1
	9.4715–3	1.9725–7	5.9293+5	6.7993–5	1.6000+8	9.0683+7	1.9506+7	4.9801+7	5.3513+3	8.5833+1	6.6693+1	1.8984+1	1.5675–1
	9.5680–3	1.9875–7	5.8848+5	6.9121–5	1.5879+8	9.0145+7	1.9337+7	4.9305+7	5.3314+3	8.5265+1	6.6287+1	1.8821+1	1.5741–1
	1.0000–2	2.0539–7	5.6945+5	7.4261–5	1.5366+8	8.7837+7	1.8617+7	4.7200+7	5.2451+3	8.2854+1	6.4563+1	1.8131+1	1.6033–1
	1.0625–2	2.1491–7	5.4423+5	8.1966–5	1.4685+8	8.4693+7	1.7667+7	4.4489+7	5.1190+3	7.9402+1	6.2039+1	1.7199+1	1.6371–1
	1.1250–2	2.2426–7	5.2153+5	8.9994–5	1.4073+8	8.1832+7	1.6816+7	4.2076+7	5.0028+3	7.6321+1	5.9785+1	1.6369+1	1.6707–1
	1.1719–2	2.3118–7	5.0593+5	9.6223–5	1.3652+8	7.9848+7	1.6234+7	4.0433+7	4.9215+3	7.4216+1	5.8242+1	1.5805+1	1.6957–1
	1.2188–2	2.3801–7	4.9141+5	1.0262–4	1.3260+8	7.7987+7	1.5693+7	3.8915+7	4.8446+3	7.2268+1	5.6812+1	1.5283+1	1.7206–1
	1.2500–2	2.4252–7	4.8226+5	1.0698–4	1.3013+8	7.6809+7	1.5354+7	3.7966+7	4.7956+3	7.1046+1	5.5915+1	1.4957+1	1.7371–1
	1.2539–2	2.4308–7	4.8115+5	1.0753–4	1.2983+8	7.6665+7	1.5313+7	3.7850+7	4.7896+3	7.0896+1	5.5806+1	1.4917+1	1.7392–1
	1.3594–2	2.5806–7	4.5323+5	1.2281–4	1.2230+8	7.3031+7	1.4282+7	3.4982+7	4.6368+3	6.7182+1	5.3070+1	1.3932+1	1.7943–1
	1.3770–2	2.6051–7	4.4895+5	1.2544–4	1.2114+8	7.2469+7	1.4125+7	3.4546+7	4.6129+3	6.6616+1	5.2653+1	1.3782+1	1.8035–1
	1.5000–2	2.7748–7	4.2150+5	1.4443–4	1.1374+8	6.8834+7	1.3119+7	3.1778+7	4.4571+3	6.3014+1	4.9995+1	1.2832+1	1.8666–1
	1.7500–2	3.1142–7	3.7557+5	1.8625–4	1.0134+8	6.2523+7	1.1489+7	2.7325+7	4.1646+3	5.6652+1	4.5221+1	1.1236+1	1.9580–1
	2.0000–2	3.4399–7	3.4001+5	2.3238–4	9.1747+7	5.7526+7	1.0241+7	2.3976+7	3.9267+3	5.1815+1	4.1574+1	1.0036+1	2.0479–1
	2.2500–2	3.7583–7	3.1121+5	2.8265–4	8.3975+7	5.3344+7	9.2654+6	2.1362+7	3.7094+3	4.7706+1	3.8436+1	9.0591+0	2.1094–1
	2.5000–2	4.0669–7	2.8759+5	3.3697–4	7.7602+7	4.9860+7	8.4716+6	1.9267+7	3.5252+3	4.4378+1	3.5885+1	8.2760+0	2.1707–1
	2.6250–2	4.2179–7	2.7729+5	3.6561–4	7.4824+7	4.8325+7	8.1275+6	1.8367+7	3.4431+3	4.2938+1	3.4778+1	7.9400+0	2.2013–1
	3.0000–2	4.6593–7	2.5102+5	4.5686–4	6.7735+7	4.4362+7	7.2558+6	1.6115+7	3.2278+3	3.9301+1	3.1973+1	7.0985+0	2.2918–1
	4.0000–2	5.7771–7	2.0245+5	7.3679–4	5.4630+7	3.6755+7	5.7113+6	1.2160+7	2.7866+3	3.2371+1	2.6571+1	5.5539+0	2.4654–1
	5.0000–2	6.8171–7	1.7157+5	1.0690–3	4.6295+7	3.1750+7	4.7681+6	9.7749+6	2.4823+3	2.7941+1	2.3088+1	4.5922+0	2.6051–1

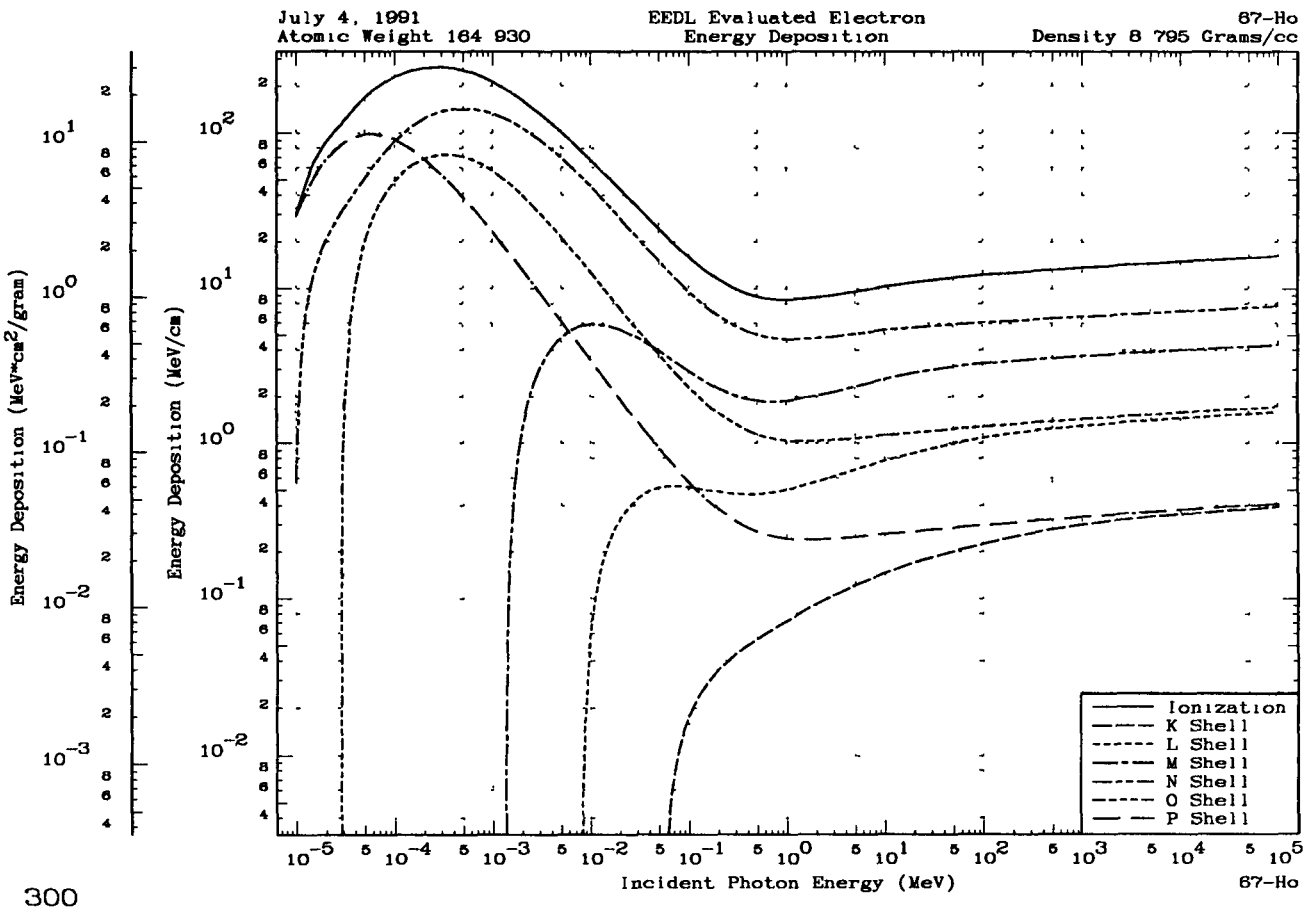
Atomic Weight 162.500 Density 8.550 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
K 5.3861–2	7.1994–7	1.6246+5	1.2106–3	4.3837+7	3.0238+7	4.4955+6	9.1014+6	2.3886+3	2.6617+1	2.2041+1	4.3102+0	2.6517–1
5.4628–2	7.2739–7	1.6079+5	1.2395–3	4.3388+7	2.9959+7	4.4454+6	8.9812+6	2.3712+3	2.6377+1	2.1849+1	4.2611+0	2.6609–1
5.5971–2	7.4038–7	1.5797+5	1.2908–3	4.2627+7	2.9485+7	4.3608+6	8.7786+6	2.3416+3	2.5971+1	2.1525+1	4.1783+0	2.6769–1
5.7986–2	7.5968–7	1.5396+5	1.3693–3	4.1544+7	2.8809+7	4.2405+6	8.4919+6	2.2992+3	2.5395+1	2.1064+1	4.0611+0	2.7010–1
6.0000–2	7.7879–7	1.5018+5	1.4494–3	4.0524+7	2.8171+7	4.1275+6	8.2238+6	2.2589+3	2.4855+1	2.0631+1	3.9515+0	2.7250–1
6.5000–2	8.2419–7	1.4191+5	1.6557–3	3.8292+7	2.6760+7	3.8845+6	7.6451+6	2.1686+3	2.3645+1	1.9661+1	3.7063+0	2.7756–1
6.8750–2	8.5753–7	1.3639+5	1.8170–3	3.6803+7	2.5814+7	3.7228+6	7.2641+6	2.1074+3	2.2841+1	1.9015+1	3.5449+0	2.8137–1
7.4375–2	9.0651–7	1.2902+5	2.0692–3	3.4815+7	2.4544+7	3.5074+6	6.7615+6	2.0245+3	2.1775+1	1.8156+1	3.3323+0	2.8707–1
8.0000–2	9.5435–7	1.2255+5	2.3332–3	3.3070+7	2.3422+7	3.3189+6	6.3268+6	1.9506+3	2.0845+1	1.7404+1	3.1486+0	2.9275–1
9.0000–2	1.0346–6	1.1305+5	2.8297–3	3.0506+7	2.1766+7	3.0496+6	5.6888+6	1.8460+3	1.9452+1	1.6280+1	2.8695+0	3.0155–1
1.0000–1	1.1118–6	1.0519+5	3.3595–3	2.8385+7	2.0384+7	2.8273+6	5.1728+6	1.7571+3	1.8309+1	1.5354+1	2.6442+0	3.1037–1
1.1250–1	1.1982–6	9.7616+4	4.0640–3	2.6340+7	1.9019+7	2.6164+6	4.7034+6	1.6658+3	1.7192+1	1.4439+1	2.4335+0	3.1898–1
1.3125–1	1.3211–6	8.8529+4	5.1990–3	2.3888+7	1.7370+7	2.3641+6	4.1529+6	1.5534+3	1.5866+1	1.3347+1	2.1875+0	3.3208–1
1.5000–1	1.4376–6	8.1355+4	6.4209–3	2.1953+7	1.6057+7	2.1654+6	3.7283+6	1.4621+3	1.4834+1	1.2490+1	1.9987+0	3.4516–1
2.0000–1	1.7048–6	6.8606+4	1.0011–2	1.8513+7	1.3676+7	1.8337+6	3.0021+6	1.2964+3	1.3061+1	1.1022+1	1.6641+0	3.7491–1
2.5000–1	1.9415–6	6.0242+4	1.3999–2	1.6256+7	1.2065+7	1.6452+6	2.5438+6	1.1943+3	1.2026+1	1.0179+1	1.4441+0	4.0253–1
3.0000–1	2.1587–6	5.4181+4	1.8290–2	1.4620+7	1.0891+7	1.5057+6	2.2218+6	1.1168+3	1.1287+1	9.5663+0	1.2910+0	4.2986–1
4.0000–1	2.5440–6	4.5974+4	2.7480–2	1.2406+7	9.2130+6	1.3466+6	1.8449+6	1.0234+3	1.0485+1	8.8924+0	1.1078+0	4.8521–1
5.0000–1	2.8813–6	4.0593+4	3.7205–2	1.0954+7	8.0804+6	1.2549+6	1.6172+6	9.6933+2	1.0084+1	8.5439+0	9.9684–1	5.4308–1
6.0000–1	3.1798–6	3.6782+4	4.7231–2	9.9252+6	7.2592+6	1.1961+6	1.4690+6	9.3603+2	9.8652+0	8.3364+0	9.2519–1	6.0358–1
8.0000–1	3.7006–6	3.1605+4	6.7641–2	8.5283+6	6.1302+6	1.1284+6	1.2689+6	8.9820+2	9.7334+0	8.1775+0	8.2671–1	7.2922–1
1.0000+0	4.1309–6	2.8313+4	8.8151–2	7.6400+6	5.3888+6	1.0916+6	1.1588+6	8.8004+2	9.7688+0	8.1321+0	7.7484–1	8.6188–1
1.5000+0	4.9474–6	2.3640+4	1.3822–1	6.3790+6	4.2949+6	1.0513+6	1.0319+6	8.6559+2	1.0207+1	8.2649+0	7.2260–1	1.2192+0
2.0000+0	5.5203–6	2.1187+4	1.8600–1	5.7171+6	3.6914+6	1.0412+6	9.8368+5	8.6354+2	1.0729+1	8.4233+0	7.0532–1	1.6002+0
3.0000+0	6.3096–6	1.8537+4	2.7468–1	5.0019+6	3.0433+6	1.0287+6	9.2910+5	8.6852+2	1.1842+1	8.7325+0	6.9832–1	2.4114+0
4.0000+0	6.8085–6	1.7178+4	3.5536–1	4.6354+6	2.6935+6	1.0239+6	9.1702+5	8.7562+2	1.2964+1	9.0051+0	7.0250–1	3.2560+0
5.0000+0	7.1586–6	1.6338+4	4.2939–1	4.4086+6	2.4798+6	1.0239+6	9.0411+5	8.8251+2	1.4067+1	9.2220+0	7.0576–1	4.1396+0
6.0000+0	7.4142–6	1.5775+4	4.9791–1	4.2567+6	2.3404+6	1.0238+6	8.9162+5	8.8818+2	1.5135+1	9.3963+0	7.0906–1	5.0297+0
8.0000+0	7.7445–6	1.5102+4	6.2143–1	4.0752+6	2.1639+6	1.0248+6	8.8550+5	8.9789+2	1.7296+1	9.6868+0	7.1518–1	6.8939+0
1.0000+1	7.9414–6	1.4728+4	7.3045–1	3.9741+6	2.0696+6	1.0257+6	8.7791+5	9.0550+2	1.9434+1	9.9376+0	7.1996–1	8.7768+0
1.5000+1	8.1188–6	1.4406+4	9.5790–1	3.8873+6	1.9873+6	1.0276+6	8.7143+5	9.2466+2	2.4745+1	1.0296+1	7.2529–1	1.3724+1
2.0000+1	8.1380–6	1.4372+4	1.1408+0	3.8781+6	1.9797+6	1.0288+6	8.6865+5	9.3675+2	3.0121+1	1.0574+1	7.3359–1	1.8813+1
3.0000+1	8.1119–6	1.4418+4	1.4245+0	3.8906+6	1.9794+6	1.0300+6	8.8024+5	9.5156+2	4.0902+1	1.0918+1	7.4804–1	2.9236+1
4.0000+1	8.0997–6	1.4440+4	1.6411+0	3.8965+6	1.9786+6	1.0307+6	8.8623+5	9.6671+2	5.1879+1	1.1147+1	7.5783–1	3.9975+1
5.0000+1	8.0973–6	1.4444+4	1.8158+0	3.8976+6	1.9779+6	1.0311+6	8.8763+5	9.7875+2	6.2963+1	1.1330+1	7.6372–1	5.0869+1
6.0000+1	8.0958–6	1.4447+4	1.9620+0	3.8983+6	1.9773+6	1.0314+6	8.8860+5	9.8881+2	7.4117+1	1.1458+1	7.6927–1	6.1890+1
8.0000+1	8.0841–6	1.4468+4	2.1976+0	3.9039+6	1.9765+6	1.0317+6	8.9478+5	1.0042+3	9.6719+1	1.1670+1	7.7684–1	8.4273+1
1.0000+2	8.0777–6	1.4479+4	2.3832+0	3.9070+6	1.9758+6	1.0319+6	8.9831+5	1.0162+3	1.1950+2	1.1854+1	7.8213–1	1.0687+2
1.5000+2	8.0594–6	1.4512+4	2.7250+0	3.9159+6	1.9746+6	1.0320+6	9.0827+5	1.0378+3	1.7685+2	1.2045+1	7.9113–1	1.6402+2
2.0000+2	8.0502–6	1.4529+4	2.9696+0	3.9204+6	1.9737+6	1.0321+6	9.1350+5	1.0523+3	2.3476+2	1.2220+1	7.9601–1	2.2175+2
3.0000+2	8.0419–6	1.4544+4	3.3161+0	3.9245+6	1.9726+6	1.0322+6	9.1863+5	1.0690+3	3.4997+2	1.2505+1	8.0114–1	3.3666+2
4.0000+2	8.0400–6	1.4547+4	3.5630+0	3.9254+6	1.9717+6	1.0322+6	9.2035+5	1.0802+3	4.6549+2	1.2651+1	8.0330–1	4.5203+2
5.0000+2	8.0420–6	1.4543+4	3.7548+0	3.9244+6	1.9710+6	1.0323+6	9.1999+5	1.0887+3	5.8182+2	1.2786+1	8.0364–1	5.6823+2
6.0000+2	8.0413–6	1.4545+4	3.9116+0	3.9247+6	1.9705+6	1.0323+6	9.2087+5	1.0964+3	6.9680+2	1.2885+1	8.0507–1	6.8311+2
8.0000+2	8.0428–6	1.4542+4	4.1594+0	3.9240+6	1.9696+6	1.0323+6	9.2099+5	1.1086+3	9.2883+2	1.3075+1	8.0650–1	9.1495+2
1.0000+3	8.0455–6	1.4537+4	4.3516+0	3.9227+6	1.9690+6	1.0323+6	9.2032+5	1.1184+3	1.1608+3	1.3226+1	8.0723–1	1.1468+3
1.5000+3	8.0462–6	1.4536+4	4.7006+0	3.9224+6	1.9678+6	1.0323+6	9.2116+5	1.1366+3	1.7443+3	1.3373+1	8.0799–1	1.7301+3
2.0000+3	8.0485–6	1.4532+4	4.9480+0	3.9212+6	1.9669+6	1.0323+6	9.2089+5	1.1499+3	2.3255+3	1.3518+1	8.0776–1	2.3112+3
3.0000+3	8.0513–6	1.4527+4	5.2965+0	3.9198+6	1.9657+6	1.0323+6	9.2067+5	1.1698+3	3.4927+3	1.3798+1	8.0761–1	3.4781+3
4.0000+3	8.0545–6	1.4521+4	5.5435+0	3.9183+6	1.9649+6	1.0323+6	9.1997+5	1.1842+3	4.6594+3	1.3914+1	8.0703–1	4.6447+3
5.0000+3	8.0592–6	1.4513+4	5.7349+0	3.9160+6	1.9642+6	1.0323+6	9.1834+5	1.1955+3	5.8350+3	1.4030+1	8.0564–1	5.8202+3
6.0000+3	8.0600–6	1.4511+4	5.8913+0	3.9156+6	1.9636+6	1.0323+6	9.1848+5	1.2037+3	6.9881+3	1.4121+1	8.0580–1	6.9732+3
8.0000+3	8.0623–6	1.4507+4	6.1383+0	3.9145+6	1.9628+6	1.0323+6	9.1821+5	1.2168+3	9.3142+3	1.4303+1	8.0564–1	9.2991+3
1.0000+4	8.0643–6	1.4503+4	6.3298+0	3.9135+6	1.9621+6	1.0323+6	9.1787+5	1.2270+3	1.1662+4	1.4470+1	8.0542–1	1.1646+4
1.5000+4	8.0672–6	1.4498+4	6.6781+0	3.9121+6	1.9609+6	1.0323+6	9.1765+5	1.2470+3	1.7440+4	1.4607+1	8.0523–1	1.7424+4
2.0000+4	8.0697–6	1.4494+4	6.9253+0	3.9109+6	1.9601+6	1.0323+6	9.1725+5	1.2613+3	2.3293+4	1.4744+1	8.0488–1	2.3277+4
3.0000+4	8.0724–6	1.4489+4	7.2738+0	3.9096+6	1.9589+6	1.0323+6	9.1714+5	1.2814+3	3.4861+4	1.5019+1	8.0479–1	3.4845+4
4.0000+4	8.0749–6	1.4484+4	7.5212+0	3.9084+6	1.9581+6	1.0323+6	9.1674+5	1.2958+3	4.6553+4	1.5154+1	8.0444–1	4.6537+4
5.0000+4	8.0793–6	1.4476+4	7.7130+0	3.9063+6	1.9574+6	1.0323+6	9.1529+5	1.3068+3	5.8137+4	1.5264+1	8.0317–1	5.8120+4
6.0000+4	8.0796–6	1.4476+4	7.8699+0	3.9062+6	1.9569+6	1.0323+6	9.1569+5	1.3159+3	6.9710+4	1.5353+1	8.0352–1	6.9694+4
8.0000+4	8.0812–6	1.4473+4	8.1173+0	3.9053+6	1.9560+6	1.0323+6	9.1572+5	1.3302+3	9.3060+4	1.5531+1	8.0355–1	9.3043+4
1.0000+5	8.0826–6	1.4471+4	8.3091+0	3.9047+6	1.9553+6	1.0323+6	9.1571+5	1.3414+3	1.1645+5	1.5700+1	8.0355–1	1.1643+5


July 4, 1991
Atomic Weight 164.930
EEDL Evaluated Electron
Cross Sections
67-Ho
Density 8.795 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
67-Ho


July 4, 1991
Atomic Weight 164.930
EEDL Evaluated Electron
Energy Deposition
67-Ho
Density 8.795 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
67-Ho


July 4, 1991
Atomic Weight 164 930
EEDL Evaluated Electron
Shell Cross Sections
67-Ho
Density 8 795 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
67-Ho


July 4, 1991
Atomic Weight 164 930
EEDL Evaluated Electron
Energy Deposition
67-Ho
Density 8 795 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
67-Ho

300

Atomic Weight 164.930 Density 8.795 Grams/cc

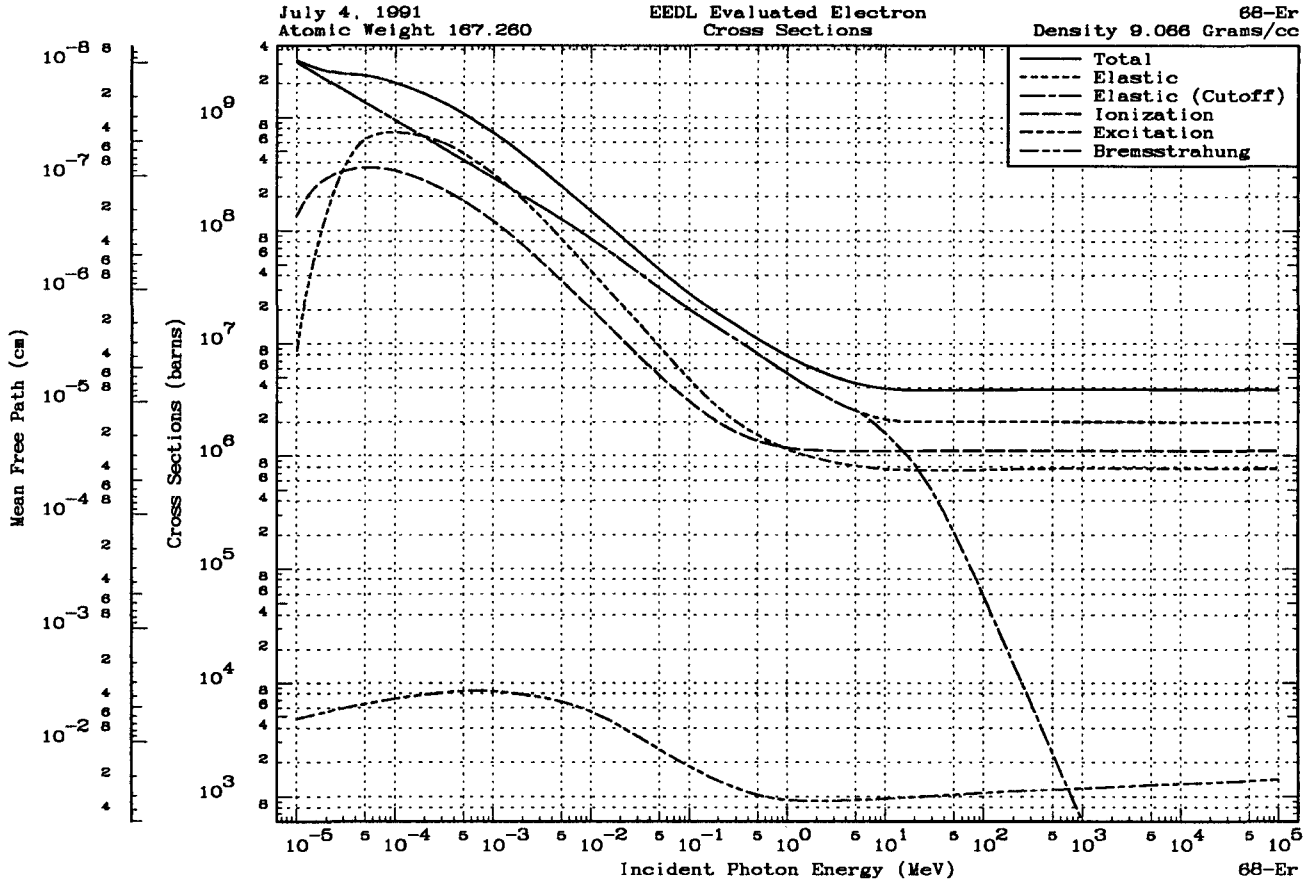
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.3232–9	1.2195+7		3.3400+9	3.1878+9	1.4109+8	1.1121+7	4.3955+3	3.2162+1	2.9878+1	2.2836+0	3.0504–4
	1.0312–5	9.4377–9	1.2048+7		3.2995+9	3.1377+9	1.4848+8	1.3287+7	4.4231+3	3.4732+1	3.1978+1	2.7540+0	3.1418–4
N6	1.0800–5	9.6094–9	1.1832+7		3.2405+9	3.0639+9	1.5969+8	1.6927+7	4.4648+3	3.8777+1	3.5217+1	3.5595+0	3.2858–4
	1.0898–5	9.6421–9	1.1792+7		3.2296+9	3.0496+9	1.6223+8	1.7708+7	4.4731+3	3.9731+1	3.5999+1	3.7319+0	3.3149–4
	1.0931–5	9.6531–9	1.1779+7		3.2259+9	3.0449+9	1.6299+8	1.7976+7	4.4758+3	4.0024+1	3.6233+1	3.7911+0	3.3247–4
	1.1185–5	9.7368–9	1.1677+7		3.1981+9	3.0091+9	1.6891+8	2.0156+7	4.4968+3	4.2343+1	3.8069+1	4.2745+0	3.4002–4
	1.1411–5	9.8088–9	1.1592+7		3.1747+9	2.9783+9	1.7412+8	2.2261+7	4.5151+3	4.4438+1	3.9693+1	4.7442+0	3.4674–4
	1.1662–5	9.8879–9	1.1499+7		3.1493+9	2.9450+9	1.7986+8	2.4376+7	4.5351+3	4.6734+1	4.1510+1	5.2233+0	3.5426–4
	1.2308–5	1.0080–8	1.1280+7		3.0892+9	2.8644+9	1.9422+8	3.0508+7	4.5851+3	5.2758+1	4.6129+1	6.6286+0	3.7368–4
	1.2497–5	1.0134–8	1.1219+7		3.0727+9	2.8421+9	1.9836+8	3.2270+7	4.5993+3	5.4525+1	4.7486+1	7.0395+0	3.7939–4
	1.3123–5	1.0305–8	1.1033+7		3.0217+9	2.7714+9	2.1159+8	3.8641+7	4.6452+3	6.0423+1	5.1881+1	8.5413+0	3.9843–4
	1.3125–5	1.0306–8	1.1032+7		3.0215+9	2.7712+9	2.1164+8	3.8667+7	4.6454+3	6.0446+1	5.1898+1	8.5475+0	3.9850–4
	1.3654–5	1.0450–8	1.0880+7		2.9797+9	2.7153+9	2.2080+8	4.3627+7	4.6829+3	6.4965+1	5.5214+1	9.7509+0	4.1471–4
	1.4061–5	1.0557–8	1.0770+7		2.9497+9	2.6745+9	2.2746+8	4.7722+7	4.7110+3	6.8444+1	5.7688+1	1.0756+1	4.2725–4
	1.5000–5	1.0784–8	1.0544+7		2.8876+9	2.5870+9	2.4247+8	5.8131+7	4.7733+3	7.6762+1	6.3407+1	1.3355+1	4.5640–4
	1.6250–5	1.1065–8	1.0276+7		2.8143+9	2.4825+9	2.5779+8	7.3983+7	4.8516+3	8.6934+1	6.9725+1	1.7209+1	4.9569–4
	1.7500–5	1.1305–8	1.0058+7		2.7545+9	2.3895+9	2.7252+8	9.2488+7	4.9253+3	9.7864+1	7.6085+1	2.1779+1	5.3549–4
	1.8125–5	1.1416–8	9.9599+6		2.7277+9	2.3467+9	2.7821+8	1.0280+8	4.9605+3	1.0323+2	7.8872+1	2.4354+1	5.5559–4
	2.0000–5	1.1702–8	9.7162+6		2.6610+9	2.2307+9	2.9428+8	1.3598+8	5.0608+3	1.1995+2	8.7145+1	3.2801+1	6.1657–4
	2.2500–5	1.2007–8	9.4698+6		2.5935+9	2.0994+9	3.0798+8	1.8611+8	5.1699+3	1.4101+2	9.5741+1	4.5269+1	6.9267–4
	2.5000–5	1.2186–8	9.3304+6		2.5554+9	1.9885+9	3.2038+8	2.4643+8	5.2694+3	1.6467+2	1.0424+2	6.0438+1	7.7002–4
O3	2.8580–5	1.2340–8	9.2143+6		2.5236+9	1.8561+9	3.3140+8	3.3605+8	5.3986+3	1.9740+2	1.1401+2	8.3392+1	8.8282–4
	2.8758–5	1.2344–8	9.2108+6		2.5226+9	1.8502+9	3.3204+8	3.4036+8	5.4046+3	1.9910+2	1.1460+2	8.4500+1	8.8842–4
	2.9068–5	1.2352–8	9.2054+6		2.5211+9	1.8400+9	3.3315+8	3.4797+8	5.4150+3	2.0210+2	1.1564+2	8.6457+1	8.9824–4
	2.9534–5	1.2360–8	9.1989+6		2.5193+9	1.8250+9	3.3482+8	3.5955+8	5.4304+3	2.0666+2	1.1722+2	8.9440+1	9.1300–4
	3.0000–5	1.2366–8	9.1946+6		2.5181+9	1.8103+9	3.3650+8	3.7132+8	5.4455+3	2.1130+2	1.1882+2	9.2477+1	9.2779–4
	3.1250–5	1.2386–8	9.1796+6		2.5141+9	1.7727+9	3.3932+8	4.0206+8	5.4854+3	2.2269+2	1.2237+2	1.0032+2	9.6765–4
O2	3.3890–5	1.2377–8	9.1865+6		2.5159+9	1.7002+9	3.4487+8	4.7087+8	5.5653+3	2.4761+2	1.2967+2	1.1794+2	1.0526–3
	3.4081–5	1.2379–8	9.1850+6		2.5155+9	1.6953+9	3.4520+8	4.7505+8	5.5709+3	2.4924+2	1.3022+2	1.1902+2	1.0588–3
	3.4451–5	1.2382–8	9.1829+6		2.5149+9	1.6859+9	3.4588+8	4.8319+8	5.5817+3	2.5242+2	1.3130+2	1.2112+2	1.0708–3
	3.5145–5	1.2384–8	9.1812+6		2.5145+9	1.6687+9	3.4723+8	4.9858+8	5.6016+3	2.5852+2	1.3341+2	1.2511+2	1.0934–3
	3.5625–5	1.2383–8	9.1817+6		2.5146+9	1.6571+9	3.4821+8	5.0935+8	5.6152+3	2.6283+2	1.3493+2	1.2790+2	1.1090–3
	3.6358–5	1.2381–8	9.1835+6		2.5151+9	1.6398+9	3.4938+8	5.2594+8	5.6356+3	2.6915+2	1.3694+2	1.3221+2	1.1330–3
	3.8179–5	1.2360–8	9.1993+6		2.5194+9	1.5991+9	3.5240+8	5.6797+8	5.6850+3	2.8524+2	1.4209+2	1.4315+2	1.1929–3
	4.0000–5	1.2349–8	9.2072+6		2.5216+9	1.5612+9	3.5563+8	6.0478+8	5.7325+3	3.0035+2	1.4753+2	1.5282+2	1.2532–3
	4.5000–5	1.2341–8	9.2132+6		2.5232+9	1.4694+9	3.5898+8	6.9489+8	5.8456+3	3.3549+2	1.5906+2	1.7643+2	1.4139–3
	5.0000–5	1.2433–8	9.1448+6		2.5045+9	1.3918+9	3.6206+8	7.5062+8	5.9486+3	3.6175+2	1.7025+2	1.9149+2	1.5773–3
O1	5.5190–5	1.2604–8	9.0207+6		2.4705+9	1.3229+9	3.6151+8	7.8615+8	6.0433+3	3.8085+2	1.7927+2	2.0158+2	1.7460–3
	5.5791–5	1.2622–8	9.0079+6		2.4670+9	1.3155+9	3.6146+8	7.9005+8	6.0538+3	3.8302+2	1.8032+2	2.0270+2	1.7657–3
	5.6843–5	1.2653–8	8.9864+6		2.4611+9	1.3029+9	3.6140+8	7.9681+8	6.0719+3	3.8682+2	1.8216+2	2.0465+2	1.8003–3
	5.8422–5	1.2695–8	8.9562+6		2.4529+9	1.2847+9	3.6134+8	8.0684+8	6.0985+3	3.9253+2	1.8497+2	2.0756+2	1.8523–3
	6.0000–5	1.2735–8	8.9284+6		2.4453+9	1.2672+9	3.6135+8	8.1672+8	6.1245+3	3.9825+2	1.8781+2	2.1043+2	1.9045–3
	6.5000–5	1.2935–8	8.7900+6		2.4073+9	1.2161+9	3.5813+8	8.3314+8	6.2034+3	4.0924+2	1.9396+2	2.1528+2	2.0711–3
	6.8750–5	1.3070–8	8.6992+6		2.3825+9	1.1815+9	3.5617+8	8.4485+8	6.2593+3	4.1753+2	1.9876+2	2.1877+2	2.1972–3
	7.0000–5	1.3113–8	8.6711+6		2.3748+9	1.1705+9	3.5558+8	8.4865+8	6.2773+3	4.2029+2	2.0038+2	2.1991+2	2.2395–3
	8.0000–5	1.3416–8	8.4750+6		2.3211+9	1.0928+9	3.5094+8	8.7731+8	6.4128+3	4.4124+2	2.1260+2	2.2863+2	2.5816–3
	9.0000–5	1.3855–8	8.2065+6		2.2475+9	1.0286+9	3.4288+8	8.7610+8	6.5288+3	4.5009+2	2.2027+2	2.2981+2	2.9268–3
	1.0000–4	1.4247–8	7.9809+6	0.0000+0	2.1858+9	9.7427+8	3.3647+8	8.7501+8	6.6344+3	4.5956+2	2.2853+2	2.3102+2	3.2775–3
	1.2500–4	1.5200–8	7.4804+6	5.3762–8	2.0487+9	8.6876+8	3.1688+8	8.6302+8	6.8525+3	4.7051+2	2.4039+2	2.3012+2	4.1673–3
	1.5000–4	1.6152–8	7.0393+6	1.0658–7	1.9279+9	7.9109+8	3.0235+8	8.3441+8	7.0361+3	4.7606+2	2.5138+2	2.2468+2	5.0819–3
N5	1.6623–4	1.6796–8	6.7694+6	1.4077–7	1.8539+9	7.5043+8	2.9165+8	8.1187+8	7.1417+3	4.7348+2	2.5391+2	2.1957+2	5.6873–3
N4	1.7363–4	1.7077–8	6.6580+6	1.5641–7	1.8234+9	7.3383+8	2.8737+8	8.0224+8	7.1870+3	4.7291+2	2.5549+2	2.1742+2	5.9661–3
	1.7467–4	1.7117–8	6.6426+6	1.5861–7	1.8192+9	7.3157+8	2.8677+8	8.0087+8	7.1927+3	4.7283+2	2.5571+2	2.1712+2	6.0061–3
	1.7693–4	1.7202–8	6.6098+6	1.6338–7	1.8102+9	7.2677+8	2.8550+8	7.9796+8	7.2049+3	4.7266+2	2.5617+2	2.1648+2	6.0928–3
	1.8270–4	1.7416–8	6.5285+6	1.7559–7	1.7880+9	7.1489+8	2.8236+8	7.9071+8	7.2356+3	4.7234+2	2.5743+2	2.1491+2	6.3153–3
	1.8734–4	1.7585–8	6.4658+6	1.8542–7	1.7708+9	7.0574+8	2.7996+8	7.8509+8	7.2597+3	4.7222+2	2.5853+2	2.1369+2	6.4950–3
	1.9135–4	1.7729–8	6.4134+6	1.9391–7	1.7565+9	6.9810+8	2.7797+8	7.8037+8	7.2801+3	4.7217+2	2.5949+2	2.1267+2	6.6508–3
	2.0000–4	1.8032–8	6.3057+6	2.1223–7	1.7270+9	6.8242+8	2.7390+8	7.7061+8	7.3228+3	4.7227+2	2.6169+2	2.1058+2	6.9882–3
	2.2500–4	1.8984–8	5.9894+6	2.6559–7	1.6403+9	6.4236+8	2.6048+8	7.3749+8	7.4292+3	4.6486+2	2.6222+2	2.0264+2	7.9843–3
	2.4375–4	1.9656–8	5.7845+6	3.0610–7	1.5842+9	6.1648+8	2.5193+8	7.1580+8	7.5024+3	4.6079+2	2.6328+2	1.9749+2	8.7405–3
	2.5000–4	1.9873–8	5.7213+6	3.1968–7	1.5669+9	6.0852+8	2.4932+8	7.0907+8	7.5257+3	4.5963+2	2.6372+2	1.9591+2	8.9942–3
	2.7188–4	2.0608–8	5.5173+6	3.6751–7	1.5110+9	5.8286+8	2.4094+8	6.8723+8	7.6034+3	4.5522+2	2.6443+2	1.9078+2	9.8881–3
	3.0000–4	2.1502–8	5.2879+6	4.2958–7	1.4482+9	5.5412+8	2.3165+8	6.6245+8	7.6955+3	4.5101+2	2.6597+2	1.8503+2	1.1050–2
N3	3.0220–4	2.1573–8	5.2704+6	4.3446–7	1.4434+9	5.5204+8	2.3083+8	6.6055+8	7.7024+3	4.5033+2	2.6576+2	1.8456+2	1.1142–2
	3.0526–4	2.1682–8	5.2441+6	4.4125–7	1.4362+9	5.4920+8	2.2971+8	6.5730+8	7.7119+3	4.4926+2	2.6551+2	1.8374+2	1.1269–2
	3.1118–4	2.1890–8	5.1942+6	4.5446–7	1.4226+9	5.4381+8	2.2758+8	6.5115+8	7.7301+3	4.4725+2	2.6505+2	1.8219+2	1.1516–2
	3.2228–4	2.2275–8	5.1045+6	4.7939–7	1.3980+9	5.3413+8	2.2378+8	6.4008+8	7.7634+3	4.4371+2	2.6430+2	1.7940+2	1.1981–2
	3.4171–4	2.2931–8	4.9584+6	5.2345–7	1.3580+9	5.1833+8	2.1761+8	6.2201+8	7.8192+3	4.3816+2	2.6328+2	1.7486+2	1.2799–2
N2	3.4305–4	2.2976–8	4.9488+6	5.2651–7	1.3553+9	5.1729+8	2.1720+8	6.2082+8	7.8229+3	4.3780+2	2.6323+2	1.7456+2	1.2855–2
	3.4661–4	2.3097–8	4.9228+6	5.3465–7	1.3482+9	5.1456+8	2.1613+8	6.1752+8	7.8322+3	4.3679+2	2.6304+2	1.7374+2	1.3008–2
	3.5328–4	2.3322–8	4.8752+6	5.4996–7	1.3352+9	5.0956+8	2.1416+8	6.1146+8	7.8495+3	4.3498+2	2.6272+2	1.7225+2	1.3293–2
	3.6496–4	2.3712–8	4.7951+6	5.7690–7	1.3133+9	5.0114+8	2.1085+8	6.0127+8	7.8789+3	4.3200+2	2.6226+2	1.6973+2	1.3794–2
	3.7086–4	2.3906–8	4.7563+6	5.9057–7	1.3026+9	4.9705+8	2.0925+8	5.9631+8	7.8935+3	4.3059+2	2.6207+2	1.6851+2	1.4048–2
	3.8248–4	2.4284–8	4.6822+6	6.1765–7	1.2823+9	4.8925+8	2.0620+8	5.8687+8	7.9215+3	4.2795+2	2.6174+2	1.6620+2	1.4550–2
	4.0000–4	2.4842–8	4.5769+6	6.5876–7	1.2535+9	4.7815+8	2.0189+8	5.7344+8	7.9625+3	4.2436+2	2.6144+2	1.6291+2	1.5310–2
N1	4.2035–4	2.5483–8	4.4618+6	7.0706–7	1.2220+9	4.6615+8	1.9654+8	5.5927+8	8.0005+3	4.1833+2	2.5903+2	1.5929+2	1.6217–2
	4.2500–4	2.5630–8	4.4362+6	7.1819–7	1.2149+9	4.6353+8	1.9538+8	5.5603+8	8.0090+3	4.1703+2	2.5854+2	1.5847+2	1.6425–2
	4.2533–4	2.5641–8	4.4344+6	7.1898–7	1.2145+9	4.6335+8	1.9530+8	5.5581+8	8.0096+3	4.1694+2	2.5850+2	1.5841+2	1.6439–2
	4.3466–4	2.5933–8	4.3843+6	7.4143–7	1.2007+9	4.5822+8	1.9303+8	5.4949+8	8.0263+3	4.1440+2	2.5756+2	1.5682+2	1.6857–2
	4.5000–4	2.6408–8	4.3056+6	7.7862–7	1.1792+9	4.5015+8	1.8947+8	5.3955+8	8.0531+3	4.1049+2	2.5615+2	1.5433+2	1.7546–2

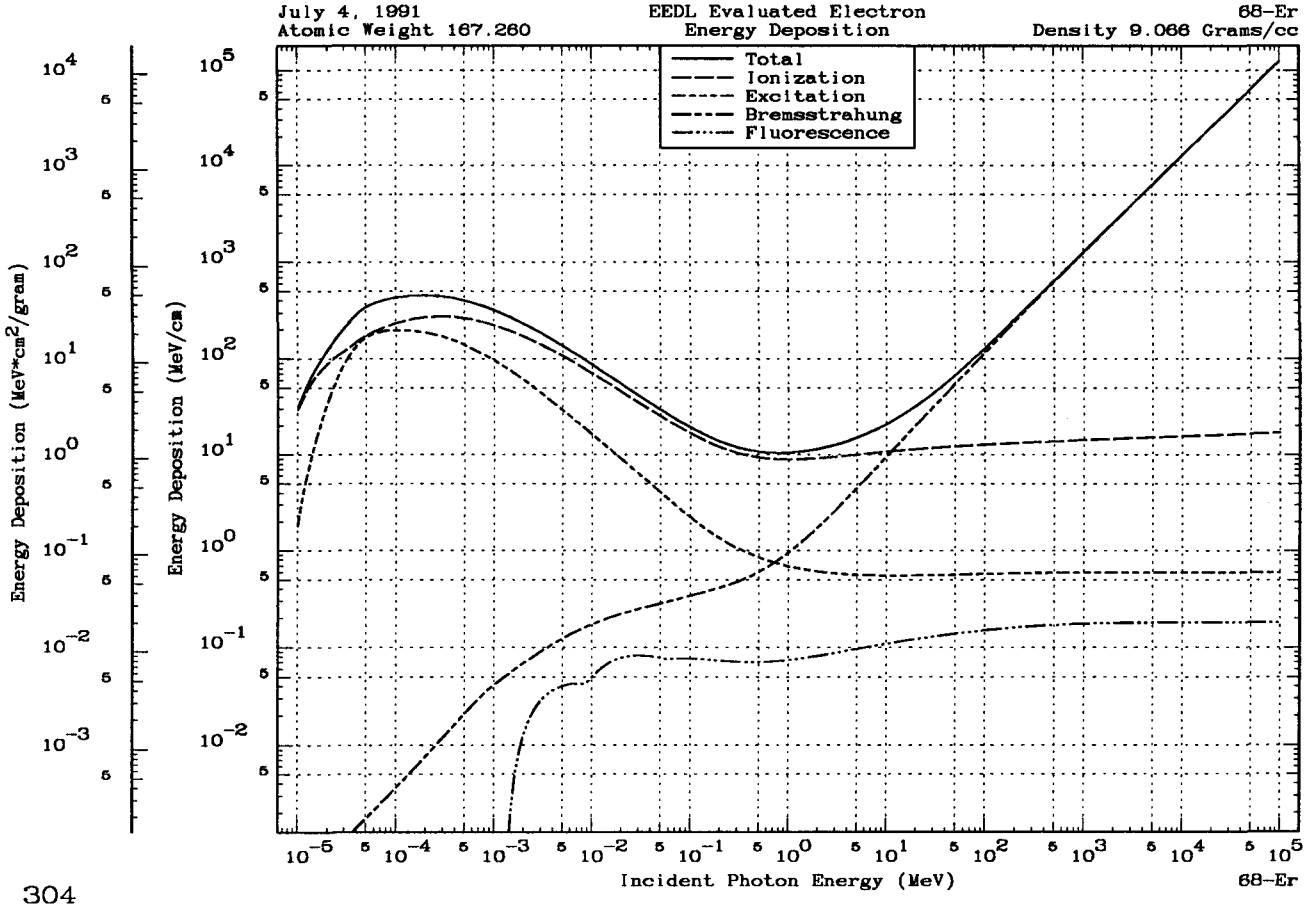
Atomic Weight 164.930 Density 8.795 Grams/cc

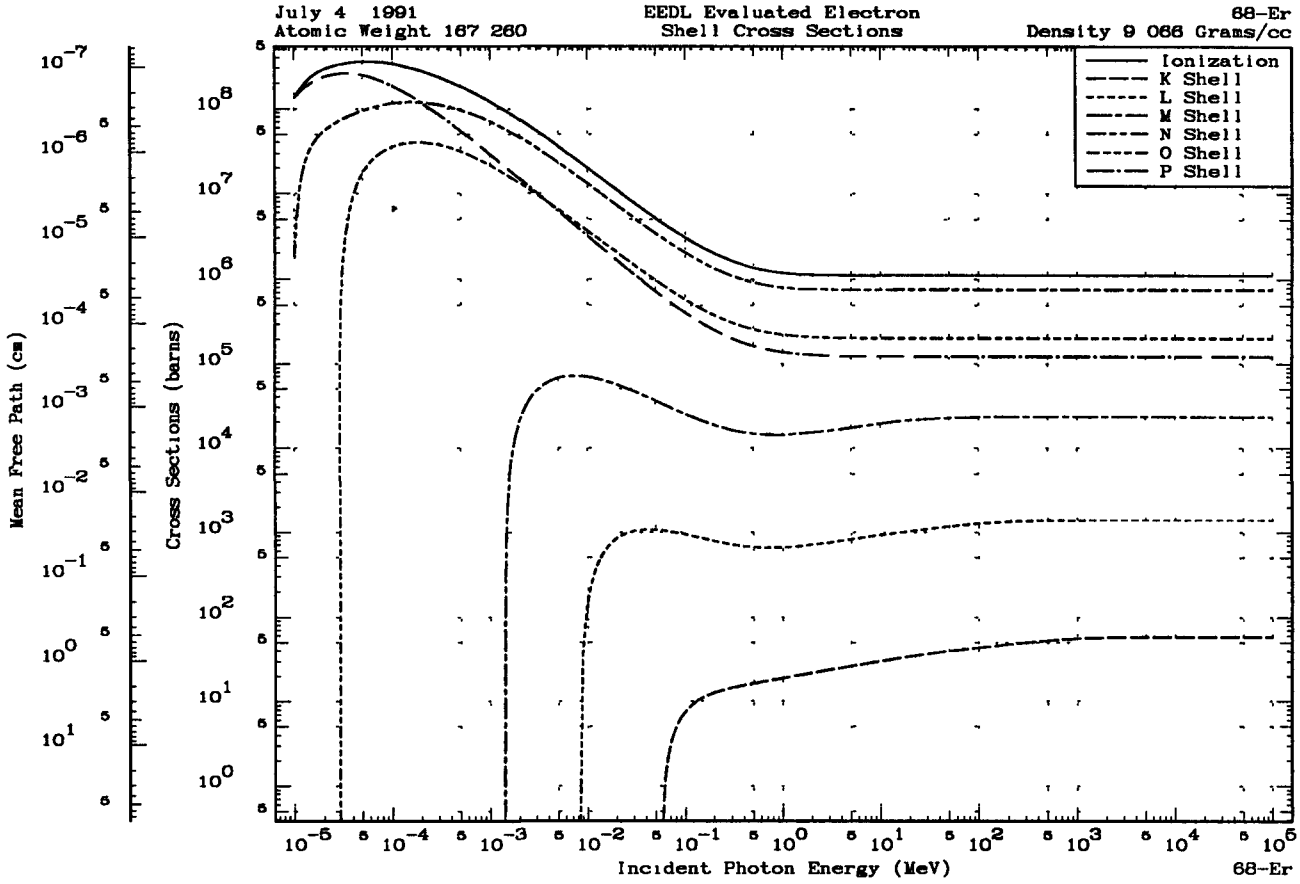
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.5100–4	2.6438–8	4.3006+6	7.8105–7	1.1778+9	4.4964+8	1.8925+8	5.3892+8	8.0548+3	4.1025+2	2.5606+2	1.5417+2	1.7591–2
	4.6250–4	2.6788–8	4.2444+6	8.0918–7	1.1624+9	4.4388+8	1.8672+8	5.3182+8	8.0743+3	4.0749+2	2.5509+2	1.5239+2	1.8110–2
	4.7550–4	2.7179–8	4.1834+6	8.4120–7	1.1457+9	4.3762+8	1.8398+8	5.2411+8	8.0958+3	4.0456+2	2.5408+2	1.5046+2	1.8697–2
	5.0000–4	2.7901–8	4.0752+6	9.0214–7	1.1161+9	4.2650+8	1.7915+8	5.1043+8	8.1349+3	3.9949+2	2.5243+2	1.4704+2	1.9808–2
	5.5000–4	2.9415–8	3.8654+6	1.0291–6	1.0586+9	4.0618+8	1.7006+8	4.8239+8	8.1989+3	3.8835+2	2.4852+2	1.3980+2	2.2058–2
	6.0000–4	3.0866–8	3.6837+6	1.1594–6	1.0089+9	3.8847+8	1.6225+8	4.5814+8	8.2577+3	3.7919+2	2.4559+2	1.3357+2	2.4325–2
	7.0000–4	3.3689–8	3.3750+6	1.4304–6	9.2432+8	3.5897+8	1.4788+8	4.1746+8	8.3140+3	3.5889+2	2.3593+2	1.2294+2	2.8625–2
	8.0000–4	3.6337–8	3.1291+6	1.7152–6	8.5697+8	3.3524+8	1.3657+8	3.8516+8	8.3631+3	3.4353+2	2.2895+2	1.1456+2	3.2953–2
	9.0000–4	3.8958–8	2.9186+6	2.0132–6	7.9932+8	3.1561+8	1.2662+8	3.5708+8	8.3427+3	3.2772+2	2.2060+2	1.0708+2	3.6578–2
	1.0000–3	4.1457–8	2.7426+6	2.3244–6	7.5113+8	2.9903+8	1.1840+8	3.3370+8	8.3244+3	3.1503+2	2.1410+2	1.0089+2	4.0195–2
	1.1250–3	4.4720–8	2.5425+6	2.7325–6	6.9633+8	2.8146+8	1.0920+8	3.0565+8	8.2463+3	2.9768+2	2.0448+2	9.3157+1	4.3776–2
	1.2500–3	4.7846–8	2.3764+6	3.1626–6	6.5083+8	2.6663+8	1.0162+8	2.8256+8	8.1771+3	2.8367+2	1.9681+2	8.6814+1	4.7332–2
M5	1.3553–3	5.0388–8	2.2565+6	3.5405–6	6.1799+8	2.5577+8	9.6179+7	2.6603+8	8.1244+3	2.7377+2	1.9143+2	8.2284+1	5.0311–2
	1.3643–3	5.0606–8	2.2468+6	3.5736–6	6.1534+8	2.5490+8	9.5729+7	2.6470+8	8.1200+3	2.7290+2	1.9093+2	8.1916+1	5.0567–2
	1.3728–3	5.0809–8	2.2378+6	3.6047–6	6.1288+8	2.5409+8	9.5311+7	2.6347+8	8.1160+3	2.7209+2	1.9046+2	8.1575+1	5.0806–2
	1.3887–3	5.1189–8	2.2212+6	3.6633–6	6.0833+8	2.5259+8	9.4539+7	2.6119+8	8.1085+3	2.7060+2	1.8961+2	8.0944+1	5.1254–2
M4	1.3952–3	5.1343–8	2.2145+6	3.6872–6	6.0650+8	2.5199+8	9.4229+7	2.6027+8	8.1055+3	2.7001+2	1.8926+2	8.0691+1	5.1437–2
	1.4083–3	5.1657–8	2.2011+6	3.7359–6	6.0281+8	2.5078+8	9.3609+7	2.5841+8	8.0982+3	2.6882+2	1.8859+2	8.0181+1	5.1775–2
	1.4165–3	5.1854–8	2.1927+6	3.7666–6	6.0052+8	2.5003+8	9.3225+7	2.5726+8	8.0936+3	2.6809+2	1.8817+2	7.9865+1	5.1987–2
	1.4312–3	5.2204–8	2.1780+6	3.8215–6	5.9650+8	2.4871+8	9.2550+7	2.5523+8	8.0856+3	2.6680+2	1.8744+2	7.9309+1	5.2366–2
	1.4583–3	5.2845–8	2.1516+6	3.9233–6	5.8926+8	2.4633+8	9.1337+7	2.5159+8	8.0710+3	2.6450+2	1.8613+2	7.8311+1	5.3063–2
	1.4656–3	5.3018–8	2.1446+6	3.9511–6	5.8734+8	2.4569+8	9.1014+7	2.5062+8	8.0671+3	2.6389+2	1.8579+2	7.8046+1	5.3252–2
	1.5000–3	5.3826–8	2.1124+6	4.0821–6	5.7853+8	2.4278+8	8.9541+7	2.4620+8	8.0490+3	2.6110+2	1.8421+2	7.6835+1	5.4136–2
	1.5625–3	5.5279–8	2.0569+6	4.3240–6	5.6332+8	2.3774+8	8.6901+7	2.3867+8	8.0162+3	2.5568+2	1.8090+2	7.4723+1	5.5707–2
	1.6250–3	5.6710–8	2.0050+6	4.5708–6	5.4910+8	2.3300+8	8.4441+7	2.3165+8	7.9847+3	2.5069+2	1.7788+2	7.2757+1	5.7274–2
	1.6719–3	5.7770–8	1.9682+6	4.7592–6	5.3902+8	2.2962+8	8.2703+7	2.2670+8	7.9620+3	2.4717+2	1.7575+2	7.1369+1	5.8446–2
M3	1.7285–3	5.9036–8	1.9260+6	4.9901–6	5.2747+8	2.2572+8	8.0714+7	2.2102+8	7.9354+3	2.4317+2	1.7333+2	6.9783+1	5.9858–2
	1.7624–3	5.9792–8	1.9016+6	5.1304–6	5.2080+8	2.2348+8	7.9558+7	2.1776+8	7.9199+3	2.4078+2	1.7186+2	6.8860+1	6.0703–2
	1.8125–3	6.0897–8	1.8671+6	5.3397–6	5.1135+8	2.2028+8	7.7923+7	2.1314+8	7.8977+3	2.3743+2	1.6981+2	6.7556+1	6.1947–2
	1.8218–3	6.1101–8	1.8609+6	5.3791–6	5.0964+8	2.1970+8	7.7628+7	2.1230+8	7.8937+3	2.3682+2	1.6944+2	6.7320+1	6.2179–2
	1.8359–3	6.1410–8	1.8515+6	5.4388–6	5.0708+8	2.1883+8	7.7185+7	2.1105+8	7.8875+3	2.3591+2	1.6888+2	6.6967+1	6.2529–2
M2	1.9104–3	6.3025–8	1.8041+6	5.7575–6	4.9408+8	2.1441+8	7.4946+7	2.0472+8	7.8561+3	2.3133+2	1.6609+2	6.5184+1	6.4372–2
	1.9552–3	6.3995–8	1.7767+6	5.9523–6	4.8659+8	2.1187+8	7.3669+7	2.0105+8	7.8379+3	2.2872+2	1.6450+2	6.4158+1	6.5479–2
	2.0000–3	6.4957–8	1.7504+6	6.1492–6	4.7939+8	2.0941+8	7.2443+7	1.9752+8	7.8201+3	2.2624+2	1.6300+2	6.3174+1	6.6584–2
	2.0625–3	6.6343–8	1.7138+6	6.4279–6	4.6937+8	2.0606+8	7.0751+7	1.9255+8	7.7866+3	2.2236+2	1.6058+2	6.1717+1	6.7921–2
M1	2.1025–3	6.7222–8	1.6914+6	6.6087–6	4.6324+8	2.0400+8	6.9716+7	1.8952+8	7.7658+3	2.2000+2	1.5911+2	6.0826+1	6.8775–2
	2.1250–3	6.7731–8	1.6787+6	6.7113–6	4.5975+8	2.0285+8	6.9140+7	1.8775+8	7.7543+3	2.1862+2	1.5824+2	6.0311+1	6.9253–2
	2.1305–3	6.7856–8	1.6756+6	6.7367–6	4.5890+8	2.0257+8	6.9000+7	1.8732+8	7.7514+3	2.1829+2	1.5803+2	6.0185+1	6.9371–2
	2.1797–3	6.8961–8	1.6488+6	6.9633–6	4.5155+8	2.0015+8	6.7784+7	1.8361+8	7.7267+3	2.1539+2	1.5622+2	5.9100+1	7.0414–2
	2.1849–3	6.9077–8	1.6460+6	6.9875–6	4.5079+8	1.9990+8	6.7659+7	1.8323+8	7.7241+3	2.1509+2	1.5603+2	5.8988+1	7.0524–2
	2.2500–3	7.0527–8	1.6122+6	7.2928–6	4.4153+8	1.9683+8	6.6129+7	1.7856+8	7.6924+3	2.1147+2	1.5377+2	5.7625+1	7.1903–2
	2.2868–3	7.1340–8	1.5938+6	7.4675–6	4.3650+8	1.9515+8	6.5300+7	1.7604+8	7.6749+3	2.0949+2	1.5253+2	5.6887+1	7.2679–2
	2.3438–3	7.2590–8	1.5663+6	7.7414–6	4.2898+8	1.9263+8	6.4061+7	1.7228+8	7.6485+3	2.0656+2	1.5070+2	5.5788+1	7.3880–2
	2.3848–3	7.3484–8	1.5473+6	7.9410–6	4.2376+8	1.9088+8	6.3202+7	1.6967+8	7.6299+3	2.0453+2	1.4943+2	5.5028+1	7.4743–2
	2.4375–3	7.4626–8	1.5236+6	8.2004–6	4.1728+8	1.8869+8	6.2137+7	1.6645+8	7.6066+3	2.0203+2	1.4787+2	5.4086+1	7.5850–2
	2.4651–3	7.5220–8	1.5116+6	8.3373–6	4.1398+8	1.8757+8	6.1595+7	1.6481+8	7.5946+3	2.0076+2	1.4707+2	5.3609+1	7.6427–2
	2.5000–3	7.5968–8	1.4967+6	8.5119–6	4.0990+8	1.8618+8	6.0926+7	1.6279+8	7.5796+3	1.9918+2	1.4609+2	5.3018+1	7.7158–2
	2.6250–3	7.8620–8	1.4462+6	9.1480–6	3.9608+8	1.8145+8	5.8659+7	1.5596+8	7.5280+3	1.9388+2	1.4278+2	5.1027+1	7.9766–2
	2.6719–3	7.9603–8	1.4283+6	9.3910–6	3.9118+8	1.7976+8	5.7859+7	1.5356+8	7.5094+3	1.9202+2	1.4161+2	5.0326+1	8.0741–2
	2.7187–3	8.0581–8	1.4110+6	9.6362–6	3.8644+8	1.7812+8	5.7083+7	1.5123+8	7.4911+3	1.9022+2	1.4049+2	4.9648+1	8.1713–2
	2.7325–3	8.0867–8	1.4060+6	9.7088–6	3.8507+8	1.7765+8	5.6859+7	1.5056+8	7.4858+3	1.8970+2	1.4016+2	4.9453+1	8.1999–2
	3.0000–3	8.6329–8	1.3171+6	1.1154–5	3.6071+8	1.6910+8	5.2887+7	1.3871+8	7.3884+3	1.8056+2	1.3447+2	4.6002+1	8.7513–2
	3.5000–3	9.6409–8	1.1794+6	1.4054–5	3.2300+8	1.5567+8	4.6682+7	1.2064+8	7.1681+3	1.6446+2	1.2380+2	4.0568+1	9.5936–2
	4.0000–3	1.0602–7	1.0724+6	1.7213–5	2.9371+8	1.4489+8	4.1906+7	1.0690+8	6.9826+3	1.5223+2	1.1568+2	3.6442+1	1.0420–1
	4.5000–3	1.1555–7	9.8402+5	2.0622–5	2.6950+8	1.3572+8	3.8003+7	9.5763+7	6.7986+3	1.4130+2	1.0818+2	3.3012+1	1.1152–1
	5.0000–3	1.2474–7	9.1148+5	2.4275–5	2.4963+8	1.2801+8	3.4825+7	8.6787+7	6.6382+3	1.3250+2	1.0213+2	3.0250+1	1.1872–1
	6.0000–3	1.4250–7	7.9792+5	3.2265–5	2.1853+8	1.1554+8	2.9880+7	7.3105+7	6.3334+3	1.1810+2	9.2008+1	2.5962+1	1.3134–1
	7.0000–3	1.5952–7	7.1277+5	4.1171–5	1.9521+8	1.0584+8	2.6204+7	6.3162+7	6.0381+3	1.0665+2	8.3732+1	2.2777+1	1.4129–1
	8.0000–3	1.7579–7	6.4679+5	5.0951–5	1.7714+8	9.8093+7	2.3390+7	5.5650+7	5.7934+3	9.7972+1	7.7449+1	2.0373+1	1.5099–1
L3	8.0617–3	1.7678–7	6.4319+5	5.1583–5	1.7615+8	9.7656+7	2.3236+7	5.5254+7	5.7780+3	9.7461+1	7.7070+1	2.0240+1	1.5148–1
	8.3040–3	1.8064–7	6.2942+5	5.4094–5	1.7238+8	9.5987+7	2.2652+7	5.3736+7	5.7188+3	9.5531+1	7.5641+1	1.9737+1	1.5342–1
	8.7280–3	1.8733–7	6.0697+5	5.8606–5	1.6623+8	9.3245+7	2.1704+7	5.1277+7	5.6206+3	9.2402+1	7.3323+1	1.8922+1	1.5679–1
L2	8.9287–3	1.9045–7	5.9700+5	6.0795–5	1.6350+8	9.2020+7	2.1285+7	5.0192+7	5.5763+3	9.1019+1	7.2298+1	1.8563+1	1.5837–1
	9.1965–3	1.9463–7	5.8419+5	6.3766–5	1.5999+8	9.0451+7	2.0752+7	4.8786+7	5.5193+3	8.9262+1	7.0999+1	1.8103+1	1.6047–1
L1	9.3602–3	1.9716–7	5.7668+5	6.5610–5	1.5794+8	8.9527+7	2.0441+7	4.7966+7	5.4855+3	8.8237+1	7.0241+1	1.7834+1	1.6175–1
	9.5201–3	1.9965–7	5.6951+5	6.7433–5	1.5597+8	8.8648+7	2.0146+7	4.7174+7	5.4533+3	8.7265+1	6.9524+1	1.7578+1	1.6300–1
	9.5983–3	2.0086–7	5.6608+5	6.8331–5	1.5504+8	8.8228+7	2.0005+7	4.6797+7	5.4378+3	8.6803+1	6.9183+1	1.7457+1	1.6361–1
	1.0000–2	2.0702–7	5.4922+5	7.3020–5	1.5042+8	8.6147+7	1.9314+7	4.4950+7	5.3608+3	8.4535+1	6.7509+1	1.6860+1	1.6672–1
	1.0625–2	2.1658–7	5.2497+5	8.0572–5	1.4378+8	8.3094+7	1.8330+7	4.2347+7	5.2325+3	8.1011+1	6.4865+1	1.5975+1	1.7024–1
	1.1250–2	2.2598–7	5.0315+5	8.8441–5	1.3780+8	8.0314+7	1.7449+7	4.0031+7	5.1144+3	7.7864+1	6.2501+1	1.5189+1	1.7373–1
	1.1719–2	2.3292–7	4.8815+5	9.4547–5	1.3369+8	7.8385+7	1.6845+7	3.8455+7	5.0316+3	7.5715+1	6.0885+1	1.4654+1	1.7634–1
	1.2188–2	2.3978–7	4.7418+5	1.0082–4	1.2987+8	7.6577+7	1.6285+7	3.6999+7	4.9534+3	7.3726+1	5.9388+1	1.4159+1	1.7893–1
	1.2500–2	2.4431–7	4.6539+5	1.0509–4	1.2746+8	7.5431+7	1.5934+7	3.6089+7	4.9035+3	7.2479+1	5.8448+1	1.3850+1	1.8065–1
	1.2539–2	2.4488–7	4.6432+5	1.0563–4	1.2716+8	7.5291+7	1.5891+7	3.5978+7	4.8974+3	7.2326+1	5.8333+1	1.3813+1	1.8086–1
	1.3359–2	2.5659–7	4.4312+5	1.1722–4	1.2136+8	7.2504+7	1.5046+7	3.3803+7	4.7750+3	6.9327+1	5.6068+1	1.3074+1	1.8533–1
	1.3594–2	2.5990–7	4.3748+5	1.2062–4	1.1981+8	7.1757+7	1.4822+7	3.3229+7	4.7419+3	6.8535+1	5.5469+1	1.2880+1	1.8660–1
	1.3770–2	2.6237–7	4.3336+5	1.2319–4	1.1869+8	7.1210+7	1.4659+7	3.2812+7	4.7177+3	6.7957+1	5.5032+1	1.2738+1	1.8755–1
	1.5000–2	2.7939–7	4.0696+5	1.4181–4	1.1146+8	6.7673+7	1.3617+7	3.0162+7	4.5591+3	6.4280+1	5.2248+1	1.1838+1	1.9413–1
	1.7500–2	3.1347–7	3.6272+5	1.8281–4	9.9339+7	6.1507+7	1.1925+7	2.5903+7	4.2620+3	5.7784+1	4.7244+1	1.0336+1	2.0368–1
	2.0000–2	3.4615–7	3.2847+5	2.2804–4	8.9960+7	5.6622+7	1.0631+7	2.2703+7	4.0204+3	5.2845+1	4.3423+1	9.2082+0	2.1308–1

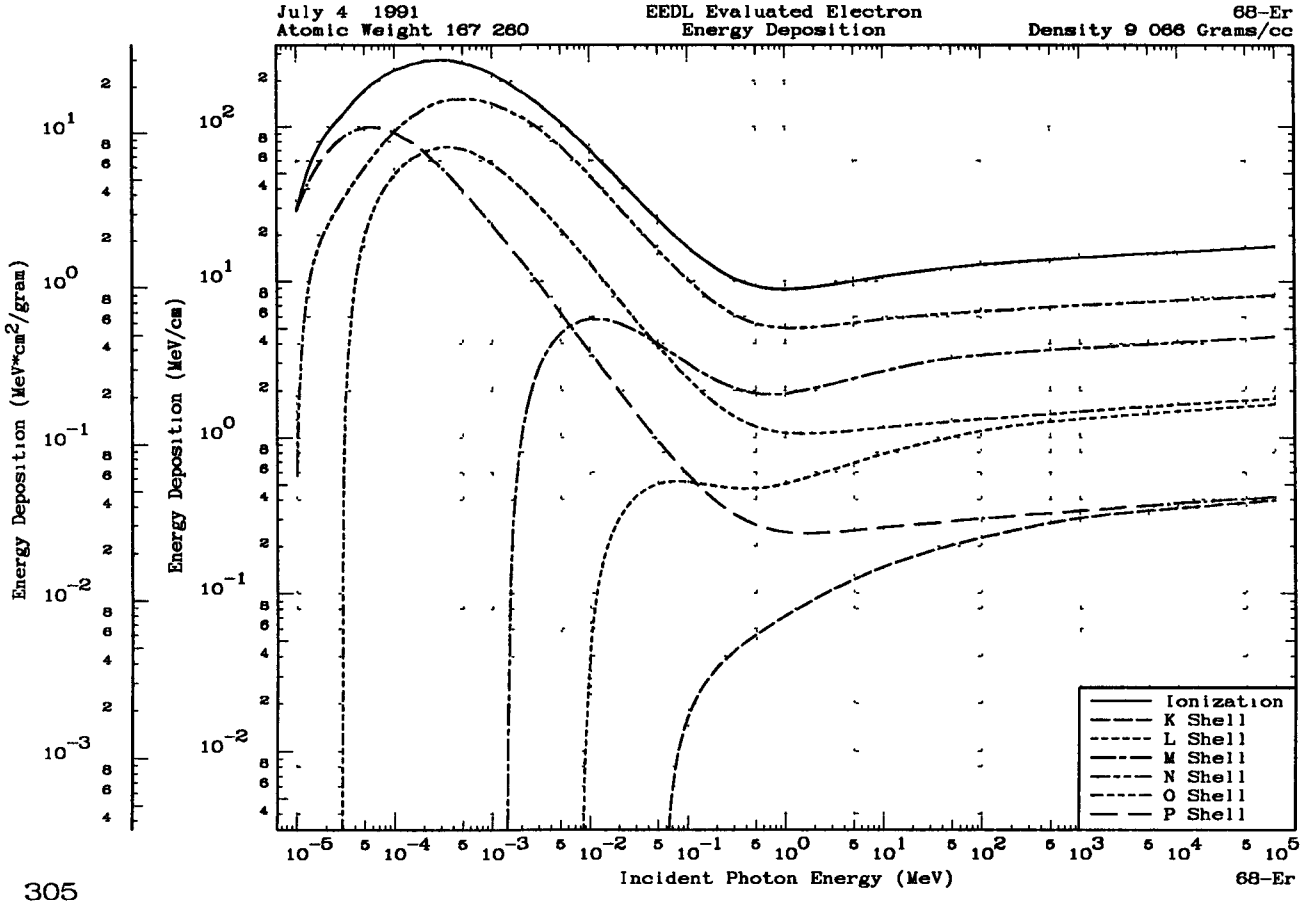
Atomic Weight 164.930 Density 8.795 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.2500–2	3.7813–7	3.0070+5	2.7733–4	8.2353+7	5.2525+7	9.6177+6	2.0206+7	3.7994+3	4.8648+1	4.0135+1	8.2940+0	2.1952–1
2.5000–2	4.0911–7	2.7792+5	3.3060–4	7.6116+7	4.9112+7	8.7935+6	1.8206+7	3.6121+3	4.5248+1	3.7461+1	7.5619+0	2.2595–1
2.6250–2	4.2427–7	2.6799+5	3.5869–4	7.3396+7	4.7608+7	8.4362+6	1.7348+7	3.5285+3	4.3777+1	3.6300+1	7.2479+0	2.2915–1
3.0000–2	4.6856–7	2.4266+5	4.4820–4	6.6458+7	4.3722+7	7.5310+6	1.5202+7	3.3095+3	4.0064+1	3.3363+1	6.4622+0	2.3864–1
4.0000–2	5.7996–7	1.9605+5	7.2266–4	5.3693+7	3.6280+7	5.9323+6	1.1478+7	2.8595+3	3.3032+1	2.7728+1	5.0469+0	2.5693–1
5.0000–2	6.8334–7	1.6639+5	1.0481–3	4.5570+7	3.1381+7	4.9530+6	9.2327+6	2.5489+3	2.8526+1	2.4088+1	4.1661+0	2.7167–1
K 5.5699–2	7.3912–7	1.5383+5	1.2550–3	4.2131+7	2.9255+7	4.5491+6	8.3242+6	2.4111+3	2.6598+1	2.2520+1	3.7987+0	2.7894–1
5.6774–2	7.4937–7	1.5173+5	1.2957–3	4.1554+7	2.8893+7	4.4811+6	8.1773+6	2.3875+3	2.6278+1	2.2257+1	3.7408+0	2.8029–1
5.8387–2	7.6464–7	1.4870+5	1.3576–3	4.0725+7	2.8372+7	4.3833+6	7.9668+6	2.3534+3	2.5818+1	2.1878+1	3.6577+0	2.8232–1
6.0000–2	7.7978–7	1.4581+5	1.4206–3	3.9934+7	2.7874+7	4.2902+6	7.7672+6	2.3206+3	2.5381+1	2.1518+1	3.5790+0	2.8434–1
6.2500–2	8.0250–7	1.4168+5	1.5204–3	3.8803+7	2.7159+7	4.1596+6	7.4827+6	2.2730+3	2.4743+1	2.0994+1	3.4623+0	2.8702–1
6.6875–2	8.4158–7	1.3510+5	1.7009–3	3.7001+7	2.6013+7	3.9519+6	7.0340+6	2.1963+3	2.3731+1	2.0161+1	3.2783+0	2.9171–1
7.3438–2	8.9873–7	1.2651+5	1.9854–3	3.4648+7	2.4508+7	3.6815+6	6.4572+6	2.0944+3	2.2418+1	1.9077+1	3.0420+0	2.9876–1
8.0000–2	9.5428–7	1.1915+5	2.2857–3	3.2631+7	2.3208+7	3.4505+6	5.9713+6	2.0054+3	2.1301+1	1.8153+1	2.8432+0	3.0576–1
9.0000–2	1.0340–6	1.0996+5	2.7715–3	3.0116+7	2.1577+7	3.1692+6	5.3676+6	1.8981+3	1.9879+1	1.6976+1	2.5880+0	3.1507–1
1.0000–1	1.1108–6	1.0236+5	3.2899–3	2.8034+7	2.0215+7	2.9371+6	4.8795+6	1.8070+3	1.8713+1	1.6007+1	2.3819+0	3.2438–1
1.1250–1	1.1966–6	9.5021+4	3.9791–3	2.6024+7	1.8871+7	2.7183+6	4.4328+6	1.7133+3	1.7574+1	1.5052+1	2.1887+0	3.3348–1
1.3125–1	1.3188–6	8.6217+4	5.0893–3	2.3612+7	1.7245+7	2.4564+6	3.9094+6	1.5980+3	1.6223+1	1.3912+1	1.9632+0	3.4730–1
1.5000–1	1.4345–6	7.9264+4	6.2843–3	2.1708+7	1.5951+7	2.2500+6	3.5062+6	1.5044+3	1.5170+1	1.3019+1	1.7902+0	3.6110–1
2.0000–1	1.7015–6	6.6825+4	9.7953–3	1.8302+7	1.3602+7	1.9050+6	2.7933+6	1.3342+3	1.3350+1	1.1486+1	1.4720+0	3.9248–1
2.5000–1	1.9355–6	5.8746+4	1.3696–2	1.6089+7	1.2012+7	1.7092+6	2.3662+6	1.2293+3	1.2303+1	1.0606+1	1.2754+0	4.2159–1
3.0000–1	2.1499–6	5.2887+4	1.7888–2	1.4484+7	1.0853+7	1.5643+6	2.0662+6	1.1498+3	1.1557+1	9.9678+0	1.1385+0	4.5040–1
4.0000–1	2.5401–6	4.4763+4	2.6870–2	1.2259+7	9.1915+6	1.3986+6	1.6682+6	1.0538+3	1.0720+1	9.2628+0	9.4882–1	5.0854–1
5.0000–1	2.8819–6	3.9453+4	3.6384–2	1.0805+7	8.0689+6	1.3034+6	1.4318+6	9.9829+2	1.0303+1	8.8991+0	8.3495–1	5.6932–1
6.0000–1	3.1840–6	3.5710+4	4.6197–2	9.7801+6	7.2543+6	1.2429+6	1.2819+6	9.6395+2	1.0079+1	8.6829+0	7.6305–1	6.3269–1
8.0000–1	3.7061–6	3.0679+4	6.6166–2	8.4022+6	6.1333+6	1.1725+6	1.0955+6	9.2513+2	9.9533+0	8.5156+0	6.7329–1	7.6431–1
1.0000+0	4.1361–6	2.7490+4	8.6214–2	7.5288+6	5.3962+6	1.1343+6	9.9745+5	9.0583+2	9.9987+0	8.4676+0	6.2849–1	9.0261–1
1.2500+0	4.5832–6	2.4808+4	1.1095–1	6.7942+6	4.7664+6	1.1111+6	9.1579+5	8.9736+2	1.0212+1	8.5321+0	5.9013–1	1.0897+0
1.5000+0	4.9637–6	2.2907+4	1.3515–1	6.2735+6	4.3068+6	1.0926+6	8.7315+5	8.9050+2	1.0454+1	8.6038+0	5.7512–1	1.2753+0
2.0000+0	5.5446–6	2.0507+4	1.8177–1	5.6162+6	3.7049+6	1.0821+6	8.2827+5	8.8968+2	1.1001+1	8.7674+0	5.5810–1	1.6757+0
3.0000+0	6.3348–6	1.7949+4	2.6821–1	4.9156+6	3.0580+6	1.0692+6	7.8759+5	8.9501+2	1.2156+1	9.0874+0	5.5531–1	2.5128+0
4.0000+0	6.8391–6	1.6625+4	3.4673–1	4.5532+6	2.7084+6	1.0640+6	7.7987+5	9.0257+2	1.3334+1	9.3700+0	5.6012–1	3.4039+0
5.0000+0	7.1847–6	1.5825+4	4.1868–1	4.3341+6	2.4943+6	1.0638+6	7.7512+5	9.0904+2	1.4476+1	9.5917+0	5.6696–1	4.3174+0
6.0000+0	7.4351–6	1.5292+4	4.8522–1	4.1882+6	2.3548+6	1.0636+6	7.6885+5	9.1483+2	1.5596+1	9.7721+0	5.7261–1	5.2513+0
8.0000+0	7.7619–6	1.4649+4	6.0506–1	4.0118+6	2.1783+6	1.0645+6	7.6809+5	9.2501+2	1.7833+1	1.0071+1	5.8071–1	7.1813+0
1.0000+1	7.9529–6	1.4297+4	7.1066–1	3.9155+6	2.0843+6	1.0652+6	7.6507+5	9.3377+2	2.0089+1	1.0330+1	5.8707–1	9.1718+0
1.5000+1	8.1123–6	1.4016+4	9.3071–1	3.8386+6	2.0013+6	1.0671+6	7.6920+5	9.5142+2	2.5576+1	1.0698+1	5.9879–1	1.4279+1
2.0000+1	8.1229–6	1.3998+4	1.1075+0	3.8336+6	1.9936+6	1.0684+6	7.7065+5	9.6340+2	3.1175+1	1.0986+1	6.0849–1	1.9581+1
3.0000+1	8.0886–6	1.4057+4	1.3814+0	3.8498+6	1.9933+6	1.0695+6	7.8602+5	9.7787+2	4.2409+1	1.1341+1	6.2441–1	3.0444+1
4.0000+1	8.0685–6	1.4092+4	1.5902+0	3.8594+6	1.9924+6	1.0703+6	7.9574+5	9.9307+2	5.3846+1	1.1579+1	6.3597–1	4.1630+1
5.0000+1	8.0553–6	1.4115+4	1.7585+0	3.8657+6	1.9917+6	1.0707+6	8.0231+5	1.0052+3	6.5379+1	1.1762+1	6.4509–1	5.2972+1
6.0000+1	8.0491–6	1.4126+4	1.8993+0	3.8687+6	1.9912+6	1.0709+6	8.0559+5	1.0153+3	7.6984+1	1.1893+1	6.5161–1	6.4440+1
8.0000+1	8.0300–6	1.4159+4	2.1260+0	3.8779+6	1.9903+6	1.0712+6	8.1533+5	1.0310+3	1.0051+2	1.2113+1	6.6134–1	8.7737+1
1.0000+2	8.0178–6	1.4181+4	2.3046+0	3.8838+6	1.9896+6	1.0715+6	8.2166+5	1.0431+3	1.2422+2	1.2305+1	6.6834–1	1.1125+2
1.5000+2	7.9914–6	1.4228+4	2.6334+0	3.8966+6	1.9884+6	1.0716+6	8.3558+5	1.0647+3	1.8387+2	1.2504+1	6.7994–1	1.7068+2
2.0000+2	7.9772–6	1.4253+4	2.8686+0	3.9036+6	1.9875+6	1.0717+6	8.4328+5	1.0792+3	2.4409+2	1.2687+1	6.8649–1	2.3072+2
3.0000+2	7.9630–6	1.4279+4	3.2018+0	3.9105+6	1.9863+6	1.0718+6	8.5135+5	1.0968+3	3.6408+2	1.2970+1	6.9362–1	3.5042+2
4.0000+2	7.9584–6	1.4287+4	3.4391+0	3.9128+6	1.9854+6	1.0718+6	8.5448+5	1.1087+3	4.8433+2	1.3124+1	6.9673–1	4.7050+2
5.0000+2	7.9588–6	1.4286+4	3.6234+0	3.9126+6	1.9847+6	1.0718+6	8.5489+5	1.1179+3	6.0544+2	1.3265+1	6.9763–1	5.9147+2
6.0000+2	7.9570–6	1.4289+4	3.7741+0	3.9135+6	1.9842+6	1.0718+6	8.5632+5	1.1259+3	7.2511+2	1.3370+1	6.9937–1	7.1104+2
8.0000+2	7.9566–6	1.4290+4	4.0122+0	3.9137+6	1.9833+6	1.0719+6	8.5737+5	1.1385+3	9.6661+2	1.3561+1	7.0136–1	9.5235+2
1.0000+3	7.9582–6	1.4287+4	4.1969+0	3.9129+6	1.9826+6	1.0719+6	8.5724+5	1.1486+3	1.2081+3	1.3717+1	7.0239–1	1.1936+3
1.5000+3	7.9574–6	1.4289+4	4.5322+0	3.9133+6	1.9814+6	1.0719+6	8.5883+5	1.1673+3	1.8154+3	1.3868+1	7.0370–1	1.8008+3
2.0000+3	7.9590–6	1.4286+4	4.7699+0	3.9125+6	1.9806+6	1.0719+6	8.5889+5	1.1809+3	2.4204+3	1.4017+1	7.0377–1	2.4057+3
3.0000+3	7.9616–6	1.4281+4	5.1047+0	3.9112+6	1.9793+6	1.0719+6	8.5885+5	1.2013+3	3.6352+3	1.4304+1	7.0377–1	3.6202+3
4.0000+3	7.9646–6	1.4276+4	5.3421+0	3.9098+6	1.9785+6	1.0719+6	8.5822+5	1.2161+3	4.8496+3	1.4425+1	7.0328–1	4.8345+3
5.0000+3	7.9696–6	1.4267+4	5.5260+0	3.9073+6	1.9778+6	1.0719+6	8.5642+5	1.2277+3	6.0732+3	1.4546+1	7.0184–1	6.0579+3
6.0000+3	7.9701–6	1.4266+4	5.6762+0	3.9071+6	1.9772+6	1.0719+6	8.5673+5	1.2361+3	7.2734+3	1.4639+1	7.0213–1	7.2580+3
8.0000+3	7.9723–6	1.4262+4	5.9136+0	3.9060+6	1.9764+6	1.0719+6	8.5649+5	1.2496+3	9.6946+3	1.4826+1	7.0200–1	9.6791+3
1.0000+4	7.9744–6	1.4258+4	6.0976+0	3.9050+6	1.9757+6	1.0719+6	8.5614+5	1.2602+3	1.2138+4	1.4997+1	7.0178–1	1.2123+4
1.5000+4	7.9772–6	1.4253+4	6.4322+0	3.9036+6	1.9745+6	1.0719+6	8.5594+5	1.2805+3	1.8148+4	1.5138+1	7.0161–1	1.8132+4
2.0000+4	7.9803–6	1.4248+4	6.6698+0	3.9021+6	1.9736+6	1.0719+6	8.5531+5	1.2952+3	2.4235+4	1.5279+1	7.0110–1	2.4219+4
3.0000+4	7.9829–6	1.4243+4	7.0048+0	3.9008+6	1.9724+6	1.0719+6	8.5523+5	1.3158+3	3.6271+4	1.5561+1	7.0104–1	3.6255+4
4.0000+4	7.9857–6	1.4238+4	7.2425+0	3.8994+6	1.9715+6	1.0719+6	8.5468+5	1.3305+3	4.8436+4	1.5701+1	7.0059–1	4.8419+4
5.0000+4	7.9901–6	1.4230+4	7.4269+0	3.8973+6	1.9708+6	1.0719+6	8.5323+5	1.3419+3	6.0488+4	1.5816+1	6.9940–1	6.0471+4
6.0000+4	7.9904–6	1.4230+4	7.5777+0	3.8971+6	1.9703+6	1.0719+6	8.5362+5	1.3512+3	7.2529+4	1.5907+1	6.9972–1	7.2513+4
8.0000+4	7.9920–6	1.4227+4	7.8155+0	3.8964+6	1.9694+6	1.0719+6	8.5369+5	1.3659+3	9.6824+4	1.6089+1	6.9978–1	9.6807+4
1.0000+5	7.9935–6	1.4224+4	7.9998+0	3.8956+6	1.9688+6	1.0719+6	8.5361+5	1.3774+3	1.2116+5	1.6263+1	6.9972–1	1.2114+5


July 4, 1991
Atomic Weight 167.260
EEDL Evaluated Electron
Cross Sections
68-Er
Density 9.066 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
68-Er


July 4, 1991
Atomic Weight 167.260
EEDL Evaluated Electron
Energy Deposition
68-Er
Density 9.066 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
68-Er


July 4 1991
Atomic Weight 167 260
EEDL Evaluated Electron
Shell Cross Sections
68-Er
Density 9 066 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
68-Er


July 4 1991
Atomic Weight 167 260
EEDL Evaluated Electron
Energy Deposition
68-Er
Density 9 066 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
68-Er

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Atomic Weight 167.260 Density 9.066 Grams/cc

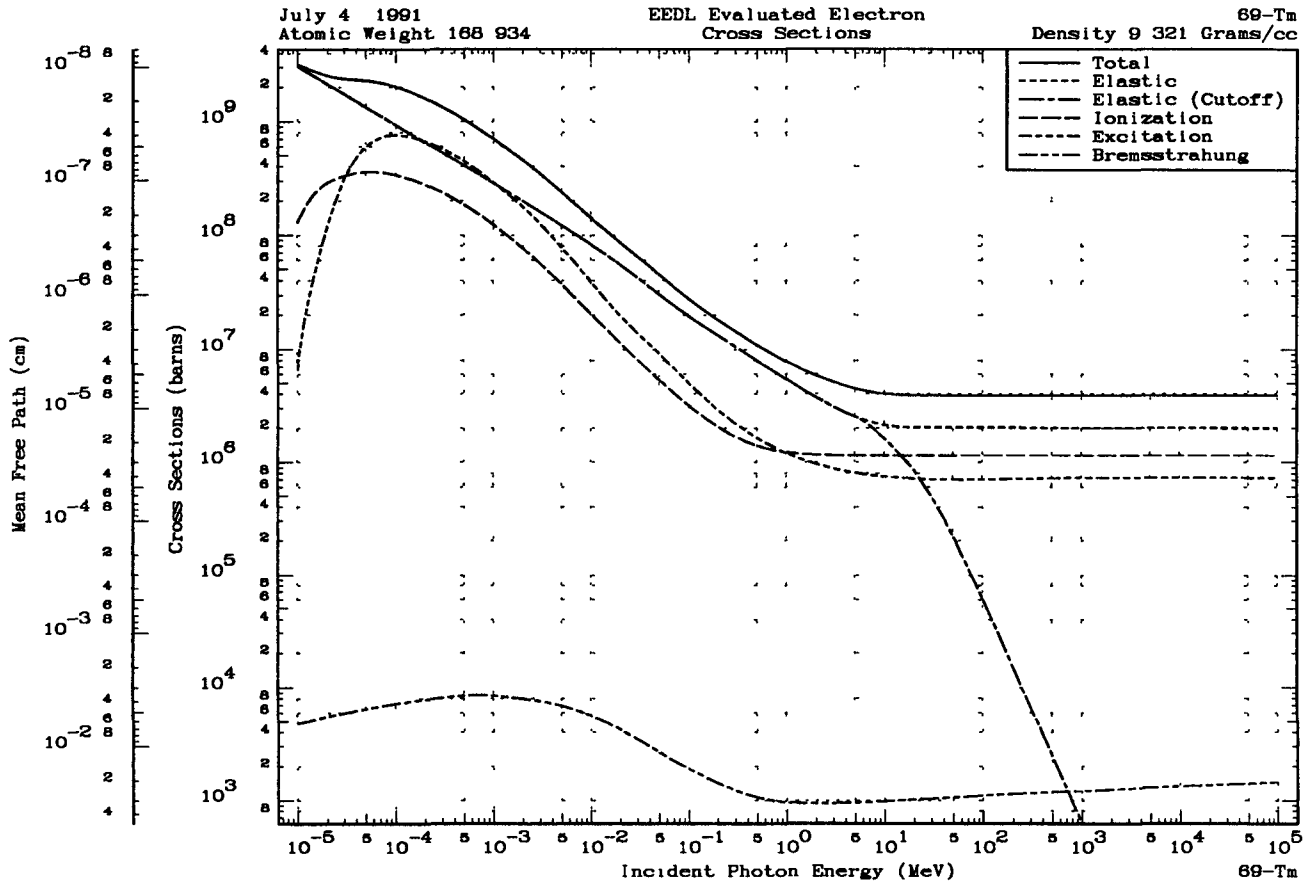
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.5307–9	1.1573+7		3.2144+9	3.0708+9	1.3508+8	8.4978+6	4.8080+3	3.1074+1	2.9286+1	1.7879+0	3.3911–4
	1.0313–5	9.6469–9	1.1434+7		3.1757+9	3.0228+9	1.4261+8	1.0315+7	4.8379+3	3.3662+1	3.1472+1	2.1900+0	3.4927–4
	1.0606–5	9.7518–9	1.1311+7		3.1415+9	2.9797+9	1.4957+8	1.2306+7	4.8652+3	3.6157+1	3.3522+1	2.6346+0	3.5884–4
N6	1.0940–5	9.8683–9	1.1177+7		3.1044+9	2.9326+9	1.5723+8	1.4610+7	4.8957+3	3.8955+1	3.5797+1	3.1578+0	3.6982–4
	1.1067–5	9.9103–9	1.1130+7		3.0913+9	2.9153+9	1.6040+8	1.5561+7	4.9071+3	4.0177+1	3.6803+1	3.3727+0	3.7399–4
	1.1155–5	9.9392–9	1.1098+7		3.0823+9	2.9035+9	1.6252+8	1.6249+7	4.9149+3	4.1004+1	3.7475+1	3.5286+0	3.7689–4
	1.1313–5	9.9903–9	1.1041+7		3.0665+9	2.8827+9	1.6631+8	1.7547+7	4.9289+3	4.2517+1	3.8693+1	3.8237+0	3.8210–4
	1.1635–5	1.0093–8	1.0928+7		3.0352+9	2.8414+9	1.7379+8	1.9973+7	4.9568+3	4.5490+1	4.1107+1	4.3829+0	3.9279–4
	1.1774–5	1.0136–8	1.0882+7		3.0224+9	2.8243+9	1.7702+8	2.1088+7	4.9686+3	4.6805+1	4.2163+1	4.6415+0	3.9738–4
	1.2177–5	1.0258–8	1.0752+7		2.9864+9	2.7759+9	1.8583+8	2.4626+7	5.0024+3	5.0527+1	4.5059+1	5.4673+0	4.1084–4
	1.2477–5	1.0345–8	1.0662+7		2.9614+9	2.7416+9	1.9274+8	2.7081+7	5.0270+3	5.3424+1	4.7372+1	6.0510+0	4.2087–4
	1.2580–5	1.0374–8	1.0632+7		2.9530+9	2.7300+9	1.9503+8	2.7971+7	5.0353+3	5.4411+1	4.8147+1	6.2637+0	4.2435–4
	1.3125–5	1.0525–8	1.0480+7		2.9108+9	2.6713+9	2.0650+8	3.3015+7	5.0785+3	5.9535+1	5.2056+1	7.4786+0	4.4273–4
	1.3185–5	1.0541–8	1.0464+7		2.9062+9	2.6650+9	2.0759+8	3.3611+7	5.0832+3	6.0079+1	5.2455+1	7.6232+0	4.4476–4
	1.3738–5	1.0688–8	1.0320+7		2.8662+9	2.6095+9	2.1728+8	3.9470+7	5.1254+3	6.5096+1	5.6040+1	9.0559+0	4.6356–4
	1.3941–5	1.0740–8	1.0270+7		2.8524+9	2.5900+9	2.2065+8	4.1797+7	5.1405+3	6.6942+1	5.7312+1	9.6300+0	4.7048–4
	1.4093–5	1.0778–8	1.0234+7		2.8424+9	2.5756+9	2.2319+8	4.3512+7	5.1517+3	6.8333+1	5.8276+1	1.0056+1	4.7566–4
	1.5000–5	1.0991–8	1.0036+7		2.7873+9	2.4946+9	2.3791+8	5.4870+7	5.2168+3	7.6906+1	6.3988+1	1.2918+1	5.0689–4
	1.6250–5	1.1265–8	9.7916+6		2.7195+9	2.3943+9	2.5346+8	7.1794+7	5.3015+3	8.7625+1	7.0510+1	1.7114+1	5.5042–4
	1.7500–5	1.1493–8	9.5970+6		2.6655+9	2.3051+9	2.6834+8	9.2085+7	5.3812+3	9.9268+1	7.7046+1	2.2221+1	5.9452–4
	1.8125–5	1.1602–8	9.5074+6		2.6406+9	2.2640+9	2.7411+8	1.0252+8	5.4193+3	1.0480+2	7.9910+1	2.4890+1	6.1678–4
	2.0000–5	1.1867–8	9.2949+6		2.5816+9	2.1526+9	2.9048+8	1.3853+8	5.5278+3	1.2268+2	8.8435+1	3.4245+1	6.8433–4
	2.2500–5	1.2155–8	9.0744+6		2.5203+9	2.0265+9	3.0451+8	1.8936+8	5.6441+3	1.4449+2	9.7291+1	4.7198+1	7.6832–4
	2.5000–5	1.2358–8	8.9258+6		2.4791+9	1.9199+9	3.1716+8	2.4198+8	5.7503+3	1.6682+2	1.0601+2	6.0810+1	8.5367–4
	2.6250–5	1.2429–8	8.8744+6		2.4648+9	1.8725+9	3.2121+8	2.7108+8	5.8001+3	1.7790+2	1.0950+2	6.8401+1	8.9682–4
O3	2.9060–5	1.2563–8	8.7801+6		2.4386+9	1.7774+9	3.2992+8	3.3128+8	5.9054+3	2.0176+2	1.1740+2	8.4356+1	9.9494–4
	2.9295–5	1.2572–8	8.7739+6		2.4369+9	1.7701+9	3.3077+8	3.3604+8	5.9137+3	2.0383+2	1.1821+2	8.5619+1	1.0031–3
	2.9648–5	1.2584–8	8.7654+6		2.4345+9	1.7593+9	3.3204+8	3.4324+8	5.9261+3	2.0696+2	1.1943+2	8.7530+1	1.0155–3
	3.0000–5	1.2595–8	8.7579+6		2.4325+9	1.7486+9	3.3332+8	3.5050+8	5.9383+3	2.1012+2	1.2066+2	8.9461+1	1.0278–3
	3.1250–5	1.2645–8	8.7232+6		2.4228+9	1.7124+9	3.3625+8	3.7410+8	5.9807+3	2.1995+2	1.2430+2	9.5652+1	1.0717–3
	3.3438–5	1.2700–8	8.6852+6		2.4122+9	1.6541+9	3.4137+8	4.1675+8	6.0516+3	2.3772+2	1.3084+2	1.0689+2	1.1493–3
O2	3.4730–5	1.2716–8	8.6743+6		2.4092+9	1.6223+9	3.4418+8	4.4276+8	6.0917+3	2.4833+2	1.3457+2	1.1376+2	1.1954–3
	3.5059–5	1.2726–8	8.6674+6		2.4073+9	1.6145+9	3.4472+8	4.4813+8	6.1018+3	2.5069+2	1.3550+2	1.1519+2	1.2073–3
	3.5677–5	1.2743–8	8.6559+6		2.4041+9	1.6001+9	3.4578+8	4.5824+8	6.1204+3	2.5517+2	1.3728+2	1.1789+2	1.2294–3
	3.6217–5	1.2756–8	8.6472+6		2.4017+9	1.5878+9	3.4674+8	4.6712+8	6.1364+3	2.5916+2	1.3890+2	1.2027+2	1.2489–3
	3.6719–5	1.2766–8	8.6402+6		2.3997+9	1.5767+9	3.4767+8	4.7540+8	6.1511+3	2.6291+2	1.4043+2	1.2248+2	1.2670–3
	3.7163–5	1.2775–8	8.6344+6		2.3981+9	1.5670+9	3.4838+8	4.8275+8	6.1640+3	2.6613+2	1.4168+2	1.2446+2	1.2831–3
	3.8582–5	1.2795–8	8.6208+6		2.3944+9	1.5372+9	3.5070+8	5.0642+8	6.2044+3	2.7656+2	1.4575+2	1.3081+2	1.3346–3
	4.0000–5	1.2805–8	8.6143+6		2.3925+9	1.5091+9	3.5314+8	5.3032+8	6.2436+3	2.8725+2	1.4999+2	1.3726+2	1.3864–3
	4.5000–5	1.2914–8	8.5415+6		2.3723+9	1.4207+9	3.5683+8	5.9474+8	6.3615+3	3.1650+2	1.6189+2	1.5462+2	1.5627–3
	5.0000–5	1.3054–8	8.4498+6		2.3469+9	1.3461+9	3.6022+8	6.4051+8	6.4689+3	3.4072+2	1.7346+2	1.6726+2	1.7417–3
	5.5000–5	1.3259–8	8.3191+6		2.3106+9	1.2820+9	3.5992+8	6.6862+8	6.5630+3	3.5777+2	1.8235+2	1.7541+2	1.9194–3
O1	5.6730–5	1.3321–8	8.2803+6		2.2998+9	1.2618+9	3.5993+8	6.7801+8	6.5938+3	3.6364+2	1.8548+2	1.7817+2	1.9814–3
	5.7548–5	1.3351–8	8.2619+6		2.2947+9	1.2526+9	3.5993+8	6.8210+8	6.6081+3	3.6634+2	1.8696+2	1.7938+2	2.0108–3
	5.8774–5	1.3394–8	8.2354+6		2.2873+9	1.2392+9	3.5996+8	6.8816+8	6.6293+3	3.7040+2	1.8921+2	1.8119+2	2.0549–3
	6.0000–5	1.3435–8	8.2103+6		2.2803+9	1.2262+9	3.6003+8	6.9416+8	6.6500+3	3.7446+2	1.9148+2	1.8298+2	2.0992–3
	6.2500–5	1.3562–8	8.1331+6		2.2589+9	1.2008+9	3.5847+8	6.9964+8	6.6913+3	3.7930+2	1.9464+2	1.8467+2	2.1899–3
	6.6875–5	1.3770–8	8.0106+6		2.2249+9	1.1599+9	3.5616+8	7.0882+8	6.7602+3	3.8787+2	2.0035+2	1.8752+2	2.3498–3
	7.0000–5	1.3907–8	7.9317+6		2.2030+9	1.1331+9	3.5478+8	7.1508+8	6.8072+3	3.9404+2	2.0454+2	1.8949+2	2.4649–3
	7.3438–5	1.4050–8	7.8507+6		2.1805+9	1.1056+9	3.5314+8	7.2172+8	6.8568+3	4.0041+2	2.0881+2	1.9160+2	2.5924–3
	8.0000–5	1.4299–8	7.7139+6		2.1425+9	1.0582+9	3.5053+8	7.3372+8	6.9463+3	4.1263+2	2.1718+2	1.9545+2	2.8379–3
	9.0000–5	1.4791–8	7.4572+6		2.0712+9	9.9627+8	3.4300+8	7.3192+8	7.0616+3	4.2151+2	2.2534+2	1.9616+2	3.2119–3
	1.0000–4	1.5232–8	7.2416+6	0.0000+0	2.0113+9	9.4395+8	3.3704+8	7.3031+8	7.1665+3	4.3101+2	2.3410+2	1.9691+2	3.5913–3
	1.2500–4	1.6270–8	6.7794+6	5.7201–8	1.8829+9	8.4223+8	3.1790+8	7.2280+8	7.3755+3	4.4315+2	2.4647+2	1.9667+2	4.5473–3
	1.3125–4	1.6501–8	6.6845+6	7.1262–8	1.8566+9	8.2149+8	3.1391+8	7.2117+8	7.4221+3	4.4586+2	2.4919+2	1.9667+2	4.7901–3
	1.5000–4	1.7214–8	6.4077+6	1.1300–7	1.7797+9	7.6731+8	3.0376+8	7.0861+8	7.5509+3	4.5260+2	2.5804+2	1.9455+2	5.5268–3
N5	1.7226–4	1.8078–8	6.1014+6	1.6218–7	1.6946+9	7.1493+8	2.8990+8	6.8977+8	7.6867+3	4.5266+2	2.6223+2	1.9043+2	6.4161–3
	1.7920–4	1.8326–8	6.0189+6	1.7749–7	1.6717+9	7.0065+8	2.8610+8	6.8494+8	7.7260+3	4.5325+2	2.6381+2	1.8944+2	6.6962–3
N4	1.8025–4	1.8363–8	6.0068+6	1.7982–7	1.6683+9	6.9855+8	2.8555+8	6.8422+8	7.7318+3	4.5335+2	2.6405+2	1.8930+2	6.7389–3
	1.8519–4	1.8532–8	5.9519+6	1.9070–7	1.6531+9	6.8897+8	2.8299+8	6.8111+8	7.7533+3	4.5396+2	2.6525+2	1.8870+2	6.9414–3
	1.8960–4	1.8681–8	5.9046+6	2.0041–7	1.6400+9	6.8074+8	2.8081+8	6.7840+8	7.7722+3	4.5459+2	2.6639+2	1.8819+2	7.1227–3
	1.9259–4	1.8780–8	5.8734+6	2.0700–7	1.6313+9	6.7531+8	2.7937+8	6.7661+8	7.7847+3	4.5505+2	2.6718+2	1.8786+2	7.2462–3
	2.0000–4	1.9020–8	5.7993+6	2.2325–7	1.6107+9	6.6241+8	2.7599+8	6.7231+8	7.8150+3	4.5628+2	2.6921+2	1.8706+2	7.5522–3
	2.1250–4	1.9486–8	5.6607+6	2.5072–7	1.5722+9	6.4220+8	2.6907+8	6.6092+8	7.8600+3	4.5385+2	2.6950+2	1.8435+2	8.0727–3
	2.2500–4	1.9934–8	5.5335+6	2.7832–7	1.5369+9	6.2372+8	2.6280+8	6.5036+8	7.9026+3	4.5199+2	2.7012+2	1.8186+2	8.5961–3
	2.3438–4	2.0258–8	5.4448+6	2.9909–7	1.5122+9	6.1084+8	2.5846+8	6.4292+8	7.9332+3	4.5088+2	2.7077+2	1.8011+2	8.9904–3
	2.4375–4	2.0575–8	5.3611+6	3.1990–7	1.4890+9	5.9872+8	2.5440+8	6.3586+8	7.9627+3	4.4997+2	2.7150+2	1.7846+2	9.3863–3
	2.5000–4	2.0781–8	5.3078+6	3.3380–7	1.4742+9	5.9103+8	2.5183+8	6.3134+8	7.9818+3	4.4947+2	2.7205+2	1.7741+2	9.6510–3
	2.6719–4	2.1331–8	5.1709+6	3.7212–7	1.4362+9	5.7128+8	2.4527+8	6.1962+8	8.0322+3	4.4754+2	2.7282+2	1.7471+2	1.0382–2
	2.7188–4	2.1477–8	5.1358+6	3.8260–7	1.4264+9	5.6623+8	2.4359+8	6.1659+8	8.0454+3	4.4710+2	2.7307+2	1.7402+2	1.0582–2
	3.0000–4	2.2319–8	4.9422+6	4.4564–7	1.3727+9	5.3845+8	2.3447+8	5.9973+8	8.1207+3	4.4522+2	2.7502+2	1.7019+2	1.1790–2
N3	3.1297–4	2.2746–8	4.8493+6	4.7488–7	1.3469+9	5.2693+8	2.2981+8	5.9011+8	8.1533+3	4.4174+2	2.7398+2	1.6775+2	1.2351–2
	3.1841–4	2.2924–8	4.8117+6	4.8721–7	1.3364+9	5.2232+8	2.2795+8	5.8612+8	8.1666+3	4.4039+2	2.7363+2	1.6675+2	1.2587–2
	3.2861–4	2.3253–8	4.7436+6	5.1044–7	1.3175+9	5.1400+8	2.2459+8	5.7889+8	8.1910+3	4.3800+2	2.7305+2	1.6493+2	1.3030–2
	3.4646–4	2.3815–8	4.6317+6	5.5136–7	1.2864+9	5.0033+8	2.1912+8	5.6696+8	8.2321+3	4.3425+2	2.7229+2	1.6195+2	1.3809–2
N2	3.5704–4	2.4140–8	4.5693+6	5.7579–7	1.2691+9	4.9272+8	2.1608+8	5.6028+8	8.2555+3	4.3227+2	2.7196+2	1.6029+2	1.4272–2
	3.6241–4	2.4306–8	4.5380+6	5.8823–7	1.2604+9	4.8899+8	2.1458+8	5.5683+8	8.2657+3	4.3123+2	2.7177+2	1.5944+2	1.4510–2
	3.7181–4	2.4594–8	4.4849+6	6.1006–7	1.2457+9	4.8265+8	2.1203+8	5.5096+8	8.2830+3	4.2953+2	2.7151+2	1.5801+2	1.4928–2
	3.7323–4	2.4637–8	4.4771+6	6.1337–7	1.2435+9	4.8172+8	2.1165+8	5.5010+8	8.2856+3	4.2929+2	2.7147+2	1.5780+2	1.4991–2
	3.8590–4	2.5018–8	4.4089+6	6.4297–7	1.2245+9	4.7359+8	2.0840+8	5.4255+8	8.3083+3	4.2719+2	2.7121+2	1.5596+2	1.5555–2

Atomic Weight 167.260 Density 9.066 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.0000–4	2.5433–8	4.3370+6	6.7605–7	1.2046+9	4.6501+8	2.0498+8	5.3456+8	8.3327+3	4.2510+2	2.7105+2	1.5403+2	1.6184–2
	4.2500–4	2.6208–8	4.2087+6	7.3533–7	1.1689+9	4.5087+8	1.9848+8	5.1958+8	8.3634+3	4.1833+2	2.6818+2	1.5014+2	1.7320–2
N1	4.3685–4	2.6567–8	4.1519+6	7.6376–7	1.1532+9	4.4460+8	1.9562+8	5.1293+8	8.3773+3	4.1541+2	2.6698+2	1.4842+2	1.7860–2
	4.4474–4	2.6811–8	4.1141+6	7.8280–7	1.1427+9	4.4056+8	1.9379+8	5.0830+8	8.3864+3	4.1350+2	2.6625+2	1.4723+2	1.8221–2
	4.5000–4	2.6972–8	4.0895+6	7.9553–7	1.1358+9	4.3793+8	1.9259+8	5.0529+8	8.3924+3	4.1227+2	2.6579+2	1.4646+2	1.8461–2
	4.5856–4	2.7233–8	4.0503+6	8.1634–7	1.1250+9	4.3375+8	1.9070+8	5.0050+8	8.4019+3	4.1032+2	2.6508+2	1.4523+2	1.8852–2
	4.6250–4	2.7352–8	4.0327+6	8.2596–7	1.1201+9	4.3186+8	1.8985+8	4.9833+8	8.4063+3	4.0945+2	2.6476+2	1.4468+2	1.9032–2
	4.7928–4	2.7854–8	3.9601+6	8.6711–7	1.0999+9	4.2409+8	1.8635+8	4.8943+8	8.4245+3	4.0593+2	2.6351+2	1.4240+2	1.9801–2
	5.0000–4	2.8461–8	3.8756+6	9.1841–7	1.0764+9	4.1505+8	1.8229+8	4.7906+8	8.4461+3	4.0195+2	2.6217+2	1.3976+2	2.0753–2
	5.5000–4	2.9975–8	3.6799+6	1.0445–6	1.0221+9	3.9538+8	1.7323+8	4.5343+8	8.4809+3	3.9139+2	2.5837+2	1.3299+2	2.3030–2
	6.0000–4	3.1424–8	3.5102+6	1.1736–6	9.7492+8	3.7824+8	1.6544+8	4.3124+8	8.5127+3	3.8277+2	2.5560+2	1.2715+2	2.5317–2
	7.0000–4	3.4250–8	3.2205+6	1.4419–6	8.9446+8	3.4967+8	1.5100+8	3.9378+8	8.5178+3	3.6288+2	2.4571+2	1.1714+2	2.9651–2
	8.0000–4	3.6897–8	2.9894+6	1.7233–6	8.3029+8	3.2668+8	1.3964+8	3.6397+8	8.5222+3	3.4798+2	2.3872+2	1.0922+2	3.3987–2
	9.0000–4	3.9481–8	2.7938+6	2.0172–6	7.7596+8	3.0765+8	1.2962+8	3.3868+8	8.4710+3	3.3261+2	2.3020+2	1.0237+2	3.7658–2
	1.0000–3	4.1941–8	2.6300+6	2.3236–6	7.3045+8	2.9158+8	1.2132+8	3.1754+8	8.4254+3	3.2028+2	2.2357+2	9.6669+1	4.1310–2
	1.1250–3	4.5138–8	2.4437+6	2.7247–6	6.7871+8	2.7454+8	1.1198+8	2.9218+8	8.3294+3	3.0311+2	2.1348+2	8.9582+1	4.5001–2
	1.2500–3	4.8196–8	2.2886+6	3.1469–6	6.3565+8	2.6014+8	1.0427+8	2.7122+8	8.2444+3	2.8921+2	2.0542+2	8.3742+1	4.8661–2
M5	1.4120–3	5.1984–8	2.1219+6	3.7216–6	5.8933+8	2.4443+8	9.6049+7	2.4885+8	8.1471+3	2.7466+2	1.9708+2	7.7531+1	5.3363–2
	1.4230–3	5.2239–8	2.1115+6	3.7617–6	5.8645+8	2.4346+8	9.5532+7	2.4745+8	8.1405+3	2.7370+2	1.9650+2	7.7142+1	5.3658–2
	1.4326–3	5.2462–8	2.1025+6	3.7969–6	5.8396+8	2.4262+8	9.5085+7	2.4624+8	8.1347+3	2.7286+2	1.9600+2	7.6806+1	5.3915–2
	1.4495–3	5.2851–8	2.0870+6	3.8589–6	5.7966+8	2.4118+8	9.4315+7	2.4416+8	8.1247+3	2.7143+2	1.9515+2	7.6226+1	5.4365–2
M4	1.4550–3	5.2979–8	2.0820+6	3.8792–6	5.7826+8	2.4071+8	9.4066+7	2.4348+8	8.1214+3	2.7096+2	1.9487+2	7.6039+1	5.4512–2
	1.4662–3	5.3238–8	2.0719+6	3.9208–6	5.7545+8	2.3976+8	9.3564+7	2.4211+8	8.1148+3	2.7003+2	1.9432+2	7.5661+1	5.4811–2
	1.4747–3	5.3433–8	2.0643+6	3.9523–6	5.7335+8	2.3906+8	9.3190+7	2.4110+8	8.1099+3	2.6935+2	1.9391+2	7.5379+1	5.5037–2
	1.4831–3	5.3625–8	2.0569+6	3.9835–6	5.7129+8	2.3836+8	9.2823+7	2.4010+8	8.1050+3	2.6867+2	1.9351+2	7.5103+1	5.5260–2
	1.5000–3	5.4011–8	2.0422+6	4.0465–6	5.6721+8	2.3699+8	9.2097+7	2.3812+8	8.0953+3	2.6734+2	1.9273+2	7.4557+1	5.5707–2
	1.5156–3	5.4385–8	2.0282+6	4.1051–6	5.6331+8	2.3573+8	9.1402+7	2.3616+8	8.0864+3	2.6587+2	1.9182+2	7.3998+1	5.6121–2
	1.5459–3	5.5105–8	2.0017+6	4.2195–6	5.5595+8	2.3336+8	9.0091+7	2.3249+8	8.0695+3	2.6311+2	1.9011+2	7.2946+1	5.6923–2
	1.6027–3	5.6441–8	1.9543+6	4.4373–6	5.4279+8	2.2910+8	8.7751+7	2.2593+8	8.0388+3	2.5822+2	1.8709+2	7.1069+1	5.8422–2
	1.6250–3	5.6963–8	1.9364+6	4.5241–6	5.3782+8	2.2749+8	8.6870+7	2.2346+8	8.0271+3	2.5640+2	1.8597+2	7.0363+1	5.9011–2
	1.7020–3	5.8739–8	1.8778+6	4.8280–6	5.2155+8	2.2216+8	8.3988+7	2.1539+8	7.9879+3	2.5043+2	1.8231+2	6.8059+1	6.1036–2
M3	1.7962–3	6.0873–8	1.8120+6	5.2092–6	5.0327+8	2.1613+8	8.0760+7	2.0637+8	7.9425+3	2.4382+2	1.7827+2	6.5486+1	6.3502–2
	1.8125–3	6.1243–8	1.8011+6	5.2762–6	5.0023+8	2.1513+8	8.0228+7	2.0486+8	7.9350+3	2.4272+2	1.7760+2	6.5049+1	6.3928–2
	1.8217–3	6.1451–8	1.7950+6	5.3140–6	4.9854+8	2.1458+8	7.9932+7	2.0402+8	7.9307+3	2.4210+2	1.7723+2	6.4807+1	6.4168–2
	1.8510–3	6.2112–8	1.7759+6	5.4357–6	4.9323+8	2.1283+8	7.9004+7	2.0138+8	7.9173+3	2.4016+2	1.7605+2	6.4046+1	6.4932–2
	1.8663–3	6.2455–8	1.7661+6	5.4993–6	4.9052+8	2.1194+8	7.8531+7	2.0004+8	7.9105+3	2.3918+2	1.7546+2	6.3659+1	6.5330–2
	1.9331–3	6.3945–8	1.7250+6	5.7813–6	4.7909+8	2.0816+8	7.6538+7	1.9439+8	7.8811+3	2.3505+2	1.7296+2	6.2029+1	6.7069–2
M2	1.9918–3	6.5237–8	1.6908+6	6.0328–6	4.6961+8	2.0500+8	7.4886+7	1.8971+8	7.8562+3	2.3167+2	1.7092+2	6.0681+1	6.8591–2
	2.0000–3	6.5418–8	1.6861+6	6.0682–6	4.6831+8	2.0457+8	7.4662+7	1.8907+8	7.8528+3	2.3121+2	1.7064+2	6.0498+1	6.8803–2
	2.0312–3	6.6106–8	1.6686+6	6.2039–6	4.6343+8	2.0292+8	7.3785+7	1.8672+8	7.8370+3	2.2924+2	1.6936+2	5.9806+1	6.9498–2
	2.0918–3	6.7429–8	1.6358+6	6.4702–6	4.5434+8	1.9982+8	7.2152+7	1.8235+8	7.8072+3	2.2559+2	1.6700+2	5.8517+1	7.0843–2
	2.1250–3	6.8149–8	1.6185+6	6.6180–6	4.4954+8	1.9819+8	7.1293+7	1.8005+8	7.7913+3	2.2367+2	1.6576+2	5.7840+1	7.1579–2
M1	2.1889–3	6.9523–8	1.5866+6	6.9059–6	4.4065+8	1.9514+8	6.9704+7	1.7580+8	7.7614+3	2.2015+2	1.6349+2	5.6588+1	7.2992–2
	2.2053–3	6.9886–8	1.5783+6	6.9807–6	4.3837+8	1.9437+8	6.9301+7	1.7468+8	7.7539+3	2.1921+2	1.6288+2	5.6258+1	7.3354–2
	2.2396–3	7.0640–8	1.5615+6	7.1377–6	4.3368+8	1.9280+8	6.8478+7	1.7240+8	7.7383+3	2.1728+2	1.6163+2	5.5584+1	7.4107–2
	2.2500–3	7.0869–8	1.5564+6	7.1857–6	4.3229+8	1.9233+8	6.8233+7	1.7171+8	7.7336+3	2.1671+2	1.6125+2	5.5383+1	7.4336–2
	2.3346–3	7.2712–8	1.5170+6	7.5804–6	4.2133+8	1.8863+8	6.6309+7	1.6638+8	7.6965+3	2.1220+2	1.5831+2	5.3813+1	7.6193–2
	2.4040–3	7.4206–8	1.4864+6	7.9099–6	4.1285+8	1.8574+8	6.4825+7	1.6227+8	7.6672+3	2.0875+2	1.5607+2	5.2603+1	7.7709–2
	2.4178–3	7.4502–8	1.4805+6	7.9762–6	4.1121+8	1.8518+8	6.4538+7	1.6148+8	7.6614+3	2.0808+2	1.5563+2	5.2370+1	7.8011–2
	2.4375–3	7.4922–8	1.4722+6	8.0710–6	4.0890+8	1.8440+8	6.4134+7	1.6036+8	7.6533+3	2.0715+2	1.5503+2	5.2041+1	7.8441–2
	2.5000–3	7.6249–8	1.4466+6	8.3749–6	4.0178+8	1.8195+8	6.2891+7	1.5693+8	7.6281+3	2.0427+2	1.5316+2	5.1032+1	7.9802–2
	2.5625–3	7.7565–8	1.4221+6	8.6829–6	3.9497+8	1.7960+8	6.1702+7	1.5365+8	7.6036+3	2.0152+2	1.5137+2	5.0068+1	8.1161–2
	2.5634–3	7.7583–8	1.4217+6	8.6872–6	3.9488+8	1.7957+8	6.1686+7	1.5361+8	7.6033+3	2.0148+2	1.5135+2	5.0055+1	8.1179–2
	2.6250–3	7.8870–8	1.3985+6	8.9951–6	3.8843+8	1.7734+8	6.0564+7	1.5052+8	7.5798+3	1.9890+2	1.4967+2	4.9148+1	8.2516–2
	2.7020–3	8.0463–8	1.3709+6	9.3852–6	3.8074+8	1.7466+8	5.9226+7	1.4685+8	7.5512+3	1.9582+2	1.4767+2	4.8069+1	8.4181–2
	2.7187–3	8.0807–8	1.3650+6	9.4709–6	3.7912+8	1.7409+8	5.8944+7	1.4608+8	7.5452+3	1.9518+2	1.4725+2	4.7841+1	8.4543–2
	2.7817–3	8.2094–8	1.3436+6	9.7953–6	3.7318+8	1.7201+8	5.7912+7	1.4325+8	7.5227+3	1.9281+2	1.4571+2	4.7011+1	8.5899–2
	3.0000–3	8.6484–8	1.2754+6	1.0950–5	3.5423+8	1.6530+8	5.4634+7	1.3429+8	7.4490+3	1.8538+2	1.4090+2	4.4383+1	9.0583–2
	3.2500–3	9.1591–8	1.2043+6	1.2332–5	3.3448+8	1.5837+8	5.1223+7	1.2488+8	7.3454+3	1.7651+2	1.3488+2	4.1530+1	9.4983–2
	3.5000–3	9.6571–8	1.1422+6	1.3780–5	3.1724+8	1.5221+8	4.8257+7	1.1676+8	7.2509+3	1.6889+2	1.2972+2	3.9068+1	9.9346–2
	4.0000–3	1.0619–7	1.0387+6	1.6856–5	2.8850+8	1.4171+8	4.3347+7	1.0343+8	7.0835+3	1.5636+2	1.2121+2	3.5034+1	1.0797–1
	4.5000–3	1.1563–7	9.5396+5	2.0173–5	2.6496+8	1.3280+8	3.9331+7	9.2820+7	6.9149+3	1.4525+2	1.1338+2	3.1755+1	1.1561–1
	5.0000–3	1.2473–7	8.8434+5	2.3726–5	2.4562+8	1.2530+8	3.6059+7	8.4252+7	6.7674+3	1.3630+2	1.0706+2	2.9110+1	1.2314–1
	6.0000–3	1.4231–7	7.7508+5	3.1491–5	2.1527+8	1.1316+8	3.0951+7	7.1155+7	6.4831+3	1.2155+2	9.6418+1	2.5000+1	1.3636–1
	7.0000–3	1.5917–7	6.9297+5	4.0143–5	1.9247+8	1.0371+8	2.7155+7	6.1598+7	6.1972+3	1.0981+2	8.7726+1	2.1941+1	1.4680–1
	8.0000–3	1.7528–7	6.2929+5	4.9639–5	1.7478+8	9.6162+7	2.4248+7	5.4364+7	5.9598+3	1.0091+2	8.1126+1	1.9629+1	1.5700–1
L3	8.3474–3	1.8076–7	6.1021+5	5.3131–5	1.6948+8	9.3819+7	2.3380+7	5.2275+7	5.8750+3	9.8064+1	7.8967+1	1.8936+1	1.5992–1
	8.7605–3	1.8724–7	5.8910+5	5.7413–5	1.6362+8	9.1225+7	2.2432+7	4.9956+7	5.7801+3	9.4959+1	7.6621+1	1.8174+1	1.6336–1
L2	9.2748–3	1.9517–7	5.6517+5	6.2930–5	1.5697+8	8.8254+7	2.1363+7	4.7349+7	5.6700+3	9.1467+1	7.3980+1	1.7319+1	1.6761–1
	9.3803–3	1.9679–7	5.6051+5	6.4088–5	1.5568+8	8.7677+7	2.1157+7	4.6837+7	5.6484+3	9.0796+1	7.3475+1	1.7153+1	1.6848–1
	9.6374–3	2.0072–7	5.4952+5	6.6944–5	1.5263+8	8.6312+7	2.0673+7	4.5635+7	5.5972+3	8.9218+1	7.2284+1	1.6763+1	1.7058–1
L1	9.7162–3	2.0192–7	5.4626+5	6.7830–5	1.5172+8	8.5905+7	2.0529+7	4.5279+7	5.5818+3	8.8750+1	7.1931+1	1.6648+1	1.7123–1
	9.8581–3	2.0409–7	5.4047+5	6.9436–5	1.5011+8	8.5185+7	2.0276+7	4.4643+7	5.5546+3	8.7926+1	7.1310+1	1.6444+1	1.7238–1
	1.0000–2	2.0624–7	5.3482+5	7.1058–5	1.4854+8	8.4482+7	2.0029+7	4.4025+7	5.5279+3	8.7126+1	7.0708+1	1.6245+1	1.7353–1
	1.0625–2	2.1567–7	5.1145+5	7.8384–5	1.4205+8	8.1499+7	1.9010+7	4.1537+7	5.3960+3	8.3518+1	6.7933+1	1.5408+1	1.7725–1
	1.1719–2	2.3176–7	4.7593+5	9.1925–5	1.3218+8	7.6898+7	1.7471+7	3.7811+7	5.1895+3	7.8091+1	6.3754+1	1.4153+1	1.8368–1
	1.2500–2	2.4298–7	4.5396+5	1.0215–4	1.2608+8	7.4011+7	1.6527+7	3.5541+7	5.0578+3	7.4772+1	6.1194+1	1.3390+1	1.8822–1
	1.2539–2	2.4353–7	4.5292+5	1.0267–4	1.2580+8	7.3874+7	1.6482+7	3.5434+7	5.0515+3	7.4616+1	6.1073+1	1.3354+1	1.8845–1
	1.3359–2	2.5507–7	4.3244+5	1.1390–4	1.2011+8	7.1150+7	1.5607+7	3.3344+7	4.9256+3	7.1540+1	5.8696+1	1.2651+1	1.9316–1
	1.3770–2	2.6076–7	4.2301+5	1.1969–4	1.1749+8	6.9885+7	1.5206+7	3.2391+7	4.8666+3	7.0134+1	5.7608+1	1.2331+1	1.9549–1

Atomic Weight 167.260 Density 9.066 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000–2	2.7751–7	3.9747+5	1.3772–4	1.1040+8	6.6427+7	1.4126+7	2.9837+7	4.7035+3	6.6361+1	5.4686+1	1.1472+1	2.0242–1
1.6250–2	2.9445–7	3.7461+5	1.5709–4	1.0404+8	6.3239+7	1.3185+7	2.7615+7	4.5371+3	6.2775+1	5.1868+1	1.0699+1	2.0744–1
1.7500–2	3.1101–7	3.5466+5	1.7751–4	9.8504+7	6.0425+7	1.2370+7	2.5705+7	4.3882+3	5.9678+1	4.9431+1	1.0034+1	2.1243–1
1.8125–2	3.1916–7	3.4561+5	1.8810–4	9.5990+7	5.9136+7	1.2002+7	2.4848+7	4.3195+3	5.8282+1	4.8331+1	9.7358+0	2.1490–1
2.0000–2	3.4311–7	3.2148+5	2.2134–4	8.9288+7	5.5666+7	1.1026+7	2.2591+7	4.1323+3	5.4594+1	4.5421+1	8.9511+0	2.2224–1
2.2500–2	3.7444–7	2.9458+5	2.6904–4	8.1816+7	5.1681+7	9.9778+6	2.0154+7	3.9002+3	5.0283+1	4.1981+1	8.0735+0	2.2904–1
2.6250–2	4.1962–7	2.6286+5	3.4760–4	7.3008+7	4.6893+7	8.7551+6	1.7357+7	3.6161+3	4.5273+1	3.7967+1	7.0669+0	2.3917–1
3.0000–2	4.6294–7	2.3827+5	4.3414–4	6.6176+7	4.3105+7	7.8181+6	1.5249+7	3.3867+3	4.1450+1	3.4892+1	6.3090+0	2.4912–1
4.0000–2	5.7236–7	1.9271+5	6.9938–4	5.3525+7	3.5824+7	6.1592+6	1.1538+7	2.9191+3	3.4185+1	2.8994+1	4.9227+0	2.6836–1
5.0000–2	6.7418–7	1.6361+5	1.0139–3	4.5441+7	3.1021+7	5.1405+6	9.2773+6	2.6002+3	2.9524+1	2.5186+1	4.0535+0	2.8392–1
K 5.7574–2	7.4695–7	1.4767+5	1.2823–3	4.1014+7	2.8322+7	4.6002+6	8.0894+6	2.4192+3	2.6951+1	2.3071+1	3.5851+0	2.9415–1
5.8180–2	7.5269–7	1.4654+5	1.3049–3	4.0701+7	2.8131+7	4.5624+6	8.0054+6	2.4063+3	2.6771+1	2.2924+1	3.5524+0	2.9495–1
6.0000–2	7.6981–7	1.4329+5	1.3735–3	3.9796+7	2.7578+7	4.4531+6	7.7632+6	2.3688+3	2.6253+1	2.2498+1	3.4584+0	2.9734–1
6.2500–2	7.9250–7	1.3918+5	1.4700–3	3.8657+7	2.6875+7	4.3175+6	7.4622+6	2.3210+3	2.5586+1	2.1948+1	3.3371+0	3.0019–1
6.6875–2	8.3154–7	1.3265+5	1.6446–3	3.6842+7	2.5749+7	4.1019+6	6.9889+6	2.2440+3	2.4526+1	2.1075+1	3.1463+0	3.0518–1
7.3438–2	8.8864–7	1.2412+5	1.9199–3	3.4475+7	2.4268+7	3.8212+6	6.3830+6	2.1416+3	2.3154+1	1.9939+1	2.9022+0	3.1266–1
8.0000–2	9.4414–7	1.1683+5	2.2108–3	3.2448+7	2.2989+7	3.5814+6	5.8752+6	2.0521+3	2.1988+1	1.8970+1	2.6977+0	3.2010–1
9.0000–2	1.0227–6	1.0785+5	2.6814–3	2.9955+7	2.1384+7	3.2909+6	5.2782+6	1.9428+3	2.0523+1	1.7741+1	2.4522+0	3.2984–1
1.0000–1	1.0983–6	1.0043+5	3.1835–3	2.7893+7	2.0044+7	3.0512+6	4.7957+6	1.8499+3	1.9321+1	1.6728+1	2.2541+0	3.3958–1
1.1250–1	1.1847–6	9.3107+4	3.8513–3	2.5860+7	1.8720+7	2.8229+6	4.3153+6	1.7572+3	1.8127+1	1.5727+1	2.0499+0	3.4931–1
1.3125–1	1.3077–6	8.4351+4	4.9283–3	2.3428+7	1.7118+7	2.5497+6	3.7586+6	1.6429+3	1.6712+1	1.4535+1	1.8136+0	3.6408–1
1.5000–1	1.4241–6	7.7454+4	6.0889–3	2.1512+7	1.5841+7	2.3346+6	3.3347+6	1.5500+3	1.5612+1	1.3599+1	1.6341+0	3.7884–1
2.0000–1	1.6852–6	6.5455+4	9.4981–3	1.8180+7	1.3525+7	1.9766+6	2.6769+6	1.3780+3	1.3758+1	1.1995+1	1.3513+0	4.1211–1
2.5000–1	1.9149–6	5.7602+4	1.3281–2	1.5999+7	1.1955+7	1.7735+6	2.2687+6	1.2701+3	1.2689+1	1.1076+1	1.1697+0	4.4285–1
3.0000–1	2.1194–6	5.2044+4	1.7342–2	1.4455+7	1.0809+7	1.6232+6	2.0218+6	1.1882+3	1.1946+1	1.0409+1	1.0642+0	4.7327–1
4.0000–1	2.4839–6	4.4407+4	2.6009–2	1.2334+7	9.1647+6	1.4517+6	1.7162+6	1.0881+3	1.1138+1	9.6724+0	9.3101–1	5.3442–1
5.0000–1	2.8010–6	3.9379+4	3.5152–2	1.0937+7	8.0525+6	1.3531+6	1.5306+6	1.0299+3	1.0741+1	9.2923+0	8.5012–1	5.9830–1
6.0000–1	3.0842–6	3.5764+4	4.4558–2	9.9332+6	7.2448+6	1.2900+6	1.3974+6	9.9393+2	1.0522+1	9.0660+0	7.9144–1	6.6470–1
8.0000–1	3.5635–6	3.0953+4	6.3660–2	8.5969+6	6.1322+6	1.2162+6	1.2476+6	9.5311+2	1.0419+1	8.8874+0	7.2857–1	8.0274–1
1.0000+0	3.9685–6	2.7795+4	8.2811–2	7.7197+6	5.3996+6	1.1767+6	1.1424+6	9.3253+2	1.0468+1	8.8367+0	6.8326–1	9.4763–1
1.5000+0	4.7402–6	2.3269+4	1.2952–1	6.4629+6	4.3158+6	1.1333+6	1.0129+6	9.1515+2	1.0945+1	8.9755+0	6.3201–1	1.3373+0
2.0000+0	5.2936–6	2.0837+4	1.7407–1	5.7873+6	3.7161+6	1.1227+6	9.4757+5	9.1378+2	1.1505+1	9.1456+0	6.0420–1	1.7554+0
3.0000+0	6.0653–6	1.8186+4	2.5681–1	5.0509+6	3.0707+6	1.1096+6	8.6966+5	9.1843+2	1.2686+1	9.4785+0	5.7913–1	2.6288+0
4.0000+0	6.5749–6	1.6776+4	3.3210–1	4.6595+6	2.7217+6	1.1043+6	8.3255+5	9.2483+2	1.3896+1	9.7733+0	5.6428–1	3.5586+0
5.0000+0	6.9224–6	1.5934+4	4.0117–1	4.4256+6	2.5078+6	1.1042+6	8.1267+5	9.3097+2	1.5074+1	1.0003+1	5.6049–1	4.5113+0
6.0000+0	7.1783–6	1.5366+4	4.6509–1	4.2678+6	2.3683+6	1.1041+6	7.9440+5	9.3697+2	1.6232+1	1.0189+1	5.5742–1	5.4857+0
8.0000+0	7.5197–6	1.4668+4	5.8026–1	4.0740+6	2.1918+6	1.1052+6	7.7607+5	9.4759+2	1.8551+1	1.0500+1	5.5263–1	7.4992+0
1.0000+1	7.7275–6	1.4274+4	6.8178–1	3.9645+6	2.0978+6	1.1061+6	7.5973+5	9.5676+2	2.0894+1	1.0769+1	5.4890–1	9.5763+0
1.5000+1	7.9035–6	1.3956+4	8.9326–1	3.8762+6	2.0147+6	1.1079+6	7.5261+5	9.7543+2	2.6622+1	1.1150+1	5.5122–1	1.4921+1
2.0000+1	7.9329–6	1.3904+4	1.0631+0	3.8619+6	2.0069+6	1.1092+6	7.4475+5	9.8812+2	3.2463+1	1.1446+1	5.5285–1	2.0464+1
3.0000+1	7.9334–6	1.3904+4	1.3262+0	3.8616+6	2.0066+6	1.1105+6	7.4350+5	1.0033+3	4.4156+1	1.1814+1	5.5520–1	3.1787+1
4.0000+1	7.9326–6	1.3905+4	1.5267+0	3.8620+6	2.0057+6	1.1112+6	7.4405+5	1.0190+3	5.6017+1	1.2058+1	5.5889–1	4.3401+1
5.0000+1	7.9333–6	1.3904+4	1.6885+0	3.8616+6	2.0050+6	1.1116+6	7.4399+5	1.0313+3	6.8036+1	1.2246+1	5.6212–1	5.5228+1
6.0000+1	7.9356–6	1.3900+4	1.8237+0	3.8605+6	2.0045+6	1.1118+6	7.4319+5	1.0413+3	8.0182+1	1.2386+1	5.6480–1	6.7231+1
8.0000+1	7.9296–6	1.3910+4	2.0414+0	3.8635+6	2.0036+6	1.1121+6	7.4669+5	1.0569+3	1.0470+2	1.2611+1	5.6901–1	9.1521+1
1.0000+2	7.9258–6	1.3917+4	2.2128+0	3.8653+6	2.0029+6	1.1124+6	7.4898+5	1.0693+3	1.2942+2	1.2809+1	5.7231–1	1.1603+2
1.5000+2	7.9147–6	1.3936+4	2.5283+0	3.8707+6	2.0016+6	1.1125+6	7.5552+5	1.0922+3	1.9164+2	1.3013+1	5.7753–1	1.7805+2
2.0000+2	7.9068–6	1.3950+4	2.7539+0	3.8746+6	2.0007+6	1.1126+6	7.6013+5	1.1077+3	2.5450+2	1.3202+1	5.8129–1	2.4071+2
3.0000+2	7.8986–6	1.3965+4	3.0736+0	3.8786+6	1.9995+6	1.1127+6	7.6533+5	1.1256+3	3.7951+2	1.3493+1	5.8572–1	3.6543+2
4.0000+2	7.8966–6	1.3968+4	3.3014+0	3.8796+6	1.9986+6	1.1127+6	7.6711+5	1.1374+3	5.0440+2	1.3654+1	5.8755–1	4.9016+2
5.0000+2	7.8955–6	1.3970+4	3.4784+0	3.8801+6	1.9979+6	1.1127+6	7.6833+5	1.1464+3	6.3008+2	1.3800+1	5.8896–1	6.1569+2
6.0000+2	7.8947–6	1.3972+4	3.6232+0	3.8805+6	1.9973+6	1.1128+6	7.6926+5	1.1545+3	7.5514+2	1.3908+1	5.9013–1	7.4064+2
8.0000+2	7.8952–6	1.3971+4	3.8517+0	3.8803+6	1.9965+6	1.1128+6	7.6991+5	1.1673+3	1.0075+3	1.4104+1	5.9157–1	9.9280+2
1.0000+3	7.8957–6	1.3970+4	4.0289+0	3.8800+6	1.9958+6	1.1128+6	7.7031+5	1.1777+3	1.2593+3	1.4266+1	5.9281–1	1.2444+3
1.5000+3	7.8938–6	1.3973+4	4.3505+0	3.8809+6	1.9945+6	1.1128+6	7.7246+5	1.1969+3	1.8923+3	1.4421+1	5.9447–1	1.8773+3
2.0000+3	7.8953–6	1.3971+4	4.5786+0	3.8802+6	1.9936+6	1.1128+6	7.7261+5	1.2109+3	2.5230+3	1.4574+1	5.9460–1	2.5078+3
3.0000+3	7.8975–6	1.3967+4	4.8998+0	3.8791+6	1.9924+6	1.1128+6	7.7274+5	1.2318+3	3.7893+3	1.4870+1	5.9473–1	3.7739+3
4.0000+3	7.9006–6	1.3961+4	5.1275+0	3.8776+6	1.9915+6	1.1128+6	7.7211+5	1.2470+3	5.0551+3	1.4996+1	5.9428–1	5.0395+3
5.0000+3	7.9056–6	1.3952+4	5.3039+0	3.8752+6	1.9908+6	1.1128+6	7.7034+5	1.2589+3	6.3306+3	1.5122+1	5.9294–1	6.3148+3
6.0000+3	7.9062–6	1.3951+4	5.4480+0	3.8749+6	1.9903+6	1.1128+6	7.7056+5	1.2676+3	7.5817+3	1.5218+1	5.9313–1	7.5659+3
8.0000+3	7.9085–6	1.3947+4	5.6757+0	3.8737+6	1.9894+6	1.1128+6	7.7032+5	1.2814+3	1.0106+4	1.5410+1	5.9300–1	1.0090+4
1.0000+4	7.9106–6	1.3944+4	5.8522+0	3.8727+6	1.9887+6	1.1128+6	7.6995+5	1.2923+3	1.2653+4	1.5587+1	5.9278–1	1.2637+4
1.5000+4	7.9136–6	1.3938+4	6.1732+0	3.8712+6	1.9875+6	1.1128+6	7.6969+5	1.3132+3	1.8918+4	1.5730+1	5.9258–1	1.8901+4
2.0000+4	7.9166–6	1.3933+4	6.4011+0	3.8698+6	1.9866+6	1.1128+6	7.6910+5	1.3282+3	2.5263+4	1.5874+1	5.9212–1	2.5247+4
3.0000+4	7.9194–6	1.3928+4	6.7225+0	3.8684+6	1.9853+6	1.1128+6	7.6897+5	1.3493+3	3.7810+4	1.6161+1	5.9202–1	3.7793+4
4.0000+4	7.9223–6	1.3923+4	6.9506+0	3.8670+6	1.9844+6	1.1128+6	7.6842+5	1.3644+3	5.0491+4	1.6305+1	5.9160–1	5.0474+4
5.0000+4	7.9271–6	1.3915+4	7.1275+0	3.8647+6	1.9837+6	1.1128+6	7.6676+5	1.3761+3	6.3054+4	1.6423+1	5.9033–1	6.3037+4
6.0000+4	7.9273–6	1.3914+4	7.2721+0	3.8646+6	1.9832+6	1.1128+6	7.6722+5	1.3856+3	7.5607+4	1.6530+1	5.9069–1	7.5590+4
8.0000+4	7.9291–6	1.3911+4	7.5002+0	3.8637+6	1.9823+6	1.1128+6	7.6722+5	1.4007+3	1.0093+5	1.6717+1	5.9069–1	1.0091+5
1.0000+5	7.9309–6	1.3908+4	7.6770+0	3.8628+6	1.9816+6	1.1128+6	7.6700+5	1.4124+3	1.2630+5	1.6892+1	5.9052–1	1.2628+5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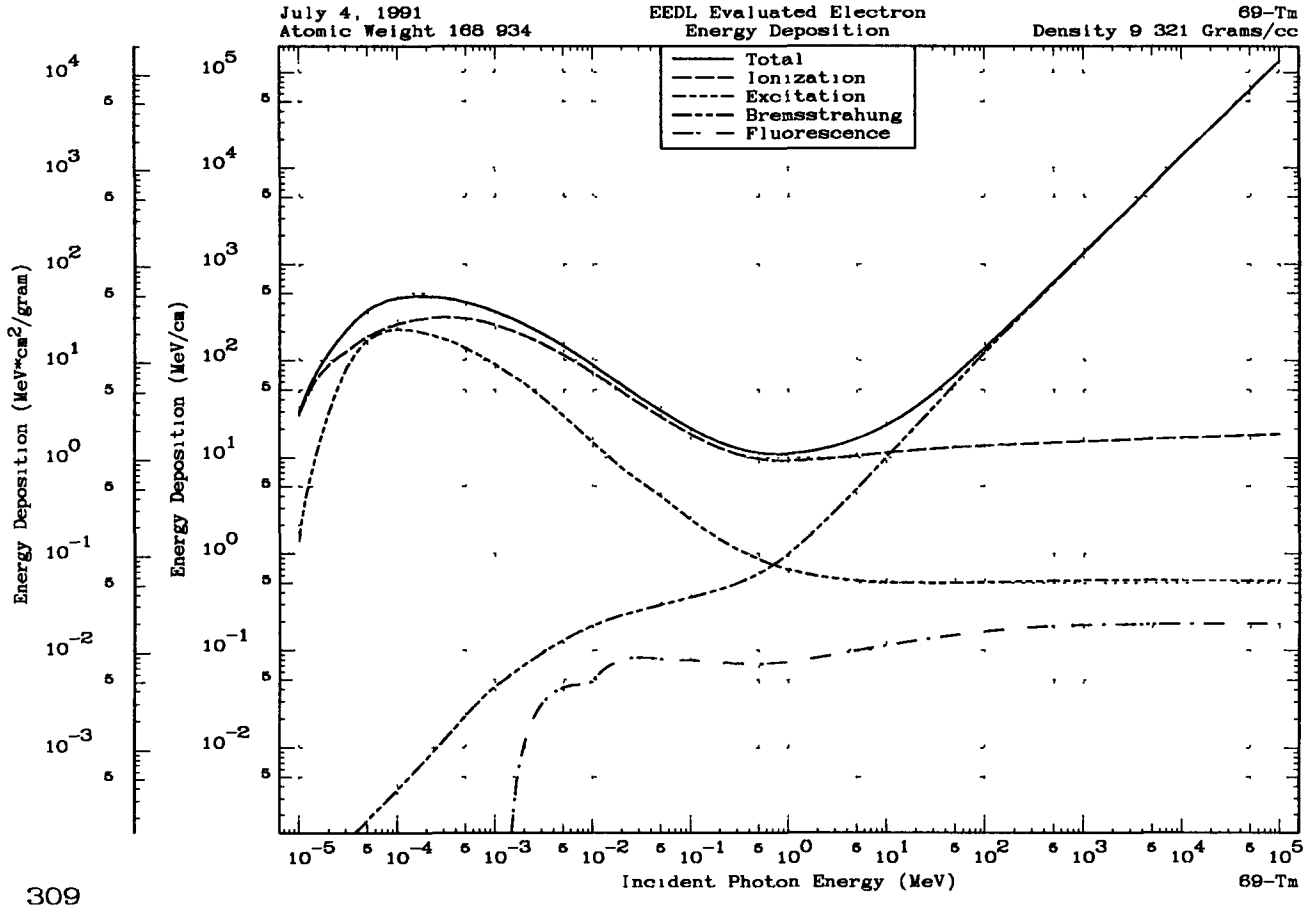
Atomic Weight 168 934
EEDL Evaluated Electron
Cross Sections
69-Tm
Density 9 321 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
69-Tm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Total
Ionization
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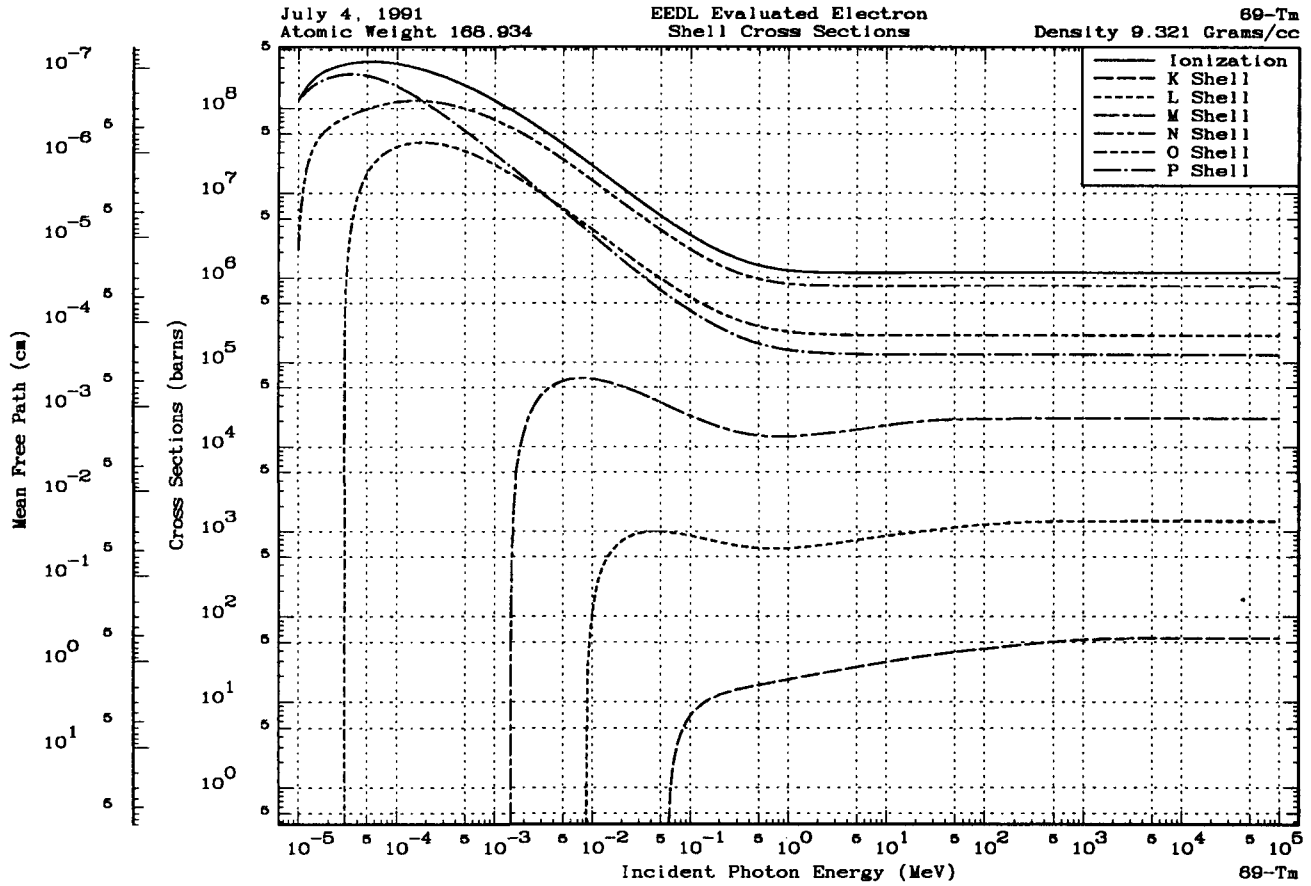
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
69-Tm

309


July 4, 1991
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EEDL Evaluated Electron
Shell Cross Sections
69-Tm
Density 9.321 Grams/cc
Ionization
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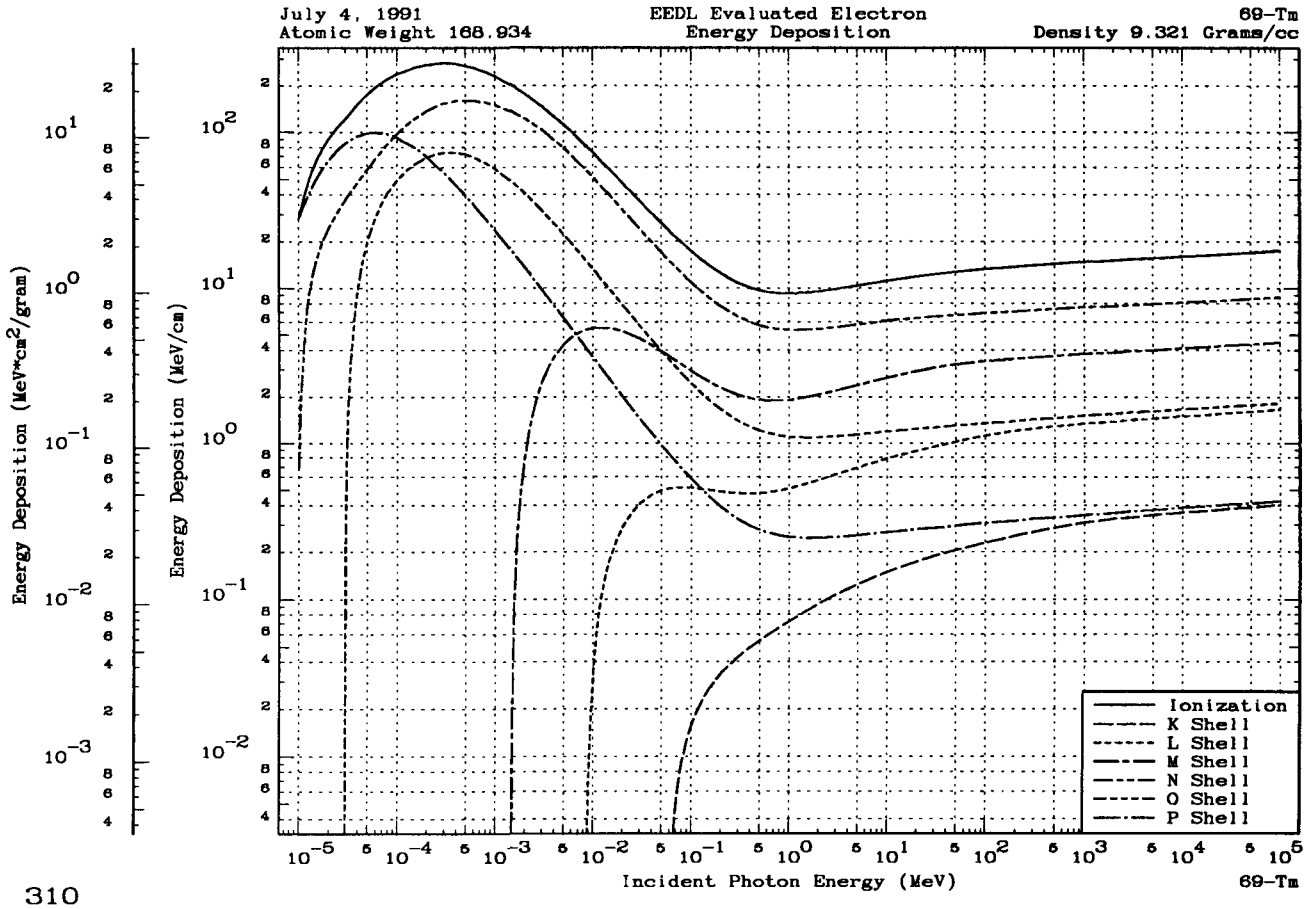
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
69-Tm


July 4, 1991
Atomic Weight 168.934
EEDL Evaluated Electron
Energy Deposition
69-Tm
Density 9.321 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
69-Tm

310

Atomic Weight 168.934 Density 9.321 Grams/cc

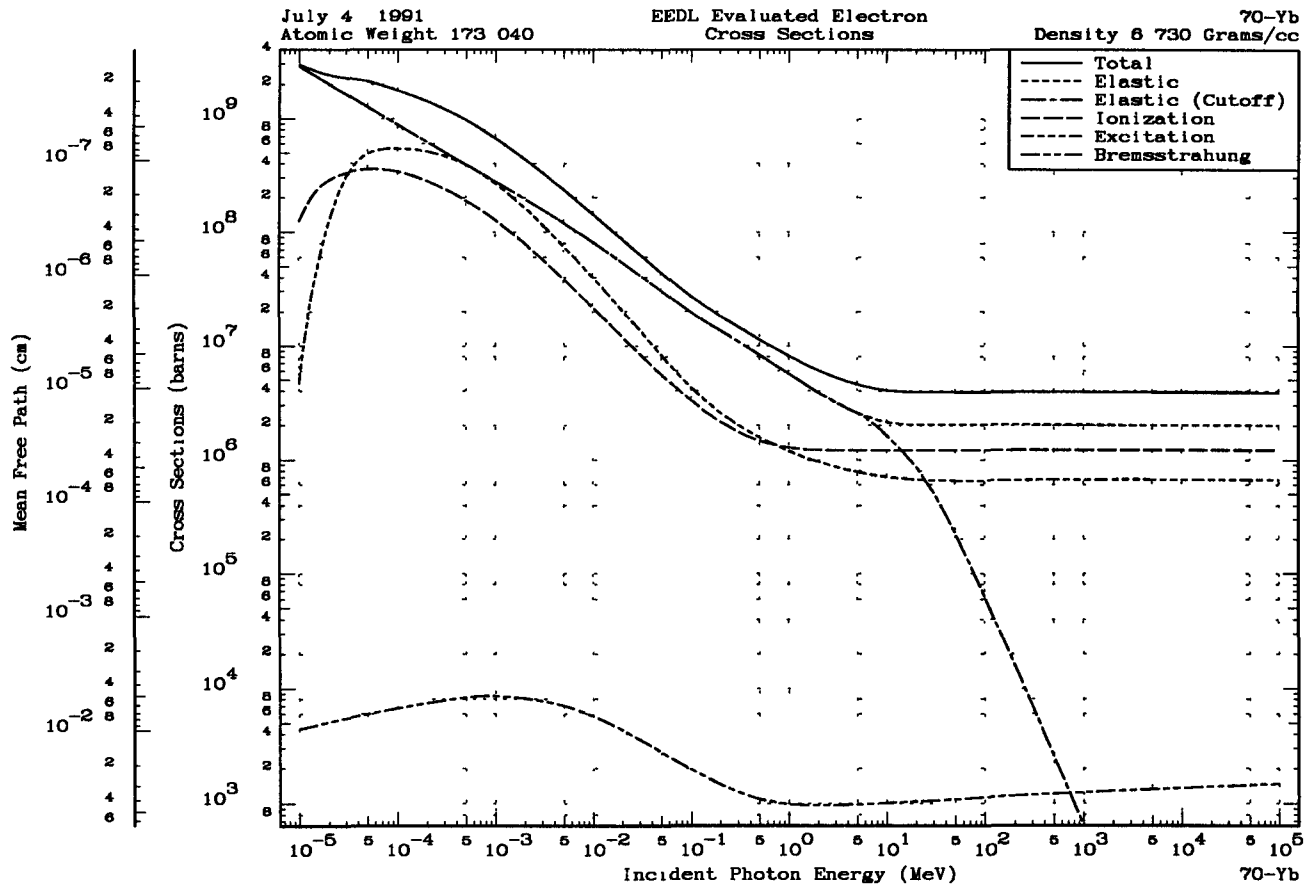
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.3952–9	1.1419+7		3.2033+9	3.0676+9	1.2917+8	6.5613+6	4.8008+3	3.0197+1	2.8779+1	1.4182+0	3.4470–4
	1.0312–5	9.5110–9	1.1280+7		3.1643+9	3.0193+9	1.3679+8	8.1926+6	4.8306+3	3.2833+1	3.1046+1	1.7865+0	3.5501–4
	1.0606–5	9.6165–9	1.1156+7		3.1296+9	2.9759+9	1.4387+8	9.8261+6	4.8580+3	3.5337+1	3.3176+1	2.1605+0	3.6476–4
N6	1.1030–5	9.7639–9	1.0988+7		3.0824+9	2.9162+9	1.5378+8	1.2369+7	4.8966+3	3.8949+1	3.6197+1	2.7517+0	3.7893–4
	1.1154–5	9.8045–9	1.0942+7		3.0696+9	2.8994+9	1.5701+8	1.3147+7	4.9076+3	4.0187+1	3.7253+1	2.9328+0	3.8309–4
	1.1394–5	9.8835–9	1.0855+7		3.0450+9	2.8677+9	1.6259+8	1.4767+7	4.9288+3	4.2398+1	3.9086+1	3.3117+0	3.9116–4
	1.1635–5	9.9604–9	1.0771+7		3.0215+9	2.8369+9	1.6804+8	1.6550+7	4.9495+3	4.4620+1	4.0889+1	3.7309+0	3.9927–4
	1.1845–5	1.0025–8	1.0702+7		3.0020+9	2.8108+9	1.7321+8	1.7969+7	4.9674+3	4.6695+1	4.2625+1	4.0693+0	4.0637–4
	1.2116–5	1.0107–8	1.0615+7		2.9778+9	2.7782+9	1.7967+8	1.9938+7	4.9901+3	4.9349+1	4.4807+1	4.5417+0	4.1556–4
	1.2240–5	1.0143–8	1.0577+7		2.9671+9	2.7637+9	1.8245+8	2.0889+7	5.0003+3	5.0530+1	4.5758+1	4.7709+0	4.1975–4
	1.2477–5	1.0213–8	1.0505+7		2.9468+9	2.7364+9	1.8758+8	2.2818+7	5.0197+3	5.2753+1	4.7514+1	5.2381+0	4.2785–4
	1.2837–5	1.0315–8	1.0401+7		2.9178+9	2.6965+9	1.9564+8	2.5612+7	5.0486+3	5.6235+1	5.0310+1	5.9246+0	4.4017–4
	1.2930–5	1.0340–8	1.0376+7		2.9106+9	2.6865+9	1.9764+8	2.6370+7	5.0559+3	5.7126+1	5.1014+1	6.1118+0	4.4334–4
	1.3125–5	1.0394–8	1.0322+7		2.8955+9	2.6658+9	2.0164+8	2.8026+7	5.0712+3	5.8941+1	5.2418+1	6.5224+0	4.5006–4
	1.3919–5	1.0609–8	1.0112+7		2.8367+9	2.5863+9	2.1577+8	3.4700+7	5.1315+3	6.5976+1	5.7765+1	8.2103+0	4.7749–4
	1.3965–5	1.0621–8	1.0101+7		2.8335+9	2.5818+9	2.1657+8	3.5122+7	5.1349+3	6.6392+1	5.8074+1	8.3181+0	4.7911–4
	1.5000–5	1.0875–8	9.8653+6		2.7674+9	2.4883+9	2.3359+8	4.5561+7	5.2095+3	7.5814+1	6.4792+1	1.1021+1	5.1530–4
	1.6250–5	1.1159–8	9.6145+6		2.6971+9	2.3876+9	2.4982+8	5.9695+7	5.2941+3	8.6314+1	7.1692+1	1.4621+1	5.5957–4
	1.7500–5	1.1403–8	9.4083+6		2.6392+9	2.2980+9	2.6459+8	7.6662+7	5.3738+3	9.7322+1	7.8312+1	1.9009+1	6.0442–4
	1.8125–5	1.1515–8	9.3170+6		2.6136+9	2.2567+9	2.7059+8	8.6303+7	5.4119+3	1.0286+2	8.1334+1	2.1531+1	6.2705–4
	2.0000–5	1.1816–8	9.0798+6		2.5471+9	2.1449+9	2.8658+8	1.1559+8	5.5203+3	1.1927+2	8.9911+1	2.9361+1	6.9575–4
	2.2500–5	1.2132–8	8.8434+6		2.4808+9	2.0184+9	3.0108+8	1.6131+8	5.6367+3	1.4039+2	9.9072+1	4.1316+1	7.8117–4
	2.5000–5	1.2350–8	8.6873+6		2.4370+9	1.9115+9	3.1412+8	2.1132+8	5.7429+3	1.6264+2	1.0807+2	5.4570+1	8.6796–4
O3	2.9540–5	1.2613–8	8.5055+6		2.3860+9	1.7538+9	3.2869+8	3.0351+8	5.9153+3	2.0072+2	1.2119+2	7.9536+1	1.0288–3
	2.9770–5	1.2621–8	8.5007+6		2.3846+9	1.7468+9	3.2954+8	3.0833+8	5.9233+3	2.0283+2	1.2200+2	8.0835+1	1.0370–3
	3.0000–5	1.2627–8	8.4964+6		2.3834+9	1.7398+9	3.3038+8	3.1319+8	5.9313+3	2.0496+2	1.2282+2	8.2145+1	1.0452–3
	3.0625–5	1.2661–8	8.4734+6		2.3770+9	1.7214+9	3.3183+8	3.2370+8	5.9527+3	2.0962+2	1.2464+2	8.4973+1	1.0675–3
	3.1797–5	1.2716–8	8.4369+6		2.3667+9	1.6884+9	3.3457+8	3.4374+8	5.9918+3	2.1852+2	1.2814+2	9.0379+1	1.1096–3
	3.3848–5	1.2784–8	8.3918+6		2.3541+9	1.6348+9	3.3936+8	3.7989+8	6.0576+3	2.3456+2	1.3439+2	1.0016+2	1.1837–3
O2	3.5580–5	1.2818–8	8.3698+6		2.3479+9	1.5933+9	3.4316+8	4.1148+8	6.1107+3	2.4831+2	1.3956+2	1.0875+2	1.2469–3
	3.5856–5	1.2827–8	8.3639+6		2.3463+9	1.5869+9	3.4364+8	4.1571+8	6.1190+3	2.5028+2	1.4038+2	1.0991+2	1.2570–3
	3.6374–5	1.2842–8	8.3539+6		2.3435+9	1.5752+9	3.4457+8	4.2367+8	6.1343+3	2.5403+2	1.4194+2	1.1209+2	1.2760–3
	3.6924–5	1.2857–8	8.3445+6		2.3408+9	1.5631+9	3.4558+8	4.3216+8	6.1504+3	2.5806+2	1.4364+2	1.1442+2	1.2962–3
	3.7281–5	1.2866–8	8.3387+6		2.3392+9	1.5553+9	3.4616+8	4.3770+8	6.1607+3	2.6061+2	1.4466+2	1.1594+2	1.3093–3
	3.8640–5	1.2893–8	8.3209+6		2.3342+9	1.5269+9	3.4838+8	4.5894+8	6.1994+3	2.7041+2	1.4862+2	1.2179+2	1.3596–3
	4.0000–5	1.2911–8	8.3096+6		2.3310+9	1.4999+9	3.5073+8	4.8043+8	6.2370+3	2.8048+2	1.5275+2	1.2773+2	1.4101–3
	4.5000–5	1.3013–8	8.2441+6		2.3126+9	1.4114+9	3.5464+8	5.4657+8	6.3553+3	3.1086+2	1.6493+2	1.4593+2	1.5896–3
	5.0000–5	1.3106–8	8.1860+6		2.2963+9	1.3368+9	3.5818+8	6.0138+8	6.4631+3	3.3798+2	1.7673+2	1.6125+2	1.7719–3
	5.5000–5	1.3259–8	8.0917+6		2.2699+9	1.2726+9	3.5852+8	6.3876+8	6.5576+3	3.5827+2	1.8624+2	1.7203+2	1.9530–3
O1	5.8300–5	1.3338–8	8.0433+6		2.2563+9	1.2349+9	3.5864+8	6.6274+8	6.6161+3	3.7128+2	1.9226+2	1.7901+2	2.0737–3
	5.9150–5	1.3359–8	8.0306+6		2.2528+9	1.2257+9	3.5875+8	6.6826+8	6.6307+3	3.7455+2	1.9390+2	1.8064+2	2.1049–3
	6.0000–5	1.3380–8	8.0186+6		2.2494+9	1.2168+9	3.5887+8	6.7374+8	6.6451+3	3.7783+2	1.9556+2	1.8227+2	2.1362–3
	6.2500–5	1.3474–8	7.9626+6		2.2337+9	1.1914+9	3.5745+8	6.8483+8	6.6866+3	3.8434+2	1.9884+2	1.8550+2	2.2286–3
	6.4688–5	1.3550–8	7.9178+6		2.2211+9	1.1705+9	3.5634+8	6.9432+8	6.7217+3	3.9005+2	2.0178+2	1.8827+2	2.3099–3
	6.8516–5	1.3671–8	7.8476+6		2.2014+9	1.1362+9	3.5469+8	7.1048+8	6.7809+3	4.0007+2	2.0705+2	1.9302+2	2.4530–3
	7.0000–5	1.3714–8	7.8229+6		2.1945+9	1.1237+9	3.5413+8	7.1660+8	6.8031+3	4.0396+2	2.0913+2	1.9482+2	2.5088–3
	7.3438–5	1.3809–8	7.7691+6		2.1794+9	1.0963+9	3.5262+8	7.3047+8	6.8529+3	4.1247+2	2.1354+2	1.9893+2	2.6387–3
	7.4258–5	1.3836–8	7.7542+6		2.1752+9	1.0900+9	3.5229+8	7.3288+8	6.8645+3	4.1428+2	2.1461+2	1.9967+2	2.6698–3
	8.0000–5	1.4008–8	7.6586+6		2.1484+9	1.0489+9	3.5027+8	7.4919+8	6.9429+3	4.2690+2	2.2221+2	2.0469+2	2.8889–3
	9.0000–5	1.4436–8	7.4316+6		2.0847+9	9.8710+8	3.4319+8	7.5443+8	7.0593+3	4.3813+2	2.3083+2	2.0730+2	3.2704–3
	1.0000–4	1.4813–8	7.2424+6	0.0000+0	2.0317+9	9.3488+8	3.3761+8	7.5915+8	7.1651+3	4.4980+2	2.4002+2	2.0978+2	3.6574–3
	1.1250–4	1.5360–8	6.9848+6	2.7634–8	1.9594+9	8.7983+8	3.2738+8	7.5217+8	7.2761+3	4.5490+2	2.4617+2	2.0872+2	4.1423–3
	1.2500–4	1.5854–8	6.7672+6	5.4932–8	1.8984+9	8.3334+8	3.1902+8	7.4599+8	7.3770+3	4.6090+2	2.5303+2	2.0787+2	4.6338–3
	1.3125–4	1.6086–8	6.6695+6	6.8456–8	1.8709+9	8.1265+8	3.1515+8	7.4314+8	7.4241+3	4.6343+2	2.5591+2	2.0751+2	4.8818–3
	1.5000–4	1.6853–8	6.3657+6	1.0872–7	1.7857+9	7.5861+8	3.0525+8	7.2186+8	7.5547+3	4.6797+2	2.6514+2	2.0282+2	5.6345–3
N5	1.7833–4	1.7981–8	5.9666+6	1.6934–7	1.6738+9	6.9391+8	2.8844+8	6.9141+8	7.7273+3	4.6668+2	2.7113+2	1.9554+2	6.7938–3
	1.8375–4	1.8200–8	5.8947+6	1.8095–7	1.6536+9	6.8329+8	2.8564+8	6.8465+8	7.7558+3	4.6638+2	2.7247+2	1.9390+2	7.0192–3
N4	1.8695–4	1.8328–8	5.8536+6	1.8782–7	1.6421+9	6.7723+8	2.8405+8	6.8078+8	7.7723+3	4.6622+2	2.7326+2	1.9296+2	7.1529–3
	1.9348–4	1.8585–8	5.7726+6	2.0182–7	1.6193+9	6.6537+8	2.8096+8	6.7299+8	7.7985+3	4.6615+2	2.7506+2	1.9109+2	7.4297–3
	2.0000–4	1.8837–8	5.6955+6	2.1581–7	1.5977+9	6.5409+8	2.7807+8	6.6554+8	7.8239+3	4.6633+2	2.7702+2	1.8930+2	7.7074–3
	2.1250–4	1.9346–8	5.5455+6	2.4271–7	1.5556+9	6.3397+8	2.7129+8	6.5035+8	7.8706+3	4.6295+2	2.7754+2	1.8540+2	8.2420–3
	2.2500–4	1.9838–8	5.4081+6	2.6979–7	1.5171+9	6.1557+8	2.6516+8	6.3634+8	7.9148+3	4.6025+2	2.7842+2	1.8182+2	8.7796–3
	2.3438–4	2.0196–8	5.3123+6	2.9020–7	1.4902+9	6.0276+8	2.6092+8	6.2652+8	7.9466+3	4.5857+2	2.7925+2	1.7931+2	9.1848–3
	2.4375–4	2.0545–8	5.2220+6	3.1068–7	1.4649+9	5.9070+8	2.5695+8	6.1723+8	7.9772+3	4.5716+2	2.8020+2	1.7695+2	9.5916–3
	2.5000–4	2.0773–8	5.1647+6	3.2436–7	1.4488+9	5.8305+8	2.5444+8	6.1131+8	7.9970+3	4.5634+2	2.8088+2	1.7545+2	9.8636–3
	2.5078–4	2.0801–8	5.1576+6	3.2607–7	1.4468+9	5.8211+8	2.5413+8	6.1058+8	7.9995+3	4.5619+2	2.8092+2	1.7526+2	9.8977–3
	2.7188–4	2.1547–8	4.9792+6	3.7249–7	1.3968+9	5.5838+8	2.4630+8	5.9208+8	8.0631+3	4.5271+2	2.8210+2	1.7060+2	1.0821–2
	2.7539–4	2.1667–8	4.9514+6	3.8026–7	1.3890+9	5.5470+8	2.4509+8	5.8919+8	8.0733+3	4.5223+2	2.8235+2	1.6987+2	1.0976–2
	3.0000–4	2.2487–8	4.7709+6	4.3484–7	1.3383+9	5.3076+8	2.3728+8	5.7029+8	8.1413+3	4.4950+2	2.8434+2	1.6514+2	1.2063–2
N3	3.2387–4	2.3307–8	4.6032+6	4.8833–7	1.2913+9	5.1024+8	2.2903+8	5.5200+8	8.2027+3	4.4309+2	2.8277+2	1.6031+2	1.3126–2
	3.2863–4	2.3468–8	4.5716+6	4.9908–7	1.2824+9	5.0643+8	2.2750+8	5.4848+8	8.2144+3	4.4194+2	2.8254+2	1.5939+2	1.3339–2
	3.3755–4	2.3767–8	4.5141+6	5.1931–7	1.2663+9	4.9950+8	2.2472+8	5.4207+8	8.2360+3	4.3990+2	2.8217+2	1.5772+2	1.3739–2
	3.5000–4	2.4176–8	4.4376+6	5.4770–7	1.2449+9	4.9028+8	2.2104+8	5.3352+8	8.2653+3	4.3728+2	2.8177+2	1.5549+2	1.4299–2
	3.5316–4	2.4279–8	4.4188+6	5.5494–7	1.2396+9	4.8802+8	2.2013+8	5.3142+8	8.2726+3	4.3664+2	2.8168+2	1.5494+2	1.4442–2
N2	3.7137–4	2.4861–8	4.3154+6	5.9680–7	1.2106+9	4.7556+8	2.1518+8	5.1982+8	8.3135+3	4.3323+2	2.8128+2	1.5194+2	1.5265–2
	3.7658–4	2.5028–8	4.2865+6	6.0884–7	1.2025+9	4.7216+8	2.1382+8	5.1648+8	8.3227+3	4.3230+2	2.8120+2	1.5108+2	1.5504–2
	3.7853–4	2.5090–8	4.2759+6	6.1335–7	1.1995+9	4.7091+8	2.1332+8	5.1525+8	8.3261+3	4.3195+2	2.8117+2	1.5077+2	1.5594–2
	3.8926–4	2.5430–8	4.2188+6	6.3825–7	1.1835+9	4.6418+8	2.1064+8	5.0862+8	8.3445+3	4.3015+2	2.8106+2	1.4907+2	1.6088–2
	4.0000–4	2.5765–8	4.1640+6	6.6326–7	1.1681+9	4.5773+8	2.0808+8	5.0226+8	8.3624+3	4.2850+2	2.8104+2	1.4745+2	1.6583–2
	4.2500–4	2.6601–8	4.0331+6	7.2210–7	1.1314+9	4.4368+8	2.0161+8	4.8607+8	8.3952+3	4.2127+2	2.7818+2	1.4307+2	1.7749–2

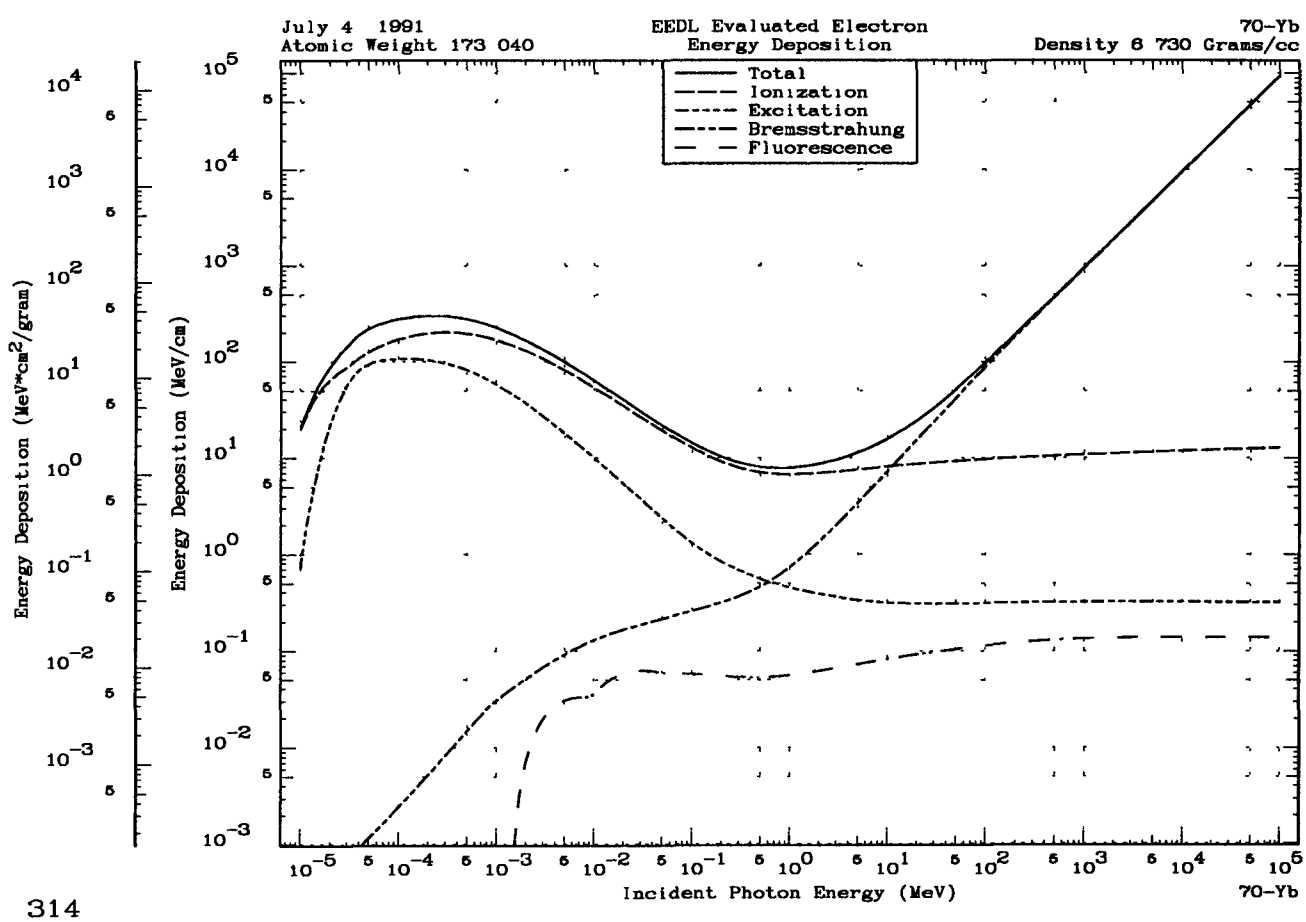
Atomic Weight 168.934 Density 9.321 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
N1	4.5373–4	2.7533–8	3.8966+6	7.9089–7	1.0931+9	4.2900+8	1.9490+8	4.6917+8	8.4308+3	4.1401+2	2.7549+2	1.3851+2	1.9095–2
	4.5951–4	2.7720–8	3.8704+6	8.0489–7	1.0857+9	4.2621+8	1.9363+8	4.6587+8	8.4377+3	4.1266+2	2.7502+2	1.3763+2	1.9367–2
	4.6250–4	2.7815–8	3.8570+6	8.1213–7	1.0820+9	4.2480+8	1.9299+8	4.6419+8	8.4412+3	4.1198+2	2.7478+2	1.3718+2	1.9507–2
	4.6964–4	2.8043–8	3.8257+6	8.2948–7	1.0732+9	4.2146+8	1.9148+8	4.6024+8	8.4496+3	4.1039+2	2.7424+2	1.3613+2	1.9843–2
	4.8482–4	2.8522–8	3.7615+6	8.6662–7	1.0552+9	4.1462+8	1.8839+8	4.5215+8	8.4669+3	4.0718+2	2.7318+2	1.3398+2	2.0558–2
	5.0000–4	2.8994–8	3.7002+6	9.0405–7	1.0380+9	4.0810+8	1.8546+8	4.4444+8	8.4838+3	4.0421+2	2.7225+2	1.3193+2	2.1275–2
	5.2500–4	2.9761–8	3.6049+6	9.6630–7	1.0112+9	3.9798+8	1.8076+8	4.3249+8	8.5037+3	3.9896+2	2.7025+2	1.2869+2	2.2446–2
	5.5000–4	3.0511–8	3.5163+6	1.0293–6	9.8639+8	3.8857+8	1.7641+8	4.2140+8	8.5226+3	3.9425+2	2.6854+2	1.2569+2	2.3620–2
	5.6250–4	3.0879–8	3.4743+6	1.0611–6	9.7462+8	3.8411+8	1.7436+8	4.1614+8	8.5318+3	3.9207+2	2.6778+2	1.2427+2	2.4208–2
	6.0000–4	3.1962–8	3.3566+6	1.1575–6	9.4161+8	3.7156+8	1.6863+8	4.0141+8	8.5582+3	3.8619+2	2.6587+2	1.2029+2	2.5976–2
	6.5000–4	3.3460–8	3.2064+6	1.2888–6	8.9945+8	3.5658+8	1.6095+8	3.8192+8	8.5649+3	3.7542+2	2.6048+2	1.1491+2	2.8217–2
	7.0000–4	3.4907–8	3.0734+6	1.4237–6	8.6216+8	3.4324+8	1.5419+8	3.6473+8	8.5711+3	3.6621+2	2.5601+2	1.1016+2	3.0459–2
	8.0000–4	3.7669–8	2.8481+6	1.7024–6	7.9895+8	3.2045+8	1.4281+8	3.3568+8	8.5824+3	3.5132+2	2.4910+2	1.0218+2	3.4949–2
	9.0000–4	4.0411–8	2.6548+6	1.9937–6	7.4474+8	3.0161+8	1.3272+8	3.1039+8	8.5370+3	3.3554+2	2.4040+2	9.5099+1	3.8753–2
	1.0000–3	4.3027–8	2.4935+6	2.2975–6	6.9947+8	2.8570+8	1.2436+8	2.8940+8	8.4965+3	3.2286+2	2.3358+2	8.9235+1	4.2541–2
	1.1250–3	4.6234–8	2.3205+6	2.6951–6	6.5095+8	2.6888+8	1.1487+8	2.6719+8	8.4050+3	3.0608+2	2.2313+2	8.2912+1	4.6342–2
	1.2500–3	4.9298–8	2.1762+6	3.1128–6	6.1048+8	2.5466+8	1.0704+8	2.4877+8	8.3239+3	2.9252+2	2.1478+2	7.7685+1	5.0114–2
	1.3125–3	5.0784–8	2.1126+6	3.3286–6	5.9262+8	2.4834+8	1.0360+8	2.4068+8	8.2867+3	2.8654+2	2.1109+2	7.5394+1	5.1990–2
M5	1.4698–3	5.4401–8	1.9721+6	3.8903–6	5.5322+8	2.3426+8	9.6053+7	2.2290+8	8.2009+3	2.7367+2	2.0324+2	7.0376+1	5.6682–2
	1.4773–3	5.4573–8	1.9659+6	3.9179–6	5.5147+8	2.3365+8	9.5716+7	2.2210+8	8.1967+3	2.7307+2	2.0286+2	7.0152+1	5.6890–2
	1.4887–3	5.4832–8	1.9566+6	3.9595–6	5.4887+8	2.3273+8	9.5216+7	2.2092+8	8.1904+3	2.7218+2	2.0231+2	6.9820+1	5.7202–2
	1.5000–3	5.5090–8	1.9475+6	4.0011–6	5.4630+8	2.3182+8	9.4722+7	2.1975+8	8.1842+3	2.7131+2	2.0176+2	6.9492+1	5.7514–2
M4	1.5160–3	5.5452–8	1.9347+6	4.0603–6	5.4274+8	2.3056+8	9.3999+7	2.1817+8	8.1755+3	2.6988+2	2.0079+2	6.9033+1	5.7954–2
	1.5459–3	5.6139–8	1.9110+6	4.1716–6	5.3609+8	2.2825+8	9.2681+7	2.1515+8	8.1595+3	2.6725+2	1.9904+2	6.8156+1	5.8776–2
	1.5765–3	5.6838–8	1.8876+6	4.2867–6	5.2950+8	2.2595+8	9.1378+7	2.1216+8	8.1436+3	2.6465+2	1.9730+2	6.7289+1	5.9616–2
	1.6594–3	5.8704–8	1.8276+6	4.6039–6	5.1267+8	2.2006+8	8.8059+7	2.0454+8	8.1019+3	2.5809+2	1.9295+2	6.5078+1	6.1886–2
	1.6824–3	5.9214–8	1.8118+6	4.6932–6	5.0825+8	2.1851+8	8.7191+7	2.0254+8	8.0908+3	2.5638+2	1.9182+2	6.4500+1	6.2513–2
	1.8297–3	6.2426–8	1.7186+6	5.2793–6	4.8210+8	2.0925+8	8.2076+7	1.9076+8	8.0231+3	2.4642+2	1.8526+2	6.1093+1	6.6521–2
	1.8412–3	6.2672–8	1.7118+6	5.3260–6	4.8021+8	2.0858+8	8.1707+7	1.8991+8	8.0181+3	2.4571+2	1.8480+2	6.0847+1	6.6832–2
M3	1.8651–3	6.3182–8	1.6980+6	5.4236–6	4.7633+8	2.0720+8	8.0953+7	1.8817+8	8.0077+3	2.4425+2	1.8384+2	6.0344+1	6.7479–2
	1.8988–3	6.3938–8	1.6779+6	5.5622–6	4.7070+8	2.0529+8	7.9913+7	1.8549+8	7.9934+3	2.4213+2	1.8250+2	5.9559+1	6.8392–2
	1.9494–3	6.5063–8	1.6489+6	5.7725–6	4.6256+8	2.0253+8	7.8411+7	1.8162+8	7.9724+3	2.3909+2	1.8059+2	5.8427+1	6.9758–2
	2.0000–3	6.6176–8	1.6212+6	5.9854–6	4.5478+8	1.9987+8	7.6977+7	1.7793+8	7.9519+3	2.3621+2	1.7879+2	5.7347+1	7.1121–2
M2	2.0752–3	6.7822–8	1.5818+6	6.3069–6	4.4374+8	1.9603+8	7.4859+7	1.7284+8	7.9155+3	2.3153+2	1.7563+2	5.5822+1	7.2862–2
	2.1041–3	6.8453–8	1.5673+6	6.4322–6	4.3965+8	1.9461+8	7.4080+7	1.7095+8	7.9020+3	2.2982+2	1.7449+2	5.5257+1	7.3530–2
	2.1250–3	6.8908–8	1.5569+6	6.5234–6	4.3675+8	1.9361+8	7.3529+7	1.6961+8	7.8923+3	2.2861+2	1.7368+2	5.4858+1	7.4012–2
	2.1601–3	6.9667–8	1.5400+6	6.6775–6	4.3200+8	1.9195+8	7.2626+7	1.6741+8	7.8762+3	2.2663+2	1.7236+2	5.4203+1	7.4821–2
	2.2344–3	7.1259–8	1.5056+6	7.0082–6	4.2234+8	1.8857+8	7.0796+7	1.6296+8	7.8432+3	2.2266+2	1.6970+2	5.2878+1	7.6530–2
	2.2500–3	7.1592–8	1.4986+6	7.0785–6	4.2038+8	1.8788+8	7.0425+7	1.6206+8	7.8364+3	2.2185+2	1.6917+2	5.2610+1	7.6888–2
	2.2651–3	7.1912–8	1.4919+6	7.1466–6	4.1851+8	1.8723+8	7.0071+7	1.6120+8	7.8299+3	2.2108+2	1.6865+2	5.2354+1	7.7234–2
M1	2.2774–3	7.2173–8	1.4865+6	7.2024–6	4.1699+8	1.8669+8	6.9785+7	1.6051+8	7.8246+3	2.2045+2	1.6823+2	5.2147+1	7.7517–2
	2.3226–3	7.3154–8	1.4666+6	7.4084–6	4.1140+8	1.8478+8	6.8736+7	1.5788+8	7.8054+3	2.1801+2	1.6657+2	5.1361+1	7.8549–2
	2.4072–3	7.4975–8	1.4309+6	7.8008–6	4.0141+8	1.8134+8	6.6864+7	1.5320+8	7.7706+3	2.1367+2	1.6362+2	4.9962+1	8.0479–2
	2.4375–3	7.5620–8	1.4187+6	7.9429–6	3.9799+8	1.8015+8	6.6223+7	1.5160+8	7.7585+3	2.1219+2	1.6262+2	4.9484+1	8.1167–2
	2.4488–3	7.5860–8	1.4142+6	7.9963–6	3.9672+8	1.7972+8	6.5987+7	1.5102+8	7.7540+3	2.1164+2	1.6225+2	4.9308+1	8.1424–2
	2.4813–3	7.6550–8	1.4015+6	8.1505–6	3.9315+8	1.7847+8	6.5320+7	1.4935+8	7.7412+3	2.1010+2	1.6121+2	4.8811+1	8.2162–2
	2.6110–3	7.9267–8	1.3535+6	8.7763–6	3.7968+8	1.7376+8	6.2808+7	1.4310+8	7.6921+3	2.0435+2	1.5732+2	4.6942+1	8.5098–2
	2.6172–3	7.9395–8	1.3513+6	8.8066–6	3.7906+8	1.7355+8	6.2694+7	1.4281+8	7.6898+3	2.0409+2	1.5714+2	4.6857+1	8.5237–2
	2.6250–3	7.9557–8	1.3485+6	8.8449–6	3.7829+8	1.7328+8	6.2550+7	1.4245+8	7.6870+3	2.0376+2	1.5692+2	4.6751+1	8.5414–2
	2.7187–3	8.1489–8	1.3166+6	9.3093–6	3.6932+8	1.7011+8	6.0884+7	1.3832+8	7.6533+3	1.9995+2	1.5435+2	4.5515+1	8.7527–2
	2.7244–3	8.1605–8	1.3147+6	9.3376–6	3.6880+8	1.6993+8	6.0786+7	1.3808+8	7.6514+3	1.9973+2	1.5420+2	4.5443+1	8.7654–2
	2.8055–3	8.3256–8	1.2886+6	9.7468–6	3.6148+8	1.6733+8	5.9431+7	1.3472+8	7.6234+3	1.9665+2	1.5212+2	4.4441+1	8.9476–2
	3.0000–3	8.7148–8	1.2311+6	1.0753–5	3.4534+8	1.6155+8	5.6448+7	1.2734+8	7.5598+3	1.8995+2	1.4761+2	4.2242+1	9.3825–2
	3.2500–3	9.2373–8	1.1614+6	1.2102–5	3.2580+8	1.5481+8	5.2944+7	1.1805+8	7.4602+3	1.8078+2	1.4130+2	3.9377+1	9.8498–2
	3.5000–3	9.7469–8	1.1007+6	1.3516–5	3.0877+8	1.4882+8	4.9897+7	1.1005+8	7.3692+3	1.7291+2	1.3589+2	3.6911+1	1.0313–1
	4.0000–3	1.0731–7	9.9973+5	1.6522–5	2.8045+8	1.3861+8	4.4847+7	9.6982+7	7.2081+3	1.5998+2	1.2698+2	3.2885+1	1.1229–1
	4.5000–3	1.1702–7	9.1681+5	1.9765–5	2.5719+8	1.2994+8	4.0714+7	8.6523+7	7.0320+3	1.4850+2	1.1878+2	2.9602+1	1.2001–1
	5.0000–3	1.2638–7	8.4887+5	2.3241–5	2.3813+8	1.2265+8	3.7343+7	7.8126+7	6.8782+3	1.3926+2	1.1217+2	2.6967+1	1.2761–1
	6.0000–3	1.4459–7	7.4201+5	3.0847–5	2.0815+8	1.1084+8	3.2077+7	6.5224+7	6.6004+3	1.2398+2	1.0099+2	2.2850+1	1.4168–1
	7.0000–3	1.6206–7	6.6201+5	3.9334–5	1.8571+8	1.0164+8	2.8155+7	5.5906+7	6.3135+3	1.1188+2	9.1902+1	1.9830+1	1.5263–1
	8.0000–3	1.7875–7	6.0018+5	4.8659–5	1.6836+8	9.4290+7	2.5150+7	4.8918+7	6.0751+3	1.0271+2	8.4986+1	1.7565+1	1.6332–1
L3	8.6381–3	1.8917–7	5.6714+5	5.5035–5	1.5910+8	9.0205+7	2.3551+7	4.5334+7	5.9222+3	9.7488+1	8.0950+1	1.6368+1	1.6894–1
	8.9786–3	1.9467–7	5.5111+5	5.8573–5	1.5460+8	8.8214+7	2.2786+7	4.3592+7	5.8467+3	9.4992+1	7.9027+1	1.5794+1	1.7191–1
	9.4893–3	2.0281–7	5.2900+5	6.4049–5	1.4840+8	8.5442+7	2.1733+7	4.1215+7	5.7402+3	9.1576+1	7.6390+1	1.5009+1	1.7632–1
L2	9.6294–3	2.0501–7	5.2330+5	6.5586–5	1.4680+8	8.4722+7	2.1463+7	4.0607+7	5.7123+3	9.0699+1	7.5713+1	1.4809+1	1.7753–1
	1.0000–2	2.1085–7	5.0881+5	6.9723–5	1.4273+8	8.2895+7	2.0781+7	3.9049+7	5.6411+3	8.8497+1	7.4015+1	1.4301+1	1.8069–1
L1	1.0081–2	2.1211–7	5.0579+5	7.0640–5	1.4189+8	8.2505+7	2.0638+7	3.8738+7	5.6241+3	8.8004+1	7.3628+1	1.4195+1	1.8127–1
	1.0235–2	2.1449–7	5.0018+5	7.2396–5	1.4031+8	8.1772+7	2.0370+7	3.8164+7	5.5908+3	8.7073+1	7.2890+1	1.4001+1	1.8223–1
	1.0625–2	2.2048–7	4.8659+5	7.6937–5	1.3650+8	7.9988+7	1.9724+7	3.6781+7	5.5093+3	8.4827+1	7.1110+1	1.3533+1	1.8466–1
	1.0830–2	2.2361–7	4.7978+5	7.9375–5	1.3459+8	7.9091+7	1.9402+7	3.6092+7	5.4680+3	8.3707+1	7.0221+1	1.3300+1	1.8593–1
	1.1172–2	2.2877–7	4.6897+5	8.3499–5	1.3156+8	7.7656+7	1.8890+7	3.5004+7	5.4018+3	8.1932+1	6.8812+1	1.2932+1	1.8804–1
	1.1352–2	2.3146–7	4.6351+5	8.5704–5	1.3002+8	7.6929+7	1.8632+7	3.4457+7	5.3680+3	8.1039+1	6.8103+1	1.2747+1	1.8915–1
	1.1719–2	2.3693–7	4.5282+5	9.0284–5	1.2702+8	7.5499+7	1.8129+7	3.3392+7	5.3013+3	7.9297+1	6.6719+1	1.2387+1	1.9141–1
	1.2129–2	2.4297–7	4.4156+5	9.5517–5	1.2387+8	7.3984+7	1.7600+7	3.2278+7	5.2302+3	7.7471+1	6.5267+1	1.2010+1	1.9391–1
	1.2264–2	2.4494–7	4.3801+5	9.7263–5	1.2287+8	7.3504+7	1.7433+7	3.1928+7	5.2075+3	7.6897+1	6.4810+1	1.1892+1	1.9474–1
	1.2500–2	2.4838–7	4.3194+5	1.0036–4	1.2117+8	7.2681+7	1.7149+7	3.1332+7	5.1687+3	7.5918+1	6.4031+1	1.1691+1	1.9617–1
	1.2539–2	2.4895–7	4.3095+5	1.0087–4	1.2089+8	7.2548+7	1.7103+7	3.1236+7	5.1623+3	7.5759+1	6.3905+1	1.1658+1	1.9641–1
	1.3565–2	2.6363–7	4.0695+5	1.1476–4	1.1416+8	6.9263+7	1.5984+7	2.8906+7	5.0054+3	7.1900+1	6.0828+1	1.0870+1	2.0259–1
	1.3632–2	2.6458–7	4.0549+5	1.1570–4	1.1375+8	6.9062+7	1.5917+7	2.8765+7	4.9957+3	7.1667+1	6.0641+1	1.0822+1	2.0299–1
	1.3770–2	2.6652–7	4.0253+5	1.1763–4	1.1292+8	6.8654+7	1.5780+7	2.8481+7	4.9760+3	7.1195+1	6.0265+1	1.0727+1	2.0381–1

Atomic Weight 168.934 Density 9.321 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000–2	2.8361–7	3.7828+5	1.3540–4	1.0611+8	6.5276+7	1.4660+7	2.6175+7	4.8115+3	6.7355+1	5.7197+1	9.9470+0	2.1108–1
1.6250–2	3.0062–7	3.5688+5	1.5447–4	1.0011+8	6.2169+7	1.3686+7	2.4253+7	4.6454+3	6.3739+1	5.4243+1	9.2803+0	2.1640–1
1.7500–2	3.1722–7	3.3820+5	1.7458–4	9.4872+7	5.9425+7	1.2842+7	2.2600+7	4.4966+3	6.0617+1	5.1689+1	8.7069+0	2.2167–1
1.8125–2	3.2539–7	3.2971+5	1.8501–4	9.2491+7	5.8168+7	1.2461+7	2.1857+7	4.4279+3	5.9209+1	5.0535+1	8.4493+0	2.2428–1
2.0000–2	3.4938–7	3.0707+5	2.1772–4	8.6139+7	5.4783+7	1.1451+7	1.9901+7	4.2406+3	5.5489+1	4.7486+1	7.7712+0	2.3205–1
2.2500–2	3.7974–7	2.8252+5	2.6460–4	7.9253+7	5.0895+7	1.0361+7	1.7993+7	4.0010+3	5.1217+1	4.3881+1	7.0970+0	2.3922–1
2.6250–2	4.2339–7	2.5340+5	3.4162–4	7.1083+7	4.6220+7	9.0894+6	1.5770+7	3.7078+3	4.6241+1	3.9678+1	6.3131+0	2.4988–1
3.0000–2	4.6512–7	2.3066+5	4.2625–4	6.4706+7	4.2519+7	8.1152+6	1.4067+7	3.4713+3	4.2435+1	3.6460+1	5.7144+0	2.6033–1
3.5000–2	5.1777–7	2.0721+5	5.5012–4	5.8126+7	3.8533+7	7.1390+6	1.2451+7	3.2063+3	3.8365+1	3.2965+1	5.1297+0	2.7056–1
4.0000–2	5.6809–7	1.8885+5	6.8605–4	5.2976+7	3.5383+7	6.3890+6	1.1202+7	2.9932+3	3.5243+1	3.0283+1	4.6797+0	2.8067–1
5.0000–2	6.6448–7	1.6146+5	9.9051–4	4.5292+7	3.0666+7	5.3350+6	9.2886+6	2.6669+3	3.0559+1	2.6295+1	3.9660+0	2.9711–1
K 5.9488–2	7.5156–7	1.4275+5	1.3184–3	4.0044+7	2.7433+7	4.6532+6	7.9556+6	2.4409+3	2.7374+1	2.3610+1	3.4543+0	3.1062–1
6.0000–2	7.5616–7	1.4188+5	1.3371–3	3.9801+7	2.7283+7	4.6219+6	7.8939+6	2.4305+3	2.7229+1	2.3487+1	3.4311+0	3.1128–1
6.1250–2	7.6708–7	1.3986+5	1.3834–3	3.9234+7	2.6931+7	4.5503+6	7.7501+6	2.4057+3	2.6881+1	2.3194+1	3.3745+0	3.1278–1
6.3594–2	7.8737–7	1.3626+5	1.4716–3	3.8223+7	2.6303+7	4.4228+6	7.4948+6	2.3613+3	2.6262+1	2.2673+1	3.2741+0	3.1561–1
6.7695–2	8.2231–7	1.3047+5	1.6308–3	3.6599+7	2.5290+7	4.2184+6	7.0885+6	2.2892+3	2.5273+1	2.1838+1	3.1145+0	3.2056–1
7.3848–2	8.7347–7	1.2283+5	1.8807–3	3.4455+7	2.3944+7	3.9496+6	6.5595+6	2.1925+3	2.3975+1	2.0740+1	2.9068+0	3.2797–1
8.0000–2	9.2327–7	1.1620+5	2.1434–3	3.2597+7	2.2770+7	3.7175+6	6.1077+6	2.1071+3	2.2859+1	1.9794+1	2.7296+0	3.3534–1
9.0000–2	9.9964–7	1.0732+5	2.5961–3	3.0106+7	2.1190+7	3.4159+6	5.4987+6	1.9954+3	2.1340+1	1.8510+1	2.4843+0	3.4566–1
1.0000–1	1.0731–6	9.9972+4	3.0790–3	2.8044+7	1.9870+7	3.1669+6	5.0056+6	1.9005+3	2.0094+1	1.7452+1	2.2860+0	3.5598–1
1.1250–1	1.1555–6	9.2847+4	3.7208–3	2.6046+7	1.8566+7	2.9306+6	4.5473+6	1.8059+3	1.8870+1	1.6406+1	2.0971+0	3.6635–1
1.3125–1	1.2727–6	8.4298+4	4.7547–3	2.3647+7	1.6988+7	2.6477+6	4.0103+6	1.6890+3	1.7418+1	1.5159+1	1.8765+0	3.8206–1
1.5000–1	1.3835–6	7.7543+4	5.8678–3	2.1753+7	1.5729+7	2.4249+6	3.5967+6	1.5940+3	1.6287+1	1.4182+1	1.7073+0	3.9776–1
2.0000–1	1.6377–6	6.5508+4	9.1369–3	1.8376+7	1.3444+7	2.0523+6	2.8789+6	1.4179+3	1.4343+1	1.2505+1	1.4048+0	4.3312–1
2.5000–1	1.8557–6	5.7813+4	1.2764–2	1.6218+7	1.1894+7	1.8408+6	2.4812+6	1.3072+3	1.3244+1	1.1543+1	1.2348+0	4.6555–1
3.0000–1	2.0550–6	5.2206+4	1.6656–2	1.4645+7	1.0762+7	1.6844+6	2.1974+6	1.2231+3	1.2458+1	1.0846+1	1.1149+0	4.9762–1
4.0000–1	2.4050–6	4.4609+4	2.4967–2	1.2514+7	9.1375+6	1.5063+6	1.8690+6	1.1202+3	1.1614+1	1.0077+1	9.7522–1	5.6207–1
5.0000–1	2.7137–6	3.9534+4	3.3740–2	1.1090+7	8.0374+6	1.4037+6	1.6480+6	1.0602+3	1.1186+1	9.6787+0	8.7906–1	6.2865–1
6.0000–1	2.9849–6	3.5942+4	4.2771–2	1.0083+7	7.2377+6	1.3383+6	1.5056+6	1.0231+3	1.0960+1	9.4435+0	8.1793–1	6.9843–1
8.0000–1	3.4500–6	3.1097+4	6.1121–2	8.7233+6	6.1350+6	1.2617+6	1.3256+6	9.8085+2	1.0839+1	9.2543+0	7.4127–1	8.4389–1
1.0000+0	3.8432–6	2.7915+4	7.9534–2	7.8308+6	5.4083+6	1.2207+6	1.2009+6	9.5930+2	1.0884+1	9.2011+0	6.8678–1	9.9580–1
1.5000+0	4.5916–6	2.3365+4	1.2448–1	6.5545+6	4.3305+6	1.1756+6	1.0474+6	9.4047+2	1.1370+1	9.3423+0	6.2354–1	1.4039+0
2.0000+0	5.1272–6	2.0925+4	1.6737–1	5.8698+6	3.7336+6	1.1646+6	9.7073+5	9.3882+2	1.1949+1	9.5176+0	5.8992–1	1.8412+0
3.0000+0	5.8790–6	1.8249+4	2.4705–1	5.1192+6	3.0899+6	1.1509+6	8.7744+5	9.4392+2	1.3172+1	9.8617+0	5.5573–1	2.7548+0
4.0000+0	6.3737–6	1.6832+4	3.1955–1	4.7218+6	2.7410+6	1.1451+6	8.3478+5	9.5062+2	1.4432+1	1.0167+1	5.3769–1	3.7269+0
5.0000+0	6.7159–6	1.5975+4	3.8606–1	4.4812+6	2.5264+6	1.1450+6	8.0892+5	9.5694+2	1.5655+1	1.0402+1	5.2978–1	4.7228+0
6.0000+0	6.9692–6	1.5394+4	4.4761–1	4.3184+6	2.3865+6	1.1449+6	7.8610+5	9.6302+2	1.6858+1	1.0593+1	5.2340–1	5.7414+0
8.0000+0	7.3120–6	1.4672+4	5.5848–1	4.1159+6	2.2087+6	1.1458+6	7.6040+5	9.7380+2	1.9272+1	1.0913+1	5.1346–1	7.8457+0
1.0000+1	7.5141–6	1.4278+4	6.5619–1	4.0052+6	2.1146+6	1.1466+6	7.4300+5	9.8311+2	2.1715+1	1.1190+1	5.0874–1	1.0016+1
1.5000+1	7.7046–6	1.3925+4	8.5968–1	3.9062+6	2.0276+6	1.1485+6	7.2918+5	1.0019+3	2.7668+1	1.1578+1	5.0589–1	1.5584+1
2.0000+1	7.7442–6	1.3854+4	1.0230+0	3.8862+6	2.0186+6	1.1497+6	7.1689+5	1.0151+3	3.3752+1	1.1887+1	5.0386–1	2.1361+1
3.0000+1	7.7563–6	1.3832+4	1.2759+0	3.8802+6	2.0194+6	1.1509+6	7.0883+5	1.0317+3	4.5962+1	1.2260+1	5.0104–1	3.3201+1
4.0000+1	7.7590–6	1.3827+4	1.4685+0	3.8788+6	2.0185+6	1.1516+6	7.0763+5	1.0465+3	5.8404+1	1.2514+1	5.0303–1	4.5388+1
5.0000+1	7.7632–6	1.3820+4	1.6235+0	3.8767+6	2.0178+6	1.1520+6	7.0584+5	1.0582+3	7.0962+1	1.2706+1	5.0459–1	5.7751+1
6.0000+1	7.7682–6	1.3811+4	1.7532+0	3.8742+6	2.0172+6	1.1522+6	7.0370+5	1.0678+3	8.3613+1	1.2850+1	5.0589–1	7.0258+1
8.0000+1	7.7674–6	1.3812+4	1.9619+0	3.8746+6	2.0163+6	1.1526+6	7.0466+5	1.0840+3	1.0920+2	1.3085+1	5.0791–1	9.5605+1
1.0000+2	7.7677–6	1.3812+4	2.1262+0	3.8745+6	2.0156+6	1.1528+6	7.0498+5	1.0976+3	1.3513+2	1.3290+1	5.0948–1	1.2133+2
1.5000+2	7.7593–6	1.3827+4	2.4284+0	3.8786+6	2.0143+6	1.1529+6	7.1027+5	1.1210+3	2.0010+2	1.3501+1	5.1350–1	1.8609+2
2.0000+2	7.7535–6	1.3837+4	2.6445+0	3.8815+6	2.0134+6	1.1530+6	7.1394+5	1.1357+3	2.6557+2	1.3696+1	5.1635–1	2.5135+2
3.0000+2	7.7456–6	1.3851+4	2.9508+0	3.8855+6	2.0122+6	1.1531+6	7.1909+5	1.1537+3	3.9608+2	1.3991+1	5.2047–1	3.8157+2
4.0000+2	7.7397–6	1.3862+4	3.1690+0	3.8885+6	2.0113+6	1.1531+6	7.2294+5	1.1661+3	5.2687+2	1.4160+1	5.2366–1	5.1219+2
5.0000+2	7.7352–6	1.3870+4	3.3384+0	3.8907+6	2.0106+6	1.1532+6	7.2583+5	1.1757+3	6.5859+2	1.4314+1	5.2616–1	6.4375+2
6.0000+2	7.7319–6	1.3876+4	3.4769+0	3.8924+6	2.0100+6	1.1532+6	7.2806+5	1.1840+3	7.8888+2	1.4427+1	5.2818–1	7.7393+2
8.0000+2	7.7271–6	1.3884+4	3.6958+0	3.8948+6	2.0091+6	1.1532+6	7.3139+5	1.1972+3	1.0518+3	1.4627+1	5.3141–1	1.0366+3
1.0000+3	7.7264–6	1.3885+4	3.8655+0	3.8952+6	2.0084+6	1.1532+6	7.3242+5	1.2077+3	1.3145+3	1.4794+1	5.3297–1	1.2992+3
1.5000+3	7.7235–6	1.3891+4	4.1737+0	3.8967+6	2.0071+6	1.1532+6	7.3514+5	1.2274+3	1.9752+3	1.4954+1	5.3496–1	1.9597+3
2.0000+3	7.7242–6	1.3889+4	4.3922+0	3.8963+6	2.0062+6	1.1532+6	7.3562+5	1.2420+3	2.6321+3	1.5111+1	5.3533–1	2.6164+3
3.0000+3	7.7260–6	1.3886+4	4.7003+0	3.8954+6	2.0049+6	1.1532+6	7.3600+5	1.2632+3	3.9480+3	1.5416+1	5.3563–1	3.9321+3
4.0000+3	7.7291–6	1.3881+4	4.9189+0	3.8938+6	2.0040+6	1.1532+6	7.3533+5	1.2788+3	5.2643+3	1.5548+1	5.3516–1	5.2483+3
5.0000+3	7.7341–6	1.3872+4	5.0883+0	3.8913+6	2.0033+6	1.1532+6	7.3347+5	1.2910+3	6.5944+3	1.5680+1	5.3383–1	6.5782+3
6.0000+3	7.7347–6	1.3870+4	5.2266+0	3.8910+6	2.0028+6	1.1532+6	7.3371+5	1.2999+3	7.9032+3	1.5779+1	5.3403–1	7.8869+3
8.0000+3	7.7370–6	1.3866+4	5.4449+0	3.8898+6	2.0019+6	1.1532+6	7.3346+5	1.3141+3	1.0544+4	1.5976+1	5.3390–1	1.0527+4
1.0000+4	7.7391–6	1.3863+4	5.6140+0	3.8888+6	2.0012+6	1.1532+6	7.3307+5	1.3253+3	1.3209+4	1.6159+1	5.3366–1	1.3192+4
1.5000+4	7.7421–6	1.3857+4	5.9215+0	3.8873+6	1.9999+6	1.1532+6	7.3285+5	1.3467+3	1.9748+4	1.6305+1	5.3350–1	1.9731+4
2.0000+4	7.7451–6	1.3852+4	6.1399+0	3.8858+6	1.9990+6	1.1532+6	7.3221+5	1.3621+3	2.6372+4	1.6452+1	5.3303–1	2.6355+4
3.0000+4	7.7480–6	1.3847+4	6.4477+0	3.8843+6	1.9977+6	1.1532+6	7.3197+5	1.3837+3	3.9469+4	1.6746+1	5.3287–1	3.9452+4
4.0000+4	7.7512–6	1.3841+4	6.6662+0	3.8827+6	1.9968+6	1.1532+6	7.3129+5	1.3993+3	5.2707+4	1.6893+1	5.3237–1	5.2690+4
5.0000+4	7.7560–6	1.3832+4	6.8357+0	3.8803+6	1.9961+6	1.1532+6	7.2955+5	1.4112+3	6.5822+4	1.7015+1	5.3111–1	6.5804+4
6.0000+4	7.7562–6	1.3832+4	6.9742+0	3.8802+6	1.9956+6	1.1532+6	7.3000+5	1.4209+3	7.8926+4	1.7136+1	5.3144–1	7.8908+4
8.0000+4	7.7581–6	1.3829+4	7.1928+0	3.8793+6	1.9947+6	1.1532+6	7.2996+5	1.4365+3	1.0536+5	1.7328+1	5.3141–1	1.0534+5
1.0000+5	7.7596–6	1.3826+4	7.3621+0	3.8785+6	1.9940+6	1.1532+6	7.2990+5	1.4485+3	1.3185+5	1.7507+1	5.3137–1	1.3183+5


July 4 1991
Atomic Weight 173 040
EEDL Evaluated Electron
Cross Sections
70-Yb
Density 6 730 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
70-Yb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Atomic Weight 173 040
EEDL Evaluated Electron
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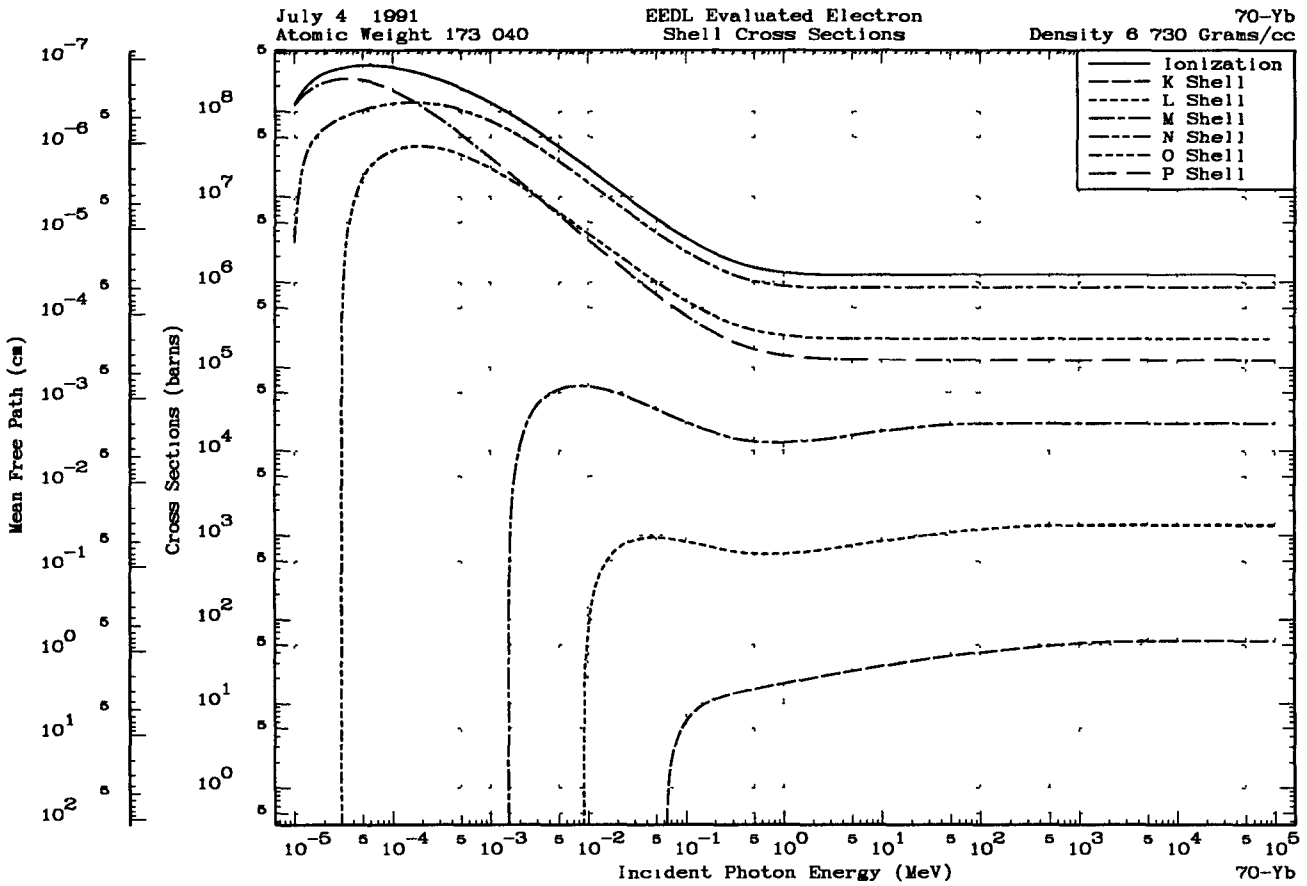
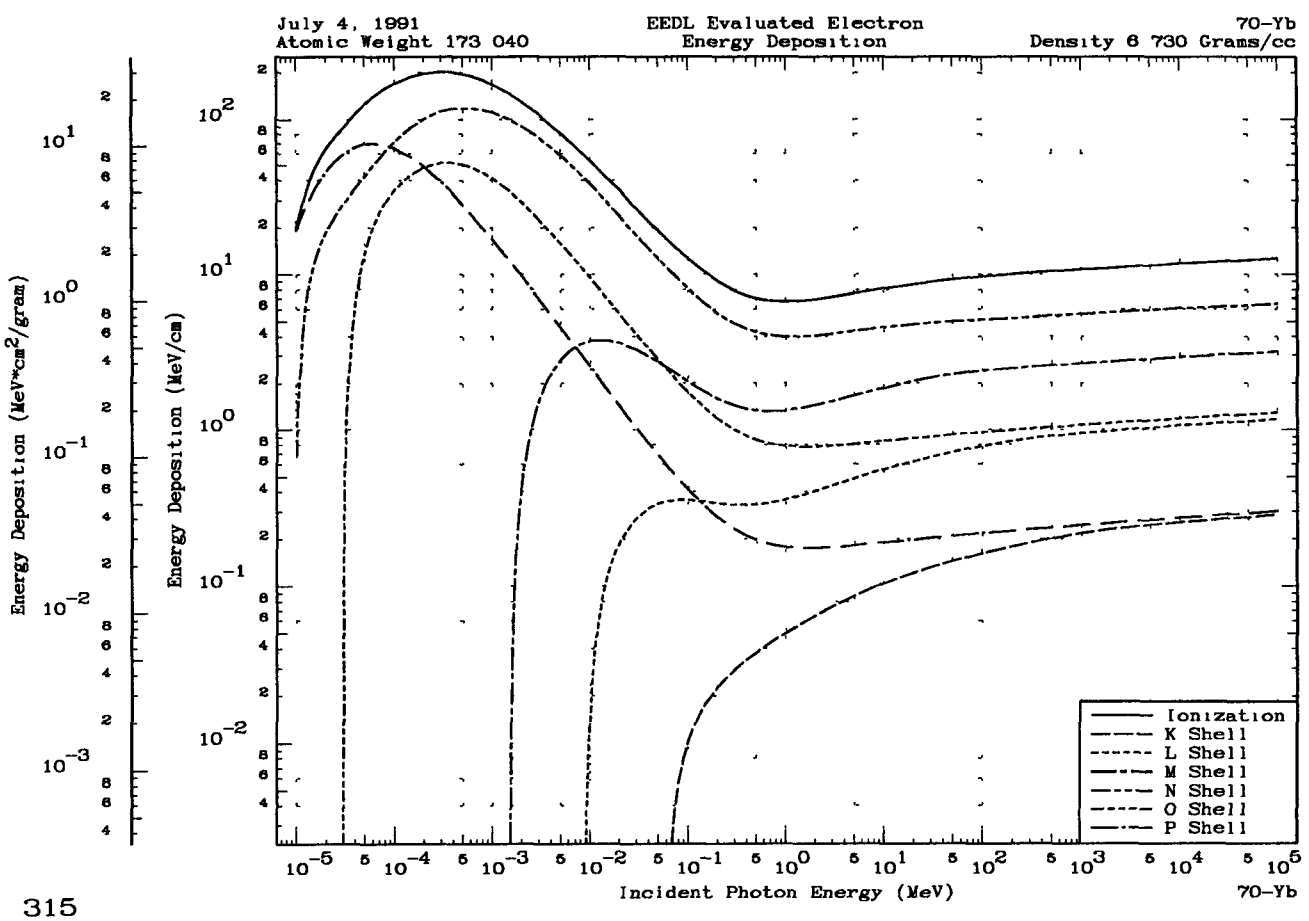
70-Yb
Density 6 730 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
70-Yb


July 4 1991
Atomic Weight 173 040
EEDL Evaluated Electron
Shell Cross Sections
70-Yb
Density 6 730 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
70-Yb


July 4, 1991
Atomic Weight 173 040
EEDL Evaluated Electron
Energy Deposition
70-Yb
Density 6 730 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
70-Yb

315

Atomic Weight 173.040 Density 6.730 Grams/cc

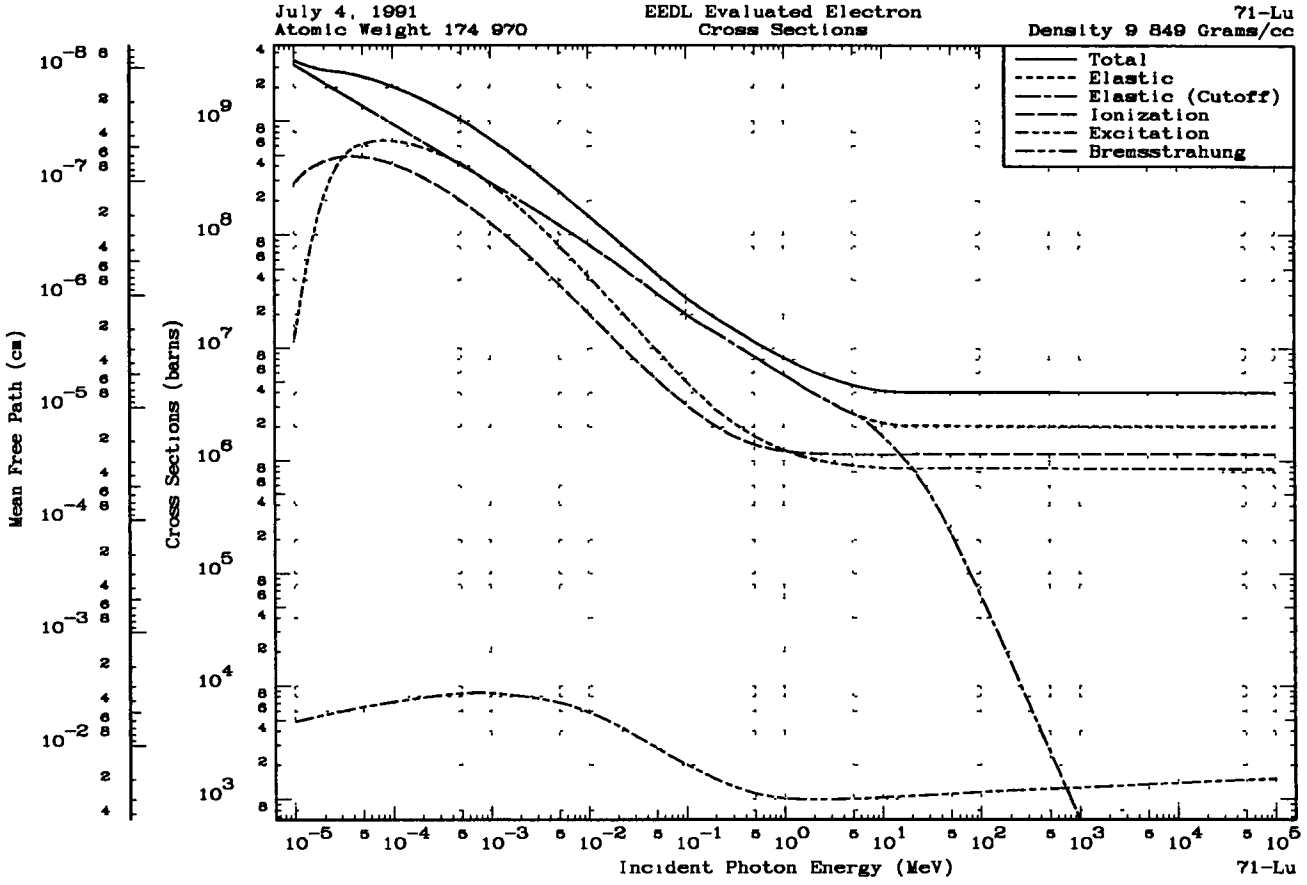
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.4339–8	1.0363+7		2.9776+9	2.8483+9	1.2465+8	4.6696+6	4.4227+3	2.0491+1	1.9774+1	7.1692–1	2.2388–4
	1.0312–5	1.4509–8	1.0241+7		2.9427+9	2.8042+9	1.3243+8	6.0691+6	4.4505+3	2.2350+1	2.1410+1	9.3997–1	2.3060–4
	1.0898–5	1.4813–8	1.0031+7		2.8823+9	2.7266+9	1.4671+8	8.9880+6	4.5008+3	2.5884+1	2.4469+1	1.4148+0	2.4331–4
N6	1.1090–5	1.4909–8	9.9664+6		2.8637+9	2.7026+9	1.5114+8	1.0016+7	4.5169+3	2.7017+1	2.5431+1	1.5849+0	2.4749–4
	1.1212–5	1.4967–8	9.9274+6		2.8525+9	2.6876+9	1.5424+8	1.0713+7	4.5270+3	2.7850+1	2.6150+1	1.6998+0	2.5016–4
	1.1411–5	1.5061–8	9.8661+6		2.8349+9	2.6637+9	1.5927+8	1.1936+7	4.5432+3	2.9224+1	2.7322+1	1.9020+0	2.5452–4
	1.1449–5	1.5078–8	9.8548+6		2.8317+9	2.6593+9	1.6025+8	1.2181+7	4.5463+3	2.9497+1	2.7554+1	1.9427+0	2.5535–4
	1.1893–5	1.5281–8	9.7237+6		2.7940+9	2.6084+9	1.7075+8	1.4850+7	4.5816+3	3.2431+1	3.0039+1	2.3914+0	2.6511–4
	1.2281–5	1.5448–8	9.6188+6		2.7639+9	2.5662+9	1.8009+8	1.7556+7	4.6117+3	3.5136+1	3.2285+1	2.8509+0	2.7371–4
	1.2308–5	1.5459–8	9.6118+6		2.7619+9	2.5634+9	1.8072+8	1.7757+7	4.6138+3	3.5322+1	3.2437+1	2.8851+0	2.7430–4
	1.2961–5	1.5725–8	9.4489+6		2.7150+9	2.4970+9	1.9502+8	2.3033+7	4.6626+3	3.9741+1	3.5946+1	3.7949+0	2.8886–4
	1.3125–5	1.5789–8	9.4110+6		2.7042+9	2.4811+9	1.9851+8	2.4539+7	4.6746+3	4.0871+1	3.6814+1	4.0570+0	2.9253–4
	1.3654–5	1.5995–8	9.2899+6		2.6693+9	2.4318+9	2.0833+8	2.9194+7	4.7123+3	4.4302+1	3.9421+1	4.8803+0	3.0444–4
	1.3980–5	1.6116–8	9.2201+6		2.6493+9	2.4029+9	2.1405+8	3.2385+7	4.7351+3	4.6430+1	4.0978+1	5.4507+0	3.1182–4
	1.5000–5	1.6460–8	9.0270+6		2.5938+9	2.3185+9	2.3116+8	4.4122+7	4.8035+3	5.3333+1	4.5750+1	7.5828+0	3.3506–4
	1.6250–5	1.6847–8	8.8197+6		2.5343+9	2.2262+9	2.4730+8	6.0715+7	4.8824+3	6.1168+1	5.0602+1	1.0565+1	3.6392–4
	1.7500–5	1.7175–8	8.6513+6		2.4859+9	2.1441+9	2.6267+8	7.9123+7	4.9567+3	6.9379+1	5.5439+1	1.3940+1	3.9316–4
	1.8125–5	1.7325–8	8.5767+6		2.4644+9	2.1062+9	2.6853+8	8.9693+7	4.9922+3	7.3432+1	5.7533+1	1.5899+1	4.0792–4
	2.0000–5	1.7709–8	8.3906+6		2.4109+9	2.0036+9	2.8494+8	1.2243+8	5.0933+3	8.5798+1	6.3700+1	2.2098+1	4.5272–4
	2.2500–5	1.8129–8	8.1962+6		2.3551+9	1.8873+9	2.9945+8	1.6833+8	5.2033+3	1.0078+2	7.0148+1	3.0631+1	5.0860–4
	2.5000–5	1.8413–8	8.0696+6		2.3187+9	1.7890+9	3.1320+8	2.1647+8	5.3037+3	1.1642+2	7.6706+1	3.9710+1	5.6541–4
	3.0000–5	1.8857–8	7.8796+6		2.2641+9	1.6309+9	3.2922+8	3.0395+8	5.4820+3	1.4355+2	8.6896+1	5.6655+1	6.8156–4
O3	3.0010–5	1.8858–8	7.8792+6		2.2640+9	1.6307+9	3.2924+8	3.0411+8	5.4823+3	1.4360+2	8.6911+1	5.6685+1	6.8179–4
	3.0322–5	1.8889–8	7.8663+6		2.2603+9	1.6221+9	3.2994+8	3.0824+8	5.4925+3	1.4502+2	8.7541+1	5.7478+1	6.8910–4
	3.0927–5	1.8946–8	7.8428+6		2.2536+9	1.6060+9	3.3131+8	3.1627+8	5.5119+3	1.4780+2	8.8779+1	5.9023+1	7.0328–4
	3.2061–5	1.9041–8	7.8036+6		2.2423+9	1.5769+9	3.3391+8	3.3146+8	5.5476+3	1.5310+2	9.1149+1	6.1951+1	7.2999–4
	3.4046–5	1.9176–8	7.7487+6		2.2265+9	1.5296+9	3.3847+8	3.5842+8	5.6076+3	1.6256+2	9.5396+1	6.7167+1	7.7708–4
O2	3.6440–5	1.9292–8	7.7022+6		2.2131+9	1.4778+9	3.4373+8	3.9159+8	5.6764+3	1.7412+2	1.0050+2	7.3615+1	8.3446–4
	3.6662–5	1.9309–8	7.6953+6		2.2112+9	1.4733+9	3.4415+8	3.9376+8	5.6825+3	1.7504+2	1.0099+2	7.4045+1	8.3983–4
	3.7023–5	1.9336–8	7.6847+6		2.2081+9	1.4660+9	3.4485+8	3.9728+8	5.6925+3	1.7654+2	1.0180+2	7.4742+1	8.4853–4
	3.7080–5	1.9340–8	7.6830+6		2.2076+9	1.4648+9	3.4495+8	3.9784+8	5.6941+3	1.7677+2	1.0191+2	7.4852+1	8.4990–4
	3.7810–5	1.9393–8	7.6618+6		2.2015+9	1.4504+9	3.4615+8	4.0496+8	5.7140+3	1.7966+2	1.0339+2	7.6264+1	8.6756–4
	3.8905–5	1.9467–8	7.6329+6		2.1932+9	1.4296+9	3.4803+8	4.1561+8	5.7433+3	1.8407+2	1.0569+2	7.8383+1	8.9416–4
	4.0000–5	1.9532–8	7.6073+6		2.1859+9	1.4096+9	3.5000+8	4.2624+8	5.7719+3	1.8858+2	1.0807+2	8.0503+1	9.2088–4
	4.2500–5	1.9723–8	7.5338+6		2.1648+9	1.3670+9	3.5193+8	4.4585+8	5.8307+3	1.9667+2	1.1230+2	8.4378+1	9.7982–4
	4.5000–5	1.9884–8	7.4727+6		2.1472+9	1.3280+9	3.5409+8	4.6516+8	5.8867+3	2.0492+2	1.1670+2	8.8211+1	1.0393–3
	4.6250–5	1.9986–8	7.4347+6		2.1363+9	1.3096+9	3.5500+8	4.7164+8	5.9137+3	2.0833+2	1.1879+2	8.9531+1	1.0692–3
	5.0000–5	2.0261–8	7.3337+6		2.1073+9	1.2589+9	3.5777+8	4.9058+8	5.9912+3	2.1850+2	1.2509+2	9.3408+1	1.1596–3
	5.5000–5	2.0675–8	7.1870+6		2.0651+9	1.1995+9	3.5832+8	5.0725+8	6.0840+3	2.2889+2	1.3190+2	9.6994+1	1.2794–3
O1	5.9900–5	2.1030–8	7.0656+6		2.0302+9	1.1488+9	3.5881+8	5.2265+8	6.1683+3	2.3872+2	1.3836+2	1.0036+2	1.3983–3
	6.0000–5	2.1039–8	7.0627+6		2.0294+9	1.1478+9	3.5883+8	5.2276+8	6.1700+3	2.3889+2	1.3850+2	1.0039+2	1.4008–3
	6.1250–5	2.1155–8	7.0239+6		2.0182+9	1.1359+9	3.5818+8	5.2420+8	6.1905+3	2.4040+2	1.3968+2	1.0072+2	1.4314–3
	6.3594–5	2.1365–8	6.9547+6		1.9983+9	1.1145+9	3.5707+8	5.2682+8	6.2281+3	2.4327+2	1.4193+2	1.0133+2	1.4889–3
	6.5644–5	2.1542–8	6.8975+6		1.9819+9	1.0967+9	3.5621+8	5.2905+8	6.2601+3	2.4580+2	1.4394+2	1.0186+2	1.5395–3
	6.9233–5	2.1837–8	6.8046+6		1.9552+9	1.0675+9	3.5493+8	5.3280+8	6.3141+3	2.5029+2	1.4754+2	1.0275+2	1.6287–3
	7.0000–5	2.1897–8	6.7858+6		1.9498+9	1.0615+9	3.5469+8	5.3358+8	6.3253+3	2.5125+2	1.4831+2	1.0294+2	1.6478–3
	7.4617–5	2.2251–8	6.6778+6		1.9188+9	1.0277+9	3.5294+8	5.3813+8	6.3908+3	2.5666+2	1.5261+2	1.0404+2	1.7637–3
	8.0000–5	2.2632–8	6.5655+6		1.8865+9	9.9208+8	3.5130+8	5.4314+8	6.4630+3	2.6303+2	1.5776+2	1.0527+2	1.9001–3
	9.0000–5	2.3438–8	6.3397+6		1.8217+9	9.3460+8	3.4453+8	5.4253+8	6.5816+3	2.6972+2	1.6400+2	1.0572+2	2.1552–3
	1.0000–4	2.4162–8	6.1497+6	0.0000+0	1.7671+9	8.8600+8	3.3905+8	5.4198+8	6.6896+3	2.7665+2	1.7047+2	1.0618+2	2.4144–3
	1.1250–4	2.5067–8	5.9277+6	4.4828–8	1.7033+9	8.3481+8	3.2911+8	5.3934+8	6.8072+3	2.8105+2	1.7497+2	1.0607+2	2.7413–3
	1.2500–4	2.5884–8	5.7406+6	8.8919–8	1.6495+9	7.9152+8	3.2099+8	5.3699+8	6.9141+3	2.8597+2	1.7994+2	1.0602+2	3.0734–3
	1.3125–4	2.6268–8	5.6566+6	1.1069–7	1.6254+9	7.7225+8	3.1723+8	5.3590+8	6.9642+3	2.8808+2	1.8206+2	1.0602+2	3.2411–3
	1.5000–4	2.7327–8	5.4375+6	1.7503–7	1.5624+9	7.2186+8	3.0760+8	5.3294+8	7.1031+3	2.9484+2	1.8879+2	1.0604+2	3.7511–3
N5	1.8444–4	2.9319–8	5.0680+6	2.9119–7	1.4562+9	6.5027+8	2.8799+8	5.1798+8	7.3237+3	2.9816+2	1.9433+2	1.0383+2	4.7110–3
	1.9222–4	2.9722–8	4.9993+6	3.1723–7	1.4365+9	6.3683+8	2.8430+8	5.1535+8	7.3631+3	2.9933+2	1.9583+2	1.0349+2	4.9391–3
N4	1.9373–4	2.9799–8	4.9864+6	3.2227–7	1.4328+9	6.3432+8	2.8361+8	5.1486+8	7.3705+3	2.9955+2	1.9612+2	1.0343+2	4.9835–3
	2.0000–4	3.0110–8	4.9349+6	3.4316–7	1.4180+9	6.2419+8	2.8087+8	5.1293+8	7.4009+3	3.0063+2	1.9742+2	1.0321+2	5.1688–3
	2.1250–4	3.0806–8	4.8234+6	3.8478–7	1.3859+9	6.0536+8	2.7426+8	5.0633+8	7.4589+3	3.0007+2	1.9798+2	1.0208+2	5.5403–3
	2.3438–4	3.1956–8	4.6498+6	4.5773–7	1.3361+9	5.7611+8	2.6412+8	4.9584+8	7.5537+3	2.9970+2	1.9937+2	1.0032+2	6.1973–3
	2.5000–4	3.2731–8	4.5397+6	5.0985–7	1.3045+9	5.5763+8	2.5778+8	4.8904+8	7.6168+3	2.9985+2	2.0064+2	9.9201+1	6.6715–3
	2.5078–4	3.2768–8	4.5345+6	5.1245–7	1.3029+9	5.5675+8	2.5747+8	4.8872+8	7.6199+3	2.9983+2	2.0067+2	9.9148+1	6.6954–3
	2.6719–4	3.3548–8	4.4291+6	5.6720–7	1.2727+9	5.3920+8	2.5130+8	4.8214+8	7.6824+3	2.9950+2	2.0142+2	9.8073+1	7.1977–3
	2.7539–4	3.3925–8	4.3799+6	5.9460–7	1.2585+9	5.3102+8	2.4844+8	4.7903+8	7.7124+3	2.9944+2	2.0186+2	9.7570+1	7.4504–3
	3.0000–4	3.5009–8	4.2442+6	6.7675–7	1.2195+9	5.0855+8	2.4064+8	4.7035+8	7.7980+3	2.9963+2	2.0345+2	9.6181+1	8.2143–3
N3	3.3492–4	3.6662–8	4.0529+6	7.9412–7	1.1646+9	4.8108+8	2.2898+8	4.5448+8	7.9095+3	2.9546+2	2.0216+2	9.3291+1	9.3122–3
	3.3899–4	3.6850–8	4.0323+6	8.0789–7	1.1586+9	4.7817+8	2.2774+8	4.5271+8	7.9216+3	2.9504+2	2.0206+2	9.2974+1	9.4413–3
	3.4661–4	3.7198–8	3.9945+6	8.3377–7	1.1478+9	4.7285+8	2.2548+8	4.4945+8	7.9442+3	2.9431+2	2.0191+2	9.2392+1	9.6839–3
	3.5000–4	3.7351–8	3.9781+6	8.4528–7	1.1431+9	4.7054+8	2.2450+8	4.4803+8	7.9540+3	2.9400+2	2.0185+2	9.2140+1	9.7918–3
	3.5996–4	3.7796–8	3.9313+6	8.7922–7	1.1296+9	4.6394+8	2.2171+8	4.4397+8	7.9826+3	2.9312+2	2.0169+2	9.1418+1	1.0110–2
	3.7998–4	3.8668–8	3.8427+6	9.4769–7	1.1042+9	4.5148+8	2.1645+8	4.3623+8	8.0380+3	2.9159+2	2.0153+2	9.0050+1	1.0753–2
N2	3.8604–4	3.8926–8	3.8172+6	9.6849–7	1.0968+9	4.4790+8	2.1494+8	4.3399+8	8.0542+3	2.9118+2	2.0151+2	8.9656+1	1.0949–2
	3.9302–4	3.9224–8	3.7882+6	9.9248–7	1.0885+9	4.4388+8	2.1325+8	4.3136+8	8.0692+3	2.9073+2	2.0152+2	8.9199+1	1.1180–2
	4.0000–4	3.9519–8	3.7599+6	1.0165–6	1.0804+9	4.3996+8	2.1161+8	4.2879+8	8.0839+3	2.9031+2	2.0155+2	8.8754+1	1.1413–2
	4.1250–4	4.0085–8	3.7068+6	1.0597–6	1.0651+9	4.3320+8	2.0830+8	4.2360+8	8.1097+3	2.8832+2	2.0053+2	8.7783+1	1.1830–2
	4.3438–4	4.1053–8	3.6194+6	1.1360–6	1.0400+9	4.2209+8	2.0289+8	4.1502+8	8.1533+3	2.8516+2	1.9896+2	8.6182+1	1.2563–2
	4.5000–4	4.1727–8	3.5609+6	1.1910–6	1.0232+9	4.1465+8	1.9929+8	4.0925+8	8.1832+3	2.8312+2	1.9800+2	8.5110+1	1.3089–2
	4.6719–4	4.2454–8	3.5000+6	1.2519–6	1.0057+9	4.0690+8	1.9556+8	4.0322+8	8.2151+3	2.8105+2	1.9705+2	8.3991+1	1.3670–2
N1	4.7100–4	4.2613–8	3.4870+6	1.2655–6	1.0019+9	4.0524+8	1.9476+8	4.0193+8	8.2220+3	2.8062+2	1.9685+2	8.3751+1	1.3799–2
	4.7825–4	4.2922–8	3.4618+6	1.2914–6	9.9473+8	4.0214+8	1.9328+8	3.9931+8	8.2351+3	2.7979+2	1.9651+2	8.3270+1	1.4045–2

Atomic Weight 173.040 Density 6.730 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.8913–4	4.3380–8	3.4253+6	1.3303–6	9.8421+8	3.9761+8	1.9111+8	3.9548+8	8.2543+3	2.7862+2	1.9603+2	8.2568+1	1.4415–2
	5.0000–4	4.3833–8	3.3899+6	1.3694–6	9.7404+8	3.9324+8	1.8903+8	3.9177+8	8.2731+3	2.7751+2	1.9560+2	8.1889+1	1.4785–2
	5.2500–4	4.4904–8	3.3090+6	1.4600–6	9.5081+8	3.8370+8	1.8434+8	3.8276+8	8.3106+3	2.7445+2	1.9426+2	8.0174+1	1.5633–2
	5.5000–4	4.5948–8	3.2338+6	1.5516–6	9.2920+8	3.7483+8	1.8000+8	3.7437+8	8.3465+3	2.7172+2	1.9312+2	7.8580+1	1.6485–2
	5.6250–4	4.6461–8	3.1981+6	1.5977–6	9.1895+8	3.7061+8	1.7795+8	3.7038+8	8.3638+3	2.7046+2	1.9262+2	7.7824+1	1.6913–2
	6.0000–4	4.7964–8	3.0979+6	1.7372–6	8.9016+8	3.5877+8	1.7222+8	3.5916+8	8.4140+3	2.6709+2	1.9137+2	7.5701+1	1.8201–2
	6.5000–4	5.0092–8	2.9663+6	1.9268–6	8.5234+8	3.4461+8	1.6450+8	3.4323+8	8.4529+3	2.6025+2	1.8764+2	7.2591+1	1.9836–2
	7.0000–4	5.2143–8	2.8496+6	2.1211–6	8.1881+8	3.3200+8	1.5771+8	3.2910+8	8.4891+3	2.5441+2	1.8455+2	6.9842+1	2.1479–2
	8.0000–4	5.6047–8	2.6511+6	2.5218–6	7.6178+8	3.1042+8	1.4625+8	3.0510+8	8.5547+3	2.4486+2	1.7965+2	6.5190+1	2.4784–2
	9.0000–4	5.9882–8	2.4814+6	2.9390–6	7.1300+8	2.9256+8	1.3606+8	2.8437+8	8.5460+3	2.3461+2	1.7348+2	6.1102+1	2.7524–2
	1.0000–3	6.3526–8	2.3390+6	3.3728–6	6.7209+8	2.7745+8	1.2760+8	2.6703+8	8.5381+3	2.2640+2	1.6867+2	5.7695+1	3.0261–2
	1.1250–3	6.8259–8	2.1768+6	3.9397–6	6.2549+8	2.6147+8	1.1798+8	2.4604+8	8.4720+3	2.1469+2	1.6121+2	5.3449+1	3.3004–2
	1.2500–3	7.2778–8	2.0417+6	4.5352–6	5.8665+8	2.4795+8	1.1003+8	2.2866+8	8.4134+3	2.0524+2	1.5526+2	4.9944+1	3.5731–2
	1.3125–3	7.4969–8	1.9820+6	4.8428–6	5.6951+8	2.4193+8	1.0653+8	2.2104+8	8.3863+3	2.0108+2	1.5263+2	4.8408+1	3.7090–2
	1.5000–3	8.1294–8	1.8278+6	5.8004–6	5.2519+8	2.2619+8	9.7554+7	2.0144+8	8.3128+3	1.9063+2	1.4611+2	4.4473+1	4.1145–2
M5	1.5285–3	8.2249–8	1.8066+6	5.9506–6	5.1910+8	2.2405+8	9.6248+7	1.9879+8	8.2995+3	1.8884+2	1.4487+2	4.3927+1	4.1703–2
	1.5432–3	8.2742–8	1.7958+6	6.0288–6	5.1601+8	2.2297+8	9.5590+7	1.9744+8	8.2928+3	1.8794+2	1.4425+2	4.3650+1	4.1990–2
	1.5575–3	8.3217–8	1.7855+6	6.1050–6	5.1306+8	2.2194+8	9.4962+7	1.9615+8	8.2863+3	1.8709+2	1.4366+2	4.3386+1	4.2269–2
M4	1.5781–3	8.3900–8	1.7710+6	6.2154–6	5.0888+8	2.2048+8	9.4075+7	1.9432+8	8.2770+3	1.8589+2	1.4283+2	4.3012+1	4.2671–2
	1.5852–3	8.4136–8	1.7660+6	6.2534–6	5.0746+8	2.1998+8	9.3774+7	1.9370+8	8.2739+3	1.8548+2	1.4255+2	4.2883+1	4.2809–2
	1.6111–3	8.4999–8	1.7481+6	6.3938–6	5.0231+8	2.1817+8	9.2691+7	1.9144+8	8.2625+3	1.8400+2	1.4154+2	4.2421+1	4.3314–2
	1.6308–3	8.5652–8	1.7348+6	6.5014–6	4.9847+8	2.1682+8	9.1886+7	1.8976+8	8.2540+3	1.8290+2	1.4078+2	4.2077+1	4.3699–2
	1.7083–3	8.8186–8	1.6849+6	6.9298–6	4.8415+8	2.1175+8	8.8885+7	1.8351+8	8.2215+3	1.7885+2	1.3801+2	4.0795+1	4.5205–2
	1.7231–3	8.8665–8	1.6758+6	7.0128–6	4.8154+8	2.1082+8	8.8338+7	1.8237+8	8.2155+3	1.7811+2	1.3751+2	4.0562+1	4.5492–2
	1.8542–3	9.2835–8	1.6006+6	7.7611–6	4.5991+8	2.0310+8	8.3834+7	1.7296+8	8.1645+3	1.7211+2	1.3342+2	3.8639+1	4.8028–2
	1.8616–3	9.3067–8	1.5966+6	7.8041–6	4.5876+8	2.0269+8	8.3596+7	1.7247+8	8.1618+3	1.7180+2	1.3321+2	3.8537+1	4.8171–2
M3	1.9352–3	9.5355–8	1.5583+6	8.2366–6	4.4775+8	1.9872+8	8.1316+7	1.6770+8	8.1349+3	1.6879+2	1.3118+2	3.7564+1	4.9590–2
	1.9676–3	9.6360–8	1.5420+6	8.4293–6	4.4308+8	1.9705+8	8.0358+7	1.6567+8	8.1235+3	1.6752+2	1.3033+2	3.7148+1	5.0214–2
	2.0000–3	9.7359–8	1.5262+6	8.6234–6	4.3854+8	1.9541+8	7.9427+7	1.6369+8	8.1122+3	1.6630+2	1.2950+2	3.6744+1	5.0836–2
	2.0625–3	9.9375–8	1.4952+6	9.0023–6	4.2964+8	1.9231+8	7.7615+7	1.5971+8	8.0815+3	1.6355+2	1.2760+2	3.5903+1	5.1883–2
M2	2.1607–3	1.0250–7	1.4496+6	9.6102–6	4.1654+8	1.8771+8	7.4958+7	1.5387+8	8.0353+3	1.5955+2	1.2483+2	3.4671+1	5.3522–2
	2.1797–3	1.0311–7	1.4411+6	9.7295–6	4.1409+8	1.8685+8	7.4468+7	1.5276+8	8.0266+3	1.5882+2	1.2432+2	3.4438+1	5.3838–2
	2.2132–3	1.0417–7	1.4264+6	9.9411–6	4.0985+8	1.8538+8	7.3623+7	1.5084+8	8.0115+3	1.5755+2	1.2346+2	3.4036+1	5.4395–2
	2.2500–3	1.0534–7	1.4106+6	1.0176–5	4.0531+8	1.8379+8	7.2720+7	1.4879+8	7.9952+3	1.5619+2	1.2253+2	3.3606+1	5.5007–2
	2.3115–3	1.0727–7	1.3851+6	1.0573–5	3.9800+8	1.8123+8	7.1267+7	1.4550+8	7.9687+3	1.5401+2	1.2104+2	3.2917+1	5.6027–2
M1	2.3681–3	1.0904–7	1.3627+6	1.0942–5	3.9157+8	1.7896+8	6.9990+7	1.4261+8	7.9450+3	1.5211+2	1.1974+2	3.2313+1	5.6963–2
	2.3848–3	1.0956–7	1.3562+6	1.1052–5	3.8970+8	1.7830+8	6.9614+7	1.4177+8	7.9380+3	1.5151+2	1.1932+2	3.2136+1	5.7238–2
	2.3976–3	1.0996–7	1.3513+6	1.1137–5	3.8828+8	1.7780+8	6.9329+7	1.4114+8	7.9328+3	1.5106+2	1.1900+2	3.2001+1	5.7448–2
	2.4076–3	1.1027–7	1.3474+6	1.1203–5	3.8717+8	1.7742+8	6.9108+7	1.4064+8	7.9286+3	1.5071+2	1.1875+2	3.1897+1	5.7613–2
	2.4375–3	1.1121–7	1.3361+6	1.1402–5	3.8392+8	1.7627+8	6.8457+7	1.3919+8	7.9165+3	1.4968+2	1.1803+2	3.1591+1	5.8105–2
	2.4816–3	1.1258–7	1.3199+6	1.1699–5	3.7925+8	1.7462+8	6.7521+7	1.3711+8	7.8988+3	1.4819+2	1.1698+2	3.1151+1	5.8829–2
	2.5482–3	1.1463–7	1.2963+6	1.2151–5	3.7247+8	1.7221+8	6.6166+7	1.3409+8	7.8728+3	1.4605+2	1.1547+2	3.0515+1	5.9919–2
	2.6112–3	1.1655–7	1.2749+6	1.2585–5	3.6632+8	1.7001+8	6.4939+7	1.3137+8	7.8489+3	1.4412+2	1.1412+2	2.9941+1	6.0949–2
	2.6924–3	1.1900–7	1.2486+6	1.3153–5	3.5878+8	1.6730+8	6.3436+7	1.2803+8	7.8191+3	1.4176+2	1.1246+2	2.9238+1	6.2271–2
	2.7187–3	1.1979–7	1.2404+6	1.3340–5	3.5641+8	1.6645+8	6.2964+7	1.2698+8	7.8096+3	1.4103+2	1.1195+2	2.9018+1	6.2700–2
	2.8056–3	1.2238–7	1.2141+6	1.3961–5	3.4887+8	1.6373+8	6.1467+7	1.2367+8	7.7791+3	1.3869+2	1.1031+2	2.8320+1	6.4110–2
	3.0000–3	1.2807–7	1.1602+6	1.5387–5	3.3338+8	1.5807+8	5.8399+7	1.1690+8	7.7146+3	1.3395+2	1.0699+2	2.6895+1	6.7251–2
	3.2500–3	1.3532–7	1.0980+6	1.7298–5	3.1550+8	1.5149+8	5.4795+7	1.0921+8	7.6039+3	1.2774+2	1.0243+2	2.5244+1	7.0589–2
	3.5000–3	1.4239–7	1.0435+6	1.9297–5	2.9985+8	1.4564+8	5.1661+7	1.0254+8	7.5028+3	1.2240+2	9.8516+1	2.3814+1	7.3896–2
	4.0000–3	1.5601–7	9.5245+5	2.3536–5	2.7368+8	1.3567+8	4.6463+7	9.1540+7	7.3241+3	1.1361+2	9.2070+1	2.1457+1	8.0424–2
	4.5000–3	1.6950–7	8.7665+5	2.8098–5	2.5190+8	1.2727+8	4.2203+7	8.2420+7	7.1440+3	1.0569+2	8.6137+1	1.9466+1	8.6221–2
	5.0000–3	1.8249–7	8.1424+5	3.2978–5	2.3396+8	1.2020+8	3.8728+7	7.5034+7	6.9866+3	9.9304+1	8.1357+1	1.7855+1	9.1926–2
	6.0000–3	2.0755–7	7.1590+5	4.3627–5	2.0571+8	1.0874+8	3.3287+7	6.3674+7	6.6836+3	8.8696+1	7.3247+1	1.5347+1	1.0195–1
	7.0000–3	2.3157–7	6.4165+5	5.5477–5	1.8437+8	9.9807+7	2.9231+7	5.5326+7	6.3850+3	8.0232+1	6.6645+1	1.3477+1	1.0988–1
	8.0000–3	2.5448–7	5.8390+5	6.8469–5	1.6778+8	9.2665+7	2.6122+7	4.8984+7	6.1371+3	7.3796+1	6.1621+1	1.2058+1	1.1761–1
L3	8.9338–3	2.7537–7	5.3960+5	8.1592–5	1.5505+8	8.6974+7	2.3774+7	4.4296+7	5.9139+3	6.8577+1	5.7472+1	1.0982+1	1.2355–1
	9.2003–3	2.8126–7	5.2829+5	8.5517–5	1.5180+8	8.5519+7	2.3186+7	4.3090+7	5.8559+3	6.7272+1	5.6437+1	1.0710+1	1.2522–1
	9.6002–3	2.9000–7	5.1237+5	9.1542–5	1.4723+8	8.3455+7	2.2360+7	4.1403+7	5.7729+3	6.5445+1	5.4989+1	1.0328+1	1.2771–1
L2	9.9926–3	2.9847–7	4.9784+5	9.7616–5	1.4305+8	8.1558+7	2.1610+7	3.9875+7	5.6958+3	6.3790+1	5.3677+1	9.9830+0	1.3014–1
	1.0000–2	2.9863–7	4.9757+5	9.7732–5	1.4297+8	8.1523+7	2.1596+7	3.9847+7	5.6944+3	6.3760+1	5.3653+1	9.9767+0	1.3019–1
	1.0078–2	3.0030–7	4.9480+5	9.8960–5	1.4218+8	8.1154+7	2.1452+7	3.9564+7	5.6780+3	6.3424+1	5.3382+1	9.9105+0	1.3059–1
	1.0386–2	3.0685–7	4.8425+5	1.0386–4	1.3914+8	7.9743+7	2.0905+7	3.8489+7	5.6151+3	6.2145+1	5.2354+1	9.6592+0	1.3216–1
L1	1.0454–2	3.0829–7	4.8197+5	1.0496–4	1.3849+8	7.9439+7	2.0787+7	3.8259+7	5.6015+3	6.1871+1	5.2134+1	9.6053+0	1.3251–1
	1.0596–2	3.1136–7	4.7722+5	1.0727–4	1.3712+8	7.8810+7	2.0548+7	3.7761+7	5.5720+3	6.1293+1	5.1670+1	9.4891+0	1.3314–1
	1.0625–2	3.1198–7	4.7627+5	1.0774–4	1.3685+8	7.8684+7	2.0500+7	3.7662+7	5.5661+3	6.1177+1	5.1578+1	9.4658+0	1.3327–1
	1.0963–2	3.1922–7	4.6547+5	1.1332–4	1.3375+8	7.7250+7	1.9957+7	3.6536+7	5.4985+3	5.9866+1	5.0528+1	9.2031+0	1.3476–1
	1.1147–2	3.2314–7	4.5982+5	1.1641–4	1.3213+8	7.6496+7	1.9674+7	3.5950+7	5.4628+3	5.9183+1	4.9981+1	9.0665+0	1.3557–1
	1.1719–2	3.3520–7	4.4329+5	1.2624–4	1.2737+8	7.4276+7	1.8846+7	3.4246+7	5.3570+3	5.7193+1	4.8386+1	8.6688+0	1.3809–1
	1.1972–2	3.4047–7	4.3642+5	1.3070–4	1.2540+8	7.3348+7	1.8504+7	3.3543+7	5.3125+3	5.6370+1	4.7726+1	8.5048+0	1.3920–1
	1.2110–2	3.4333–7	4.3278+5	1.3316–4	1.2436+8	7.2856+7	1.8323+7	3.3172+7	5.2887+3	5.5936+1	4.7378+1	8.4183+0	1.3980–1
	1.2500–2	3.5136–7	4.2289+5	1.4021–4	1.2151+8	7.1509+7	1.7831+7	3.2167+7	5.2236+3	5.4756+1	4.6431+1	8.1838+0	1.4150–1
	1.3359–2	3.6879–7	4.0291+5	1.5625–4	1.1577+8	6.8766+7	1.6842+7	3.0157+7	5.0897+3	5.2385+1	4.4524+1	7.7151+0	1.4521–1
	1.3486–2	3.7133–7	4.0015+5	1.5868–4	1.1498+8	6.8386+7	1.6707+7	2.9883+7	5.0710+3	5.2060+1	4.4263+1	7.6510+0	1.4576–1
	1.3555–2	3.7271–7	3.9867+5	1.6001–4	1.1455+8	6.8180+7	1.6634+7	2.9735+7	5.0608+3	5.1885+1	4.4123+1	7.6165+0	1.4605–1
	1.5000–2	4.0111–7	3.7044+5	1.8878–4	1.0644+8	6.4236+7	1.5250+7	2.6951+7	4.8644+3	4.8583+1	4.1464+1	6.9675+0	1.5218–1
	1.6250–2	4.2545–7	3.4925+5	2.1523–4	1.0035+8	6.1185+7	1.4238+7	2.4925+7	4.7013+3	4.5959+1	3.9320+1	6.4821+0	1.5605–1
	1.7500–2	4.4923–7	3.3076+5	2.4312–4	9.5041+7	5.8490+7	1.3361+7	2.3185+7	4.5551+3	4.3692+1	3.7467+1	6.0654+0	1.5988–1
	1.8125–2	4.6093–7	3.2237+5	2.5760–4	9.2629+7	5.7256+7	1.2965+7	2.2404+7	4.4875+3	4.2670+1	3.6630+1	5.8784+0	1.6179–1
	2.0000–2	4.9530–7	3.0000+5	3.0299–4	8.6201+7	5.3930+7	1.1916+7	2.0350+7	4.3031+3	3.9972+1	3.4418+1	5.3868+0	1.6746–1
	2.2500–2	5.4016–7	2.7508+5	3.6814–4	7.9043+7	5.0121+7	1.0783+7	1.8134+7	4.0714+3	3.6815+1	3.1800+1	4.8420+0	1.7269–1

Atomic Weight 173.040 Density 6.730 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.6250–2	6.0476–7	2.4570+5	4.7544–4	7.0599+7	4.5539+7	9.4623+6	1.5595+7	3.7870+3	3.3147+1	2.8749+1	4.2177+0	1.8051–1
3.0000–2	6.6663–7	2.2290+5	5.9364–4	6.4047+7	4.1909+7	8.4499+6	1.3684+7	3.5567+3	3.0349+1	2.6413+1	3.7482+0	1.8820–1
3.5000–2	7.4665–7	1.9901+5	7.6717–4	5.7183+7	3.8009+7	7.4365+6	1.1734+7	3.2935+3	2.7328+1	2.3878+1	3.2549+0	1.9570–1
4.0000–2	8.2334–7	1.8047+5	9.5833–4	5.1856+7	3.4925+7	6.6578+6	1.0271+7	3.0814+3	2.5020+1	2.1932+1	2.8849+0	2.0313–1
5.0000–2	9.6835–7	1.5344+5	1.3880–3	4.4091+7	3.0305+7	5.5604+6	8.2232+6	2.7519+3	2.1610+1	1.9040+1	2.3548+0	2.1522–1
6.0000–2	1.1042–6	1.3456+5	1.8783–3	3.8665+7	2.6987+7	4.8181+6	6.8575+6	2.5090+3	1.9227+1	1.7007+1	1.9949+0	2.2565–1
K 6.1441–2	1.1231–6	1.3230+5	1.9538–3	3.8015+7	2.6583+7	4.7310+6	6.6993+6	2.4792+3	1.8940+1	1.6761+1	1.9523+0	2.2702–1
6.2601–2	1.1379–6	1.3058+5	2.0154–3	3.7520+7	2.6272+7	4.6645+6	6.5809+6	2.4561+3	1.8720+1	1.6572+1	1.9206+0	2.2804–1
6.4776–2	1.1655–6	1.2749+5	2.1328–3	3.6633+7	2.5715+7	4.5455+6	6.3703+6	2.4145+3	1.8327+1	1.6233+1	1.8642+0	2.2996–1
6.8582–2	1.2130–6	1.2250+5	2.3442–3	3.5198+7	2.4810+7	4.3533+6	6.0330+6	2.3466+3	1.7694+1	1.5686+1	1.7740+0	2.3332–1
7.4291–2	1.2827–6	1.1584+5	2.6748–3	3.3285+7	2.3595+7	4.0977+6	5.5905+6	2.2546+3	1.6854+1	1.4960+1	1.6557+0	2.3835–1
8.0000–2	1.3507–6	1.1001+5	3.0210–3	3.1609+7	2.2523+7	3.8745+6	5.2097+6	2.1727+3	1.6124+1	1.4327+1	1.5539+0	2.4334–1
9.0000–2	1.4612–6	1.0169+5	3.6626–3	2.9219+7	2.0958+7	3.5612+6	4.6980+6	2.0580+3	1.5063+1	1.3397+1	1.4151+0	2.5102–1
1.0000–1	1.5675–6	9.4794+4	4.3464–3	2.7238+7	1.9651+7	3.3024+6	4.2830+6	1.9605+3	1.4192+1	1.2630+1	1.3027+0	2.5870–1
1.1250–1	1.6832–6	8.8279+4	5.2549–3	2.5366+7	1.8406+7	3.0566+6	3.9020+6	1.8605+3	1.3337+1	1.1874+1	1.1974+0	2.6624–1
1.3125–1	1.8473–6	8.0436+4	6.7170–3	2.3113+7	1.6895+7	2.7623+6	3.4541+6	1.7374+3	1.2323+1	1.0971+1	1.0741+0	2.7766–1
1.5000–1	1.9988–6	7.4341+4	8.2889–3	2.1361+7	1.5686+7	2.5304+6	3.1428+6	1.6373+3	1.1543+1	1.0264+1	9.9008–1	2.8904–1
2.0000–1	2.3371–6	6.3577+4	1.2895–2	1.8268+7	1.3557+7	2.1428+6	2.5668+6	1.4548+3	1.0193+1	9.0491+0	8.2937–1	3.1486–1
2.5000–1	2.6287–6	5.6525+4	1.7993–2	1.6242+7	1.2069+7	1.9229+6	2.2491+6	1.3412+3	9.4324+0	8.3537+0	7.4009–1	3.3859–1
3.0000–1	2.8937–6	5.1349+4	2.3453–2	1.4755+7	1.0974+7	1.7601+6	2.0189+6	1.2549+3	8.8878+0	7.8494+0	6.7637–1	3.6204–1
4.0000–1	3.3616–6	4.4202+4	3.5090–2	1.2701+7	9.3698+6	1.5748+6	1.7552+6	1.1501+3	8.3066+0	7.2939+0	6.0360–1	4.0905–1
5.0000–1	3.7674–6	3.9441+4	4.7343–2	1.1333+7	8.2872+6	1.4684+6	1.5762+6	1.0892+3	8.0169+0	7.0058+0	5.5343–1	4.5763–1
6.0000–1	4.1242–6	3.6028+4	5.9937–2	1.0352+7	7.4963+6	1.4006+6	1.4544+6	1.0516+3	7.8639+0	6.8359+0	5.1957–1	5.0841–1
8.0000–1	4.7327–6	3.1396+4	8.5487–2	9.0213+6	6.3981+6	1.3222+6	1.3000+6	1.0089+3	7.7922+0	6.7007+0	4.7743–1	6.1409–1
1.0000+0	5.2519–6	2.8292+4	1.1109–1	8.1295+6	5.6575+6	1.2794+6	1.1916+6	9.8734+2	7.8338+0	6.6623+0	4.4710–1	7.2435–1
1.5000+0	6.2758–6	2.3676+4	1.7348–1	6.8032+6	4.5243+6	1.2339+6	1.0440+6	9.6871+2	8.1950+0	6.7678+0	4.0705–1	1.0202+0
2.0000+0	7.0536–6	2.1066+4	2.3297–1	6.0530+6	3.8624+6	1.2237+6	9.6585+5	9.6677+2	8.6190+0	6.8978+0	3.8433–1	1.3369+0
3.0000+0	8.1258–6	1.8286+4	3.4338–1	5.2543+6	3.1759+6	1.2111+6	8.6634+5	9.7054+2	9.5098+0	7.1530+0	3.5910–1	1.9977+0
4.0000+0	8.8486–6	1.6792+4	4.4379–1	4.8251+6	2.8056+6	1.2061+6	8.1250+5	9.7600+2	1.0422+1	7.3787+0	3.4252–1	2.7006+0
5.0000+0	9.3487–6	1.5894+4	5.3590–1	4.5670+6	2.5776+6	1.2065+6	7.8187+5	9.8152+2	1.1305+1	7.5496+0	3.3517–1	3.4203+0
6.0000+0	9.7256–6	1.5278+4	6.2111–1	4.3900+6	2.4266+6	1.2069+6	7.5550+5	9.8708+2	1.2176+1	7.6903+0	3.2926–1	4.1561+0
8.0000+0	1.0233–5	1.4521+4	7.7460–1	4.1723+6	2.2383+6	1.2087+6	7.2434+5	9.9716+2	1.3923+1	7.9265+0	3.2018–1	5.6767+0
1.0000+1	1.0542–5	1.4095+4	9.0983–1	4.0500+6	2.1350+6	1.2101+6	7.0385+5	1.0060+3	1.5692+1	8.1318+0	3.1549–1	7.2451+0
1.5000+1	1.0831–5	1.3719+4	1.1914+0	3.9421+6	2.0431+6	1.2125+6	6.8546+5	1.0244+3	1.9994+1	8.4150+0	3.1156–1	1.1268+1
2.0000+1	1.0896–5	1.3637+4	1.4174+0	3.9185+6	2.0332+6	1.2141+6	6.7017+5	1.0373+3	2.4397+1	8.6421+0	3.0882–1	1.5446+1
3.0000+1	1.0912–5	1.3617+4	1.7672+0	3.9127+6	2.0341+6	1.2157+6	6.6184+5	1.0532+3	3.3244+1	8.9253+0	3.0682–1	2.4012+1
4.0000+1	1.0918–5	1.3610+4	2.0335+0	3.9106+6	2.0331+6	1.2166+6	6.5979+5	1.0699+3	4.2202+1	9.1156+0	3.0771–1	3.2779+1
5.0000+1	1.0926–5	1.3600+4	2.2481+0	3.9078+6	2.0323+6	1.2171+6	6.5732+5	1.0830+3	5.1272+1	9.2552+0	3.0839–1	4.1709+1
6.0000+1	1.0934–5	1.3589+4	2.4276+0	3.9048+6	2.0316+6	1.2174+6	6.5462+5	1.0939+3	6.0440+1	9.3567+0	3.0896–1	5.0774+1
8.0000+1	1.0932–5	1.3593+4	2.7162+0	3.9057+6	2.0306+6	1.2179+6	6.5603+5	1.1108+3	7.8955+1	9.5383+0	3.1050–1	6.9106+1
1.0000+2	1.0930–5	1.3594+4	2.9436+0	3.9062+6	2.0299+6	1.2182+6	6.5704+5	1.1238+3	9.7601+1	9.6843+0	3.1186–1	8.7605+1
1.5000+2	1.0923–5	1.3603+4	3.3619+0	3.9087+6	2.0284+6	1.2183+6	6.6080+5	1.1471+3	1.4453+2	9.8388+0	3.1378–1	1.3438+2
2.0000+2	1.0918–5	1.3609+4	3.6611+0	3.9104+6	2.0274+6	1.2185+6	6.6338+5	1.1626+3	1.9191+2	9.9799+0	3.1514–1	1.8161+2
3.0000+2	1.0912–5	1.3617+4	4.0850+0	3.9127+6	2.0260+6	1.2186+6	6.6691+5	1.1818+3	2.8627+2	1.0200+1	3.1708–1	2.7575+2
4.0000+2	1.0910–5	1.3619+4	4.3869+0	3.9133+6	2.0250+6	1.2186+6	6.6845+5	1.1948+3	3.8049+2	1.0323+1	3.1809–1	3.6985+2
5.0000+2	1.0911–5	1.3618+4	4.6216+0	3.9129+6	2.0242+6	1.2187+6	6.6882+5	1.2048+3	4.7532+2	1.0430+1	3.1854–1	4.6457+2
6.0000+2	1.0913–5	1.3616+4	4.8135+0	3.9125+6	2.0236+6	1.2187+6	6.6899+5	1.2134+3	5.6965+2	1.0511+1	3.1889–1	5.5882+2
8.0000+2	1.0915–5	1.3613+4	5.1164+0	3.9115+6	2.0226+6	1.2187+6	6.6903+5	1.2271+3	7.6002+2	1.0657+1	3.1945–1	7.4904+2
1.0000+3	1.0918–5	1.3609+4	5.3513+0	3.9105+6	2.0218+6	1.2187+6	6.6878+5	1.2379+3	9.4998+2	1.0778+1	3.1987–1	9.3888+2
1.5000+3	1.0917–5	1.3610+4	5.7778+0	3.9107+6	2.0204+6	1.2187+6	6.7038+5	1.2581+3	1.4273+3	1.0893+1	3.2064–1	1.4161+3
2.0000+3	1.0915–5	1.3613+4	6.0802+0	3.9116+6	2.0194+6	1.2187+6	6.7222+5	1.2731+3	1.9020+3	1.1006+1	3.2153–1	1.8906+3
3.0000+3	1.0914–5	1.3614+4	6.5066+0	3.9119+6	2.0180+6	1.2187+6	6.7395+5	1.2949+3	2.8528+3	1.1224+1	3.2238–1	2.8412+3
4.0000+3	1.0917–5	1.3610+4	6.8091+0	3.9108+6	2.0170+6	1.2187+6	6.7382+5	1.3109+3	3.8039+3	1.1319+1	3.2233–1	3.7923+3
5.0000+3	1.0925–5	1.3601+4	7.0435+0	3.9082+6	2.0162+6	1.2187+6	6.7192+5	1.3234+3	4.7651+3	1.1415+1	3.2144–1	4.7533+3
6.0000+3	1.0925–5	1.3600+4	7.2349+0	3.9079+6	2.0156+6	1.2187+6	6.7233+5	1.3325+3	5.7108+3	1.1485+1	3.2165–1	5.6990+3
8.0000+3	1.0929–5	1.3596+4	7.5371+0	3.9067+6	2.0146+6	1.2187+6	6.7206+5	1.3470+3	7.6187+3	1.1627+1	3.2156–1	7.6067+3
1.0000+4	1.0932–5	1.3592+4	7.7711+0	3.9055+6	2.0138+6	1.2187+6	6.7169+5	1.3584+3	9.5443+3	1.1757+1	3.2142–1	9.5322+3
1.5000+4	1.0937–5	1.3586+4	8.1967+0	3.9039+6	2.0124+6	1.2187+6	6.7140+5	1.3804+3	1.4270+4	1.1861+1	3.2128–1	1.4258+4
2.0000+4	1.0941–5	1.3580+4	8.4988+0	3.9021+6	2.0114+6	1.2187+6	6.7066+5	1.3962+3	1.9056+4	1.1966+1	3.2092–1	1.9044+4
3.0000+4	1.0946–5	1.3574+4	8.9249+0	3.9004+6	2.0100+6	1.2187+6	6.7032+5	1.4183+3	2.8520+4	1.2175+1	3.2076–1	2.8508+4
4.0000+4	1.0951–5	1.3569+4	9.2272+0	3.8988+6	2.0090+6	1.2187+6	6.6968+5	1.4343+3	3.8086+4	1.2281+1	3.2046–1	3.8073+4
5.0000+4	1.0959–5	1.3559+4	9.4617+0	3.8960+6	2.0082+6	1.2187+6	6.6762+5	1.4465+3	4.7563+4	1.2369+1	3.1947–1	4.7550+4
6.0000+4	1.0959–5	1.3559+4	9.6535+0	3.8959+6	2.0076+6	1.2187+6	6.6821+5	1.4565+3	5.7031+4	1.2456+1	3.1975–1	5.7019+4
8.0000+4	1.0962–5	1.3555+4	9.9559+0	3.8948+6	2.0066+6	1.2187+6	6.6800+5	1.4724+3	7.6134+4	1.2592+1	3.1966–1	7.6121+4
1.0000+5	1.0965–5	1.3552+4	1.0190+1	3.8939+6	2.0058+6	1.2187+6	6.6790+5	1.4847+3	9.5271+4	1.2721+1	3.1961–1	9.5258+4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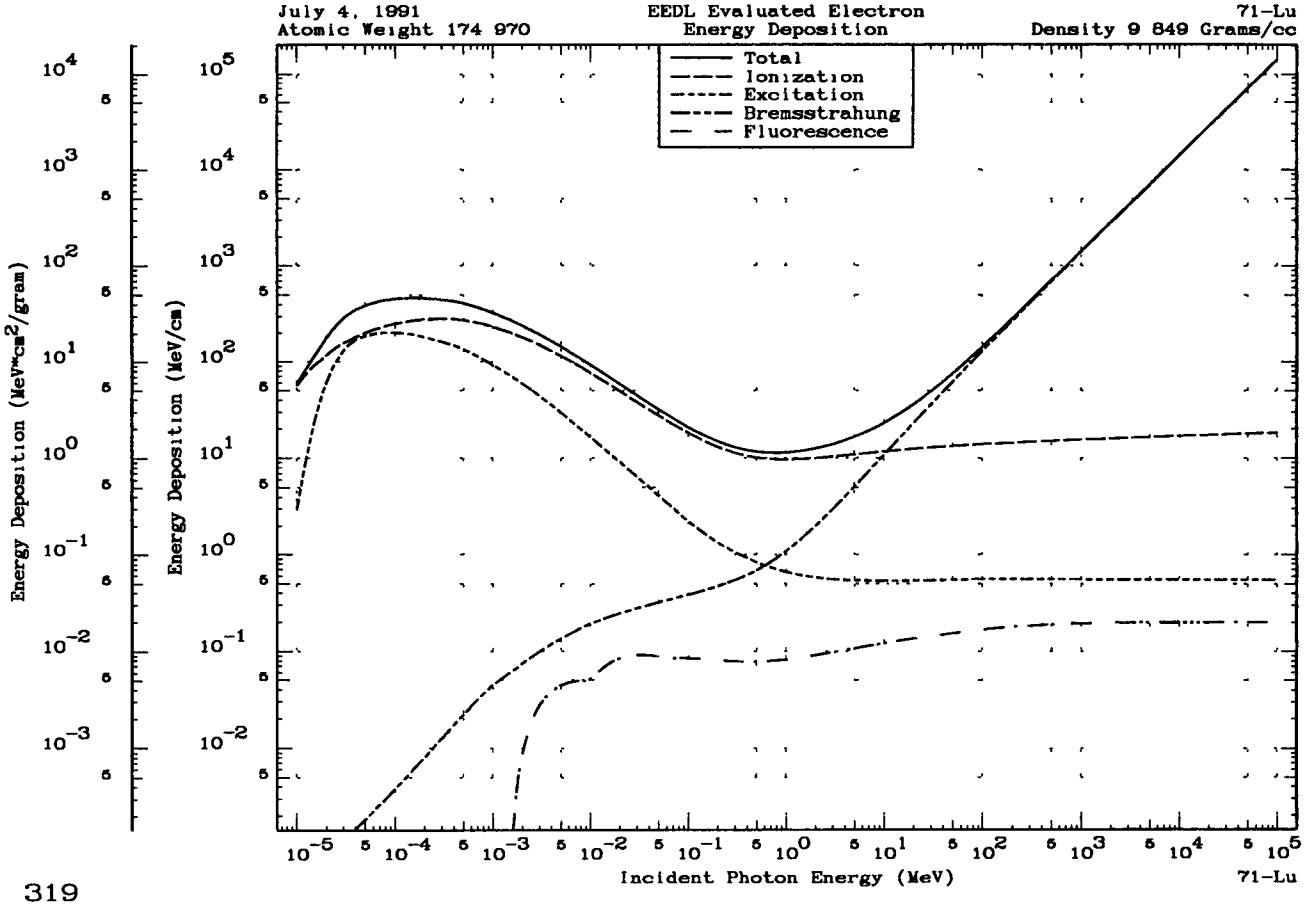
EEDL Evaluated Electron
Cross Sections
71-Lu
Density 9 849 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
71-Lu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EEDL Evaluated Electron
Energy Deposition
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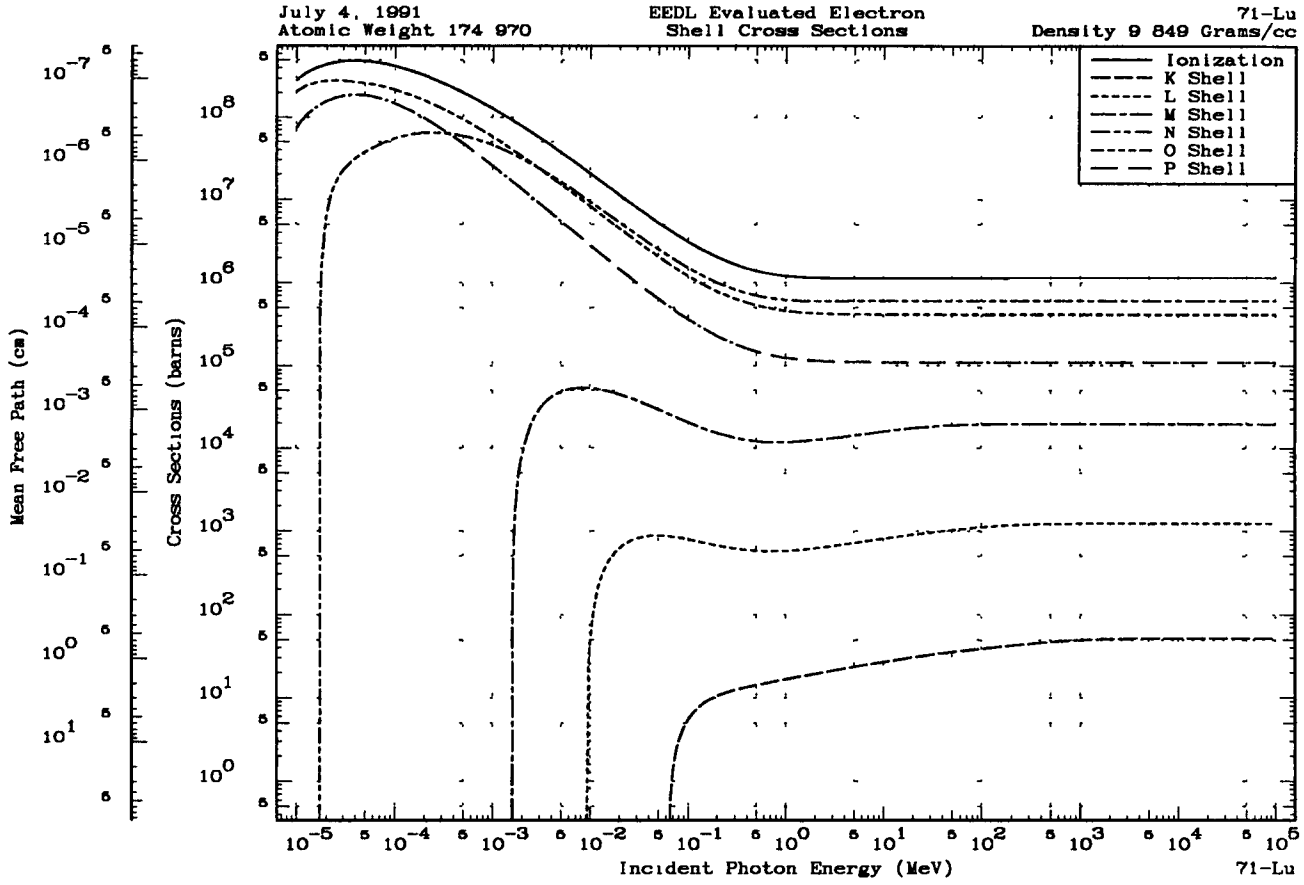
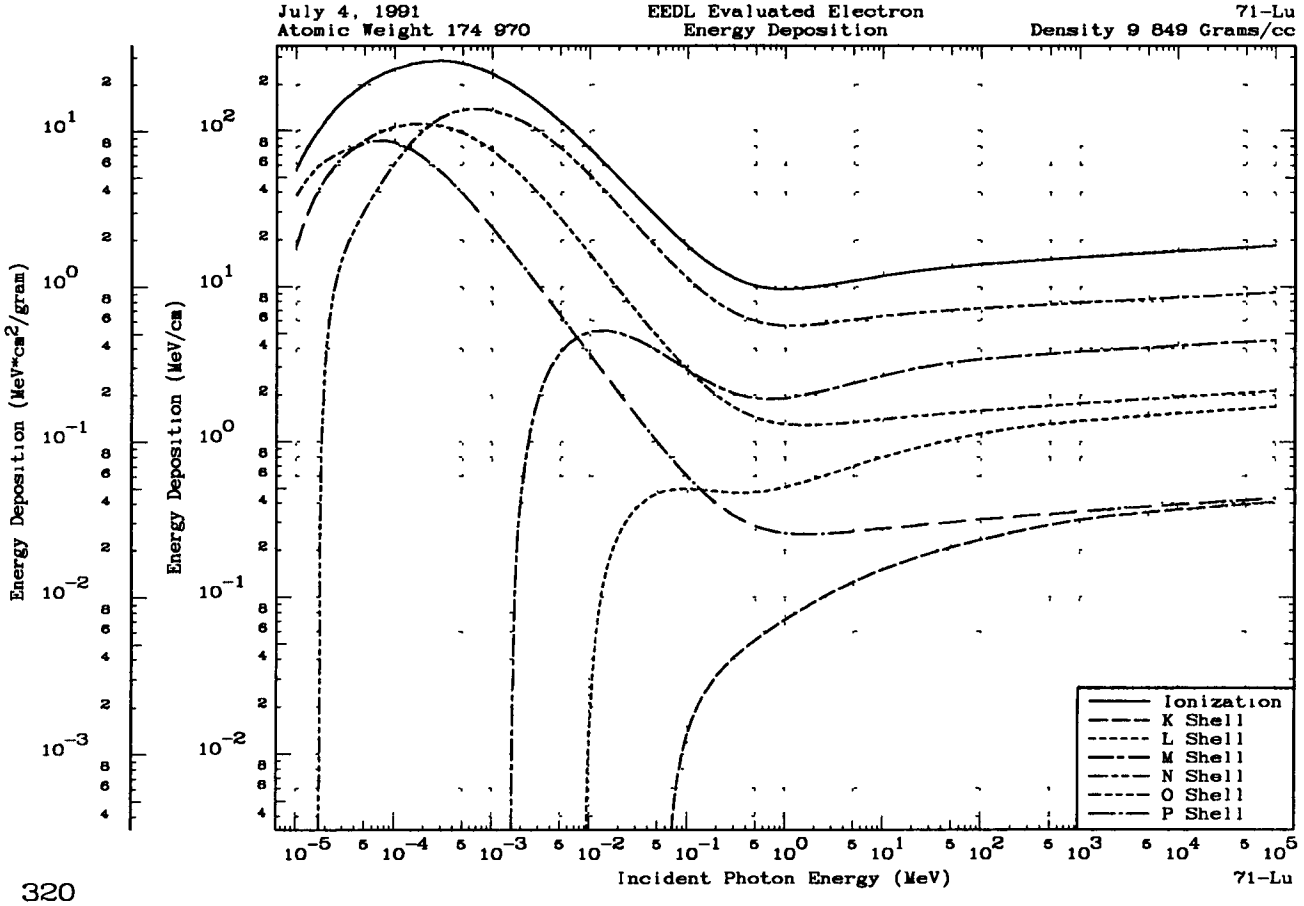
Density 9 849 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
71-Lu


July 4, 1991
Atomic Weight 174 970
EEDL Evaluated Electron
Shell Cross Sections
71-Lu
Density 9 849 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
71-Lu


July 4, 1991
Atomic Weight 174 970
EEDL Evaluated Electron
Energy Deposition
71-Lu
Density 9 849 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
71-Lu

Atomic Weight 174.970 Density 9.849 Grams/cc

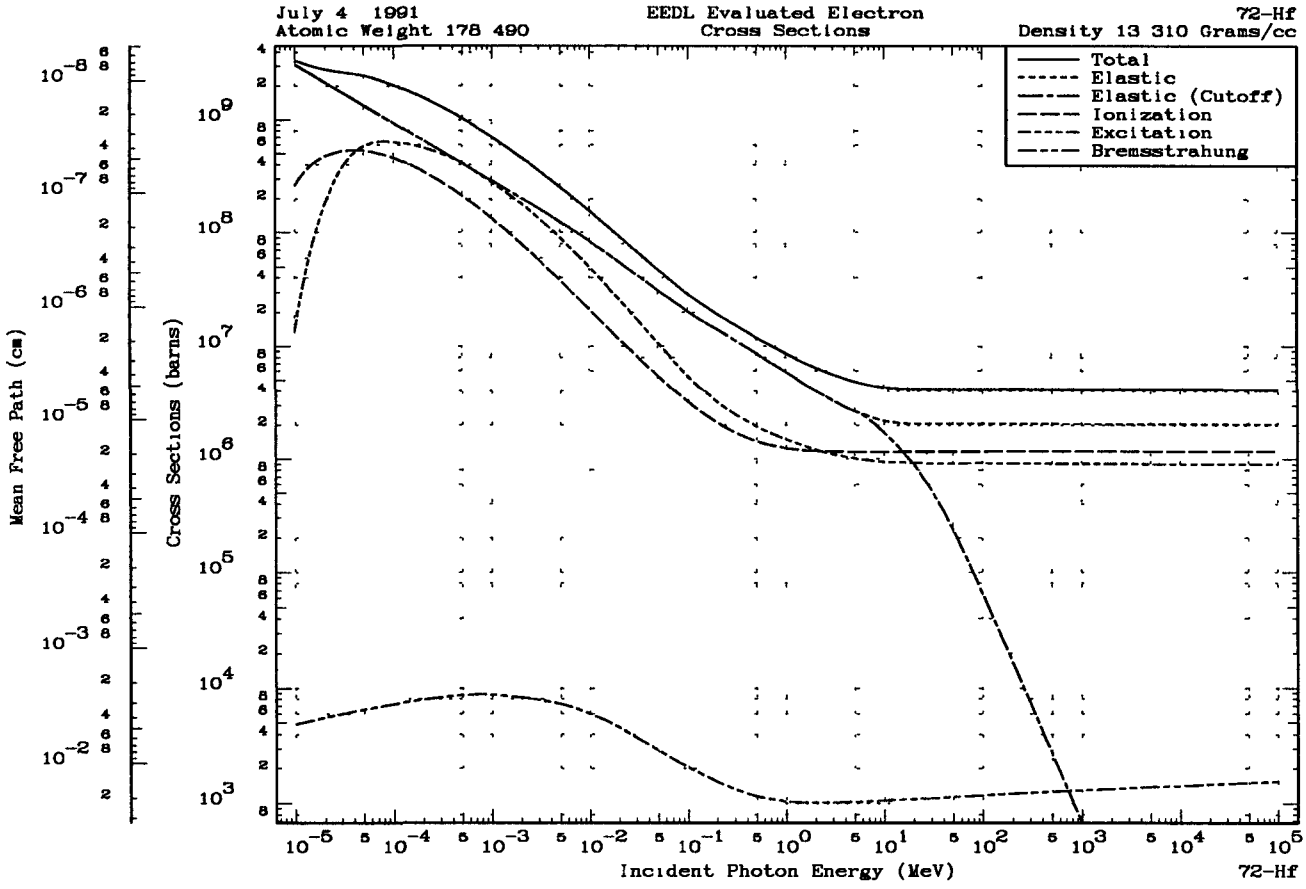
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.5781–9	1.1836+7		3.4390+9	3.1452+9	2.8158+8	1.2193+7	4.8440+3	5.9210+1	5.6254+1	2.9564+0	3.5486–4
	1.1250–5	8.9490–9	1.1346+7		3.2965+9	2.9585+9	3.1567+8	2.2263+7	4.9604+3	7.1695+1	6.6055+1	5.6399+0	3.9770–4
	1.2500–5	9.2664–9	1.0957+7		3.1835+9	2.8009+9	3.4444+8	3.8148+7	5.0668+3	8.5059+1	7.5170+1	9.8878+0	4.4128–4
	1.3125–5	9.4074–9	1.0793+7		3.1358+9	2.7308+9	3.5703+8	4.7940+7	5.1169+3	9.2073+1	7.9507+1	1.2566+1	4.6334–4
	1.5000–5	9.7694–9	1.0393+7		3.0196+9	2.5478+9	3.8764+8	8.4163+7	5.2565+3	1.1388+2	9.1080+1	2.2801+1	5.3053–4
N7	1.7320–5	1.0107–8	1.0045+7		2.9186+9	2.3644+9	4.1398+8	1.4026+8	5.4111+3	1.4201+2	1.0302+2	3.8993+1	6.1561–4
	1.7488–5	1.0128–8	1.0025+7		2.9127+9	2.3526+9	4.1565+8	1.4445+8	5.4216+3	1.4414+2	1.0393+2	4.0210+1	6.2183–4
	1.8116–5	1.0199–8	9.9557+6		2.8926+9	2.3099+9	4.2178+8	1.6092+8	5.4602+3	1.5234+2	1.0733+2	4.5007+1	6.4525–4
	1.8587–5	1.0244–8	9.9110+6		2.8796+9	2.2793+9	4.2627+8	1.7407+8	5.4886+3	1.5873+2	1.0987+2	4.8857+1	6.6291–4
N6	1.8960–5	1.0277–8	9.8798+6		2.8705+9	2.2558+9	4.2969+8	1.8499+8	5.5106+3	1.6390+2	1.1183+2	5.2068+1	6.7696–4
	1.9220–5	1.0299–8	9.8587+6		2.8644+9	2.2399+9	4.3233+8	1.9212+8	5.5258+3	1.6756+2	1.1340+2	5.4162+1	6.8677–4
	1.9293–5	1.0305–8	9.8529+6		2.8627+9	2.2355+9	4.3304+8	1.9416+8	5.5300+3	1.6859+2	1.1382+2	5.4763+1	6.8954–4
	2.0000–5	1.0356–8	9.8044+6		2.8486+9	2.1941+9	4.3996+8	2.1455+8	5.5702+3	1.7880+2	1.1802+2	6.0780+1	7.1634–4
	2.0625–5	1.0412–8	9.7513+6		2.8332+9	2.1593+9	4.4371+8	2.3016+8	5.6007+3	1.8623+2	1.2091+2	6.5325+1	7.3819–4
	2.1250–5	1.0461–8	9.7056+6		2.8199+9	2.1261+9	4.4742+8	2.4640+8	5.6304+3	1.9388+2	1.2381+2	7.0064+1	7.6013–4
	2.1797–5	1.0499–8	9.6709+6		2.8098+9	2.0982+9	4.5052+8	2.6111+8	5.6558+3	2.0067+2	1.2630+2	7.4370+1	7.7941–4
	2.2822–5	1.0555–8	9.6194+6		2.7949+9	2.0487+9	4.5616+8	2.9001+8	5.7021+3	2.1378+2	1.3093+2	8.2852+1	8.1574–4
	2.3438–5	1.0580–8	9.5965+6		2.7882+9	2.0206+9	4.5947+8	3.0816+8	5.7290+3	2.2191+2	1.3371+2	8.8200+1	8.3765–4
	2.4617–5	1.0650–8	9.5334+6		2.7699+9	1.9697+9	4.6536+8	3.3482+8	5.7791+3	2.3500+2	1.3883+2	9.6163+1	8.7988–4
	2.5000–5	1.0670–8	9.5160+6		2.7648+9	1.9539+9	4.6719+8	3.4367+8	5.7950+3	2.3929+2	1.4047+2	9.8818+1	8.9367–4
	2.6719–5	1.0744–8	9.4498+6		2.7456+9	1.8876+9	4.7346+8	3.8453+8	5.8636+3	2.5782+2	1.4669+2	1.1113+2	9.5589–4
	2.7308–5	1.0763–8	9.4332+6		2.7408+9	1.8663+9	4.7545+8	3.9897+8	5.8864+3	2.6426+2	1.4876+2	1.1550+2	9.7736–4
	3.0000–5	1.0870–8	9.3410+6		2.7140+9	1.7774+9	4.8398+8	4.5263+8	5.9853+3	2.9013+2	1.5806+2	1.3207+2	1.0763–3
O3	3.4220–5	1.1071–8	9.1713+6		2.6647+9	1.6599+9	4.8669+8	5.1802+8	6.1246+3	3.1995+2	1.6809+2	1.5185+2	1.2329–3
	3.4581–5	1.1092–8	9.1540+6		2.6597+9	1.6509+9	4.8683+8	5.2191+8	6.1358+3	3.2203+2	1.6898+2	1.5305+2	1.2465–3
	3.5259–5	1.1129–8	9.1230+6		2.6506+9	1.6344+9	4.8710+8	5.2916+8	6.1567+3	3.2594+2	1.7065+2	1.5530+2	1.2719–3
	3.6444–5	1.1191–8	9.0725+6		2.6360+9	1.6066+9	4.8763+8	5.4176+8	6.1924+3	3.3282+2	1.7362+2	1.5920+2	1.3167–3
	3.8222–5	1.1275–8	9.0048+6		2.6163+9	1.5673+9	4.8854+8	5.6045+8	6.2442+3	3.4319+2	1.7819+2	1.6501+2	1.3842–3
	4.0000–5	1.1350–8	8.9459+6		2.5992+9	1.5307+9	4.8953+8	5.7888+8	6.2940+3	3.5361+2	1.8284+2	1.7076+2	1.4522–3
O2	4.1520–5	1.1434–8	8.8798+6		2.5800+9	1.5014+9	4.8798+8	5.9060+8	6.3352+3	3.5975+2	1.8536+2	1.7439+2	1.5107–3
	4.1785–5	1.1451–8	8.8664+6		2.5761+9	1.4964+9	4.8776+8	5.9187+8	6.3415+3	3.6065+2	1.8584+2	1.7480+2	1.5204–3
	4.2298–5	1.1485–8	8.8409+6		2.5687+9	1.4870+9	4.8735+8	5.9433+8	6.3537+3	3.6239+2	1.8681+2	1.7558+2	1.5392–3
	4.3261–5	1.1545–8	8.7947+6		2.5553+9	1.4697+9	4.8665+8	5.9889+8	6.3762+3	3.6572+2	1.8868+2	1.7704+2	1.5746–3
	4.4104–5	1.1596–8	8.7560+6		2.5440+9	1.4551+9	4.8612+8	6.0282+8	6.3955+3	3.6869+2	1.9038+2	1.7831+2	1.6057–3
	4.5000–5	1.1648–8	8.7164+6		2.5325+9	1.4399+9	4.8561+8	6.0696+8	6.4157+3	3.7187+2	1.9223+2	1.7964+2	1.6388–3
	4.7052–5	1.1765–8	8.6304+6		2.5075+9	1.4070+9	4.8432+8	6.1621+8	6.4607+3	3.7886+2	1.9624+2	1.8262+2	1.7149–3
	5.0000–5	1.1918–8	8.5190+6		2.4752+9	1.3633+9	4.8281+8	6.2906+8	6.5226+3	3.8895+2	2.0216+2	1.8679+2	1.8251–3
	5.5000–5	1.2205–8	8.3189+6		2.4170+9	1.2975+9	4.7741+8	6.4213+8	6.6182+3	4.0127+2	2.0993+2	1.9134+2	2.0118–3
	6.0000–5	1.2462–8	8.1474+6		2.3672+9	1.2402+9	4.7271+8	6.5430+8	6.7068+3	4.1333+2	2.1769+2	1.9564+2	2.2007–3
O1	6.6340–5	1.2793–8	7.9363+6		2.3059+9	1.1771+9	4.6277+8	6.6594+8	6.8104+3	4.2337+2	2.2378+2	1.9958+2	2.4433–3
	6.7194–5	1.2840–8	7.9078+6		2.2976+9	1.1694+9	4.6160+8	6.6662+8	6.8237+3	4.2457+2	2.2472+2	1.9985+2	2.4763–3
	6.8795–5	1.2924–8	7.8560+6		2.2825+9	1.1551+9	4.5948+8	6.6788+8	6.8483+3	4.2686+2	2.2650+2	2.0036+2	2.5381–3
	7.0000–5	1.2987–8	7.8182+6		2.2715+9	1.1448+9	4.5795+8	6.6880+8	6.8665+3	4.2860+2	2.2787+2	2.0073+2	2.5849–3
	7.1596–5	1.3069–8	7.7693+6		2.2573+9	1.1314+9	4.5586+8	6.7001+8	6.8902+3	4.3073+2	2.2951+2	2.0122+2	2.6469–3
	7.5798–5	1.3275–8	7.6486+6		2.2223+9	1.0984+9	4.5076+8	6.7306+8	6.9505+3	4.3644+2	2.3397+2	2.0247+2	2.8112–3
	8.0000–5	1.3469–8	7.5384+6		2.1902+9	1.0681+9	4.4617+8	6.7597+8	7.0080+3	4.4232+2	2.3864+2	2.0368+2	2.9767–3
	9.0000–5	1.3995–8	7.2551+6		2.1079+9	1.0047+9	4.3183+8	6.7137+8	7.1259+3	4.4835+2	2.4516+2	2.0319+2	3.3704–3
	1.0000–4	1.4471–8	7.0161+6	0.0000+0	2.0385+9	9.5126+8	4.1995+8	6.6727+8	7.2332+3	4.5527+2	2.5242+2	2.0284+2	3.7698–3
	1.1250–4	1.5079–8	6.7334+6	2.7398–8	1.9563+9	8.9490+8	4.0255+8	6.5889+8	7.3460+3	4.5719+2	2.5624+2	2.0094+2	4.2705–3
	1.2500–4	1.5633–8	6.4947+6	5.4640–8	1.8870+9	8.4732+8	3.8820+8	6.5148+8	7.4484+3	4.6051+2	2.6118+2	1.9933+2	4.7781–3
	1.3125–4	1.5896–8	6.3875+6	6.8189–8	1.8558+9	8.2615+8	3.8160+8	6.4808+8	7.4963+3	4.6210+2	2.6349+2	1.9860+2	5.0343–3
	1.5000–4	1.6685–8	6.0854+6	1.0859–7	1.7681+9	7.7088+8	3.6462+8	6.3258+8	7.6290+3	4.6617+2	2.7138+2	1.9479+2	5.8117–3
	1.7500–4	1.7768–8	5.7144+6	1.6243–7	1.6603+9	7.1166+8	3.4132+8	6.0730+8	7.7762+3	4.6249+2	2.7461+2	1.8787+2	6.8733–3
N5	1.9932–4	1.8724–8	5.4225+6	2.1504–7	1.5755+9	6.6523+8	3.2349+8	5.8675+8	7.9027+3	4.6195+2	2.7961+2	1.8233+2	7.9237–3
	2.0000–4	1.8750–8	5.4150+6	2.1652–7	1.5733+9	6.6405+8	3.2305+8	5.8619+8	7.9054+3	4.6198+2	2.7979+2	1.8218+2	7.9537–3
	2.0625–4	1.8992–8	5.3462+6	2.3006–7	1.5533+9	6.5354+8	3.1836+8	5.8139+8	7.9306+3	4.6082+2	2.7998+2	1.8084+2	8.2297–3
N4	2.0938–4	1.9111–8	5.3128+6	2.3686–7	1.5436+9	6.4846+8	3.1609+8	5.7905+8	7.9430+3	4.6028+2	2.8009+2	1.8019+2	8.3683–3
	2.1221–4	1.9224–8	5.2815+6	2.4302–7	1.5345+9	6.4396+8	3.1399+8	5.7656+8	7.9540+3	4.5957+2	2.8008+2	1.7948+2	8.4938–3
	2.1770–4	1.9441–8	5.2226+6	2.5497–7	1.5174+9	6.3549+8	3.1005+8	5.7184+8	7.9750+3	4.5831+2	2.8015+2	1.7815+2	8.7375–3
	2.1797–4	1.9452–8	5.2197+6	2.5556–7	1.5166+9	6.3508+8	3.0986+8	5.7161+8	7.9760+3	4.5825+2	2.8016+2	1.7808+2	8.7495–3
	2.2799–4	1.9839–8	5.1178+6	2.7747–7	1.4870+9	6.2045+8	3.0308+8	5.6342+8	8.0131+3	4.5619+2	2.8041+2	1.7577+2	9.1961–3
	2.3848–4	2.0233–8	5.0182+6	3.0051–7	1.4580+9	6.0615+8	2.9652+8	5.5533+8	8.0504+3	4.5445+2	2.8095+2	1.7349+2	9.6661–3
	2.4599–4	2.0509–8	4.9507+6	3.1706–7	1.4384+9	5.9648+8	2.9210+8	5.4982+8	8.0762+3	4.5339+2	2.8143+2	1.7195+2	1.0004–2
	2.5000–4	2.0654–8	4.9160+6	3.2591–7	1.4283+9	5.9150+8	2.8984+8	5.4696+8	8.0897+3	4.5289+2	2.8173+2	1.7115+2	1.0185–2
	2.5949–4	2.0992–8	4.8368+6	3.4690–7	1.4053+9	5.8018+8	2.8468+8	5.4045+8	8.1209+3	4.5143+2	2.8209+2	1.6933+2	1.0614–2
	2.6924–4	2.1331–8	4.7600+6	3.6852–7	1.3830+9	5.6919+8	2.7971+8	5.3408+8	8.1519+3	4.5018+2	2.8262+2	1.6755+2	1.1056–2
	2.7975–4	2.1687–8	4.6817+6	3.9189–7	1.3602+9	5.5800+8	2.7467+8	5.2755+8	8.1842+3	4.4904+2	2.8329+2	1.6574+2	1.1535–2
	3.0000–4	2.2352–8	4.5425+6	4.3708–7	1.3198+9	5.3814+8	2.6581+8	5.1583+8	8.2435+3	4.4747+2	2.8495+2	1.6250+2	1.2463–2
	3.2500–4	2.3178–8	4.3805+6	4.9331–7	1.2727+9	5.1629+8	2.5451+8	5.0192+8	8.3119+3	4.4166+2	2.8316+2	1.5849+2	1.3617–2
N3	3.5505–4	2.4123–8	4.2090+6	5.6178–7	1.2229+9	4.9318+8	2.4273+8	4.8699+8	8.3882+3	4.3615+2	2.8193+2	1.5421+2	1.5017–2
	3.6067–4	2.4298–8	4.1786+6	5.7468–7	1.2141+9	4.8919+8	2.4066+8	4.8421+8	8.3999+3	4.3516+2	2.8172+2	1.5343+2	1.5283–2
	3.7050–4	2.4602–8	4.1271+6	5.9732–7	1.1991+9	4.8242+8	2.3718+8	4.7949+8	8.4201+3	4.3354+2	2.8142+2	1.5210+2	1.5749–2
	3.8525–4	2.5048–8	4.0536+6	6.3142–7	1.1777+9	4.7278+8	2.3223+8	4.7273+8	8.4494+3	4.3135+2	2.8113+2	1.5020+2	1.6451–2
	4.0000–4	2.5484–8	3.9842+6	6.6569–7	1.1576+9	4.6367+8	2.2760+8	4.6631+8	8.4777+3	4.2944+2	2.8102+2	1.4840+2	1.7155–2
N2	4.1019–4	2.5800–8	3.9354+6	6.8949–7	1.1434+9	4.5767+8	2.2424+8	4.6147+8	8.4912+3	4.2685+2	2.7986+2	1.4697+2	1.7651–2
	4.1580–4	2.5977–8	3.9086+6	7.0266–7	1.1356+9	4.5447+8	2.2246+8	4.5869+8	8.4985+3	4.2545+2	2.7928+2	1.4615+2	1.7925–2
	4.2500–4	2.6264–8	3.8659+6	7.2434–7	1.1232+9	4.4935+8	2.1961+8	4.5425+8	8.5103+3	4.2324+2	2.7838+2	1.4485+2	1.8374–2
	4.2633–4	2.6305–8	3.8599+6	7.2748–7	1.1215+9	4.4862+8	2.1921+8	4.5362+8	8.5120+3	4.2293+2	2.7825+2	1.4466+2	1.8439–2
	4.4475–4	2.6868–8	3.7789+6	7.7124–7	1.0979+9	4.3891+8	2.1386+8	4.4517+8	8.5348+3	4.1885+2	2.7664+2	1.4219+2	1.9340–2
	4.6250–4	2.7400–8	3.7056+6	8.1380–7	1.0766+9	4.3011+8	2.0904+8	4.3749+8	8.5560+3	4.1528+2	2.7532+2	1.3994+2	2.0211–2

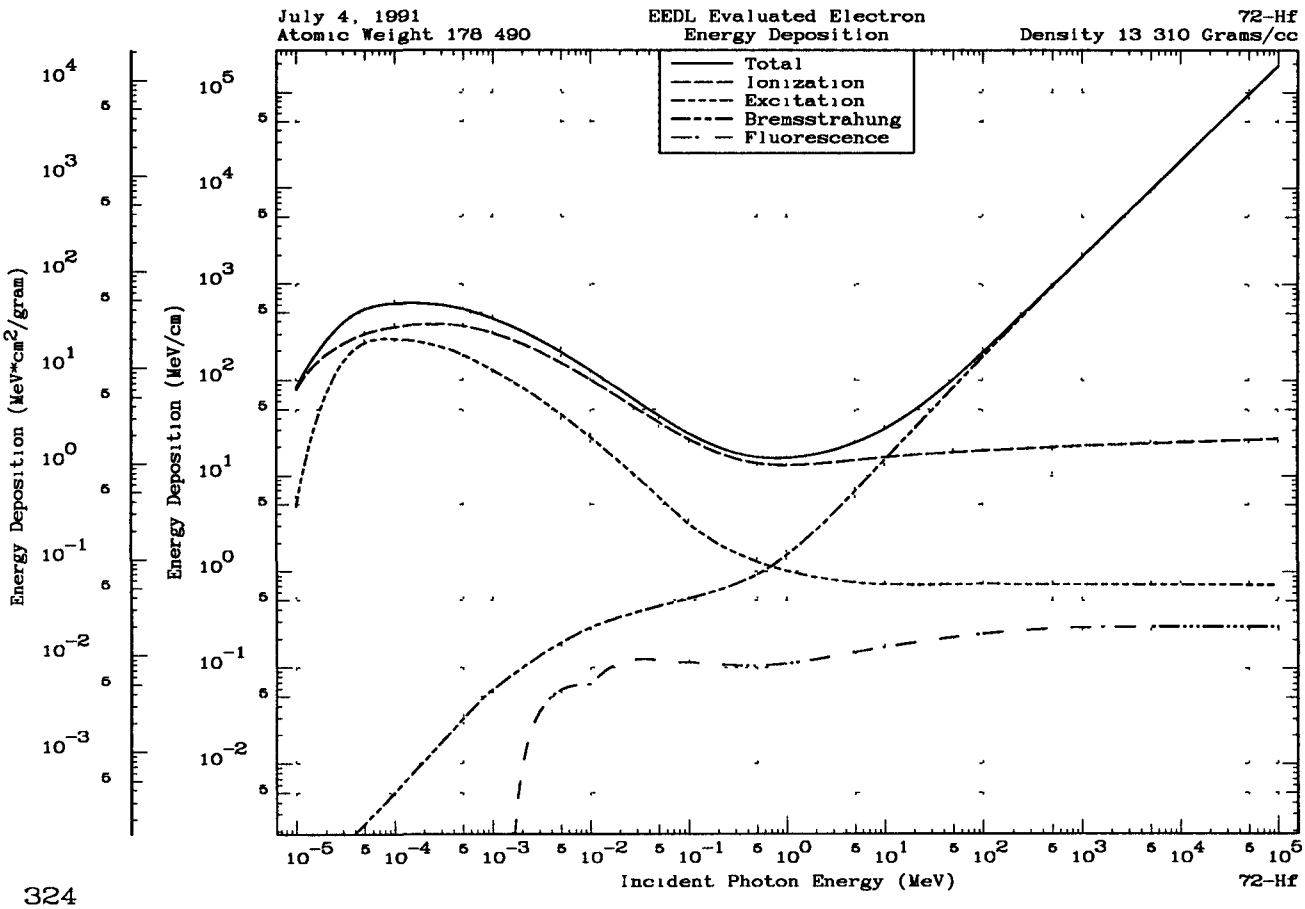
Atomic Weight 174.970 Density 9.849 Grams/cc

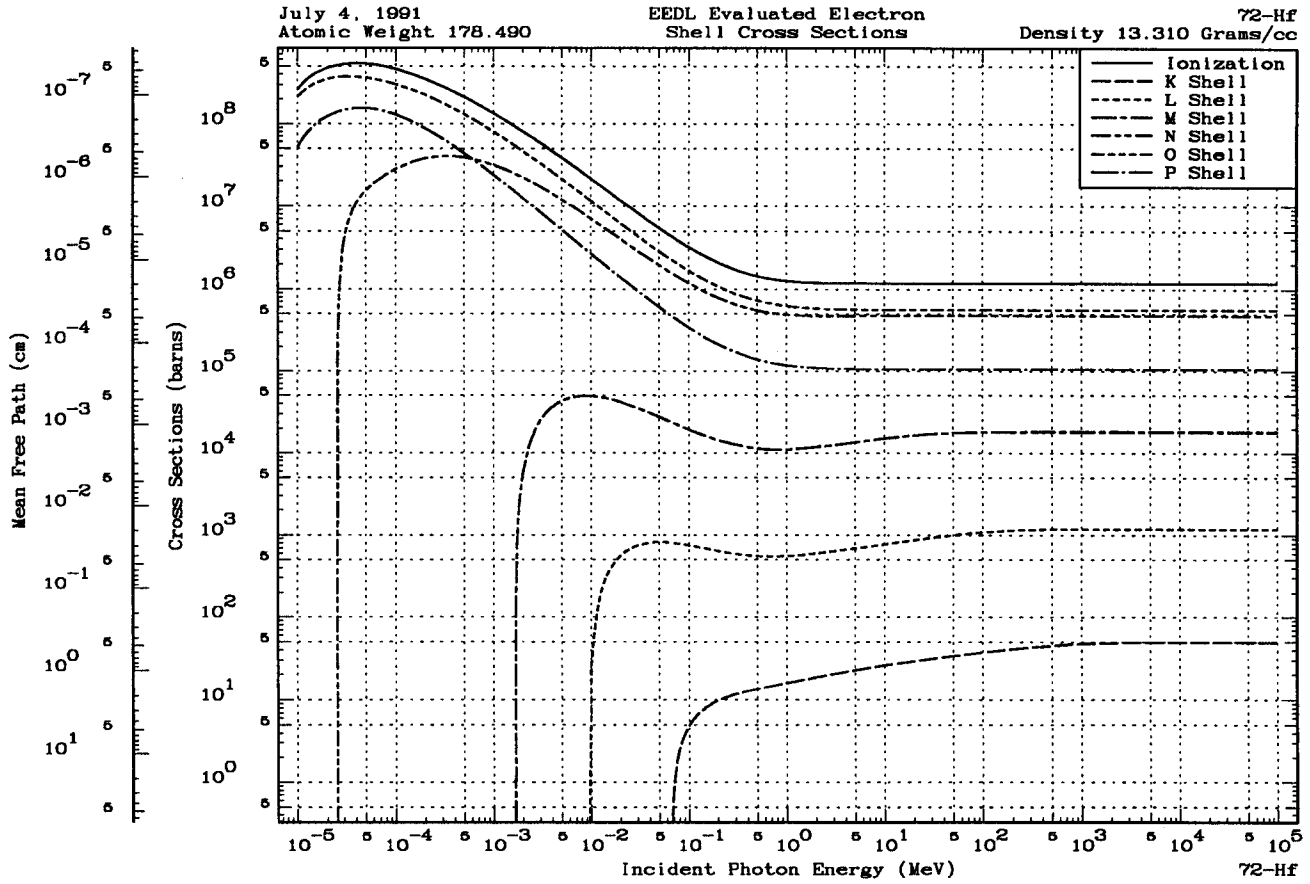
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.7237–4	2.7691–8	3.6667+6	8.3763–7	1.0653+9	4.2543+8	2.0649+8	4.3340+8	8.5674+3	4.1342+2	2.7466+2	1.3874+2	2.0696–2
N1	4.9785–4	2.8427–8	3.5717+6	8.9958–7	1.0377+9	4.1402+8	2.0032+8	4.2339+8	8.5960+3	4.0907+2	2.7322+2	1.3583+2	2.1952–2
	5.0000–4	2.8489–8	3.5639+6	9.0484–7	1.0355+9	4.1310+8	1.9983+8	4.2253+8	8.5983+3	4.0872+2	2.7311+2	1.3558+2	2.2058–2
	5.1250–4	2.8866–8	3.5174+6	9.3553–7	1.0220+9	4.0785+8	1.9686+8	4.1722+8	8.6088+3	4.0601+2	2.7200+2	1.3399+2	2.2669–2
	5.3438–4	2.9515–8	3.4400+6	9.8970–7	9.9949+8	3.9913+8	1.9196+8	4.0839+8	8.6266+3	4.0164+2	2.7025+2	1.3136+2	2.3740–2
	5.5000–4	2.9970–8	3.3878+6	1.0287–6	9.8430+8	3.9322+8	1.8866+8	4.0241+8	8.6389+3	3.9875+2	2.6915+2	1.2958+2	2.4507–2
	5.6719–4	3.0464–8	3.3329+6	1.0720–6	9.6835+8	3.8700+8	1.8522+8	3.9612+8	8.6520+3	3.9578+2	2.6806+2	1.2770+2	2.5352–2
	6.0000–4	3.1386–8	3.2350+6	1.1554–6	9.3990+8	3.7590+8	1.7912+8	3.8488+8	8.6761+3	3.9068+2	2.6629+2	1.2436+2	2.6968–2
	6.5000–4	3.2875–8	3.0885+6	1.2852–6	8.9734+8	3.6065+8	1.7010+8	3.6658+8	8.6877+3	3.7983+2	2.6100+2	1.1880+2	2.9315–2
	7.0000–4	3.4314–8	2.9590+6	1.4185–6	8.5971+8	3.4708+8	1.6221+8	3.5042+8	8.6985+3	3.7058+2	2.5666+2	1.1389+2	3.1665–2
	7.2500–4	3.5016–8	2.8996+6	1.4864–6	8.4247+8	3.4083+8	1.5861+8	3.4302+8	8.7036+3	3.6640+2	2.5471+2	1.1165+2	3.2841–2
	8.0000–4	3.7061–8	2.7396+6	1.6942–6	7.9598+8	3.2390+8	1.4900+8	3.2307+8	8.7180+3	3.5550+2	2.4985+2	1.0562+2	3.6374–2
	9.0000–4	3.9750–8	2.5543+6	1.9818–6	7.4214+8	3.0474+8	1.3763+8	2.9976+8	8.6803+3	3.3984+2	2.4134+2	9.8463+1	4.0376–2
	1.0000–3	4.2313–8	2.3996+6	2.2816–6	6.9718+8	2.8857+8	1.2826+8	2.8034+8	8.6467+3	3.2735+2	2.3479+2	9.2516+1	4.4362–2
	1.1250–3	4.5469–8	2.2330+6	2.6736–6	6.4879+8	2.7147+8	1.1791+8	2.5940+8	8.5615+3	3.1059+2	2.2455+2	8.5998+1	4.8357–2
	1.2500–3	4.8484–8	2.0942+6	3.0851–6	6.0845+8	2.5703+8	1.0941+8	2.4200+8	8.4859+3	2.9707+2	2.1642+2	8.0595+1	5.2324–2
	1.3125–3	4.9945–8	2.0329+6	3.2976–6	5.9065+8	2.5061+8	1.0569+8	2.3434+8	8.4512+3	2.9111+2	2.1283+2	7.8222+1	5.4297–2
	1.5000–3	5.4166–8	1.8745+6	3.9588–6	5.4462+8	2.3384+8	9.6180+7	2.1460+8	8.3568+3	2.7615+2	2.0397+2	7.2119+1	6.0180–2
M5	1.5978–3	5.6417–8	1.7997+6	4.3187–6	5.2289+8	2.2630+8	9.1736+7	2.0484+8	8.3074+3	2.6750+2	1.9842+2	6.9024+1	6.2975–2
	1.6104–3	5.6703–8	1.7906+6	4.3657–6	5.2025+8	2.2538+8	9.1200+7	2.0366+8	8.3013+3	2.6647+2	1.9776+2	6.8649+1	6.3333–2
	1.6225–3	5.6980–8	1.7819+6	4.4115–6	5.1772+8	2.2451+8	9.0688+7	2.0252+8	8.2954+3	2.6548+2	1.9713+2	6.8290+1	6.3680–2
	1.6461–3	5.7514–8	1.7654+6	4.5007–6	5.1291+8	2.2283+8	8.9714+7	2.0036+8	8.2842+3	2.6361+2	1.9594+2	6.7607+1	6.4352–2
M4	1.6508–3	5.7620–8	1.7621+6	4.5184–6	5.1198+8	2.2250+8	8.9525+7	1.9994+8	8.2819+3	2.6325+2	1.9571+2	6.7475+1	6.4485–2
	1.6682–3	5.8015–8	1.7501+6	4.5848–6	5.0849+8	2.2129+8	8.8820+7	1.9837+8	8.2738+3	2.6188+2	1.9484+2	6.6977+1	6.4981–2
	1.6944–3	5.8605–8	1.7325+6	4.6853–6	5.0337+8	2.1951+8	8.7787+7	1.9606+8	8.2617+3	2.5988+2	1.9356+2	6.6246+1	6.5725–2
	1.7097–3	5.8947–8	1.7224+6	4.7442–6	5.0045+8	2.1849+8	8.7198+7	1.9475+8	8.2547+3	2.5874+2	1.9284+2	6.5829+1	6.6159–2
	1.7708–3	6.0306–8	1.6836+6	4.9824–6	4.8917+8	2.1455+8	8.4931+7	1.8968+8	8.2275+3	2.5436+2	1.9007+2	6.4225+1	6.7891–2
	1.8549–3	6.2146–8	1.6338+6	5.3164–6	4.7469+8	2.0945+8	8.2034+7	1.8319+8	8.1918+3	2.4883+2	1.8659+2	6.2173+1	7.0266–2
	1.8854–3	6.2808–8	1.6166+6	5.4397–6	4.6969+8	2.0768+8	8.1037+7	1.8096+8	8.1792+3	2.4693+2	1.8540+2	6.1467+1	7.1127–2
	2.0000–3	6.5252–8	1.5560+6	5.9100–6	4.5210+8	2.0142+8	7.7543+7	1.7312+8	8.1341+3	2.4035+2	1.8128+2	5.8990+1	7.4349–2
M3	2.0161–3	6.5594–8	1.5479+6	5.9771–6	4.4973+8	2.0057+8	7.7062+7	1.7209+8	8.1279+3	2.3932+2	1.8059+2	5.8657+1	7.4800–2
	2.0468–3	6.6249–8	1.5326+6	6.1061–6	4.4529+8	1.9897+8	7.6162+7	1.7015+8	8.1162+3	2.3741+2	1.7930+2	5.8032+1	7.5654–2
	2.1064–3	6.7507–8	1.5040+6	6.3589–6	4.3699+8	1.9598+8	7.4486+7	1.6652+8	8.0940+3	2.3386+2	1.7692+2	5.6867+1	7.7305–2
	2.2181–3	6.9830–8	1.4540+6	6.8429–6	4.2245+8	1.9070+8	7.1562+7	1.6018+8	8.0541+3	2.2772+2	1.7280+2	5.4833+1	8.0391–2
M2	2.2580–3	7.0649–8	1.4371+6	7.0189–6	4.1756+8	1.8891+8	7.0582+7	1.5805+8	8.0404+3	2.2567+2	1.7144+2	5.4149+1	8.1490–2
	2.3044–3	7.1603–8	1.4180+6	7.2254–6	4.1199+8	1.8689+8	6.9480+7	1.5561+8	8.0206+3	2.2336+2	1.6990+2	5.3373+1	8.2587–2
	2.3913–3	7.3374–8	1.3838+6	7.6183–6	4.0205+8	1.8327+8	6.7516+7	1.5125+8	7.9845+3	2.1926+2	1.6719+2	5.1990+1	8.4639–2
	2.4136–3	7.3824–8	1.3753+6	7.7201–6	3.9960+8	1.8238+8	6.7034+7	1.5018+8	7.9756+3	2.1826+2	1.6653+2	5.1650+1	8.5163–2
	2.4375–3	7.4305–8	1.3664+6	7.8299–6	3.9701+8	1.8143+8	6.6526+7	1.4905+8	7.9660+3	2.1721+2	1.6583+2	5.1292+1	8.5726–2
M1	2.4705–3	7.4967–8	1.3544+6	7.9823–6	3.9351+8	1.8014+8	6.5838+7	1.4752+8	7.9530+3	2.1578+2	1.6489+2	5.0807+1	8.6502–2
	2.5036–3	7.5636–8	1.3424+6	8.1363–6	3.9002+8	1.7888+8	6.5146+7	1.4599+8	7.9402+3	2.1420+2	1.6380+2	5.0312+1	8.7279–2
	2.5656–3	7.6884–8	1.3206+6	8.4279–6	3.8370+8	1.7658+8	6.3894+7	1.4321+8	7.9166+3	2.1135+2	1.6184+2	4.9416+1	8.8734–2
	2.6006–3	7.7581–8	1.3087+6	8.5937–6	3.8025+8	1.7532+8	6.3213+7	1.4170+8	7.9036+3	2.0980+2	1.6078+2	4.8929+1	8.9552–2
	2.6742–3	7.9041–8	1.2846+6	8.9475–6	3.7322+8	1.7276+8	6.1829+7	1.3863+8	7.8768+3	2.0666+2	1.5863+2	4.7939+1	9.1274–2
	2.7068–3	7.9682–8	1.2742+6	9.1056–6	3.7022+8	1.7165+8	6.1240+7	1.3732+8	7.8653+3	2.0533+2	1.5772+2	4.7516+1	9.2033–2
	2.7187–3	7.9917–8	1.2705+6	9.1639–6	3.6913+8	1.7125+8	6.1026+7	1.3685+8	7.8610+3	2.0485+2	1.5739+2	4.7364+1	9.2312–2
	2.8003–3	8.1506–8	1.2457+6	9.5650–6	3.6194+8	1.6860+8	5.9615+7	1.3371+8	7.8329+3	2.0165+2	1.5521+2	4.6353+1	9.4210–2
	2.8371–3	8.2219–8	1.2349+6	9.7483–6	3.5880+8	1.6744+8	5.9002+7	1.3235+8	7.8204+3	2.0027+2	1.5426+2	4.5914+1	9.5066–2
	3.0000–3	8.5331–8	1.1899+6	1.0573–5	3.4571+8	1.6257+8	5.6455+7	1.2668+8	7.7676+3	1.9456+2	1.5037+2	4.4088+1	9.8839–2
	3.2500–3	9.0188–8	1.1258+6	1.1889–5	3.2709+8	1.5576+8	5.2895+7	1.1843+8	7.6713+3	1.8556+2	1.4408+2	4.1385+1	1.0385–1
	3.5000–3	9.4919–8	1.0697+6	1.3265–5	3.1079+8	1.4970+8	4.9804+7	1.1128+8	7.5833+3	1.7783+2	1.3868+2	3.9040+1	1.0881–1
	3.6250–3	9.7240–8	1.0441+6	1.3975–5	3.0337+8	1.4692+8	4.8405+7	1.0804+8	7.5419+3	1.7432+2	1.3623+2	3.7981+1	1.1128–1
	4.0000–3	1.0404–7	9.7587+5	1.6185–5	2.8354+8	1.3938+8	4.4690+7	9.9455+7	7.4272+3	1.6510+2	1.2980+2	3.5173+1	1.1864–1
	4.5000–3	1.1310–7	8.9776+5	1.9324–5	2.6084+8	1.3066+8	4.0530+7	8.9643+7	7.2614+3	1.5363+2	1.2159+2	3.1909+1	1.2718–1
	5.0000–3	1.2182–7	8.3345+5	2.2681–5	2.4216+8	1.2332+8	3.7143+7	8.1689+7	7.1162+3	1.4436+2	1.1496+2	2.9266+1	1.3559–1
	6.0000–3	1.3865–7	7.3231+5	3.0007–5	2.1277+8	1.1144+8	3.1867+7	6.9457+7	6.8350+3	1.2894+2	1.0363+2	2.5159+1	1.5051–1
	7.0000–3	1.5475–7	6.5610+5	3.8156–5	1.9063+8	1.0219+8	2.7950+7	6.0474+7	6.5472+3	1.1669+2	9.4420+1	2.2105+1	1.6234–1
	8.0000–3	1.7012–7	5.9682+5	4.7088–5	1.7340+8	9.4808+7	2.4952+7	5.3638+7	6.3077+3	1.0737+2	8.7411+1	1.9783+1	1.7390–1
L3	9.2432–3	1.8864–7	5.3822+5	5.9225–5	1.5638+8	8.7231+7	2.2042+7	4.7099+7	6.0195+3	9.7637+1	7.9933+1	1.7518+1	1.8568–1
	9.6216–3	1.9418–7	5.2289+5	6.3151–5	1.5192+8	8.5236+7	2.1297+7	4.5385+7	5.9418+3	9.5150+1	7.8028+1	1.6933+1	1.8921–1
	1.0000–2	1.9964–7	5.0859+5	6.7177–5	1.4777+8	8.3361+7	2.0604+7	4.3797+7	5.8680+3	9.2844+1	7.6261+1	1.6390+1	1.9271–1
L2	1.0373–2	2.0496–7	4.9537+5	7.1244–5	1.4393+8	8.1595+7	1.9964+7	4.2363+7	5.7900+3	9.0575+1	7.4490+1	1.5890+1	1.9556–1
	1.0625–2	2.0854–7	4.8688+5	7.4049–5	1.4146+8	8.0458+7	1.9555+7	4.1442+7	5.7394+3	8.9130+1	7.3363+1	1.5570+1	1.9748–1
	1.0662–2	2.0906–7	4.8566+5	7.4467–5	1.4111+8	8.0294+7	1.9497+7	4.1310+7	5.7321+3	8.8922+1	7.3201+1	1.5524+1	1.9776–1
L1	1.0845–2	2.1163–7	4.7976+5	7.6534–5	1.3939+8	7.9500+7	1.9213+7	4.0672+7	5.6966+3	8.7920+1	7.2419+1	1.5302+1	1.9915–1
	1.0975–2	2.1347–7	4.7564+5	7.8017–5	1.3820+8	7.8944+7	1.9017+7	4.0229+7	5.6702+3	8.7205+1	7.1859+1	1.5146+1	2.0000–1
	1.1204–2	2.1669–7	4.6857+5	8.0668–5	1.3614+8	7.7987+7	1.8680+7	3.9468+7	5.6246+3	8.5981+1	7.0901+1	1.4879+1	2.0150–1
	1.1478–2	2.2050–7	4.6047+5	8.3876–5	1.3379+8	7.6885+7	1.8296+7	3.8601+7	5.5719+3	8.4582+1	6.9806+1	1.4573+1	2.0329–1
	1.1719–2	2.2383–7	4.5362+5	8.6743–5	1.3180+8	7.5950+7	1.7971+7	3.7869+7	5.5270+3	8.3403+1	6.8883+1	1.4316+1	2.0485–1
	1.2153–2	2.2979–7	4.4186+5	9.2017–5	1.2838+8	7.4338+7	1.7416+7	3.6620+7	5.4491+3	8.1388+1	6.7303+1	1.3877+1	2.0767–1
	1.2358–2	2.3258–7	4.3655+5	9.4552–5	1.2684+8	7.3608+7	1.7166+7	3.6059+7	5.4137+3	8.0483+1	6.6594+1	1.3679+1	2.0899–1
	1.2500–2	2.3449–7	4.3299+5	9.6317–5	1.2580+8	7.3115+7	1.6998+7	3.5683+7	5.3897+3	7.9874+1	6.6118+1	1.3547+1	2.0990–1
	1.3359–2	2.4599–7	4.1276+5	1.0731–4	1.1992+8	7.0305+7	1.6052+7	3.3563+7	5.2517+3	7.6437+1	6.3420+1	1.2802+1	2.1540–1
	1.3577–2	2.4886–7	4.0800+5	1.1017–4	1.1854+8	6.9640+7	1.5830+7	3.3067+7	5.2188+3	7.5633+1	6.2789+1	1.2627+1	2.1678–1
	1.3679–2	2.5020–7	4.0580+5	1.1153–4	1.1790+8	6.9331+7	1.5728+7	3.2839+7	5.2035+3	7.5262+1	6.2497+1	1.2547+1	2.1742–1
	1.5000–2	2.6730–7	3.7985+5	1.2961–4	1.1036+8	6.5665+7	1.4527+7	3.0165+7	5.0198+3	7.0921+1	5.9087+1	1.1608+1	2.2571–1
	1.6250–2	2.8335–7	3.5833+5	1.4772–4	1.0411+8	6.2549+7	1.3562+7	2.7996+7	4.8490+3	6.7118+1	5.6058+1	1.0828+1	2.3150–1
	1.8125–2	3.0674–7	3.3101+5	1.7670–4	9.6173+7	5.8535+7	1.2348+7	2.5285+7	4.6253+3	6.2347+1	5.2252+1	9.8545+0	2.4010–1
	2.0000–2	3.2940–7	3.0824+5	2.0776–4	8.9557+7	5.5138+7	1.1347+7	2.3068+7	4.4325+3	5.8427+1	4.9120+1	9.0584+0	2.4856–1
	2.2500–2	3.5895–7	2.8286+5	2.5232–4	8.2185+7	5.1250+7	1.0267+7	2.0663+7	4.1850+3	5.3847+1	4.5416+1	8.1748+0	2.5640–1

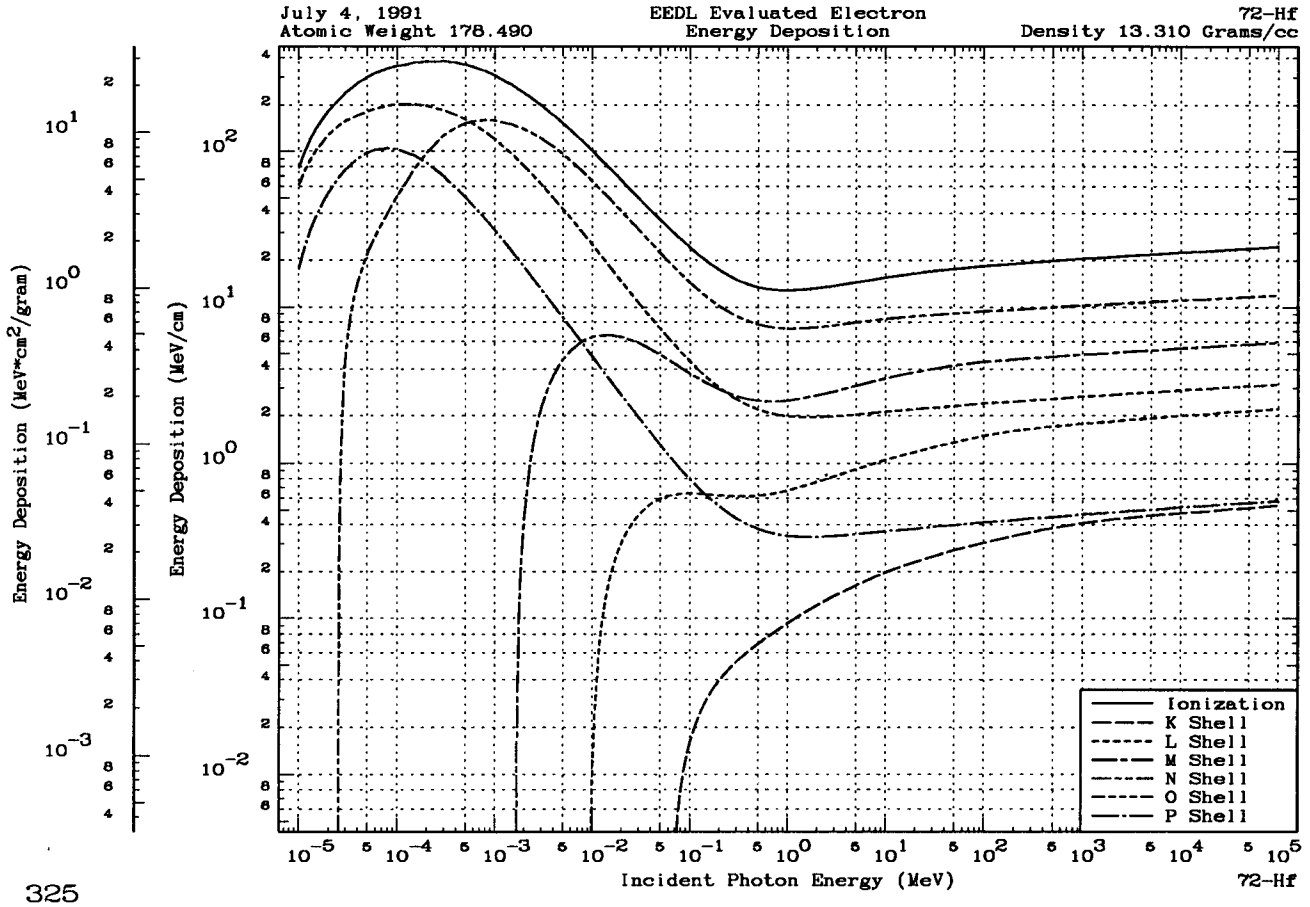
Atomic Weight 174.970 Density 9.849 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.6250–2	4.0149–7	2.5289+5	3.2565–4	7.3475+7	4.6572+7	9.0078+6	1.7891+7	3.8818+3	4.8520+1	4.1095+1	7.1566+0	2.6805–1
3.0000–2	4.4224–7	2.2959+5	4.0637–4	6.6706+7	4.2867+7	8.0429+6	1.5793+7	3.6369+3	4.4451+1	3.7785+1	6.3864+0	2.7946–1
3.5000–2	4.9464–7	2.0527+5	5.2480–4	5.9639+7	3.8888+7	7.0763+6	1.3671+7	3.3622+3	4.0065+1	3.4186+1	5.5878+0	2.9068–1
4.0000–2	5.4484–7	1.8635+5	6.5514–4	5.4144+7	3.5742+7	6.3336+6	1.2066+7	3.1410+3	3.6709+1	3.1423+1	4.9838+0	3.0177–1
5.0000–2	6.3951–7	1.5877+5	9.4786–4	4.6129+7	3.1028+7	5.2876+6	9.8115+6	2.8022+3	3.1735+1	2.7295+1	4.1204+0	3.1986–1
6.0000–2	7.2850–7	1.3937+5	1.2817–3	4.0494+7	2.7641+7	4.5817+6	8.2683+6	2.5564+3	2.8248+1	2.4393+1	3.5190+0	3.3549–1
K 6.3442–2	7.5821–7	1.3391+5	1.4057–3	3.8907+7	2.6682+7	4.3903+6	7.8321+6	2.4866+3	2.7266+1	2.3580+1	3.3456+0	3.4039–1
6.4477–2	7.6698–7	1.3238+5	1.4438–3	3.8462+7	2.6414+7	4.3371+6	7.7085+6	2.4670+3	2.6990+1	2.3352+1	3.2965+0	3.4175–1
6.6417–2	7.8331–7	1.2962+5	1.5164–3	3.7661+7	2.5930+7	4.2413+6	7.4872+6	2.4315+3	2.6495+1	2.2942+1	3.2086+0	3.4430–1
6.9813–2	8.1152–7	1.2511+5	1.6465–3	3.6351+7	2.5135+7	4.0848+6	7.1293+6	2.3729+3	2.5688+1	2.2273+1	3.0664+0	3.4876–1
7.4907–2	8.5303–7	1.1903+5	1.8491–3	3.4582+7	2.4054+7	3.8737+6	6.6526+6	2.2925+3	2.4603+1	2.1371+1	2.8771+0	3.5544–1
8.0000–2	8.9365–7	1.1362+5	2.0603–3	3.3011+7	2.3086+7	3.6864+6	6.2362+6	2.2199+3	2.3645+1	2.0571+1	2.7117+0	3.6209–1
9.0000–2	9.6852–7	1.0483+5	2.4980–3	3.0459+7	2.1488+7	3.3884+6	5.5808+6	2.0990+3	2.2063+1	1.9243+1	2.4470+0	3.7338–1
1.0000–1	1.0406–6	9.7573+4	2.9652–3	2.8349+7	2.0152+7	3.1424+6	5.0530+6	1.9964+3	2.0766+1	1.8148+1	2.2340+0	3.8463–1
1.1250–1	1.1189–6	9.0745+4	3.5862–3	2.6365+7	1.8876+7	2.9085+6	4.5786+6	1.9000+3	1.9502+1	1.7067+1	2.0396+0	3.9617–1
1.3125–1	1.2300–6	8.2545+4	4.5866–3	2.3983+7	1.7328+7	2.6286+6	4.0244+6	1.7809+3	1.8003+1	1.5777+1	1.8129+0	4.1366–1
1.5000–1	1.3349–6	7.6059+4	5.6634–3	2.2099+7	1.6090+7	2.4080+6	3.5988+6	1.6837+3	1.6835+1	1.4765+1	1.6392+0	4.3111–1
2.0000–1	1.5678–6	6.4761+4	8.8253–3	1.8816+7	1.3902+7	2.0407+6	2.8719+6	1.4991+3	1.4834+1	1.3027+1	1.3366+0	4.7014–1
2.5000–1	1.7678–6	5.7436+4	1.2330–2	1.6688+7	1.2374+7	1.8324+6	2.4799+6	1.3827+3	1.3711+1	1.2033+1	1.1721+0	5.0579–1
3.0000–1	1.9497–6	5.2076+4	1.6088–2	1.5130+7	1.1251+7	1.6781+6	2.1997+6	1.2943+3	1.2907+1	1.1310+1	1.0556+0	5.4101–1
4.0000–1	2.2711–6	4.4706+4	2.4106–2	1.2989+7	9.6083+6	1.5019+6	1.8775+6	1.1857+3	1.2048+1	1.0516+1	9.2136–1	6.1137–1
5.0000–1	2.5515–6	3.9794+4	3.2558–2	1.1562+7	8.4997+6	1.4009+6	1.6602+6	1.1223+3	1.1617+1	1.0104+1	8.2909–1	6.8395–1
6.0000–1	2.7936–6	3.6345+4	4.1248–2	1.0560+7	7.6895+6	1.3360+6	1.5333+6	1.0828+3	1.1398+1	9.8609+0	7.7699–1	7.5969–1
8.0000–1	3.2113–6	3.1618+4	5.8878–2	9.1863+6	6.5660+6	1.2610+6	1.3582+6	1.0377+3	1.1291+1	9.6694+0	7.0441–1	9.1718–1
1.0000+0	3.5615–6	2.8509+4	7.6537–2	8.2830+6	5.8098+6	1.2205+6	1.2516+6	1.0145+3	1.1360+1	9.6181+0	6.6102–1	1.0814+0
1.5000+0	4.2532–6	2.3872+4	1.1954–1	6.9359+6	4.6517+6	1.1763+6	1.1070+6	9.9413+2	1.1898+1	9.7724+0	6.0393–1	1.5213+0
2.0000+0	4.7694–6	2.1288+4	1.6048–1	6.1852+6	3.9733+6	1.1653+6	1.0457+6	9.9162+2	1.2534+1	9.9623+0	5.8020–1	1.9911+0
3.0000+0	5.4831–6	1.8518+4	2.3633–1	5.3802+6	3.2632+6	1.1515+6	9.6448+5	9.9519+2	1.3855+1	1.0330+1	5.5373–1	2.9718+0
4.0000+0	5.9457–6	1.7077+4	3.0520–1	4.9616+6	2.8792+6	1.1481+6	9.3324+5	1.0007+3	1.5209+1	1.0653+1	5.4329–1	4.0130+0
5.0000+0	6.2710–6	1.6191+4	3.6827–1	4.7042+6	2.6404+6	1.1479+6	9.1489+5	1.0063+3	1.6520+1	1.0899+1	5.4000–1	5.0814+0
6.0000+0	6.5133–6	1.5589+4	4.2654–1	4.5292+6	2.4826+6	1.1477+6	8.9795+5	1.0119+3	1.7813+1	1.1100+1	5.3732–1	6.1755+0
8.0000+0	6.8399–6	1.4844+4	5.3140–1	4.3129+6	2.2826+6	1.1483+6	8.8102+5	1.0237+3	2.0393+1	1.1438+1	5.3315–1	8.4218+0
1.0000+1	7.0398–6	1.4423+4	6.2371–1	4.1905+6	2.1702+6	1.1494+6	8.6981+5	1.0352+3	2.2992+1	1.1729+1	5.3227–1	1.0731+1
1.5000+1	7.2306–6	1.4042+4	8.1550–1	4.0799+6	2.0624+6	1.1512+6	8.6516+5	1.0523+3	2.9413+1	1.2131+1	5.3546–1	1.6746+1
2.0000+1	7.2717–6	1.3963+4	9.6906–1	4.0568+6	2.0442+6	1.1525+6	8.5908+5	1.0644+3	3.5925+1	1.2454+1	5.3770–1	2.2933+1
3.0000+1	7.2631–6	1.3979+4	1.2064+0	4.0616+6	2.0459+6	1.1536+6	8.6108+5	1.0818+3	4.9031+1	1.2853+1	5.4092–1	3.5637+1
4.0000+1	7.2600–6	1.3985+4	1.3868+0	4.0634+6	2.0449+6	1.1544+6	8.6306+5	1.0980+3	6.2377+1	1.3124+1	5.4414–1	4.8710+1
5.0000+1	7.2592–6	1.3987+4	1.5319+0	4.0638+6	2.0441+6	1.1547+6	8.6390+5	1.1108+3	7.5838+1	1.3320+1	5.4665–1	6.1971+1
6.0000+1	7.2597–6	1.3986+4	1.6532+0	4.0635+6	2.0434+6	1.1550+6	8.6404+5	1.1214+3	8.9399+1	1.3463+1	5.4871–1	7.5387+1
8.0000+1	7.2628–6	1.3980+4	1.8483+0	4.0618+6	2.0424+6	1.1553+6	8.6294+5	1.1383+3	1.1683+2	1.3724+1	5.5197–1	1.0256+2
1.0000+2	7.2592–6	1.3987+4	2.0019+0	4.0638+6	2.0416+6	1.1555+6	8.6552+5	1.1516+3	1.4458+2	1.3933+1	5.5451–1	1.3009+2
1.5000+2	7.2611–6	1.3983+4	2.2843+0	4.0627+6	2.0401+6	1.1557+6	8.6577+5	1.1754+3	2.1411+2	1.4154+1	5.5485–1	1.9940+2
2.0000+2	7.2625–6	1.3981+4	2.4863+0	4.0620+6	2.0391+6	1.1558+6	8.6591+5	1.1917+3	2.8441+2	1.4357+1	5.5512–1	2.6950+2
3.0000+2	7.2649–6	1.3976+4	2.7722+0	4.0606+6	2.0377+6	1.1559+6	8.6587+5	1.2124+3	4.2435+2	1.4669+1	5.5546–1	4.0913+2
4.0000+2	7.2686–6	1.3969+4	2.9758+0	4.0585+6	2.0366+6	1.1559+6	8.6478+5	1.2262+3	5.6444+2	1.4851+1	5.5512–1	5.4904+2
5.0000+2	7.2734–6	1.3959+4	3.1340+0	4.0558+6	2.0359+6	1.1559+6	8.6285+5	1.2368+3	7.0552+2	1.5007+1	5.5424–1	6.8996+2
6.0000+2	7.2776–6	1.3952+4	3.2633+0	4.0535+6	2.0352+6	1.1559+6	8.6118+5	1.2451+3	8.4529+2	1.5125+1	5.5353–1	8.2962+2
8.0000+2	7.2845–6	1.3938+4	3.4675+0	4.0497+6	2.0342+6	1.1559+6	8.5832+5	1.2583+3	1.1272+3	1.5336+1	5.5241–1	1.1113+3
1.0000+3	7.2903–6	1.3927+4	3.6258+0	4.0465+6	2.0334+6	1.1559+6	8.5589+5	1.2691+3	1.4089+3	1.5513+1	5.5156–1	1.3929+3
1.5000+3	7.2955–6	1.3917+4	3.9134+0	4.0436+6	2.0320+6	1.1559+6	8.5440+5	1.2894+3	2.1170+3	1.5680+1	5.5061–1	2.1008+3
2.0000+3	7.2959–6	1.3916+4	4.1173+0	4.0434+6	2.0309+6	1.1559+6	8.5517+5	1.3050+3	2.8206+3	1.5844+1	5.5112–1	2.8042+3
3.0000+3	7.2976–6	1.3913+4	4.4048+0	4.0424+6	2.0295+6	1.1559+6	8.5567+5	1.3274+3	4.2311+3	1.6163+1	5.5146–1	4.2144+3
4.0000+3	7.3007–6	1.3907+4	4.6087+0	4.0407+6	2.0285+6	1.1559+6	8.5495+5	1.3437+3	5.6430+3	1.6305+1	5.5102–1	5.6261+3
5.0000+3	7.3062–6	1.3897+4	4.7667+0	4.0376+6	2.0277+6	1.1559+6	8.5265+5	1.3565+3	7.0696+3	1.6444+1	5.4956–1	7.0526+3
6.0000+3	7.3067–6	1.3896+4	4.8957+0	4.0374+6	2.0271+6	1.1559+6	8.5304+5	1.3659+3	8.4726+3	1.6548+1	5.4983–1	8.4555+3
8.0000+3	7.3090–6	1.3892+4	5.0994+0	4.0361+6	2.0260+6	1.1559+6	8.5276+5	1.3808+3	1.1303+4	1.6755+1	5.4970–1	1.1286+4
1.0000+4	7.3112–6	1.3887+4	5.2572+0	4.0349+6	2.0252+6	1.1559+6	8.5233+5	1.3925+3	1.4160+4	1.6946+1	5.4946–1	1.4143+4
1.5000+4	7.3146–6	1.3881+4	5.5440+0	4.0330+6	2.0238+6	1.1559+6	8.5185+5	1.4150+3	2.1171+4	1.7102+1	5.4915–1	2.1153+4
2.0000+4	7.3180–6	1.3875+4	5.7477+0	4.0312+6	2.0228+6	1.1559+6	8.5101+5	1.4312+3	2.8273+4	1.7257+1	5.4861–1	2.8255+4
3.0000+4	7.3211–6	1.3869+4	6.0348+0	4.0294+6	2.0214+6	1.1559+6	8.5069+5	1.4540+3	4.2314+4	1.7569+1	5.4841–1	4.2296+4
4.0000+4	7.3243–6	1.3862+4	6.2386+0	4.0276+6	2.0203+6	1.1559+6	8.4990+5	1.4703+3	5.6506+4	1.7731+1	5.4790–1	5.6488+4
5.0000+4	7.3296–6	1.3852+4	6.3967+0	4.0248+6	2.0196+6	1.1559+6	8.4780+5	1.4828+3	7.0567+4	1.7867+1	5.4654–1	7.0548+4
6.0000+4	7.3297–6	1.3852+4	6.5259+0	4.0247+6	2.0189+6	1.1559+6	8.4837+5	1.4931+3	8.4615+4	1.7969+1	5.4692–1	8.4597+4
8.0000+4	7.3318–6	1.3848+4	6.7298+0	4.0236+6	2.0179+6	1.1559+6	8.4821+5	1.5093+3	1.1296+5	1.8172+1	5.4682–1	1.1294+5
1.0000+5	7.3333–6	1.3845+4	6.8877+0	4.0227+6	2.0171+6	1.1559+6	8.4815+5	1.5220+3	1.4135+5	1.8362+1	5.4678–1	1.4133+5


July 4 1991
Atomic Weight 178 490
EEDL Evaluated Electron
Cross Sections
72-Hf
Density 13 310 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
72-Hf


July 4, 1991
Atomic Weight 178 490
EEDL Evaluated Electron
Energy Deposition
72-Hf
Density 13 310 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
72-Hf


July 4, 1991
Atomic Weight 178.490
EEDL Evaluated Electron
Shell Cross Sections
72-Hf
Density 13.310 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
72-Hf


July 4, 1991
Atomic Weight 178.490
EEDL Evaluated Electron
Energy Deposition
72-Hf
Density 13.310 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
72-Hf

325

Atomic Weight 178.490 Density 13.310 Grams/cc

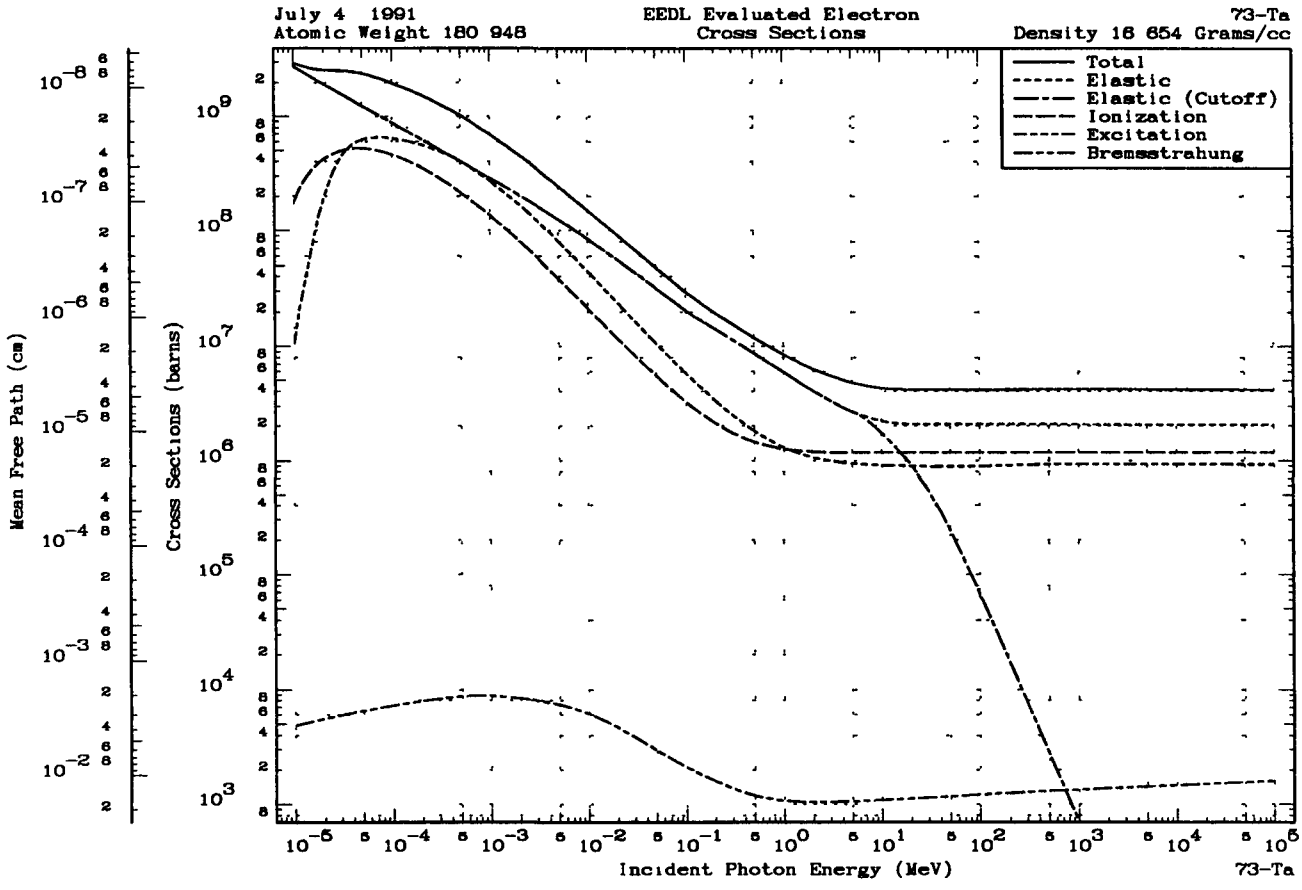
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.6238–9	1.1343+7		3.3619+9	3.0845+9	2.6336+8	1.3970+7	4.8503+3	8.3376+1	7.8620+1	4.7561+0	4.7071–4
	1.1250–5	6.8743–9	1.0929+7		3.2393+9	2.9030+9	3.1034+8	2.5974+7	4.9669+3	1.0552+2	9.6419+1	9.0958+0	5.2755–4
	1.3125–5	7.1912–9	1.0448+7		3.0966+9	2.6815+9	3.6533+8	4.9722+7	5.1237+3	1.3819+2	1.2005+2	1.8137+1	6.1465–4
	1.5000–5	7.4484–9	1.0087+7		2.9897+9	2.5034+9	4.0700+8	7.9304+7	5.2636+3	1.7047+2	1.4038+2	3.0083+1	7.0379–4
	1.7500–5	7.7242–9	9.7268+6		2.8829+9	2.3124+9	4.4422+8	1.2633+8	5.4298+3	2.1092+2	1.6195+2	4.8964+1	8.2554–4
	2.0000–5	7.9154–9	9.4918+6		2.8133+9	2.1587+9	4.7616+8	1.7838+8	5.5780+3	2.5338+2	1.8277+2	7.0607+1	9.5033–4
N7	2.5400–5	8.2061–9	9.1555+6		2.7136+9	1.9088+9	5.1085+8	2.9399+8	5.8221+3	3.3321+2	2.1451+2	1.1870+2	1.2064–3
	2.5687–5	8.2194–9	9.1408+6		2.7092+9	1.8977+9	5.1206+8	2.9944+8	5.8336+3	3.3699+2	2.1601+2	1.2098+2	1.2201–3
	2.6227–5	8.2425–9	9.1151+6		2.7016+9	1.8776+9	5.1429+8	3.0978+8	5.8549+3	3.4411+2	2.1880+2	1.2531+2	1.2459–3
	2.7170–5	8.2782–9	9.0759+6		2.6900+9	1.8437+9	5.1810+8	3.2819+8	5.8912+3	3.5671+2	2.2367+2	1.3304+2	1.2911–3
N6	2.7260–5	8.2813–9	9.0724+6		2.6890+9	1.8406+9	5.1844+8	3.2997+8	5.8946+3	3.5791+2	2.2412+2	1.3379+2	1.2954–3
	2.7603–5	8.2944–9	9.0581+6		2.6847+9	1.8288+9	5.1990+8	3.3605+8	5.9075+3	3.6235+2	2.2602+2	1.3633+2	1.3119–3
	2.8202–5	8.3156–9	9.0350+6		2.6779+9	1.8086+9	5.2247+8	3.4677+8	5.9298+3	3.7023+2	2.2940+2	1.4082+2	1.3408–3
	2.8585–5	8.3279–9	9.0216+6		2.6739+9	1.7961+9	5.2411+8	3.5368+8	5.9439+3	3.7530+2	2.3158+2	1.4372+2	1.3593–3
	2.9101–5	8.3434–9	9.0049+6		2.6690+9	1.7797+9	5.2625+8	3.6305+8	5.9625+3	3.8212+2	2.3446+2	1.4766+2	1.3843–3
	3.0000–5	8.3669–9	8.9797+6		2.6615+9	1.7520+9	5.2992+8	3.7956+8	5.9944+3	3.9410+2	2.3949+2	1.5461+2	1.4281–3
	3.1250–5	8.4164–9	8.9268+6		2.6458+9	1.7156+9	5.3166+8	3.9856+8	6.0374+3	4.0677+2	2.4421+2	1.6256+2	1.4892–3
	3.2500–5	8.4592–9	8.8816+6		2.6324+9	1.6813+9	5.3340+8	4.1771+8	6.0790+3	4.1957+2	2.4899+2	1.7058+2	1.5507–3
	3.3438–5	8.4874–9	8.8521+6		2.6237+9	1.6569+9	5.3459+8	4.3217+8	6.1094+3	4.2913+2	2.5247+2	1.7665+2	1.5971–3
	3.5000–5	8.5275–9	8.8105+6		2.6114+9	1.6184+9	5.3648+8	4.5644+8	6.1584+3	4.4506+2	2.5819+2	1.8687+2	1.6748–3
	3.6250–5	8.5672–9	8.7697+6		2.5992+9	1.5895+9	5.3805+8	4.7173+8	6.1964+3	4.5627+2	2.6290+2	1.9337+2	1.7374–3
	3.6719–5	8.5810–9	8.7555+6		2.5951+9	1.5790+9	5.3859+8	4.7746+8	6.2104+3	4.6043+2	2.6462+2	1.9581+2	1.7609–3
O3	3.8100–5	8.6189–9	8.7171+6		2.5837+9	1.5493+9	5.4006+8	4.9430+8	6.2507+3	4.7255+2	2.6955+2	2.0300+2	1.8306–3
	3.8575–5	8.6351–9	8.7007+6		2.5788+9	1.5394+9	5.4045+8	4.9890+8	6.2642+3	4.7627+2	2.7129+2	2.0498+2	1.8546–3
	3.9288–5	8.6585–9	8.6772+6		2.5718+9	1.5250+9	5.4105+8	5.0576+8	6.2844+3	4.8187+2	2.7392+2	2.0795+2	1.8908–3
	4.0000–5	8.6809–9	8.6548+6		2.5652+9	1.5110+9	5.4161+8	5.1259+8	6.3042+3	4.8740+2	2.7649+2	2.1091+2	1.9270–3
	4.1250–5	8.7272–9	8.6089+6		2.5516+9	1.4873+9	5.4075+8	5.2358+8	6.3361+3	4.9519+2	2.7960+2	2.1558+2	1.9888–3
	4.5000–5	8.8488–9	8.4906+6		2.5165+9	1.4222+9	5.3841+8	5.5595+8	6.4272+3	5.1835+2	2.8894+2	2.2940+2	2.1755–3
	4.5625–5	8.8665–9	8.4736+6		2.5115+9	1.4121+9	5.3812+8	5.6126+8	6.4418+3	5.2231+2	2.9064+2	2.3168+2	2.2069–3
O2	4.6340–5	8.8864–9	8.4547+6		2.5059+9	1.4009+9	5.3770+8	5.6731+8	6.4582+3	5.2667+2	2.9240+2	2.3427+2	2.2428–3
	4.7255–5	8.9193–9	8.4235+6		2.4966+9	1.3868+9	5.3723+8	5.7255+8	6.4776+3	5.3133+2	2.9476+2	2.3656+2	2.2875–3
	4.7941–5	8.9432–9	8.4009+6		2.4899+9	1.3766+9	5.3690+8	5.7644+8	6.4919+3	5.3484+2	2.9657+2	2.3827+2	2.3211–3
	4.8971–5	8.9779–9	8.3685+6		2.4803+9	1.3616+9	5.3646+8	5.8223+8	6.5131+3	5.4016+2	2.9935+2	2.4081+2	2.3716–3
	5.0000–5	9.0111–9	8.3377+6		2.4712+9	1.3471+9	5.3609+8	5.8795+8	6.5339+3	5.4554+2	3.0222+2	2.4332+2	2.4222–3
	5.2500–5	9.1124–9	8.2450+6		2.4437+9	1.3138+9	5.3257+8	5.9739+8	6.5830+3	5.5412+2	3.0651+2	2.4760+2	2.5458–3
	5.5000–5	9.2070–9	8.1603+6		2.4186+9	1.2827+9	5.2938+8	6.0652+8	6.6301+3	5.6280+2	3.1102+2	2.5177+2	2.6701–3
	6.0000–5	9.3791–9	8.0105+6		2.3742+9	1.2266+9	5.2366+8	6.2400+8	6.7192+3	5.8017+2	3.2035+2	2.5981+2	2.9211–3
	6.5000–5	9.5833–9	7.8398+6		2.3237+9	1.1771+9	5.1456+8	6.3198+8	6.8021+3	5.8900+2	3.2543+2	2.6357+2	3.1749–3
	7.0000–5	9.7706–9	7.6896+6		2.2791+9	1.1331+9	5.0656+8	6.3947+8	6.8799+3	5.9820+2	3.3107+2	2.6712+2	3.4314–3
O1	7.2560–5	9.8611–9	7.6190+6		2.2582+9	1.1123+9	5.0272+8	6.4313+8	6.9179+3	6.0282+2	3.3394+2	2.6888+2	3.5638–3
	7.3490–5	9.8965–9	7.5917+6		2.2501+9	1.1051+9	5.0138+8	6.4364+8	6.9314+3	6.0422+2	3.3504+2	2.6918+2	3.6120–3
	7.5118–5	9.9575–9	7.5452+6		2.2363+9	1.0927+9	4.9912+8	6.4451+8	6.9547+3	6.0669+2	3.3699+2	2.6970+2	3.6966–3
	7.7559–5	1.0046–8	7.4785+6		2.2165+9	1.0749+9	4.9588+8	6.4580+8	6.9889+3	6.1049+2	3.4002+2	2.7046+2	3.8240–3
	8.0000–5	1.0132–8	7.4150+6		2.1977+9	1.0579+9	4.9282+8	6.4704+8	7.0222+3	6.1438+2	3.4316+2	2.7122+2	3.9520–3
	8.5000–5	1.0339–8	7.2668+6		2.1538+9	1.0254+9	4.8417+8	6.4424+8	7.0832+3	6.1674+2	3.4617+2	2.7057+2	4.2126–3
	9.0000–5	1.0536–8	7.1313+6		2.1136+9	9.9569+8	4.7632+8	6.4162+8	7.1412+3	6.1957+2	3.4959+2	2.6998+2	4.4753–3
	9.2500–5	1.0631–8	7.0674+6		2.0947+9	9.8176+8	4.7258+8	6.4036+8	7.1692+3	6.2100+2	3.5127+2	2.6972+2	4.6073–3
	1.0000–4	1.0904–8	6.8905+6	0.0000+0	2.0423+9	9.4317+8	4.6230+8	6.3680+8	7.2494+3	6.2578+2	3.5678+2	2.6899+2	5.0062–3
	1.1250–4	1.1378–8	6.6031+6	1.9991–8	1.9571+9	8.8784+8	4.4235+8	6.2689+8	7.3636+3	6.2479+2	3.5924+2	2.6555+2	5.6722–3
	1.2500–4	1.1814–8	6.3596+6	3.9982–8	1.8849+9	8.4110+8	4.2564+8	6.1815+8	7.4673+3	6.2581+2	3.6322+2	2.6258+2	6.3474–3
	1.3125–4	1.2020–8	6.2507+6	4.9961–8	1.8526+9	8.2030+8	4.1817+8	6.1415+8	7.5158+3	6.2674+2	3.6549+2	2.6124+2	6.6883–3
	1.5000–4	1.2595–8	5.9653+6	7.9769–8	1.7681+9	7.6597+8	3.9877+8	6.0332+8	7.6501+3	6.3133+2	3.7361+2	2.5771+2	7.7228–3
	1.7500–4	1.3384–8	5.6136+6	1.1955–7	1.6638+9	7.0770+8	3.7230+8	5.8381+8	7.7995+3	6.2552+2	3.7513+2	2.5038+2	9.1374–3
	2.0000–4	1.4096–8	5.3298+6	1.5956–7	1.5797+9	6.6082+8	3.5145+8	5.6742+8	7.9313+3	6.2418+2	3.7983+2	2.4433+2	1.0577–2
N5	2.1471–4	1.4520–8	5.1744+6	1.8322–7	1.5336+9	6.3719+8	3.3931+8	5.5713+8	7.9913+3	6.1957+2	3.7923+2	2.4032+2	1.1447–2
	2.2004–4	1.4668–8	5.1221+6	1.9183–7	1.5181+9	6.2921+8	3.3526+8	5.5366+8	8.0121+3	6.1834+2	3.7935+2	2.3898+2	1.1764–2
N4	2.2559–4	1.4820–8	5.0697+6	2.0081–7	1.5026+9	6.2122+8	3.3122+8	5.5016+8	8.0333+3	6.1719+2	3.7954+2	2.3763+2	1.2094–2
	2.3004–4	1.4945–8	5.0273+6	2.0802–7	1.4900+9	6.1503+8	3.2788+8	5.4712+8	8.0500+3	6.1573+2	3.7927+2	2.3645+2	1.2360–2
	2.3024–4	1.4950–8	5.0254+6	2.0836–7	1.4895+9	6.1475+8	3.2773+8	5.4698+8	8.0508+3	6.1566+2	3.7926+2	2.3639+2	1.2372–2
	2.3896–4	1.5191–8	4.9458+6	2.2255–7	1.4659+9	6.0313+8	3.2150+8	5.4124+8	8.0826+3	6.1300+2	3.7883+2	2.3415+2	1.2895–2
	2.4753–4	1.5422–8	4.8718+6	2.3655–7	1.4439+9	5.9233+8	3.1574+8	5.3586+8	8.1129+3	6.1075+2	3.7868+2	2.3205+2	1.3410–2
	2.5000–4	1.5488–8	4.8511+6	2.4060–7	1.4378+9	5.8931+8	3.1414+8	5.3435+8	8.1215+3	6.1014+2	3.7866+2	2.3147+2	1.3559–2
	2.5422–4	1.5599–8	4.8165+6	2.4752–7	1.4276+9	5.8427+8	3.1146+8	5.3182+8	8.1360+3	6.0916+2	3.7867+2	2.3048+2	1.3814–2
	2.7376–4	1.6099–8	4.6670+6	2.7970–7	1.3832+9	5.6248+8	2.9999+8	5.2076+8	8.2002+3	6.0546+2	3.7924+2	2.2620+2	1.5000–2
	2.7711–4	1.6182–8	4.6429+6	2.8523–7	1.3761+9	5.5898+8	2.9816+8	5.1897+8	8.2108+3	6.0495+2	3.7942+2	2.2551+2	1.5204–2
	3.0000–4	1.6734–8	4.4896+6	3.2315–7	1.3307+9	5.3667+8	2.8659+8	5.0742+8	8.2803+3	6.0232+2	3.8122+2	2.2108+2	1.6606–2
	3.5000–4	1.7987–8	4.1771+6	4.0734–7	1.2381+9	4.9594+8	2.6261+8	4.7950+8	8.4170+3	5.8553+2	3.7570+2	2.0982+2	1.9707–2
N3	3.7582–4	1.8593–8	4.0409+6	4.5168–7	1.1977+9	4.7819+8	2.5236+8	4.6713+8	8.4809+3	5.7914+2	3.7426+2	2.0486+2	2.1328–2
	3.8187–4	1.8733–8	4.0107+6	4.6213–7	1.1887+9	4.7430+8	2.5012+8	4.6429+8	8.4915+3	5.7780+2	3.7404+2	2.0374+2	2.1716–2
	3.9093–4	1.8941–8	3.9666+6	4.7785–7	1.1757+9	4.6864+8	2.4687+8	4.6014+8	8.5072+3	5.7591+2	3.7378+2	2.0210+2	2.2299–2
	4.0000–4	1.9146–8	3.9241+6	4.9362–7	1.1630+9	4.6318+8	2.4374+8	4.5612+8	8.5226+3	5.7416+2	3.7362+2	2.0052+2	2.2883–2
	4.2500–4	1.9734–8	3.8073+6	5.3748–7	1.1284+9	4.4903+8	2.3493+8	4.4447+8	8.5566+3	5.6583+2	3.7009+2	1.9572+2	2.4510–2
N2	4.3527–4	1.9970–8	3.7623+6	5.5568–7	1.1151+9	4.4358+8	2.3156+8	4.3997+8	8.5700+3	5.6272+2	3.6883+2	1.9386+2	2.5180–2
	4.4336–4	2.0158–8	3.7271+6	5.7009–7	1.1047+9	4.3942+8	2.2900+8	4.3626+8	8.5804+3	5.6031+2	3.6793+2	1.9235+2	2.5709–2
	4.5752–4	2.0484–8	3.6679+6	5.9545–7	1.0871+9	4.3241+8	2.2471+8	4.3000+8	8.5981+3	5.5634+2	3.6652+2	1.8979+2	2.6636–2
	4.6250–4	2.0597–8	3.6477+6	6.0441–7	1.0811+9	4.3002+8	2.2325+8	4.2786+8	8.6042+3	5.5501+2	3.6607+2	1.8891+2	2.6963–2
	4.7876–4	2.0962–8	3.5841+6	6.3382–7	1.0623+9	4.2248+8	2.1868+8	4.2112+8	8.6238+3	5.5092+2	3.6473+2	1.8616+2	2.8031–2
	5.0000–4	2.1430–8	3.5059+6	6.7254–7	1.0391+9	4.1320+8	2.1309+8	4.1280+8	8.6484+3	5.4610+2	3.6329+2	1.8277+2	2.9429–2
N1	5.2569–4	2.2006–8	3.4142+6	7.1993–7	1.0119+9	4.0275+8	2.0640+8	4.0277+8	8.6769+3	5.3826+2	3.5964+2	1.7859+2	3.1127–2
	5.3498–4	2.2216–8	3.3818+6	7.3723–7	1.0023+9	3.9915+8	2.0412+8	3.9906+8	8.6842+3	5.3554+2	3.5846+2	1.7704+2	3.1735–2

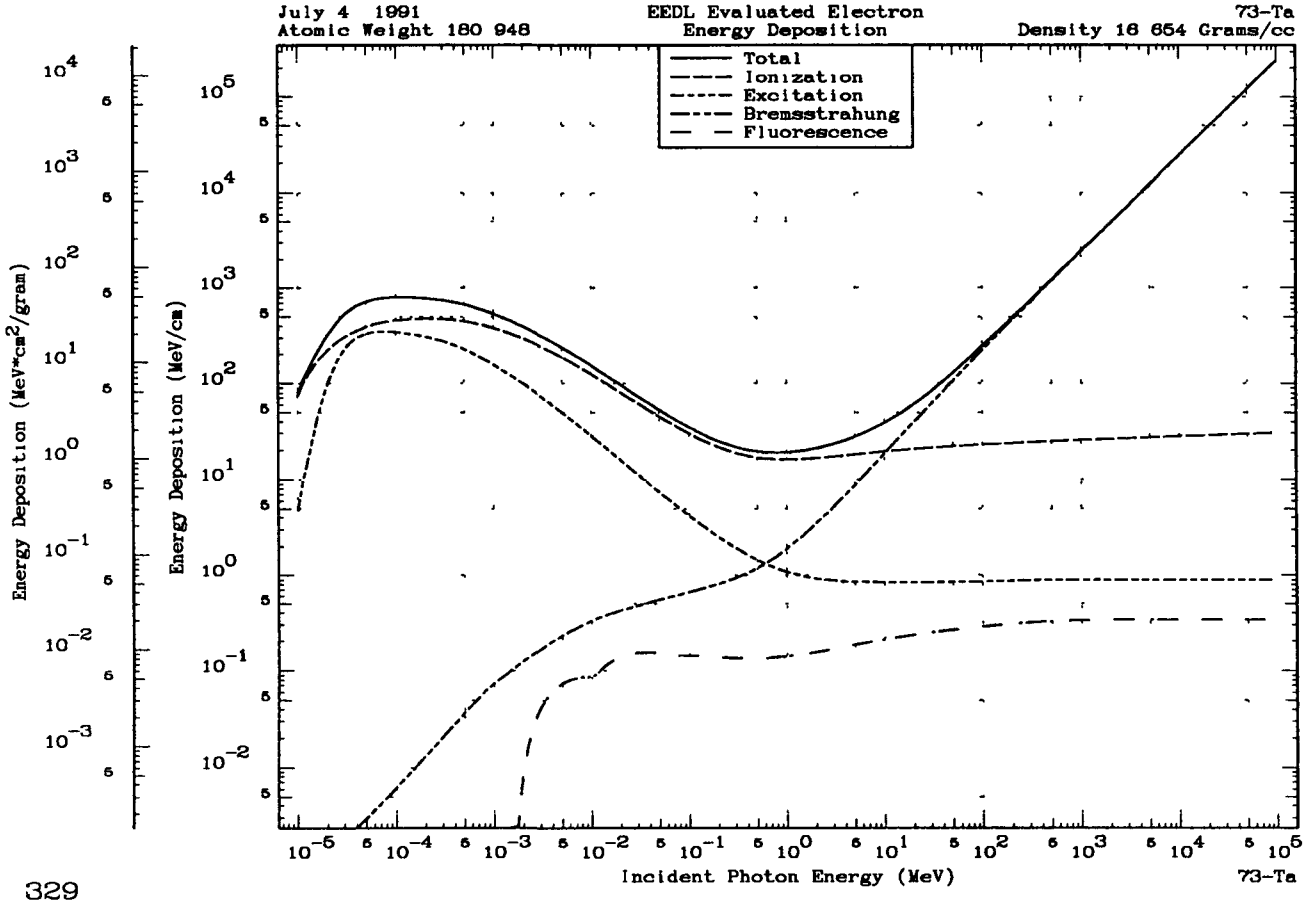
Atomic Weight 178.490 Density 13.310 Grams/cc

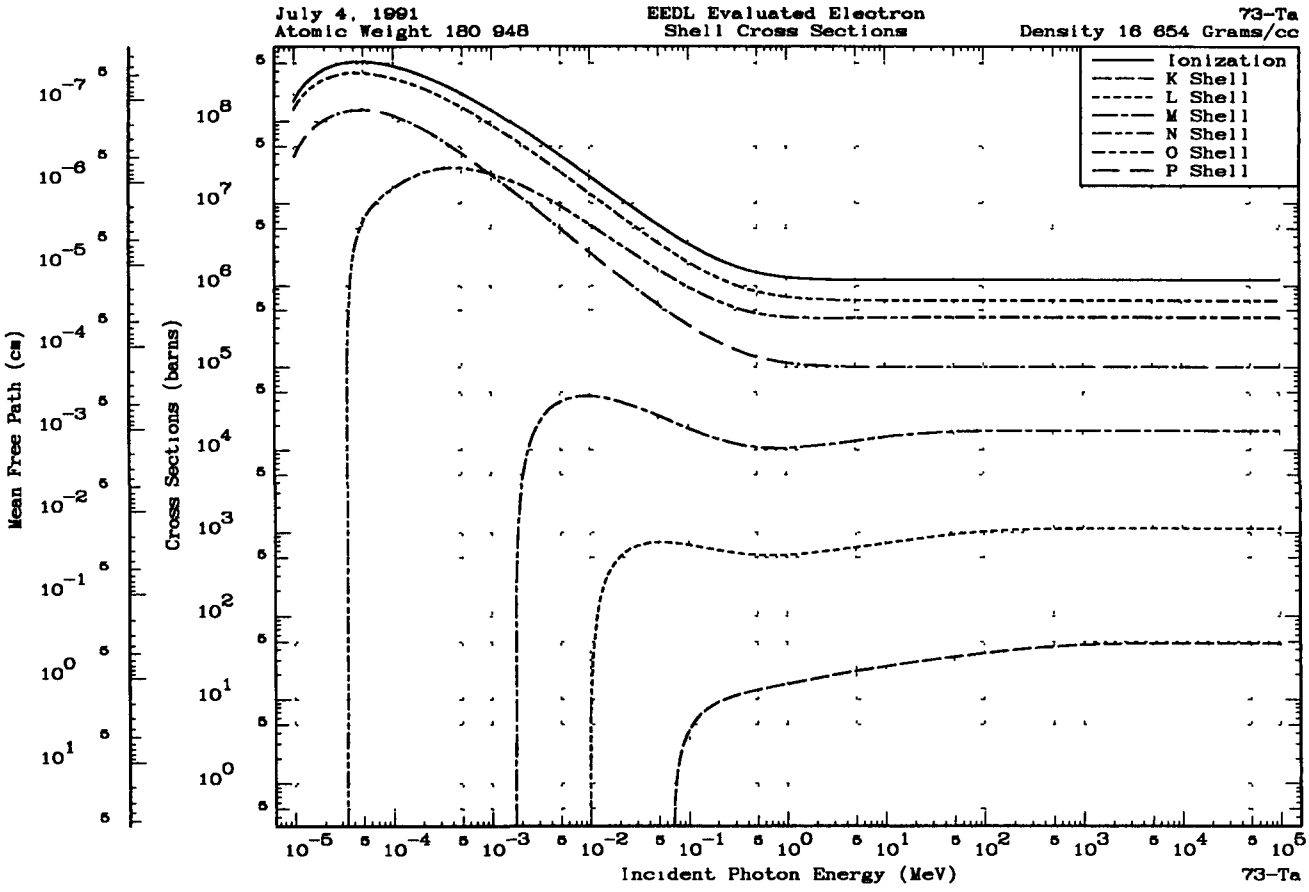
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.5000–4	2.2553–8	3.3313+6	7.6539–7	9.8737+8	3.9354+8	2.0057+8	3.9326+8	8.6959+3	5.3136+2	3.5670+2	1.7463+2	3.2720–2
	5.5123–4	2.2581–8	3.3273+6	7.6771–7	9.8617+8	3.9309+8	2.0028+8	3.9279+8	8.6968+3	5.3103+2	3.5656+2	1.7444+2	3.2801–2
	5.7562–4	2.3117–8	3.2500+6	8.1390–7	9.6327+8	3.8448+8	1.9489+8	3.8390+8	8.7151+3	5.2480+2	3.5402+2	1.7075+2	3.4403–2
	6.0000–4	2.3643–8	3.1777+6	8.6061–7	9.4185+8	3.7640+8	1.8987+8	3.7557+8	8.7326+3	5.1917+2	3.5183+2	1.6730+2	3.6009–2
	6.5000–4	2.4735–8	3.0375+6	9.5826–7	9.0029+8	3.6130+8	1.8000+8	3.5898+8	8.7474+3	5.0494+2	3.4459+2	1.6031+2	3.9162–2
	7.0000–4	2.5788–8	2.9134+6	1.0585–6	8.6351+8	3.4786+8	1.7137+8	3.4428+8	8.7611+3	4.9284+2	3.3866+2	1.5413+2	4.2321–2
	7.2500–4	2.6302–8	2.8565+6	1.1095–6	8.4664+8	3.4167+8	1.6744+8	3.3753+8	8.7676+3	4.8737+2	3.3602+2	1.5130+2	4.3902–2
	8.0000–4	2.7796–8	2.7029+6	1.2657–6	8.0112+8	3.2488+8	1.5694+8	3.1929+8	8.7859+3	4.7315+2	3.2944+2	1.4366+2	4.8652–2
	9.0000–4	2.9741–8	2.5262+6	1.4817–6	7.4874+8	3.0588+8	1.4459+8	2.9825+8	8.7531+3	4.5281+2	3.1800+2	1.3475+2	5.4048–2
	1.0000–3	3.1591–8	2.3782+6	1.7066–6	7.0489+8	2.8983+8	1.3443+8	2.8061+8	8.7238+3	4.3654+2	3.0918+2	1.2730+2	5.9427–2
	1.1250–3	3.3903–8	2.2161+6	2.0005–6	6.5682+8	2.7282+8	1.2334+8	2.6065+8	8.6425+3	4.1439+2	2.9560+2	1.1872+2	6.4821–2
	1.2500–3	3.6109–8	2.0807+6	2.3088–6	6.1670+8	2.5845+8	1.1423+8	2.4401+8	8.5704+3	3.9648+2	2.8482+2	1.1159+2	7.0179–2
	1.3125–3	3.7177–8	2.0209+6	2.4681–6	5.9897+8	2.5206+8	1.1025+8	2.3666+8	8.5372+3	3.8862+2	2.8010+2	1.0844+2	7.2845–2
	1.5000–3	4.0259–8	1.8662+6	2.9632–6	5.5312+8	2.3535+8	1.0008+8	2.1767+8	8.4470+3	3.6884+2	2.6842+2	1.0034+2	8.0795–2
M5	1.6687–3	4.2970–8	1.7485+6	3.4324–6	5.1823+8	2.2282+8	9.2283+7	2.0312+8	8.3669+3	3.5048+2	2.5637+2	9.4022+1	8.7290–2
	1.6894–3	4.3297–8	1.7353+6	3.4917–6	5.1431+8	2.2141+8	9.1422+7	2.0147+8	8.3577+3	3.4847+2	2.5507+2	9.3314+1	8.8084–2
	1.7088–3	4.3602–8	1.7231+6	3.5475–6	5.1071+8	2.2012+8	9.0632+7	1.9996+8	8.3492+3	3.4664+2	2.5388+2	9.2663+1	8.8828–2
M4	1.7255–3	4.3863–8	1.7129+6	3.5957–6	5.0767+8	2.1902+8	8.9966+7	1.9868+8	8.3420+3	3.4509+2	2.5288+2	9.2113+1	8.9467–2
	1.7611–3	4.4418–8	1.6915+6	3.6995–6	5.0133+8	2.1673+8	8.8570+7	1.9602+8	8.3267+3	3.4180+2	2.5076+2	9.0957+1	9.0830–2
	1.7941–3	4.4928–8	1.6723+6	3.7964–6	4.9564+8	2.1468+8	8.7322+7	1.9364+8	8.3129+3	3.3888+2	2.4886+2	8.9921+1	9.2090–2
	1.8209–3	4.5338–8	1.6571+6	3.8756–6	4.9116+8	2.1305+8	8.6341+7	1.9176+8	8.3019+3	3.3658+2	2.4738+2	8.9105+1	9.3109–2
	1.8971–3	4.6494–8	1.6159+6	4.1041–6	4.7895+8	2.0861+8	8.3681+7	1.8665+8	8.2716+3	3.3038+2	2.4340+2	8.6886+1	9.6011–2
	2.0000–3	4.8026–8	1.5644+6	4.4193–6	4.6367+8	2.0302+8	8.0378+7	1.8026+8	8.2326+3	3.2277+2	2.3855+2	8.4115+1	9.9918–2
M3	2.0990–3	4.9489–8	1.5181+6	4.7298–6	4.4996+8	1.9792+8	7.7381+7	1.7466+8	8.1971+3	3.1494+2	2.3320+2	8.1641+1	1.0366–1
	2.1250–3	4.9875–8	1.5064+6	4.8126–6	4.4648+8	1.9664+8	7.6636+7	1.7320+8	8.1870+3	3.1299+2	2.3188+2	8.1002+1	1.0458–1
	2.1272–3	4.9907–8	1.5054+6	4.8195–6	4.4620+8	1.9653+8	7.6574+7	1.7308+8	8.1861+3	3.1283+2	2.3178+2	8.0949+1	1.0466–1
	2.1817–3	5.0710–8	1.4816+6	4.9950–6	4.3913+8	1.9393+8	7.5066+7	1.7013+8	8.1652+3	3.0888+2	2.2912+2	7.9652+1	1.0658–1
	2.2500–3	5.1705–8	1.4531+6	5.2178–6	4.3068+8	1.9080+8	7.3271+7	1.6660+8	8.1399+3	3.0421+2	2.2600+2	7.8105+1	1.0898–1
	2.2840–3	5.2196–8	1.4394+6	5.3300–6	4.2663+8	1.8930+8	7.2414+7	1.6491+8	8.1276+3	3.0198+2	2.2450+2	7.7364+1	1.1017–1
M2	2.3581–3	5.3256–8	1.4108+6	5.5773–6	4.1814+8	1.8614+8	7.0623+7	1.6137+8	8.1014+3	2.9733+2	2.2140+2	7.5812+1	1.1277–1
	2.3982–3	5.3849–8	1.3952+6	5.7128–6	4.1353+8	1.8449+8	6.9687+7	1.5935+8	8.0856+3	2.9474+2	2.1971+2	7.4924+1	1.1405–1
	2.4375–3	5.4425–8	1.3805+6	5.8466–6	4.0915+8	1.8292+8	6.8797+7	1.5743+8	8.0703+3	2.9230+2	2.1810+2	7.4080+1	1.1531–1
	2.4630–3	5.4798–8	1.3711+6	5.9341–6	4.0637+8	1.8192+8	6.8234+7	1.5621+8	8.0606+3	2.9075+2	2.1709+2	7.3545+1	1.1612–1
	2.4734–3	5.4950–8	1.3673+6	5.9700–6	4.0525+8	1.8151+8	6.8006+7	1.5572+8	8.0566+3	2.9012+2	2.1667+2	7.3328+1	1.1645–1
M1	2.5760–3	5.6432–8	1.3314+6	6.3272–6	3.9460+8	1.7767+8	6.5858+7	1.5107+8	8.0187+3	2.8422+2	2.1282+2	7.1285+1	1.1972–1
	2.6051–3	5.6850–8	1.3216+6	6.4298–6	3.9170+8	1.7662+8	6.5267+7	1.4981+8	8.0083+3	2.8251+2	2.1166+2	7.0725+1	1.2064–1
	2.6290–3	5.7193–8	1.3137+6	6.5147–6	3.8936+8	1.7577+8	6.4790+7	1.4879+8	7.9998+3	2.8112+2	2.1073+2	7.0272+1	1.2140–1
	2.6719–3	5.7804–8	1.2998+6	6.6679–6	3.8524+8	1.7427+8	6.3954+7	1.4700+8	7.9848+3	2.7870+2	2.0910+2	6.9478+1	1.2276–1
	2.7187–3	5.8469–8	1.2850+6	6.8368–6	3.8086+8	1.7268+8	6.3068+7	1.4510+8	7.9687+3	2.7614+2	2.0738+2	6.8636+1	1.2424–1
	2.7217–3	5.8511–8	1.2841+6	6.8477–6	3.8058+8	1.7258+8	6.3012+7	1.4498+8	7.9676+3	2.7597+2	2.0727+2	6.8583+1	1.2434–1
	2.8025–3	5.9646–8	1.2596+6	7.1427–6	3.7334+8	1.6994+8	6.1551+7	1.4184+8	7.9406+3	2.7174+2	2.0442+2	6.7192+1	1.2689–1
	2.8609–3	6.0458–8	1.2427+6	7.3586–6	3.6833+8	1.6811+8	6.0543+7	1.3967+8	7.9216+3	2.6883+2	2.0247+2	6.6231+1	1.2873–1
	3.0000–3	6.2370–8	1.2046+6	7.8824–6	3.5704+8	1.6395+8	5.8283+7	1.3480+8	7.8781+3	2.6234+2	1.9813+2	6.4073+1	1.3310–1
	3.2500–3	6.5771–8	1.1423+6	8.8575–6	3.3857+8	1.5710+8	5.4582+7	1.2689+8	7.7837+3	2.5055+2	1.8988+2	6.0528+1	1.3990–1
	3.5000–3	6.9078–8	1.0876+6	9.8761–6	3.2236+8	1.5101+8	5.1370+7	1.1998+8	7.6973+3	2.4039+2	1.8281+2	5.7435+1	1.4665–1
	3.6250–3	7.0699–8	1.0627+6	1.0401–5	3.1497+8	1.4821+8	4.9916+7	1.1684+8	7.6567+3	2.3578+2	1.7960+2	5.6031+1	1.5001–1
	4.0000–3	7.5446–8	9.9584+5	1.2034–5	2.9516+8	1.4062+8	4.6058+7	1.0847+8	7.5440+3	2.2363+2	1.7118+2	5.2290+1	1.6001–1
	4.5000–3	8.1845–8	9.1797+5	1.4350–5	2.7208+8	1.3187+8	4.1748+7	9.8454+7	7.3796+3	2.0839+2	1.6049+2	4.7732+1	1.7162–1
	5.0000–3	8.8006–8	8.5371+5	1.6823–5	2.5303+8	1.2450+8	3.8240+7	9.0283+7	7.2355+3	1.9601+2	1.5181+2	4.4018+1	1.8307–1
	5.5000–3	9.4091–8	7.9850+5	1.9450–5	2.3667+8	1.1810+8	3.5279+7	8.3282+7	7.0874+3	1.8475+2	1.4375+2	4.0808+1	1.9329–1
	6.0000–3	9.9995–8	7.5135+5	2.2228–5	2.2269+8	1.1254+8	3.2780+7	7.7366+7	6.9549+3	1.7530+2	1.3699+2	3.8099+1	2.0338–1
	7.0000–3	1.1147–7	6.7399+5	2.8220–5	1.9977+8	1.0320+8	2.8738+7	6.7819+7	6.6655+3	1.5878+2	1.2490+2	3.3664+1	2.1949–1
	8.0000–3	1.2242–7	6.1371+5	3.4781–5	1.8190+8	9.5739+7	2.5646+7	6.0507+7	6.4246+3	1.4620+2	1.1569+2	3.0272+1	2.3523–1
L3	9.5583–3	1.3902–7	5.4042+5	4.6070–5	1.6018+8	8.6274+7	2.2006+7	5.1889+7	6.0684+3	1.3019+2	1.0371+2	2.6223+1	2.5529–1
	1.0000–2	1.4359–7	5.2322+5	4.9512–5	1.5508+8	8.4025+7	2.1168+7	4.9879+7	5.9812+3	1.2651+2	1.0097+2	2.5279+1	2.6086–1
	1.0625–2	1.4999–7	5.0091+5	5.4553–5	1.4847+8	8.1049+7	2.0087+7	4.7324+7	5.8514+3	1.2149+2	9.7159+1	2.4064+1	2.6737–1
L2	1.0763–2	1.5138–7	4.9630+5	5.5694–5	1.4710+8	8.0429+7	1.9865+7	4.6797+7	5.8241+3	1.2045+2	9.6372+1	2.3814+1	2.6880–1
	1.1028–2	1.5413–7	4.8746+5	5.7910–5	1.4448+8	7.9275+7	1.9452+7	4.5745+7	5.7730+3	1.1851+2	9.4919+1	2.3315+1	2.7153–1
L1	1.1245–2	1.5637–7	4.8049+5	5.9755–5	1.4241+8	7.8360+7	1.9127+7	4.4918+7	5.7324+3	1.1697+2	9.3775+1	2.2923+1	2.7377–1
	1.1362–2	1.5758–7	4.7679+5	6.0761–5	1.4132+8	7.7873+7	1.8956+7	4.4482+7	5.7093+3	1.1614+2	9.3149+1	2.2713+1	2.7479–1
	1.1524–2	1.5924–7	4.7180+5	6.2163–5	1.3984+8	7.7213+7	1.8725+7	4.3894+7	5.6779+3	1.1501+2	9.2304+1	2.2430+1	2.7621–1
	1.1719–2	1.6123–7	4.6598+5	6.3864–5	1.3811+8	7.6440+7	1.8456+7	4.3209+7	5.6410+3	1.1370+2	9.1318+1	2.2100+1	2.7790–1
	1.1817–2	1.6224–7	4.6310+5	6.4731–5	1.3726+8	7.6057+7	1.8323+7	4.2871+7	5.6227+3	1.1305+2	9.0831+1	2.1937+1	2.7876–1
	1.2393–2	1.6807–7	4.4703+5	6.9911–5	1.3249+8	7.3910+7	1.7584+7	4.0995+7	5.5195+3	1.0944+2	8.8126+1	2.1034+1	2.8375–1
	1.2500–2	1.6914–7	4.4420+5	7.0888–5	1.3166+8	7.3530+7	1.7455+7	4.0666+7	5.5011+3	1.0881+2	8.7651+1	2.0875+1	2.8467–1
	1.2539–2	1.6953–7	4.4317+5	7.1248–5	1.3135+8	7.3392+7	1.7407+7	4.0547+7	5.4944+3	1.0858+2	8.7478+1	2.0818+1	2.8501–1
	1.2613–2	1.7027–7	4.4125+5	7.1928–5	1.3078+8	7.3134+7	1.7320+7	4.0324+7	5.4819+3	1.0815+2	8.7155+1	2.0711+1	2.8564–1
	1.3697–2	1.8097–7	4.1516+5	8.2228–5	1.2305+8	6.9597+7	1.6128+7	3.7318+7	5.3087+3	1.0235+2	8.2791+1	1.9264+1	2.9492–1
	1.3770–2	1.8168–7	4.1354+5	8.2942–5	1.2257+8	6.9375+7	1.6055+7	3.7133+7	5.2977+3	1.0199+2	8.2521+1	1.9174+1	2.9554–1
	1.3806–2	1.8204–7	4.1272+5	8.3304–5	1.2233+8	6.9264+7	1.6018+7	3.7039+7	5.2922+3	1.0181+2	8.2386+1	1.9129+1	2.9585–1
	1.5000–2	1.9351–7	3.8825+5	9.5348–5	1.1507+8	6.5895+7	1.4910+7	3.4263+7	5.1241+3	9.6438+1	7.8339+1	1.7793+1	3.0590–1
	1.6250–2	2.0540–7	3.6578+5	1.0867–4	1.0841+8	6.2717+7	1.3917+7	3.1775+7	4.9512+3	9.1228+1	7.4338+1	1.6576+1	3.1382–1
	1.7500–2	2.1703–7	3.4619+5	1.2272–4	1.0261+8	5.9912+7	1.3056+7	2.9633+7	4.7964+3	8.6729+1	7.0878+1	1.5529+1	3.2167–1
	1.8125–2	2.2275–7	3.3729+5	1.3002–4	9.9970+7	5.8628+7	1.2668+7	2.8670+7	4.7247+3	8.4698+1	6.9315+1	1.5058+1	3.2557–1
	2.0000–2	2.3958–7	3.1359+5	1.5289–4	9.2945+7	5.5171+7	1.1638+7	2.6131+7	4.5295+3	7.9334+1	6.5179+1	1.3817+1	3.3714–1
	2.2500–2	2.6152–7	2.8729+5	1.8572–4	8.5148+7	5.1280+7	1.0528+7	2.3336+7	4.2781+3	7.3049+1	6.0281+1	1.2420+1	3.4790–1
	2.6250–2	2.9315–7	2.5629+5	2.3980–4	7.5961+7	4.6600+7	9.2341+6	2.0124+7	3.9700+3	6.5745+1	5.4566+1	1.0816+1	3.6387–1
	3.0000–2	3.2348–7	2.3226+5	2.9941–4	6.8840+7	4.2892+7	8.2428+6	1.7701+7	3.7211+3	6.0171+1	5.0186+1	9.6061+0	3.7952–1
	3.5000–2	3.6234–7	2.0735+5	3.8697–4	6.1457+7	3.9000+7	7.2509+6	1.5202+7	3.4415+3	5.4135+1	4.5412+1	8.3281+0	3.9494–1
	4.0000–2	3.9956–7	1.8804+5	4.8351–4	5.5732+7	3.5916+7	6.4889+6	1.3325+7	3.2162+3	4.9523+1	4.1745+1	7.3679+0	4.1016–1

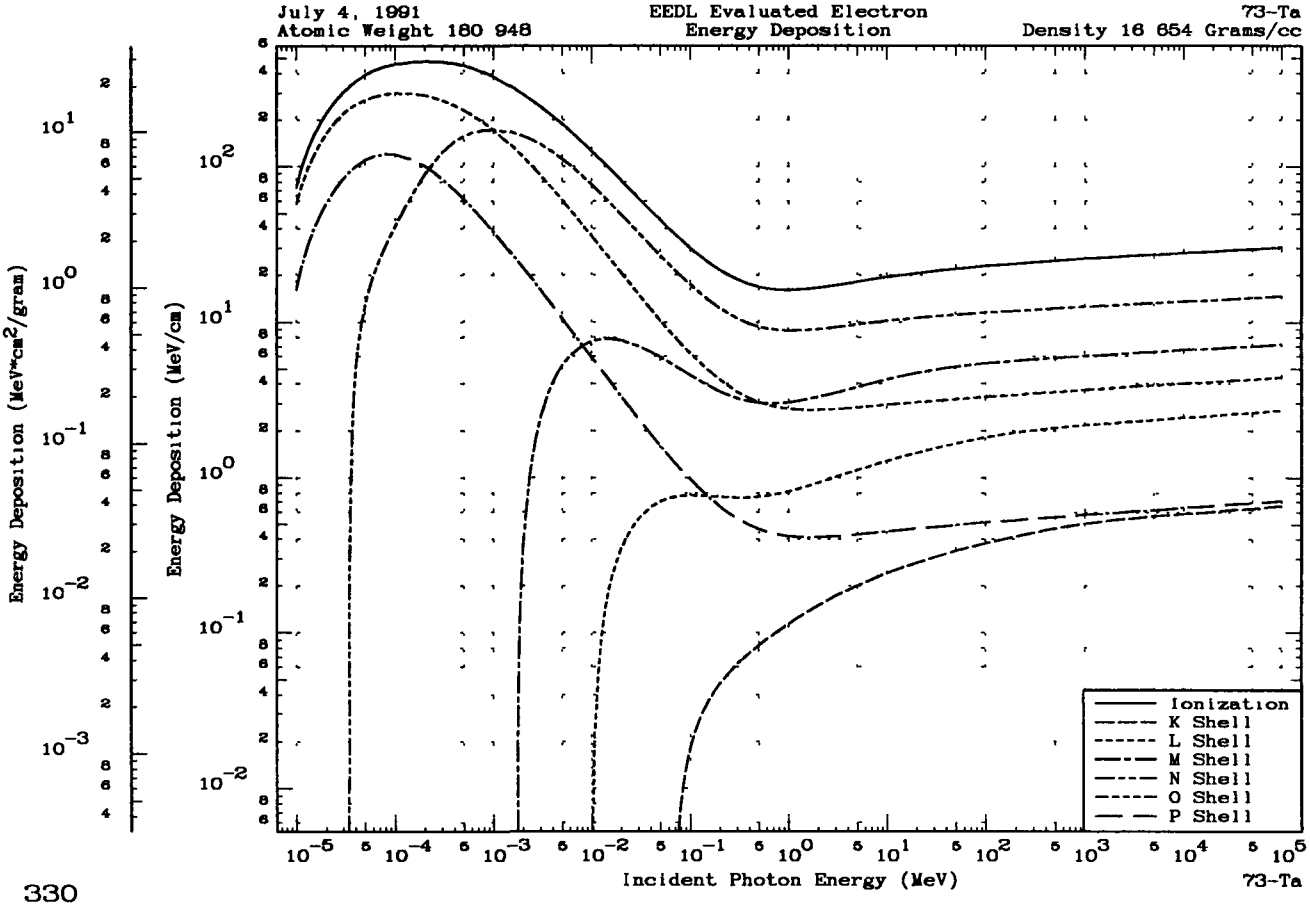
Atomic Weight 178.490 Density 13.310 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000–2	4.6967–7	1.5997+5	7.0074–4	4.7412+7	3.1304+7	5.4150+6	1.0690+7	2.8709+3	4.2711+1	3.6279+1	5.9978+0	4.3503–1
6.0000–2	5.3530–7	1.4036+5	9.4896–4	4.1600+7	2.7979+7	4.6893+6	8.9287+6	2.6202+3	3.7955+1	3.2429+1	5.0696+0	4.5653–1
K 6.5482–2	5.6977–7	1.3186+5	1.0975–3	3.9083+7	2.6512+7	4.3849+6	8.1834+6	2.5095+3	3.5895+1	3.0757+1	4.6708+0	4.6727–1
6.6389–2	5.7538–7	1.3058+5	1.1229–3	3.8702+7	2.6288+7	4.3397+6	8.0710+6	2.4928+3	3.5586+1	3.0506+1	4.6106+0	4.6889–1
6.8091–2	5.8585–7	1.2824+5	1.1710–3	3.8010+7	2.5882+7	4.2578+6	7.8683+6	2.4623+3	3.5026+1	3.0052+1	4.5019+0	4.7193–1
7.1068–2	6.0396–7	1.2440+5	1.2572–3	3.6871+7	2.5209+7	4.1227+6	7.5369+6	2.4117+3	3.4106+1	2.9304+1	4.3244+0	4.7725–1
7.5534–2	6.3067–7	1.1913+5	1.3906–3	3.5309+7	2.4280+7	3.9377+6	7.0889+6	2.3413+3	3.2849+1	2.8280+1	4.0845+0	4.8522–1
8.0000–2	6.5687–7	1.1438+5	1.5289–3	3.3900+7	2.3436+7	3.7710+6	6.6911+6	2.2768+3	3.1721+1	2.7357+1	3.8713+0	4.9315–1
8.5000–2	6.8480–7	1.0971+5	1.6894–3	3.2518+7	2.2589+7	3.6105+6	6.3161+6	2.2125+3	3.0601+1	2.6433+1	3.6679+0	5.0093–1
9.2500–2	7.2567–7	1.0353+5	1.9406–3	3.0687+7	2.1458+7	3.3981+6	5.8278+6	2.1257+3	2.9125+1	2.5209+1	3.4030+0	5.1260–1
1.0000–1	7.6541–7	9.8158+4	2.2039–3	2.9093+7	2.0466+7	3.2134+6	5.4112+6	2.0487+3	2.7848+1	2.4147+1	3.1771+0	5.2422–1
1.1250–1	8.2294–7	9.1297+4	2.6670–3	2.7059+7	1.9171+7	2.9746+6	4.9121+6	1.9503+3	2.6157+1	2.2714+1	2.9031+0	5.4015–1
1.3125–1	9.0460–7	8.3055+4	3.4128–3	2.4617+7	1.7598+7	2.6888+6	4.3278+6	1.8286+3	2.4149+1	2.1002+1	2.5831+0	5.6427–1
1.5000–1	9.7961–7	7.6696+4	4.2151–3	2.2732+7	1.6341+7	2.4636+6	3.9260+6	1.7293+3	2.2613+1	1.9658+1	2.3662+0	5.8832–1
1.7500–1	1.0665–6	7.0445+4	5.3588–3	2.0879+7	1.5114+7	2.2546+6	3.5095+6	1.6254+3	2.1122+1	1.8371+1	2.1354+0	6.1524–1
2.0000–1	1.1479–6	6.5452+4	6.5765–3	1.9399+7	1.4125+7	2.0879+6	3.1845+6	1.5405+3	1.9950+1	1.7352+1	1.9560+0	6.4211–1
2.5000–1	1.2920–6	5.8152+4	9.1818–3	1.7236+7	1.2576+7	1.8743+6	2.7846+6	1.4212+3	1.8453+1	1.6028+1	1.7338+0	6.9110–1
3.0000–1	1.4230–6	5.2799+4	1.1973–2	1.5649+7	1.1436+7	1.7160+6	2.4955+6	1.3306+3	1.7380+1	1.5066+1	1.5748+0	7.3947–1
4.0000–1	1.6536–6	4.5434+4	1.7924–2	1.3466+7	9.7646+6	1.5359+6	2.1646+6	1.2190+3	1.6242+1	1.4014+1	1.3930+0	8.3574–1
5.0000–1	1.8544–6	4.0515+4	2.4192–2	1.2008+7	8.6367+6	1.4321+6	1.9382+6	1.1536+3	1.5668+1	1.3467+1	1.2666+0	9.3496–1
6.0000–1	2.0284–6	3.7040+4	3.0635–2	1.0978+7	7.8125+6	1.3657+6	1.7990+6	1.1128+3	1.5373+1	1.3144+1	1.1908+0	1.0384+0
8.0000–1	2.3283–6	3.2269+4	4.3708–2	9.5641+6	6.6679+6	1.2884+6	1.6067+6	1.0662+3	1.5226+1	1.2887+1	1.0854+0	1.2531+0
1.0000+0	2.5808–6	2.9112+4	5.6805–2	8.6284+6	5.8953+6	1.2464+6	1.4856+6	1.0422+3	1.5317+1	1.2820+1	1.0196+0	1.4770+0
1.5000+0	3.0803–6	2.4391+4	8.8709–2	7.2293+6	4.7133+6	1.2009+6	1.3141+6	1.0209+3	1.6032+1	1.3029+1	9.2778–1	2.0756+0
2.0000+0	3.4680–6	2.1664+4	1.1912–1	6.4211+6	4.0217+6	1.1865+6	1.2119+6	1.0179+3	1.6861+1	1.3278+1	8.6823–1	2.7144+0
3.0000+0	3.9901–6	1.8829+4	1.7552–1	5.5808+6	3.2974+6	1.1713+6	1.1111+6	1.0211+3	1.8627+1	1.3760+1	8.2000–1	4.0471+0
4.0000+0	4.3406–6	1.7309+4	2.2677–1	5.1302+6	2.9059+6	1.1688+6	1.0545+6	1.0273+3	2.0427+1	1.4179+1	7.8745–1	5.4613+0
5.0000+0	4.5955–6	1.6349+4	2.7371–1	4.8457+6	2.6625+6	1.1678+6	1.0143+6	1.0333+3	2.2201+1	1.4522+1	7.6634–1	6.9125+0
6.0000+0	4.7787–6	1.5722+4	3.1708–1	4.6599+6	2.5018+6	1.1671+6	9.9003+5	1.0394+3	2.3942+1	1.4786+1	7.5673–1	8.3989+0
8.0000+0	5.0301–6	1.4936+4	3.9505–1	4.4270+6	2.2981+6	1.1669+6	9.6090+5	1.0501+3	2.7438+1	1.5228+1	7.4182–1	1.1468+1
1.0000+1	5.1838–6	1.4494+4	4.6361–1	4.2958+6	2.1837+6	1.1679+6	9.4316+5	1.0595+3	3.0975+1	1.5609+1	7.3535–1	1.4631+1
1.5000+1	5.3284–6	1.4100+4	6.0600–1	4.1792+6	2.0740+6	1.1694+6	9.3472+5	1.0791+3	3.9611+1	1.6137+1	7.3365–1	2.2740+1
2.0000+1	5.3608–6	1.4015+4	7.1994–1	4.1539+6	2.0554+6	1.1704+6	9.2702+5	1.0926+3	4.8449+1	1.6553+1	7.3243–1	3.1163+1
3.0000+1	5.3757–6	1.3976+4	8.9573–1	4.1424+6	2.0572+6	1.1714+6	9.1280+5	1.1089+3	6.6249+1	1.7090+1	7.3073–1	4.8428+1
4.0000+1	5.3722–6	1.3985+4	1.0292+0	4.1451+6	2.0561+6	1.1719+6	9.1595+5	1.1257+3	8.4324+1	1.7428+1	7.3450–1	6.6162+1
5.0000+1	5.3702–6	1.3991+4	1.1365+0	4.1467+6	2.0553+6	1.1723+6	9.1796+5	1.1386+3	1.0258+2	1.7691+1	7.3737–1	8.4149+1
6.0000+1	5.3689–6	1.3994+4	1.2262+0	4.1476+6	2.0547+6	1.1724+6	9.1935+5	1.1491+3	1.2096+2	1.7885+1	7.3975–1	1.0234+2
8.0000+1	5.3679–6	1.3996+4	1.3703+0	4.1484+6	2.0536+6	1.1727+6	9.2090+5	1.1666+3	1.5824+2	1.8212+1	7.4353–1	1.3929+2
1.0000+2	5.3680–6	1.3996+4	1.4837+0	4.1483+6	2.0528+6	1.1729+6	9.2144+5	1.1804+3	1.9582+2	1.8500+1	7.4649–1	1.7657+2
1.5000+2	5.3741–6	1.3980+4	1.6921+0	4.1436+6	2.0513+6	1.1730+6	9.1809+5	1.2054+3	2.9038+2	1.8789+1	7.4398–1	2.7085+2
2.0000+2	5.3785–6	1.3969+4	1.8410+0	4.1402+6	2.0503+6	1.1731+6	9.1563+5	1.2207+3	3.8566+2	1.9058+1	7.4218–1	3.6586+2
3.0000+2	5.3845–6	1.3953+4	2.0518+0	4.1356+6	2.0488+6	1.1731+6	9.1238+5	1.2416+3	5.7565+2	1.9470+1	7.3993–1	5.5544+2
4.0000+2	5.3876–6	1.3945+4	2.2019+0	4.1333+6	2.0478+6	1.1732+6	9.1106+5	1.2561+3	7.6580+2	1.9713+1	7.3926–1	7.4535+2
5.0000+2	5.3900–6	1.3939+4	2.3185+0	4.1314+6	2.0470+6	1.1732+6	9.0997+5	1.2673+3	9.5736+2	1.9929+1	7.3877–1	9.3669+2
6.0000+2	5.3921–6	1.3934+4	2.4138+0	4.1298+6	2.0463+6	1.1732+6	9.0899+5	1.2759+3	1.1471+3	2.0086+1	7.3836–1	1.1262+3
8.0000+2	5.3958–6	1.3924+4	2.5642+0	4.1270+6	2.0453+6	1.1732+6	9.0720+5	1.2895+3	1.5297+3	2.0367+1	7.3769–1	1.5086+3
1.0000+3	5.3959–6	1.3924+4	2.6809+0	4.1269+6	2.0445+6	1.1732+6	9.0789+5	1.3005+3	1.9123+3	2.0600+1	7.3904–1	1.8910+3
1.5000+3	5.3954–6	1.3925+4	2.8927+0	4.1272+6	2.0430+6	1.1732+6	9.0970+5	1.3213+3	2.8740+3	2.0822+1	7.4052–1	2.8525+3
2.0000+3	5.3970–6	1.3921+4	3.0429+0	4.1260+6	2.0420+6	1.1732+6	9.0947+5	1.3373+3	3.8299+3	2.1042+1	7.4034–1	3.8081+3
3.0000+3	5.3993–6	1.3915+4	3.2546+0	4.1242+6	2.0405+6	1.1732+6	9.0916+5	1.3603+3	5.7450+3	2.1469+1	7.4011–1	5.7228+3
4.0000+3	5.4022–6	1.3908+4	3.4049+0	4.1220+6	2.0395+6	1.1732+6	9.0797+5	1.3770+3	7.6609+3	2.1663+1	7.3917–1	7.6385+3
5.0000+3	5.4068–6	1.3896+4	3.5212+0	4.1186+6	2.0387+6	1.1732+6	9.0530+5	1.3902+3	9.5967+3	2.1850+1	7.3702–1	9.5741+3
6.0000+3	5.4072–6	1.3895+4	3.6163+0	4.1182+6	2.0380+6	1.1732+6	9.0560+5	1.3998+3	1.1502+4	2.1989+1	7.3728–1	1.1479+4
8.0000+3	5.4090–6	1.3890+4	3.7663+0	4.1169+6	2.0370+6	1.1732+6	9.0527+5	1.4150+3	1.5344+4	2.2268+1	7.3706–1	1.5321+4
1.0000+4	5.4107–6	1.3886+4	3.8825+0	4.1156+6	2.0362+6	1.1732+6	9.0471+5	1.4270+3	1.9223+4	2.2522+1	7.3666–1	1.9200+4
1.5000+4	5.4132–6	1.3879+4	4.0938+0	4.1137+6	2.0347+6	1.1732+6	9.0427+5	1.4501+3	2.8740+4	2.2730+1	7.3630–1	2.8716+4
2.0000+4	5.4157–6	1.3873+4	4.2439+0	4.1118+6	2.0337+6	1.1732+6	9.0339+5	1.4667+3	3.8381+4	2.2939+1	7.3558–1	3.8357+4
3.0000+4	5.4183–6	1.3866+4	4.4554+0	4.1098+6	2.0323+6	1.1732+6	9.0289+5	1.4900+3	5.7442+4	2.3356+1	7.3517–1	5.7417+4
4.0000+4	5.4206–6	1.3860+4	4.6055+0	4.1080+6	2.0312+6	1.1732+6	9.0212+5	1.5067+3	7.6707+4	2.3575+1	7.3455–1	7.6682+4
5.0000+4	5.4248–6	1.3850+4	4.7219+0	4.1049+6	2.0304+6	1.1732+6	8.9974+5	1.5196+3	9.5794+4	2.3760+1	7.3261–1	9.5769+4
6.0000+4	5.4247–6	1.3850+4	4.8171+0	4.1050+6	2.0298+6	1.1732+6	9.0046+5	1.5301+3	1.1486+5	2.3896+1	7.3320–1	1.1484+5
8.0000+4	5.4263–6	1.3846+4	4.9673+0	4.1038+6	2.0287+6	1.1732+6	9.0029+5	1.5467+3	1.5334+5	2.4168+1	7.3306–1	1.5331+5
1.0000+5	5.4276–6	1.3843+4	5.0837+0	4.1028+6	2.0280+6	1.1732+6	9.0007+5	1.5597+3	1.9188+5	2.4423+1	7.3288–1	1.9186+5


July 4 1991
Atomic Weight 180 948
EEDL Evaluated Electron
Cross Sections
73-Ta
Density 16 654 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
73-Ta


July 4 1991
Atomic Weight 180 948
EEDL Evaluated Electron
Energy Deposition
73-Ta
Density 16 654 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
73-Ta


July 4, 1991
Atomic Weight 180 948
EEDL Evaluated Electron
Shell Cross Sections
73-Ta
Density 16 654 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
73-Ta


July 4, 1991
Atomic Weight 180 948
EEDL Evaluated Electron
Energy Deposition
73-Ta
Density 16 654 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
73-Ta

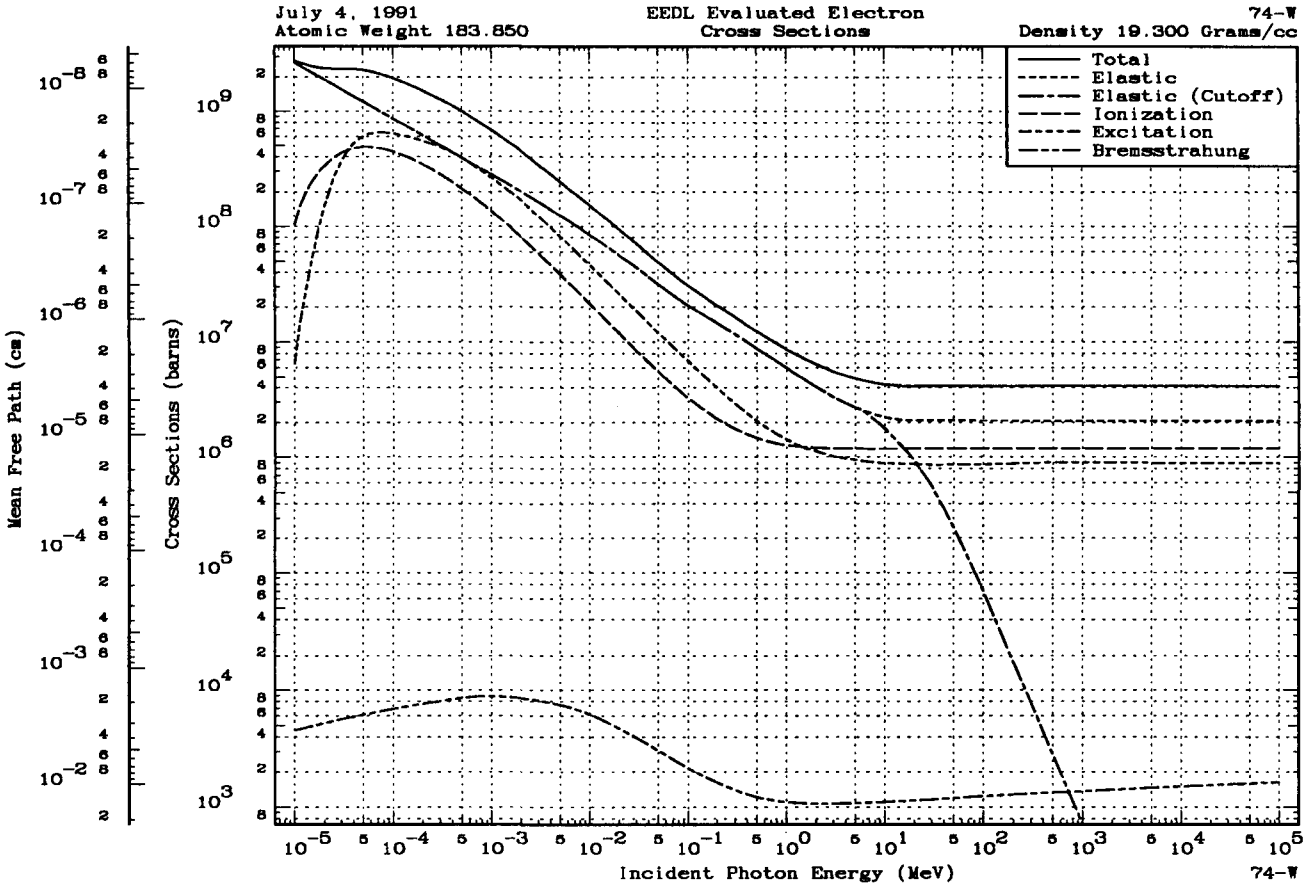
Atomic Weight 180.948 Density 16.654 Grams/cc

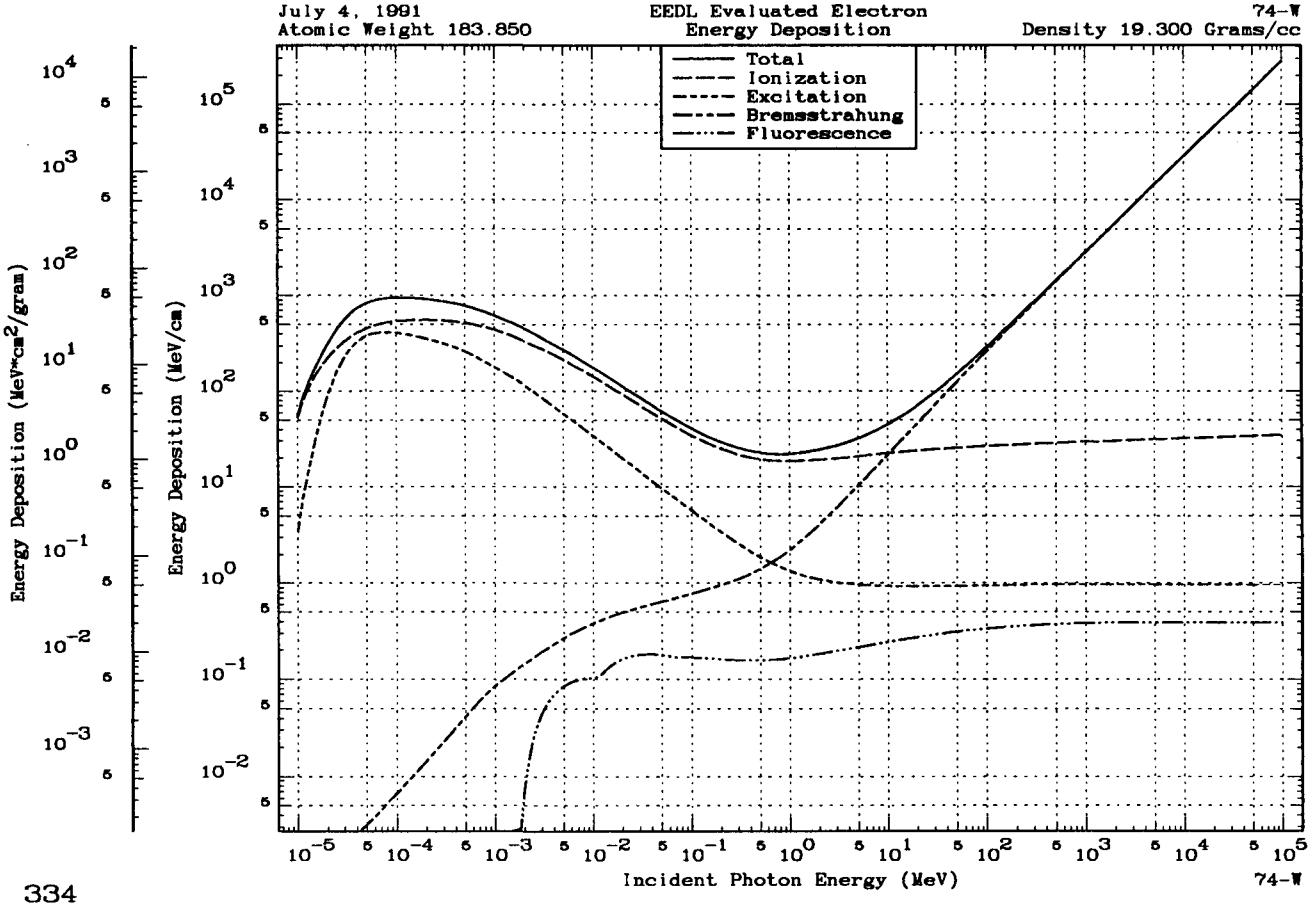
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.1503–9	9.7630+6		2.9335+9	2.7433+9	1.7941+8	1.0783+7	4.8345+3	7.8916+1	7.4170+1	4.7457+0	5.7910–4
	1.1250–5	6.3591–9	9.4425+6		2.8372+9	2.5884+9	2.2768+8	2.1089+7	4.9509+3	1.0721+2	9.7674+1	9.5380+0	6.4906–4
	1.3125–5	6.6222–9	9.0673+6		2.7245+9	2.3989+9	2.8628+8	3.9316+7	5.1074+3	1.4790+2	1.2940+2	1.8500+1	7.5626–4
	1.5000–5	6.8122–9	8.8144+6		2.6485+9	2.2459+9	3.3266+8	6.9894+7	5.2470+3	1.9165+2	1.5749+2	3.4166+1	8.6599–4
	1.7500–5	6.9702–9	8.6146+6		2.5884+9	2.0815+9	3.8073+8	1.2624+8	5.4129+3	2.5329+2	1.9028+2	6.3008+1	1.0159–3
	2.0000–5	7.0513–9	8.5156+6		2.5587+9	1.9488+9	4.1799+8	1.9193+8	5.5608+3	3.1765+2	2.1988+2	9.7772+1	1.1694–3
	2.5000–5	7.1094–9	8.4459+6		2.5378+9	1.7456+9	4.6774+8	3.2440+8	5.7862+3	4.3562+2	2.6797+2	1.6765+2	1.4593–3
	3.0000–5	7.1366–9	8.4137+6		2.5281+9	1.5954+9	4.9686+8	4.3578+8	5.9771+3	5.3329+2	3.0485+2	2.2844+2	1.7579–3
N7	3.4040–5	7.1859–9	8.3560+6		2.5107+9	1.4992+9	5.0980+8	5.0174+8	6.1112+3	5.9133+2	3.2727+2	2.6405+2	2.0029–3
	3.4413–5	7.1936–9	8.3471+6		2.5081+9	1.4912+9	5.1072+8	5.0616+8	6.1229+3	5.9573+2	3.2926+2	2.6648+2	2.0257–3
	3.5111–5	7.2071–9	8.3315+6		2.5034+9	1.4765+9	5.1241+8	5.1444+8	6.1445+3	6.0397+2	3.3296+2	2.7101+2	2.0686–3
N6	3.6140–5	7.2252–9	8.3105+6		2.4971+9	1.4557+9	5.1482+8	5.2657+8	6.1758+3	6.1604+2	3.3836+2	2.7768+2	2.1320–3
	3.6333–5	7.2294–9	8.3057+6		2.4956+9	1.4519+9	5.1518+8	5.2858+8	6.1816+3	6.1815+2	3.3935+2	2.7879+2	2.1440–3
	3.6623–5	7.2356–9	8.2986+6		2.4935+9	1.4462+9	5.1567+8	5.3159+8	6.1902+3	6.2121+2	3.4075+2	2.8046+2	2.1619–3
	3.7467–5	7.2529–9	8.2788+6		2.4876+9	1.4301+9	5.1712+8	5.4033+8	6.2150+3	6.3019+2	3.4489+2	2.8530+2	2.2143–3
	3.8167–5	7.2662–9	8.2636+6		2.4830+9	1.4171+9	5.1832+8	5.4753+8	6.2353+3	6.3765+2	3.4836+2	2.8929+2	2.2578–3
	3.8733–5	7.2765–9	8.2520+6		2.4795+9	1.4069+9	5.1926+8	5.5334+8	6.2515+3	6.4365+2	3.5114+2	2.9251+2	2.2932–3
	4.0000–5	7.2975–9	8.2283+6		2.4724+9	1.3848+9	5.2133+8	5.6622+8	6.2869+3	6.5702+2	3.5734+2	2.9968+2	2.3725–3
O3	4.1890–5	7.3483–9	8.1714+6		2.4553+9	1.3537+9	5.2156+8	5.7999+8	6.3381+3	6.7086+2	3.6359+2	3.0727+2	2.4915–3
	4.2500–5	7.3655–9	8.1523+6		2.4495+9	1.3441+9	5.2179+8	5.8360+8	6.3525+3	6.7525+2	3.6596+2	3.0929+2	2.5281–3
	4.3347–5	7.3891–9	8.1263+6		2.4417+9	1.3311+9	5.2201+8	5.8857+8	6.3723+3	6.8111+2	3.6904+2	3.1207+2	2.5790–3
	4.6250–5	7.4632–9	8.0456+6		2.4175+9	1.2894+9	5.2290+8	6.0521+8	6.4377+3	7.0129+2	3.7990+2	3.2138+2	2.7543–3
	4.6674–5	7.4732–9	8.0348+6		2.4142+9	1.2836+9	5.2305+8	6.0758+8	6.4470+3	7.0427+2	3.8155+2	3.2272+2	2.7800–3
	5.0000–5	7.5472–9	7.9560+6		2.3905+9	1.2408+9	5.2386+8	6.2583+8	6.5172+3	7.2659+2	3.9358+2	3.3301+2	2.9830–3
O2	5.1150–5	7.5853–9	7.9161+6		2.3786+9	1.2270+9	5.2280+8	6.2871+8	6.5402+3	7.3090+2	3.9615+2	3.3475+2	3.0529–3
	5.5000–5	7.7049–9	7.7932+6		2.3416+9	1.1840+9	5.1998+8	6.3764+8	6.6138+3	7.4640+2	4.0617+2	3.4023+2	3.2887–3
	5.5575–5	7.7221–9	7.7758+6		2.3364+9	1.1780+9	5.1952+8	6.3893+8	6.6245+3	7.4855+2	4.0752+2	3.4103+2	3.3241–3
	6.0000–5	7.8468–9	7.6523+6		2.2993+9	1.1344+9	5.1638+8	6.4851+8	6.7033+3	7.6547+2	4.1847+2	3.4700+2	3.5982–3
	7.0000–5	8.1786–9	7.3418+6		2.2060+9	1.0516+9	5.0239+8	6.5205+8	6.8647+3	7.8225+2	4.3231+2	3.4994+2	4.2278–3
O1	7.8810–5	8.4361–9	7.1177+6		2.1387+9	9.9199+8	4.9188+8	6.5479+8	6.9914+3	7.9697+2	4.4463+2	3.5233+2	4.7930–3
	8.0000–5	8.4692–9	7.0899+6		2.1303+9	9.8470+8	4.9064+8	6.5495+8	7.0076+3	7.9908+2	4.4652+2	3.5256+2	4.8700–3
	8.2500–5	8.5531–9	7.0203+6		2.1094+9	9.6991+8	4.8661+8	6.5288+8	7.0388+3	7.9983+2	4.4807+2	3.5175+2	5.0307–3
	8.6875–5	8.6949–9	6.9058+6		2.0750+9	9.4556+8	4.8000+8	6.4943+8	7.0915+3	8.0155+2	4.5112+2	3.5042+2	5.3133–3
	9.0000–5	8.7926–9	6.8291+6		2.0519+9	9.2927+8	4.7560+8	6.4708+8	7.1277+3	8.0308+2	4.5355+2	3.4953+2	5.5163–3
	9.0156–5	8.7974–9	6.8254+6		2.0508+9	9.2847+8	4.7538+8	6.4697+8	7.1295+3	8.0315+2	4.5366+2	3.4949+2	5.5265–3
	9.5078–5	8.9460–9	6.7120+6		2.0168+9	9.0451+8	4.6879+8	6.4345+8	7.1844+3	8.0556+2	4.5738+2	3.4818+2	5.8482–3
	1.0000–4	9.0883–9	6.6069+6	0.0000+0	1.9852+9	8.8233+8	4.6272+8	6.4012+8	7.2369+3	8.0846+2	4.6149+2	3.4697+2	6.1722–3
	1.1250–4	9.4727–9	6.3388+6	1.5501–8	1.9046+9	8.3294+8	4.4378+8	6.2791+8	7.3526+3	8.0437+2	4.6316+2	3.4121+2	6.9957–3
	1.2500–4	9.8260–9	6.1109+6	3.1053–8	1.8361+9	7.9111+8	4.2784+8	6.1717+8	7.4577+3	8.0306+2	4.6682+2	3.3623+2	7.8308–3
	1.3125–4	9.9937–9	6.0084+6	3.8838–8	1.8053+9	7.7246+8	4.2060+8	6.1227+8	7.5068+3	8.0274+2	4.6875+2	3.3398+2	8.2524–3
	1.5000–4	1.0463–8	5.7388+6	6.2173–8	1.7244+9	7.2363+8	4.0169+8	5.9904+8	7.6431+3	8.0426+2	4.7625+2	3.2800+2	9.5323–3
	1.7500–4	1.1106–8	5.4067+6	9.3465–8	1.6246+9	6.7108+8	3.7570+8	5.7778+8	7.7953+3	7.9360+2	4.7606+2	3.1754+2	1.1284–2
	2.0000–4	1.1687–8	5.1378+6	1.2506–7	1.5438+9	6.2866+8	3.5513+8	5.5998+8	7.9296+3	7.8914+2	4.8024+2	3.0890+2	1.3068–2
N5	2.3072–4	1.2393–8	4.8453+6	1.6432–7	1.4559+9	5.8623+8	3.3136+8	5.3827+8	8.0552+3	7.7570+2	4.7775+2	2.9793+2	1.5333–2
	2.3505–4	1.2487–8	4.8085+6	1.6991–7	1.4448+9	5.8092+8	3.2843+8	5.3546+8	8.0716+3	7.7443+2	4.7787+2	2.9654+2	1.5655–2
N4	2.4248–4	1.2647–8	4.7478+6	1.7951–7	1.4266+9	5.7215+8	3.2361+8	5.3080+8	8.0993+3	7.7247+2	4.7823+2	2.9422+2	1.6209–2
	2.4317–4	1.2662–8	4.7420+6	1.8041–7	1.4248+9	5.7135+8	3.2314+8	5.3034+8	8.1018+3	7.7216+2	4.7816+2	2.9399+2	1.6260–2
	2.4608–4	1.2727–8	4.7180+6	1.8417–7	1.4176+9	5.6804+8	3.2116+8	5.2842+8	8.1124+3	7.7083+2	4.7781+2	2.9301+2	1.6477–2
	2.5282–4	1.2874–8	4.6639+6	1.9293–7	1.4014+9	5.6058+8	3.1672+8	5.2407+8	8.1366+3	7.6796+2	4.7715+2	2.9079+2	1.6983–2
	2.5738–4	1.2973–8	4.6286+6	1.9888–7	1.3907+9	5.5570+8	3.1382+8	5.2121+8	8.1526+3	7.6618+2	4.7682+2	2.8934+2	1.7325–2
	2.6461–4	1.3127–8	4.5743+6	2.0834–7	1.3744+9	5.4822+8	3.0940+8	5.1681+8	8.1775+3	7.6354+2	4.7642+2	2.8711+2	1.7870–2
	2.7869–4	1.3419–8	4.4748+6	2.2683–7	1.3445+9	5.3450+8	3.0135+8	5.0868+8	8.2242+3	7.5915+2	4.7614+2	2.8299+2	1.8935–2
	2.8231–4	1.3492–8	4.4504+6	2.3160–7	1.3372+9	5.3114+8	2.9939+8	5.0668+8	8.2359+3	7.5815+2	4.7616+2	2.8198+2	1.9210–2
	3.0000–4	1.3843–8	4.3376+6	2.5500–7	1.3033+9	5.1558+8	2.9038+8	4.9735+8	8.2911+3	7.5405+2	4.7675+2	2.7728+2	2.0558–2
	3.2500–4	1.4365–8	4.1800+6	2.8843–7	1.2560+9	4.9593+8	2.7748+8	4.8256+8	8.3611+3	7.4160+2	4.7202+2	2.6956+2	2.2488–2
	3.6250–4	1.5105–8	3.9751+6	3.3950–7	1.1944+9	4.7032+8	2.6098+8	4.6310+8	8.4575+3	7.2699+2	4.6753+2	2.5943+2	2.5411–2
N3	3.9736–4	1.5755–8	3.8113+6	3.8779–7	1.1452+9	4.4981+8	2.4802+8	4.4734+8	8.5395+3	7.1684+2	4.6553+2	2.5128+2	2.8158–2
	4.0000–4	1.5805–8	3.7993+6	3.9147–7	1.1416+9	4.4837+8	2.4711+8	4.4608+8	8.5435+3	7.1604+2	4.6538+2	2.5064+2	2.8372–2
	4.0625–4	1.5926–8	3.7702+6	4.0022–7	1.1329+9	4.4501+8	2.4479+8	4.4305+8	8.5529+3	7.1315+2	4.6410+2	2.4902+2	2.8879–2
	4.1797–4	1.6151–8	3.7177+6	4.1671–7	1.1170+9	4.3892+8	2.4060+8	4.3753+8	8.5702+3	7.0801+2	4.6189+2	2.4609+2	2.9831–2
	4.3848–4	1.6538–8	3.6308+6	4.4585–7	1.0910+9	4.2884+8	2.3372+8	4.2838+8	8.5995+3	6.9977+2	4.5850+2	2.4124+2	3.1502–2
N2	4.6141–4	1.6958–8	3.5408+6	4.7881–7	1.0639+9	4.1838+8	2.2666+8	4.1887+8	8.6307+3	6.9159+2	4.5536+2	2.3620+2	3.3377–2
	4.6623–4	1.7048–8	3.5222+6	4.8580–7	1.0583+9	4.1627+8	2.2525+8	4.1680+8	8.6371+3	6.8993+2	4.5479+2	2.3511+2	3.3773–2
	4.6924–4	1.7103–8	3.5108+6	4.9015–7	1.0549+9	4.1498+8	2.2439+8	4.1552+8	8.6411+3	6.8891+2	4.5444+2	2.3444+2	3.4019–2
	4.7468–4	1.7203–8	3.4904+6	4.9806–7	1.0488+9	4.1267+8	2.2284+8	4.1325+8	8.6482+3	6.8711+2	4.5383+2	2.3324+2	3.4465–2
	4.8734–4	1.7434–8	3.4443+6	5.1654–7	1.0349+9	4.0744+8	2.1936+8	4.0810+8	8.6644+3	6.8310+2	4.5253+2	2.3053+2	3.5506–2
	5.0000–4	1.7661–8	3.4000+6	5.3513–7	1.0216+9	4.0240+8	2.1603+8	4.0314+8	8.6802+3	6.7937+2	4.5141+2	2.2793+2	3.6549–2
	5.2500–4	1.8119–8	3.3140+6	5.7219–7	9.9577+8	3.9300+8	2.0944+8	3.9333+8	8.7099+3	6.6955+2	4.4685+2	2.2267+2	3.8612–2
N1	5.5465–4	1.8648–8	3.2200+6	6.1682–7	9.6752+8	3.8267+8	2.0228+8	3.8257+8	8.7434+3	6.5918+2	4.4224+2	2.1690+2	4.1068–2
	5.6032–4	1.8750–8	3.2024+6	6.2544–7	9.6222+8	3.8079+8	2.0098+8	3.8044+8	8.7473+3	6.5727+2	4.4146+2	2.1576+2	4.1532–2
	5.6250–4	1.8790–8	3.1956+6	6.2876–7	9.6020+8	3.8007+8	2.0049+8	3.7963+8	8.7489+3	6.5654+2	4.4117+2	2.1533+2	4.1710–2
	5.8016–4	1.9106–8	3.1427+6	6.5577–7	9.4430+8	3.7442+8	1.9663+8	3.7325+8	8.7609+3	6.5090+2	4.3893+2	2.1193+2	4.3155–2
	6.0000–4	1.9456–8	3.0862+6	6.8639–7	9.2732+8	3.6836+8	1.9252+8	3.6643+8	8.7740+3	6.4503+2	4.3670+2	2.0829+2	4.4780–2
	6.2500–4	1.9905–8	3.0166+6	7.2544–7	9.0639+8	3.6115+8	1.8732+8	3.5792+8	8.7839+3	6.3556+2	4.3183+2	2.0368+2	4.6753–2
	6.6875–4	2.0672–8	2.9047+6	7.9509–7	8.7279+8	3.4950+8	1.7904+8	3.4425+8	8.8002+3	6.2074+2	4.2440+2	1.9629+2	5.0211–2
	7.0000–4	2.1205–8	2.8317+6	8.4582–7	8.5084+8	3.4184+8	1.7368+8	3.3532+8	8.8113+3	6.1135+2	4.1983+2	1.9146+2	5.2685–2
	7.3438–4	2.1779–8	2.7571+6	9.0249–7	8.2842+8	3.3399+8	1.6823+8	3.2619+8	8.8229+3	6.0186+2	4.1527+2	1.8653+2	5.5409–2
	8.0000–4	2.2840–8	2.6289+6	1.0130–6	7.8991+8	3.2042+8	1.5898+8	3.1051+8	8.8437+3	5.8620+2	4.0806+2	1.7808+2	6.0621–2
	9.0000–4	2.4434–8	2.4574+6	1.1874–6	7.3839+8	3.0264+8	1.4645+8	2.8930+8	8.8173+3	5.6028+2	3.9368+2	1.6653+2	6.7391–2
	1.0000–3	2.5949–8	2.3139+6	1.3693–6	6.9527+8	2.8757+8	1.3613+8	2.7156+8	8.7937+3	5.3955+2	3.8258+2	1.5690+2	7.4143–2

Atomic Weight 180.948 Density 16.654 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.1250–3	2.7878–8	2.1538+6	1.6073–6	6.4717+8	2.7156+8	1.2485+8	2.5075+8	8.7182+3	5.1111+2	3.6565+2	1.4539+2	8.0922–2
	1.2500–3	2.9719–8	2.0204+6	1.8576–6	6.0708+8	2.5801+8	1.1559+8	2.3348+8	8.6512+3	4.8811+2	3.5216+2	1.3586+2	8.7658–2
	1.3125–3	3.0611–8	1.9616+6	1.9869–6	5.8940+8	2.5196+8	1.1154+8	2.2589+8	8.6203+3	4.7809+2	3.4632+2	1.3168+2	9.1012–2
	1.5000–3	3.3183–8	1.8095+6	2.3898–6	5.4371+8	2.3613+8	1.0121+8	2.0637+8	8.5364+3	4.5287+2	3.3184+2	1.2093+2	1.0102–1
M5	1.7416–3	3.6388–8	1.6502+6	2.9429–6	4.9583+8	2.1937+8	9.0313+7	1.8614+8	8.4301+3	4.2122+2	3.1142+2	1.0969+2	1.1271–1
	1.7577–3	3.6596–8	1.6408+6	2.9813–6	4.9300+8	2.1836+8	8.9674+7	1.8496+8	8.4236+3	4.1937+2	3.1023+2	1.0903+2	1.1349–1
	1.7729–3	3.6791–8	1.6321+6	3.0175–6	4.9039+8	2.1743+8	8.9085+7	1.8387+8	8.4176+3	4.1766+2	3.0913+2	1.0841+2	1.1422–1
M4	1.8023–3	3.7168–8	1.6155+6	3.0882–6	4.8542+8	2.1566+8	8.7966+7	1.8179+8	8.4060+3	4.1442+2	3.0705+2	1.0725+2	1.1564–1
	1.8510–3	3.7788–8	1.5890+6	3.2063–6	4.7745+8	2.1282+8	8.6182+7	1.7844+8	8.3872+3	4.0927+2	3.0377+2	1.0538+2	1.1797–1
	1.8517–3	3.7798–8	1.5886+6	3.2082–6	4.7733+8	2.1278+8	8.6154+7	1.7838+8	8.3869+3	4.0919+2	3.0372+2	1.0535+2	1.1801–1
	1.9259–3	3.8731–8	1.5503+6	3.3910–6	4.6583+8	2.0866+8	8.3595+7	1.7356+8	8.3593+3	4.0183+2	2.9905+2	1.0266+2	1.2156–1
	2.0000–3	3.9650–8	1.5144+6	3.5771–6	4.5503+8	2.0478+8	8.1206+7	1.6904+8	8.3329+3	3.9505+2	2.9478+2	1.0014+2	1.2511–1
	2.0625–3	4.0447–8	1.4845+6	3.7366–6	4.4606+8	2.0154+8	7.9261+7	1.6526+8	8.3114+3	3.8865+2	2.9053+2	9.7994+1	1.2809–1
M3	2.1841–3	4.1973–8	1.4306+6	4.0542–6	4.2985+8	1.9564+8	7.5767+7	1.5843+8	8.2715+3	3.7725+2	2.8298+2	9.4130+1	1.3387–1
	2.2351–3	4.2622–8	1.4088+6	4.1901–6	4.2330+8	1.9332+8	7.4403+7	1.5558+8	8.2514+3	3.7274+2	2.8008+2	9.2520+1	1.3602–1
	2.2500–3	4.2811–8	1.4026+6	4.2302–6	4.2144+8	1.9265+8	7.4016+7	1.5476+8	8.2456+3	3.7145+2	2.7926+2	9.2062+1	1.3664–1
	2.3307–3	4.3825–8	1.3701+6	4.4495–6	4.1169+8	1.8917+8	7.1993+7	1.5052+8	8.2149+3	3.6478+2	2.7496+2	8.9673+1	1.4002–1
	2.3848–3	4.4497–8	1.3494+6	4.5985–6	4.0547+8	1.8693+8	7.0708+7	1.4782+8	8.1950+3	3.6056+2	2.7226+2	8.8154+1	1.4229–1
	2.4144–3	4.4862–8	1.3384+6	4.6809–6	4.0216+8	1.8574+8	7.0027+7	1.4639+8	8.1843+3	3.5832+2	2.7083+2	8.7348+1	1.4352–1
M2	2.4614–3	4.5440–8	1.3214+6	4.8128–6	3.9705+8	1.8389+8	6.8974+7	1.4418+8	8.1676+3	3.5488+2	2.6863+2	8.6105+1	1.4548–1
	2.4951–3	4.5854–8	1.3095+6	4.9080–6	3.9347+8	1.8259+8	6.8229+7	1.4265+8	8.1552+3	3.5225+2	2.6687+2	8.5232+1	1.4684–1
	2.5582–3	4.6625–8	1.2878+6	5.0884–6	3.8696+8	1.8021+8	6.6879+7	1.3987+8	8.1324+3	3.4751+2	2.6371+2	8.3651+1	1.4937–1
	2.5608–3	4.6657–8	1.2870+6	5.0959–6	3.8670+8	1.8011+8	6.6825+7	1.3975+8	8.1315+3	3.4732+2	2.6359+2	8.3587+1	1.4948–1
	2.6686–3	4.7958–8	1.2521+6	5.4098–6	3.7621+8	1.7625+8	6.4657+7	1.3529+8	8.0940+3	3.3975+2	2.5854+2	8.1047+1	1.5380–1
M1	2.6847–3	4.8150–8	1.2471+6	5.4572–6	3.7470+8	1.7570+8	6.4348+7	1.3465+8	8.0885+3	3.3867+2	2.5783+2	8.0684+1	1.5444–1
	2.7241–3	4.8623–8	1.2349+6	5.5740–6	3.7106+8	1.7436+8	6.3600+7	1.3309+8	8.0753+3	3.3600+2	2.5604+2	7.9803+1	1.5601–1
	2.7804–3	4.9295–8	1.2181+6	5.7424–6	3.6600+8	1.7249+8	6.2565+7	1.3094+8	8.0569+3	3.3232+2	2.5358+2	7.8583+1	1.5826–1
	2.7931–3	4.9446–8	1.2144+6	5.7807–6	3.6489+8	1.7208+8	6.2337+7	1.3047+8	8.0527+3	3.3151+2	2.5304+2	7.8314+1	1.5876–1
	2.8343–3	4.9934–8	1.2025+6	5.9056–6	3.6132+8	1.7075+8	6.1609+7	1.2895+8	8.0395+3	3.2893+2	2.5132+2	7.7455+1	1.6040–1
	2.8965–3	5.0666–8	1.1851+6	6.0958–6	3.5610+8	1.6881+8	6.0546+7	1.2674+8	8.0200+3	3.2517+2	2.4881+2	7.6202+1	1.6288–1
	3.0000–3	5.1870–8	1.1576+6	6.4169–6	3.4783+8	1.6572+8	5.8867+7	1.2324+8	7.9885+3	3.1927+2	2.4488+2	7.4221+1	1.6698–1
	3.1250–3	5.3323–8	1.1261+6	6.8131–6	3.3835+8	1.6214+8	5.6931+7	1.1927+8	7.9408+3	3.1174+2	2.3962+2	7.1945+1	1.7129–1
	3.2500–3	5.4756–8	1.0966+6	7.2186–6	3.2950+8	1.5878+8	5.5131+7	1.1557+8	7.8952+3	3.0477+2	2.3477+2	6.9828+1	1.7558–1
	3.3437–3	5.5818–8	1.0757+6	7.5287–6	3.2323+8	1.5639+8	5.3863+7	1.1297+8	7.8623+3	2.9988+2	2.3136+2	6.8334+1	1.7879–1
	3.5000–3	5.7565–8	1.0431+6	8.0565–6	3.1342+8	1.5262+8	5.1888+7	1.0890+8	7.8098+3	2.9229+2	2.2610+2	6.6007+1	1.8411–1
	3.6250–3	5.8942–8	1.0187+6	8.4883–6	3.0610+8	1.4979+8	5.0420+7	1.0588+8	7.7696+3	2.8662+2	2.2216+2	6.4276+1	1.8836–1
	3.6719–3	5.9454–8	1.0099+6	8.6525–6	3.0346+8	1.4876+8	4.9893+7	1.0480+8	7.7550+3	2.8459+2	2.2075+2	6.3655+1	1.8995–1
	4.0000–3	6.2976–8	9.5347+5	9.8324–6	2.8649+8	1.4212+8	4.6525+7	9.7841+7	7.6581+3	2.7169+2	2.1181+2	5.9677+1	2.0100–1
	4.5000–3	6.8296–8	8.7920+5	1.1738–5	2.6417+8	1.3327+8	4.2168+7	8.8730+7	7.4948+3	2.5325+2	1.9863+2	5.4399+1	2.1570–1
	5.0000–3	7.3415–8	8.1789+5	1.3773–5	2.4575+8	1.2582+8	3.8621+7	8.1302+7	7.3517+3	2.3829+2	1.8796+2	5.0100+1	2.3019–1
	5.5000–3	7.8475–8	7.6516+5	1.5934–5	2.2991+8	1.1936+8	3.5632+7	7.4913+7	7.2041+3	2.2461+2	1.7801+2	4.6364+1	2.4314–1
	6.0000–3	8.3381–8	7.2014+5	1.8219–5	2.1638+8	1.1374+8	3.3109+7	6.9519+7	7.0720+3	2.1314+2	1.6967+2	4.3213+1	2.5592–1
	7.0000–3	9.2915–8	6.4624+5	2.3146–5	1.9418+8	1.0432+8	2.9034+7	6.0816+7	6.7827+3	1.9311+2	1.5476+2	3.8075+1	2.7634–1
	8.0000–3	1.0200–7	5.8867+5	2.8540–5	1.7688+8	9.6792+7	2.5915+7	5.4163+7	6.5417+3	1.7787+2	1.4342+2	3.4151+1	2.9632–1
L3	9.8792–3	1.1851–7	5.0665+5	3.9843–5	1.5224+8	8.5596+7	2.1620+7	4.5012+7	6.1197+3	1.5516+2	1.2615+2	2.8690+1	3.2693–1
	1.0000–2	1.1954–7	5.0229+5	4.0625–5	1.5092+8	8.4993+7	2.1395+7	4.4529+7	6.0963+3	1.5398+2	1.2525+2	2.8403+1	3.2886–1
	1.0625–2	1.2483–7	4.8101+5	4.4766–5	1.4453+8	8.2009+7	2.0305+7	4.2210+7	5.9652+3	1.4789+2	1.2054+2	2.7007+1	3.3713–1
L2	1.1163–2	1.2931–7	4.6437+5	4.8464–5	1.3953+8	7.9656+7	1.9457+7	4.0409+7	5.8606+3	1.4315+2	1.1689+2	2.5924+1	3.4419–1
	1.1643–2	1.3323–7	4.5069+5	5.1860–5	1.3542+8	7.7706+7	1.8765+7	3.8943+7	5.7729+3	1.3928+2	1.1389+2	2.5034+1	3.5043–1
L1	1.1656–2	1.3334–7	4.5032+5	5.1956–5	1.3531+8	7.7653+7	1.8746+7	3.8904+7	5.7705+3	1.3917+2	1.1381+2	2.5011+1	3.5060–1
	1.1719–2	1.3385–7	4.4860+5	5.2408–5	1.3479+8	7.7405+7	1.8659+7	3.8719+7	5.7584+3	1.3867+2	1.1342+2	2.4898+1	3.5128–1
	1.1865–2	1.3504–7	4.4463+5	5.3467–5	1.3360+8	7.6837+7	1.8461+7	3.8297+7	5.7306+3	1.3751+2	1.1252+2	2.4642+1	3.5286–1
	1.2482–2	1.4002–7	4.2882+5	5.8030–5	1.2885+8	7.4557+7	1.7671+7	3.6616+7	5.6185+3	1.3292+2	1.0894+2	2.3621+1	3.5950–1
	1.2539–2	1.4048–7	4.2743+5	5.8461–5	1.2843+8	7.4355+7	1.7601+7	3.6468+7	5.6085+3	1.3252+2	1.0863+2	2.3532+1	3.6011–1
	1.2649–2	1.4136–7	4.2478+5	5.9290–5	1.2763+8	7.3971+7	1.7470+7	3.6188+7	5.5895+3	1.3176+2	1.0803+2	2.3362+1	3.6129–1
	1.3741–2	1.4995–7	4.0043+5	6.7808–5	1.2032+8	7.0418+7	1.6265+7	3.3629+7	5.4118+3	1.2477+2	1.0259+2	2.1809+1	3.7291–1
	1.3770–2	1.5017–7	3.9984+5	6.8037–5	1.2014+8	7.0331+7	1.6236+7	3.3567+7	5.4074+3	1.2460+2	1.0246+2	2.1771+1	3.7321–1
	1.3824–2	1.5060–7	3.9871+5	6.8478–5	1.1980+8	7.0165+7	1.6181+7	3.3449+7	5.3990+3	1.2428+2	1.0221+2	2.1700+1	3.7379–1
	1.5000–2	1.5960–7	3.7623+5	7.8188–5	1.1305+8	6.6842+7	1.5081+7	3.1117+7	5.2299+3	1.1792+2	9.7248+1	2.0286+1	3.8611–1
	1.6250–2	1.6903–7	3.5525+5	8.9081–5	1.0674+8	6.3694+7	1.4077+7	2.8965+7	5.0546+3	1.1165+2	9.2293+1	1.8959+1	3.9619–1
	1.7500–2	1.7823–7	3.3690+5	1.0056–4	1.0123+8	6.0912+7	1.3206+7	2.7105+7	4.8975+3	1.0622+2	8.8002+1	1.7813+1	4.0619–1
	1.8125–2	1.8276–7	3.2856+5	1.0651–4	9.8722+7	5.9637+7	1.2813+7	2.6266+7	4.8249+3	1.0377+2	8.6066+1	1.7297+1	4.1115–1
	2.0000–2	1.9605–7	3.0628+5	1.2517–4	9.2029+7	5.6202+7	1.1772+7	2.4050+7	4.6268+3	9.7299+1	8.0939+1	1.5933+1	4.2588–1
	2.2500–2	2.1325–7	2.8158+5	1.5192–4	8.4606+7	5.2314+7	1.0649+7	2.1638+7	4.3714+3	8.9728+1	7.4869+1	1.4419+1	4.3961–1
	2.6250–2	2.3797–7	2.5233+5	1.9591–4	7.5817+7	4.7630+7	9.3399+6	1.8843+7	4.0583+3	8.0908+1	6.7781+1	1.2667+1	4.5999–1
	3.0000–2	2.6160–7	2.2954+5	2.4430–4	6.8969+7	4.3912+7	8.3370+6	1.6716+7	3.8053+3	7.4165+1	6.2350+1	1.1335+1	4.7995–1
	3.5000–2	2.9219–7	2.0550+5	3.1527–4	6.1747+7	3.9855+7	7.3336+6	1.4555+7	3.5207+3	6.6876+1	5.6423+1	9.9528+0	4.9967–1
	4.0000–2	3.2148–7	1.8678+5	3.9334–4	5.6122+7	3.6645+7	6.5628+6	1.2910+7	3.2915+3	6.1288+1	5.1867+1	8.9021+0	5.1913–1
	5.0000–2	3.7674–7	1.5938+5	5.6858–4	4.7890+7	3.1818+7	5.4766+6	1.0593+7	2.9398+3	5.3043+1	4.5094+1	7.3983+0	5.5098–1
	6.0000–2	4.2845–7	1.4015+5	7.6817–4	4.2110+7	2.8336+7	4.7432+6	9.0283+6	2.6844+3	4.7273+1	4.0321+1	6.3735+0	5.7856–1
K	6.7565–2	4.6549–7	1.2900+5	9.3415–4	3.8760+7	2.6289+7	4.3300+6	8.1379+6	2.5324+3	4.3923+1	3.7543+1	5.7832+0	5.9754–1
	6.8342–2	4.6919–7	1.2798+5	9.5191–4	3.8453+7	2.6101+7	4.2930+6	8.0565+6	2.5184+3	4.3618+1	3.7290+1	5.7291+0	5.9930–1
	7.1257–2	4.8298–7	1.2432+5	1.0196–3	3.7355+7	2.5426+7	4.1604+6	7.7664+6	2.4683+3	4.2527+1	3.6385+1	5.5361+0	6.0588–1
	7.5628–2	5.0333–7	1.1930+5	1.1242–3	3.5845+7	2.4494+7	3.9784+6	7.3707+6	2.3984+3	4.1033+1	3.5144+1	5.2730+0	6.1573–1
	8.0000–2	5.2331–7	1.1474+5	1.2325–3	3.4477+7	2.3645+7	3.8140+6	7.0158+6	2.3343+3	3.9686+1	3.4024+1	5.0371+0	6.2555–1
	8.5000–2	5.4512–7	1.1015+5	1.3608–3	3.3097+7	2.2784+7	3.6517+6	6.6595+6	2.2687+3	3.8309+1	3.2876+1	4.7970+0	6.3554–1
	9.2500–2	5.7704–7	1.0406+5	1.5613–3	3.1267+7	2.1635+7	3.4368+6	6.1926+6	2.1802+3	3.6491+1	3.1358+1	4.4826+0	6.5053–1
	1.0000–1	6.0808–7	9.8746+4	1.7714–3	2.9670+7	2.0627+7	3.2500+6	5.7912+6	2.1016+3	3.4917+1	3.0039+1	4.2125+0	6.6543–1
	1.1250–1	6.5372–7	9.1852+4	2.1408–3	2.7599+7	1.9318+7	3.0085+6	5.2700+6	2.0011+3	3.2800+1	2.8257+1	3.8562+0	6.8588–1
	1.3125–1	7.1853–7	8.3567+4	2.7355–3	2.5110+7	1.7730+7	2.7194+6	4.6582+6	1.8768+3	3.0285+1	2.6129+1	3.4388+0	7.1680–1

Atomic Weight 180.948												Density 16.654 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000–1	7.7971–7	7.7011+4	3.3756–3	2.3140+7	1.6460+7	2.4916+6	4.1859+6	1.7754+3	2.8323+1	2.4458+1	3.1173+0	7.4762–1
1.7500–1	8.5101–7	7.0558+4	4.2893–3	2.1201+7	1.5220+7	2.2801+6	3.6995+6	1.6693+3	2.6423+1	2.2862+1	2.7785+0	7.8215–1
2.0000–1	9.1781–7	6.5423+4	5.2632–3	1.9658+7	1.4221+7	2.1114+6	3.3241+6	1.5826+3	2.4932+1	2.1598+1	2.5177+0	8.1659–1
2.5000–1	1.0374–6	5.7880+4	7.3501–3	1.7391+7	1.2655+7	1.8956+6	2.8390+6	1.4605+3	2.3011+1	1.9955+1	2.1765+0	8.7928–1
3.0000–1	1.1464–6	5.2377+4	9.5905–3	1.5738+7	1.1505+7	1.7357+6	2.4956+6	1.3678+3	2.1637+1	1.8759+1	1.9363+0	9.4116–1
4.0000–1	1.3421–6	4.4741+4	1.4379–2	1.3443+7	9.8194+6	1.5533+6	2.0694+6	1.2534+3	2.0146+1	1.7449+1	1.6339+0	1.0637+0
5.0000–1	1.5107–6	3.9747+4	1.9436–2	1.1943+7	8.6825+6	1.4477+6	1.8113+6	1.1862+3	1.9407+1	1.6766+1	1.4499+0	1.1905+0
6.0000–1	1.6596–6	3.6180+4	2.4642–2	1.0871+7	7.8521+6	1.3804+6	1.6375+6	1.1441+3	1.9013+1	1.6365+1	1.3258+0	1.3217+0
8.0000–1	1.9134–6	3.1382+4	3.5216–2	9.4294+6	6.6998+6	1.3018+6	1.4266+6	1.0957+3	1.8817+1	1.6046+1	1.1761+0	1.5946+0
1.0000+0	2.1276–6	2.8223+4	4.5814–2	8.4801+6	5.9233+6	1.2591+6	1.2967+6	1.0707+3	1.8927+1	1.5964+1	1.0840+0	1.8790+0
1.5000+0	2.5448–6	2.3596+4	7.1610–2	7.0898+6	4.7352+6	1.2135+6	1.1401+6	1.0476+3	1.9846+1	1.6232+1	9.7728–1	2.6373+0
2.0000+0	2.8647–6	2.0961+4	9.6157–2	6.2981+6	4.0403+6	1.1962+6	1.0606+6	1.0430+3	2.0901+1	1.6534+1	9.2097–1	3.4462+0
3.0000+0	3.2890–6	1.8257+4	1.4161–1	5.4856+6	3.3129+6	1.1804+6	9.9121+5	1.0446+3	2.3138+1	1.7120+1	8.8366–1	5.1342+0
4.0000+0	3.5697–6	1.6821+4	1.8284–1	5.0542+6	2.9199+6	1.1784+6	9.5478+5	1.0517+3	2.5403+1	1.7623+1	8.6010–1	6.9199+0
5.0000+0	3.7640–6	1.5952+4	2.2054–1	4.7933+6	2.6756+6	1.1770+6	9.3962+5	1.0579+3	2.7679+1	1.8070+1	8.5528–1	8.7540+0
6.0000+0	3.9064–6	1.5371+4	2.5530–1	4.6185+6	2.5142+6	1.1759+6	9.2734+5	1.0637+3	2.9896+1	1.8410+1	8.5290–1	1.0633+1
8.0000+0	4.0994–6	1.4648+4	3.1770–1	4.4012+6	2.3099+6	1.1751+6	9.1516+5	1.0744+3	3.4310+1	1.8949+1	8.4913–1	1.4512+1
1.0000+1	4.2194–6	1.4231+4	3.7250–1	4.2760+6	2.1950+6	1.1758+6	9.0406+5	1.0840+3	3.8764+1	1.9407+1	8.4619–1	1.8510+1
1.5000+1	4.3343–6	1.3854+4	4.8613–1	4.1626+6	2.0849+6	1.1772+6	8.9948+5	1.1032+3	4.9699+1	2.0059+1	8.4675–1	2.8793+1
2.0000+1	4.3578–6	1.3779+4	5.7694–1	4.1401+6	2.0662+6	1.1780+6	8.9477+5	1.1184+3	6.0790+1	2.0577+1	8.4713–1	3.9366+1
3.0000+1	4.3652–6	1.3756+4	7.1685–1	4.1332+6	2.0680+6	1.1788+6	8.8527+5	1.1374+3	8.3341+1	2.1223+1	8.4769–1	6.1270+1
4.0000+1	4.3638–6	1.3760+4	8.2293–1	4.1345+6	2.0669+6	1.1793+6	8.8712+5	1.1527+3	1.0612+2	2.1645+1	8.5074–1	8.3626+1
5.0000+1	4.3632–6	1.3762+4	9.0819–1	4.1351+6	2.0661+6	1.1795+6	8.8827+5	1.1659+3	1.2920+2	2.1966+1	8.5312–1	1.0638+2
6.0000+1	4.3630–6	1.3762+4	9.7936–1	4.1352+6	2.0654+6	1.1797+6	8.8896+5	1.1770+3	1.5247+2	2.2203+1	8.5506–1	1.2941+2
8.0000+1	4.3633–6	1.3761+4	1.0937+0	4.1349+6	2.0643+6	1.1799+6	8.8947+5	1.1948+3	1.9962+2	2.2605+1	8.5811–1	1.7616+2
1.0000+2	4.3627–6	1.3764+4	1.1835+0	4.1355+6	2.0635+6	1.1800+6	8.9078+5	1.2090+3	2.4715+2	2.2964+1	8.6193–1	2.2333+2
1.5000+2	4.3535–6	1.3792+4	1.3485+0	4.1442+6	2.0620+6	1.1801+6	9.0083+5	1.2347+3	3.6678+2	2.3315+1	8.7185–1	3.4259+2
2.0000+2	4.3472–6	1.3813+4	1.4664+0	4.1503+6	2.0610+6	1.1802+6	9.0790+5	1.2504+3	4.8711+2	2.3643+1	8.7889–1	4.6259+2
3.0000+2	4.3382–6	1.3841+4	1.6333+0	4.1589+6	2.0595+6	1.1802+6	9.1790+5	1.2718+3	7.2735+2	2.4172+1	8.8898–1	7.0229+2
4.0000+2	4.3346–6	1.3853+4	1.7521+0	4.1623+6	2.0584+6	1.1803+6	9.2235+5	1.2865+3	9.6776+2	2.4470+1	8.9369–1	9.4240+2
5.0000+2	4.3333–6	1.3857+4	1.8443+0	4.1636+6	2.0576+6	1.1803+6	9.2439+5	1.2980+3	1.2100+3	2.4738+1	8.9608–1	1.1843+3
6.0000+2	4.3323–6	1.3860+4	1.9197+0	4.1646+6	2.0570+6	1.1803+6	9.2603+5	1.3068+3	1.4498+3	2.4928+1	8.9807–1	1.4240+3
8.0000+2	4.3309–6	1.3865+4	2.0387+0	4.1659+6	2.0559+6	1.1803+6	9.2840+5	1.3207+3	1.9336+3	2.5286+1	9.0118–1	1.9074+3
1.0000+3	4.3300–6	1.3867+4	2.1311+0	4.1668+6	2.0551+6	1.1803+6	9.3007+5	1.3320+3	2.4173+3	2.5574+1	9.0361–1	2.3908+3
1.5000+3	4.3304–6	1.3866+4	2.2986+0	4.1664+6	2.0536+6	1.1803+6	9.3114+5	1.3533+3	3.6331+3	2.5854+1	9.0467–1	3.6064+3
2.0000+3	4.3323–6	1.3860+4	2.4174+0	4.1645+6	2.0526+6	1.1803+6	9.3033+5	1.3697+3	4.8417+3	2.6131+1	9.0390–1	4.8146+3
3.0000+3	4.3346–6	1.3853+4	2.5849+0	4.1623+6	2.0511+6	1.1803+6	9.2956+5	1.3933+3	7.2630+3	2.6655+1	9.0317–1	7.2355+3
4.0000+3	4.3371–6	1.3845+4	2.7037+0	4.1599+6	2.0500+6	1.1803+6	9.2817+5	1.4105+3	9.6852+3	2.6903+1	9.0184–1	9.6574+3
5.0000+3	4.3409–6	1.3832+4	2.7958+0	4.1563+6	2.0492+6	1.1803+6	9.2535+5	1.4239+3	1.2133+4	2.7138+1	8.9912–1	1.2105+4
6.0000+3	4.3414–6	1.3831+4	2.8710+0	4.1558+6	2.0485+6	1.1803+6	9.2556+5	1.4338+3	1.4541+4	2.7314+1	8.9935–1	1.4513+4
8.0000+3	4.3429–6	1.3826+4	2.9896+0	4.1544+6	2.0475+6	1.1803+6	9.2516+5	1.4494+3	1.9399+4	2.7658+1	8.9901–1	1.9371+4
1.0000+4	4.3442–6	1.3822+4	3.0816+0	4.1531+6	2.0467+6	1.1803+6	9.2466+5	1.4617+3	2.4303+4	2.7977+1	8.9857–1	2.4274+4
1.5000+4	4.3465–6	1.3815+4	3.2487+0	4.1509+6	2.0452+6	1.1803+6	9.2397+5	1.4853+3	3.6335+4	2.8237+1	8.9791–1	3.6306+4
2.0000+4	4.3484–6	1.3809+4	3.3674+0	4.1491+6	2.0442+6	1.1803+6	9.2317+5	1.5023+3	4.8523+4	2.8497+1	8.9713–1	4.8494+4
3.0000+4	4.3503–6	1.3803+4	3.5347+0	4.1473+6	2.0427+6	1.1803+6	9.2283+5	1.5262+3	7.2622+4	2.9018+1	8.9680–1	7.2592+4
4.0000+4	4.3523–6	1.3796+4	3.6534+0	4.1454+6	2.0416+6	1.1803+6	9.2192+5	1.5433+3	9.6979+4	2.9296+1	8.9591–1	9.6948+4
5.0000+4	4.3558–6	1.3785+4	3.7455+0	4.1421+6	2.0408+6	1.1803+6	9.1940+5	1.5565+3	1.2111+5	2.9530+1	8.9347–1	1.2108+5
6.0000+4	4.3560–6	1.3785+4	3.8208+0	4.1419+6	2.0401+6	1.1803+6	9.1992+5	1.5672+3	1.4522+5	2.9701+1	8.9397–1	1.4519+5
8.0000+4	4.3570–6	1.3781+4	3.9396+0	4.1409+6	2.0391+6	1.1803+6	9.1991+5	1.5843+3	1.9386+5	3.0042+1	8.9397–1	1.9383+5
1.0000+5	4.3580–6	1.3778+4	4.0316+0	4.1400+6	2.0383+6	1.1803+6	9.1979+5	1.5976+3	2.4259+5	3.0357+1	8.9386–1	2.4256+5


July 4, 1991
Atomic Weight 183.850
EEDL Evaluated Electron
Cross Sections
74-W
Density 19.300 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
74-W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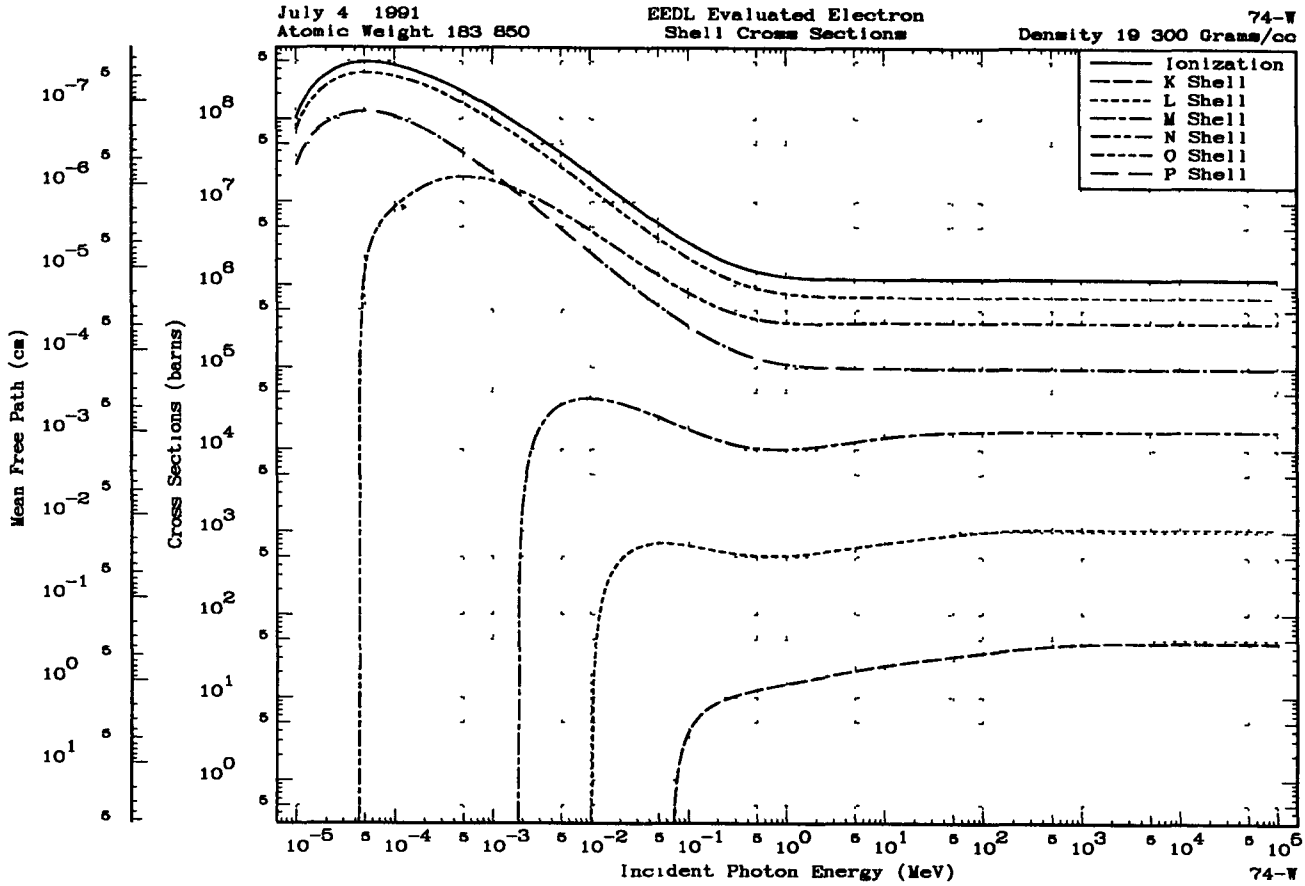
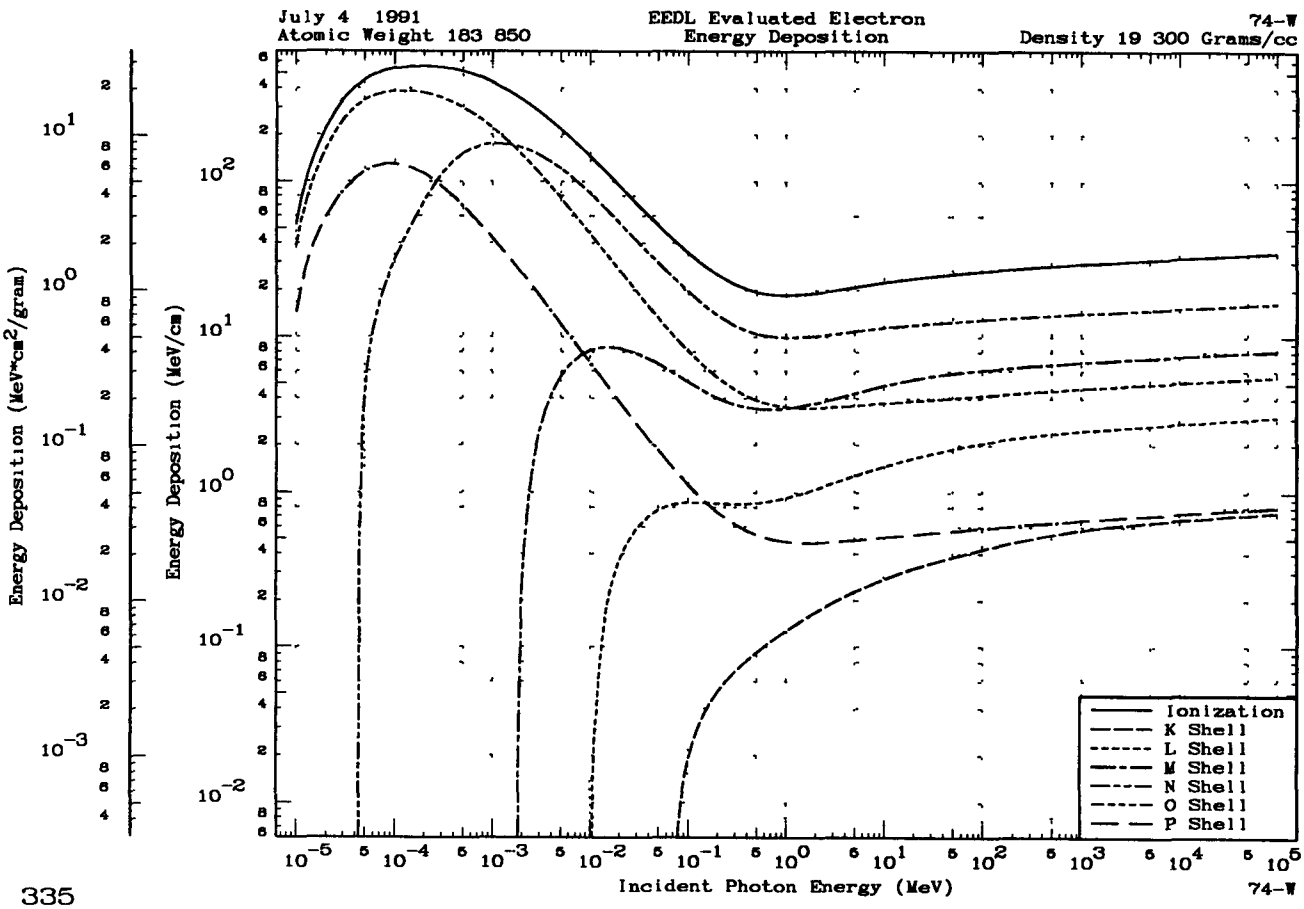
Atomic Weight 183.850
EEDL Evaluated Electron
Energy Deposition
74-W
Density 19.300 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
74-W

334


July 4 1991
Atomic Weight 183 850
EEDL Evaluated Electron
Shell Cross Sections
74-W
Density 19 300 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
74-W


July 4 1991
Atomic Weight 183 850
EEDL Evaluated Electron
Energy Deposition
74-W
Density 19 300 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
74-W

335

Atomic Weight 183.850 Density 19.300 Grams/cc

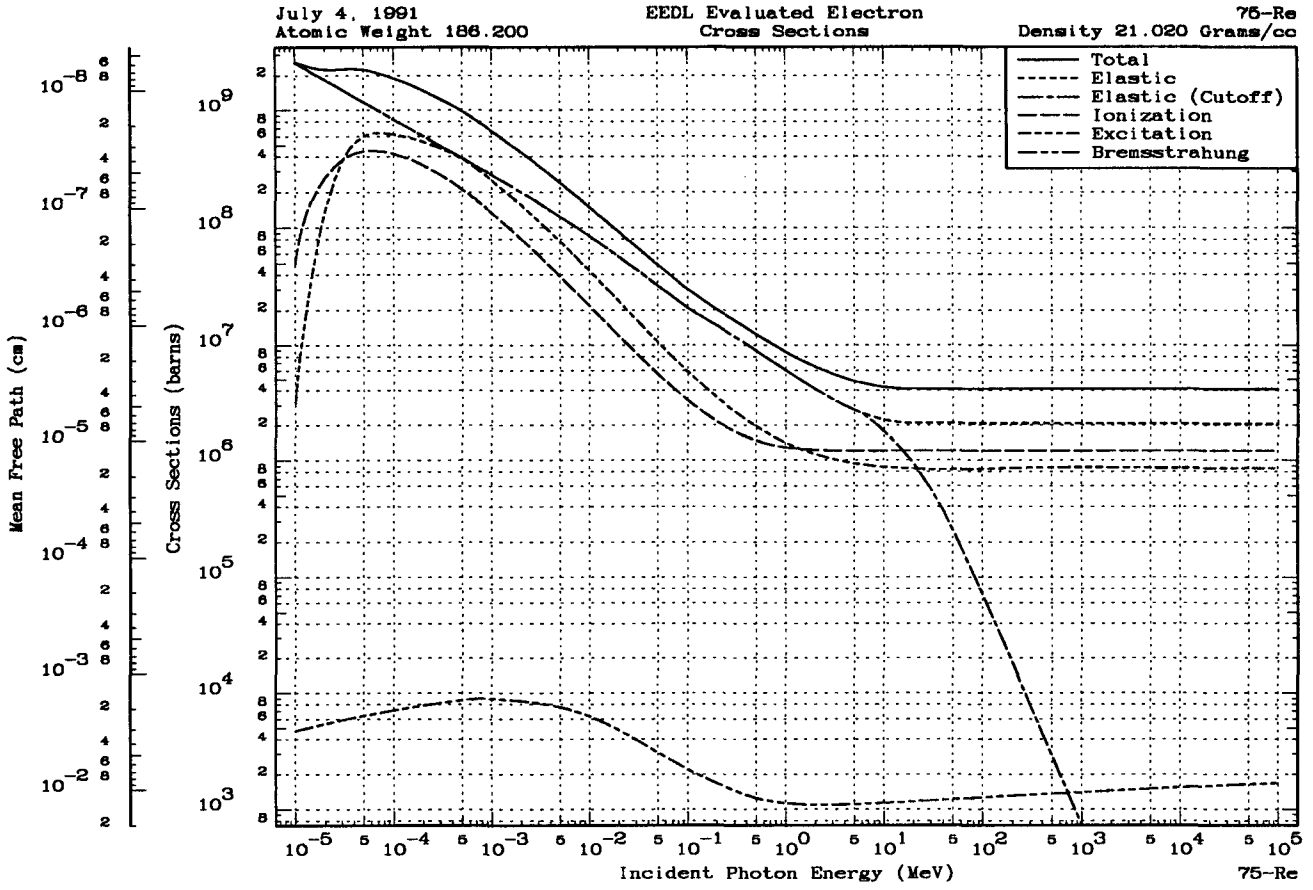
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.7039–9	9.0838+6		2.7732+9	2.6656+9	1.0116+8	6.4612+6	4.5422+3	5.5885+1	5.2516+1	3.3684+0	6.2067–4
	1.1250–5	5.9150–9	8.7597+6		2.6742+9	2.5160+9	1.4404+8	1.4175+7	4.6525+3	8.5091+1	7.7502+1	7.5884+0	6.9581–4
	1.2188–5	6.0594–9	8.5509+6		2.6105+9	2.4192+9	1.7077+8	2.0523+7	4.7290+3	1.0545+2	9.4251+1	1.1203+1	7.5305–4
	1.3125–5	6.1792–9	8.3852+6		2.5599+9	2.3329+9	1.9808+8	2.8911+7	4.8010+3	1.2815+2	1.1206+2	1.6085+1	8.1101–4
	1.3594–5	6.2365–9	8.3081+6		2.5364+9	2.2931+9	2.0959+8	3.3672+7	4.8354+3	1.3889+2	1.1998+2	1.8911+1	8.4024–4
	1.5000–5	6.3785–9	8.1232+6		2.4799+9	2.1851+9	2.4319+8	5.1637+7	4.9334+3	1.7384+2	1.4403+2	2.9814+1	9.2892–4
	1.7500–5	6.5547–9	7.9048+6		2.4133+9	2.0261+9	2.9329+8	9.3911+7	5.0907+3	2.3878+2	1.8341+2	5.5361+1	1.0900–3
	2.0000–5	6.6530–9	7.7880+6		2.3776+9	1.8977+9	3.3378+8	1.4615+8	5.2311+3	3.0771+2	2.1979+2	8.7924+1	1.2552–3
	2.5000–5	6.7091–9	7.7228+6		2.3577+9	1.7011+9	3.9415+8	2.6249+8	5.4473+3	4.4356+2	2.8329+2	1.6026+2	1.5677–3
	3.0000–5	6.7069–9	7.7254+6		2.3585+9	1.5556+9	4.3396+8	3.6890+8	5.6305+3	5.6367+2	3.3515+2	2.2852+2	1.8898–3
	3.5000–5	6.7111–9	7.7206+6		2.3570+9	1.4426+9	4.5662+8	4.5777+8	5.7883+3	6.5769+2	3.7276+2	2.8492+2	2.2180–3
	4.0000–5	6.7352–9	7.6930+6		2.3486+9	1.3514+9	4.7447+8	5.2272+8	5.9285+3	7.3498+2	4.0810+2	3.2688+2	2.5536–3
N7	4.3250–5	6.7800–9	7.6421+6		2.3331+9	1.3008+9	4.7771+8	5.5459+8	6.0115+3	7.6872+2	4.2135+2	3.4737+2	2.7745–3
	4.4094–5	6.7897–9	7.6312+6		2.3297+9	1.2885+9	4.7866+8	5.6253+8	6.0303+3	7.7769+2	4.2519+2	3.5250+2	2.8291–3
	4.5570–5	6.8048–9	7.6143+6		2.3246+9	1.2679+9	4.8028+8	5.7633+8	6.0625+3	7.9330+2	4.3188+2	3.6142+2	2.9252–3
N6	4.5610–5	6.8052–9	7.6138+6		2.3244+9	1.2674+9	4.8032+8	5.7670+8	6.0633+3	7.9371+2	4.3205+2	3.6165+2	2.9278–3
O3	4.5650–5	6.8056–9	7.6134+6		2.3243+9	1.2669+9	4.8037+8	5.7707+8	6.0642+3	7.9413+2	4.3224+2	3.6189+2	2.9304–3
	4.6194–5	6.8159–9	7.6018+6		2.3208+9	1.2595+9	4.8103+8	5.8018+8	6.0758+3	7.9887+2	4.3493+2	3.6394+2	2.9659–3
	4.6708–5	6.8253–9	7.5914+6		2.3176+9	1.2527+9	4.8171+8	5.8310+8	6.0867+3	8.0349+2	4.3762+2	3.6587+2	2.9995–3
	4.7785–5	6.8443–9	7.5703+6		2.3112+9	1.2389+9	4.8311+8	5.8918+8	6.1091+3	8.1317+2	4.4328+2	3.6989+2	3.0701–3
	4.8097–5	6.8495–9	7.5646+6		2.3094+9	1.2349+9	4.8353+8	5.9092+8	6.1156+3	8.1602+2	4.4498+2	3.7104+2	3.0906–3
	4.8354–5	6.8538–9	7.5598+6		2.3079+9	1.2317+9	4.8385+8	5.9236+8	6.1208+3	8.1829+2	4.4630+2	3.7199+2	3.1074–3
	5.0000–5	6.8803–9	7.5307+6		2.2990+9	1.2117+9	4.8588+8	6.0144+8	6.1540+3	8.3282+2	4.5480+2	3.7801+2	3.2159–3
	5.2500–5	6.9310–9	7.4756+6		2.2822+9	1.1831+9	4.8565+8	6.1343+8	6.2027+3	8.4907+2	4.6301+2	3.8605+2	3.3816–3
	5.5000–5	6.9772–9	7.4261+6		2.2671+9	1.1565+9	4.8548+8	6.2509+8	6.2495+3	8.6521+2	4.7131+2	3.9390+2	3.5485–3
O2	5.6020–5	6.9950–9	7.4072+6		2.2613+9	1.1462+9	4.8538+8	6.2976+8	6.2681+3	8.7165+2	4.7460+2	3.9705+2	3.6168–3
	5.7015–5	7.0206–9	7.3802+6		2.2531+9	1.1364+9	4.8529+8	6.3144+8	6.2859+3	8.7616+2	4.7783+2	3.9832+2	3.6837–3
	5.8507–5	7.0578–9	7.3413+6		2.2412+9	1.1221+9	4.8520+8	6.3392+8	6.3122+3	8.8299+2	4.8278+2	4.0021+2	3.7843–3
	6.0000–5	7.0938–9	7.3041+6		2.2299+9	1.1084+9	4.8514+8	6.3635+8	6.3379+3	8.8989+2	4.8783+2	4.0206+2	3.8853–3
	6.1250–5	7.1281–9	7.2689+6		2.2191+9	1.0973+9	4.8386+8	6.3802+8	6.3591+3	8.9330+2	4.9004+2	4.0325+2	3.9702–3
	6.5000–5	7.2262–9	7.1703+6		2.1890+9	1.0658+9	4.8034+8	6.4283+8	6.4204+3	9.0390+2	4.9719+2	4.0672+2	4.2262–3
	6.5938–5	7.2498–9	7.1469+6		2.1819+9	1.0584+9	4.7946+8	6.4400+8	6.4353+3	9.0645+2	4.9889+2	4.0756+2	4.2906–3
	7.0000–5	7.3480–9	7.0514+6		2.1527+9	1.0279+9	4.7590+8	6.4889+8	6.4977+3	9.1757+2	5.0645+2	4.1112+2	4.5710–3
	7.2500–5	7.4053–9	6.9968+6		2.1361+9	1.0104+9	4.7385+8	6.5179+8	6.5347+3	9.2447+2	5.1122+2	4.1324+2	4.7447–3
	7.2969–5	7.4185–9	6.9844+6		2.1323+9	1.0072+9	4.7346+8	6.5156+8	6.5415+3	9.2523+2	5.1208+2	4.1315+2	4.7774–3
	8.0000–5	7.6071–9	6.8112+6		2.0794+9	9.6294+8	4.6807+8	6.4836+8	6.6394+3	9.3717+2	5.2524+2	4.1192+2	5.2712–3
O1	8.5140–5	7.7480–9	6.6874+6		2.0416+9	9.3407+8	4.6144+8	6.4608+8	6.7065+3	9.4019+2	5.2907+2	4.1112+2	5.6362–3
	8.6069–5	7.7734–9	6.6655+6		2.0349+9	9.2912+8	4.6033+8	6.4547+8	6.7176+3	9.4076+2	5.2990+2	4.1085+2	5.7020–3
	8.7810–5	7.8203–9	6.6255+6		2.0227+9	9.2007+8	4.5828+8	6.4434+8	6.7382+3	9.4188+2	5.3150+2	4.1037+2	5.8255–3
	9.0000–5	7.8783–9	6.5768+6		2.0078+9	9.0905+8	4.5580+8	6.4296+8	6.7635+3	9.4340+2	5.3360+2	4.0979+2	5.9813–3
	9.0858–5	7.9007–9	6.5581+6		2.0021+9	9.0485+8	4.5483+8	6.4244+8	6.7733+3	9.4395+2	5.3439+2	4.0956+2	6.0425–3
	9.5429–5	8.0174–9	6.4627+6		1.9730+9	8.8339+8	4.4990+8	6.3970+8	6.8241+3	9.4715+2	5.3871+2	4.0843+2	6.3699–3
	1.0000–4	8.1292–9	6.3737+6	0.0000+0	1.9458+9	8.6341+8	4.4533+8	6.3710+8	6.8729+3	9.5078+2	5.4340+2	4.0738+2	6.6995–3
	1.0625–4	8.3033–9	6.2401+6	6.5860–9	1.9051+9	8.3832+8	4.3656+8	6.3016+8	6.9351+3	9.4721+2	5.4378+2	4.0342+2	7.1520–3
	1.1250–4	8.4698–9	6.1174+6	1.3193–8	1.8676+9	8.1534+8	4.2855+8	6.2370+8	6.9943+3	9.4465+2	5.4488+2	3.9976+2	7.6082–3
	1.1719–4	8.5906–9	6.0314+6	1.8160–8	1.8413+9	7.9931+8	4.2290+8	6.1912+8	7.0368+3	9.4301+2	5.4582+2	3.9718+2	7.9528–3
	1.2500–4	8.7841–9	5.8986+6	2.6452–8	1.8008+9	7.7461+8	4.1422+8	6.1195+8	7.1046+3	9.4119+2	5.4802+2	3.9316+2	8.5312–3
	1.3125–4	8.9326–9	5.8005+6	3.3096–8	1.7708+9	7.5644+8	4.0780+8	6.0658+8	7.1563+3	9.4032+2	5.5013+2	3.9018+2	8.9976–3
	1.3359–4	8.9871–9	5.7653+6	3.5589–8	1.7601+9	7.4996+8	4.0548+8	6.0465+8	7.1752+3	9.4003+2	5.5092+2	3.8910+2	9.1734–3
	1.5000–4	9.3496–9	5.5418+6	5.3041–8	1.6919+9	7.0888+8	3.9084+8	5.9213+8	7.2998+3	9.4008+2	5.5783+2	3.8224+2	1.0415–2
	1.7500–4	9.9196–9	5.2234+6	7.9847–8	1.5946+9	6.5767+8	3.6681+8	5.7015+8	7.4632+3	9.2525+2	5.5599+2	3.6924+2	1.2366–2
	2.0000–4	1.0436–8	4.9649+6	1.0698–7	1.5157+9	6.1632+8	3.4765+8	5.5176+8	7.6078+3	9.1746+2	5.5895+2	3.5850+2	1.4357–2
N5	2.4734–4	1.1383–8	4.5520+6	1.5926–7	1.3897+9	5.5582+8	3.1505+8	5.1882+8	7.8218+3	8.9386+2	5.5509+2	3.3875+2	1.8312–2
	2.5063–4	1.1446–8	4.5267+6	1.6294–7	1.3819+9	5.5225+8	3.1298+8	5.1671+8	7.8353+3	8.9211+2	5.5463+2	3.3747+2	1.8591–2
	2.5680–4	1.1564–8	4.4805+6	1.6987–7	1.3678+9	5.4576+8	3.0924+8	5.1284+8	7.8602+3	8.8904+2	5.5389+2	3.3512+2	1.9115–2
N4	2.6005–4	1.1626–8	4.4568+6	1.7353–7	1.3606+9	5.4243+8	3.0732+8	5.1085+8	7.8731+3	8.8749+2	5.5355+2	3.3392+2	1.9392–2
	2.6504–4	1.1721–8	4.4206+6	1.7916–7	1.3496+9	5.3744+8	3.0439+8	5.0773+8	7.8927+3	8.8498+2	5.5294+2	3.3202+2	1.9818–2
	2.6760–4	1.1769–8	4.4024+6	1.8205–7	1.3440+9	5.3493+8	3.0292+8	5.0616+8	7.9026+3	8.8376+2	5.5267+2	3.3107+2	2.0037–2
	2.7378–4	1.1885–8	4.3596+6	1.8906–7	1.3309+9	5.2903+8	2.9947+8	5.0244+8	7.9262+3	8.8094+2	5.5209+2	3.2882+2	2.0566–2
	2.8380–4	1.2069–8	4.2932+6	2.0046–7	1.3107+9	5.1986+8	2.9414+8	4.9665+8	7.9635+3	8.7683+2	5.5149+2	3.2532+2	2.1428–2
	2.8689–4	1.2125–8	4.2733+6	2.0398–7	1.3046+9	5.1713+8	2.9256+8	4.9492+8	7.9747+3	8.7567+2	5.5137+2	3.2428+2	2.1695–2
	3.0000–4	1.2358–8	4.1928+6	2.1899–7	1.2800+9	5.0601+8	2.8615+8	4.8783+8	8.0214+3	8.7124+2	5.5121+2	3.2001+2	2.2830–2
	3.2500–4	1.2821–8	4.0412+6	2.4793–7	1.2337+9	4.8681+8	2.7377+8	4.7315+8	8.1035+3	8.5640+2	5.4546+2	3.1092+2	2.5027–2
	3.5000–4	1.3264–8	3.9062+6	2.7734–7	1.1925+9	4.6969+8	2.6287+8	4.5995+8	8.1803+3	8.4420+2	5.4139+2	3.0279+2	2.7245–2
	3.6250–4	1.3479–8	3.8439+6	2.9219–7	1.1735+9	4.6179+8	2.5788+8	4.5383+8	8.2169+3	8.3891+2	5.3986+2	2.9902+2	2.8362–2
	4.0000–4	1.4099–8	3.6749+6	3.3724–7	1.1219+9	4.4034+8	2.4448+8	4.3709+8	8.3204+3	8.2577+2	5.3698+2	2.8875+2	3.1743–2
N3	4.1962–4	1.4432–8	3.5901+6	3.6115–7	1.0960+9	4.3028+8	2.3760+8	4.2812+8	8.3636+3	8.1553+2	5.3239+2	2.8310+2	3.3580–2
	4.2464–4	1.4518–8	3.5688+6	3.6732–7	1.0895+9	4.2782+8	2.3593+8	4.2577+8	8.3744+3	8.1303+2	5.3136+2	2.8164+2	3.4052–2
	4.3406–4	1.4678–8	3.5300+6	3.7894–7	1.0777+9	4.2331+8	2.3287+8	4.2149+8	8.3943+3	8.0855+2	5.2955+2	2.7896+2	3.4938–2
	4.5000–4	1.4944–8	3.4673+6	3.9874–7	1.0585+9	4.1601+8	2.2796+8	4.1455+8	8.4270+3	8.0147+2	5.2683+2	2.7461+2	3.6443–2
	4.5055–4	1.4953–8	3.4652+6	3.9942–7	1.0579+9	4.1577+8	2.2779+8	4.1431+8	8.4282+3	8.0124+2	5.2674+2	2.7447+2	3.6495–2
	4.7527–4	1.5355–8	3.3744+6	4.3047–7	1.0302+9	4.0518+8	2.2073+8	4.0424+8	8.4770+3	7.9135+2	5.2314+2	2.6817+2	3.8843–2
N2	4.8861–4	1.5567–8	3.3283+6	4.4738–7	1.0161+9	3.9981+8	2.1718+8	3.9911+8	8.5024+3	7.8654+2	5.2152+2	2.6498+2	4.0114–2
	4.9430–4	1.5659–8	3.3088+6	4.5463–7	1.0102+9	3.9758+8	2.1571+8	3.9685+8	8.5130+3	7.8452+2	5.2091+2	2.6357+2	4.0659–2
	5.0000–4	1.5751–8	3.2896+6	4.6189–7	1.0043+9	3.9539+8	2.1427+8	3.9462+8	8.5236+3	7.8258+2	5.2034+2	2.6219+2	4.1204–2
	5.1250–4	1.5957–8	3.2470+6	4.7793–7	9.9128+8	3.9071+8	2.1096+8	3.8960+8	8.5448+3	7.7660+2	5.1755+2	2.5901+2	4.2400–2
	5.3438–4	1.6313–8	3.1762+6	5.0627–7	9.6967+8	3.8291+8	2.0550+8	3.8126+8	8.5808+3	7.6689+2	5.1312+2	2.5373+2	4.4501–2
	5.5000–4	1.6563–8	3.1284+6	5.2673–7	9.5506+8	3.7762+8	2.0183+8	3.7560+8	8.6057+3	7.6049+2	5.1029+2	2.5015+2	4.6008–2
	5.6719–4	1.6833–8	3.0781+6	5.4943–7	9.3971+8	3.7205+8	1.9799+8	3.6966+8	8.6324+3	7.5388+2	5.0744+2	2.4639+2	4.7670–2
N1	5.8470–4	1.7104–8	3.0292+6	5.7276–7	9.2480+8	3.6663+8	1.9427+8	3.6388+8	8.6589+3	7.4760+2	5.0481+2	2.4274+2	4.9369–2

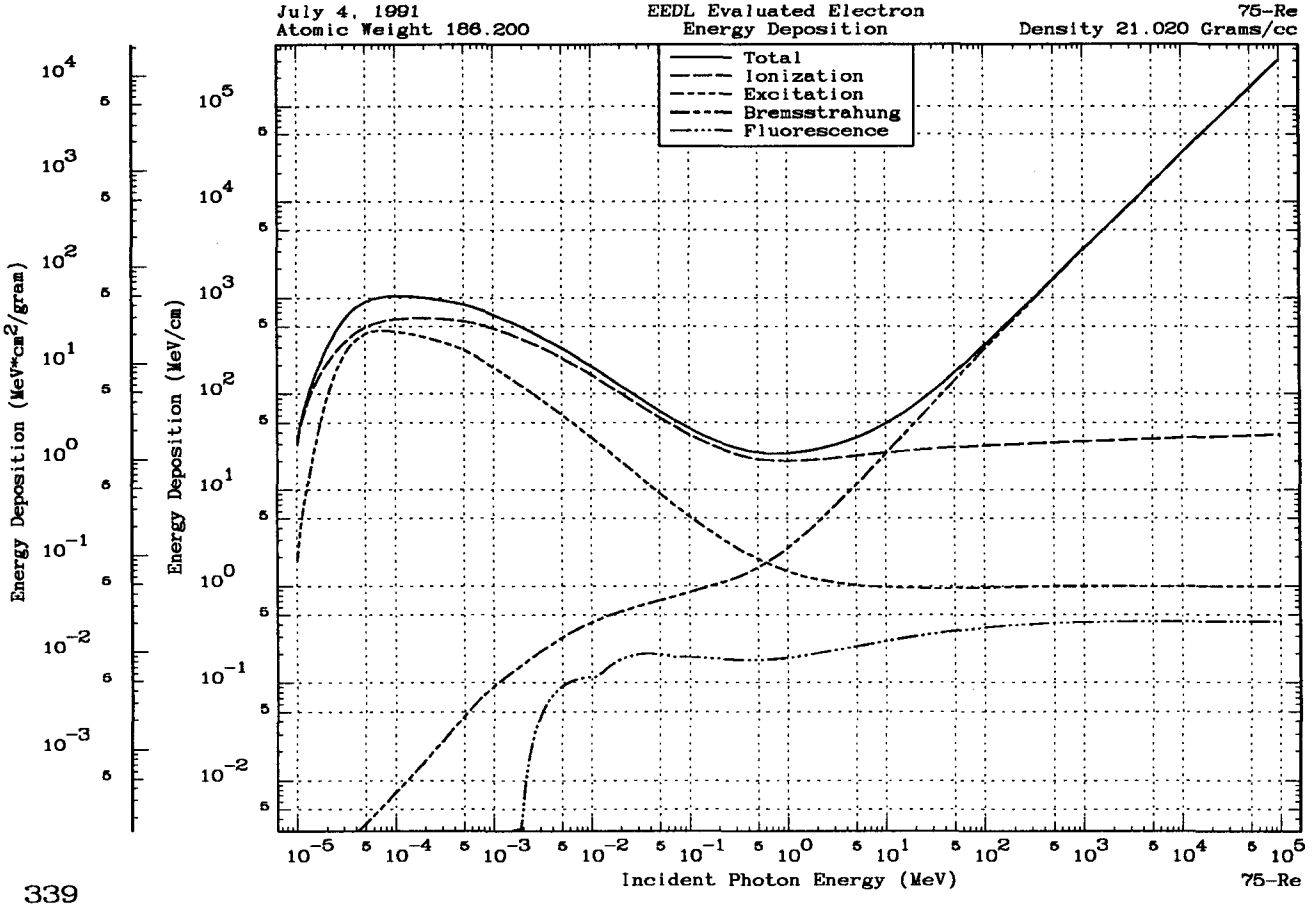
Atomic Weight 183.850 Density 19.300 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.9235–4	1.7225–8	3.0080+6	5.8301–7	9.1833+8	3.6434+8	1.9271+8	3.6127+8	8.6688+3	7.4491+2	5.0376+2	2.4110+2	5.0110–2
	6.0000–4	1.7345–8	2.9873+6	5.9330–7	9.1199+8	3.6209+8	1.9118+8	3.5871+8	8.6785+3	7.4231+2	5.0277+2	2.3949+2	5.0852–2
	6.2500–4	1.7747–8	2.9195+6	6.2723–7	8.9131+8	3.5503+8	1.8606+8	3.5021+8	8.7020+3	7.3117+2	4.9708+2	2.3404+2	5.3173–2
	6.5000–4	1.8142–8	2.8560+6	6.6167–7	8.7190+8	3.4837+8	1.8128+8	3.4223+8	8.7246+3	7.2093+2	4.9193+2	2.2894+2	5.5501–2
	6.6875–4	1.8434–8	2.8108+6	6.8780–7	8.5810+8	3.4363+8	1.7790+8	3.3656+8	8.7410+3	7.1378+2	4.8840+2	2.2532+2	5.7251–2
	7.0000–4	1.8912–8	2.7397+6	7.3193–7	8.3642+8	3.3614+8	1.7262+8	3.2765+8	8.7674+3	7.0276+2	4.8307+2	2.1963+2	6.0174–2
	7.2500–4	1.9287–8	2.6864+6	7.6771–7	8.2014+8	3.3049+8	1.6867+8	3.2097+8	8.7878+3	6.9456+2	4.7914+2	2.1536+2	6.2519–2
	7.3438–4	1.9426–8	2.6672+6	7.8124–7	8.1427+8	3.2845+8	1.6725+8	3.1855+8	8.7953+3	6.9164+2	4.7776+2	2.1382+2	6.3400–2
	8.0000–4	2.0378–8	2.5426+6	8.7740–7	7.7623+8	3.1516+8	1.5812+8	3.0293+8	8.8452+3	6.7330+2	4.6936+2	2.0387+2	6.9587–2
	9.0000–4	2.1801–8	2.3767+6	1.0294–6	7.2557+8	2.9775+8	1.4568+8	2.8213+8	8.8510+3	6.4312+2	4.5254+2	1.9050+2	7.7576–2
	1.0000–3	2.3154–8	2.2378+6	1.1878–6	6.8318+8	2.8299+8	1.3544+8	2.6474+8	8.8562+3	6.1900+2	4.3958+2	1.7934+2	8.5570–2
	1.1250–3	2.4822–8	2.0874+6	1.3952–6	6.3727+8	2.6732+8	1.2427+8	2.4567+8	8.7996+3	5.8696+2	4.1991+2	1.6695+2	9.3484–2
	1.2500–3	2.6411–8	1.9618+6	1.6130–6	5.9892+8	2.5404+8	1.1510+8	2.2978+8	8.7492+3	5.6110+2	4.0435+2	1.5665+2	1.0136–1
	1.3125–3	2.7180–8	1.9063+6	1.7255–6	5.8198+8	2.4811+8	1.1109+8	2.2277+8	8.7259+3	5.4978+2	3.9756+2	1.5211+2	1.0529–1
	1.5000–3	2.9396–8	1.7626+6	2.0757–6	5.3811+8	2.3259+8	1.0085+8	2.0467+8	8.6627+3	5.2139+2	3.8085+2	1.4041+2	1.1702–1
M5	1.8162–3	3.3014–8	1.5694+6	2.7103–6	4.7913+8	2.1175+8	8.7210+7	1.8016+8	8.5465+3	4.7582+2	3.5130+2	1.2438+2	1.3503–1
	1.8392–3	3.3268–8	1.5574+6	2.7587–6	4.7547+8	2.1044+8	8.6375+7	1.7865+8	8.5389+3	4.7302+2	3.4950+2	1.2339+2	1.3633–1
	1.8593–3	3.3489–8	1.5472+6	2.8013–6	4.7234+8	2.0932+8	8.5660+7	1.7735+8	8.5324+3	4.7064+2	3.4796+2	1.2254+2	1.3747–1
M4	1.8811–3	3.3728–8	1.5362+6	2.8478–6	4.6899+8	2.0812+8	8.4899+7	1.7597+8	8.5253+3	4.6811+2	3.4633+2	1.2163+2	1.3871–1
	1.8945–3	3.3875–8	1.5295+6	2.8764–6	4.6695+8	2.0739+8	8.4441+7	1.7511+8	8.5211+3	4.6658+2	3.4537+2	1.2107+2	1.3946–1
	1.9108–3	3.4056–8	1.5214+6	2.9115–6	4.6448+8	2.0651+8	8.3887+7	1.7407+8	8.5159+3	4.6473+2	3.4420+2	1.2039+2	1.4039–1
	1.9472–3	3.4454–8	1.5038+6	2.9902–6	4.5911+8	2.0459+8	8.2686+7	1.7182+8	8.5046+3	4.6073+2	3.4168+2	1.1892+2	1.4244–1
	1.9554–3	3.4543–8	1.5000+6	3.0080–6	4.5792+8	2.0417+8	8.2422+7	1.7132+8	8.5021+3	4.5986+2	3.4112+2	1.1859+2	1.4290–1
	2.0000–3	3.5027–8	1.4793+6	3.1055–6	4.5160+8	2.0191+8	8.1016+7	1.6867+8	8.4885+3	4.5521+2	3.3820+2	1.1686+2	1.4542–1
	2.0625–3	3.5742–8	1.4497+6	3.2439–6	4.4257+8	1.9875+8	7.9078+7	1.6474+8	8.4611+3	4.4771+2	3.3332+2	1.1424+2	1.4850–1
	2.1211–3	3.6404–8	1.4233+6	3.3758–6	4.3451+8	1.9591+8	7.7355+7	1.6124+8	8.4362+3	4.4107+2	3.2901+2	1.1191+2	1.5138–1
	2.2500–3	3.7839–8	1.3693+6	3.6725–6	4.1804+8	1.9008+8	7.3852+7	1.5410+8	8.3841+3	4.2769+2	3.2037+2	1.0716+2	1.5771–1
M3	2.2712–3	3.8072–8	1.3609+6	3.7222–6	4.1548+8	1.8916+8	7.3311+7	1.5300+8	8.3758+3	4.2562+2	3.1904+2	1.0643+2	1.5875–1
	2.3167–3	3.8575–8	1.3432+6	3.8298–6	4.1006+8	1.8724+8	7.2172+7	1.5064+8	8.3584+3	4.2120+2	3.1617+2	1.0487+2	1.6097–1
	2.3408–3	3.8839–8	1.3341+6	3.8871–6	4.0728+8	1.8625+8	7.1586+7	1.4943+8	8.3493+3	4.1893+2	3.1469+2	1.0407+2	1.6215–1
	2.4022–3	3.9507–8	1.3115+6	4.0345–6	4.0039+8	1.8379+8	7.0141+7	1.4645+8	8.3266+3	4.1334+2	3.1108+2	1.0210+2	1.6514–1
	2.4375–3	3.9889–8	1.2989+6	4.1203–6	3.9655+8	1.8241+8	6.9339+7	1.4479+8	8.3138+3	4.1024+2	3.0908+2	1.0100+2	1.6686–1
	2.4769–3	4.0313–8	1.2853+6	4.2168–6	3.9238+8	1.8092+8	6.8469+7	1.4299+8	8.2998+3	4.0689+2	3.0691+2	9.9807+1	1.6877–1
	2.5056–3	4.0620–8	1.2756+6	4.2876–6	3.8941+8	1.7985+8	6.7850+7	1.4171+8	8.2898+3	4.0450+2	3.0537+2	9.8960+1	1.7017–1
M2	2.5678–3	4.1281–8	1.2551+6	4.4422–6	3.8318+8	1.7759+8	6.6554+7	1.3903+8	8.2684+3	3.9952+2	3.0216+2	9.7186+1	1.7318–1
	2.6077–3	4.1705–8	1.2424+6	4.5425–6	3.7929+8	1.7617+8	6.5739+7	1.3737+8	8.2551+3	3.9616+2	2.9991+2	9.6077+1	1.7511–1
	2.6218–3	4.1855–8	1.2379+6	4.5782–6	3.7793+8	1.7568+8	6.5455+7	1.3679+8	8.2504+3	3.9500+2	2.9913+2	9.5691+1	1.7580–1
	2.7164–3	4.2848–8	1.2092+6	4.8199–6	3.6917+8	1.7247+8	6.3628+7	1.3307+8	8.2197+3	3.8750+2	2.9412+2	9.3202+1	1.8036–1
	2.7187–3	4.2873–8	1.2085+6	4.8260–6	3.6896+8	1.7239+8	6.3583+7	1.3298+8	8.2190+3	3.8732+2	2.9400+2	9.3142+1	1.8048–1
	2.7528–3	4.3227–8	1.1986+6	4.9143–6	3.6593+8	1.7127+8	6.2954+7	1.3169+8	8.2082+3	3.8474+2	2.9227+2	9.2284+1	1.8212–1
M1	2.7965–3	4.3680–8	1.1862+6	5.0283–6	3.6214+8	1.6987+8	6.2167+7	1.3009+8	8.1946+3	3.8151+2	2.9012+2	9.1212+1	1.8423–1
	2.8474–3	4.4207–8	1.1721+6	5.1623–6	3.5782+8	1.6828+8	6.1279+7	1.2825+8	8.1786+3	3.7787+2	2.8769+2	8.9991+1	1.8664–1
	2.8582–3	4.4318–8	1.1691+6	5.1909–6	3.5692+8	1.6795+8	6.1094+7	1.2787+8	8.1753+3	3.7711+2	2.8719+2	8.9737+1	1.8716–1
	2.9237–3	4.4990–8	1.1517+6	5.3657–6	3.5159+8	1.6598+8	5.9999+7	1.2560+8	8.1552+3	3.7264+2	2.8422+2	8.8232+1	1.9026–1
	3.0000–3	4.5767–8	1.1321+6	5.5718–6	3.4563+8	1.6377+8	5.8779+7	1.2307+8	8.1324+3	3.6768+2	2.8094+2	8.6552+1	1.9388–1
	3.1250–3	4.7036–8	1.1016+6	5.9159–6	3.3630+8	1.6027+8	5.6850+7	1.1916+8	8.0807+3	3.5903+2	2.7491+2	8.3923+1	1.9884–1
	3.2500–3	4.8288–8	1.0730+6	6.2680–6	3.2758+8	1.5699+8	5.5058+7	1.1553+8	8.0314+3	3.5103+2	2.6935+2	8.1477+1	2.0378–1
	3.3437–3	4.9215–8	1.0528+6	6.5372–6	3.2141+8	1.5465+8	5.3795+7	1.1296+8	7.9957+3	3.4540+2	2.6545+2	7.9750+1	2.0747–1
	3.5000–3	5.0740–8	1.0212+6	6.9954–6	3.1175+8	1.5096+8	5.1828+7	1.0895+8	7.9389+3	3.3669+2	2.5941+2	7.7058+1	2.1360–1
	3.6719–3	5.2389–8	9.8901+5	7.5127–6	3.0194+8	1.4719+8	4.9841+7	1.0490+8	7.8797+3	3.2786+2	2.5330+2	7.4337+1	2.2031–1
	4.0000–3	5.5461–8	9.3423+5	8.5368–6	2.8521+8	1.4068+8	4.6486+7	9.8039+7	7.7750+3	3.1307+2	2.4311+2	6.9730+1	2.3303–1
	4.5000–3	6.0056–8	8.6276+5	1.0190–5	2.6339+8	1.3199+8	4.2151+7	8.9239+7	7.6085+3	2.9197+2	2.2796+2	6.3760+1	2.5030–1
	5.0000–3	6.4473–8	8.0365+5	1.1955–5	2.4535+8	1.2468+8	3.8621+7	8.2039+7	7.4626+3	2.7483+2	2.1568+2	5.8880+1	2.6734–1
	6.0000–3	7.2962–8	7.1014+5	1.5796–5	2.1680+8	1.1284+8	3.3136+7	7.0820+7	7.1794+3	2.4641+2	1.9489+2	5.1227+1	2.9737–1
	7.0000–3	8.1058–8	6.3921+5	2.0054–5	1.9515+8	1.0361+8	2.9074+7	6.2458+7	6.8907+3	2.2366+2	1.7787+2	4.5470+1	3.2120–1
	8.0000–3	8.8761–8	5.8374+5	2.4708–5	1.7821+8	9.6224+7	2.5963+7	5.6017+7	6.6501+3	2.0631+2	1.6492+2	4.1042+1	3.4452–1
	1.0000–2	1.0353–7	5.0045+5	3.5108–5	1.5278+8	8.4740+7	2.1445+7	4.6591+7	6.2017+3	1.7894+2	1.4406+2	3.4490+1	3.8258–1
L3	1.0206–2	1.0501–7	4.9340+5	3.6267–5	1.5063+8	8.3750+7	2.1072+7	4.5802+7	6.1572+3	1.7653+2	1.4221+2	3.3935+1	3.8581–1
	1.0506–2	1.0715–7	4.8355+5	3.7981–5	1.4762+8	8.2365+7	2.0553+7	4.4700+7	6.0945+3	1.7319+2	1.3963+2	3.3161+1	3.9049–1
	1.1067–2	1.1111–7	4.6633+5	4.1280–5	1.4237+8	7.9929+7	1.9652+7	4.2780+7	5.9833+3	1.6738+2	1.3517+2	3.1814+1	3.9921–1
L2	1.1573–2	1.1461–7	4.5208+5	4.4345–5	1.3802+8	7.7898+7	1.8911+7	4.1200+7	5.8895+3	1.6261+2	1.3149+2	3.0705+1	4.0699–1
	1.2001–2	1.1754–7	4.4082+5	4.7010–5	1.3458+8	7.6283+7	1.8329+7	3.9961+7	5.8108+3	1.5885+2	1.2861+2	2.9830+1	4.1310–1
L1	1.2077–2	1.1805–7	4.3891+5	4.7487–5	1.3399+8	7.6007+7	1.8231+7	3.9750+7	5.7973+3	1.5822+2	1.2812+2	2.9681+1	4.1417–1
	1.2260–2	1.1929–7	4.3433+5	4.8648–5	1.3260+8	7.5346+7	1.7997+7	3.9249+7	5.7626+3	1.5664+2	1.2689+2	2.9327+1	4.1645–1
	1.2751–2	1.2261–7	4.2258+5	5.1826–5	1.2901+8	7.3642+7	1.7398+7	3.7965+7	5.6729+3	1.5260+2	1.2376+2	2.8420+1	4.2255–1
	1.2945–2	1.2391–7	4.1816+5	5.3102–5	1.2766+8	7.2998+7	1.7174+7	3.7484+7	5.6388+3	1.5109+2	1.2258+2	2.8080+1	4.2494–1
	1.3525–2	1.2775–7	4.0557+5	5.7000–5	1.2382+8	7.1157+7	1.6538+7	3.6118+7	5.5408+3	1.4680+2	1.1926+2	2.7115+1	4.3208–1
	1.3876–2	1.3005–7	3.9842+5	5.9405–5	1.2163+8	7.0106+7	1.6178+7	3.5345+7	5.4845+3	1.4438+2	1.1738+2	2.6570+1	4.3637–1
	1.3972–2	1.3068–7	3.9650+5	6.0078–5	1.2105+8	6.9822+7	1.6082+7	3.5137+7	5.4693+3	1.4373+2	1.1687+2	2.6424+1	4.3755–1
	1.5000–2	1.3729–7	3.7741+5	6.7391–5	1.1522+8	6.6996+7	1.5130+7	3.3089+7	5.3164+3	1.3733+2	1.1190+2	2.4979+1	4.4998–1
	1.6250–2	1.4520–7	3.5683+5	7.6742–5	1.0894+8	6.3884+7	1.4124+7	3.0924+7	5.1390+3	1.3010+2	1.0621+2	2.3429+1	4.6182–1
	1.7500–2	1.5293–7	3.3881+5	8.6588–5	1.0344+8	6.1131+7	1.3254+7	2.9045+7	4.9799+3	1.2385+2	1.0129+2	2.2085+1	4.7356–1
	1.8125–2	1.5672–7	3.3061+5	9.1693–5	1.0093+8	5.9870+7	1.2860+7	2.8196+7	4.9063+3	1.2102+2	9.9068+1	2.1478+1	4.7939–1
	2.0000–2	1.6786–7	3.0867+5	1.0768–4	9.4235+7	5.6468+7	1.1819+7	2.5944+7	4.7057+3	1.1355+2	9.3182+1	1.9868+1	4.9667–1
	2.2500–2	1.8244–7	2.8401+5	1.3060–4	8.6705+7	5.2524+7	1.0695+7	2.3482+7	4.4626+3	1.0480+2	8.6211+1	1.8076+1	5.1268–1
	2.6250–2	2.0339–7	2.5475+5	1.6824–4	7.7773+7	4.7777+7	9.3838+6	2.0609+7	4.1633+3	9.4594+1	7.8070+1	1.5988+1	5.3661–1
	3.0000–2	2.2342–7	2.3192+5	2.0962–4	7.0802+7	4.4012+7	8.3794+6	1.8406+7	3.9203+3	8.6778+1	7.1828+1	1.4389+1	5.6020–1
	3.5000–2	2.4963–7	2.0756+5	2.7024–4	6.3366+7	3.9839+7	7.3728+6	1.6151+7	3.6421+3	7.8323+1	6.5018+1	1.272[illegible]+1	5.8308–1
	4.0000–2	2.7476–7	1.8857+5	3.3688–4	5.7570+7	3.6545+7	6.5995+6	1.4422+7	3.4171+3	7.1833+1	5.9782+1	1.1445+1	6.0583–1
	5.0000–2	3.2253–7	1.6065+5	4.8635–4	4.9044+7	3.1596+7	5.5091+6	1.1935+7	3.0602+3	6.2208+1	5.1981+1	9.5832+0	6.4354–1

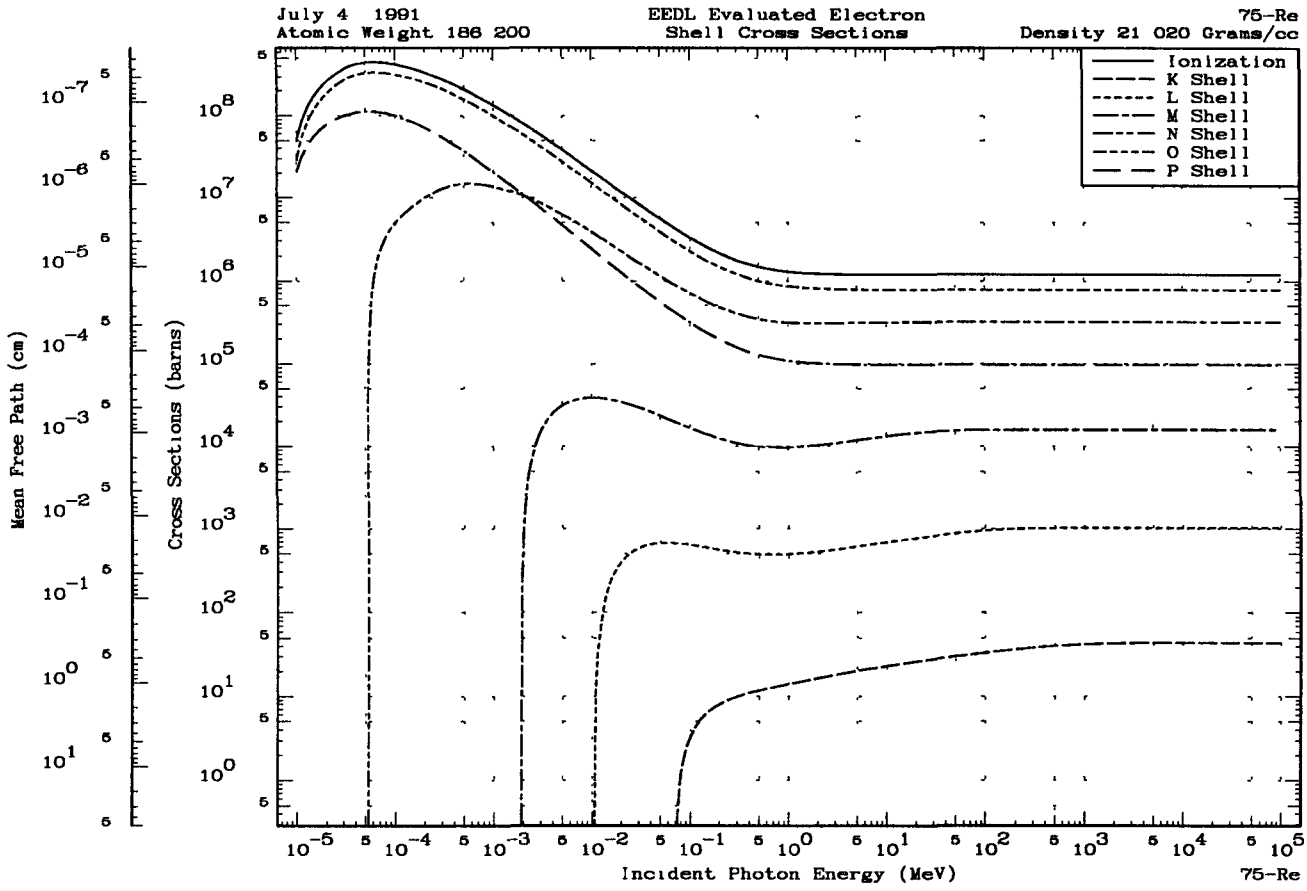
Atomic Weight 183.850 Density 19.300 Grams/cc

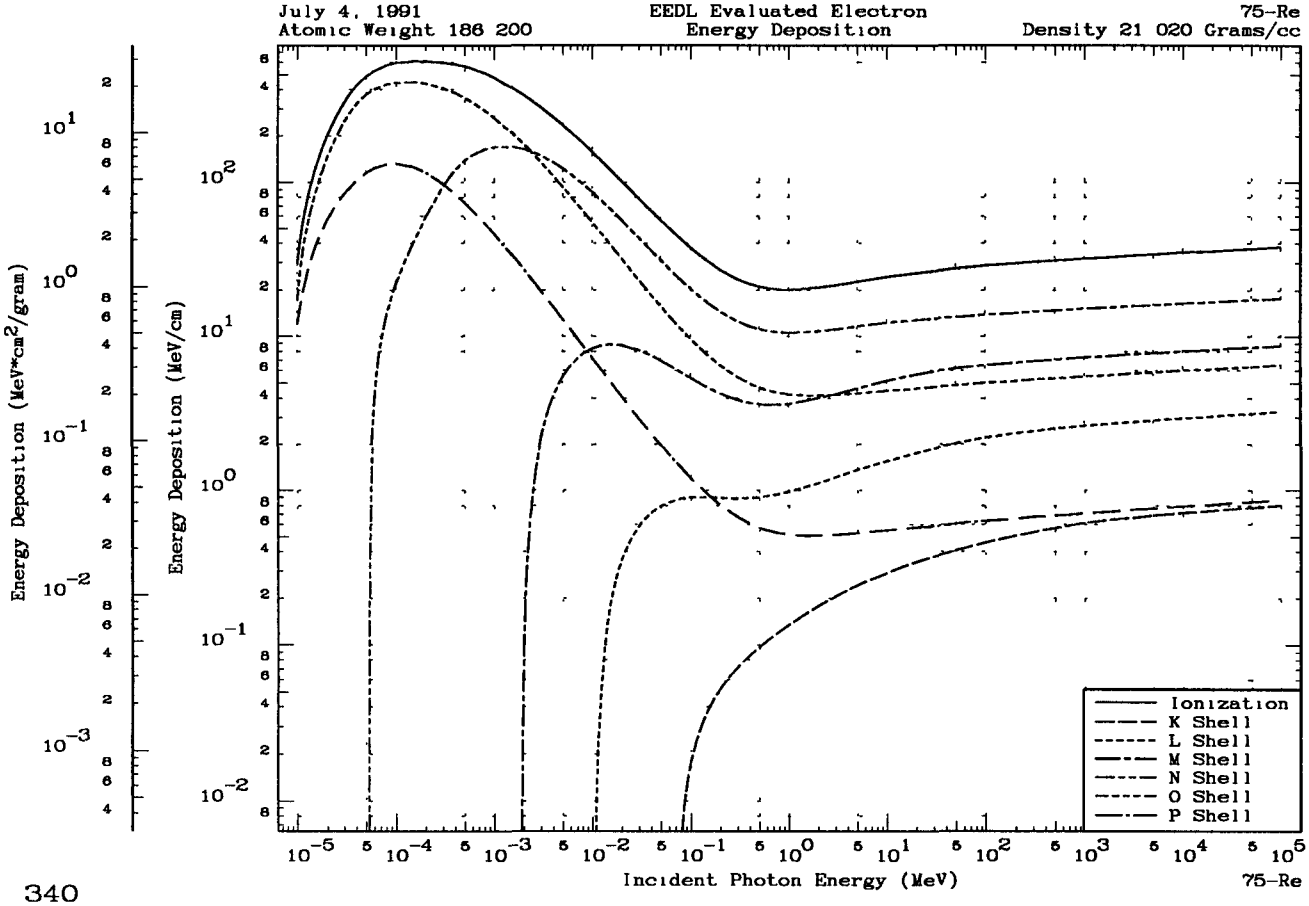
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.0000–2	3.6621–7	1.4149+5	6.5639–4	4.3194+7	2.8086+7	4.7714+6	1.0335+7	2.7889+3	5.5535+1	4.6481+1	8.3778+0	6.7634–1
K 6.9689–2	4.0523–7	1.2786+5	8.3893–4	3.9035+7	2.5594+7	4.2540+6	9.1843+6	2.5830+3	5.0695+1	4.2487+1	7.5028+0	7.0484–1
7.0978–2	4.1022–7	1.2631+5	8.6450–4	3.8560+7	2.5311+7	4.1962+6	9.0504+6	2.5590+3	5.0143+1	4.2035+1	7.4001+0	7.0833–1
7.3233–2	4.1887–7	1.2370+5	9.0990–4	3.7764+7	2.4836+7	4.0994+6	8.8262+6	2.5185+3	4.9220+1	4.1277+1	7.2284+0	7.1444–1
7.6617–2	4.3168–7	1.2003+5	9.7956–4	3.6644+7	2.4165+7	3.9636+6	8.5124+6	2.4613+3	4.7926+1	4.0214+1	6.9880+0	7.2355–1
8.0000–2	4.4429–7	1.1662+5	1.0510–3	3.5603+7	2.3540+7	3.8378+6	8.2225+6	2.4077+3	4.6729+1	3.9230+1	6.7663+0	7.3261–1
8.5000–2	4.6200–7	1.1215+5	1.1599–3	3.4239+7	2.2734+7	3.6746+6	7.8281+6	2.3365+3	4.5114+1	3.7909+1	6.4606+0	7.4461–1
9.2500–2	4.8785–7	1.0621+5	1.3302–3	3.2424+7	2.1655+7	3.4585+6	7.3093+6	2.2406+3	4.2981+1	3.6160+1	6.0589+0	7.6251–1
1.0000–1	5.1293–7	1.0102+5	1.5086–3	3.0839+7	2.0705+7	3.2706+6	6.8615+6	2.1557+3	4.1133+1	3.4640+1	5.7125+0	7.8023–1
1.1250–1	5.5068–7	9.4089+4	1.8222–3	2.8725+7	1.9458+7	3.0278+6	6.2364+6	2.0503+3	3.8615+1	3.2590+1	5.2201+0	8.0436–1
1.3125–1	6.0415–7	8.5762+4	2.3276–3	2.6182+7	1.7940+7	2.7371+6	5.5036+6	1.9202+3	3.5625+1	3.0141+1	4.6436+0	8.4077–1
1.5000–1	6.5448–7	7.9167+4	2.8719–3	2.4169+7	1.6720+7	2.5080+6	4.9387+6	1.8141+3	3.3293+1	2.8216+1	4.2002+0	8.7697–1
1.7500–1	7.1424–7	7.2543+4	3.6494–3	2.2147+7	1.5468+7	2.2952+6	4.3815+6	1.7072+3	3.1046+1	2.6374+1	3.7548+0	9.1776–1
2.0000–1	7.7023–7	6.7270+4	4.4784–3	2.0537+7	1.4460+7	2.1256+6	3.9499+6	1.6198+3	2.9283+1	2.4914+1	3.4106+0	9.5846–1
2.5000–1	8.7333–7	5.9328+4	6.2570–3	1.8112+7	1.2861+7	1.9085+6	3.3412+6	1.4965+3	2.6973+1	2.3024+1	2.9165+0	1.0326+0
3.0000–1	9.6745–7	5.3557+4	8.1698–3	1.6350+7	1.1687+7	1.7477+6	2.9141+6	1.4027+3	2.5323+1	2.1646+1	2.5712+0	1.1058+0
4.0000–1	1.1375–6	4.5551+4	1.2267–2	1.3906+7	9.9634+6	1.5639+6	2.3776+6	1.2865+3	2.3517+1	2.0136+1	2.1310+0	1.2505+0
5.0000–1	1.2843–6	4.0344+4	1.6603–2	1.2317+7	8.8019+6	1.4578+6	2.0558+6	1.2181+3	2.2615+1	1.9350+1	1.8656+0	1.3999+0
6.0000–1	1.4144–6	3.6632+4	2.1073–2	1.1183+7	7.9542+6	1.3899+6	1.8382+6	1.1751+3	2.2129+1	1.8889+1	1.6853+0	1.5544+0
8.0000–1	1.6366–6	3.1659+4	3.0166–2	9.6651+6	6.7794+6	1.3105+6	1.5741+6	1.1257+3	2.1861+1	1.8519+1	1.4666+0	1.8750+0
1.0000+0	1.8237–6	2.8411+4	3.9292–2	8.6737+6	5.9890+6	1.2673+6	1.4163+6	1.1000+3	2.1970+1	1.8425+1	1.3365+0	2.2085+0
1.5000+0	2.1943–6	2.3612+4	6.1536–2	7.2086+6	4.7811+6	1.2206+6	1.2059+6	1.0759+3	2.2993+1	1.8734+1	1.1638+0	3.0956+0
2.0000+0	2.4716–6	2.0964+4	8.2723–2	6.4000+6	4.0754+6	1.2036+6	1.1199+6	1.0697+3	2.4217+1	1.9083+1	1.0934+0	4.0409+0
3.0000+0	2.8567–6	1.8137+4	1.2198–1	5.5372+6	3.3379+6	1.1869+6	1.0113+6	1.0684+3	2.6775+1	1.9754+1	1.0109+0	6.0100+0
4.0000+0	3.0997–6	1.6716+4	1.5760–1	5.1031+6	2.9398+6	1.1850+6	9.7723+5	1.0741+3	2.9410+1	2.0327+1	9.8608–1	8.0966+0
5.0000+0	3.2771–6	1.5811+4	1.9017–1	4.8268+6	2.6926+6	1.1836+6	9.4960+5	1.0795+3	3.2040+1	2.0835+1	9.6724–1	1.0238+1
6.0000+0	3.4099–6	1.5195+4	2.2018–1	4.6389+6	2.5293+6	1.1824+6	9.2605+5	1.0848+3	3.4638+1	2.1255+1	9.5213–1	1.2431+1
8.0000+0	3.5879–6	1.4441+4	2.7403–1	4.4087+6	2.3227+6	1.1812+6	9.0371+5	1.0949+3	3.9763+1	2.1868+1	9.3652–1	1.6958+1
1.0000+1	3.6947–6	1.4024+4	3.2130–1	4.2813+6	2.2066+6	1.1818+6	8.9174+5	1.1043+3	4.4947+1	2.2389+1	9.3140–1	2.1627+1
1.5000+1	3.8002–6	1.3634+4	4.1927–1	4.1625+6	2.0954+6	1.1830+6	8.8291+5	1.1247+3	5.7654+1	2.3132+1	9.2691–1	3.3595+1
2.0000+1	3.8237–6	1.3551+4	4.9747–1	4.1369+6	2.0766+6	1.1838+6	8.7542+5	1.1398+3	7.0666+1	2.3712+1	9.2375–1	4.6030+1
3.0000+1	3.8323–6	1.3520+4	6.1779–1	4.1276+6	2.0783+6	1.1845+6	8.6363+5	1.1588+3	9.6942+1	2.4478+1	9.2059–1	7.1543+1
4.0000+1	3.8307–6	1.3526+4	7.0896–1	4.1293+6	2.0772+6	1.1849+6	8.6603+5	1.1777+3	1.2351+2	2.4935+1	9.2438–1	9.7649+1
5.0000+1	3.8297–6	1.3529+4	7.8219–1	4.1304+6	2.0764+6	1.1852+6	8.6765+5	1.1924+3	1.5048+2	2.5325+1	9.2735–1	1.2423+2
6.0000+1	3.8291–6	1.3532+4	8.4326–1	4.1311+6	2.0757+6	1.1854+6	8.6879+5	1.2044+3	1.7774+2	2.5605+1	9.2982–1	1.5121+2
8.0000+1	3.8287–6	1.3533+4	9.4129–1	4.1315+6	2.0746+6	1.1855+6	8.7007+5	1.2234+3	2.3278+2	2.6060+1	9.3367–1	2.0579+2
1.0000+2	3.8280–6	1.3535+4	1.0184+0	4.1322+6	2.0738+6	1.1857+6	8.7152+5	1.2383+3	2.8828+2	2.6462+1	9.3772–1	2.6088+2
1.5000+2	3.8212–6	1.3560+4	1.1598+0	4.1396+6	2.0723+6	1.1858+6	8.8033+5	1.2647+3	4.2802+2	2.6867+1	9.4739–1	4.0021+2
2.0000+2	3.8163–6	1.3577+4	1.2608+0	4.1448+6	2.0712+6	1.1858+6	8.8655+5	1.2802+3	5.6860+2	2.7246+1	9.5428–1	5.4040+2
3.0000+2	3.8096–6	1.3601+4	1.4037+0	4.1522+6	2.0697+6	1.1859+6	8.9530+5	1.3008+3	8.4917+2	2.7860+1	9.6408–1	8.2035+2
4.0000+2	3.8075–6	1.3608+4	1.5055+0	4.1545+6	2.0686+6	1.1859+6	8.9869+5	1.3155+3	1.1293+3	2.8213+1	9.6813–1	1.1002+3
5.0000+2	3.8071–6	1.3610+4	1.5845+0	4.1549+6	2.0678+6	1.1859+6	8.9986+5	1.3269+3	1.4114+3	2.8496+1	9.6977–1	1.3819+3
6.0000+2	3.8069–6	1.3610+4	1.6492+0	4.1551+6	2.0671+6	1.1859+6	9.0079+5	1.3364+3	1.6919+3	2.8716+1	9.7116–1	1.6622+3
8.0000+2	3.8067–6	1.3611+4	1.7511+0	4.1554+6	2.0661+6	1.1859+6	9.0206+5	1.3516+3	2.2580+3	2.9132+1	9.7331–1	2.2279+3
1.0000+3	3.8067–6	1.3611+4	1.8302+0	4.1553+6	2.0652+6	1.1859+6	9.0286+5	1.3637+3	2.8230+3	2.9468+1	9.7496–1	2.7925+3
1.5000+3	3.8081–6	1.3606+4	1.9737+0	4.1539+6	2.0637+6	1.1859+6	9.0285+5	1.3860+3	4.2428+3	2.9790+1	9.7496–1	4.2120+3
2.0000+3	3.8101–6	1.3599+4	2.0754+0	4.1517+6	2.0626+6	1.1859+6	9.0172+5	1.4026+3	5.6544+3	3.0110+1	9.7375–1	5.6233+3
3.0000+3	3.8126–6	1.3590+4	2.2188+0	4.1490+6	2.0611+6	1.1859+6	9.0047+5	1.4266+3	8.4825+3	3.0715+1	9.7243–1	8.4508+3
4.0000+3	3.8149–6	1.3582+4	2.3206+0	4.1464+6	2.0601+6	1.1859+6	8.9899+5	1.4442+3	1.1312+4	3.1007+1	9.7085–1	1.1280+4
5.0000+3	3.8183–6	1.3570+4	2.3994+0	4.1427+6	2.0592+6	1.1859+6	8.9610+5	1.4580+3	1.4170+4	3.1279+1	9.6775–1	1.4138+4
6.0000+3	3.8188–6	1.3568+4	2.4637+0	4.1422+6	2.0586+6	1.1859+6	8.9625+5	1.4681+3	1.6982+4	3.1484+1	9.6794–1	1.6949+4
8.0000+3	3.8202–6	1.3563+4	2.5654+0	4.1406+6	2.0575+6	1.1859+6	8.9574+5	1.4841+3	2.2654+4	3.1885+1	9.6743–1	2.2621+4
1.0000+4	3.8214–6	1.3559+4	2.6441+0	4.1393+6	2.0567+6	1.1859+6	8.9523+5	1.4967+3	2.8379+4	3.2245+1	9.6693–1	2.8346+4
1.5000+4	3.8233–6	1.3552+4	2.7872+0	4.1373+6	2.0552+6	1.1859+6	8.9471+5	1.5209+3	4.2426+4	3.2545+1	9.6636–1	4.2393+4
2.0000+4	3.8252–6	1.3545+4	2.8888+0	4.1353+6	2.0541+6	1.1859+6	8.9371+5	1.5383+3	5.6656+4	3.2845+1	9.6528–1	5.6622+4
3.0000+4	3.8269–6	1.3539+4	3.0321+0	4.1334+6	2.0526+6	1.1859+6	8.9330+5	1.5628+3	8.4793+4	3.3446+1	9.6484–1	8.4759+4
4.0000+4	3.8287–6	1.3533+4	3.1338+0	4.1315+6	2.0515+6	1.1859+6	8.9242+5	1.5803+3	1.1323+5	3.3769+1	9.6389–1	1.1320+5
5.0000+4	3.8319–6	1.3522+4	3.2127+0	4.1280+6	2.0507+6	1.1859+6	8.8978+5	1.5938+3	1.4141+5	3.4042+1	9.6105–1	1.4137+5
6.0000+4	3.8319–6	1.3522+4	3.2772+0	4.1280+6	2.0501+6	1.1859+6	8.9043+5	1.6048+3	1.6956+5	3.4239+1	9.6174–1	1.6953+5
8.0000+4	3.8330–6	1.3518+4	3.3789+0	4.1268+6	2.0490+6	1.1859+6	8.9031+5	1.6223+3	2.2636+5	3.4633+1	9.6162–1	2.2632+5
1.0000+5	3.8340–6	1.3514+4	3.4577+0	4.1258+6	2.0482+6	1.1859+6	8.9007+5	1.6359+3	2.8325+5	3.4997+1	9.6136–1	2.8322+5


July 4, 1991
Atomic Weight 186.200
EEDL Evaluated Electron
Cross Sections
75-Re
Density 21.020 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
75-Re


July 4, 1991
Atomic Weight 186.200
EEDL Evaluated Electron
Energy Deposition
75-Re
Density 21.020 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
75-Re

339


July 4 1991
Atomic Weight 186 200
EEDL Evaluated Electron
Shell Cross Sections
75-Re
Density 21 020 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
75-Re


July 4, 1991
Atomic Weight 186 200
EEDL Evaluated Electron
Energy Deposition
75-Re
Density 21 020 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
75-Re

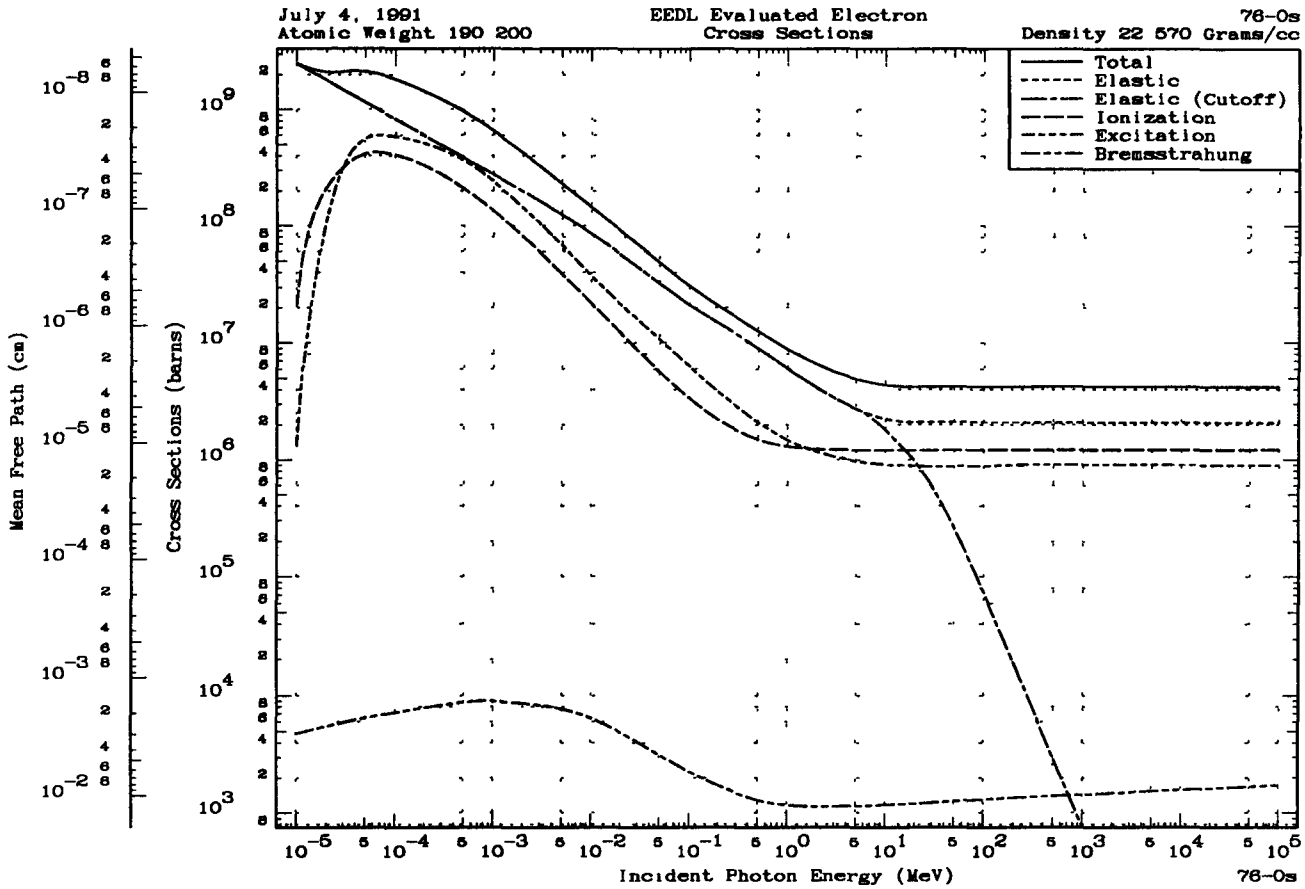
Atomic Weight 186.200 Density 21.020 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	5.6472–9	8.4243+6		2.6047+9	2.5526+9	4.8967+7	3.1166+6	4.7446+3	3.1065+1	2.9258+1	1.8065+0	6.9715–4
1.0625–5	5.7643–9	8.2531+6		2.5518+9	2.4789+9	6.7308+7	5.5539+6	4.8033+3	4.4382+1	4.1114+1	3.2673+0	7.3912–4
1.1250–5	5.8734–9	8.0998+6		2.5044+9	2.4114+9	8.4462+7	8.5620+6	4.8593+3	5.7662+1	5.2550+1	5.1108+0	7.8146–4
1.1719–5	5.9478–9	7.9986+6		2.4731+9	2.3643+9	9.7772+7	1.1053+7	4.8997+3	6.8376+1	6.1706+1	6.6691+0	8.1347–4
1.3125–5	6.1493–9	7.7365+6		2.3921+9	2.2383+9	1.3285+8	2.0952+7	5.0136+3	1.0014+2	8.7088+1	1.3049+1	9.1068–4
1.3359–5	6.1774–9	7.7013+6		2.3812+9	2.2192+9	1.3882+8	2.3149+7	5.0317+3	1.0605+2	9.1561+1	1.4492+1	9.2702–4
1.5000–5	6.3545–9	7.4866+6		2.3148+9	2.0984+9	1.7505+8	4.1377+7	5.1513+3	1.4671+2	1.2022+2	2.6490+1	1.0429–3
1.7500–5	6.5325–9	7.2826+6		2.2517+9	1.9477+9	2.2273+8	8.1276+7	5.3149+3	2.1474+2	1.6161+2	5.3123+1	1.2236–3
2.0000–5	6.6182–9	7.1884+6		2.2226+9	1.8260+9	2.6336+8	1.3324+8	5.4608+3	2.9013+2	2.0126+2	8.8875+1	1.4088–3
2.5000–5	6.6327–9	7.1726+6		2.2177+9	1.6393+9	3.2696+8	2.5145+8	5.6843+3	4.4329+2	2.7299+2	1.7029+2	1.7588–3
3.0000–5	6.5754–9	7.2351+6		2.2371+9	1.5010+9	3.7262+8	3.6340+8	5.8737+3	5.8505+2	3.3522+2	2.4983+2	2.1194–3
3.5000–5	6.5275–9	7.2882+6		2.2535+9	1.3935+9	4.0433+8	4.5564+8	6.0366+3	7.0041+2	3.8567+2	3.1474+2	2.4867–3
4.0000–5	6.5220–9	7.2944+6		2.2554+9	1.3066+9	4.2674+8	5.2202+8	6.1814+3	7.9233+2	4.3001+2	3.6231+2	2.8622–3
O3 4.9400–5	6.6154–9	7.1914+6		2.2235+9	1.1802+9	4.4617+8	5.9714+8	6.4000+3	9.0146+2	4.8513+2	4.1633+2	3.5575–3
5.0000–5	6.6227–9	7.1834+6		2.2211+9	1.1734+9	4.4738+8	6.0029+8	6.4122+3	9.0753+2	4.8888+2	4.1865+2	3.6016–3
N7 5.2990–5	6.6709–9	7.1316+6		2.2050+9	1.1410+9	4.4876+8	6.1528+8	6.4713+3	9.2965+2	4.9991+2	4.2974+2	3.8228–3
5.3438–5	6.6804–9	7.1214+6		2.2019+9	1.1364+9	4.4906+8	6.1643+8	6.4799+3	9.3254+2	5.0190+2	4.3064+2	3.8560–3
5.3866–5	6.6897–9	7.1115+6		2.1988+9	1.1320+9	4.4929+8	6.1753+8	6.4881+3	9.3511+2	5.0360+2	4.3150+2	3.8879–3
5.5400–5	6.7219–9	7.0774+6		2.1883+9	1.1168+9	4.5010+8	6.2140+8	6.5169+3	9.4429+2	5.0975+2	4.3453+2	4.0023–3
N6 5.5640–5	6.7268–9	7.0723+6		2.1867+9	1.1145+9	4.5022+8	6.2200+8	6.5214+3	9.4571+2	5.1070+2	4.3500+2	4.0202–3
5.6730–5	6.7488–9	7.0493+6		2.1796+9	1.1041+9	4.5087+8	6.2462+8	6.5414+3	9.5245+2	5.1537+2	4.3708+2	4.1018–3
5.7700–5	6.7677–9	7.0296+6		2.1735+9	1.0951+9	4.5146+8	6.2691+8	6.5589+3	9.5852+2	5.1962+2	4.3890+2	4.1746–3
5.8365–5	6.7804–9	7.0164+6		2.1694+9	1.0891+9	4.5187+8	6.2847+8	6.5708+3	9.6270+2	5.2255+2	4.4014+2	4.2246–3
6.0000–5	6.8106–9	6.9853+6		2.1598+9	1.0747+9	4.5287+8	6.3224+8	6.5996+3	9.7293+2	5.2978+2	4.4315+2	4.3479–3
O2 6.0970–5	6.8312–9	6.9641+6		2.1533+9	1.0664+9	4.5229+8	6.3456+8	6.6163+3	9.7672+2	5.3183+2	4.4488+2	4.4213–3
6.2159–5	6.8640–9	6.9310+6		2.1430+9	1.0565+9	4.5167+8	6.3481+8	6.6365+3	9.7983+2	5.3463+2	4.4519+2	4.5115–3
6.2500–5	6.8732–9	6.9216+6		2.1401+9	1.0537+9	4.5150+8	6.3488+8	6.6423+3	9.8073+2	5.3544+2	4.4528+2	4.5374–3
6.4389–5	6.9236–9	6.8712+6		2.1245+9	1.0387+9	4.5055+8	6.3525+8	6.6736+3	9.8568+2	5.3990+2	4.4577+2	4.6812–3
6.5000–5	6.9396–9	6.8554+6		2.1196+9	1.0340+9	4.5026+8	6.3537+8	6.6835+3	9.8730+2	5.4138+2	4.4592+2	4.7279–3
6.6875–5	6.9877–9	6.8082+6		2.1051+9	1.0199+9	4.4939+8	6.3573+8	6.7136+3	9.9230+2	5.4590+2	4.4640+2	4.8714–3
6.8292–5	7.0231–9	6.7739+6		2.0944+9	1.0097+9	4.4876+8	6.3600+8	6.7359+3	9.9613+2	5.4937+2	4.4675+2	4.9803–3
6.8750–5	7.0344–9	6.7630+6		2.0911+9	1.0064+9	4.4856+8	6.3608+8	6.7430+3	9.9736+2	5.5050+2	4.4686+2	5.0156–3
7.0000–5	7.0649–9	6.7338+6		2.0821+9	9.9772+8	4.4801+8	6.3631+8	6.7622+3	1.0007+3	5.5349+2	4.4717+2	5.1120–3
7.3438–5	7.1463–9	6.6571+6		2.0583+9	9.7493+8	4.4647+8	6.3692+8	6.8137+3	1.0094+3	5.6144+2	4.4800+2	5.3783–3
8.0000–5	7.2909–9	6.5251+6		2.0175+9	9.3553+8	4.4397+8	6.3800+8	6.9064+3	1.0270+3	5.7751+2	4.4954+2	5.8918–3
9.0000–5	7.5504–9	6.3009+6		1.9482+9	8.8391+8	4.3416+8	6.3010+8	7.0335+3	1.0328+3	5.8757+2	4.4527+2	6.6831–3
O1 9.1570–5	7.5888–9	6.2689+6		1.9383+9	8.7657+8	4.3278+8	6.2895+8	7.0523+3	1.0340+3	5.8933+2	4.4466+2	6.8085–3
9.2624–5	7.6146–9	6.2477+6		1.9318+9	8.7175+8	4.3185+8	6.2815+8	7.0638+3	1.0347+3	5.9046+2	4.4424+2	6.8918–3
9.4468–5	7.6590–9	6.2115+6		1.9205+9	8.6351+8	4.3025+8	6.2677+8	7.0835+3	1.0360+3	5.9249+2	4.4352+2	7.0378–3
9.7234–5	7.7243–9	6.1589+6		1.9043+9	8.5158+8	4.2796+8	6.2476+8	7.1126+3	1.0381+3	5.9566+2	4.4248+2	7.2574–3
1.0000–4	7.7881–9	6.1086+6	0.0000+0	1.8887+9	8.4015+8	4.2576+8	6.2281+8	7.1409+3	1.0404+3	5.9895+2	4.4149+2	7.4779–3
1.0625–4	7.9495–9	5.9845+6	6.0176–9	1.8504+9	8.1609+8	4.1821+8	6.1605+8	7.2025+3	1.0368+3	5.9959+2	4.3718+2	7.9790–3
1.1250–4	8.1039–9	5.8705+6	1.2054–8	1.8151+9	7.9404+8	4.1130+8	6.0975+8	7.2611+3	1.0341+3	6.0095+2	4.3319+2	8.4840–3
1.1719–4	8.2158–9	5.7905+6	1.6591–8	1.7904+9	7.7865+8	4.0643+8	6.0529+8	7.3033+3	1.0325+3	6.0209+2	4.3037+2	8.8653–3
1.2500–4	8.3950–9	5.6669+6	2.4164–8	1.7522+9	7.5494+8	3.9891+8	5.9831+8	7.3704+3	1.0306+3	6.0462+2	4.2599+2	9.5051–3
1.3125–4	8.5326–9	5.5755+6	3.0231–8	1.7239+9	7.3749+8	3.9334+8	5.9308+8	7.4215+3	1.0297+3	6.0694+2	4.2274+2	1.0021–2
1.3359–4	8.5830–9	5.5428+6	3.2507–8	1.7138+9	7.3126+8	3.9132+8	5.9120+8	7.4402+3	1.0294+3	6.0780+2	4.2157+2	1.0215–2
1.5000–4	8.9185–9	5.3342+6	4.8447–8	1.6493+9	6.9178+8	3.7852+8	5.7901+8	7.5633+3	1.0292+3	6.1513+2	4.1407+2	1.1588–2
1.7500–4	9.4533–9	5.0325+6	7.2946–8	1.5560+9	6.4252+8	3.5649+8	5.5700+8	7.7231+3	1.0117+3	6.1211+2	3.9955+2	1.3739–2
2.0000–4	9.9378–9	4.7871+6	9.7781–8	1.4801+9	6.0269+8	3.3884+8	5.3862+8	7.8642+3	1.0017+3	6.1415+2	3.8753+2	1.5932–2
2.5000–4	1.0889–8	4.3689+6	1.4855–7	1.3508+9	5.4157+8	3.0569+8	5.0356+8	8.0764+3	9.6828+2	6.0430+2	3.6396+2	2.0517–2
N5 2.6454–4	1.1142–8	4.2696+6	1.6361–7	1.3201+9	5.2709+8	2.9799+8	4.9505+8	8.1310+3	9.6225+2	6.0395+2	3.5828+2	2.1873–2
2.6897–4	1.1221–8	4.2397+6	1.6822–7	1.3109+9	5.2291+8	2.9562+8	4.9235+8	8.1471+3	9.5985+2	6.0337+2	3.5645+2	2.2288–2
2.7673–4	1.1356–8	4.1891+6	1.7632–7	1.2953+9	5.1583+8	2.9164+8	4.8777+8	8.1748+3	9.5593+2	6.0256+2	3.5335+2	2.3016–2
N4 2.7826–4	1.1383–8	4.1794+6	1.7792–7	1.2922+9	5.1447+8	2.9087+8	4.8688+8	8.1802+3	9.5520+2	6.0241+2	3.5275+2	2.3160–2
2.8370–4	1.1477–8	4.1452+6	1.8362–7	1.2817+9	5.0972+8	2.8821+8	4.8372+8	8.1991+3	9.5273+2	6.0208+2	3.5063+2	2.3672–2
2.8837–4	1.1556–8	4.1166+6	1.8853–7	1.2728+9	5.0575+8	2.8599+8	4.8107+8	8.2151+3	9.5077+2	6.0191+2	3.4884+2	2.4113–2
2.9185–4	1.1615–8	4.0957+6	1.9219–7	1.2664+9	5.0285+8	2.8438+8	4.7913+8	8.2268+3	9.4938+2	6.0182+2	3.4754+2	2.4442–2
3.0000–4	1.1752–8	4.0482+6	2.0079–7	1.2517+9	4.9626+8	2.8071+8	4.7471+8	8.2539+3	9.4637+2	6.0178+2	3.4457+2	2.5215–2
3.2500–4	1.2187–8	3.9036+6	2.2744–7	1.2070+9	4.7771+8	2.6891+8	4.6034+8	8.3308+3	9.3010+2	5.9539+2	3.3468+2	2.7615–2
3.4375–4	1.2501–8	3.8056+6	2.4771–7	1.1767+9	4.6513+8	2.6100+8	4.5052+8	8.3850+3	9.1984+2	5.9187+2	3.2795+2	2.9430–2
3.5000–4	1.2603–8	3.7747+6	2.5452–7	1.1671+9	4.6115+8	2.5853+8	4.4742+8	8.4025+3	9.1677+2	5.9092+2	3.2582+2	3.0037–2
3.6250–4	1.2805–8	3.7151+6	2.6820–7	1.1487+9	4.5352+8	2.5374+8	4.4143+8	8.4367+3	9.1080+2	5.8904+2	3.2172+2	3.1256–2
3.7188–4	1.2954–8	3.6724+6	2.7851–7	1.1355+9	4.4804+8	2.5033+8	4.3712+8	8.4617+3	9.0666+2	5.8785+2	3.1878+2	3.2173–2
4.0000–4	1.3388–8	3.5534+6	3.0972–7	1.0987+9	4.3276+8	2.4088+8	4.2505+8	8.5334+3	8.9598+2	5.8540+2	3.1054+2	3.4941–2
N3 4.4259–4	1.4061–8	3.3833+6	3.5787–7	1.0461+9	4.1245+8	2.2710+8	4.0653+8	8.6160+3	8.7292+2	5.7526+2	2.9762+2	3.9292–2
4.4977–4	1.4174–8	3.3564+6	3.6611–7	1.0378+9	4.0931+8	2.2499+8	4.0345+8	8.6292+3	8.6943+2	5.7390+2	2.9548+2	4.0030–2
4.6233–4	1.4369–8	3.3108+6	3.8061–7	1.0237+9	4.0399+8	2.2144+8	3.9823+8	8.6518+3	8.6364+2	5.7174+2	2.9186+2	4.1323–2
4.8116–4	1.4657–8	3.2459+6	4.0252–7	1.0036+9	3.9640+8	2.1641+8	3.9079+8	8.6848+3	8.5569+2	5.6895+2	2.8670+2	4.3269–2
5.0000–4	1.4938–8	3.1847+6	4.2462–7	9.8469+8	3.8923+8	2.1169+8	3.8376+8	8.7166+3	8.4852+2	5.6664+2	2.8183+2	4.5223–2
N2 5.1683–4	1.5195–8	3.1309+6	4.4456–7	9.6806+8	3.8315+8	2.0740+8	3.7749+8	8.7441+3	8.3996+2	5.6249+2	2.7743+2	4.6975–2
5.2203–4	1.5275–8	3.1145+6	4.5076–7	9.6297+8	3.8134+8	2.0612+8	3.7550+8	8.7509+3	8.3737+2	5.6130+2	2.7602+2	4.7513–2
5.3177–4	1.5425–8	3.0842+6	4.6243–7	9.5362+8	3.7800+8	2.0379+8	3.7183+8	8.7634+3	8.3268+2	5.5917+2	2.7345+2	4.8521–2
5.4883–4	1.5683–8	3.0334+6	4.8301–7	9.3790+8	3.7237+8	1.9987+8	3.6565+8	8.7849+3	8.2491+2	5.5573+2	2.6913+2	5.0290–2
5.5000–4	1.5701–8	3.0300+6	4.8443–7	9.3685+8	3.7200+8	1.9961+8	3.6524+8	8.7863+3	8.2440+2	5.5551+2	2.6884+2	5.0411–2
5.7442–4	1.6064–8	2.9615+6	5.1423–7	9.1568+8	3.6440+8	1.9436+8	3.5692+8	8.8159+3	8.1420+2	5.5114+2	2.6302+2	5.2951–2
6.0000–4	1.6436–8	2.8945+6	5.4584–7	8.9495+8	3.5693+8	1.8925+8	3.4876+8	8.8457+3	8.0458+2	5.4721+2	2.5731+2	5.5622–2
N1 6.1583–4	1.6673–8	2.8534+6	5.6561–7	8.8225+8	3.5254+8	1.8608+8	3.4362+8	8.8603+3	7.9700+2	5.4328+2	2.5366+2	5.7267–2
6.2734–4	1.6851–8	2.8232+6	5.8010–7	8.7291+8	3.4945+8	1.8383+8	3.3962+8	8.8675+3	7.9136+2	5.4048+2	2.5082+2	5.8413–2
6.4892–4	1.7181–8	2.7689+6	6.0755–7	8.5613+8	3.4388+8	1.7980+8	3.3244+8	8.8807+3	7.8134+2	5.3557+2	2.4571+2	6.0564–2

Atomic Weight 186.200 Density 21.020 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.5000–4	1.7198–8	2.7663+6	6.0893–7	8.5532+8	3.4361+8	1.7960+8	3.3210+8	8.8814+3	7.8086+2	5.3533+2	2.4546+2	6.0671–2
6.8669–4	1.7748–8	2.6806+6	6.5639–7	8.2881+8	3.3476+8	1.7327+8	3.2078+8	8.9029+3	7.6540+2	5.2792+2	2.3742+2	6.4337–2
7.0000–4	1.7944–8	2.6513+6	6.7383–7	8.1975+8	3.3172+8	1.7111+8	3.1691+8	8.9104+3	7.6022+2	5.2548+2	2.3467+2	6.5668–2
7.2500–4	1.8308–8	2.5985+6	7.0692–7	8.0345+8	3.2624+8	1.6724+8	3.0996+8	8.9242+3	7.5095+2	5.2114+2	2.2974+2	6.8173–2
7.4335–4	1.8571–8	2.5617+6	7.3146–7	7.9205+8	3.2239+8	1.6455+8	3.0511+8	8.9340+3	7.4456+2	5.1820+2	2.2629+2	7.0013–2
8.0000–4	1.9367–8	2.4564+6	8.0846–7	7.5951+8	3.1133+8	1.5689+8	2.9128+8	8.9630+3	7.2691+2	5.1034+2	2.1649+2	7.5708–2
9.0000–4	2.0759–8	2.2917+6	9.4936–7	7.0859+8	2.9438+8	1.4470+8	2.6949+8	8.9525+3	6.9287+2	4.9189+2	2.0089+2	8.4304–2
1.0000–3	2.2084–8	2.1542+6	1.0966–6	6.6606+8	2.8001+8	1.3466+8	2.5138+8	8.9432+3	6.6572+2	4.7768+2	1.8795+2	9.2891–2
1.1250–3	2.3707–8	2.0067+6	1.2895–6	6.2046+8	2.6473+8	1.2363+8	2.3209+8	8.8762+3	6.3034+2	4.5621+2	1.7403+2	1.0151–1
1.2500–3	2.5255–8	1.8838+6	1.4925–6	5.8244+8	2.5177+8	1.1457+8	2.1609+8	8.8168+3	6.0179+2	4.3918+2	1.6250+2	1.1008–1
1.3125–3	2.6004–8	1.8295+6	1.5974–6	5.6567+8	2.4599+8	1.1061+8	2.0906+8	8.7894+3	5.8936+2	4.3181+2	1.5744+2	1.1435–1
1.5000–3	2.8163–8	1.6892+6	1.9243–6	5.2229+8	2.3083+8	1.0049+8	1.9096+8	8.7148+3	5.5818+2	4.1362+2	1.4443+2	1.2709–1
1.7500–3	3.0949–8	1.5372+6	2.3893–6	4.7528+8	2.1422+8	8.9405+7	1.7164+8	8.6155+3	5.1757+2	3.8704+2	1.3039+2	1.4254–1
M5 1.8927–3	3.2465–8	1.4654+6	2.6701–6	4.5309+8	2.0624+8	8.4260+7	1.6258+8	8.5654+3	4.9899+2	3.7502+2	1.2382+2	1.5129–1
1.9195–3	3.2747–8	1.4527+6	2.7240–6	4.4918+8	2.0483+8	8.3361+7	1.6098+8	8.5565+3	4.9574+2	3.7294+2	1.2265+2	1.5293–1
1.9598–3	3.3169–8	1.4343+6	2.8056–6	4.4348+8	2.0277+8	8.2052+7	1.5864+8	8.5433+3	4.9103+2	3.6992+2	1.2096+2	1.5539–1
M4 1.9618–3	3.3190–8	1.4334+6	2.8097–6	4.4319+8	2.0267+8	8.1987+7	1.5853+8	8.5426+3	4.9080+2	3.6977+2	1.2087+2	1.5552–1
1.9809–3	3.3394–8	1.4246+6	2.8487–6	4.4048+8	2.0171+8	8.1384+7	1.5737+8	8.5365+3	4.8859+2	3.6839+2	1.2004+2	1.5668–1
2.0000–3	3.3598–8	1.4160+6	2.8879–6	4.3781+8	2.0077+8	8.0791+7	1.5624+8	8.5304+3	4.8642+2	3.6705+2	1.1922+2	1.5785–1
2.0156–3	3.3767–8	1.4089+6	2.9201–6	4.3562+8	1.9998+8	8.0302+7	1.5533+8	8.5249+3	4.8440+2	3.6569+2	1.1855+2	1.5876–1
2.0464–3	3.4098–8	1.3952+6	2.9838–6	4.3138+8	1.9845+8	7.9358+7	1.5357+8	8.5142+3	4.8051+2	3.6310+2	1.1726+2	1.6055–1
2.0625–3	3.4271–8	1.3882+6	3.0174–6	4.2921+8	1.9766+8	7.8873+7	1.5267+8	8.5086+3	4.7852+2	3.6177+2	1.1659+2	1.6148–1
2.1060–3	3.4734–8	1.3696+6	3.1088–6	4.2348+8	1.9558+8	7.7599+7	1.5030+8	8.4939+3	4.7328+2	3.5827+2	1.1485+2	1.6401–1
2.2177–3	3.5909–8	1.3248+6	3.3481–6	4.0963+8	1.9052+8	7.4533+7	1.4458+8	8.4575+3	4.6076+2	3.4994+2	1.1065+2	1.7047–1
2.2969–3	3.6727–8	1.2953+6	3.5214–6	4.0051+8	1.8716+8	7.2525+7	1.4082+8	8.4329+3	4.5262+2	3.4456+2	1.0789+2	1.7504–1
M3 2.3605–3	3.7376–8	1.2728+6	3.6629–6	3.9355+8	1.8458+8	7.0999+7	1.3796+8	8.4138+3	4.4644+2	3.4047+2	1.0579+2	1.7871–1
2.4005–3	3.7786–8	1.2590+6	3.7529–6	3.8929+8	1.8300+8	7.0065+7	1.3621+8	8.3993+3	4.4247+2	3.3779+2	1.0450+2	1.8077–1
2.4133–3	3.7916–8	1.2547+6	3.7819–6	3.8794+8	1.8250+8	6.9771+7	1.3566+8	8.3948+3	4.4123+2	3.3695+2	1.0410+2	1.8143–1
2.4754–3	3.8546–8	1.2342+6	3.9236–6	3.8161+8	1.8015+8	6.8388+7	1.3307+8	8.3729+3	4.3537+2	3.3299+2	1.0220+2	1.8464–1
2.6066–3	3.9855–8	1.1937+6	4.2289–6	3.6908+8	1.7545+8	6.5664+7	1.2795+8	8.3288+3	4.2391+2	3.2528+2	9.8442+1	1.9138–1
2.6484–3	4.0267–8	1.1814+6	4.3281–6	3.6530+8	1.7403+8	6.4846+7	1.2642+8	8.3152+3	4.2049+2	3.2298+2	9.7313+1	1.9353–1
M2 2.6774–3	4.0551–8	1.1732+6	4.3972–6	3.6274+8	1.7306+8	6.4294+7	1.2537+8	8.3059+3	4.1817+2	3.2143+2	9.6550+1	1.9501–1
2.7066–3	4.0839–8	1.1649+6	4.4673–6	3.6018+8	1.7209+8	6.3741+7	1.2434+8	8.2967+3	4.1575+2	3.1977+2	9.5787+1	1.9651–1
2.7177–3	4.0948–8	1.1618+6	4.4940–6	3.5922+8	1.7173+8	6.3534+7	1.2395+8	8.2932+3	4.1485+2	3.1915+2	9.5503+1	1.9708–1
2.7883–3	4.1636–8	1.1426+6	4.6652–6	3.5328+8	1.6948+8	6.2253+7	1.2155+8	8.2715+3	4.0924+2	3.1530+2	9.3734+1	2.0068–1
2.8033–3	4.1782–8	1.1386+6	4.7019–6	3.5205+8	1.6901+8	6.1988+7	1.2105+8	8.2669+3	4.0808+2	3.1451+2	9.3368+1	2.0145–1
2.8942–3	4.2657–8	1.1153+6	4.9265–6	3.4483+8	1.6625+8	6.0437+7	1.1813+8	8.2399+3	4.0132+2	3.0989+2	9.1224+1	2.0608–1
M1 2.9116–3	4.2824–8	1.1109+6	4.9700–6	3.4348+8	1.6573+8	6.0150+7	1.1759+8	8.2349+3	4.0007+2	3.0904+2	9.0827+1	2.0697–1
2.9558–3	4.3247–8	1.1000+6	5.0809–6	3.4013+8	1.6445+8	5.9435+7	1.1623+8	8.2222+3	3.9697+2	3.0693+2	8.9831+1	2.0922–1
3.0000–3	4.3668–8	1.0895+6	5.1927–6	3.3685+8	1.6320+8	5.8739+7	1.1491+8	8.2097+3	3.9397+2	3.0489+2	8.8861+1	2.1146–1
3.1250–3	4.4855–8	1.0606+6	5.5137–6	3.2793+8	1.5975+8	5.6824+7	1.1136+8	8.1637+3	3.8482+2	2.9838+2	8.6224+1	2.1699–1
3.2500–3	4.6025–8	1.0337+6	5.8422–6	3.1960+8	1.5650+8	5.5044+7	1.0805+8	8.1198+3	3.7636+2	2.9237+2	8.3768+1	2.2250–1
3.3437–3	4.6891–8	1.0146+6	6.0933–6	3.1369+8	1.5419+8	5.3789+7	1.0571+8	8.0881+3	3.7038+2	2.8812+2	8.2034+1	2.2662–1
3.6250–3	4.9438–8	9.6230+5	6.8696–6	2.9754+8	1.4781+8	5.0381+7	9.9341+7	7.9987+3	3.5426+2	2.7671+2	7.7313+1	2.3891–1
3.6719–3	4.9855–8	9.5424+5	7.0024–6	2.9504+8	1.4681+8	4.9860+7	9.8364+7	7.9846+3	3.5179+2	2.7496+2	7.6589+1	2.4095–1
4.0000–3	5.2721–8	9.0238+5	7.9566–6	2.7901+8	1.4038+8	4.6523+7	9.2096+7	7.8911+3	3.3609+2	2.6389+2	7.1947+1	2.5517–1
4.5000–3	5.7059–8	8.3377+5	9.4967–6	2.5780+8	1.3179+8	4.2211+7	8.3791+7	7.7308+3	3.1347+2	2.4746+2	6.5733+1	2.7408–1
5.0000–3	6.1226–8	7.7701+5	1.1140–5	2.4025+8	1.2454+8	3.8698+7	7.6999+7	7.5902+3	2.9510+2	2.3415+2	6.0657+1	2.9275–1
5.5000–3	6.5327–8	7.2824+5	1.2884–5	2.2517+8	1.1826+8	3.5732+7	7.1165+7	7.4438+3	2.7853+2	2.2196+2	5.6259+1	3.0944–1
6.0000–3	6.9299–8	6.8650+5	1.4726–5	2.1226+8	1.1280+8	3.3226+7	6.6226+7	7.3126+3	2.6460+2	2.1174+2	5.2540+1	3.2593–1
7.0000–3	7.6993–8	6.1790+5	1.8691–5	1.9105+8	1.0364+8	2.9174+7	5.8225+7	7.0213+3	2.4012+2	1.9330+2	4.6462+1	3.5234–1
8.0000–3	8.4311–8	5.6427+5	2.3027–5	1.7447+8	9.6312+7	2.6068+7	5.2080+7	6.7784+3	2.2141+2	1.7924+2	4.1799+1	3.7817–1
1.0000–2	9.8351–8	4.8371+5	3.2719–5	1.4956+8	8.4880+7	2.1556+7	4.3117+7	6.3257+3	1.9201+2	1.5666+2	3.4931+1	4.2037–1
L3 1.0538–2	1.0199–7	4.6645+5	3.5570–5	1.4422+8	8.2363+7	2.0611+7	4.1244+7	6.2097+3	1.8546+2	1.5155+2	3.3480+1	4.2963–1
1.0817–2	1.0386–7	4.5808+5	3.7087–5	1.4163+8	8.1136+7	2.0155+7	4.0337+7	6.1522+3	1.8231+2	1.4910+2	3.2778+1	4.3434–1
1.1340–2	1.0731–7	4.4334+5	3.9999–5	1.3708+8	7.8965+7	1.9357+7	3.8748+7	6.0498+3	1.7679+2	1.4480+2	3.1548+1	4.4312–1
L2 1.1993–2	1.1155–7	4.2649+5	4.3761–5	1.3187+8	7.6465+7	1.8452+7	3.6944+7	5.9304+3	1.7054+2	1.3993+2	3.0152+1	4.5398–1
1.2255–2	1.1323–7	4.2017+5	4.5306–5	1.2991+8	7.5522+7	1.8114+7	3.6270+7	5.8804+3	1.6820+2	1.3812+2	2.9629+1	4.5758–1
1.2369–2	1.1395–7	4.1748+5	4.5987–5	1.2908+8	7.5121+7	1.7971+7	3.5984+7	5.8590+3	1.6721+2	1.3735+2	2.9408+1	4.5915–1
L1 1.2508–2	1.1484–7	4.1427+5	4.6822–5	1.2809+8	7.4640+7	1.7800+7	3.5642+7	5.8333+3	1.6603+2	1.3643+2	2.9143+1	4.6106–1
1.2664–2	1.1584–7	4.1070+5	4.7764–5	1.2699+8	7.4103+7	1.7612+7	3.5266+7	5.8050+3	1.6466+2	1.3535+2	2.8850+1	4.6319–1
1.3027–2	1.1814–7	4.0269+5	4.9989–5	1.2451+8	7.2892+7	1.7190+7	3.4422+7	5.7410+3	1.6159+2	1.3292+2	2.8194+1	4.6814–1
1.3248–2	1.1953–7	3.9799+5	5.1365–5	1.2306+8	7.2180+7	1.6943+7	3.3929+7	5.7031+3	1.5979+2	1.3151+2	2.7811+1	4.7115–1
1.3627–2	1.2191–7	3.9024+5	5.3762–5	1.2066+8	7.1000+7	1.6537+7	3.3117+7	5.6402+3	1.5684+2	1.2919+2	2.7180+1	4.7630–1
1.4013–2	1.2430–7	3.8273+5	5.6245–5	1.1834+8	6.9853+7	1.6145+7	3.2333+7	5.5787+3	1.5400+2	1.2694+2	2.6571+1	4.8150–1
1.4124–2	1.2498–7	3.8064+5	5.6965–5	1.1769+8	6.9534+7	1.6036+7	3.2116+7	5.5615+3	1.5321+2	1.2632+2	2.6402+1	4.8299–1
1.5000–2	1.3032–7	3.6505+5	6.2796–5	1.1287+8	6.7136+7	1.5229+7	3.0501+7	5.4316+3	1.4735+2	1.2171+2	2.5148+1	4.9469–1
1.6250–2	1.3793–7	3.4491+5	7.1512–5	1.0664+8	6.4008+7	1.4222+7	2.8410+7	5.2502+3	1.3954+2	1.1554+2	2.3500+1	5.0788–1
1.7500–2	1.4535–7	3.2730+5	8.0694–5	1.0120+8	6.1241+7	1.3350+7	2.6602+7	5.0877+3	1.3279+2	1.1019+2	2.2076+1	5.2094–1
1.8125–2	1.4900–7	3.1928+5	8.5456–5	9.8720+7	5.9974+7	1.2955+7	2.5786+7	5.0125+3	1.2974+2	1.0778+2	2.1433+1	5.2742–1
2.0000–2	1.5971–7	2.9787+5	1.0038–4	9.2100+7	5.6555+7	1.1911+7	2.3629+7	4.8075+3	1.2167+2	1.0139+2	1.9736+1	5.4664–1
2.2500–2	1.7366–7	2.7394+5	1.2176–4	8.4702+7	5.2635+7	1.0781+7	2.1281+7	4.5478+3	1.1224+2	9.3815+1	1.7858+1	5.6470–1
2.6250–2	1.9371–7	2.4559+5	1.5693–4	7.5936+7	4.7911+7	9.4637+6	1.8557+7	4.2289+3	1.0124+2	8.4965+1	1.5682+1	5.9150–1
3.0000–2	2.1287–7	2.2349+5	1.9560–4	6.9101+7	4.4163+7	8.4537+6	1.6480+7	3.9708+3	9.2821+1	7.8178+1	1.4025+1	6.1775–1
3.5000–2	2.3753–7	2.0029+5	2.5229–4	6.1927+7	4.0114+7	7.4407+6	1.4368+7	3.6769+3	8.3739+1	7.0784+1	1.2311+1	6.4369–1
4.0000–2	2.6112–7	1.8219+5	3.1463–4	5.6333+7	3.6908+7	6.6622+6	1.2759+7	3.4399+3	7.6764+1	6.5088+1	1.1007+1	6.6925–1
5.0000–2	3.0539–7	1.5578+5	4.5450–4	4.8165+7	3.2092+7	5.5635+6	1.0507+7	3.0765+3	6.6469+1	5.6598+1	9.1594+0	7.1120–1
6.0000–2	3.4651–7	1.3730+5	6.1372–4	4.2451+7	2.8627+7	4.8205+6	8.9998+6	2.8129+3	5.9283+1	5.0621+1	7.9140+0	7.4756–1
K 7.1856–2	3.9194–7	1.2138+5	8.2496–4	3.7530+7	2.5605+7	4.1993+6	7.7230+6	2.5793+3	5.3087+1	4.5453+1	6.8487+0	7.8542–1
7.2874–2	3.9569–7	1.2023+5	8.4421–4	3.7174+7	2.5385+7	4.1555+6	7.6311+6	2.5621+3	5.2642+1	4.5081+1	6.7717+0	7.8845–1

Atomic Weight 186.200												Density 21.020 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
7.4656–2	4.0222–7	1.1828+5	8.7830–4	3.6571+7	2.5011+7	4.0814+6	7.4760+6	2.5329+3	5.1888+1	4.4453+1	6.6416+0	7.9374–1
7.7328–2	4.1191–7	1.1550+5	9.3034–4	3.5710+7	2.4476+7	3.9759+6	7.2557+6	2.4910+3	5.0817+1	4.3558+1	6.4571+0	8.0167–1
8.0000–2	4.2149–7	1.1287+5	9.8345–4	3.4899+7	2.3970+7	3.8765+6	7.0490+6	2.4511+3	4.9810+1	4.2716+1	6.2840+0	8.0957–1
8.5000–2	4.3865–7	1.0846+5	1.0856–3	3.3534+7	2.3116+7	3.7119+6	6.7038+6	2.3831+3	4.8093+1	4.1278+1	5.9921+0	8.2278–1
9.2500–2	4.6372–7	1.0259+5	1.2453–3	3.1721+7	2.1974+7	3.4940+6	6.2503+6	2.2913+3	4.5825+1	3.9374+1	5.6091+0	8.4255–1
1.0000–1	4.8808–7	9.7472+4	1.4126–3	3.0138+7	2.0972+7	3.3045+6	5.8594+6	2.2098+3	4.3861+1	3.7719+1	5.2792+0	8.6222–1
1.1250–1	5.2364–7	9.0852+4	1.7065–3	2.8091+7	1.9668+7	3.0594+6	5.3607+6	2.1048+3	4.1232+1	3.5490+1	4.8533+0	8.8924–1
1.2188–1	5.4925–7	8.6616+4	1.9386–3	2.6781+7	1.8829+7	2.9034+6	5.0463+6	2.0364+3	3.9566+1	3.4072+1	4.5852+0	9.0965–1
1.3594–1	5.8617–7	8.1160+4	2.3039–3	2.5094+7	1.7742+7	2.7032+6	4.6468+6	1.9466+3	3.7441+1	3.2256+1	4.2451+0	9.4024–1
1.5000–1	6.2153–7	7.6543+4	2.6887–3	2.3666+7	1.6816+7	2.5347+6	4.3139+6	1.8690+3	3.5664+1	3.0731+1	3.9622+0	9.7067–1
1.7500–1	6.7689–7	7.0282+4	3.4141–3	2.1731+7	1.5569+7	2.3200+6	3.8395+6	1.7578+3	3.3293+1	2.8726+1	3.5509+0	1.0163+0
2.0000–1	7.2869–7	6.5286+4	4.1868–3	2.0186+7	1.4565+7	2.1488+6	3.4710+6	1.6669+3	3.1430+1	2.7136+1	3.2322+0	1.0617+0
2.5000–1	8.2013–7	5.8008+4	5.8415–3	1.7936+7	1.3012+7	1.9293+6	2.9931+6	1.5394+3	2.9037+1	2.5077+1	2.8149+0	1.1443+0
3.0000–1	9.0317–7	5.2674+4	7.6165–3	1.6286+7	1.1866+7	1.7668+6	2.6519+6	1.4425+3	2.7320+1	2.3576+1	2.5185+0	1.2257+0
4.0000–1	1.0522–6	4.5212+4	1.1407–2	1.3979+7	1.0170+7	1.5813+6	2.2266+6	1.3219+3	2.5462+1	2.1931+1	2.1451+0	1.3861+0
5.0000–1	1.1839–6	4.0184+4	1.5407–2	1.2425+7	8.9814+6	1.4740+6	1.9681+6	1.2500+3	2.4545+1	2.1077+1	1.9175+0	1.5507+0
6.0000–1	1.3037–6	3.6491+4	1.9523–2	1.1283+7	8.0972+6	1.4053+6	1.7791+6	1.2050+3	2.4045+1	2.0575+1	1.7497+0	1.7203+0
8.0000–1	1.5096–6	3.1513+4	2.7885–2	9.7437+6	6.8710+6	1.3249+6	1.5466+6	1.1552+3	2.3793+1	2.0172+1	1.5434+0	2.0774+0
1.0000+0	1.6828–6	2.8271+4	3.6265–2	8.7413+6	6.0487+6	1.2810+6	1.4104+6	1.1290+3	2.3940+1	2.0068+1	1.4239+0	2.4478+0
1.5000+0	2.0238–6	2.3507+4	5.6666–2	7.2682+6	4.8161+6	1.2334+6	1.2176+6	1.1035+3	2.5087+1	2.0406+1	1.2550+0	3.4255+0
2.0000+0	2.2744–6	2.0917+4	7.6082–2	6.4675+6	4.1251+6	1.2166+6	1.1246+6	1.0975+3	2.6427+1	2.0789+1	1.1714+0	4.4660+0
3.0000+0	2.6284–6	1.8100+4	1.1203–1	5.5964+6	3.3735+6	1.1990+6	1.0228+6	1.0980+3	2.9262+1	2.1522+1	1.0885+0	6.6518+0
4.0000+0	2.8629–6	1.6617+4	1.4463–1	5.1379+6	2.9660+6	1.1971+6	9.7370+5	1.1035+3	3.2132+1	2.2147+1	1.0452+0	8.9400+0
5.0000+0	3.0318–6	1.5692+4	1.7444–1	4.8517+6	2.7157+6	1.1957+6	9.3915+5	1.1094+3	3.4998+1	2.2697+1	1.0168+0	1.1284+1
6.0000+0	3.1555–6	1.5077+4	2.0189–1	4.6616+6	2.5475+6	1.1945+6	9.1844+5	1.1160+3	3.7889+1	2.3155+1	1.0029+0	1.3731+1
8.0000+0	3.3249–6	1.4308+4	2.5114–1	4.4240+6	2.3375+6	1.1931+6	8.9224+5	1.1264+3	4.3466+1	2.3821+1	9.8141–1	1.8664+1
1.0000+1	3.4284–6	1.3876+4	2.9436–1	4.2904+6	2.2198+6	1.1937+6	8.7573+5	1.1370+3	4.9203+1	2.4386+1	9.7026–1	2.3846+1
1.5000+1	3.5321–6	1.3469+4	3.8383–1	4.1645+6	2.1055+6	1.1948+6	8.6305+5	1.1565+3	6.3139+1	2.5192+1	9.6074–1	3.6987+1
2.0000+1	3.5564–6	1.3377+4	4.5518–1	4.1360+6	2.0864+6	1.1955+6	8.5297+5	1.1700+3	7.7515+1	2.5819+1	9.5401–1	5.0741+1
3.0000+1	3.5683–6	1.3332+4	5.6480–1	4.1223+6	2.0882+6	1.1962+6	8.3671+5	1.1907+3	1.0646+2	2.6653+1	9.4463–1	7.8868+1
4.0000+1	3.5669–6	1.3338+4	6.4779–1	4.1239+6	2.0871+6	1.1966+6	8.3906+5	1.2065+3	1.3570+2	2.7146+1	9.4844–1	1.0760+2
5.0000+1	3.5660–6	1.3341+4	7.1444–1	4.1249+6	2.0862+6	1.1969+6	8.4061+5	1.2209+3	1.6536+2	2.7561+1	9.5136–1	1.3685+2
6.0000+1	3.5654–6	1.3343+4	7.7002–1	4.1256+6	2.0855+6	1.1970+6	8.4175+5	1.2328+3	1.9529+2	2.7872+1	9.5381–1	1.6647+2
8.0000+1	3.5651–6	1.3344+4	8.5922–1	4.1259+6	2.0844+6	1.1972+6	8.4305+5	1.2519+3	2.5590+2	2.8361+1	9.5762–1	2.2658+2
1.0000+2	3.5652–6	1.3344+4	9.2931–1	4.1258+6	2.0836+6	1.1973+6	8.4363+5	1.2669+3	3.1698+2	2.8804+1	9.6061–1	2.8721+2
1.5000+2	3.5592–6	1.3366+4	1.0579+0	4.1328+6	2.0821+6	1.1974+6	8.5202+5	1.2939+3	4.7070+2	2.9254+1	9.7033–1	4.4048+2
2.0000+2	3.5550–6	1.3382+4	1.1497+0	4.1377+6	2.0810+6	1.1975+6	8.5795+5	1.3103+3	6.2557+2	2.9676+1	9.7726–1	5.9491+2
3.0000+2	3.5490–6	1.3405+4	1.2797+0	4.1446+6	2.0794+6	1.1975+6	8.6634+5	1.3327+3	9.3437+2	3.0330+1	9.8719–1	9.0305+2
4.0000+2	3.5466–6	1.3414+4	1.3721+0	4.1474+6	2.0783+6	1.1975+6	8.7020+5	1.3482+3	1.2434+3	3.0733+1	9.9195–1	1.2117+3
5.0000+2	3.5466–6	1.3414+4	1.4439+0	4.1474+6	2.0775+6	1.1976+6	8.7101+5	1.3603+3	1.5547+3	3.1013+1	9.9324–1	1.5227+3
6.0000+2	3.5467–6	1.3414+4	1.5026+0	4.1474+6	2.0768+6	1.1976+6	8.7165+5	1.3695+3	1.8631+3	3.1262+1	9.9433–1	1.8308+3
8.0000+2	3.5469–6	1.3413+4	1.5952+0	4.1471+6	2.0757+6	1.1976+6	8.7244+5	1.3842+3	2.4851+3	3.1711+1	9.9596–1	2.4524+3
1.0000+3	3.5472–6	1.3412+4	1.6670+0	4.1468+6	2.0749+6	1.1976+6	8.7299+5	1.3961+3	3.1068+3	3.2075+1	9.9732–1	3.0737+3
1.5000+3	3.5490–6	1.3405+4	1.7974+0	4.1447+6	2.0734+6	1.1976+6	8.7232+5	1.4185+3	4.6692+3	3.2431+1	9.9657–1	4.6358+3
2.0000+3	3.5510–6	1.3397+4	1.8899+0	4.1424+6	2.0723+6	1.1976+6	8.7107+5	1.4357+3	6.2219+3	3.2783+1	9.9514–1	6.1881+3
3.0000+3	3.5535–6	1.3388+4	2.0202+0	4.1395+6	2.0707+6	1.1976+6	8.6968+5	1.4604+3	9.3345+3	3.3423+1	9.9358–1	9.3001+3
4.0000+3	3.5557–6	1.3379+4	2.1126+0	4.1368+6	2.0697+6	1.1976+6	8.6811+5	1.4784+3	1.2450+4	3.3751+1	9.9181–1	1.2415+4
5.0000+3	3.5592–6	1.3367+4	2.1842+0	4.1328+6	2.0688+6	1.1976+6	8.6494+5	1.4925+3	1.5598+4	3.4051+1	9.8821–1	1.5563+4
6.0000+3	3.5596–6	1.3365+4	2.2427+0	4.1324+6	2.0681+6	1.1976+6	8.6516+5	1.5028+3	1.8693+4	3.4280+1	9.8848–1	1.8658+4
8.0000+3	3.5609–6	1.3360+4	2.3350+0	4.1308+6	2.0671+6	1.1976+6	8.6465+5	1.5193+3	2.4938+4	3.4706+1	9.8794–1	2.4902+4
1.0000+4	3.5621–6	1.3356+4	2.4065+0	4.1295+6	2.0662+6	1.1976+6	8.6413+5	1.5322+3	3.1241+4	3.5101+1	9.8739–1	3.1204+4
1.5000+4	3.5640–6	1.3348+4	2.5365+0	4.1272+6	2.0647+6	1.1976+6	8.6336+5	1.5569+3	4.6706+4	3.5428+1	9.8651–1	4.6670+4
2.0000+4	3.5659–6	1.3341+4	2.6289+0	4.1250+6	2.0636+6	1.1976+6	8.6223+5	1.5748+3	6.2373+4	3.5754+1	9.8522–1	6.2336+4
3.0000+4	3.5676–6	1.3335+4	2.7590+0	4.1230+6	2.0621+6	1.1976+6	8.6175+5	1.5998+3	9.3350+4	3.6406+1	9.8467–1	9.3313+4
4.0000+4	3.5694–6	1.3328+4	2.8514+0	4.1210+6	2.0610+6	1.1976+6	8.6080+5	1.6177+3	1.2466+5	3.6761+1	9.8359–1	1.2462+5
5.0000+4	3.5724–6	1.3317+4	2.9230+0	4.1175+6	2.0602+6	1.1976+6	8.5812+5	1.6315+3	1.5568+5	3.7062+1	9.8053–1	1.5564+5
6.0000+4	3.5724–6	1.3317+4	2.9816+0	4.1175+6	2.0595+6	1.1976+6	8.5877+5	1.6428+3	1.8667+5	3.7276+1	9.8127–1	1.8663+5
8.0000+4	3.5735–6	1.3313+4	3.0740+0	4.1163+6	2.0584+6	1.1976+6	8.5865+5	1.6607+3	2.4920+5	3.7705+1	9.8114–1	2.4916+5
1.0000+5	3.5744–6	1.3309+4	3.1456+0	4.1152+6	2.0576+6	1.1976+6	8.5835+5	1.6747+3	3.1184+5	3.8101+1	9.8080–1	3.1180+5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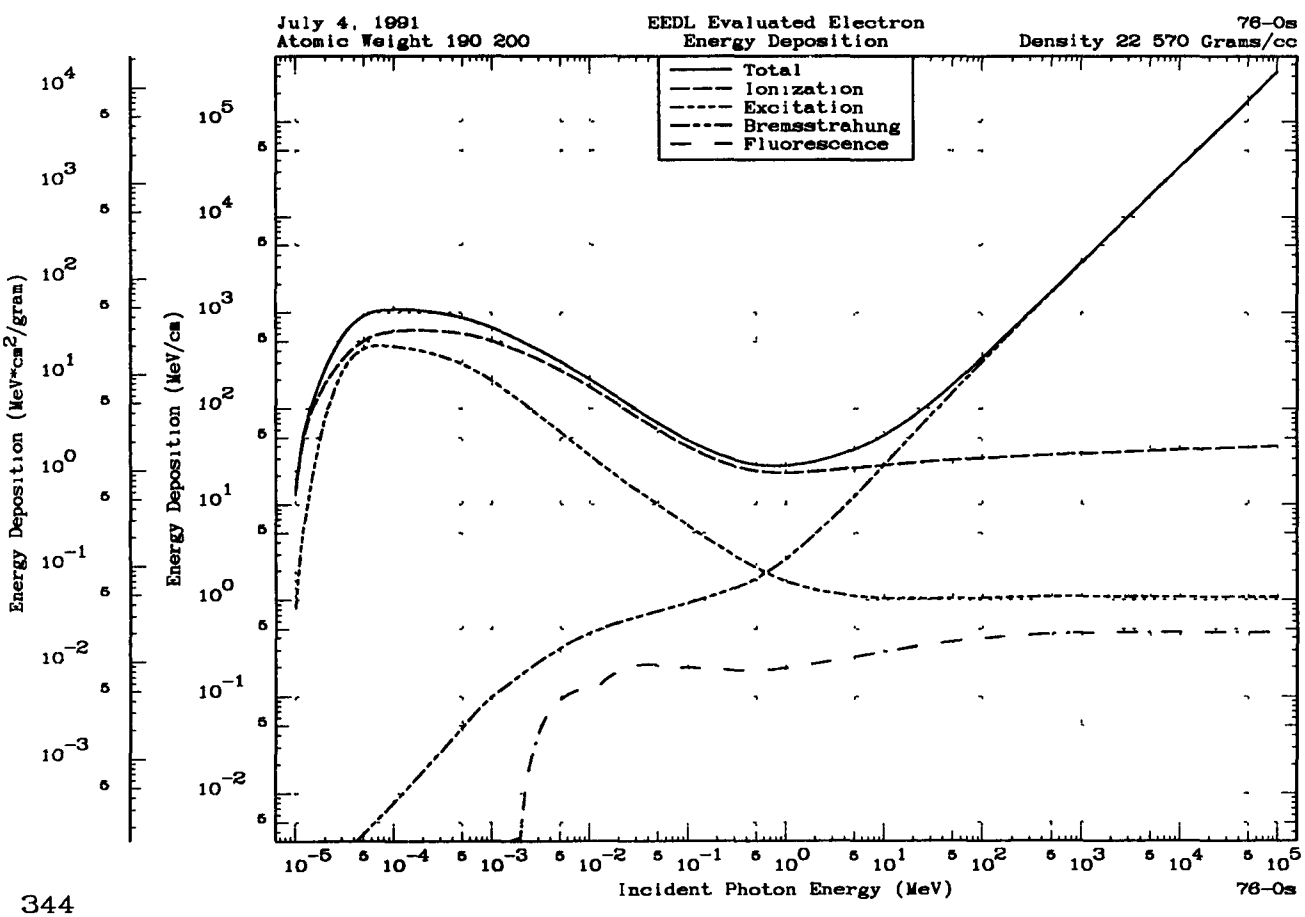
EEDL Evaluated Electron
Cross Sections
76-Os
Density 22 570 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
76-Os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EEDL Evaluated Electron
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76-Os
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Excitation
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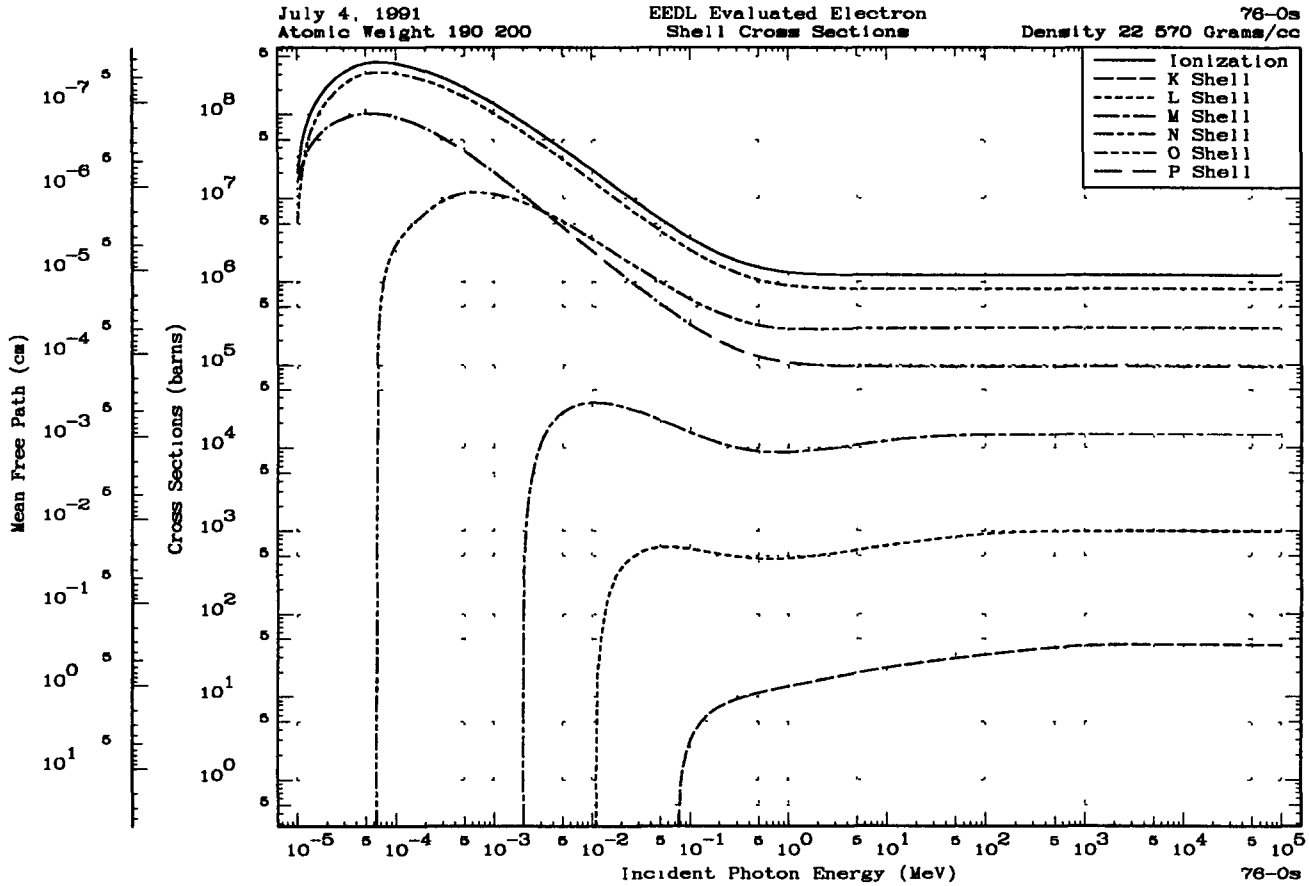
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
76-Os

344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EEDL Evaluated Electron
Shell Cross Sections
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Density 22 570 Grams/cc
Ionization
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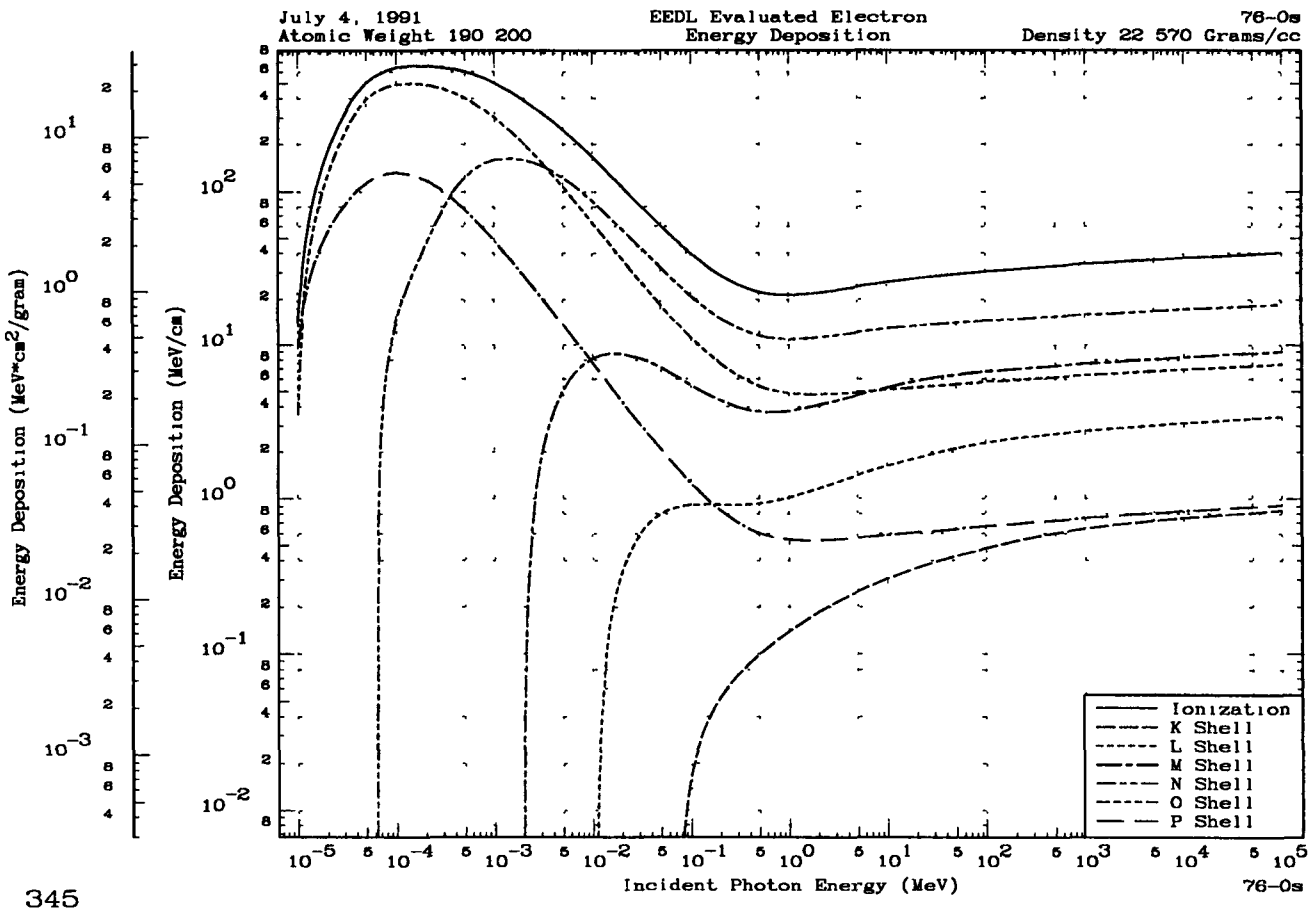
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
76-Os


July 4, 1991
Atomic Weight 190 200
EEDL Evaluated Electron
Energy Deposition
76-Os
Density 22 570 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
76-Os

345

Atomic Weight 190.200 Density 22.570 Grams/cc

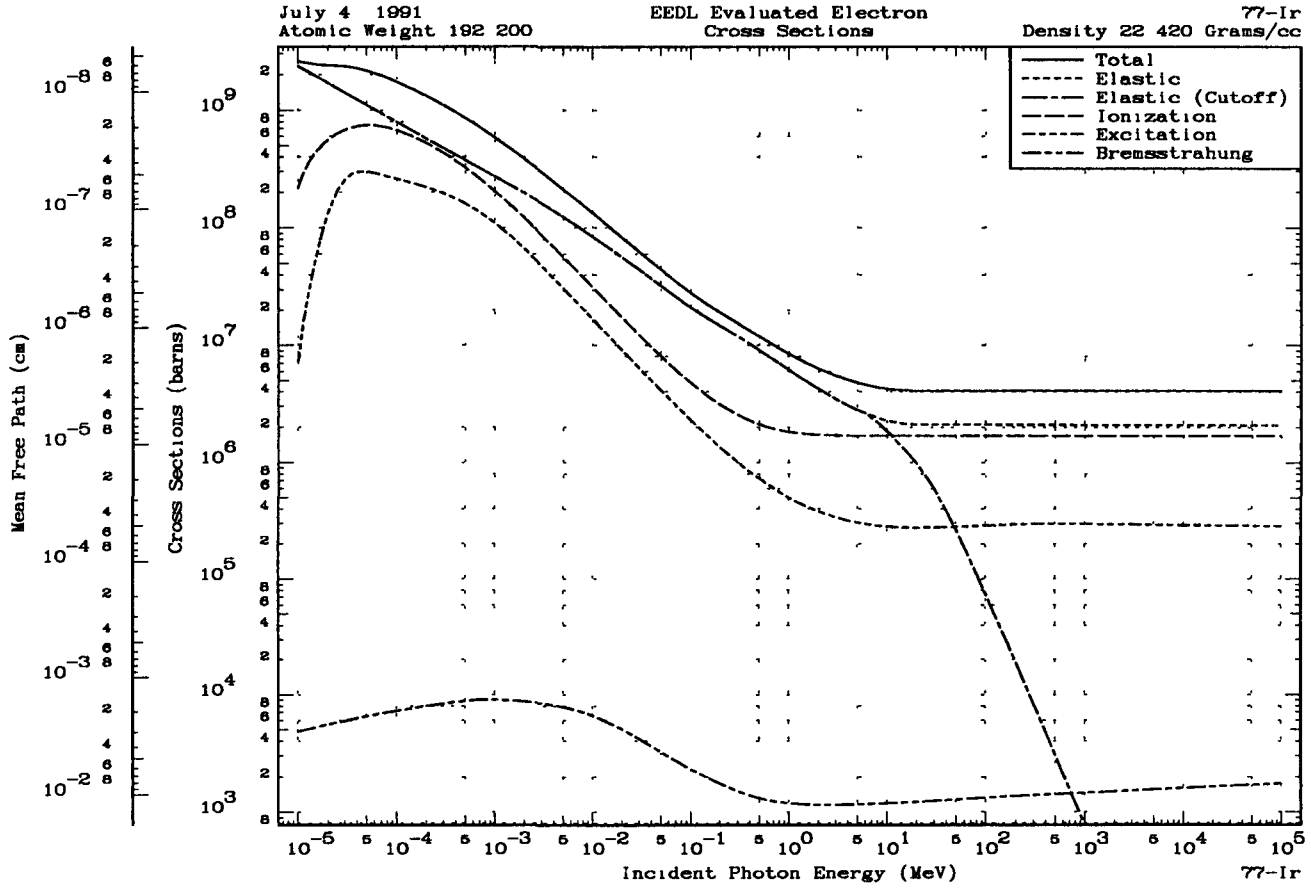
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.5828–9	7.9362+6		2.5065+9	2.4846+9	2.0583+7	1.3118+6	4.7625+3	1.4096+1	1.3272+1	8.2316–1	7.3559–4
	1.0625–5	5.7139–9	7.7541+6		2.4490+9	2.4134+9	3.2828+7	2.7545+6	4.8214+3	2.3590+1	2.1831+1	1.7585+0	7.7987–4
O4	1.0790–5	5.7480–9	7.7082+6		2.4345+9	2.3957+9	3.5662+7	3.1965+6	4.8365+3	2.5894+1	2.3844+1	2.0498+0	7.9164–4
	1.1250–5	5.8299–9	7.5999+6		2.4003+9	2.3482+9	4.7306+7	4.8366+6	4.8777+3	3.5480+1	3.2352+1	3.1280+0	8.2456–4
	1.1316–5	5.8413–9	7.5851+6		2.3956+9	2.3416+9	4.8916+7	5.1256+6	4.8835+3	3.6874+1	3.3554+1	3.3189+0	8.2931–4
	1.1719–5	5.9085–9	7.4988+6		2.3684+9	2.3026+9	5.8938+7	6.8012+6	4.9183+3	4.5507+1	4.1070+1	4.4365+0	8.5834–4
	1.2188–5	5.9842–9	7.4039+6		2.3384+9	2.2597+9	6.9710+7	8.9656+6	4.9576+3	5.5291+1	4.9391+1	5.8984+0	8.9233–4
	1.2237–5	5.9918–9	7.3945+6		2.3355+9	2.2553+9	7.0881+7	9.2254+6	4.9616+3	5.6392+1	5.0316+1	6.0747+0	8.9593–4
	1.3359–5	6.1533–9	7.2005+6		2.2742+9	2.1624+9	9.6007+7	1.5772+7	5.0508+3	8.1092+1	7.0494+1	1.0596+1	9.7821–4
	1.3594–5	6.1835–9	7.1653+6		2.2630+9	2.1444+9	1.0108+8	1.7541+7	5.0687+3	8.6549+1	7.4714+1	1.1834+1	9.9554–4
	1.3619–5	6.1867–9	7.1616+6		2.2619+9	2.1425+9	1.0159+8	1.7738+7	5.0705+3	8.7119+1	7.5147+1	1.1972+1	9.9738–4
	1.5000–5	6.3459–9	6.9819+6		2.2051+9	2.0455+9	1.2932+8	3.0275+7	5.1709+3	1.2005+2	9.9116+1	2.0931+1	1.1005–3
	1.7500–5	6.5494–9	6.7650+6		2.1366+9	1.8997+9	1.7357+8	6.3284+7	5.3353+3	1.8533+2	1.4065+2	4.4677+1	1.2912–3
	2.0000–5	6.6549–9	6.6578+6		2.1028+9	1.7819+9	2.1177+8	1.0909+8	5.4818+3	2.5931+2	1.8070+2	7.8608+1	1.4867–3
	2.2500–5	6.7123–9	6.6008+6		2.0848+9	1.6840+9	2.4305+8	1.5770+8	5.5993+3	3.3144+2	2.1689+2	1.1454+2	1.6699–3
	2.5000–5	6.6833–9	6.6294+6		2.0938+9	1.6010+9	2.7349+8	2.1929+8	5.7065+3	4.1542+2	2.5488+2	1.6053+2	1.8561–3
	2.6250–5	6.6830–9	6.6298+6		2.0939+9	1.5640+9	2.8578+8	2.4413+8	5.7568+3	4.5112+2	2.7169+2	1.7942+2	1.9503–3
	3.0000–5	6.6177–9	6.6952+6		2.1146+9	1.4670+9	3.2010+8	3.2750+8	5.8968+3	5.6543+2	3.2192+2	2.4351+2	2.2368–3
	3.5000–5	6.5499–9	6.7644+6		2.1364+9	1.3626+9	3.5716+8	4.1665+8	6.0606+3	6.9328+2	3.8195+2	3.1132+2	2.6245–3
	4.0000–5	6.5244–9	6.7910+6		2.1448+9	1.2783+9	3.8342+8	4.8313+8	6.2061+3	7.9727+2	4.3449+2	3.6278+2	3.0210–3
	5.0000–5	6.5914–9	6.7218+6		2.1230+9	1.1488+9	4.1320+8	5.6094+8	6.4385+3	9.3364+2	5.1040+2	4.2323+2	3.8019–3
O3	5.3150–5	6.6468–9	6.6659+6		2.1053+9	1.1158+9	4.1670+8	5.7285+8	6.5011+3	9.5813+2	5.2525+2	4.3288+2	4.0481–3
	5.4006–5	6.6635–9	6.6491+6		2.1000+9	1.1073+9	4.1770+8	5.7507+8	6.5176+3	9.6432+2	5.2957+2	4.3475+2	4.1153–3
	5.5505–5	6.6918–9	6.6211+6		2.0912+9	1.0929+9	4.1942+8	5.7889+8	6.5459+3	9.7508+2	5.3712+2	4.3797+2	4.2334–3
	5.7752–5	6.7319–9	6.5816+6		2.0787+9	1.0723+9	4.2192+8	5.8448+8	6.5872+3	9.9111+2	5.4841+2	4.4269+2	4.4113–3
	6.0000–5	6.7695–9	6.5450+6		2.0671+9	1.0529+9	4.2436+8	5.8991+8	6.6272+3	1.0070+3	5.5973+2	4.4730+2	4.5903–3
N7	6.3260–5	6.8462–9	6.4717+6		2.0440+9	1.0266+9	4.2432+8	5.9311+8	6.6830+3	1.0191+3	5.6903+2	4.5009+2	4.8514–3
	6.5353–5	6.8926–9	6.4281+6		2.0302+9	1.0107+9	4.2446+8	5.9506+8	6.7175+3	1.0275+3	5.7573+2	4.5179+2	5.0201–3
O2	6.6010–5	6.9069–9	6.4149+6		2.0260+9	1.0059+9	4.2450+8	5.9566+8	6.7282+3	1.0301+3	5.7779+2	4.5232+2	5.0732–3
N6	6.6210–5	6.9112–9	6.4109+6		2.0248+9	1.0044+9	4.2452+8	5.9584+8	6.7314+3	1.0309+3	5.7845+2	4.5248+2	5.0894–3
	6.6884–5	6.9283–9	6.3950+6		2.0198+9	9.9956+8	4.2432+8	5.9588+8	6.7422+3	1.0328+3	5.8016+2	4.5259+2	5.1441–3
	6.7934–5	6.9547–9	6.3708+6		2.0121+9	9.9215+8	4.2402+8	5.9594+8	6.7589+3	1.0357+3	5.8290+2	4.5276+2	5.2292–3
	6.8524–5	6.9693–9	6.3574+6		2.0079+9	9.8805+8	4.2387+8	5.9597+8	6.7681+3	1.0373+3	5.8449+2	4.5285+2	5.2772–3
	6.9014–5	6.9813–9	6.3465+6		2.0044+9	9.8468+8	4.2375+8	5.9600+8	6.7758+3	1.0388+3	5.8582+2	4.5293+2	5.3171–3
	7.0000–5	7.0053–9	6.3248+6		1.9976+9	9.7802+8	4.2349+8	5.9606+8	6.7910+3	1.0415+3	5.8839+2	4.5309+2	5.3974–3
	7.0950–5	7.0282–9	6.3042+6		1.9911+9	9.7174+8	4.2322+8	5.9611+8	6.8056+3	1.0440+3	5.9080+2	4.5324+2	5.4750–3
	7.1393–5	7.0387–9	6.2947+6		1.9881+9	9.6885+8	4.2309+8	5.9614+8	6.8123+3	1.0452+3	5.9189+2	4.5331+2	5.5112–3
	7.4507–5	7.1112–9	6.2305+6		1.9678+9	9.4926+8	4.2224+8	5.9631+8	6.8585+3	1.0536+3	5.9979+2	4.5381+2	5.7668–3
	7.5475–5	7.1331–9	6.2114+6		1.9618+9	9.4341+8	4.2200+8	5.9636+8	6.8726+3	1.0562+3	6.0227+2	4.5396+2	5.8466–3
	7.5696–5	7.1381–9	6.2071+6		1.9604+9	9.4209+8	4.2194+8	5.9637+8	6.8757+3	1.0568+3	6.0283+2	4.5400+2	5.8648–3
	8.0000–5	7.2319–9	6.1266+6		1.9350+9	9.1750+8	4.2089+8	5.9659+8	6.9363+3	1.0685+3	6.1385+2	4.5467+2	6.2213–3
	9.0000–5	7.4759–9	5.9266+6		1.8718+9	8.6723+8	4.1425+8	5.9033+8	7.0608+3	1.0800+3	6.2874+2	4.5121+2	7.0537–3
O1	9.8120–5	7.6579–9	5.7857+6		1.8273+9	8.3212+8	4.0942+8	5.8579+8	7.1535+3	1.0896+3	6.4078+2	4.4879+2	7.7393–3
	1.0000–4	7.7006–9	5.7536+6	0.0000+0	1.8172+9	8.2460+8	4.0842+8	5.8418+8	7.1729+3	1.0917+3	6.4386+2	4.4781+2	7.8979–3
	1.0313–4	7.7789–9	5.6958+6	2.8644–9	1.7989+9	8.1261+8	4.0506+8	5.8124+8	7.2045+3	1.0903+3	6.4446+2	4.4579+2	8.1623–3
	1.0898–4	7.9208–9	5.5937+6	8.2431–9	1.7667+9	7.9151+8	3.9917+8	5.7600+8	7.2615+3	1.0883+3	6.4613+2	4.4220+2	8.6610–3
	1.1250–4	8.0031–9	5.5362+6	1.1475–8	1.7485+9	7.7964+8	3.9586+8	5.7302+8	7.2945+3	1.0876+3	6.4742+2	4.4017+2	8.9620–3
	1.1924–4	8.1562–9	5.4322+6	1.7675–8	1.7157+9	7.5835+8	3.8975+8	5.6759+8	7.3552+3	1.0860+3	6.4954+2	4.3648+2	9.5422–3
	1.2500–4	8.2820–9	5.3498+6	2.2982–8	1.6896+9	7.4151+8	3.8492+8	5.6321+8	7.4049+3	1.0854+3	6.5182+2	4.3353+2	1.0042–2
	1.2693–4	8.3231–9	5.3234+6	2.4759–8	1.6813+9	7.3612+8	3.8337+8	5.6181+8	7.4211+3	1.0852+3	6.5256+2	4.3258+2	1.0210–2
	1.3125–4	8.4133–9	5.2662+6	2.8742–8	1.6633+9	7.2448+8	3.8003+8	5.5873+8	7.4567+3	1.0849+3	6.5437+2	4.3052+2	1.0588–2
	1.3846–4	8.5597–9	5.1762+6	3.5393–8	1.6348+9	7.0627+8	3.7469+8	5.5386+8	7.5138+3	1.0844+3	6.5717+2	4.2727+2	1.1222–2
	1.5000–4	8.7819–9	5.0452+6	4.6027–8	1.5934+9	6.7987+8	3.6693+8	5.4665+8	7.6001+3	1.0852+3	6.6265+2	4.2251+2	1.2245–2
	1.7500–4	9.2990–9	4.7647+6	6.9260–8	1.5049+9	6.3177+8	3.4672+8	5.2635+8	7.7618+3	1.0670+3	6.5896+2	4.0801+2	1.4521–2
	2.0000–4	9.7680–9	4.5359+6	9.2814–8	1.4326+9	5.9287+8	3.3034+8	5.0938+8	7.9046+3	1.0558+3	6.5978+2	3.9600+2	1.6841–2
	2.2500–4	1.0249–8	4.3230+6	1.1674–7	1.3653+9	5.6054+8	3.1331+8	4.9148+8	8.0175+3	1.0343+3	6.5135+2	3.8289+2	1.9248–2
	2.5000–4	1.0697–8	4.1420+6	1.4109–7	1.3082+9	5.3312+8	2.9905+8	4.7600+8	8.1198+3	1.0187+3	6.4705+2	3.7161+2	2.1689–2
N5	2.8229–4	1.1237–8	3.9429+6	1.7304–7	1.2453+9	5.0317+8	2.8336+8	4.5876+8	8.2394+3	1.0030+3	6.4387+2	3.5912+2	2.4885–2
	2.8672–4	1.1310–8	3.9173+6	1.7746–7	1.2372+9	4.9946+8	2.8141+8	4.5635+8	8.2548+3	1.0011+3	6.4370+2	3.5735+2	2.5326–2
	2.9336–4	1.1419–8	3.8800+6	1.8410–7	1.2254+9	4.9404+8	2.7856+8	4.5282+8	8.2776+3	9.9838+2	6.4357+2	3.5478+2	2.5991–2
N4	2.9708–4	1.1479–8	3.8596+6	1.8783–7	1.2190+9	4.9109+8	2.7701+8	4.5090+8	8.2902+3	9.9696+2	6.4356+2	3.5338+2	2.6364–2
	3.0000–4	1.1527–8	3.8439+6	1.9076–7	1.2140+9	4.8881+8	2.7582+8	4.4939+8	8.2999+3	9.9595+2	6.4364+2	3.5228+2	2.6657–2
	3.0625–4	1.1634–8	3.8084+6	1.9705–7	1.2028+9	4.8407+8	2.7286+8	4.4591+8	8.3200+3	9.9132+2	6.4160+2	3.4969+2	2.7290–2
	3.1250–4	1.1740–8	3.7741+6	2.0337–7	1.1920+9	4.7946+8	2.6999+8	4.4252+8	8.3397+3	9.8693+2	6.3974+2	3.4717+2	2.7924–2
	3.1797–4	1.1831–8	3.7448+6	2.0892–7	1.1827+9	4.7554+8	2.6756+8	4.3964+8	8.3567+3	9.8327+2	6.3822+2	3.4502+2	2.8481–2
	3.3438–4	1.2101–8	3.6614+6	2.2569–7	1.1564+9	4.6436+8	2.6066+8	4.3137+8	8.4061+3	9.7322+2	6.3431+2	3.3888+2	3.0157–2
	3.3848–4	1.2167–8	3.6415+6	2.2991–7	1.1501+9	4.6169+8	2.5902+8	4.2939+8	8.4181+3	9.7091+2	6.3347+2	3.3741+2	3.0578–2
	3.5000–4	1.2351–8	3.5874+6	2.4182–7	1.1330+9	4.5444+8	2.5458+8	4.2400+8	8.4512+3	9.6479+2	6.3135+2	3.3341+2	3.1763–2
	3.6719–4	1.2618–8	3.5114+6	2.5971–7	1.1090+9	4.4425+8	2.4835+8	4.1640+8	8.4988+3	9.5640+2	6.2859+2	3.2778+2	3.3539–2
	3.6924–4	1.2649–8	3.5027+6	2.6185–7	1.1063+9	4.4308+8	2.4764+8	4.1553+8	8.5043+3	9.5547+2	6.2830+2	3.2714+2	3.3751–2
	4.0000–4	1.3109–8	3.3799+6	2.9426–7	1.0675+9	4.2662+8	2.3769+8	4.0317+8	8.5845+3	9.4324+2	6.2519+2	3.1801+2	3.6956–2
	4.5000–4	1.3873–8	3.1936+6	3.4807–7	1.0087+9	4.0353+8	2.2225+8	3.8287+8	8.6850+3	9.1528+2	6.1253+2	3.0270+2	4.2400–2
N3	4.6623–4	1.4111–8	3.1398+6	3.6587–7	9.9165+8	3.9684+8	2.1783+8	3.7697+8	8.7155+3	9.0770+2	6.0940+2	2.9826+2	4.4182–2
	4.7467–4	1.4237–8	3.1121+6	3.7519–7	9.8292+8	3.9349+8	2.1564+8	3.7379+8	8.7310+3	9.0392+2	6.0800+2	2.9587+2	4.5111–2
	4.8734–4	1.4422–8	3.0721+6	3.8925–7	9.7027+8	3.8862+8	2.1247+8	3.6917+8	8.7537+3	8.9856+2	6.0610+2	2.9242+2	4.6507–2
	5.0000–4	1.4606–8	3.0335+6	4.0338–7	9.5810+8	3.8394+8	2.0943+8	3.6472+8	8.7760+3	8.9358+2	6.0445+2	2.8909+2	4.7908–2
	5.2500–4	1.4973–8	2.9590+6	4.3156–7	9.3457+8	3.7520+8	2.0333+8	3.5604+8	8.8184+3	8.8056+2	5.9804+2	2.8247+2	5.0684–2
N2	5.4607–4	1.5276–8	2.9003+6	4.5563–7	9.1603+8	3.6829+8	1.9855+8	3.4918+8	8.8528+3	8.7059+2	5.9329+2	2.7726+2	5.3034–2
	5.5281–4	1.5374–8	2.8818+6	4.6338–7	9.1018+8	3.6616+8	1.9709+8	3.4692+8	8.8600+3	8.6751+2	5.9191+2	2.7554+2	5.3766–2
	5.6250–4	1.5514–8	2.8558+6	4.7458–7	9.0197+8	3.6316+8	1.9504+8	3.4375+8	8.8703+3	8.6322+2	5.9003+2	2.7314+2	5.4820–2

Atomic Weight 190.200 Density 22.570 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.6461–4	1.5545–8	2.8503+6	4.7702–7	9.0021+8	3.6252+8	1.9461+8	3.4307+8	8.8725+3	8.6231+2	5.8963+2	2.7262+2	5.5050–2
	5.8230–4	1.5797–8	2.8048+6	4.9763–7	8.8584+8	3.5728+8	1.9103+8	3.3752+8	8.8907+3	8.5496+2	5.8648+2	2.6841+2	5.6979–2
	6.0000–4	1.6045–8	2.7614+6	5.1841–7	8.7213+8	3.5226+8	1.8764+8	3.3222+8	8.9085+3	8.4813+2	5.8367+2	2.6440+2	5.8912–2
	6.2500–4	1.6403–8	2.7010+6	5.4811–7	8.5308+8	3.4553+8	1.8281+8	3.2473+8	8.9312+3	8.3581+2	5.7709+2	2.5866+2	6.1638–2
N1	6.4803–4	1.6727–8	2.6487+6	5.7584–7	8.3656+8	3.3968+8	1.7865+8	3.1823+8	8.9515+3	8.2532+2	5.7158+2	2.5367+2	6.4156–2
	6.5753–4	1.6865–8	2.6272+6	5.8737–7	8.2976+8	3.3735+8	1.7698+8	3.1542+8	8.9574+3	8.2093+2	5.6935+2	2.5152+2	6.5166–2
	6.6875–4	1.7025–8	2.6024+6	6.0109–7	8.2192+8	3.3467+8	1.7506+8	3.1219+8	8.9643+3	8.1593+2	5.6683+2	2.4903+2	6.6359–2
	6.7534–4	1.7119–8	2.5881+6	6.0917–7	8.1742+8	3.3312+8	1.7396+8	3.1033+8	8.9683+3	8.1307+2	5.6540+2	2.4761+2	6.7060–2
	7.0000–4	1.7467–8	2.5366+6	6.3970–7	8.0116+8	3.2752+8	1.7000+8	3.0363+8	8.9829+3	8.0288+2	5.6035+2	2.4246+2	6.9686–2
	7.0650–4	1.7557–8	2.5235+6	6.4781–7	7.9702+8	3.2610+8	1.6899+8	3.0192+8	8.9867+3	8.0031+2	5.5909+2	2.4115+2	7.0380–2
	7.3438–4	1.7942–8	2.4695+6	6.8287–7	7.7995+8	3.2019+8	1.6485+8	2.9490+8	9.0025+3	7.8987+2	5.5403+2	2.3576+2	7.3354–2
	7.5325–4	1.8198–8	2.4347+6	7.0686–7	7.6896+8	3.1638+8	1.6220+8	2.9037+8	9.0128+3	7.8328+2	5.5091+2	2.3230+2	7.5373–2
	8.0000–4	1.8821–8	2.3542+6	7.6712–7	7.4352+8	3.0750+8	1.5609+8	2.7992+8	9.0375+3	7.6846+2	5.4409+2	2.2429+2	8.0380–2
	8.5000–4	1.9512–8	2.2708+6	8.3302–7	7.1719+8	2.9882+8	1.4976+8	2.6860+8	9.0346+3	7.4907+2	5.3347+2	2.1551+2	8.4985–2
	9.0000–4	2.0185–8	2.1950+6	9.0055–7	6.9327+8	2.9086+8	1.4405+8	2.5834+8	9.0318+3	7.3187+2	5.2422+2	2.0756+2	8.9588–2
	9.2500–4	2.0516–8	2.1597+6	9.3489–7	6.8209+8	2.8712+8	1.4140+8	2.5356+8	9.0304+3	7.2396+2	5.2001+2	2.0386+2	9.1890–2
	1.0000–3	2.1485–8	2.0622+6	1.0400–6	6.5133+8	2.7674+8	1.3413+8	2.4045+8	9.0266+3	7.0272+2	5.0891+2	1.9371+2	9.8792–2
	1.1250–3	2.3101–8	1.9180+6	1.2230–6	6.0576+8	2.6173+8	1.2325+8	2.2077+8	8.9625+3	6.6436+2	4.8591+2	1.7834+2	1.0802–1
	1.2500–3	2.4643–8	1.7979+6	1.4156–6	5.6785+8	2.4899+8	1.1430+8	2.0454+8	8.9055+3	6.3347+2	4.6769+2	1.6567+2	1.1720–1
	1.3125–3	2.5390–8	1.7450+6	1.5153–6	5.5115+8	2.4331+8	1.1039+8	1.9744+8	8.8793+3	6.2005+2	4.5980+2	1.6012+2	1.2177–1
	1.5000–3	2.7545–8	1.6085+6	1.8263–6	5.0802+8	2.2840+8	1.0038+8	1.7923+8	8.8078+3	5.8642+2	4.4036+2	1.4593+2	1.3543–1
	1.7500–3	3.0393–8	1.4578+6	2.2696–6	4.6042+8	2.1208+8	8.9394+7	1.5894+8	8.7165+3	5.4204+2	4.1195+2	1.2994+2	1.5235–1
M5	1.9709–3	3.2775–8	1.3518+6	2.6889–6	4.2696+8	2.0030+8	8.1773+7	1.4487+8	8.6467+3	5.1181+2	3.9278+2	1.1886+2	1.6720–1
	1.9854–3	3.2930–8	1.3455+6	2.7174–6	4.2495+8	1.9959+8	8.1321+7	1.4403+8	8.6424+3	5.1001+2	3.9164+2	1.1820+2	1.6817–1
	2.0000–3	3.3084–8	1.3392+6	2.7460–6	4.2297+8	1.9888+8	8.0875+7	1.4320+8	8.6381+3	5.0824+2	3.9053+2	1.1755+2	1.6914–1
	2.0156–3	3.3252–8	1.3324+6	2.7768–6	4.2083+8	1.9811+8	8.0389+7	1.4233+8	8.6318+3	5.0610+2	3.8908+2	1.1685+2	1.7004–1
M4	2.0445–3	3.3560–8	1.3202+6	2.8340–6	4.1697+8	1.9670+8	7.9508+7	1.4075+8	8.6203+3	5.0224+2	3.8647+2	1.1560+2	1.7169–1
	2.0464–3	3.3580–8	1.3194+6	2.8378–6	4.1672+8	1.9661+8	7.9451+7	1.4065+8	8.6196+3	5.0199+2	3.8630+2	1.1551+2	1.7180–1
	2.1060–3	3.4214–8	1.2950+6	2.9574–6	4.0900+8	1.9380+8	7.7703+7	1.3749+8	8.5964+3	4.9435+2	3.8116+2	1.1301+2	1.7520–1
	2.1639–3	3.4824–8	1.2723+6	3.0755–6	4.0184+8	1.9118+8	7.6087+7	1.3457+8	8.5746+3	4.8730+2	3.7643+2	1.1069+2	1.7851–1
	2.2177–3	3.5384–8	1.2522+6	3.1866–6	3.9548+8	1.8884+8	7.4654+7	1.3198+8	8.5549+3	4.8109+2	3.7227+2	1.0864+2	1.8157–1
	2.2685–3	3.5907–8	1.2339+6	3.2927–6	3.8972+8	1.8671+8	7.3360+7	1.2964+8	8.5368+3	4.7549+2	3.6852+2	1.0678+2	1.8445–1
	2.4133–3	3.7377–8	1.1854+6	3.6021–6	3.7439+8	1.8101+8	6.9934+7	1.2343+8	8.4874+3	4.6078+2	3.5872+2	1.0187+2	1.9267–1
M3	2.4517–3	3.7761–8	1.1733+6	3.6858–6	3.7058+8	1.7959+8	6.9087+7	1.2190+8	8.4749+3	4.5716+2	3.5631+2	1.0065+2	1.9484–1
	2.4860–3	3.8106–8	1.1627+6	3.7610–6	3.6723+8	1.7832+8	6.8335+7	1.2056+8	8.4638+3	4.5368+2	3.5390+2	9.9584+1	1.9677–1
	2.5502–3	3.8748–8	1.1435+6	3.9036–6	3.6114+8	1.7603+8	6.6974+7	1.1814+8	8.4436+3	4.4742+2	3.4957+2	9.7651+1	2.0040–1
	2.6627–3	3.9857–8	1.1116+6	4.1579–6	3.5110+8	1.7221+8	6.4736+7	1.1414+8	8.4095+3	4.3717+2	3.4249+2	9.4469+1	2.0672–1
	2.7066–3	4.0286–8	1.0998+6	4.2589–6	3.4736+8	1.7078+8	6.3907+7	1.1266+8	8.3967+3	4.3339+2	3.3989+2	9.3290+1	2.0919–1
	2.7257–3	4.0470–8	1.0948+6	4.3029–6	3.4578+8	1.7017+8	6.3555+7	1.1204+8	8.3911+3	4.3179+2	3.3879+2	9.2791+1	2.1026–1
M2	2.7902–3	4.1093–8	1.0782+6	4.4532–6	3.4053+8	1.6816+8	6.2396+7	1.0997+8	8.3728+3	4.2651+2	3.3515+2	9.1143+1	2.1388–1
	2.8313–3	4.1491–8	1.0679+6	4.5501–6	3.3727+8	1.6691+8	6.1679+7	1.0867+8	8.3613+3	4.2319+2	3.3286+2	9.0110+1	2.1618–1
	2.8426–3	4.1600–8	1.0651+6	4.5768–6	3.3638+8	1.6657+8	6.1485+7	1.0832+8	8.3582+3	4.2229+2	3.3224+2	8.9831+1	2.1681–1
	2.9213–3	4.2354–8	1.0461+6	4.7645–6	3.3040+8	1.6427+8	6.0174+7	1.0594+8	8.3368+3	4.1624+2	3.2808+2	8.7944+1	2.2121–1
	3.0000–3	4.3100–8	1.0280+6	4.9548–6	3.2467+8	1.6206+8	5.8926+7	1.0368+8	8.3161+3	4.1052+2	3.2415+2	8.6147+1	2.2560–1
M1	3.0300–3	4.3387–8	1.0212+6	5.0281–6	3.2253+8	1.6124+8	5.8454+7	1.0283+8	8.3083+3	4.0814+2	3.2245+2	8.5461+1	2.2727–1
	3.0906–3	4.3966–8	1.0077+6	5.1775–6	3.1828+8	1.5960+8	5.7528+7	1.0115+8	8.2863+3	4.0342+2	3.1908+2	8.4113+1	2.3015–1
	3.1250–3	4.4293–8	1.0003+6	5.2630–6	3.1593+8	1.5868+8	5.7017+7	1.0022+8	8.2741+3	4.0083+2	3.1723+2	8.3370+1	2.3178–1
	3.2043–3	4.5042–8	9.8368+5	5.4623–6	3.1068+8	1.5664+8	5.5876+7	9.8157+7	8.2464+3	3.9506+2	3.1311+2	8.1713+1	2.3554–1
	3.2500–3	4.5470–8	9.7441+5	5.5784–6	3.0775+8	1.5550+8	5.5242+7	9.7009+7	8.2308+3	3.9185+2	3.1083+2	8.0791+1	2.3770–1
	3.3437–3	4.6342–8	9.5609+5	5.8196–6	3.0196+8	1.5322+8	5.3990+7	9.4743+7	8.1995+3	3.8552+2	3.0630+2	7.8974+1	2.4212–1
	3.4032–3	4.6890–8	9.4491+5	5.9747–6	2.9843+8	1.5183+8	5.3229+7	9.3365+7	8.1802+3	3.8168+2	3.0356+2	7.7869+1	2.4493–1
	3.5000–3	4.7775–8	9.2741+5	6.2302–6	2.9291+8	1.4964+8	5.2040+7	9.1215+7	8.1495+3	3.7570+2	2.9930+2	7.6144+1	2.4948–1
	3.5524–3	4.8250–8	9.1827+5	6.3703–6	2.9002+8	1.4850+8	5.1421+7	9.0095+7	8.1333+3	3.7259+2	2.9709+2	7.5247+1	2.5194–1
	3.6250–3	4.8904–8	9.0599+5	6.5662–6	2.8614+8	1.4695+8	5.0591+7	8.8594+7	8.1114+3	3.6844+2	2.9414+2	7.4043+1	2.5534–1
	3.7762–3	5.0251–8	8.8170+5	6.9813–6	2.7847+8	1.4387+8	4.8954+7	8.5635+7	8.0671+3	3.6024+2	2.8831+2	7.1672+1	2.6240–1
	4.0000–3	5.2208–8	8.4865+5	7.6122–6	2.6803+8	1.3965+8	4.6740+7	8.1635+7	8.0052+3	3.4924+2	2.8050+2	6.8466+1	2.7280–1
	4.5000–3	5.6528–8	7.8379+5	9.0946–6	2.4755+8	1.3117+8	4.2423+7	7.3950+7	7.8465+3	3.2560+2	2.6305+2	6.2257+1	2.9317–1
	5.0000–3	6.0677–8	7.3020+5	1.0677–5	2.3062+8	1.2402+8	3.8905+7	6.7690+7	7.7072+3	3.0643+2	2.4892+2	5.7203+1	3.1328–1
	5.5000–3	6.4724–8	6.8454+5	1.2357–5	2.1620+8	1.1781+8	3.5938+7	6.2447+7	7.5616+3	2.8923+2	2.3596+2	5.2941+1	3.3127–1
	6.0000–3	6.8641–8	6.4549+5	1.4130–5	2.0387+8	1.1241+8	3.3430+7	5.8016+7	7.4311+3	2.7478+2	2.2509+2	4.9341+1	3.4905–1
	7.0000–3	7.6228–8	5.8124+5	1.7949–5	1.8358+8	1.0335+8	2.9367+7	5.0855+7	7.1395+3	2.4936+2	2.0551+2	4.3479+1	3.7752–1
	8.0000–3	8.3437–8	5.3102+5	2.2124–5	1.6772+8	9.6087+7	2.6251+7	4.5369+7	6.8961+3	2.2990+2	1.9050+2	3.8994+1	4.0539–1
	1.0000–2	9.7249–8	4.5560+5	3.1457–5	1.4389+8	8.4772+7	2.1720+7	3.7396+7	6.4409+3	1.9939+2	1.6653+2	3.2413+1	4.5093–1
L3	1.0877–2	1.0295–7	4.3035+5	3.5978–5	1.3592+8	8.0808+7	2.0219+7	3.4888+7	6.2543+3	1.8874+2	1.5794+2	3.0334+1	4.6717–1
	1.1392–2	1.0622–7	4.1711+5	3.8749–5	1.3174+8	7.8705+7	1.9437+7	3.3590+7	6.1502+3	1.8321+2	1.5348+2	2.9256+1	4.7604–1
	1.2294–2	1.1182–7	3.9623+5	4.3792–5	1.2514+8	7.5362+7	1.8216+7	3.1559+7	5.9825+3	1.7458+2	1.4652+2	2.7568+1	4.9141–1
L2	1.2424–2	1.1261–7	3.9344+5	4.4537–5	1.2426+8	7.4913+7	1.8054+7	3.1289+7	5.9598+3	1.7344+2	1.4560+2	2.7344+1	4.9360–1
	1.2746–2	1.1459–7	3.8667+5	4.6409–5	1.2212+8	7.3817+7	1.7665+7	3.0635+7	5.9007+3	1.7056+2	1.4326+2	2.6803+1	4.9837–1
L1	1.2950–2	1.1583–7	3.8253+5	4.7612–5	1.2082+8	7.3145+7	1.7427+7	3.0237+7	5.8643+3	1.6881+2	1.4183+2	2.6473+1	5.0137–1
	1.3078–2	1.1660–7	3.7998+5	4.8373–5	1.2001+8	7.2730+7	1.7281+7	2.9993+7	5.8418+3	1.6772+2	1.4095+2	2.6270+1	5.0326–1
	1.3310–2	1.1800–7	3.7548+5	4.9760–5	1.1859+8	7.1996+7	1.7025+7	2.9564+7	5.8020+3	1.6581+2	1.3939+2	2.5912+1	5.0666–1
	1.3647–2	1.2002–7	3.6916+5	5.1813–5	1.1659+8	7.0960+7	1.6665+7	2.8963+7	5.7457+3	1.6313+2	1.3720+2	2.5409+1	5.1160–1
	1.4039–2	1.2235–7	3.6214+5	5.4238–5	1.1438+8	6.9807+7	1.6267+7	2.8297+7	5.6827+3	1.6016+2	1.3479+2	2.4854+1	5.1730–1
	1.4155–2	1.2303–7	3.6013+5	5.4963–5	1.1374+8	6.9476+7	1.6153+7	2.8107+7	5.6645+3	1.5932+2	1.3410+2	2.4695+1	5.1899–1
	1.5000–2	1.2796–7	3.4626+5	6.0367–5	1.0936+8	6.7183+7	1.5374+7	2.6799+7	5.5380+3	1.5352+2	1.2938+2	2.3605+1	5.3118–1
	1.6250–2	1.3511–7	3.2792+5	6.8727–5	1.0357+8	6.4075+7	1.4361+7	2.5129+7	5.3545+3	1.4557+2	1.2283+2	2.2199+1	5.4544–1
	1.7500–2	1.4208–7	3.1183+5	7.7523–5	9.8487+7	6.1325+7	1.3483+7	2.3674+7	5.1900+3	1.3869+2	1.1716+2	2.0976+1	5.5957–1
	1.8125–2	1.4551–7	3.0450+5	8.2081–5	9.6171+7	6.0065+7	1.3086+7	2.3016+7	5.1139+3	1.3558+2	1.1459+2	2.0423+1	5.6658–1
	2.0000–2	1.5554–7	2.8486+5	9.6348–5	8.9968+7	5.6665+7	1.2034+7	2.1264+7	4.9063+3	1.2734+2	1.0780+2	1.8952+1	5.8737–1
	2.2500–2	1.6837–7	2.6315+5	1.1676–4	8.3113+7	5.2756+7	1.0897+7	1.9455+7	4.6429+3	1.1777+2	9.9746+1	1.7415+1	6.0697–1

Atomic Weight 190.200 Density 22.570 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.6250–2	1.8674–7	2.3727+5	1.5022–4	7.4938+7	4.8045+7	9.5690+6	1.7319+7	4.3195+3	1.0657+2	9.0332+1	1.5602+1	6.3604–1
3.0000–2	2.0423–7	2.1695+5	1.8691–4	6.8520+7	4.4305+7	8.5510+6	1.5659+7	4.0575+3	9.7973+1	8.3112+1	1.4197+1	6.6451–1
3.5000–2	2.2675–7	1.9540+5	2.4053–4	6.1714+7	4.0255+7	7.5294+6	1.3926+7	3.7588+3	8.8652+1	7.5257+1	1.2703+1	6.9273–1
4.0000–2	2.4822–7	1.7849+5	2.9935–4	5.6375+7	3.7048+7	6.7439+6	1.2580+7	3.5179+3	8.1472+1	6.9206+1	1.1546+1	7.2053–1
5.0000–2	2.8864–7	1.5350+5	4.3092–4	4.8481+7	3.2226+7	5.6357+6	1.0616+7	3.1481+3	7.0789+1	6.0186+1	9.8367+0	7.6623–1
6.0000–2	3.2630–7	1.3579+5	5.8027–4	4.2886+7	2.8757+7	4.8851+6	9.2414+6	2.8795+3	6.3265+1	5.3828+1	8.6311+0	8.0587–1
K 7.4066–2	3.7502–7	1.1815+5	8.1693–4	3.7315+7	2.5263+7	4.1639+6	7.8848+6	2.6039+3	5.5764+1	4.7480+1	7.4298+0	8.5436–1
7.4808–2	3.7748–7	1.1738+5	8.3027–4	3.7071+7	2.5110+7	4.1332+6	7.8254+6	2.5916+3	5.5440+1	4.7206+1	7.3772+0	8.5677–1
7.7404–2	3.8602–7	1.1478+5	8.7757–4	3.6251+7	2.4593+7	4.0297+6	7.6256+6	2.5502+3	5.4349+1	4.6284+1	7.2001+0	8.6516–1
8.0000–2	3.9447–7	1.1232+5	9.2579–4	3.5474+7	2.4102+7	3.9320+6	7.4373+6	2.5107+3	5.3321+1	4.5414+1	7.0332+0	8.7354–1
8.5000–2	4.1013–7	1.0803+5	1.0212–3	3.4120+7	2.3248+7	3.7654+6	7.1046+6	2.4413+3	5.1510+1	4.3887+1	6.7348+0	8.8797–1
9.2500–2	4.3299–7	1.0233+5	1.1703–3	3.2318+7	2.2106+7	3.5448+6	6.6653+6	2.3477+3	4.9116+1	4.1865+1	6.3413+0	9.0955–1
1.0000–1	4.5518–7	9.7338+4	1.3263–3	3.0743+7	2.1103+7	3.3529+6	6.2844+6	2.2645+3	4.7039+1	4.0108+1	6.0004+0	9.3101–1
1.1250–1	4.8850–7	9.0700+4	1.6004–3	2.8646+7	1.9790+7	3.1042+6	5.7497+6	2.1575+3	4.4211+1	3.7736+1	5.5142+0	9.6051–1
1.3125–1	5.3572–7	8.2704+4	2.0415–3	2.6121+7	1.8194+7	2.8065+6	5.1180+6	2.0250+3	4.0847+1	3.4901+1	4.9408+0	1.0050+0
1.5000–1	5.8022–7	7.6361+4	2.5159–3	2.4118+7	1.6917+7	2.5719+6	4.6271+6	1.9169+3	3.8218+1	3.2673+1	4.4964+0	1.0493+0
1.7500–1	6.3160–7	7.0150+4	3.1926–3	2.2156+7	1.5649+7	2.3543+6	4.1507+6	1.8034+3	3.5702+1	3.0544+1	4.0589+0	1.0990+0
2.0000–1	6.7969–7	6.5187+4	3.9130–3	2.0588+7	1.4628+7	2.1807+6	3.7778+6	1.7106+3	3.3722+1	2.8856+1	3.7174+0	1.1485+0
2.5000–1	7.6602–7	5.7840+4	5.4556–3	1.8268+7	1.3051+7	1.9582+6	3.2573+6	1.5801+3	3.1138+1	2.6665+1	3.2342+0	1.2385+0
3.0000–1	8.4453–7	5.2463+4	7.1111–3	1.6570+7	1.1889+7	1.7934+6	2.8856+6	1.4808+3	2.9285+1	2.5067+1	2.8910+0	1.3271+0
4.0000–1	9.8621–7	4.4926+4	1.0650–2	1.4189+7	1.0176+7	1.6050+6	2.4070+6	1.3572+3	2.7259+1	2.3314+1	2.4432+0	1.5012+0
5.0000–1	1.1136–6	3.9788+4	1.4389–2	1.2566+7	8.9743+6	1.4960+6	2.0948+6	1.2834+3	2.6230+1	2.2402+1	2.1484+0	1.6796+0
6.0000–1	1.2251–6	3.6166+4	1.8241–2	1.1423+7	8.0909+6	1.4261+6	1.9042+6	1.2373+3	2.5700+1	2.1867+1	1.9698+0	1.8632+0
8.0000–1	1.4208–6	3.1184+4	2.6068–2	9.8491+6	6.8658+6	1.3441+6	1.6380+6	1.1860+3	2.5403+1	2.1436+1	1.7176+0	2.2494+0
1.0000+0	1.5864–6	2.7928+4	3.3920–2	8.8207+6	6.0429+6	1.2997+6	1.4770+6	1.1589+3	2.5541+1	2.1327+1	1.5654+0	2.6493+0
1.5000+0	1.9063–6	2.3242+4	5.3042–2	7.3408+6	4.8136+6	1.2507+6	1.2753+6	1.1317+3	2.6763+1	2.1682+1	1.3774+0	3.7036+0
2.0000+0	2.1441–6	2.0664+4	7.1245–2	6.5264+6	4.1246+6	1.2340+6	1.1668+6	1.1249+3	2.8185+1	2.2089+1	1.2725+0	4.8239+0
3.0000+0	2.4772–6	1.7885+4	1.0494–1	5.6488+6	3.3769+6	1.2155+6	1.0553+6	1.1247+3	3.1215+1	2.2866+1	1.1741+0	7.1751+0
4.0000+0	2.6939–6	1.6447+4	1.3550–1	5.1945+6	2.9726+6	1.2136+6	1.0072+6	1.1299+3	3.4290+1	2.3527+1	1.1295+0	9.6336+0
5.0000+0	2.8527–6	1.5532+4	1.6343–1	4.9054+6	2.7225+6	1.2121+6	9.6966+5	1.1358+3	3.7355+1	2.4108+1	1.0961+0	1.2151+1
6.0000+0	2.9679–6	1.4929+4	1.8915–1	4.7150+6	2.5554+6	1.2109+6	9.4762+5	1.1419+3	4.0457+1	2.4592+1	1.0797+0	1.4786+1
8.0000+0	3.1233–6	1.4186+4	2.3525–1	4.4804+6	2.3461+6	1.2092+6	9.2398+5	1.1517+3	4.6451+1	2.5297+1	1.0596+0	2.0094+1
1.0000+1	3.2209–6	1.3756+4	2.7568–1	4.3446+6	2.2290+6	1.2097+6	9.0478+5	1.1626+3	5.2605+1	2.5894+1	1.0443+0	2.5666+1
1.5000+1	3.3145–6	1.3368+4	3.5932–1	4.2220+6	2.1148+6	1.2107+6	8.9524+5	1.1827+3	6.7581+1	2.6747+1	1.0378+0	3.9796+1
2.0000+1	3.3352–6	1.3285+4	4.2595–1	4.1957+6	2.0958+6	1.2114+6	8.8738+5	1.1962+3	8.3035+1	2.7408+1	1.0332+0	5.4594+1
3.0000+1	3.3437–6	1.3251+4	5.2822–1	4.1851+6	2.0976+6	1.2120+6	8.7428+5	1.2171+3	1.1417+2	2.8294+1	1.0268+0	8.4849+1
4.0000+1	3.3415–6	1.3260+4	6.0559–1	4.1879+6	2.0965+6	1.2124+6	8.7779+5	1.2334+3	1.4561+2	2.8807+1	1.0320+0	1.1577+2
5.0000+1	3.3399–6	1.3266+4	6.6769–1	4.1898+6	2.0956+6	1.2127+6	8.8026+5	1.2486+3	1.7752+2	2.9256+1	1.0361+0	1.4723+2
6.0000+1	3.3389–6	1.3270+4	7.1945–1	4.1910+6	2.0949+6	1.2128+6	8.8205+5	1.2611+3	2.0972+2	2.9586+1	1.0394+0	1.7910+2
8.0000+1	3.3376–6	1.3275+4	8.0249–1	4.1926+6	2.0938+6	1.2130+6	8.8461+5	1.2809+3	2.7492+2	3.0100+1	1.0448+0	2.4377+2
1.0000+2	3.3366–6	1.3279+4	8.6772–1	4.1939+6	2.0929+6	1.2131+6	8.8661+5	1.2964+3	3.4064+2	3.0574+1	1.0495+0	3.0901+2
1.5000+2	3.3312–6	1.3300+4	9.8738–1	4.2007+6	2.0914+6	1.2132+6	8.9485+5	1.3238+3	5.0600+2	3.1051+1	1.0594+0	4.7389+2
2.0000+2	3.3274–6	1.3316+4	1.0728+0	4.2055+6	2.0903+6	1.2132+6	9.0067+5	1.3405+3	6.7256+2	3.1498+1	1.0665+0	6.4000+2
3.0000+2	3.3221–6	1.3337+4	1.1936+0	4.2122+6	2.0887+6	1.2133+6	9.0887+5	1.3634+3	1.0047+3	3.2196+1	1.0766+0	9.7140+2
4.0000+2	3.3208–6	1.3342+4	1.2796+0	4.2139+6	2.0876+6	1.2133+6	9.1164+5	1.3793+3	1.3371+3	3.2631+1	1.0802+0	1.3034+3
5.0000+2	3.3210–6	1.3341+4	1.3464+0	4.2137+6	2.0868+6	1.2133+6	9.1224+5	1.3917+3	1.6719+3	3.2920+1	1.0813+0	1.6379+3
6.0000+2	3.3211–6	1.3341+4	1.4009+0	4.2135+6	2.0861+6	1.2133+6	9.1271+5	1.4012+3	2.0036+3	3.3186+1	1.0822+0	1.9693+3
8.0000+2	3.3216–6	1.3339+4	1.4871+0	4.2129+6	2.0849+6	1.2133+6	9.1324+5	1.4162+3	2.6727+3	3.3664+1	1.0836+0	2.6380+3
1.0000+3	3.3220–6	1.3337+4	1.5538+0	4.2124+6	2.0841+6	1.2133+6	9.1359+5	1.4285+3	3.3413+3	3.4055+1	1.0847+0	3.3062+3
1.5000+3	3.3238–6	1.3330+4	1.6751+0	4.2101+6	2.0826+6	1.2133+6	9.1274+5	1.4514+3	5.0218+3	3.4432+1	1.0837+0	4.9863+3
2.0000+3	3.3259–6	1.3322+4	1.7610+0	4.2074+6	2.0815+6	1.2133+6	9.1117+5	1.4690+3	6.6918+3	3.4807+1	1.0819+0	6.6559+3
3.0000+3	3.3283–6	1.3312+4	1.8822+0	4.2045+6	2.0799+6	1.2133+6	9.0976+5	1.4944+3	1.0040+4	3.5488+1	1.0802+0	1.0003+4
4.0000+3	3.3305–6	1.3303+4	1.9681+0	4.2016+6	2.0788+6	1.2133+6	9.0800+5	1.5128+3	1.3391+4	3.5841+1	1.0781+0	1.3354+4
5.0000+3	3.3338–6	1.3290+4	2.0347+0	4.1975+6	2.0780+6	1.2133+6	9.0473+5	1.5272+3	1.6777+4	3.6159+1	1.0743+0	1.6740+4
6.0000+3	3.3341–6	1.3289+4	2.0891+0	4.1971+6	2.0773+6	1.2133+6	9.0501+5	1.5378+3	2.0115+4	3.6403+1	1.0746+0	2.0077+4
8.0000+3	3.3354–6	1.3284+4	2.1748+0	4.1955+6	2.0762+6	1.2133+6	9.0444+5	1.5547+3	2.6848+4	3.6856+1	1.0740+0	2.6810+4
1.0000+4	3.3365–6	1.3279+4	2.2412+0	4.1941+6	2.0753+6	1.2133+6	9.0386+5	1.5679+3	3.3645+4	3.7277+1	1.0734+0	3.3607+4
1.5000+4	3.3384–6	1.3272+4	2.3620+0	4.1918+6	2.0738+6	1.2133+6	9.0307+5	1.5932+3	5.0244+4	3.7627+1	1.0724+0	5.0205+4
2.0000+4	3.3400–6	1.3266+4	2.4479+0	4.1897+6	2.0727+6	1.2133+6	9.0211+5	1.6114+3	6.7057+4	3.7977+1	1.0713+0	6.7018+4
3.0000+4	3.3417–6	1.3259+4	2.5690+0	4.1875+6	2.0711+6	1.2133+6	9.0145+5	1.6370+3	1.0035+5	3.8677+1	1.0705+0	1.0031+5
4.0000+4	3.3434–6	1.3252+4	2.6549+0	4.1854+6	2.0700+6	1.2133+6	9.0042+5	1.6554+3	1.3401+5	3.9036+1	1.0693+0	1.3397+5
5.0000+4	3.3463–6	1.3241+4	2.7215+0	4.1818+6	2.0692+6	1.2133+6	8.9765+5	1.6695+3	1.6736+5	3.9361+1	1.0660+0	1.6732+5
6.0000+4	3.3463–6	1.3241+4	2.7760+0	4.1818+6	2.0685+6	1.2133+6	8.9831+5	1.6811+3	2.0068+5	3.9590+1	1.0668+0	2.0064+5
8.0000+4	3.3472–6	1.3237+4	2.8620+0	4.1806+6	2.0674+6	1.2133+6	8.9819+5	1.6994+3	2.6790+5	4.0048+1	1.0666+0	2.6785+5
1.0000+5	3.3481–6	1.3233+4	2.9286+0	4.1795+6	2.0666+6	1.2133+6	8.9794+5	1.7137+3	3.3523+5	4.0473+1	1.0663+0	3.3519+5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EEDL Evaluated Electron
Cross Sections
77-Ir
Density 22 420 Grams/cc
Total
Elastic
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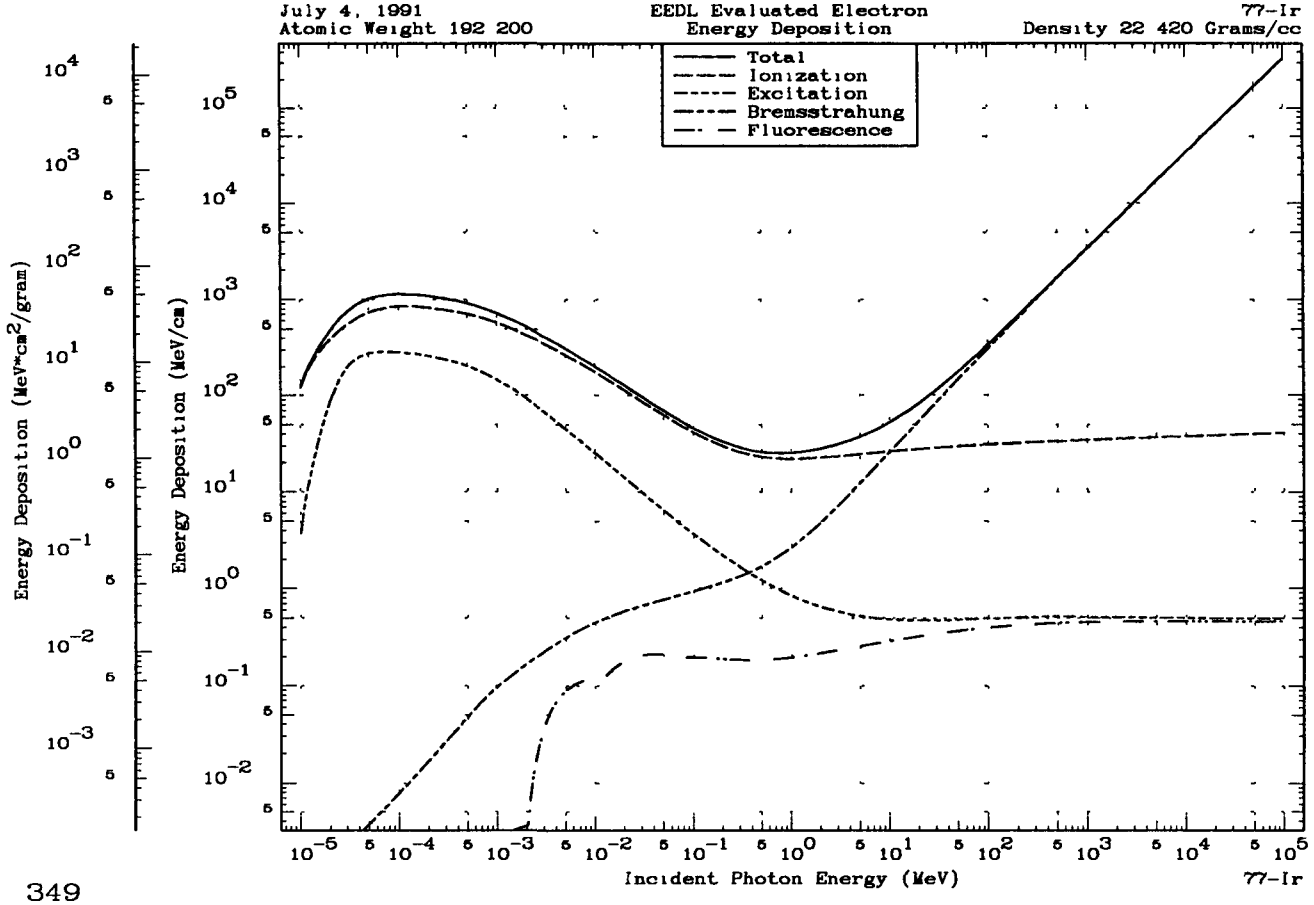
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
77-Ir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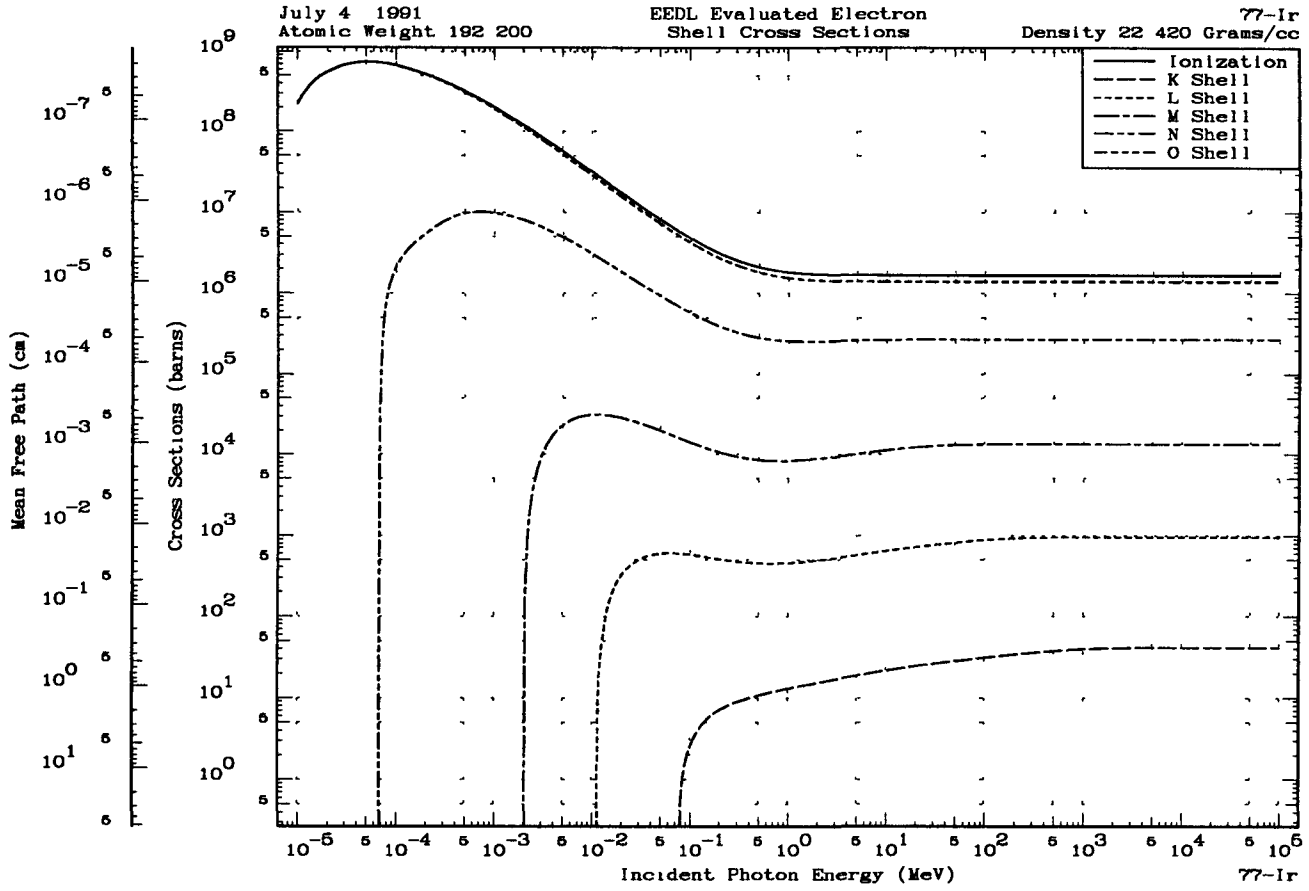
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
77-Ir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EEDL Evaluated Electron
Shell Cross Sections
77-Ir
Density 22 420 Grams/cc
Ionization
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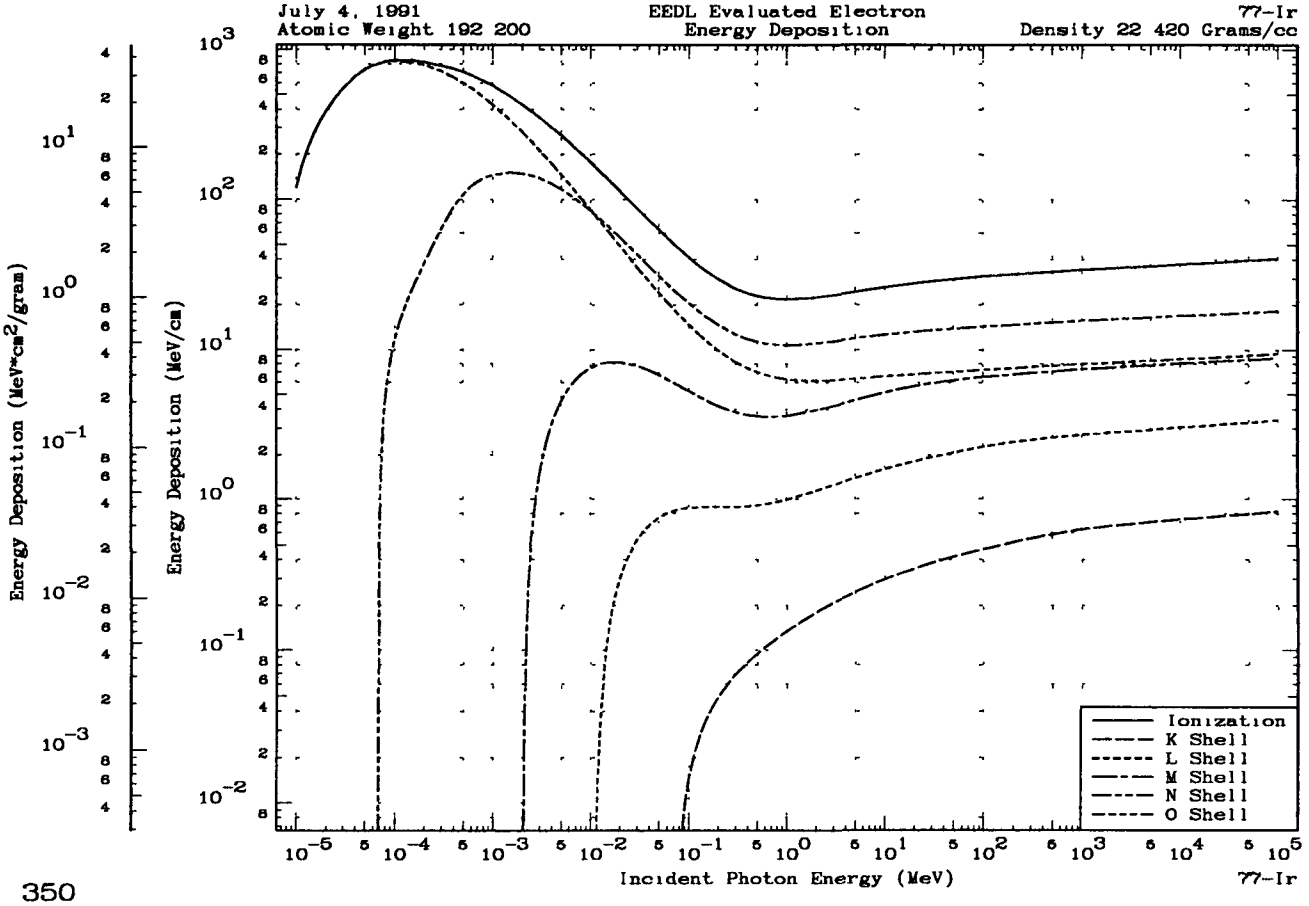
L Shell
M Shell
N Shell
O Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
77-Ir


July 4, 1991
Atomic Weight 192 200
EEDL Evaluated Electron
Energy Deposition
77-Ir
Density 22 420 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
77-Ir

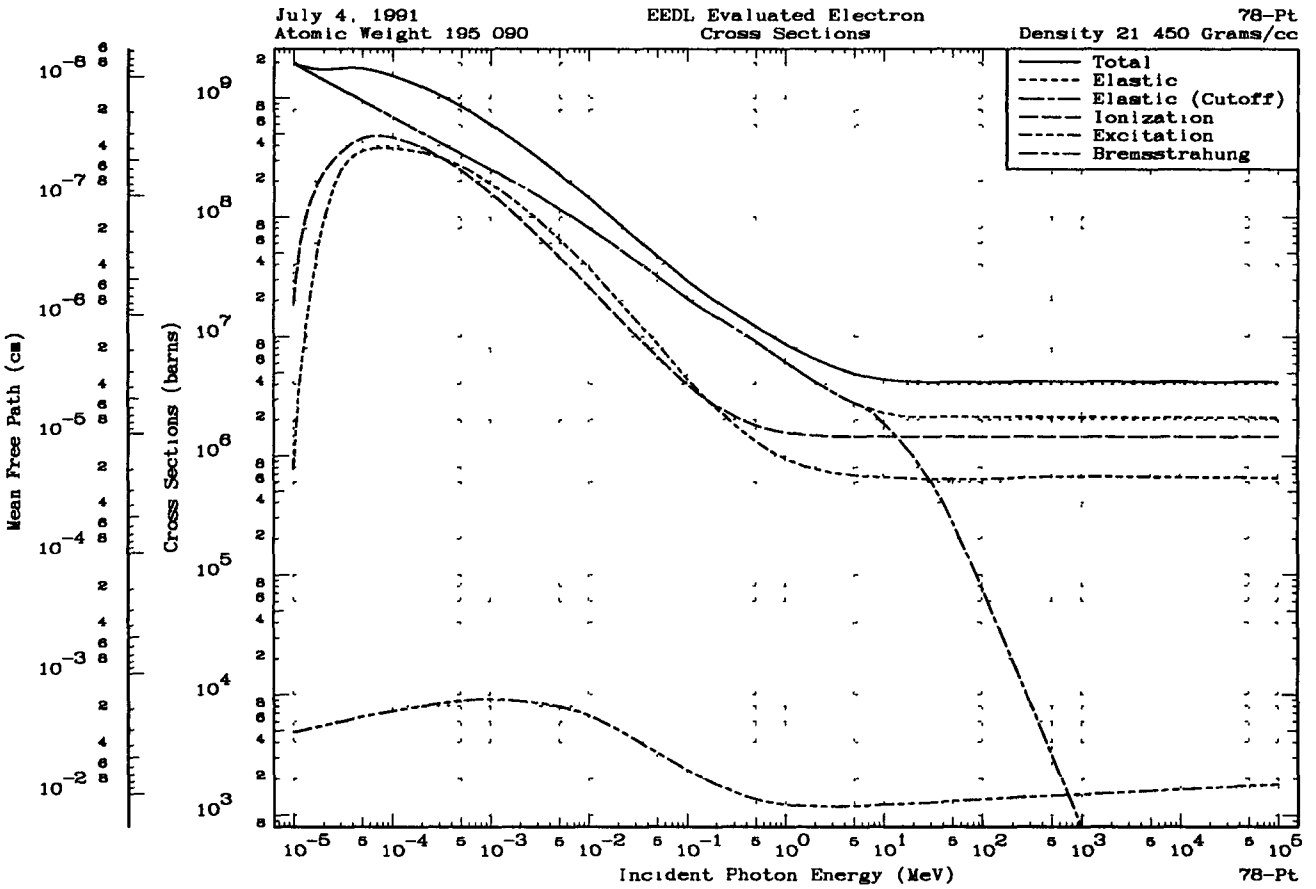
Atomic Weight 192.200 Density 22.420 Grams/cc

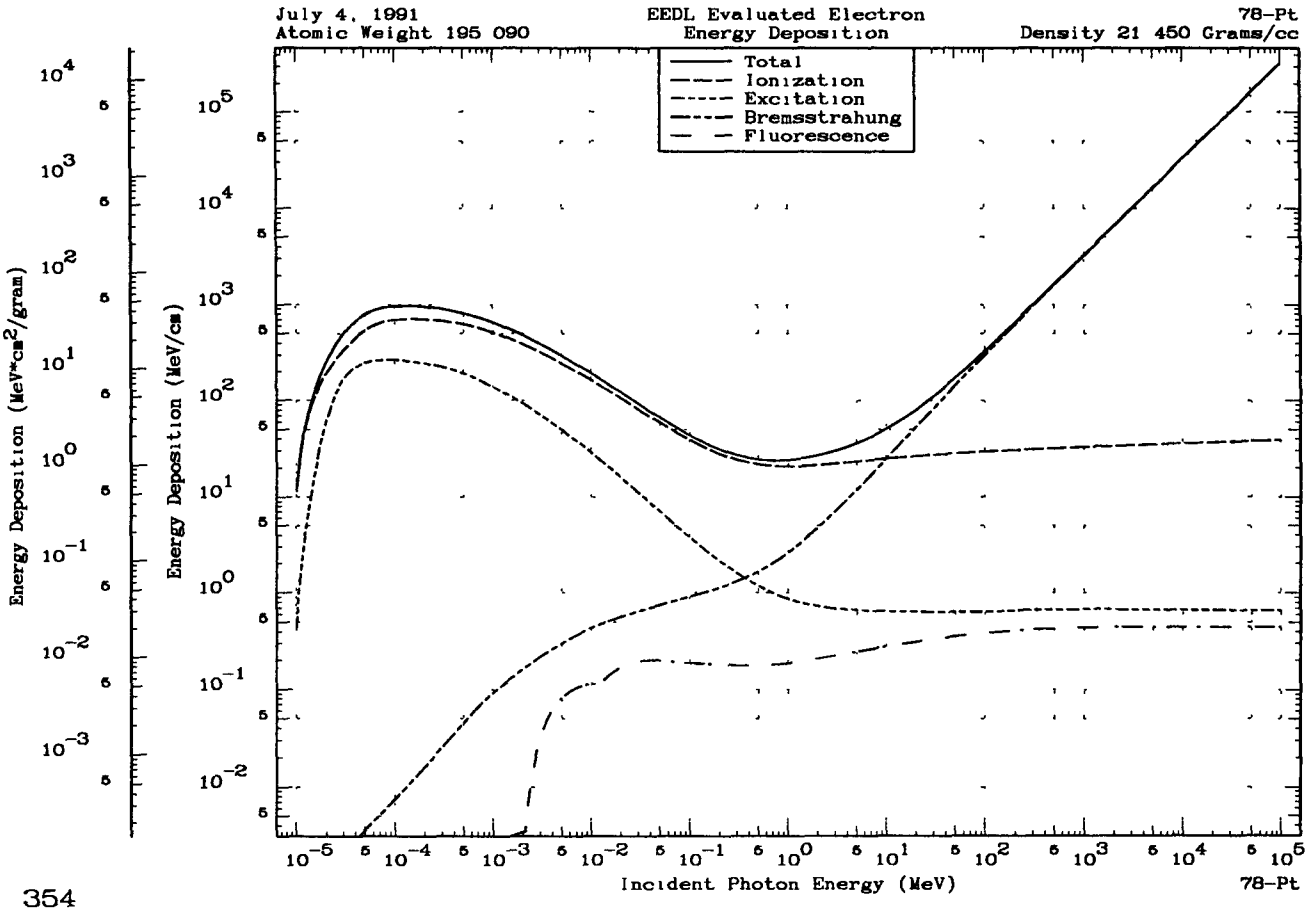
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.5247–9	8.0735+6		2.5767+9	2.3507+9	2.1892+8	7.0600+6	4.7941+3	1.2274+2	1.1900+2	3.7407+0	7.2791–4
	1.1250–5	5.6327–9	7.9185+6		2.5272+9	2.2237+9	2.8787+8	1.5682+7	4.9101+3	1.7102+2	1.6244+2	8.5846+0	8.1596–4
	1.3125–5	5.7651–9	7.7367+6		2.4692+9	2.0678+9	3.7035+8	3.1070+7	5.0661+3	2.3787+2	2.2005+2	1.7826+1	9.5091–4
	1.5000–5	5.8546–9	7.6184+6		2.4315+9	1.9416+9	4.3682+8	5.3038+7	5.2053+3	3.0355+2	2.7172+2	3.1827+1	1.0891–3
	1.7500–5	5.9273–9	7.5250+6		2.4016+9	1.8055+9	5.0586+8	9.0298+7	5.3707+3	3.8918+2	3.3214+2	5.7045+1	1.2778–3
	2.0000–5	5.9701–9	7.4711+6		2.3844+9	1.6953+9	5.5850+8	1.3065+8	5.5183+3	4.7262+2	3.8595+2	8.6672+1	1.4712–3
	2.5000–5	6.0163–9	7.4137+6		2.3661+9	1.5260+9	6.3415+8	2.0601+8	5.7444+3	6.2600+2	4.7805+2	1.4795+2	1.8368–3
	3.0000–5	6.0880–9	7.3264+6		2.3383+9	1.4003+9	6.8190+8	2.5610+8	5.9361+3	7.5030+2	5.5233+2	1.9796+2	2.2136–3
	3.5000–5	6.1993–9	7.1948+6		2.2963+9	1.3023+9	7.0819+8	2.8579+8	6.1010+3	8.4140+2	6.0796+2	2.3344+2	2.5973–3
	4.0000–5	6.3209–9	7.0565+6		2.2521+9	1.2230+9	7.3190+8	2.9725+8	6.2475+3	9.1963+2	6.6381+2	2.5582+2	2.9897–3
	5.0000–5	6.6344–9	6.7230+6		2.1457+9	1.1011+9	7.4549+8	2.9908+8	6.4815+3	1.0141+3	7.3571+2	2.7838+2	3.7627–3
O3	5.1660–5	6.6903–9	6.6668+6		2.1277+9	1.0843+9	7.4468+8	2.9874+8	6.5152+3	1.0237+3	7.4301+2	2.8064+2	3.8909–3
	5.2703–5	6.7271–9	6.6303+6		2.1161+9	1.0742+9	7.4429+8	2.9762+8	6.5358+3	1.0292+3	7.4796+2	2.8127+2	3.9716–3
	5.4527–5	6.7900–9	6.5689+6		2.0965+9	1.0571+9	7.4363+8	2.9573+8	6.5712+3	1.0391+3	7.5667+2	2.8240+2	4.1135–3
	6.0000–5	6.9685–9	6.4006+6		2.0428+9	1.0106+9	7.4168+8	2.9049+8	6.6716+3	1.0683+3	7.8232+2	2.8599+2	4.5431–3
	6.5000–5	7.1412–9	6.2459+6		1.9934+9	9.7328+8	7.3325+8	2.8689+8	6.7568+3	1.0802+3	7.9309+2	2.8710+2	4.9404–3
O2	6.5680–5	7.1639–9	6.2261+6		1.9871+9	9.6853+8	7.3213+8	2.8642+8	6.7680+3	1.0817+3	7.9445+2	2.8726+2	4.9948–3
	6.6575–5	7.1940–9	6.2000+6		1.9788+9	9.6238+8	7.3069+8	2.8570+8	6.7825+3	1.0838+3	7.9636+2	2.8739+2	5.0665–3
N7	6.8060–5	7.2432–9	6.1579+6		1.9653+9	9.5245+8	7.2837+8	2.8451+8	6.8063+3	1.0872+3	7.9957+2	2.8762+2	5.1857–3
	6.8253–5	7.2495–9	6.1526+6		1.9636+9	9.5118+8	7.2809+8	2.8435+8	6.8093+3	1.0877+3	8.0005+2	2.8765+2	5.2013–3
	6.9553–5	7.2917–9	6.1169+6		1.9523+9	9.4278+8	7.2620+8	2.8327+8	6.8297+3	1.0911+3	8.0328+2	2.8782+2	5.3060–3
	6.9722–5	7.2972–9	6.1124+6		1.9508+9	9.4170+8	7.2595+8	2.8313+8	6.8323+3	1.0915+3	8.0368+2	2.8785+2	5.3196–3
N6	7.1330–5	7.3485–9	6.0696+6		1.9372+9	9.3165+8	7.2367+8	2.8183+8	6.8571+3	1.0958+3	8.0767+2	2.8809+2	5.4497–3
	7.2164–5	7.3757–9	6.0473+6		1.9300+9	9.2657+8	7.2257+8	2.8088+8	6.8697+3	1.0980+3	8.1003+2	2.8797+2	5.5173–3
	7.2414–5	7.3838–9	6.0407+6		1.9279+9	9.2507+8	7.2224+8	2.8060+8	6.8735+3	1.0986+3	8.1070+2	2.8793+2	5.5375–3
	7.2500–5	7.3866–9	6.0384+6		1.9272+9	9.2455+8	7.2212+8	2.8050+8	6.8748+3	1.0989+3	8.1093+2	2.8792+2	5.5445–3
	7.4310–5	7.4448–9	5.9911+6		1.9121+9	9.1389+8	7.1972+8	2.7849+8	6.9017+3	1.1034+3	8.1573+2	2.8770+2	5.6917–3
	7.4861–5	7.4623–9	5.9771+6		1.9076+9	9.1072+8	7.1901+8	2.7789+8	6.9098+3	1.1049+3	8.1722+2	2.8764+2	5.7366–3
	7.6082–5	7.5007–9	5.9465+6		1.8979+9	9.0382+8	7.1746+8	2.7659+8	6.9276+3	1.1081+3	8.2055+2	2.8752+2	5.8363–3
	7.7155–5	7.5340–9	5.9202+6		1.8895+9	8.9788+8	7.1612+8	2.7546+8	6.9430+3	1.1109+3	8.2347+2	2.8742+2	5.9241–3
	8.0000–5	7.6206–9	5.8529+6		1.8680+9	8.8272+8	7.1270+8	2.7258+8	6.9829+3	1.1186+3	8.3136+2	2.8724+2	6.1577–3
	8.5000–5	7.7801–9	5.7330+6		1.8297+9	8.5790+8	7.0262+8	2.6918+8	7.0471+3	1.1216+3	8.3524+2	2.8634+2	6.5679–3
	9.0000–5	7.9328–9	5.6226+6		1.7945+9	8.3515+8	6.9331+8	2.6602+8	7.1081+3	1.1254+3	8.3972+2	2.8564+2	6.9815–3
	9.2500–5	8.0070–9	5.5705+6		1.7779+9	8.2445+8	6.8889+8	2.6451+8	7.1375+3	1.1274+3	8.4205+2	2.8534+2	7.1895–3
O1	9.9140–5	8.1973–9	5.4412+6		1.7366+9	7.9800+8	6.7782+8	2.6075+8	7.2125+3	1.1333+3	8.4854+2	2.8474+2	7.7458–3
	1.0000–4	8.2216–9	5.4251+6	0.0000+0	1.7315+9	7.9477+8	6.7648+8	2.6021+8	7.2214+3	1.1342+3	8.4953+2	2.8464+2	7.8177–3
	1.0313–4	8.3170–9	5.3629+6	2.7582–9	1.7116+9	7.8340+8	6.6969+8	2.5848+8	7.2532+3	1.1318+3	8.4818+2	2.8365+2	8.0796–3
	1.0898–4	8.4907–9	5.2531+6	7.9426–9	1.6766+9	7.6341+8	6.5775+8	2.5541+8	7.3107+3	1.1284+3	8.4646+2	2.8195+2	8.5733–3
	1.1250–4	8.5918–9	5.1913+6	1.1061–8	1.6568+9	7.5215+8	6.5103+8	2.5366+8	7.3440+3	1.1269+3	8.4589+2	2.8101+2	8.8714–3
	1.1411–4	8.6377–9	5.1638+6	1.2491–8	1.6481+9	7.4716+8	6.4800+8	2.5288+8	7.3589+3	1.1261+3	8.4548+2	2.8060+2	9.0084–3
	1.2308–4	8.8853–9	5.0199+6	2.0470–8	1.6021+9	7.2116+8	6.3219+8	2.4877+8	7.4389+3	1.1227+3	8.4420+2	2.7853+2	9.7760–3
	1.3125–4	9.1001–9	4.9014+6	2.7749–8	1.5643+9	6.9980+8	6.1917+8	2.4534+8	7.5075+3	1.1213+3	8.4437+2	2.7692+2	1.0481–2
	1.3654–4	9.2350–9	4.8298+6	3.2470–8	1.5415+9	6.8697+8	6.1123+8	2.4325+8	7.5500+3	1.1205+3	8.4450+2	2.7600+2	1.0942–2
	1.5000–4	9.5627–9	4.6643+6	4.4481–8	1.4886+9	6.5741+8	5.9287+8	2.3835+8	7.6521+3	1.1205+3	8.4644+2	2.7401+2	1.2123–2
	1.7500–4	1.0188–8	4.3780+6	6.7003–8	1.3973+9	6.1165+8	5.5647+8	2.2913+8	7.8153+3	1.0996+3	8.3239+2	2.6717+2	1.4377–2
	2.0000–4	1.0759–8	4.1456+6	8.9869–8	1.3231+9	5.7460+8	5.2703+8	2.2144+8	7.9595+3	1.0871+3	8.2529+2	2.6181+2	1.6675–2
	2.2500–4	1.1341–8	3.9327+6	1.1313–7	1.2552+9	5.4379+8	4.9780+8	2.1356+8	8.0737+3	1.0628+3	8.0800+2	2.5474+2	1.9060–2
	2.5000–4	1.1886–8	3.7524+6	1.3685–7	1.1976+9	5.1763+8	4.7323+8	2.0674+8	8.1772+3	1.0449+3	7.9607+2	2.4878+2	2.1478–2
	2.6250–4	1.2148–8	3.6717+6	1.4886–7	1.1718+9	5.0594+8	4.6223+8	2.0366+8	8.2256+3	1.0372+3	7.9106+2	2.4614+2	2.2698–2
N5	2.9458–4	1.2786–8	3.4883+6	1.8001–7	1.1133+9	4.7937+8	4.3737+8	1.9656+8	8.3411+3	1.0223+3	7.8204+2	2.4021+2	2.5862–2
	3.0000–4	1.2895–8	3.4591+6	1.8532–7	1.1040+9	4.7530+8	4.3339+8	1.9528+8	8.3595+3	1.0196+3	7.8046+2	2.3907+2	2.6400–2
N4	3.1052–4	1.3107–8	3.4030+6	1.9568–7	1.0861+9	4.6769+8	4.2522+8	1.9318+8	8.3944+3	1.0117+3	7.7466+2	2.3699+2	2.7450–2
	3.1250–4	1.3147–8	3.3926+6	1.9764–7	1.0828+9	4.6631+8	4.2373+8	1.9272+8	8.4007+3	1.0102+3	7.7364+2	2.3653+2	2.7649–2
	3.1611–4	1.3220–8	3.3738+6	2.0122–7	1.0768+9	4.6383+8	4.2104+8	1.9189+8	8.4120+3	1.0075+3	7.7177+2	2.3572+2	2.8014–2
	3.2660–4	1.3430–8	3.3211+6	2.1166–7	1.0599+9	4.5685+8	4.1353+8	1.8956+8	8.4443+3	1.0002+3	7.6673+2	2.3343+2	2.9075–2
	3.3438–4	1.3583–8	3.2836+6	2.1946–7	1.0480+9	4.5188+8	4.0821+8	1.8790+8	8.4677+3	9.9517+2	7.6333+2	2.3180+2	2.9865–2
	3.4495–4	1.3789–8	3.2348+6	2.3012–7	1.0324+9	4.4539+8	4.0128+8	1.8572+8	8.4987+3	9.8879+2	7.5908+2	2.2968+2	3.0942–2
	3.6719–4	1.4209–8	3.1391+6	2.5274–7	1.0019+9	4.3265+8	3.8777+8	1.8142+8	8.5613+3	9.7708+2	7.5153+2	2.2553+2	3.3220–2
	3.7247–4	1.4307–8	3.1176+6	2.5816–7	9.9500+8	4.2978+8	3.8476+8	1.8045+8	8.5757+3	9.7460+2	7.4997+2	2.2460+2	3.3764–2
	4.0000–4	1.4804–8	3.0129+6	2.8657–7	9.6159+8	4.1578+8	3.7010+8	1.7570+8	8.6478+3	9.6336+2	7.4325+2	2.2007+2	3.6612–2
	4.5000–4	1.5715–8	2.8383+6	3.3927–7	9.0586+8	3.9365+8	3.4491+8	1.6730+8	8.7506+3	9.3438+2	7.2310+2	2.1124+2	4.2021–2
N3	4.8455–4	1.6313–8	2.7342+6	3.7656–7	8.7263+8	3.8036+8	3.3004+8	1.6223+8	8.8157+3	9.1860+2	7.1258+2	2.0597+2	4.5796–2
	4.9227–4	1.6446–8	2.7120+6	3.8498–7	8.6556+8	3.7757+8	3.2696+8	1.6102+8	8.8297+3	9.1539+2	7.1061+2	2.0473+2	4.6644–2
	5.0000–4	1.6578–8	2.6904+6	3.9344–7	8.5866+8	3.7485+8	3.2396+8	1.5985+8	8.8435+3	9.1233+2	7.0876+2	2.0352+2	4.7494–2
	5.2500–4	1.7010–8	2.6221+6	4.2104–7	8.3687+8	3.6646+8	3.1412+8	1.5628+8	8.8830+3	8.9902+2	6.9937+2	1.9960+2	5.0231–2
	5.6250–4	1.7639–8	2.5287+6	4.6316–7	8.0704+8	3.5490+8	3.0076+8	1.5137+8	8.9392+3	8.8160+2	6.8732+2	1.9422+2	5.4360–2
N2	5.7035–4	1.7768–8	2.5103+6	4.7208–7	8.0119+8	3.5262+8	2.9815+8	1.5041+8	8.9506+3	8.7829+2	6.8506+2	1.9317+2	5.5228–2
	5.7776–4	1.7891–8	2.4931+6	4.8054–7	7.9568+8	3.5052+8	2.9574+8	1.4942+8	8.9580+3	8.7518+2	6.8303+2	1.9209+2	5.6029–2
	6.0000–4	1.8255–8	2.4434+6	5.0607–7	7.7981+8	3.4442+8	2.8881+8	1.4656+8	8.9798+3	8.6646+2	6.7740+2	1.8900+2	5.8435–2
	6.2500–4	1.8666–8	2.3895+6	5.3513–7	7.6262+8	3.3795+8	2.8114+8	1.4351+8	9.0023+3	8.5452+2	6.6892+2	1.8553+2	6.1131–2
	6.5000–4	1.9070–8	2.3389+6	5.6457–7	7.4648+8	3.3186+8	2.7397+8	1.4064+8	9.0240+3	8.4356+2	6.6123+2	1.8227+2	6.3833–2
	6.6875–4	1.9368–8	2.3030+6	5.8690–7	7.3500+8	3.2750+8	2.6890+8	1.3860+8	9.0397+3	8.3594+2	6.5591+2	1.7995+2	6.5864–2
N1	6.7532–4	1.9471–8	2.2907+6	5.9477–7	7.3110+8	3.2602+8	2.6717+8	1.3790+8	9.0451+3	8.3336+2	6.5413+2	1.7917+2	6.6576–2
	6.8311–4	1.9597–8	2.2760+6	6.0414–7	7.2641+8	3.2429+8	2.6510+8	1.3701+8	9.0496+3	8.2990+2	6.5170+2	1.7814+2	6.7390–2
	6.9772–4	1.9831–8	2.2491+6	6.2182–7	7.1783+8	3.2112+8	2.6132+8	1.3538+8	9.0579+3	8.2363+2	6.4730+2	1.7626+2	6.8918–2
	7.2329–4	2.0236–8	2.2042+6	6.5306–7	7.0348+8	3.1579+8	2.5502+8	1.3266+8	9.0719+3	8.1332+2	6.4012+2	1.7312+2	7.1594–2
	7.3438–4	2.0409–8	2.1855+6	6.6672–7	6.9751+8	3.1357+8	2.5241+8	1.3152+8	9.0779+3	8.0908+2	6.3720+2	1.7181+2	7.2756–2
	7.6165–4	2.0830–8	2.1413+6	7.0063–7	6.8342+8	3.0831+8	2.4626+8	1.2884+8	9.0922+3	7.9925+2	6.3044+2	1.6873+2	7.5617–2
	8.0000–4	2.1410–8	2.0833+6	7.4900–7	6.6490+8	3.0135+8	2.3823+8	1.2531+8	9.1115+3	7.8670+2	6.2193+2	1.6469+2	7.9648–2
	8.5000–4	2.2173–8	2.0116+6	8.1335–7	6.4200+8	2.9299+8	2.2830+8	1.2071+8	9.1109+3	7.6750+2	6.0822+2	1.5919+2	8.4271–2

Atomic Weight 192.200 Density 22.420 Grams/cc

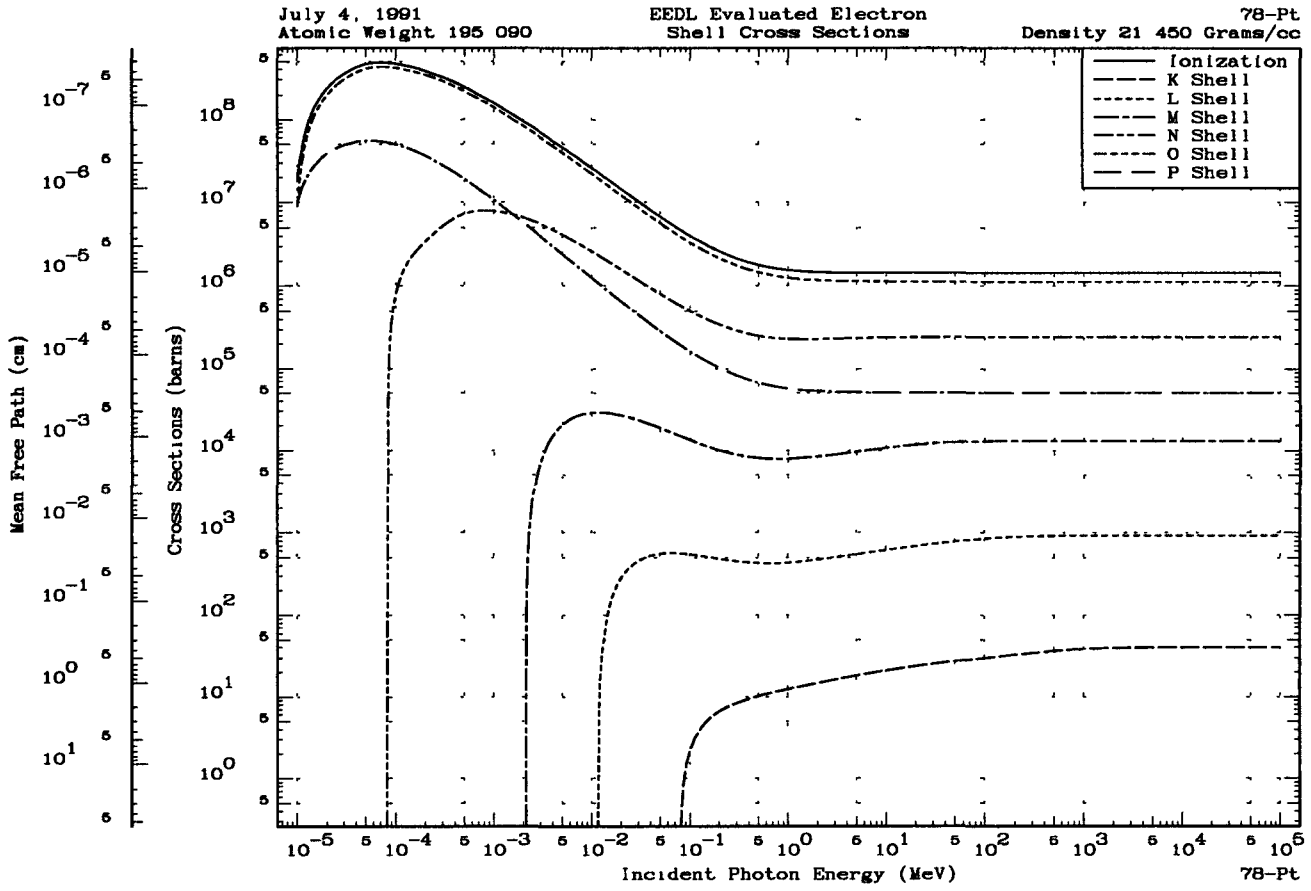
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	9.0000–4	2.2917–8	1.9463+6	8.7922–7	6.2117+8	2.8531+8	2.1933+8	1.1652+8	9.1104+3	7.5048+2	5.9618+2	1.5421+2	8.8894–2
	9.2500–4	2.3282–8	1.9158+6	9.1271–7	6.1144+8	2.8170+8	2.1516+8	1.1456+8	9.1101+3	7.4266+2	5.9069+2	1.5188+2	9.1206–2
	1.0000–3	2.4350–8	1.8318+6	1.0152–6	5.8462+8	2.7169+8	2.0375+8	1.0917+8	9.1094+3	7.2168+2	5.7609+2	1.4550+2	9.8140–2
	1.1250–3	2.6120–8	1.7076+6	1.1932–6	5.4500+8	2.5719+8	1.8672+8	1.0108+8	9.0485+3	6.8302+2	5.4738+2	1.3554+2	1.0736–1
	1.2500–3	2.7805–8	1.6041+6	1.3805–6	5.1197+8	2.4488+8	1.7273+8	9.4349+7	8.9943+3	6.5189+2	5.2449+2	1.2729+2	1.1654–1
	1.3125–3	2.8620–8	1.5585+6	1.4774–6	4.9739+8	2.3938+8	1.6661+8	9.1385+7	8.9694+3	6.3838+2	5.1459+2	1.2366+2	1.2111–1
	1.5000–3	3.0966–8	1.4404+6	1.7791–6	4.5970+8	2.2496+8	1.5100+8	8.3743+7	8.9014+3	6.0456+2	4.9007+2	1.1435+2	1.3477–1
	1.7500–3	3.4090–8	1.3084+6	2.2092–6	4.1758+8	2.0914+8	1.3401+8	7.4424+7	8.8142+3	5.5863+2	4.5605+2	1.0244+2	1.5171–1
	2.0000–3	3.7031–8	1.2045+6	2.6713–6	3.8442+8	1.9634+8	1.2088+8	6.7194+7	8.7393+3	5.2377+2	4.3039+2	9.3219+1	1.6853–1
M5	2.0448–3	3.7562–8	1.1874+6	2.7574–6	3.7898+8	1.9421+8	1.1876+8	6.6000+7	8.7220+3	5.1736+2	4.2555+2	9.1645+1	1.7110–1
	2.0746–3	3.7914–8	1.1764+6	2.8153–6	3.7546+8	1.9282+8	1.1740+8	6.5225+7	8.7107+3	5.1325+2	4.2245+2	9.0627+1	1.7281–1
	2.1036–3	3.8254–8	1.1660+6	2.8719–6	3.7213+8	1.9151+8	1.1612+8	6.4493+7	8.7000+3	5.0938+2	4.1954+2	8.9664+1	1.7447–1
M4	2.1232–3	3.8483–8	1.1590+6	2.9105–6	3.6992+8	1.9064+8	1.1526+8	6.4007+7	8.6927+3	5.0680+2	4.1760+2	8.9025+1	1.7559–1
	2.1316–3	3.8581–8	1.1561+6	2.9271–6	3.6898+8	1.9027+8	1.1490+8	6.3797+7	8.6897+3	5.0571+2	4.1678+2	8.8750+1	1.7607–1
	2.1859–3	3.9213–8	1.1375+6	3.0351–6	3.6302+8	1.8792+8	1.1262+8	6.2472+7	8.6702+3	4.9881+2	4.1162+2	8.7020+1	1.7918–1
	2.2328–3	3.9755–8	1.1220+6	3.1298–6	3.5808+8	1.8596+8	1.1074+8	6.1374+7	8.6537+3	4.9311+2	4.0734+2	8.5586+1	1.8186–1
	2.2876–3	4.0382–8	1.1045+6	3.2417–6	3.5252+8	1.8375+8	1.0862+8	6.0143+7	8.6349+3	4.8674+2	4.0258+2	8.3980+1	1.8498–1
	2.4246–3	4.1923–8	1.0639+6	3.5274–6	3.3956+8	1.7855+8	1.0371+8	5.7294+7	8.5901+3	4.7207+2	3.9162+2	8.0262+1	1.9277–1
	2.4657–3	4.2378–8	1.0525+6	3.6149–6	3.3591+8	1.7707+8	1.0233+8	5.6495+7	8.5772+3	4.6799+2	3.8857+2	7.9220+1	1.9511–1
M3	2.5390–3	4.3183–8	1.0329+6	3.7727–6	3.2965+8	1.7453+8	9.9979+7	5.5131+7	8.5548+3	4.6101+2	3.8337+2	7.7441+1	1.9926–1
	2.5684–3	4.3509–8	1.0251+6	3.8368–6	3.2718+8	1.7352+8	9.9049+7	5.4600+7	8.5460+3	4.5801+2	3.8108+2	7.6737+1	2.0092–1
	2.5966–3	4.3819–8	1.0179+6	3.8984–6	3.2486+8	1.7258+8	9.8178+7	5.4102+7	8.5376+3	4.5520+2	3.7892+2	7.6078+1	2.0252–1
	2.6975–3	4.4919–8	9.9296+5	4.1224–6	3.1691+8	1.6931+8	9.5195+7	5.2400+7	8.5086+3	4.4563+2	3.7159+2	7.3823+1	2.0821–1
	2.7329–3	4.5301–8	9.8459+5	4.2021–6	3.1424+8	1.6820+8	9.4196+7	5.1830+7	8.4987+3	4.4243+2	3.6915+2	7.3068+1	2.1020–1
	2.7842–3	4.5852–8	9.7275+5	4.3187–6	3.1046+8	1.6664+8	9.2787+7	5.1026+7	8.4845+3	4.3792+2	3.6570+2	7.2005+1	2.1309–1
	2.8487–3	4.6539–8	9.5840+5	4.4670–6	3.0588+8	1.6473+8	9.1083+7	5.0054+7	8.4672+3	4.3249+2	3.6155+2	7.0718+1	2.1672–1
M2	2.9002–3	4.7083–8	9.4734+5	4.5866–6	3.0235+8	1.6326+8	8.9773+7	4.9308+7	8.4536+3	4.2832+2	3.5837+2	6.9731+1	2.1961–1
	2.9501–3	4.7608–8	9.3688+5	4.7036–6	2.9901+8	1.6187+8	8.8543+7	4.8594+7	8.4407+3	4.2441+2	3.5540+2	6.8794+1	2.2241–1
	3.0000–3	4.8130–8	9.2673+5	4.8217–6	2.9577+8	1.6051+8	8.7350+7	4.7902+7	8.4281+3	4.2064+2	3.5253+2	6.7886+1	2.2520–1
	3.1250–3	4.9424–8	9.0245+5	5.1224–6	2.8802+8	1.5725+8	8.4472+7	4.6289+7	8.3973+3	4.1070+2	3.4476+2	6.5715+1	2.3218–1
M1	3.1457–3	4.9637–8	8.9859+5	5.1729–6	2.8679+8	1.5673+8	8.4015+7	4.6033+7	8.3924+3	4.0913+2	3.4353+2	6.5371+1	2.3334–1
	3.1991–3	5.0190–8	8.8869+5	5.3041–6	2.8363+8	1.5539+8	8.2857+7	4.5377+7	8.3732+3	4.0510+2	3.4037+2	6.4488+1	2.3582–1
	3.2500–3	5.0713–8	8.7951+5	5.4303–6	2.8070+8	1.5414+8	8.1784+7	4.4769+7	8.3553+3	4.0137+2	3.3746+2	6.3671+1	2.3819–1
	3.2992–3	5.1216–8	8.7087+5	5.5535–6	2.7794+8	1.5296+8	8.0777+7	4.4199+7	8.3382+3	3.9786+2	3.3472+2	6.2904+1	2.4047–1
	3.3437–3	5.1670–8	8.6323+5	5.6659–6	2.7551+8	1.5191+8	7.9888+7	4.3696+7	8.3230+3	3.9477+2	3.3230+2	6.2228+1	2.4253–1
	3.4744–3	5.2985–8	8.4180+5	6.0005–6	2.6867+8	1.4896+8	7.7403+7	4.2290+7	8.2798+3	3.8615+2	3.2557+2	6.0337+1	2.4857–1
	3.6250–3	5.4478–8	8.1873+5	6.3952–6	2.6130+8	1.4577+8	7.4742+7	4.0786+7	8.2322+3	3.7698+2	3.1841+2	5.8316+1	2.5551–1
	3.6719–3	5.4938–8	8.1188+5	6.5200–6	2.5912+8	1.4481+8	7.3955+7	4.0341+7	8.2178+3	3.7426+2	3.1628+2	5.7718+1	2.5766–1
	3.7372–3	5.5575–8	8.0257+5	6.6954–6	2.5615+8	1.4351+8	7.2888+7	3.9739+7	8.1982+3	3.7058+2	3.1341+2	5.6909+1	2.6066–1
	4.0000–3	5.8095–8	7.6777+5	7.4179–6	2.4504+8	1.3861+8	6.8921+7	3.7499+7	8.1228+3	3.5700+2	3.0282+2	5.3902+1	2.7267–1
	4.5000–3	6.2821–8	7.1001+5	8.8687–6	2.2660+8	1.3027+8	6.2439+7	3.3882+7	7.9654+3	3.3255+2	2.8329+2	4.8961+1	2.9316–1
	5.0000–3	6.7352–8	6.6224+5	1.0419–5	2.1136+8	1.2325+8	5.7163+7	3.0942+7	7.8272+3	3.1275+2	2.6749+2	4.4950+1	3.1341–1
	5.5000–3	7.1770–8	6.2147+5	1.2065–5	1.9835+8	1.1713+8	5.2726+7	2.8483+7	7.6820+3	2.9485+2	2.5296+2	4.1553+1	3.3152–1
	6.0000–3	7.6041–8	5.8657+5	1.3806–5	1.8721+8	1.1181+8	4.8980+7	2.6410+7	7.5517+3	2.7981+2	2.4077+2	3.8689+1	3.4943–1
	7.0000–3	8.4302–8	5.2908+5	1.7558–5	1.6886+8	1.0286+8	4.2926+7	2.3068+7	7.2587+3	2.5359+2	2.1920+2	3.4011+1	3.7812–1
	8.0000–3	9.2136–8	4.8410+5	2.1666–5	1.5450+8	9.5685+7	3.8294+7	2.0517+7	7.0142+3	2.3354+2	2.0269+2	3.0443+1	4.0622–1
	9.0000–3	9.9777–8	4.4703+5	2.6115–5	1.4267+8	8.9595+7	3.4590+7	1.8479+7	6.7682+3	2.1623+2	1.8825+2	2.7550+1	4.2939–1
	1.0000–2	1.0712–7	4.1639+5	3.0896–5	1.3289+8	8.4477+7	3.1582+7	1.6828+7	6.5555+3	2.0222+2	1.7656+2	2.5208+1	4.5214–1
L3	1.1214–2	1.1575–7	3.8533+5	3.7131–5	1.2298+8	7.9170+7	2.8602+7	1.5202+7	6.3002+3	1.8742+2	1.6408+2	2.2864+1	4.7479–1
	1.1687–2	1.1904–7	3.7469+5	3.9691–5	1.1959+8	7.7334+7	2.7595+7	1.4650+7	6.2047+3	1.8236+2	1.5981+2	2.2072+1	4.8261–1
	1.2515–2	1.2468–7	3.5775+5	4.4334–5	1.1418+8	7.4387+7	2.6005+7	1.3779+7	6.0498+3	1.7439+2	1.5307+2	2.0822+1	4.9616–1
L2	1.2859–2	1.2698–7	3.5126+5	4.6322–5	1.1211+8	7.3252+7	2.5402+7	1.3448+7	5.9895+3	1.7137+2	1.5052+2	2.0349+1	5.0174–1
	1.3394–2	1.3054–7	3.4169+5	4.9488–5	1.0905+8	7.1555+7	2.4519+7	1.2971+7	5.8959+3	1.6676+2	1.4659+2	1.9654+1	5.0969–1
L1	1.3396–2	1.3055–7	3.4165+5	4.9498–5	1.0904+8	7.1550+7	2.4516+7	1.2969+7	5.8956+3	1.6674+2	1.4658+2	1.9652+1	5.0972–1
	1.3758–2	1.3293–7	3.3554+5	5.1687–5	1.0709+8	7.0462+7	2.3957+7	1.2664+7	5.8352+3	1.6381+2	1.4409+2	1.9210+1	5.1506–1
	1.3797–2	1.3319–7	3.3489+5	5.1927–5	1.0688+8	7.0347+7	2.3898+7	1.2632+7	5.8288+3	1.6350+2	1.4382+2	1.9163+1	5.1564–1
	1.4197–2	1.3579–7	3.2847+5	5.4397–5	1.0483+8	6.9200+7	2.3314+7	1.2313+7	5.7647+3	1.6044+2	1.4122+2	1.8702+1	5.2152–1
	1.4399–2	1.3709–7	3.2535+5	5.5658–5	1.0384+8	6.8642+7	2.3031+7	1.2158+7	5.7334+3	1.5896+2	1.3996+2	1.8479+1	5.2447–1
	1.5000–2	1.4094–7	3.1647+5	5.9493–5	1.0100+8	6.7046+7	2.2229+7	1.1721+7	5.6434+3	1.5477+2	1.3639+2	1.7847+1	5.3323–1
	1.6250–2	1.4885–7	2.9966+5	6.7791–5	9.5638+7	6.3969+7	2.0744+7	1.0920+7	5.4578+3	1.4658+2	1.2936+2	1.6671+1	5.4766–1
	1.8125–2	1.6032–7	2.7821+5	8.1054–5	8.8794+7	5.9997+7	1.8878+7	9.9136+6	5.2143+3	1.3629+2	1.2052+2	1.5197+1	5.6906–1
	2.0000–2	1.7139–7	2.6025+5	9.5258–5	8.3060+7	5.6628+7	1.7340+7	9.0863+6	5.0042+3	1.2782+2	1.1325+2	1.3985+1	5.9010–1
	2.2500–2	1.8577–7	2.4010+5	1.1562–4	7.6630+7	5.2754+7	1.5680+7	8.1912+6	4.7372+3	1.1792+2	1.0466+2	1.2653+1	6.1000–1
	2.5000–2	1.9961–7	2.2345+5	1.3757–4	7.1315+7	4.9514+7	1.4331+7	7.4655+6	4.5104+3	1.0987+2	9.7666+1	1.1574+1	6.2972–1
	2.6250–2	2.0636–7	2.1614+5	1.4914–4	6.8984+7	4.8081+7	1.3746+7	7.1515+6	4.4091+3	1.0638+2	9.4634+1	1.1107+1	6.3949–1
	3.0000–2	2.2597–7	1.9739+5	1.8594–4	6.2997+7	4.4370+7	1.2265+7	6.3583+6	4.1434+3	9.7541+1	8.6944+1	9.9288+0	6.6836–1
	3.5000–2	2.5117–7	1.7758+5	2.3988–4	5.6676+7	4.0333+7	1.0784+7	5.5551+6	3.8400+3	8.8017+1	7.8606+1	8.7140+0	6.9706–1
	4.0000–2	2.7520–7	1.6208+5	2.9918–4	5.1727+7	3.7135+7	9.6466+6	4.9418+6	3.5951+3	8.0699+1	7.2186+1	7.7870+0	7.2530–1
	5.0000–2	3.2019–7	1.3930+5	4.3221–4	4.4458+7	3.2321+7	8.0449+6	4.0890+6	3.2193+3	6.9903+1	6.2646+1	6.4852+0	7.7180–1
	6.0000–2	3.6200–7	1.2321+5	5.8360–4	3.9325+7	2.8855+7	6.9628+6	3.5036+6	2.9462+3	6.2354+1	5.5957+1	5.5848+0	8.1216–1
K	7.6314–2	4.2423–7	1.0514+5	8.6481–4	3.3556+7	2.4899+7	5.7945+6	2.8593+6	2.6285+3	5.3879+1	4.8425+1	4.5854+0	8.6898–1
	7.7235–2	4.2757–7	1.0432+5	8.8197–4	3.3294+7	2.4718+7	5.7425+6	2.8303+6	2.6137+3	5.3499+1	4.8087+1	4.5404+0	8.7201–1
	8.0000–2	4.3750–7	1.0195+5	9.3418–4	3.2538+7	2.4195+7	5.5930+6	2.7472+6	2.5709+3	5.2406+1	4.7113+1	4.4114+0	8.8110–1
	8.5000–2	4.5467–7	9.8101+4	1.0313–3	3.1309+7	2.3340+7	5.3538+6	2.6132+6	2.5002+3	5.0609+1	4.5511+1	4.2017+0	8.9581–1
	8.8750–2	4.6730–7	9.5449+4	1.1063–3	3.0463+7	2.2749+7	5.1898+6	2.5217+6	2.4511+3	4.9378+1	4.4412+1	4.0587+0	9.0684–1
	9.4375–2	4.8587–7	9.1800+4	1.2222–3	2.9299+7	2.1934+7	4.9649+6	2.3970+6	2.3828+3	4.7693+1	4.2906+1	3.8637+0	9.2331–1
	1.0000–1	5.0404–7	8.8492+4	1.3420–3	2.8243+7	2.1193+7	4.7620+6	2.2852+6	2.3202+3	4.6176+1	4.1548+1	3.6889+0	9.3970–1
	1.1250–1	5.3957–7	8.2664+4	1.6212–3	2.6383+7	1.9887+7	4.4063+6	2.0875+6	2.2110+3	4.3413+1	3.9066+1	3.3771+0	9.6981–1
	1.3125–1	5.8983–7	7.5621+4	2.0703–3	2.4135+7	1.8298+7	3.9807+6	1.8543+6	2.0758+3	4.0125+1	3.6100+1	3.0098+0	1.0152+0
	1.5000–1	6.3706–7	7.0013+4	2.5532–3	2.2345+7	1.7024+7	3.6454+6	1.6735+6	1.9654+3	3.7555+1	3.3769+1	2.7252+0	1.0603+0

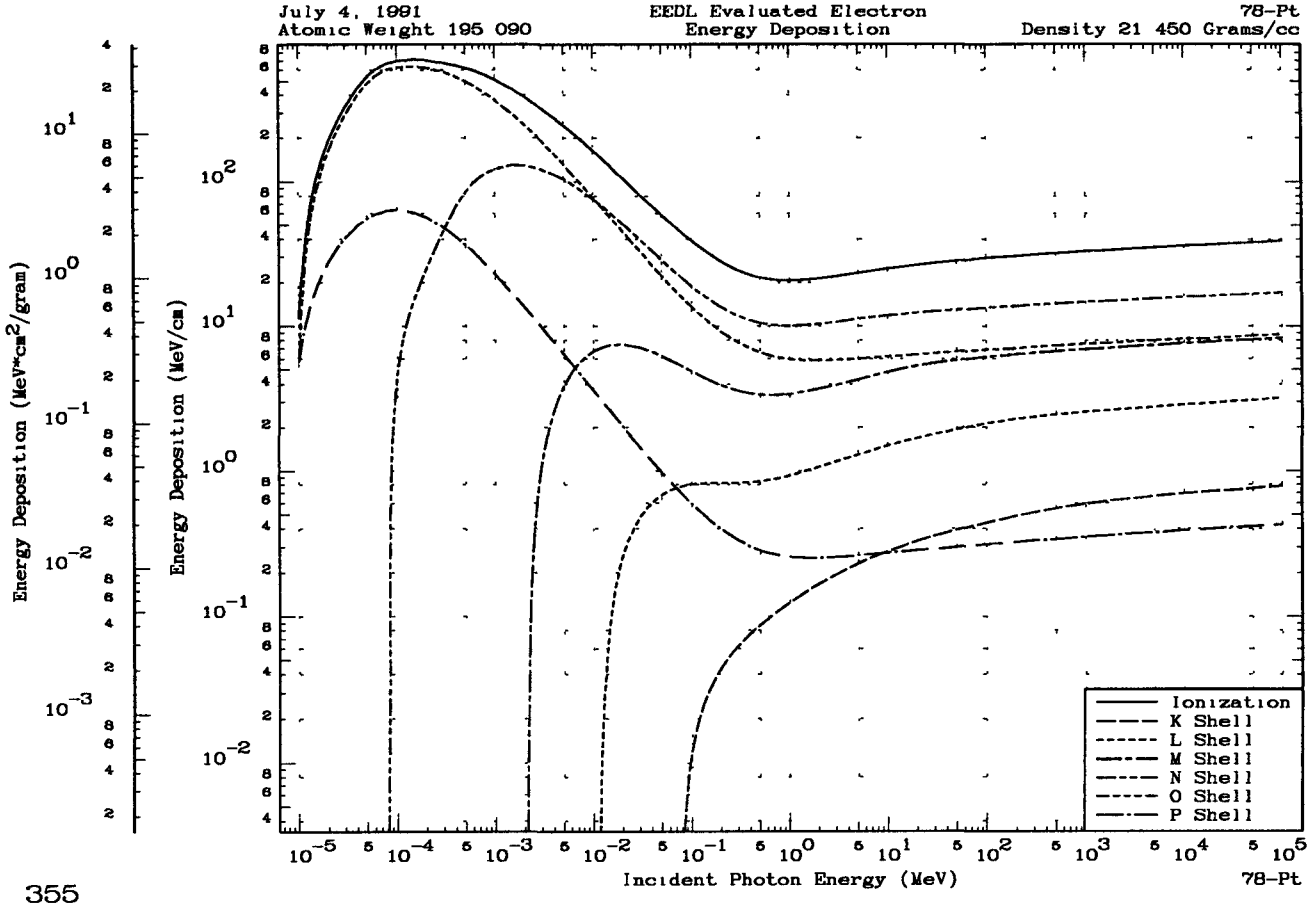
Atomic Weight 192.200												Density 22.420 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.7500–1	6.9124–7	6.4526+4	3.2419–3	2.0594+7	1.5771+7	3.3345+6	1.4870+6	1.8494+3	3.5079+1	3.1539+1	2.4284+0	1.1110+0
2.0000–1	7.4179–7	6.0129+4	3.9751–3	1.9190+7	1.4760+7	3.0867+6	1.3423+6	1.7545+3	3.3131+1	2.9771+1	2.1983+0	1.1615+0
2.5000–1	8.3179–7	5.3623+4	5.5445–3	1.7114+7	1.3196+7	2.7688+6	1.1471+6	1.6210+3	3.0622+1	2.7483+1	1.8855+0	1.2529+0
3.0000–1	9.1329–7	4.8838+4	7.2273–3	1.5587+7	1.2043+7	2.5336+6	1.0088+6	1.5195+3	2.8820+1	2.5813+1	1.6644+0	1.3430+0
4.0000–1	1.0597–6	4.2090+4	1.0820–2	1.3433+7	1.0336+7	2.2642+6	8.3176+5	1.3928+3	2.6875+1	2.3977+1	1.3786+0	1.5197+0
5.0000–1	1.1887–6	3.7524+4	1.4608–2	1.1976+7	9.1397+6	2.1074+6	7.2742+5	1.3171+3	2.5924+1	2.3014+1	1.2099+0	1.7004+0
6.0000–1	1.3045–6	3.4191+4	1.8503–2	1.0912+7	8.2494+6	2.0070+6	6.5450+5	1.2697+3	2.5424+1	2.2446+1	1.0917+0	1.8862+0
8.0000–1	1.5044–6	2.9648+4	2.6406–2	9.4624+6	7.0127+6	1.8889+6	5.5965+5	1.2169+3	2.5190+1	2.1976+1	9.3732–1	2.2765+0
1.0000+0	1.6728–6	2.6664+4	3.4318–2	8.5100+6	6.1818+6	1.8238+6	5.0314+5	1.1889+3	2.5370+1	2.1844+1	8.4522–1	2.6803+0
1.2500+0	1.8496–6	2.4114+4	4.4056–2	7.6962+6	5.4596+6	1.7828+6	4.5263+5	1.1733+3	2.5976+1	2.1999+1	7.6230–1	3.2146+0
1.5000+0	2.0030–6	2.2268+4	5.3562–2	7.1069+6	4.9327+6	1.7501+6	4.2301+5	1.1607+3	2.6627+1	2.2170+1	7.1421–1	3.7434+0
2.0000+0	2.2465–6	1.9854+4	7.1844–2	6.3366+6	4.2294+6	1.7253+6	3.8079+5	1.1534+3	2.8084+1	2.2568+1	6.4455–1	4.8716+0
3.0000+0	2.5880–6	1.7235+4	1.0564–1	5.5006+6	3.4625+6	1.6955+6	3.4142+5	1.1526+3	3.1152+1	2.3333+1	5.8093–1	7.2375+0
4.0000+0	2.8163–6	1.5838+4	1.3625–1	5.0546+6	3.0439+6	1.6917+6	3.1796+5	1.1576+3	3.4238+1	2.3986+1	5.4174–1	9.7101+0
5.0000+0	2.9784–6	1.4975+4	1.6421–1	4.7795+6	2.7828+6	1.6887+6	3.0681+5	1.1635+3	3.7329+1	2.4564+1	5.2344–1	1.2241+1
6.0000+0	3.0979–6	1.4398+4	1.8994–1	4.5951+6	2.6098+6	1.6862+6	2.9791+5	1.1694+3	4.0442+1	2.5043+1	5.0895–1	1.4891+1
8.0000+0	3.2665–6	1.3655+4	2.3604–1	4.3580+6	2.3878+6	1.6822+6	2.8682+5	1.1788+3	4.6470+1	2.5752+1	4.9134–1	2.0227+1
1.0000+1	3.3667–6	1.3248+4	2.7644–1	4.2283+6	2.2635+6	1.6823+6	2.8131+5	1.1881+3	5.2667+1	2.6342+1	4.8322–1	2.5841+1
1.5000+1	3.4776–6	1.2826+4	3.5995–1	4.0934+6	2.1335+6	1.6830+6	2.7568+5	1.2052+3	6.7707+1	2.7188+1	4.7367–1	4.0045+1
2.0000+1	3.5013–6	1.2739+4	4.2643–1	4.0657+6	2.1057+6	1.6835+6	2.7529+5	1.2207+3	8.3243+1	2.7851+1	4.7313–1	5.4920+1
3.0000+1	3.4996–6	1.2745+4	5.2840–1	4.0677+6	2.1065+6	1.6838+6	2.7617+5	1.2441+3	1.1456+2	2.8737+1	4.7489–1	8.5348+1
4.0000+1	3.4993–6	1.2746+4	6.0548–1	4.0681+6	2.1054+6	1.6842+6	2.7724+5	1.2620+3	1.4619+2	2.9259+1	4.7699–1	1.1645+2
5.0000+1	3.4977–6	1.2752+4	6.6732–1	4.0700+6	2.1045+6	1.6844+6	2.7975+5	1.2773+3	1.7827+2	2.9687+1	4.8156–1	1.4810+2
6.0000+1	3.4964–6	1.2757+4	7.1887–1	4.0714+6	2.1038+6	1.6846+6	2.8179+5	1.2899+3	2.1064+2	3.0007+1	4.8534–1	1.8015+2
8.0000+1	3.4945–6	1.2764+4	8.0153–1	4.0737+6	2.1027+6	1.6847+6	2.8497+5	1.3099+3	2.7621+2	3.0536+1	4.9134–1	2.4518+2
1.0000+2	3.4932–6	1.2768+4	8.6645–1	4.0751+6	2.1018+6	1.6848+6	2.8718+5	1.3256+3	3.4229+2	3.1011+1	4.9568–1	3.1078+2
1.5000+2	3.4909–6	1.2777+4	9.8551–1	4.0778+6	2.1002+6	1.6849+6	2.9134+5	1.3538+3	5.0855+2	3.1478+1	5.0287–1	4.7657+2
2.0000+2	3.4893–6	1.2783+4	1.0705+0	4.0798+6	2.0991+6	1.6849+6	2.9434+5	1.3709+3	6.7600+2	3.1915+1	5.0804–1	6.4358+2
3.0000+2	3.4869–6	1.2792+4	1.1907+0	4.0825+6	2.0975+6	1.6850+6	2.9860+5	1.3944+3	1.0100+3	3.2629+1	5.1541–1	9.7682+2
4.0000+2	3.4870–6	1.2791+4	1.2763+0	4.0824+6	2.0964+6	1.6850+6	2.9960+5	1.4108+3	1.3442+3	3.3067+1	5.1714–1	1.3106+3
5.0000+2	3.4879–6	1.2788+4	1.3426+0	4.0813+6	2.0956+6	1.6850+6	2.9936+5	1.4235+3	1.6809+3	3.3353+1	5.1675–1	1.6470+3
6.0000+2	3.4887–6	1.2785+4	1.3969+0	4.0805+6	2.0949+6	1.6850+6	2.9917+5	1.4331+3	2.0144+3	3.3607+1	5.1643–1	1.9803+3
8.0000+2	3.4899–6	1.2781+4	1.4826+0	4.0791+6	2.0937+6	1.6850+6	2.9886+5	1.4485+3	2.6872+3	3.4088+1	5.1591–1	2.6526+3
1.0000+3	3.4908–6	1.2777+4	1.5490+0	4.0780+6	2.0929+6	1.6850+6	2.9862+5	1.4610+3	3.3596+3	3.4481+1	5.1552–1	3.3246+3
1.5000+3	3.4935–6	1.2767+4	1.6696+0	4.0748+6	2.0913+6	1.6850+6	2.9701+5	1.4845+3	5.0494+3	3.4855+1	5.1274–1	5.0141+3
2.0000+3	3.4954–6	1.2760+4	1.7550+0	4.0725+6	2.0902+6	1.6850+6	2.9583+5	1.5025+3	6.7287+3	3.5227+1	5.1070–1	6.6930+3
3.0000+3	3.4976–6	1.2753+4	1.8756+0	4.0701+6	2.0886+6	1.6850+6	2.9489+5	1.5285+3	1.0095+4	3.5902+1	5.0909–1	1.0059+4
4.0000+3	3.4996–6	1.2745+4	1.9610+0	4.0677+6	2.0875+6	1.6850+6	2.9367+5	1.5473+3	1.3465+4	3.6267+1	5.0698–1	1.3428+4
5.0000+3	3.5023–6	1.2735+4	2.0272+0	4.0646+6	2.0866+6	1.6850+6	2.9135+5	1.5621+3	1.6870+4	3.6583+1	5.0297–1	1.6833+4
6.0000+3	3.5028–6	1.2734+4	2.0813+0	4.0640+6	2.0859+6	1.6850+6	2.9147+5	1.5729+3	2.0217+4	3.6824+1	5.0319–1	2.0180+4
8.0000+3	3.5040–6	1.2729+4	2.1667+0	4.0626+6	2.0848+6	1.6850+6	2.9115+5	1.5901+3	2.6972+4	3.7274+1	5.0262–1	2.6934+4
1.0000+4	3.5051–6	1.2725+4	2.2328+0	4.0613+6	2.0840+6	1.6850+6	2.9070+5	1.6036+3	3.3788+4	3.7692+1	5.0185–1	3.3750+4
1.5000+4	3.5069–6	1.2719+4	2.3530+0	4.0592+6	2.0824+6	1.6850+6	2.9017+5	1.6295+3	5.0516+4	3.8037+1	5.0094–1	5.0477+4
2.0000+4	3.5086–6	1.2712+4	2.4383+0	4.0572+6	2.0813+6	1.6850+6	2.8928+5	1.6482+3	6.7461+4	3.8382+1	4.9939–1	6.7422+4
3.0000+4	3.5103–6	1.2706+4	2.5587+0	4.0553+6	2.0797+6	1.6850+6	2.8883+5	1.6744+3	1.0097+5	3.9072+1	4.9862–1	1.0093+5
4.0000+4	3.5119–6	1.2701+4	2.6441+0	4.0535+6	2.0786+6	1.6850+6	2.8814+5	1.6932+3	1.3483+5	3.9441+1	4.9743–1	1.3479+5
5.0000+4	3.5144–6	1.2692+4	2.7103+0	4.0506+6	2.0777+6	1.6850+6	2.8614+5	1.7076+3	1.6838+5	3.9776+1	4.9398–1	1.6834+5
6.0000+4	3.5145–6	1.2691+4	2.7645+0	4.0504+6	2.0770+6	1.6850+6	2.8663+5	1.7194+3	2.0190+5	4.0002+1	4.9483–1	2.0186+5
8.0000+4	3.5156–6	1.2687+4	2.8499+0	4.0491+6	2.0759+6	1.6850+6	2.8643+5	1.7381+3	2.6953+5	4.0455+1	4.9448–1	2.6949+5
1.0000+5	3.5166–6	1.2683+4	2.9161+0	4.0480+6	2.0751+6	1.6850+6	2.8614+5	1.7527+3	3.3728+5	4.0875+1	4.9398–1	3.3724+5


July 4, 1991
Atomic Weight 195 090
EEDL Evaluated Electron
Cross Sections
78-Pt
Density 21 450 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
78-Pt


July 4, 1991
Atomic Weight 195 090
EEDL Evaluated Electron
Energy Deposition
78-Pt
Density 21 450 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
78-Pt

354


July 4, 1991
Atomic Weight 195 090
EEDL Evaluated Electron
Shell Cross Sections
78-Pt
Density 21 450 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
78-Pt


July 4, 1991
Atomic Weight 195 090
EEDL Evaluated Electron
Energy Deposition
78-Pt
Density 21 450 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
78-Pt

355

Atomic Weight 195.090 Density 21.450 Grams/cc

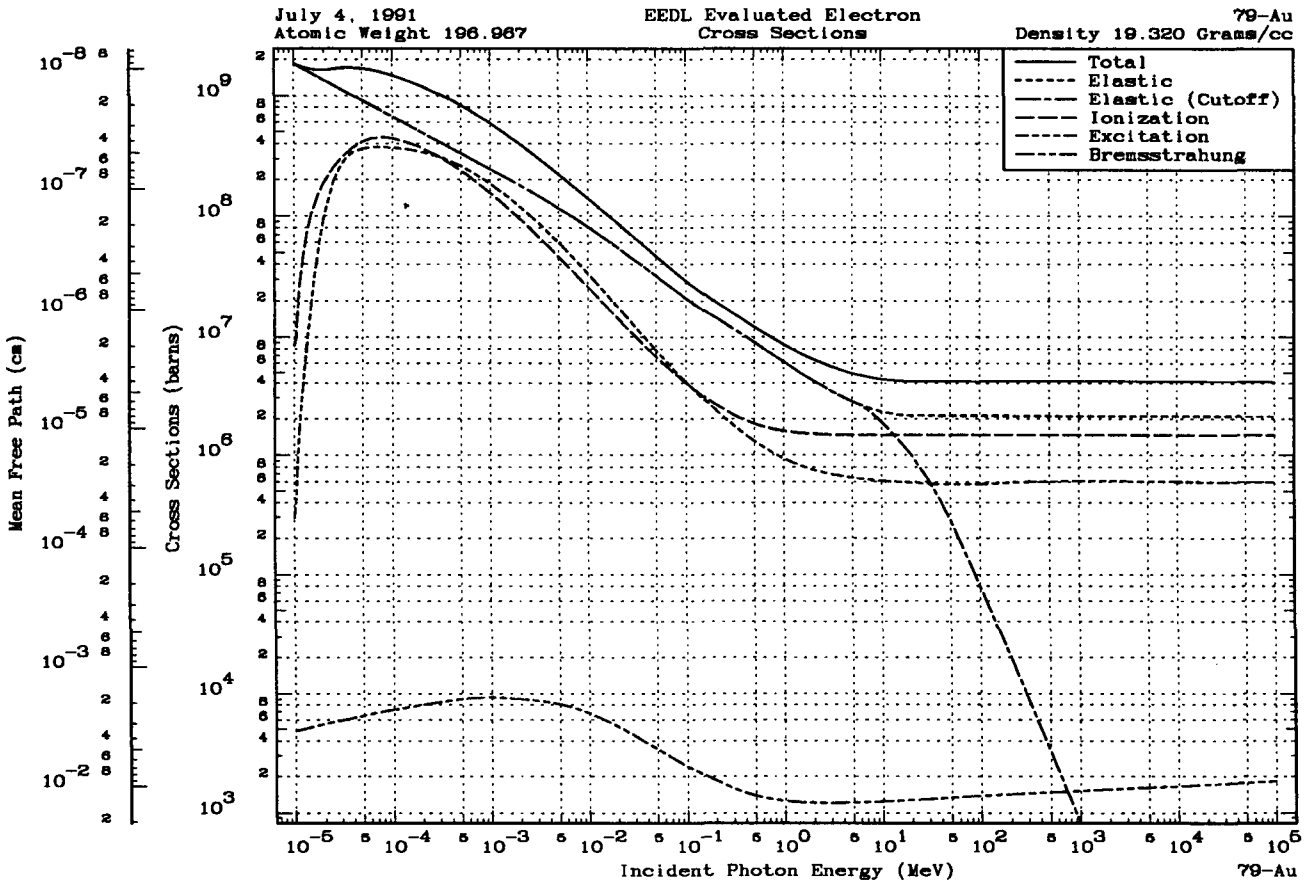
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.6724–9	6.0763+6		1.9685+9	1.9488+9	1.8910+7	7.7201+5	4.8217+3	1.1794+1	1.1357+1	4.3625–1	6.9006–4
	1.0625–5	7.8213–9	5.9607+6		1.9310+9	1.8965+9	3.2716+7	1.8053+6	4.8814+3	2.1378+1	2.0338+1	1.0390+0	7.3161–4
O4	1.1020–5	7.9143–9	5.8906+6		1.9083+9	1.8657+9	4.0032+7	2.6037+6	4.9177+3	2.6735+1	2.5219+1	1.5158+0	7.5807–4
	1.1250–5	7.9552–9	5.8603+6		1.8985+9	1.8484+9	4.6770+7	3.2691+6	4.9384+3	3.1777+1	2.9865+1	1.9112+0	7.7354–4
	1.1269–5	7.9585–9	5.8579+6		1.8977+9	1.8471+9	4.7306+7	3.3203+6	4.9401+3	3.2182+1	3.0240+1	1.9418+0	7.7480–4
	1.1719–5	8.0301–9	5.8057+6		1.8808+9	1.8149+9	6.1096+7	4.7916+6	4.9795+3	4.2750+1	3.9923+1	2.8254+0	8.0523–4
	1.1735–5	8.0328–9	5.8037+6		1.8801+9	1.8137+9	6.1555+7	4.8423+6	4.9809+3	4.3113+1	4.0256+1	2.8561+0	8.0634–4
	1.2388–5	8.1429–9	5.7252+6		1.8547+9	1.7702+9	7.7246+7	7.2643+6	5.0360+3	5.6037+1	5.1701+1	4.3354+0	8.5082–4
	1.2551–5	8.1654–9	5.7094+6		1.8496+9	1.7598+9	8.1839+7	7.9223+6	5.0494+3	5.9843+1	5.5100+1	4.7420+0	8.6201–4
	1.3125–5	8.2422–9	5.6563+6		1.8324+9	1.7249+9	9.6832+7	1.0648+7	5.0954+3	7.2734+1	6.6294+1	6.4390+0	9.0148–4
	1.3359–5	8.2688–9	5.6381+6		1.8265+9	1.7113+9	1.0326+8	1.1972+7	5.1138+3	7.8458+1	7.1188+1	7.2692+0	9.1770–4
	1.3694–5	8.3093–9	5.6106+6		1.8176+9	1.6923+9	1.1112+8	1.4101+7	5.1395+3	8.5966+1	7.7353+1	8.6126+0	9.4092–4
	1.3776–5	8.3185–9	5.6044+6		1.8156+9	1.6878+9	1.1311+8	1.4608+7	5.1457+3	8.7865+1	7.8930+1	8.9350+0	9.4661–4
	1.5000–5	8.4345–9	5.5273+6		1.7906+9	1.6246+9	1.4179+8	2.4218+7	5.2355+3	1.1721+2	1.0208+2	1.5130+1	1.0325–3
	1.7500–5	8.5754–9	5.4365+6		1.7612+9	1.5160+9	1.9198+8	5.3190+7	5.4019+3	1.7997+2	1.4600+2	3.3968+1	1.2114–3
	2.0000–5	8.6110–9	5.4140+6		1.7539+9	1.4278+9	2.3448+8	9.1581+7	5.5504+3	2.4731+2	1.8756+2	5.9756+1	1.3948–3
	2.2500–5	8.6161–9	5.4108+6		1.7529+9	1.3543+9	2.6900+8	1.2954+8	5.6694+3	3.1000+2	2.2475+2	8.5247+1	1.5667–3
	2.5000–5	8.5305–9	5.4651+6		1.7704+9	1.2918+9	3.0202+8	1.7665+8	5.7780+3	3.8013+2	2.6290+2	1.1723+2	1.7415–3
	2.6250–5	8.5199–9	5.4719+6		1.7727+9	1.2638+9	3.1562+8	1.9323+8	5.8290+3	4.0904+2	2.8026+2	1.2878+2	1.8298–3
	3.0000–5	8.4339–9	5.5277+6		1.7907+9	1.1903+9	3.5340+8	2.4703+8	5.9709+3	4.9880+2	3.3209+2	1.6670+2	2.0987–3
	3.5000–5	8.4079–9	5.5448+6		1.7963+9	1.1109+9	3.9064+8	2.9468+8	6.1369+3	5.9068+2	3.9071+2	1.9996+2	2.4626–3
	4.0000–5	8.4064–9	5.5458+6		1.7966+9	1.0465+9	4.2382+8	3.2627+8	6.2844+3	6.7193+2	4.4931+2	2.2261+2	2.8347–3
	5.0000–5	8.5285–9	5.4664+6		1.7709+9	9.4712+8	4.6285+8	3.6088+8	6.5201+3	7.8598+2	5.3848+2	2.4749+2	3.5678–3
O3	5.7740–5	8.6912–9	5.3641+6		1.7377+9	8.8808+8	4.7682+8	3.7280+8	6.6708+3	8.4268+2	5.8596+2	2.5672+2	4.1391–3
	5.8870–5	8.7151–9	5.3493+6		1.7329+9	8.8041+8	4.7882+8	3.7369+8	6.6914+3	8.5068+2	5.9319+2	2.5749+2	4.2235–3
	6.0000–5	8.7384–9	5.3351+6		1.7283+9	8.7296+8	4.8079+8	3.7456+8	6.7116+3	8.5868+2	6.0042+2	2.5825+2	4.3080–3
	6.5000–5	8.8732–9	5.2540+6		1.7021+9	8.4227+8	4.8235+8	3.7744+8	6.7975+3	8.7947+2	6.1890+2	2.6056+2	4.6849–3
	7.2500–5	9.0540–9	5.1491+6		1.6681+9	8.0212+8	4.8455+8	3.8140+8	6.9164+3	9.1045+2	6.4665+2	2.6380+2	5.2579–3
O2	7.3340–5	9.0729–9	5.1384+6		1.6646+9	7.9800+8	4.8478+8	3.8182+8	6.9291+3	9.1386+2	6.4972+2	2.6414+2	5.3227–3
	7.4173–5	9.0949–9	5.1259+6		1.6606+9	7.9398+8	4.8462+8	3.8196+8	6.9415+3	9.1624+2	6.5194+2	2.6430+2	5.3869–3
	7.5629–5	9.1329–9	5.1046+6		1.6537+9	7.8711+8	4.8436+8	3.8219+8	6.9630+3	9.2041+2	6.5584+2	2.6456+2	5.4996–3
	7.7815–5	9.1885–9	5.0738+6		1.6437+9	7.7714+8	4.8399+8	3.8253+8	6.9945+3	9.2670+2	6.6175+2	2.6495+2	5.6693–3
	8.0000–5	9.2424–9	5.0442+6		1.6341+9	7.6758+8	4.8364+8	3.8286+8	7.0254+3	9.3305+2	6.6771+2	2.6533+2	5.8396–3
N7	8.1870–5	9.2945–9	5.0159+6		1.6249+9	7.5968+8	4.8212+8	3.8311+8	7.0512+3	9.3552+2	6.6986+2	2.6565+2	5.9859–3
	8.4136–5	9.3558–9	4.9830+6		1.6143+9	7.5047+8	4.8041+8	3.8339+8	7.0818+3	9.3899+2	6.7297+2	2.6601+2	6.1638–3
N6	8.5490–5	9.3918–9	4.9639+6		1.6081+9	7.4513+8	4.7941+8	3.8355+8	7.0998+3	9.4104+2	6.7480+2	2.6623+2	6.2705–3
	8.7304–5	9.4421–9	4.9375+6		1.5995+9	7.3816+8	4.7816+8	3.8319+8	7.1218+3	9.4377+2	6.7764+2	2.6613+2	6.4121–3
	8.8102–5	9.4639–9	4.9261+6		1.5958+9	7.3516+8	4.7763+8	3.8303+8	7.1314+3	9.4502+2	6.7893+2	2.6608+2	6.4746–3
	9.0000–5	9.5151–9	4.8996+6		1.5872+9	7.2819+8	4.7638+8	3.8266+8	7.1539+3	9.4791+2	6.8192+2	2.6598+2	6.6235–3
	9.0478–5	9.5279–9	4.8930+6		1.5851+9	7.2647+8	4.7606+8	3.8257+8	7.1595+3	9.4863+2	6.8266+2	2.6596+2	6.6610–3
	9.4051–5	9.6216–9	4.8453+6		1.5697+9	7.1399+8	4.7376+8	3.8191+8	7.2005+3	9.5398+2	6.8818+2	2.6579+2	6.9426–3
	9.5239–5	9.6521–9	4.8301+6		1.5647+9	7.1000+8	4.7302+8	3.8169+8	7.2138+3	9.5578+2	6.9004+2	2.6573+2	7.0366–3
	1.0000–4	9.7707–9	4.7714+6	0.0000+0	1.5457+9	6.9468+8	4.7018+8	3.8086+8	7.2659+3	9.6319+2	6.9764+2	2.6554+2	7.4147–3
	1.0625–4	9.9394–9	4.6904+6	6.4867–9	1.5195+9	6.7622+8	4.6322+8	3.8004+8	7.3294+3	9.6383+2	6.9862+2	2.6520+2	7.9127–3
O1	1.0844–4	9.9965–9	4.6636+6	8.7584–9	1.5108+9	6.7012+8	4.6091+8	3.7976+8	7.3509+3	9.6423+2	6.9912+2	2.6510+2	8.0882–3
	1.0974–4	1.0032–8	4.6469+6	1.0106–8	1.5054+9	6.6659+8	4.5956+8	3.7924+8	7.3634+3	9.6426+2	6.9946+2	2.6479+2	8.1925–3
	1.1226–4	1.0101–8	4.6154+6	1.2715–8	1.4952+9	6.5991+8	4.5700+8	3.7826+8	7.3874+3	9.6446+2	7.0023+2	2.6422+2	8.3950–3
	1.1250–4	1.0108–8	4.6124+6	1.2969–8	1.4942+9	6.5927+8	4.5676+8	3.7817+8	7.3897+3	9.6448+2	7.0031+2	2.6416+2	8.4147–3
	1.1697–4	1.0227–8	4.5586+6	1.7606–8	1.4768+9	6.4795+8	4.5234+8	3.7648+8	7.4312+3	9.6466+2	7.0147+2	2.6319+2	8.7763–3
	1.1719–4	1.0232–8	4.5561+6	1.7829–8	1.4760+9	6.4743+8	4.5213+8	3.7640+8	7.4331+3	9.6468+2	7.0153+2	2.6314+2	8.7937–3
	1.2110–4	1.0334–8	4.5114+6	2.1885–8	1.4615+9	6.3805+8	4.4845+8	3.7499+8	7.4682+3	9.6503+2	7.0270+2	2.6233+2	9.1118–3
	1.2188–4	1.0353–8	4.5029+6	2.2686–8	1.4587+9	6.3625+8	4.4775+8	3.7471+8	7.4750+3	9.6513+2	7.0295+2	2.6217+2	9.1747–3
	1.2833–4	1.0514–8	4.4340+6	2.9367–8	1.4364+9	6.2184+8	4.4207+8	3.7251+8	7.5305+3	9.6615+2	7.0523+2	2.6091+2	9.7024–3
	1.3125–4	1.0585–8	4.4044+6	3.2392–8	1.4268+9	6.1565+8	4.3962+8	3.7155+8	7.5549+3	9.6681+2	7.0643+2	2.6037+2	9.9427–3
	1.3359–4	1.0641–8	4.3813+6	3.4816–8	1.4193+9	6.1083+8	4.3770+8	3.7079+8	7.5741+3	9.6729+2	7.0734+2	2.5994+2	1.0136–2
	1.3594–4	1.0696–8	4.3586+6	3.7239–8	1.4120+9	6.0613+8	4.3581+8	3.7006+8	7.5930+3	9.6780+2	7.0825+2	2.5953+2	1.0330–2
	1.3916–4	1.0771–8	4.3284+6	4.0570–8	1.4022+9	5.9985+8	4.3328+8	3.6906+8	7.6186+3	9.6853+2	7.0954+2	2.5897+2	1.0597–2
	1.5000–4	1.1012–8	4.2335+6	5.1740–8	1.3714+9	5.8020+8	4.2534+8	3.6590+8	7.7010+3	9.7176+2	7.1452+2	2.5723+2	1.1501–2
	1.7500–4	1.1599–8	4.0192+6	7.7628–8	1.3020+9	5.4181+8	4.0285+8	3.5738+8	7.8662+3	9.5966+2	7.0769+2	2.5196+2	1.3643–2
	2.0000–4	1.2129–8	3.8438+6	1.0377–7	1.2452+9	5.1061+8	3.8445+8	3.5016+8	8.0122+3	9.5278+2	7.0518+2	2.4758+2	1.5826–2
	2.2500–4	1.2689–8	3.6741+6	1.3027–7	1.1902+9	4.8459+8	3.6519+8	3.4045+8	8.1286+3	9.3406+2	6.9285+2	2.4119+2	1.8098–2
	2.5000–4	1.3209–8	3.5294+6	1.5724–7	1.1434+9	4.6244+8	3.4894+8	3.3199+8	8.2342+3	9.2040+2	6.8471+2	2.3567+2	2.0401–2
	2.6250–4	1.3457–8	3.4645+6	1.7086–7	1.1223+9	4.5252+8	3.4166+8	3.2815+8	8.2836+3	9.1467+2	6.8148+2	2.3317+2	2.1564–2
	3.0000–4	1.4155–8	3.2936+6	2.1214–7	1.0670+9	4.2647+8	3.2265+8	3.1786+8	8.4202+3	9.0232+2	6.7578+2	2.2652+2	2.5092–2
N5	3.1596–4	1.4462–8	3.2237+6	2.2992–7	1.0443+9	4.1676+8	3.1423+8	3.1333+8	8.4738+3	8.9266+2	6.6916+2	2.2347+2	2.6611–2
	3.2121–4	1.4561–8	3.2018+6	2.3581–7	1.0372+9	4.1375+8	3.1161+8	3.1186+8	8.4909+3	8.8981+2	6.6730+2	2.2248+2	2.7113–2
	3.3106–4	1.4743–8	3.1621+6	2.4691–7	1.0244+9	4.0830+8	3.0688+8	3.0919+8	8.5224+3	8.8482+2	6.6410+2	2.2069+2	2.8056–2
N4	3.3310–4	1.4781–8	3.1541+6	2.4922–7	1.0218+9	4.0720+8	3.0593+8	3.0865+8	8.5288+3	8.8382+2	6.6347+2	2.2032+2	2.8252–2
	3.4146–4	1.4937–8	3.1211+6	2.5870–7	1.0111+9	4.0278+8	3.0210+8	3.0622+8	8.5537+3	8.7963+2	6.6090+2	2.1870+2	2.9064–2
	3.4830–4	1.5062–8	3.0951+6	2.6649–7	1.0027+9	3.9929+8	2.9908+8	3.0430+8	8.5736+3	8.7644+2	6.5899+2	2.1742+2	2.9730–2
	3.5610–4	1.5204–8	3.0663+6	2.7540–7	9.9334+8	3.9542+8	2.9574+8	3.0216+8	8.5959+3	8.7299+2	6.5697+2	2.1599+2	3.0491–2
	3.7415–4	1.5525–8	3.0030+6	2.9617–7	9.7283+8	3.8692+8	2.8845+8	2.9745+8	8.6459+3	8.6586+2	6.5298+2	2.1285+2	3.2260–2
	3.7805–4	1.5593–8	2.9899+6	3.0067–7	9.6859+8	3.8516+8	2.8695+8	2.9647+8	8.6564+3	8.6446+2	6.5223+2	2.1220+2	3.2644–2
	4.0000–4	1.5967–8	2.9198+6	3.2617–7	9.4587+8	3.7573+8	2.7894+8	2.9120+8	8.7139+3	8.5742+2	6.4870+2	2.0870+2	3.4812–2
	4.5000–4	1.6839–8	2.7686+6	3.8529–7	8.9692+8	3.5677+8	2.6128+8	2.7885+8	8.8172+3	8.3418+2	6.3383+2	2.0031+2	3.9927–2
	5.0000–4	1.7655–8	2.6407+6	4.4586–7	8.5545+8	3.4063+8	2.4656+8	2.6825+8	8.9106+3	8.1690+2	6.2371+2	1.9314+2	4.5103–2
N3	5.1204–4	1.7854–8	2.6112+6	4.6065–7	8.4591+8	3.3709+8	2.4309+8	2.6573+8	8.9318+3	8.1141+2	6.1997+2	1.9140+2	4.6357–2
	5.1754–4	1.7946–8	2.5978+6	4.6743–7	8.4158+8	3.3551+8	2.4155+8	2.6451+8	8.9398+3	8.0898+2	6.1837+2	1.9056+2	4.6927–2
	5.2785–4	1.8117–8	2.5733+6	4.8021–7	8.3363+8	3.3261+8	2.3874+8	2.6228+8	8.9545+3	8.0457+2	6.1549+2	1.8903+2	4.7995–2
	5.4588–4	1.8412–8	2.5321+6	5.0273–7	8.2028+8	3.2774+8	2.3403+8	2.5851+8	8.9796+3	7.9732+2	6.1082+2	1.8644+2	4.9870–2

Atomic Weight 195.090 — Density 21.450 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.7294–4	1.8844–8	2.4740+6	5.3688–7	8.0146+8	3.2084+8	2.2742+8	2.5318+8	9.0159+3	7.8747+2	6.0463+2	1.8278+2	5.2692–2
	6.0000–4	1.9265–8	2.4199+6	5.7143–7	7.8393+8	3.1440+8	2.2132+8	2.4820+8	9.0507+3	7.7874+2	5.9932+2	1.7937+2	5.5526–2
N2	6.0419–4	1.9332–8	2.4116+6	5.7682–7	7.8124+8	3.1344+8	2.2034+8	2.4745+8	9.0550+3	7.7696+2	5.9806+2	1.7885+2	5.5963–2
	6.1031–4	1.9431–8	2.3993+6	5.8471–7	7.7726+8	3.1206+8	2.1894+8	2.4625+8	9.0603+3	7.7433+2	5.9625+2	1.7802+2	5.6587–2
	6.2217–4	1.9621–8	2.3760+6	6.0007–7	7.6971+8	3.0943+8	2.1629+8	2.4399+8	9.0706+3	7.6938+2	5.9288+2	1.7645+2	5.7798–2
	6.4439–4	1.9974–8	2.3341+6	6.2913–7	7.5614+8	3.0469+8	2.1153+8	2.3991+8	9.0894+3	7.6065+2	5.8697+2	1.7362+2	6.0073–2
	6.5000–4	2.0061–8	2.3239+6	6.3651–7	7.5283+8	3.0353+8	2.1038+8	2.3891+8	9.0941+3	7.5854+2	5.8556+2	1.7293+2	6.0647–2
	6.8330–4	2.0575–8	2.2659+6	6.8074–7	7.3404+8	2.9694+8	2.0384+8	2.3325+8	9.1209+3	7.4684+2	5.7777+2	1.6900+2	6.4065–2
N1	7.1221–4	2.1010–8	2.2189+6	7.1970–7	7.1883+8	2.9158+8	1.9859+8	2.2865+8	9.1433+3	7.3767+2	5.7178+2	1.6582+2	6.7041–2
	7.2318–4	2.1177–8	2.2014+6	7.3461–7	7.1317+8	2.8963+8	1.9667+8	2.2686+8	9.1495+3	7.3404+2	5.6939+2	1.6457+2	6.8135–2
	7.2500–4	2.1205–8	2.1986+6	7.3709–7	7.1224+8	2.8931+8	1.9636+8	2.2656+8	9.1505+3	7.3344+2	5.6901+2	1.6437+2	6.8317–2
	7.4165–4	2.1455–8	2.1729+6	7.5987–7	7.0393+8	2.8644+8	1.9356+8	2.2392+8	9.1598+3	7.2816+2	5.6556+2	1.6253+2	6.9978–2
	7.4239–4	2.1466–8	2.1718+6	7.6088–7	7.0356+8	2.8631+8	1.9343+8	2.2381+8	9.1602+3	7.2793+2	5.6541+2	1.6245+2	7.0053–2
	7.7119–4	2.1893–8	2.1295+6	8.0069–7	6.8986+8	2.8156+8	1.8883+8	2.1946+8	9.1758+3	7.1939+2	5.5989+2	1.5943+2	7.2933–2
	8.0000–4	2.2311–8	2.0896+6	8.4095–7	6.7692+8	2.7706+8	1.8451+8	2.1534+8	9.1909+3	7.1155+2	5.5490+2	1.5657+2	7.5818–2
	8.5000–4	2.3042–8	2.0233+6	9.1204–7	6.5544+8	2.6978+8	1.7713+8	2.0853+8	9.1917+3	6.9529+2	5.4342+2	1.5180+2	8.0234–2
	9.0000–4	2.3752–8	1.9628+6	9.8470–7	6.3585+8	2.6309+8	1.7046+8	2.0230+8	9.1924+3	6.8089+2	5.3336+2	1.4744+2	8.4651–2
	9.2500–4	2.4099–8	1.9345+6	1.0216–6	6.2668+8	2.5994+8	1.6736+8	1.9938+8	9.1927+3	6.7427+2	5.2878+2	1.4540+2	8.6859–2
	1.0000–3	2.5115–8	1.8563+6	1.1343–6	6.0135+8	2.5118+8	1.5885+8	1.9131+8	9.1937+3	6.5652+2	5.1667+2	1.3976+2	9.3485–2
	1.1250–3	2.6833–8	1.7374+6	1.3298–6	5.6284+8	2.3847+8	1.4604+8	1.7833+8	9.1355+3	6.2290+2	4.9222+2	1.3058+2	1.0232–1
	1.2500–3	2.8463–8	1.6379+6	1.5349–6	5.3060+8	2.2764+8	1.3549+8	1.6746+8	9.0838+3	5.9579+2	4.7277+2	1.2290+2	1.1112–1
	1.3125–3	2.9250–8	1.5938+6	1.6409–6	5.1633+8	2.2280+8	1.3087+8	1.6266+8	9.0599+3	5.8396+2	4.6433+2	1.1952+2	1.1550–1
	1.5000–3	3.1509–8	1.4796+6	1.9704–6	4.7931+8	2.1006+8	1.1904+8	1.5020+8	8.9950+3	5.5431+2	4.4344+2	1.1074+2	1.2860–1
	1.7500–3	3.4439–8	1.3537+6	2.4382–6	4.3854+8	1.9596+8	1.0606+8	1.3651+8	8.9115+3	5.1494+2	4.1380+2	1.0100+2	1.4487–1
	2.0000–3	3.7183–8	1.2538+6	2.9385–6	4.0617+8	1.8452+8	9.5987+7	1.2566+8	8.8398+3	4.8493+2	3.9148+2	9.3294+1	1.6102–1
M5	2.1290–3	3.8583–8	1.2083+6	3.2088–6	3.9144+8	1.7913+8	9.1451+7	1.2085+8	8.7926+3	4.6938+2	3.7937+2	8.9838+1	1.6813–1
	2.1562–3	3.8875–8	1.1992+6	3.2670–6	3.8850+8	1.7805+8	9.0556+7	1.1989+8	8.7830+3	4.6633+2	3.7701+2	8.9147+1	1.6963–1
	2.1826–3	3.9156–8	1.1906+6	3.3237–6	3.8571+8	1.7703+8	8.9708+7	1.1897+8	8.7738+3	4.6344+2	3.7478+2	8.8491+1	1.7108–1
M4	2.2124–3	3.9471–8	1.1811+6	3.3883–6	3.8263+8	1.7589+8	8.8772+7	1.1796+8	8.7636+3	4.6025+2	3.7231+2	8.7765+1	1.7271–1
	2.2337–3	3.9702–8	1.1742+6	3.4346–6	3.8040+8	1.7509+8	8.8113+7	1.1719+8	8.7565+3	4.5795+2	3.7056+2	8.7216+1	1.7388–1
	2.2816–3	4.0219–8	1.1591+6	3.5398–6	3.7551+8	1.7332+8	8.6671+7	1.1551+8	8.7406+3	4.5291+2	3.6672+2	8.6014+1	1.7651–1
	2.4093–3	4.1575–8	1.1213+6	3.8258–6	3.6326+8	1.6886+8	8.3078+7	1.1132+8	8.6999+3	4.4040+2	3.5721+2	8.3005+1	1.8349–1
	2.4612–3	4.2118–8	1.1069+6	3.9442–6	3.5859+8	1.6715+8	8.1715+7	1.0972+8	8.6840+3	4.3569+2	3.5364+2	8.1860+1	1.8632–1
	2.5570–3	4.3106–8	1.0815+6	4.1662–6	3.5036+8	1.6412+8	7.9328+7	1.0691+8	8.6556+3	4.2744+2	3.4740+2	7.9848+1	1.9154–1
M3	2.6369–3	4.3919–8	1.0615+6	4.3546–6	3.4388+8	1.6172+8	7.7455+7	1.0470+8	8.6328+3	4.2101+2	3.4255+2	7.8264+1	1.9588–1
	2.6823–3	4.4390–8	1.0502+6	4.4629–6	3.4023+8	1.6037+8	7.6423+7	1.0343+8	8.6202+3	4.1730+2	3.3975+2	7.7349+1	1.9834–1
	2.7306–3	4.4887–8	1.0386+6	4.5792–6	3.3646+8	1.5898+8	7.5360+7	1.0211+8	8.6070+3	4.1348+2	3.3688+2	7.6404+1	2.0096–1
	2.7617–3	4.5206–8	1.0313+6	4.6547–6	3.3409+8	1.5810+8	7.4692+7	1.0129+8	8.5987+3	4.1109+2	3.3507+2	7.5811+1	2.0265–1
	2.7785–3	4.5377–8	1.0274+6	4.6955–6	3.3283+8	1.5763+8	7.4337+7	1.0085+8	8.5942+3	4.0982+2	3.3412+2	7.5496+1	2.0356–1
	2.8809–3	4.6412–8	1.0045+6	4.9476–6	3.2541+8	1.5487+8	7.2256+7	9.8274+7	8.5676+3	4.0237+2	3.2852+2	7.3642+1	2.0909–1
	3.0000–3	4.7598–8	9.7945+5	5.2467–6	3.1730+8	1.5183+8	6.9995+7	9.5466+7	8.5379+3	3.9435+2	3.2251+2	7.1623+1	2.1551–1
M2	3.0220–3	4.7816–8	9.7499+5	5.3026–6	3.1585+8	1.5129+8	6.9585+7	9.4974+7	8.5326+3	3.9273+2	3.2124+2	7.1265+1	2.1669–1
	3.0831–3	4.8421–8	9.6280+5	5.4591–6	3.1191+8	1.4980+8	6.8475+7	9.3618+7	8.5145+3	3.8832+2	3.1782+2	7.0282+1	2.1973–1
	3.1977–3	4.9543–8	9.4099+5	5.7573–6	3.0484+8	1.4714+8	6.6498+7	9.1197+7	8.4816+3	3.8049+2	3.1174+2	6.8528+1	2.2543–1
	3.2500–3	5.0050–8	9.3147+5	5.8953–6	3.0175+8	1.4597+8	6.5639+7	9.0142+7	8.4670+3	3.7710+2	3.0911+2	6.7764+1	2.2802–1
M1	3.2732–3	5.0274–8	9.2733+5	5.9569–6	3.0041+8	1.4546+8	6.5265+7	8.9683+7	8.4606+3	3.7563+2	3.0797+2	6.7431+1	2.2917–1
	3.3186–3	5.0714–8	9.1927+5	6.0783–6	2.9780+8	1.4446+8	6.4544+7	8.8788+7	8.4451+3	3.7274+2	3.0573+2	6.6782+1	2.3119–1
	3.3983–3	5.1480–8	9.0559+5	6.2935–6	2.9337+8	1.4277+8	6.3322+7	8.7269+7	8.4186+3	3.6786+2	3.0194+2	6.5681+1	2.3472–1
	3.4038–3	5.1533–8	9.0466+5	6.3084–6	2.9307+8	1.4266+8	6.3239+7	8.7166+7	8.4168+3	3.6753+2	3.0169+2	6.5607+1	2.3497–1
	3.5000–3	5.2448–8	8.8888+5	6.5722–6	2.8796+8	1.4070+8	6.1836+7	8.5416+7	8.3857+3	3.6193+2	2.9735+2	6.4339+1	2.3923–1
	3.5487–3	5.2908–8	8.8115+5	6.7073–6	2.8545+8	1.3973+8	6.1151+7	8.4561+7	8.3703+3	3.5920+2	2.9524+2	6.3720+1	2.4138–1
	3.5529–3	5.2947–8	8.8051+5	6.7188–6	2.8524+8	1.3965+8	6.1094+7	8.4490+7	8.3690+3	3.5898+2	2.9507+2	6.3668+1	2.4156–1
	3.6250–3	5.3623–8	8.6941+5	6.9209–6	2.8165+8	1.3827+8	6.0113+7	8.3263+7	8.3466+3	3.5508+2	2.9205+2	6.2780+1	2.4475–1
	3.7744–3	5.5005–8	8.4756+5	7.3461–6	2.7457+8	1.3552+8	5.8191+7	8.0853+7	8.3020+3	3.4744+2	2.8615+2	6.1035+1	2.5132–1
	3.7764–3	5.5024–8	8.4727+5	7.3521–6	2.7448+8	1.3548+8	5.8165+7	8.0821+7	8.3014+3	3.4733+2	2.8607+2	6.1012+1	2.5141–1
	4.0000–3	5.7052–8	8.1715+5	8.0056–6	2.6472+8	1.3167+8	5.5535+7	7.7509+7	8.2382+3	3.3695+2	2.7807+2	5.8615+1	2.6121–1
	4.2500–3	5.9324–8	7.8585+5	8.7609–6	2.5458+8	1.2764+8	5.2841+7	7.4090+7	8.1576+3	3.2512+2	2.6874+2	5.6117+1	2.7111–1
	4.5000–3	6.1546–8	7.5749+5	9.5426–6	2.4539+8	1.2396+8	5.0423+7	7.1005+7	8.0824+3	3.1456+2	2.6041+2	5.3865+1	2.8096–1
	4.6250–3	6.2638–8	7.4427+5	9.9431–6	2.4111+8	1.2223+8	4.9303+7	6.9572+7	8.0466+3	3.0966+2	2.5655+2	5.2819+1	2.8586–1
	5.0000–3	6.5850–8	7.0798+5	1.1181–5	2.2935+8	1.1744+8	4.6253+7	6.5651+7	7.9456+3	2.9637+2	2.4611+2	4.9958+1	3.0048–1
	5.5000–3	7.0135–8	6.6472+5	1.2917–5	2.1534+8	1.1176+8	4.2741+7	6.0831+7	7.8012+3	2.7979+2	2.3306+2	4.6414+1	3.1796–1
	6.0000–3	7.4278–8	6.2765+5	1.4750–5	2.0333+8	1.0681+8	3.9771+7	5.6740+7	7.6716+3	2.6586+2	2.2212+2	4.3408+1	3.3523–1
	7.0000–3	8.2316–8	5.6635+5	1.8696–5	1.8347+8	9.8463+7	3.4953+7	5.0050+7	7.3784+3	2.4139+2	2.0257+2	3.8457+1	3.6297–1
	8.0000–3	8.9940–8	5.1834+5	2.3008–5	1.6792+8	9.1761+7	3.1257+7	4.4895+7	7.1335+3	2.2263+2	1.8760+2	3.4647+1	3.9013–1
	1.0000–2	1.0460–7	4.4571+5	3.2644–5	1.4439+8	8.1228+7	2.5883+7	3.7271+7	6.6722+3	1.9320+2	1.6380+2	2.8966+1	4.3456–1
L3	1.1567–2	1.1568–7	4.0303+5	4.1151–5	1.3056+8	7.4919+7	2.2878+7	3.2758+7	6.3466+3	1.7548+2	1.4944+2	2.5574+1	4.6279–1
	1.1996–2	1.1864–7	3.9296+5	4.3626–5	1.2730+8	7.3408+7	2.2183+7	3.1704+7	6.2604+3	1.7128+2	1.4604+2	2.4780+1	4.6931–1
	1.2747–2	1.2374–7	3.7677+5	4.8098–5	1.2206+8	7.0957+7	2.1070+7	3.0023+7	6.1191+3	1.6458+2	1.4059+2	2.3513+1	4.8066–1
L2	1.3313–2	1.2751–7	3.6562+5	5.1585–5	1.1844+8	6.9254+7	2.0309+7	2.8875+7	6.0200+3	1.6000+2	1.3687+2	2.2648+1	4.8913–1
	1.3735–2	1.3030–7	3.5779+5	5.4249–5	1.1591+8	6.8044+7	1.9778+7	2.8081+7	5.9484+3	1.5672+2	1.3418+2	2.2046+1	4.9517–1
L1	1.3862–2	1.3113–7	3.5552+5	5.5063–5	1.1517+8	6.7690+7	1.9624+7	2.7850+7	5.9274+3	1.5577+2	1.3340+2	2.1871+1	4.9699–1
	1.4367–2	1.3443–7	3.4679+5	5.8346–5	1.1234+8	6.6334+7	1.9036+7	2.6967+7	5.8465+3	1.5214+2	1.3043+2	2.1203+1	5.0417–1
	1.4431–2	1.3485–7	3.4573+5	5.8765–5	1.1200+8	6.6168+7	1.8965+7	2.6860+7	5.8366+3	1.5170+2	1.3007+2	2.1123+1	5.0507–1
	1.5000–2	1.3851–7	3.3658+5	6.2563–5	1.0904+8	6.4738+7	1.8353+7	2.5941+7	5.7507+3	1.4792+2	1.2698+2	2.0429+1	5.1310–1
	1.6250–2	1.4648–7	3.1826+5	7.1246–5	1.0310+8	6.1807+7	1.7147+7	2.4143+7	5.5629+3	1.4009+2	1.2050+2	1.9058+1	5.2705–1
	1.7500–2	1.5425–7	3.0223+5	8.0392–5	9.7909+7	5.9213+7	1.6102+7	2.2589+7	5.3945+3	1.3331+2	1.1489+2	1.7875+1	5.4088–1
	1.8125–2	1.5807–7	2.9493+5	8.5135–5	9.5545+7	5.8022+7	1.5630+7	2.1888+7	5.3165+3	1.3025+2	1.1236+2	1.7341+1	5.4774–1
	2.0000–2	1.6926–7	2.7543+5	9.9998–5	8.9228+7	5.4809+7	1.4377+7	2.0037+7	5.1038+3	1.2214+2	1.0564+2	1.5932+1	5.6808–1
	2.2500–2	1.8387–7	2.5355+5	1.2130–4	8.2137+7	5.1114+7	1.3021+7	1.7998+7	4.8331+3	1.1266+2	9.7707+1	1.4361+1	5.8750–1
	2.5000–2	1.9796–7	2.3550+5	1.4429–4	7.6292+7	4.8021+7	1.1916+7	1.6350+7	4.6032+3	1.0494+2	9.1239+1	1.3092+1	6.0674–1

Atomic Weight 195.090 Density 21.450 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.6250–2	2.0483–7	2.2760+5	1.5640–4	7.3733+7	4.6652+7	1.1437+7	1.5639+7	4.5004+3	1.0159+2	8.8429+1	1.2544+1	6.1626–1
3.0000–2	2.2482–7	2.0737+5	1.9494–4	6.7177+7	4.3104+7	1.0222+7	1.3847+7	4.2308+3	9.3112+1	8.1303+1	1.1165+1	6.4440–1
3.5000–2	2.5062–7	1.8602+5	2.5147–4	6.0261+7	3.9255+7	9.0037+6	1.1998+7	3.9227+3	8.3966+1	7.3571+1	9.7229+0	6.7237–1
4.0000–2	2.7526–7	1.6937+5	3.1365–4	5.4867+7	3.6200+7	8.0666+6	1.0598+7	3.6741+3	7.6944+1	6.7613+1	8.6309+0	6.9988–1
5.0000–2	3.2178–7	1.4488+5	4.5329–4	4.6935+7	3.1595+7	6.7422+6	8.5942+6	3.2919+3	6.6531+1	5.8731+1	7.0543+0	7.4523–1
6.0000–2	3.6514–7	1.2768+5	6.1245–4	4.1361+7	2.8272+7	5.8453+6	7.2415+6	3.0138+3	5.9276+1	5.2509+1	5.9824+0	7.8460–1
K 7.8615–2	4.3922–7	1.0614+5	9.5317–4	3.4386+7	2.3997+7	4.7671+6	5.6186+6	2.6529+3	5.0239+1	4.4705+1	4.6860+0	8.4744–1
7.9307–2	4.4183–7	1.0552+5	9.6699–4	3.4182+7	2.3871+7	4.7361+6	5.5723+6	2.6421+3	4.9979+1	4.4480+1	4.6490+0	8.4966–1
8.0000–2	4.4444–7	1.0490+5	9.8089–4	3.3982+7	2.3747+7	4.7055+6	5.5267+6	2.6313+3	4.9722+1	4.4258+1	4.6126+0	8.5188–1
8.2500–2	4.5366–7	1.0276+5	1.0316–3	3.3291+7	2.3316+7	4.6033+6	5.3692+6	2.5945+3	4.8834+1	4.3489+1	4.4856+0	8.5907–1
8.6875–2	4.6955–7	9.9286+4	1.1226–3	3.2164+7	2.2610+7	4.4367+6	5.1148+6	2.5338+3	4.7389+1	4.2237+1	4.2805+0	8.7163–1
9.3438–2	4.9287–7	9.4589+4	1.2640–3	3.0643+7	2.1651+7	4.2121+6	4.7766+6	2.4506+3	4.5446+1	4.0548+1	4.0079+0	8.9042–1
1.0000–1	5.1560–7	9.0418+4	1.4112–3	2.9292+7	2.0795+7	4.0130+6	4.4815+6	2.3756+3	4.3731+1	3.9052+1	3.7700+0	9.0908–1
1.1250–1	5.5375–7	8.4189+4	1.7060–3	2.7273+7	1.9511+7	3.7160+6	4.0439+6	2.2642+3	4.1088+1	3.6736+1	3.4141+0	9.3852–1
1.3125–1	6.0780–7	7.6703+4	2.1807–3	2.4848+7	1.7951+7	3.3604+6	3.5350+6	2.1262+3	3.7949+1	3.3965+1	3.0006+0	9.8285–1
1.5000–1	6.5870–7	7.0776+4	2.6915–3	2.2928+7	1.6700+7	3.0800+6	3.1462+6	2.0134+3	3.5499+1	3.1788+1	2.6850+0	1.0269+0
1.7500–1	7.1673–7	6.5046+4	3.4201–3	2.1072+7	1.5477+7	2.8195+6	2.7738+6	1.8952+3	3.3153+1	2.9697+1	2.3796+0	1.0764+0
2.0000–1	7.7094–7	6.0472+4	4.1959–3	1.9590+7	1.4490+7	2.6117+6	2.4870+6	1.7984+3	3.1309+1	2.8039+1	2.1446+0	1.1257+0
2.5000–1	8.6742–7	5.3745+4	5.8567–3	1.7411+7	1.2966+7	2.3451+6	2.0981+6	1.6621+3	2.8935+1	2.5897+1	1.8229+0	1.2149+0
3.0000–1	9.5489–7	4.8823+4	7.6376–3	1.5816+7	1.1841+7	2.1476+6	1.8260+6	1.5584+3	2.7234+1	2.4333+1	1.5983+0	1.3027+0
4.0000–1	1.1096–6	4.2017+4	1.1437–2	1.3612+7	1.0178+7	1.9216+6	1.5104+6	1.4289+3	2.5430+1	2.2619+1	1.3365+0	1.4747+0
5.0000–1	1.2457–6	3.7426+4	1.5439–2	1.2124+7	9.0117+6	1.7905+6	1.3209+6	1.3513+3	2.4547+1	2.1718+1	1.1790+0	1.6500+0
6.0000–1	1.3671–6	3.4101+4	1.9550–2	1.1047+7	8.1433+6	1.7064+6	1.1961+6	1.3027+3	2.4100+1	2.1194+1	1.0753+0	1.8307+0
8.0000–1	1.5768–6	2.9566+4	2.7882–2	9.5782+6	6.9354+6	1.6076+6	1.0339+6	1.2483+3	2.3908+1	2.0760+1	9.4036–1	2.2077+0
1.0000+0	1.7513–6	2.6620+4	3.6212–2	8.6236+6	6.1226+6	1.5534+6	9.4639+5	1.2193+3	2.4113+1	2.0645+1	8.6858–1	2.5987+0
1.5000+0	2.0926–6	2.2279+4	5.6427–2	7.2173+6	4.8985+6	1.4926+6	8.2500+5	1.1895+3	2.5366+1	2.0970+1	7.6966–1	3.6263+0
2.0000+0	2.3383–6	1.9937+4	7.5602–2	6.4588+6	4.2081+6	1.4726+6	7.7693+5	1.1810+3	2.6801+1	2.1355+1	7.3099–1	4.7145+0
3.0000+0	2.6872–6	1.7349+4	1.1098–1	5.6203+6	3.4538+6	1.4488+6	7.1651+5	1.1783+3	2.9790+1	2.2110+1	6.8597–1	6.9943+0
4.0000+0	2.9113–6	1.6014+4	1.4295–1	5.1877+6	3.0413+6	1.4463+6	6.9886+5	1.1822+3	3.2801+1	2.2753+1	6.7372–1	9.3750+0
5.0000+0	3.0735–6	1.5168+4	1.7213–1	4.9138+6	2.7838+6	1.4444+6	6.8449+5	1.1872+3	3.5791+1	2.3317+1	6.6445–1	1.1810+1
6.0000+0	3.1939–6	1.4596+4	1.9898–1	4.7286+6	2.6129+6	1.4424+6	6.7206+5	1.1939+3	3.8745+1	2.3726+1	6.5692–1	1.4362+1
8.0000+0	3.3601–6	1.3875+4	2.4707–1	4.4947+6	2.3935+6	1.4398+6	6.6023+5	1.2045+3	4.4570+1	2.4417+1	6.4912–1	1.9504+1
1.0000+1	3.4599–6	1.3474+4	2.8917–1	4.3651+6	2.2705+6	1.4403+6	6.5311+5	1.2154+3	5.0548+1	2.4995+1	6.4587–1	2.4907+1
1.5000+1	3.5704–6	1.3057+4	3.7614–1	4.2299+6	2.1418+6	1.4413+6	6.4561+5	1.2355+3	6.5051+1	2.5808+1	6.4100–1	3.8602+1
2.0000+1	3.5984–6	1.2956+4	4.4531–1	4.1970+6	2.1142+6	1.4419+6	6.3961+5	1.2505+3	8.0036+1	2.6453+1	6.3757–1	5.2945+1
3.0000+1	3.6057–6	1.2929+4	5.5134–1	4.1886+6	2.1151+6	1.4424+6	6.2980+5	1.2731+3	1.1020+2	2.7285+1	6.3277–1	8.2283+1
4.0000+1	3.6060–6	1.2928+4	6.3144–1	4.1882+6	2.1139+6	1.4429+6	6.3012+5	1.2903+3	1.4071+2	2.7807+1	6.3375–1	1.1227+2
5.0000+1	3.6065–6	1.2927+4	6.9569–1	4.1877+6	2.1130+6	1.4431+6	6.3023+5	1.3059+3	1.7162+2	2.8207+1	6.3452–1	1.4278+2
6.0000+1	3.6070–6	1.2925+4	7.4923–1	4.1871+6	2.1123+6	1.4433+6	6.3020+5	1.3187+3	2.0282+2	2.8504+1	6.3515–1	1.7368+2
8.0000+1	3.6081–6	1.2921+4	8.3507–1	4.1858+6	2.1112+6	1.4435+6	6.2987+5	1.3391+3	2.6602+2	2.9018+1	6.3613–1	2.3637+2
1.0000+2	3.6092–6	1.2917+4	9.0247–1	4.1846+6	2.1103+6	1.4436+6	6.2933+5	1.3551+3	3.2971+2	2.9481+1	6.3690–1	2.9959+2
1.5000+2	3.6026–6	1.2941+4	1.0261+0	4.1922+6	2.1087+6	1.4437+6	6.3849+5	1.3839+3	4.8995+2	2.9935+1	6.4627–1	4.5936+2
2.0000+2	3.5979–6	1.2958+4	1.1143+0	4.1977+6	2.1075+6	1.4437+6	6.4504+5	1.4013+3	6.5135+2	3.0359+1	6.5301–1	6.2033+2
3.0000+2	3.5912–6	1.2982+4	1.2390+0	4.2055+6	2.1060+6	1.4438+6	6.5430+5	1.4254+3	9.7317+2	3.1025+1	6.6259–1	9.4148+2
4.0000+2	3.5880–6	1.2993+4	1.3278+0	4.2092+6	2.1048+6	1.4438+6	6.5913+5	1.4421+3	1.2953+3	3.1451+1	6.6769–1	1.2632+3
5.0000+2	3.5872–6	1.2996+4	1.3967+0	4.2102+6	2.1040+6	1.4438+6	6.6095+5	1.4552+3	1.6198+3	3.1726+1	6.6974–1	1.5874+3
6.0000+2	3.5866–6	1.2999+4	1.4530+0	4.2109+6	2.1032+6	1.4438+6	6.6244+5	1.4651+3	1.9412+3	3.1977+1	6.7147–1	1.9085+3
8.0000+2	3.5856–6	1.3002+4	1.5419+0	4.2121+6	2.1021+6	1.4438+6	6.6470+5	1.4809+3	2.5896+3	3.2432+1	6.7418–1	2.5565+3
1.0000+3	3.5849–6	1.3004+4	1.6108+0	4.2128+6	2.1012+6	1.4438+6	6.6630+5	1.4937+3	3.2375+3	3.2803+1	6.7623–1	3.2040+3
1.5000+3	3.5862–6	1.3000+4	1.7359+0	4.2113+6	2.0996+6	1.4438+6	6.6636+5	1.5178+3	4.8661+3	3.3161+1	6.7630–1	4.8322+3
2.0000+3	3.5883–6	1.2992+4	1.8246+0	4.2088+6	2.0985+6	1.4438+6	6.6498+5	1.5362+3	6.4845+3	3.3516+1	6.7491–1	6.4503+3
3.0000+3	3.5912–6	1.2982+4	1.9497+0	4.2055+6	2.0969+6	1.4438+6	6.6321+5	1.5627+3	9.7287+3	3.4162+1	6.7312–1	9.6939+3
4.0000+3	3.5937–6	1.2973+4	2.0384+0	4.2026+6	2.0958+6	1.4438+6	6.6143+5	1.5820+3	1.2976+4	3.4511+1	6.7133–1	1.2941+4
5.0000+3	3.5976–6	1.2959+4	2.1071+0	4.1980+6	2.0949+6	1.4438+6	6.5770+5	1.5971+3	1.6257+4	3.4812+1	6.6756–1	1.6222+4
6.0000+3	3.5980–6	1.2957+4	2.1632+0	4.1976+6	2.0942+6	1.4438+6	6.5795+5	1.6082+3	1.9483+4	3.5044+1	6.6782–1	1.9447+4
8.0000+3	3.5996–6	1.2951+4	2.2518+0	4.1957+6	2.0931+6	1.4438+6	6.5715+5	1.6258+3	2.5991+4	3.5476+1	6.6703–1	2.5955+4
1.0000+4	3.6009–6	1.2947+4	2.3204+0	4.1942+6	2.0922+6	1.4438+6	6.5653+5	1.6396+3	3.2560+4	3.5871+1	6.6643–1	3.2524+4
1.5000+4	3.6031–6	1.2939+4	2.4451+0	4.1917+6	2.0906+6	1.4438+6	6.5556+5	1.6661+3	4.8679+4	3.6208+1	6.6544–1	4.8642+4
2.0000+4	3.6050–6	1.2932+4	2.5337+0	4.1894+6	2.0895+6	1.4438+6	6.5438+5	1.6852+3	6.5007+4	3.6545+1	6.6425–1	6.4970+4
3.0000+4	3.6070–6	1.2925+4	2.6586+0	4.1871+6	2.0879+6	1.4438+6	6.5366+5	1.7120+3	9.7293+4	3.7203+1	6.6352–1	9.7255+4
4.0000+4	3.6090–6	1.2918+4	2.7472+0	4.1848+6	2.0868+6	1.4438+6	6.5242+5	1.7312+3	1.2993+5	3.7527+1	6.6226–1	1.2989+5
5.0000+4	3.6124–6	1.2905+4	2.8160+0	4.1808+6	2.0859+6	1.4438+6	6.4929+5	1.7460+3	1.6225+5	3.7851+1	6.5908–1	1.6222+5
6.0000+4	3.6124–6	1.2906+4	2.8722+0	4.1809+6	2.0852+6	1.4438+6	6.5007+5	1.7580+3	1.9456+5	3.8072+1	6.5988–1	1.9452+5
8.0000+4	3.6135–6	1.2901+4	2.9608+0	4.1795+6	2.0841+6	1.4438+6	6.4981+5	1.7772+3	2.5973+5	3.8504+1	6.5961–1	2.5969+5
1.0000+5	3.6146–6	1.2898+4	3.0295+0	4.1783+6	2.0832+6	1.4438+6	6.4948+5	1.7921+3	3.2501+5	3.8911+1	6.5928–1	3.2497+5


July 4, 1991
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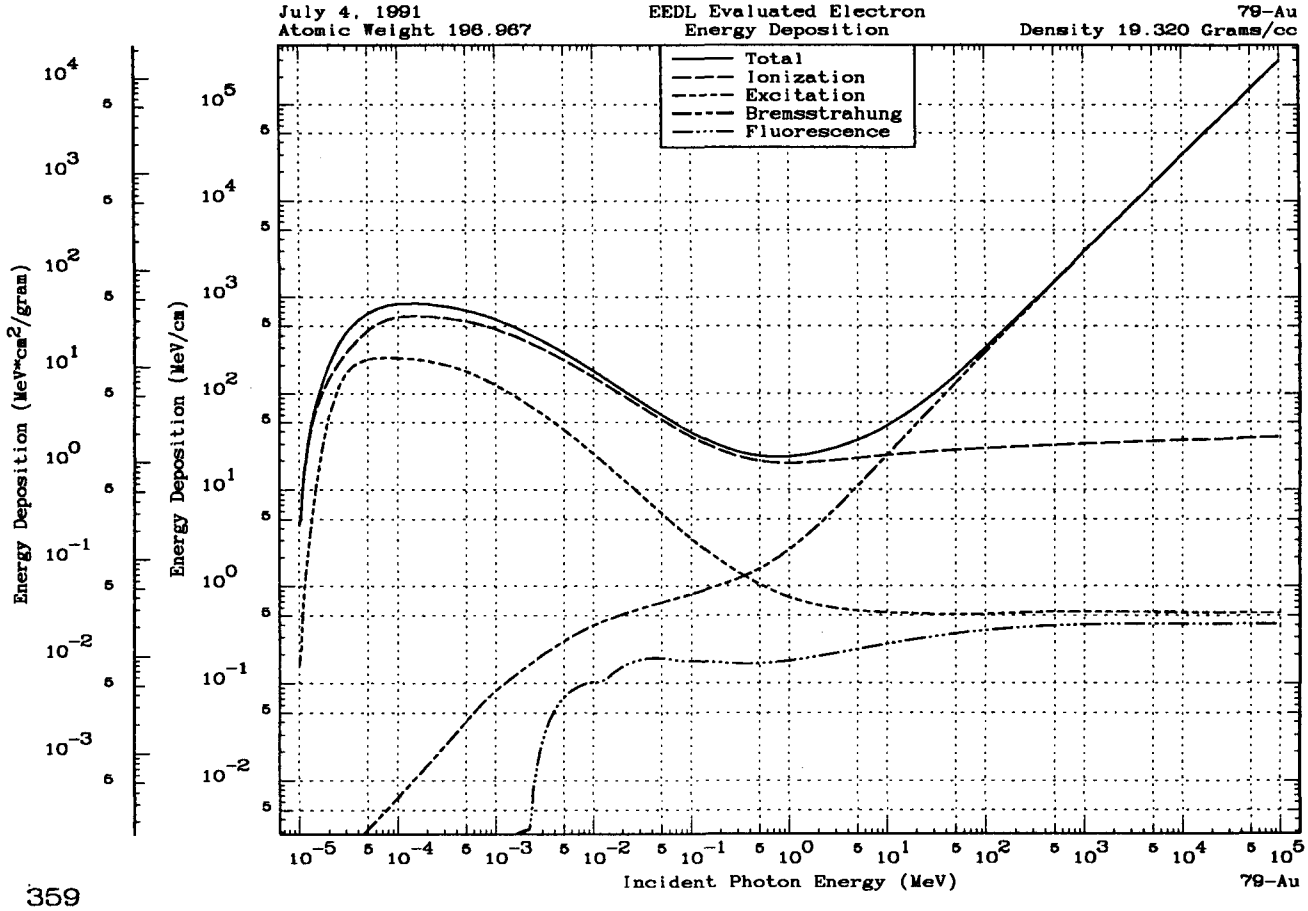
EEDL Evaluated Electron
Cross Sections
79-Au
Density 19.320 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
79-Au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Fluorescence
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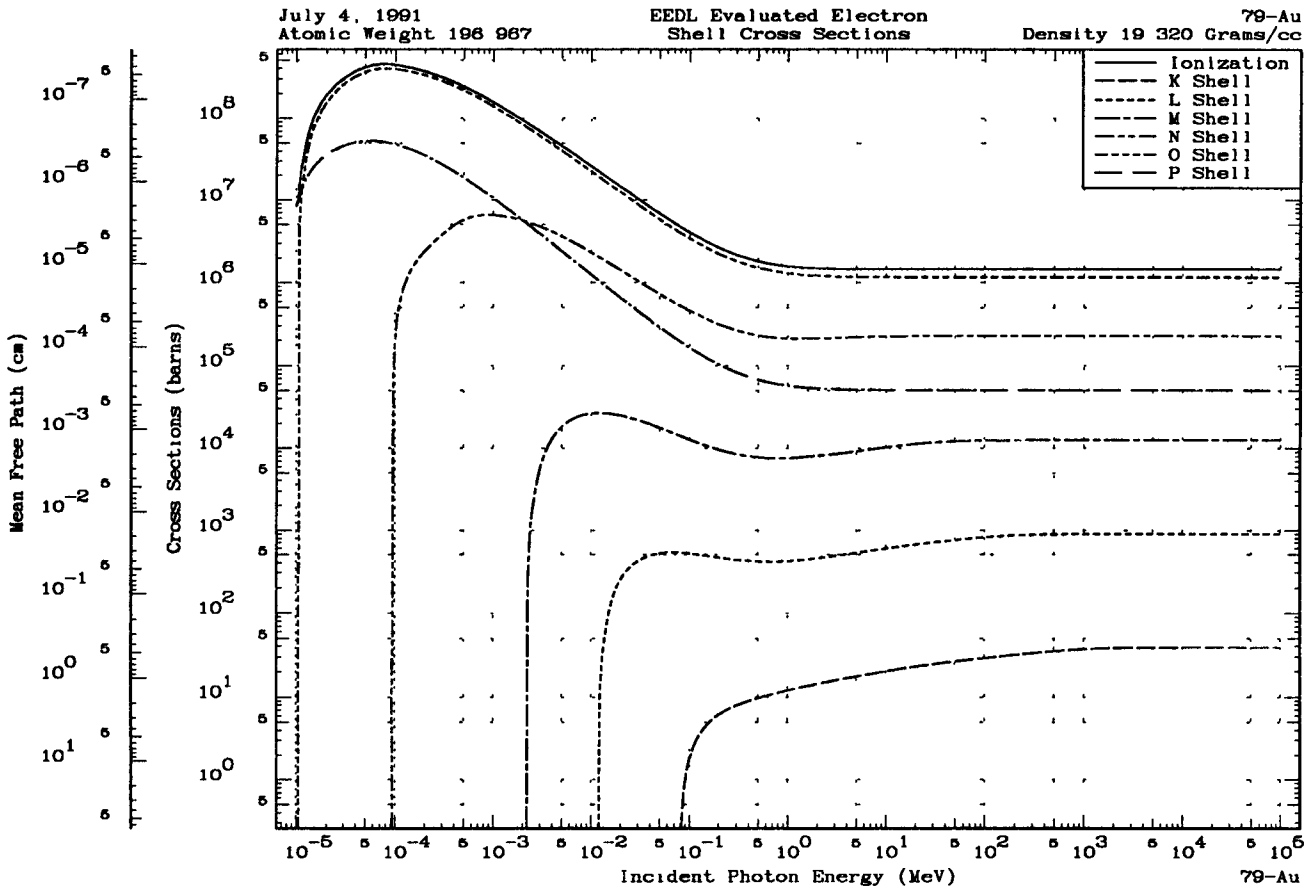
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
79-Au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EEDL Evaluated Electron
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Density 19 320 Grams/cc
Ionization
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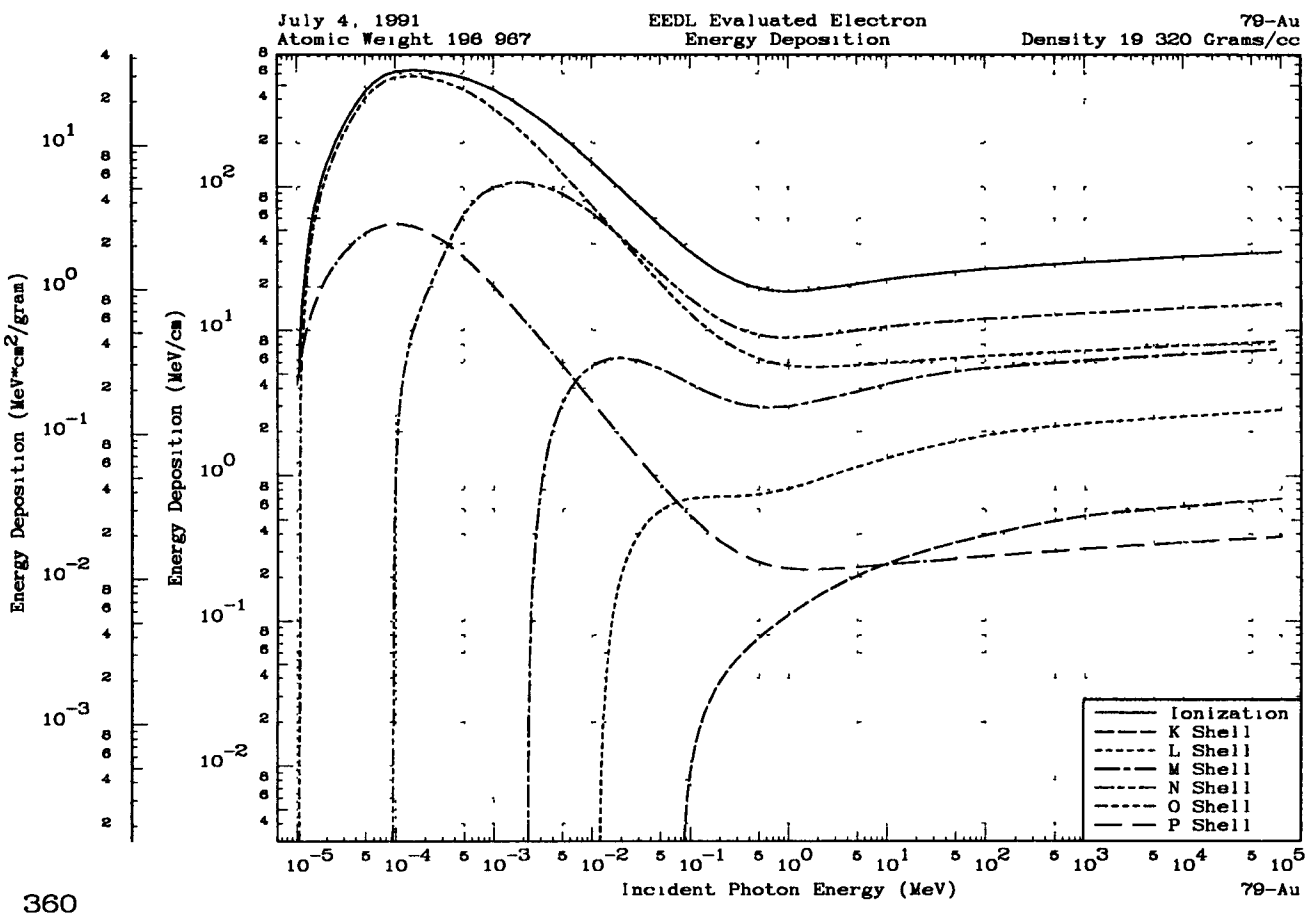
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
79-Au


July 4, 1991
Atomic Weight 196 967
EEDL Evaluated Electron
Energy Deposition
79-Au
Density 19 320 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
79-Au

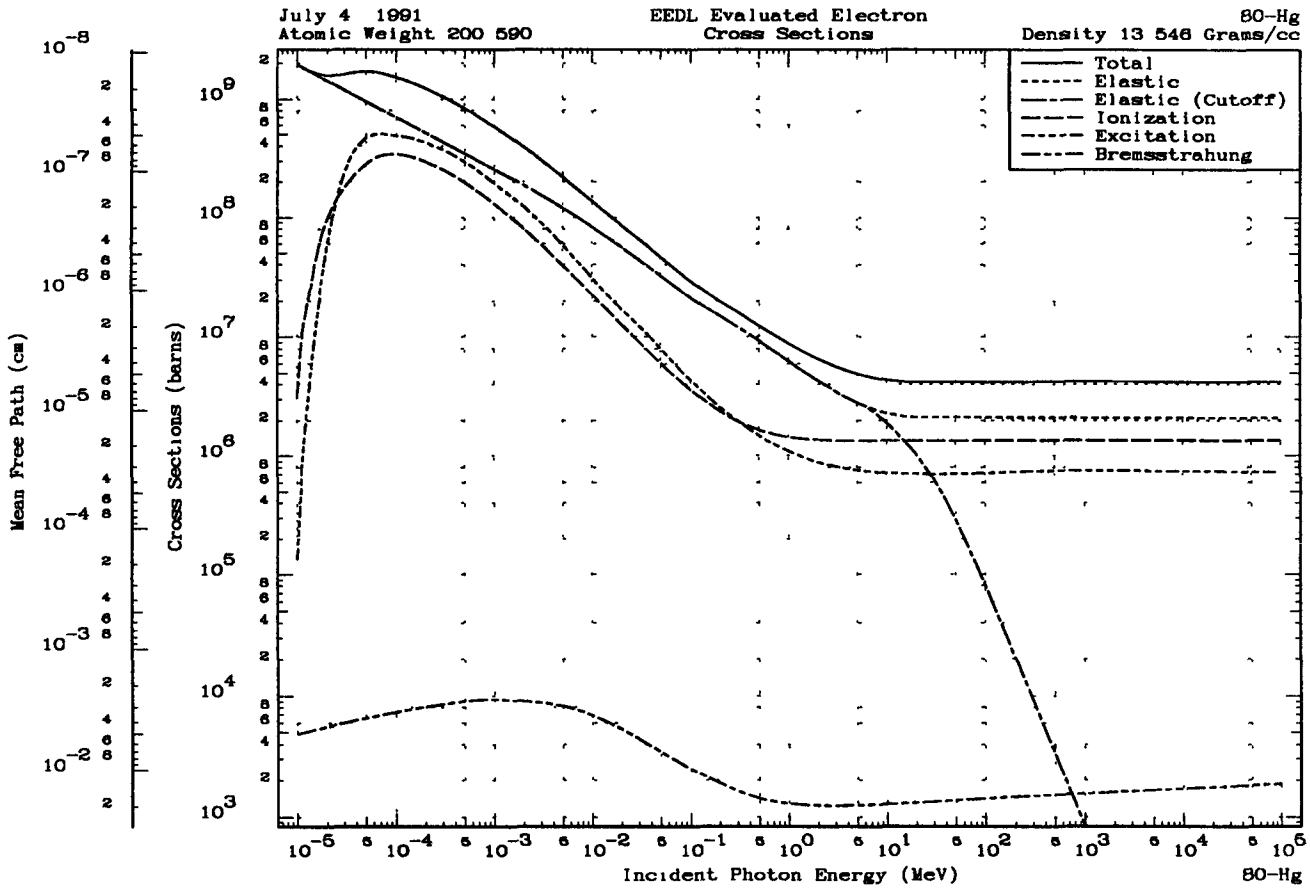
Atomic Weight 196.967 Density 19.320 Grams/cc

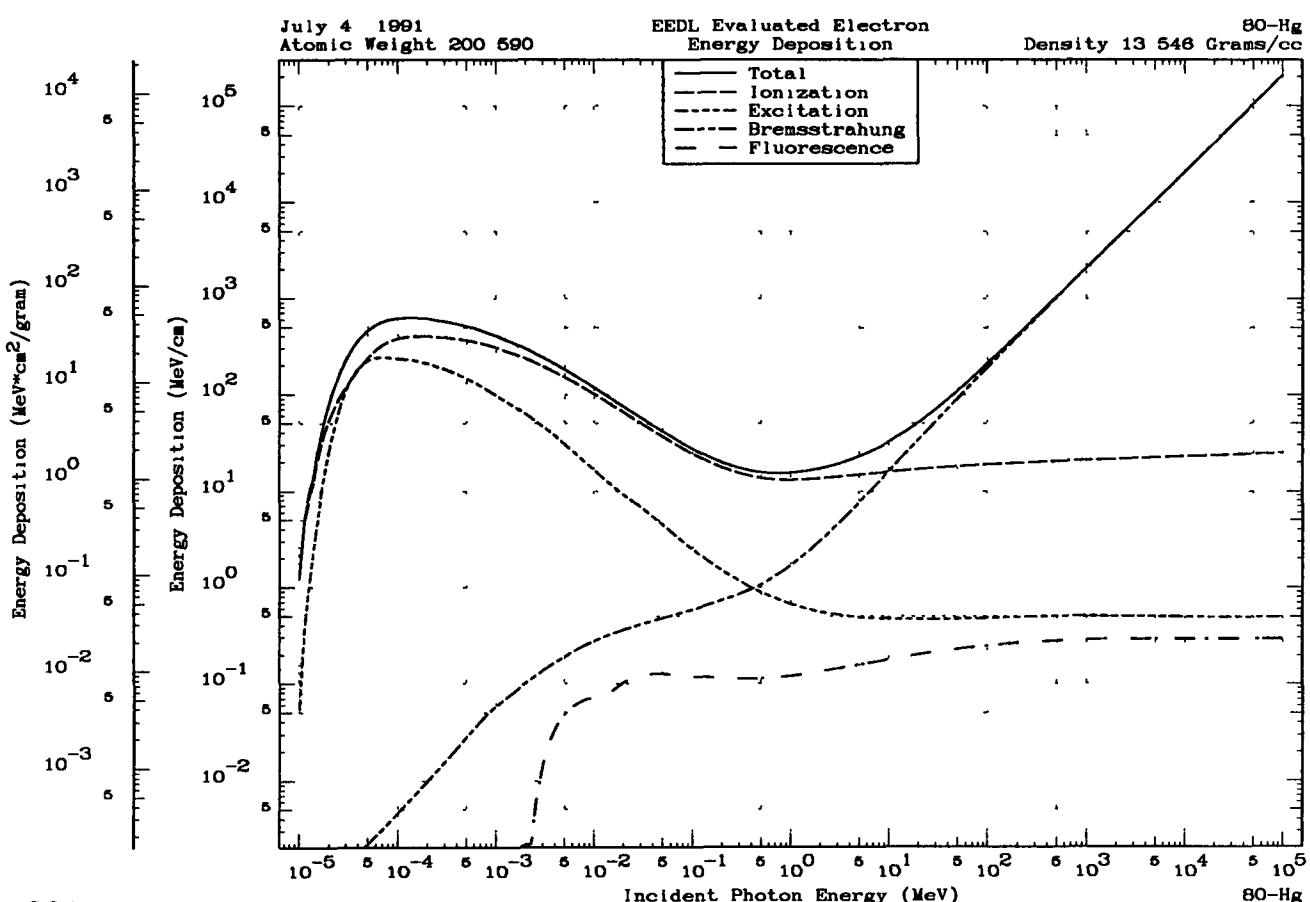
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.0861–9	5.6966+6		1.8632+9	1.8546+9	8.3401+6	2.9425+5	4.8190+3	4.4521+0	4.3001+0	1.5143–1	6.1528–4
O5	1.0460–5	9.2584–9	5.5906+6		1.8285+9	1.8180+9	1.0038+7	4.5757+5	4.8633+3	5.4823+0	5.2431+0	2.3861–1	6.4252–4
	1.0744–5	9.3365–9	5.5438+6		1.8132+9	1.7966+9	1.5757+7	8.4255+5	4.8898+3	9.1729+0	8.7298+0	4.4243–1	6.5942–4
	1.1250–5	9.4694–9	5.4660+6		1.7878+9	1.7604+9	2.5720+7	1.6659+6	4.9358+3	1.5780+1	1.4894+1	8.8561–1	6.8974–4
	1.1276–5	9.4748–9	5.4629+6		1.7867+9	1.7586+9	2.6421+7	1.7234+6	4.9381+3	1.6254+1	1.5336+1	9.1671–1	6.9129–4
O4	1.2160–5	9.6909–9	5.3411+6		1.7469+9	1.7008+9	4.2475+7	3.5905+6	5.0144+3	2.7630+1	2.5679+1	1.9505+0	7.4477–4
	1.2207–5	9.6986–9	5.3368+6		1.7455+9	1.6980+9	4.3848+7	3.7223+6	5.0184+3	2.8625+1	2.6601+1	2.0237+0	7.4762–4
	1.2515–5	9.7610–9	5.3027+6		1.7344+9	1.6793+9	5.0337+7	4.7042+6	5.0438+3	3.3627+1	3.1056+1	2.5702+0	7.6643–4
	1.3136–5	9.8696–9	5.2444+6		1.7153+9	1.6437+9	6.4463+7	7.1189+6	5.0938+3	4.4809+1	4.0880+1	3.9280+0	8.0456–4
	1.3594–5	9.9350–9	5.2098+6		1.7040+9	1.6190+9	7.5446+7	9.5398+6	5.1293+3	5.3915+1	4.8612+1	5.3019+0	8.3282–4
	1.3603–5	9.9362–9	5.2092+6		1.7038+9	1.6185+9	7.5678+7	9.5952+6	5.1300+3	5.4111+1	4.8777+1	5.3334+0	8.3340–4
	1.4068–5	1.0003–8	5.1745+6		1.6924+9	1.5946+9	8.5472+7	1.2347+7	5.1652+3	6.2874+1	5.5961+1	6.9128+0	8.6230–4
	1.5000–5	1.0106–8	5.1219+6		1.6752+9	1.5500+9	1.0525+8	1.9972+7	5.2330+3	8.2097+1	7.0751+1	1.1345+1	9.2068–4
	1.6250–5	1.0221–8	5.0640+6		1.6563+9	1.4961+9	1.2668+8	3.3536+7	5.3188+3	1.0695+2	8.7688+1	1.9263+1	9.9995–4
	1.7500–5	1.0263–8	5.0432+6		1.6495+9	1.4478+9	1.5086+8	5.0797+7	5.3995+3	1.3692+2	1.0742+2	2.9500+1	1.0803–3
	1.8125–5	1.0275–8	5.0372+6		1.6475+9	1.4255+9	1.6019+8	6.1833+7	5.4382+3	1.5166+2	1.1555+2	3.6105+1	1.1208–3
	2.0000–5	1.0253–8	5.0482+6		1.6511+9	1.3648+9	1.8980+8	9.6537+7	5.5481+3	1.9947+2	1.4218+2	5.7290+1	1.2439–3
	2.2500–5	1.0222–8	5.0635+6		1.6561+9	1.2955+9	2.2123+8	1.3942+8	5.6674+3	2.5649+2	1.7302+2	8.3468+1	1.3973–3
	2.5000–5	1.0058–8	5.1460+6		1.6831+9	1.2365+9	2.5292+8	1.9369+8	5.7762+3	3.2322+2	2.0624+2	1.1697+2	1.5532–3
	2.6250–5	1.0037–8	5.1568+6		1.6866+9	1.2101+9	2.6519+8	2.1136+8	5.8273+3	3.4874+2	2.2054+2	1.2820+2	1.6321–3
	3.0000–5	9.8937–9	5.2316+6		1.7111+9	1.1407+9	3.0206+8	2.6839+8	5.9695+3	4.3060+2	2.6570+2	1.6489+2	1.8721–3
	3.5000–5	9.8425–9	5.2588+6		1.7200+9	1.0657+9	3.4010+8	3.1423+8	6.1359+3	5.1275+2	3.1859+2	1.9416+2	2.1969–3
	4.0000–5	9.8561–9	5.2516+6		1.7176+9	1.0047+9	3.7263+8	3.4031+8	6.2837+3	5.8182+2	3.7035+2	2.1147+2	2.5289–3
	5.0000–5	1.0015–8	5.1681+6		1.6903+9	9.1056+8	4.1600+8	3.6376+8	6.5205+3	6.8251+2	4.5531+2	2.2721+2	3.1837–3
	6.0000–5	1.0246–8	5.0515+6		1.6522+9	8.4023+8	4.3966+8	3.7231+8	6.7131+3	7.5243+2	5.1862+2	2.3380+2	3.8450–3
O3	6.1370–5	1.0286–8	5.0320+6		1.6458+9	8.3191+8	4.4102+8	3.7290+8	6.7373+3	7.5865+2	5.2440+2	2.3425+2	3.9369–3
	6.2534–5	1.0324–8	5.0136+6		1.6398+9	8.2504+8	4.4178+8	3.7298+8	6.7576+3	7.6306+2	5.2869+2	2.3437+2	4.0152–3
	6.4718–5	1.0393–8	4.9804+6		1.6290+9	8.1265+8	4.4318+8	3.7312+8	6.7947+3	7.7131+2	5.3672+2	2.3459+2	4.1626–3
	7.2359–5	1.0614–8	4.8767+6		1.5950+9	7.7363+8	4.4780+8	3.7360+8	6.9169+3	8.0018+2	5.6483+2	2.3534+2	4.6841–3
O2	7.8550–5	1.0774–8	4.8043+6		1.5713+9	7.4613+8	4.5126+8	3.7395+8	7.0082+3	8.2347+2	5.8753+2	2.3594+2	5.1126–3
	8.0000–5	1.0813–8	4.7867+6		1.5656+9	7.4014+8	4.5157+8	3.7387+8	7.0287+3	8.2790+2	5.9192+2	2.3598+2	5.2137–3
	8.2500–5	1.0896–8	4.7505+6		1.5538+9	7.3017+8	4.5030+8	3.7328+8	7.0623+3	8.3131+2	5.9553+2	2.3578+2	5.3878–3
	8.6875–5	1.1034–8	4.6909+6		1.5343+9	7.1372+8	4.4822+8	3.7231+8	7.1192+3	8.3746+2	6.0200+2	2.3546+2	5.6944–3
	9.0000–5	1.1129–8	4.6508+6		1.5211+9	7.0268+8	4.4682+8	3.7164+8	7.1584+3	8.4196+2	6.0670+2	2.3525+2	5.9148–3
N7	9.3390–5	1.1229–8	4.6094+6		1.5076+9	6.9132+8	4.4533+8	3.7094+8	7.1997+3	8.4678+2	6.1174+2	2.3504+2	6.1551–3
	9.6695–5	1.1325–8	4.5705+6		1.4949+9	6.8080+8	4.4404+8	3.7004+8	7.2361+3	8.5188+2	6.1718+2	2.3470+2	6.3882–3
N6	9.7370–5	1.1344–8	4.5628+6		1.4924+9	6.7872+8	4.4378+8	3.6985+8	7.2434+3	8.5292+2	6.1828+2	2.3464+2	6.4360–3
	1.0000–4	1.1417–8	4.5335+6	0.0000+0	1.4828+9	6.7079+8	4.4285+8	3.6914+8	7.2715+3	8.5734+2	6.2295+2	2.3438+2	6.6225–3
	1.0625–4	1.1610–8	4.4584+6	7.2822–9	1.4582+9	6.5322+8	4.3733+8	3.6766+8	7.3358+3	8.5917+2	6.2552+2	2.3365+2	7.0683–3
	1.1172–4	1.1770–8	4.3975+6	1.3640–8	1.4383+9	6.3902+8	4.3285+8	3.6644+8	7.3894+3	8.6120+2	6.2814+2	2.3305+2	7.4613–3
	1.1250–4	1.1793–8	4.3892+6	1.4547–8	1.4356+9	6.3707+8	4.3223+8	3.6627+8	7.3969+3	8.6150+2	6.2851+2	2.3297+2	7.5177–3
O1	1.1523–4	1.1870–8	4.3606+6	1.7714–8	1.4262+9	6.3042+8	4.3011+8	3.6568+8	7.4226+3	8.6256+2	6.2986+2	2.3269+2	7.7151–3
	1.1740–4	1.1934–8	4.3371+6	2.0233–8	1.4185+9	6.2528+8	4.2820+8	3.6504+8	7.4428+3	8.6272+2	6.3034+2	2.3237+2	7.8726–3
	1.2129–4	1.2047–8	4.2966+6	2.4736–8	1.4053+9	6.1643+8	4.2492+8	3.6393+8	7.4781+3	8.6322+2	6.3140+2	2.3181+2	8.1554–3
	1.2148–4	1.2052–8	4.2946+6	2.4955–8	1.4046+9	6.1601+8	4.2476+8	3.6387+8	7.4798+3	8.6324+2	6.3145+2	2.3179+2	8.1692–3
	1.2188–4	1.2064–8	4.2906+6	2.5415–8	1.4033+9	6.1513+8	4.2443+8	3.6376+8	7.4833+3	8.6328+2	6.3154+2	2.3173+2	8.1982–3
	1.2861–4	1.2252–8	4.2248+6	3.3210–8	1.3818+9	6.0081+8	4.1905+8	3.6193+8	7.5419+3	8.6425+2	6.3341+2	2.3083+2	8.6913–3
	1.3125–4	1.2323–8	4.2002+6	3.6266–8	1.3738+9	5.9549+8	4.1705+8	3.6123+8	7.5642+3	8.6478+2	6.3428+2	2.3049+2	8.8858–3
	1.3564–4	1.2440–8	4.1609+6	4.1345–8	1.3609+9	5.8696+8	4.1382+8	3.6012+8	7.6005+3	8.6574+2	6.3578+2	2.2995+2	9.2106–3
	1.3594–4	1.2447–8	4.1583+6	4.1684–8	1.3601+9	5.8641+8	4.1361+8	3.6004+8	7.6028+3	8.6580+2	6.3588+2	2.2991+2	9.2323–3
	1.3930–4	1.2535–8	4.1293+6	4.5570–8	1.3506+9	5.8016+8	4.1121+8	3.5922+8	7.6299+3	8.6650+2	6.3698+2	2.2952+2	9.4821–3
	1.5000–4	1.2801–8	4.0434+6	5.7893–8	1.3225+9	5.6167+8	4.0409+8	3.5673+8	7.7123+3	8.6939+2	6.4104+2	2.2834+2	1.0281–2
	1.7500–4	1.3459–8	3.8457+6	8.6784–8	1.2578+9	5.2501+8	3.8467+8	3.4814+8	7.8802+3	8.6127+2	6.3780+2	2.2346+2	1.2201–2
	2.0000–4	1.4052–8	3.6834+6	1.1588–7	1.2047+9	4.9519+8	3.6866+8	3.4087+8	8.0287+3	8.5700+2	6.3759+2	2.1939+2	1.4159–2
	2.2500–4	1.4685–8	3.5247+6	1.4534–7	1.1528+9	4.7030+8	3.5091+8	3.3163+8	8.1483+3	8.4048+2	6.2660+2	2.1386+2	1.6199–2
	2.5000–4	1.5271–8	3.3894+6	1.7530–7	1.1086+9	4.4910+8	3.3590+8	3.2358+8	8.2568+3	8.2832+2	6.1923+2	2.0906+2	1.8268–2
	2.6250–4	1.5550–8	3.3285+6	1.9044–7	1.0887+9	4.3960+8	3.2914+8	3.1992+8	8.3075+3	8.2310+2	6.1618+2	2.0690+2	1.9313–2
	3.0000–4	1.6337–8	3.1682+6	2.3632–7	1.0362+9	4.1464+8	3.1148+8	3.1010+8	8.4479+3	8.1156+2	6.1041+2	2.0113+2	2.2483–2
N5	3.3505–4	1.7070–8	3.0321+6	2.7997–7	9.9173+8	3.9516+8	2.9502+8	3.0154+8	8.5659+3	7.9466+2	5.9873+2	1.9590+2	2.5493–2
	3.3911–4	1.7155–8	3.0173+6	2.8508–7	9.8686+8	3.9310+8	2.9329+8	3.0046+8	8.5789+3	7.9294+2	5.9767+2	1.9524+2	2.5845–2
	3.4672–4	1.7311–8	2.9900+6	2.9470–7	9.7795+8	3.8934+8	2.9013+8	2.9847+8	8.6028+3	7.8987+2	5.9582+2	1.9403+2	2.6505–2
N4	3.5348–4	1.7448–8	2.9665+6	3.0327–7	9.7027+8	3.8609+8	2.8741+8	2.9676+8	8.6237+3	7.8730+2	5.9429+2	1.9298+2	2.7092–2
	3.5930–4	1.7569–8	2.9461+6	3.1067–7	9.6357+8	3.8337+8	2.8512+8	2.9507+8	8.6402+3	7.8494+2	5.9296+2	1.9195+2	2.7606–2
	3.6004–4	1.7585–8	2.9435+6	3.1162–7	9.6273+8	3.8303+8	2.8483+8	2.9486+8	8.6423+3	7.8465+2	5.9279+2	1.9182+2	2.7672–2
	3.6947–4	1.7778–8	2.9114+6	3.2366–7	9.5223+8	3.7876+8	2.8124+8	2.9222+8	8.6686+3	7.8104+2	5.9080+2	1.9021+2	2.8507–2
	3.8002–4	1.7992–8	2.8769+6	3.3720–7	9.4094+8	3.7417+8	2.7740+8	2.8936+8	8.6973+3	7.7733+2	5.8884+2	1.8847+2	2.9444–2
	3.8474–4	1.8086–8	2.8619+6	3.4327–7	9.3604+8	3.7217+8	2.7574+8	2.8812+8	8.7099+3	7.7578+2	5.8804+2	1.8771+2	2.9864–2
	4.0000–4	1.8386–8	2.8152+6	3.6301–7	9.2077+8	3.6595+8	2.7056+8	2.8424+8	8.7498+3	7.7115+2	5.8577+2	1.8535+2	3.1228–2
	4.2500–4	1.8887–8	2.7405+6	3.9567–7	8.9633+8	3.5646+8	2.6181+8	2.7804+8	8.8039+3	7.5995+2	5.7842+2	1.8150+2	3.3525–2
	4.5000–4	1.9371–8	2.6720+6	4.2877–7	8.7393+8	3.4774+8	2.5386+8	2.7232+8	8.8553+3	7.5034+2	5.7235+2	1.7795+2	3.5837–2
	4.6250–4	1.9607–8	2.6398+6	4.4548–7	8.6340+8	3.4364+8	2.5014+8	2.6961+8	8.8800+3	7.4603+2	5.6971+2	1.7628+2	3.6998–2
	5.0000–4	2.0294–8	2.5505+6	4.9612–7	8.3421+8	3.3222+8	2.3991+8	2.6207+8	8.9508+3	7.3491+2	5.6325+2	1.7162+2	4.0501–2
N3	5.3739–4	2.0994–8	2.4655+6	5.4751–7	8.0639+8	3.2200+8	2.3006+8	2.5432+8	9.0167+3	7.2040+2	5.5361+2	1.6674+2	4.4022–2
	5.4522–4	2.1142–8	2.4483+6	5.5840–7	8.0075+8	3.1999+8	2.2814+8	2.5261+8	9.0281+3	7.1758+2	5.5187+2	1.6567+2	4.4762–2
	5.5891–4	2.1397–8	2.4190+6	5.7754–7	7.9119+8	3.1657+8	2.2489+8	2.4972+8	9.0476+3	7.1289+2	5.4899+2	1.6386+2	4.6058–2
	5.7946–4	2.1774–8	2.3771+6	6.0649–7	7.7748+8	3.1166+8	2.2025+8	2.4557+8	9.0760+3	7.0638+2	5.4508+2	1.6125+2	4.8009–2
	6.0000–4	2.2144–8	2.3374+6	6.3570–7	7.6450+8	3.0699+8	2.1588+8	2.4162+8	9.1035+3	7.0044+2	5.4161+2	1.5878+2	4.9965–2
	6.2500–4	2.2599–8	2.2903+6	6.7163–7	7.4910+8	3.0160+8	2.1047+8	2.3702+8	9.1341+3	6.9110+2	5.3518+2	1.5586+2	5.2353–2
N2	6.3628–4	2.2802–8	2.2700+6	6.8800–7	7.4245+8	2.9928+8	2.0814+8	2.3503+8	9.1475+3	6.8714+2	5.3248+2	1.5460+2	5.3433–2
	6.4651–4	2.2985–8	2.2519+6	7.0293–7	7.3652+8	2.9721+8	2.0608+8	2.3322+8	9.1559+3	6.8355+2	5.3004+2	1.5346+2	5.4364–2

Atomic Weight 196.967 Density 19.320 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.6570–4	2.3325–8	2.2190+6	7.3113–7	7.2578+8	2.9347+8	2.0237+8	2.2993+8	9.1713+3	6.7716+2	5.2573+2	1.5138+2	5.6111–2
	6.6875–4	2.3379–8	2.2139+6	7.3564–7	7.2412+8	2.9289+8	2.0180+8	2.2942+8	9.1737+3	6.7618+2	5.2507+2	1.5106+2	5.6389–2
	6.9927–4	2.3908–8	2.1649+6	7.8110–7	7.0808+8	2.8728+8	1.9629+8	2.2451+8	9.1973+3	6.6689+2	5.1888+2	1.4795+2	5.9176–2
	7.0000–4	2.3921–8	2.1638+6	7.8219–7	7.0771+8	2.8715+8	1.9616+8	2.2439+8	9.1979+3	6.6668+2	5.1875+2	1.4788+2	5.9242–2
	7.2446–4	2.4336–8	2.1269+6	8.1906–7	6.9564+8	2.8291+8	1.9203+8	2.2069+8	9.2161+3	6.5983+2	5.1423+2	1.4554+2	6.1480–2
	7.3438–4	2.4503–8	2.1124+6	8.3412–7	6.9091+8	2.8125+8	1.9042+8	2.1923+8	9.2233+3	6.5720+2	5.1252+2	1.4462+2	6.2389–2
N1	7.4740–4	2.4719–8	2.0939+6	8.5399–7	6.8486+8	2.7911+8	1.8837+8	2.1737+8	9.2326+3	6.5385+2	5.1035+2	1.4344+2	6.3584–2
	7.6055–4	2.4938–8	2.0755+6	8.7416–7	6.7885+8	2.7701+8	1.8634+8	2.1549+8	9.2400+3	6.5041+2	5.0809+2	1.4226+2	6.4757–2
	7.6223–4	2.4966–8	2.0732+6	8.7674–7	6.7809+8	2.7675+8	1.8608+8	2.1526+8	9.2409+3	6.4998+2	5.0780+2	1.4211+2	6.4907–2
	7.8028–4	2.5263–8	2.0489+6	9.0460–7	6.7013+8	2.7395+8	1.8340+8	2.1277+8	9.2507+3	6.4548+2	5.0488+2	1.4053+2	6.6519–2
	8.0000–4	2.5583–8	2.0232+6	9.3527–7	6.6174+8	2.7101+8	1.8059+8	2.1014+8	9.2612+3	6.4083+2	5.0189+2	1.3887+2	6.8283–2
	8.5000–4	2.6411–8	1.9598+6	1.0142–6	6.4100+8	2.6398+8	1.7347+8	2.0353+8	9.2648+3	6.2628+2	4.9155+2	1.3466+2	7.2279–2
	9.0000–4	2.7215–8	1.9019+6	1.0949–6	6.2206+8	2.5752+8	1.6704+8	1.9749+8	9.2682+3	6.1340+2	4.8251+2	1.3081+2	7.6277–2
	9.2500–4	2.7608–8	1.8748+6	1.1358–6	6.1320+8	2.5448+8	1.6405+8	1.9466+8	9.2698+3	6.0748+2	4.7840+2	1.2900+2	7.8276–2
	1.0000–3	2.8757–8	1.7999+6	1.2609–6	5.8870+8	2.4603+8	1.5583+8	1.8683+8	9.2745+3	5.9162+2	4.6752+2	1.2402+2	8.4276–2
	1.1250–3	3.0731–8	1.6843+6	1.4778–6	5.5088+8	2.3375+8	1.4343+8	1.7370+8	9.2205+3	5.6112+2	4.4548+2	1.1555+2	9.2247–2
	1.2500–3	3.2605–8	1.5875+6	1.7057–6	5.1923+8	2.2328+8	1.3320+8	1.6273+8	9.1725+3	5.3645+2	4.2787+2	1.0848+2	1.0018–1
	1.3125–3	3.3509–8	1.5447+6	1.8233–6	5.0522+8	2.1859+8	1.2872+8	1.5789+8	9.1504+3	5.2575+2	4.2028+2	1.0537+2	1.0414–1
	1.5000–3	3.6105–8	1.4336+6	2.1894–6	4.6888+8	2.0626+8	1.1724+8	1.4537+8	9.0901+3	4.9887+2	4.0143+2	9.7324+1	1.1596–1
	1.7500–3	3.9553–8	1.3086+6	2.7097–6	4.2802+8	1.9261+8	1.0460+8	1.3079+8	9.0135+3	4.6261+2	3.7463+2	8.7842+1	1.3083–1
	2.0000–3	4.2786–8	1.2097+6	3.2669–6	3.9567+8	1.8152+8	9.4787+7	1.1935+8	8.9476+3	4.3503+2	3.5447+2	8.0412+1	1.4560–1
M5	2.2122–3	4.5484–8	1.1380+6	3.7678–6	3.7220+8	1.7316+8	8.7754+7	1.1128+8	8.8737+3	4.1245+2	3.3717+2	7.5125+1	1.5623–1
	2.2614–3	4.6098–8	1.1228+6	3.8878–6	3.6725+8	1.7138+8	8.6290+7	1.0957+8	8.8577+3	4.0779+2	3.3363+2	7.4008+1	1.5868–1
M4	2.3007–3	4.6582–8	1.1111+6	3.9845–6	3.6342+8	1.7001+8	8.5163+7	1.0825+8	8.8451+3	4.0421+2	3.3091+2	7.3146+1	1.6064–1
	2.3076–3	4.6668–8	1.1091+6	4.0016–6	3.6276+8	1.6977+8	8.4966+7	1.0802+8	8.8429+3	4.0357+2	3.3042+2	7.2996+1	1.6099–1
	2.3509–3	4.7203–8	1.0965+6	4.1094–6	3.5864+8	1.6828+8	8.3756+7	1.0661+8	8.8295+3	3.9964+2	3.2741+2	7.2073+1	1.6314–1
	2.4320–3	4.8196–8	1.0739+6	4.3142–6	3.5126+8	1.6558+8	8.1591+7	1.0408+8	8.8048+3	3.9263+2	3.2205+2	7.0419+1	1.6717–1
	2.6066–3	5.0286–8	1.0293+6	4.7669–6	3.3666+8	1.6022+8	7.7341+7	9.9090+7	8.7548+3	3.7895+2	3.1161+2	6.7161+1	1.7583–1
	2.7160–3	5.1565–8	1.0038+6	5.0585–6	3.2831+8	1.5712+8	7.4930+7	9.6249+7	8.7252+3	3.7127+2	3.0579+2	6.5305+1	1.8123–1
M3	2.7340–3	5.1773–8	9.9974+5	5.1070–6	3.2699+8	1.5663+8	7.4550+7	9.5801+7	8.7205+3	3.7006+2	3.0487+2	6.5012+1	1.8212–1
	2.7672–3	5.2162–8	9.9230+5	5.1971–6	3.2455+8	1.5572+8	7.3852+7	9.4975+7	8.7118+3	3.6778+2	3.0313+2	6.4472+1	1.8376–1
	2.8033–3	5.2581–8	9.8438+5	5.2955–6	3.2196+8	1.5475+8	7.3111+7	9.4099+7	8.7025+3	3.6537+2	3.0128+2	6.3899+1	1.8553–1
	2.8254–3	5.2837–8	9.7962+5	5.3562–6	3.2040+8	1.5416+8	7.2665+7	9.3571+7	8.6969+3	3.6391+2	3.0017+2	6.3553+1	1.8662–1
	2.9127–3	5.3839–8	9.6139+5	5.5979–6	3.1444+8	1.5191+8	7.0966+7	9.1555+7	8.6752+3	3.5840+2	2.9597+2	6.2235+1	1.9091–1
	3.0000–3	5.4828–8	9.4404+5	5.8432–6	3.0877+8	1.4976+8	6.9355+7	8.9640+7	8.6542+3	3.5321+2	2.9203+2	6.0983+1	1.9519–1
M2	3.1443–3	5.6446–8	9.1698+5	6.2571–6	2.9992+8	1.4641+8	6.6818+7	8.6685+7	8.6208+3	3.4404+2	2.8480+2	5.9032+1	2.0226–1
	3.1978–3	5.7057–8	9.0717+5	6.4133–6	2.9671+8	1.4520+8	6.5930+7	8.5567+7	8.6024+3	3.4079+2	2.8229+2	5.8294+1	2.0446–1
	3.2500–3	5.7649–8	8.9785+5	6.5672–6	2.9366+8	1.4406+8	6.5089+7	8.4506+7	8.5848+3	3.3773+2	2.7992+2	5.7595+1	2.0661–1
	3.2981–3	5.8191–8	8.8949+5	6.7101–6	2.9093+8	1.4303+8	6.4335+7	8.3556+7	8.5688+3	3.3497+2	2.7779+2	5.6968+1	2.0859–1
M1	3.4014–3	5.9345–8	8.7219+5	7.0213–6	2.8527+8	1.4088+8	6.2781+7	8.1593+7	8.5354+3	3.2930+2	2.7341+2	5.5675+1	2.1283–1
	3.4735–3	6.0150–8	8.6051+5	7.2416–6	2.8145+8	1.3944+8	6.1735+7	8.0265+7	8.5122+3	3.2543+2	2.7042+2	5.4796+1	2.1574–1
	3.4762–3	6.0180–8	8.6009+5	7.2499–6	2.8131+8	1.3939+8	6.1697+7	8.0216+7	8.5113+3	3.2529+2	2.7031+2	5.4764+1	2.1585–1
	3.6072–3	6.1624–8	8.3994+5	7.6566–6	2.7472+8	1.3688+8	5.9898+7	7.7929+7	8.4705+3	3.1866+2	2.6519+2	5.3252+1	2.2113–1
	3.6250–3	6.1818–8	8.3729+5	7.7126–6	2.7385+8	1.3655+8	5.9662+7	7.7629+7	8.4651+3	3.1779+2	2.6452+2	5.3053+1	2.2184–1
	3.7368–3	6.3032–8	8.2117+5	8.0673–6	2.6858+8	1.3454+8	5.8229+7	7.5807+7	8.4317+3	3.1251+2	2.6044+2	5.1849+1	2.2633–1
	3.8036–3	6.3751–8	8.1191+5	8.2821–6	2.6555+8	1.3337+8	5.7410+7	7.4763+7	8.4123+3	3.0950+2	2.5811+2	5.1159+1	2.2901–1
	4.0000–3	6.5834–8	7.8621+5	8.9254–6	2.5715+8	1.3012+8	5.5145+7	7.1875+7	8.3574+3	3.0122+2	2.5173+2	4.9251+1	2.3685–1
	4.2500–3	6.8484–8	7.5579+5	9.7703–6	2.4720+8	1.2618+8	5.2497+7	6.8514+7	8.2772+3	2.9059+2	2.4333+2	4.7016+1	2.4589–1
	4.5000–3	7.1074–8	7.2825+5	1.0645–5	2.3819+8	1.2257+8	5.0119+7	6.5489+7	8.2023+3	2.8110+2	2.3584+2	4.5005+1	2.5487–1
	4.6250–3	7.2348–8	7.1543+5	1.1093–5	2.3400+8	1.2088+8	4.9018+7	6.4086+7	8.1666+3	2.7671+2	2.3237+2	4.4074+1	2.5934–1
	5.0000–3	7.6093–8	6.8022+5	1.2478–5	2.2248+8	1.1620+8	4.6017+7	6.0258+7	8.0659+3	2.6479+2	2.2299+2	4.1531+1	2.7268–1
	5.5000–3	8.1028–8	6.3879+5	1.4422–5	2.0893+8	1.1063+8	4.2544+7	5.5749+7	7.9220+3	2.4993+2	2.1112+2	3.8517+1	2.8865–1
	6.0000–3	8.5795–8	6.0330+5	1.6474–5	1.9732+8	1.0578+8	3.9604+7	5.1927+7	7.7927+3	2.3745+2	2.0118+2	3.5965+1	3.0445–1
	7.0000–3	9.5122–8	5.4414+5	2.0893–5	1.7797+8	9.7592+7	3.4845+7	4.5528+7	7.4948+3	2.1549+2	1.8350+2	3.1659+1	3.2947–1
	8.0000–3	1.0396–7	4.9786+5	2.5725–5	1.6284+8	9.1012+7	3.1190+7	4.0627+7	7.2459+3	1.9868+2	1.6996+2	2.8362+1	3.5396–1
	9.0000–3	1.1263–7	4.5957+5	3.0952–5	1.5031+8	8.5399+7	2.8254+7	3.6651+7	6.9951+3	1.8411+2	1.5807+2	2.5669+1	3.7419–1
	1.0000–2	1.2095–7	4.2795+5	3.6566–5	1.3997+8	8.0672+7	2.5864+7	3.3426+7	6.7781+3	1.7231+2	1.4843+2	2.3485+1	3.9405–1
L3	1.1922–2	1.3634–7	3.7965+5	4.8375–5	1.2417+8	7.3254+7	2.2306+7	2.8606+7	6.3934+3	1.5357+2	1.3294+2	2.0198+1	4.2670–1
	1.2307–2	1.3934–7	3.7148+5	5.0907–5	1.2150+8	7.1975+7	2.1716+7	2.7802+7	6.3165+3	1.5036+2	1.3028+2	1.9648+1	4.3184–1
	1.2980–2	1.4450–7	3.5819+5	5.5464–5	1.1715+8	6.9881+7	2.0762+7	2.6504+7	6.1898+3	1.4517+2	1.2597+2	1.8760+1	4.4077–1
L2	1.3776–2	1.5049–7	3.4393+5	6.1054–5	1.1249+8	6.7614+7	1.9746+7	2.5125+7	6.0511+3	1.3966+2	1.2139+2	1.7817+1	4.5123–1
	1.3990–2	1.5209–7	3.4031+5	6.2594–5	1.1131+8	6.7035+7	1.9491+7	2.4775+7	6.0157+3	1.3825+2	1.2021+2	1.7577+1	4.5403–1
	1.4082–2	1.5278–7	3.3879+5	6.3261–5	1.1081+8	6.6790+7	1.9383+7	2.4628+7	6.0007+3	1.3765+2	1.1972+2	1.7476+1	4.5523–1
L1	1.4336–2	1.5466–7	3.3466+5	6.5117–5	1.0946+8	6.6128+7	1.9093+7	2.4231+7	5.9600+3	1.3605+2	1.1839+2	1.7204+1	4.5854–1
	1.4541–2	1.5618–7	3.3142+5	6.6630–5	1.0840+8	6.5606+7	1.8866+7	2.3919+7	5.9279+3	1.3479+2	1.1734+2	1.6990+1	4.6120–1
	1.5000–2	1.5954–7	3.2443+5	7.0070–5	1.0611+8	6.4479+7	1.8377+7	2.3250+7	5.8582+3	1.3210+2	1.1510+2	1.6532+1	4.6713–1
	1.6250–2	1.6861–7	3.0699+5	7.9792–5	1.0041+8	6.1607+7	1.7178+7	2.1616+7	5.6682+3	1.2512+2	1.0924+2	1.5405+1	4.7993–1
	1.8125–2	1.8176–7	2.8477+5	9.5329–5	9.3139+7	5.7894+7	1.5668+7	1.9571+7	5.4190+3	1.1635+2	1.0185+2	1.3994+1	4.9892–1
	2.0000–2	1.9446–7	2.6618+5	1.1197–4	8.7059+7	5.4738+7	1.4421+7	1.7895+7	5.2037+3	1.0913+2	9.5771+1	1.2837+1	5.1759–1
	2.2500–2	2.1090–7	2.4542+5	1.3581–4	8.0269+7	5.1124+7	1.3070+7	1.6070+7	4.9293+3	1.0069+2	8.8586+1	1.1565+1	5.3546–1
	2.5000–2	2.2674–7	2.2828+5	1.6153–4	7.4664+7	4.8094+7	1.1970+7	1.4596+7	4.6962+3	9.3818+1	8.2727+1	1.0537+1	5.5315–1
	2.6250–2	2.3445–7	2.2077+5	1.7507–4	7.2209+7	4.6752+7	1.1492+7	1.3960+7	4.5920+3	9.0842+1	8.0186+1	1.0094+1	5.6191–1
	3.0000–2	2.5685–7	2.0152+5	2.1816–4	6.5910+7	4.3268+7	1.0280+7	1.2358+7	4.3186+3	8.3301+1	7.3735+1	8.9780+0	5.8779–1
	3.5000–2	2.8553–7	1.8128+5	2.8132–4	5.9290+7	3.9499+7	9.0612+6	1.0726+7	4.0058+3	7.5170+1	6.6728+1	7.8282+0	6.1357–1
	4.0000–2	3.1284–7	1.6545+5	3.5076–4	5.4115+7	3.6500+7	8.1231+6	9.4879+6	3.7532+3	6.8922+1	6.1327+1	6.9560+0	6.3893–1
	4.5000–2	3.3895–7	1.5271+5	4.2613–4	4.9946+7	3.4036+7	7.3920+6	8.5149+6	3.5429+3	6.3825+1	5.6900+1	6.2650+0	6.5997–1
	5.0000–2	3.6407–7	1.4217+5	5.0714–4	4.6499+7	3.1973+7	6.7941+6	7.7294+6	3.3647+3	5.9665+1	5.3277+1	5.7074+0	6.8077–1
	6.0000–2	4.1210–7	1.2560+5	6.8454–4	4.1080+7	2.8645+7	5.8950+6	6.5371+6	3.0818+3	5.3198+1	4.7626+1	4.8553+0	7.1713–1
	7.0000–2	4.5744–7	1.1315+5	8.8154–4	3.7008+7	2.6080+7	5.2521+6	5.6735+6	2.8667+3	4.8400+1	4.3418+1	4.2336+0	7.4839–1
	8.0000–2	5.0060–7	1.0340+5	1.0965–3	3.3818+7	2.4044+7	4.7522+6	5.0183+6	2.6925+3	4.4686+1	4.0144+1	3.7620+0	7.7930–1

Atomic Weight 196.967												Density 19.320 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
K 8.0960–2	5.0460–7	1.0258+5	1.1181–3	3.3549+7	2.3871+7	4.7121+6	4.9640+6	2.6776+3	4.4377+1	3.9872+1	3.7224+0	7.8214–1
8.2150–2	5.0949–7	1.0159+5	1.1450–3	3.3228+7	2.3660+7	4.6636+6	4.9018+6	2.6598+3	4.4006+1	3.9543+1	3.6773+0	7.8528–1
8.4381–2	5.1858–7	9.9810+4	1.1961–3	3.2645+7	2.3277+7	4.5758+6	4.7894+6	2.6276+3	4.3335+1	3.8948+1	3.5960+0	7.9117–1
8.8286–2	5.3429–7	9.6875+4	1.2874–3	3.1685+7	2.2646+7	4.4314+6	4.6056+6	2.5740+3	4.2232+1	3.7968+1	3.4629+0	8.0147–1
9.4143–2	5.5741–7	9.2858+4	1.4286–3	3.0371+7	2.1778+7	4.2341+6	4.3567+6	2.4998+3	4.0730+1	3.6630+1	3.2827+0	8.1686–1
1.0000–1	5.8002–7	8.9238+4	1.5748–3	2.9187+7	2.0993+7	4.0567+6	4.1351+6	2.4320+3	3.9383+1	3.5429+1	3.1223+0	8.3217–1
1.1250–1	6.2261–7	8.3133+4	1.9021–3	2.7190+7	1.9679+7	3.7579+6	3.7515+6	2.3181+3	3.7028+1	3.3327+1	2.8420+0	8.5931–1
1.2188–1	6.5328–7	7.9230+4	2.1605–3	2.5914+7	1.8833+7	3.5675+6	3.5113+6	2.2438+3	3.5536+1	3.1989+1	2.6667+0	8.7975–1
1.3594–1	6.9751–7	7.4207+4	2.5673–3	2.4271+7	1.7737+7	3.3232+6	3.2083+6	2.1463+3	3.3632+1	3.0276+1	2.4455+0	9.1035–1
1.5000–1	7.3987–7	6.9958+4	2.9956–3	2.2881+7	1.6804+7	3.1174+6	2.9576+6	2.0620+3	3.2039+1	2.8836+1	2.2627+0	9.4074–1
1.7500–1	8.0370–7	6.4402+4	3.8024–3	2.1064+7	1.5571+7	2.8551+6	2.6358+6	1.9417+3	2.9955+1	2.6943+1	2.0261+0	9.8663–1
2.0000–1	8.6331–7	5.9955+4	4.6607–3	1.9610+7	1.4576+7	2.6459+6	2.3856+6	1.8432+3	2.8314+1	2.5440+1	1.8424+0	1.0322+0
2.5000–1	9.6981–7	5.3371+4	6.4963–3	1.7456+7	1.3045+7	2.3770+6	2.0320+6	1.7039+3	2.6193+1	2.3498+1	1.5802+0	1.1145+0
3.0000–1	1.0663–6	4.8541+4	8.4630–3	1.5876+7	1.1915+7	2.1778+6	1.7825+6	1.5980+3	2.4670+1	2.2079+1	1.3956+0	1.1956+0
4.0000–1	1.2369–6	4.1847+4	1.2655–2	1.3687+7	1.0244+7	1.9494+6	1.4919+6	1.4655+3	2.3057+1	2.0523+1	1.1798+0	1.3540+0
5.0000–1	1.3876–6	3.7301+4	1.7069–2	1.2200+7	9.0715+6	1.8170+6	1.3102+6	1.3861+3	2.2265+1	1.9705+1	1.0445+0	1.5151+0
6.0000–1	1.5219–6	3.4010+4	2.1601–2	1.1124+7	8.1972+6	1.7323+6	1.1930+6	1.3362+3	2.1867+1	1.9229+1	9.5734–1	1.6810+0
8.0000–1	1.7550–6	2.9492+4	3.0782–2	9.6460+6	6.9807+6	1.6324+6	1.0317+6	1.2803+3	2.1697+1	1.8834+1	8.3685–1	2.0267+0
1.0000+0	1.9505–6	2.6536+4	3.9961–2	8.6792+6	6.1621+6	1.5775+6	9.3830+5	1.2504+3	2.1882+1	1.8730+1	7.6749–1	2.3847+0
1.5000+0	2.3293–6	2.2221+4	6.2227–2	7.2679+6	4.9289+6	1.5165+6	8.2127+5	1.2194+3	2.3039+1	1.9032+1	6.8208–1	3.3246+0
2.0000+0	2.6088–6	1.9841+4	8.3338–2	6.4893+6	4.2331+6	1.4969+6	7.5811+5	1.2098+3	2.4342+1	1.9388+1	6.3464–1	4.3189+0
3.0000+0	3.0012–6	1.7247+4	1.2228–1	5.6409+6	3.4727+6	1.4723+6	6.9470+5	1.2066+3	2.7068+1	2.0078+1	5.9111–1	6.3993+0
4.0000+0	3.2585–6	1.5885+4	1.5747–1	5.1954+6	3.0568+6	1.4698+6	6.6753+5	1.2106+3	2.9802+1	2.0659+1	5.7175–1	8.5720+0
5.0000+0	3.4459–6	1.5021+4	1.8959–1	4.9128+6	2.7972+6	1.4681+6	6.4622+5	1.2157+3	3.2513+1	2.1161+1	5.5716–1	1.0795+1
6.0000+0	3.5821–6	1.4449+4	2.1913–1	4.7260+6	2.6250+6	1.4664+6	6.3332+5	1.2217+3	3.5223+1	2.1550+1	5.4966–1	1.3124+1
8.0000+0	3.7723–6	1.3721+4	2.7202–1	4.4878+6	2.4038+6	1.4639+6	6.1887+5	1.2311+3	4.0533+1	2.2181+1	5.4018–1	1.7812+1
1.0000+1	3.8893–6	1.3308+4	3.1831–1	4.3527+6	2.2799+6	1.4645+6	6.0713+5	1.2409+3	4.5987+1	2.2707+1	5.3294–1	2.2748+1
1.5000+1	4.0173–6	1.2884+4	4.1388–1	4.2140+6	2.1501+6	1.4656+6	5.9704+5	1.2590+3	5.9206+1	2.3444+1	5.2606–1	3.5236+1
2.0000+1	4.0507–6	1.2778+4	4.8986–1	4.1793+6	2.1223+6	1.4664+6	5.8934+5	1.2752+3	7.2878+1	2.4040+1	5.2124–1	4.8317+1
3.0000+1	4.0609–6	1.2746+4	6.0628–1	4.1688+6	2.1232+6	1.4669+6	5.7740+5	1.3001+3	1.0039+2	2.4798+1	5.1451–1	7.5075+1
4.0000+1	4.0626–6	1.2741+4	6.9419–1	4.1671+6	2.1220+6	1.4675+6	5.7631+5	1.3193+3	1.2823+2	2.5281+1	5.1406–1	1.0244+2
5.0000+1	4.0633–6	1.2738+4	7.6468–1	4.1663+6	2.1211+6	1.4677+6	5.7617+5	1.3348+3	1.5646+2	2.5644+1	5.1445–1	1.3030+2
6.0000+1	4.0641–6	1.2736+4	8.2341–1	4.1655+6	2.1204+6	1.4679+6	5.7594+5	1.3476+3	1.8489+2	2.5914+1	5.1477–1	1.5846+2
8.0000+1	4.0655–6	1.2731+4	9.1756–1	4.1641+6	2.1192+6	1.4681+6	5.7535+5	1.3686+3	2.4252+2	2.6399+1	5.1528–1	2.1561+2
1.0000+2	4.0670–6	1.2727+4	9.9150–1	4.1626+6	2.1183+6	1.4682+6	5.7463+5	1.3851+3	3.0058+2	2.6807+1	5.1568–1	2.7326+2
1.5000+2	4.0600–6	1.2749+4	1.1271+0	4.1698+6	2.1167+6	1.4683+6	5.8328+5	1.4147+3	4.4672+2	2.7220+1	5.2352–1	4.1898+2
2.0000+2	4.0550–6	1.2764+4	1.2238+0	4.1749+6	2.1156+6	1.4684+6	5.8947+5	1.4322+3	5.9390+2	2.7606+1	5.2916–1	5.6577+2
3.0000+2	4.0480–6	1.2787+4	1.3606+0	4.1821+6	2.1140+6	1.4685+6	5.9825+5	1.4557+3	8.8750+2	2.8216+1	5.3721–1	8.5875+2
4.0000+2	4.0447–6	1.2797+4	1.4579+0	4.1856+6	2.1128+6	1.4685+6	6.0279+5	1.4723+3	1.1815+3	2.8608+1	5.4146–1	1.1523+3
5.0000+2	4.0438–6	1.2800+4	1.5335+0	4.1864+6	2.1119+6	1.4685+6	6.0452+5	1.4853+3	1.4776+3	2.8847+1	5.4318–1	1.4482+3
6.0000+2	4.0432–6	1.2802+4	1.5952+0	4.1871+6	2.1112+6	1.4685+6	6.0591+5	1.4960+3	1.7705+3	2.9071+1	5.4460–1	1.7409+3
8.0000+2	4.0422–6	1.2805+4	1.6927+0	4.1881+6	2.1100+6	1.4685+6	6.0802+5	1.5131+3	2.3618+3	2.9484+1	5.4684–1	2.3318+3
1.0000+3	4.0416–6	1.2807+4	1.7683+0	4.1888+6	2.1091+6	1.4685+6	6.0958+5	1.5266+3	2.9526+3	2.9824+1	5.4858–1	2.9222+3
1.5000+3	4.0432–6	1.2802+4	1.9054+0	4.1871+6	2.1075+6	1.4685+6	6.0951+5	1.5517+3	4.4378+3	3.0148+1	5.4852–1	4.4071+3
2.0000+3	4.0458–6	1.2793+4	2.0027+0	4.1843+6	2.1064+6	1.4685+6	6.0786+5	1.5703+3	5.9154+3	3.0469+1	5.4704–1	5.8843+3
3.0000+3	4.0491–6	1.2783+4	2.1398+0	4.1810+6	2.1048+6	1.4685+6	6.0608+5	1.5974+3	8.8749+3	3.1054+1	5.4545–1	8.8433+3
4.0000+3	4.0522–6	1.2773+4	2.2370+0	4.1777+6	2.1036+6	1.4685+6	6.0396+5	1.6171+3	1.1835+4	3.1375+1	5.4356–1	1.1803+4
5.0000+3	4.0567–6	1.2759+4	2.3123+0	4.1731+6	2.1028+6	1.4685+6	6.0021+5	1.6326+3	1.4826+4	3.1648+1	5.4019–1	1.4794+4
6.0000+3	4.0573–6	1.2757+4	2.3739+0	4.1725+6	2.1020+6	1.4685+6	6.0033+5	1.6440+3	1.7768+4	3.1848+1	5.4031–1	1.7736+4
8.0000+3	4.0592–6	1.2751+4	2.4710+0	4.1706+6	2.1009+6	1.4685+6	5.9952+5	1.6620+3	2.3703+4	3.2240+1	5.3960–1	2.3670+4
1.0000+4	4.0608–6	1.2746+4	2.5462+0	4.1689+6	2.1000+6	1.4685+6	5.9871+5	1.6761+3	2.9694+4	3.2599+1	5.3889–1	2.9660+4
1.5000+4	4.0634–6	1.2738+4	2.6830+0	4.1663+6	2.0984+6	1.4685+6	5.9766+5	1.7032+3	4.4392+4	3.2896+1	5.3795–1	4.4358+4
2.0000+4	4.0658–6	1.2730+4	2.7801+0	4.1638+6	2.0972+6	1.4685+6	5.9628+5	1.7227+3	5.9281+4	3.3193+1	5.3671–1	5.9247+4
3.0000+4	4.0683–6	1.2723+4	2.9171+0	4.1613+6	2.0956+6	1.4685+6	5.9536+5	1.7501+3	8.8723+4	3.3788+1	5.3588–1	8.8688+4
4.0000+4	4.0705–6	1.2716+4	3.0143+0	4.1590+6	2.0945+6	1.4685+6	5.9418+5	1.7697+3	1.1848+5	3.4107+1	5.3481–1	1.1845+5
5.0000+4	4.0746–6	1.2703+4	3.0897+0	4.1548+6	2.0936+6	1.4685+6	5.9090+5	1.7848+3	1.4796+5	3.4397+1	5.3186–1	1.4793+5
6.0000+4	4.0746–6	1.2703+4	3.1513+0	4.1548+6	2.0929+6	1.4685+6	5.9155+5	1.7971+3	1.7742+5	3.4592+1	5.3245–1	1.7738+5
8.0000+4	4.0759–6	1.2699+4	3.2485+0	4.1535+6	2.0918+6	1.4685+6	5.9135+5	1.8167+3	2.3685+5	3.4983+1	5.3228–1	2.3681+5
1.0000+5	4.0772–6	1.2695+4	3.3238+0	4.1521+6	2.0909+6	1.4685+6	5.9089+5	1.8320+3	2.9638+5	3.5345+1	5.3186–1	2.9635+5


July 4 1991
Atomic Weight 200 590
EEDL Evaluated Electron
Cross Sections
80-Hg
Density 13 546 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
80-Hg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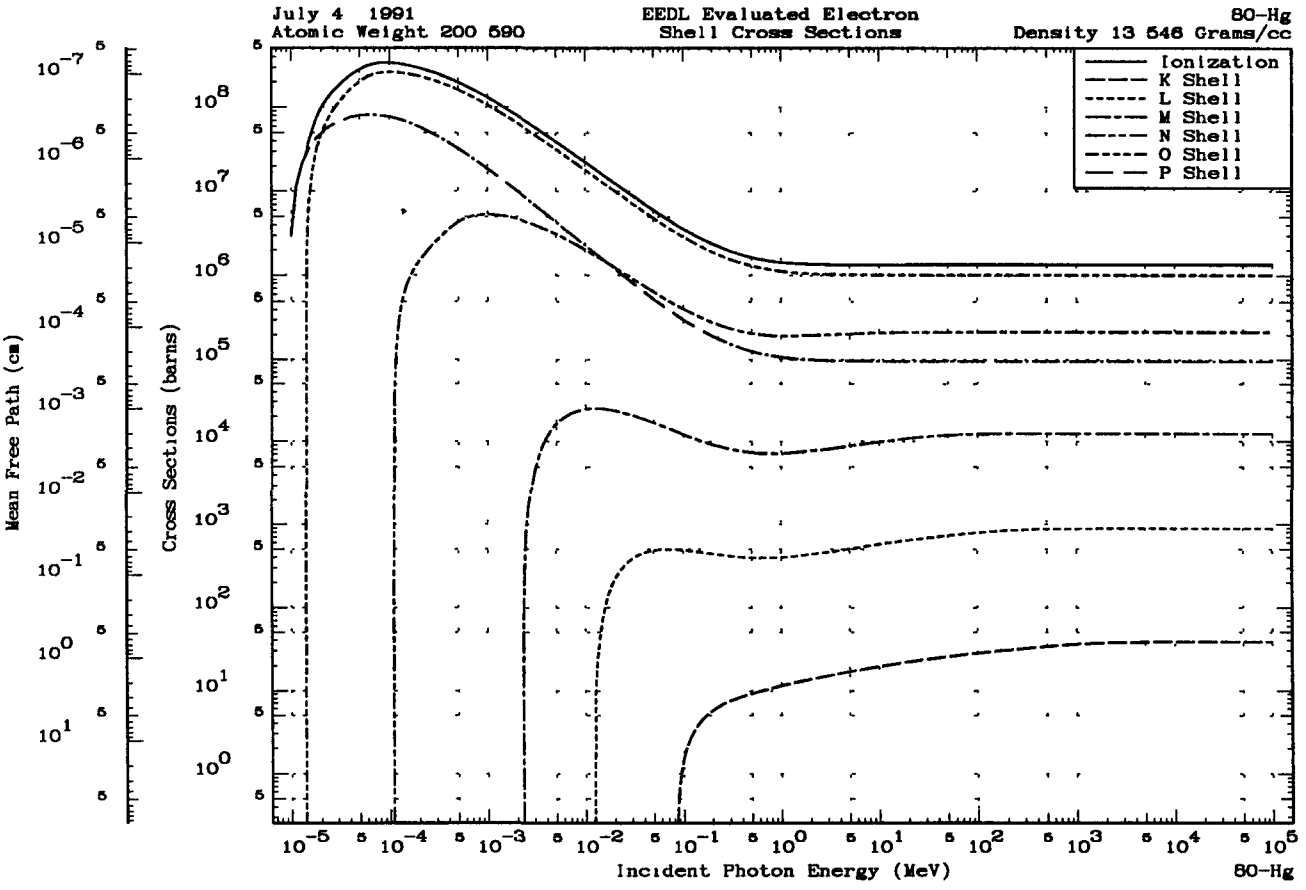
EEDL Evaluated Electron
Energy Deposition
80-Hg
Density 13 546 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
80-Hg

364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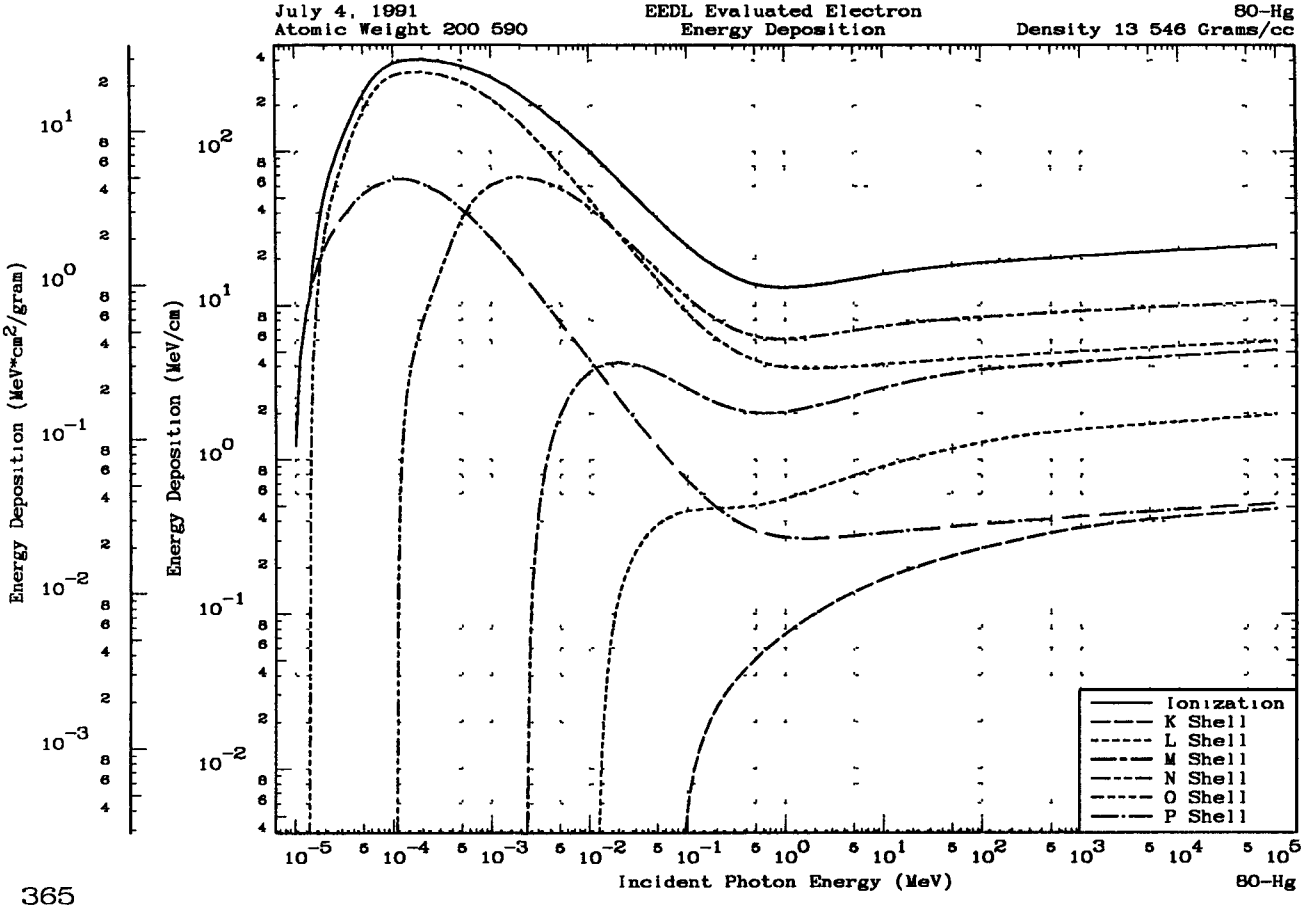
EEDL Evaluated Electron
Shell Cross Sections
80-Hg
Density 13 546 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
80-Hg


July 4, 1991
Atomic Weight 200 590
EEDL Evaluated Electron
Energy Deposition
80-Hg
Density 13 546 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
80-Hg

365

Atomic Weight 200.590 — Density 13.546 Grams/cc

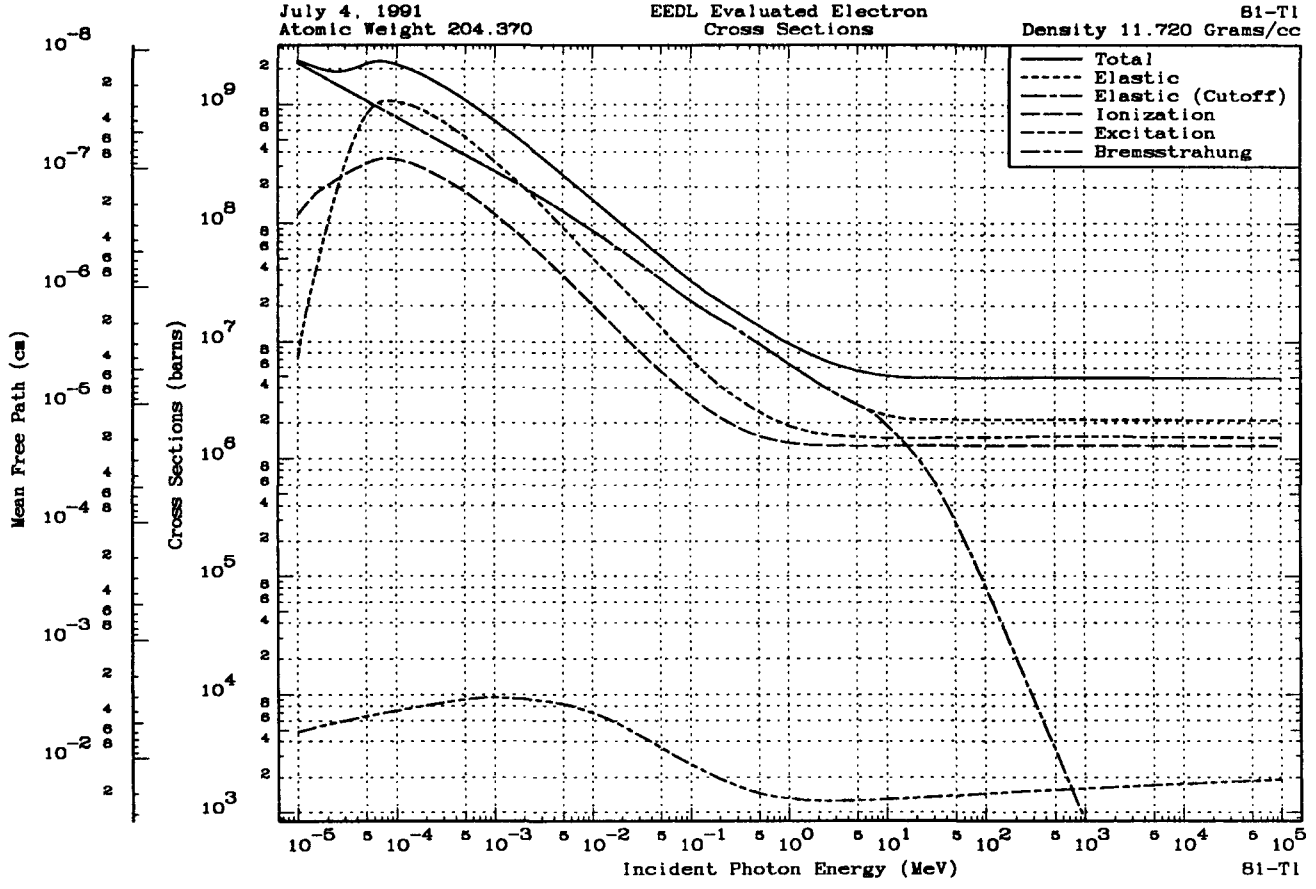
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2579–8	5.8688+6		1.9548+9	1.9516+9	3.1222+6	1.3631+5	4.8585+3	1.2810+0	1.2270+0	5.3564–2	4.2708–4
	1.1250–5	1.3191–8	5.5964+6		1.8641+9	1.8518+9	1.1488+7	8.3329+5	4.9762+3	4.9973+0	4.6610+0	3.3582–1	4.7876–4
	1.2187–5	1.3620–8	5.4200+6		1.8054+9	1.7869+9	1.6559+7	1.8848+6	5.0578+3	7.6433+0	6.8690+0	7.7377–1	5.1810–4
	1.2891–5	1.3915–8	5.3054+6		1.7672+9	1.7427+9	2.1400+7	3.0129+6	5.1158+3	1.0278+1	9.0238+0	1.2539+0	5.4797–4
	1.3594–5	1.4203–8	5.1976+6		1.7313+9	1.7020+9	2.4583+7	4.6969+6	5.1713+3	1.2505+1	1.0523+1	1.9814+0	5.7809–4
O5	1.3960–5	1.4346–8	5.1460+6		1.7141+9	1.6819+9	2.6348+7	5.7895+6	5.1993+3	1.3826+1	1.1366+1	2.4593+0	5.9386–4
	1.4220–5	1.4428–8	5.1167+6		1.7043+9	1.6682+9	2.9470+7	6.6830+6	5.2189+3	1.5880+1	1.3031+1	2.8482+0	6.0511–4
	1.4480–5	1.4513–8	5.0867+6		1.6943+9	1.6547+9	3.1876+7	7.6944+6	5.2381+3	1.7588+1	1.4297+1	3.2900+0	6.1640–4
	1.5000–5	1.4657–8	5.0368+6		1.6777+9	1.6289+9	3.8876+7	9.8878+6	5.2758+3	2.2369+1	1.8113+1	4.2555+0	6.3906–4
O4	1.5980–5	1.4927–8	4.9455+6		1.6473+9	1.5836+9	4.8296+7	1.5376+7	5.3441+3	3.0169+1	2.3474+1	6.6944+0	6.8214–4
	1.6250–5	1.4982–8	4.9274+6		1.6413+9	1.5718+9	5.2331+7	1.7079+7	5.3623+3	3.3328+1	2.5874+1	7.4530+0	6.9409–4
	1.6482–5	1.5034–8	4.9105+6		1.6356+9	1.5619+9	5.5032+7	1.8670+7	5.3779+3	3.5661+1	2.7497+1	8.1633+0	7.0440–4
	1.7362–5	1.5199–8	4.8572+6		1.6179+9	1.5261+9	6.5862+7	2.5863+7	5.4350+3	4.5486+1	3.4093+1	1.1393+1	7.4365–4
	1.7500–5	1.5221–8	4.8501+6		1.6155+9	1.5208+9	6.7558+7	2.7181+7	5.4437+3	4.7122+1	3.5134+1	1.1987+1	7.4984–4
	1.8125–5	1.5316–8	4.8200+6		1.6055+9	1.4972+9	7.5131+7	3.3176+7	5.4827+3	5.4658+1	3.9950+1	1.4708+1	7.7798–4
	1.8681–5	1.5389–8	4.7971+6		1.5978+9	1.4771+9	8.1318+7	3.9387+7	5.5165+3	6.1537+1	4.3995+1	1.7542+1	8.0315–4
	2.0000–5	1.5513–8	4.7587+6		1.5851+9	1.4329+9	9.6025+7	5.6159+7	5.5935+3	7.9096+1	5.3810+1	2.5286+1	8.6340–4
	2.2500–5	1.5609–8	4.7294+6		1.5753+9	1.3596+9	1.2029+8	9.5382+7	5.7137+3	1.1447+2	7.1099+1	4.3367+1	9.6989–4
	2.6250–5	1.5490–8	4.7659+6		1.5875+9	1.2693+9	1.5156+8	1.6656+8	5.8750+3	1.7266+2	9.5826+1	7.6832+1	1.1329–3
	3.0000–5	1.5235–8	4.8456+6		1.6140+9	1.1960+9	1.7750+8	2.4052+8	6.0184+3	2.3149+2	1.1894+2	1.1254+2	1.2995–3
	3.5000–5	1.4852–8	4.9706+6		1.6556+9	1.1168+9	2.0974+8	3.2911+8	6.1861+3	3.0552+2	1.5057+2	1.5495+2	1.5249–3
	4.0000–5	1.4593–8	5.0588+6		1.6850+9	1.0524+9	2.3871+8	3.9387+8	6.3352+3	3.6908+2	1.8250+2	1.8657+2	1.7554–3
	5.0000–5	1.4391–8	5.1299+6		1.7087+9	9.5309+8	2.8325+8	4.7238+8	6.5739+3	4.6576+2	2.4084+2	2.2491+2	2.2100–3
	6.0000–5	1.4542–8	5.0764+6		1.6909+9	8.7893+8	3.1330+8	4.9867+8	6.7681+3	5.2850+2	2.8979+2	2.3870+2	2.6690–3
O3	6.8300–5	1.4783–8	4.9937+6		1.6633+9	8.2976+8	3.2798+8	5.0559+8	6.9096+3	5.6262+2	3.2014+2	2.4247+2	3.0585–3
	6.9031–5	1.4815–8	4.9829+6		1.6597+9	8.2585+8	3.2868+8	5.0522+8	6.9213+3	5.6446+2	3.2211+2	2.4234+2	3.0932–3
	7.0402–5	1.4874–8	4.9632+6		1.6532+9	8.1866+8	3.2999+8	5.0454+8	6.9431+3	5.6790+2	3.2581+2	2.4210+2	3.1583–3
	7.2802–5	1.4974–8	4.9302+6		1.6422+9	8.0656+8	3.3224+8	5.0338+8	6.9804+3	5.7395+2	3.3226+2	2.4168+2	3.2727–3
	8.0000–5	1.5251–8	4.8406+6		1.6123+9	7.7347+8	3.3873+8	5.0013+8	7.0863+3	5.9222+2	3.5166+2	2.4055+2	3.6191–3
O2	8.7340–5	1.5581–8	4.7380+6		1.5782+9	7.4389+8	3.3961+8	4.9467+8	7.1863+3	6.0072+2	3.6234+2	2.3838+2	3.9771–3
	8.8923–5	1.5649–8	4.7175+6		1.5713+9	7.3798+8	3.3983+8	4.9352+8	7.2054+3	6.0267+2	3.6473+2	2.3793+2	4.0540–3
	9.0000–5	1.5694–8	4.7037+6		1.5668+9	7.3404+8	3.3997+8	4.9274+8	7.2182+3	6.0399+2	3.6636+2	2.3763+2	4.1064–3
	9.1692–5	1.5765–8	4.6826+6		1.5597+9	7.2799+8	3.4018+8	4.9155+8	7.2380+3	6.0604+2	3.6887+2	2.3717+2	4.1890–3
	9.5846–5	1.5934–8	4.6331+6		1.5432+9	7.1380+8	3.4069+8	4.8872+8	7.2854+3	6.1112+2	3.7504+2	2.3608+2	4.3925–3
	1.0000–4	1.6096–8	4.5865+6	0.0000+0	1.5277+9	7.0047+8	3.4120+8	4.8603+8	7.3311+3	6.1630+2	3.8124+2	2.3505+2	4.5972–3
N7	1.0913–4	1.6474–8	4.4812+6	1.4779–8	1.4926+9	6.7397+8	3.3762+8	4.8103+8	7.4247+3	6.1924+2	3.8632+2	2.3291+2	5.0502–3
	1.1168–4	1.6571–8	4.4548+6	1.8899–8	1.4839+9	6.6712+8	3.3673+8	4.7999+8	7.4497+3	6.2048+2	3.8798+2	2.3249+2	5.1779–3
	1.1250–4	1.6602–8	4.4466+6	2.0214–8	1.4811+9	6.6498+8	3.3645+8	4.7967+8	7.4576+3	6.2086+2	3.8849+2	2.3236+2	5.2188–3
N6	1.1350–4	1.6640–8	4.4366+6	2.1824–8	1.4778+9	6.6239+8	3.3611+8	4.7927+8	7.4672+3	6.2133+2	3.8912+2	2.3220+2	5.2689–3
	1.1578–4	1.6724–8	4.4143+6	2.5492–8	1.4703+9	6.5659+8	3.3531+8	4.7843+8	7.4888+3	6.2247+2	3.9059+2	2.3187+2	5.3835–3
	1.1647–4	1.6749–8	4.4076+6	2.6605–8	1.4681+9	6.5487+8	3.3507+8	4.7818+8	7.4953+3	6.2283+2	3.9105+2	2.3177+2	5.4184–3
	1.2006–4	1.6878–8	4.3740+6	3.2352–8	1.4569+9	6.4616+8	3.3386+8	4.7690+8	7.5283+3	6.2462+2	3.9334+2	2.3127+2	5.5993–3
	1.2485–4	1.7044–8	4.3312+6	4.0015–8	1.4427+9	6.3508+8	3.3234+8	4.7526+8	7.5713+3	6.2717+2	3.9653+2	2.3063+2	5.8425–3
O1	1.2573–4	1.7074–8	4.3237+6	4.1410–8	1.4402+9	6.3313+8	3.3206+8	4.7497+8	7.5790+3	6.2764+2	3.9711+2	2.3052+2	5.8870–3
	1.2725–4	1.7137–8	4.3079+6	4.3827–8	1.4349+9	6.2978+8	3.3116+8	4.7395+8	7.5922+3	6.2741+2	3.9732+2	2.3008+2	5.9642–3
	1.2754–4	1.7149–8	4.3048+6	4.4301–8	1.4339+9	6.2914+8	3.3099+8	4.7375+8	7.5947+3	6.2737+2	3.9736+2	2.3000+2	5.9794–3
	1.3009–4	1.7253–8	4.2789+6	4.8362–8	1.4253+9	6.2367+8	3.2950+8	4.7208+8	7.6166+3	6.2700+2	3.9771+2	2.2928+2	6.1094–3
	1.3125–4	1.7299–8	4.2674+6	5.0210–8	1.4214+9	6.2123+8	3.2884+8	4.7133+8	7.6264+3	6.2685+2	3.9788+2	2.2896+2	6.1687–3
	1.3507–4	1.7451–8	4.2302+6	5.6303–8	1.4090+9	6.1342+8	3.2670+8	4.6892+8	7.6582+3	6.2637+2	3.9843+2	2.2794+2	6.3645–3
	1.3743–4	1.7543–8	4.2080+6	6.0072–8	1.4016+9	6.0874+8	3.2542+8	4.6747+8	7.6775+3	6.2614+2	3.9882+2	2.2732+2	6.4860–3
	1.3877–4	1.7595–8	4.1956+6	6.2219–8	1.3975+9	6.0613+8	3.2470+8	4.6666+8	7.6883+3	6.2601+2	3.9903+2	2.2697+2	6.5552–3
	1.4253–4	1.7739–8	4.1616+6	6.8230–8	1.3862+9	5.9902+8	3.2272+8	4.6444+8	7.7182+3	6.2568+2	3.9964+2	2.2603+2	6.7497–3
	1.5000–4	1.8015–8	4.0978+6	8.0165–8	1.3649+9	5.8567+8	3.1903+8	4.6022+8	7.7757+3	6.2535+2	4.0109+2	2.2425+2	7.1376–3
	1.6250–4	1.8510–8	3.9883+6	1.0022–7	1.3285+9	5.6533+8	3.1219+8	4.5092+8	7.8632+3	6.2134+2	4.0132+2	2.2001+2	7.8008–3
	1.7500–4	1.8978–8	3.8899+6	1.2038–7	1.2957+9	5.4714+8	3.0606+8	4.4248+8	7.9452+3	6.1836+2	4.0218+2	2.1617+2	8.4709–3
	1.8125–4	1.9204–8	3.8442+6	1.3050–7	1.2805+9	5.3873+8	3.0318+8	4.3854+8	7.9843+3	6.1705+2	4.0266+2	2.1438+2	8.8085–3
	2.0000–4	1.9849–8	3.7191+6	1.6096–7	1.2388+9	5.1582+8	2.9531+8	4.2766+8	8.0950+3	6.1418+2	4.0470+2	2.0948+2	9.8306–3
	2.2500–4	2.0794–8	3.5501+6	2.0212–7	1.1825+9	4.8968+8	2.8225+8	4.1056+8	8.2159+3	6.0059+2	3.9912+2	2.0146+2	1.1248–2
	2.5000–4	2.1675–8	3.4058+6	2.4411–7	1.1344+9	4.6743+8	2.7118+8	3.9583+8	8.3256+3	5.9014+2	3.9554+2	1.9458+2	1.2687–2
	2.6250–4	2.2095–8	3.3411+6	2.6538–7	1.1129+9	4.5747+8	2.6620+8	3.8919+8	8.3769+3	5.8569+2	3.9419+2	1.9149+2	1.3413–2
	3.0000–4	2.3285–8	3.1704+6	3.2998–7	1.0560+9	4.3128+8	2.5315+8	3.7159+8	8.5189+3	5.7532+2	3.9199+2	1.8331+2	1.5617–2
N5	3.5842–4	2.5149–8	2.9354+6	4.3356–7	9.7775+8	3.9891+8	2.3316+8	3.4567+8	8.7118+3	5.5283+2	3.8181+2	1.7100+2	1.9120–2
	3.6362–4	2.5316–8	2.9160+6	4.4297–7	9.7130+8	3.9641+8	2.3163+8	3.4326+8	8.7276+3	5.5107+2	3.8120+2	1.6985+2	1.9435–2
	3.7271–4	2.5605–8	2.8831+6	4.5952–7	9.6033+8	3.9215+8	2.2902+8	3.3915+8	8.7548+3	5.4816+2	3.8024+2	1.6790+2	1.9988–2
N4	3.7821–4	2.5778–8	2.8638+6	4.6957–7	9.5389+8	3.8965+8	2.2750+8	3.3674+8	8.7709+3	5.4648+2	3.7970+2	1.6675+2	2.0324–2
	3.8366–4	2.5948–8	2.8450+6	4.7955–7	9.4763+8	3.8722+8	2.2602+8	3.3438+8	8.7845+3	5.4491+2	3.7926+2	1.6564+2	2.0666–2
	3.8636–4	2.6032–8	2.8358+6	4.8451–7	9.4457+8	3.8603+8	2.2531+8	3.3322+8	8.7912+3	5.4416+2	3.7905+2	1.6509+2	2.0836–2
	3.9183–4	2.6202–8	2.8175+6	4.9458–7	9.3847+8	3.8367+8	2.2387+8	3.3092+8	8.8045+3	5.4267+2	3.7865+2	1.6400+2	2.1180–2
	4.0000–4	2.6452–8	2.7908+6	5.0966–7	9.2959+8	3.8022+8	2.2179+8	3.2758+8	8.8242+3	5.4058+2	3.7814+2	1.6242+2	2.1696–2
	4.2500–4	2.7227–8	2.7114+6	5.5629–7	9.0313+8	3.7027+8	2.1495+8	3.1790+8	8.8791+3	5.3171+2	3.7391+2	1.5778+2	2.3293–2
	4.6250–4	2.8344–8	2.6045+6	6.2757–7	8.6754+8	3.5683+8	2.0581+8	3.0488+8	8.9563+3	5.2056+2	3.6899+2	1.5154+2	2.5709–2
	5.0000–4	2.9412–8	2.5100+6	7.0024–7	8.3604+8	3.4488+8	1.9780+8	2.9336+8	9.0281+3	5.1156+2	3.6550+2	1.4603+2	2.8146–2
	5.5000–4	3.0810–8	2.3961+6	7.9932–7	7.9810+8	3.3080+8	1.8762+8	2.7967+8	9.1127+3	4.9780+2	3.5833+2	1.3943+2	3.1418–2
N3	5.6713–4	3.1273–8	2.3606+6	8.3387–7	7.8628+8	3.2639+8	1.8447+8	2.7541+8	9.1400+3	4.9373+2	3.5632+2	1.3738+2	3.2546–2
	5.7535–4	3.1494–8	2.3441+6	8.5055–7	7.8077+8	3.2435+8	1.8302+8	2.7340+8	9.1507+3	4.9191+2	3.5546+2	1.3642+2	3.3084–2
	5.8767–4	3.1821–8	2.3199+6	8.7567–7	7.7273+8	3.2135+8	1.8090+8	2.7047+8	9.1665+3	4.8929+2	3.5424+2	1.3502+2	3.3892–2
	6.0000–4	3.2145–8	2.2965+6	9.0093–7	7.6495+8	3.1845+8	1.7885+8	2.6763+8	9.1819+3	4.8682+2	3.5312+2	1.3366+2	3.4701–2
	6.2500–4	3.2854–8	2.2470+6	9.5266–7	7.4843+8	3.1282+8	1.7455+8	2.6106+8	9.2110+3	4.7977+2	3.4927+2	1.3046+2	3.6338–2
	6.6875–4	3.4062–8	2.1673+6	1.0449–6	7.2189+8	3.0370+8	1.6766+8	2.5053+8	9.2594+3	4.6881+2	3.4343+2	1.2535+2	3.9216–2
N2	6.7317–4	3.4182–8	2.1597+6	1.0543–6	7.1936+8	3.0283+8	1.6700+8	2.4952+8	9.2641+3	4.6779+2	3.4289+2	1.2486+2	3.9508–2

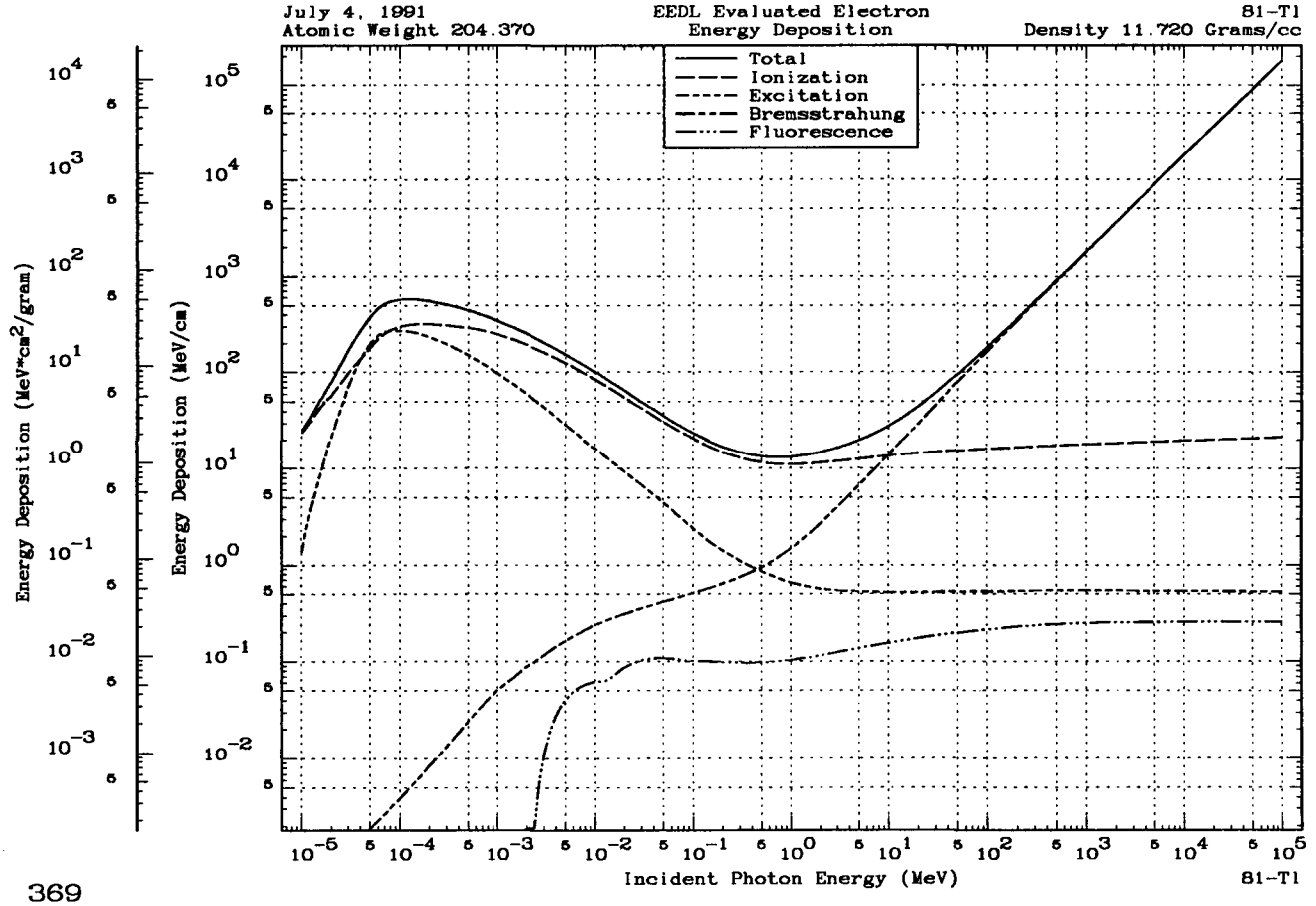
Atomic Weight 200.590 — Density 13.546 Grams/cc

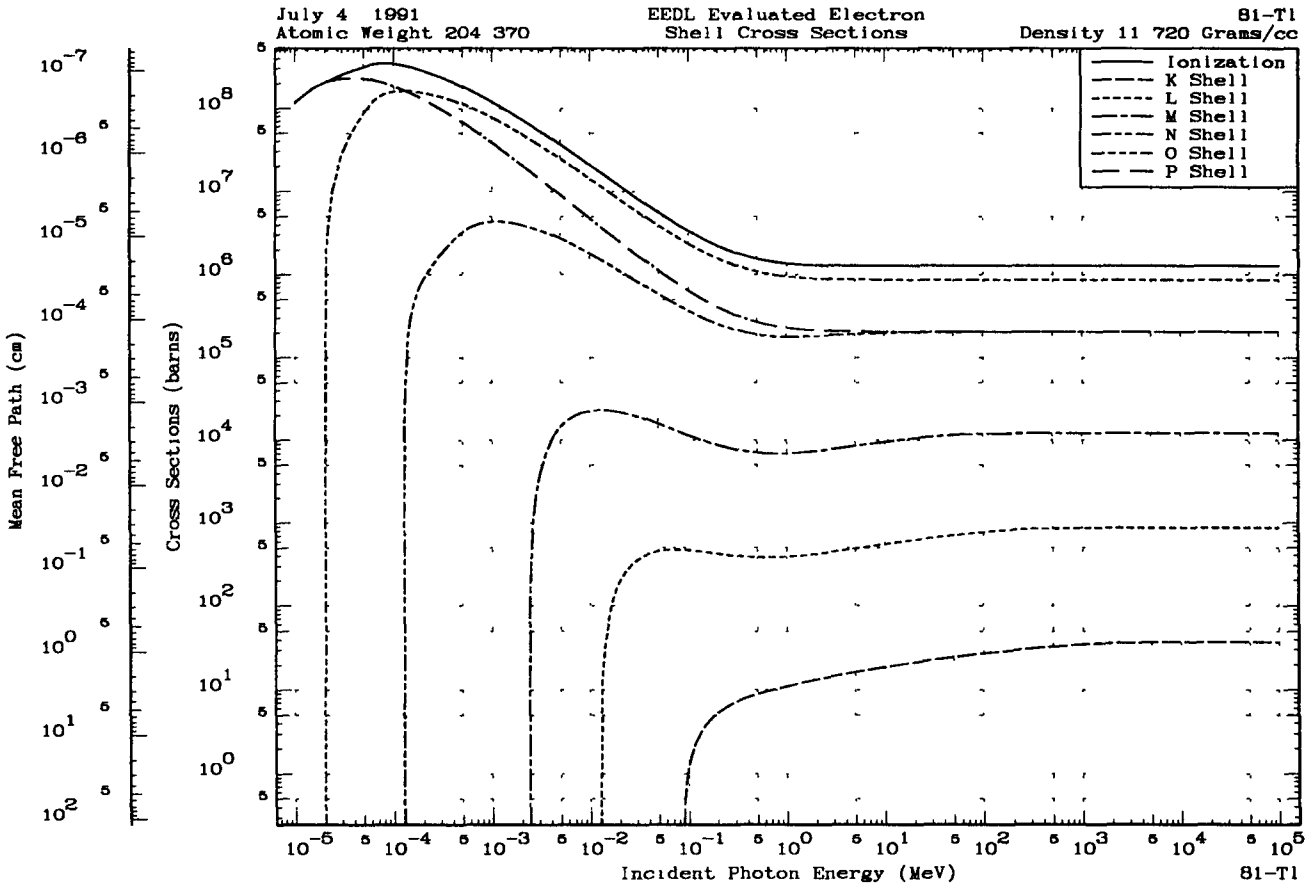
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.8110–4	3.4398–8	2.1461+6	1.0713–6	7.1485+8	3.0128+8	1.6584+8	2.4772+8	9.2702+3	4.6589+2	3.4187+2	1.2398+2	4.0013–2
6.9596–4	3.4800–8	2.1214+6	1.1033–6	7.0660+8	2.9845+8	1.6371+8	2.4443+8	9.2813+3	4.6245+2	3.4002+2	1.2238+2	4.0962–2
7.0000–4	3.4908–8	2.1148+6	1.1121–6	7.0441+8	2.9770+8	1.6314+8	2.4356+8	9.2843+3	4.6154+2	3.3954+2	1.2196+2	4.1220–2
7.2197–4	3.5492–8	2.0800+6	1.1599–6	6.9281+8	2.9370+8	1.6016+8	2.3894+8	9.3003+3	4.5676+2	3.3700+2	1.1971+2	4.2625–2
7.3438–4	3.5818–8	2.0610+6	1.1872–6	6.8651+8	2.9152+8	1.5854+8	2.3644+8	9.3092+3	4.5420+2	3.3566+2	1.1849+2	4.3420–2
7.6099–4	3.6508–8	2.0221+6	1.2461–6	6.7353+8	2.8702+8	1.5522+8	2.3128+8	9.3276+3	4.4902+2	3.3298+2	1.1599+2	4.5126–2
N1 7.8744–4	3.7183–8	1.9854+6	1.3053–6	6.6131+8	2.8276+8	1.5210+8	2.2644+8	9.3454+3	4.4426+2	3.3058+2	1.1364+2	4.6826–2
8.0000–4	3.7501–8	1.9685+6	1.3337–6	6.5570+8	2.8081+8	1.5067+8	2.2420+8	9.3507+3	4.4208+2	3.2948+2	1.1255+2	4.7589–2
8.2500–4	3.8140–8	1.9356+6	1.3906–6	6.4472+8	2.7706+8	1.4774+8	2.1992+8	9.3522+3	4.3671+2	3.2621+2	1.1046+2	4.8970–2
8.5000–4	3.8769–8	1.9042+6	1.4481–6	6.3425+8	2.7347+8	1.4494+8	2.1583+8	9.3538+3	4.3166+2	3.2315+2	1.0846+2	5.0351–2
8.6875–4	3.9235–8	1.8815+6	1.4918–6	6.2672+8	2.7087+8	1.4294+8	2.1290+8	9.3549+3	4.2808+2	3.2100+2	1.0703+2	5.1386–2
9.0000–4	4.0001–8	1.8455+6	1.5652–6	6.1471+8	2.6672+8	1.3976+8	2.0823+8	9.3567+3	4.2244+2	3.1764+2	1.0475+2	5.3113–2
9.2500–4	4.0605–8	1.8181+6	1.6247–6	6.0557+8	2.6354+8	1.3734+8	2.0468+8	9.3580+3	4.1819+2	3.1513+2	1.0301+2	5.4495–2
9.3438–4	4.0830–8	1.8081+6	1.6472–6	6.0224+8	2.6238+8	1.3646+8	2.0339+8	9.3586+3	4.1666+2	3.1423+2	1.0238+2	5.5013–2
1.0000–3	4.2371–8	1.7423+6	1.8066–6	5.8033+8	2.5471+8	1.3071+8	1.9491+8	9.3620+3	4.0681+2	3.0851+2	9.8246+1	5.8641–2
1.1250–3	4.5281–8	1.6303+6	2.1221–6	5.4304+8	2.4189+8	1.2055+8	1.8059+8	9.3102+3	3.8579+2	2.9452+2	9.1204+1	6.4216–2
1.2500–3	4.8043–8	1.5366+6	2.4534–6	5.1182+8	2.3096+8	1.1217+8	1.6867+8	9.2642+3	3.6885+2	2.8343+2	8.5351+1	6.9769–2
1.3125–3	4.9376–8	1.4951+6	2.6246–6	4.9800+8	2.2608+8	1.0849+8	1.6342+8	9.2429+3	3.6148+2	2.7863+2	8.2775+1	7.2537–2
1.5000–3	5.3205–8	1.3875+6	3.1570–6	4.6216+8	2.1322+8	9.9062+7	1.4988+8	9.1850+3	3.4302+2	2.6681+2	7.6134+1	8.0814–2
1.7500–3	5.8179–8	1.2689+6	3.9132–6	4.2265+8	1.9901+8	8.8599+7	1.3503+8	9.1115+3	3.1845+2	2.4956+2	6.8790+1	9.1217–2
2.0000–3	6.2840–8	1.1748+6	4.7223–6	3.9130+8	1.8747+8	8.0460+7	1.2337+8	9.0484+3	2.9974+2	2.3661+2	6.3027+1	1.0156–1
M5 2.3008–3	6.8530–8	1.0772+6	5.7638–6	3.5881+8	1.7553+8	7.2437+7	1.1084+8	8.9497+3	2.7813+2	2.2125+2	5.6772+1	1.1212–1
2.3226–3	6.8932–8	1.0709+6	5.8426–6	3.5672+8	1.7475+8	7.1926+7	1.1003+8	8.9431+3	2.7677+2	2.2029+2	5.6372+1	1.1288–1
2.3650–3	6.9707–8	1.0590+6	5.9962–6	3.5275+8	1.7328+8	7.0959+7	1.0851+8	8.9304+3	2.7420+2	2.1847+2	5.5615+1	1.1436–1
M4 2.3948–3	7.0250–8	1.0509+6	6.1054–6	3.5003+8	1.7226+8	7.0296+7	1.0746+8	8.9217+3	2.7245+2	2.1723+2	5.5097+1	1.1540–1
2.4047–3	7.0431–8	1.0482+6	6.1416–6	3.4913+8	1.7192+8	7.0076+7	1.0712+8	8.9188+3	2.7184+2	2.1680+2	5.4927+1	1.1575–1
2.4791–3	7.1787–8	1.0284+6	6.4176–6	3.4253+8	1.6942+8	6.8471+7	1.0463+8	8.8976+3	2.6745+2	2.1365+2	5.3683+1	1.1834–1
2.6093–3	7.4120–8	9.9599+5	6.9111–6	3.3175+8	1.6531+8	6.5858+7	1.0058+8	8.8620+3	2.6035+2	2.0856+2	5.1658+1	1.2287–1
2.6596–3	7.5007–8	9.8421+5	7.1051–6	3.2783+8	1.6380+8	6.4911+7	9.9109+7	8.8488+3	2.5778+2	2.0673+2	5.0925+1	1.2462–1
M3 2.8369–3	7.8084–8	9.4543+5	7.8044–6	3.1491+8	1.5880+8	6.1809+7	9.4293+7	8.8042+3	2.4943+2	2.0078+2	4.8521+1	1.3075–1
2.8777–3	7.8785–8	9.3701+5	7.9685–6	3.1211+8	1.5771+8	6.1140+7	9.3251+7	8.7943+3	2.4762+2	1.9949+2	4.8002+1	1.3216–1
2.9388–3	7.9830–8	9.2474+5	8.2168–6	3.0802+8	1.5611+8	6.0168+7	9.1736+7	8.7799+3	2.4500+2	1.9762+2	4.7247+1	1.3427–1
3.0000–3	8.0866–8	9.1290+5	8.4677–6	3.0408+8	1.5456+8	5.9232+7	9.0276+7	8.7657+3	2.4249+2	1.9583+2	4.6520+1	1.3638–1
3.1250–3	8.2971–8	8.8974+5	8.9892–6	2.9636+8	1.5152+8	5.7371+7	8.7465+7	8.7310+3	2.3694+2	1.9169+2	4.5108+1	1.4039–1
M2 3.2739–3	8.5435–8	8.6408+5	9.6258–6	2.8781+8	1.4812+8	5.5323+7	8.4365+7	8.6917+3	2.3087+2	1.8717+2	4.3551+1	1.4515–1
3.3193–3	8.6181–8	8.5660+5	9.8231–6	2.8532+8	1.4712+8	5.4731+7	8.3465+7	8.6766+3	2.2911+2	1.8586+2	4.3100+1	1.4644–1
3.3437–3	8.6581–8	8.5264+5	9.9301–6	2.8400+8	1.4659+8	5.4417+7	8.2988+7	8.6686+3	2.2818+2	1.8517+2	4.2862+1	1.4714–1
3.4044–3	8.7568–8	8.4303+5	1.0197–5	2.8080+8	1.4530+8	5.3659+7	8.1834+7	8.6490+3	2.2594+2	1.8350+2	4.2284+1	1.4886–1
3.5000–3	8.9111–8	8.2843+5	1.0624–5	2.7594+8	1.4334+8	5.2510+7	8.0085+7	8.6189+3	2.2255+2	1.8099+2	4.1408+1	1.5158–1
M1 3.5368–3	8.9700–8	8.2299+5	1.0789–5	2.7413+8	1.4260+8	5.2083+7	7.9435+7	8.6076+3	2.2129+2	1.8005+2	4.1083+1	1.5262–1
3.5533–3	8.9972–8	8.2050+5	1.0864–5	2.7330+8	1.4228+8	5.1893+7	7.9122+7	8.6025+3	2.2070+2	1.7963+2	4.0925+1	1.5309–1
3.5947–3	9.0654–8	8.1433+5	1.1052–5	2.7125+8	1.4147+8	5.1423+7	7.8347+7	8.5900+3	2.1926+2	1.7857+2	4.0535+1	1.5426–1
3.6250–3	9.1150–8	8.0990+5	1.1191–5	2.6977+8	1.4088+8	5.1085+7	7.7791+7	8.5809+3	2.1822+2	1.7781+2	4.0254+1	1.5512–1
3.6719–3	9.1915–8	8.0316+5	1.1406–5	2.6752+8	1.4000+8	5.0572+7	7.6947+7	8.5671+3	2.1664+2	1.7665+2	3.9829+1	1.5644–1
3.6960–3	9.2308–8	7.9974+5	1.1518–5	2.6638+8	1.3954+8	5.0312+7	7.6520+7	8.5600+3	2.1584+2	1.7607+2	3.9614+1	1.5713–1
3.7766–3	9.3611–8	7.8861+5	1.1894–5	2.6268+8	1.3807+8	4.9467+7	7.5131+7	8.5368+3	2.1325+2	1.7417+2	3.8914+1	1.5940–1
3.8480–3	9.4756–8	7.7908+5	1.2230–5	2.5950+8	1.3680+8	4.8745+7	7.3946+7	8.5167+3	2.1104+2	1.7256+2	3.8317+1	1.6141–1
4.0000–3	9.7165–8	7.5976+5	1.2958–5	2.5307+8	1.3422+8	4.7286+7	7.1553+7	8.4753+3	2.0660+2	1.6932+2	3.7112+1	1.6568–1
4.2500–3	1.0123–7	7.2928+5	1.4191–5	2.4291+8	1.3013+8	4.5057+7	6.7716+7	8.3959+3	1.9914+2	1.6380+2	3.5168+1	1.7204–1
4.5000–3	1.0520–7	7.0174+5	1.5467–5	2.3374+8	1.2639+8	4.3053+7	6.4286+7	8.3217+3	1.9250+2	1.5889+2	3.3431+1	1.7836–1
4.6250–3	1.0715–7	6.8894+5	1.6122–5	2.2948+8	1.2464+8	4.2125+7	6.2705+7	8.2864+3	1.8942+2	1.5661+2	3.2629+1	1.8151–1
5.0000–3	1.1290–7	6.5387+5	1.8147–5	2.1780+8	1.1978+8	3.9593+7	5.8414+7	8.1867+3	1.8109+2	1.5044+2	3.0456+1	1.9090–1
5.5000–3	1.2038–7	6.1322+5	2.0989–5	2.0426+8	1.1401+8	3.6661+7	5.3578+7	8.0432+3	1.7078+2	1.4258+2	2.7997+1	2.0215–1
6.0000–3	1.2762–7	5.7847+5	2.3994–5	1.9268+8	1.0898+8	3.4177+7	4.9514+7	7.9144+3	1.6213+2	1.3599+2	2.5931+1	2.1328–1
7.0000–3	1.4155–7	5.2152+5	3.0466–5	1.7371+8	1.0050+8	3.0140+7	4.3068+7	7.6150+3	1.4711+2	1.2425+2	2.2637+1	2.3091–1
8.0000–3	1.5476–7	4.7702+5	3.7544–5	1.5889+8	9.3682+7	2.7034+7	3.8167+7	7.3649+3	1.3562+2	1.1524+2	2.0133+1	2.4818–1
9.0000–3	1.6764–7	4.4036+5	4.5202–5	1.4668+8	8.7878+7	2.4530+7	3.4262+7	7.1122+3	1.2568+2	1.0729+2	1.8127+1	2.6245–1
1.0000–2	1.8002–7	4.1009+5	5.3425–5	1.3660+8	8.2991+7	2.2488+7	3.1109+7	6.8936+3	1.1763+2	1.0085+2	1.6507+1	2.7646–1
L3 1.2287–2	2.0703–7	3.5658+5	7.4202–5	1.1877+8	7.4076+7	1.8966+7	2.5723+7	6.4317+3	1.0285+2	8.8823+1	1.3723+1	3.0295–1
1.2626–2	2.1089–7	3.5005+5	7.7529–5	1.1660+8	7.2956+7	1.8542+7	2.5095+7	6.3659+3	1.0100+2	8.7302+1	1.3397+1	3.0613–1
1.3220–2	2.1755–7	3.3934+5	8.3494–5	1.1303+8	7.1103+7	1.7849+7	2.4071+7	6.2564+3	9.7991+1	8.4813+1	1.2866+1	3.1168–1
1.4110–2	2.2734–7	3.2472+5	9.2773–5	1.0816+8	6.8556+7	1.6910+7	2.2688+7	6.1042+3	9.3917+1	8.1448+1	1.2149+1	3.1992–1
L2 1.4254–2	2.2891–7	3.2250+5	9.4313–5	1.0742+8	6.8167+7	1.6767+7	2.2480+7	6.0809+3	9.3302+1	8.0940+1	1.2041+1	3.2125–1
1.4627–2	2.3285–7	3.1704+5	9.8344–5	1.0560+8	6.7186+7	1.6412+7	2.1997+7	6.0218+3	9.1775+1	7.9658+1	1.1792+1	3.2467–1
L1 1.4826–2	2.3494–7	3.1422+5	1.0052–4	1.0466+8	6.6678+7	1.6229+7	2.1749+7	5.9911+3	9.0990+1	7.9000+1	1.1664+1	3.2648–1
1.5000–2	2.3676–7	3.1180+5	1.0244–4	1.0386+8	6.6242+7	1.6073+7	2.1536+7	5.9648+3	9.0321+1	7.8438+1	1.1555+1	3.2807–1
1.5625–2	2.4331–7	3.0341+5	1.0946–4	1.0106+8	6.4703+7	1.5538+7	2.0814+7	5.8649+3	8.7900+1	7.6389+1	1.1178+1	3.3261–1
1.6250–2	2.4977–7	2.9556+5	1.1666–4	9.8448+7	6.3259+7	1.5042+7	2.0142+7	5.7705+3	8.5654+1	7.4488+1	1.0829+1	3.3712–1
1.6719–2	2.5456–7	2.9000+5	1.2218–4	9.6597+7	6.2231+7	1.4691+7	1.9668+7	5.7029+3	8.4070+1	7.3147+1	1.0582+1	3.4049–1
1.7188–2	2.5930–7	2.8470+5	1.2781–4	9.4831+7	6.1248+7	1.4359+7	1.9219+7	5.6380+3	8.2567+1	7.1875+1	1.0348+1	3.4385–1
1.8125–2	2.6864–7	2.7480+5	1.3936–4	9.1534+7	5.9404+7	1.3741+7	1.8384+7	5.5155+3	7.9778+1	6.9514+1	9.9137+0	3.5053–1
1.8359–2	2.7095–7	2.7246+5	1.4231–4	9.0754+7	5.8966+7	1.3596+7	1.8187+7	5.4862+3	7.9122+1	6.8959+1	9.8115+0	3.5219–1
1.8594–2	2.7324–7	2.7017+5	1.4528–4	8.9991+7	5.8537+7	1.3454+7	1.7995+7	5.4575+3	7.8482+1	6.8417+1	9.7117+0	3.5385–1
2.0000–2	2.8682–7	2.5738+5	1.6362–4	8.5732+7	5.6130+7	1.2666+7	1.6931+7	5.2953+3	7.4934+1	6.5413+1	9.1580+0	3.6371–1
2.2500–2	3.0998–7	2.3815+5	1.9830–4	7.9325+7	5.2362+7	1.1499+7	1.5459+7	5.0200+3	6.9313+1	6.0550+1	8.3871+0	3.7640–1
2.5000–2	3.3225–7	2.2219+5	2.3562–4	7.4009+7	4.9206+7	1.0546+7	1.4252+7	4.7860+3	6.4725+1	5.6581+1	7.7550+0	3.8897–1
2.6250–2	3.4308–7	2.1518+5	2.5523–4	7.1672+7	4.7810+7	1.0132+7	1.3725+7	4.6813+3	6.2733+1	5.4859+1	7.4794+0	3.9520–1
3.0000–2	3.7453–7	1.9711+5	3.1756–4	6.5655+7	4.4188+7	9.0813+6	1.2381+7	4.4064+3	5.7674+1	5.0484+1	6.7769+0	4.1359–1
3.5000–2	4.1553–7	1.7766+5	4.0869–4	5.9176+7	4.0262+7	8.0214+6	1.0889+7	4.0890+3	5.2150+1	4.5732+1	5.9859+0	4.3193–1
4.0000–2	4.5456–7	1.6240+5	5.0870–4	5.4094+7	3.7144+7	7.2040+6	9.7425+6	3.8326+3	4.7895+1	4.2067+1	5.3787+0	4.4995–1

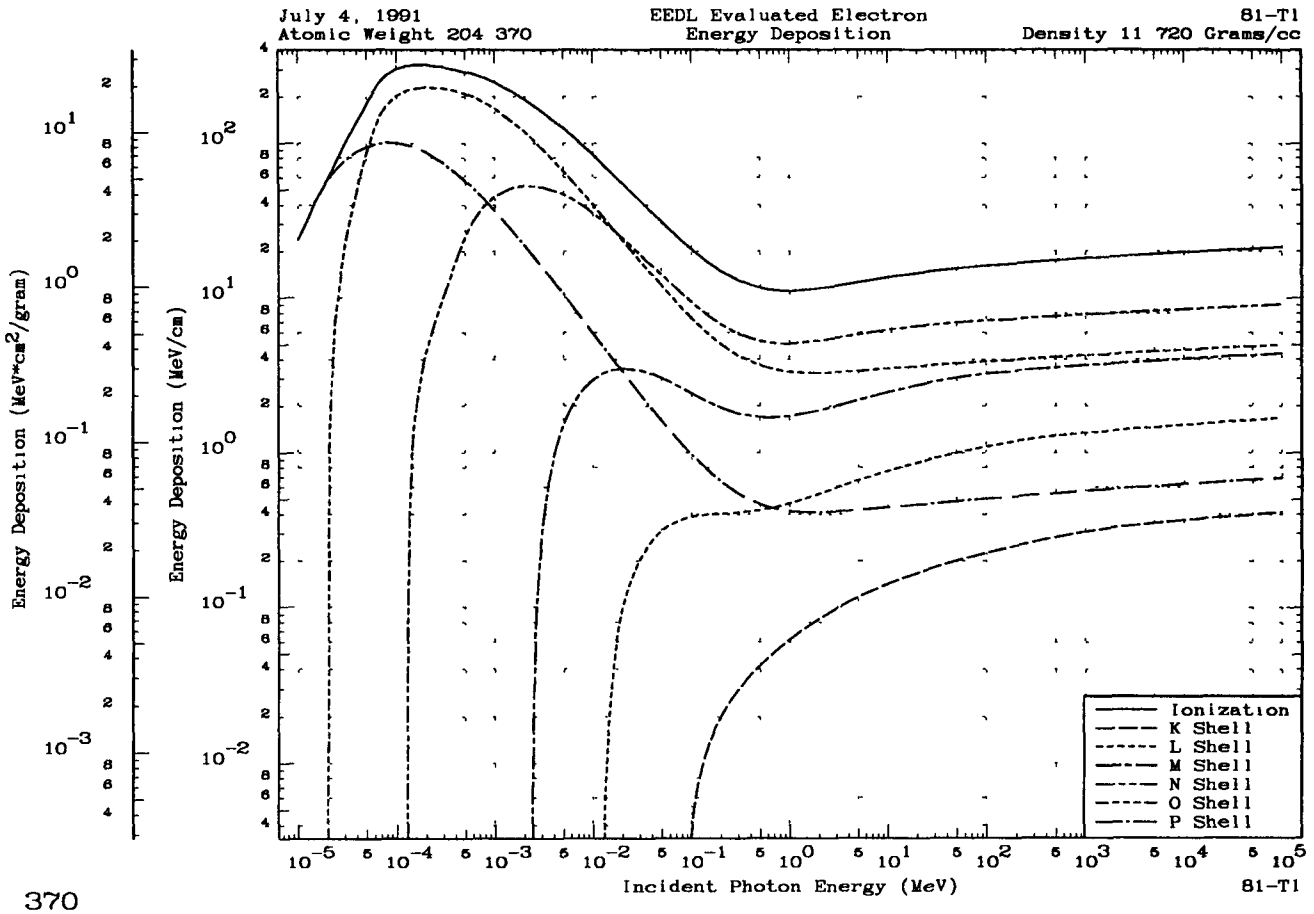
Atomic Weight 200.590 — Density 13.546 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000–2	5.2892–7	1.3957+5	7.3277–4	4.6490+7	3.2444+7	6.0466+6	7.9955+6	3.4379+3	4.1516+1	3.6592+1	4.4442+0	4.7974–1
6.0000–2	5.9810–7	1.2343+5	9.8763–4	4.1113+7	2.9049+7	5.2571+6	6.8032+6	3.1503+3	3.7043+1	3.2735+1	3.8026+0	5.0565–1
8.0000–2	7.2427–7	1.0193+5	1.5756–3	3.3951+7	2.4423+7	4.2529+6	5.2725+6	2.7541+3	3.1159+1	2.7636+1	2.9732+0	5.4997–1
K 8.3353–2	7.4385–7	9.9244+4	1.6845–3	3.3057+7	2.3836+7	4.1326+6	5.0854+6	2.7026+3	3.0429+1	2.7001+1	2.8706+0	5.5678–1
8.4393–2	7.4980–7	9.8456+4	1.7188–3	3.2795+7	2.3662+7	4.0969+6	5.0330+6	2.6875+3	3.0214+1	2.6814+1	2.8420+0	5.5872–1
8.6344–2	7.6089–7	9.7021+4	1.7838–3	3.2317+7	2.3344+7	4.0320+6	4.9379+6	2.6598+3	2.9825+1	2.6472+1	2.7902+0	5.6235–1
8.9758–2	7.8007–7	9.4635+4	1.8995–3	3.1522+7	2.2815+7	3.9242+6	4.7806+6	2.6136+3	2.9178+1	2.5905+1	2.7046+0	5.6871–1
9.4879–2	8.0835–7	9.1325+4	2.0777–3	3.0419+7	2.2078+7	3.7750+6	4.5641+6	2.5488+3	2.8285+1	2.5120+1	2.5869+0	5.7821–1
1.0000–1	8.3606–7	8.8298+4	2.2614–3	2.9411+7	2.1401+7	3.6388+6	4.3682+6	2.4889+3	2.7473+1	2.4405+1	2.4803+0	5.8767–1
1.0625–1	8.6627–7	8.5218+4	2.4925–3	2.8385+7	2.0715+7	3.5004+6	4.1674+6	2.4285+3	2.6619+1	2.3652+1	2.3700+0	5.9733–1
1.1719–1	9.1737–7	8.0472+4	2.9139–3	2.6804+7	1.9652+7	3.2877+6	3.8621+6	2.3340+3	2.5312+1	2.2495+1	2.2025+0	6.1431–1
1.3359–1	9.9034–7	7.4543+4	3.5836–3	2.4829+7	1.8315+7	3.0234+6	3.4886+6	2.2134+3	2.3698+1	2.1061+1	1.9977+0	6.3977–1
1.5000–1	1.0595–6	6.9674+4	4.2957–3	2.3207+7	1.7209+7	2.8076+6	3.1886+6	2.1119+3	2.2392+1	1.9893+1	1.8335+0	6.6504–1
1.7500–1	1.1503–6	6.4175+4	5.4501–3	2.1376+7	1.5955+7	2.5748+6	2.8445+6	1.9893+3	2.0939+1	1.8598+1	1.6431+0	6.9776–1
2.0000–1	1.2351–6	5.9773+4	6.6779–3	1.9909+7	1.4942+7	2.3890+6	2.5766+6	1.8888+3	1.9794+1	1.7569+1	1.4951+0	7.3026–1
2.5000–1	1.3844–6	5.3325+4	9.3019–3	1.7762+7	1.3375+7	2.1502+6	2.2350+6	1.7464+3	1.8333+1	1.6239+1	1.3055+0	7.8853–1
3.0000–1	1.5196–6	4.8581+4	1.2111–2	1.6182+7	1.2217+7	1.9731+6	1.9898+6	1.6381+3	1.7282+1	1.5266+1	1.1700+0	8.4591–1
4.0000–1	1.7643–6	4.1842+4	1.8095–2	1.3937+7	1.0497+7	1.7700+6	1.6684+6	1.5024+3	1.6149+1	1.4199+1	9.9055–1	9.5902–1
5.0000–1	1.9787–6	3.7308+4	2.4395–2	1.2427+7	9.2875+6	1.6523+6	1.4857+6	1.4209+3	1.5603+1	1.3641+1	8.8892–1	1.0725+0
6.0000–1	2.1731–6	3.3971+4	3.0862–2	1.1315+7	8.3841+6	1.5768+6	1.3531+6	1.3698+3	1.5322+1	1.3316+1	8.1486–1	1.1908+0
8.0000–1	2.5058–6	2.9461+4	4.3962–2	9.8131+6	7.1277+6	1.4883+6	1.1957+6	1.3117+3	1.5213+1	1.3051+1	7.2775–1	1.4347+0
1.0000+0	2.7901–6	2.6459+4	5.7054–2	8.8132+6	6.2835+6	1.4400+6	1.0884+6	1.2809+3	1.5341+1	1.2986+1	6.6797–1	1.6875+0
1.5000+0	3.3423–6	2.2087+4	8.8796–2	7.3570+6	5.0128+6	1.3880+6	9.5492+5	1.2487+3	1.6170+1	1.3224+1	5.9497–1	2.3510+0
2.0000+0	3.7528–6	1.9671+4	1.1887–1	6.5522+6	4.2962+6	1.3723+6	8.8251+5	1.2384+3	1.7093+1	1.3487+1	5.5430–1	3.0513+0
3.0000+0	4.3273–6	1.7060+4	1.7431–1	5.6824+6	3.5141+6	1.3515+6	8.1551+5	1.2343+3	1.9015+1	1.3978+1	5.2075–1	4.5159+0
4.0000+0	4.7162–6	1.5653+4	2.2440–1	5.2138+6	3.0871+6	1.3494+6	7.7609+5	1.2381+3	2.0944+1	1.4401+1	4.9900–1	6.0444+0
5.0000+0	4.9922–6	1.4788+4	2.7012–1	4.9256+6	2.8208+6	1.3484+6	7.5508+5	1.2430+3	2.2831+1	1.4735+1	4.8883–1	7.6076+0
6.0000+0	5.1942–6	1.4212+4	3.1218–1	4.7340+6	2.6443+6	1.3476+6	7.4080+5	1.2490+3	2.4743+1	1.5014+1	4.8289–1	9.2463+0
8.0000+0	5.4783–6	1.3475+4	3.8741–1	4.4885+6	2.4179+6	1.3468+6	7.2256+5	1.2584+3	2.8515+1	1.5496+1	4.7374–1	1.2545+1
1.0000+1	5.6501–6	1.3066+4	4.5322–1	4.3520+6	2.2910+6	1.3478+6	7.1191+5	1.2683+3	3.2349+1	1.5861+1	4.6947–1	1.6018+1
1.5000+1	5.8338–6	1.2654+4	5.8903–1	4.2150+6	2.1584+6	1.3496+6	7.0568+5	1.2864+3	4.1676+1	1.6403+1	4.6723–1	2.4805+1
2.0000+1	5.8788–6	1.2557+4	6.9699–1	4.1827+6	2.1300+6	1.3509+6	7.0054+5	1.3029+3	5.1286+1	1.6841+1	4.6569–1	3.3979+1
3.0000+1	5.8868–6	1.2540+4	8.6242–1	4.1771+6	2.1309+6	1.3518+6	6.9310+5	1.3283+3	7.0639+1	1.7371+1	4.6443–1	5.2803+1
4.0000+1	5.8812–6	1.2552+4	9.8732–1	4.1810+6	2.1297+6	1.3525+6	6.9749+5	1.3480+3	9.0291+1	1.7723+1	4.6788–1	7.2100+1
5.0000+1	5.8774–6	1.2560+4	1.0874+0	4.1837+6	2.1288+6	1.3528+6	7.0072+5	1.3639+3	1.1017+2	1.7990+1	4.7057–1	9.1709+1
6.0000+1	5.8745–6	1.2567+4	1.1708+0	4.1858+6	2.1280+6	1.3531+6	7.0328+5	1.3770+3	1.3020+2	1.8198+1	4.7281–1	1.1153+2
8.0000+1	5.8705–6	1.2575+4	1.3045+0	4.1886+6	2.1269+6	1.3534+6	7.0693+5	1.3978+3	1.7075+2	1.8534+1	4.7630–1	1.5174+2
1.0000+2	5.8669–6	1.2583+4	1.4096+0	4.1912+6	2.1260+6	1.3536+6	7.1020+5	1.4158+3	2.1162+2	1.8822+1	4.7956–1	1.9232+2
1.5000+2	5.8549–6	1.2609+4	1.6022+0	4.1998+6	2.1243+6	1.3537+6	7.2030+5	1.4449+3	3.1429+2	1.9119+1	4.8647–1	2.9468+2
2.0000+2	5.8463–6	1.2627+4	1.7397+0	4.2059+6	2.1232+6	1.3538+6	7.2752+5	1.4636+3	4.1800+2	1.9393+1	4.9143–1	3.9811+2
3.0000+2	5.8343–6	1.2653+4	1.9341+0	4.2147+6	2.1215+6	1.3539+6	7.3773+5	1.4876+3	6.2458+2	1.9826+1	4.9851–1	6.0425+2
4.0000+2	5.8304–6	1.2662+4	2.0724+0	4.2175+6	2.1204+6	1.3539+6	7.4167+5	1.5046+3	8.3144+2	2.0101+1	5.0135–1	8.1084+2
5.0000+2	5.8297–6	1.2663+4	2.1797+0	4.2179+6	2.1195+6	1.3539+6	7.4303+5	1.5179+3	1.0398+3	2.0268+1	5.0245–1	1.0190+3
6.0000+2	5.8292–6	1.2664+4	2.2674+0	4.2183+6	2.1187+6	1.3540+6	7.4408+5	1.5289+3	1.2459+3	2.0429+1	5.0335–1	1.2250+3
8.0000+2	5.8286–6	1.2666+4	2.4059+0	4.2187+6	2.1176+6	1.3540+6	7.4564+5	1.5464+3	1.6620+3	2.0720+1	5.0477–1	1.6408+3
1.0000+3	5.8283–6	1.2666+4	2.5133+0	4.2189+6	2.1167+6	1.3540+6	7.4673+5	1.5603+3	2.0777+3	2.0958+1	5.0587–1	2.0562+3
1.5000+3	5.8307–6	1.2661+4	2.7083+0	4.2172+6	2.1150+6	1.3540+6	7.4666+5	1.5859+3	3.1229+3	2.1184+1	5.0583–1	3.1012+3
2.0000+3	5.8342–6	1.2653+4	2.8465+0	4.2147+6	2.1139+6	1.3540+6	7.4527+5	1.6050+3	4.1625+3	2.1407+1	5.0489–1	4.1406+3
3.0000+3	5.8387–6	1.2644+4	3.0413+0	4.2115+6	2.1122+6	1.3540+6	7.4363+5	1.6326+3	6.2449+3	2.1822+1	5.0379–1	6.2226+3
4.0000+3	5.8430–6	1.2634+4	3.1795+0	4.2083+6	2.1111+6	1.3540+6	7.4163+5	1.6528+3	8.3277+3	2.2042+1	5.0245–1	8.3052+3
5.0000+3	5.8493–6	1.2621+4	3.2865+0	4.2038+6	2.1102+6	1.3540+6	7.3801+5	1.6686+3	1.0432+4	2.2229+1	5.0001–1	1.0410+4
6.0000+3	5.8501–6	1.2619+4	3.3740+0	4.2032+6	2.1095+6	1.3540+6	7.3811+5	1.6801+3	1.2503+4	2.2373+1	5.0009–1	1.2480+4
8.0000+3	5.8532–6	1.2612+4	3.5120+0	4.2010+6	2.1083+6	1.3540+6	7.3700+5	1.6985+3	1.6679+4	2.2649+1	4.9936–1	1.6656+4
1.0000+4	5.8556–6	1.2607+4	3.6189+0	4.1993+6	2.1074+6	1.3540+6	7.3619+5	1.7129+3	2.0895+4	2.2898+1	4.9883–1	2.0871+4
1.5000+4	5.8593–6	1.2599+4	3.8133+0	4.1966+6	2.1058+6	1.3540+6	7.3510+5	1.7407+3	3.1238+4	2.3105+1	4.9810–1	3.1214+4
2.0000+4	5.8629–6	1.2591+4	3.9513+0	4.1940+6	2.1046+6	1.3540+6	7.3366+5	1.7606+3	4.1715+4	2.3313+1	4.9713–1	4.1692+4
3.0000+4	5.8665–6	1.2584+4	4.1460+0	4.1915+6	2.1030+6	1.3540+6	7.3270+5	1.7886+3	6.2433+4	2.3718+1	4.9647–1	6.2409+4
4.0000+4	5.8698–6	1.2577+4	4.2841+0	4.1891+6	2.1018+6	1.3540+6	7.3150+5	1.8086+3	8.3374+4	2.3953+1	4.9566–1	8.3349+4
5.0000+4	5.8755–6	1.2564+4	4.3912+0	4.1851+6	2.1010+6	1.3540+6	7.2832+5	1.8241+3	1.0412+5	2.4156+1	4.9351–1	1.0410+5
6.0000+4	5.8756–6	1.2564+4	4.4788+0	4.1850+6	2.1002+6	1.3540+6	7.2898+5	1.8366+3	1.2485+5	2.4293+1	4.9395–1	1.2482+5
8.0000+4	5.8778–6	1.2560+4	4.6169+0	4.1835+6	2.0991+6	1.3540+6	7.2855+5	1.8567+3	1.6667+5	2.4561+1	4.9367–1	1.6664+5
1.0000+5	5.8795–6	1.2556+4	4.7240+0	4.1822+6	2.0982+6	1.3540+6	7.2819+5	1.8723+3	2.0856+5	2.4814+1	4.9342–1	2.0854+5


July 4, 1991
Atomic Weight 204.370
EEDL Evaluated Electron
Cross Sections
81-Tl
Density 11.720 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
81-Tl


July 4, 1991
Atomic Weight 204.370
EEDL Evaluated Electron
Energy Deposition
81-Tl
Density 11.720 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
81-Tl


July 4 1991
Atomic Weight 204 370
EEDL Evaluated Electron
Shell Cross Sections
81-Tl
Density 11 720 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
81-Tl


July 4, 1991
Atomic Weight 204 370
EEDL Evaluated Electron
Energy Deposition
81-Tl
Density 11 720 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
81-Tl

370

Atomic Weight 204.370 Density 11.720 Grams/cc

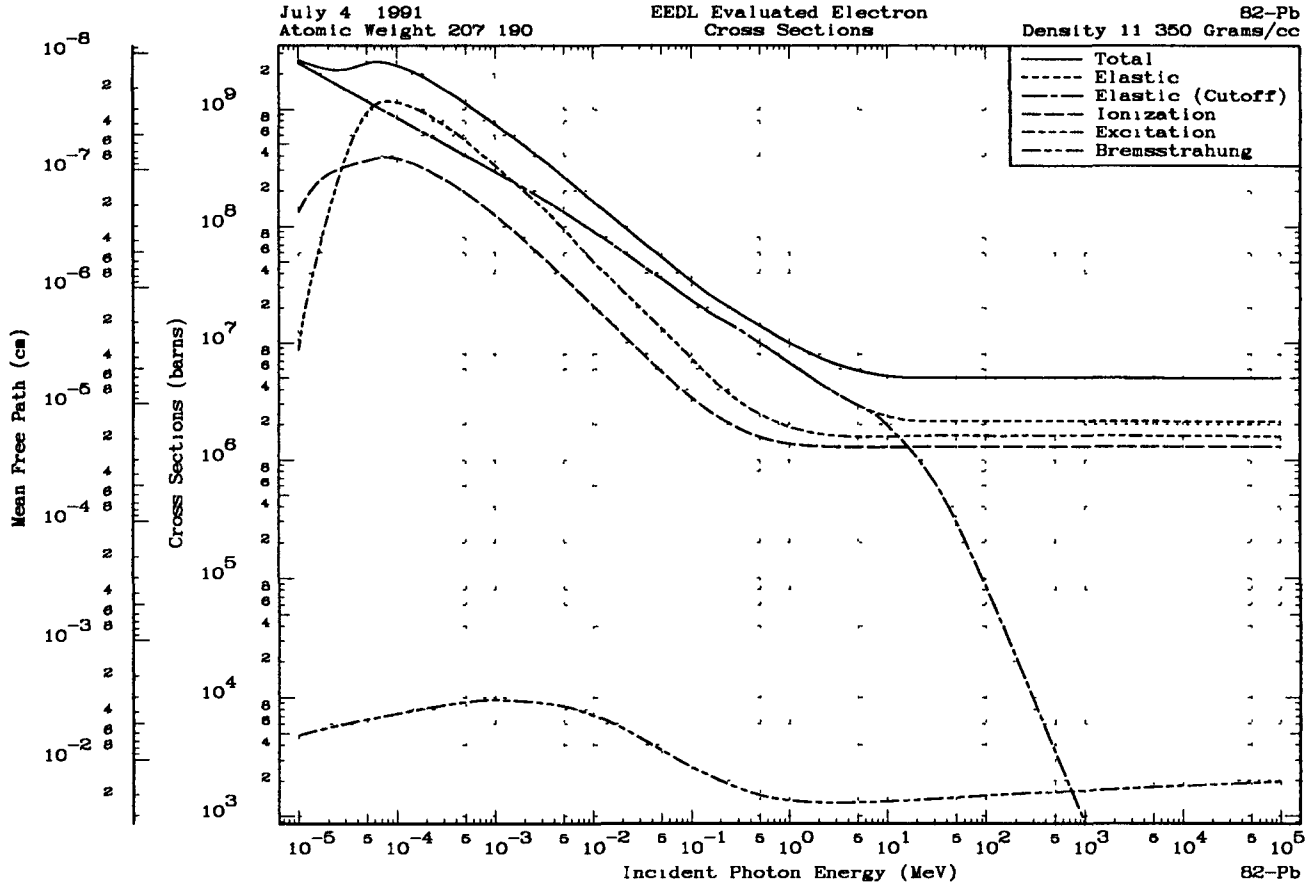
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2245–8	6.9681+6		2.3647+9	2.2394+9	1.1815+8	7.1202+6	4.8352+3	2.5071+1	2.3736+1	1.3348+0	3.6095–4
	1.1250–5	1.2772–8	6.6807+6		2.2672+9	2.1217+9	1.3251+8	1.2974+7	4.9525+3	3.0304+1	2.7790+1	2.5132+0	4.0464–4
P1	1.2360–5	1.3186–8	6.4711+6		2.1960+9	2.0321+9	1.4531+8	1.8656+7	5.0483+3	3.5326+1	3.1608+1	3.7174+0	4.4410–4
	1.3020–5	1.3408–8	6.3636+6		2.1596+9	1.9842+9	1.5272+8	2.2674+7	5.1021+3	3.8864+1	3.4284+1	4.5793+0	4.6783–4
	1.3125–5	1.3443–8	6.3472+6		2.1540+9	1.9769+9	1.5378+8	2.3367+7	5.1104+3	3.9395+1	3.4665+1	4.7293+0	4.7163–4
	1.4010–5	1.3714–8	6.2217+6		2.1114+9	1.9186+9	1.6359+8	2.9221+7	5.1787+3	4.4364+1	3.8344+1	6.0200+0	5.0380–4
	1.5000–5	1.3985–8	6.1013+6		2.0705+9	1.8594+9	1.7417+8	3.6922+7	5.2512+3	5.0212+1	4.2455+1	7.7562+0	5.4019–4
	1.6250–5	1.4305–8	5.9648+6		2.0242+9	1.7924+9	1.8341+8	4.8373+7	5.3375+3	5.6910+1	4.6573+1	1.0336+1	5.8672–4
	1.7500–5	1.4575–8	5.8540+6		1.9866+9	1.7326+9	1.9196+8	6.2118+7	5.4186+3	6.4059+1	5.0562+1	1.3496+1	6.3387–4
	1.8125–5	1.4692–8	5.8074+6		1.9708+9	1.7049+9	1.9599+8	6.9928+7	5.4575+3	6.7892+1	5.2572+1	1.5319+1	6.5766–4
	2.0000–5	1.4986–8	5.6936+6		1.9322+9	1.6296+9	2.0687+8	9.5708+7	5.5679+3	7.9737+1	5.8254+1	2.1482+1	7.2990–4
O5	2.0010–5	1.4987–8	5.6931+6		1.9320+9	1.6293+9	2.0691+8	9.5862+7	5.5685+3	7.9795+1	5.8276+1	2.1518+1	7.3029–4
	2.0634–5	1.5062–8	5.6648+6		1.9224+9	1.6065+9	2.1038+8	1.0558+8	5.6005+3	8.4447+1	6.0641+1	2.3806+1	7.5314–4
	2.1805–5	1.5171–8	5.6242+6		1.9087+9	1.5663+9	2.1678+8	1.2555+8	5.6586+3	9.3646+1	6.5094+1	2.8552+1	7.9626–4
O4	2.2400–5	1.5213–8	5.6088+6		1.9034+9	1.5471+9	2.1969+8	1.3663+8	5.6871+3	9.8372+1	6.7168+1	3.1203+1	8.1831–4
	2.3854–5	1.5285–8	5.5821+6		1.8944+9	1.5031+9	2.2780+8	1.6345+8	5.7514+3	1.1114+2	7.3528+1	3.7608+1	8.7102–4
	2.4300–5	1.5300–8	5.5769+6		1.8926+9	1.4904+9	2.2986+8	1.7232+8	5.7705+3	1.1495+2	7.5209+1	3.9738+1	8.8730–4
	2.5000–5	1.5313–8	5.5720+6		1.8909+9	1.4711+9	2.3296+8	1.8685+8	5.8000+3	1.2101+2	7.7772+1	4.3242+1	9.1292–4
	2.6250–5	1.5302–8	5.5760+6		1.8923+9	1.4386+9	2.3900+8	2.1473+8	5.8508+3	1.3278+2	8.2775+1	5.0009+1	9.5893–4
	2.7150–5	1.5269–8	5.5881+6		1.8964+9	1.4165+9	2.4349+8	2.3639+8	5.8862+3	1.4196+2	8.6652+1	5.5302+1	9.9226–4
	3.0000–5	1.5095–8	5.6524+6		1.9182+9	1.3531+9	2.5797+8	3.0714+8	5.9923+3	1.7240+2	9.9521+1	7.2879+1	1.0989–3
	3.5000–5	1.4658–8	5.8208+6		1.9754+9	1.2610+9	2.7441+8	4.4000+8	6.1599+3	2.2443+2	1.1870+2	1.0573+2	1.2897–3
	4.0000–5	1.4139–8	6.0347+6		2.0480+9	1.1862+9	2.9073+8	5.7099+8	6.3089+3	2.7828+2	1.3934+2	1.3893+2	1.4848–3
	4.5000–5	1.3610–8	6.2694+6		2.1276+9	1.1240+9	3.0313+8	7.0046+8	6.4341+3	3.3078+2	1.5914+2	1.7163+2	1.6757–3
	5.0000–5	1.3148–8	6.4897+6		2.2024+9	1.0712+9	3.1720+8	8.1403+8	6.5481+3	3.8247+2	1.8161+2	2.0086+2	1.8698–3
	6.0000–5	1.2604–8	6.7696+6		2.2973+9	9.8546+8	3.3755+8	9.7433+8	6.7431+3	4.6671+2	2.2261+2	2.4410+2	2.2589–3
	7.0000–5	1.2490–8	6.8314+6		2.3184+9	9.1839+8	3.4800+8	1.0520+9	6.9125+3	5.1995+2	2.5447+2	2.6547+2	2.6574–3
O3	7.7960–5	1.2615–8	6.7637+6		2.2954+9	8.7425+8	3.5133+8	1.0698+9	7.0334+3	5.4424+2	2.7271+2	2.7153+2	2.9807–3
	7.8980–5	1.2629–8	6.7561+6		2.2928+9	8.6907+8	3.5183+8	1.0719+9	7.0482+3	5.4745+2	2.7517+2	2.7227+2	3.0225–3
	8.0000–5	1.2643–8	6.7487+6		2.2903+9	8.6398+8	3.5234+8	1.0739+9	7.0627+3	5.5066+2	2.7765+2	2.7301+2	3.0644–3
	8.2500–5	1.2728–8	6.7036+6		2.2750+9	8.5191+8	3.5144+8	1.0716+9	7.0964+3	5.5383+2	2.8080+2	2.7302+2	3.1667–3
	8.6875–5	1.2871–8	6.6294+6		2.2498+9	8.3201+8	3.5005+8	1.0677+9	7.1532+3	5.5943+2	2.8637+2	2.7306+2	3.3468–3
O2	9.9030–5	1.3230–8	6.4495+6		2.1887+9	7.8365+8	3.4715+8	1.0579+9	7.2993+3	5.7546+2	3.0205+2	2.7341+2	3.8539–3
	1.0000–4	1.3262–8	6.4337+6	0.0000+0	2.1834+9	7.8017+8	3.4685+8	1.0564+9	7.3098+3	5.7639+2	3.0314+2	2.7325+2	3.8946–3
	1.0313–4	1.3379–8	6.3774+6	5.4205–9	2.1643+9	7.6932+8	3.4450+8	1.0504+9	7.3431+3	5.7664+2	3.0448+2	2.7216+2	4.0258–3
	1.0898–4	1.3591–8	6.2780+6	1.5575–8	2.1305+9	7.5023+8	3.4040+8	1.0399+9	7.4033+3	5.7736+2	3.0712+2	2.7023+2	4.2733–3
	1.1250–4	1.3714–8	6.2219+6	2.1662–8	2.1115+9	7.3948+8	3.3811+8	1.0339+9	7.4381+3	5.7791+2	3.0876+2	2.6915+2	4.4228–3
N7	1.2816–4	1.4224–8	5.9985+6	4.8681–8	2.0357+9	6.9693+8	3.2917+8	1.0096+9	7.5826+3	5.8126+2	3.1633+2	2.6492+2	5.0961–3
	1.2949–4	1.4274–8	5.9775+6	5.0973–8	2.0285+9	6.9366+8	3.2822+8	1.0067+9	7.5942+3	5.8088+2	3.1659+2	2.6429+2	5.1539–3
	1.3089–4	1.4326–8	5.9557+6	5.3381–8	2.0212+9	6.9028+8	3.2724+8	1.0036+9	7.6062+3	5.8049+2	3.1684+2	2.6365+2	5.2147–3
N6	1.3295–4	1.4403–8	5.9242+6	5.6931–8	2.0105+9	6.8539+8	3.2581+8	9.9927+8	7.6238+3	5.7992+2	3.1721+2	2.6271+2	5.3044–3
	1.3567–4	1.4501–8	5.8842+6	6.1619–8	1.9969+9	6.7912+8	3.2400+8	9.9376+8	7.6466+3	5.7938+2	3.1782+2	2.6156+2	5.4230–3
	1.3721–4	1.4556–8	5.8619+6	6.4288–8	1.9893+9	6.7563+8	3.2300+8	9.9069+8	7.6594+3	5.7906+2	3.1815+2	2.6091+2	5.4907–3
O1	1.3916–4	1.4625–8	5.8343+6	6.7651–8	1.9800+9	6.7131+8	3.2175+8	9.8689+8	7.6753+3	5.7869+2	3.1857+2	2.6012+2	5.5760–3
	1.4187–4	1.4719–8	5.7968+6	7.2336–8	1.9672+9	6.6545+8	3.2008+8	9.8171+8	7.6972+3	5.7833+2	3.1926+2	2.5906+2	5.6951–3
	1.4283–4	1.4752–8	5.7838+6	7.4003–8	1.9628+9	6.6340+8	3.1950+8	9.7990+8	7.7049+3	5.7822+2	3.1952+2	2.5869+2	5.7375–3
	1.4361–4	1.4779–8	5.7734+6	7.5338–8	1.9593+9	6.6178+8	3.1904+8	9.7845+8	7.7110+3	5.7813+2	3.1973+2	2.5839+2	5.7715–3
	1.4594–4	1.4858–8	5.7425+6	7.9367–8	1.9488+9	6.5695+8	3.1766+8	9.7417+8	7.7294+3	5.7786+2	3.2033+2	2.5752+2	5.8743–3
	1.5000–4	1.4995–8	5.6902+6	8.6404–8	1.9310+9	6.4880+8	3.1536+8	9.6689+8	7.7608+3	5.7752+2	3.2147+2	2.5605+2	6.0543–3
	1.5625–4	1.5239–8	5.5991+6	9.7260–8	1.9001+9	6.3686+8	3.1081+8	9.5243+8	7.8062+3	5.7390+2	3.2118+2	2.5271+2	6.3357–3
	1.6250–4	1.5477–8	5.5130+6	1.0818–7	1.8709+9	6.2561+8	3.0656+8	9.3875+8	7.8500+3	5.7069+2	3.2111+2	2.4957+2	6.6188–3
	1.6719–4	1.5651–8	5.4515+6	1.1641–7	1.8501+9	6.1757+8	3.0353+8	9.2895+8	7.8820+3	5.6842+2	3.2108+2	2.4733+2	6.8321–3
	1.7500–4	1.5936–8	5.3543+6	1.3020–7	1.8171+9	6.0487+8	2.9876+8	9.1343+8	7.9336+3	5.6502+2	3.2122+2	2.4379+2	7.1894–3
	1.8125–4	1.6157–8	5.2809+6	1.4128–7	1.7922+9	5.9530+8	2.9517+8	9.0168+8	7.9735+3	5.6255+2	3.2142+2	2.4113+2	7.4769–3
	1.8359–4	1.6239–8	5.2543+6	1.4545–7	1.7831+9	5.9183+8	2.9386+8	8.9742+8	7.9881+3	5.6166+2	3.2149+2	2.4016+2	7.5851–3
	2.0000–4	1.6794–8	5.0806+6	1.7480–7	1.7242+9	5.6923+8	2.8542+8	8.6952+8	8.0864+3	5.5631+2	3.2242+2	2.3388+2	8.3475–3
	2.2500–4	1.7736–8	4.8108+6	2.2040–7	1.6326+9	5.3955+8	2.7104+8	8.2201+8	8.2113+3	5.4022+2	3.1793+2	2.2228+2	9.5579–3
	2.5000–4	1.8621–8	4.5822+6	2.6723–7	1.5551+9	5.1431+8	2.5902+8	7.8172+8	8.3247+3	5.2765+2	3.1514+2	2.1250+2	1.0786–2
	2.6250–4	1.9045–8	4.4802+6	2.9104–7	1.5204+9	5.0302+8	2.5366+8	7.6373+8	8.3778+3	5.2224+2	3.1407+2	2.0816+2	1.1407–2
	3.0000–4	2.0253–8	4.2130+6	3.6376–7	1.4297+9	4.7338+8	2.3975+8	7.1660+8	8.5246+3	5.0924+2	3.1238+2	1.9685+2	1.3291–2
	3.5000–4	2.1930–8	3.8907+6	4.6417–7	1.3204+9	4.4154+8	2.2193+8	6.5689+8	8.6969+3	4.8683+2	3.0512+2	1.8170+2	1.5853–2
N5	3.8513–4	2.3036–8	3.7039+6	5.3721–7	1.2570+9	4.2287+8	2.1173+8	6.2237+8	8.8055+3	4.7509+2	3.0209+2	1.7298+2	1.7683–2
	3.9257–4	2.3268–8	3.6671+6	5.5290–7	1.2445+9	4.1924+8	2.0975+8	6.1547+8	8.8238+3	4.7293+2	3.0164+2	1.7127+2	1.8088–2
	4.0000–4	2.3497–8	3.6313+6	5.6865–7	1.2323+9	4.1571+8	2.0783+8	6.0878+8	8.8417+3	4.7087+2	3.0124+2	1.6961+2	1.8493–2
N4	4.0635–4	2.3690–8	3.6016+6	5.8217–7	1.2223+9	4.1277+8	2.0603+8	6.0347+8	8.8569+3	4.6852+2	3.0027+2	1.6823+2	1.8840–2
	4.1220–4	2.3875–8	3.5738+6	5.9469–7	1.2128+9	4.1011+8	2.0441+8	5.9829+8	8.8706+3	4.6635+2	2.9944+2	1.6689+2	1.9161–2
	4.2318–4	2.4218–8	3.5232+6	6.1832–7	1.1957+9	4.0528+8	2.0148+8	5.8890+8	8.8959+3	4.6249+2	2.9801+2	1.6446+2	1.9763–2
	4.2500–4	2.4274–8	3.5150+6	6.2227–7	1.1929+9	4.0450+8	2.0100+8	5.8737+8	8.9001+3	4.6188+2	2.9779+2	1.6407+2	1.9863–2
	4.4238–4	2.4807–8	3.4395+6	6.6013–7	1.1673+9	3.9725+8	1.9663+8	5.7336+8	8.9388+3	4.5625+2	2.9577+2	1.6045+2	2.0821–2
	4.6250–4	2.5411–8	3.3578+6	7.0451–7	1.1395+9	3.8937+8	1.9193+8	5.5820+8	8.9821+3	4.5038+2	2.9382+2	1.5654+2	2.1935–2
	4.7119–4	2.5668–8	3.3242+6	7.2386–7	1.1281+9	3.8611+8	1.9000+8	5.5198+8	9.0002+3	4.4804+2	2.9308+2	1.5494+2	2.2418–2
	5.0000–4	2.6504–8	3.2193+6	7.8867–7	1.0925+9	3.7592+8	1.8401+8	5.3260+8	9.0583+3	4.4102+2	2.9105+2	1.4995+2	2.4026–2
	5.5000–4	2.8003–8	3.0470+6	9.0383–7	1.0340+9	3.6010+8	1.7428+8	4.9965+8	9.1446+3	4.2738+2	2.8608+2	1.4127+2	2.6834–2
	6.0000–4	2.9441–8	2.8982+6	1.0224–6	9.8353+8	3.4625+8	1.6593+8	4.7135+8	9.2241+3	4.1641+2	2.8255+2	1.3383+2	2.9669–2
N3	6.0032–4	2.9450–8	2.8973+6	1.0231–6	9.8323+8	3.4616+8	1.6587+8	4.7118+8	9.2245+3	4.1632+2	2.8251+2	1.3379+2	2.9687–2
	6.0656–4	2.9628–8	2.8798+6	1.0381–6	9.7731+8	3.4455+8	1.6482+8	4.6793+8	9.2318+3	4.1469+2	2.8175+2	1.3292+2	3.0034–2
	6.1865–4	2.9971–8	2.8469+6	1.0674–6	9.6612+8	3.4150+8	1.6283+8	4.6178+8	9.2458+3	4.1164+2	2.8033+2	1.3128+2	3.0705–2
	6.4132–4	3.0607–8	2.7878+6	1.1228–6	9.4606+8	3.3600+8	1.5927+8	4.5078+8	9.2714+3	4.0626+2	2.7788+2	1.2835+2	3.1968–2
	6.8099–4	3.1695–8	2.6920+6	1.2215–6	9.1359+8	3.2703+8	1.5354+8	4.3301+8	9.3142+3	3.9780+2	2.7415+2	1.2362+2	3.4186–2
N2	7.1397–4	3.2578–8	2.6191+6	1.3051–6	8.8882+8	3.2013+8	1.4919+8	4.1950+8	9.3480+3	3.9158+2	2.7151+2	1.2003+2	3.6037–2

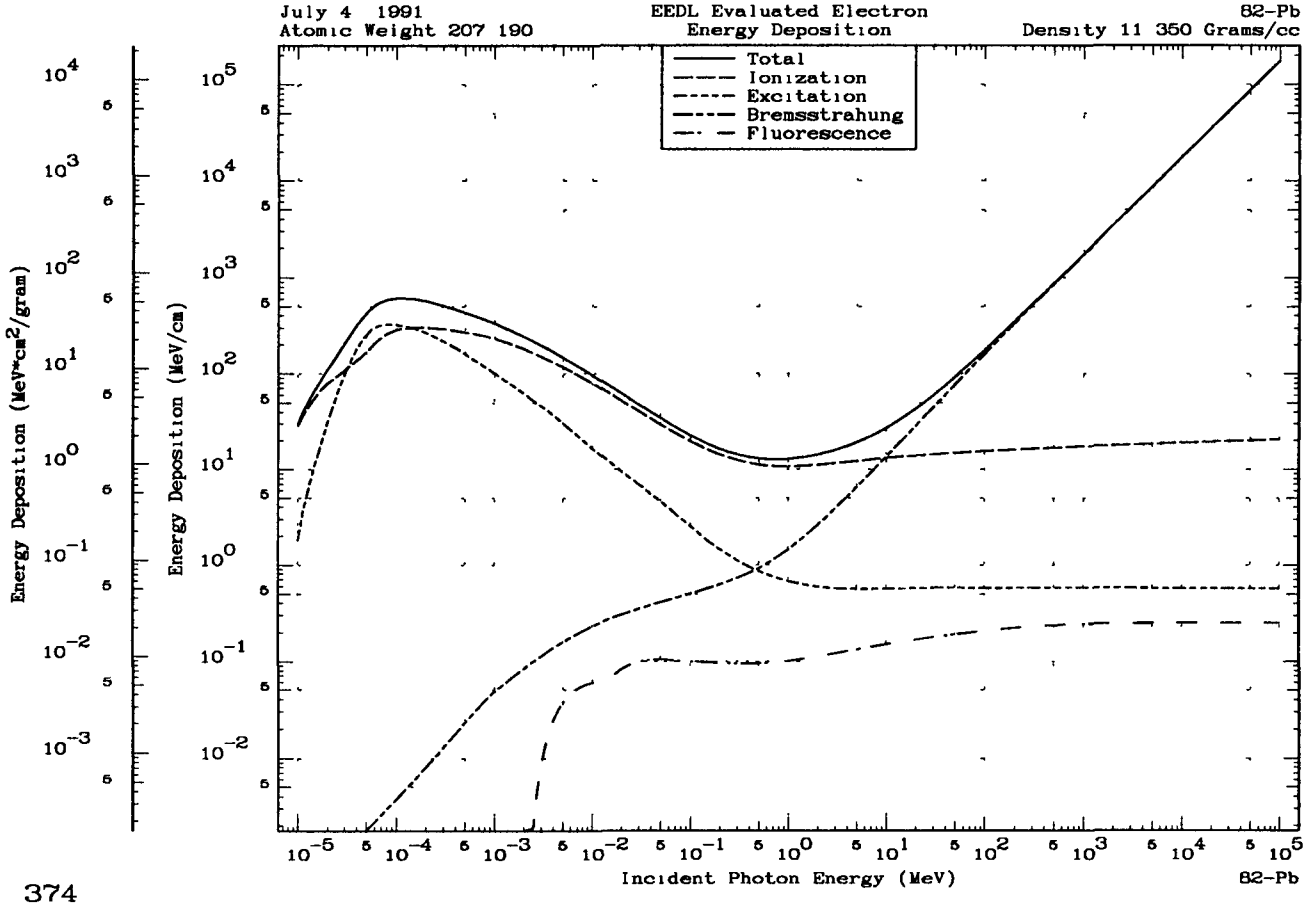
Atomic Weight 204.370 — Density 11.720 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	7.2472–4	3.2863–8	2.5963+6	1.3326–6	8.8111+8	3.1798+8	1.4782+8	4.1530+8	9.3561+3	3.8951+2	2.7057+2	1.1891+2	3.6620–2
	7.4050–4	3.3278–8	2.5640+6	1.3733–6	8.7013+8	3.1491+8	1.4587+8	4.0933+8	9.3679+3	3.8660+2	2.6926+2	1.1731+2	3.7476–2
	7.4354–4	3.3358–8	2.5579+6	1.3811–6	8.6804+8	3.1433+8	1.4551+8	4.0820+8	9.3701+3	3.8605+2	2.6901+2	1.1701+2	3.7642–2
	7.7177–4	3.4089–8	2.5030+6	1.4547–6	8.4942+8	3.0909+8	1.4222+8	3.9811+8	9.3905+3	3.8121+2	2.6687+2	1.1431+2	3.9177–2
	8.0000–4	3.4809–8	2.4512+6	1.5292–6	8.3186+8	3.0412+8	1.3913+8	3.8860+8	9.4101+3	3.7676+2	2.6495+2	1.1177+2	4.0715–2
N1	8.3143–4	3.5600–8	2.3967+6	1.6133–6	8.1336+8	2.9888+8	1.3566+8	3.7880+8	9.4145+3	3.7095+2	2.6181+2	1.0909+2	4.2209–2
	8.4197–4	3.5870–8	2.3787+6	1.6418–6	8.0724+8	2.9719+8	1.3455+8	3.7549+8	9.4160+3	3.6907+2	2.6083+2	1.0820+2	4.2710–2
	8.5000–4	3.6075–8	2.3652+6	1.6636–6	8.0266+8	2.9592+8	1.3372+8	3.7301+8	9.4171+3	3.6766+2	2.6010+2	1.0752+2	4.3092–2
	8.6172–4	3.6372–8	2.3459+6	1.6955–6	7.9611+8	2.9410+8	1.3253+8	3.6946+8	9.4186+3	3.6566+2	2.5906+2	1.0656+2	4.3649–2
	8.9629–4	3.7238–8	2.2913+6	1.7908–6	7.7758+8	2.8893+8	1.2918+8	3.5946+8	9.4231+3	3.6009+2	2.5619+2	1.0386+2	4.5294–2
	9.0000–4	3.7331–8	2.2856+6	1.8011–6	7.7567+8	2.8839+8	1.2883+8	3.5843+8	9.4236+3	3.5952+2	2.5589+2	1.0358+2	4.5471–2
	9.2500–4	3.7947–8	2.2485+6	1.8710–6	7.6307+8	2.8485+8	1.2656+8	3.5164+8	9.4267+3	3.5579+2	2.5400+2	1.0174+2	4.6660–2
	9.4815–4	3.8511–8	2.2156+6	1.9364–6	7.5188+8	2.8170+8	1.2455+8	3.4563+8	9.4295+3	3.5253+2	2.5236+2	1.0012+2	4.7762–2
	1.0000–3	3.9754–8	2.1463+6	2.0849–6	7.2838+8	2.7501+8	1.2033+8	3.3303+8	9.4356+3	3.4582+2	2.4905+2	9.6716+1	5.0232–2
	1.1250–3	4.2724–8	1.9971+6	2.4561–6	6.7775+8	2.6075+8	1.1091+8	3.0608+8	9.3919+3	3.2781+2	2.3848+2	8.9274+1	5.5073–2
	1.2188–3	4.4860–8	1.9020+6	2.7471–6	6.4547+8	2.5148+8	1.0496+8	2.8903+8	9.3623+3	3.1666+2	2.3203+2	8.4570+1	5.8693–2
	1.2500–3	4.5557–8	1.8729+6	2.8463–6	6.3561+8	2.4862+8	1.0314+8	2.8383+8	9.3530+3	3.1332+2	2.3012+2	8.3139+1	5.9897–2
	1.3125–3	4.6930–8	1.8181+6	3.0478–6	6.1701+8	2.4320+8	9.9723+7	2.7408+8	9.3350+3	3.0684+2	2.2632+2	8.0455+1	6.2304–2
	1.3594–3	4.7941–8	1.7798+6	3.2017–6	6.0399+8	2.3937+8	9.7335+7	2.6728+8	9.3221+3	3.0234+2	2.2370+2	7.8584+1	6.4107–2
	1.5000–3	5.0890–8	1.6766+6	3.6762–6	5.6899+8	2.2895+8	9.0956+7	2.4908+8	9.2860+3	2.9056+2	2.1691+2	7.3584+1	6.9502–2
	1.7500–3	5.6118–8	1.5205+6	4.5696–6	5.1599+8	2.1327+8	8.1295+7	2.2141+8	9.2183+3	2.6934+2	2.0347+2	6.5797+1	7.8480–2
	2.0000–3	6.1050–8	1.3976+6	5.5269–6	4.7430+8	2.0056+8	7.3788+7	1.9994+8	9.1600+3	2.5312+2	1.9327+2	5.9766+1	8.7408–2
M5	2.3939–3	6.8540–8	1.2449+6	7.1573–6	4.2247+8	1.8393+8	6.4454+7	1.7408+8	9.0369+3	2.3044+2	1.7796+2	5.2386+1	9.9354–2
	2.4318–3	6.9271–8	1.2318+6	7.3223–6	4.1801+8	1.8254+8	6.3699+7	1.7177+8	9.0262+3	2.2857+2	1.7674+2	5.1730+1	1.0050–1
M4	2.4937–3	7.0455–8	1.2110+6	7.5950–6	4.1098+8	1.8034+8	6.2508+7	1.6813+8	9.0091+3	2.2564+2	1.7484+2	5.0698+1	1.0236–1
	2.5028–3	7.0629–8	1.2081+6	7.6354–6	4.0997+8	1.8002+8	6.2334+7	1.6761+8	9.0067+3	2.2519+2	1.7454+2	5.0549+1	1.0264–1
	2.5570–3	7.1658–8	1.1907+6	7.8774–6	4.0408+8	1.7814+8	6.1322+7	1.6462+8	8.9922+3	2.2259+2	1.7280+2	4.9684+1	1.0427–1
	2.5650–3	7.1809–8	1.1882+6	7.9132–6	4.0324+8	1.7786+8	6.1176+7	1.6419+8	8.9900+3	2.2221+2	1.7255+2	4.9560+1	1.0451–1
	2.7785–3	7.5785–8	1.1259+6	8.8947–6	3.8208+8	1.7101+8	5.7553+7	1.5351+8	8.9361+3	2.1296+2	1.6637+2	4.6476+1	1.1091–1
	2.7825–3	7.5858–8	1.1248+6	8.9134–6	3.8171+8	1.7089+8	5.7490+7	1.5332+8	8.9351+3	2.1280+2	1.6627+2	4.6422+1	1.1103–1
M3	2.9446–3	7.8800–8	1.0828+6	9.6865–6	3.6746+8	1.6620+8	5.5061+7	1.4619+8	8.8971+3	2.0667+2	1.6219+2	4.4364+1	1.1588–1
	3.0000–3	7.9798–8	1.0693+6	9.9558–6	3.6287+8	1.6469+8	5.4285+7	1.4389+8	8.8846+3	2.0473+2	1.6090+2	4.3704+1	1.1753–1
	3.1250–3	8.2029–8	1.0402+6	1.0574–5	3.5300+8	1.6138+8	5.2583+7	1.3903+8	8.8470+3	1.9999+2	1.5758+2	4.2290+1	1.2088–1
	3.2344–3	8.3955–8	1.0163+6	1.1126–5	3.4490+8	1.5864+8	5.1191+7	1.3506+8	8.8154+3	1.9614+2	1.5488+2	4.1136+1	1.2380–1
M2	3.4097–3	8.6993–8	9.8082+5	1.2033–5	3.3286+8	1.5452+8	4.9128+7	1.2920+8	8.7672+3	1.9048+2	1.5092+2	3.9429+1	1.2846–1
	3.4258–3	8.7270–8	9.7771+5	1.2117–5	3.3180+8	1.5416+8	4.8948+7	1.2869+8	8.7620+3	1.8997+2	1.5057+2	3.9280+1	1.2886–1
	3.4835–3	8.8260–8	9.6674+5	1.2423–5	3.2808+8	1.5287+8	4.8311+7	1.2689+8	8.7439+3	1.8821+2	1.4933+2	3.8754+1	1.3028–1
	3.5000–3	8.8542–8	9.6366+5	1.2510–5	3.2703+8	1.5251+8	4.8132+7	1.2639+8	8.7388+3	1.8772+2	1.4898+2	3.8607+1	1.3068–1
	3.6126–3	9.0453–8	9.4330+5	1.3116–5	3.2012+8	1.5010+8	4.6953+7	1.2306+8	8.7045+3	1.8445+2	1.4668+2	3.7635+1	1.3345–1
M1	3.6787–3	9.1565–8	9.3185+5	1.3476–5	3.1624+8	1.4874+8	4.6291+7	1.2120+8	8.6850+3	1.8262+2	1.4539+2	3.7091+1	1.3506–1
	3.7129–3	9.2138–8	9.2605+5	1.3663–5	3.1427+8	1.4805+8	4.5956+7	1.2025+8	8.6750+3	1.8169+2	1.4474+2	3.6815+1	1.3590–1
	3.7590–3	9.2909–8	9.1836+5	1.3918–5	3.1166+8	1.4713+8	4.5512+7	1.1901+8	8.6618+3	1.8046+2	1.4387+2	3.6450+1	1.3702–1
	3.8063–3	9.3695–8	9.1065+5	1.4181–5	3.0904+8	1.4621+8	4.5068+7	1.1776+8	8.6483+3	1.7923+2	1.4300+2	3.6085+1	1.3818–1
	3.8795–3	9.4906–8	8.9904+5	1.4592–5	3.0510+8	1.4482+8	4.4399+7	1.1588+8	8.6279+3	1.7738+2	1.4170+2	3.5536+1	1.3996–1
	4.0000–3	9.6880–8	8.8072+5	1.5276–5	2.9889+8	1.4260+8	4.3346+7	1.1293+8	8.5953+3	1.7449+2	1.3967+2	3.4673+1	1.4289–1
	4.2500–3	1.0100–7	8.4476+5	1.6735–5	2.8668+8	1.3818+8	4.1300+7	1.0719+8	8.5158+3	1.6833+2	1.3521+2	3.2979+1	1.4840–1
	4.5000–3	1.0504–7	8.1228+5	1.8245–5	2.7566+8	1.3414+8	3.9460+7	1.0205+8	8.4415+3	1.6284+2	1.3122+2	3.1462+1	1.5388–1
	4.6250–3	1.0703–7	7.9718+5	1.9019–5	2.7054+8	1.3225+8	3.8609+7	9.9672+7	8.4062+3	1.6030+2	1.2938+2	3.0761+1	1.5661–1
	5.0000–3	1.1289–7	7.5583+5	2.1410–5	2.5650+8	1.2700+8	3.6286+7	9.3209+7	8.3063+3	1.5341+2	1.2439+2	2.8854+1	1.6474–1
	5.5000–3	1.2064–7	7.0725+5	2.4764–5	2.4001+8	1.2077+8	3.3603+7	8.5636+7	8.1618+3	1.4481+2	1.1803+2	2.6597+1	1.7447–1
	6.0000–3	1.2816–7	6.6579+5	2.8306–5	2.2594+8	1.1535+8	3.1329+7	7.9261+7	8.0321+3	1.3756+2	1.1268+2	2.4698+1	1.8409–1
	7.0000–3	1.4251–7	5.9871+5	3.5928–5	2.0318+8	1.0620+8	2.7628+7	6.9348+7	7.7336+3	1.2503+2	1.0311+2	2.1720+1	1.9949–1
	8.0000–3	1.5616–7	5.4637+5	4.4250–5	1.8542+8	9.8861+7	2.4781+7	6.1770+7	7.4841+3	1.1543+2	9.5768+1	1.9445+1	2.1457–1
	9.0000–3	1.6926–7	5.0411+5	5.3239–5	1.7108+8	9.2615+7	2.2495+7	5.5960+7	7.2298+3	1.0717+2	8.9267+1	1.7680+1	2.2695–1
	1.0000–2	1.8185–7	4.6919+5	6.2874–5	1.5923+8	8.7362+7	2.0631+7	5.1227+7	7.0097+3	1.0048+2	8.3994+1	1.6244+1	2.3910–1
L3	1.2660–2	2.1360–7	3.9946+5	9.1386–5	1.3556+8	7.6525+7	1.6982+7	4.2049+7	6.4709+3	8.6462+1	7.2768+1	1.3429+1	2.6505–1
	1.3245–2	2.2030–7	3.8731+5	9.8252–5	1.3144+8	7.4582+7	1.6360+7	4.0489+7	6.3641+3	8.3957+1	7.0740+1	1.2947+1	2.6989–1
	1.4123–2	2.3017–7	3.7070+5	1.0892–4	1.2580+8	7.1909+7	1.5515+7	3.8373+7	6.2154+3	8.0563+1	6.7992+1	1.2294+1	2.7710–1
L2	1.4746–2	2.3705–7	3.5994+5	1.1677–4	1.2215+8	7.0162+7	1.4971+7	3.7011+7	6.1172+3	7.8380+1	6.6224+1	1.1874+1	2.8216–1
	1.5000–2	2.3984–7	3.5576+5	1.2003–4	1.2073+8	6.9483+7	1.4762+7	3.6482+7	6.0758+3	7.7540+1	6.5545+1	1.1712+1	2.8391–1
L1	1.5330–2	2.4341–7	3.5054+5	1.2431–4	1.1896+8	6.8628+7	1.4499+7	3.5827+7	6.0234+3	7.6439+1	6.4646+1	1.1507+1	2.8616–1
	1.5625–2	2.4660–7	3.4601+5	1.2820–4	1.1742+8	6.7874+7	1.4273+7	3.5269+7	5.9770+3	7.5484+1	6.3862+1	1.1334+1	2.8804–1
	1.5914–2	2.4970–7	3.4171+5	1.3204–4	1.1596+8	6.7158+7	1.4059+7	3.4741+7	5.9328+3	7.4579+1	6.3120+1	1.1169+1	2.8987–1
	1.6250–2	2.5328–7	3.3687+5	1.3658–4	1.1432+8	6.6349+7	1.3819+7	3.4148+7	5.8827+3	7.3564+1	6.2287+1	1.0985+1	2.9201–1
	1.6719–2	2.5824–7	3.3040+5	1.4302–4	1.1213+8	6.5265+7	1.3498+7	3.3357+7	5.8152+3	7.2211+1	6.1177+1	1.0739+1	2.9497–1
	1.6935–2	2.6052–7	3.2752+5	1.4603–4	1.1115+8	6.4780+7	1.3356+7	3.3006+7	5.7849+3	7.1609+1	6.0684+1	1.0629+1	2.9633–1
	1.8125–2	2.7284–7	3.1272+5	1.6301–4	1.0613+8	6.2282+7	1.2629+7	3.1211+7	5.6278+3	6.8542+1	5.8168+1	1.0071+1	3.0378–1
	1.8359–2	2.7524–7	3.1000+5	1.6644–4	1.0520+8	6.1820+7	1.2496+7	3.0882+7	5.5985+3	6.7981+1	5.7708+1	9.9685+0	3.0523–1
	1.8468–2	2.7634–7	3.0877+5	1.6804–4	1.0478+8	6.1609+7	1.2436+7	3.0733+7	5.5852+3	6.7727+1	5.7499+1	9.9220+0	3.0591–1
	2.0000–2	2.9172–7	2.9249+5	1.9124–4	9.9260+7	5.8829+7	1.1646+7	2.8780+7	5.4075+3	6.4398+1	5.4768+1	9.3148+0	3.1535–1
	2.1250–2	3.0407–7	2.8061+5	2.1104–4	9.5229+7	5.6756+7	1.1083+7	2.7385+7	5.2605+3	6.1847+1	5.2651+1	8.8748+0	3.2092–1
	2.2500–2	3.1617–7	2.6987+5	2.3164–4	9.1583+7	5.4869+7	1.0578+7	2.6131+7	5.1255+3	5.9556+1	5.0750+1	8.4797+0	3.2646–1
	2.3438–2	3.2510–7	2.6245+5	2.4759–4	8.9067+7	5.3559+7	1.0232+7	2.5271+7	5.0312+3	5.7984+1	4.9445+1	8.2087+0	3.3060–1
	2.4375–2	3.3392–7	2.5553+5	2.6396–4	8.6716+7	5.2331+7	9.9094+6	2.4471+7	4.9422+3	5.6523+1	4.8231+1	7.9568+0	3.3472–1
	2.5000–2	3.3973–7	2.5115+5	2.7511–4	8.5233+7	5.1553+7	9.7069+6	2.3969+7	4.8856+3	5.5605+1	4.7469+1	7.7984+0	3.3745–1
	2.6250–2	3.5121–7	2.4295+5	2.9795–4	8.2447+7	5.0086+7	9.3281+6	2.3029+7	4.7784+3	5.3884+1	4.6039+1	7.5025+0	3.4289–1
	2.6719–2	3.5546–7	2.4004+5	3.0670–4	8.1460+7	4.9564+7	9.1944+6	2.2697+7	4.7401+3	5.3277+1	4.5534+1	7.3980+0	3.4492–1
	2.7188–2	3.5969–7	2.3721+5	3.1554–4	8.0502+7	4.9056+7	9.0650+6	2.2376+7	4.7028+3	5.2689+1	4.5045+1	7.2969+0	3.4694–1
	3.0000–2	3.8458–7	2.2186+5	3.7060–4	7.5292+7	4.6281+7	8.3659+6	2.0641+7	4.4969+3	4.9516+1	4.2407+1	6.7509+0	3.5895–1
	3.5000–2	4.2782–7	1.9944+5	4.7674–4	6.7682+7	4.2126+7	7.3960+6	1.8157+7	4.1742+3	4.4781+1	3.8448+1	5.9580+0	3.7503–1

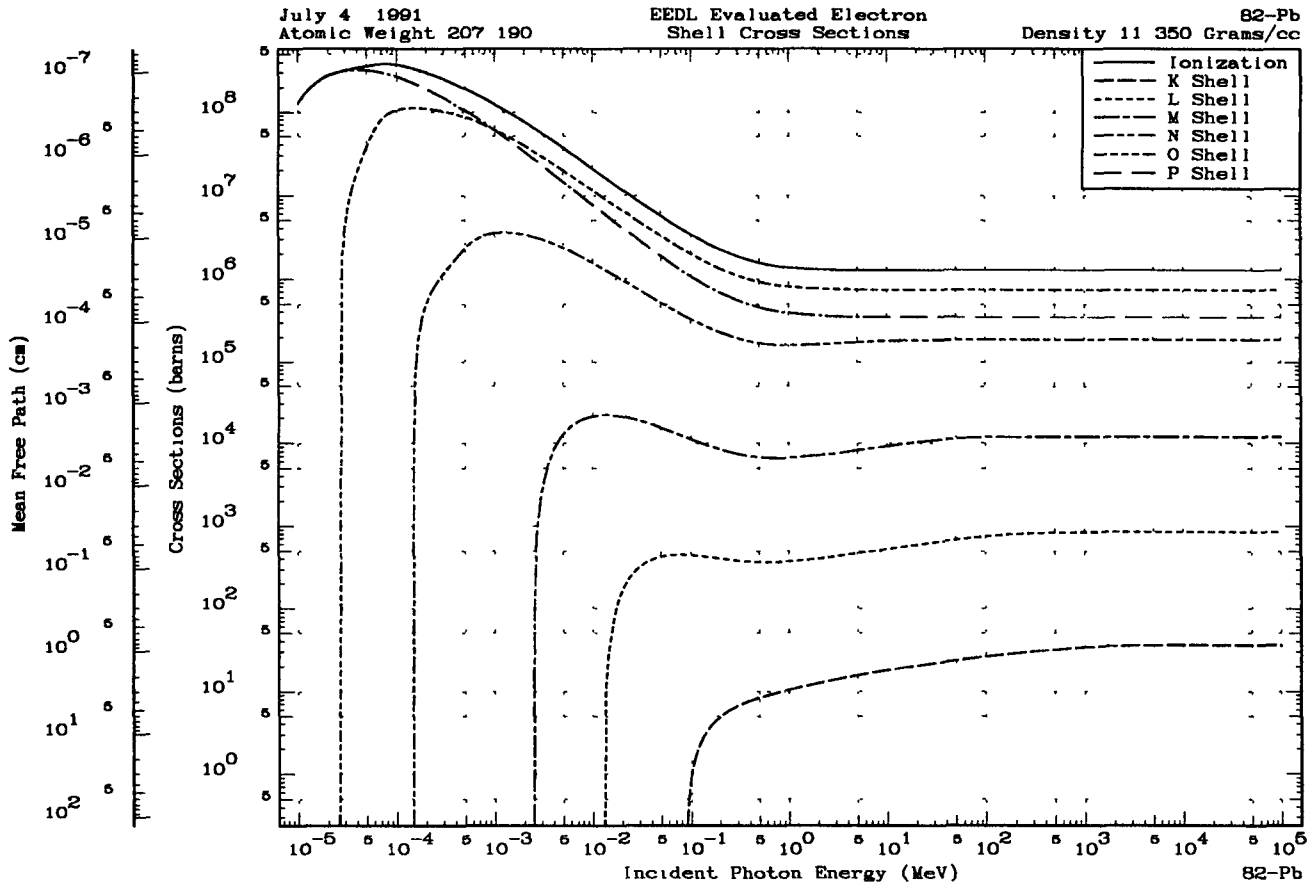
Atomic Weight 204.370 Density 11.720 Grams/cc

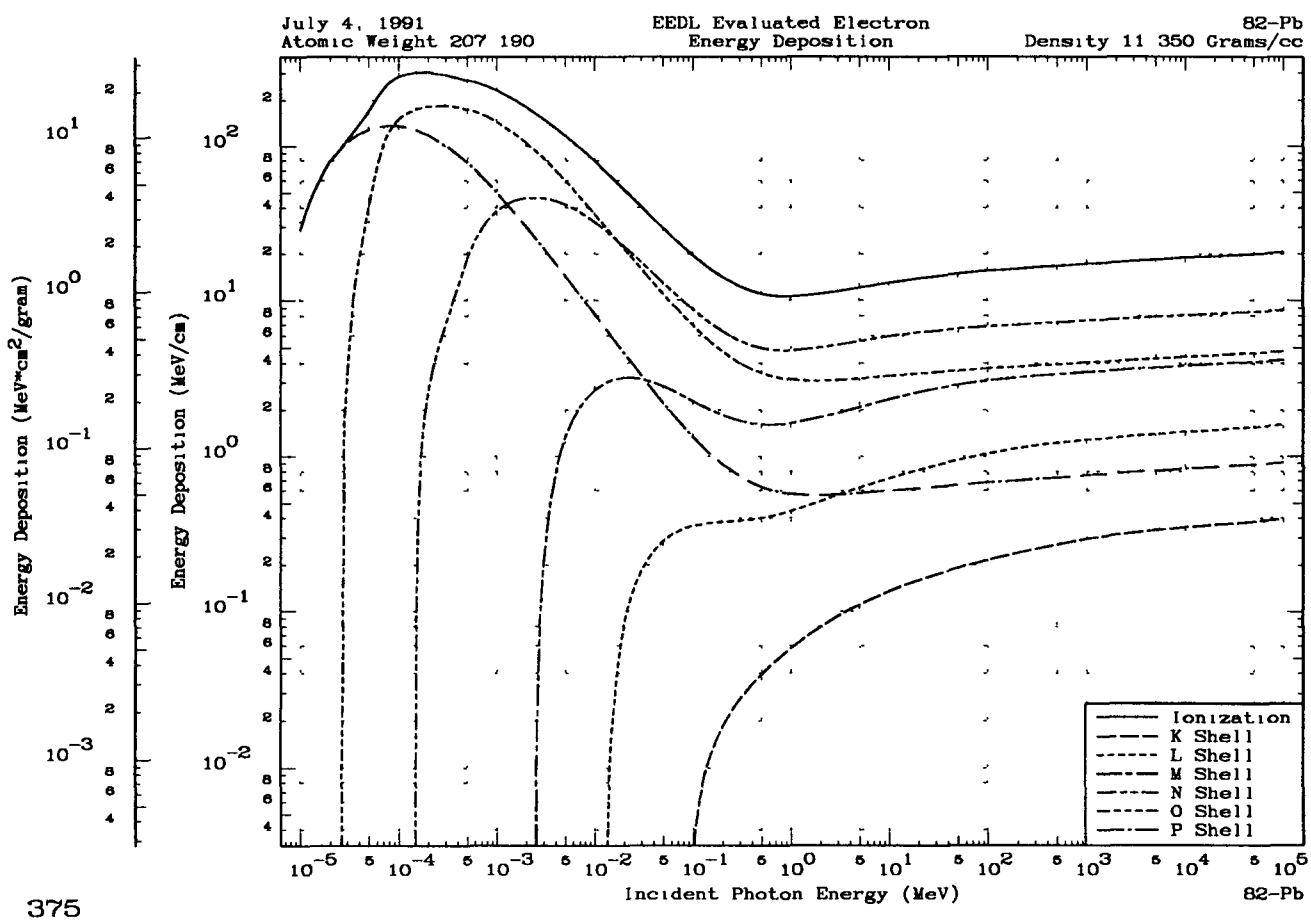
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000–2	4.6909–7	1.8189+5	5.9320–4	6.1729+7	3.8829+7	6.6477+6	1.6248+7	3.9135+3	4.1131+1	3.5391+1	5.3491+0	3.9083–1
5.0000–2	5.4803–7	1.5569+5	8.5405–4	5.2837+7	3.3855+7	5.5862+6	1.3392+7	3.5119+3	3.5671+1	3.0824+1	4.4298+0	4.1696–1
6.0000–2	6.2268–7	1.3703+5	1.1507–3	4.6503+7	3.0268+7	4.8629+6	1.1368+7	3.2194+3	3.1820+1	2.7607+1	3.7740+0	4.3969–1
7.0000–2	6.9244–7	1.2322+5	1.4800–3	4.1817+7	2.7570+7	4.3442+6	9.9002+6	2.9968+3	2.8962+1	2.5207+1	3.2953+0	4.5926–1
8.0000–2	7.5895–7	1.1242+5	1.8392–3	3.8153+7	2.5427+7	3.9400+6	8.7826+6	2.8165+3	2.6747+1	2.3338+1	2.9310+0	4.7859–1
K 8.5798–2	7.9527–7	1.0729+5	2.0604–3	3.6410+7	2.4403+7	3.7534+6	8.2508+6	2.7284+3	2.5686+1	2.2441+1	2.7563+0	4.8855–1
8.6686–2	8.0076–7	1.0655+5	2.0950–3	3.6161+7	2.4256+7	3.7267+6	8.1750+6	2.7158+3	2.5534+1	2.2313+1	2.7314+0	4.9001–1
9.0014–2	8.2117–7	1.0391+5	2.2268–3	3.5262+7	2.3725+7	3.6306+6	7.9034+6	2.6702+3	2.4990+1	2.1852+1	2.6424+0	4.9544–1
9.5007–2	8.5130–7	1.0023+5	2.4297–3	3.4014+7	2.2984+7	3.4973+6	7.5298+6	2.6062+3	2.4236+1	2.1213+1	2.5199+0	5.0357–1
1.0000–1	8.8086–7	9.6865+4	2.6387–3	3.2872+7	2.2303+7	3.3753+6	7.1917+6	2.5468+3	2.3550+1	2.0629+1	2.4092+0	5.1167–1
1.0625–1	9.1392–7	9.3361+4	2.9083–3	3.1683+7	2.1594+7	3.2481+6	6.8388+6	2.4854+3	2.2810+1	1.9998+1	2.2927+0	5.2015–1
1.1719–1	9.6988–7	8.7974+4	3.4001–3	2.9855+7	2.0496+7	3.0525+6	6.3047+6	2.3893+3	2.1680+1	1.9028+1	2.1164+0	5.3505–1
1.3359–1	1.0499–6	8.1271+4	4.1823–3	2.7580+7	1.9114+7	2.8094+6	5.6550+6	2.2665+3	2.0285+1	1.7825+1	1.9022+0	5.5739–1
1.5000–1	1.1258–6	7.5787+4	5.0145–3	2.5719+7	1.7970+7	2.6107+6	5.1367+6	2.1633+3	1.9156+1	1.6846+1	1.7312+0	5.7956–1
1.7500–1	1.2240–6	6.9708+4	6.3636–3	2.3656+7	1.6666+7	2.3962+6	4.5924+6	2.0383+3	1.7917+1	1.5758+1	1.5509+0	6.0830–1
2.0000–1	1.3157–6	6.4849+4	7.7984–3	2.2007+7	1.5613+7	2.2248+6	4.1677+6	1.9359+3	1.6941+1	1.4894+1	1.4104+0	6.3684–1
2.5000–1	1.4759–6	5.7810+4	1.0864–2	1.9619+7	1.3975+7	2.0048+6	3.6369+6	1.7903+3	1.5698+1	1.3776+1	1.2340+0	6.8805–1
3.0000–1	1.6211–6	5.2634+4	1.4143–2	1.7862+7	1.2765+7	1.8413+6	3.2538+6	1.6796+3	1.4802+1	1.2956+1	1.1070+0	7.3844–1
4.0000–1	1.8814–6	4.5352+4	2.1127–2	1.5391+7	1.0957+7	1.6541+6	2.7778+6	1.5404+3	1.3846+1	1.2060+1	9.4840–1	8.3762–1
5.0000–1	2.1108–6	4.0422+4	2.8473–2	1.3718+7	9.6780+6	1.5458+6	2.4926+6	1.4568+3	1.3383+1	1.1593+1	8.5326–1	9.3696–1
6.0000–1	2.3205–6	3.6770+4	3.6013–2	1.2479+7	8.7192+6	1.4765+6	2.2815+6	1.4044+3	1.3145+1	1.1322+1	7.8264–1	1.0404+0
8.0000–1	2.6731–6	3.1920+4	5.1277–2	1.0833+7	7.3936+6	1.3953+6	2.0423+6	1.3448+3	1.3060+1	1.1104+1	7.0286–1	1.2530+0
1.0000+0	2.9733–6	2.8697+4	6.6522–2	9.7388+6	6.5011+6	1.3513+6	1.8851+6	1.3129+3	1.3179+1	1.1056+1	6.5030–1	1.4731+0
1.5000+0	3.5393–6	2.4107+4	1.0344–1	8.1812+6	5.1598+6	1.3043+6	1.7158+6	1.2788+3	1.3917+1	1.1273+1	5.9421–1	2.0500+0
2.0000+0	3.9552–6	2.1573+4	1.3836–1	7.3210+6	4.4042+6	1.2905+6	1.6250+6	1.2676+3	1.4728+1	1.1506+1	5.6396–1	2.6583+0
3.0000+0	4.5188–6	1.8882+4	2.0266–1	6.4078+6	3.5827+6	1.2725+6	1.5514+6	1.2630+3	1.6405+1	1.1934+1	5.4079–1	3.9297+0
4.0000+0	4.8742–6	1.7505+4	2.6069–1	5.9406+6	3.1355+6	1.2713+6	1.5326+6	1.2665+3	1.8087+1	1.2297+1	5.3485–1	5.2560+0
5.0000+0	5.1285–6	1.6637+4	3.1359–1	5.6461+6	2.8563+6	1.2707+6	1.5178+6	1.2711+3	1.9745+1	1.2603+1	5.3032–1	6.6120+0
6.0000+0	5.3138–6	1.6057+4	3.6222–1	5.4492+6	2.6724+6	1.2701+6	1.5055+6	1.2770+3	2.1399+1	1.2839+1	5.2663–1	8.0332+0
8.0000+0	5.5703–6	1.5318+4	4.4921–1	5.1983+6	2.4369+6	1.2696+6	1.4905+6	1.2862+3	2.4660+1	1.3244+1	5.2265–1	1.0893+1
1.0000+1	5.7195–6	1.4918+4	5.2526–1	5.0627+6	2.3046+6	1.2713+6	1.4855+6	1.2962+3	2.8007+1	1.3578+1	5.2214–1	1.3906+1
1.5000+1	5.8776–6	1.4517+4	6.8207–1	4.9265+6	2.1667+6	1.2735+6	1.4850+6	1.3144+3	3.6108+1	1.4059+1	5.2214–1	2.1527+1
2.0000+1	5.9115–6	1.4434+4	8.0663–1	4.8982+6	2.1372+6	1.2752+6	1.4845+6	1.3311+3	4.4462+1	1.4453+1	5.2214–1	2.9486+1
3.0000+1	5.9106–6	1.4436+4	9.9747–1	4.8990+6	2.1382+6	1.2759+6	1.4835+6	1.3567+3	6.1234+1	1.4891+1	5.2214–1	4.5821+1
4.0000+1	5.9004–6	1.4461+4	1.1415+0	4.9074+6	2.1370+6	1.2767+6	1.4923+6	1.3763+3	7.8288+1	1.5198+1	5.2559–1	6.2564+1
5.0000+1	5.8929–6	1.4479+4	1.2570+0	4.9137+6	2.1361+6	1.2773+6	1.4990+6	1.3931+3	9.5538+1	1.5447+1	5.2828–1	7.9563+1
6.0000+1	5.8870–6	1.4494+4	1.3531+0	4.9187+6	2.1353+6	1.2776+6	1.5043+6	1.4069+3	1.1295+2	1.5643+1	5.3050–1	9.6773+1
8.0000+1	5.8863–6	1.4495+4	1.5073+0	4.9192+6	2.1341+6	1.2779+6	1.5057+6	1.4288+3	1.4814+2	1.5922+1	5.3170–1	1.3169+2
1.0000+2	5.8869–6	1.4494+4	1.6283+0	4.9187+6	2.1332+6	1.2781+6	1.5059+6	1.4461+3	1.8359+2	1.6169+1	5.3247–1	1.6689+2
1.5000+2	5.8877–6	1.4492+4	1.8503+0	4.9181+6	2.1316+6	1.2783+6	1.5067+6	1.4769+3	2.7281+2	1.6428+1	5.3278–1	2.5585+2
2.0000+2	5.8768–6	1.4519+4	2.0087+0	4.9272+6	2.1304+6	1.2784+6	1.5170+6	1.4953+3	3.6267+2	1.6666+1	5.3640–1	3.4547+2
3.0000+2	5.8659–6	1.4546+4	2.2328+0	4.9363+6	2.1287+6	1.2785+6	1.5276+6	1.5198+3	5.4192+2	1.7043+1	5.4020–1	5.2434+2
4.0000+2	5.8632–6	1.4553+4	2.3921+0	4.9386+6	2.1275+6	1.2785+6	1.5310+6	1.5373+3	7.2141+2	1.7280+1	5.4145–1	7.0359+2
5.0000+2	5.8670–6	1.4543+4	2.5158+0	4.9354+6	2.1266+6	1.2786+6	1.5287+6	1.5509+3	9.0219+2	1.7425+1	5.4065–1	8.8422+2
6.0000+2	5.8648–6	1.4548+4	2.6170+0	4.9372+6	2.1259+6	1.2786+6	1.5312+6	1.5621+3	1.0811+3	1.7562+1	5.4158–1	1.0629+3
8.0000+2	5.8646–6	1.4549+4	2.7766+0	4.9374+6	2.1247+6	1.2786+6	1.5326+6	1.5800+3	1.4421+3	1.7813+1	5.4213–1	1.4237+3
1.0000+3	5.8653–6	1.4547+4	2.9004+0	4.9369+6	2.1238+6	1.2786+6	1.5329+6	1.5941+3	1.8028+3	1.8020+1	5.4230–1	1.7842+3
1.5000+3	5.8679–6	1.4541+4	3.1250+0	4.9347+6	2.1221+6	1.2786+6	1.5323+6	1.6203+3	2.7096+3	1.8212+1	5.4210–1	2.6909+3
2.0000+3	5.8728–6	1.4529+4	3.2843+0	4.9306+6	2.1210+6	1.2786+6	1.5294+6	1.6398+3	3.6117+3	1.8402+1	5.4106–1	3.5928+3
3.0000+3	5.8783–6	1.4515+4	3.5088+0	4.9259+6	2.1193+6	1.2786+6	1.5263+6	1.6681+3	5.4186+3	1.8770+1	5.3999–1	5.3993+3
4.0000+3	5.8841–6	1.4501+4	3.6681+0	4.9211+6	2.1181+6	1.2786+6	1.5226+6	1.6887+3	7.2258+3	1.8956+1	5.3868–1	7.2063+3
5.0000+3	5.8931–6	1.4479+4	3.7915+0	4.9135+6	2.1172+6	1.2786+6	1.5160+6	1.7049+3	9.0519+3	1.9113+1	5.3633–1	9.0323+3
6.0000+3	5.8940–6	1.4476+4	3.8923+0	4.9128+6	2.1165+6	1.2786+6	1.5160+6	1.7167+3	1.0848+4	1.9235+1	5.3633–1	1.0828+4
8.0000+3	5.8976–6	1.4468+4	4.0513+0	4.9098+6	2.1153+6	1.2786+6	1.5141+6	1.7355+3	1.4472+4	1.9477+1	5.3568–1	1.4452+4
1.0000+4	5.9003–6	1.4461+4	4.1745+0	4.9075+6	2.1144+6	1.2786+6	1.5128+6	1.7502+3	1.8129+4	1.9690+1	5.3519–1	1.8109+4
1.5000+4	5.9053–6	1.4449+4	4.3986+0	4.9034+6	2.1128+6	1.2786+6	1.5102+6	1.7785+3	2.7103+4	1.9871+1	5.3429–1	2.7083+4
2.0000+4	5.9094–6	1.4439+4	4.5577+0	4.9000+6	2.1116+6	1.2786+6	1.5080+6	1.7989+3	3.6194+4	2.0052+1	5.3350–1	3.6173+4
3.0000+4	5.9135–6	1.4429+4	4.7820+0	4.8966+6	2.1100+6	1.2786+6	1.5062+6	1.8274+3	5.4169+4	2.0406+1	5.3288–1	5.4148+4
4.0000+4	5.9175–6	1.4419+4	4.9412+0	4.8933+6	2.1088+6	1.2786+6	1.5041+6	1.8480+3	7.2337+4	2.0615+1	5.3212–1	7.2316+4
5.0000+4	5.9248–6	1.4401+4	5.0646+0	4.8872+6	2.1079+6	1.2786+6	1.4989+6	1.8637+3	9.0337+4	2.0766+1	5.3029–1	9.0316+4
6.0000+4	5.9249–6	1.4401+4	5.1656+0	4.8872+6	2.1072+6	1.2786+6	1.4996+6	1.8766+3	1.0832+5	2.0885+1	5.3053–1	1.0830+5
8.0000+4	5.9270–6	1.4396+4	5.3248+0	4.8855+6	2.1060+6	1.2786+6	1.4990+6	1.8971+3	1.4461+5	2.1118+1	5.3032–1	1.4458+5
1.0000+5	5.9290–6	1.4391+4	5.4482+0	4.8838+6	2.1051+6	1.2786+6	1.4982+6	1.9130+3	1.8095+5	2.1337+1	5.3005–1	1.8093+5


July 4 1991
Atomic Weight 207 190
EEDL Evaluated Electron
Cross Sections
82-Pb
Density 11 350 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
82-Pb


July 4 1991
Atomic Weight 207 190
EEDL Evaluated Electron
Energy Deposition
82-Pb
Density 11 350 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
82-Pb

374


July 4 1991
Atomic Weight 207 190
EEDL Evaluated Electron
Shell Cross Sections
82-Pb
Density 11 350 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
82-Pb


July 4, 1991
Atomic Weight 207 190
EEDL Evaluated Electron
Energy Deposition
82-Pb
Density 11 350 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
82-Pb

Atomic Weight 207.190 — Density 11.350 Grams/cc

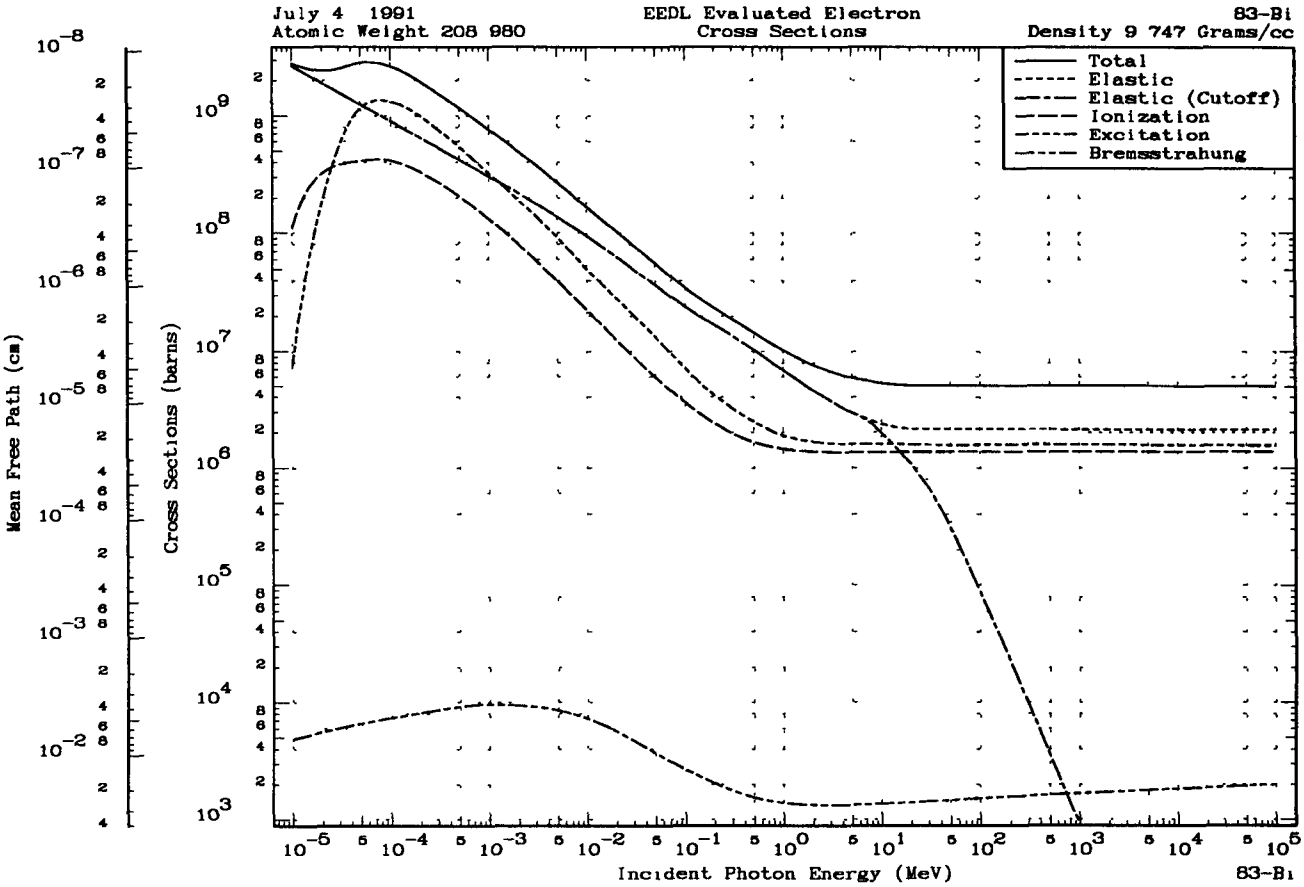
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.1530–8	7.6415+6		2.6291+9	2.4892+9	1.3105+8	8.7576+6	4.8698+3	3.0566+1	2.8746+1	1.8192+0	3.4726–4
	1.1250–5	1.1970–8	7.3605+6		2.5324+9	2.3554+9	1.5994+8	1.7004+7	4.9880+3	4.0245+1	3.6602+1	3.6421+0	3.8930–4
	1.3125–5	1.2532–8	7.0305+6		2.4188+9	2.1910+9	1.9615+8	3.1631+7	5.1470+3	5.4647+1	4.7565+1	7.0812+0	4.5375–4
	1.5000–5	1.2997–8	6.7787+6		2.3322+9	2.0580+9	2.2467+8	4.9563+7	5.2889+3	6.8729+1	5.7153+1	1.1575+1	5.1972–4
P1	1.5050–5	1.3009–8	6.7727+6		2.3301+9	2.0548+9	2.2523+8	5.0128+7	5.2925+3	6.9075+1	5.7357+1	1.1717+1	5.2150–4
	1.5205–5	1.3043–8	6.7550+6		2.3240+9	2.0449+9	2.2724+8	5.1871+7	5.3035+3	7.0271+1	5.8121+1	1.2150+1	5.2701–4
	1.5504–5	1.3107–8	6.7222+6		2.3128+9	2.0263+9	2.3110+8	5.5369+7	5.3246+3	7.2620+1	5.9599+1	1.3020+1	5.3771–4
	1.6628–5	1.3318–8	6.6157+6		2.2761+9	1.9608+9	2.4534+8	6.9964+7	5.4010+3	8.1859+1	6.5162+1	1.6695+1	5.7815–4
	1.7500–5	1.3452–8	6.5495+6		2.2533+9	1.9144+9	2.5598+8	8.2995+7	5.4575+3	8.9451+1	6.9422+1	2.0029+1	6.0985–4
	1.8314–5	1.3575–8	6.4905+6		2.2330+9	1.8740+9	2.6344+8	9.5642+7	5.5083+3	9.6176+1	7.2854+1	2.3322+1	6.3969–4
	2.0000–5	1.3767–8	6.3998+6		2.2018+9	1.7981+9	2.7787+8	1.2587+8	5.6079+3	1.1107+2	7.9721+1	3.1350+1	7.0224–4
	2.2500–5	1.3971–8	6.3061+6		2.1696+9	1.7014+9	2.9074+8	1.7745+8	5.7297+3	1.3200+2	8.7085+1	4.4916+1	7.8934–4
	2.5000–5	1.4015–8	6.2867+6		2.1629+9	1.6193+9	3.0232+8	2.4125+8	5.8409+3	1.5626+2	9.4213+1	6.2047+1	8.7790–4
O5	2.6030–5	1.4008–8	6.2895+6		2.1639+9	1.5890+9	3.0698+8	2.6792+8	5.8841+3	1.6657+2	9.7213+1	6.9357+1	9.1479–4
	2.8015–5	1.3945–8	6.3181+6		2.1737+9	1.5351+9	3.1452+8	3.2412+8	5.9620+3	1.8782+2	1.0328+2	8.4540+1	9.8565–4
O4	2.8810–5	1.3900–8	6.3385+6		2.1807+9	1.5151+9	3.1718+8	3.4849+8	5.9919+3	1.9664+2	1.0547+2	9.1170+1	1.0143–3
	3.0000–5	1.3837–8	6.3672+6		2.1906+9	1.4866+9	3.2182+8	3.8222+8	6.0355+3	2.0991+2	1.0947+2	1.0044+2	1.0573–3
	3.2500–5	1.3677–8	6.4420+6		2.2163+9	1.4319+9	3.2784+8	4.5663+8	6.1226+3	2.3722+2	1.1655+2	1.2067+2	1.1485–3
	3.5000–5	1.3440–8	6.5555+6		2.2554+9	1.3830+9	3.3398+8	5.3838+8	6.2044+3	2.6712+2	1.2406+2	1.4306+2	1.2409–3
	3.6250–5	1.3337–8	6.6060+6		2.2728+9	1.3605+9	3.3686+8	5.7542+8	6.2435+3	2.8108+2	1.2776+2	1.5332+2	1.2874–3
	3.7500–5	1.3223–8	6.6629+6		2.2924+9	1.3390+9	3.3969+8	6.1362+8	6.2815+3	2.9544+2	1.3149+2	1.6395+2	1.3342–3
	4.0000–5	1.2963–8	6.7964+6		2.3383+9	1.2992+9	3.4563+8	6.9348+8	6.3545+3	3.2570+2	1.3940+2	1.8630+2	1.4286–3
	4.2500–5	1.2778–8	6.8952+6		2.3723+9	1.2628+9	3.4876+8	7.6069+8	6.4192+3	3.5113+2	1.4619+2	2.0493+2	1.5201–3
	4.6250–5	1.2455–8	7.0739+6		2.4338+9	1.2138+9	3.5454+8	8.6544+8	6.5104+3	3.9188+2	1.5775+2	2.3413+2	1.6588–3
	5.0000–5	1.2232–8	7.2026+6		2.4780+9	1.1703+9	3.6142+8	9.4634+8	6.5957+3	4.2802+2	1.7093+2	2.5709+2	1.7991–3
	5.5000–5	1.1974–8	7.3582+6		2.5316+9	1.1192+9	3.6789+8	1.0445+9	6.6978+3	4.7320+2	1.8770+2	2.8549+2	1.9851–3
	6.0000–5	1.1901–8	7.4030+6		2.5470+9	1.0745+9	3.7565+8	1.0968+9	6.7923+3	5.0804+2	2.0642+2	3.0162+2	2.1735–3
	6.5000–5	1.1852–8	7.4341+6		2.5577+9	1.0350+9	3.8002+8	1.1427+9	6.8805+3	5.3790+2	2.2277+2	3.1513+2	2.3642–3
	7.2500–5	1.1990–8	7.3484+6		2.5282+9	9.8343+8	3.8410+8	1.1607+9	7.0026+3	5.6506+2	2.4360+2	3.2146+2	2.6542–3
	8.0000–5	1.2114–8	7.2727+6		2.5022+9	9.3913+8	3.8590+8	1.1771+9	7.1146+3	5.8796+2	2.6056+2	3.2740+2	2.9487–3
O3	8.7640–5	1.2387–8	7.1126+6		2.4471+9	8.9987+8	3.8288+8	1.1643+9	7.2199+3	5.9704+2	2.7162+2	3.2542+2	3.2528–3
	8.9185–5	1.2442–8	7.0811+6		2.4363+9	8.9254+8	3.8208+8	1.1616+9	7.2388+3	5.9847+2	2.7345+2	3.2502+2	3.3142–3
	9.1889–5	1.2536–8	7.0280+6		2.4180+9	8.8015+8	3.8076+8	1.1570+9	7.2712+3	6.0102+2	2.7666+2	3.2435+2	3.4219–3
	9.5944–5	1.2673–8	6.9524+6		2.3920+9	8.6253+8	3.7896+8	1.1505+9	7.3184+3	6.0496+2	2.8154+2	3.2342+2	3.5844–3
	1.0000–4	1.2804–8	6.8814+6	0.0000+0	2.3675+9	8.4597+8	3.7734+8	1.1442+9	7.3639+3	6.0905+2	2.8647+2	3.2257+2	3.7478–3
O2	1.1091–4	1.3184–8	6.6830+6	1.7890–8	2.2993+9	8.0611+8	3.6838+8	1.1248+9	7.4776+3	6.1061+2	2.9218+2	3.1842+2	4.1911–3
	1.1213–4	1.3232–8	6.6584+6	1.9892–8	2.2908+9	8.0200+8	3.6731+8	1.1215+9	7.4897+3	6.1023+2	2.9259+2	3.1763+2	4.2411–3
	1.1450–4	1.3325–8	6.6119+6	2.3771–8	2.2748+9	7.9424+8	3.6530+8	1.1152+9	7.5129+3	6.0955+2	2.9341+2	3.1614+2	4.3382–3
	1.1894–4	1.3496–8	6.5282+6	3.1059–8	2.2460+9	7.8028+8	3.6171+8	1.1040+9	7.5553+3	6.0846+2	2.9501+2	3.1344+2	4.5211–3
	1.2282–4	1.3642–8	6.4586+6	3.7444–8	2.2220+9	7.6869+8	3.5876+8	1.0946+9	7.5913+3	6.0770+2	2.9649+2	3.1120+2	4.6820–3
	1.2500–4	1.3722–8	6.4208+6	4.1034–8	2.2091+9	7.6240+8	3.5717+8	1.0895+9	7.6111+3	6.0734+2	2.9735+2	3.0998+2	4.7726–3
	1.2961–4	1.3891–8	6.3425+6	4.8640–8	2.1821+9	7.4963+8	3.5348+8	1.0790+9	7.6520+3	6.0598+2	2.9847+2	3.0751+2	4.9651–3
	1.3750–4	1.4171–8	6.2173+6	6.1674–8	2.1391+9	7.2928+8	3.4763+8	1.0621+9	7.7192+3	6.0406+2	3.0051+2	3.0355+2	5.2963–3
N7	1.4781–4	1.4520–8	6.0681+6	7.8768–8	2.0877+9	7.0511+8	3.4072+8	1.0419+9	7.8022+3	6.0225+2	3.0340+2	2.9884+2	5.7334–3
	1.5000–4	1.4598–8	6.0357+6	8.2406–8	2.0766+9	7.0029+8	3.3925+8	1.0370+9	7.8192+3	6.0158+2	3.0390+2	2.9767+2	5.8268–3
O1	1.5283–4	1.4713–8	5.9882+6	8.7120–8	2.0602+9	6.9422+8	3.3680+8	1.0292+9	7.8409+3	5.9922+2	3.0362+2	2.9559+2	5.9477–3
N6	1.5304–4	1.4722–8	5.9847+6	8.7470–8	2.0590+9	6.9377+8	3.3663+8	1.0286+9	7.8425+3	5.9906+2	3.0361+2	2.9545+2	5.9567–3
	1.5578–4	1.4833–8	5.9399+6	9.2048–8	2.0436+9	6.8806+8	3.3436+8	1.0212+9	7.8624+3	5.9703+2	3.0352+2	2.9350+2	6.0757–3
	1.5597–4	1.4841–8	5.9368+6	9.2378–8	2.0425+9	6.8766+8	3.3420+8	1.0207+9	7.8638+3	5.9689+2	3.0352+2	2.9337+2	6.0843–3
	1.5625–4	1.4852–8	5.9323+6	9.2839–8	2.0410+9	6.8709+8	3.3398+8	1.0199+9	7.8658+3	5.9669+2	3.0351+2	2.9317+2	6.0963–3
	1.6131–4	1.5053–8	5.8529+6	1.0134–7	2.0137+9	6.7697+8	3.2995+8	1.0067+9	7.9017+3	5.9305+2	3.0332+2	2.8973+2	6.3168–3
	1.6614–4	1.5243–8	5.7803+6	1.0952–7	1.9887+9	6.6771+8	3.2631+8	9.9465+8	7.9351+3	5.8993+2	3.0334+2	2.8658+2	6.5287–3
	1.6698–4	1.5275–8	5.7680+6	1.1094–7	1.9845+9	6.6615+8	3.2570+8	9.9261+8	7.9408+3	5.8942+2	3.0336+2	2.8605+2	6.5655–3
	1.6719–4	1.5283–8	5.7650+6	1.1129–7	1.9834+9	6.6576+8	3.2555+8	9.9211+8	7.9422+3	5.8929+2	3.0336+2	2.8592+2	6.5746–3
	1.7461–4	1.5566–8	5.6602+6	1.2393–7	1.9474+9	6.5242+8	3.2030+8	9.7465+8	7.9917+3	5.8482+2	3.0342+2	2.8139+2	6.9015–3
	1.7500–4	1.5581–8	5.6548+6	1.2460–7	1.9455+9	6.5174+8	3.2003+8	9.7376+8	7.9943+3	5.8460+2	3.0343+2	2.8116+2	6.9189–3
	1.8349–4	1.5895–8	5.5430+6	1.3918–7	1.9070+9	6.3751+8	3.1445+8	9.5508+8	8.0486+3	5.8002+2	3.0370+2	2.7632+2	7.2956–3
	1.8359–4	1.5899–8	5.5417+6	1.3936–7	1.9066+9	6.3734+8	3.1438+8	9.5486+8	8.0492+3	5.7997+2	3.0370+2	2.7626+2	7.3002–3
	1.8730–4	1.6033–8	5.4951+6	1.4576–7	1.8906+9	6.3142+8	3.1206+8	9.4708+8	8.0723+3	5.7809+2	3.0383+2	2.7425+2	7.4655–3
	2.0000–4	1.6482–8	5.3455+6	1.6784–7	1.8391+9	6.1241+8	3.0466+8	9.2203+8	8.1483+3	5.7238+2	3.0457+2	2.6780+2	8.0349–3
	2.2500–4	1.7495–8	5.0360+6	2.1230–7	1.7326+9	5.7970+8	2.8847+8	8.6443+8	8.2749+3	5.5231+2	3.0024+2	2.5207+2	9.2009–3
	2.6250–4	1.8912–8	4.6587+6	2.8166–7	1.6028+9	5.3951+8	2.6886+8	7.9444+8	8.4436+3	5.2908+2	2.9604+2	2.3303+2	1.0982–2
	3.0000–4	2.0228–8	4.3557+6	3.5373–7	1.4986+9	5.0695+8	2.5320+8	7.3842+8	8.5925+3	5.1170+2	2.9382+2	2.1787+2	1.2797–2
	3.5000–4	2.1976–8	4.0092+6	4.5398–7	1.3794+9	4.7199+8	2.3341+8	6.7396+8	8.7634+3	4.8605+2	2.8612+2	1.9991+2	1.5281–2
	4.0000–4	2.3605–8	3.7325+6	5.5889–7	1.2842+9	4.4366+8	2.1779+8	6.2268+8	8.9142+3	4.6726+2	2.8156+2	1.8568+2	1.7811–2
N5	4.1249–4	2.4001–8	3.6709+6	5.8577–7	1.2630+9	4.3739+8	2.1394+8	6.1164+8	8.9444+3	4.6213+2	2.7957+2	1.8254+2	1.8470–2
	4.1796–4	2.4183–8	3.6432+6	5.9763–7	1.2534+9	4.3473+8	2.1231+8	6.0639+8	8.9573+3	4.5985+2	2.7878+2	1.8105+2	1.8760–2
	4.2821–4	2.4523–8	3.5928+6	6.2003–7	1.2361+9	4.2988+8	2.0936+8	5.9685+8	8.9812+3	4.5574+2	2.7739+2	1.7833+2	1.9303–2
N4	4.3523–4	2.4753–8	3.5594+6	6.3547–7	1.2246+9	4.2666+8	2.0741+8	5.9054+8	8.9972+3	4.5305+2	2.7649+2	1.7654+2	1.9676–2
	4.4333–4	2.5028–8	3.5202+6	6.5341–7	1.2111+9	4.2304+8	2.0522+8	5.8286+8	9.0155+3	4.4993+2	2.7555+2	1.7436+2	2.0107–2
	4.4616–4	2.5124–8	3.5068+6	6.5972–7	1.2065+9	4.2179+8	2.0447+8	5.8023+8	9.0218+3	4.4887+2	2.7524+2	1.7361+2	2.0258–2
	4.5750–4	2.5506–8	3.4544+6	6.8508–7	1.1885+9	4.1692+8	2.0156+8	5.6999+8	9.0466+3	4.4477+2	2.7404+2	1.7071+2	2.0864–2
	4.7308–4	2.6023–8	3.3857+6	7.2033–7	1.1648+9	4.1050+8	1.9774+8	5.5659+8	9.0800+3	4.3952+2	2.7259+2	1.6691+2	2.1699–2
	4.7875–4	2.6209–8	3.3616+6	7.3325–7	1.1566+9	4.0824+8	1.9640+8	5.5190+8	9.0918+3	4.3771+2	2.7210+2	1.6558+2	2.2004–2
	5.0000–4	2.6899–8	3.2754+6	7.8216–7	1.1269+9	4.0012+8	1.9163+8	5.3514+8	9.1353+3	4.3138+2	2.7052+2	1.6084+2	2.3150–2
	5.5000–4	2.8474–8	3.0943+6	9.0002–7	1.0646+9	3.8284+8	1.8127+8	5.0045+8	9.2233+3	4.1718+2	2.6627+2	1.5088+2	2.5856–2
	6.0000–4	2.9986–8	2.9382+6	1.0215–6	1.0109+9	3.6773+8	1.7240+8	4.7074+8	9.3044+3	4.0578+2	2.6338+2	1.4237+2	2.8589–2
N3	6.3430–4	3.1003–8	2.8419+6	1.1070–6	9.7773+8	3.5838+8	1.6648+8	4.5286+8	9.3509+3	3.9698+2	2.5977+2	1.3718+2	3.0467–2
	6.4466–4	3.1306–8	2.8143+6	1.1332–6	9.6826+8	3.5571+8	1.6479+8	4.4775+8	9.3615+3	3.9447+2	2.5873+2	1.3571+2	3.1017–2
	6.6407–4	3.1869–8	2.7646+6	1.1827–6	9.5115+8	3.5085+8	1.6174+8	4.3855+8	9.3809+3	3.8998+2	2.5690+2	1.3304+2	3.2049–2

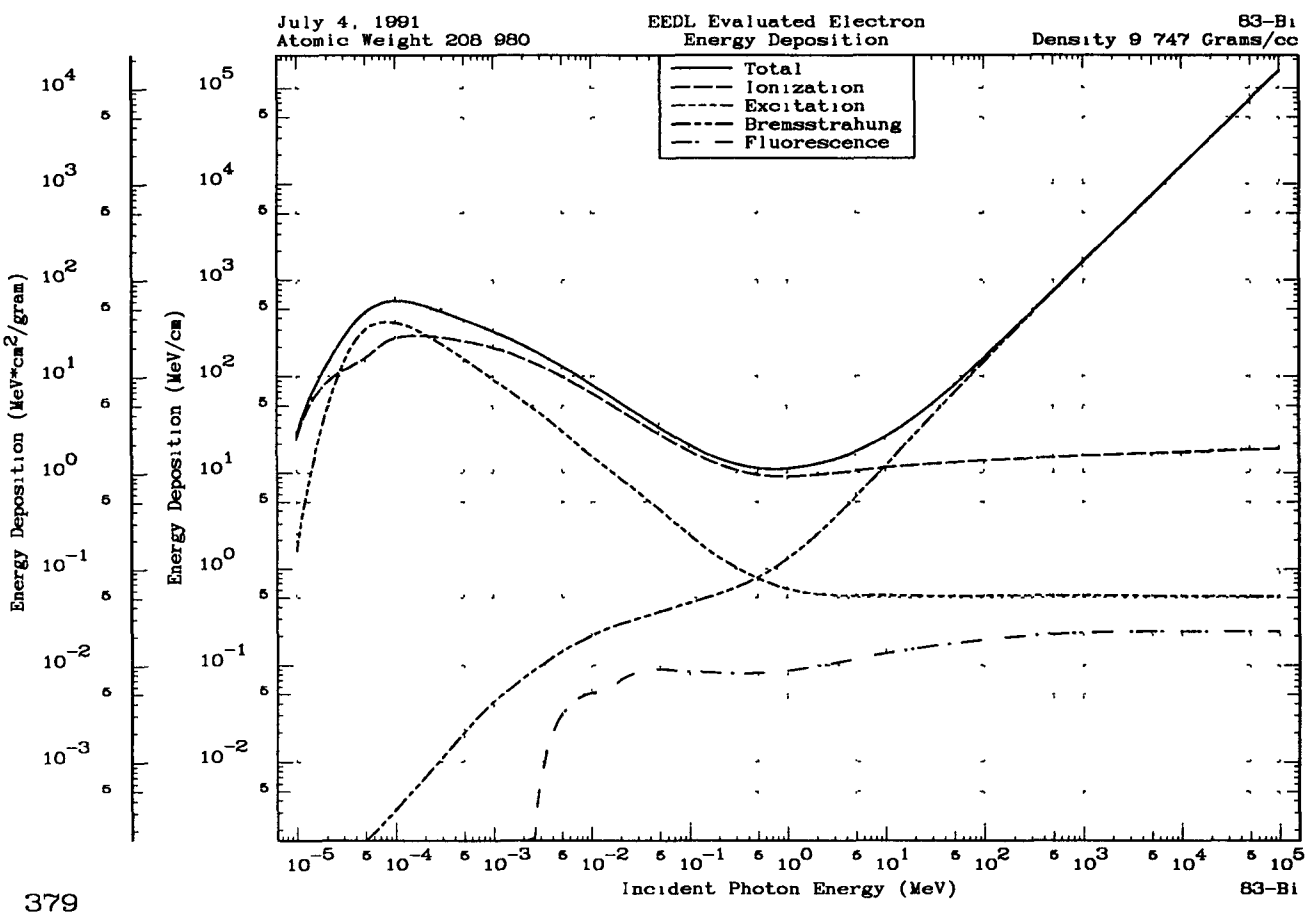
Atomic Weight 207.190 — Density 11.350 Grams/cc

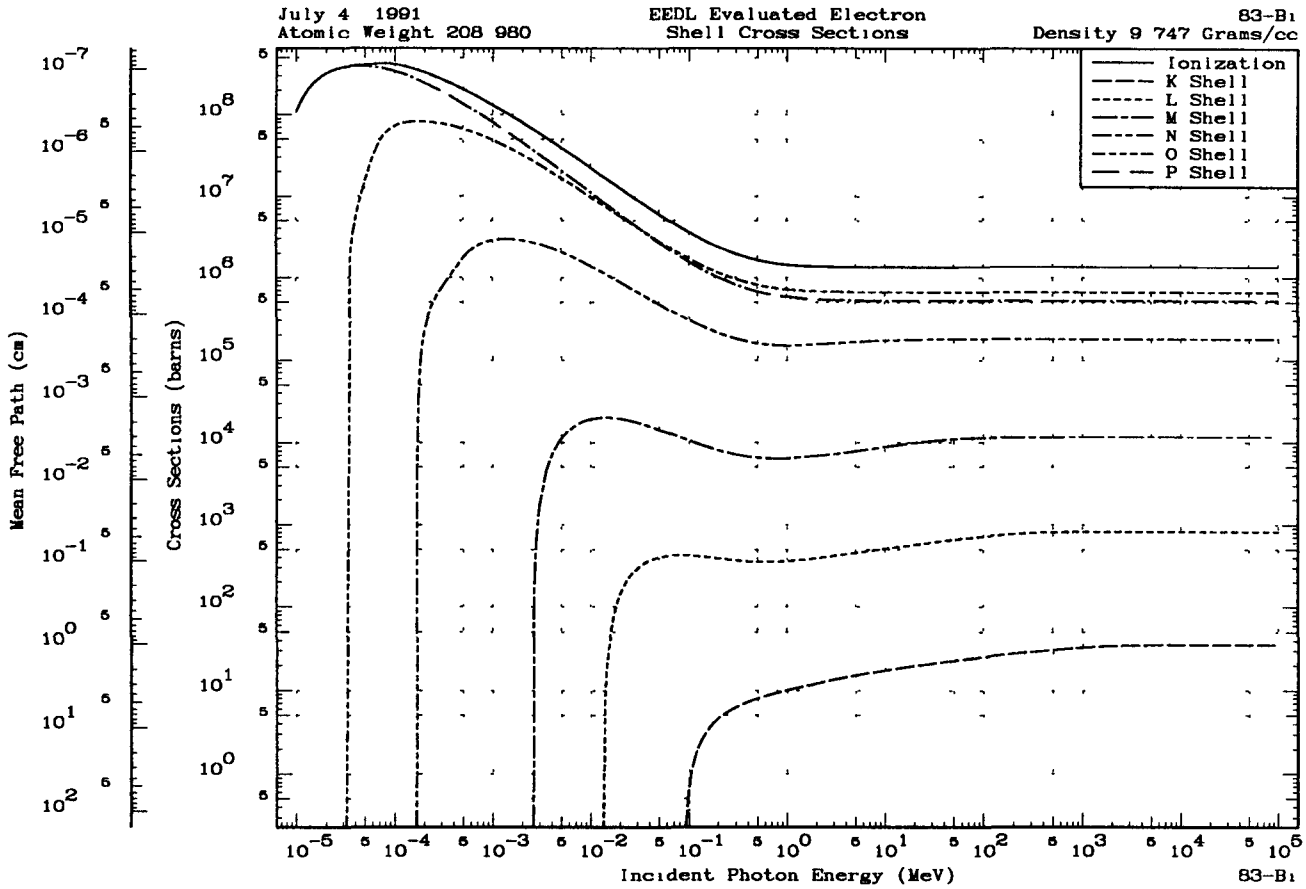
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.9806–4	3.2838–8	2.6831+6	1.2706–6	9.2310+8	3.4284+8	1.5675+8	4.2350+8	9.4138+3	3.8279+2	2.5406+2	1.2869+2	3.3861–2
	7.0000–4	3.2893–8	2.6786+6	1.2757–6	9.2156+8	3.4240+8	1.5648+8	4.2267+8	9.4156+3	3.8240+2	2.5392+2	1.2845+2	3.3965–2
	7.2354–4	3.3551–8	2.6260+6	1.3376–6	9.0348+8	3.3720+8	1.5327+8	4.1300+8	9.4374+3	3.7786+2	2.5217+2	1.2565+2	3.5224–2
N2	7.5602–4	3.4444–8	2.5580+6	1.4243–6	8.8006+8	3.3041+8	1.4914+8	4.0050+8	9.4665+3	3.7212+2	2.5004+2	1.2204+2	3.6967–2
	7.6177–4	3.4601–8	2.5464+6	1.4397–6	8.7607+8	3.2925+8	1.4843+8	3.9838+8	9.4707+3	3.7112+2	2.4965+2	1.2143+2	3.7267–2
	7.6701–4	3.4743–8	2.5359+6	1.4539–6	8.7248+8	3.2821+8	1.4779+8	3.9647+8	9.4744+3	3.7021+2	2.4930+2	1.2088+2	3.7542–2
	7.8351–4	3.5188–8	2.5038+6	1.4986–6	8.6143+8	3.2499+8	1.4583+8	3.9061+8	9.4862+3	3.6747+2	2.4825+2	1.1918+2	3.8406–2
	8.0000–4	3.5630–8	2.4728+6	1.5436–6	8.5076+8	3.2187+8	1.4393+8	3.8495+8	9.4976+3	3.6486+2	2.4727+2	1.1754+2	3.9271–2
	8.5000–4	3.6959–8	2.3839+6	1.6824–6	8.2017+8	3.1296+8	1.3824+8	3.6896+8	9.5060+3	3.5573+2	2.4285+2	1.1284+2	4.1572–2
N1	8.7672–4	3.7656–8	2.3398+6	1.7580–6	8.0499+8	3.0851+8	1.3542+8	3.6105+8	9.5102+3	3.5130+2	2.4074+2	1.1052+2	4.2803–2
	8.9213–4	3.8064–8	2.3147+6	1.8020–6	7.9635+8	3.0603+8	1.3386+8	3.5645+8	9.5126+3	3.4877+2	2.3955+2	1.0918+2	4.3512–2
	9.0000–4	3.8272–8	2.3021+6	1.8246–6	7.9203+8	3.0479+8	1.3309+8	3.5415+8	9.5138+3	3.4752+2	2.3897+2	1.0851+2	4.3875–2
	9.1910–4	3.8772–8	2.2724+6	1.8798–6	7.8181+8	3.0184+8	1.3124+8	3.4871+8	9.5167+3	3.4456+2	2.3759+2	1.0692+2	4.4755–2
	9.2500–4	3.8926–8	2.2634+6	1.8970–6	7.7872+8	3.0095+8	1.3069+8	3.4707+8	9.5176+3	3.4367+2	2.3718+2	1.0644+2	4.5027–2
	9.5955–4	3.9818–8	2.2127+6	1.9982–6	7.6127+8	2.9588+8	1.2755+8	3.3782+8	9.5227+3	3.3870+2	2.3491+2	1.0374+2	4.6620–2
	1.0000–3	4.0846–8	2.1570+6	2.1186–6	7.4212+8	2.9028+8	1.2412+8	3.2771+8	9.5284+3	3.3336+2	2.3252+2	1.0079+2	4.8486–2
	1.0625–3	4.2412–8	2.0774+6	2.3088–6	7.1471+8	2.8223+8	1.1894+8	3.1353+8	9.5074+3	3.2398+2	2.2734+2	9.6584+1	5.0838–2
	1.1250–3	4.3941–8	2.0051+6	2.5042–6	6.8984+8	2.7484+8	1.1426+8	3.0073+8	9.4878+3	3.1563+2	2.2279+2	9.2788+1	5.3187–2
	1.1719–3	4.5065–8	1.9551+6	2.6541–6	6.7264+8	2.6969+8	1.1104+8	2.9190+8	9.4737+3	3.0994+2	2.1971+2	9.0174+1	5.4946–2
	1.2500–3	4.6897–8	1.8787+6	2.9097–6	6.4637+8	2.6173+8	1.0615+8	2.7848+8	9.4516+3	3.0140+2	2.1514+2	8.6199+1	5.7873–2
	1.3125–3	4.8329–8	1.8230+6	3.1193–6	6.2721+8	2.5587+8	1.0258+8	2.6874+8	9.4349+3	2.9504+2	2.1167+2	8.3318+1	6.0210–2
	1.3359–3	4.8860–8	1.8032+6	3.1990–6	6.2040+8	2.5378+8	1.0132+8	2.6530+8	9.4288+3	2.9280+2	2.1044+2	8.2298+1	6.1086–2
	1.5000–3	5.2466–8	1.6793+6	3.7729–6	5.7776+8	2.4050+8	9.3447+7	2.4380+8	9.3893+3	2.7911+2	2.0310+2	7.5945+1	6.7204–2
	1.7500–3	5.7815–8	1.5239+6	4.7031–6	5.2430+8	2.2368+8	8.3410+7	2.1720+8	9.3191+3	2.5866+2	1.9061+2	6.7967+1	7.5717–2
	2.0000–3	6.2862–8	1.4016+6	5.7000–6	4.8221+8	2.1006+8	7.5623+7	1.9652+8	9.2587+3	2.4307+2	1.8121+2	6.1773+1	8.4182–2
	2.2500–3	6.7742–8	1.3006+6	6.7606–6	4.4747+8	1.9831+8	6.9150+7	1.7999+8	9.1968+3	2.2851+2	1.7165+2	5.6768+1	9.2165–2
M5	2.4890–3	7.2210–8	1.2201+6	7.8333–6	4.1978+8	1.8877+8	6.4058+7	1.6694+8	9.1442+3	2.1719+2	1.6427+2	5.2820+1	9.9758–2
	2.5209–3	7.2797–8	1.2103+6	7.9808–6	4.1640+8	1.8758+8	6.3432+7	1.6537+8	9.1340+3	2.1575+2	1.6330+2	5.2340+1	1.0065–1
	2.5808–3	7.3889–8	1.1924+6	8.2601–6	4.1024+8	1.8541+8	6.2297+7	1.6252+8	9.1153+3	2.1313+2	1.6156+2	5.1469+1	1.0231–1
M4	2.5947–3	7.4141–8	1.1884+6	8.3253–6	4.0885+8	1.8492+8	6.2040+7	1.6188+8	9.1111+3	2.1254+2	1.6116+2	5.1273+1	1.0269–1
	2.6454–3	7.5060–8	1.1738+6	8.5648–6	4.0384+8	1.8315+8	6.1121+7	1.5956+8	9.0940+3	2.1042+2	1.5975+2	5.0567+1	1.0403–1
	2.6856–3	7.5786–8	1.1626+6	8.7569–6	3.9998+8	1.8178+8	6.0413+7	1.5778+8	9.0806+3	2.0879+2	1.5866+2	5.0024+1	1.0510–1
	2.7340–3	7.6652–8	1.1494+6	8.9898–6	3.9546+8	1.8017+8	5.9587+7	1.5569+8	9.0649+3	2.0689+2	1.5740+2	4.9388+1	1.0638–1
	2.8670–3	7.9003–8	1.1152+6	9.6403–6	3.8369+8	1.7596+8	5.7446+7	1.5028+8	9.0231+3	2.0200+2	1.5415+2	4.7741+1	1.0988–1
	3.0000–3	8.1310–8	1.0836+6	1.0306–5	3.7280+8	1.7203+8	5.5476+7	1.4528+8	8.9835+3	1.9754+2	1.5121+2	4.6222+1	1.1337–1
M3	3.0546–3	8.2245–8	1.0713+6	1.0584–5	3.6856+8	1.7050+8	5.4695+7	1.4336+8	8.9677+3	1.9557+2	1.4983+2	4.5631+1	1.1480–1
	3.1137–3	8.3284–8	1.0579+6	1.0888–5	3.6396+8	1.6885+8	5.3877+7	1.4122+8	8.9510+3	1.9348+2	1.4838+2	4.4974+1	1.1635–1
	3.2245–3	8.5213–8	1.0339+6	1.1466–5	3.5573+8	1.6590+8	5.2417+7	1.3740+8	8.9207+3	1.8974+2	1.4582+2	4.3801+1	1.1925–1
	3.4184–3	8.8528–8	9.9523+5	1.2504–5	3.4240+8	1.6108+8	5.0068+7	1.3125+8	8.8702+3	1.8378+2	1.4174+2	4.1913+1	1.2429–1
	3.5000–3	8.9903–8	9.8001+5	1.2951–5	3.3717+8	1.5917+8	4.9150+7	1.2884+8	8.8499+3	1.8147+2	1.4017+2	4.1174+1	1.2641–1
M2	3.5493–3	9.0727–8	9.7110+5	1.3224–5	3.3411+8	1.5805+8	4.8614+7	1.2744+8	8.8379+3	1.8011+2	1.3924+2	4.0742+1	1.2769–1
	3.6056–3	9.1712–8	9.6068+5	1.3538–5	3.3052+8	1.5679+8	4.8011+7	1.2571+8	8.8244+3	1.7850+2	1.3816+2	4.0207+1	1.2915–1
	3.7042–3	9.3421–8	9.4310+5	1.4095–5	3.2447+8	1.5466+8	4.6997+7	1.2281+8	8.8013+3	1.7580+2	1.3636+2	3.9308+1	1.3170–1
	3.7819–3	9.4757–8	9.2981+5	1.4539–5	3.1990+8	1.5304+8	4.6231+7	1.2062+8	8.7835+3	1.7377+2	1.3501+2	3.8631+1	1.3371–1
M1	3.8243–3	9.5482–8	9.2275+5	1.4784–5	3.1747+8	1.5217+8	4.5825+7	1.1946+8	8.7740+3	1.7270+2	1.3429+2	3.8271+1	1.3480–1
	3.8521–3	9.5957–8	9.1818+5	1.4945–5	3.1590+8	1.5161+8	4.5564+7	1.1871+8	8.7673+3	1.7201+2	1.3383+2	3.8039+1	1.3550–1
	3.8682–3	9.6232–8	9.1555+5	1.5039–5	3.1499+8	1.5129+8	4.5413+7	1.1828+8	8.7634+3	1.7161+2	1.3357+2	3.7906+1	1.3590–1
	4.0000–3	9.8467–8	8.9478+5	1.5814–5	3.0785+8	1.4873+8	4.4227+7	1.1488+8	8.7322+3	1.6850+2	1.3150+2	3.6856+1	1.3920–1
	4.1250–3	1.0059–7	8.7593+5	1.6562–5	3.0136+8	1.4635+8	4.3148+7	1.1186+8	8.6874+3	1.6542+2	1.2936+2	3.5915+1	1.4174–1
	4.2500–3	1.0268–7	8.5804+5	1.7325–5	2.9521+8	1.4407+8	4.2126+7	1.0900+8	8.6442+3	1.6252+2	1.2735+2	3.5025+1	1.4428–1
	4.3437–3	1.0424–7	8.4521+5	1.7905–5	2.9079+8	1.4243+8	4.1395+7	1.0696+8	8.6127+3	1.6045+2	1.2591+2	3.4390+1	1.4617–1
	4.5000–3	1.0681–7	8.2487+5	1.8889–5	2.8379+8	1.3981+8	4.0239+7	1.0373+8	8.5619+3	1.5718+2	1.2364+2	3.3386+1	1.4933–1
	4.6250–3	1.0885–7	8.0945+5	1.9691–5	2.7849+8	1.3782+8	3.9365+7	1.0130+8	8.5228+3	1.5471+2	1.2193+2	3.2629+1	1.5184–1
	4.6719–3	1.0960–7	8.0385+5	1.9995–5	2.7656+8	1.3709+8	3.9048+7	1.0042+8	8.5085+3	1.5382+2	1.2131+2	3.2354+1	1.5278–1
	5.0000–3	1.1484–7	7.6723+5	2.2169–5	2.6396+8	1.3229+8	3.6983+7	9.4683+7	8.4125+3	1.4802+2	1.1729+2	3.0570+1	1.5934–1
	5.5000–3	1.2280–7	7.1747+5	2.5646–5	2.4684+8	1.2574+8	3.4230+7	8.6863+7	8.2765+3	1.3964+2	1.1136+2	2.8117+1	1.6913–1
	6.0000–3	1.3052–7	6.7504+5	2.9320–5	2.3225+8	1.2005+8	3.1899+7	8.0290+7	8.1544+3	1.3260+2	1.0637+2	2.6056+1	1.7881–1
	7.0000–3	1.4553–7	6.0541+5	3.7234–5	2.0829+8	1.1047+8	2.8108+7	6.9700+7	7.8545+3	1.2032+2	9.7417+1	2.2708+1	1.9385–1
	8.0000–3	1.5983–7	5.5126+5	4.5888–5	1.8966+8	1.0279+8	2.5195+7	6.1663+7	7.6036+3	1.1093+2	9.0556+1	2.0168+1	2.0859–1
	9.0000–3	1.7365–7	5.0737+5	5.5247–5	1.7456+8	9.6308+7	2.2858+7	5.5387+7	7.3475+3	1.0285+2	8.4463+1	1.8167+1	2.2070–1
	1.0000–2	1.8697–7	4.7124+5	6.5294–5	1.6213+8	9.0852+7	2.0954+7	5.0316+7	7.1258+3	9.6296+1	7.9512+1	1.6552+1	2.3260–1
	1.1250–2	2.0261–7	4.3486+5	7.8775–5	1.4961+8	8.5013+7	1.9002+7	4.5591+7	6.8474+3	8.9233+1	7.3950+1	1.5038+1	2.4456–1
L3	1.3040–2	2.2399–7	3.9334+5	9.9780–5	1.3533+8	7.8219+7	1.6813+7	4.0290+7	6.5138+3	8.1327+1	6.7724+1	1.3341+1	2.6132–1
	1.3530–2	2.2971–7	3.8355+5	1.0588–4	1.3196+8	7.6583+7	1.6306+7	3.9066+7	6.4251+3	7.9415+1	6.6202+1	1.2947+1	2.6516–1
	1.4265–2	2.3815–7	3.6995+5	1.1529–4	1.2728+8	7.4297+7	1.5605+7	3.7374+7	6.3000+3	7.6775+1	6.4102+1	1.2402+1	2.7088–1
	1.5000–2	2.4645–7	3.5750+5	1.2502–4	1.2300+8	7.2188+7	1.4967+7	3.5836+7	6.1835+3	7.4377+1	6.2193+1	1.1907+1	2.7655–1
L2	1.5251–2	2.4924–7	3.5349+5	1.2841–4	1.2162+8	7.1505+7	1.4762+7	3.5345+7	6.1431+3	7.3569+1	6.1543+1	1.1748+1	2.7824–1
	1.5845–2	2.5580–7	3.4444+5	1.3658–4	1.1850+8	6.9958+7	1.4302+7	3.4238+7	6.0512+3	7.1755+1	6.0084+1	1.1389+1	2.8222–1
L1	1.5847–2	2.5582–7	3.4440+5	1.3661–4	1.1849+8	6.9952+7	1.4300+7	3.4234+7	6.0508+3	7.1748+1	6.0078+1	1.1387+1	2.8223–1
	1.6250–2	2.6030–7	3.3848+5	1.4228–4	1.1645+8	6.8919+7	1.4005+7	3.3523+7	5.9898+3	7.0573+1	5.9132+1	1.1157+1	2.8472–1
	1.6366–2	2.6158–7	3.3682+5	1.4392–4	1.1588+8	6.8628+7	1.3923+7	3.3324+7	5.9726+3	7.0245+1	5.8867+1	1.1092+1	2.8543–1
	1.6884–2	2.6727–7	3.2965+5	1.5137–4	1.1342+8	6.7374+7	1.3569+7	3.2468+7	5.8980+3	6.8831+1	5.7727+1	1.0815+1	2.8861–1
	1.7275–2	2.7153–7	3.2448+5	1.5709–4	1.1164+8	6.6466+7	1.3314+7	3.1852+7	5.8437+3	6.7814+1	5.6908+1	1.0615+1	2.9101–1
	1.8125–2	2.8068–7	3.1390+5	1.6983–4	1.0800+8	6.4601+7	1.2794+7	3.0598+7	5.7315+3	6.5745+1	5.5240+1	1.0209+1	2.9619–1
	1.8442–2	2.8405–7	3.1018+5	1.7467–4	1.0672+8	6.3941+7	1.2612+7	3.0158+7	5.6915+3	6.5019+1	5.4655+1	1.0066+1	2.9811–1
	1.8637–2	2.8612–7	3.0793+5	1.7769–4	1.0594+8	6.3542+7	1.2502+7	2.9893+7	5.6673+3	6.4583+1	5.4303+1	9.9805+0	2.9929–1
	2.0000–2	3.0036–7	2.9333+5	1.9926–4	1.0092+8	6.0940+7	1.1793+7	2.8180+7	5.5081+3	6.1760+1	5.2027+1	9.4258+0	3.0747–1
	2.1250–2	3.1304–7	2.8145+5	2.1991–4	9.6832+7	5.8787+7	1.1221+7	2.6818+7	5.3592+3	5.9319+1	5.0027+1	8.9798+0	3.1295–1
	2.2500–2	3.2547–7	2.7070+5	2.4138–4	9.3134+7	5.6827+7	1.0708+7	2.5594+7	5.2226+3	5.7128+1	4.8231+1	8.5791+0	3.1840–1
	2.3438–2	3.3464–7	2.6328+5	2.5801–4	9.0582+7	5.5467+7	1.0355+7	2.4754+7	5.1271+3	5.5624+1	4.6997+1	8.3043+0	3.2248–1

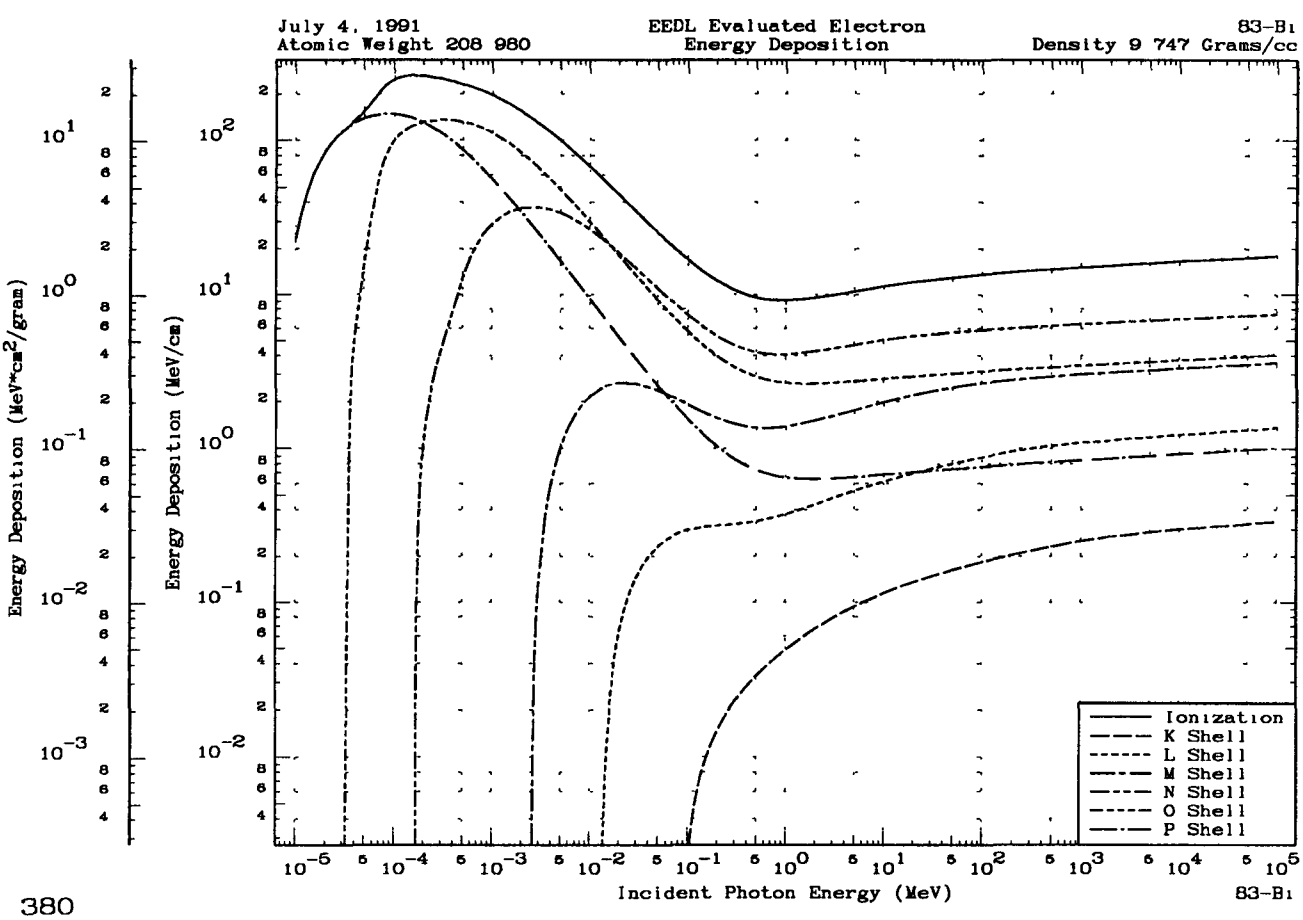
Atomic Weight 207.190 Density 11.350 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.4375–2	3.4369–7	2.5635+5	2.7508–4	8.8197+7	5.4191+7	1.0028+7	2.3973+7	5.0370+3	5.4226+1	4.5851+1	8.0488+0	3.2653–1
2.5000–2	3.4966–7	2.5198+5	2.8670–4	8.6692+7	5.3383+7	9.8222+6	2.3482+7	4.9797+3	5.3348+1	4.5130+1	7.8882+0	3.2922–1
2.6250–2	3.6144–7	2.4376+5	3.1051–4	8.3866+7	5.1860+7	9.4374+6	2.2564+7	4.8711+3	5.1701+1	4.3779+1	7.5879+0	3.3458–1
2.6719–2	3.6581–7	2.4085+5	3.1962–4	8.2864+7	5.1318+7	9.3016+6	2.2240+7	4.8323+3	5.1120+1	4.3302+1	7.4819+0	3.3658–1
2.7188–2	3.7015–7	2.3803+5	3.2884–4	8.1892+7	5.0791+7	9.1701+6	2.1926+7	4.7944+3	5.0557+1	4.2839+1	7.3793+0	3.3857–1
3.0000–2	3.9570–7	2.2266+5	3.8621–4	7.6605+7	4.7909+7	8.4602+6	2.0231+7	4.5858+3	4.7521+1	4.0345+1	6.8252+0	3.5038–1
3.5000–2	4.3850–7	2.0093+5	4.9677–4	6.9128+7	4.3801+7	7.4766+6	1.7846+7	4.2585+3	4.3004+1	3.6600+1	6.0381+0	3.6622–1
4.0000–2	4.7919–7	1.8387+5	6.1802–4	6.3259+7	4.0528+7	6.7179+6	1.6008+7	3.9938+3	3.9520+1	3.3706+1	5.4321+0	3.8178–1
5.0000–2	5.5521–7	1.5869+5	8.8931–4	5.4597+7	3.5623+7	5.6420+6	1.3328+7	3.5860+3	3.4325+1	2.9377+1	4.5407+0	4.0751–1
6.0000–2	6.2705–7	1.4051+5	1.1973–3	4.8342+7	3.1971+7	4.9110+6	1.1456+7	3.2894+3	3.0669+1	2.6325+1	3.9149+0	4.2959–1
8.0000–2	7.6373–7	1.1536+5	1.9072–3	3.9690+7	2.6755+7	3.9785+6	8.9539+6	2.8789+3	2.5821+1	2.2279+1	3.0735+0	4.6820–1
K 8.8290–2	8.1701–7	1.0784+5	2.2374–3	3.7102+7	2.5157+7	3.7159+6	8.2263+6	2.7533+3	2.4400+1	2.1090+1	2.8272+0	4.8229–1
8.9754–2	8.2626–7	1.0663+5	2.2977–3	3.6686+7	2.4899+7	3.6739+6	8.1103+6	2.7333+3	2.4173+1	2.0900+1	2.7880+0	4.8457–1
9.2315–2	8.4232–7	1.0460+5	2.4045–3	3.5987+7	2.4466+7	3.6030+6	7.9157+6	2.6993+3	2.3791+1	2.0580+1	2.7223+0	4.8855–1
9.6158–2	8.6613–7	1.0172+5	2.5679–3	3.4997+7	2.3850+7	3.5027+6	7.6419+6	2.6509+3	2.3252+1	2.0127+1	2.6299+0	4.9451–1
1.0000–1	8.8964–7	9.9036+4	2.7349–3	3.4073+7	2.3274+7	3.4090+6	7.3877+6	2.6052+3	2.2749+1	1.9704+1	2.5441+0	5.0045–1
1.0625–1	9.2442–7	9.5309+4	3.0141–3	3.2791+7	2.2495+7	3.2805+6	7.0128+6	2.5426+3	2.2030+1	1.9104+1	2.4166+0	5.0891–1
1.1719–1	9.8342–7	8.9591+4	3.5234–3	3.0824+7	2.1291+7	3.0831+6	6.4466+6	2.4445+3	2.0930+1	1.8182+1	2.2241+0	5.2376–1
1.3359–1	1.0680–6	8.2494+4	4.3338–3	2.8382+7	1.9782+7	2.8377+6	5.7603+6	2.3193+3	1.9574+1	1.7037+1	1.9908+0	5.4599–1
1.5000–1	1.1486–6	7.6706+4	5.1964–3	2.6391+7	1.8537+7	2.6371+6	5.2146+6	2.2140+3	1.8478+1	1.6104+1	1.8054+0	5.6801–1
1.7500–1	1.2490–6	7.0541+4	6.5952–3	2.4269+7	1.7195+7	2.4210+6	4.6511+6	2.0867+3	1.7281+1	1.5071+1	1.6131+0	5.9646–1
2.0000–1	1.3428–6	6.5614+4	8.0828–3	2.2574+7	1.6112+7	2.2482+6	4.2124+6	1.9824+3	1.6338+1	1.4250+1	1.4635+0	6.2469–1
2.5000–1	1.5077–6	5.8436+4	1.1263–2	2.0105+7	1.4450+7	2.0263+6	3.6262+6	1.8340+3	1.5124+1	1.3186+1	1.2628+0	6.7524–1
3.0000–1	1.6571–6	5.3168+4	1.4668–2	1.8292+7	1.3221+7	1.8614+6	3.2084+6	1.7211+3	1.4251+1	1.2407+1	1.1199+0	7.2496–1
4.0000–1	1.9210–6	4.5865+4	2.1921–2	1.5780+7	1.1376+7	1.6729+6	2.7291+6	1.5789+3	1.3333+1	1.1555+1	9.5538–1	8.2262–1
5.0000–1	2.1511–6	4.0959+4	2.9547–2	1.4092+7	1.0063+7	1.5638+6	2.4633+6	1.4933+3	1.2896+1	1.1112+1	8.6436–1	9.2031–1
6.0000–1	2.3610–6	3.7318+4	3.7369–2	1.2839+7	9.0759+6	1.4938+6	2.2679+6	1.4396+3	1.2674+1	1.0855+1	7.9726–1	1.0220+0
8.0000–1	2.7177–6	3.2420+4	5.3183–2	1.1154+7	7.6928+6	1.4130+6	2.0467+6	1.3780+3	1.2620+1	1.0668+1	7.2159–1	1.2304+0
1.0000+0	3.0211–6	2.9164+4	6.8965–2	1.0034+7	6.7642+6	1.3675+6	1.9007+6	1.3447+3	1.2725+1	1.0607+1	6.7150–1	1.4460+0
1.5000+0	3.5962–6	2.4500+4	1.0718–1	8.4290+6	5.3624+6	1.3198+6	1.7455+6	1.3085+3	1.3451+1	1.0822+1	6.1899–1	2.0101+0
2.0000+0	4.0215–6	2.1909+4	1.4329–1	7.5376+6	4.5675+6	1.3059+6	1.6630+6	1.2965+3	1.4246+1	1.1051+1	5.9081–1	2.6043+0
3.0000+0	4.5996–6	1.9155+4	2.0973–1	6.5902+6	3.7037+6	1.2875+6	1.5976+6	1.2901+3	1.5886+1	1.1470+1	5.6979–1	3.8456+0
4.0000+0	4.9690–6	1.7731+4	2.6964–1	6.1003+6	3.2321+6	1.2864+6	1.5805+6	1.2926+3	1.7528+1	1.1824+1	5.6429–1	5.1392+0
5.0000+0	5.2336–6	1.6835+4	3.2423–1	5.7919+6	2.9376+6	1.2861+6	1.5670+6	1.2977+3	1.9130+1	1.2108+1	5.6003–1	6.4620+0
6.0000+0	5.4209–6	1.6253+4	3.7441–1	5.5917+6	2.7386+6	1.2858+6	1.5660+6	1.3034+3	2.0753+1	1.2347+1	5.6026–1	7.8460+0
8.0000+0	5.6715–6	1.5535+4	4.6403–1	5.3447+6	2.4887+6	1.2857+6	1.5690+6	1.3124+3	2.3954+1	1.2761+1	5.6254–1	1.0631+1
1.0000+1	5.8276–6	1.5119+4	5.4232–1	5.2016+6	2.3424+6	1.2872+6	1.5707+6	1.3225+3	2.7208+1	1.3072+1	5.6432–1	1.3572+1
1.5000+1	5.9884–6	1.4713+4	7.0363–1	5.0619+6	2.1863+6	1.2895+6	1.5847+6	1.3410+3	3.5121+1	1.3541+1	5.6953–1	2.1011+1
2.0000+1	6.0231–6	1.4628+4	8.3165–1	5.0327+6	2.1455+6	1.2912+6	1.5946+6	1.3584+3	4.3273+1	1.3921+1	5.7326–1	2.8779+1
3.0000+1	6.0063–6	1.4669+4	1.0277+0	5.0468+6	2.1450+6	1.2920+6	1.6084+6	1.3848+3	5.9614+1	1.4349+1	5.7854–1	4.4687+1
4.0000+1	6.0012–6	1.4681+4	1.1757+0	5.0511+6	2.1439+6	1.2928+6	1.6129+6	1.4051+3	7.6193+1	1.4648+1	5.8052–1	6.0965+1
5.0000+1	6.0041–6	1.4674+4	1.2942+0	5.0487+6	2.1429+6	1.2934+6	1.6109+6	1.4226+3	9.3087+1	1.4889+1	5.8012–1	7.7617+1
6.0000+1	6.0066–6	1.4668+4	1.3929+0	5.0466+6	2.1422+6	1.2938+6	1.6092+6	1.4368+3	1.1010+2	1.5081+1	5.7983–1	9.4444+1
8.0000+1	6.0113–6	1.4657+4	1.5510+0	5.0426+6	2.1410+6	1.2941+6	1.6060+6	1.4594+3	1.4444+2	1.5352+1	5.7936–1	1.2851+2
1.0000+2	6.0156–6	1.4646+4	1.6751+0	5.0390+6	2.1401+6	1.2943+6	1.6032+6	1.4770+3	1.7904+2	1.5592+1	5.7900–1	1.6287+2
1.5000+2	6.0229–6	1.4629+4	1.9027+0	5.0329+6	2.1384+6	1.2945+6	1.5985+6	1.5086+3	2.6610+2	1.5847+1	5.7735–1	2.4968+2
2.0000+2	6.0151–6	1.4647+4	2.0651+0	5.0394+6	2.1372+6	1.2946+6	1.6061+6	1.5273+3	3.5377+2	1.6082+1	5.8009–1	3.3711+2
3.0000+2	6.0078–6	1.4665+4	2.2948+0	5.0455+6	2.1355+6	1.2947+6	1.6138+6	1.5523+3	5.2866+2	1.6456+1	5.8289–1	5.1162+2
4.0000+2	6.0069–6	1.4667+4	2.4582+0	5.0463+6	2.1343+6	1.2947+6	1.6157+6	1.5701+3	7.0377+2	1.6661+1	5.8362–1	6.8652+2
5.0000+2	6.0118–6	1.4656+4	2.5850+0	5.0422+6	2.1334+6	1.2947+6	1.6125+6	1.5841+3	8.8016+2	1.6804+1	5.8249–1	8.6277+2
6.0000+2	6.0106–6	1.4658+4	2.6887+0	5.0431+6	2.1326+6	1.2947+6	1.6141+6	1.5955+3	1.0547+3	1.6935+1	5.8313–1	1.0372+3
8.0000+2	6.0113–6	1.4657+4	2.8523+0	5.0426+6	2.1315+6	1.2948+6	1.6148+6	1.6138+3	1.4070+3	1.7182+1	5.8342–1	1.3893+3
1.0000+3	6.0127–6	1.4653+4	2.9791+0	5.0415+6	2.1305+6	1.2948+6	1.6145+6	1.6283+3	1.7590+3	1.7387+1	5.8339–1	1.7410+3
1.5000+3	6.0160–6	1.4645+4	3.2094+0	5.0386+6	2.1289+6	1.2948+6	1.6133+6	1.6552+3	2.6439+3	1.7573+1	5.8296–1	2.6258+3
2.0000+3	6.0210–6	1.4633+4	3.3726+0	5.0345+6	2.1277+6	1.2948+6	1.6103+6	1.6751+3	3.5242+3	1.7757+1	5.8187–1	3.5058+3
3.0000+3	6.0274–6	1.4618+4	3.6027+0	5.0292+6	2.1260+6	1.2948+6	1.6067+6	1.7040+3	5.2873+3	1.8114+1	5.8056–1	5.2686+3
4.0000+3	6.0335–6	1.4603+4	3.7659+0	5.0241+6	2.1248+6	1.2948+6	1.6027+6	1.7251+3	7.0507+3	1.8293+1	5.7913–1	7.0318+3
5.0000+3	6.0420–6	1.4582+4	3.8924+0	5.0170+6	2.1239+6	1.2948+6	1.5965+6	1.7416+3	8.8325+3	1.8445+1	5.7689–1	8.8134+3
6.0000+3	6.0431–6	1.4579+4	3.9957+0	5.0160+6	2.1232+6	1.2948+6	1.5963+6	1.7537+3	1.0585+4	1.8563+1	5.7682–1	1.0566+4
8.0000+3	6.0467–6	1.4571+4	4.1587+0	5.0130+6	2.1220+6	1.2948+6	1.5945+6	1.7728+3	1.4122+4	1.8797+1	5.7616–1	1.4103+4
1.0000+4	6.0496–6	1.4564+4	4.2849+0	5.0107+6	2.1211+6	1.2948+6	1.5930+6	1.7879+3	1.7692+4	1.9003+1	5.7563–1	1.7672+4
1.5000+4	6.0545–6	1.4552+4	4.5145+0	5.0066+6	2.1194+6	1.2948+6	1.5907+6	1.8168+3	2.6451+4	1.9182+1	5.7478–1	2.6431+4
2.0000+4	6.0586–6	1.4542+4	4.6775+0	5.0032+6	2.1182+6	1.2948+6	1.5884+6	1.8376+3	3.5324+4	1.9361+1	5.7395–1	3.5304+4
3.0000+4	6.0628–6	1.4532+4	4.9074+0	4.9997+6	2.1165+6	1.2948+6	1.5865+6	1.8668+3	5.2868+4	1.9710+1	5.7329–1	5.2847+4
4.0000+4	6.0669–6	1.4522+4	5.0705+0	4.9964+6	2.1154+6	1.2948+6	1.5844+6	1.8878+3	7.0600+4	1.9889+1	5.7250–1	7.0580+4
5.0000+4	6.0740–6	1.4505+4	5.1970+0	4.9906+6	2.1144+6	1.2948+6	1.5794+6	1.9039+3	8.8168+4	2.0037+1	5.7072–1	8.8147+4
6.0000+4	6.0740–6	1.4505+4	5.3004+0	4.9906+6	2.1137+6	1.2948+6	1.5802+6	1.9170+3	1.0572+5	2.0153+1	5.7098–1	1.0570+5
8.0000+4	6.0763–6	1.4500+4	5.4636+0	4.9887+6	2.1125+6	1.2948+6	1.5794+6	1.9379+3	1.4113+5	2.0381+1	5.7072–1	1.4111+5
1.0000+5	6.0784–6	1.4495+4	5.5900+0	4.9870+6	2.1116+6	1.2948+6	1.5786+6	1.9542+3	1.7661+5	2.0597+1	5.7042–1	1.7659+5


July 4 1991
Atomic Weight 208 980
EEDL Evaluated Electron
Cross Sections
83-Bi
Density 9 747 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
83-Bi


July 4, 1991
Atomic Weight 208 980
EEDL Evaluated Electron
Energy Deposition
83-Bi
Density 9 747 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
83-Bi


July 4 1991
Atomic Weight 208 980
EEDL Evaluated Electron
Shell Cross Sections
83-Bi
Density 9 747 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
83-Bi


July 4, 1991
Atomic Weight 208 980
EEDL Evaluated Electron
Energy Deposition
83-Bi
Density 9 747 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
83-Bi

Atomic Weight 208.980 Density 9.747 Grams/cc

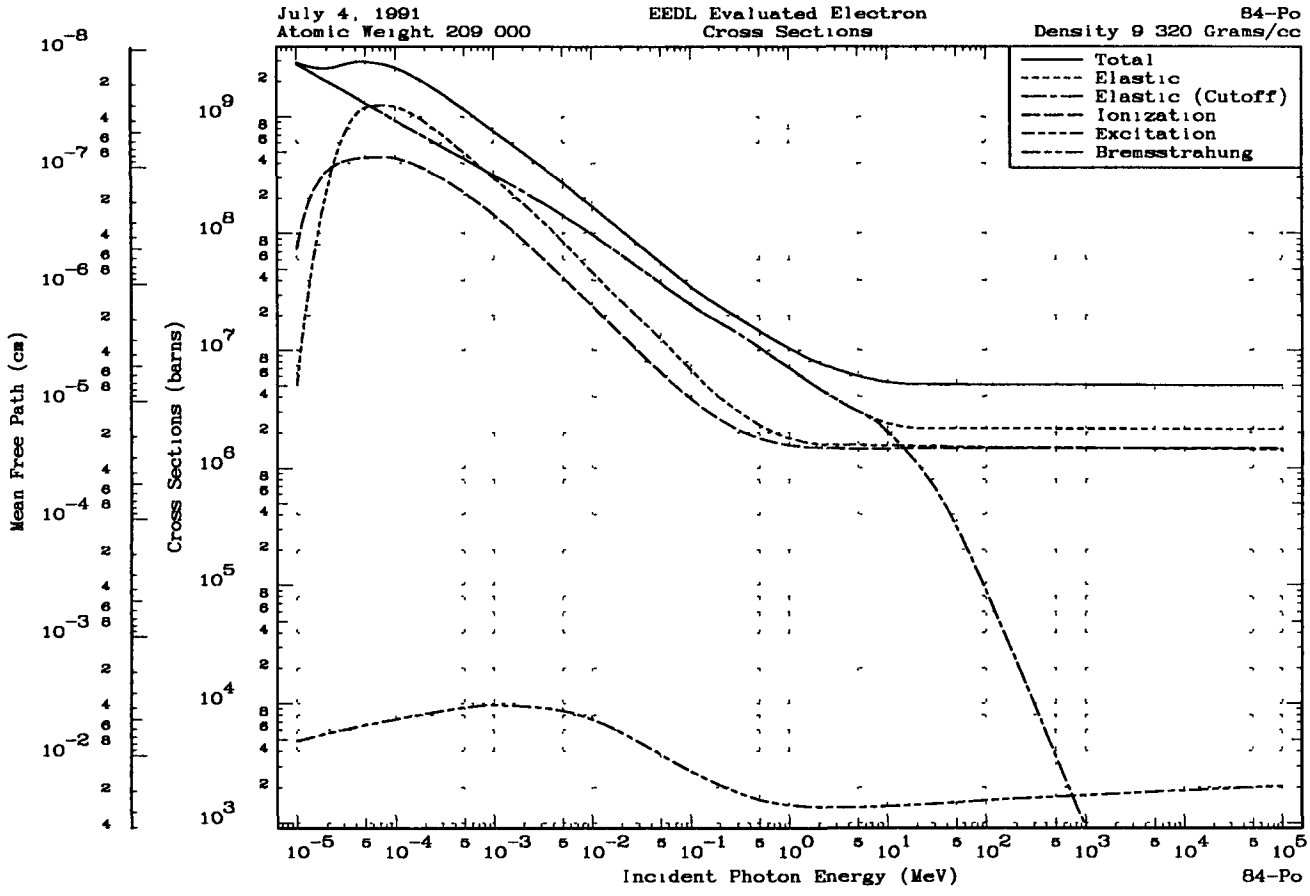
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2761–8	8.0397+6		2.7899+9	2.6722+9	1.1009+8	7.6244+6	4.8699+3	2.4445+1	2.2908+1	1.5368+0	2.9567–4
	1.1250–5	1.3211–8	7.7657+6		2.6948+9	2.5272+9	1.5094+8	1.6729+7	4.9882+3	3.6386+1	3.2912+1	3.4745+0	3.3148–4
	1.3125–5	1.3750–8	7.4616+6		2.5893+9	2.3492+9	2.0474+8	3.5360+7	5.1474+3	5.5010+1	4.7340+1	7.6692+0	3.8637–4
	1.5000–5	1.4153–8	7.2488+6		2.5155+9	2.2052+9	2.4798+8	6.2297+7	5.2894+3	7.4112+1	6.0027+1	1.4085+1	4.4256–4
P1	1.7690–5	1.4535–8	7.0585+6		2.4495+9	2.0394+9	2.9179+8	1.1821+8	5.4703+3	1.0210+2	7.4372+1	2.7724+1	5.2524–4
	1.7979–5	1.4565–8	7.0439+6		2.4444+9	2.0239+9	2.9554+8	1.2496+8	5.4883+3	1.0515+2	7.5759+1	2.9390+1	5.3425–4
	1.8484–5	1.4609–8	7.0226+6		2.4370+9	1.9975+9	3.0207+8	1.3743+8	5.5194+3	1.1067+2	7.8191+1	3.2482+1	5.5008–4
	1.9242–5	1.4656–8	7.0004+6		2.4293+9	1.9598+9	3.1174+8	1.5775+8	5.5648+3	1.1941+2	8.1848+1	3.7559+1	5.7397–4
	2.0000–5	1.4679–8	6.9895+6		2.4255+9	1.9243+9	3.2113+8	1.8011+8	5.6088+3	1.2864+2	8.5443+1	4.3196+1	5.9802–4
	2.1250–5	1.4720–8	6.9700+6		2.4187+9	1.8698+9	3.3185+8	2.1711+8	5.6709+3	1.4249+2	9.0083+1	5.2409+1	6.3480–4
	2.2500–5	1.4707–8	6.9758+6		2.4208+9	1.8198+9	3.4199+8	2.5893+8	5.7301+3	1.5750+2	9.4586+1	6.2910+1	6.7190–4
	2.3438–5	1.4668–8	6.9946+6		2.4273+9	1.7850+9	3.4864+8	2.9364+8	5.7727+3	1.6939+2	9.7699+1	7.1688+1	6.9992–4
	2.5000–5	1.4595–8	7.0293+6		2.4393+9	1.7312+9	3.5907+8	3.4900+8	5.8408+3	1.8859+2	1.0271+2	8.5883+1	7.4700–4
	2.6250–5	1.4505–8	7.0731+6		2.4545+9	1.6917+9	3.6517+8	3.9767+8	5.8928+3	2.0451+2	1.0603+2	9.8481+1	7.8498–4
	2.6719–5	1.4463–8	7.0937+6		2.4617+9	1.6775+9	3.6715+8	4.1696+8	5.9118+3	2.1070+2	1.0719+2	1.0350+2	7.9930–4
	3.0000–5	1.4140–8	7.2556+6		2.5178+9	1.5880+9	3.7984+8	5.5002+8	6.0374+3	2.5381+2	1.1502+2	1.3879+2	9.0056–4
O5	3.2170–5	1.3943–8	7.3584+6		2.5535+9	1.5363+9	3.8391+8	6.3329+8	6.1136+3	2.7907+2	1.1858+2	1.6049+2	9.6800–4
O4	3.5370–5	1.3570–8	7.5603+6		2.6236+9	1.4690+9	3.9117+8	7.6347+8	6.2185+3	3.2007+2	1.2534+2	1.9473+2	1.0687–3
	3.6085–5	1.3510–8	7.5941+6		2.6353+9	1.4551+9	3.9263+8	7.8756+8	6.2409+3	3.2806+2	1.2690+2	2.0116+2	1.0914–3
	3.7685–5	1.3365–8	7.6764+6		2.6639+9	1.4256+9	3.9587+8	8.4241+8	6.2897+3	3.4627+2	1.3040+2	2.1587+2	1.1425–3
	3.8043–5	1.3331–8	7.6960+6		2.6707+9	1.4192+9	3.9660+8	8.5484+8	6.3003+3	3.5042+2	1.3120+2	2.1922+2	1.1540–3
	4.0000–5	1.3135–8	7.8110+6		2.7106+9	1.3859+9	4.0057+8	9.2407+8	6.3573+3	3.7354+2	1.3563+2	2.3791+2	1.2170–3
	4.2500–5	1.2951–8	7.9218+6		2.7490+9	1.3468+9	4.0237+8	9.9988+8	6.4222+3	3.9804+2	1.3999+2	2.5805+2	1.2950–3
	4.4375–5	1.2802–8	8.0140+6		2.7810+9	1.3195+9	4.0383+8	1.0576+9	6.4689+3	4.1685+2	1.4340+2	2.7344+2	1.3540–3
	4.7188–5	1.2679–8	8.0919+6		2.8081+9	1.2818+9	4.0646+8	1.1198+9	6.5358+3	4.3937+2	1.4905+2	2.9031+2	1.4431–3
	5.0000–5	1.2542–8	8.1800+6		2.8386+9	1.2471+9	4.0969+8	1.1818+9	6.5996+3	4.6265+2	1.5545+2	3.0720+2	1.5330–3
	5.6250–5	1.2414–8	8.2647+6		2.8680+9	1.1796+9	4.1350+8	1.2749+9	6.7266+3	5.0287+2	1.6929+2	3.3358+2	1.7316–3
	6.0000–5	1.2455–8	8.2370+6		2.8584+9	1.1441+9	4.1705+8	1.2972+9	6.7973+3	5.1995+2	1.7921+2	3.4073+2	1.8524–3
	6.5000–5	1.2520–8	8.1948+6		2.8438+9	1.1016+9	4.1860+8	1.3235+9	6.8860+3	5.3921+2	1.9076+2	3.4845+2	2.0150–3
	7.0000–5	1.2566–8	8.1648+6		2.8333+9	1.0637+9	4.2126+8	1.3484+9	6.9691+3	5.5941+2	2.0360+2	3.5581+2	2.1796–3
	7.2500–5	1.2586–8	8.1516+6		2.8288+9	1.0462+9	4.2227+8	1.3603+9	7.0088+3	5.6889+2	2.0952+2	3.5937+2	2.2625–3
	7.5000–5	1.2642–8	8.1154+6		2.8162+9	1.0296+9	4.2298+8	1.3637+9	7.0474+3	5.7562+2	2.1495+2	3.6067+2	2.3458–3
	8.0000–5	1.2748–8	8.0477+6		2.7927+9	9.9860+8	4.2399+8	1.3701+9	7.1214+3	5.8847+2	2.2526+2	3.6320+2	2.5137–3
	9.0000–5	1.3124–8	7.8174+6		2.7128+9	9.4451+8	4.1916+8	1.3491+9	7.2538+3	5.9769+2	2.3811+2	3.5958+2	2.8524–3
O3	9.7460–5	1.3388–8	7.6634+6		2.6594+9	9.0960+8	4.1465+8	1.3351+9	7.3447+3	6.0264+2	2.4536+2	3.5728+2	3.1087–3
	9.8730–5	1.3436–8	7.6359+6		2.6498+9	9.0405+8	4.1398+8	1.3318+9	7.3589+3	6.0331+2	2.4666+2	3.5665+2	3.1523–3
	1.0000–4	1.3484–8	7.6089+6	0.0000+0	2.6404+9	8.9860+8	4.1334+8	1.3285+9	7.3730+3	6.0400+2	2.4796+2	3.5604+2	3.1960–3
	1.0313–4	1.3615–8	7.5355+6	5.1765–9	2.6150+9	8.8567+8	4.1042+8	1.3189+9	7.4070+3	6.0337+2	2.4961+2	3.5375+2	3.3040–3
	1.0898–4	1.3853–8	7.4062+6	1.4894–8	2.5701+9	8.6291+8	4.0534+8	1.3018+9	7.4684+3	6.0251+2	2.5280+2	3.4971+2	3.5077–3
	1.1250–4	1.3991–8	7.3332+6	2.0731–8	2.5447+9	8.5010+8	4.0252+8	1.2921+9	7.5040+3	6.0217+2	2.5475+2	3.4741+2	3.6306–3
	1.1924–4	1.4251–8	7.1991+6	3.1936–8	2.4982+9	8.2711+8	3.9657+8	1.2745+9	7.5696+3	6.0054+2	2.5726+2	3.4328+2	3.8677–3
O2	1.2312–4	1.4396–8	7.1266+6	3.8404–8	2.4731+9	8.1472+8	3.9336+8	1.2650+9	7.6059+3	5.9977+2	2.5873+2	3.4104+2	4.0052–3
	1.2480–4	1.4478–8	7.0864+6	4.1209–8	2.4591+9	8.0954+8	3.9173+8	1.2578+9	7.6213+3	5.9829+2	2.5899+2	3.3930+2	4.0649–3
	1.2795–4	1.4629–8	7.0132+6	4.6485–8	2.4337+9	8.0009+8	3.8875+8	1.2449+9	7.6498+3	5.9563+2	2.5950+2	3.3613+2	4.1771–3
	1.3346–4	1.4888–8	6.8911+6	5.5773–8	2.3914+9	7.8434+8	3.8381+8	1.2232+9	7.6982+3	5.9134+2	2.6049+2	3.3084+2	4.3744–3
	1.3462–4	1.4942–8	6.8665+6	5.7731–8	2.3828+9	7.8116+8	3.8282+8	1.2188+9	7.7081+3	5.9049+2	2.6071+2	3.2977+2	4.4160–3
	1.4173–4	1.5265–8	6.7212+6	6.9826–8	2.3324+9	7.6244+8	3.7696+8	1.1930+9	7.7677+3	5.8558+2	2.6209+2	3.2349+2	4.6725–3
	1.5000–4	1.5627–8	6.5651+6	8.4007–8	2.2782+9	7.4234+8	3.7071+8	1.1651+9	7.8339+3	5.8062+2	2.6387+2	3.1675+2	4.9732–3
O1	1.6686–4	1.6473–8	6.2282+6	1.1351–7	2.1613+9	7.0600+8	3.5553+8	1.0998+9	7.9597+3	5.6231+2	2.6247+2	2.9984+2	5.5935–3
N7	1.6817–4	1.6537–8	6.2041+6	1.1584–7	2.1530+9	7.0341+8	3.5445+8	1.0951+9	7.9690+3	5.6104+2	2.6241+2	2.9863+2	5.6420–3
	1.6893–4	1.6574–8	6.1902+6	1.1720–7	2.1481+9	7.0191+8	3.5383+8	1.0924+9	7.9744+3	5.6033+2	2.6239+2	2.9794+2	5.6703–3
	1.7215–4	1.6729–8	6.1326+6	1.2296–7	2.1281+9	6.9570+8	3.5128+8	1.0812+9	7.9969+3	5.5741+2	2.6235+2	2.9505+2	5.7900–3
	1.7282–4	1.6761–8	6.1210+6	1.2416–7	2.1241+9	6.9444+8	3.5076+8	1.0789+9	8.0015+3	5.5681+2	2.6234+2	2.9447+2	5.8148–3
N6	1.7387–4	1.6812–8	6.1025+6	1.2605–7	2.1177+9	6.9245+8	3.4994+8	1.0753+9	8.0088+3	5.5588+2	2.6233+2	2.9355+2	5.8541–3
	1.7714–4	1.6968–8	6.0464+6	1.3194–7	2.0982+9	6.8640+8	3.4746+8	1.0644+9	8.0299+3	5.5310+2	2.6235+2	2.9075+2	5.9795–3
	1.7911–4	1.7062–8	6.0133+6	1.3552–7	2.0867+9	6.8282+8	3.4600+8	1.0579+9	8.0425+3	5.5149+2	2.6238+2	2.8910+2	6.0555–3
	1.7961–4	1.7085–8	6.0050+6	1.3642–7	2.0838+9	6.8193+8	3.4563+8	1.0563+9	8.0456+3	5.5108+2	2.6238+2	2.8869+2	6.0748–3
	1.8285–4	1.7237–8	5.9520+6	1.4232–7	2.0654+9	6.7621+8	3.4329+8	1.0460+9	8.0660+3	5.4850+2	2.6244+2	2.8605+2	6.1998–3
	1.8956–4	1.7547–8	5.8468+6	1.5460–7	2.0289+9	6.6483+8	3.3865+8	1.0255+9	8.1071+3	5.4348+2	2.6265+2	2.8083+2	6.4594–3
	1.8981–4	1.7559–8	5.8430+6	1.5506–7	2.0276+9	6.6442+8	3.3848+8	1.0247+9	8.1086+3	5.4330+2	2.6266+2	2.8064+2	6.4691–3
	1.9143–4	1.7633–8	5.8185+6	1.5804–7	2.0191+9	6.6177+8	3.3740+8	1.0199+9	8.1183+3	5.4215+2	2.6272+2	2.7943+2	6.5320–3
	2.0000–4	1.8019–8	5.6938+6	1.7394–7	1.9758+9	6.4824+8	3.3191+8	9.9568+8	8.1687+3	5.3639+2	2.6313+2	2.7325+2	6.8663–3
	2.1250–4	1.8637–8	5.5051+6	1.9752–7	1.9104+9	6.2999+8	3.2251+8	9.5786+8	8.2357+3	5.2422+2	2.6094+2	2.6328+2	7.3671–3
	2.2500–4	1.9237–8	5.3332+6	2.2161–7	1.8507+9	6.1325+8	3.1394+8	9.2351+8	8.2993+3	5.1332+2	2.5907+2	2.5424+2	7.8719–3
	2.3438–4	1.9678–8	5.2139+6	2.4001–7	1.8093+9	6.0157+8	3.0799+8	8.9974+8	8.3451+3	5.0588+2	2.5789+2	2.4798+2	8.2530–3
	2.5000–4	2.0393–8	5.0309+6	2.7124–7	1.7458+9	5.8355+8	2.9885+8	8.6340+8	8.4180+3	4.9461+2	2.5617+2	2.3843+2	8.8929–3
	2.6250–4	2.0950–8	4.8971+6	2.9673–7	1.6994+9	5.7029+8	2.9218+8	8.3690+8	8.4735+3	4.8654+2	2.5506+2	2.3147+2	9.4088–3
	2.6719–4	2.1156–8	4.8494+6	3.0639–7	1.6829+9	5.6556+8	2.8980+8	8.2749+8	8.4937+3	4.8370+2	2.5469+2	2.2900+2	9.6032–3
	3.0000–4	2.2550–8	4.5496+6	3.7548–7	1.5788+9	5.3552+8	2.7481+8	7.6847+8	8.6273+3	4.6625+2	2.5271+2	2.1353+2	1.0976–2
	3.5000–4	2.4654–8	4.1615+6	4.8598–7	1.4441+9	4.9817+8	2.5295+8	6.9299+8	8.8038+3	4.3899+2	2.4560+2	1.9337+2	1.3118–2
	4.0000–4	2.6624–8	3.8535+6	6.0259–7	1.3372+9	4.6792+8	2.3567+8	6.3364+8	8.9597+3	4.1871+2	2.4115+2	1.7755+2	1.5302–2
N5	4.4061–4	2.8159–8	3.6434+6	7.0147–7	1.2643+9	4.4720+8	2.2267+8	5.9445+8	9.0577+3	4.0283+2	2.3585+2	1.6696+2	1.7144–2
	4.4803–4	2.8433–8	3.6083+6	7.1996–7	1.2521+9	4.4371+8	2.2051+8	5.8791+8	9.0748+3	4.0029+2	2.3507+2	1.6520+2	1.7483–2
	4.6102–4	2.8908–8	3.5490+6	7.5258–7	1.2316+9	4.3780+8	2.1688+8	5.7689+8	9.1040+3	3.9607+2	2.3382+2	1.6223+2	1.8078–2
N4	4.6495–4	2.9050–8	3.5316+6	7.6251–7	1.2255+9	4.3607+8	2.1582+8	5.7366+8	9.1127+3	3.9485+2	2.3346+2	1.6136+2	1.8258–2
	4.7371–4	2.9380–8	3.4920+6	7.8478–7	1.2118+9	4.3227+8	2.1350+8	5.6602+8	9.1319+3	3.9207+2	2.3274+2	1.5931+2	1.8661–2
	4.8051–4	2.9634–8	3.4621+6	8.0217–7	1.2014+9	4.2939+8	2.1175+8	5.6026+8	9.1466+3	3.8999+2	2.3221+2	1.5776+2	1.8974–2
	4.8686–4	2.9870–8	3.4348+6	8.1847–7	1.1919+9	4.2676+8	2.1015+8	5.5501+8	9.1601+3	3.8812+2	2.3175+2	1.5635+2	1.9267–2
	5.0000–4	3.0354–8	3.3800+6	8.5250–7	1.1729+9	4.2147+8	2.0696+8	5.4449+8	9.1876+3	3.8443+2	2.3088+2	1.5353+2	1.9875–2
	5.5000–4	3.2219–8	3.1843+6	9.8503–7	1.1050+9	4.0306+8	1.9556+8	5.0640+8	9.2788+3	3.7020+2	2.2702+2	1.4316+2	2.2198–2

Atomic Weight 208.980 Density 9.747 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.0000–4	3.4015–8	3.0162+6	1.1223–6	1.0467+9	3.8696+8	1.8577+8	4.7395+8	9.3628+3	3.5855+2	2.2420+2	1.3433+2	2.4544–2
N3	6.6916–4	3.6418–8	2.8171+6	1.3196–6	9.7760+8	3.6768+8	1.7337+8	4.3655+8	9.4558+3	3.4240+2	2.1830+2	1.2407+2	2.7797–2
	6.7734–4	3.6696–8	2.7958+6	1.3436–6	9.7021+8	3.6559+8	1.7203+8	4.3258+8	9.4633+3	3.4066+2	2.1765+2	1.2298+2	2.8166–2
	6.9267–4	3.7213–8	2.7570+6	1.3888–6	9.5673+8	3.6177+8	1.6958+8	4.2537+8	9.4773+3	3.3751+2	2.1649+2	1.2099+2	2.8859–2
	7.0000–4	3.7458–8	2.7389+6	1.4106–6	9.5047+8	3.5999+8	1.6845+8	4.2201+8	9.4839+3	3.3606+2	2.1596+2	1.2007+2	2.9191–2
	7.1950–4	3.8106–8	2.6924+6	1.4689–6	9.3431+8	3.5539+8	1.6552+8	4.1339+8	9.5012+3	3.3233+2	2.1460+2	1.1770+2	3.0074–2
	7.5975–4	3.9420–8	2.6026+6	1.5913–6	9.0317+8	3.4644+8	1.5989+8	3.9683+8	9.5354+3	3.2531+2	2.1212+2	1.1315+2	3.1902–2
N2	7.9943–4	4.0687–8	2.5216+6	1.7145–6	8.7504+8	3.3827+8	1.5482+8	3.8194+8	9.5675+3	3.1918+2	2.1008+2	1.0907+2	3.3711–2
	8.0000–4	4.0705–8	2.5205+6	1.7162–6	8.7466+8	3.3816+8	1.5475+8	3.8174+8	9.5676+3	3.1910+2	2.1005+2	1.0901+2	3.3733–2
	8.1250–4	4.1101–8	2.4962+6	1.7556–6	8.6623+8	3.3571+8	1.5314+8	3.7737+8	9.5704+3	3.1687+2	2.0904+2	1.0780+2	3.4229–2
	8.3594–4	4.1837–8	2.4523+6	1.8300–6	8.5100+8	3.3127+8	1.5024+8	3.6947+8	9.5756+3	3.1289+2	2.0724+2	1.0561+2	3.5160–2
	8.5000–4	4.2274–8	2.4269+6	1.8751–6	8.4219+8	3.2869+8	1.4857+8	3.6492+8	9.5786+3	3.1061+2	2.0622+2	1.0435+2	3.5718–2
	8.7695–4	4.3104–8	2.3802+6	1.9625–6	8.2597+8	3.2392+8	1.4549+8	3.5655+8	9.5842+3	3.0644+2	2.0438+2	1.0203+2	3.6789–2
	9.0772–4	4.4039–8	2.3297+6	2.0636–6	8.0844+8	3.1873+8	1.4217+8	3.4753+8	9.5905+3	3.0201+2	2.0244+2	9.9531+1	3.8012–2
N1	9.2343–4	4.4511–8	2.3049+6	2.1158–6	7.9986+8	3.1617+8	1.4055+8	3.4313+8	9.5936+3	2.9986+2	2.0152+2	9.8310+1	3.8637–2
	9.3300–4	4.4798–8	2.2902+6	2.1478–6	7.9473+8	3.1465+8	1.3959+8	3.4049+8	9.5955+3	2.9858+2	2.0095+2	9.7583+1	3.9017–2
	9.5386–4	4.5420–8	2.2588+6	2.2180–6	7.8385+8	3.1141+8	1.3754+8	3.3490+8	9.5995+3	2.9586+2	1.9978+2	9.6042+1	3.9847–2
	9.6650–4	4.5795–8	2.2403+6	2.2608–6	7.7744+8	3.0949+8	1.3634+8	3.3161+8	9.6018+3	2.9428+2	1.9910+2	9.5137+1	4.0350–2
	1.0000–3	4.6776–8	2.1933+6	2.3754–6	7.6112+8	3.0459+8	1.3328+8	3.2325+8	9.6080+3	2.9029+2	1.9741+2	9.2836+1	4.1684–2
	1.0625–3	4.8589–8	2.1115+6	2.5939–6	7.3273+8	2.9604+8	1.2768+8	3.0900+8	9.5896+3	2.8192+2	1.9302+2	8.8855+1	4.3718–2
	1.1250–3	5.0358–8	2.0373+6	2.8186–6	7.0699+8	2.8821+8	1.2263+8	2.9615+8	9.5722+3	2.7447+2	1.8916+2	8.5265+1	4.5749–2
	1.1719–3	5.1659–8	1.9860+6	2.9910–6	6.8919+8	2.8274+8	1.1915+8	2.8730+8	9.5598+3	2.6937+2	1.8653+2	8.2793+1	4.7271–2
	1.2500–3	5.3780–8	1.9077+6	3.2852–6	6.6201+8	2.7430+8	1.1386+8	2.7384+8	9.5402+3	2.6174+2	1.8266+2	7.9038+1	4.9803–2
	1.2539–3	5.3885–8	1.9040+6	3.3001–6	6.6072+8	2.7390+8	1.1361+8	2.7320+8	9.5393+3	2.6137+2	1.8246+2	7.8861+1	4.9930–2
	1.3125–3	5.5440–8	1.8506+6	3.5266–6	6.4219+8	2.6809+8	1.1001+8	2.6408+8	9.5254+3	2.5607+2	1.7970+2	7.6317+1	5.1826–2
	1.3769–3	5.7117–8	1.7962+6	3.7809–6	6.2333+8	2.6213+8	1.0635+8	2.5484+8	9.5110+3	2.5072+2	1.7693+2	7.3740+1	5.3910–2
	1.5000–3	6.0233–8	1.7033+6	4.2807–6	5.9108+8	2.5180+8	1.0015+8	2.3913+8	9.4852+3	2.4182+2	1.7240+2	6.9362+1	5.7880–2
	1.7500–3	6.6444–8	1.5441+6	5.3552–6	5.3583+8	2.3403+8	8.9326+7	2.1246+8	9.4201+3	2.2370+2	1.6179+2	6.1845+1	6.5252–2
	2.0000–3	7.2307–8	1.4189+6	6.5086–6	4.9239+8	2.1966+8	8.0937+7	1.9178+8	9.3640+3	2.0994+2	1.5385+2	5.6021+1	7.2587–2
	2.2500–3	7.7969–8	1.3159+6	7.7374–6	4.5663+8	2.0731+8	7.3966+7	1.7534+8	9.3007+3	1.9710+2	1.4567+2	5.1347+1	7.9370–2
M5	2.5860–3	8.5202–8	1.2042+6	9.5036–6	4.1786+8	1.9362+8	6.6521+7	1.5771+8	9.2264+3	1.8355+2	1.3712+2	4.6342+1	8.8434–2
	2.6119–3	8.5747–8	1.1965+6	9.6450–6	4.1521+8	1.9266+8	6.6010+7	1.5653+8	9.2177+3	1.8259+2	1.3649+2	4.6004+1	8.9029–2
	2.6604–3	8.6763–8	1.1825+6	9.9120–6	4.1034+8	1.9090+8	6.5075+7	1.5436+8	9.2018+3	1.8083+2	1.3536+2	4.5384+1	9.0143–2
M4	2.6980–3	8.7546–8	1.1719+6	1.0121–5	4.0668+8	1.8957+8	6.4371+7	1.5273+8	9.1896+3	1.7951+2	1.3450+2	4.4918+1	9.1005–2
	2.7169–3	8.7937–8	1.1667+6	1.0226–5	4.0486+8	1.8891+8	6.4025+7	1.5192+8	9.1836+3	1.7887+2	1.3409+2	4.4688+1	9.1438–2
	2.7453–3	8.8526–8	1.1589+6	1.0385–5	4.0217+8	1.8793+8	6.3511+7	1.5072+8	9.1746+3	1.7791+2	1.3347+2	4.4347+1	9.2089–2
	2.7877–3	8.9398–8	1.1476+6	1.0624–5	3.9825+8	1.8650+8	6.2763+7	1.4898+8	9.1614+3	1.7652+2	1.3257+2	4.3850+1	9.3058–2
	2.8938–3	9.1562–8	1.1205+6	1.1232–5	3.8884+8	1.8305+8	6.0974+7	1.4480+8	9.1292+3	1.7320+2	1.3045+2	4.2661+1	9.5484–2
	3.0000–3	9.3695–8	1.0950+6	1.1850–5	3.7998+8	1.7979+8	5.9300+7	1.4088+8	9.0983+3	1.7013+2	1.2848+2	4.1547+1	9.7905–2
M3	3.1669–3	9.6990–8	1.0578+6	1.2846–5	3.6708+8	1.7500+8	5.6824+7	1.3525+8	9.0520+3	1.6506+2	1.2503+2	3.9929+1	1.0170–1
	3.2190–3	9.8060–8	1.0463+6	1.3163–5	3.6307+8	1.7355+8	5.6096+7	1.3342+8	9.0381+3	1.6352+2	1.2401+2	3.9402+1	1.0288–1
	3.3166–3	1.0005–7	1.0255+6	1.3765–5	3.5585+8	1.7094+8	5.4789+7	1.3012+8	9.0127+3	1.6076+2	1.2220+2	3.8455+1	1.0509–1
	3.4874–3	1.0348–7	9.9147+5	1.4843–5	3.4406+8	1.6663+8	5.2660+7	1.2476+8	8.9702+3	1.5629+2	1.1927+2	3.6915+1	1.0895–1
	3.5000–3	1.0373–7	9.8908+5	1.4923–5	3.4323+8	1.6632+8	5.2511+7	1.2439+8	8.9671+3	1.5598+2	1.1906+2	3.6807+1	1.0923–1
M2	3.6927–3	1.0752–7	9.5422+5	1.6177–5	3.3113+8	1.6185+8	5.0339+7	1.1893+8	8.9220+3	1.5143+2	1.1608+2	3.5239+1	1.1356–1
	3.7437–3	1.0852–7	9.4543+5	1.6515–5	3.2808+8	1.6072+8	4.9795+7	1.1755+8	8.9105+3	1.5027+2	1.1532+2	3.4841+1	1.1471–1
	3.7695–3	1.0902–7	9.4106+5	1.6687–5	3.2657+8	1.6016+8	4.9524+7	1.1687+8	8.9047+3	1.4970+2	1.1494+2	3.4644+1	1.1528–1
	3.8848–3	1.1125–7	9.2217+5	1.7464–5	3.2001+8	1.5773+8	4.8357+7	1.1392+8	8.8795+3	1.4722+2	1.1331+2	3.3793+1	1.1786–1
M1	3.9739–3	1.1297–7	9.0821+5	1.8073–5	3.1516+8	1.5592+8	4.7496+7	1.1174+8	8.8605+3	1.4541+2	1.1212+2	3.3166+1	1.1986–1
	4.0000–3	1.1347–7	9.0416+5	1.8253–5	3.1376+8	1.5539+8	4.7251+7	1.1111+8	8.8514+3	1.4489+2	1.1178+2	3.2986+1	1.2033–1
	4.0625–3	1.1468–7	8.9464+5	1.8686–5	3.1046+8	1.5412+8	4.6665+7	1.0966+8	8.8289+3	1.4355+2	1.1086+2	3.2566+1	1.2144–1
	4.1797–3	1.1692–7	8.7746+5	1.9509–5	3.0450+8	1.5183+8	4.5609+7	1.0705+8	8.7878+3	1.4115+2	1.0922+2	3.1810+1	1.2351–1
	4.2500–3	1.1826–7	8.6755+5	2.0010–5	3.0106+8	1.5050+8	4.5001+7	1.0555+8	8.7637+3	1.3977+2	1.0827+2	3.1375+1	1.2475–1
	4.3848–3	1.2080–7	8.4931+5	2.0983–5	2.9473+8	1.4804+8	4.3886+7	1.0280+8	8.7189+3	1.3724+2	1.0654+2	3.0577+1	1.2712–1
	4.5000–3	1.2295–7	8.3446+5	2.1829–5	2.8958+8	1.4602+8	4.2980+7	1.0056+8	8.6818+3	1.3520+2	1.0514+2	2.9930+1	1.2914–1
	4.6250–3	1.2526–7	8.1908+5	2.2761–5	2.8424+8	1.4393+8	4.2044+7	9.8256+7	8.6428+3	1.3308+2	1.0369+2	2.9262+1	1.3133–1
	4.6924–3	1.2649–7	8.1108+5	2.3269–5	2.8146+8	1.4283+8	4.1559+7	9.7059+7	8.6223+3	1.3198+2	1.0294+2	2.8916+1	1.3250–1
	5.0000–3	1.3206–7	7.7691+5	2.5642–5	2.6960+8	1.3813+8	3.9494+7	9.1977+7	8.5329+3	1.2735+2	9.9763+1	2.7445+1	1.3785–1
	5.5000–3	1.4099–7	7.2769+5	2.9682–5	2.5252+8	1.3124+8	3.6542+7	8.4730+7	8.3973+3	1.2022+2	9.4744+1	2.5334+1	1.4636–1
	6.0000–3	1.4964–7	6.8562+5	3.3948–5	2.3792+8	1.2526+8	3.4044+7	7.8613+7	8.2754+3	1.1423+2	9.0518+1	2.3554+1	1.5479–1
	7.0000–3	1.6671–7	6.1543+5	4.3134–5	2.1357+8	1.1517+8	2.9992+7	6.8392+7	7.9748+3	1.0367+2	8.2947+1	2.0557+1	1.6788–1
	8.0000–3	1.8295–7	5.6079+5	5.3176–5	1.9460+8	1.0710+8	2.6879+7	6.0619+7	7.7232+3	9.5601+1	7.7141+1	1.8279+1	1.8072–1
	9.0000–3	1.9855–7	5.1673+5	6.4034–5	1.7932+8	1.0026+8	2.4376+7	5.4670+7	7.4656+3	8.8685+1	7.1966+1	1.6527+1	1.9127–1
	1.0000–2	2.1356–7	4.8040+5	7.5683–5	1.6671+8	9.4518+7	2.2338+7	4.9845+7	7.2424+3	8.3070+1	6.7761+1	1.5107+1	2.0163–1
	1.1250–2	2.3148–7	4.4321+5	9.1313–5	1.5380+8	8.8394+7	2.0250+7	4.5153+7	6.9603+3	7.6952+1	6.3024+1	1.3716+1	2.1199–1
	1.2500–2	2.4873–7	4.1248+5	1.0811–4	1.4314+8	8.3252+7	1.8549+7	4.1330+7	6.7173+3	7.1976+1	5.9170+1	1.2583+1	2.2216–1
L3	1.3425–2	2.6111–7	3.9292+5	1.2125–4	1.3635+8	7.9940+7	1.7479+7	3.8926+7	6.5574+3	6.8844+1	5.6744+1	1.1871+1	2.2957–1
	1.3819–2	2.6626–7	3.8533+5	1.2702–4	1.3372+8	7.8623+7	1.7063+7	3.8024+7	6.4870+3	6.7587+1	5.5752+1	1.1603+1	2.3219–1
	1.4409–2	2.7389–7	3.7459+5	1.3587–4	1.2999+8	7.6753+7	1.6478+7	3.6753+7	6.3864+3	6.5820+1	5.4359+1	1.1225+1	2.3610–1
	1.5000–2	2.8140–7	3.6458+5	1.4496–4	1.2652+8	7.5002+7	1.5936+7	3.5575+7	6.2913+3	6.4183+1	5.3068+1	1.0875+1	2.3998–1
L2	1.5768–2	2.9101–7	3.5254+5	1.5712–4	1.2234+8	7.2879+7	1.5287+7	3.4167+7	6.1693+3	6.2126+1	5.1428+1	1.0454+1	2.4448–1
	1.6250–2	2.9703–7	3.4540+5	1.6496–4	1.1986+8	7.1604+7	1.4908+7	3.3345+7	6.0969+3	6.0929+1	5.0474+1	1.0208+1	2.4729–1
	1.6297–2	2.9761–7	3.4473+5	1.6573–4	1.1963+8	7.1482+7	1.4872+7	3.3267+7	6.0900+3	6.0816+1	5.0383+1	1.0185+1	2.4756–1
L1	1.6376–2	2.9859–7	3.4360+5	1.6703–4	1.1924+8	7.1280+7	1.4813+7	3.3137+7	6.0784+3	6.0626+1	5.0232+1	1.0146+1	2.4802–1
	1.6829–2	3.0419–7	3.3728+5	1.7457–4	1.1704+8	7.0145+7	1.4480+7	3.2411+7	6.0121+3	5.9560+1	4.9381+1	9.9289+0	2.5042–1
	1.7223–2	3.0901–7	3.3202+5	1.8123–4	1.1522+8	6.9197+7	1.4204+7	3.1809+7	5.9564+3	5.8676+1	4.8675+1	9.7487+0	2.5250–1
	1.7622–2	3.1386–7	3.2689+5	1.8808–4	1.1344+8	6.8270+7	1.3936+7	3.1223+7	5.9017+3	5.7817+1	4.7989+1	9.5736+0	2.5461–1
	1.8125–2	3.1992–7	3.2069+5	1.9686–4	1.1129+8	6.7149+7	1.3614+7	3.0518+7	5.8352+3	5.6784+1	4.7164+1	9.3627+0	2.5725–1
	1.8611–2	3.2572–7	3.1498+5	2.0550–4	1.0930+8	6.6110+7	1.3318+7	2.9869+7	5.7734+3	5.5835+1	4.6406+1	9.1688+0	2.5979–1
	1.8811–2	3.2809–7	3.1271+5	2.0908–4	1.0852+8	6.5697+7	1.3200+7	2.9612+7	5.7486+3	5.5458+1	4.6105+1	9.0919+0	2.6083–1

Atomic Weight 208.980 Density 9.747 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.0000–2	3.4202–7	2.9997+5	2.3094–4	1.0409+8	6.3370+7	1.2545+7	2.8175+7	5.6085+3	5.3359+1	4.4430+1	8.6626+0	2.6700–1
2.2500–2	3.7071–7	2.7675+5	2.7965–4	9.6039+7	5.9067+7	1.1385+7	2.5582+7	5.3197+3	4.9352+1	4.1195+1	7.8802+0	2.7659–1
2.4375–2	3.9153–7	2.6204+5	3.1864–4	9.0933+7	5.6311+7	1.0659+7	2.3957+7	5.1319+3	4.6841+1	3.9167+1	7.3901+0	2.8371–1
2.5000–2	3.9835–7	2.5755+5	3.3209–4	8.9376+7	5.5467+7	1.0439+7	2.3465+7	5.0739+3	4.6080+1	3.8552+1	7.2418+0	2.8607–1
2.6250–2	4.1182–7	2.4913+5	3.5965–4	8.6453+7	5.3875+7	1.0029+7	2.2545+7	4.9640+3	4.4657+1	3.7402+1	6.9644+0	2.9076–1
2.7188–2	4.2178–7	2.4325+5	3.8088–4	8.4411+7	5.2758+7	9.7431+6	2.1905+7	4.8864+3	4.3669+1	3.6603+1	6.7717+0	2.9426–1
3.0000–2	4.5099–7	2.2749+5	4.4730–4	7.8944+7	4.9747+7	8.9855+6	2.0207+7	4.6751+3	4.1045+1	3.4481+1	6.2599+0	3.0461–1
3.5000–2	5.0128–7	2.0467+5	5.7531–4	7.1023+7	4.5291+7	7.9378+6	1.7790+7	4.3435+3	3.7134+1	3.1291+1	5.5246+0	3.1853–1
4.0000–2	5.4926–7	1.8679+5	7.1574–4	6.4820+7	4.1754+7	7.1300+6	1.5931+7	4.0753+3	3.4118+1	2.8826+1	4.9595+0	3.3219–1
4.5000–2	5.9523–7	1.7236+5	8.6786–4	5.9813+7	3.8854+7	6.5009+6	1.4455+7	3.8514+3	3.1653+1	2.6802+1	4.5080+0	3.4357–1
5.0000–2	6.3953–7	1.6042+5	1.0311–3	5.5670+7	3.6431+7	5.9855+6	1.3250+7	3.6615+3	2.9637+1	2.5142+1	4.1399+0	3.5482–1
6.0000–2	7.2539–7	1.4144+5	1.3881–3	4.9081+7	3.2589+7	5.2076+6	1.1281+7	3.3602+3	2.6446+1	2.2537+1	3.5346+0	3.7424–1
8.0000–2	8.8313–7	1.1617+5	2.2117–3	4.0314+7	2.7354+7	4.2183+6	8.7391+6	2.9429+3	2.2241+1	1.9083+1	2.7495+0	4.0821–1
K 9.0832–2	9.6139–7	1.0672+5	2.7167–3	3.7032+7	2.5357+7	3.8625+6	7.8103+6	2.7794+3	2.0675+1	1.7790+1	2.4610+0	4.2437–1
9.1978–2	9.6948–7	1.0583+5	2.7723–3	3.6723+7	2.5168+7	3.8290+6	7.7237+6	2.7641+3	2.0528+1	1.7668+1	2.4342+0	4.2590–1
9.3984–2	9.8356–7	1.0431+5	2.8706–3	3.6198+7	2.4846+7	3.7721+6	7.5771+6	2.7380+3	2.0279+1	1.7462+1	2.3888+0	4.2858–1
9.6992–2	1.0045–6	1.0214+5	3.0203–3	3.5444+7	2.4383+7	3.6906+6	7.3679+6	2.7003+3	1.9923+1	1.7166+1	2.3240+0	4.3259–1
1.0000–1	1.0252–6	1.0008+5	3.1726–3	3.4729+7	2.3942+7	3.6132+6	7.1706+6	2.6643+3	1.9585+1	1.6885+1	2.2628+0	4.3659–1
1.0625–1	1.0637–6	9.6451+4	3.4968–3	3.3470+7	2.3173+7	3.4770+6	6.8175+6	2.6005+3	1.8969+1	1.6373+1	2.1528+0	4.4404–1
1.1719–1	1.1290–6	9.0875+4	4.0882–3	3.1535+7	2.1982+7	3.2677+6	6.2831+6	2.5006+3	1.8028+1	1.5585+1	1.9862+0	4.5711–1
1.3359–1	1.2223–6	8.3936+4	5.0289–3	2.9128+7	2.0484+7	3.0074+6	5.6335+6	2.3729+3	1.6866+1	1.4606+1	1.7838+0	4.7666–1
1.5000–1	1.3110–6	7.8260+4	6.0298–3	2.7158+7	1.9245+7	2.7948+6	5.1153+6	2.2655+3	1.5926+1	1.3808+1	1.6224+0	4.9603–1
1.7500–1	1.4249–6	7.2001+4	7.6525–3	2.4986+7	1.7849+7	2.5657+6	4.5694+6	2.1356+3	1.4899+1	1.2927+1	1.4516+0	5.2108–1
2.0000–1	1.5314–6	6.6996+4	9.3777–3	2.3249+7	1.6721+7	2.3826+6	4.1439+6	2.0292+3	1.4090+1	1.2226+1	1.3185+0	5.4591–1
2.5000–1	1.7170–6	5.9753+4	1.3062–2	2.0735+7	1.4966+7	2.1481+6	3.6192+6	1.8767+3	1.3063+1	1.1319+1	1.1541+0	5.9026–1
3.0000–1	1.8851–6	5.4423+4	1.7003–2	1.8886+7	1.3670+7	1.9738+6	3.2402+6	1.7607+3	1.2322+1	1.0653+1	1.0356+0	6.3385–1
4.0000–1	2.1896–6	4.6856+4	2.5390–2	1.6260+7	1.1726+7	1.7747+6	2.7576+6	1.6177+3	1.1531+1	9.9271+0	8.8401–1	7.1995–1
5.0000–1	2.4608–6	4.1693+4	3.4211–2	1.4468+7	1.0347+7	1.6595+6	2.4599+6	1.5311+3	1.1146+1	9.5491+0	7.9036–1	8.0606–1
6.0000–1	2.7010–6	3.7985+4	4.3259–2	1.3181+7	9.3142+6	1.5857+6	2.2800+6	1.4754+3	1.0958+1	9.3305+0	7.3374–1	8.9422–1
8.0000–1	3.1228–6	3.2853+4	6.1556–2	1.1401+7	7.8718+6	1.5004+6	2.0272+6	1.4107+3	1.0903+1	9.1731+0	6.5419–1	1.0761+0
1.0000+0	3.4735–6	2.9537+4	7.9818–2	1.0250+7	6.9061+6	1.4526+6	1.8899+6	1.3772+3	1.1000+1	9.1234+0	6.1113–1	1.2656+0
1.5000+0	4.1419–6	2.4770+4	1.2400–1	8.5958+6	5.4531+6	1.4022+6	1.7391+6	1.3391+3	1.1640+1	9.3195+0	5.6442–1	1.7564+0
2.0000+0	4.6263–6	2.2176+4	1.6571–1	7.6957+6	4.6327+6	1.3890+6	1.6727+6	1.3260+3	1.2342+1	9.5249+0	5.4384–1	2.2733+0
3.0000+0	5.2853–6	1.9411+4	2.4240–1	6.7361+6	3.7445+6	1.3711+6	1.6192+6	1.3189+3	1.3762+1	9.8816+0	5.2841–1	3.3522+0
4.0000+0	5.7066–6	1.7978+4	3.1153–1	6.2389+6	3.2609+6	1.3655+6	1.6111+6	1.3209+3	1.5192+1	1.0190+1	5.2628–1	4.4758+0
5.0000+0	5.9959–6	1.7111+4	3.7450–1	5.9378+6	2.9596+6	1.3658+6	1.6111+6	1.3245+3	1.6586+1	1.0436+1	5.2679–1	5.6229+0
6.0000+0	6.2084–6	1.6525+4	4.3236–1	5.7347+6	2.7564+6	1.3662+6	1.6107+6	1.3301+3	1.8004+1	1.0649+1	5.2721–1	6.8276+0
8.0000+0	6.4960–6	1.5794+4	5.3567–1	5.4807+6	2.5013+6	1.3669+6	1.6112+6	1.3388+3	2.0782+1	1.1003+1	5.2841–1	9.2508+0
1.0000+1	6.6749–6	1.5370+4	6.2588–1	5.3338+6	2.3525+6	1.3680+6	1.6120+6	1.3504+3	2.3615+1	1.1279+1	5.2973–1	1.1806+1
1.5000+1	6.8948–6	1.4880+4	8.1172–1	5.1637+6	2.1940+6	1.3706+6	1.5978+6	1.3716+3	3.0490+1	1.1689+1	5.2522–1	1.8276+1
2.0000+1	6.9624–6	1.4736+4	9.5917–1	5.1136+6	2.1521+6	1.3725+6	1.5876+6	1.3884+3	3.7577+1	1.2022+1	5.2204–1	2.5032+1
3.0000+1	6.9816–6	1.4695+4	1.1849+0	5.0995+6	2.1515+6	1.3734+6	1.5732+6	1.4142+3	5.1789+1	1.2404+1	5.1757–1	3.8867+1
4.0000+1	6.9884–6	1.4681+4	1.3552+0	5.0945+6	2.1504+6	1.3744+6	1.5683+6	1.4341+3	6.6207+1	1.2670+1	5.1628–1	5.3020+1
5.0000+1	6.9930–6	1.4671+4	1.4917+0	5.0912+6	2.1495+6	1.3749+6	1.5654+6	1.4522+3	8.0883+1	1.2867+1	5.1561–1	6.7500+1
6.0000+1	6.9969–6	1.4663+4	1.6052+0	5.0883+6	2.1487+6	1.3754+6	1.5628+6	1.4669+3	9.5680+1	1.3035+1	5.1504–1	8.2130+1
8.0000+1	6.9980–6	1.4661+4	1.7871+0	5.0876+6	2.1475+6	1.3757+6	1.5629+6	1.4901+3	1.2554+2	1.3276+1	5.1566–1	1.1175+2
1.0000+2	6.9828–6	1.4693+4	1.9299+0	5.0986+6	2.1465+6	1.3760+6	1.5746+6	1.5082+3	1.5563+2	1.3487+1	5.2013–1	1.4162+2
1.5000+2	6.9734–6	1.4712+4	2.1917+0	5.1055+6	2.1448+6	1.3762+6	1.5830+6	1.5405+3	2.3133+2	1.3710+1	5.2291–1	2.1710+2
2.0000+2	6.9686–6	1.4723+4	2.3786+0	5.1090+6	2.1436+6	1.3763+6	1.5875+6	1.5596+3	3.0755+2	1.3915+1	5.2442–1	2.9311+2
3.0000+2	6.9640–6	1.4732+4	2.6428+0	5.1124+6	2.1419+6	1.3764+6	1.5925+6	1.5851+3	4.5961+2	1.4241+1	5.2608–1	4.4484+2
4.0000+2	6.9657–6	1.4729+4	2.8307+0	5.1112+6	2.1407+6	1.3764+6	1.5924+6	1.6033+3	6.1186+2	1.4419+1	5.2608–1	5.9691+2
5.0000+2	6.9722–6	1.4715+4	2.9765+0	5.1063+6	2.1398+6	1.3765+6	1.5885+6	1.6176+3	7.6522+2	1.4544+1	5.2482–1	7.5015+2
6.0000+2	6.9721–6	1.4715+4	3.0957+0	5.1065+6	2.1390+6	1.3765+6	1.5893+6	1.6293+3	9.1698+2	1.4658+1	5.2513–1	9.0180+2
8.0000+2	6.9744–6	1.4710+4	3.2839+0	5.1048+6	2.1378+6	1.3765+6	1.5888+6	1.6481+3	1.2233+3	1.4874+1	5.2502–1	1.2079+3
1.0000+3	6.9769–6	1.4705+4	3.4298+0	5.1029+6	2.1369+6	1.3765+6	1.5878+6	1.6629+3	1.5293+3	1.5048+1	5.2476–1	1.5138+3
1.5000+3	6.9816–6	1.4695+4	3.6947+0	5.0995+6	2.1352+6	1.3765+6	1.5861+6	1.6903+3	2.2988+3	1.5212+1	5.2417–1	2.2831+3
2.0000+3	6.9879–6	1.4682+4	3.8824+0	5.0949+6	2.1340+6	1.3765+6	1.5827+6	1.7107+3	3.0641+3	1.5373+1	5.2305–1	3.0483+3
3.0000+3	6.9954–6	1.4666+4	4.1470+0	5.0894+6	2.1323+6	1.3765+6	1.5788+6	1.7402+3	4.5972+3	1.5687+1	5.2179–1	4.5810+3
4.0000+3	7.0024–6	1.4651+4	4.3348+0	5.0843+6	2.1311+6	1.3765+6	1.5749+6	1.7618+3	6.1305+3	1.5849+1	5.2049–1	6.1141+3
5.0000+3	7.0118–6	1.4632+4	4.4802+0	5.0775+6	2.1302+6	1.3765+6	1.5691+6	1.7787+3	7.6798+3	1.5955+1	5.1856–1	7.6633+3
6.0000+3	7.0135–6	1.4628+4	4.5990+0	5.0763+6	2.1294+6	1.3765+6	1.5685+6	1.7910+3	9.2040+3	1.6057+1	5.1838–1	9.1874+3
8.0000+3	7.0181–6	1.4619+4	4.7865+0	5.0730+6	2.1282+6	1.3765+6	1.5664+6	1.8106+3	1.2279+4	1.6262+1	5.1769–1	1.2262+4
1.0000+4	7.0215–6	1.4612+4	4.9317+0	5.0705+6	2.1273+6	1.3765+6	1.5649+6	1.8260+3	1.5383+4	1.6443+1	5.1718–1	1.5366+4
1.5000+4	7.0271–6	1.4600+4	5.1957+0	5.0665+6	2.1256+6	1.3765+6	1.5625+6	1.8555+3	2.2998+4	1.6597+1	5.1639–1	2.2981+4
2.0000+4	7.0321–6	1.4590+4	5.3832+0	5.0629+6	2.1244+6	1.3765+6	1.5600+6	1.8767+3	3.0713+4	1.6750+1	5.1558–1	3.0696+4
3.0000+4	7.0368–6	1.4580+4	5.6475+0	5.0595+6	2.1228+6	1.3765+6	1.5583+6	1.9066+3	4.5967+4	1.7051+1	5.1501–1	4.5949+4
4.0000+4	7.0411–6	1.4571+4	5.8351+0	5.0564+6	2.1216+6	1.3765+6	1.5564+6	1.9280+3	6.1385+4	1.7207+1	5.1437–1	6.1367+4
5.0000+4	7.0494–6	1.4554+4	5.9806+0	5.0505+6	2.1206+6	1.3765+6	1.5514+6	1.9444+3	7.6659+4	1.7334+1	5.1271–1	7.6641+4
6.0000+4	7.0495–6	1.4554+4	6.0996+0	5.0504+6	2.1199+6	1.3765+6	1.5520+6	1.9578+3	9.1921+4	1.7434+1	5.1294–1	9.1903+4
8.0000+4	7.0518–6	1.4549+4	6.2872+0	5.0487+6	2.1187+6	1.3765+6	1.5515+6	1.9792+3	1.2271+5	1.7631+1	5.1277–1	1.2269+5
1.0000+5	7.0545–6	1.4543+4	6.4326+0	5.0468+6	2.1178+6	1.3765+6	1.5505+6	1.9958+3	1.5356+5	1.7816+1	5.1243–1	1.5354+5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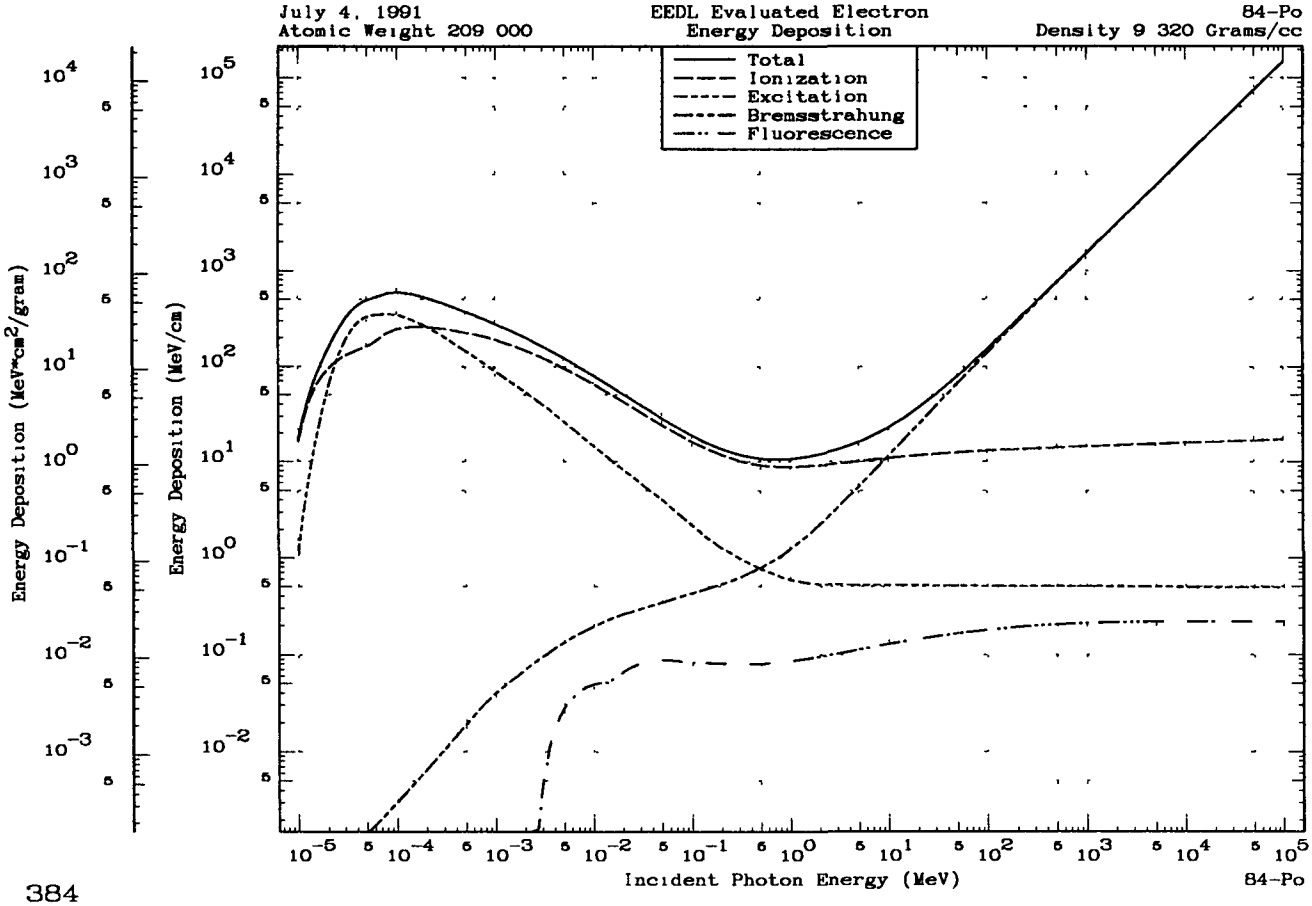
EEDL Evaluated Electron
Cross Sections
84-Po
Density 9 320 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
84-Po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Total
Ionization
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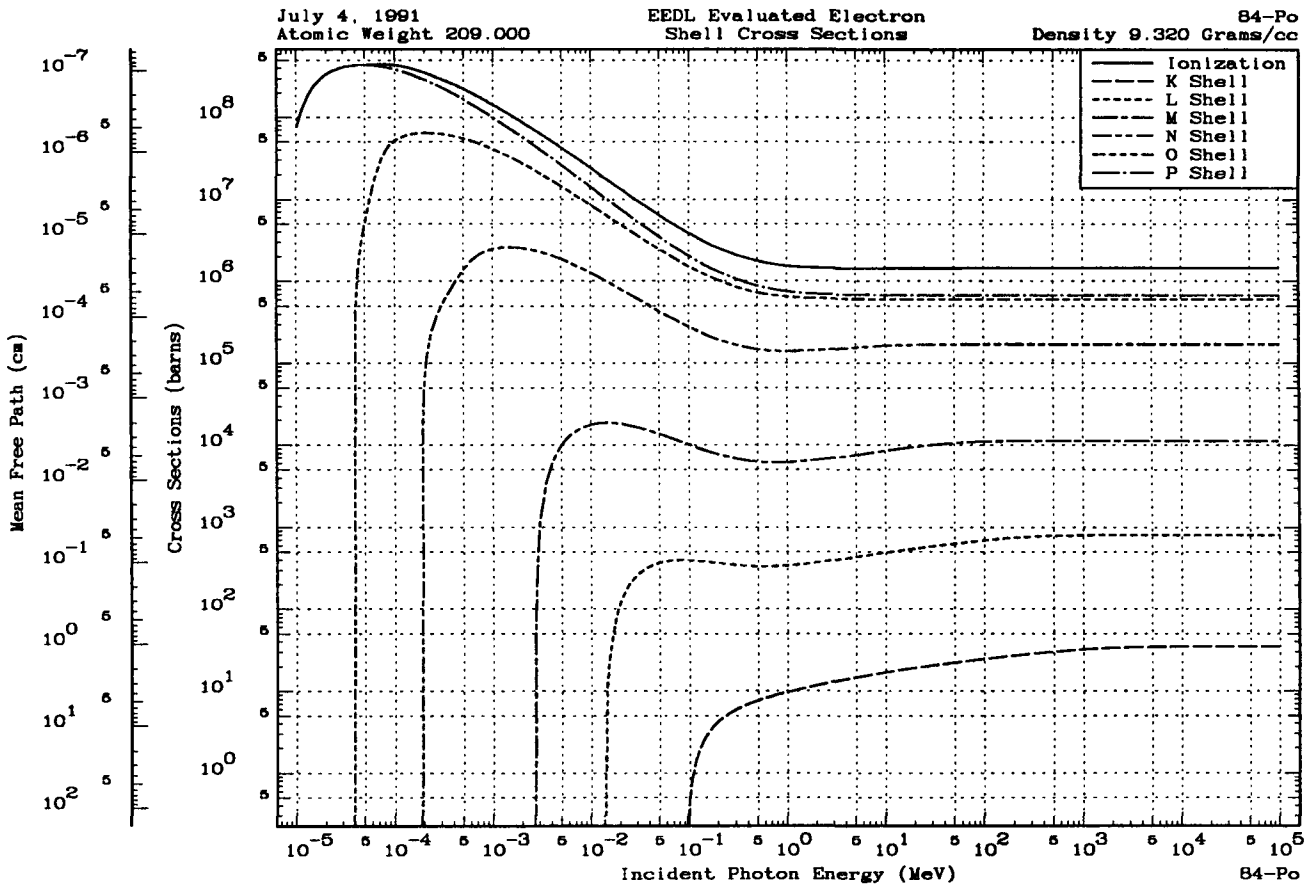
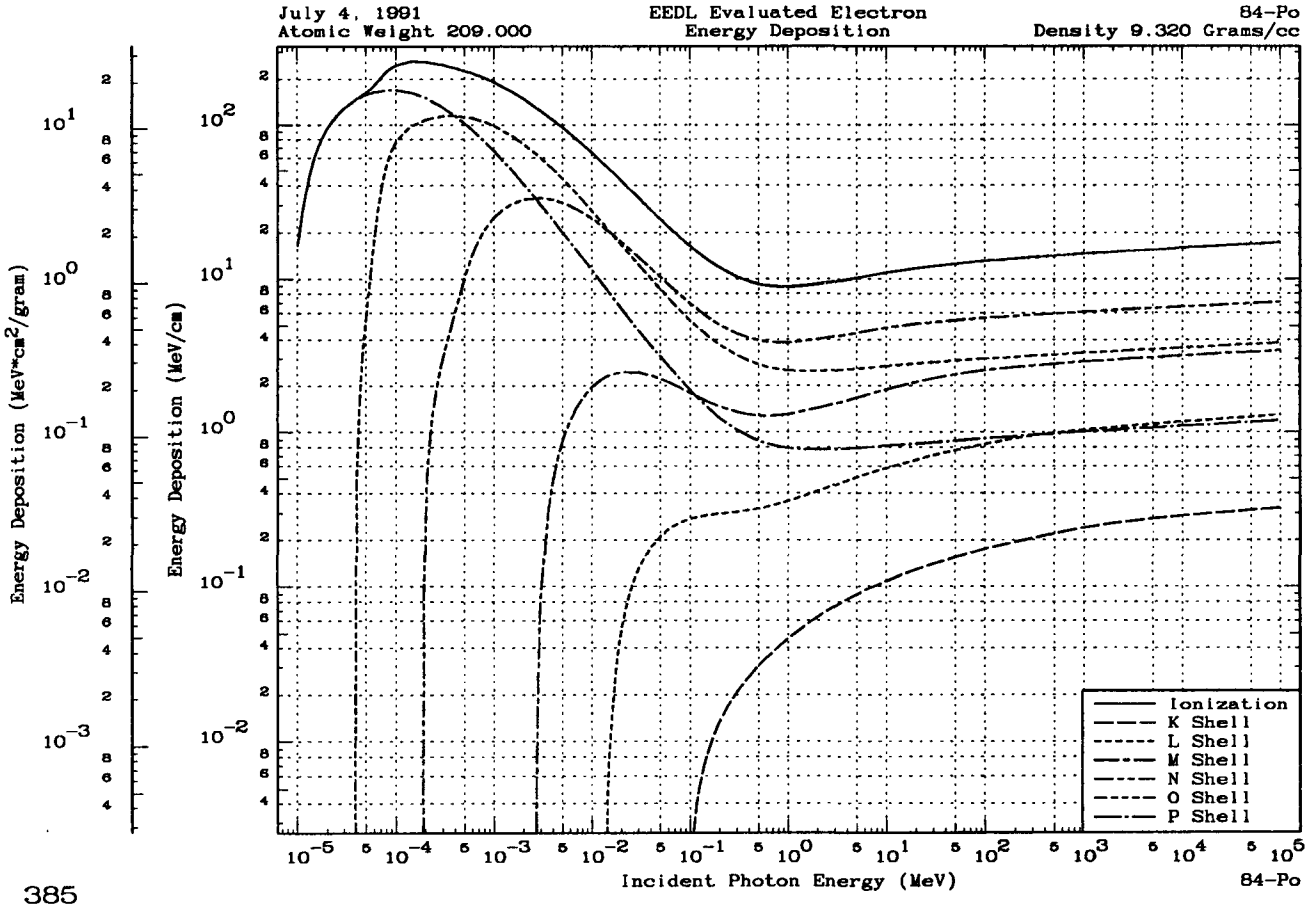
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
84-Po

384


July 4, 1991
Atomic Weight 209.000
EEDL Evaluated Electron
Shell Cross Sections
84-Po
Density 9.320 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
84-Po


July 4, 1991
Atomic Weight 209.000
EEDL Evaluated Electron
Energy Deposition
84-Po
Density 9.320 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
84-Po

385

Atomic Weight 209.000 — Density 9.320 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2990–8	8.2597+6		2.8665+9	2.7863+9	7.5158+7	5.0693+6	4.8844+3	1.7369+1	1.6273+1	1.0951+0	2.8354–4
P2	1.0250–5	1.3103–8	8.1884+6		2.8418+9	2.7538+9	8.1779+7	6.2189+6	4.9091+3	1.9192+1	1.7831+1	1.3606+0	2.9036–4
	1.0324–5	1.3134–8	8.1696+6		2.8353+9	2.7444+9	8.4282+7	6.6083+6	4.9163+3	1.9889+1	1.8441+1	1.4481+0	2.9239–4
	1.0470–5	1.3191–8	8.1339+6		2.8229+9	2.7261+9	8.9351+7	7.4384+6	4.9304+3	2.1317+1	1.9682+1	1.6350+0	2.9639–4
	1.0612–5	1.3245–8	8.1006+6		2.8114+9	2.7088+9	9.4269+7	8.3300+6	4.9440+3	2.2723+1	2.0886+1	1.8365+0	3.0028–4
	1.0753–5	1.3296–8	8.0699+6		2.8007+9	2.6918+9	9.9725+7	9.1861+6	4.9573+3	2.4274+1	2.2242+1	2.0313+0	3.0417–4
	1.1019–5	1.3386–8	8.0155+6		2.7818+9	2.6607+9	1.1007+8	1.1000+7	4.9820+3	2.7268+1	2.4821+1	2.4462+0	3.1149–4
	1.1250–5	1.3459–8	7.9723+6		2.7668+9	2.6346+9	1.1937+8	1.2824+7	5.0032+3	3.0018+1	2.7152+1	2.8656+0	3.1789–4
	1.1517–5	1.3548–8	7.9197+6		2.7486+9	2.6055+9	1.2824+8	1.4864+7	5.0271+3	3.2814+1	2.9474+1	3.3399+0	3.2529–4
	1.2300–5	1.3778–8	7.7878+6		2.7028+9	2.5252+9	1.5504+8	2.2509+7	5.0950+3	4.1730+1	3.6590+1	5.1402+0	3.4721–4
	1.2387–5	1.3799–8	7.7756+6		2.6985+9	2.5167+9	1.5834+8	2.3447+7	5.1024+3	4.2847+1	3.7483+1	5.3639+0	3.4967–4
	1.3125–5	1.3965–8	7.6830+6		2.6664+9	2.4485+9	1.8518+8	3.2727+7	5.1630+3	5.2384+1	4.4784+1	7.5996+0	3.7053–4
	1.3650–5	1.4077–8	7.6220+6		2.6452+9	2.4033+9	2.0094+8	4.1031+7	5.2044+3	5.8938+1	4.9309+1	9.6284+0	3.8550–4
	1.3694–5	1.4086–8	7.6174+6		2.6437+9	2.3996+9	2.0230+8	4.1728+7	5.2078+3	5.9504+1	4.9703+1	9.8005+0	3.8675–4
	1.5000–5	1.4288–8	7.5098+6		2.6063+9	2.2979+9	2.4091+8	6.7450+7	5.3055+3	7.7333+1	6.1080+1	1.6253+1	4.2443–4
	1.6250–5	1.4443–8	7.4288+6		2.5782+9	2.2121+9	2.6909+8	9.6933+7	5.3928+3	9.3646+1	6.9950+1	2.3696+1	4.6100–4
	1.7500–5	1.4505–8	7.3971+6		2.5672+9	2.1356+9	2.9601+8	1.3561+8	5.4749+3	1.1234+2	7.8719+1	3.3623+1	4.9806–4
	1.8125–5	1.4533–8	7.3831+6		2.5623+9	2.1003+9	3.0683+8	1.5522+8	5.5142+3	1.2122+2	8.2465+1	3.8757+1	5.1676–4
	2.0000–5	1.4504–8	7.3978+6		2.5674+9	2.0043+9	3.3640+8	2.2676+8	5.6260+3	1.5083+2	9.3026+1	5.7805+1	5.7355–4
P1	2.0330–5	1.4493–8	7.4035+6		2.5694+9	1.9887+9	3.4017+8	2.4050+8	5.6448+3	1.5593+2	9.4473+1	6.1460+1	5.8364–4
	2.0632–5	1.4476–8	7.4118+6		2.5723+9	1.9748+9	3.4383+8	2.5363+8	5.6599+3	1.6082+2	9.5905+1	6.4913+1	5.9214–4
	2.1218–5	1.4432–8	7.4344+6		2.5801+9	1.9487+9	3.5086+8	2.8052+8	5.6886+3	1.7069+2	9.8683+1	7.2010+1	6.0866–4
	2.2315–5	1.4360–8	7.4719+6		2.5931+9	1.9026+9	3.6389+8	3.2669+8	5.7408+3	1.8824+2	1.0391+2	8.4325+1	6.3981–4
	2.2500–5	1.4344–8	7.4804+6		2.5961+9	1.8951+9	3.6603+8	3.3492+8	5.7494+3	1.9130+2	1.0478+2	8.6528+1	6.4506–4
	2.4237–5	1.4173–8	7.5706+6		2.6274+9	1.8293+9	3.7883+8	4.1924+8	5.8272+3	2.2012+2	1.1086+2	1.0925+2	6.9485–4
	2.6250–5	1.3955–8	7.6889+6		2.6685+9	1.7613+9	3.9299+8	5.1421+8	5.9119+3	2.5319+2	1.1785+2	1.3534+2	7.5325–4
	2.7118–5	1.3836–8	7.7546+6		2.6913+9	1.7342+9	3.9820+8	5.5884+8	5.9468+3	2.6819+2	1.2048+2	1.4771+2	7.7863–4
	3.0000–5	1.3502–8	7.9468+6		2.7580+9	1.6529+9	4.1450+8	6.9051+8	6.0565+3	3.1404+2	1.2895+2	1.8509+2	8.6381–4
	3.5000–5	1.3043–8	8.2262+6		2.8549+9	1.5363+9	4.2743+8	8.9119+8	6.2266+3	3.7958+2	1.3836+2	2.4122+2	1.0139–3
O5	3.8510–5	1.2793–8	8.3872+6		2.9108+9	1.4682+9	4.3553+8	1.0071+9	6.3345+3	4.1921+2	1.4475+2	2.7445+2	1.1214–3
	4.0000–5	1.2764–8	8.4059+6		2.9173+9	1.4420+9	4.3897+8	1.0363+9	6.3778+3	4.3105+2	1.4781+2	2.8324+2	1.1674–3
O4	4.2160–5	1.2720–8	8.4351+6		2.9274+9	1.4064+9	4.4029+8	1.0807+9	6.4384+3	4.4660+2	1.5069+2	2.9591+2	1.2347–3
	4.2500–5	1.2717–8	8.4373+6		2.9282+9	1.4011+9	4.4054+8	1.0866+9	6.4469+3	4.4881+2	1.5120+2	2.9760+2	1.2449–3
	4.4120–5	1.2698–8	8.4497+6		2.9325+9	1.3764+9	4.4177+8	1.1143+9	6.4866+3	4.5931+2	1.5367+2	3.0564+2	1.2932–3
	4.4375–5	1.2695–8	8.4519+6		2.9332+9	1.3727+9	4.4197+8	1.1186+9	6.4928+3	4.6096+2	1.5407+2	3.0689+2	1.3008–3
	4.5590–5	1.2678–8	8.4634+6		2.9372+9	1.3552+9	4.4290+8	1.1391+9	6.5217+3	4.6881+2	1.5595+2	3.1287+2	1.3373–3
	4.7188–5	1.2652–8	8.4808+6		2.9433+9	1.3332+9	4.4420+8	1.1659+9	6.5587+3	4.7918+2	1.5852+2	3.2066+2	1.3854–3
	4.7795–5	1.2661–8	8.4742+6		2.9410+9	1.3251+9	4.4470+8	1.1711+9	6.5725+3	4.8181+2	1.5953+2	3.2228+2	1.4037–3
	5.0000–5	1.2693–8	8.4529+6		2.9336+9	1.2971+9	4.4663+8	1.1899+9	6.6214+3	4.9138+2	1.6329+2	3.2808+2	1.4707–3
	5.2500–5	1.2768–8	8.4036+6		2.9165+9	1.2674+9	4.4668+8	1.2024+9	6.6741+3	4.9905+2	1.6674+2	3.3232+2	1.5466–3
	5.4375–5	1.2819–8	8.3704+6		2.9050+9	1.2465+9	4.4700+8	1.2115+9	6.7122+3	5.0504+2	1.6962+2	3.3542+2	1.6038–3
	5.7188–5	1.2886–8	8.3264+6		2.8897+9	1.2170+9	4.4804+8	1.2247+9	6.7674+3	5.1461+2	1.7465+2	3.3996+2	1.6903–3
	6.0000–5	1.2945–8	8.2887+6		2.8766+9	1.1896+9	4.4973+8	1.2373+9	6.8204+3	5.2489+2	1.8051+2	3.4438+2	1.7773–3
	6.5000–5	1.3122–8	8.1769+6		2.8378+9	1.1453+9	4.5018+8	1.2424+9	6.9096+3	5.3693+2	1.9045+2	3.4648+2	1.9335–3
	6.6875–5	1.3184–8	8.1386+6		2.8245+9	1.1299+9	4.5045+8	1.2442+9	6.9416+3	5.4149+2	1.9424+2	3.4724+2	1.9925–3
	7.2500–5	1.3352–8	8.0360+6		2.7889+9	1.0874+9	4.5219+8	1.2493+9	7.0333+3	5.5625+2	2.0680+2	3.4945+2	2.1711–3
	7.3438–5	1.3379–8	8.0197+6		2.7833+9	1.0808+9	4.5234+8	1.2501+9	7.0480+3	5.5848+2	2.0867+2	3.4981+2	2.2010–3
	8.0000–5	1.3556–8	7.9150+6		2.7469+9	1.0378+9	4.5354+8	1.2556+9	7.1466+3	5.7404+2	2.2179+2	3.5225+2	2.4123–3
	8.5000–5	1.3774–8	7.7897+6		2.7034+9	1.0084+9	4.5088+8	1.2442+9	7.2146+3	5.7819+2	2.2830+2	3.4988+2	2.5741–3
	9.0000–5	1.3981–8	7.6742+6		2.6633+9	9.8139+8	4.4841+8	1.2335+9	7.2794+3	5.8237+2	2.3466+2	3.4770+2	2.7374–3
	9.2500–5	1.4083–8	7.6188+6		2.6441+9	9.6871+8	4.4694+8	1.2285+9	7.3106+3	5.8400+2	2.3732+2	3.4668+2	2.8195–3
	1.0000–4	1.4376–8	7.4636+6	0.0000+0	2.5903+9	9.3353+8	4.4257+8	1.2142+9	7.4002+3	5.8845+2	2.4460+2	3.4385+2	3.0677–3
O3	1.0752–4	1.4697–8	7.3005+6	1.2788–8	2.5337+9	9.0206+8	4.3522+8	1.1964+9	7.4814+3	5.8769+2	2.4834+2	3.3934+2	3.3181–3
	1.0885–4	1.4768–8	7.2656+6	1.5049–8	2.5215+9	8.9683+8	4.3385+8	1.1908+9	7.4953+3	5.8672+2	2.4884+2	3.3788+2	3.3626–3
	1.1142–4	1.4903–8	7.1997+6	1.9440–8	2.4987+9	8.8698+8	4.3128+8	1.1804+9	7.5217+3	5.8494+2	2.4982+2	3.3512+2	3.4490–3
	1.1250–4	1.4959–8	7.1727+6	2.1287–8	2.4893+9	8.8295+8	4.3023+8	1.1761+9	7.5326+3	5.8421+2	2.5023+2	3.3398+2	3.4853–3
	1.1624–4	1.5152–8	7.0813+6	2.7707–8	2.4576+9	8.6939+8	4.2650+8	1.1617+9	7.5698+3	5.8157+2	2.5139+2	3.3018+2	3.6117–3
	1.2046–4	1.5365–8	6.9832+6	3.4980–8	2.4235+9	8.5485+8	4.2252+8	1.1462+9	7.6105+3	5.7883+2	2.5274+2	3.2609+2	3.7548–3
	1.2785–4	1.5726–8	6.8230+6	4.7783–8	2.3679+9	8.3113+8	4.1607+8	1.1207+9	7.6790+3	5.7464+2	2.5522+2	3.1941+2	4.0070–3
O2	1.3573–4	1.6096–8	6.6661+6	6.1548–8	2.3135+9	8.0793+8	4.0980+8	1.0957+9	7.7484+3	5.7089+2	2.5803+2	3.1286+2	4.2786–3
	1.3751–4	1.6184–8	6.6298+6	6.4677–8	2.3009+9	8.0296+8	4.0817+8	1.0897+9	7.7637+3	5.6961+2	2.5831+2	3.1130+2	4.3404–3
	1.3892–4	1.6253–8	6.6016+6	6.7153–8	2.2911+9	7.9910+8	4.0691+8	1.0851+9	7.7756+3	5.6862+2	2.5853+2	3.1008+2	4.3892–3
	1.4064–4	1.6337–8	6.5679+6	7.0167–8	2.2794+9	7.9448+8	4.0540+8	1.0795+9	7.7899+3	5.6744+2	2.5880+2	3.0864+2	4.4487–3
	1.4532–4	1.6562–8	6.4786+6	7.8442–8	2.2484+9	7.8227+8	4.0141+8	1.0647+9	7.8284+3	5.6437+2	2.5956+2	3.0480+2	4.6119–3
	1.5000–4	1.6782–8	6.3935+6	8.6759–8	2.2189+9	7.7062+8	3.9762+8	1.0506+9	7.8659+3	5.6154+2	2.6038+2	3.0115+2	4.7759–3
	1.6250–4	1.7409–8	6.1631+6	1.0925–7	2.1389+9	7.4199+8	3.8551+8	1.0114+9	7.9612+3	5.4982+2	2.5935+2	2.9047+2	5.2171–3
	1.7500–4	1.8010–8	5.9576+6	1.3220–7	2.0676+9	7.1644+8	3.7477+8	9.7639+8	8.0505+3	5.3976+2	2.5879+2	2.8096+2	5.6633–3
O1	1.8134–4	1.8305–8	5.8615+6	1.4400–7	2.0342+9	7.0448+8	3.6974+8	9.6001+8	8.0937+3	5.3514+2	2.5861+2	2.7652+2	5.8914–3
	1.8367–4	1.8425–8	5.8235+6	1.4836–7	2.0210+9	7.0023+8	3.6796+8	9.5285+8	8.1085+3	5.3316+2	2.5858+2	2.7457+2	5.9776–3
	1.8775–4	1.8632–8	5.7587+6	1.5604–7	1.9986+9	6.9299+8	3.6493+8	9.4065+8	8.1339+3	5.2981+2	2.5855+2	2.7125+2	6.1290–3
N7	1.8930–4	1.8710–8	5.7348+6	1.5896–7	1.9903+9	6.9031+8	3.6381+8	9.3614+8	8.1433+3	5.2858+2	2.5855+2	2.7002+2	6.1864–3
	1.9388–4	1.8938–8	5.6656+6	1.6765–7	1.9663+9	6.8255+8	3.6058+8	9.2311+8	8.1698+3	5.2515+2	2.5866+2	2.6649+2	6.3602–3
	1.9465–4	1.8977–8	5.6542+6	1.6912–7	1.9623+9	6.8127+8	3.6005+8	9.2096+8	8.1742+3	5.2459+2	2.5868+2	2.6590+2	6.3895–3
N6	1.9550–4	1.9019–8	5.6416+6	1.7075–7	1.9579+9	6.7987+8	3.5947+8	9.1861+8	8.1790+3	5.2398+2	2.5870+2	2.6526+2	6.4219–3
	2.0000–4	1.9240–8	5.5768+6	1.7936–7	1.9354+9	6.7259+8	3.5646+8	9.0637+8	8.2043+3	5.2089+2	2.5893+2	2.6195+2	6.5934–3
	2.0625–4	1.9561–8	5.4853+6	1.9143–7	1.9037+9	6.6287+8	3.5135+8	8.8946+8	8.2386+3	5.1503+2	2.5779+2	2.5724+2	6.8326–3
	2.1250–4	1.9877–8	5.3981+6	2.0363–7	1.8734+9	6.5358+8	3.4648+8	8.7336+8	8.2720+3	5.0954+2	2.5678+2	2.5275+2	7.0727–3
	2.1797–4	2.0149–8	5.3250+6	2.1441–7	1.8481+9	6.4577+8	3.4239+8	8.5989+8	8.3005+3	5.0495+2	2.5596+2	2.4899+2	7.2836–3
	2.2344–4	2.0419–8	5.2547+6	2.2529–7	1.8237+9	6.3824+8	3.3846+8	8.4695+8	8.3284+3	5.0058+2	2.5519+2	2.4539+2	7.4953–3
	2.2500–4	2.0495–8	5.2351+6	2.2841–7	1.8169+9	6.3614+8	3.3737+8	8.4335+8	8.3363+3	4.9937+2	2.5498+2	2.4438+2	7.5559–3

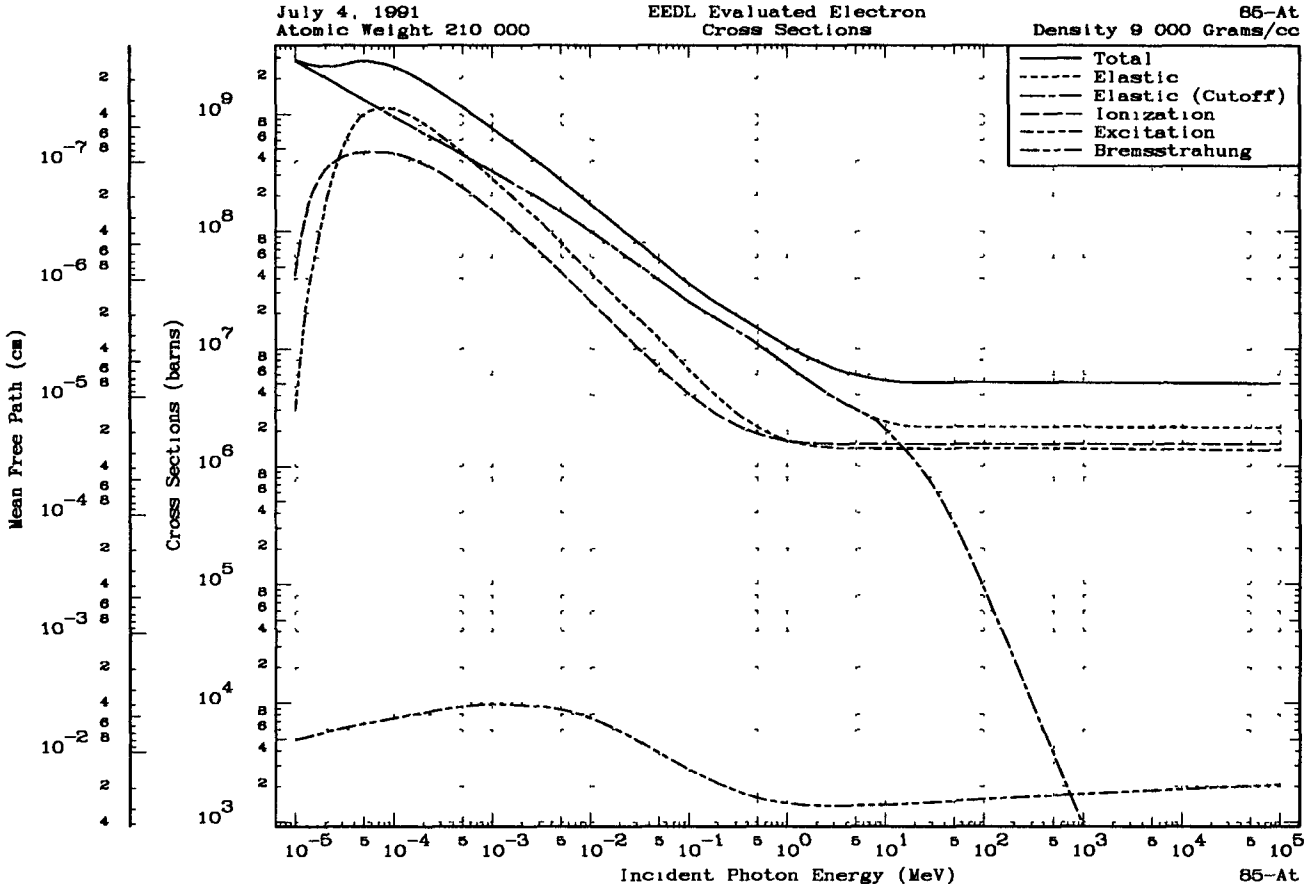
Atomic Weight 209.000 Density 9.320 Grams/cc

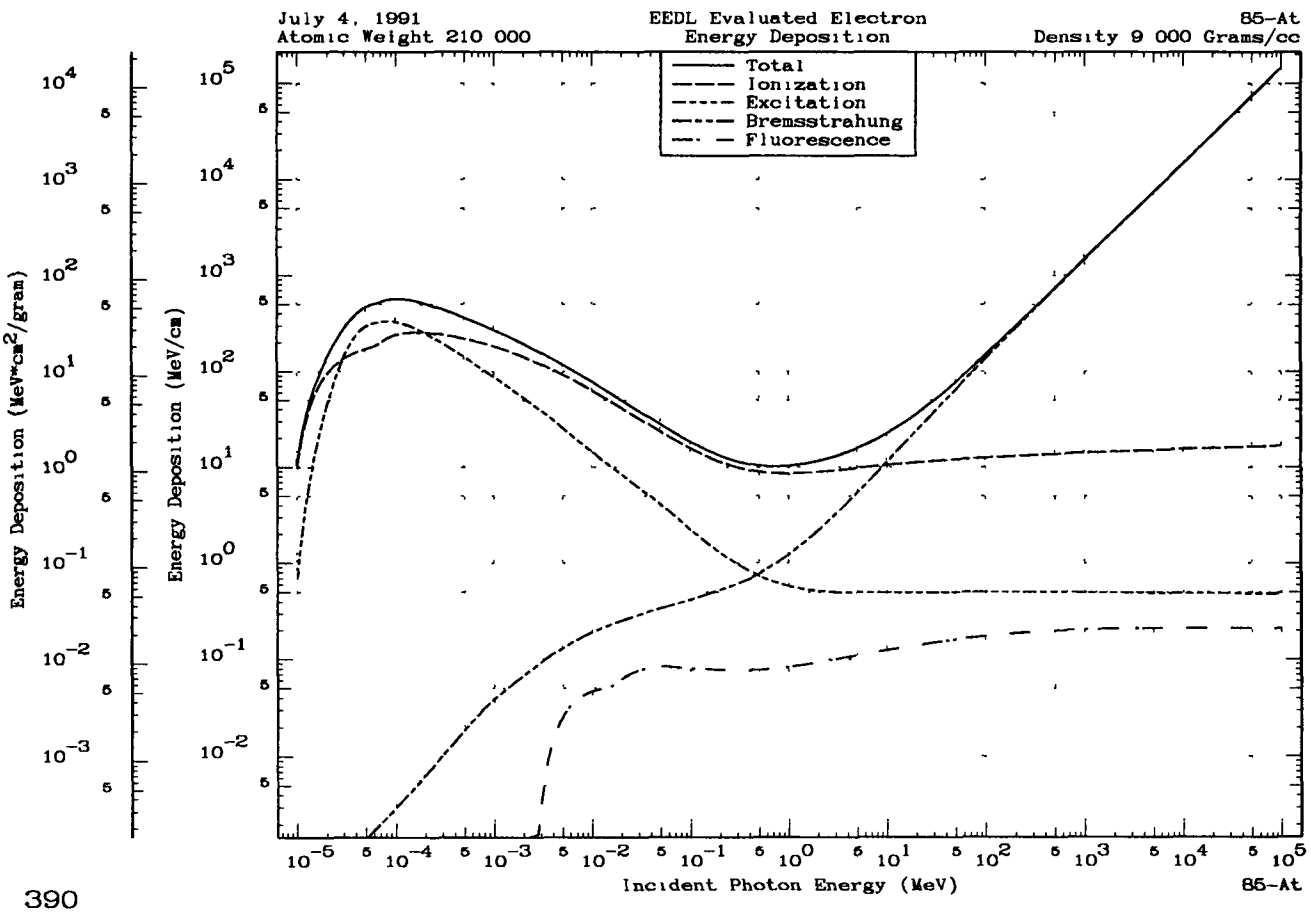
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.3438–4	2.0949–8	5.1219+6	2.4731–7	1.7776+9	6.2398+8	3.3104+8	8.2254+8	8.3825+3	4.9243+2	2.5383+2	2.3859+2	7.9207–3
	2.3848–4	2.1144–8	5.0746+6	2.5567–7	1.7611+9	6.1888+8	3.2840+8	8.1385+8	8.4023+3	4.8955+2	2.5337+2	2.3617+2	8.0810–3
	2.4258–4	2.1338–8	5.0285+6	2.6407–7	1.7451+9	6.1391+8	3.2582+8	8.0541+8	8.4217+3	4.8675+2	2.5292+2	2.3382+2	8.2416–3
	2.5000–4	2.1684–8	4.9481+6	2.7939–7	1.7172+9	6.0522+8	3.2133+8	7.9069+8	8.4562+3	4.8192+2	2.5218+2	2.2973+2	8.5332–3
	2.6250–4	2.2259–8	4.8203+6	3.0555–7	1.6729+9	5.9141+8	3.1406+8	7.6743+8	8.5123+3	4.7402+2	2.5075+2	2.2327+2	9.0271–3
	2.6719–4	2.2471–8	4.7748+6	3.1547–7	1.6571+9	5.8648+8	3.1147+8	7.5916+8	8.5327+3	4.7124+2	2.5026+2	2.2097+2	9.2131–3
	2.6924–4	2.2563–8	4.7553+6	3.1982–7	1.6503+9	5.8437+8	3.1035+8	7.5562+8	8.5416+3	4.7005+2	2.5005+2	2.1999+2	9.2946–3
	2.7129–4	2.2655–8	4.7361+6	3.2419–7	1.6437+9	5.8227+8	3.0925+8	7.5212+8	8.5504+3	4.6887+2	2.4984+2	2.1902+2	9.3762–3
	3.0000–4	2.3977–8	4.4749+6	3.8650–7	1.5530+9	5.5522+8	2.9512+8	7.0267+8	8.6678+3	4.5276+2	2.4752+2	2.0524+2	1.0528–2
	3.5000–4	2.6218–8	4.0925+6	5.0037–7	1.4203+9	5.1633+8	2.7177+8	6.3219+8	8.8468+3	4.2570+2	2.4038+2	1.8531+2	1.2581–2
	4.0000–4	2.8317–8	3.7891+6	6.2070–7	1.3150+9	4.8485+8	2.5327+8	5.7688+8	9.0049+3	4.0552+2	2.3580+2	1.6970+2	1.4675–2
N5	4.6954–4	3.1132–8	3.4465+6	7.9791–7	1.1961+9	4.4962+8	2.3067+8	5.1581+8	9.1736+3	3.7962+2	2.2733+2	1.5227+2	1.7733–2
	4.7716–4	3.1429–8	3.4139+6	8.1803–7	1.1848+9	4.4623+8	2.2854+8	5.1002+8	9.1907+3	3.7731+2	2.2667+2	1.5062+2	1.8071–2
	4.8858–4	3.1871–8	3.3665+6	8.4843–7	1.1684+9	4.4129+8	2.2544+8	5.0163+8	9.2159+3	3.7401+2	2.2574+2	1.4824+2	1.8580–2
N4	4.9556–4	3.2139–8	3.3385+6	8.6715–7	1.1586+9	4.3835+8	2.2361+8	4.9666+8	9.2310+3	3.7207+2	2.2522+2	1.4683+2	1.8892–2
	5.0000–4	3.2309–8	3.3209+6	8.7911–7	1.1525+9	4.3651+8	2.2247+8	4.9355+8	9.2406+3	3.7089+2	2.2491+2	1.4595+2	1.9091–2
	5.1250–4	3.2794–8	3.2718+6	9.1298–7	1.1355+9	4.3147+8	2.1919+8	4.8481+8	9.2653+3	3.6718+2	2.2372+2	1.4344+2	1.9652–2
	5.2500–4	3.3275–8	3.2246+6	9.4718–7	1.1191+9	4.2660+8	2.1605+8	4.7642+8	9.2895+3	3.6368+2	2.2262+2	1.4104+2	2.0214–2
	5.3438–4	3.3632–8	3.1903+6	9.7305–7	1.1072+9	4.2307+8	2.1378+8	4.7036+8	9.3073+3	3.6117+2	2.2185+2	1.3929+2	2.0637–2
	5.6719–4	3.4860–8	3.0779+6	1.0649–6	1.0682+9	4.1136+8	2.0632+8	4.5050+8	9.3675+3	3.5311+2	2.1949+2	1.3360+2	2.2124–2
	6.0000–4	3.6058–8	2.9757+6	1.1588–6	1.0327+9	4.0062+8	1.9957+8	4.3253+8	9.4247+3	3.4611+2	2.1765+2	1.2844+2	2.3621–2
	6.5000–4	3.7879–8	2.8326+6	1.3058–6	9.8306+8	3.8581+8	1.8967+8	4.0757+8	9.4918+3	3.3439+2	2.1313+2	1.2124+2	2.5872–2
N3	7.0496–4	3.9814–8	2.6949+6	1.4728–6	9.3528+8	3.7135+8	1.8019+8	3.8374+8	9.5603+3	3.2361+2	2.0922+2	1.1436+2	2.8366–2
	7.1684–4	4.0225–8	2.6674+6	1.5097–6	9.2573+8	3.6844+8	1.7826+8	3.7902+8	9.5713+3	3.2137+2	2.0835+2	1.1299+2	2.8885–2
	7.2500–4	4.0506–8	2.6489+6	1.5351–6	9.1931+8	3.6648+8	1.7697+8	3.7586+8	9.5788+3	3.1988+2	2.0777+2	1.1208+2	2.9243–2
	7.3763–4	4.0937–8	2.6210+6	1.5747–6	9.0962+8	3.6351+8	1.7501+8	3.7109+8	9.5902+3	3.1763+2	2.0691+2	1.1070+2	2.9797–2
	7.6881–4	4.1990–8	2.5553+6	1.6737–6	8.8682+8	3.5650+8	1.7043+8	3.5989+8	9.6177+3	3.1244+2	2.0496+2	1.0746+2	3.1167–2
	8.0000–4	4.3024–8	2.4939+6	1.7743–6	8.6550+8	3.4989+8	1.6615+8	3.4945+8	9.6442+3	3.0771+2	2.0324+2	1.0444+2	3.2541–2
N2	8.4430–4	4.4474–8	2.4126+6	1.9200–6	8.3729+8	3.4112+8	1.6023+8	3.3592+8	9.6563+3	3.0038+2	1.9986+2	1.0048+2	3.4248–2
	8.5000–4	4.4659–8	2.4026+6	1.9390–6	8.3382+8	3.4005+8	1.5951+8	3.3426+8	9.6578+3	2.9949+2	1.9946+2	1.0000+2	3.4467–2
	8.5403–4	4.4789–8	2.3956+6	1.9525–6	8.3140+8	3.3929+8	1.5900+8	3.3310+8	9.6589+3	2.9887+2	1.9917+2	9.9664+1	3.4623–2
	8.7228–4	4.5375–8	2.3646+6	2.0138–6	8.2065+8	3.3593+8	1.5676+8	3.2795+8	9.6636+3	2.9613+2	1.9793+2	9.8167+1	3.5327–2
	9.0000–4	4.6257–8	2.3196+6	2.1081–6	8.0502+8	3.3102+8	1.5351+8	3.2048+8	9.6707+3	2.9219+2	1.9616+2	9.5995+1	3.6396–2
	9.0421–4	4.6389–8	2.3130+6	2.1225–6	8.0272+8	3.3029+8	1.5303+8	3.1938+8	9.6717+3	2.9161+2	1.9590+2	9.5676+1	3.6559–2
	9.2500–4	4.7042–8	2.2809+6	2.1941–6	7.9159+8	3.2678+8	1.5072+8	3.1408+8	9.6769+3	2.8883+2	1.9466+2	9.4134+1	3.7361–2
	9.5210–4	4.7883–8	2.2408+6	2.2885–6	7.7768+8	3.2237+8	1.4783+8	3.0747+8	9.6834+3	2.8540+2	1.9315+2	9.2213+1	3.8409–2
N1	9.7164–4	4.8482–8	2.2131+6	2.3573–6	7.6806+8	3.1930+8	1.4584+8	3.0291+8	9.6880+3	2.8306+2	1.9213+2	9.0887+1	3.9164–2
	9.8582–4	4.8916–8	2.1935+6	2.4075–6	7.6125+8	3.1713+8	1.4444+8	2.9968+8	9.6912+3	2.8141+2	1.9142+2	8.9952+1	3.9712–2
	1.0000–3	4.9347–8	2.1743+6	2.4580–6	7.5461+8	3.1501+8	1.4307+8	2.9652+8	9.6945+3	2.7982+2	1.9074+2	8.9039+1	4.0261–2
	1.0313–3	5.0294–8	2.1334+6	2.5705–6	7.4039+8	3.1047+8	1.3998+8	2.8993+8	9.6863+3	2.7567+2	1.8852+2	8.7105+1	4.1248–2
	1.0625–3	5.1230–8	2.0944+6	2.6847–6	7.2687+8	3.0613+8	1.3706+8	2.8367+8	9.6783+3	2.7176+2	1.8645+2	8.5269+1	4.2235–2
	1.0898–3	5.2039–8	2.0618+6	2.7859–6	7.1556+8	3.0249+8	1.3462+8	2.7845+8	9.6716+3	2.6852+2	1.8474+2	8.3739+1	4.3097–2
	1.1250–3	5.3068–8	2.0219+6	2.9178–6	7.0169+8	2.9799+8	1.3163+8	2.7206+8	9.6632+3	2.6459+2	1.8268+2	8.1866+1	4.4206–2
	1.1411–3	5.3535–8	2.0042+6	2.9789–6	6.9558+8	2.9600+8	1.3032+8	2.6925+8	9.6594+3	2.6286+2	1.8177+2	8.1042+1	4.4714–2
	1.1719–3	5.4418–8	1.9717+6	3.0967–6	6.8428+8	2.9231+8	1.2790+8	2.6406+8	9.6523+3	2.5969+2	1.8013+2	7.9522+1	4.5684–2
	1.2308–3	5.6085–8	1.9131+6	3.3262–6	6.6395+8	2.8563+8	1.2356+8	2.5475+8	9.6393+3	2.5408+2	1.7723+2	7.6795+1	4.7540–2
	1.2500–3	5.6620–8	1.8950+6	3.4019–6	6.5768+8	2.8356+8	1.2222+8	2.5189+8	9.6353+3	2.5237+2	1.7636+2	7.5957+1	4.8143–2
	1.3125–3	5.8342–8	1.8391+6	3.6523–6	6.3826+8	2.7711+8	1.1808+8	2.4306+8	9.6224+3	2.4685+2	1.7343+2	7.3372+1	5.0108–2
	1.3359–3	5.8979–8	1.8192+6	3.7476–6	6.3137+8	2.7481+8	1.1661+8	2.3994+8	9.6177+3	2.4491+2	1.7240+2	7.2458+1	5.0844–2
	1.3654–3	5.9774–8	1.7950+6	3.8686–6	6.2297+8	2.7199+8	1.1483+8	2.3614+8	9.6119+3	2.4256+2	1.7117+2	7.1346+1	5.1770–2
	1.5000–3	6.3313–8	1.6947+6	4.4346–6	5.8815+8	2.6020+8	1.0748+8	2.2046+8	9.5872+3	2.3304+2	1.6622+2	6.6758+1	5.5990–2
	1.7500–3	6.9716–8	1.5390+6	5.5493–6	5.3413+8	2.4179+8	9.5898+7	1.9644+8	9.5269+3	2.1572+2	1.5600+2	5.9657+1	6.3159–2
	2.0000–3	7.5753–8	1.4164+6	6.7452–6	4.9157+8	2.2689+8	8.6912+7	1.7776+8	9.4750+3	2.0251+2	1.4830+2	5.4139+1	7.0294–2
	2.2500–3	8.1679–8	1.3136+6	8.0198–6	4.5590+8	2.1411+8	7.9418+7	1.6236+8	9.4093+3	1.8993+2	1.4031+2	4.9551+1	7.6761–2
	2.5000–3	8.7351–8	1.2283+6	9.3727–6	4.2630+8	2.0329+8	7.3277+7	1.4972+8	9.3509+3	1.7973+2	1.3386+2	4.5788+1	8.3195–2
M5	2.6851–3	9.1405–8	1.1738+6	1.0421–5	4.0739+8	1.9627+8	6.9393+7	1.4172+8	9.3115+3	1.7333+2	1.2984+2	4.3405+1	8.7940–2
	2.7048–3	9.1833–8	1.1684+6	1.0535–5	4.0549+8	1.9556+8	6.9003+7	1.4093+8	9.3052+3	1.7267+2	1.2941+2	4.3169+1	8.8380–2
	2.7786–3	9.3425–8	1.1485+6	1.0966–5	3.9858+8	1.9295+8	6.7582+7	1.3805+8	9.2823+3	1.7027+2	1.2787+2	4.2309+1	9.0027–2
M4	2.8035–3	9.3958–8	1.1420+6	1.1112–5	3.9632+8	1.9209+8	6.7118+7	1.3710+8	9.2747+3	1.6949+2	1.2737+2	4.2028+1	9.0582–2
	2.8281–3	9.4483–8	1.1356+6	1.1257–5	3.9412+8	1.9125+8	6.6667+7	1.3619+8	9.2673+3	1.6873+2	1.2689+2	4.1754+1	9.1129–2
	2.8893–3	9.5785–8	1.1202+6	1.1622–5	3.8876+8	1.8922+8	6.5574+7	1.3396+8	9.2491+3	1.6690+2	1.2572+2	4.1090+1	9.2491–2
	2.9140–3	9.6308–8	1.1141+6	1.1771–5	3.8665+8	1.8842+8	6.5145+7	1.3308+8	9.2419+3	1.6619+2	1.2526+2	4.0829+1	9.3041–2
	3.0000–3	9.8111–8	1.0936+6	1.2292–5	3.7954+8	1.8570+8	6.3700+7	1.3013+8	9.2173+3	1.6378+2	1.2374+2	3.9951+1	9.4950–2
M3	3.2815–3	1.0391–7	1.0326+6	1.4054–5	3.5837+8	1.7751+8	5.9353+7	1.2150+8	9.1418+3	1.5576+2	1.1830+2	3.7360+1	1.0118–1
	3.3264–3	1.0483–7	1.0236+6	1.4344–5	3.5523+8	1.7629+8	5.8718+7	1.2021+8	9.1304+3	1.5458+2	1.1750+2	3.6974+1	1.0217–1
	3.4106–3	1.0654–7	1.0071+6	1.4892–5	3.4952+8	1.7407+8	5.7567+7	1.1788+8	9.1095+3	1.5245+2	1.1607+2	3.6274+1	1.0402–1
	3.5000–3	1.0834–7	9.9038+5	1.5483–5	3.4371+8	1.7179+8	5.6401+7	1.1551+8	9.0879+3	1.5030+2	1.1463+2	3.5563+1	1.0599–1
	3.5579–3	1.0950–7	9.7991+5	1.5870–5	3.4008+8	1.7036+8	5.5673+7	1.1403+8	9.0743+3	1.4895+2	1.1372+2	3.5120+1	1.0726–1
	3.7790–3	1.1385–7	9.4247+5	1.7378–5	3.2709+8	1.6523+8	5.3083+7	1.0877+8	9.0243+3	1.4416+2	1.1051+2	3.3542+1	1.1209–1
M2	3.8402–3	1.1503–7	9.3275+5	1.7805–5	3.2371+8	1.6388+8	5.2413+7	1.0741+8	9.0110+3	1.4293+2	1.0968+2	3.3133+1	1.1343–1
	3.9201–3	1.1664–7	9.1987+5	1.8367–5	3.1924+8	1.6217+8	5.1564+7	1.0550+8	8.9921+3	1.4131+2	1.0863+2	3.2560+1	1.1512–1
	4.0000–3	1.1824–7	9.0743+5	1.8936–5	3.1493+8	1.6050+8	5.0746+7	1.0367+8	8.9736+3	1.3975+2	1.0763+2	3.2008+1	1.1681–1
M1	4.1276–3	1.2080–7	8.8819+5	1.9857–5	3.0825+8	1.5786+8	4.9481+7	1.0090+8	8.9281+3	1.3714+2	1.0585+2	3.1168+1	1.1901–1
	4.1821–3	1.2189–7	8.8026+5	2.0256–5	3.0550+8	1.5677+8	4.8961+7	9.9755+7	8.9091+3	1.3606+2	1.0512+2	3.0822+1	1.1995–1
	4.2844–3	1.2392–7	8.6586+5	2.1013–5	3.0050+8	1.5478+8	4.8019+7	9.7688+7	8.8743+3	1.3412+2	1.0381+2	3.0198+1	1.2171–1
	4.3437–3	1.2509–7	8.5777+5	2.1458–5	2.9769+8	1.5366+8	4.7490+7	9.6529+7	8.8546+3	1.3304+2	1.0307+2	2.9847+1	1.2273–1
	4.4633–3	1.2742–7	8.4204+5	2.2363–5	2.9223+8	1.5147+8	4.6465+7	9.4284+7	8.8157+3	1.3094+2	1.0165+2	2.9168+1	1.2477–1
	4.5000–3	1.2814–7	8.3735+5	2.2644–5	2.9060+8	1.5082+8	4.6160+7	9.3616+7	8.8040+3	1.3032+2	1.0122+2	2.8967+1	1.2540–1
	4.6719–3	1.3145–7	8.1625+5	2.3978–5	2.8328+8	1.4786+8	4.4790+7	9.0623+7	8.7507+3	1.2751+2	9.9322+1	2.8062+1	1.2833–1
	4.7316–3	1.3259–7	8.0923+5	2.4448–5	2.8084+8	1.4687+8	4.4335+7	8.9630+7	8.7327+3	1.2658+2	9.8692+1	2.7761+1	1.2935–1

Atomic Weight 209.000 Density 9.320 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000–3	1.3765–7	7.7947+5	2.6602–5	2.7052+8	1.4265+8	4.2414+7	8.5443+7	8.6551+3	1.2268+2	9.6050+1	2.6496+1	1.3390–1
5.5000–3	1.4691–7	7.3036+5	3.0796–5	2.5347+8	1.3553+8	3.9248+7	7.8689+7	8.5194+3	1.1581+2	9.1223+1	2.4445+1	1.4221–1
6.0000–3	1.5587–7	6.8837+5	3.5225–5	2.3890+8	1.2933+8	3.6567+7	7.2991+7	8.3975+3	1.1002+2	8.7158+1	2.2715+1	1.5043–1
7.0000–3	1.7329–7	6.1918+5	4.4758–5	2.1489+8	1.1889+8	3.2210+7	6.3776+7	8.0955+3	9.9937+1	7.9872+1	1.9901+1	1.6322–1
8.0000–3	1.8985–7	5.6517+5	5.5172–5	1.9614+8	1.1053+8	2.8863+7	5.6740+7	7.8426+3	9.2216+1	7.4286+1	1.7754+1	1.7576–1
9.0000–3	2.0581–7	5.2133+5	6.6425–5	1.8093+8	1.0345+8	2.6175+7	5.1298+7	7.5834+3	8.5588+1	6.9316+1	1.6085+1	1.8608–1
1.0000–2	2.2117–7	4.8512+5	7.8493–5	1.6836+8	9.7496+7	2.3986+7	4.6873+7	7.3588+3	8.0203+1	6.5278+1	1.4729+1	1.9622–1
1.2500–2	2.5771–7	4.1635+5	1.1196–4	1.4449+8	8.5825+7	1.9916+7	3.8746+7	6.8274+3	6.9437+1	5.7000+1	1.2221+1	2.1621–1
L3 1.3817–2	2.7593–7	3.8885+5	1.3153–4	1.3495+8	8.1051+7	1.8323+7	3.5572+7	6.6015+3	6.5201+1	5.3732+1	1.1242+1	2.2645–1
1.4409–2	2.8397–7	3.7784+5	1.4073–4	1.3113+8	7.9115+7	1.7693+7	3.4318+7	6.4977+3	6.3476+1	5.2390+1	1.0855+1	2.3013–1
1.5000–2	2.9189–7	3.6759+5	1.5017–4	1.2757+8	7.7301+7	1.7109+7	3.3156+7	6.3996+3	6.1878+1	5.1147+1	1.0497+1	2.3379–1
1.6250–2	3.0834–7	3.4798+5	1.7090–4	1.2077+8	7.3786+7	1.6004+7	3.0971+7	6.2032+3	5.8708+1	4.8649+1	9.8178+0	2.4096–1
L2 1.6297–2	3.0895–7	3.4729+5	1.7170–4	1.2053+8	7.3662+7	1.5965+7	3.0895+7	6.1963+3	5.8598+1	4.8562+1	9.7942+0	2.4123–1
1.6760–2	3.1498–7	3.4064+5	1.7968–4	1.1822+8	7.2453+7	1.5597+7	3.0164+7	6.1290+3	5.7541+1	4.7730+1	9.5676+0	2.4386–1
L1 1.6918–2	3.1703–7	3.3844+5	1.8243–4	1.1746+8	7.2052+7	1.5475+7	2.9923+7	6.1067+3	5.7193+1	4.7455+1	9.4929+0	2.4476–1
1.7570–2	3.2530–7	3.2984+5	1.9397–4	1.1447+8	7.0460+7	1.4996+7	2.9010+7	6.0147+3	5.5810+1	4.6353+1	9.2091+0	2.4808–1
1.7688–2	3.2679–7	3.2833+5	1.9610–4	1.1395+8	7.0181+7	1.4912+7	2.8851+7	5.9984+3	5.5569+1	4.6161+1	9.1596+0	2.4868–1
1.8125–2	3.3225–7	3.2293+5	2.0402–4	1.1207+8	6.9177+7	1.4613+7	2.8280+7	5.9400+3	5.4706+1	4.5473+1	8.9822+0	2.5090–1
1.8785–2	3.4043–7	3.1518+5	2.1622–4	1.0938+8	6.7730+7	1.4184+7	2.7463+7	5.8553+3	5.3471+1	4.4489+1	8.7284+0	2.5423–1
1.8844–2	3.4116–7	3.1450+5	2.1733–4	1.0915+8	6.7604+7	1.4147+7	2.7392+7	5.8479+3	5.3364+1	4.4403+1	8.7064+0	2.5453–1
2.0000–2	3.5523–7	3.0204+5	2.3940–4	1.0482+8	6.5267+7	1.3464+7	2.6088+7	5.7098+3	5.1396+1	4.2834+1	8.3013+0	2.6031–1
2.2500–2	3.8468–7	2.7892+5	2.8995–4	9.6801+7	6.0850+7	1.2217+7	2.3728+7	5.4175+3	4.7552+1	3.9719+1	7.5635+0	2.6975–1
2.4375–2	4.0604–7	2.6425+5	3.3042–4	9.1709+7	5.8020+7	1.1437+7	2.2247+7	5.2275+3	4.5143+1	3.7766+1	7.1007+0	2.7676–1
2.5000–2	4.1303–7	2.5978+5	3.4438–4	9.0157+7	5.7152+7	1.1201+7	2.1799+7	5.1688+3	4.4413+1	3.7174+1	6.9604+0	2.7908–1
2.6250–2	4.2684–7	2.5138+5	3.7296–4	8.7241+7	5.5517+7	1.0759+7	2.0959+7	5.0575+3	4.3048+1	3.6066+1	6.6982+0	2.8369–1
2.7188–2	4.3704–7	2.4550+5	3.9498–4	8.5203+7	5.4370+7	1.0453+7	2.0375+7	4.9790+3	4.2099+1	3.5296+1	6.5158+0	2.8713–1
3.0000–2	4.6697–7	2.2977+5	4.6387–4	7.9743+7	5.1277+7	9.6388+6	1.8823+7	4.7650+3	3.9580+1	3.3252+1	6.0311+0	2.9732–1
3.5000–2	5.1847–7	2.0695+5	5.9658–4	7.1822+7	4.6676+7	8.5118+6	1.6630+7	4.4289+3	3.5835+1	3.0183+1	5.3404+0	3.1103–1
4.0000–2	5.6755–7	1.8905+5	7.4206–4	6.5611+7	4.3026+7	7.6432+6	1.4937+7	4.1569+3	3.2943+1	2.7811+1	4.8078+0	3.2449–1
5.0000–2	6.5993–7	1.6259+5	1.0674–3	5.6427+7	3.7529+7	6.4134+6	1.2480+7	3.7371+3	2.8640+1	2.4262+1	4.0306+0	3.4682–1
6.0000–2	7.4788–7	1.4347+5	1.4367–3	4.9791+7	3.3563+7	5.5778+6	1.0646+7	3.4313+3	2.5569+1	2.1756+1	3.4474+0	3.6599–1
8.0000–2	9.0888–7	1.1805+5	2.2884–3	4.0971+7	2.8167+7	4.5142+6	8.2865+6	3.0074+3	2.1514+1	1.8421+1	2.6938+0	3.9954–1
K 9.3424–2	1.0072–6	1.0653+5	2.9404–3	3.6972+7	2.5676+7	4.0523+6	7.2416+6	2.8064+3	1.9690+1	1.6913+1	2.3584+0	4.1893–1
9.5068–2	1.0189–6	1.0531+5	3.0243–3	3.6548+7	2.5410+7	4.0034+6	7.1322+6	2.7850+3	1.9498+1	1.6753+1	2.3234+0	4.2109–1
9.7534–2	1.0363–6	1.0354+5	3.1517–3	3.5934+7	2.5024+7	3.9327+6	6.9746+6	2.7540+3	1.9220+1	1.6523+1	2.2729+0	4.2434–1
1.0000–1	1.0535–6	1.0185+5	3.2809–3	3.5346+7	2.4654+7	3.8650+6	6.8243+6	2.7241+3	1.8954+1	1.6302+1	2.2248+0	4.2758–1
1.0625–1	1.0930–6	9.8165+4	3.6159–3	3.4069+7	2.3862+7	3.7190+6	6.4845+6	2.6591+3	1.8358+1	1.5808+1	2.1153+0	4.3494–1
1.1719–1	1.1599–6	9.2506+4	4.2270–3	3.2105+7	2.2636+7	3.4947+6	5.9709+6	2.5573+3	1.7446+1	1.5049+1	1.9497+0	4.4786–1
1.2539–1	1.2083–6	8.8797+4	4.7054–3	3.0817+7	2.1827+7	3.3478+6	5.6402+6	2.4893+3	1.6852+1	1.4552+1	1.8431+0	4.5753–1
1.3770–1	1.2786–6	8.3918+4	5.4528–3	2.9124+7	2.0754+7	3.1547+6	5.2126+6	2.3982+3	1.6076+1	1.3899+1	1.7053+0	4.7197–1
1.5000–1	1.3462–6	7.9701+4	6.2345–3	2.7660+7	1.9820+7	2.9880+6	4.8500+6	2.3178+3	1.5411+1	1.3336+1	1.5885+0	4.8629–1
1.7500–1	1.4634–6	7.3320+4	7.9116–3	2.5446+7	1.8380+7	2.7428+6	4.3205+6	2.1854+3	1.4415+1	1.2487+1	1.4174+0	5.1104–1
2.0000–1	1.5728–6	6.8219+4	9.6948–3	2.3676+7	1.7218+7	2.5468+6	3.9088+6	2.0769+3	1.3630+1	1.1810+1	1.2844+0	5.3558–1
2.5000–1	1.7636–6	6.0840+4	1.3504–2	2.1115+7	1.5413+7	2.2955+6	3.4046+6	1.9221+3	1.2637+1	1.0936+1	1.1211+0	5.7952–1
3.0000–1	1.9363–6	5.5413+4	1.7577–2	1.9231+7	1.4079+7	2.1089+6	3.0412+6	1.8042+3	1.1920+1	1.0294+1	1.0036+0	6.2271–1
4.0000–1	2.2600–6	4.7477+4	2.6247–2	1.6477+7	1.1997+7	1.8958+6	2.5823+6	1.6554+3	1.1156+1	9.5944+0	8.5459–1	7.0695–1
5.0000–1	2.5461–6	4.2142+4	3.5361–2	1.4625+7	1.0549+7	1.7730+6	2.3014+6	1.5671+3	1.0791+1	9.2353+0	7.6335–1	7.9186–1
6.0000–1	2.7944–6	3.8397+4	4.4707–2	1.3326+7	9.4971+6	1.6940+6	2.1333+6	1.5107+3	1.0609+1	9.0216+0	7.0883–1	8.7863–1
8.0000–1	3.2246–6	3.3274+4	6.3603–2	1.1548+7	8.0460+6	1.6026+6	1.8979+6	1.4442+3	1.0560+1	8.8709+0	6.3232–1	1.0571+0
1.0000+0	3.5806–6	2.9966+4	8.2455–2	1.0400+7	7.0753+6	1.5516+6	1.7715+6	1.4096+3	1.0658+1	8.8248+0	5.9142–1	1.2415+0
1.5000+0	4.2624–6	2.5173+4	1.2804–1	8.7363+6	5.6019+6	1.4971+6	1.6359+6	1.3701+3	1.1287+1	9.0159+0	5.4811–1	1.7228+0
2.0000+0	4.7691–6	2.2498+4	1.7104–1	7.8080+6	4.7466+6	1.4824+6	1.5776+6	1.3565+3	1.1974+1	9.2162+0	5.2949–1	2.2278+0
3.0000+0	5.4528–6	1.9677+4	2.5003–1	6.8290+6	3.7989+6	1.4624+6	1.5663+6	1.3482+3	1.3372+1	9.5626+0	5.2759–1	3.2815+0
4.0000+0	5.8904–6	1.8215+4	3.2117–1	6.3217+6	3.3023+6	1.4572+6	1.5608+6	1.3488+3	1.4765+1	9.8609+0	5.2624–1	4.3780+0
5.0000+0	6.1999–6	1.7306+4	3.8596–1	6.0062+6	2.9915+6	1.4572+6	1.5561+6	1.3515+3	1.6123+1	1.0101+1	5.2519–1	5.4968+0
6.0000+0	6.4270–6	1.6695+4	4.4549–1	5.7939+6	2.7833+6	1.4572+6	1.5520+6	1.3561+3	1.7493+1	1.0307+1	5.2434–1	6.6614+0
8.0000+0	6.7412–6	1.5916+4	5.5171–1	5.5238+6	2.5200+6	1.4575+6	1.5450+6	1.3662+3	2.0233+1	1.0652+1	5.2299–1	9.0574+0
1.0000+1	6.9392–6	1.5462+4	6.4443–1	5.3663+6	2.3674+6	1.4586+6	1.5389+6	1.3763+3	2.2964+1	1.0921+1	5.2197–1	1.1521+1
1.5000+1	7.1642–6	1.4977+4	8.3536–1	5.1977+6	2.2021+6	1.4613+6	1.5329+6	1.3999+3	2.9699+1	1.1320+1	5.2009–1	1.7859+1
2.0000+1	7.2304–6	1.4840+4	9.8669–1	5.1501+6	2.1581+6	1.4633+6	1.5273+6	1.4181+3	3.6622+1	1.1645+1	5.1835–1	2.4459+1
3.0000+1	7.2416–6	1.4817+4	1.2182+0	5.1422+6	2.1575+6	1.4642+6	1.5190+6	1.4409+3	5.0514+1	1.2019+1	5.1582–1	3.7980+1
4.0000+1	7.2502–6	1.4799+4	1.3929+0	5.1361+6	2.1565+6	1.4652+6	1.5129+6	1.4646+3	6.4561+1	1.2278+1	5.1403–1	5.1768+1
5.0000+1	7.2575–6	1.4784+4	1.5328+0	5.1309+6	2.1556+6	1.4658+6	1.5080+6	1.4830+3	7.8886+1	1.2471+1	5.1265–1	6.5902+1
6.0000+1	7.2639–6	1.4771+4	1.6492+0	5.1263+6	2.1548+6	1.4663+6	1.5038+6	1.4980+3	9.3331+1	1.2636+1	5.1150–1	8.0184+1
8.0000+1	7.2749–6	1.4749+4	1.8356+0	5.1186+6	2.1536+6	1.4667+6	1.4969+6	1.5217+3	1.2248+2	1.2873+1	5.0973–1	1.0910+2
1.0000+2	7.2839–6	1.4731+4	1.9820+0	5.1123+6	2.1526+6	1.4669+6	1.4912+6	1.5402+3	1.5184+2	1.3074+1	5.0836–1	1.3826+2
1.5000+2	7.3013–6	1.4695+4	2.2503+0	5.1001+6	2.1509+6	1.4671+6	1.4805+6	1.5732+3	2.2573+2	1.3294+1	5.0473–1	2.1193+2
2.0000+2	7.2994–6	1.4699+4	2.4418+0	5.1014+6	2.1497+6	1.4672+6	1.4829+6	1.5929+3	3.0013+2	1.3494+1	5.0557–1	2.8613+2
3.0000+2	7.2984–6	1.4701+4	2.7125+0	5.1022+6	2.1480+6	1.4674+6	1.4852+6	1.6191+3	4.4857+2	1.3803+1	5.0637–1	4.3426+2
4.0000+2	7.3014–6	1.4695+4	2.9050+0	5.1001+6	2.1468+6	1.4674+6	1.4842+6	1.6377+3	5.9721+2	1.3976+1	5.0608–1	5.8273+2
5.0000+2	7.3093–6	1.4679+4	3.0545+0	5.0945+6	2.1458+6	1.4674+6	1.4796+6	1.6522+3	7.4694+2	1.4100+1	5.0452–1	7.3234+2
6.0000+2	7.3097–6	1.4679+4	3.1766+0	5.0942+6	2.1451+6	1.4675+6	1.4801+6	1.6642+3	8.9512+2	1.4214+1	5.0470–1	8.8040+2
8.0000+2	7.3134–6	1.4671+4	3.3694+0	5.0916+6	2.1439+6	1.4675+6	1.4786+6	1.6834+3	1.1942+3	1.4418+1	5.0428–1	1.1793+3
1.0000+3	7.3165–6	1.4665+4	3.5189+0	5.0895+6	2.1429+6	1.4675+6	1.4775+6	1.6986+3	1.4913+3	1.4588+1	5.0393–1	1.4762+3
1.5000+3	7.3224–6	1.4653+4	3.7906+0	5.0854+6	2.1412+6	1.4675+6	1.4750+6	1.7266+3	2.2398+3	1.4747+1	5.0310–1	2.2246+3
2.0000+3	7.3292–6	1.4639+4	3.9832+0	5.0807+6	2.1400+6	1.4675+6	1.4715+6	1.7474+3	2.9887+3	1.4904+1	5.0189–1	2.9733+3
3.0000+3	7.3373–6	1.4623+4	4.2541+0	5.0751+6	2.1383+6	1.4675+6	1.4675+6	1.7779+3	4.4971+3	1.5207+1	5.0054–1	4.4814+3
4.0000+3	7.3447–6	1.4609+4	4.4460+0	5.0699+6	2.1371+6	1.4675+6	1.4636+6	1.7998+3	5.9937+3	1.5365+1	4.9920–1	5.9779+3
5.0000+3	7.3546–6	1.4589+4	4.5949+0	5.0632+6	2.1361+6	1.4675+6	1.4578+6	1.8171+3	7.4995+3	1.5469+1	4.9721–1	7.4835+3
6.0000+3	7.3563–6	1.4586+4	4.7165+0	5.0620+6	2.1353+6	1.4675+6	1.4573+6	1.8296+3	8.9882+3	1.5569+1	4.9705–1	8.9721+3

Atomic Weight 209.000												Density 9.320 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+3	7.3608–6	1.4577+4	4.9085+0	5.0589+6	2.1341+6	1.4675+6	1.4554+6	1.8497+3	1.1992+4	1.5769+1	4.9641–1	1.1975+4
1.0000+4	7.3645–6	1.4569+4	5.0572+0	5.0564+6	2.1332+6	1.4675+6	1.4538+6	1.8654+3	1.5023+4	1.5939+1	4.9587–1	1.5007+4
1.5000+4	7.3704–6	1.4558+4	5.3275+0	5.0523+6	2.1315+6	1.4675+6	1.4514+6	1.8955+3	2.2461+4	1.6088+1	4.9504–1	2.2445+4
2.0000+4	7.3755–6	1.4548+4	5.5195+0	5.0488+6	2.1303+6	1.4675+6	1.4491+6	1.9172+3	2.9996+4	1.6237+1	4.9426–1	2.9979+4
3.0000+4	7.3805–6	1.4538+4	5.7902+0	5.0454+6	2.1286+6	1.4675+6	1.4474+6	1.9477+3	4.4894+4	1.6528+1	4.9367–1	4.4877+4
4.0000+4	7.3853–6	1.4528+4	5.9823+0	5.0421+6	2.1274+6	1.4675+6	1.4452+6	1.9696+3	5.9951+4	1.6680+1	4.9294–1	5.9934+4
5.0000+4	7.3929–6	1.4513+4	6.1312+0	5.0369+6	2.1265+6	1.4675+6	1.4410+6	1.9863+3	7.4869+4	1.6803+1	4.9149–1	7.4852+4
6.0000+4	7.3933–6	1.4513+4	6.2530+0	5.0366+6	2.1257+6	1.4675+6	1.4414+6	2.0001+3	8.9775+4	1.6898+1	4.9166–1	8.9758+4
8.0000+4	7.3961–6	1.4507+4	6.4452+0	5.0347+6	2.1245+6	1.4675+6	1.4408+6	2.0219+3	1.1985+5	1.7088+1	4.9142–1	1.1983+5
1.0000+5	7.3988–6	1.4502+4	6.5940+0	5.0329+6	2.1235+6	1.4675+6	1.4398+6	2.0389+3	1.4997+5	1.7269+1	4.9109–1	1.4995+5


July 4, 1991
Atomic Weight 210 000
EEDL Evaluated Electron
Cross Sections
85-At
Density 9 000 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
85-At


July 4, 1991
Atomic Weight 210 000
EEDL Evaluated Electron
Energy Deposition
85-At
Density 9 000 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
85-At

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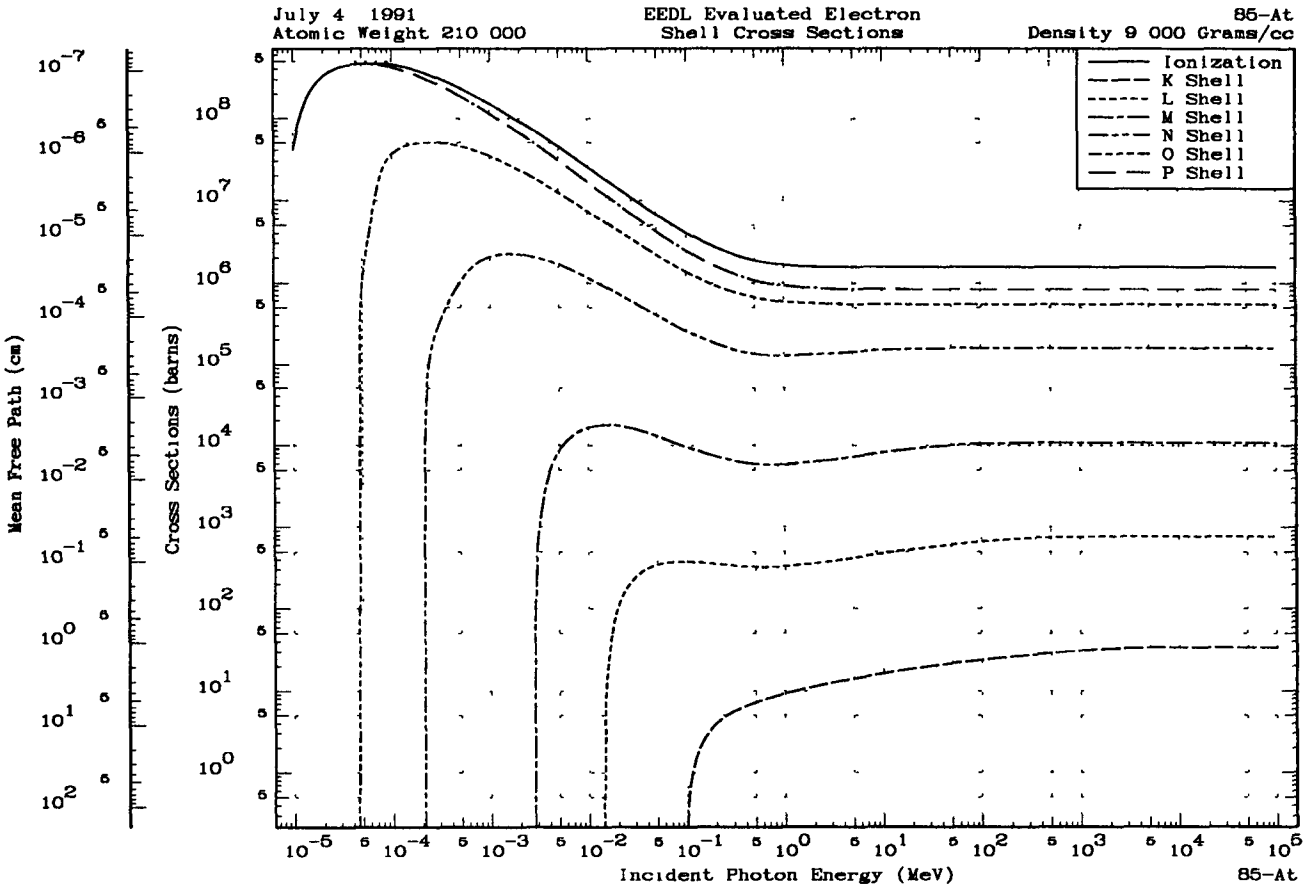
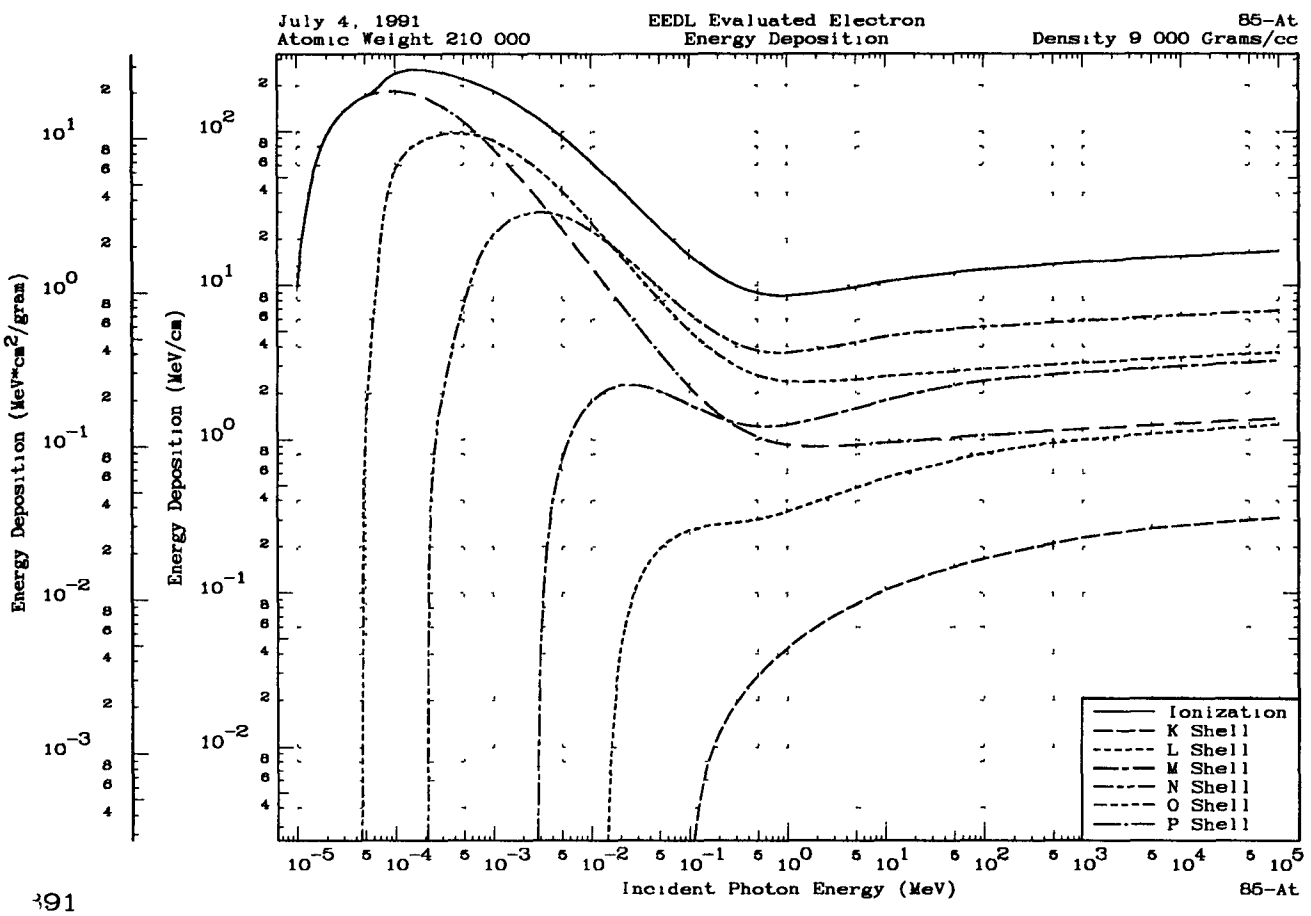

July 4 1991
Atomic Weight 210 000
EEDL Evaluated Electron
Shell Cross Sections
85-At
Density 9 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
85-At


July 4, 1991
Atomic Weight 210 000
EEDL Evaluated Electron
Energy Deposition
85-At
Density 9 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
85-At

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Atomic Weight 210.000 Density 9.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.3476–8	8.2448+6		2.8751+9	2.8297+9	4.2325+7	3.0152+6	4.9305+3	1.0417+1	9.7241+0	6.9233–1	2.7507–4
	1.1250–5	1.3993–8	7.9403+6		2.7689+9	2.6762+9	8.4316+7	8.4315+6	5.0504+3	2.2014+1	2.0015+1	1.9992+0	3.0839–4
P2	1.1940–5	1.4232–8	7.8071+6		2.7224+9	2.6017+9	1.0652+8	1.4178+7	5.1120+3	2.9127+1	2.5706+1	3.4205+0	3.2704–4
	1.2036–5	1.4259–8	7.7921+6		2.7172+9	2.5919+9	1.1037+8	1.4921+7	5.1204+3	3.0329+1	2.6722+1	3.6060+0	3.2963–4
	1.2128–5	1.4285–8	7.7783+6		2.7124+9	2.5825+9	1.1420+8	1.5673+7	5.1284+3	3.1529+1	2.7735+1	3.7941+0	3.3216–4
	1.2188–5	1.4301–8	7.7696+6		2.7094+9	2.5766+9	1.1664+8	1.6170+7	5.1335+3	3.2296+1	2.8377+1	3.9185+0	3.3377–4
	1.2308–5	1.4337–8	7.7497+6		2.7024+9	2.5646+9	1.2061+8	1.7220+7	5.1438+3	3.3647+1	2.9465+1	4.1819+0	3.3704–4
	1.2644–5	1.4433–8	7.6983+6		2.6845+9	2.5320+9	1.3199+8	2.0468+7	5.1721+3	3.7598+1	3.2597+1	5.0004+0	3.4624–4
	1.2939–5	1.4510–8	7.6574+6		2.6702+9	2.5046+9	1.4249+8	2.3191+7	5.1965+3	4.1212+1	3.5516+1	5.6952+0	3.5433–4
	1.3454–5	1.4625–8	7.5973+6		2.6493+9	2.4586+9	1.6197+8	2.8661+7	5.2380+3	4.8098+1	4.0995+1	7.1024+0	3.6855–4
	1.3594–5	1.4653–8	7.5830+6		2.6443+9	2.4466+9	1.6735+8	3.0312+7	5.2491+3	5.0048+1	4.2518+1	7.5298+0	3.7242–4
	1.3750–5	1.4689–8	7.5643+6		2.6378+9	2.4334+9	1.7212+8	3.2249+7	5.2613+3	5.1939+1	4.3906+1	8.0327+0	3.7676–4
	1.4227–5	1.4789–8	7.5132+6		2.6199+9	2.3944+9	1.8753+8	3.7993+7	5.2980+3	5.7992+1	4.8449+1	9.5416+0	3.9005–4
	1.5000–5	1.4918–8	7.4482+6		2.5973+9	2.3351+9	2.1314+8	4.8993+7	5.3555+3	6.8575+1	5.6107+1	1.2468+1	4.1174–4
	1.7500–5	1.5219–8	7.3009+6		2.5459+9	2.1707+9	2.7961+8	9.5648+7	5.5265+3	1.0243+2	7.7392+1	2.5042+1	4.8317–4
	2.0000–5	1.5343–8	7.2420+6		2.5254+9	2.0376+9	3.2882+8	1.5896+8	5.6790+3	1.3744+2	9.4653+1	4.2784+1	5.5640–4
	2.2500–5	1.5348–8	7.2393+6		2.5245+9	1.9270+9	3.6366+8	2.3380+8	5.8048+3	1.7209+2	1.0805+2	6.4034+1	6.2628–4
P1	2.3010–5	1.5326–8	7.2500+6		2.5282+9	1.9066+9	3.6992+8	2.5161+8	5.8290+3	1.7971+2	1.1056+2	6.9155+1	6.4068–4
	2.3447–5	1.5312–8	7.2563+6		2.5304+9	1.8897+9	3.7395+8	2.6670+8	5.8487+3	1.8577+2	1.1233+2	7.3444+1	6.5278–4
	2.4266–5	1.5271–8	7.2760+6		2.5373+9	1.8592+9	3.8142+8	2.9661+8	5.8849+3	1.9762+2	1.1564+2	8.1978+1	6.7554–4
	2.5700–5	1.5204–8	7.3079+6		2.5484+9	1.8093+9	3.9429+8	3.4473+8	5.9459+3	2.1735+2	1.2146+2	9.5884+1	7.1565–4
	2.6250–5	1.5166–8	7.3263+6		2.5548+9	1.7912+9	3.9912+8	3.6442+8	5.9686+3	2.2528+2	1.2368+2	1.0160+2	7.3115–4
	2.7850–5	1.5027–8	7.3943+6		2.5785+9	1.7417+9	4.1125+8	4.2551+8	6.0324+3	2.4893+2	1.2946+2	1.1947+2	7.7645–4
	3.0000–5	1.4841–8	7.4865+6		2.6107+9	1.6814+9	4.2697+8	5.0225+8	6.1135+3	2.7952+2	1.3718+2	1.4234+2	8.3796–4
	3.2500–5	1.4631–8	7.5941+6		2.6482+9	1.6189+9	4.3642+8	5.9280+8	6.2021+3	3.1170+2	1.4286+2	1.6884+2	9.1033–4
	3.5000–5	1.4439–8	7.6951+6		2.6834+9	1.5631+9	4.4532+8	6.7491+8	6.2852+3	3.4160+2	1.4842+2	1.9318+2	9.8356–4
	3.6250–5	1.4328–8	7.7547+6		2.7042+9	1.5374+9	4.4910+8	7.1766+8	6.3249+3	3.5692+2	1.5099+2	2.0593+2	1.0205–3
	4.0000–5	1.4112–8	7.8738+6		2.7457+9	1.4674+9	4.5976+8	8.1851+8	6.4378+3	3.9514+2	1.5854+2	2.3660+2	1.1325–3
O5	4.5060–5	1.3891–8	7.9991+6		2.7894+9	1.3870+9	4.6401+8	9.3835+8	6.5717+3	4.3699+2	1.6457+2	2.7242+2	1.2827–3
	4.7530–5	1.3880–8	8.0049+6		2.7914+9	1.3524+9	4.6647+8	9.7252+8	6.6289+3	4.5102+2	1.6808+2	2.8294+2	1.3544–3
O4	4.9200–5	1.3868–8	8.0120+6		2.7939+9	1.3305+9	4.6806+8	9.9529+8	6.6662+3	4.6042+2	1.7042+2	2.8999+2	1.4032–3
	5.0000–5	1.3860–8	8.0165+6		2.7955+9	1.3204+9	4.6895+8	1.0061+9	6.6836+3	4.6507+2	1.7172+2	2.9335+2	1.4266–3
	5.2500–5	1.3888–8	8.0006+6		2.7899+9	1.2903+9	4.6889+8	1.0308+9	6.7368+3	4.7559+2	1.7436+2	3.0123+2	1.5002–3
	5.4375–5	1.3903–8	7.9918+6		2.7868+9	1.2690+9	4.6892+8	1.0489+9	6.7753+3	4.8347+2	1.7642+2	3.0704+2	1.5558–3
	5.5781–5	1.3912–8	7.9867+6		2.7851+9	1.2538+9	4.6902+8	1.0623+9	6.8034+3	4.8942+2	1.7806+2	3.1136+2	1.5976–3
	5.7188–5	1.3946–8	7.9672+6		2.7783+9	1.2391+9	4.6920+8	1.0699+9	6.8310+3	4.9381+2	1.7979+2	3.1402+2	1.6396–3
	5.7891–5	1.3962–8	7.9579+6		2.7750+9	1.2320+9	4.6932+8	1.0738+9	6.8445+3	4.9602+2	1.8069+2	3.1533+2	1.6606–3
	5.8594–5	1.3978–8	7.9490+6		2.7719+9	1.2250+9	4.6946+8	1.0775+9	6.8580+3	4.9826+2	1.8162+2	3.1664+2	1.6817–3
	6.0000–5	1.4008–8	7.9322+6		2.7661+9	1.2113+9	4.6982+8	1.0849+9	6.8844+3	5.0282+2	1.8359+2	3.1923+2	1.7240–3
	6.4619–5	1.4165–8	7.8439+6		2.7353+9	1.1695+9	4.6810+8	1.0976+9	6.9678+3	5.1270+2	1.8918+2	3.2352+2	1.8639–3
	6.4688–5	1.4167–8	7.8427+6		2.7348+9	1.1689+9	4.6809+8	1.0978+9	6.9690+3	5.1286+2	1.8928+2	3.2358+2	1.8660–3
	6.8516–5	1.4281–8	7.7806+6		2.7132+9	1.1376+9	4.6785+8	1.1078+9	7.0344+3	5.2238+2	1.9540+2	3.2698+2	1.9830–3
	7.0000–5	1.4321–8	7.7586+6		2.7055+9	1.1261+9	4.6793+8	1.1115+9	7.0589+3	5.2625+2	1.9799+2	3.2826+2	2.0287–3
	7.1168–5	1.4351–8	7.7421+6		2.6998+9	1.1173+9	4.6810+8	1.1144+9	7.0779+3	5.2945+2	2.0019+2	3.2926+2	2.0647–3
	7.4258–5	1.4426–8	7.7020+6		2.6858+9	1.0951+9	4.6889+8	1.1218+9	7.1269+3	5.3832+2	2.0648+2	3.3184+2	2.1604–3
	7.5584–5	1.4457–8	7.6856+6		2.6801+9	1.0859+9	4.6919+8	1.1249+9	7.1474+3	5.4205+2	2.0912+2	3.3292+2	2.2017–3
	8.0000–5	1.4552–8	7.6352+6		2.6625+9	1.0572+9	4.7034+8	1.1350+9	7.2136+3	5.5449+2	2.1804+2	3.3645+2	2.3398–3
	8.5000–5	1.4771–8	7.5225+6		2.6232+9	1.0273+9	4.6823+8	1.1277+9	7.2822+3	5.6026+2	2.2526+2	3.3501+2	2.4968–3
	9.2500–5	1.5083–8	7.3668+6		2.5689+9	9.8698+8	4.6435+8	1.1176+9	7.3791+3	5.6702+2	2.3394+2	3.3308+2	2.7347–3
	1.0000–4	1.5378–8	7.2254+6	0.0000+0	2.5196+9	9.5125+8	4.6005+8	1.1083+9	7.4695+3	5.7244+2	2.4105+2	3.3139+2	2.9755–3
	1.1250–4	1.5995–8	6.9466+6	2.1902–8	2.4224+9	8.9984+8	4.4825+8	1.0743+9	7.6030+3	5.6899+2	2.4700+2	3.2200+2	3.3804–3
O3	1.1782–4	1.6244–8	6.8403+6	3.1262–8	2.3853+9	8.8045+8	4.4366+8	1.0612+9	7.6560+3	5.6776+2	2.4935+2	3.1841+2	3.5547–3
	1.1983–4	1.6351–8	6.7952+6	3.4808–8	2.3696+9	8.7345+8	4.4167+8	1.0545+9	7.6755+3	5.6645+2	2.4992+2	3.1653+2	3.6209–3
	1.2360–4	1.6550–8	6.7135+6	4.1479–8	2.3411+9	8.6078+8	4.3808+8	1.0422+9	7.7114+3	5.6416+2	2.5103+2	3.1312+2	3.7455–3
	1.3020–4	1.6889–8	6.5788+6	5.3215–8	2.2941+9	8.3991+8	4.3222+8	1.0220+9	7.7720+3	5.6060+2	2.5309+2	3.0751+2	3.9647–3
	1.3125–4	1.6942–8	6.5583+6	5.5085–8	2.2870+9	8.3674+8	4.3133+8	1.0189+9	7.7814+3	5.6008+2	2.5342+2	3.0666+2	3.9997–3
	1.4010–4	1.7382–8	6.3923+6	7.0960–8	2.2291+9	8.1138+8	4.2355+8	9.9415+8	7.8581+3	5.5503+2	2.5521+2	2.9981+2	4.2965–3
O2	1.4878–4	1.7796–8	6.2436+6	8.6656–8	2.1772+9	7.8870+8	4.1662+8	9.7188+8	7.9295+3	5.5083+2	2.5714+2	2.9368+2	4.5903–3
	1.5000–4	1.7860–8	6.2212+6	8.8873–8	2.1694+9	7.8567+8	4.1565+8	9.6808+8	7.9392+3	5.5002+2	2.5740+2	2.9262+2	4.6318–3
	1.5313–4	1.8035–8	6.1609+6	9.4571–8	2.1484+9	7.7807+8	4.1244+8	9.5786+8	7.9634+3	5.4679+2	2.5712+2	2.8966+2	4.7396–3
	1.5898–4	1.8358–8	6.0526+6	1.0534–7	2.1106+9	7.6441+8	4.0667+8	9.3953+8	8.0076+3	5.4106+2	2.5670+2	2.8435+2	4.9426–3
	1.6411–4	1.8635–8	5.9626+6	1.1486–7	2.0793+9	7.5305+8	4.0189+8	9.2431+8	8.0451+3	5.3638+2	2.5642+2	2.7995+2	5.1211–3
	1.7308–4	1.9108–8	5.8150+6	1.3171–7	2.0278+9	7.3438+8	3.9404+8	8.9933+8	8.1085+3	5.2885+2	2.5612+2	2.7273+2	5.4355–3
	1.7500–4	1.9207–8	5.7849+6	1.3534–7	2.0173+9	7.3058+8	3.9244+8	8.9424+8	8.1216+3	5.2734+2	2.5608+2	2.7126+2	5.5030–3
	1.8654–4	1.9793–8	5.6137+6	1.5740–7	1.9576+9	7.0890+8	3.8335+8	8.6532+8	8.1984+3	5.1888+2	2.5596+2	2.6292+2	5.9114–3
O1	1.9627–4	2.0271–8	5.4813+6	1.7626–7	1.9114+9	6.9211+8	3.7632+8	8.4298+8	8.2601+3	5.1256+2	2.5608+2	2.5648+2	6.2585–3
	2.0000–4	2.0468–8	5.4284+6	1.8356–7	1.8930+9	6.8599+8	3.7375+8	8.3321+8	8.2813+3	5.0981+2	2.5614+2	2.5366+2	6.3972–3
	2.0625–4	2.0803–8	5.3412+6	1.9589–7	1.8626+9	6.7610+8	3.6866+8	8.1779+8	8.3162+3	5.0421+2	2.5509+2	2.4912+2	6.6304–3
N7	2.1120–4	2.1063–8	5.2751+6	2.0575–7	1.8395+9	6.6858+8	3.6480+8	8.0610+8	8.3432+3	4.9999+2	2.5431+2	2.4568+2	6.8158–3
	2.1398–4	2.1208–8	5.2390+6	2.1131–7	1.8269+9	6.6448+8	3.6270+8	7.9973+8	8.3581+3	4.9776+2	2.5395+2	2.4380+2	6.9200–3
N6	2.1793–4	2.1413–8	5.1888+6	2.1928–7	1.8094+9	6.5876+8	3.5978+8	7.9087+8	8.3790+3	4.9466+2	2.5345+2	2.4120+2	7.0688–3
	2.1935–4	2.1487–8	5.1710+6	2.2216–7	1.8032+9	6.5675+8	3.5869+8	7.8775+8	8.3865+3	4.9350+2	2.5322+2	2.4028+2	7.1224–3
	2.2306–4	2.1679–8	5.1252+6	2.2969–7	1.7872+9	6.5158+8	3.5590+8	7.7975+8	8.4057+3	4.9052+2	2.5260+2	2.3792+2	7.2624–3
	2.2943–4	2.2005–8	5.0493+6	2.4275–7	1.7608+9	6.4297+8	3.5128+8	7.6650+8	8.4381+3	4.8564+2	2.5162+2	2.3402+2	7.5038–3
	2.3268–4	2.2169–8	5.0119+6	2.4945–7	1.7477+9	6.3873+8	3.4900+8	7.5998+8	8.4543+3	4.8326+2	2.5115+2	2.3210+2	7.6270–3
	2.3848–4	2.2460–8	4.9470+6	2.6150–7	1.7251+9	6.3136+8	3.4505+8	7.4868+8	8.4828+3	4.7913+2	2.5036+2	2.2877+2	7.8479–3
	2.4707–4	2.2885–8	4.8552+6	2.7955–7	1.6931+9	6.2090+8	3.3946+8	7.3272+8	8.5239+3	4.7340+2	2.4932+2	2.2407+2	8.1768–3
	2.4951–4	2.3004–8	4.8302+6	2.8470–7	1.6843+9	6.1804+8	3.3793+8	7.2836+8	8.5353+3	4.7185+2	2.4905+2	2.2279+2	8.2702–3
	2.5000–4	2.3028–8	4.8251+6	2.8574–7	1.6826+9	6.1746+8	3.3763+8	7.2749+8	8.5376+3	4.7153+2	2.4899+2	2.2254+2	8.2890–3
	2.6250–4	2.3629–8	4.7024+6	3.1247–7	1.6398+9	6.0341+8	3.3015+8	7.0621+8	8.5947+3	4.6397+2	2.4768+2	2.1628+2	8.7708–3

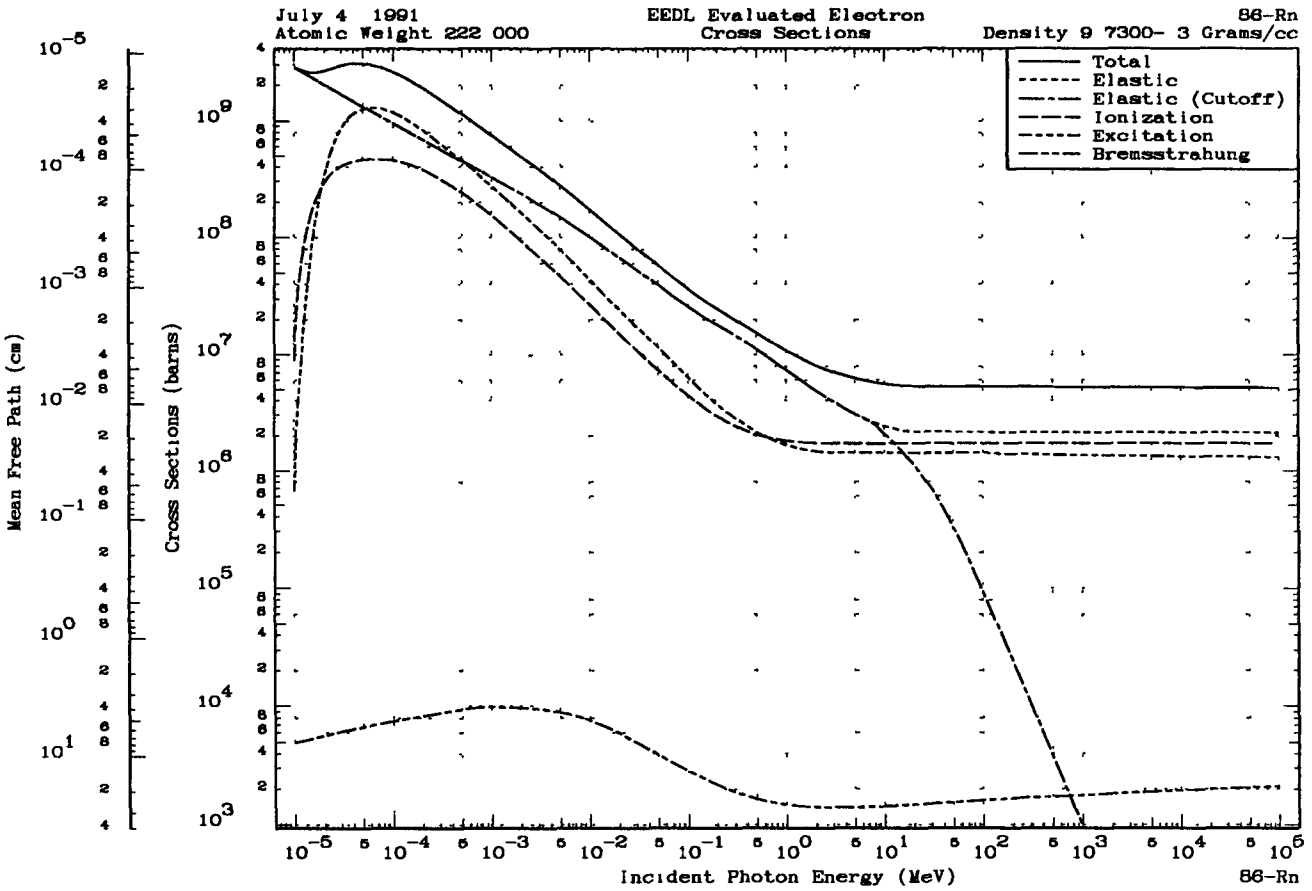
Atomic Weight 210.000 Density 9.000 Grams/cc

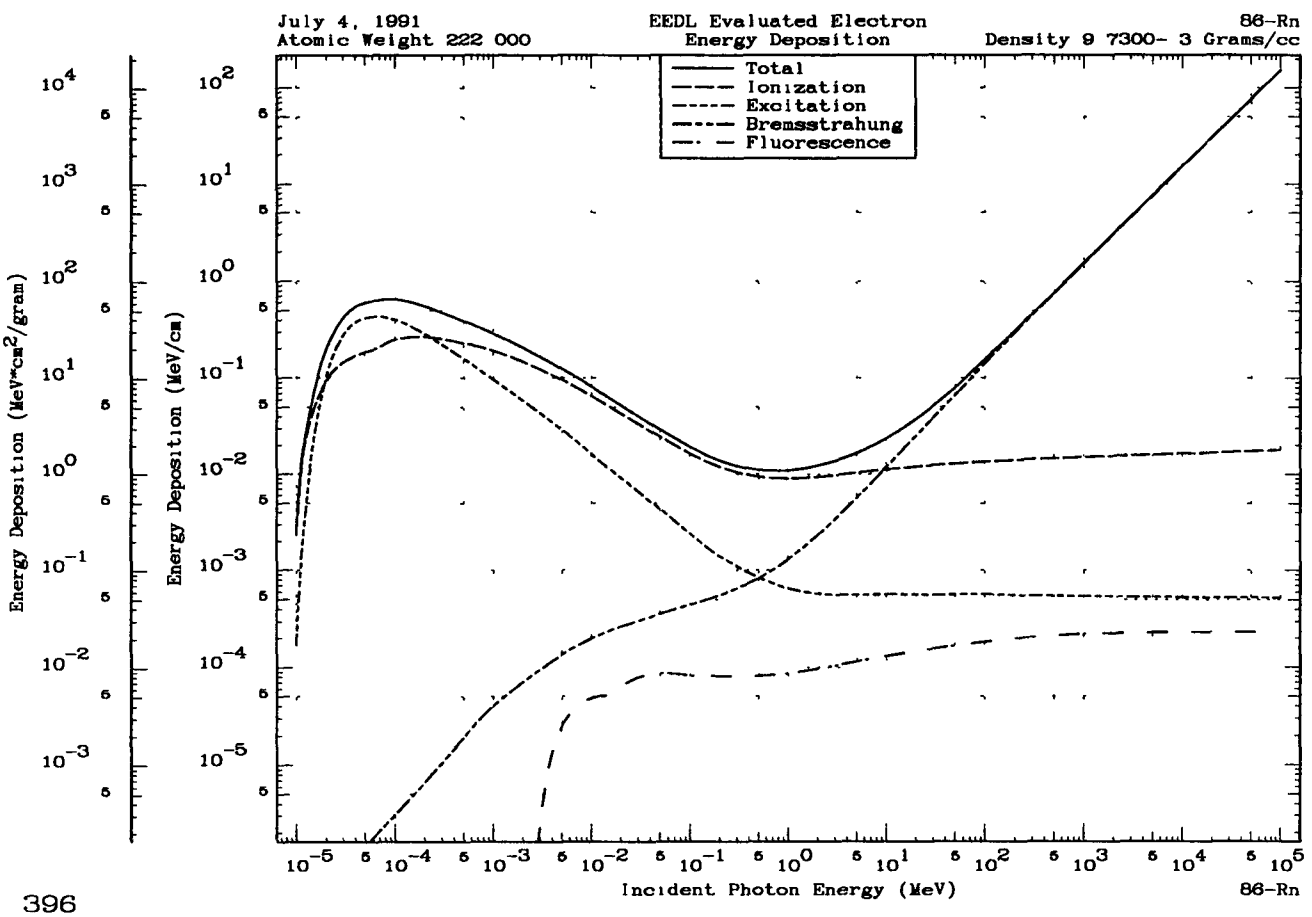
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.6924–4	2.3947–8	4.6399+6	3.2705–7	1.6180+9	5.9625+8	3.2634+8	6.9540+8	8.6245+3	4.6019+2	2.4707+2	2.1310+2	9.0318–3
	2.7354–4	2.4148–8	4.6013+6	3.3642–7	1.6045+9	5.9181+8	3.2399+8	6.8873+8	8.6432+3	4.5788+2	2.4672+2	2.1115+2	9.1988–3
	2.7475–4	2.4204–8	4.5905+6	3.3908–7	1.6008+9	5.9057+8	3.2334+8	6.8687+8	8.6484+3	4.5723+2	2.4662+2	2.1060+2	9.2461–3
	2.7500–4	2.4216–8	4.5884+6	3.3961–7	1.6000+9	5.9032+8	3.2320+8	6.8650+8	8.6495+3	4.5710+2	2.4660+2	2.1049+2	9.2557–3
	3.0000–4	2.5351–8	4.3828+6	3.9505–7	1.5283+9	5.6659+8	3.1066+8	6.5110+8	8.7529+3	4.4494+2	2.4483+2	2.0010+2	1.0235–2
	3.5000–4	2.7652–8	4.0182+6	5.1089–7	1.4012+9	5.2700+8	2.8622+8	5.8798+8	8.9349+3	4.1859+2	2.3728+2	1.8130+2	1.2237–2
	4.0000–4	2.9804–8	3.7280+6	6.3327–7	1.3000+9	4.9495+8	2.6679+8	5.3827+8	9.0956+3	3.9868+2	2.3215+2	1.6651+2	1.4278–2
	4.5000–4	3.1893–8	3.4839+6	7.6176–7	1.2149+9	4.6833+8	2.4918+8	4.9737+8	9.2206+3	3.7971+2	2.2547+2	1.5423+2	1.6407–2
N5	4.9928–4	3.3850–8	3.2825+6	8.9415–7	1.1446+9	4.4603+8	2.3473+8	4.6388+8	9.3323+3	3.6488+2	2.2069+2	1.4418+2	1.8534–2
	5.0000–4	3.3879–8	3.2796+6	8.9612–7	1.1437+9	4.4573+8	2.3454+8	4.6338+8	9.3339+3	3.6467+2	2.2063+2	1.4403+2	1.8565–2
	5.0625–4	3.4135–8	3.2551+6	9.1331–7	1.1351+9	4.4313+8	2.3280+8	4.5915+8	9.3473+3	3.6274+2	2.1998+2	1.4274+2	1.8836–2
	5.1797–4	3.4610–8	3.2104+6	9.4577–7	1.1195+9	4.3840+8	2.2963+8	4.5146+8	9.3722+3	3.5926+2	2.1883+2	1.4041+2	1.9347–2
N4	5.2708–4	3.4977–8	3.1767+6	9.7122–7	1.1078+9	4.3482+8	2.2725+8	4.4569+8	9.3911+3	3.5665+2	2.1798+2	1.3865+2	1.9745–2
	5.3620–4	3.5341–8	3.1440+6	9.9687–7	1.0963+9	4.3134+8	2.2494+8	4.4006+8	9.4077+3	3.5417+2	2.1720+2	1.3695+2	2.0140–2
	5.3848–4	3.5432–8	3.1359+6	1.0033–6	1.0935+9	4.3048+8	2.2437+8	4.3867+8	9.4117+3	3.5356+2	2.1701+2	1.3653+2	2.0239–2
	5.5215–4	3.5972–8	3.0888+6	1.0422–6	1.0771+9	4.2544+8	2.2105+8	4.3060+8	9.4360+3	3.5004+2	2.1593+2	1.3409+2	2.0834–2
	5.6924–4	3.6640–8	3.0325+6	1.0913–6	1.0575+9	4.1940+8	2.1709+8	4.2097+8	9.4655+3	3.4591+2	2.1471+2	1.3118+2	2.1579–2
	5.7607–4	3.6905–8	3.0108+6	1.1111–6	1.0499+9	4.1705+8	2.1556+8	4.1726+8	9.4771+3	3.4434+2	2.1425+2	1.3006+2	2.1878–2
	6.0000–4	3.7820–8	2.9379+6	1.1811–6	1.0245+9	4.0916+8	2.1044+8	4.0486+8	9.5168+3	3.3915+2	2.1282+2	1.2631+2	2.2927–2
	6.5000–4	3.9709–8	2.7982+6	1.3312–6	9.7576+8	3.9407+8	2.0001+8	3.8166+8	9.5802+3	3.2741+2	2.0814+2	1.1925+2	2.5077–2
	7.0000–4	4.1535–8	2.6751+6	1.4862–6	9.3285+8	3.8060+8	1.9087+8	3.6137+8	9.6393+3	3.1748+2	2.0438+2	1.1307+2	2.7241–2
	7.2500–4	4.2428–8	2.6188+6	1.5655–6	9.1321+8	3.7438+8	1.8668+8	3.5214+8	9.6674+3	3.1293+2	2.0263+2	1.1026+2	2.8328–2
N3	7.4171–4	4.3017–8	2.5829+6	1.6192–6	9.0070+8	3.7040+8	1.8402+8	3.4628+8	9.6857+3	3.1006+2	2.0156+2	1.0848+2	2.9056–2
	7.4900–4	4.3274–8	2.5676+6	1.6427–6	8.9537+8	3.6870+8	1.8287+8	3.4379+8	9.6922+3	3.0883+2	2.0108+2	1.0772+2	2.9365–2
	7.7450–4	4.4161–8	2.5160+6	1.7259–6	8.7737+8	3.6295+8	1.7900+8	3.3541+8	9.7144+3	3.0472+2	1.9952+2	1.0517+2	3.0449–2
	8.0000–4	4.5037–8	2.4671+6	1.8101–6	8.6032+8	3.5747+8	1.7535+8	3.2749+8	9.7359+3	3.0090+2	1.9812+2	1.0275+2	3.1534–2
	8.5000–4	4.6733–8	2.3776+6	1.9785–6	8.2909+8	3.4744+8	1.6837+8	3.1327+8	9.7506+3	2.9283+2	1.9440+2	9.8390+1	3.3406–2
N2	8.9065–4	4.8081–8	2.3109+6	2.1188–6	8.0585+8	3.3990+8	1.6320+8	3.0274+8	9.7619+3	2.8696+2	1.9176+2	9.5159+1	3.4930–2
	9.0432–4	4.8529–8	2.2896+6	2.1665–6	7.9841+8	3.3748+8	1.6155+8	2.9937+8	9.7655+3	2.8506+2	1.9089+2	9.4129+1	3.5443–2
	9.2500–4	4.9202–8	2.2583+6	2.2395–6	7.8749+8	3.3392+8	1.5912+8	2.9444+8	9.7710+3	2.8230+2	1.8964+2	9.2621+1	3.6219–2
	9.2824–4	4.9307–8	2.2535+6	2.2509–6	7.8582+8	3.3337+8	1.5875+8	2.9368+8	9.7719+3	2.8187+2	1.8945+2	9.2390+1	3.6341–2
	9.6412–4	5.0457–8	2.2021+6	2.3792–6	7.6789+8	3.2749+8	1.5479+8	2.8561+8	9.7811+3	2.7740+2	1.8744+2	8.9923+1	3.7689–2
	1.0000–3	5.1590–8	2.1537+6	2.5096–6	7.5104+8	3.2192+8	1.5107+8	2.7804+8	9.7899+3	2.7328+2	1.8563+2	8.7612+1	3.9038–2
N1	1.0214–3	5.2257–8	2.1262+6	2.5883–6	7.4144+8	3.1873+8	1.4886+8	2.7384+8	9.7848+3	2.7057+2	1.8422+2	8.6316+1	3.9699–2
	1.0364–3	5.2723–8	2.1074+6	2.6437–6	7.3489+8	3.1656+8	1.4734+8	2.7098+8	9.7812+3	2.6867+2	1.8320+2	8.5433+1	4.0161–2
	1.0625–3	5.3530–8	2.0757+6	2.7416–6	7.2381+8	3.1287+8	1.4478+8	2.6615+8	9.7752+3	2.6547+2	1.8149+2	8.3944+1	4.0968–2
	1.0653–3	5.3617–8	2.0723+6	2.7523–6	7.2264+8	3.1248+8	1.4450+8	2.6564+8	9.7745+3	2.6514+2	1.8131+2	8.3786+1	4.1055–2
	1.1197–3	5.5267–8	2.0104+6	2.9597–6	7.0107+8	3.0526+8	1.3953+8	2.5627+8	9.7625+3	2.5900+2	1.7806+2	8.0895+1	4.2731–2
	1.1250–3	5.5427–8	2.0046+6	2.9803–6	6.9904+8	3.0458+8	1.3907+8	2.5539+8	9.7613+3	2.5843+2	1.7776+2	8.0625+1	4.2896–2
	1.1672–3	5.6683–8	1.9602+6	3.1450–6	6.8356+8	2.9935+8	1.3551+8	2.4869+8	9.7524+3	2.5407+2	1.7546+2	7.8558+1	4.4197–2
	1.1719–3	5.6821–8	1.9555+6	3.1634–6	6.8190+8	2.9879+8	1.3513+8	2.4797+8	9.7514+3	2.5360+2	1.7522+2	7.8338+1	4.4340–2
	1.2500–3	5.9091–8	1.8803+6	3.4759–6	6.5570+8	2.8986+8	1.2915+8	2.3668+8	9.7358+3	2.4637+2	1.7147+2	7.4858+1	4.6745–2
	1.2504–3	5.9103–8	1.8800+6	3.4776–6	6.5557+8	2.8981+8	1.2912+8	2.3663+8	9.7357+3	2.4633+2	1.7145+2	7.4841+1	4.6758–2
	1.3125–3	6.0867–8	1.8255+6	3.7324–6	6.3657+8	2.8328+8	1.2479+8	2.2849+8	9.7240+3	2.4097+2	1.6859+2	7.2335+1	4.8667–2
	1.3359–3	6.1523–8	1.8060+6	3.8301–6	6.2977+8	2.8094+8	1.2324+8	2.2559+8	9.7197+3	2.3906+2	1.6757+2	7.1441+1	4.9387–2
	1.3752–3	6.2612–8	1.7746+6	3.9953–6	6.1882+8	2.7714+8	1.2076+8	2.2092+8	9.7127+3	2.3601+2	1.6595+2	7.0003+1	5.0593–2
	1.5000–3	6.5989–8	1.6838+6	4.5341–6	5.8716+8	2.6605+8	1.1362+8	2.0749+8	9.6917+3	2.2738+2	1.6145+2	6.5870+1	5.4421–2
	1.7500–3	7.2625–8	1.5299+6	5.6770–6	5.3351+8	2.4727+8	1.0141+8	1.8482+8	9.6348+3	2.1033+2	1.5144+2	5.8825+1	6.1432–2
	2.0000–3	7.8877–8	1.4087+6	6.9039–6	4.9122+8	2.3209+8	9.1927+7	1.6720+8	9.5857+3	1.9733+2	1.4390+2	5.3352+1	6.8413–2
	2.2500–3	8.5059–8	1.3063+6	8.2125–6	4.5552+8	2.1905+8	8.4011+7	1.5245+8	9.5182+3	1.8491+2	1.3610+2	4.8733+1	7.4637–2
	2.5000–3	9.0973–8	1.2214+6	9.6027–6	4.2591+8	2.0801+8	7.7524+7	1.4036+8	9.4582+3	1.7484+2	1.2981+2	4.4950+1	8.0831–2
	2.6250–3	9.3841–8	1.1840+6	1.0327–5	4.1289+8	2.0309+8	7.4694+7	1.3509+8	9.4306+3	1.7044+2	1.2706+2	4.3301+1	8.3917–2
M5	2.7862–3	9.7461–8	1.1401+6	1.1287–5	3.9755+8	1.9724+8	7.1381+7	1.2893+8	9.3969+3	1.6533+2	1.2387+2	4.1372+1	8.7887–2
	2.8129–3	9.8058–8	1.1331+6	1.1449–5	3.9513+8	1.9630+8	7.0858+7	1.2796+8	9.3890+3	1.6451+2	1.2335+2	4.1070+1	8.8469–2
	2.9065–3	1.0013–7	1.1097+6	1.2022–5	3.8696+8	1.9314+8	6.9094+7	1.2472+8	9.3618+3	1.6174+2	1.2159+2	4.0054+1	9.0508–2
M4	2.9114–3	1.0024–7	1.1085+6	1.2053–5	3.8654+8	1.9298+8	6.9004+7	1.2455+8	9.3604+3	1.6160+2	1.2150+2	4.0002+1	9.0615–2
	2.9335–3	1.0072–7	1.1031+6	1.2190–5	3.8467+8	1.9225+8	6.8603+7	1.2381+8	9.3541+3	1.6097+2	1.2111+2	3.9770+1	9.1097–2
	3.0000–3	1.0218–7	1.0875+6	1.2606–5	3.7921+8	1.9012+8	6.7430+7	1.2165+8	9.3355+3	1.5915+2	1.1996+2	3.9093+1	9.2542–2
	3.2500–3	1.0756–7	1.0330+6	1.4212–5	3.6023+8	1.8263+8	6.3326+7	1.1426+8	9.2694+3	1.5210+2	1.1523+2	3.6767+1	9.7959–2
M3	3.3985–3	1.1068–7	1.0039+6	1.5201–5	3.5007+8	1.7858+8	6.1148+7	1.1034+8	9.2328+3	1.4838+2	1.1274+2	3.5531+1	1.0116–1
	3.4737–3	1.1229–7	9.8954+5	1.5711–5	3.4506+8	1.7661+8	6.0099+7	1.0834+8	9.2145+3	1.4654+2	1.1153+2	3.4903+1	1.0278–1
	3.5000–3	1.1284–7	9.8464+5	1.5891–5	3.4336+8	1.7594+8	5.9742+7	1.0767+8	9.2082+3	1.4592+2	1.1112+2	3.4689+1	1.0334–1
	3.6053–3	1.1506–7	9.6564+5	1.6618–5	3.3673+8	1.7332+8	5.8360+7	1.0504+8	9.1836+3	1.4349+2	1.0953+2	3.3862+1	1.0559–1
	3.8026–3	1.1916–7	9.3244+5	1.8014–5	3.2516+8	1.6870+8	5.5955+7	1.0049+8	9.1394+3	1.3930+2	1.0677+2	3.2425+1	1.0980–1
M2	3.9918–3	1.2301–7	9.0326+5	1.9390–5	3.1498+8	1.6460+8	5.3853+7	9.6512+7	9.0994+3	1.3568+2	1.0439+2	3.1170+1	1.1381–1
	4.0000–3	1.2318–7	9.0201+5	1.9450–5	3.1454+8	1.6443+8	5.3766+7	9.6340+7	9.0964+3	1.3552+2	1.0429+2	3.1116+1	1.1395–1
	4.0625–3	1.2447–7	8.9264+5	1.9914–5	3.1128+8	1.6309+8	5.3101+7	9.5078+7	9.0739+3	1.3426+2	1.0343+2	3.0714+1	1.1501–1
	4.1797–3	1.2688–7	8.7573+5	2.0794–5	3.0538+8	1.6066+8	5.1902+7	9.2804+7	9.0329+3	1.3199+2	1.0188+2	2.9992+1	1.1699–1
	4.2500–3	1.2831–7	8.6596+5	2.1329–5	3.0197+8	1.5926+8	5.1212+7	9.1496+7	9.0089+3	1.3068+2	1.0099+2	2.9576+1	1.1818–1
M1	4.2855–3	1.2903–7	8.6114+5	2.1602–5	3.0029+8	1.5856+8	5.0872+7	9.0850+7	8.9969+3	1.3004+2	1.0055+2	2.9371+1	1.1878–1
	4.3748–3	1.3083–7	8.4927+5	2.2293–5	2.9615+8	1.5685+8	5.0037+7	8.9262+7	8.9674+3	1.2846+2	9.9473+1	2.8868+1	1.2028–1
	4.3848–3	1.3103–7	8.4797+5	2.2370–5	2.9570+8	1.5666+8	4.9945+7	8.9088+7	8.9641+3	1.2829+2	9.9355+1	2.8813+1	1.2044–1
	4.5000–3	1.3334–7	8.3332+5	2.3275–5	2.9059+8	1.5453+8	4.8917+7	8.7134+7	8.9271+3	1.2635+2	9.8037+1	2.8194+1	1.2238–1
	4.5311–3	1.3395–7	8.2947+5	2.3522–5	2.8925+8	1.5397+8	4.8648+7	8.6622+7	8.9173+3	1.2585+2	9.7691+1	2.8032+1	1.2290–1
	4.6250–3	1.3581–7	8.1813+5	2.4273–5	2.8529+8	1.5232+8	4.7854+7	8.5116+7	8.8882+3	1.2435+2	9.6671+1	2.7555+1	1.2447–1
	4.6924–3	1.3713–7	8.1024+5	2.4817–5	2.8254+8	1.5116+8	4.7303+7	8.4069+7	8.8677+3	1.2331+2	9.5964+1	2.7224+1	1.2559–1
	4.7656–3	1.3856–7	8.0187+5	2.5413–5	2.7962+8	1.4993+8	4.6720+7	8.2964+7	8.8459+3	1.2222+2	9.5218+1	2.6874+1	1.2681–1
	5.0000–3	1.4309–7	7.7650+5	2.7357–5	2.7078+8	1.4619+8	4.4956+7	7.9626+7	8.7784+3	1.1892+2	9.2974+1	2.5817+1	1.3071–1
	5.5000–3	1.5259–7	7.2817+5	3.1683–5	2.5392+8	1.3890+8	4.1611+7	7.3408+7	8.6429+3	1.1232+2	8.8339+1	2.3838+1	1.3886–1
	6.0000–3	1.6178–7	6.8682+5	3.6249–5	2.3950+8	1.3256+8	3.8778+7	6.8156+7	8.5210+3	1.0675+2	8.4432+1	2.2166+1	1.4692–1

Atomic Weight 210.000 Density 9.000 Grams/cc

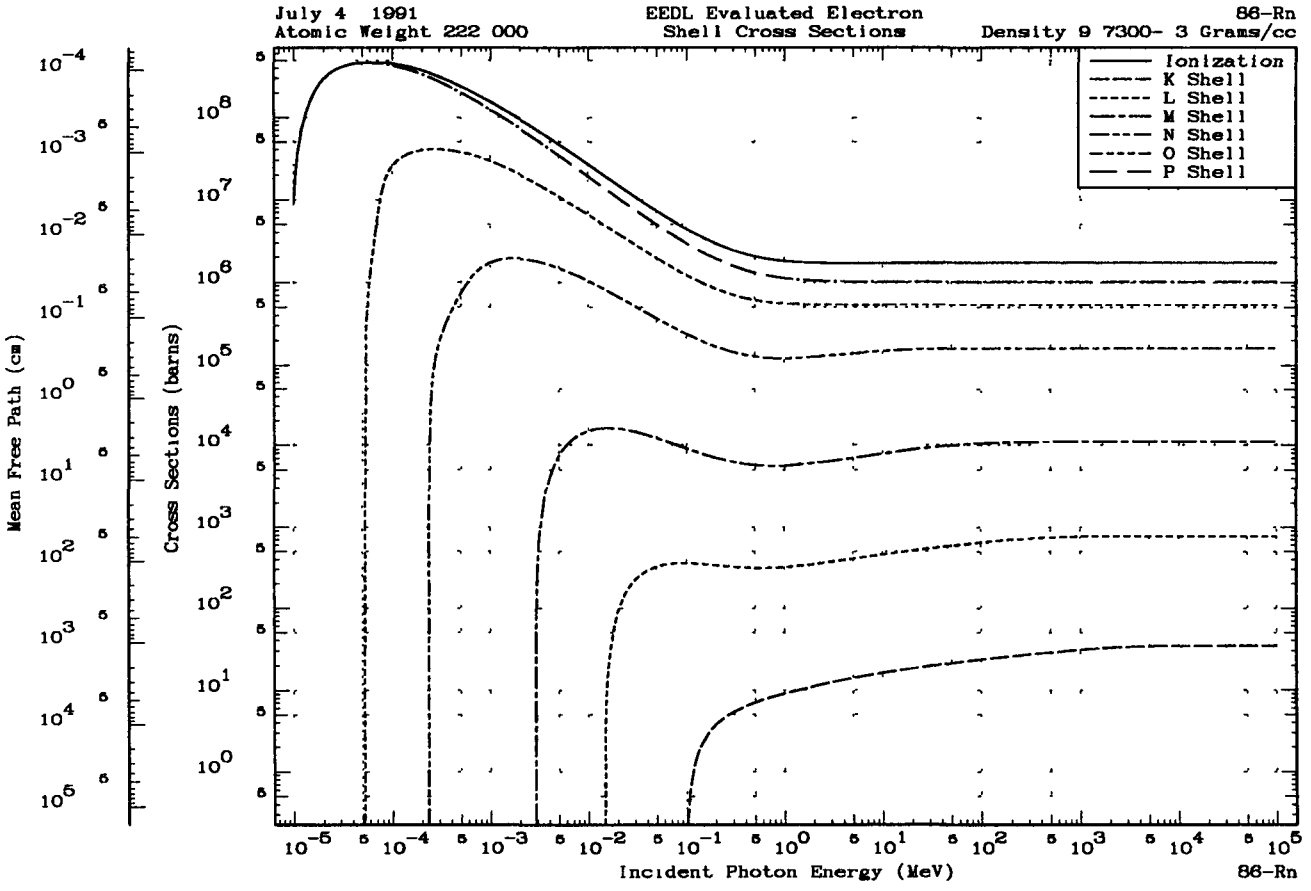
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.5000–3	1.7078–7	6.5061+5	4.1051–5	2.2688+8	1.2690+8	3.6310+7	6.3664+7	8.3618+3	1.0153+2	8.0647+1	2.0731+1	1.5323–1
7.0000–3	1.7954–7	6.1888+5	4.6089–5	2.1581+8	1.2187+8	3.4166+7	5.9770+7	8.2171+3	9.7024+1	7.7377+1	1.9487+1	1.5948–1
8.0000–3	1.9640–7	5.6573+5	5.6812–5	1.9728+8	1.1330+8	3.0621+7	5.3344+7	7.9626+3	8.9578+1	7.1971+1	1.7435+1	1.7179–1
9.0000–3	2.1257–7	5.2270+5	6.8393–5	1.8227+8	1.0603+8	2.7775+7	4.8454+7	7.7012+3	8.3203+1	6.7154+1	1.5867+1	1.8193–1
1.0000–2	2.2811–7	4.8708+5	8.0802–5	1.6985+8	9.9928+7	2.5456+7	4.4461+7	7.4747+3	7.8020+1	6.3241+1	1.4587+1	1.9189–1
1.1250–2	2.4696–7	4.4991+5	9.7443–5	1.5689+8	9.3414+7	2.3076+7	4.0392+7	7.1853+3	7.2288+1	5.8811+1	1.3275+1	2.0172–1
1.2500–2	2.6509–7	4.1914+5	1.1532–4	1.4616+8	8.7947+7	2.1138+7	3.7069+7	6.9360+3	6.7619+1	5.5204+1	1.2204+1	2.1139–1
L3 1.4215–2	2.8896–7	3.8452+5	1.4171–4	1.3409+8	8.1707+7	1.8993+7	3.3382+7	6.6434+3	6.2426+1	5.1185+1	1.1016+1	2.2437–1
1.4608–2	2.9431–7	3.7754+5	1.4805–4	1.3165+8	8.0432+7	1.8567+7	3.2646+7	6.5738+3	6.1364+1	5.0358+1	1.0779+1	2.2662–1
1.5000–2	2.9960–7	3.7086+5	1.5450–4	1.2932+8	7.9211+7	1.8161+7	3.1945+7	6.5067+3	6.0353+1	4.9571+1	1.0554+1	2.2885–1
1.6250–2	3.1624–7	3.5135+5	1.7575–4	1.2252+8	7.5592+7	1.6989+7	2.9932+7	6.3085+3	5.7288+1	4.7152+1	9.9001+0	2.3592–1
L2 1.6840–2	3.2394–7	3.4300+5	1.8617–4	1.1961+8	7.4033+7	1.6491+7	2.9076+7	6.2221+3	5.5986+1	4.6125+1	9.6224+0	2.3923–1
1.7235–2	3.2908–7	3.3764+5	1.9328–4	1.1774+8	7.3026+7	1.6176+7	2.8531+7	6.1665+3	5.5161+1	4.5474+1	9.4460+0	2.4144–1
L1 1.7473–2	3.3216–7	3.3451+5	1.9761–4	1.1665+8	7.2437+7	1.5992+7	2.8213+7	6.1339+3	5.4681+1	4.5095+1	9.3432+0	2.4276–1
1.7926–2	3.3798–7	3.2875+5	2.0597–4	1.1464+8	7.1349+7	1.5655+7	2.7631+7	6.0712+3	5.3784+1	4.4386+1	9.1539+0	2.4497–1
1.8105–2	3.4025–7	3.2655+5	2.0930–4	1.1387+8	7.0933+7	1.5526+7	2.7409+7	6.0471+3	5.3443+1	4.4115+1	9.0818+0	2.4584–1
1.8125–2	3.4051–7	3.2631+5	2.0968–4	1.1379+8	7.0886+7	1.5512+7	2.7384+7	6.0444+3	5.3405+1	4.4085+1	9.0737+0	2.4594–1
1.8963–2	3.5109–7	3.1647+5	2.2560–4	1.1036+8	6.9018+7	1.4940+7	2.6394+7	5.9357+3	5.1881+1	4.2879+1	8.7521+0	2.5001–1
1.9052–2	3.5221–7	3.1547+5	2.2733–4	1.1001+8	6.8827+7	1.4882+7	2.6293+7	5.9245+3	5.1726+1	4.2756+1	8.7193+0	2.5045–1
2.0000–2	3.6397–7	3.0528+5	2.4593–4	1.0646+8	6.6882+7	1.4293+7	2.5274+7	5.8102+3	5.0160+1	4.1517+1	8.3883+0	2.5501–1
2.1250–2	3.7916–7	2.9304+5	2.7135–4	1.0219+8	6.4514+7	1.3596+7	2.4072+7	5.6562+3	4.8186+1	3.9931+1	7.9958+0	2.5969–1
2.2500–2	3.9406–7	2.8197+5	2.9778–4	9.8326+7	6.2358+7	1.2970+7	2.2991+7	5.5147+3	4.6414+1	3.8506+1	7.6430+0	2.6435–1
2.3438–2	4.0504–7	2.7432+5	3.1825–4	9.5659+7	6.0863+7	1.2541+7	2.2249+7	5.4159+3	4.5197+1	3.7528+1	7.4009+0	2.6782–1
2.4375–2	4.1588–7	2.6717+5	3.3926–4	9.3167+7	5.9460+7	1.2142+7	2.1559+7	5.3226+3	4.4066+1	3.6619+1	7.1756+0	2.7128–1
2.5000–2	4.2302–7	2.6266+5	3.5356–4	9.1594+7	5.8572+7	1.1892+7	2.1124+7	5.2632+3	4.3354+1	3.6047+1	7.0339+0	2.7357–1
2.6719–2	4.4236–7	2.5118+5	3.9405–4	8.7590+7	5.6302+7	1.1258+7	2.0025+7	5.1105+3	4.1550+1	3.4595+1	6.6753+0	2.7984–1
2.7188–2	4.4755–7	2.4826+5	4.0539–4	8.6573+7	5.5723+7	1.1098+7	1.9747+7	5.0712+3	4.1095+1	3.4228+1	6.5846+0	2.8153–1
3.0000–2	4.7812–7	2.3239+5	4.7597–4	8.1039+7	5.2555+7	1.0234+7	1.8245+7	4.8548+3	3.8635+1	3.2248+1	6.0948+0	2.9160–1
3.5000–2	5.3070–7	2.0937+5	6.1193–4	7.3009+7	4.7845+7	9.0378+6	1.6122+7	4.5144+3	3.4975+1	2.9272+1	5.3972+0	3.0519–1
4.0000–2	5.8080–7	1.9131+5	7.6100–4	6.6711+7	4.4107+7	8.1157+6	1.4484+7	4.2389+3	3.2149+1	2.6971+1	4.8591+0	3.1853–1
5.0000–2	6.7502–7	1.6460+5	1.0943–3	5.7400+7	3.8477+7	6.8083+6	1.2111+7	3.8131+3	2.7947+1	2.3531+1	4.0758+0	3.4066–1
6.0000–2	7.6384–7	1.4546+5	1.4727–3	5.0725+7	3.4415+7	5.9203+6	1.0386+7	3.5026+3	2.4967+1	2.1103+1	3.5044+0	3.5969–1
8.0000–2	9.2824–7	1.1970+5	2.3451–3	4.1741+7	2.8883+7	4.7896+6	8.0657+6	3.0717+3	2.0997+1	1.7872+1	2.7319+0	3.9297–1
K 9.6068–2	1.0477–6	1.0605+5	3.1511–3	3.6982+7	2.5893+7	4.2166+6	6.8695+6	2.8326+3	1.8911+1	1.6164+1	2.3316+0	4.1567–1
9.7051–2	1.0548–6	1.0534+5	3.2033–3	3.6734+7	2.5736+7	4.1868+6	6.8082+6	2.8201+3	1.8803+1	1.6075+1	2.3112+0	4.1695–1
1.0000–1	1.0759–6	1.0328+5	3.3614–3	3.6014+7	2.5280+7	4.1005+6	6.6311+6	2.7836+3	1.8491+1	1.5818+1	2.2521+0	4.2080–1
1.0625–1	1.1160–6	9.9565+4	3.7048–3	3.4720+7	2.4469+7	3.9453+6	6.3032+6	2.7174+3	1.7910+1	1.5340+1	2.1420+0	4.2812–1
1.1172–1	1.1503–6	9.6596+4	4.0142–3	3.3684+7	2.3816+7	3.8213+6	6.0440+6	2.6639+3	1.7447+1	1.4957+1	2.0550+0	4.3453–1
1.2129–1	1.2086–6	9.1931+4	4.5744–3	3.2058+7	2.2786+7	3.6266+6	5.6425+6	2.5785+3	1.6723+1	1.4357+1	1.9202+0	4.4574–1
1.3564–1	1.2927–6	8.5954+4	5.4574–3	2.9973+7	2.1455+7	3.3776+6	5.1385+6	2.4666+3	1.5803+1	1.3589+1	1.7511+0	4.6249–1
1.5000–1	1.3731–6	8.0923+4	6.3886–3	2.8219+7	2.0324+7	3.1684+6	4.7238+6	2.3701+3	1.5036+1	1.2945+1	1.6119+0	4.7908–1
1.7500–1	1.4919–6	7.4476+4	8.1073–3	2.5971+7	1.8848+7	2.9079+6	4.2131+6	2.2354+3	1.4065+1	1.2121+1	1.4400+0	5.0367–1
2.0000–1	1.6029–6	6.9320+4	9.9350–3	2.4173+7	1.7656+7	2.6997+6	3.8155+6	2.1249+3	1.3299+1	1.1465+1	1.3062+0	5.2803–1
2.5000–1	1.8032–6	6.1619+4	1.3843–2	2.1488+7	1.5800+7	2.4331+6	3.2522+6	1.9662+3	1.2305+1	1.0618+1	1.1157+0	5.7154–1
3.0000–1	1.9848–6	5.5981+4	1.8029–2	1.9521+7	1.4430+7	2.2350+6	2.8543+6	1.8453+3	1.1591+1	9.9955+0	9.8132–1	6.1427–1
4.0000–1	2.3113–6	4.8072+4	2.6946–2	1.6763+7	1.2348+7	2.0090+6	2.4051+6	1.6960+3	1.0845+1	9.3172+0	8.2930–1	6.9831–1
5.0000–1	2.6034–6	4.2680+4	3.6324–2	1.4883+7	1.0873+7	1.8782+6	2.1299+6	1.6052+3	1.0483+1	8.9647+0	7.3608–1	7.8211–1
6.0000–1	2.8639–6	3.8797+4	4.5943–2	1.3529+7	9.7666+6	1.7945+6	1.9663+6	1.5467+3	1.0311+1	8.7626+0	6.8074–1	8.6761–1
8.0000–1	3.3120–6	3.3548+4	6.5369–2	1.1699+7	8.2280+6	1.6975+6	1.7718+6	1.4784+3	1.0280+1	8.6216+0	6.1511–1	1.0435+0
1.0000+0	3.6910–6	3.0103+4	8.4736–2	1.0497+7	7.1955+6	1.6432+6	1.6572+6	1.4425+3	1.0374+1	8.5723+0	5.7652–1	1.2251+0
1.5000+0	4.4268–6	2.5100+4	1.3156–1	8.7526+6	5.6461+6	1.5846+6	1.5204+6	1.4011+3	1.0987+1	8.7578+0	5.3085–1	1.6982+0
2.0000+0	4.9574–6	2.2413+4	1.7573–1	7.8158+6	4.7754+6	1.5685+6	1.4705+6	1.3866+3	1.1662+1	8.9536+0	5.1432–1	2.1942+0
3.0000+0	5.6965–6	1.9505+4	2.5685–1	6.8017+6	3.8332+6	1.5467+6	1.4204+6	1.3779+3	1.3018+1	9.2910+0	4.9869–1	3.2288+0
4.0000+0	6.1704–6	1.8007+4	3.2988–1	6.2793+6	3.3231+6	1.5418+6	1.4130+6	1.3790+3	1.4387+1	9.5812+0	4.9660–1	4.3093+0
5.0000+0	6.5010–6	1.7091+4	3.9634–1	5.9600+6	3.0062+6	1.5415+6	1.4109+6	1.3822+3	1.5726+1	9.8143+0	4.9636–1	5.4153+0
6.0000+0	6.7451–6	1.6473+4	4.5737–1	5.7443+6	2.7927+6	1.5414+6	1.4088+6	1.3864+3	1.7064+1	1.0016+1	4.9613–1	6.5520+0
8.0000+0	7.0769–6	1.5700+4	5.6625–1	5.4749+6	2.5245+6	1.5413+6	1.4078+6	1.3956+3	1.9739+1	1.0353+1	4.9677–1	8.8889+0
1.0000+1	7.2834–6	1.5255+4	6.6127–1	5.3198+6	2.3679+6	1.5425+6	1.4079+6	1.4058+3	2.2415+1	1.0615+1	4.9783–1	1.1302+1
1.5000+1	7.5190–6	1.4777+4	8.5662–1	5.1531+6	2.2009+6	1.5453+6	1.4055+6	1.4302+3	2.9060+1	1.1006+1	4.9713–1	1.7557+1
2.0000+1	7.5843–6	1.4650+4	1.0114+0	5.1087+6	2.1563+6	1.5472+6	1.4037+6	1.4471+3	3.5800+1	1.1323+1	4.9665–1	2.3980+1
3.0000+1	7.5874–6	1.4644+4	1.2481+0	5.1066+6	2.1560+6	1.5482+6	1.4010+6	1.4731+3	4.9426+1	1.1689+1	4.9595–1	3.7241+1
4.0000+1	7.5842–6	1.4650+4	1.4265+0	5.1088+6	2.1553+6	1.5492+6	1.4028+6	1.4937+3	6.3233+1	1.1942+1	4.9688–1	5.0794+1
5.0000+1	7.5770–6	1.4664+4	1.5693+0	5.1136+6	2.1545+6	1.5498+6	1.4078+6	1.5127+3	7.7277+1	1.2131+1	4.9892–1	6.4648+1
6.0000+1	7.5715–6	1.4675+4	1.6881+0	5.1173+6	2.1539+6	1.5503+6	1.4116+6	1.5277+3	9.1443+1	1.2291+1	5.0057–1	7.8652+1
8.0000+1	7.5638–6	1.4690+4	1.8784+0	5.1226+6	2.1530+6	1.5507+6	1.4174+6	1.5516+3	1.2006+2	1.2524+1	5.0320–1	1.0703+2
1.0000+2	7.5584–6	1.4700+4	2.0277+0	5.1262+6	2.1522+6	1.5510+6	1.4215+6	1.5716+3	1.4887+2	1.2719+1	5.0524–1	1.3564+2
1.5000+2	7.5642–6	1.4689+4	2.3015+0	5.1223+6	2.1508+6	1.5512+6	1.4187+6	1.6039+3	2.2123+2	1.2939+1	5.0426–1	2.0779+2
2.0000+2	7.5672–6	1.4683+4	2.4967+0	5.1202+6	2.1498+6	1.5513+6	1.4174+6	1.6247+3	2.9431+2	1.3139+1	5.0382–1	2.8067+2
3.0000+2	7.5720–6	1.4674+4	2.7728+0	5.1170+6	2.1485+6	1.5514+6	1.4155+6	1.6515+3	4.3987+2	1.3423+1	5.0315–1	4.2594+2
4.0000+2	7.5780–6	1.4662+4	2.9692+0	5.1129+6	2.1475+6	1.5515+6	1.4123+6	1.6705+3	5.8565+2	1.3597+1	5.0204–1	5.7155+2
5.0000+2	7.5873–6	1.4644+4	3.1215+0	5.1067+6	2.1468+6	1.5515+6	1.4067+6	1.6854+3	7.3250+2	1.3722+1	5.0010–1	7.1828+2
6.0000+2	7.5893–6	1.4641+4	3.2461+0	5.1054+6	2.1462+6	1.5515+6	1.4060+6	1.6977+3	8.7781+2	1.3837+1	4.9987–1	8.6348+2
8.0000+2	7.5942–6	1.4631+4	3.4426+0	5.1020+6	2.1452+6	1.5515+6	1.4036+6	1.7173+3	1.1711+3	1.4028+1	4.9907–1	1.1566+3
1.0000+3	7.5985–6	1.4623+4	3.5951+0	5.0992+6	2.1444+6	1.5515+6	1.4015+6	1.7327+3	1.4641+3	1.4197+1	4.9837–1	1.4494+3
1.5000+3	7.6055–6	1.4609+4	3.8717+0	5.0945+6	2.1431+6	1.5515+6	1.3981+6	1.7613+3	2.2008+3	1.4352+1	4.9719–1	2.1860+3
2.0000+3	7.6127–6	1.4595+4	4.0678+0	5.0896+6	2.1421+6	1.5515+6	1.3942+6	1.7826+3	2.9337+3	1.4505+1	4.9579–1	2.9187+3
3.0000+3	7.6217–6	1.4578+4	4.3442+0	5.0837+6	2.1407+6	1.5515+6	1.3896+6	1.8134+3	4.4016+3	1.4801+1	4.9414–1	4.3864+3
4.0000+3	7.6290–6	1.4564+4	4.5402+0	5.0788+6	2.1398+6	1.5516+6	1.3856+6	1.8359+3	5.8699+3	1.4952+1	4.9275–1	5.8544+3
5.0000+3	7.6387–6	1.4546+4	4.6921+0	5.0723+6	2.1390+6	1.5516+6	1.3799+6	1.8535+3	7.3534+3	1.5054+1	4.9071–1	7.3379+3
6.0000+3	7.6404–6	1.4543+4	4.8161+0	5.0712+6	2.1384+6	1.5516+6	1.3794+6	1.8664+3	8.8165+3	1.5152+1	4.9053–1	8.8009+3

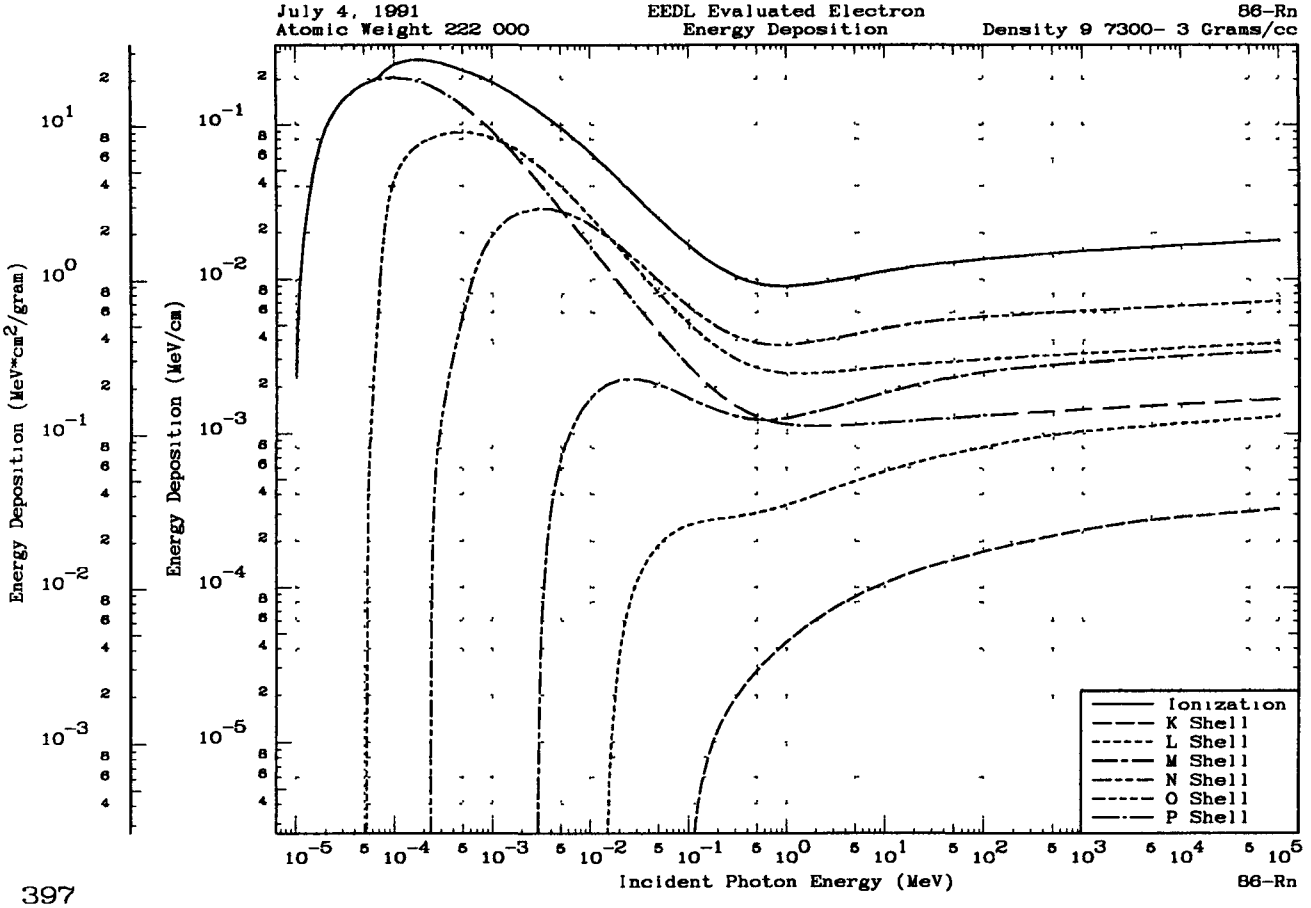
Atomic Weight 210.000												Density 9.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+3	7.6450–6	1.4534+4	5.0118+0	5.0682+6	2.1374+6	1.5516+6	1.3773+6	1.8869+3	1.1769+4	1.5348+1	4.8978–1	1.1753+4
1.0000+4	7.6485–6	1.4527+4	5.1633+0	5.0658+6	2.1367+6	1.5516+6	1.3757+6	1.9030+3	1.4748+4	1.5511+1	4.8922–1	1.4732+4
1.5000+4	7.6540–6	1.4517+4	5.4389+0	5.0622+6	2.1353+6	1.5516+6	1.3734+6	1.9337+3	2.2024+4	1.5656+1	4.8839–1	2.2008+4
2.0000+4	7.6590–6	1.4507+4	5.6347+0	5.0588+6	2.1344+6	1.5516+6	1.3710+6	1.9558+3	2.9395+4	1.5800+1	4.8753–1	2.9379+4
3.0000+4	7.6635–6	1.4499+4	5.9109+0	5.0559+6	2.1330+6	1.5516+6	1.3694+6	1.9868+3	4.3991+4	1.6083+1	4.8697–1	4.3975+4
4.0000+4	7.6680–6	1.4490+4	6.1069+0	5.0529+6	2.1321+6	1.5516+6	1.3673+6	2.0091+3	5.8746+4	1.6233+1	4.8624–1	5.8730+4
5.0000+4	7.6755–6	1.4476+4	6.2589+0	5.0480+6	2.1313+6	1.5516+6	1.3631+6	2.0263+3	7.3364+4	1.6352+1	4.8475–1	7.3348+4
6.0000+4	7.6757–6	1.4476+4	6.3832+0	5.0479+6	2.1307+6	1.5516+6	1.3636+6	2.0403+3	8.7970+4	1.6444+1	4.8491–1	8.7953+4
8.0000+4	7.6783–6	1.4471+4	6.5793+0	5.0462+6	2.1297+6	1.5516+6	1.3628+6	2.0625+3	1.1744+5	1.6629+1	4.8464–1	1.1742+5
1.0000+5	7.6805–6	1.4467+4	6.7312+0	5.0447+6	2.1290+6	1.5516+6	1.3621+6	2.0798+3	1.4696+5	1.6804+1	4.8439–1	1.4694+5


July 4 1991
Atomic Weight 222 000
EEDL Evaluated Electron
Cross Sections
86-Rn
Density 9 7300- 3 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
86-Rn


July 4, 1991
Atomic Weight 222 000
EEDL Evaluated Electron
Energy Deposition
86-Rn
Density 9 7300- 3 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
86-Rn

396


July 4 1991
Atomic Weight 222 000
EEDL Evaluated Electron
Shell Cross Sections
86-Rn
Density 9 7300- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
86-Rn


July 4, 1991
Atomic Weight 222 000
EEDL Evaluated Electron
Energy Deposition
86-Rn
Density 9 7300- 3 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
86-Rn

Atomic Weight 222.000 — Density 9.7300– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.3366–5	7.6892+6		2.8345+9	2.8249+9	8.9206+6	6.6727+5	4.9411+3	2.4628–3	2.2911–3	1.7137–4	2.8192–7
	1.0312–5	1.3514–5	7.6053+6		2.8036+9	2.7845+9	1.7631+7	1.5178+6	4.9722+3	4.9567–3	4.5639–3	3.9250–4	2.9038–7
	1.0898–5	1.3765–5	7.4661+6		2.7523+9	2.7130+9	3.5501+7	3.7824+6	5.0286+3	1.0316–2	9.3244–3	9.9079–4	3.0639–7
	1.1924–5	1.4140–5	7.2686+6		2.6795+9	2.6007+9	6.8595+7	1.0181+7	5.1217+3	2.1171–2	1.8444–2	2.7266–3	3.3473–7
	1.2949–5	1.4429–5	7.1228+6		2.6257+9	2.5018+9	9.8693+7	2.5242+7	5.2087+3	3.4004–2	2.7096–2	6.9075–3	3.6345–7
	1.3462–5	1.4522–5	7.0774+6		2.6090+9	2.4565+9	1.1714+8	3.5338+7	5.2501+3	4.2267–2	3.2492–2	9.7737–3	3.7796–7
P2	1.3690–5	1.4566–5	7.0559+6		2.6011+9	2.4372+9	1.2299+8	4.0873+7	5.2681+3	4.5631–2	3.4272–2	1.1358–2	3.8444–7
	1.3772–5	1.4579–5	7.0494+6		2.5987+9	2.4304+9	1.2544+8	4.2875+7	5.2746+3	4.6963–2	3.5033–2	1.1930–2	3.8677–7
	1.3925–5	1.4601–5	7.0387+6		2.5947+9	2.4178+9	1.3013+8	4.6860+7	5.2865+3	4.9564–2	3.6492–2	1.3071–2	3.9115–7
	1.4060–5	1.4618–5	7.0308+6		2.5918+9	2.4069+9	1.3434+8	5.0608+7	5.2969+3	5.1955–2	3.7807–2	1.4147–2	3.9499–7
	1.4295–5	1.4640–5	7.0202+6		2.5879+9	2.3882+9	1.4194+8	5.7804+7	5.3148+3	5.6415–2	4.0195–2	1.6220–2	4.0172–7
	1.4647–5	1.4664–5	7.0087+6		2.5837+9	2.3610+9	1.5386+8	6.8858+7	5.3413+3	6.3403–2	4.3972–2	1.9431–2	4.1185–7
	1.5000–5	1.4669–5	7.0063+6		2.5828+9	2.3347+9	1.6640+8	8.1685+7	5.3673+3	7.1165–2	4.7985–2	2.3179–2	4.2202–7
	1.5625–5	1.4684–5	6.9993+6		2.5802+9	2.2904+9	1.8475+8	1.0512+8	5.4122+3	8.4089–2	5.4033–2	3.0055–2	4.4014–7
	1.6250–5	1.4650–5	7.0154+6		2.5862+9	2.2485+9	2.0372+8	1.3394+8	5.4557+3	9.8949–2	6.0362–2	3.8586–2	4.5839–7
	1.6719–5	1.4634–5	7.0228+6		2.5889+9	2.2187+9	2.1610+8	1.5414+8	5.4875+3	1.0935–1	6.4699–2	4.4655–2	4.7215–7
	1.8125–5	1.4467–5	7.1040+6		2.6188+9	2.1360+9	2.5308+8	2.2971+8	5.5786+3	1.4555–1	7.7884–2	6.7665–2	5.1384–7
	1.8359–5	1.4444–5	7.1155+6		2.6230+9	2.1231+9	2.5842+8	2.4148+8	5.5933+3	1.5120–1	7.9871–2	7.1329–2	5.2085–7
	2.0000–5	1.4190–5	7.2429+6		2.6700+9	2.0394+9	2.9372+8	3.3686+8	5.6919+3	1.9463–1	9.3221–2	1.0141–1	5.7032–7
	2.2500–5	1.3775–5	7.4609+6		2.7504+9	1.9296+9	3.3634+8	4.8448+8	5.8162+3	2.5876–1	1.1042–1	1.4834–1	6.4118–7
	2.4375–5	1.3515–5	7.6045+6		2.8033+9	1.8583+9	3.5911+8	5.8589+8	5.9022+3	3.0203–1	1.2038–1	1.8164–1	6.9512–7
P1	2.5720–5	1.3286–5	7.7353+6		2.8515+9	1.8120+9	3.7397+8	6.6559+8	5.9607+3	3.3529–1	1.2710–1	2.0819–1	7.3421–7
	2.5988–5	1.3256–5	7.7533+6		2.8582+9	1.8032+9	3.7643+8	6.7852+8	5.9718+3	3.4077–1	1.2829–1	2.1248–1	7.4193–7
	2.6489–5	1.3196–5	7.7886+6		2.8712+9	1.7871+9	3.8103+8	7.0310+8	5.9924+3	3.5118–1	1.3053–1	2.2065–1	7.5642–7
	2.7188–5	1.3106–5	7.8415+6		2.8907+9	1.7653+9	3.8738+8	7.3798+8	6.0205+3	3.6594–1	1.3365–1	2.3229–1	7.7668–7
	2.7367–5	1.3083–5	7.8554+6		2.8958+9	1.7599+9	3.8886+8	7.4706+8	6.0276+3	3.6972–1	1.3440–1	2.3533–1	7.8190–7
	2.8683–5	1.2903–5	7.9652+6		2.9363+9	1.7214+9	3.9952+8	8.1530+8	6.0788+3	3.9806–1	1.3980–1	2.5826–1	8.2032–7
	3.0000–5	1.2760–5	8.0543+6		2.9691+9	1.6855+9	4.0998+8	8.7362+8	6.1281+3	4.2349–1	1.4522–1	2.7828–1	8.5905–7
	3.2500–5	1.2551–5	8.1885+6		3.0186+9	1.6233+9	4.2188+8	9.7340+8	6.2170+3	4.6393–1	1.5218–1	3.1175–1	9.3327–7
	3.5000–5	1.2404–5	8.2854+6		3.0543+9	1.5678+9	4.3323+8	1.0533+9	6.3005+3	4.9824–1	1.5907–1	3.3917–1	1.0084–6
	3.6250–5	1.2326–5	8.3380+6		3.0737+9	1.5422+9	4.3814+8	1.0934+9	6.3405+3	5.1522–1	1.6219–1	3.5303–1	1.0463–6
	4.0000–5	1.2258–5	8.3841+6		3.0907+9	1.4725+9	4.5208+8	1.1661+9	6.4538+3	5.5091–1	1.7136–1	3.7955–1	1.1611–6
	4.5000–5	1.2276–5	8.3719+6		3.0862+9	1.3933+9	4.5929+8	1.2337+9	6.5832+3	5.8209–1	1.7873–1	4.0335–1	1.3108–6
	5.0000–5	1.2369–5	8.3094+6		3.0632+9	1.3260+9	4.6586+8	1.2713+9	6.7011+3	6.0349–1	1.8596–1	4.1753–1	1.4629–6
O5	5.1840–5	1.2406–5	8.2845+6		3.0540+9	1.3037+9	4.6601+8	1.2843+9	6.7407+3	6.1004–1	1.8752–1	4.2252–1	1.5185–6
	5.3880–5	1.2474–5	8.2394+6		3.0374+9	1.2803+9	4.6645+8	1.2906+9	6.7833+3	6.1504–1	1.8962–1	4.2542–1	1.5804–6
O4	5.6490–5	1.2555–5	8.1858+6		3.0176+9	1.2522+9	4.6701+8	1.2984+9	6.8358+3	6.2134–1	1.9230–1	4.2904–1	1.6601–6
	5.6940–5	1.2574–5	8.1736+6		3.0131+9	1.2475+9	4.6716+8	1.2984+9	6.8446+3	6.2207–1	1.9285–1	4.2922–1	1.6739–6
	5.8470–5	1.2637–5	8.1330+6		2.9981+9	1.2321+9	4.6762+8	1.2984+9	6.8743+3	6.2447–1	1.9462–1	4.2984–1	1.7209–6
	6.0000–5	1.2698–5	8.0940+6		2.9838+9	1.2172+9	4.6810+8	1.2984+9	6.9033+3	6.2689–1	1.9643–1	4.3046–1	1.7681–6
	6.2500–5	1.2809–5	8.0239+6		2.9579+9	1.1941+9	4.6683+8	1.2970+9	6.9494+3	6.2872–1	1.9834–1	4.3037–1	1.8456–6
	6.3521–5	1.2852–5	7.9966+6		2.9478+9	1.1851+9	4.6637+8	1.2964+9	6.9678+3	6.2954–1	1.9920–1	4.3034–1	1.8774–6
	6.4688–5	1.2901–5	7.9662+6		2.9367+9	1.1750+9	4.6592+8	1.2958+9	6.9885+3	6.3058–1	2.0027–1	4.3031–1	1.9138–6
	6.5516–5	1.2935–5	7.9452+6		2.9289+9	1.1680+9	4.6564+8	1.2953+9	7.0030+3	6.3136–1	2.0108–1	4.3029–1	1.9398–6
	6.6602–5	1.2979–5	7.9186+6		2.9191+9	1.1590+9	4.6537+8	1.2947+9	7.0218+3	6.3252–1	2.0226–1	4.3026–1	1.9738–6
	6.7327–5	1.3007–5	7.9012+6		2.9127+9	1.1531+9	4.6523+8	1.2943+9	7.0342+3	6.3337–1	2.0312–1	4.3024–1	1.9966–6
	6.8276–5	1.3044–5	7.8790+6		2.9045+9	1.1456+9	4.6511+8	1.2938+9	7.0502+3	6.3456–1	2.0433–1	4.3023–1	2.0265–6
	7.0000–5	1.3109–5	7.8403+6		2.8902+9	1.1322+9	4.6506+8	1.2930+9	7.0790+3	6.3698–1	2.0678–1	4.3020–1	2.0809–6
	7.0297–5	1.3119–5	7.8339+6		2.8879+9	1.1300+9	4.6507+8	1.2928+9	7.0838+3	6.3743–1	2.0723–1	4.3020–1	2.0902–6
	7.2306–5	1.3191–5	7.7914+6		2.8722+9	1.1151+9	4.6526+8	1.2918+9	7.1165+3	6.4067–1	2.1049–1	4.3018–1	2.1540–6
	7.2723–5	1.3205–5	7.7829+6		2.8691+9	1.1121+9	4.6535+8	1.2916+9	7.1231+3	6.4142–1	2.1124–1	4.3017–1	2.1672–6
	7.4230–5	1.3257–5	7.7527+6		2.8579+9	1.1015+9	4.6558+8	1.2909+9	7.1470+3	6.4398–1	2.1382–1	4.3016–1	2.2152–6
	7.6361–5	1.3360–5	7.6930+6		2.8359+9	1.0869+9	4.6623+8	1.2828+9	7.1800+3	6.4575–1	2.1795–1	4.2779–1	2.2833–6
	7.7115–5	1.3396–5	7.6722+6		2.8283+9	1.0819+9	4.6638+8	1.2800+9	7.1915+3	6.4628–1	2.1930–1	4.2698–1	2.3075–6
	8.0000–5	1.3530–5	7.5961+6		2.8002+9	1.0634+9	4.6725+8	1.2696+9	7.2347+3	6.4882–1	2.2487–1	4.2395–1	2.4003–6
	8.5000–5	1.3796–5	7.4495+6		2.7462+9	1.0336+9	4.6546+8	1.2472+9	7.3040+3	6.4936–1	2.3203–1	4.1733–1	2.5615–6
	8.8750–5	1.3990–5	7.3462+6		2.7081+9	1.0128+9	4.6385+8	1.2314+9	7.3538+3	6.4933–1	2.3662–1	4.1271–1	2.6833–6
	9.2500–5	1.4178–5	7.2489+6		2.6723+9	9.9334+8	4.6235+8	1.2165+9	7.4018+3	6.4951–1	2.4115–1	4.0835–1	2.8059–6
	9.4375–5	1.4270–5	7.2020+6		2.6549+9	9.8403+8	4.6150+8	1.2094+9	7.4252+3	6.4946–1	2.4319–1	4.0627–1	2.8674–6
	1.0000–4	1.4541–5	7.0680+6	0.0000+0	2.6056+9	9.5764+8	4.5891+8	1.1890+9	7.4931+3	6.4919–1	2.4884–1	4.0035–1	3.0532–6
	1.1250–4	1.5227–5	6.7496+6	1.9425–5	2.4882+9	9.0622+8	4.4731+8	1.1346+9	7.6282+3	6.3784–1	2.5488–1	3.8296–1	3.4693–6
O3	1.2837–4	1.6037–5	6.4085+6	4.4558–5	2.3624+9	8.5189+8	4.3387+8	1.0767+9	7.7825+3	6.2508–1	2.6057–1	3.6450–1	4.0072–6
	1.2972–4	1.6117–5	6.3769+6	4.6724–5	2.3508+9	8.4772+8	4.3276+8	1.0703+9	7.7948+3	6.2339–1	2.6093–1	3.6245–1	4.0535–6
	1.3226–4	1.6265–5	6.3188+6	5.0801–5	2.3294+9	8.4007+8	4.3073+8	1.0586+9	7.8177+3	6.2033–1	2.6163–1	3.5869–1	4.1405–6
	1.3669–4	1.6520–5	6.2213+6	5.7979–5	2.2934+9	8.2719+8	4.2731+8	1.0389+9	7.8570+3	6.1528–1	2.6289–1	3.5238–1	4.2932–6
	1.4335–4	1.6893–5	6.0837+6	6.8855–5	2.2427+9	8.0897+8	4.2249+8	1.0112+9	7.9139+3	6.0838–1	2.6487–1	3.4350–1	4.5237–6
	1.5000–4	1.7257–5	5.9555+6	7.9848–5	2.1955+9	7.9195+8	4.1800+8	9.8549+8	7.9685+3	6.0221–1	2.6694–1	3.3526–1	4.7558–6
O2	1.6229–4	1.7932–5	5.7313+6	1.0050–4	2.1128+9	7.6326+8	4.0661+8	9.4289+8	8.0643+3	5.8785–1	2.6660–1	3.2125–1	5.1883–6
	1.6465–4	1.8060–5	5.6908+6	1.0452–4	2.0979+9	7.5812+8	4.0453+8	9.3521+8	8.0814+3	5.8523–1	2.6649–1	3.1873–1	5.2735–6
	1.6907–4	1.8296–5	5.6174+6	1.1210–4	2.0708+9	7.4877+8	4.0074+8	9.2126+8	8.1129+3	5.8051–1	2.6634–1	3.1417–1	5.4338–6
	1.7680–4	1.8701–5	5.4956+6	1.2552–4	2.0259+9	7.3325+8	3.9446+8	8.9817+8	8.1664+3	5.7283–1	2.6619–1	3.0663–1	5.7158–6
	1.8125–4	1.8930–5	5.4291+6	1.3331–4	2.0014+9	7.2476+8	3.9104+8	8.8560+8	8.1962+3	5.6870–1	2.6618–1	3.0252–1	5.8788–6
	1.8840–4	1.9292–5	5.3274+6	1.4595–4	1.9639+9	7.1174+8	3.8578+8	8.6637+8	8.2429+3	5.6247–1	2.6622–1	2.9624–1	6.1421–6
	2.0000–4	1.9863–5	5.1743+6	1.6675–4	1.9074+9	6.9209+8	3.7786+8	8.3749+8	8.3156+3	5.5335–1	2.6651–1	2.8683–1	6.5722–6
O1	2.1169–4	2.0436–5	5.0291+6	1.8808–4	1.8539+9	6.7391+8	3.6883+8	8.1119+8	8.3814+3	5.4285–1	2.6472–1	2.7812–1	7.0223–6
	2.1445–4	2.0580–5	4.9940+6	1.9317–4	1.8410+9	6.6983+8	3.6681+8	8.0431+8	8.3965+3	5.4020–1	2.6436–1	2.7583–1	7.1291–6
	2.1980–4	2.0856–5	4.9278+6	2.0312–4	1.8166+9	6.6215+8	3.6301+8	7.9140+8	8.4252+3	5.3527–1	2.6371–1	2.7155–1	7.3365–6
	2.2500–4	2.1122–5	4.8658+6	2.1288–4	1.7937+9	6.5493+8	3.5945+8	7.7933+8	8.4526+3	5.3068–1	2.6313–1	2.6754–1	7.5390–6
	2.2982–4	2.1366–5	4.8103+6	2.2200–4	1.7733+9	6.4846+8	3.5625+8	7.6855+8	8.4775+3	5.2660–1	2.6262–1	2.6397–1	7.7273–6
N7	2.3387–4	2.1568–5	4.7651+6	2.2971–4	1.7566+9	6.4317+8	3.5364+8	7.5978+8	8.4981+3	5.2328–1	2.6222–1	2.6106–1	7.8858–6

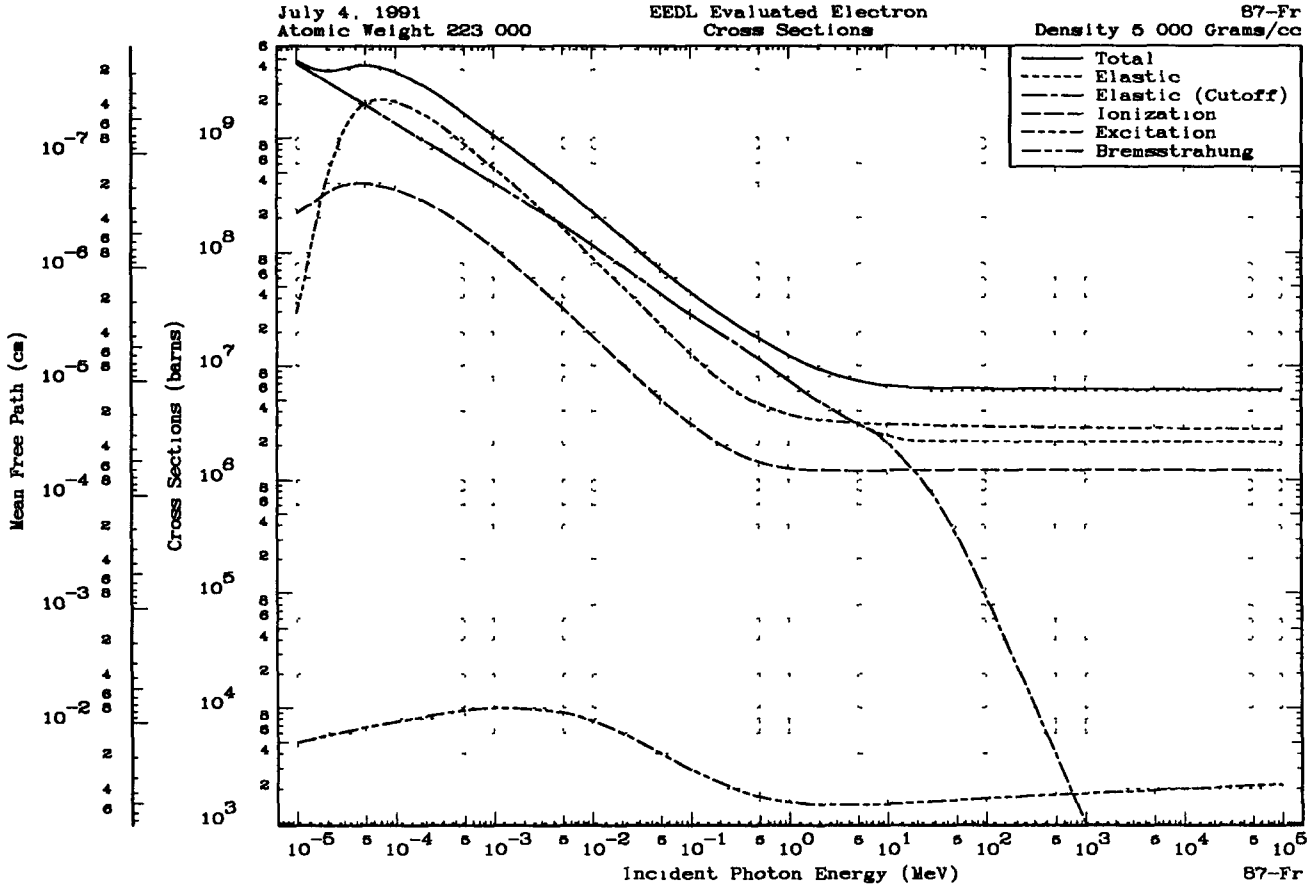
Atomic Weight 222.000 Density 9.7300– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.3800–4	2.1774–5	4.7200+6	2.3763–4	1.7400+9	6.3792+8	3.5106+8	7.5099+8	8.5188+3	5.2005–1	2.6189–1	2.5815–1	8.0481–6
N6	2.4116–4	2.1931–5	4.6863+6	2.4372–4	1.7276+9	6.3399+8	3.4913+8	7.4444+8	8.5344+3	5.1764–1	2.6164–1	2.5599–1	8.1723–6
	2.4484–4	2.2114–5	4.6475+6	2.5084–4	1.7132+9	6.2951+8	3.4669+8	7.3703+8	8.5523+3	5.1460–1	2.6107–1	2.5352–1	8.3172–6
	2.4575–4	2.2160–5	4.6379+6	2.5262–4	1.7097+9	6.2841+8	3.4609+8	7.3521+8	8.5568+3	5.1385–1	2.6093–1	2.5291–1	8.3534–6
	2.4737–4	2.2240–5	4.6212+6	2.5577–4	1.7036+9	6.2649+8	3.4504+8	7.3204+8	8.5645+3	5.1254–1	2.6068–1	2.5185–1	8.4171–6
	2.5173–4	2.2455–5	4.5770+6	2.6432–4	1.6873+9	6.2137+8	3.4226+8	7.2362+8	8.5854+3	5.0909–1	2.6004–1	2.4904–1	8.5899–6
	2.5932–4	2.2824–5	4.5029+6	2.7929–4	1.6600+9	6.1280+8	3.3760+8	7.0956+8	8.6208+3	5.0338–1	2.5902–1	2.4436–1	8.8909–6
	2.6053–4	2.2882–5	4.4914+6	2.8170–4	1.6557+9	6.1146+8	3.3687+8	7.0738+8	8.6264+3	5.0250–1	2.5886–1	2.4363–1	8.9391–6
	2.6250–4	2.2978–5	4.4728+6	2.8563–4	1.6489+9	6.0930+8	3.3570+8	7.0386+8	8.6354+3	5.0108–1	2.5861–1	2.4246–1	9.0177–6
	2.6380–4	2.3040–5	4.4607+6	2.8823–4	1.6444+9	6.0789+8	3.3494+8	7.0156+8	8.6413+3	5.0014–1	2.5845–1	2.4169–1	9.0696–6
	2.7966–4	2.3790–5	4.3201+6	3.2028–4	1.5926+9	5.9149+8	3.2606+8	6.7501+8	8.7116+3	4.8947–1	2.5662–1	2.3284–1	9.7046–6
	2.8026–4	2.3818–5	4.3150+6	3.2152–4	1.5907+9	5.9089+8	3.2574+8	6.7404+8	8.7142+3	4.8908–1	2.5655–1	2.3252–1	9.7289–6
	2.8190–4	2.3894–5	4.3012+6	3.2487–4	1.5856+9	5.8928+8	3.2487+8	6.7145+8	8.7213+3	4.8805–1	2.5639–1	2.3166–1	9.7948–6
	3.0000–4	2.4722–5	4.1572+6	3.6237–4	1.5325+9	5.7235+8	3.1575+8	6.4439+8	8.7969+3	4.7740–1	2.5474–1	2.2265–1	1.0527–5
	3.5000–4	2.6951–5	3.8133+6	4.7042–4	1.4058+9	5.3257+8	2.9146+8	5.8170+8	8.9831+3	4.4836–1	2.4676–1	2.0159–1	1.2591–5
	4.0000–4	2.9036–5	3.5396+6	5.8477–4	1.3048+9	5.0036+8	2.7212+8	5.3235+8	9.1475+3	4.2635–1	2.4130–1	1.8503–1	1.4697–5
	4.5000–4	3.1072–5	3.3076+6	7.0506–4	1.2193+9	4.7358+8	2.5444+8	4.9128+8	9.2765+3	4.0517–1	2.3402–1	1.7113–1	1.6895–5
	5.0000–4	3.3008–5	3.1136+6	8.3110–4	1.1478+9	4.5085+8	2.3971+8	4.5722+8	9.3934+3	3.8829–1	2.2865–1	1.5962–1	1.9123–5
N5	5.2982–4	3.4185–5	3.0064+6	9.0889–4	1.1083+9	4.3882+8	2.3167+8	4.3779+8	9.4583+3	3.7849–1	2.2549–1	1.5298–1	2.0465–5
	5.3859–4	3.4526–5	2.9767+6	9.3215–4	1.0973+9	4.3546+8	2.2945+8	4.3242+8	9.4762+3	3.7585–1	2.2469–1	1.5115–1	2.0862–5
	5.5394–4	3.5117–5	2.9266+6	9.7323–4	1.0789+9	4.2979+8	2.2570+8	4.2337+8	9.5068+3	3.7146–1	2.2337–1	1.4806–1	2.1558–5
N4	5.5950–4	3.5329–5	2.9090+6	9.8822–4	1.0724+9	4.2779+8	2.2439+8	4.2021+8	9.5177+3	3.6993–1	2.2292–1	1.4698–1	2.1811–5
	5.6962–4	3.5714–5	2.8777+6	1.0157–3	1.0608+9	4.2422+8	2.2205+8	4.1456+8	9.5351+3	3.6725–1	2.2217–1	1.4506–1	2.2271–5
	5.7697–4	3.5992–5	2.8555+6	1.0357–3	1.0527+9	4.2169+8	2.2040+8	4.1057+8	9.5476+3	3.6538–1	2.2165–1	1.4370–1	2.2606–5
	5.8481–4	3.6286–5	2.8324+6	1.0573–3	1.0441+9	4.1904+8	2.1867+8	4.0640+8	9.5608+3	3.6343–1	2.2112–1	1.4229–1	2.2964–5
	6.0000–4	3.6851–5	2.7889+6	1.0993–3	1.0281+9	4.1405+8	2.1544+8	3.9861+8	9.5858+3	3.5985–1	2.2018–1	1.3964–1	2.3658–5
	6.2500–4	3.7782–5	2.7202+6	1.1694–3	1.0028+9	4.0623+8	2.0996+8	3.8657+8	9.6187+3	3.5306–1	2.1753–1	1.3551–1	2.4763–5
	6.5000–4	3.8697–5	2.6559+6	1.2408–3	9.7907+8	3.9886+8	2.0485+8	3.7534+8	9.6505+3	3.4683–1	2.1514–1	1.3166–1	2.5871–5
	7.0000–4	4.0483–5	2.5387+6	1.3873–3	9.3588+8	3.8530+8	1.9556+8	3.5501+8	9.7107+3	3.3581–1	2.1109–1	1.2469–1	2.8099–5
	7.1250–4	4.0921–5	2.5116+6	1.4247–3	9.2586+8	3.8212+8	1.9341+8	3.5032+8	9.7252+3	3.3325–1	2.1014–1	1.2308–1	2.8658–5
	7.2500–4	4.1355–5	2.4852+6	1.4624–3	9.1613+8	3.7903+8	1.9131+8	3.4577+8	9.7394+3	3.3078–1	2.0923–1	1.2152–1	2.9218–5
N3	7.7939–4	4.3210–5	2.3785+6	1.6293–3	8.7680+8	3.6644+8	1.8287+8	3.2748+8	9.7988+3	3.2102–1	2.0573–1	1.1526–1	3.1664–5
	7.8970–4	4.3557–5	2.3596+6	1.6614–3	8.6983+8	3.6420+8	1.8137+8	3.2425+8	9.8068+3	3.1931–1	2.0513–1	1.1415–1	3.2107–5
	8.0000–4	4.3901–5	2.3411+6	1.6938–3	8.6301+8	3.6200+8	1.7990+8	3.2110+8	9.8148+3	3.1766–1	2.0455–1	1.1307–1	3.2550–5
	8.2500–4	4.4736–5	2.2974+6	1.7731–3	8.4690+8	3.5684+8	1.7627+8	3.1378+8	9.8241+3	3.1308–1	2.0251–1	1.1055–1	3.3529–5
	8.6875–4	4.6172–5	2.2259+6	1.9145–3	8.2056+8	3.4833+8	1.7036+8	3.0186+8	9.8397+3	3.0574–1	1.9927–1	1.0643–1	3.5246–5
	9.0000–4	4.7179–5	2.1784+6	2.0175–3	8.0304+8	3.4263+8	1.6643+8	2.9397+8	9.8503+3	3.0094–1	1.9719–1	1.0371–1	3.6473–5
N2	9.3851–4	4.8400–5	2.1235+6	2.1466–3	7.8279+8	3.3599+8	1.6191+8	2.8488+8	9.8630+3	2.9548–1	1.9486–1	1.0058–1	3.7988–5
	9.5388–4	4.8880–5	2.1026+6	2.1989–3	7.7509+8	3.3345+8	1.6018+8	2.8145+8	9.8679+3	2.9339–1	1.9396–1	9.9396–2	3.8593–5
	9.7694–4	4.9595–5	2.0723+6	2.2779–3	7.6393+8	3.2975+8	1.5769+8	2.7647+8	9.8752+3	2.9040–1	1.9267–1	9.7688–2	3.9501–5
	1.0000–3	5.0302–5	2.0431+6	2.3576–3	7.5318+8	3.2618+8	1.5529+8	2.7170+8	9.8822+3	2.8756–1	1.9147–1	9.6049–2	4.0409–5
	1.0625–3	5.2178–5	1.9697+6	2.5781–3	7.2611+8	3.1704+8	1.4894+8	2.6012+8	9.8689+3	2.7946–1	1.8739–1	9.2029–2	4.2406–5
N1	1.0727–3	5.2479–5	1.9584+6	2.6147–3	7.2194+8	3.1563+8	1.4797+8	2.5834+8	9.8668+3	2.7823–1	1.8677–1	9.1411–2	4.2732–5
	1.0860–3	5.2875–5	1.9438+6	2.6628–3	7.1654+8	3.1380+8	1.4669+8	2.5604+8	9.8640+3	2.7656–1	1.8590–1	9.0615–2	4.3158–5
	1.1119–3	5.3634–5	1.9162+6	2.7569–3	7.0639+8	3.1036+8	1.4430+8	2.5173+8	9.8588+3	2.7343–1	1.8427–1	8.9118–2	4.3984–5
	1.1250–3	5.4016–5	1.9027+6	2.8049–3	7.0141+8	3.0866+8	1.4313+8	2.4961+8	9.8563+3	2.7191–1	1.8348–1	8.8385–2	4.4401–5
	1.1604–3	5.5039–5	1.8673+6	2.9361–3	6.8836+8	3.0421+8	1.4006+8	2.4408+8	9.8495+3	2.6792–1	1.8141–1	8.6468–2	4.5531–5
	1.1719–3	5.5367–5	1.8562+6	2.9790–3	6.8428+8	3.0281+8	1.3911+8	2.4236+8	9.8473+3	2.6669–1	1.8077–1	8.5870–2	4.5896–5
	1.2029–3	5.6248–5	1.8272+6	3.0959–3	6.7357+8	2.9913+8	1.3660+8	2.3783+8	9.8416+3	2.6346–1	1.7911–1	8.4302–2	4.6884–5
	1.2500–3	5.7569–5	1.7852+6	3.2764–3	6.5811+8	2.9379+8	1.3299+8	2.3133+8	9.8331+3	2.5885–1	1.7676–1	8.2046–2	4.8385–5
	1.2539–3	5.7678–5	1.7819+6	3.2915–3	6.5687+8	2.9336+8	1.3270+8	2.3080+8	9.8324+3	2.5848–1	1.7656–1	8.1866–2	4.8509–5
	1.2772–3	5.8321–5	1.7622+6	3.3818–3	6.4963+8	2.9084+8	1.3101+8	2.2776+8	9.8284+3	2.5629–1	1.7543–1	8.0812–2	4.9249–5
	1.3125–3	5.9289–5	1.7334+6	3.5205–3	6.3902+8	2.8714+8	1.2855+8	2.2332+8	9.8224+3	2.5312–1	1.7380–1	7.9272–2	5.0374–5
	1.3769–3	6.1028–5	1.6841+6	3.7780–3	6.2082+8	2.8076+8	1.2432+8	2.1572+8	9.8119+3	2.4766–1	1.7097–1	7.6640–2	5.2423–5
	1.3886–3	6.1338–5	1.6756+6	3.8250–3	6.1768+8	2.7966+8	1.2360+8	2.1442+8	9.8101+3	2.4673–1	1.7049–1	7.6188–2	5.2793–5
	1.5000–3	6.4252–5	1.5996+6	4.2843–3	5.8966+8	2.6972+8	1.1714+8	2.0280+8	9.7932+3	2.3854–1	1.6632–1	7.2165–2	5.6331–5
	1.7500–3	7.0619–5	1.4553+6	5.3739–3	5.3650+8	2.5091+8	1.0469+8	1.8088+8	9.7401+3	2.2055–1	1.5598–1	6.4510–2	6.3608–5
	2.0000–3	7.6611–5	1.3415+6	6.5442–3	4.9454+8	2.3568+8	9.5016+7	1.6383+8	9.6943+3	2.0683–1	1.4820–1	5.8556–2	7.0855–5
	2.2500–3	8.2495–5	1.2458+6	7.7928–3	4.5927+8	2.2262+8	8.6934+7	1.4970+8	9.6263+3	1.9379–1	1.4012–1	5.3589–2	7.7248–5
	2.5000–3	8.8117–5	1.1663+6	9.1194–3	4.2996+8	2.1155+8	8.0302+7	1.3810+8	9.5659+3	1.8321–1	1.3361–1	4.9512–2	8.3610–5
	2.6250–3	9.0841–5	1.1314+6	9.8104–3	4.1707+8	2.0661+8	7.7407+7	1.3304+8	9.5381+3	1.7859–1	1.3077–1	4.7733–2	8.6779–5
M5	2.8893–3	9.6433–5	1.0658+6	1.1327–2	3.9288+8	1.9723+8	7.2021+7	1.2362+8	9.4836+3	1.7006–1	1.2554–1	4.4424–2	9.3459–5
	2.9170–3	9.7008–5	1.0594+6	1.1490–2	3.9055+8	1.9632+8	7.1501+7	1.2272+8	9.4758+3	1.6923–1	1.2503–1	4.4108–2	9.4086–5
	3.0000–3	9.8723–5	1.0410+6	1.1984–2	3.8377+8	1.9367+8	6.9992+7	1.2011+8	9.4530+3	1.6681–1	1.2353–1	4.3189–2	9.5966–5
M4	3.0216–3	9.9166–5	1.0364+6	1.2114–2	3.8205+8	1.9299+8	6.9605+7	1.1945+8	9.4472+3	1.6613–1	1.2308–1	4.2957–2	9.6455–5
	3.0369–3	9.9483–5	1.0331+6	1.2206–2	3.8084+8	1.9251+8	6.9333+7	1.1899+8	9.4431+3	1.6565–1	1.2276–1	4.2794–2	9.6800–5
	3.0670–3	1.0010–4	1.0267+6	1.2388–2	3.7847+8	1.9156+8	6.8806+7	1.1809+8	9.4351+3	1.6473–1	1.2215–1	4.2478–2	9.7480–5
	3.1250–3	1.0130–4	1.0146+6	1.2742–2	3.7402+8	1.8978+8	6.7816+7	1.1641+8	9.4199+3	1.6299–1	1.2101–1	4.1884–2	9.8790–5
	3.1253–3	1.0130–4	1.0145+6	1.2744–2	3.7400+8	1.8977+8	6.7811+7	1.1640+8	9.4199+3	1.6299–1	1.2101–1	4.1881–2	9.8797–5
	3.2346–3	1.0352–4	9.9276+5	1.3422–2	3.6597+8	1.8655+8	6.6031+7	1.1338+8	9.3921+3	1.5987–1	1.1895–1	4.0813–2	1.0126–4
M3	3.5179–3	1.0914–4	9.4164+5	1.5235–2	3.4713+8	1.7891+8	6.1883+7	1.0632+8	9.3246+3	1.5266–1	1.1423–1	3.8322–2	1.0762–4
	3.5625–3	1.1002–4	9.3415+5	1.5528–2	3.4437+8	1.7778+8	6.1276+7	1.0530+8	9.3142+3	1.5160–1	1.1353–1	3.7961–2	1.0861–4
	3.5782–3	1.1033–4	9.3156+5	1.5631–2	3.4341+8	1.7738+8	6.1067+7	1.0495+8	9.3105+3	1.5123–1	1.1328–1	3.7836–2	1.0896–4
	3.6173–3	1.1109–4	9.2516+5	1.5891–2	3.4105+8	1.7641+8	6.0550+7	1.0408+8	9.3015+3	1.5032–1	1.1268–1	3.7527–2	1.0983–4
	3.6836–3	1.1237–4	9.1458+5	1.6334–2	3.3715+8	1.7480+8	5.9696+7	1.0264+8	9.2864+3	1.4882–1	1.1169–1	3.7019–2	1.1129–4
	3.8418–3	1.1540–4	8.9058+5	1.7409–2	3.2830+8	1.7114+8	5.7768+7	9.9391+7	9.2517+3	1.4544–1	1.0945–1	3.5868–2	1.1478–4
	4.0000–3	1.1838–4	8.6817+5	1.8509–2	3.2004+8	1.6769+8	5.5977+7	9.6367+7	9.2185+3	1.4232–1	1.0740–1	3.4798–2	1.1827–4
M2	4.1476–3	1.2117–4	8.4819+5	1.9557–2	3.1268+8	1.6453+8	5.4395+7	9.3741+7	9.1662+3	1.3931–1	1.0533–1	3.3864–2	1.2087–4
	4.2009–3	1.2220–4	8.4103+5	1.9941–2	3.1004+8	1.6343+8	5.3849+7	9.2745+7	9.1478+3	1.3825–1	1.0461–1	3.3509–2	1.2181–4
	4.2500–3	1.2315–4	8.3455+5	2.0298–2	3.0765+8	1.6244+8	5.3356+7	9.1847+7	9.1311+3	1.3728–1	1.0397–1	3.3190–2	1.2267–4

Atomic Weight 222.000 — Density 9.7300– 3 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.3008–3	1.2412–4	8.2800+5	2.0669–2	3.0523+8	1.6143+8	5.2858+7	9.0938+7	9.1141+3	1.3631–1	1.0332–1	3.2866–2	1.2356–4
M1	4.4477–3	1.2692–4	8.0975+5	2.1757–2	2.9851+8	1.5861+8	5.1473+7	8.8417+7	9.0662+3	1.3362–1	1.0153–1	3.1969–2	1.2614–4
	4.4756–3	1.2745–4	8.0638+5	2.1966–2	2.9726+8	1.5809+8	5.1220+7	8.7947+7	9.0573+3	1.3312–1	1.0120–1	3.1802–2	1.2663–4
	4.5167–3	1.2823–4	8.0147+5	2.2276–2	2.9545+8	1.5733+8	5.0850+7	8.7264+7	9.0443+3	1.3240–1	1.0072–1	3.1559–2	1.2735–4
	4.6250–3	1.3027–4	7.8891+5	2.3100–2	2.9082+8	1.5539+8	4.9907+7	8.5520+7	9.0107+3	1.3056–1	9.9494–2	3.0940–2	1.2923–4
	4.6375–3	1.3051–4	7.8748+5	2.3196–2	2.9030+8	1.5517+8	4.9801+7	8.5323+7	9.0069+3	1.3036–1	9.9356–2	3.0870–2	1.2945–4
	4.7378–3	1.3238–4	7.7634+5	2.3970–2	2.8619+8	1.5343+8	4.8966+7	8.3782+7	8.9767+3	1.2873–1	9.8278–2	3.0323–2	1.3120–4
	4.8188–3	1.3389–4	7.6763+5	2.4602–2	2.8298+8	1.5208+8	4.8315+7	8.2580+7	8.9529+3	1.2747–1	9.7439–2	2.9897–2	1.3260–4
	5.0000–3	1.3721–4	7.4901+5	2.6039–2	2.7612+8	1.4916+8	4.6927+7	8.0022+7	8.9012+3	1.2478–1	9.5660–2	2.8989–2	1.3574–4
	5.2500–3	1.4179–4	7.2483+5	2.8072–2	2.6720+8	1.4528+8	4.5135+7	7.6775+7	8.8316+3	1.2117–1	9.3204–2	2.7830–2	1.4000–4
	5.5000–3	1.4629–4	7.0254+5	3.0164–2	2.5898+8	1.4168+8	4.3491+7	7.3801+7	8.7658+3	1.1788–1	9.0965–2	2.6769–2	1.4424–4
	5.6250–3	1.4851–4	6.9203+5	3.1231–2	2.5511+8	1.3998+8	4.2719+7	7.2406+7	8.7342+3	1.1633–1	8.9912–2	2.6272–2	1.4635–4
	6.0000–3	1.5507–4	6.6275+5	3.4515–2	2.4432+8	1.3519+8	4.0577+7	6.8544+7	8.6441+3	1.1206–1	8.7011–2	2.4895–2	1.5265–4
	6.5000–3	1.6367–4	6.2796+5	3.9090–2	2.3149+8	1.2941+8	3.8037+7	6.4039+7	8.4842+3	1.0657–1	8.3128–2	2.3282–2	1.5924–4
	7.0000–3	1.7202–4	5.9745+5	4.3890–2	2.2024+8	1.2427+8	3.5829+7	6.0132+7	8.3387+3	1.0182–1	7.9773–2	2.1884–2	1.6577–4
	8.0000–3	1.8812–4	5.4633+5	5.4110–2	2.0140+8	1.1554+8	3.2171+7	5.3685+7	8.0830+3	9.3977–2	7.4221–2	1.9577–2	1.7863–4
	9.0000–3	2.0400–4	5.0379+5	6.5158–2	1.8572+8	1.0813+8	2.9230+7	4.8351+7	7.8198+3	8.7128–2	6.9279–2	1.7660–2	1.8923–4
	1.0000–2	2.1928–4	4.6868+5	7.7018–2	1.7278+8	1.0191+8	2.6829+7	4.4031+7	7.5917+3	8.1568–2	6.5262–2	1.6107–2	1.9964–4
	1.1250–2	2.3773–4	4.3231+5	9.2947–2	1.5937+8	9.5267+7	2.4362+7	3.9730+7	7.2966+3	7.5462–2	6.0698–2	1.4554–2	2.0973–4
	1.2500–2	2.5549–4	4.0227+5	1.1008–1	1.4829+8	8.9695+7	2.2349+7	3.6240+7	7.0423+3	7.0497–2	5.6982–2	1.3295–2	2.1964–4
	1.3125–2	2.6414–4	3.8910+5	1.1909–1	1.4344+8	8.7226+7	2.1475+7	3.4730+7	6.9276+3	6.8330–2	5.5356–2	1.2750–2	2.2453–4
L3	1.4619–2	2.8424–4	3.6157+5	1.4170–1	1.3329+8	8.2010+7	1.9662+7	3.1612+7	6.6807+3	6.3852–2	5.1990–2	1.1625–2	2.3606–4
	1.5000–2	2.8928–4	3.5527+5	1.4772–1	1.3097+8	8.0802+7	1.9252+7	3.0907+7	6.6150+3	6.2815–2	5.1205–2	1.1371–2	2.3834–4
	1.5625–2	2.9736–4	3.4562+5	1.5780–1	1.2741+8	7.8894+7	1.8618+7	2.9891+7	6.5122+3	6.1161–2	4.9916–2	1.1003–2	2.4205–4
	1.6719–2	3.1124–4	3.3021+5	1.7608–1	1.2173+8	7.5829+7	1.7614+7	2.8281+7	6.3451+3	5.8542–2	4.7873–2	1.0420–2	2.4851–4
L2	1.7396–2	3.1967–4	3.2150+5	1.8779–1	1.1852+8	7.4086+7	1.7050+7	2.7377+7	6.2491+3	5.7072–2	4.6726–2	1.0093–2	2.5247–4
L1	1.8042–2	3.2764–4	3.1368+5	1.9925–1	1.1564+8	7.2507+7	1.6549+7	2.6574+7	6.1622+3	5.5747–2	4.5689–2	9.8018–3	2.5622–4
	1.8359–2	3.3152–4	3.1001+5	2.0497–1	1.1428+8	7.1763+7	1.6314+7	2.6197+7	6.1191+3	5.5126–2	4.5203–2	9.6652–3	2.5777–4
	1.8532–2	3.3362–4	3.0806+5	2.0810–1	1.1356+8	7.1369+7	1.6190+7	2.5997+7	6.0961+3	5.4797–2	4.4945–2	9.5929–3	2.5862–4
	1.9024–2	3.3958–4	3.0266+5	2.1716–1	1.1157+8	7.0272+7	1.5847+7	2.5446+7	6.0320+3	5.3887–2	4.4233–2	9.3929–3	2.6102–4
	2.0000–2	3.5124–4	2.9260+5	2.3557–1	1.0786+8	6.8224+7	1.5212+7	2.4424+7	5.9115+3	5.2204–2	4.2915–2	9.0226–3	2.6577–4
	2.1250–2	3.6592–4	2.8087+5	2.6000–1	1.0354+8	6.5809+7	1.4482+7	2.3242+7	5.7558+3	5.0144–2	4.1282–2	8.5923–3	2.7069–4
	2.2500–2	3.8031–4	2.7024+5	2.8540–1	9.9622+7	6.3611+7	1.3825+7	2.2181+7	5.6128+3	4.8295–2	3.9814–2	8.2058–3	2.7559–4
	2.3438–2	3.9092–4	2.6291+5	3.0507–1	9.6919+7	6.2086+7	1.3375+7	2.1452+7	5.5129+3	4.7025–2	3.8805–2	7.9406–3	2.7924–4
	2.4375–2	4.0138–4	2.5605+5	3.2526–1	9.4392+7	6.0655+7	1.2956+7	2.0775+7	5.4185+3	4.5844–2	3.7867–2	7.6940–3	2.8287–4
	2.5000–2	4.0828–4	2.5173+5	3.3900–1	9.2797+7	5.9749+7	1.2693+7	2.0349+7	5.3585+3	4.5102–2	3.7277–2	7.5391–3	2.8529–4
	2.6250–2	4.2190–4	2.4360+5	3.6715–1	8.9800+7	5.8042+7	1.2201+7	1.9553+7	5.2446+3	4.3711–2	3.6171–2	7.2494–3	2.9008–4
	2.6719–2	4.2695–4	2.4072+5	3.7794–1	8.8738+7	5.7434+7	1.2027+7	1.9272+7	5.2039+3	4.3220–2	3.5781–2	7.1471–3	2.9187–4
	2.7188–2	4.3197–4	2.3792+5	3.8884–1	8.7707+7	5.6844+7	1.1858+7	1.9000+7	5.1642+3	4.2744–2	3.5402–2	7.0480–3	2.9366–4
	3.0000–2	4.6149–4	2.2270+5	4.5670–1	8.2097+7	5.3613+7	1.0949+7	1.7530+7	4.9452+3	4.0176–2	3.3359–2	6.5133–3	3.0424–4
	3.5000–2	5.1220–4	2.0066+5	5.8748–1	7.3970+7	4.8840+7	9.6857+6	1.5440+7	4.6004+3	3.6356–2	3.0289–2	5.7482–3	3.1856–4
	4.0000–2	5.6049–4	1.8337+5	7.3091–1	6.7596+7	4.5050+7	8.7103+6	1.3832+7	4.3212+3	3.3406–2	2.7914–2	5.1598–3	3.3261–4
	5.0000–2	6.5121–4	1.5782+5	1.0518+0	5.8179+7	3.9345+7	7.3259+6	1.1504+7	3.8893+3	2.9020–2	2.4359–2	4.3049–3	3.5595–4
	6.0000–2	7.3595–4	1.3965+5	1.4160+0	5.1480+7	3.5198+7	6.3825+6	9.8962+6	3.5740+3	2.5950–2	2.1862–2	3.7124–3	3.7602–4
	8.0000–2	8.9176–4	1.1525+5	2.2546+0	4.2485+7	2.9539+7	5.1771+6	7.7667+6	3.1361+3	2.1864–2	1.8528–2	2.9248–3	4.1114–4
K	9.8764–2	1.0240–3	1.0037+5	3.1653+0	3.6999+7	2.6040+7	4.4781+6	6.4776+6	2.8585+3	1.9396–2	1.6511–2	2.4460–3	4.3882–4
	1.0000–1	1.0324–3	9.9550+4	3.2292+0	3.6698+7	2.5847+7	4.4399+6	6.4083+6	2.8432+3	1.9262–2	1.6401–2	2.4203–3	4.4052–4
	1.0313–1	1.0517–3	9.7721+4	3.3928+0	3.6024+7	2.5421+7	4.3547+6	6.2450+6	2.8088+3	1.8952–2	1.6148–2	2.3594–3	4.4438–4
	1.0898–1	1.0873–3	9.4524+4	3.7064+0	3.4845+7	2.4675+7	4.2059+6	5.9621+6	2.7482+3	1.8411–2	1.5706–2	2.2539–3	4.5163–4
	1.1924–1	1.1477–3	8.9551+4	4.2764+0	3.3012+7	2.3506+7	3.9745+6	5.5290+6	2.6524+3	1.7574–2	1.5018–2	2.0923–3	4.6432–4
	1.2693–1	1.1915–3	8.6254+4	4.7211+0	3.1797+7	2.2726+7	3.8212+6	5.2466+6	2.5877+3	1.7023–2	1.4562–2	1.9870–3	4.7382–4
	1.3846–1	1.2553–3	8.1873+4	5.4136+0	3.0182+7	2.1684+7	3.6177+6	4.8774+6	2.5004+3	1.6295–2	1.3958–2	1.8494–3	4.8799–4
	1.5000–1	1.3168–3	7.8046+4	6.1356+0	2.8771+7	2.0768+7	3.4402+6	4.5608+6	2.4227+3	1.5665–2	1.3431–2	1.7314–3	5.0204–4
	1.6250–1	1.3746–3	7.4765+4	6.9476+0	2.7561+7	1.9971+7	3.2918+6	4.2966+6	2.3505+3	1.5127–2	1.2980–2	1.6325–3	5.1505–4
	1.8125–1	1.4575–3	7.0515+4	8.2162+0	2.5995+7	1.8932+7	3.0996+6	3.9606+6	2.2555+3	1.4438–2	1.2396–2	1.5068–3	5.3448–4
	2.0000–1	1.5363–3	6.6897+4	9.5417+0	2.4661+7	1.8042+7	2.9361+6	3.6803+6	2.1732+3	1.3857–2	1.1901–2	1.4020–3	5.5374–4
	2.2500–1	1.6315–3	6.2995+4	1.1383+1	2.3223+7	1.7018+7	2.7811+6	3.4218+6	2.0864+3	1.3309–2	1.1427–2	1.3051–3	5.7681–4
	2.6250–1	1.7649–3	5.8233+4	1.4272+1	2.1467+7	1.5764+7	2.5907+6	3.1106+6	1.9779+3	1.2648–2	1.0848–2	1.1886–3	6.1109–4
	3.0000–1	1.8892–3	5.4403+4	1.7301+1	2.0055+7	1.4753+7	2.4364+6	2.8640+6	1.8886+3	1.2124–2	1.0383–2	1.0964–3	6.4484–4
	4.0000–1	2.1956–3	4.6809+4	2.5824+1	1.7256+7	1.2630+7	2.1932+6	2.4301+6	1.7363+3	1.1350–2	9.6833–3	9.3346–4	7.3314–4
	5.0000–1	2.4688–3	4.1630+4	3.4778+1	1.5347+7	1.1128+7	2.0538+6	2.1634+6	1.6435+3	1.0987–2	9.3321–3	8.3319–4	8.2139–4
	6.0000–1	2.7127–3	3.7887+4	4.3957+1	1.3966+7	9.9976+6	1.9647+6	2.0026+6	1.5836+3	1.0804–2	9.1192–3	7.7291–4	9.1142–4
	8.0000–1	3.1393–3	3.2738+4	6.2509+1	1.2069+7	8.4273+6	1.8619+6	1.7778+6	1.5132+3	1.0757–2	8.9728–3	6.8841–4	1.0959–3
	1.0000+0	3.4965–3	2.9394+4	8.1013+1	1.0836+7	7.3721+6	1.8055+6	1.6566+6	1.4761+3	1.0860–2	8.9308–3	6.4307–4	1.2861–3
	1.5000+0	4.1814–3	2.4579+4	1.2571+2	9.0607+6	5.7851+6	1.7484+6	1.5257+6	1.4327+3	1.1521–2	9.1449–3	5.9482–4	1.7808–3
	2.0000+0	4.6817–3	2.1952+4	1.6784+2	8.0926+6	4.8938+6	1.7279+6	1.4694+6	1.4172+3	1.2219–2	9.3463–3	5.7408–4	2.2988–3
	3.0000+0	5.3665–3	1.9151+4	2.4526+2	7.0599+6	3.9245+6	1.7081+6	1.4259+6	1.4074+3	1.3642–2	9.7036–3	5.5956–4	3.3784–3
	4.0000+0	5.8029–3	1.7711+4	3.1497+2	6.5289+6	3.3988+6	1.7068+6	1.4219+6	1.4078+3	1.5070–2	1.0006–2	5.5869–4	4.5054–3
	5.0000+0	6.1087–3	1.6824+4	3.7839+2	6.2021+6	3.0698+6	1.7066+6	1.4244+6	1.4107+3	1.6489–2	1.0270–2	5.6033–4	5.6589–3
	6.0000+0	6.3324–3	1.6230+4	4.3657+2	5.9830+6	2.8490+6	1.7065+6	1.4261+6	1.4146+3	1.7907–2	1.0499–2	5.6170–4	6.8468–3
	8.0000+0	6.6414–3	1.5475+4	5.4031+2	5.7047+6	2.5667+6	1.7074+6	1.4291+6	1.4232+3	2.0719–2	1.0862–2	5.6426–4	9.2927–3
	1.0000+1	6.8308–3	1.5046+4	6.3084+2	5.5465+6	2.4037+6	1.7099+6	1.4315+6	1.4338+3	2.3522–2	1.1144–2	5.6658–4	1.1812–2
	1.5000+1	7.0645–3	1.4548+4	8.1704+2	5.3630+6	2.2207+6	1.7143+6	1.4266+6	1.4605+3	3.0486–2	1.1588–2	5.6484–4	1.8333–2
	2.0000+1	7.1420–3	1.4390+4	9.6453+2	5.3048+6	2.1629+6	1.7175+6	1.4229+6	1.4785+3	3.7562–2	1.1944–2	5.6360–4	2.5054–2
	3.0000+1	7.1489–3	1.4376+4	1.1903+3	5.2997+6	2.1612+6	1.7195+6	1.4175+6	1.5022+3	5.1762–2	1.2333–2	5.6188–4	3.8867–2
	4.0000+1	7.1467–3	1.4381+4	1.3607+3	5.3013+6	2.1607+6	1.7213+6	1.4179+6	1.5252+3	6.6248–2	1.2634–2	5.6244–4	5.3052–2
	5.0000+1	7.1407–3	1.4393+4	1.4971+3	5.3058+6	2.1599+6	1.7223+6	1.4220+6	1.5435+3	8.0901–2	1.2855–2	5.6450–4	6.7482–2
	6.0000+1	7.1365–3	1.4401+4	1.6106+3	5.3089+6	2.1593+6	1.7228+6	1.4252+6	1.5590+3	9.5702–2	1.3017–2	5.6618–4	8.2119–2
	8.0000+1	7.1307–3	1.4413+4	1.7925+3	5.3132+6	2.1583+6	1.7236+6	1.4297+6	1.5842+3	1.2553–1	1.3282–2	5.6882–4	1.1168–1
	1.0000+2	7.1366–3	1.4401+4	1.9352+3	5.3088+6	2.1575+6	1.7241+6	1.4256+6	1.6040+3	1.5573–1	1.3491–2	5.6801–4	1.4167–1

Atomic Weight 222.000													Density 9.7300– 3 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000+2	7.1737–3	1.4327+4	2.1970+3	5.2814+6	2.1562+6	1.7244+6	1.3991+6	1.6371+3	2.3122–1	1.3736–2	5.5750–4	2.1693–1
2.0000+2	7.1844–3	1.4305+4	2.3839+3	5.2735+6	2.1552+6	1.7247+6	1.3920+6	1.6576+3	3.0740–1	1.3954–2	5.5468–4	2.9289–1
3.0000+2	7.1956–3	1.4283+4	2.6483+3	5.2653+6	2.1538+6	1.7249+6	1.3849+6	1.6851+3	4.5931–1	1.4264–2	5.5191–4	4.4449–1
4.0000+2	7.2046–3	1.4265+4	2.8364+3	5.2587+6	2.1528+6	1.7250+6	1.3792+6	1.7045+3	6.1144–1	1.4451–2	5.4969–4	5.9644–1
5.0000+2	7.2155–3	1.4244+4	2.9823+3	5.2508+6	2.1521+6	1.7250+6	1.3720+6	1.7197+3	7.6469–1	1.4588–2	5.4684–4	7.4955–1
6.0000+2	7.2196–3	1.4235+4	3.1016+3	5.2478+6	2.1514+6	1.7251+6	1.3695+6	1.7323+3	9.1629–1	1.4707–2	5.4591–4	9.0103–1
8.0000+2	7.2279–3	1.4219+4	3.2899+3	5.2417+6	2.1505+6	1.7251+6	1.3644+6	1.7523+3	1.2223+0	1.4913–2	5.4399–4	1.2068+0
1.0000+3	7.2338–3	1.4208+4	3.4360+3	5.2375+6	2.1497+6	1.7251+6	1.3609+6	1.7681+3	1.5281+0	1.5087–2	5.4266–4	1.5125+0
1.5000+3	7.2428–3	1.4190+4	3.7010+3	5.2310+6	2.1483+6	1.7251+6	1.3557+6	1.7973+3	2.2970+0	1.5251–2	5.4061–4	2.2812+0
2.0000+3	7.2502–3	1.4175+4	3.8889+3	5.2256+6	2.1473+6	1.7251+6	1.3514+6	1.8190+3	3.0617+0	1.5412–2	5.3886–4	3.0457+0
3.0000+3	7.2595–3	1.4157+4	4.1537+3	5.2190+6	2.1460+6	1.7251+6	1.3460+6	1.8504+3	4.5934+0	1.5717–2	5.3673–4	4.5771+0
4.0000+3	7.2671–3	1.4143+4	4.3416+3	5.2135+6	2.1450+6	1.7251+6	1.3415+6	1.8733+3	6.1254+0	1.5879–2	5.3493–4	6.1090+0
5.0000+3	7.2765–3	1.4124+4	4.4872+3	5.2067+6	2.1442+6	1.7251+6	1.3355+6	1.8913+3	7.6735+0	1.5982–2	5.3253–4	7.6570+0
6.0000+3	7.2790–3	1.4119+4	4.6060+3	5.2050+6	2.1436+6	1.7251+6	1.3343+6	1.9045+3	9.1967+0	1.6085–2	5.3208–4	9.1800+0
8.0000+3	7.2842–3	1.4109+4	4.7937+3	5.2013+6	2.1426+6	1.7251+6	1.3315+6	1.9254+3	1.2270+1	1.6285–2	5.3097–4	1.2253+1
1.0000+4	7.2883–3	1.4101+4	4.9390+3	5.1983+6	2.1419+6	1.7251+6	1.3293+6	1.9417+3	1.5371+1	1.6459–2	5.3011–4	1.5354+1
1.5000+4	7.2945–3	1.4089+4	5.2032+3	5.1939+6	2.1405+6	1.7251+6	1.3263+6	1.9731+3	2.2981+1	1.6604–2	5.2889–4	2.2964+1
2.0000+4	7.2995–3	1.4080+4	5.3909+3	5.1903+6	2.1395+6	1.7251+6	1.3237+6	1.9957+3	3.0691+1	1.6750–2	5.2783–4	3.0673+1
3.0000+4	7.3046–3	1.4070+4	5.6554+3	5.1867+6	2.1382+6	1.7251+6	1.3214+6	2.0274+3	4.5933+1	1.7040–2	5.2694–4	4.5915+1
4.0000+4	7.3087–3	1.4062+4	5.8431+3	5.1838+6	2.1372+6	1.7251+6	1.3194+6	2.0502+3	6.1339+1	1.7215–2	5.2615–4	6.1321+1
5.0000+4	7.3156–3	1.4049+4	5.9887+3	5.1789+6	2.1364+6	1.7251+6	1.3153+6	2.0677+3	7.6602+1	1.7335–2	5.2448–4	7.6584+1
6.0000+4	7.3163–3	1.4047+4	6.1078+3	5.1784+6	2.1358+6	1.7251+6	1.3154+6	2.0819+3	9.1853+1	1.7430–2	5.2453–4	9.1835+1
8.0000+4	7.3189–3	1.4042+4	6.2956+3	5.1766+6	2.1349+6	1.7251+6	1.3145+6	2.1047+3	1.2262+2	1.7620–2	5.2419–4	1.2260+2
1.0000+5	7.3209–3	1.4039+4	6.4411+3	5.1752+6	2.1341+6	1.7251+6	1.3138+6	2.1223+3	1.5344+2	1.7798–2	5.2390–4	1.5342+2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EEDL Evaluated Electron
Cross Sections
87-Fr
Density 5 000 Grams/cc
Total
Elastic
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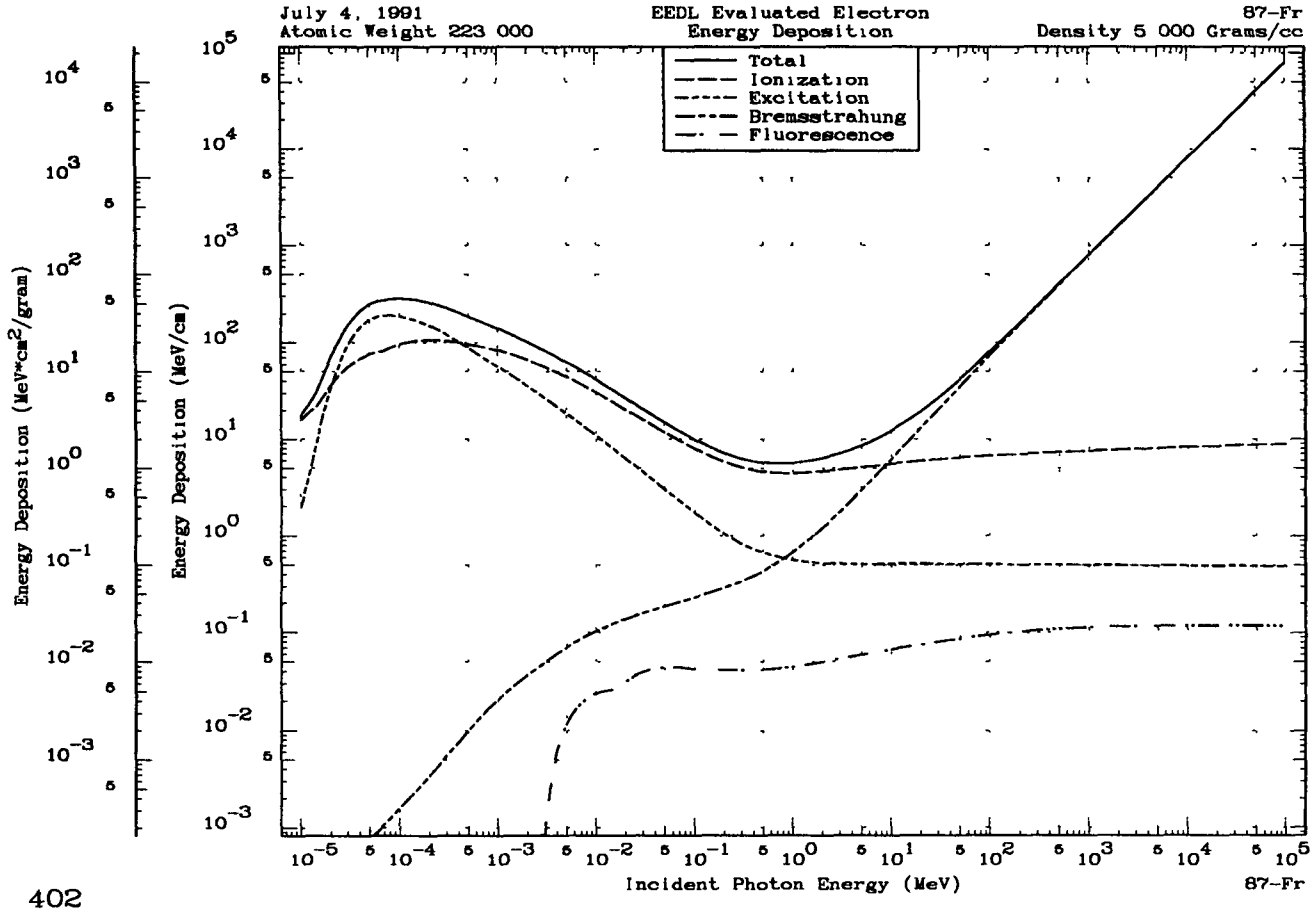
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
87-Fr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EEDL Evaluated Electron
Energy Deposition
87-Fr
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Excitation
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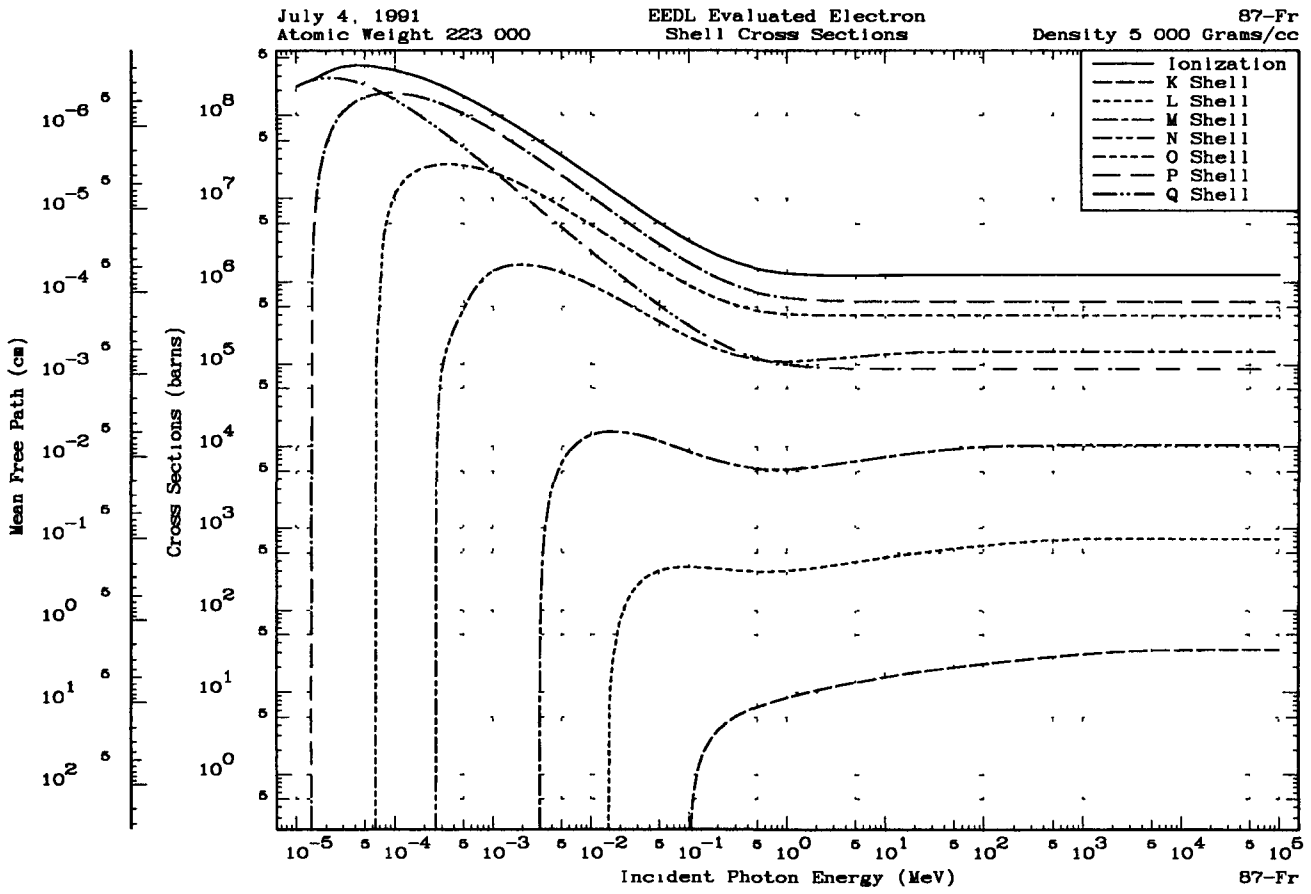
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
87-Fr

402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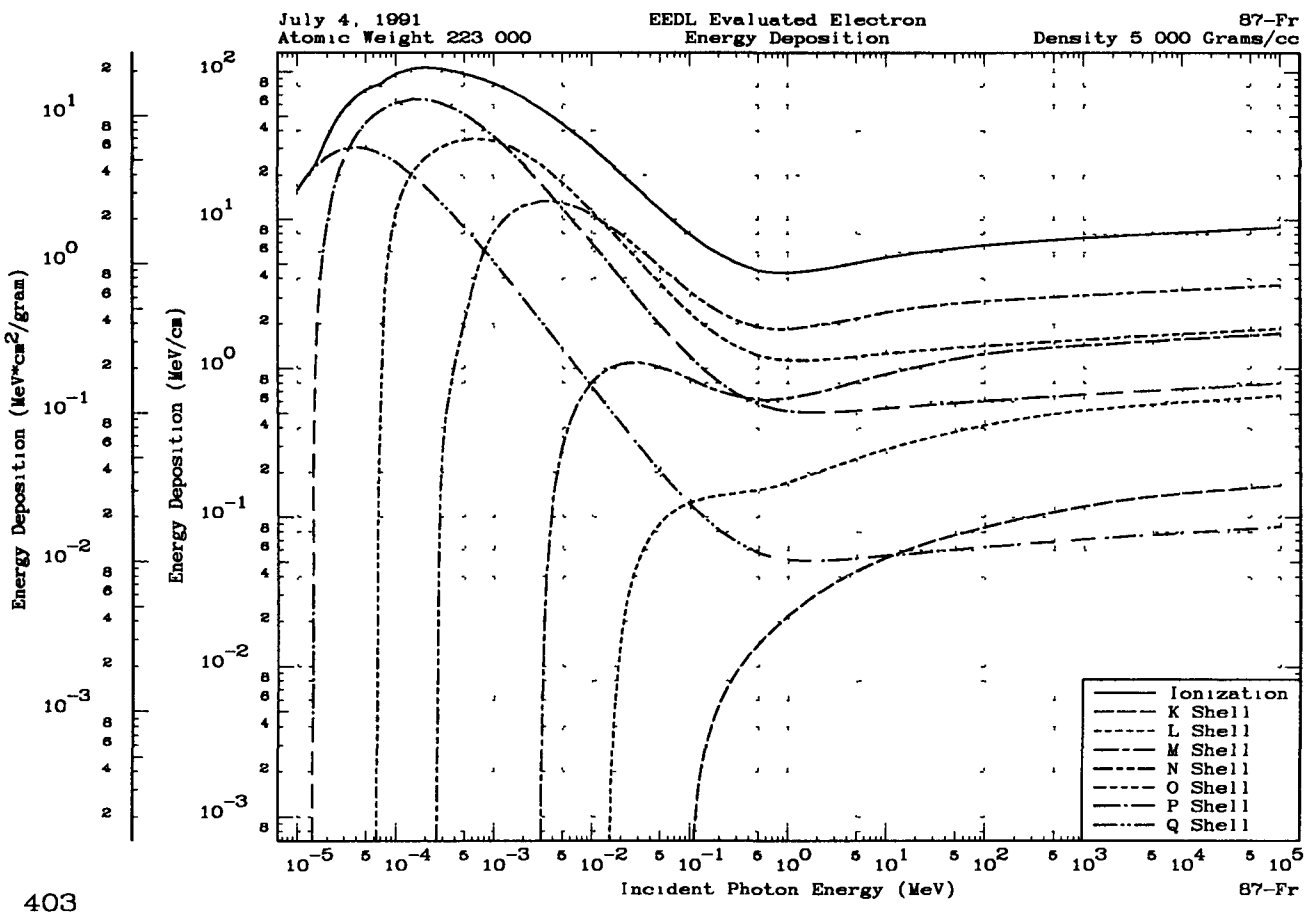
EEDL Evaluated Electron
Shell Cross Sections
87-Fr
Density 5 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
87-Fr


July 4, 1991
Atomic Weight 223 000
EEDL Evaluated Electron
Energy Deposition
87-Fr
Density 5 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
87-Fr

Atomic Weight 223.000 Density 5.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.5546–8	1.2865+7		4.7638+9	4.5139+9	2.2075+8	2.9215+7	4.9648+3	1.7612+1	1.5670+1	1.9421+0	1.4491–4
	1.2500–5	1.7080–8	1.1709+7		4.3360+9	4.0163+9	2.5213+8	6.7581+7	5.1962+3	2.4294+1	1.9555+1	4.7390+0	1.8034–4
P3	1.4140–5	1.7862–8	1.1197+7		4.1463+9	3.7653+9	2.6391+8	1.1711+8	5.3287+3	2.9984+1	2.1491+1	8.4923+0	2.0422–4
	1.4355–5	1.7947–8	1.1144+7		4.1267+9	3.7357+9	2.6627+8	1.2475+8	5.3451+3	3.0992+1	2.1915+1	9.0768+0	2.0739–4
	1.4516–5	1.8008–8	1.1106+7		4.1126+9	3.7139+9	2.6801+8	1.3073+8	5.3573+3	3.1766+1	2.2230+1	9.5355+0	2.0977–4
	1.4637–5	1.8052–8	1.1079+7		4.1025+9	3.6978+9	2.6936+8	1.3536+8	5.3664+3	3.2367+1	2.2476+1	9.8911+0	2.1156–4
	1.4819–5	1.8116–8	1.1040+7		4.0881+9	3.6740+9	2.7153+8	1.4252+8	5.3799+3	3.3321+1	2.2877+1	1.0444+1	2.1425–4
	1.5000–5	1.8177–8	1.1003+7		4.0745+9	3.6507+9	2.7380+8	1.4998+8	5.3933+3	3.4322+1	2.3301+1	1.1021+1	2.1694–4
	1.5313–5	1.8278–8	1.0942+7		4.0518+9	3.6115+9	2.7685+8	1.6348+8	5.4161+3	3.6014+1	2.3955+1	1.2059+1	2.2159–4
	1.5605–5	1.8365–8	1.0890+7		4.0327+9	3.5758+9	2.7986+8	1.7695+8	5.4370+3	3.7705+1	2.4606+1	1.3099+1	2.2597–4
	1.5898–5	1.8444–8	1.0843+7		4.0153+9	3.5412+9	2.8283+8	1.9123+8	5.4577+3	3.9463+1	2.5256+1	1.4207+1	2.3035–4
	1.6155–5	1.8512–8	1.0804+7		4.0006+9	3.5117+9	2.8581+8	2.0307+8	5.4756+3	4.1038+1	2.5905+1	1.5133+1	2.3421–4
	1.7116–5	1.8722–8	1.0683+7		3.9559+9	3.4070+9	2.9665+8	2.5219+8	5.5406+3	4.7328+1	2.8317+1	1.9011+1	2.4874–4
	1.7500–5	1.8786–8	1.0646+7		3.9423+9	3.3677+9	3.0057+8	2.7405+8	5.5657+3	4.9970+1	2.9216+1	2.0754+1	2.5459–4
	1.8558–5	1.8928–8	1.0566+7		3.9127+9	3.2658+9	3.1295+8	3.3392+8	5.6328+3	5.7670+1	3.2065+1	2.5604+1	2.7081–4
P2	1.9280–5	1.8983–8	1.0536+7		3.9013+9	3.2012+9	3.2043+8	3.7969+8	5.6769+3	6.3218+1	3.3858+1	2.9360+1	2.8197–4
	1.9640–5	1.8998–8	1.0528+7		3.8984+9	3.1703+9	3.2427+8	4.0378+8	5.6984+3	6.6157+1	3.4834+1	3.1324+1	2.8757–4
	2.0000–5	1.9002–8	1.0525+7		3.8975+9	3.1403+9	3.2825+8	4.2891+8	5.7195+3	6.9231+1	3.5849+1	3.3381+1	2.9318–4
	2.0918–5	1.9032–8	1.0508+7		3.8913+9	3.0674+9	3.3462+8	4.8921+8	5.7665+3	7.6051+1	3.7798+1	3.8253+1	3.0642–4
	2.1619–5	1.9019–8	1.0516+7		3.8939+9	3.0150+9	3.4015+8	5.3881+8	5.8013+3	8.1744+1	3.9462+1	4.2281+1	3.1658–4
	2.2143–5	1.8990–8	1.0532+7		3.9000+9	2.9774+9	3.4460+8	5.7798+8	5.8267+3	8.6268+1	4.0792+1	4.5476+1	3.2421–4
	2.2500–5	1.8960–8	1.0548+7		3.9061+9	2.9526+9	3.4772+8	6.0577+8	5.8437+3	8.9470+1	4.1722+1	4.7748+1	3.2943–4
	2.3125–5	1.8947–8	1.0556+7		3.9089+9	2.9106+9	3.5206+8	6.4626+8	5.8730+3	9.4220+1	4.3119+1	5.1101+1	3.3858–4
	2.4375–5	1.8872–8	1.0598+7		3.9243+9	2.8314+9	3.6097+8	7.3189+8	5.9296+3	1.0422+2	4.5987+1	5.8236+1	3.5701–4
	2.4844–5	1.8831–8	1.0621+7		3.9328+9	2.8033+9	3.6393+8	7.6556+8	5.9502+3	1.0806+2	4.6999+1	6.1058+1	3.6396–4
	2.5000–5	1.8816–8	1.0629+7		3.9360+9	2.7941+9	3.6484+8	7.7701+8	5.9570+3	1.0934+2	4.7317+1	6.2019+1	3.6628–4
	2.7188–5	1.8528–8	1.0795+7		3.9973+9	2.6741+9	3.7579+8	9.4734+8	6.0488+3	1.2803+2	5.1587+1	7.6439+1	3.9899–4
	2.7422–5	1.8503–8	1.0809+7		4.0026+9	2.6621+9	3.7678+8	9.6367+8	6.0583+3	1.2985+2	5.2008+1	7.7847+1	4.0252–4
	3.0000–5	1.8155–8	1.1016+7		4.0793+9	2.5398+9	3.8694+8	1.1525+9	6.1584+3	1.5072+2	5.6433+1	9.4286+1	4.4165–4
P1	3.2640–5	1.7864–8	1.1196+7		4.1458+9	2.4301+9	3.9130+8	1.3244+9	6.2526+3	1.6883+2	5.9728+1	1.0910+2	4.8196–4
	3.3100–5	1.7825–8	1.1220+7		4.1547+9	2.4123+9	3.9191+8	1.3505+9	6.2684+3	1.7165+2	6.0268+1	1.1138+2	4.8904–4
	3.3963–5	1.7748–8	1.1269+7		4.1729+9	2.3800+9	3.9309+8	1.3997+9	6.2976+3	1.7699+2	6.1289+1	1.1570+2	5.0235–4
	3.5472–5	1.7596–8	1.1366+7		4.2088+9	2.3264+9	3.9531+8	1.4871+9	6.3471+3	1.8650+2	6.3105+1	1.2340+2	5.2578–4
	3.6250–5	1.7511–8	1.1421+7		4.2293+9	2.3001+9	3.9651+8	1.5327+9	6.3720+3	1.9149+2	6.4051+1	1.2744+2	5.3791–4
	3.6604–5	1.7488–8	1.1437+7		4.2350+9	2.2884+9	3.9699+8	1.5496+9	6.3831+3	1.9342+2	6.4461+1	1.2896+2	5.4345–4
	4.0000–5	1.7228–8	1.1609+7		4.2989+9	2.1845+9	4.0181+8	1.7126+9	6.4860+3	2.1218+2	6.8422+1	1.4376+2	5.9698–4
	4.5000–5	1.7053–8	1.1728+7		4.3429+9	2.0537+9	4.0052+8	1.8886+9	6.6162+3	2.3190+2	7.2054+1	1.5984+2	6.7395–4
	5.0000–5	1.7011–8	1.1757+7		4.3535+9	1.9434+9	3.9967+8	2.0105+9	6.7350+3	2.4710+2	7.5551+1	1.7155+2	7.5220–4
	6.0000–5	1.7247–8	1.1596+7		4.2941+9	1.7663+9	3.9059+8	2.1372+9	6.9386+3	2.6535+2	7.9896+1	1.8546+2	9.0921–4
O5	6.3520–5	1.7432–8	1.1473+7		4.2485+9	1.7143+9	3.8545+8	2.1487+9	7.0035+3	2.6767+2	8.0626+1	1.8704+2	9.6542–4
	6.4550–5	1.7484–8	1.1439+7		4.2359+9	1.6999+9	3.8413+8	2.1518+9	7.0220+3	2.6840+2	8.0917+1	1.8748+2	9.8196–4
	6.5516–5	1.7532–8	1.1408+7		4.2244+9	1.6868+9	3.8293+8	2.1547+9	7.0390+3	2.6909+2	8.1195+1	1.8789+2	9.9750–4
	6.6421–5	1.7576–8	1.1379+7		4.2138+9	1.6747+9	3.8184+8	2.1573+9	7.0548+3	2.6974+2	8.1462+1	1.8827+2	1.0121–3
	6.7270–5	1.7616–8	1.1353+7		4.2042+9	1.6636+9	3.8085+8	2.1597+9	7.0695+3	2.7035+2	8.1721+1	1.8863+2	1.0258–3
	6.8065–5	1.7653–8	1.1329+7		4.1953+9	1.6533+9	3.7995+8	2.1620+9	7.0830+3	2.7093+2	8.1970+1	1.8896+2	1.0387–3
O4	6.8730–5	1.7684–8	1.1310+7		4.1881+9	1.6450+9	3.7923+8	2.1639+9	7.0943+3	2.7143+2	8.2192+1	1.8924+2	1.0495–3
	7.0139–5	1.7760–8	1.1261+7		4.1700+9	1.6276+9	3.7773+8	2.1647+9	7.1179+3	2.7227+2	8.2704+1	1.8957+2	1.0724–3
	7.0166–5	1.7762–8	1.1260+7		4.1697+9	1.6272+9	3.7771+8	2.1648+9	7.1183+3	2.7229+2	8.2714+1	1.8957+2	1.0728–3
	7.1357–5	1.7824–8	1.1221+7		4.1550+9	1.6129+9	3.7655+8	2.1655+9	7.1379+3	2.7306+2	8.3210+1	1.8985+2	1.0922–3
	7.1371–5	1.7825–8	1.1220+7		4.1548+9	1.6128+9	3.7654+8	2.1655+9	7.1381+3	2.7307+2	8.3217+1	1.8985+2	1.0924–3
	7.1897–5	1.7852–8	1.1203+7		4.1485+9	1.6066+9	3.7608+8	2.1658+9	7.1467+3	2.7345+2	8.3470+1	1.8997+2	1.1010–3
	7.2450–5	1.7881–8	1.1185+7		4.1419+9	1.6001+9	3.7563+8	2.1661+9	7.1557+3	2.7386+2	8.3761+1	1.9010+2	1.1100–3
	7.4338–5	1.7974–8	1.1127+7		4.1203+9	1.5787+9	3.7438+8	2.1672+9	7.1858+3	2.7550+2	8.4960+1	1.9054+2	1.1410–3
	7.4659–5	1.7990–8	1.1117+7		4.1168+9	1.5751+9	3.7422+8	2.1674+9	7.1909+3	2.7582+2	8.5203+1	1.9061+2	1.1462–3
	7.5753–5	1.8042–8	1.1085+7		4.1048+9	1.5632+9	3.7356+8	2.1681+9	7.2080+3	2.7679+2	8.5922+1	1.9086+2	1.1642–3
	7.5994–5	1.8054–8	1.1078+7		4.1022+9	1.5606+9	3.7343+8	2.1682+9	7.2117+3	2.7701+2	8.6091+1	1.9092+2	1.1682–3
	7.7877–5	1.8142–8	1.1024+7		4.0823+9	1.5407+9	3.7231+8	2.1693+9	7.2406+3	2.7862+2	8.7274+1	1.9135+2	1.1993–3
	7.7997–5	1.8147–8	1.1021+7		4.0810+9	1.5395+9	3.7225+8	2.1693+9	7.2424+3	2.7873+2	8.7354+1	1.9137+2	1.2013–3
	8.0000–5	1.8239–8	1.0966+7		4.0606+9	1.5191+9	3.7109+8	2.1704+9	7.2725+3	2.8040+2	8.8569+1	1.9183+2	1.2344–3
	8.2500–5	1.8417–8	1.0860+7		4.0213+9	1.4948+9	3.6834+8	2.1581+9	7.3079+3	2.8076+2	8.9517+1	1.9124+2	1.2758–3
	8.5000–5	1.8590–8	1.0758+7		3.9838+9	1.4716+9	3.6586+8	2.1463+9	7.3424+3	2.8126+2	9.0579+1	1.9068+2	1.3174–3
	8.6875–5	1.8718–8	1.0685+7		3.9566+9	1.4549+9	3.6399+8	2.1377+9	7.3677+3	2.8157+2	9.1285+1	1.9028+2	1.3487–3
	9.2500–5	1.9088–8	1.0478+7		3.8800+9	1.4079+9	3.5906+8	2.1131+9	7.4410+3	2.8281+2	9.3627+1	1.8918+2	1.4432–3
	9.3438–5	1.9147–8	1.0445+7		3.8679+9	1.4004+9	3.5827+8	2.1092+9	7.4528+3	2.8302+2	9.4003+1	1.8901+2	1.4590–3
	1.0000–4	1.9553–8	1.0229+7	0.0000+0	3.7877+9	1.3515+9	3.5323+8	2.0830+9	7.5330+3	2.8459+2	9.6670+1	1.8791+2	1.5704–3
	1.1250–4	2.0493–8	9.7593+6	4.4169–8	3.6139+9	1.2704+9	3.4033+8	2.0031+9	7.6695+3	2.8143+2	9.9394+1	1.8203+2	1.7847–3
	1.2188–4	2.1156–8	9.4535+6	7.7604–8	3.5006+9	1.2181+9	3.3186+8	1.9506+9	7.7637+3	2.7936+2	1.0113+2	1.7823+2	1.9476–3
	1.2500–4	2.1370–8	9.3590+6	8.8802–8	3.4656+9	1.2020+9	3.2928+8	1.9343+9	7.7937+3	2.7877+2	1.0171+2	1.7705+2	2.0023–3
	1.3125–4	2.1787–8	9.1800+6	1.1126–7	3.3993+9	1.1716+9	3.2444+8	1.9033+9	7.8519+3	2.7774+2	1.0290+2	1.7484+2	2.1124–3
	1.3594–4	2.2092–8	9.0532+6	1.2817–7	3.3524+9	1.1502+9	3.2093+8	1.8812+9	7.8940+3	2.7693+2	1.0365+2	1.7328+2	2.1954–3
O3	1.4391–4	2.2595–8	8.8514+6	1.5702–7	3.2777+9	1.1163+9	3.1535+8	1.8460+9	7.9629+3	2.7570+2	1.0489+2	1.7081+2	2.3376–3
	1.4543–4	2.2709–8	8.8069+6	1.6254–7	3.2612+9	1.1102+9	3.1430+8	1.8367+9	7.9757+3	2.7525+2	1.0512+2	1.7012+2	2.3649–3
	1.5000–4	2.3047–8	8.6777+6	1.7918–7	3.2134+9	1.0923+9	3.1127+8	1.8098+9	8.0134+3	2.7399+2	1.0585+2	1.6813+2	2.4470–3
	1.5625–4	2.3492–8	8.5137+6	2.0209–7	3.1526+9	1.0691+9	3.0601+8	1.7775+9	8.0634+3	2.7149+2	1.0597+2	1.6552+2	2.5599–3
	1.6719–4	2.4245–8	8.2491+6	2.4267–7	3.0546+9	1.0318+9	2.9762+8	1.7252+9	8.1470+3	2.6763+2	1.0631+2	1.6132+2	2.7592–3
O2	1.8100–4	2.5158–8	7.9498+6	2.9468–7	2.9438+9	9.8965+8	2.8832+8	1.6658+9	8.2462+3	2.6351+2	1.0693+2	1.5658+2	3.0135–3
	1.8338–4	2.5315–8	7.9005+6	3.0371–7	2.9255+9	9.8290+8	2.8676+8	1.6559+9	8.2615+3	2.6280+2	1.0700+2	1.5580+2	3.0593–3
	1.8359–4	2.5329–8	7.8960+6	3.0454–7	2.9239+9	9.8228+8	2.8662+8	1.6550+9	8.2629+3	2.6273+2	1.0700+2	1.5573+2	3.0635–3
	1.8753–4	2.5587–8	7.8164+6	3.1956–7	2.8944+9	9.7140+8	2.8412+8	1.6389+9	8.2880+3	2.6158+2	1.0711+2	1.5447+2	3.1397–3
	1.9377–4	2.5989–8	7.6955+6	3.4347–7	2.8496+9	9.5485+8	2.8035+8	1.6144+9	8.3268+3	2.5988+2	1.0731+2	1.5257+2	3.2609–3

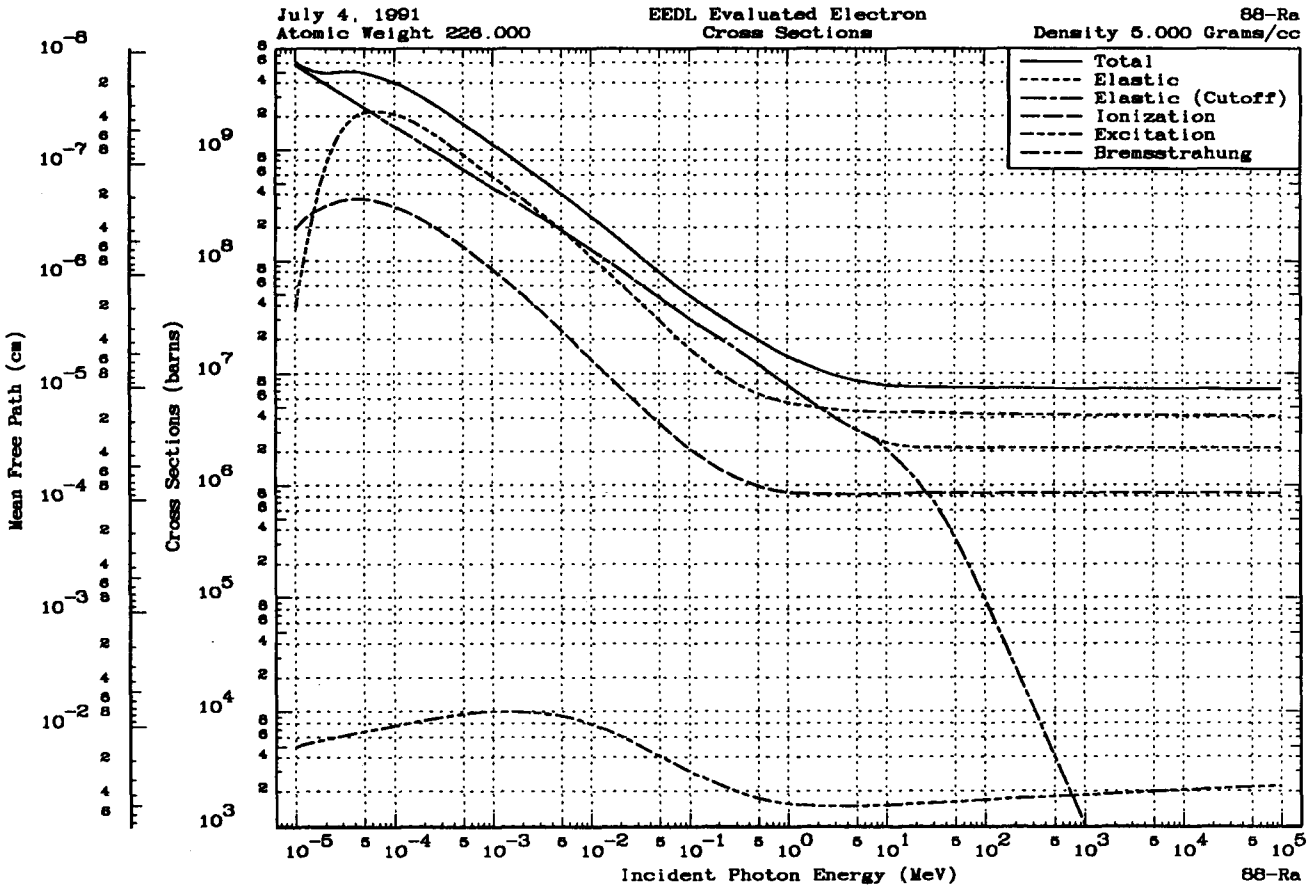
Atomic Weight 223.000 Density 5.000 Grams/cc

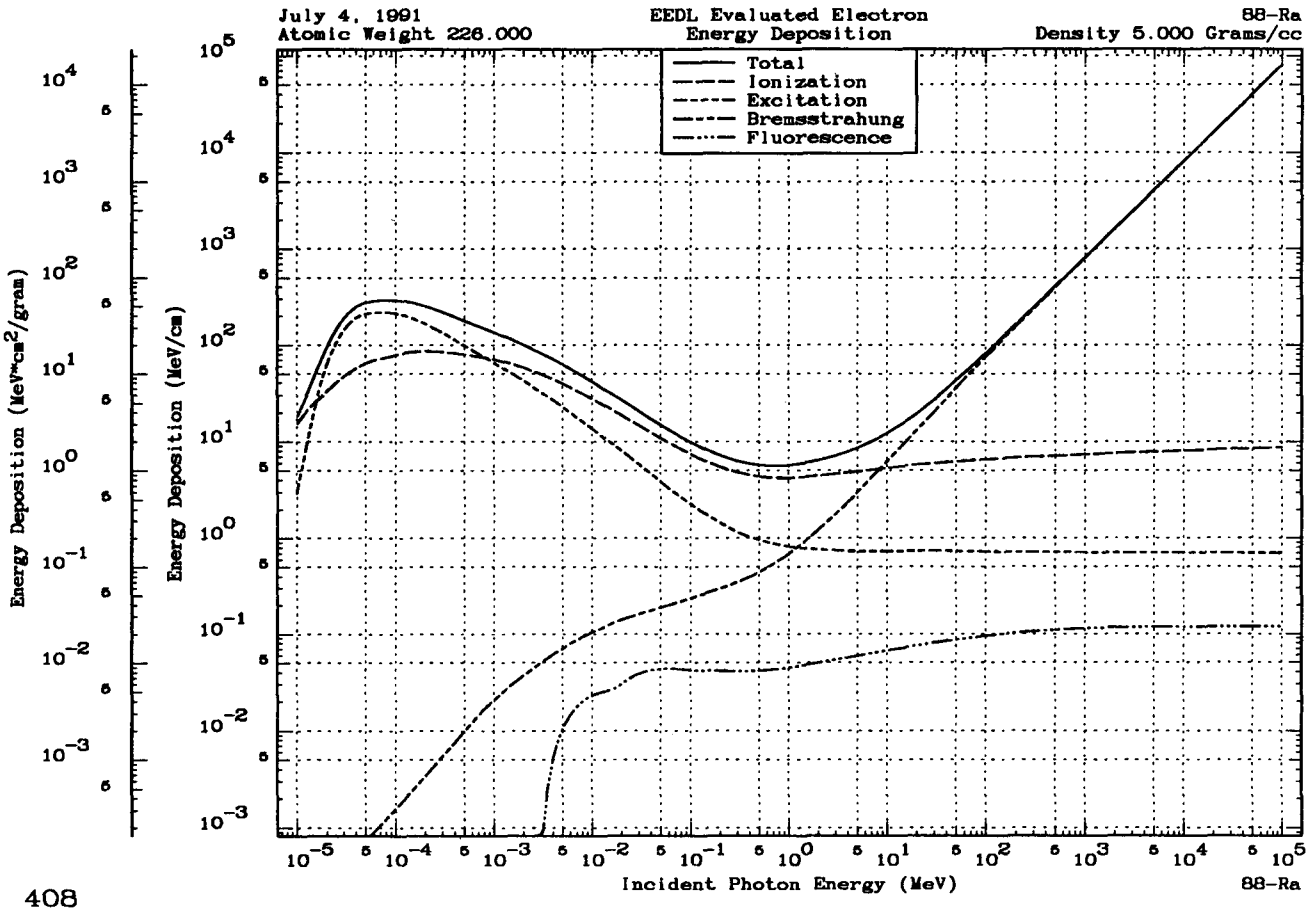
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.0000–4	2.6384–8	7.5802+6	3.6753–7	2.8070+9	9.3910+8	2.7678+8	1.5911+9	8.3645+3	2.5830+2	1.0754+2	1.5076+2	3.3826–3
	2.1250–4	2.7249–8	7.3399+6	4.1638–7	2.7179+9	9.0968+8	2.6893+8	1.5393+9	8.4359+3	2.5349+2	1.0711+2	1.4638+2	3.6307–3
	2.2344–4	2.7984–8	7.1468+6	4.5986–7	2.6465+9	8.8601+8	2.6268+8	1.4978+9	8.4955+3	2.4971+2	1.0684+2	1.4287+2	3.8496–3
O1	2.3234–4	2.8570–8	7.0003+6	4.9571–7	2.5922+9	8.6802+8	2.5796+8	1.4662+9	8.5421+3	2.4691+2	1.0670+2	1.4021+2	4.0288–3
	2.3657–4	2.8861–8	6.9299+6	5.1289–7	2.5661+9	8.5983+8	2.5572+8	1.4506+9	8.5638+3	2.4545+2	1.0657+2	1.3888+2	4.1143–3
	2.4258–4	2.9269–8	6.8332+6	5.3747–7	2.5303+9	8.4858+8	2.5265+8	1.4291+9	8.5939+3	2.4346+2	1.0641+2	1.3705+2	4.2362–3
	2.4450–4	2.9398–8	6.8032+6	5.4536–7	2.5192+9	8.4507+8	2.5170+8	1.4224+9	8.6034+3	2.4284+2	1.0636+2	1.3648+2	4.2752–3
	2.5000–4	2.9767–8	6.7189+6	5.6810–7	2.4880+9	8.3525+8	2.4903+8	1.4037+9	8.6303+3	2.4113+2	1.0624+2	1.3489+2	4.3873–3
	2.5837–4	3.0320–8	6.5963+6	6.0300–7	2.4426+9	8.2093+8	2.4516+8	1.3765+9	8.6703+3	2.3866+2	1.0608+2	1.3258+2	4.5586–3
N7	2.6207–4	3.0562–8	6.5441+6	6.1853–7	2.4233+9	8.1482+8	2.4351+8	1.3649+9	8.6875+3	2.3762+2	1.0602+2	1.3160+2	4.6344–3
	2.6444–4	3.0716–8	6.5113+6	6.2852–7	2.4111+9	8.1098+8	2.4240+8	1.3578+9	8.6985+3	2.3690+2	1.0592+2	1.3097+2	4.6832–3
	2.6889–4	3.1003–8	6.4510+6	6.4734–7	2.3888+9	8.0391+8	2.4037+8	1.3445+9	8.7189+3	2.3559+2	1.0576+2	1.2983+2	4.7747–3
N6	2.6995–4	3.1071–8	6.4369+6	6.5185–7	2.3836+9	8.0224+8	2.3988+8	1.3414+9	8.7237+3	2.3528+2	1.0572+2	1.2956+2	4.7967–3
	2.7371–4	3.1313–8	6.3870+6	6.6785–7	2.3651+9	7.9644+8	2.3822+8	1.3304+9	8.7406+3	2.3422+2	1.0560+2	1.2861+2	4.8742–3
	2.7666–4	3.1503–8	6.3485+6	6.8051–7	2.3509+9	7.9196+8	2.3694+8	1.3220+9	8.7538+3	2.3341+2	1.0552+2	1.2789+2	4.9354–3
	2.7919–4	3.1664–8	6.3162+6	6.9133–7	2.3389+9	7.8819+8	2.3586+8	1.3148+9	8.7649+3	2.3273+2	1.0545+2	1.2727+2	4.9877–3
	2.8028–4	3.1734–8	6.3024+6	6.9603–7	2.3338+9	7.8658+8	2.3540+8	1.3118+9	8.7697+3	2.3244+2	1.0542+2	1.2701+2	5.0103–3
	2.8833–4	3.2243–8	6.2029+6	7.3083–7	2.2969+9	7.7496+8	2.3210+8	1.2898+9	8.8046+3	2.3037+2	1.0523+2	1.2513+2	5.1777–3
	2.9014–4	3.2357–8	6.1811+6	7.3868–7	2.2889+9	7.7242+8	2.3138+8	1.2851+9	8.8123+3	2.2992+2	1.0519+2	1.2472+2	5.2154–3
	3.0000–4	3.2970–8	6.0662+6	7.8179–7	2.2463+9	7.5898+8	2.2758+8	1.2598+9	8.8537+3	2.2757+2	1.0501+2	1.2255+2	5.4214–3
	3.2500–4	3.4600–8	5.7804+6	8.9340–7	2.1405+9	7.2765+8	2.1771+8	1.1951+9	8.9516+3	2.2043+2	1.0364+2	1.1679+2	5.9511–3
	3.5000–4	3.6179–8	5.5281+6	1.0084–6	2.0471+9	6.9980+8	2.0905+8	1.1382+9	9.0432+3	2.1427+2	1.0253+2	1.1173+2	6.4865–3
	3.6250–4	3.6950–8	5.4127+6	1.0672–6	2.0043+9	6.8699+8	2.0510+8	1.1122+9	9.0869+3	2.1150+2	1.0208+2	1.0942+2	6.7563–3
	4.0000–4	3.9201–8	5.1019+6	1.2476–6	1.8893+9	6.5228+8	1.9452+8	1.0424+9	9.2107+3	2.0428+2	1.0103+2	1.0324+2	7.5733–3
	5.0000–4	4.5192–8	4.4255+6	1.7603–6	1.6388+9	5.7992+8	1.7054+8	8.8831+8	9.4632+3	1.8605+2	9.6858+1	8.9186+1	9.8614–3
N5	5.6595–4	4.8890–8	4.0908+6	2.1239–6	1.5148+9	5.4327+8	1.5811+8	8.1345+8	9.6025+3	1.7682+2	9.4580+1	8.2226+1	1.1403–2
	5.7446–4	4.9359–8	4.0519+6	2.1721–6	1.5004+9	5.3901+8	1.5669+8	8.0472+8	9.6175+3	1.7580+2	9.4369+1	8.1424+1	1.1604–2
	5.8723–4	5.0058–8	3.9954+6	2.2451–6	1.4795+9	5.3280+8	1.5463+8	7.9204+8	9.6397+3	1.7435+2	9.4081+1	8.0258+1	1.1905–2
N4	5.9760–4	5.0621–8	3.9509+6	2.3047–6	1.4630+9	5.2791+8	1.5301+8	7.8209+8	9.6574+3	1.7323+2	9.3871+1	7.9344+1	1.2150–2
	6.0000–4	5.0752–8	3.9407+6	2.3186–6	1.4593+9	5.2680+8	1.5264+8	7.7982+8	9.6614+3	1.7298+2	9.3827+1	7.9136+1	1.2207–2
	6.1250–4	5.1426–8	3.8891+6	2.3912–6	1.4401+9	5.2111+8	1.5061+8	7.6841+8	9.6787+3	1.7140+2	9.3327+1	7.8061+1	1.2493–2
	6.2500–4	5.2094–8	3.8392+6	2.4645–6	1.4217+9	5.1559+8	1.4865+8	7.5740+8	9.6957+3	1.6989+2	9.2857+1	7.7025+1	1.2780–2
	6.3594–4	5.2676–8	3.7968+6	2.5291–6	1.4060+9	5.1090+8	1.4699+8	7.4807+8	9.7103+3	1.6863+2	9.2469+1	7.6147+1	1.3031–2
	6.6875–4	5.4396–8	3.6767+6	2.7257–6	1.3615+9	4.9753+8	1.4229+8	7.2166+8	9.7529+3	1.6510+2	9.1426+1	7.3663+1	1.3788–2
	6.7695–4	5.4821–8	3.6482+6	2.7755–6	1.3509+9	4.9434+8	1.4118+8	7.1541+8	9.7632+3	1.6428+2	9.1192+1	7.3075+1	1.3978–2
	7.0000–4	5.6005–8	3.5711+6	2.9168–6	1.3224+9	4.8570+8	1.3818+8	6.9850+8	9.7916+3	1.6208+2	9.0578+1	7.1487+1	1.4511–2
	8.0000–4	6.0977–8	3.2799+6	3.5497–6	1.2146+9	4.5270+8	1.2690+8	6.3494+8	9.9058+3	1.5396+2	8.8411+1	6.5531+1	1.6846–2
N3	8.2280–4	6.2073–8	3.2220+6	3.6988–6	1.1931+9	4.4604+8	1.2451+8	6.2256+8	9.9145+3	1.5207+2	8.7717+1	6.4334+1	1.7305–2
	8.3387–4	6.2606–8	3.1946+6	3.7718–6	1.1830+9	4.4291+8	1.2339+8	6.1664+8	9.9186+3	1.5118+2	8.7399+1	6.3768+1	1.7528–2
	8.5464–4	6.3600–8	3.1447+6	3.9099–6	1.1645+9	4.3721+8	1.2136+8	6.0589+8	9.9263+3	1.4959+2	8.6833+1	6.2741+1	1.7946–2
	8.9098–4	6.5316–8	3.0620+6	4.1549–6	1.1339+9	4.2772+8	1.1801+8	5.8813+8	9.9392+3	1.4700+2	8.5935+1	6.1045+1	1.8680–2
	9.0000–4	6.5738–8	3.0424+6	4.2164–6	1.1266+9	4.2545+8	1.1721+8	5.8391+8	9.9423+3	1.4639+2	8.5729+1	6.0643+1	1.8862–2
	9.4549–4	6.7842–8	2.9480+6	4.5303–6	1.0917+9	4.1454+8	1.1339+8	5.6370+8	9.9576+3	1.4345+2	8.4719+1	5.8715+1	1.9781–2
N2	9.9269–4	6.9986–8	2.8577+6	4.8625–6	1.0582+9	4.0404+8	1.0976+8	5.4441+8	9.9727+3	1.4072+2	8.3820+1	5.6878+1	2.0736–2
	1.0000–3	7.0317–8	2.8443+6	4.9145–6	1.0532+9	4.0248+8	1.0922+8	5.4152+8	9.9750+3	1.4032+2	8.3690+1	5.6605+1	2.0884–2
	1.0313–3	7.1707–8	2.7891+6	5.1388–6	1.0328+9	3.9603+8	1.0689+8	5.2987+8	9.9691+3	1.3836+2	8.2871+1	5.5470+1	2.1402–2
	1.0605–3	7.2997–8	2.7399+6	5.3519–6	1.0146+9	3.9025+8	1.0482+8	5.1949+8	9.9638+3	1.3664+2	8.2158+1	5.4458+1	2.1887–2
	1.1155–3	7.5377–8	2.6533+6	5.7584–6	9.8253+8	3.8004+8	1.0119+8	5.0129+8	9.9542+3	1.3366+2	8.0949+1	5.2686+1	2.2797–2
N1	1.1303–3	7.6011–8	2.6312+6	5.8696–6	9.7433+8	3.7742+8	1.0026+8	4.9664+8	9.9517+3	1.3291+2	8.0649+1	5.2233+1	2.3042–2
	1.1534–3	7.7004–8	2.5973+6	6.0443–6	9.6177+8	3.7343+8	9.8827+7	4.8950+8	9.9478+3	1.3167+2	8.0108+1	5.1537+1	2.3424–2
	1.1967–3	7.8845–8	2.5366+6	6.3760–6	9.3932+8	3.6627+8	9.6271+7	4.7677+8	9.9408+3	1.2948+2	7.9161+1	5.0294+1	2.4141–2
	1.2116–3	7.9471–8	2.5166+6	6.4913–6	9.3191+8	3.6390+8	9.5430+7	4.7257+8	9.9385+3	1.2876+2	7.8855+1	4.9886+1	2.4387–2
	1.2188–3	7.9770–8	2.5072+6	6.5468–6	9.2842+8	3.6278+8	9.5033+7	4.7059+8	9.9374+3	1.2843+2	7.8711+1	4.9692+1	2.4505–2
	1.2346–3	8.0435–8	2.4865+6	6.6709–6	9.2075+8	3.6032+8	9.4165+7	4.6625+8	9.9349+3	1.2769+2	7.8397+1	4.9270+1	2.4768–2
	1.2500–3	8.1074–8	2.4669+6	6.7915–6	9.1349+8	3.5799+8	9.3344+7	4.6215+8	9.9326+3	1.2700+2	7.8102+1	4.8870+1	2.5021–2
	1.3010–3	8.3173–8	2.4046+6	7.1965–6	8.9043+8	3.5056+8	9.0736+7	4.4912+8	9.9250+3	1.2478+2	7.7151+1	4.7602+1	2.5863–2
	1.3125–3	8.3644–8	2.3911+6	7.2890–6	8.8542+8	3.4894+8	9.0171+7	4.4630+8	9.9233+3	1.2430+2	7.6949+1	4.7328+1	2.6054–2
	1.3558–3	8.5398–8	2.3420+6	7.6398–6	8.6724+8	3.4305+8	8.8121+7	4.3606+8	9.9172+3	1.2255+2	7.6190+1	4.6332+1	2.6768–2
	1.4005–3	8.7186–8	2.2940+6	8.0070–6	8.4945+8	3.3726+8	8.6123+7	4.2607+8	9.9110+3	1.2086+2	7.5467+1	4.5361+1	2.7506–2
	1.5000–3	9.1090–8	2.1956+6	8.8422–6	8.1304+8	3.2532+8	8.2054+7	4.0566+8	9.8980+3	1.1746+2	7.4049+1	4.3381+1	2.9146–2
	1.7500–3	1.0064–7	1.9872+6	1.1051–5	7.3587+8	3.0004+8	7.3222+7	3.6260+8	9.8487+3	1.0898+2	6.9853+1	3.9093+1	3.2927–2
	2.0000–3	1.0970–7	1.8232+6	1.3416–5	6.7513+8	2.7973+8	6.6382+7	3.2901+8	9.8061+3	1.0254+2	6.6743+1	3.5759+1	3.6694–2
	2.2500–3	1.1853–7	1.6873+6	1.5932–5	6.2480+8	2.6319+8	6.0661+7	3.0094+8	9.7374+3	9.6255+1	6.3320+1	3.2895+1	3.9985–2
	2.5000–3	1.2702–7	1.5746+6	1.8600–5	5.8308+8	2.4922+8	5.5979+7	2.7787+8	9.6764+3	9.1163+1	6.0574+1	3.0546+1	4.3259–2
	2.6250–3	1.3114–7	1.5251+6	1.9989–5	5.6475+8	2.4301+8	5.3937+7	2.6779+8	9.6482+3	8.8942+1	5.9376+1	2.9521+1	4.4891–2
M5	2.9992–3	1.4307–7	1.3980+6	2.4334–5	5.1766+8	2.2682+8	4.8747+7	2.4209+8	9.5717+3	8.3353+1	5.6390+1	2.6913+1	4.9754–2
	3.0000–3	1.4309–7	1.3977+6	2.4343–5	5.1757+8	2.2678+8	4.8737+7	2.4204+8	9.5715+3	8.3342+1	5.6384+1	2.6908+1	4.9764–2
	3.0156–3	1.4358–7	1.3930+6	2.4531–5	5.1582+8	2.2617+8	4.8540+7	2.4110+8	9.5674+3	8.3104+1	5.6244+1	2.6810+1	4.9948–2
	3.0771–3	1.4548–7	1.3748+6	2.5276–5	5.0908+8	2.2382+8	4.7779+7	2.3747+8	9.5512+3	8.2188+1	5.5705+1	2.6432+1	5.0672–2
M4	3.1389–3	1.4737–7	1.3571+6	2.6031–5	5.0254+8	2.2153+8	4.7043+7	2.3396+8	9.5353+3	8.1302+1	5.5184+1	2.6067+1	5.1398–2
	3.1658–3	1.4820–7	1.3495+6	2.6363–5	4.9973+8	2.2054+8	4.6729+7	2.3245+8	9.5285+3	8.0923+1	5.4961+1	2.5910+1	5.1714–2
	3.1925–3	1.4902–7	1.3421+6	2.6693–5	4.9697+8	2.1957+8	4.6423+7	2.3097+8	9.5218+3	8.0553+1	5.4743+1	2.5757+1	5.2028–2
	3.2179–3	1.4980–7	1.3351+6	2.7010–5	4.9438+8	2.1865+8	4.6135+7	2.2959+8	9.5155+3	8.0205+1	5.4539+1	2.5614+1	5.2326–2
	3.3157–3	1.5278–7	1.3091+6	2.8239–5	4.8475+8	2.1524+8	4.5066+7	2.2444+8	9.4917+3	7.8917+1	5.3783+1	2.5080+1	5.3472–2
	3.3944–3	1.5515–7	1.2890+6	2.9242–5	4.7733+8	2.1260+8	4.4246+7	2.2048+8	9.4730+3	7.7931+1	5.3206+1	2.4671+1	5.4393–2
M3	3.6445–3	1.6257–7	1.2302+6	3.2512–5	4.5556+8	2.0479+8	4.1854+7	2.0891+8	9.4168+3	7.5066+1	5.1535+1	2.3474+1	5.7311–2
	3.6578–3	1.6296–7	1.2273+6	3.2690–5	4.5447+8	2.0439+8	4.1733+7	2.0833+8	9.4137+3	7.4920+1	5.1449+1	2.3414+1	5.7464–2
	3.6889–3	1.6387–7	1.2205+6	3.3106–5	4.5194+8	2.0348+8	4.1456+7	2.0700+8	9.4067+3	7.4582+1	5.1249+1	2.3275+1	5.7821–2
	3.7667–3	1.6614–7	1.2038+6	3.4154–5	4.4578+8	2.0125+8	4.0780+7	2.0374+8	9.3894+3	7.3761+1	5.0766+1	2.2937+1	5.8713–2
	3.8833–3	1.6950–7	1.1799+6	3.5748–5	4.3693+8	1.9804+8	3.9813+7	1.9907+8	9.3642+3	7.2590+1	5.0079+1	2.2451+1	6.0048–2

Atomic Weight 223.000 Density 5.000 Grams/cc

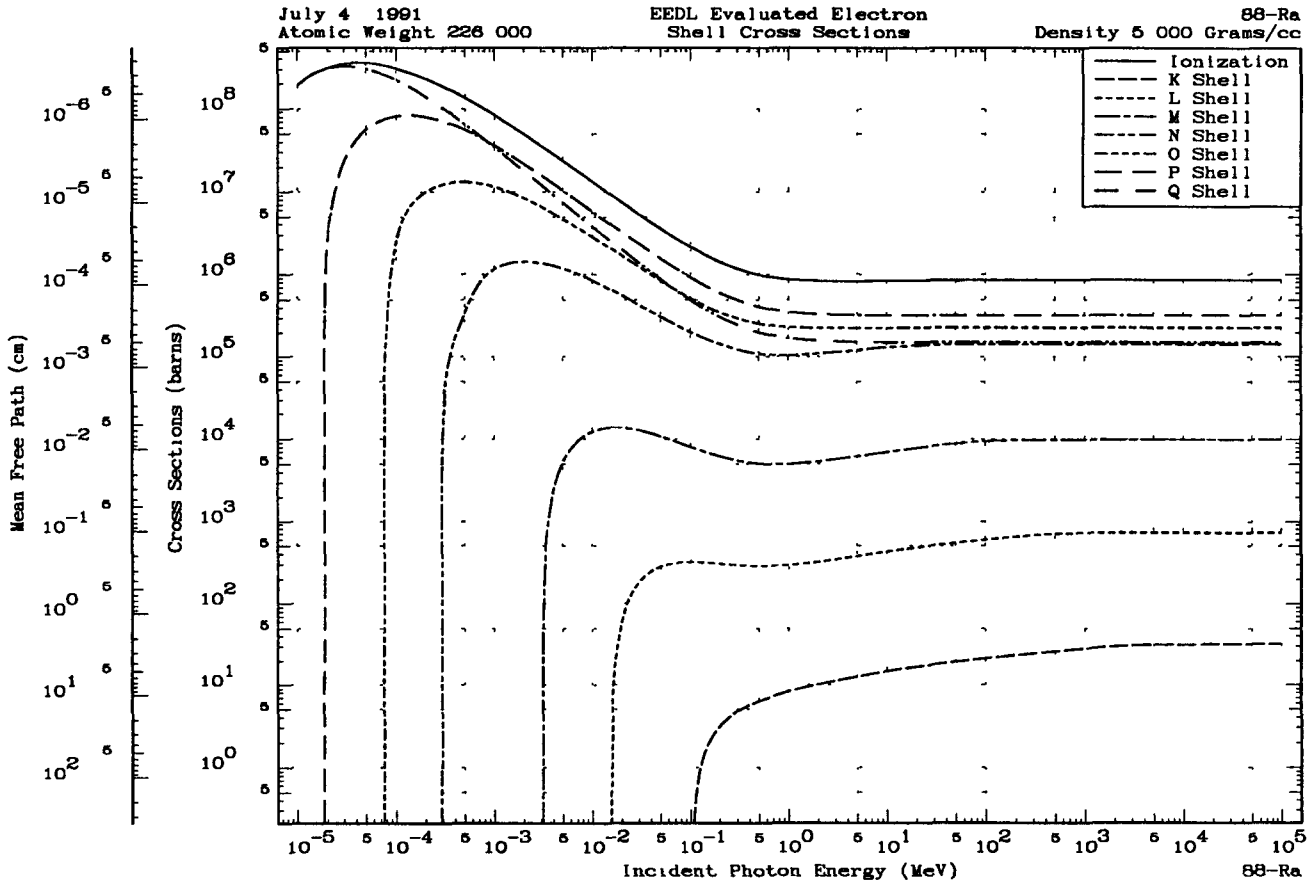
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.0000–3	1.7283–7	1.1572+6	3.7368–5	4.2852+8	1.9497+8	3.8897+7	1.9464+8	9.3397+3	7.1487+1	4.9435+1	2.1992+1	6.1381–2
	4.2500–3	1.7996–7	1.1114+6	4.0926–5	4.1154+8	1.8860+8	3.7060+7	1.8588+8	9.2526+3	6.9049+1	4.7927+1	2.1059+1	6.3678–2
M2	4.3125–3	1.8172–7	1.1006+6	4.1835–5	4.0756+8	1.8710+8	3.6632+7	1.8382+8	9.2317+3	6.8482+1	4.7576+1	2.0841+1	6.4250–2
	4.3984–3	1.8423–7	1.0856+6	4.3097–5	4.0199+8	1.8508+8	3.6060+7	1.8084+8	9.2036+3	6.7701+1	4.7111+1	2.0525+1	6.5036–2
	4.5000–3	1.8718–7	1.0685+6	4.4607–5	3.9565+8	1.8278+8	3.5411+7	1.7745+8	9.1711+3	6.6816+1	4.6585+1	2.0165+1	6.5962–2
	4.5488–3	1.8860–7	1.0605+6	4.5340–5	3.9269+8	1.8170+8	3.5108+7	1.7587+8	9.1558+3	6.6402+1	4.6338+1	1.9998+1	6.6407–2
M1	4.6191–3	1.9062–7	1.0492+6	4.6403–5	3.8853+8	1.8018+8	3.4682+7	1.7365+8	9.1342+3	6.5822+1	4.5992+1	1.9762+1	6.7046–2
	4.7143–3	1.9336–7	1.0343+6	4.7858–5	3.8301+8	1.7818+8	3.4123+7	1.7070+8	9.1054+3	6.5060+1	4.5540+1	1.9452+1	6.7910–2
	4.7744–3	1.9509–7	1.0252+6	4.8785–5	3.7963+8	1.7695+8	3.3781+7	1.6889+8	9.0876+3	6.4594+1	4.5264+1	1.9262+1	6.8455–2
	4.8572–3	1.9745–7	1.0129+6	5.0072–5	3.7509+8	1.7529+8	3.3323+7	1.6647+8	9.0634+3	6.3971+1	4.4894+1	1.9007+1	6.9204–2
	5.0000–3	2.0149–7	9.9259+5	5.2323–5	3.6756+8	1.7253+8	3.2564+7	1.6246+8	9.0229+3	6.2943+1	4.4286+1	1.8586+1	7.0493–2
	5.2500–3	2.0851–7	9.5920+5	5.6352–5	3.5519+8	1.6787+8	3.1312+7	1.5600+8	8.9534+3	6.1167+1	4.3201+1	1.7894+1	7.2715–2
	5.5000–3	2.1541–7	9.2845+5	6.0494–5	3.4381+8	1.6354+8	3.0163+7	1.5009+8	8.8877+3	5.9547+1	4.2212+1	1.7260+1	7.4926–2
	5.6250–3	2.1883–7	9.1396+5	6.2607–5	3.3844+8	1.6150+8	2.9624+7	1.4731+8	8.8561+3	5.8787+1	4.1748+1	1.6963+1	7.6027–2
	6.0000–3	2.2893–7	8.7365+5	6.9103–5	3.2351+8	1.5575+8	2.8130+7	1.3962+8	8.7660+3	5.6689+1	4.0470+1	1.6140+1	7.9313–2
	6.5000–3	2.4214–7	8.2595+5	7.8140–5	3.0585+8	1.4884+8	2.6359+7	1.3064+8	8.6057+3	5.3978+1	3.8732+1	1.5163+1	8.2756–2
	7.0000–3	2.5504–7	7.8420+5	8.7611–5	2.9039+8	1.4272+8	2.4820+7	1.2284+8	8.4599+3	5.1635+1	3.7233+1	1.4317+1	8.6163–2
	7.2500–3	2.6137–7	7.6520+5	9.2503–5	2.8335+8	1.3991+8	2.4124+7	1.1931+8	8.3917+3	5.0573+1	3.6551+1	1.3934+1	8.7854–2
	8.0000–3	2.7996–7	7.1440+5	1.0776–4	2.6454+8	1.3232+8	2.2275+7	1.0994+8	8.2033+3	4.7765+1	3.4754+1	1.2918+1	9.2878–2
	9.0000–3	3.0424–7	6.5738+5	1.2947–4	2.4343+8	1.2359+8	2.0229+7	9.9604+7	7.9387+3	4.4395+1	3.2518+1	1.1778+1	9.8420–2
	1.0000–2	3.2767–7	6.1037+5	1.5272–4	2.2602+8	1.1627+8	1.8560+7	9.1182+7	7.7093+3	4.1654+1	3.0699+1	1.0851+1	1.0387–1
	1.1250–2	3.5633–7	5.6128+5	1.8389–4	2.0784+8	1.0846+8	1.6850+7	8.2527+7	7.4092+3	3.8591+1	2.8605+1	9.8775+0	1.0906–1
	1.2500–2	3.8401–7	5.2082+5	2.1738–4	1.9286+8	1.0191+8	1.5455+7	7.5484+7	7.1507+3	3.6101+1	2.6900+1	9.0866+0	1.1417–1
	1.3125–2	3.9752–7	5.0311+5	2.3495–4	1.8630+8	9.9019+7	1.4849+7	7.2429+7	7.0340+3	3.5014+1	2.6154+1	8.7439+0	1.1669–1
	1.5000–2	4.3690–7	4.5777+5	2.9072–4	1.6951+8	9.1510+7	1.3311+7	6.4685+7	6.7244+3	3.2263+1	2.4263+1	7.8761+0	1.2414–1
L3	1.5034–2	4.3760–7	4.5704+5	2.9178–4	1.6924+8	9.1387+7	1.3286+7	6.4562+7	6.7186+3	3.2215+1	2.4229+1	7.8619+0	1.2424–1
	1.5655–2	4.5045–7	4.4400+5	3.1130–4	1.6441+8	8.9163+7	1.2852+7	6.2392+7	6.6157+3	3.1377+1	2.3637+1	7.6134+0	1.2618–1
	1.6741–2	4.7257–7	4.2322+5	3.4668–4	1.5672+8	8.5595+7	1.2164+7	5.8952+7	6.4485+3	3.0047+1	2.2698+1	7.2199+0	1.2954–1
L2	1.7971–2	4.9709–7	4.0234+5	3.8854–4	1.4899+8	8.1980+7	1.1477+7	5.5523+7	6.2765+3	2.8722+1	2.1761+1	6.8280+0	1.3330–1
	1.8371–2	5.0497–7	3.9606+5	4.0255–4	1.4666+8	8.0880+7	1.1273+7	5.4504+7	6.2227+3	2.8321+1	2.1477+1	6.7103+0	1.3442–1
	1.8478–2	5.0708–7	3.9441+5	4.0636–4	1.4605+8	8.0590+7	1.1219+7	5.4236+7	6.2085+3	2.8216+1	2.1402+1	6.6794+0	1.3472–1
L1	1.8630–2	5.1006–7	3.9211+5	4.1175–4	1.4520+8	8.0186+7	1.1144+7	5.3863+7	6.1886+3	2.8070+1	2.1298+1	6.6364+0	1.3514–1
	1.9239–2	5.2197–7	3.8316+5	4.3368–4	1.4189+8	7.8616+7	1.0855+7	5.2409+7	6.1087+3	2.7503+1	2.0897+1	6.4696+0	1.3666–1
	1.9315–2	5.2344–7	3.8208+5	4.3644–4	1.4149+8	7.8426+7	1.0820+7	5.2234+7	6.0990+3	2.7435+1	2.0848+1	6.4495+0	1.3684–1
	2.0000–2	5.3669–7	3.7265+5	4.6168–4	1.3799+8	7.6764+7	1.0516+7	5.0708+7	6.0138+3	2.6841+1	2.0427+1	6.2745+0	1.3854–1
	2.1250–2	5.6070–7	3.5670+5	5.0920–4	1.3209+8	7.3916+7	1.0011+7	4.8152+7	5.8564+3	2.5781+1	1.9665+1	5.9748+0	1.4113–1
	2.2500–2	5.8430–7	3.4229+5	5.5860–4	1.2675+8	7.1327+7	9.5577+6	4.5860+7	5.7118+3	2.4830+1	1.8980+1	5.7062+0	1.4370–1
	2.3438–2	6.0174–7	3.3237+5	5.9686–4	1.2308+8	6.9534+7	9.2465+6	4.4291+7	5.6107+3	2.4178+1	1.8509+1	5.5224+0	1.4562–1
	2.4375–2	6.1897–7	3.2312+5	6.3613–4	1.1965+8	6.7854+7	8.9571+6	4.2833+7	5.5153+3	2.3571+1	1.8072+1	5.3517+0	1.4753–1
	2.5000–2	6.3035–7	3.1728+5	6.6286–4	1.1749+8	6.6791+7	8.7751+6	4.1918+7	5.4546+3	2.3190+1	1.7797+1	5.2446+0	1.4880–1
	2.6719–2	6.6122–7	3.0247+5	7.3857–4	1.1200+8	6.4078+7	8.3148+6	3.9607+7	5.2983+3	2.2225+1	1.7098+1	4.9741+0	1.5226–1
	2.7188–2	6.6954–7	2.9871+5	7.5977–4	1.1061+8	6.3387+7	8.1985+6	3.9023+7	5.2581+3	2.1981+1	1.6922+1	4.9059+0	1.5320–1
	3.0000–2	7.1856–7	2.7833+5	8.9171–4	1.0307+8	5.9612+7	7.5702+6	3.5880+7	5.0365+3	2.0666+1	1.5969+1	4.5385+0	1.5877–1
	3.5000–2	8.0272–7	2.4915+5	1.1460–3	9.2262+7	5.4116+7	6.6986+6	3.1443+7	4.6874+3	1.8700+1	1.4525+1	4.0085+0	1.6631–1
	4.0000–2	8.8334–7	2.2641+5	1.4248–3	8.3841+7	4.9767+7	6.0256+6	2.8045+7	4.4046+3	1.7186+1	1.3409+1	3.6033+0	1.7371–1
	4.5000–2	9.6081–7	2.0816+5	1.7268–3	7.7081+7	4.6221+7	5.5002+6	2.5355+7	4.1678+3	1.5942+1	1.2485+1	3.2775+0	1.7990–1
	5.0000–2	1.0357–6	1.9310+5	2.0509–3	7.1506+7	4.3264+7	5.0694+6	2.3168+7	3.9667+3	1.4926+1	1.1727+1	3.0130+0	1.8601–1
	6.0000–2	1.1777–6	1.6983+5	2.7591–3	6.2887+7	3.8636+7	4.4181+6	1.9830+7	3.6467+3	1.3343+1	1.0543+1	2.6038+0	1.9660–1
	8.0000–2	1.4364–6	1.3923+5	4.3900–3	5.1558+7	3.2445+7	3.5857+6	1.5524+7	3.2020+3	1.1243+1	8.9590+0	2.0693+0	2.1513–1
	1.0000–1	1.6682–6	1.1989+5	6.2833–3	4.4396+7	2.8444+7	3.0763+6	1.2872+7	2.9041+3	9.9119+0	7.9457+0	1.7356+0	2.3063–1
K	1.0152–1	1.6844–6	1.1874+5	6.4372–3	4.3968+7	2.8200+7	3.0465+6	1.2718+7	2.8853+3	9.8323+0	7.8847+0	1.7159+0	2.3174–1
	1.0303–1	1.7003–6	1.1763+5	6.5919–3	4.3557+7	2.7968+7	3.0183+6	1.2568+7	2.8686+3	9.7560+0	7.8267+0	1.6966+0	2.3272–1
	1.0597–1	1.7309–6	1.1555+5	6.8950–3	4.2787+7	2.7532+7	2.9656+6	1.2287+7	2.8372+3	9.6135+0	7.7182+0	1.6607+0	2.3463–1
	1.1147–1	1.7873–6	1.1190+5	7.4751–3	4.1436+7	2.6764+7	2.8729+6	1.1796+7	2.7815+3	9.3635+0	7.5273+0	1.5980+0	2.3821–1
	1.2111–1	1.8836–6	1.0618+5	8.5258–3	3.9318+7	2.5553+7	2.7275+6	1.1034+7	2.6927+3	8.9732+0	7.2279+0	1.5008+0	2.4448–1
	1.2833–1	1.9539–6	1.0236+5	9.3426–3	3.7904+7	2.4739+7	2.6302+6	1.0532+7	2.6323+3	8.7137+0	7.0278+0	1.4367+0	2.4917–1
	1.3916–1	2.0565–6	9.7253+4	1.0612–2	3.6013+7	2.3644+7	2.5000+6	9.8662+6	2.5501+3	8.3682+0	6.7601+0	1.3520+0	2.5616–1
	1.5000–1	2.1560–6	9.2763+4	1.1930–2	3.4350+7	2.2674+7	2.3853+6	9.2882+6	2.4763+3	8.0663+0	6.5248+0	1.2784+0	2.6311–1
	1.7500–1	2.3624–6	8.4661+4	1.5134–2	3.1350+7	2.0857+7	2.1916+6	8.2987+6	2.3368+3	7.5448+0	6.1175+0	1.1506+0	2.7683–1
	2.0000–1	2.5566–6	7.8228+4	1.8541–2	2.8968+7	1.9402+7	2.0367+6	7.5271+6	2.2224+3	7.1347+0	5.7931+0	1.0511+0	2.9042–1
	2.5000–1	2.9019–6	6.8920+4	2.5820–2	2.5521+7	1.7146+7	1.8384+6	6.5343+6	2.0577+3	6.6107+0	5.3741+0	9.2186–1	3.1470–1
	3.0000–1	3.2181–6	6.2148+4	3.3608–2	2.3014+7	1.5500+7	1.6909+6	5.8212+6	1.9323+3	6.2340+0	5.0659+0	8.2958–1	3.3853–1
	4.0000–1	3.7681–6	5.3077+4	5.0169–2	1.9654+7	1.3090+7	1.5232+6	5.0389+6	1.7770+3	5.8464+0	4.7326+0	7.2887–1	3.8492–1
	5.0000–1	4.2399–6	4.7171+4	6.7537–2	1.7467+7	1.1433+7	1.4271+6	4.6061+6	1.6816+3	5.6701+0	4.5645+0	6.7413–1	4.3147–1
	6.0000–1	4.6712–6	4.2815+4	8.5313–2	1.5855+7	1.0208+7	1.3661+6	4.2790+6	1.6206+3	5.5807+0	4.4694+0	6.3246–1	4.7881–1
	8.0000–1	5.3775–6	3.7192+4	1.2120–1	1.3772+7	8.5360+6	1.2956+6	3.9390+6	1.5483+3	5.5668+0	4.3998+0	5.9145–1	5.7559–1
	1.0000+0	5.9770–6	3.3461+4	1.5694–1	1.2391+7	7.4302+6	1.2576+6	3.7015+6	1.5100+3	5.6240+0	4.3863+0	5.6261–1	6.7505–1
	1.5000+0	7.0805–6	2.8247+4	2.4322–1	1.0460+7	5.7926+6	1.2208+6	3.4448+6	1.4651+3	5.9692+0	4.4999+0	5.3544–1	9.3391–1
	2.0000+0	7.8625–6	2.5437+4	3.2455–1	9.4194+6	4.8884+6	1.2080+6	3.3216+6	1.4482+3	6.3310+0	4.6051+0	5.2248–1	1.2034+0
	3.0000+0	8.9095–6	2.2448+4	4.7390–1	8.3125+6	3.9141+6	1.1966+6	3.2004+6	1.4369+3	7.0735+0	4.7928+0	5.1576–1	1.7650+0
	4.0000+0	9.5786–6	2.0880+4	6.0837–1	7.7318+6	3.3888+6	1.1968+6	3.1448+6	1.4376+3	7.8119+0	4.9478+0	5.1104–1	2.3530+0
	5.0000+0	1.0034–5	1.9932+4	7.3068–1	7.3809+6	3.0623+6	1.1978+6	3.1194+6	1.4405+3	8.5515+0	5.0834+0	5.1114–1	2.9570+0
	6.0000+0	1.0366–5	1.9294+4	8.4284–1	7.1446+6	2.8447+6	1.1987+6	3.0998+6	1.4449+3	9.2900+0	5.2013+0	5.1217–1	3.5765+0
	8.0000+0	1.0849–5	1.8435+4	1.0428+0	6.8265+6	2.5651+6	1.2012+6	3.0588+6	1.4548+3	1.0754+1	5.3862+0	5.1378–1	4.8545+0
	1.0000+1	1.1129–5	1.7970+4	1.2171+0	6.6544+6	2.4056+6	1.2040+6	3.0434+6	1.4650+3	1.2217+1	5.5309+0	5.1506–1	6.1710+0
	1.5000+1	1.1474–5	1.7431+4	1.5757+0	6.4548+6	2.2241+6	1.2082+6	3.0210+6	1.4889+3	1.5830+1	5.7573+0	5.1459–1	9.5577+0
	2.0000+1	1.1607–5	1.7231+4	1.8595+0	6.3805+6	2.1680+6	1.2114+6	2.9997+6	1.5080+3	1.9533+1	5.9387+0	5.1426–1	1.3080+1
	3.0000+1	1.1687–5	1.7113+4	2.2935+0	6.3370+6	2.1662+6	1.2134+6	2.9558+6	1.5326+3	2.6942+1	6.1393+0	5.1326–1	2.0289+1
	4.0000+1	1.1704–5	1.7088+4	2.6207+0	6.3276+6	2.1657+6	1.2150+6	2.9453+6	1.5559+3	3.4500+1	6.2945+0	5.1239–1	2.7693+1
	5.0000+1	1.1721–5	1.7063+4	2.8825+0	6.3185+6	2.1649+6	1.2160+6	2.9359+6	1.5744+3	4.2143+1	6.4087+0	5.1173–1	3.5222+1

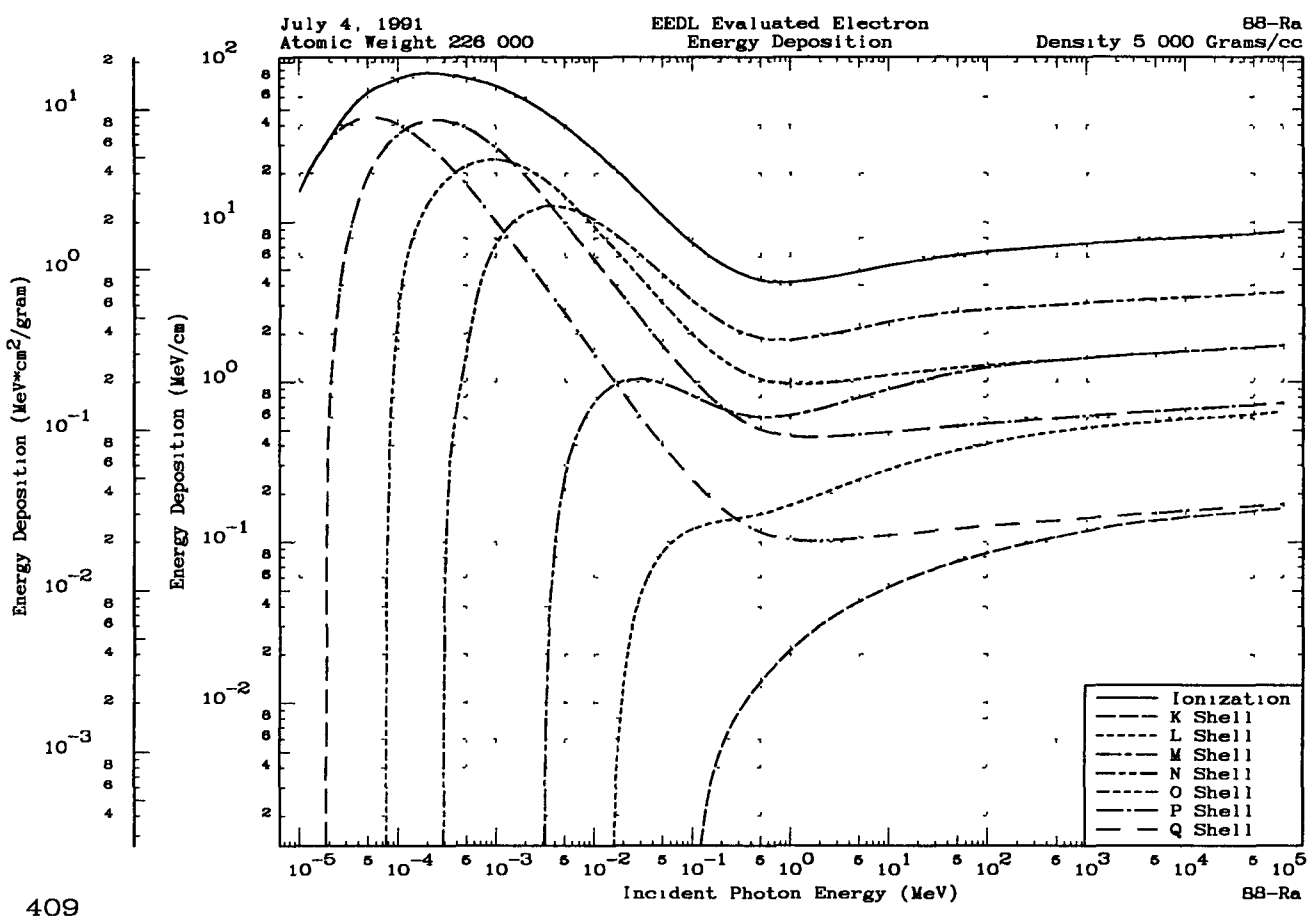
Atomic Weight 223.000													Density 5.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.0000+1	1.1739–5	1.7038+4	3.1004+0	6.3091+6	2.1643+6	1.2165+6	2.9267+6	1.5899+3	4.9854+1	6.4859+0	5.1108–1	2.8857+1
8.0000+1	1.1771–5	1.6992+4	3.4495+0	6.2920+6	2.1633+6	1.2172+6	2.9099+6	1.6155+3	6.5433+1	6.6226+0	5.1006–1	5.8301+1
1.0000+2	1.1800–5	1.6949+4	3.7234+0	6.2764+6	2.1625+6	1.2177+6	2.8945+6	1.6364+3	8.1185+1	6.7293+0	5.0927–1	7.3947+1
1.5000+2	1.1841–5	1.6891+4	4.2255+0	6.2548+6	2.1611+6	1.2180+6	2.8740+6	1.6701+3	1.2058+2	6.8542+0	5.0584–1	1.1322+2
2.0000+2	1.1855–5	1.6870+4	4.5839+0	6.2471+6	2.1602+6	1.2182+6	2.8671+6	1.6911+3	1.6034+2	6.9660+0	5.0481–1	1.5287+2
3.0000+2	1.1872–5	1.6846+4	5.0906+0	6.2380+6	2.1588+6	1.2184+6	2.8591+6	1.7204+3	2.3960+2	7.1253+0	5.0377–1	2.3197+2
4.0000+2	1.1889–5	1.6823+4	5.4512+0	6.2294+6	2.1578+6	1.2185+6	2.8514+6	1.7409+3	3.1893+2	7.2209+0	5.0277–1	3.1121+2
5.0000+2	1.1909–5	1.6794+4	5.7310+0	6.2188+6	2.1570+6	1.2185+6	2.8415+6	1.7569+3	3.9886+2	7.2911+0	5.0138–1	3.9107+2
6.0000+2	1.1918–5	1.6781+4	5.9597+0	6.2142+6	2.1564+6	1.2186+6	2.8375+6	1.7691+3	4.7802+2	7.3537+0	5.0102–1	4.7017+2
8.0000+2	1.1937–5	1.6755+4	6.3206+0	6.2042+6	2.1554+6	1.2186+6	2.8284+6	1.7885+3	6.3773+2	7.4595+0	5.0015–1	6.2977+2
1.0000+3	1.1953–5	1.6732+4	6.6005+0	6.1960+6	2.1546+6	1.2186+6	2.8210+6	1.8042+3	7.9741+2	7.5493+0	4.9954–1	7.8936+2
1.5000+3	1.1967–5	1.6713+4	7.1084+0	6.1889+6	2.1532+6	1.2186+6	2.8152+6	1.8335+3	1.1989+3	7.6360+0	4.9854–1	1.1907+3
2.0000+3	1.1978–5	1.6697+4	7.4684+0	6.1831+6	2.1523+6	1.2186+6	2.8103+6	1.8559+3	1.5979+3	7.7209+0	4.9769–1	1.5896+3
3.0000+3	1.1992–5	1.6677+4	7.9758+0	6.1756+6	2.1509+6	1.2186+6	2.8042+6	1.8880+3	2.3973+3	7.8824+0	4.9664–1	2.3890+3
4.0000+3	1.2005–5	1.6660+4	8.3358+0	6.1692+6	2.1499+6	1.2186+6	2.7987+6	1.9113+3	3.1972+3	7.9539+0	4.9569–1	3.1887+3
5.0000+3	1.2020–5	1.6640+4	8.6146+0	6.1616+6	2.1491+6	1.2186+6	2.7919+6	1.9296+3	4.0053+3	8.0084+0	4.9452–1	3.9968+3
6.0000+3	1.2024–5	1.6634+4	8.8424+0	6.1596+6	2.1485+6	1.2186+6	2.7905+6	1.9431+3	4.8022+3	8.0627+0	4.9429–1	4.7936+3
8.0000+3	1.2033–5	1.6621+4	9.2016+0	6.1549+6	2.1475+6	1.2186+6	2.7868+6	1.9646+3	6.4099+3	8.1688+0	4.9370–1	6.4012+3
1.0000+4	1.2039–5	1.6612+4	9.4797+0	6.1516+6	2.1467+6	1.2186+6	2.7842+6	1.9814+3	8.0327+3	8.2584+0	4.9329–1	8.0240+3
1.5000+4	1.2049–5	1.6599+4	9.9857+0	6.1466+6	2.1453+6	1.2186+6	2.7806+6	2.0134+3	1.1995+4	8.3359+0	4.9265–1	1.1986+4
2.0000+4	1.2057–5	1.6588+4	1.0345+1	6.1426+6	2.1444+6	1.2186+6	2.7776+6	2.0364+3	1.6008+4	8.4134+0	4.9211–1	1.6000+4
3.0000+4	1.2065–5	1.6577+4	1.0852+1	6.1386+6	2.1430+6	1.2186+6	2.7749+6	2.0687+3	2.3958+4	8.5649+0	4.9164–1	2.3949+4
4.0000+4	1.2072–5	1.6568+4	1.1212+1	6.1350+6	2.1420+6	1.2186+6	2.7723+6	2.0919+3	3.1993+4	8.6456+0	4.9118–1	3.1984+4
5.0000+4	1.2082–5	1.6553+4	1.1492+1	6.1295+6	2.1412+6	1.2186+6	2.7676+6	2.1098+3	3.9954+4	8.7091+0	4.9035–1	3.9945+4
6.0000+4	1.2083–5	1.6552+4	1.1720+1	6.1292+6	2.1406+6	1.2186+6	2.7678+6	2.1244+3	4.7908+4	8.7586+0	4.9040–1	4.7899+4
8.0000+4	1.2087–5	1.6546+4	1.2080+1	6.1270+6	2.1396+6	1.2186+6	2.7666+6	2.1476+3	6.3956+4	8.8576+0	4.9018–1	6.3947+4
1.0000+5	1.2091–5	1.6541+4	1.2359+1	6.1253+6	2.1389+6	1.2186+6	2.7656+6	2.1655+3	8.0032+4	8.9515+0	4.9001–1	8.0022+4


July 4, 1991
Atomic Weight 226.000
EEDL Evaluated Electron
Cross Sections
88-Ra
Density 5.000 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
88-Ra


July 4, 1991
Atomic Weight 226.000
EEDL Evaluated Electron
Energy Deposition
88-Ra
Density 5.000 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
88-Ra

408


July 4 1991
Atomic Weight 226 000
EEDL Evaluated Electron
Shell Cross Sections
88-Ra
Density 5 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
88-Ra


July 4, 1991
Atomic Weight 226 000
EEDL Evaluated Electron
Energy Deposition
88-Ra
Density 5 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
88-Ra

Atomic Weight 226.000 Density 5.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.2656–8	1.5803+7		5.9306+9	5.7001+9	1.9329+8	3.7264+7	4.9884+3	1.8342+1	1.5468+1	2.8736+0	1.4367–4
	1.2500–5	1.3911–8	1.4377+7		5.3954+9	5.0453+9	2.3863+8	1.1153+8	5.2210+3	2.9881+1	2.0788+1	9.0927+0	1.7879–4
	1.3125–5	1.4160–8	1.4125+7		5.3007+9	4.9124+9	2.4651+8	1.4174+8	5.2733+3	3.3589+1	2.1876+1	1.1712+1	1.8776–4
	1.5000–5	1.4752–8	1.3557+7		5.0877+9	4.5665+9	2.6944+8	2.5177+8	5.4191+3	4.6865+1	2.5227+1	2.1637+1	2.1508–4
	1.7500–5	1.5217–8	1.3143+7		4.9324+9	4.1973+9	2.8897+8	4.4616+8	5.5925+3	6.8299+1	2.8735+1	3.9564+1	2.5241–4
P3	1.8620–5	1.5326–8	1.3049+7		4.8972+9	4.0573+9	2.9722+8	5.4265+8	5.6638+3	7.9115+1	3.0329+1	4.8786+1	2.6944–4
	1.8965–5	1.5350–8	1.3029+7		4.8897+9	4.0168+9	2.9986+8	5.7306+8	5.6851+3	8.2598+1	3.0923+1	5.1674+1	2.7473–4
	1.9483–5	1.5372–8	1.3011+7		4.8826+9	3.9581+9	3.0375+8	6.2077+8	5.7164+3	8.8034+1	3.1808+1	5.6226+1	2.8268–4
	2.0000–5	1.5380–8	1.3004+7		4.8801+9	3.9017+9	3.0734+8	6.7105+8	5.7471+3	9.3685+1	3.2636+1	6.1049+1	2.9068–4
	2.0625–5	1.5398–8	1.2989+7		4.8745+9	3.8366+9	3.1058+8	7.2732+8	5.7798+3	9.9946+1	3.3545+1	6.6401+1	2.9967–4
	2.1797–5	1.5384–8	1.3001+7		4.8789+9	3.7224+9	3.1598+8	8.4049+8	5.8390+3	1.1236+2	3.5122+1	7.7236+1	3.1664–4
	2.3848–5	1.5343–8	1.3035+7		4.8918+9	3.5438+9	3.2637+8	1.0216+9	5.9366+3	1.3320+2	3.8249+1	9.4952+1	3.4667–4
P2	2.4880–5	1.5274–8	1.3094+7		4.9138+9	3.4626+9	3.3119+8	1.1200+9	5.9831+3	1.4447+2	3.9775+1	1.0469+2	3.6193–4
	2.5200–5	1.5268–8	1.3099+7		4.9160+9	3.4385+9	3.3235+8	1.1451+9	5.9969+3	1.4737+2	4.0221+1	1.0715+2	3.6662–4
	2.5800–5	1.5250–8	1.3115+7		4.9218+9	3.3946+9	3.3458+8	1.1927+9	6.0224+3	1.5290+2	4.1078+1	1.1182+2	3.7542–4
	2.6850–5	1.5200–8	1.3158+7		4.9380+9	3.3213+9	3.3868+8	1.2780+9	6.0659+3	1.6289+2	4.2654+1	1.2024+2	3.9091–4
	2.6924–5	1.5196–8	1.3162+7		4.9394+9	3.3163+9	3.3898+8	1.2840+9	6.0689+3	1.6361+2	4.2767+1	1.2084+2	3.9200–4
	2.8425–5	1.5091–8	1.3253+7		4.9737+9	3.2194+9	3.4387+8	1.4105+9	6.1286+3	1.7819+2	4.4792+1	1.3340+2	4.1431–4
	3.0000–5	1.5050–8	1.3289+7		4.9873+9	3.1258+9	3.4916+8	1.5123+9	6.1885+3	1.9078+2	4.7005+1	1.4377+2	4.3791–4
	3.0625–5	1.5033–8	1.3304+7		4.9927+9	3.0907+9	3.4982+8	1.5522+9	6.2115+3	1.9535+2	4.7602+1	1.4774+2	4.4732–4
	3.2969–5	1.4938–8	1.3389+7		5.0247+9	2.9685+9	3.5273+8	1.7035+9	6.2947+3	2.1290+2	4.9994+1	1.6291+2	4.8291–4
	3.5000–5	1.4957–8	1.3371+7		5.0181+9	2.8730+9	3.5587+8	1.7892+9	6.3630+3	2.2408+2	5.2286+1	1.7180+2	5.1406–4
	3.5313–5	1.4959–8	1.3370+7		5.0176+9	2.8590+9	3.5624+8	1.8024+9	6.3732+3	2.2577+2	5.2609+1	1.7316+2	5.1888–4
P1	3.9540–5	1.4933–8	1.3393+7		5.0263+9	2.6875+9	3.6089+8	1.9779+9	6.5045+3	2.4844+2	5.6822+1	1.9162+2	5.8472–4
	4.0000–5	1.4945–8	1.3382+7		5.0220+9	2.6705+9	3.6152+8	1.9900+9	6.5181+3	2.5030+2	5.7334+1	1.9296+2	5.9196–4
	4.1250–5	1.4997–8	1.3336+7		5.0046+9	2.6259+9	3.6126+8	2.0175+9	6.5521+3	2.5416+2	5.8239+1	1.9592+2	6.1092–4
	4.3438–5	1.5077–8	1.3265+7		4.9781+9	2.5527+9	3.6103+8	2.0644+9	6.6096+3	2.6087+2	5.9869+1	2.0100+2	6.4430–4
	4.5000–5	1.5126–8	1.3222+7		4.9620+9	2.5038+9	3.6101+8	2.0971+9	6.6492+3	2.6563+2	6.1059+1	2.0457+2	6.6830–4
	4.6719–5	1.5228–8	1.3133+7		4.9287+9	2.4530+9	3.6062+8	2.1151+9	6.6915+3	2.6897+2	6.2233+1	2.0674+2	6.9485–4
	5.0000–5	1.5407–8	1.2982+7		4.8717+9	2.3635+9	3.6014+8	2.1481+9	6.7688+3	2.7528+2	6.4508+1	2.1077+2	7.4592–4
	5.5000–5	1.5743–8	1.2704+7		4.7677+9	2.2434+9	3.5543+8	2.1689+9	6.8752+3	2.8085+2	6.6721+1	2.1413+2	8.2328–4
	6.0000–5	1.6042–8	1.2467+7		4.6788+9	2.1391+9	3.5167+8	2.1881+9	6.9739+3	2.8640+2	6.9055+1	2.1734+2	9.0168–4
	7.0000–5	1.6722–8	1.1961+7		4.4886+9	1.9660+9	3.3870+8	2.1839+9	7.1522+3	2.8976+2	7.1445+1	2.1832+2	1.0613–3
O5	7.5520–5	1.7056–8	1.1726+7		4.4005+9	1.8860+9	3.3266+8	2.1818+9	7.2417+3	2.9167+2	7.2791+1	2.1888+2	1.1509–3
	7.6640–5	1.7130–8	1.1676+7		4.3816+9	1.8709+9	3.3152+8	2.1792+9	7.2591+3	2.9188+2	7.3094+1	2.1878+2	1.1692–3
	7.8320–5	1.7238–8	1.1602+7		4.3541+9	1.8488+9	3.2985+8	2.1755+9	7.2850+3	2.9221+2	7.3554+1	2.1865+2	1.1967–3
	8.0000–5	1.7344–8	1.1531+7		4.3275+9	1.8275+9	3.2824+8	2.1718+9	7.3103+3	2.9254+2	7.4014+1	2.1853+2	1.2243–3
O4	8.1320–5	1.7429–8	1.1475+7		4.3065+9	1.8112+9	3.2646+8	2.1689+9	7.3299+3	2.9262+2	7.4186+1	2.1844+2	1.2461–3
	8.2404–5	1.7511–8	1.1422+7		4.2863+9	1.7981+9	3.2508+8	2.1631+9	7.3453+3	2.9241+2	7.4378+1	2.1803+2	1.2639–3
	8.2488–5	1.7517–8	1.1417+7		4.2847+9	1.7971+9	3.2497+8	2.1627+9	7.3465+3	2.9239+2	7.4393+1	2.1800+2	1.2653–3
	8.4603–5	1.7675–8	1.1315+7		4.2465+9	1.7724+9	3.2239+8	2.1517+9	7.3759+3	2.9203+2	7.4793+1	2.1723+2	1.3002–3
	8.4677–5	1.7680–8	1.1312+7		4.2452+9	1.7715+9	3.2230+8	2.1514+9	7.3769+3	2.9202+2	7.4807+1	2.1721+2	1.3014–3
	8.8452–5	1.7954–8	1.1139+7		4.1804+9	1.7297+9	3.1800+8	2.1326+9	7.4279+3	2.9150+2	7.5583+1	2.1591+2	1.3640–3
	8.8507–5	1.7958–8	1.1137+7		4.1795+9	1.7291+9	3.1794+8	2.1324+9	7.4286+3	2.9149+2	7.5594+1	2.1590+2	1.3649–3
	9.0000–5	1.8064–8	1.1072+7		4.1550+9	1.7134+9	3.1632+8	2.1253+9	7.4482+3	2.9131+2	7.5900+1	2.1541+2	1.3897–3
	9.1381–5	1.8161–8	1.1013+7		4.1328+9	1.6992+9	3.1487+8	2.1188+9	7.4662+3	2.9118+2	7.6203+1	2.1497+2	1.4128–3
	9.5690–5	1.8456–8	1.0837+7		4.0669+9	1.6569+9	3.1068+8	2.0993+9	7.5207+3	2.9092+2	7.7251+1	2.1367+2	1.4850–3
	1.0000–4	1.8740–8	1.0673+7	0.0000+0	4.0052+9	1.6174+9	3.0695+8	2.0809+9	7.5732+3	2.9093+2	7.8472+1	2.1245+2	1.5578–3
	1.1250–4	1.9664–8	1.0171+7	4.3324–8	3.8169+9	1.5163+9	2.9337+8	2.0073+9	7.7111+3	2.8613+2	8.0139+1	2.0599+2	1.7704–3
	1.2188–4	2.0314–8	9.8453+6	7.6250–8	3.6948+9	1.4512+9	2.8483+8	1.9587+9	7.8062+3	2.8332+2	8.1535+1	2.0179+2	1.9322–3
	1.2500–4	2.0524–8	9.7447+6	8.7297–8	3.6570+9	1.4312+9	2.8219+8	1.9436+9	7.8365+3	2.8246+2	8.1973+1	2.0049+2	1.9865–3
	1.3594–4	2.1346–8	9.3694+6	1.2636–7	3.5162+9	1.3669+9	2.7303+8	1.8763+9	7.9379+3	2.7755+2	8.3153+1	1.9440+2	2.1782–3
	1.5000–4	2.2351–8	8.9480+6	1.7752–7	3.3580+9	1.2951+9	2.6280+8	1.8002+9	8.0585+3	2.7221+2	8.4625+1	1.8758+2	2.4280–3
O3	1.5983–4	2.3016–8	8.6896+6	2.1391–7	3.2611+9	1.2508+9	2.5502+8	1.7552+9	8.1372+3	2.6811+2	8.4764+1	1.8334+2	2.6046–3
	1.6234–4	2.3204–8	8.6191+6	2.2329–7	3.2346+9	1.2401+9	2.5313+8	1.7413+9	8.1562+3	2.6684+2	8.4821+1	1.8202+2	2.6509–3
	1.6705–4	2.3553–8	8.4914+6	2.4101–7	3.1867+9	1.2209+9	2.4972+8	1.7161+9	8.1910+3	2.6457+2	8.4952+1	1.7961+2	2.7380–3
	1.7500–4	2.4132–8	8.2878+6	2.7127–7	3.1103+9	1.1901+9	2.4435+8	1.6758+9	8.2480+3	2.6104+2	8.5246+1	1.7579+2	2.8859–3
	1.7529–4	2.4152–8	8.2808+6	2.7236–7	3.1076+9	1.1891+9	2.4416+8	1.6744+9	8.2500+3	2.6091+2	8.5253+1	1.7565+2	2.8913–3
	1.8764–4	2.5027–8	7.9915+6	3.2019–7	2.9991+9	1.1455+9	2.3646+8	1.6171+9	8.3343+3	2.5583+2	8.5597+1	1.7023+2	3.1231–3
	2.0000–4	2.5872–8	7.7303+6	3.6891–7	2.9010+9	1.1061+9	2.2961+8	1.5653+9	8.4139+3	2.5143+2	8.6087+1	1.6534+2	3.3572–3
O2	2.0032–4	2.5895–8	7.7235+6	3.7019–7	2.8985+9	1.1052+9	2.2941+8	1.5639+9	8.4158+3	2.5129+2	8.6077+1	1.6521+2	3.3635–3
	2.0344–4	2.6118–8	7.6574+6	3.8262–7	2.8737+9	1.0959+9	2.2752+8	1.5503+9	8.4342+3	2.4987+2	8.5988+1	1.6388+2	3.4247–3
	2.0947–4	2.6547–8	7.5337+6	4.0690–7	2.8273+9	1.0785+9	2.2398+8	1.5248+9	8.4692+3	2.4723+2	8.5845+1	1.6138+2	3.5438–3
	2.2079–4	2.7337–8	7.3162+6	4.5310–7	2.7456+9	1.0478+9	2.1782+8	1.4800+9	8.5324+3	2.4267+2	8.5671+1	1.5700+2	3.7684–3
	2.2500–4	2.7626–8	7.2396+6	4.7052–7	2.7169+9	1.0370+9	2.1566+8	1.4642+9	8.5553+3	2.4110+2	8.5633+1	1.5546+2	3.8524–3
	2.4059–4	2.8675–8	6.9748+6	5.3592–7	2.6175+9	9.9960+8	2.0822+8	1.4097+9	8.6368+3	2.3566+2	8.5515+1	1.5014+2	4.1654–3
O1	2.5363–4	2.9528–8	6.7732+6	5.9173–7	2.5419+9	9.7110+8	2.0262+8	1.3681+9	8.7016+3	2.3164+2	8.5533+1	1.4610+2	4.4295–3
	2.5653–4	2.9716–8	6.7303+6	6.0427–7	2.5258+9	9.6507+8	2.0131+8	1.3594+9	8.7156+3	2.3068+2	8.5436+1	1.4524+2	4.4884–3
	2.6196–4	3.0066–8	6.6520+6	6.2792–7	2.4964+9	9.5405+8	1.9893+8	1.3434+9	8.7415+3	2.2893+2	8.5271+1	1.4365+2	4.5992–3
	2.6250–4	3.0101–8	6.6443+6	6.3027–7	2.4935+9	9.5297+8	1.9870+8	1.3418+9	8.7440+3	2.2876+2	8.5255+1	1.4350+2	4.6102–3
	2.7030–4	3.0597–8	6.5366+6	6.6452–7	2.4531+9	9.3781+8	1.9545+8	1.3198+9	8.7803+3	2.2637+2	8.5043+1	1.4133+2	4.7697–3
	2.7147–4	3.0671–8	6.5208+6	6.6972–7	2.4471+9	9.3558+8	1.9497+8	1.3166+9	8.7857+3	2.2603+2	8.5014+1	1.4101+2	4.7939–3
	2.8574–4	3.1561–8	6.3370+6	7.3340–7	2.3782+9	9.0968+8	1.8946+8	1.2790+9	8.8496+3	2.2202+2	8.4716+1	1.3730+2	5.0877–3
N7	2.9119–4	3.1895–8	6.2705+6	7.5804–7	2.3532+9	9.0030+8	1.8748+8	1.2654+9	8.8733+3	2.2060+2	8.4628+1	1.3596+2	5.2007–3
	2.9560–4	3.2165–8	6.2179+6	7.7806–7	2.3335+9	8.9292+8	1.8593+8	1.2546+9	8.8922+3	2.1949+2	8.4586+1	1.3490+2	5.2921–3
N6	2.9970–4	3.2415–8	6.1699+6	7.9680–7	2.3155+9	8.8620+8	1.8453+8	1.2447+9	8.9096+3	2.1850+2	8.4554+1	1.3394+2	5.3775–3
	3.0000–4	3.2433–8	6.1665+6	7.9818–7	2.3142+9	8.8572+8	1.8442+8	1.2440+9	8.9108+3	2.1843+2	8.4553+1	1.3387+2	5.3837–3
	3.0625–4	3.2836–8	6.0909+6	8.2692–7	2.2858+9	8.7574+8	1.8212+8	1.2279+9	8.9364+3	2.1653+2	8.4276+1	1.3224+2	5.5150–3
	3.1250–4	3.3235–8	6.0177+6	8.5590–7	2.2583+9	8.6608+8	1.7989+8	1.2124+9	8.9615+3	2.1470+2	8.4025+1	1.3067+2	5.6466–3
	3.1797–4	3.3582–8	5.9556+6	8.8147–7	2.2350+9	8.5787+8	1.7800+8	1.1991+9	8.9832+3	2.1316+2	8.3819+1	1.2933+2	5.7621–3

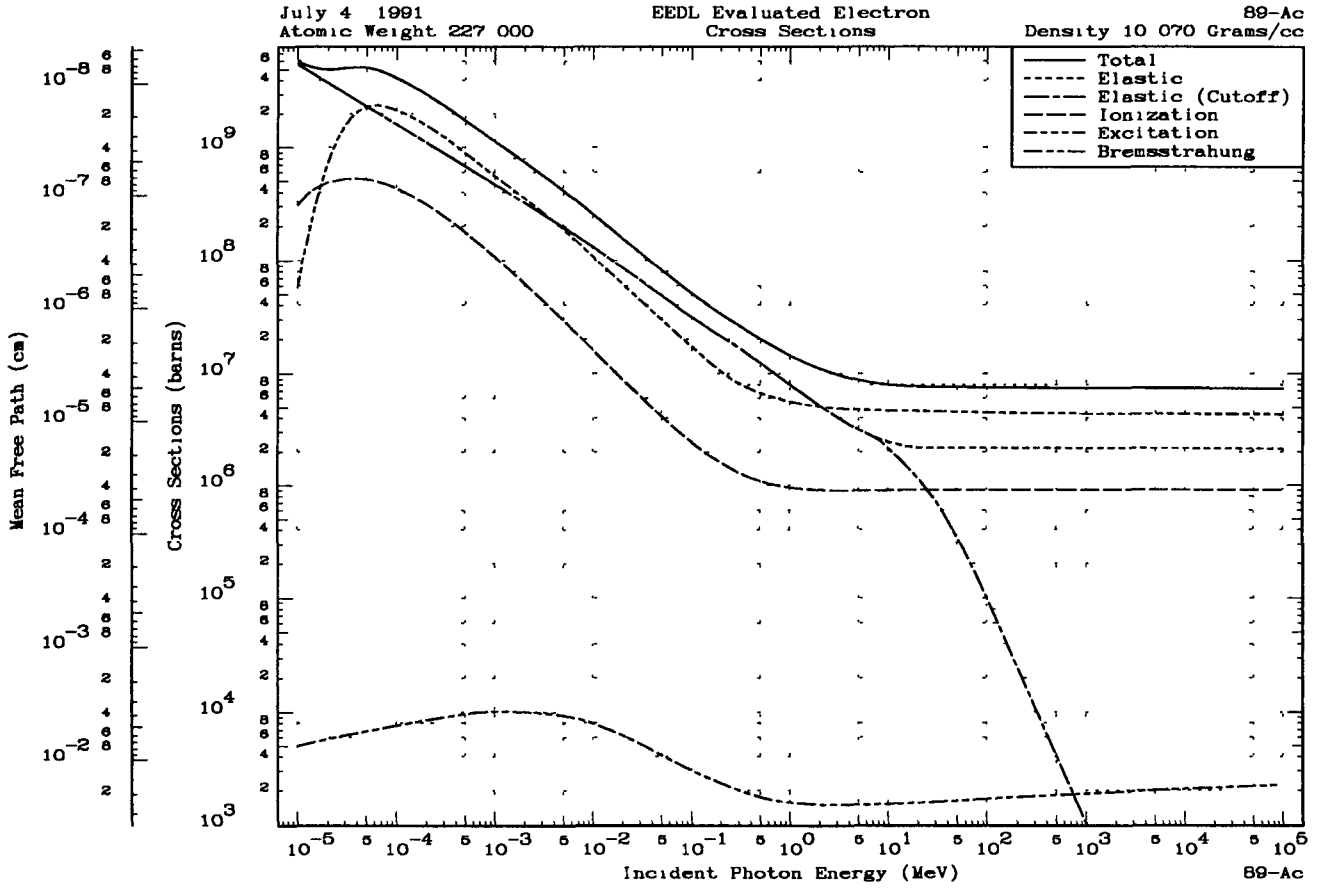
Atomic Weight 226.000 Density 5.000 Grams/cc

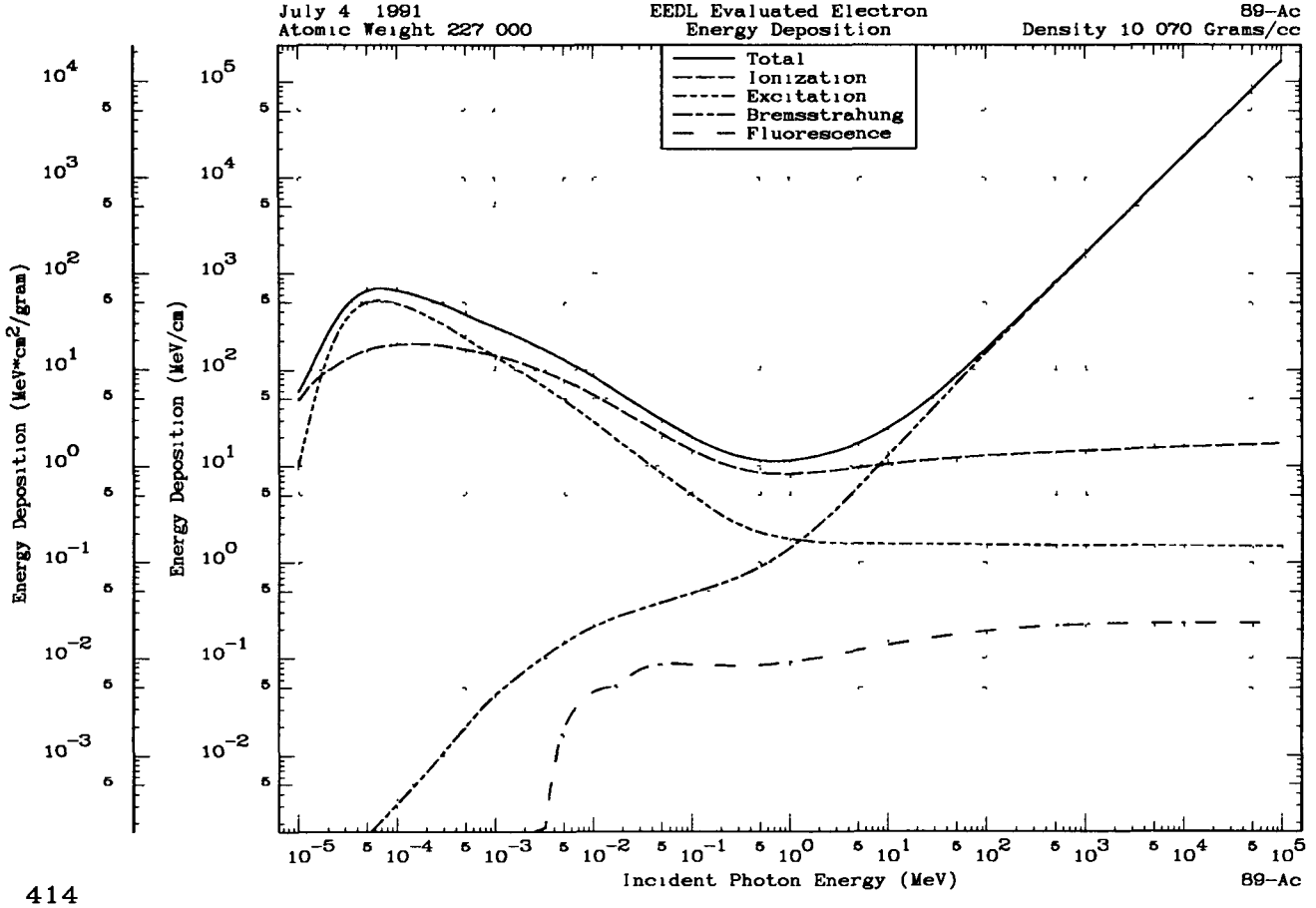
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.2500–4	3.4024–8	5.8782+6	9.1460–7	2.2060+9	8.4763+8	1.7566+8	1.1827+9	9.0106+3	2.1125+2	8.3569+1	1.2767+2	5.9110–3
	3.3438–4	3.4607–8	5.7791+6	9.5924–7	2.1688+9	8.3449+8	1.7268+8	1.1616+9	9.0463+3	2.0883+2	8.3281+1	1.2554+2	6.1103–3
	3.3848–4	3.4860–8	5.7372+6	9.7893–7	2.1531+9	8.2892+8	1.7142+8	1.1527+9	9.0616+3	2.0781+2	8.3161+1	1.2465+2	6.1977–3
	3.5000–4	3.5564–8	5.6236+6	1.0347–6	2.1104+9	8.1382+8	1.6802+8	1.1286+9	9.1039+3	2.0507+2	8.2847+1	1.2221+2	6.4441–3
	3.6250–4	3.6317–8	5.5070+6	1.0961–6	2.0667+9	7.9829+8	1.6454+8	1.1039+9	9.1484+3	2.0228+2	8.2555+1	1.1972+2	6.7127–3
	3.6924–4	3.6719–8	5.4468+6	1.1295–6	2.0441+9	7.9026+8	1.6275+8	1.0911+9	9.1719+3	2.0086+2	8.2422+1	1.1843+2	6.8581–3
	4.0000–4	3.8513–8	5.1931+6	1.2850–6	1.9489+9	7.5628+8	1.5528+8	1.0373+9	9.2745+3	1.9503+2	8.1993+1	1.1303+2	7.5263–3
	4.5000–4	4.1366–8	4.8349+6	1.5478–6	1.8145+9	7.0889+8	1.4396+8	9.6158+8	9.4117+3	1.8556+2	8.0278+1	1.0528+2	8.6642–3
	5.0000–4	4.4091–8	4.5360+6	1.8228–6	1.7023+9	6.6903+8	1.3470+8	8.9855+8	9.5361+3	1.7811+2	7.9250+1	9.8847+1	9.8189–3
	5.5000–4	4.6718–8	4.2810+6	2.1089–6	1.6066+9	6.3490+8	1.2652+8	8.4515+8	9.6417+3	1.7140+2	7.8055+1	9.3330+1	1.0980–2
	6.0000–4	4.9249–8	4.0610+6	2.4054–6	1.5240+9	6.0526+8	1.1957+8	7.9917+8	9.7390+3	1.6590+2	7.7300+1	8.8591+1	1.2154–2
N5	6.0306–4	4.9401–8	4.0485+6	2.4239–6	1.5193+9	6.0357+8	1.1915+8	7.9659+8	9.7442+3	1.6554+2	7.7210+1	8.8320+1	1.2226–2
	6.0921–4	4.9707–8	4.0236+6	2.4612–6	1.5100+9	6.0022+8	1.1832+8	7.9144+8	9.7546+3	1.6484+2	7.7043+1	8.7783+1	1.2370–2
	6.2114–4	5.0294–8	3.9766+6	2.5338–6	1.4923+9	5.9386+8	1.1675+8	7.8172+8	9.7743+3	1.6351+2	7.6736+1	8.6766+1	1.2650–2
N4	6.3677–4	5.1059–8	3.9171+6	2.6299–6	1.4700+9	5.8580+8	1.1477+8	7.6942+8	9.7998+3	1.6186+2	7.6367+1	8.5481+1	1.3018–2
	6.4350–4	5.1387–8	3.8921+6	2.6715–6	1.4606+9	5.8243+8	1.1394+8	7.6424+8	9.8085+3	1.6116+2	7.6210+1	8.4939+1	1.3171–2
	6.4697–4	5.1555–8	3.8793+6	2.6931–6	1.4558+9	5.8071+8	1.1351+8	7.6160+8	9.8129+3	1.6081+2	7.6129+1	8.4663+1	1.3250–2
	6.6610–4	5.2479–8	3.8111+6	2.8128–6	1.4302+9	5.7149+8	1.1126+8	7.4746+8	9.8371+3	1.5892+2	7.5719+1	8.3186+1	1.3686–2
	6.8262–4	5.3267–8	3.7546+6	2.9172–6	1.4090+9	5.6385+8	1.0941+8	7.3578+8	9.8575+3	1.5739+2	7.5408+1	8.1966+1	1.4064–2
	6.9957–4	5.4069–8	3.6990+6	3.0255–6	1.3882+9	5.5630+8	1.0759+8	7.2427+8	9.8779+3	1.5590+2	7.5121+1	8.0764+1	1.4453–2
	7.0000–4	5.4088–8	3.6976+6	3.0282–6	1.3877+9	5.5612+8	1.0755+8	7.2398+8	9.8784+3	1.5586+2	7.5114+1	8.0735+1	1.4462–2
	7.2468–4	5.5241–8	3.6205+6	3.1876–6	1.3587+9	5.4563+8	1.0504+8	7.0803+8	9.9074+3	1.5381+2	7.4726+1	7.9071+1	1.5029–2
	7.2500–4	5.5256–8	3.6195+6	3.1897–6	1.3583+9	5.4550+8	1.0501+8	7.0783+8	9.9077+3	1.5379+2	7.4721+1	7.9050+1	1.5037–2
	7.4131–4	5.6008–8	3.5709+6	3.2962–6	1.3401+9	5.3887+8	1.0343+8	6.9778+8	9.9263+3	1.5249+2	7.4474+1	7.8003+1	1.5413–2
	7.6234–4	5.6969–8	3.5107+6	3.4348–6	1.3175+9	5.3065+8	1.0148+8	6.8534+8	9.9498+3	1.5091+2	7.4186+1	7.6707+1	1.5898–2
	8.0000–4	5.8663–8	3.4093+6	3.6865–6	1.2794+9	5.1678+8	9.8233+7	6.6442+8	9.9904+3	1.4831+2	7.3766+1	7.4531+1	1.6770–2
N3	8.6731–4	6.1608–8	3.2464+6	4.1480–6	1.2183+9	4.9435+8	9.2732+7	6.3121+8	1.0020+4	1.4344+2	7.2425+1	7.1000+1	1.8141–2
	8.8390–4	6.2334–8	3.2085+6	4.2641–6	1.2041+9	4.8923+8	9.1489+7	6.2338+8	1.0027+4	1.4232+2	7.2131+1	7.0174+1	1.8479–2
	9.0000–4	6.3033–8	3.1729+6	4.3776–6	1.1907+9	4.8440+8	9.0322+7	6.1601+8	1.0033+4	1.4128+2	7.1863+1	6.9397+1	1.8808–2
	9.1292–4	6.3591–8	3.1451+6	4.4694–6	1.1803+9	4.8062+8	8.9412+7	6.1025+8	1.0038+4	1.4047+2	7.1656+1	6.8791+1	1.9072–2
	9.5646–4	6.5449–8	3.0558+6	4.7822–6	1.1468+9	4.6848+8	8.6511+7	5.9181+8	1.0055+4	1.3790+2	7.1029+1	6.6849+1	1.9962–2
	1.0000–3	6.7272–8	2.9730+6	5.1006–6	1.1157+9	4.5716+8	8.3841+7	5.7470+8	1.0072+4	1.3558+2	7.0508+1	6.5050+1	2.0854–2
N2	1.0486–3	6.9270–8	2.8873+6	5.4628–6	1.0835+9	4.4542+8	8.0969+7	5.5714+8	1.0064+4	1.3278+2	6.9602+1	6.3158+1	2.1657–2
	1.0625–3	6.9837–8	2.8638+6	5.5678–6	1.0747+9	4.4222+8	8.0190+7	5.5230+8	1.0061+4	1.3202+2	6.9361+1	6.2641+1	2.1887–2
	1.0627–3	6.9847–8	2.8634+6	5.5694–6	1.0746+9	4.4218+8	8.0178+7	5.5223+8	1.0061+4	1.3201+2	6.9358+1	6.2633+1	2.1890–2
	1.0900–3	7.0955–8	2.8187+6	5.7776–6	1.0578+9	4.3607+8	7.8700+7	5.4303+8	1.0057+4	1.3058+2	6.8907+1	6.1649+1	2.2341–2
	1.1250–3	7.2357–8	2.7641+6	6.0471–6	1.0373+9	4.2859+8	7.6905+7	5.3180+8	1.0051+4	1.2885+2	6.8378+1	6.0449+1	2.2919–2
	1.1413–3	7.3004–8	2.7396+6	6.1738–6	1.0281+9	4.2523+8	7.6102+7	5.2677+8	1.0049+4	1.2808+2	6.8145+1	5.9911+1	2.3187–2
	1.1719–3	7.4210–8	2.6950+6	6.4140–6	1.0114+9	4.1911+8	7.4649+7	5.1763+8	1.0044+4	1.2669+2	6.7732+1	5.8934+1	2.3692–2
N1	1.1897–3	7.4907–8	2.6700+6	6.5551–6	1.0020+9	4.1566+8	7.3835+7	5.1248+8	1.0042+4	1.2592+2	6.7506+1	5.8385+1	2.3986–2
	1.2091–3	7.5665–8	2.6432+6	6.7097–6	9.9196+8	4.1199+8	7.2944+7	5.0701+8	1.0039+4	1.2500+2	6.7174+1	5.7797+1	2.4306–2
	1.2455–3	7.7073–8	2.5949+6	7.0026–6	9.7384+8	4.0536+8	7.1343+7	4.9713+8	1.0034+4	1.2335+2	6.6587+1	5.6735+1	2.4906–2
	1.2646–3	7.7807–8	2.5705+6	7.1582–6	9.6465+8	4.0198+8	7.0535+7	4.9212+8	1.0031+4	1.2252+2	6.6296+1	5.6198+1	2.5221–2
	1.3091–3	7.9498–8	2.5158+6	7.5241–6	9.4413+8	3.9444+8	6.8738+7	4.8095+8	1.0026+4	1.2069+2	6.5664+1	5.4998+1	2.5954–2
	1.3125–3	7.9626–8	2.5117+6	7.5524–6	9.4261+8	3.9388+8	6.8604+7	4.8012+8	1.0025+4	1.2055+2	6.5617+1	5.4909+1	2.6010–2
	1.3359–3	8.0507–8	2.4843+6	7.7476–6	9.3229+8	3.9007+8	6.7706+7	4.7451+8	1.0022+4	1.1964+2	6.5303+1	5.4307+1	2.6396–2
	1.3823–3	8.2231–8	2.4322+6	8.1379–6	9.1275+8	3.8285+8	6.6009+7	4.6388+8	1.0016+4	1.1792+2	6.4721+1	5.3168+1	2.7159–2
	1.4045–3	8.3051–8	2.4082+6	8.3272–6	9.0374+8	3.7952+8	6.5232+7	4.5898+8	1.0013+4	1.1713+2	6.4461+1	5.2644+1	2.7526–2
	1.5000–3	8.6510–8	2.3119+6	9.1531–6	8.6760+8	3.6609+8	6.2135+7	4.3937+8	1.0002+4	1.1404+2	6.3469+1	5.0545+1	2.9096–2
	1.6250–3	9.0921–8	2.1997+6	1.0270–5	8.2552+8	3.5038+8	5.8409+7	4.1672+8	9.9783+3	1.0980+2	6.1690+1	4.8074+1	3.0990–2
	1.7500–3	9.5200–8	2.1008+6	1.1428–5	7.8841+8	3.3644+8	5.5173+7	3.9679+8	9.9563+3	1.0614+2	6.0204+1	4.5904+1	3.2881–2
	1.8125–3	9.7295–8	2.0556+6	1.2021–5	7.7144+8	3.3003+8	5.3707+7	3.8768+8	9.9459+3	1.0448+2	5.9537+1	4.4914+1	3.3825–2
	2.0000–3	1.0341–7	1.9340+6	1.3854–5	7.2578+8	3.1270+8	4.9816+7	3.6325+8	9.9167+3	1.0013+2	5.7836+1	4.2260+1	3.6653–2
	2.2500–3	1.1147–7	1.7942+6	1.6428–5	6.7332+8	2.9334+8	4.5356+7	3.3462+8	9.8504+3	9.4192+1	5.5063+1	3.9089+1	3.9954–2
	2.5000–3	1.1920–7	1.6779+6	1.9153–5	6.2968+8	2.7703+8	4.1721+7	3.1092+8	9.7914+3	8.9371+1	5.2859+1	3.6469+1	4.3240–2
	2.6250–3	1.2295–7	1.6267+6	2.0568–5	6.1046+8	2.6979+8	4.0142+7	3.0052+8	9.7643+3	8.7266+1	5.1900+1	3.5322+1	4.4878–2
	3.0000–3	1.3382–7	1.4945+6	2.5002–5	5.6087+8	2.5092+8	3.6133+7	2.7381+8	9.6903+3	8.1952+1	4.9524+1	3.2378+1	4.9771–2
M5	3.1113–3	1.3694–7	1.4605+6	2.6373–5	5.4809+8	2.4601+8	3.5080+7	2.6699+8	9.6617+3	8.0368+1	4.8705+1	3.1612+1	5.1086–2
	3.1391–3	1.3772–7	1.4523+6	2.6719–5	5.4501+8	2.4482+8	3.4828+7	2.6535+8	9.6547+3	7.9991+1	4.8511+1	3.1428+1	5.1414–2
	3.1929–3	1.3921–7	1.4367+6	2.7395–5	5.3917+8	2.4258+8	3.4352+7	2.6223+8	9.6414+3	7.9277+1	4.8145+1	3.1079+1	5.2048–2
M4	3.2587–3	1.4102–7	1.4182+6	2.8230–5	5.3224+8	2.3990+8	3.3788+7	2.5854+8	9.6254+3	7.8433+1	4.7714+1	3.0666+1	5.2824–2
	3.2819–3	1.4165–7	1.4119+6	2.8526–5	5.2986+8	2.3898+8	3.3595+7	2.5727+8	9.6199+3	7.8141+1	4.7564+1	3.0523+1	5.3096–2
	3.2938–3	1.4198–7	1.4086+6	2.8678–5	5.2864+8	2.3851+8	3.3496+7	2.5662+8	9.6171+3	7.7992+1	4.7488+1	3.0451+1	5.3236–2
	3.3716–3	1.4410–7	1.3879+6	2.9683–5	5.2086+8	2.3551+8	3.2867+7	2.5247+8	9.5989+3	7.7042+1	4.7002+1	2.9985+1	5.4152–2
	3.4703–3	1.4676–7	1.3627+6	3.0973–5	5.1141+8	2.3185+8	3.2107+7	2.4745+8	9.5764+3	7.5897+1	4.6420+1	2.9421+1	5.5310–2
	3.5287–3	1.4833–7	1.3484+6	3.1746–5	5.0603+8	2.2976+8	3.1676+7	2.4458+8	9.5634+3	7.5247+1	4.6090+1	2.9101+1	5.5994–2
M3	3.7737–3	1.5477–7	1.2922+6	3.5058–5	4.8495+8	2.2154+8	3.0002+7	2.3340+8	9.5115+3	7.2728+1	4.4820+1	2.7848+1	5.8858–2
	3.8303–3	1.5624–7	1.2801+6	3.5838–5	4.8038+8	2.1975+8	2.9643+7	2.3098+8	9.4990+3	7.2184+1	4.4547+1	2.7577+1	5.9504–2
	3.9151–3	1.5843–7	1.2624+6	3.7020–5	4.7374+8	2.1714+8	2.9122+7	2.2747+8	9.4806+3	7.1398+1	4.4155+1	2.7182+1	6.0472–2
	4.0000–3	1.6061–7	1.2453+6	3.8215–5	4.6733+8	2.1463+8	2.8621+7	2.2408+8	9.4626+3	7.0645+1	4.3781+1	2.6803+1	6.1438–2
	4.2500–3	1.6712–7	1.1968+6	4.1815–5	4.4912+8	2.0749+8	2.7227+7	2.1440+8	9.3756+3	6.8273+1	4.2511+1	2.5698+1	6.3747–2
	4.4375–3	1.7191–7	1.1634+6	4.4594–5	4.3660+8	2.0255+8	2.6276+7	2.0776+8	9.3141+3	6.6660+1	4.1654+1	2.4941+1	6.5470–2
M2	4.4820–3	1.7304–7	1.1558+6	4.5264–5	4.3376+8	2.0143+8	2.6062+7	2.0626+8	9.3000+3	6.6297+1	4.1461+1	2.4769+1	6.5878–2
	4.5467–3	1.7473–7	1.1446+6	4.6244–5	4.2956+8	1.9982+8	2.5756+7	2.0397+8	9.2797+3	6.5762+1	4.1186+1	2.4510+1	6.6471–2
	4.6601–3	1.7767–7	1.1257+6	4.7979–5	4.2245+8	1.9710+8	2.5241+7	2.0011+8	9.2449+3	6.4861+1	4.0722+1	2.4071+1	6.7506–2
	4.7187–3	1.7918–7	1.1162+6	4.8887–5	4.1889+8	1.9573+8	2.4983+7	1.9817+8	9.2273+3	6.4410+1	4.0491+1	2.3852+1	6.8042–2
M1	4.7951–3	1.8114–7	1.1041+6	5.0078–5	4.1436+8	1.9398+8	2.4656+7	1.9572+8	9.2048+3	6.3840+1	4.0198+1	2.3573+1	6.8737–2
	4.8300–3	1.8203–7	1.0987+6	5.0626–5	4.1232+8	1.9320+8	2.4509+7	1.9461+8	9.1946+3	6.3585+1	4.0068+1	2.3448+1	6.9055–2
	4.8976–3	1.8376–7	1.0884+6	5.1692–5	4.0845+8	1.9171+8	2.4232+7	1.9250+8	9.1751+3	6.3102+1	3.9822+1	2.3211+1	6.9669–2
	5.0000–3	1.8636–7	1.0732+6	5.3325–5	4.0274+8	1.8951+8	2.3824+7	1.8940+8	9.1462+3	6.2393+1	3.9461+1	2.2861+1	7.0598–2

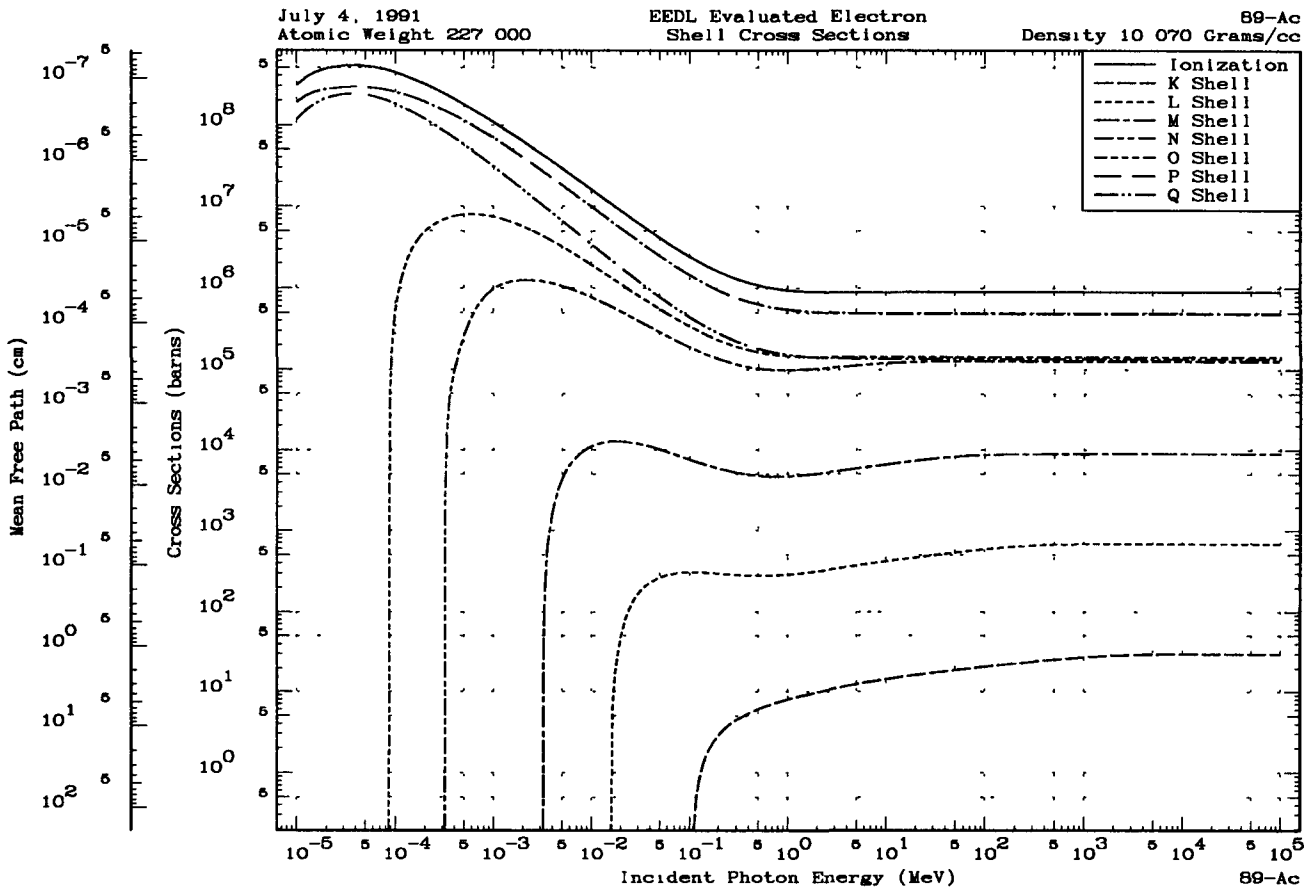
Atomic Weight 226.000 Density 5.000 Grams/cc

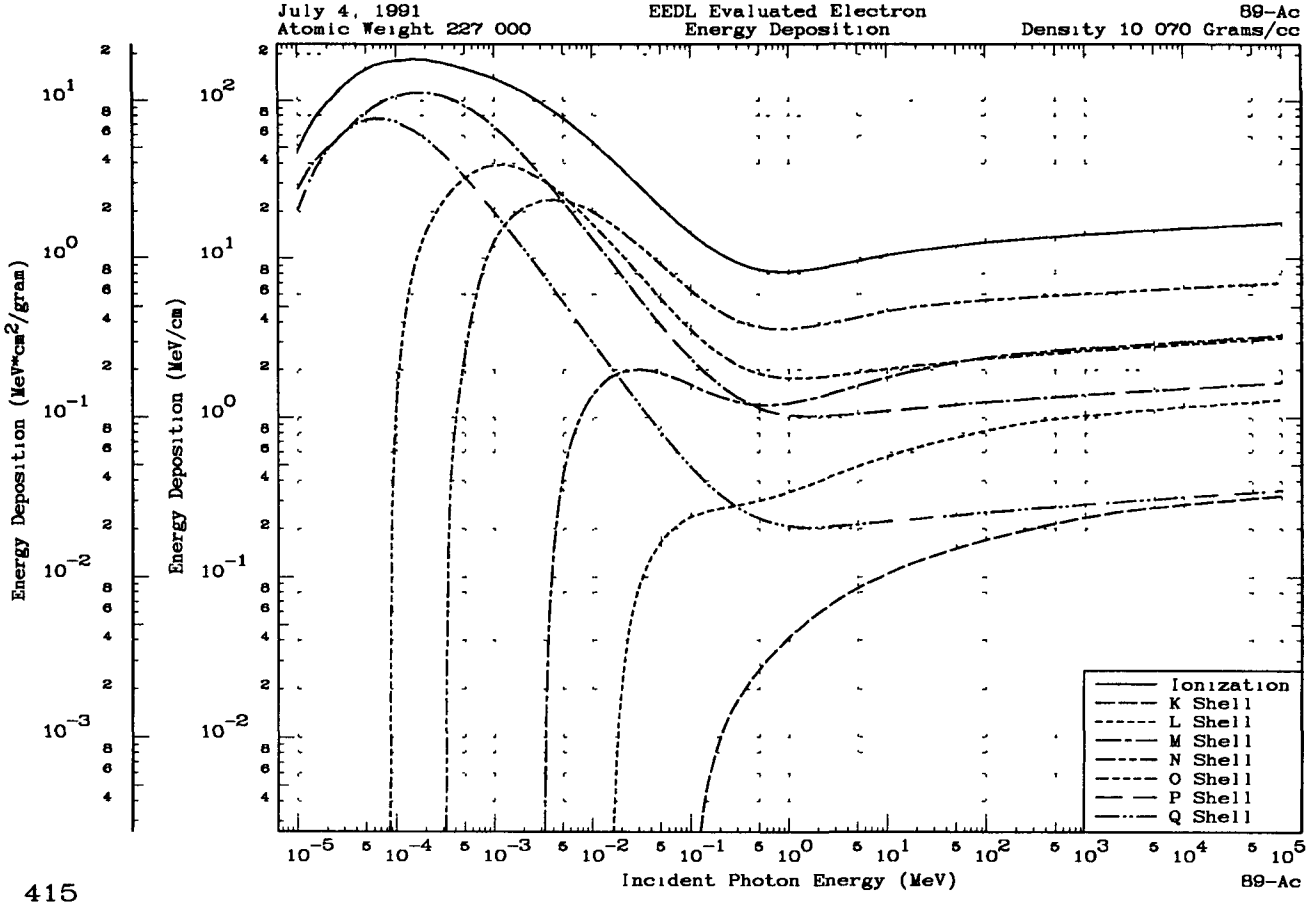
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.2500–3	1.9264–7	1.0382+6	5.7388–5	3.8963+8	1.8435+8	2.2880+7	1.8239+8	9.0768+3	6.0668+1	3.8540+1	2.2056+1	7.2832–2
5.4375–3	1.9727–7	1.0138+6	6.0509–5	3.8047+8	1.8072+8	2.2225+7	1.7751+8	9.0272+3	5.9474+1	3.7905+1	2.1495+1	7.4500–2
5.5000–3	1.9881–7	1.0060+6	6.1564–5	3.7753+8	1.7956+8	2.2016+7	1.7595+8	9.0111+3	5.9094+1	3.7703+1	2.1316+1	7.5055–2
5.6250–3	2.0186–7	9.9079+5	6.3692–5	3.7183+8	1.7729+8	2.1611+7	1.7292+8	8.9796+3	5.8354+1	3.7310+1	2.0968+1	7.6162–2
6.0000–3	2.1087–7	9.4844+5	7.0234–5	3.5593+8	1.7094+8	2.0489+7	1.6450+8	8.8895+3	5.6314+1	3.6232+1	2.0002+1	7.9467–2
6.5000–3	2.2269–7	8.9812+5	7.9328–5	3.3705+8	1.6327+8	1.9163+7	1.5461+8	8.7284+3	5.3672+1	3.4732+1	1.8856+1	8.2933–2
7.0000–3	2.3420–7	8.5397+5	8.8848–5	3.2048+8	1.5648+8	1.8014+7	1.4598+8	8.5819+3	5.1387+1	3.3442+1	1.7858+1	8.6364–2
7.2500–3	2.3985–7	8.3385+5	9.3762–5	3.1293+8	1.5337+8	1.7495+7	1.4206+8	8.5133+3	5.0350+1	3.2857+1	1.7405+1	8.8067–2
8.0000–3	2.5642–7	7.7997+5	1.0908–4	2.9271+8	1.4495+8	1.6118+7	1.3163+8	8.3240+3	4.7609+1	3.1316+1	1.6200+1	9.3126–2
9.0000–3	2.7857–7	7.1794+5	1.3086–4	2.6943+8	1.3522+8	1.4601+7	1.1961+8	8.0577+3	4.4262+1	2.9375+1	1.4789+1	9.8711–2
1.0000–2	2.9996–7	6.6676+5	1.5418–4	2.5022+8	1.2706+8	1.3367+7	1.0979+8	7.8266+3	4.1536+1	2.7794+1	1.3638+1	1.0420–1
1.1250–2	3.2601–7	6.1348+5	1.8543–4	2.3023+8	1.1836+8	1.2105+7	9.9755+7	7.5243+3	3.8501+1	2.5947+1	1.2445+1	1.0945–1
1.2500–2	3.5118–7	5.6951+5	2.1898–4	2.1373+8	1.1108+8	1.1079+7	9.1561+7	7.2637+3	3.6032+1	2.4446+1	1.1471+1	1.1461–1
1.3125–2	3.6346–7	5.5026+5	2.3659–4	2.0650+8	1.0786+8	1.0635+7	8.7998+7	7.1461+3	3.4955+1	2.3790+1	1.1048+1	1.1715–1
1.5000–2	3.9928–7	5.0091+5	2.9244–4	1.8798+8	9.9526+7	9.5077+6	7.8940+7	6.8340+3	3.2227+1	2.2129+1	9.9734+0	1.2466–1
L3 1.5456–2	4.0777–7	4.9047+5	3.0673–4	1.8406+8	9.7732+7	9.2718+6	7.7054+7	6.7569+3	3.1608+1	2.1737+1	9.7455+0	1.2611–1
1.6024–2	4.1838–7	4.7803+5	3.2491–4	1.7940+8	9.5569+7	8.9957+6	7.4826+7	6.6648+3	3.0879+1	2.1274+1	9.4768+0	1.2787–1
1.7018–2	4.3668–7	4.5800+5	3.5772–4	1.7188+8	9.2068+7	8.5536+6	7.1253+7	6.5141+3	2.9711+1	2.0534+1	9.0462+0	1.3093–1
L2 1.8560–2	4.6443–7	4.3064+5	4.1106–4	1.6161+8	8.7248+7	7.9549+6	6.6401+7	6.3028+3	2.8129+1	1.9531+1	8.4619+0	1.3562–1
1.8920–2	4.7082–7	4.2479+5	4.2393–4	1.5942+8	8.6211+7	7.8283+6	6.5371+7	6.2544+3	2.7789+1	1.9315+1	8.3373+0	1.3653–1
L1 1.9232–2	4.7632–7	4.1988+5	4.3522–4	1.5757+8	8.5339+7	7.7222+6	6.4507+7	6.2135+3	2.7504+1	1.9134+1	8.2327+0	1.3731–1
1.9460–2	4.8034–7	4.1637+5	4.4354–4	1.5626+8	8.4715+7	7.6466+6	6.3889+7	6.1842+3	2.7301+1	1.9005+1	8.1582+0	1.3789–1
2.0000–2	4.8980–7	4.0833+5	4.6349–4	1.5324+8	8.3284+7	7.4740+6	6.2474+7	6.1166+3	2.6838+1	1.8711+1	7.9877+0	1.3924–1
2.1250–2	5.1176–7	3.9081+5	5.1101–4	1.4666+8	8.0168+7	7.1085+6	5.9382+7	5.9576+3	2.5776+1	1.8026+1	7.6085+0	1.4186–1
2.2500–2	5.3334–7	3.7499+5	5.6042–4	1.4073+8	7.7336+7	6.7804+6	5.6606+7	5.8115+3	2.4823+1	1.7410+1	7.2683+0	1.4448–1
2.3438–2	5.4930–7	3.6410+5	5.9870–4	1.3664+8	7.5375+7	6.5555+6	5.4704+7	5.7093+3	2.4170+1	1.6988+1	7.0352+0	1.4643–1
2.5000–2	5.7549–7	3.4753+5	6.6470–4	1.3042+8	7.2376+7	6.2152+6	5.1826+7	5.5514+3	2.3181+1	1.6348+1	6.6827+0	1.4965–1
2.6250–2	5.9609–7	3.3552+5	7.1948–4	1.2591+8	7.0188+7	5.9698+6	4.9751+7	5.4350+3	2.2466+1	1.5885+1	6.4288+0	1.5221–1
2.6719–2	6.0375–7	3.3127+5	7.4046–4	1.2432+8	6.9411+7	5.8832+6	4.9019+7	5.3933+3	2.2214+1	1.5722+1	6.3392+0	1.5317–1
3.0000–2	6.5625–7	3.0476+5	8.9361–4	1.1437+8	6.4532+7	5.3471+6	4.4488+7	5.1286+3	2.0654+1	1.4710+1	5.7850+0	1.5976–1
3.5000–2	7.3352–7	2.7266+5	1.1480–3	1.0232+8	5.8513+7	4.7214+6	3.9084+7	4.7750+3	1.8684+1	1.3404+1	5.1126+0	1.6743–1
4.0000–2	8.0761–7	2.4764+5	1.4271–3	9.2936+7	5.3755+7	4.2394+6	3.4937+7	4.4885+3	1.7166+1	1.2394+1	4.5972+0	1.7495–1
4.5000–2	8.7900–7	2.2753+5	1.7295–3	8.5389+7	4.9875+7	3.8643+6	3.1645+7	4.2484+3	1.5920+1	1.1555+1	4.1833+0	1.8125–1
5.0000–2	9.4807–7	2.1096+5	2.0541–3	7.9168+7	4.6642+7	3.5572+6	2.8964+7	4.0445+3	1.4902+1	1.0868+1	3.8466+0	1.8746–1
6.0000–2	1.0798–6	1.8522+5	2.7637–3	6.9508+7	4.1535+7	3.0939+6	2.4875+7	3.7197+3	1.3313+1	9.7871+0	3.3279+0	1.9823–1
8.0000–2	1.3222–6	1.5126+5	4.3988–3	5.6764+7	3.4630+7	2.5035+6	1.9627+7	3.2680+3	1.1211+1	8.3375+0	2.6560+0	2.1706–1
1.0000–1	1.5328–6	1.3048+5	6.2942–3	4.8968+7	3.0146+7	2.1430+6	1.6676+7	2.9654+3	9.9189+0	7.4095+0	2.2766+0	2.3282–1
K 1.0432–1	1.5747–6	1.2701+5	6.7346–3	4.7663+7	2.9401+7	2.0844+6	1.6175+7	2.9120+3	9.7006+0	7.2535+0	2.2110+0	2.3601–1
1.0575–1	1.5882–6	1.2593+5	6.8822–3	4.7258+7	2.9174+7	2.0665+6	1.6015+7	2.8967+3	9.6326+0	7.2055+0	2.1902+0	2.3694–1
1.0851–1	1.6142–6	1.2390+5	7.1713–3	4.6498+7	2.8747+7	2.0329+6	1.5716+7	2.8679+3	9.5051+0	7.1152+0	2.1511+0	2.3876–1
1.1370–1	1.6622–6	1.2032+5	7.7235–3	4.5155+7	2.7990+7	1.9736+6	1.5189+7	2.8166+3	9.2804+0	6.9558+0	2.0824+0	2.4216–1
1.2277–1	1.7442–6	1.1466+5	8.7205–3	4.3031+7	2.6788+7	1.8798+6	1.4360+7	2.7342+3	8.9263+0	6.7037+0	1.9744+0	2.4812–1
1.3639–1	1.8631–6	1.0735+5	1.0286–2	4.0286+7	2.5226+7	1.7586+6	1.3298+7	2.6253+3	8.4715+0	6.3782+0	1.8363+0	2.5701–1
1.5000–1	1.9775–6	1.0114+5	1.1930–2	3.7955+7	2.3892+7	1.6558+6	1.2405+7	2.5304+3	8.0885+0	6.1024+0	1.7203+0	2.6583–1
1.7500–1	2.1630–6	9.2464+4	1.5125–2	3.4700+7	2.1999+7	1.5193+6	1.1179+7	2.3886+3	7.5658+0	5.7272+0	1.5588+0	2.7980–1
2.0000–1	2.3375–6	8.5561+4	1.8523–2	3.2109+7	2.0481+7	1.4103+6	1.0215+7	2.2721+3	7.1547+0	5.4288+0	1.4323+0	2.9362–1
2.2500–1	2.4939–6	8.0195+4	2.2088–2	3.0096+7	1.9209+7	1.3350+6	9.5492+6	2.1820+3	6.8698+0	5.2196+0	1.3442+0	3.0605–1
2.6250–1	2.7145–6	7.3679+4	2.7688–2	2.7650+7	1.7663+7	1.2426+6	8.7425+6	2.0694+3	6.5269+0	4.9644+0	1.2380+0	3.2450–1
3.0000–1	2.9212–6	6.8464+4	3.3556–2	2.5694+7	1.6425+7	1.1677+6	8.0990+6	1.9766+3	6.2562+0	4.7600+0	1.1536+0	3.4265–1
4.0000–1	3.4040–6	5.8754+4	5.0054–2	2.2049+7	1.3878+7	1.0503+6	7.1196+6	1.8180+3	5.8708+0	4.4554+0	1.0256+0	3.8983–1
5.0000–1	3.8123–6	5.2462+4	6.7336–2	1.9688+7	1.2111+7	9.8347+5	6.5915+6	1.7205+3	5.7023+0	4.3070+0	9.5813–1	4.3708–1
6.0000–1	4.1850–6	4.7790+4	8.5023–2	1.7935+7	1.0798+7	9.4021+5	6.1947+6	1.6578+3	5.6059+0	4.2137+0	9.0725–1	4.8495–1
8.0000–1	4.7992–6	4.1673+4	1.2073–1	1.5639+7	8.9989+6	8.9212+5	5.7466+6	1.5835+3	5.5977+0	4.1633+0	8.5183–1	5.8249–1
1.0000+0	5.3137–6	3.7639+4	1.5629–1	1.4125+7	7.8109+6	8.6565+5	5.4471+6	1.5442+3	5.6498+0	4.1517+0	8.1487–1	6.8324–1
1.5000+0	6.2582–6	3.1958+4	2.4223–1	1.1993+7	6.0534+6	8.4189+5	5.0965+6	1.4980+3	5.9901+0	4.2701+0	7.7556–1	9.4448–1
2.0000+0	6.9282–6	2.8867+4	3.2329–1	1.0833+7	5.0783+6	8.3467+5	4.9190+6	1.4804+3	6.3491+0	4.3778+0	7.5537–1	1.2160+0
3.0000+0	7.8208–6	2.5573+4	4.7229–1	9.5970+6	4.0313+6	8.2846+5	4.7357+6	1.4686+3	7.0877+0	4.5686+0	7.4081–1	1.7783+0
4.0000+0	8.3957–6	2.3822+4	6.0648–1	8.9399+6	3.4672+6	8.2980+5	4.6414+6	1.4707+3	7.8279+0	4.7246+0	7.3066–1	2.3727+0
5.0000+0	8.7737–6	2.2795+4	7.2852–1	8.5547+6	3.1216+6	8.3163+5	4.6000+6	1.4743+3	8.5716+0	4.8606+0	7.2874–1	2.9823+0
6.0000+0	9.0482–6	2.2104+4	8.4041–1	8.2951+6	2.8898+6	8.3322+5	4.5706+6	1.4787+3	9.3142+0	4.9792+0	7.2867–1	3.6063+0
8.0000+0	9.4464–6	2.1172+4	1.0398+0	7.9455+6	2.5938+6	8.3764+5	4.5125+6	1.4889+3	1.0784+1	5.1626+0	7.2853–1	4.8928+0
1.0000+1	9.6802–6	2.0661+4	1.2137+0	7.7536+6	2.4237+6	8.4062+5	4.4877+6	1.4993+3	1.2254+1	5.3080+0	7.2843–1	6.2176+0
1.5000+1	9.9371–6	2.0127+4	1.5709+0	7.5531+6	2.2322+6	8.4514+5	4.4742+6	1.5223+3	1.5899+1	5.5358+0	7.2984–1	9.6337+0
2.0000+1	1.0033–5	1.9935+4	1.8535+0	7.4811+6	2.1727+6	8.4843+5	4.4584+6	1.5416+3	1.9604+1	5.7182+0	7.3084–1	1.3155+1
3.0000+1	1.0079–5	1.9843+4	2.2855+0	7.4467+6	2.1709+6	8.5065+5	4.4235+6	1.5660+3	2.7100+1	5.9149+0	7.3225–1	2.0453+1
4.0000+1	1.0092–5	1.9819+4	2.6108+0	7.4376+6	2.1704+6	8.5236+5	4.4132+6	1.5870+3	3.4689+1	6.0704+0	7.3159–1	2.7887+1
5.0000+1	1.0118–5	1.9767+4	2.8712+0	7.4181+6	2.1696+6	8.5340+5	4.3935+6	1.6063+3	4.2366+1	6.1857+0	7.2935–1	3.5451+1
6.0000+1	1.0142–5	1.9721+4	3.0880+0	7.4008+6	2.1690+6	8.5385+5	4.3763+6	1.6219+3	5.0106+1	6.2641+0	7.2752–1	4.3114+1
8.0000+1	1.0183–5	1.9641+4	3.4354+0	7.3710+6	2.1680+6	8.5458+5	4.3468+6	1.6467+3	6.5762+1	6.3989+0	7.2464–1	5.8639+1
1.0000+2	1.0218–5	1.9573+4	3.7079+0	7.3452+6	2.1672+6	8.5507+5	4.3213+6	1.6678+3	8.1557+1	6.5062+0	7.2242–1	7.4329+1
1.5000+2	1.0265–5	1.9483+4	4.2075+0	7.3117+6	2.1658+6	8.5540+5	4.2888+6	1.7023+3	1.2124+2	6.6324+0	7.1718–1	1.1389+2
2.0000+2	1.0281–5	1.9453+4	4.5638+0	7.3005+6	2.1648+6	8.5563+5	4.2784+6	1.7248+3	1.6132+2	6.7452+0	7.1562–1	1.5386+2
3.0000+2	1.0300–5	1.9417+4	5.0675+0	7.2870+6	2.1634+6	8.5582+5	4.2660+6	1.7535+3	2.4111+2	6.9006+0	7.1393–1	2.3349+2
4.0000+2	1.0316–5	1.9387+4	5.4257+0	7.2757+6	2.1624+6	8.5592+5	4.2556+6	1.7737+3	3.2101+2	6.9971+0	7.1257–1	3.1330+2
5.0000+2	1.0334–5	1.9354+4	5.7037+0	7.2633+6	2.1616+6	8.5597+5	4.2439+6	1.7895+3	4.0151+2	7.0685+0	7.1098–1	3.9373+2
6.0000+2	1.0343–5	1.9338+4	5.9309+0	7.2571+6	2.1610+6	8.5600+5	4.2383+6	1.8026+3	4.8116+2	7.1310+0	7.1041–1	4.7332+2
8.0000+2	1.0360–5	1.9306+4	6.2895+0	7.2451+6	2.1600+6	8.5603+5	4.2273+6	1.8234+3	6.4193+2	7.2348+0	7.0932–1	6.3399+2
1.0000+3	1.0374–5	1.9280+4	6.5676+0	7.2353+6	2.1592+6	8.5604+5	4.2182+6	1.8399+3	8.0251+2	7.3256+0	7.0853–1	7.9447+2
1.5000+3	1.0386–5	1.9257+4	7.0723+0	7.2267+6	2.1578+6	8.5605+5	4.2110+6	1.8704+3	1.2062+3	7.4122+0	7.0735–1	1.1981+3
2.0000+3	1.0396–5	1.9238+4	7.4301+0	7.2197+6	2.1568+6	8.5606+5	4.2050+6	1.8930+3	1.6077+3	7.4969+0	7.0635–1	1.5995+3

Atomic Weight 226.000												Density 5.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+3	1.0408–5	1.9215+4	7.9344+0	7.2111+6	2.1554+6	8.5607+5	4.1977+6	1.9257+3	2.4124+3	7.6583+0	7.0516–1	2.4040+3
4.0000+3	1.0418–5	1.9197+4	8.2921+0	7.2043+6	2.1544+6	8.5607+5	4.1918+6	1.9496+3	3.2176+3	7.7296+0	7.0421–1	3.2092+3
5.0000+3	1.0431–5	1.9174+4	8.5691+0	7.1957+6	2.1537+6	8.5607+5	4.1840+6	1.9683+3	4.0313+3	7.7839+0	7.0292–1	4.0228+3
6.0000+3	1.0434–5	1.9168+4	8.7954+0	7.1935+6	2.1530+6	8.5607+5	4.1824+6	1.9820+3	4.8313+3	7.8381+0	7.0269–1	4.8228+3
8.0000+3	1.0441–5	1.9155+4	9.1526+0	7.1884+6	2.1520+6	8.5607+5	4.1783+6	2.0038+3	6.4454+3	7.9440+0	7.0206–1	6.4368+3
1.0000+4	1.0447–5	1.9145+4	9.4292+0	7.1847+6	2.1513+6	8.5607+5	4.1753+6	2.0209+3	8.0746+3	8.0336+0	7.0162–1	8.0659+3
1.5000+4	1.0455–5	1.9130+4	9.9322+0	7.1790+6	2.1499+6	8.5607+5	4.1711+6	2.0536+3	1.2073+4	8.1135+0	7.0090–1	1.2064+4
2.0000+4	1.0461–5	1.9118+4	1.0289+1	7.1748+6	2.1489+6	8.5607+5	4.1678+6	2.0771+3	1.6123+4	8.1932+0	7.0035–1	1.6114+4
3.0000+4	1.0467–5	1.9107+4	1.0793+1	7.1707+6	2.1475+6	8.5607+5	4.1650+6	2.1101+3	2.4131+4	8.3494+0	6.9989–1	2.4122+4
4.0000+4	1.0473–5	1.9098+4	1.1150+1	7.1670+6	2.1465+6	8.5607+5	4.1623+6	2.1337+3	3.2225+4	8.4138+0	6.9943–1	3.2216+4
5.0000+4	1.0481–5	1.9082+4	1.1427+1	7.1610+6	2.1457+6	8.5607+5	4.1570+6	2.1519+3	4.0243+4	8.4782+0	6.9856–1	4.0234+4
6.0000+4	1.0482–5	1.9081+4	1.1654+1	7.1606+6	2.1451+6	8.5607+5	4.1573+6	2.1668+3	4.8256+4	8.5287+0	6.9861–1	4.8246+4
8.0000+4	1.0485–5	1.9075+4	1.2011+1	7.1585+6	2.1441+6	8.5607+5	4.1561+6	2.1904+3	6.4419+4	8.6296+0	6.9841–1	6.4410+4
1.0000+5	1.0488–5	1.9069+4	1.2288+1	7.1562+6	2.1433+6	8.5607+5	4.1546+6	2.2088+3	8.0612+4	8.7256+0	6.9815–1	8.0603+4


July 4 1991
Atomic Weight 227 000
EEDL Evaluated Electron
Cross Sections
89-Ac
Density 10 070 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
89-Ac


July 4 1991
Atomic Weight 227 000
EEDL Evaluated Electron
Energy Deposition
89-Ac
Density 10 070 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
89-Ac


July 4, 1991
Atomic Weight 227 000
EEDL Evaluated Electron
Shell Cross Sections
89-Ac
Density 10 070 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
89-Ac


July 4, 1991
Atomic Weight 227 000
EEDL Evaluated Electron
Energy Deposition
89-Ac
Density 10 070 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
89-Ac

415

Atomic Weight 227.000 — Density 10.070 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	6.3571–9	1.5621+7		5.8882+9	5.5218+9	3.0806+8	5.8349+7	4.9926+3	5.8003+1	4.8055+1	9.9484+0	2.8832–4
	1.1250–5	6.6528–9	1.4927+7		5.6265+9	5.1847+9	3.4426+8	9.7503+7	5.1143+3	7.3120+1	5.6008+1	1.7112+1	3.2326–4
	1.2500–5	6.8995–9	1.4393+7		5.4254+9	4.9007+9	3.8042+8	1.4427+8	5.2256+3	9.0483+1	6.4443+1	2.6040+1	3.5883–4
	1.3125–5	7.0049–9	1.4177+7		5.3438+9	4.7745+9	3.9284+8	1.7644+8	5.2780+3	1.0002+2	6.7730+1	3.2287+1	3.7683–4
	1.5000–5	7.2439–9	1.3709+7		5.1674+9	4.4454+9	4.2913+8	2.9283+8	5.4241+3	1.3365+2	7.7863+1	5.5783+1	4.3168–4
	1.7500–5	7.4312–9	1.3363+7		5.0372+9	4.0937+9	4.6009+8	4.8343+8	5.5978+3	1.8300+2	8.8324+1	9.4677+1	5.0661–4
	2.0000–5	7.4951–9	1.3249+7		4.9942+9	3.8115+9	4.8458+8	6.9808+8	5.7527+3	2.3847+2	9.8024+1	1.4045+2	5.8344–4
P3	2.1950–5	7.4823–9	1.3272+7		5.0028+9	3.6265+9	4.9366+8	8.8258+8	5.8553+3	2.8292+2	1.0321+2	1.7971+2	6.4126–4
	2.2202–5	7.4821–9	1.3272+7		5.0029+9	3.6045+9	4.9478+8	9.0362+8	5.8674+3	2.8816+2	1.0399+2	1.8417+2	6.4852–4
	2.2689–5	7.4791–9	1.3278+7		5.0049+9	3.5629+9	4.9689+8	9.4512+8	5.8904+3	2.9848+2	1.0550+2	1.9298+2	6.6262–4
	2.3603–5	7.4645–9	1.3304+7		5.0147+9	3.4884+9	5.0073+8	1.0255+9	5.9326+3	3.1840+2	1.0829+2	2.1011+2	6.8917–4
	2.5000–5	7.4211–9	1.3381+7		5.0440+9	3.3828+9	5.0624+8	1.1550+9	5.9946+3	3.5036+2	1.1247+2	2.3788+2	7.3006–4
	2.5202–5	7.4127–9	1.3396+7		5.0497+9	3.3683+9	5.0708+8	1.1744+9	6.0033+3	3.5512+2	1.1306+2	2.4206+2	7.3600–4
	2.7601–5	7.3594–9	1.3494+7		5.0863+9	3.2084+9	5.1594+8	1.3620+9	6.1028+3	4.0276+2	1.1951+2	2.8324+2	8.0709–4
P2	2.9310–5	7.2948–9	1.3613+7		5.1314+9	3.1069+9	5.2234+8	1.5021+9	6.1695+3	4.3873+2	1.2438+2	3.1435+2	8.5831–4
	2.9655–5	7.2832–9	1.3635+7		5.1395+9	3.0876+9	5.2346+8	1.5285+9	6.1825+3	4.4557+2	1.2540+2	3.2017+2	8.6870–4
	3.0000–5	7.2709–9	1.3658+7		5.1482+9	3.0685+9	5.2459+8	1.5551+9	6.1955+3	4.5246+2	1.2643+2	3.2603+2	8.7912–4
	3.1250–5	7.2538–9	1.3690+7		5.1604+9	3.0023+9	5.2519+8	1.6329+9	6.2413+3	4.7193+2	1.2883+2	3.4310+2	9.1701–4
	3.2344–5	7.2335–9	1.3729+7		5.1749+9	2.9475+9	5.2582+8	1.7015+9	6.2803+3	4.8920+2	1.3101+2	3.5820+2	9.5035–4
	3.4258–5	7.1873–9	1.3817+7		5.2081+9	2.8583+9	5.2717+8	1.8227+9	6.3459+3	5.1996+2	1.3497+2	3.8499+2	1.0091–3
	3.5000–5	7.1662–9	1.3857+7		5.2235+9	2.8257+9	5.2775+8	1.8700+9	6.3705+3	5.3205+2	1.3655+2	3.9550+2	1.0321–3
	3.8565–5	7.1507–9	1.3887+7		5.2347+9	2.6829+9	5.2953+8	2.0223+9	6.4832+3	5.7380+2	1.4344+2	4.3036+2	1.1433–3
	4.0000–5	7.1377–9	1.3913+7		5.2443+9	2.6310+9	5.3047+8	2.0829+9	6.5261+3	5.9073+2	1.4638+2	4.4435+2	1.1885–3
P1	4.5170–5	7.1582–9	1.3873+7		5.2293+9	2.4654+9	5.2455+8	2.2394+9	6.6658+3	6.3320+2	1.5300+2	4.8020+2	1.3498–3
	4.5774–5	7.1656–9	1.3859+7		5.2239+9	2.4479+9	5.2390+8	2.2520+9	6.6804+3	6.3699+2	1.5377+2	4.8321+2	1.3682–3
	4.6830–5	7.1777–9	1.3835+7		5.2151+9	2.4183+9	5.2281+8	2.2740+9	6.7055+3	6.4359+2	1.5514+2	4.8845+2	1.4005–3
	4.8415–5	7.1940–9	1.3804+7		5.2033+9	2.3756+9	5.2131+8	2.3064+9	6.7423+3	6.5344+2	1.5724+2	4.9620+2	1.4491–3
	5.0000–5	7.2080–9	1.3777+7		5.1932+9	2.3350+9	5.1994+8	2.3382+9	6.7781+3	6.6324+2	1.5940+2	5.0384+2	1.4979–3
	5.2500–5	7.2775–9	1.3645+7		5.1436+9	2.2749+9	5.1609+8	2.3526+9	6.8328+3	6.6997+2	1.6172+2	5.0825+2	1.5754–3
	5.5000–5	7.3426–9	1.3524+7		5.0979+9	2.2190+9	5.1257+8	2.3664+9	6.8853+3	6.7667+2	1.6411+2	5.1256+2	1.6535–3
	5.6250–5	7.3737–9	1.3467+7		5.0765+9	2.1925+9	5.1088+8	2.3731+9	6.9108+3	6.7998+2	1.6531+2	5.1467+2	1.6927–3
	6.0000–5	7.4615–9	1.3309+7		5.0167+9	2.1181+9	5.0621+8	2.3924+9	6.9845+3	6.8985+2	1.6899+2	5.2086+2	1.8111–3
	6.5000–5	7.5847–9	1.3093+7		4.9352+9	2.0294+9	4.9562+8	2.4102+9	7.0771+3	6.9725+2	1.7108+2	5.2616+2	1.9706–3
	7.0000–5	7.7823–9	1.2760+7		4.8100+9	1.9505+9	4.8634+8	2.3731+9	7.1640+3	6.9300+2	1.7353+2	5.1947+2	2.1320–3
	8.0000–5	8.1495–9	1.2185+7		4.5932+9	1.8161+9	4.6947+8	2.3076+9	7.3231+3	6.8579+2	1.7791+2	5.0788+2	2.4598–3
O5	8.6380–5	8.3776–9	1.1854+7		4.4681+9	1.7431+9	4.5688+8	2.2682+9	7.4161+3	6.7965+2	1.7859+2	5.0107+2	2.6722–3
	8.8083–5	8.4419–9	1.1763+7		4.4341+9	1.7250+9	4.5381+8	2.2553+9	7.4392+3	6.7767+2	1.7893+2	4.9874+2	2.7291–3
	9.1062–5	8.5525–9	1.1611+7		4.3768+9	1.6946+9	4.4864+8	2.2336+9	7.4787+3	6.7440+2	1.7957+2	4.9482+2	2.8290–3
O4	9.2820–5	8.6167–9	1.1525+7		4.3442+9	1.6773+9	4.4570+8	2.2211+9	7.5014+3	6.7254+2	1.7994+2	4.9260+2	2.8882–3
	9.4615–5	8.6884–9	1.1430+7		4.3083+9	1.6602+9	4.4281+8	2.2053+9	7.5237+3	6.7003+2	1.8039+2	4.8964+2	2.9486–3
	9.7308–5	8.7944–9	1.1292+7		4.2564+9	1.6355+9	4.3864+8	2.1823+9	7.5564+3	6.6651+2	1.8115+2	4.8535+2	3.0395–3
	1.0000–4	8.8986–9	1.1160+7	0.0000+0	4.2066+9	1.6118+9	4.3468+8	2.1601+9	7.5884+3	6.6325+2	1.8200+2	4.8124+2	3.1307–3
	1.0625–4	9.1369–9	1.0869+7	9.4918–9	4.0968+9	1.5603+9	4.2329+8	2.1132+9	7.6599+3	6.5371+2	1.8189+2	4.7181+2	3.3439–3
	1.0762–4	9.1879–9	1.0808+7	1.1586–8	4.0741+9	1.5497+9	4.2094+8	2.1035+9	7.6751+3	6.5177+2	1.8191+2	4.6985+2	3.3908–3
	1.1292–4	9.3818–9	1.0585+7	1.9759–8	3.9899+9	1.5103+9	4.1233+8	2.0672+9	7.7324+3	6.4476+2	1.8216+2	4.6259+2	3.5732–3
	1.1719–4	9.5342–9	1.0416+7	2.6412–8	3.9261+9	1.4806+9	4.0588+8	2.0396+9	7.7769+3	6.3966+2	1.8257+2	4.5708+2	3.7213–3
	1.2219–4	9.7083–9	1.0229+7	3.4260–8	3.8557+9	1.4479+9	3.9880+8	2.0090+9	7.8273+3	6.3411+2	1.8311+2	4.5100+2	3.8955–3
	1.2500–4	9.8044–9	1.0129+7	3.8708–8	3.8179+9	1.4303+9	3.9502+8	1.9925+9	7.8550+3	6.3120+2	1.8347+2	4.4773+2	3.9941–3
	1.2813–4	9.9103–9	1.0020+7	4.3680–8	3.7771+9	1.4115+9	3.9078+8	1.9748+9	7.8851+3	6.2787+2	1.8365+2	4.4421+2	4.1041–3
	1.3359–4	1.0118–8	9.8152+6	5.2435–8	3.6997+9	1.3803+9	3.8380+8	1.9356+9	7.9362+3	6.2037+2	1.8416+2	4.3621+2	4.2971–3
	1.3609–4	1.0211–8	9.7254+6	5.6474–8	3.6659+9	1.3667+9	3.8074+8	1.9185+9	7.9590+3	6.1710+2	1.8438+2	4.3272+2	4.3857–3
	1.5000–4	1.0714–8	9.2683+6	7.9310–8	3.4936+9	1.2974+9	3.6525+8	1.8310+9	8.0797+3	6.0094+2	1.8599+2	4.1494+2	4.8833–3
	1.6250–4	1.1148–8	8.9077+6	1.0037–7	3.3577+9	1.2429+9	3.5046+8	1.7643+9	8.1804+3	5.8601+2	1.8509+2	4.0092+2	5.3365–3
O3	1.7466–4	1.1554–8	8.5952+6	1.2135–7	3.2399+9	1.1959+9	3.3780+8	1.7062+9	8.2722+3	5.7345+2	1.8469+2	3.8876+2	5.7823–3
	1.7783–4	1.1665–8	8.5129+6	1.2689–7	3.2089+9	1.1844+9	3.3470+8	1.6898+9	8.2943+3	5.6992+2	1.8460+2	3.8531+2	5.9030–3
	1.8125–4	1.1785–8	8.4266+6	1.3291–7	3.1763+9	1.1724+9	3.3146+8	1.6725+9	8.3179+3	5.6623+2	1.8453+2	3.8169+2	6.0338–3
	1.8337–4	1.1858–8	8.3744+6	1.3667–7	3.1567+9	1.1651+9	3.2949+8	1.6620+9	8.3323+3	5.6401+2	1.8449+2	3.7950+2	6.1150–3
	1.9169–4	1.2143–8	8.1782+6	1.5152–7	3.0827+9	1.1378+9	3.2215+8	1.6227+9	8.3874+3	5.5573+2	1.8443+2	3.7130+2	6.4348–3
	2.0000–4	1.2421–8	7.9948+6	1.6658–7	3.0136+9	1.1122+9	3.1532+8	1.5860+9	8.4405+3	5.4818+2	1.8453+2	3.6364+2	6.7566–3
	2.1250–4	1.2848–8	7.7290+6	1.8966–7	2.9134+9	1.0767+9	3.0460+8	1.5321+9	8.5146+3	5.3518+2	1.8317+2	3.5200+2	7.2544–3
O2	2.1879–4	1.3059–8	7.6044+6	2.0148–7	2.8664+9	1.0600+9	2.9961+8	1.5068+9	8.5505+3	5.2917+2	1.8262+2	3.4655+2	7.5065–3
	2.2133–4	1.3144–8	7.5552+6	2.0629–7	2.8479+9	1.0535+9	2.9758+8	1.4968+9	8.5647+3	5.2670+2	1.8229+2	3.4439+2	7.6086–3
	2.2624–4	1.3307–8	7.4625+6	2.1566–7	2.8129+9	1.0412+9	2.9377+8	1.4779+9	8.5919+3	5.2206+2	1.8171+2	3.4033+2	7.8068–3
	2.3438–4	1.3574–8	7.3159+6	2.3135–7	2.7577+9	1.0217+9	2.8777+8	1.4482+9	8.6357+3	5.1479+2	1.8086+2	3.3392+2	8.1358–3
	2.3546–4	1.3609–8	7.2969+6	2.3346–7	2.7505+9	1.0192+9	2.8699+8	1.4443+9	8.6415+3	5.1386+2	1.8076+2	3.3309+2	8.1800–3
	2.5160–4	1.4125–8	7.0304+6	2.6527–7	2.6501+9	9.8366+8	2.7616+8	1.3902+9	8.7245+3	5.0088+2	1.7942+2	3.2145+2	8.8385–3
	2.6370–4	1.4502–8	6.8476+6	2.8964–7	2.5811+9	9.5923+8	2.6879+8	1.3531+9	8.7838+3	4.9218+2	1.7869+2	3.1348+2	9.3364–3
	2.6719–4	1.4609–8	6.7973+6	2.9674–7	2.5622+9	9.5251+8	2.6677+8	1.3429+9	8.8005+3	4.8982+2	1.7852+2	3.1129+2	9.4807–3
O1	2.7410–4	1.4820–8	6.7007+6	3.1092–7	2.5258+9	9.3958+8	2.6290+8	1.3233+9	8.8330+3	4.8530+2	1.7820+2	3.0709+2	9.7671–3
	2.7734–4	1.4919–8	6.6564+6	3.1761–7	2.5091+9	9.3369+8	2.6104+8	1.3143+9	8.8479+3	4.8307+2	1.7791+2	3.0515+2	9.9017–3
	2.8185–4	1.5055–8	6.5960+6	3.2698–7	2.4863+9	9.2566+8	2.5852+8	1.3021+9	8.8686+3	4.8005+2	1.7752+2	3.0252+2	1.0090–2
	2.8300–4	1.5090–8	6.5808+6	3.2938–7	2.4806+9	9.2364+8	2.5789+8	1.2991+9	8.8738+3	4.7930+2	1.7743+2	3.0186+2	1.0138–2
	2.9150–4	1.5344–8	6.4719+6	3.4721–7	2.4395+9	9.0913+8	2.5335+8	1.2770+9	8.9117+3	4.7391+2	1.7678+2	2.9711+2	1.0493–2
	3.0000–4	1.5595–8	6.3678+6	3.6524–7	2.4003+9	8.9525+8	2.4904+8	1.2560+9	8.9487+3	4.6882+2	1.7622+2	2.9258+2	1.0850–2
N7	3.1974–4	1.6168–8	6.1422+6	4.0791–7	2.3153+9	8.6523+8	2.3909+8	1.2109+9	9.0314+3	4.5651+2	1.7388+2	2.8262+2	1.1685–2
	3.2476–4	1.6326–8	6.0827+6	4.1894–7	2.2928+9	8.5805+8	2.3673+8	1.1981+9	9.0517+3	4.5316+2	1.7340+2	2.7975+2	1.1898–2
	3.2500–4	1.6333–8	6.0799+6	4.1948–7	2.2918+9	8.5771+8	2.3662+8	1.1974+9	9.0527+3	4.5300+2	1.7338+2	2.7961+2	1.1908–2
N6	3.2890–4	1.6456–8	6.0347+6	4.2811–7	2.2747+9	8.5225+8	2.3483+8	1.1877+9	9.0682+3	4.5046+2	1.7301+2	2.7743+2	1.2074–2
	3.3416–4	1.6621–8	5.9747+6	4.3984–7	2.2521+9	8.4504+8	2.3244+8	1.1746+9	9.0885+3	4.4709+2	1.7251+2	2.7456+2	1.2301–2
	3.3779–4	1.6734–8	5.9343+6	4.4797–7	2.2369+9	8.4017+8	2.3083+8	1.1659+9	9.1024+3	4.4481+2	1.7217+2	2.7262+2	1.2458–2

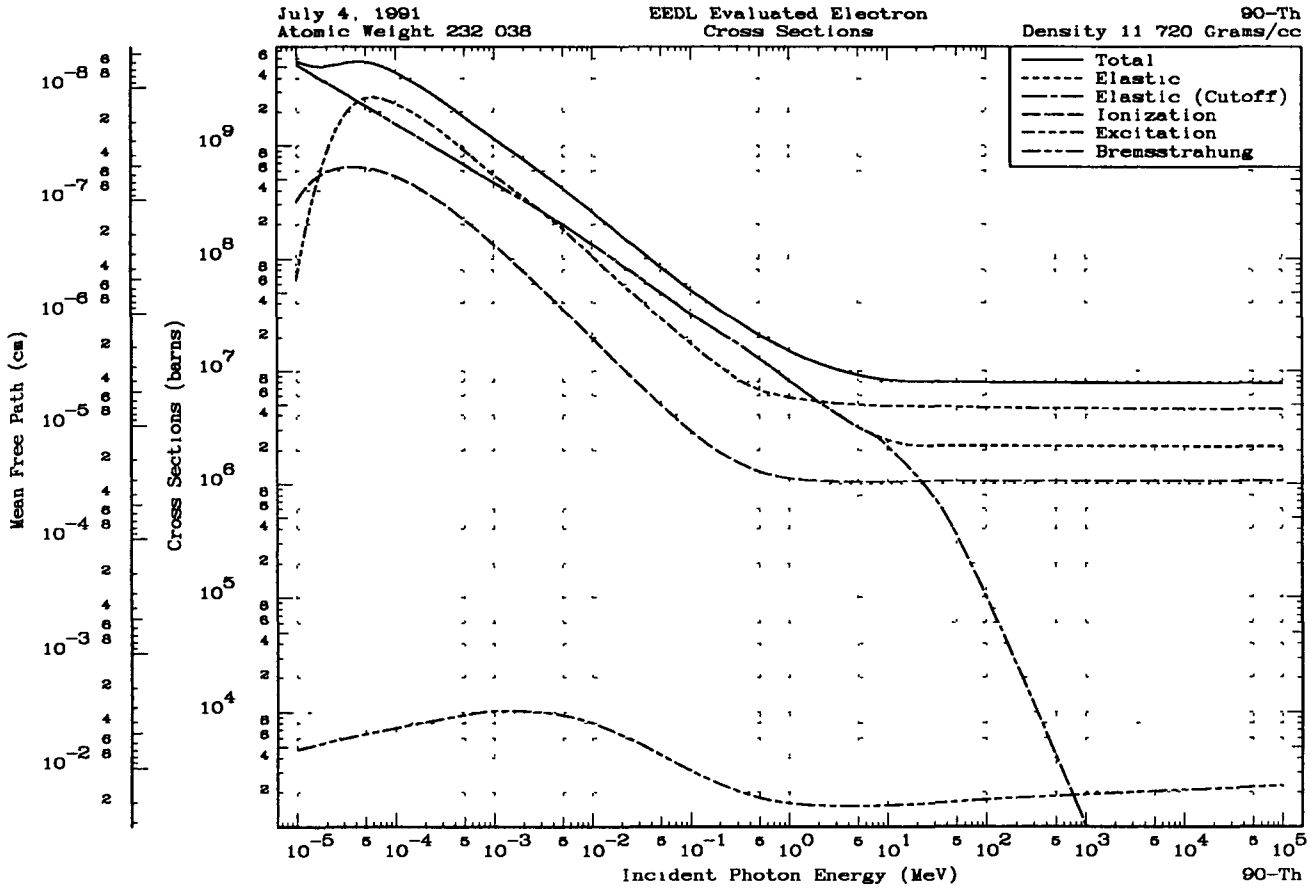
Atomic Weight 227.000 — Density 10.070 Grams/cc

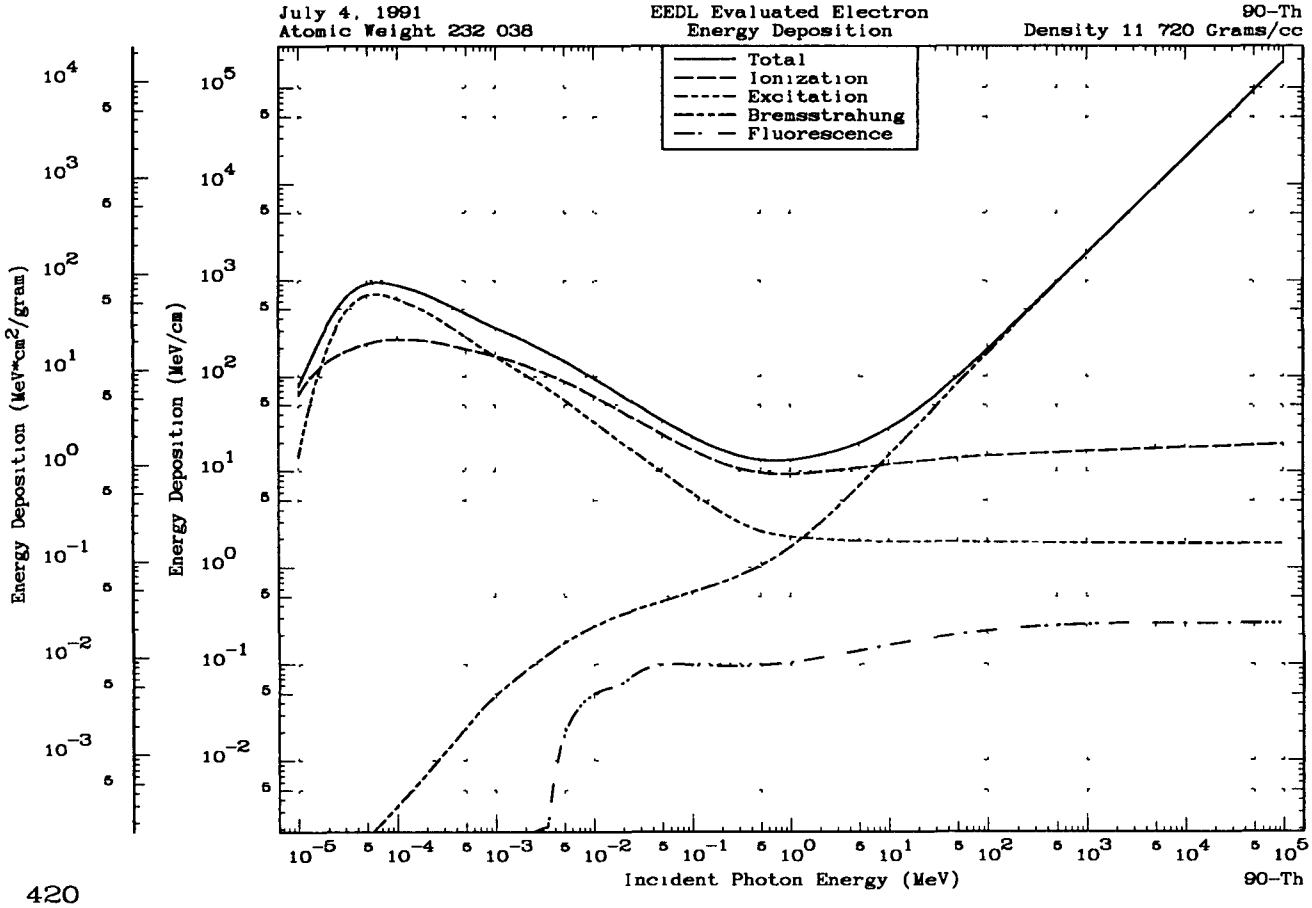
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.5000–4	1.7112–8	5.8032+6	4.7565–7	2.1875+9	8.2435+8	2.2561+8	1.1375+9	9.1480+3	4.3751+2	1.7114+2	2.6636+2	1.2988–2
	3.5062–4	1.7131–8	5.7967+6	4.7707–7	2.1850+9	8.2357+8	2.2535+8	1.1361+9	9.1503+3	4.3716+2	1.7109+2	2.6605+2	1.3015–2
	3.5334–4	1.7215–8	5.7686+6	4.8330–7	2.1744+9	8.2017+8	2.2424+8	1.1300+9	9.1602+3	4.3560+2	1.7088+2	2.6471+2	1.3133–2
	3.6250–4	1.7494–8	5.6766+6	5.0445–7	2.1397+9	8.0901+8	2.2058+8	1.1101+9	9.1933+3	4.3050+2	1.7016+2	2.6032+2	1.3532–2
	3.7531–4	1.7880–8	5.5540+6	5.3445–7	2.0935+9	7.9412+8	2.1573+8	1.0837+9	9.2384+3	4.2380+2	1.6930+2	2.5449+2	1.4094–2
	4.0000–4	1.8609–8	5.3364+6	5.9352–7	2.0115+9	7.6749+8	2.0717+8	1.0368+9	9.3217+3	4.1215+2	1.6797+2	2.4416+2	1.5183–2
	4.2500–4	1.9334–8	5.1363+6	6.5507–7	1.9361+9	7.4299+8	1.9879+8	9.9431+8	9.3946+3	4.0026+2	1.6560+2	2.3464+2	1.6331–2
	4.5000–4	2.0042–8	4.9548+6	7.1837–7	1.8677+9	7.2060+8	1.9124+8	9.5582+8	9.4639+3	3.8969+2	1.6364+2	2.2603+2	1.7488–2
	4.6250–4	2.0391–8	4.8701+6	7.5064–7	1.8358+9	7.1012+8	1.8774+8	9.3791+8	9.4973+3	3.8485+2	1.6280+2	2.2203+2	1.8070–2
	5.0000–4	2.1414–8	4.6373+6	8.4976–7	1.7480+9	6.8109+8	1.7817+8	8.8874+8	9.5929+3	3.7190+2	1.6083+2	2.1105+2	1.9828–2
	5.5000–4	2.2718–8	4.3712+6	9.8710–7	1.6477+9	6.4722+8	1.6670+8	8.3375+8	9.7042+3	3.5635+2	1.5768+2	1.9865+2	2.2196–2
	6.0000–4	2.3976–8	4.1419+6	1.1300–6	1.5613+9	6.1777+8	1.5696+8	7.8653+8	9.8068+3	3.4355+2	1.5551+2	1.8801+2	2.4592–2
N5	6.3962–4	2.4946–8	3.9808+6	1.2470–6	1.5005+9	5.9699+8	1.4985+8	7.5368+8	9.8772+3	3.3358+2	1.5301+2	1.8054+2	2.6504–2
	6.4964–4	2.5189–8	3.9425+6	1.2772–6	1.4861+9	5.9204+8	1.4818+8	7.4585+8	9.8929+3	3.3128+2	1.5249+2	1.7877+2	2.6979–2
	6.6844–4	2.5639–8	3.8731+6	1.3343–6	1.4599+9	5.8307+8	1.4516+8	7.3171+8	9.9216+3	3.2718+2	1.5159+2	1.7556+2	2.7874–2
N4	6.7551–4	2.5808–8	3.8479+6	1.3559–6	1.4504+9	5.7980+8	1.4407+8	7.2655+8	9.9323+3	3.2570+2	1.5127+2	1.7440+2	2.8211–2
	6.8329–4	2.5992–8	3.8205+6	1.3799–6	1.4401+9	5.7625+8	1.4288+8	7.2098+8	9.9416+3	3.2408+2	1.5092+2	1.7313+2	2.8567–2
	6.9788–4	2.6336–8	3.7706+6	1.4251–6	1.4213+9	5.6977+8	1.4071+8	7.1081+8	9.9588+3	3.2118+2	1.5033+2	1.7082+2	2.9235–2
	7.0000–4	2.6386–8	3.7635+6	1.4317–6	1.4186+9	5.6885+8	1.4040+8	7.0936+8	9.9613+3	3.2076+2	1.5024+2	1.7049+2	2.9332–2
	7.0133–4	2.6417–8	3.7591+6	1.4358–6	1.4169+9	5.6827+8	1.4021+8	7.0846+8	9.9629+3	3.2050+2	1.5019+2	1.7028+2	2.9393–2
	7.2341–4	2.6932–8	3.6872+6	1.5052–6	1.3899+9	5.5892+8	1.3710+8	6.9385+8	9.9882+3	3.1626+2	1.4926+2	1.6696+2	3.0407–2
	7.2600–4	2.6992–8	3.6791+6	1.5134–6	1.3868+9	5.5785+8	1.3674+8	6.9219+8	9.9911+3	3.1578+2	1.4916+2	1.6659+2	3.0527–2
	7.6171–4	2.7810–8	3.5708+6	1.6276–6	1.3460+9	5.4370+8	1.3209+8	6.7020+8	1.0031+4	3.0954+2	1.4791+2	1.6159+2	3.2173–2
	7.6300–4	2.7839–8	3.5671+6	1.6318–6	1.3446+9	5.4321+8	1.3193+8	6.6944+8	1.0032+4	3.0932+2	1.4787+2	1.6142+2	3.2232–2
	8.0000–4	2.8671–8	3.4637+6	1.7525–6	1.3056+9	5.2961+8	1.2752+8	6.4847+8	1.0071+4	3.0352+2	1.4683+2	1.5666+2	3.3945–2
N3	9.1144–4	3.1089–8	3.1942+6	2.1304–6	1.2040+9	4.9391+8	1.1566+8	5.9445+8	1.0124+4	2.8651+2	1.4224+2	1.4423+2	3.8557–2
	9.2251–4	3.1325–8	3.1702+6	2.1691–6	1.1950+9	4.9072+8	1.1462+8	5.8961+8	1.0129+4	2.8503+2	1.4186+2	1.4313+2	3.9016–2
	9.4188–4	3.1735–8	3.1292+6	2.2374–6	1.1795+9	4.8530+8	1.1286+8	5.8137+8	1.0138+4	2.8252+2	1.4123+2	1.4125+2	3.9820–2
	9.7094–4	3.2343–8	3.0704+6	2.3409–6	1.1574+9	4.7747+8	1.1033+8	5.6953+8	1.0150+4	2.7898+2	1.4038+2	1.3856+2	4.1028–2
	1.0000–3	3.2945–8	3.0143+6	2.4457–6	1.1362+9	4.6999+8	1.0794+8	5.5828+8	1.0162+4	2.7567+2	1.3963+2	1.3600+2	4.2237–2
	1.0625–3	3.4208–8	2.9029+6	2.6756–6	1.0942+9	4.5499+8	1.0302+8	5.3622+8	1.0154+4	2.6815+2	1.3724+2	1.3086+2	4.4337–2
N2	1.1048–3	3.5047–8	2.8335+6	2.8347–6	1.0681+9	4.4559+8	9.9974+7	5.2248+8	1.0149+4	2.6356+2	1.3584+2	1.2767+2	4.5758–2
	1.1295–3	3.5525–8	2.7953+6	2.9288–6	1.0537+9	4.4035+8	9.8289+7	5.1504+8	1.0146+4	2.6103+2	1.3502+2	1.2596+2	4.6587–2
	1.1719–3	3.6336–8	2.7330+6	3.0925–6	1.0302+9	4.3176+8	9.5548+7	5.0286+8	1.0142+4	2.5694+2	1.3373+2	1.2316+2	4.8009–2
	1.1758–3	3.6410–8	2.7274+6	3.1078–6	1.0281+9	4.3098+8	9.5303+7	5.0177+8	1.0141+4	2.5658+2	1.3362+2	1.2291+2	4.8141–2
	1.2163–3	3.7174–8	2.6714+6	3.2669–6	1.0070+9	4.2324+8	9.2862+7	4.9085+8	1.0137+4	2.5297+2	1.3252+2	1.2040+2	4.9501–2
N1	1.2495–3	3.7790–8	2.6278+6	3.3987–6	9.9053+8	4.1719+8	9.0972+7	4.8235+8	1.0133+4	2.5020+2	1.3170+2	1.1845+2	5.0613–2
	1.2808–3	3.8365–8	2.5884+6	3.5245–6	9.7568+8	4.1171+8	8.9221+7	4.7474+8	1.0130+4	2.4740+2	1.3067+2	1.1668+2	5.1663–2
	1.2872–3	3.8483–8	2.5805+6	3.5506–6	9.7270+8	4.1060+8	8.8870+7	4.7321+8	1.0129+4	2.4684+2	1.3047+2	1.1632+2	5.1879–2
	1.3125–3	3.8942–8	2.5501+6	3.6533–6	9.6124+8	4.0636+8	8.7526+7	4.6734+8	1.0127+4	2.4470+2	1.2970+2	1.1496+2	5.2725–2
	1.3356–3	3.9359–8	2.5231+6	3.7481–6	9.5106+8	4.0258+8	8.6337+7	4.6213+8	1.0124+4	2.4281+2	1.2901+2	1.1374+2	5.3500–2
	1.3767–3	4.0093–8	2.4769+6	3.9185–6	9.3364+8	3.9611+8	8.4312+7	4.5322+8	1.0121+4	2.3960+2	1.2787+2	1.1167+2	5.4876–2
	1.3769–3	4.0097–8	2.4766+6	3.9195–6	9.3354+8	3.9607+8	8.4301+7	4.5317+8	1.0121+4	2.3958+2	1.2787+2	1.1166+2	5.4885–2
	1.3936–3	4.0392–8	2.4585+6	3.9893–6	9.2672+8	3.9352+8	8.3510+7	4.4967+8	1.0119+4	2.3833+2	1.2743+2	1.1085+2	5.5443–2
	1.4383–3	4.1177–8	2.4116+6	4.1782–6	9.0905+8	3.8693+8	8.1475+7	4.4064+8	1.0115+4	2.3512+2	1.2632+2	1.0875+2	5.6941–2
	1.5000–3	4.2243–8	2.3508+6	4.4428–6	8.8611+8	3.7834+8	7.8852+7	4.2891+8	1.0109+4	2.3103+2	1.2494+2	1.0603+2	5.9005–2
	1.6250–3	4.4362–8	2.2385+6	4.9942–6	8.4379+8	3.6248+8	7.3942+7	4.0736+8	1.0088+4	2.2239+2	1.2135+2	1.0098+2	6.2862–2
	1.7500–3	4.6416–8	2.1395+6	5.5659–6	8.0646+8	3.4839+8	6.9683+7	3.8837+8	1.0068+4	2.1495+2	1.1835+2	9.6533+1	6.6712–2
	1.8125–3	4.7420–8	2.0941+6	5.8590–6	7.8937+8	3.4191+8	6.7756+7	3.7970+8	1.0059+4	2.1159+2	1.1701+2	9.4504+1	6.8635–2
	2.0000–3	5.0353–8	1.9722+6	6.7642–6	7.4339+8	3.2437+8	6.2645+7	3.5637+8	1.0033+4	2.0275+2	1.1361+2	8.9060+1	7.4397–2
	2.2500–3	5.4228–8	1.8312+6	8.0354–6	6.9027+8	3.0448+8	5.6845+7	3.2894+8	9.9682+3	1.9070+2	1.0810+2	8.2513+1	8.1126–2
	2.5000–3	5.7940–8	1.7139+6	9.3811–6	6.4605+8	2.8772+8	5.2128+7	3.0619+8	9.9110+3	1.8093+2	1.0374+2	7.7095+1	8.7825–2
	2.6250–3	5.9742–8	1.6622+6	1.0080–5	6.2657+8	2.8028+8	5.0082+7	2.9620+8	9.8846+3	1.7666+2	1.0185+2	7.4717+1	9.1164–2
	3.0000–3	6.4956–8	1.5288+6	1.2270–5	5.7627+8	2.6088+8	4.4898+7	2.7048+8	9.8128+3	1.6591+2	9.7192+1	6.8612+1	1.0114–1
M5	3.2241–3	6.7992–8	1.4605+6	1.3647–5	5.5054+8	2.5093+8	4.2264+7	2.5734+8	9.7567+3	1.5960+2	9.4057+1	6.5433+1	1.0654–1
	3.2483–3	6.8318–8	1.4536+6	1.3800–5	5.4791+8	2.4990+8	4.1999+7	2.5600+8	9.7509+3	1.5896+2	9.3747+1	6.5110+1	1.0712–1
	3.2953–3	6.8948–8	1.4403+6	1.4096–5	5.4290+8	2.4794+8	4.1497+7	2.5346+8	9.7397+3	1.5776+2	9.3159+1	6.4498+1	1.0825–1
M4	3.3796–3	7.0070–8	1.4172+6	1.4634–5	5.3421+8	2.4454+8	4.0628+7	2.4904+8	9.7202+3	1.5569+2	9.2147+1	6.3435+1	1.1027–1
	3.3834–3	7.0120–8	1.4162+6	1.4659–5	5.3383+8	2.4439+8	4.0590+7	2.4884+8	9.7193+3	1.5560+2	9.2102+1	6.3387+1	1.1036–1
	3.3990–3	7.0326–8	1.4121+6	1.4759–5	5.3226+8	2.4377+8	4.0433+7	2.4805+8	9.7158+3	1.5522+2	9.1915+1	6.3195+1	1.1073–1
	3.4741–3	7.1315–8	1.3925+6	1.5246–5	5.2488+8	2.4087+8	3.9697+7	2.4430+8	9.6989+3	1.5344+2	9.1039+1	6.2289+1	1.1253–1
	3.5376–3	7.2145–8	1.3765+6	1.5661–5	5.1885+8	2.3850+8	3.9099+7	2.4124+8	9.6849+3	1.5199+2	9.0331+1	6.1550+1	1.1405–1
	3.6056–3	7.3027–8	1.3598+6	1.6111–5	5.1258+8	2.3603+8	3.8479+7	2.3806+8	9.6703+3	1.5050+2	8.9598+1	6.0782+1	1.1567–1
	3.8028–3	7.5552–8	1.3144+6	1.7439–5	4.9545+8	2.2925+8	3.6798+7	2.2940+8	9.6294+3	1.4644+2	8.7632+1	5.8690+1	1.2037–1
M3	3.9039–3	7.6826–8	1.2926+6	1.8134–5	4.8723+8	2.2598+8	3.5998+7	2.2525+8	9.6093+3	1.4452+2	8.6706+1	5.7688+1	1.2278–1
	3.9519–3	7.7433–8	1.2825+6	1.8468–5	4.8342+8	2.2446+8	3.5631+7	2.2332+8	9.5979+3	1.4363+2	8.6282+1	5.7224+1	1.2386–1
	4.0000–3	7.8037–8	1.2725+6	1.8803–5	4.7967+8	2.2297+8	3.5272+7	2.2143+8	9.5867+3	1.4276+2	8.5870+1	5.6769+1	1.2494–1
	4.1250–3	7.9603–8	1.2475+6	1.9686–5	4.7023+8	2.1911+8	3.4360+7	2.1676+8	9.5422+3	1.4034+2	8.4582+1	5.5627+1	1.2731–1
	4.3437–3	8.2304–8	1.2066+6	2.1267–5	4.5481+8	2.1278+8	3.2882+7	2.0913+8	9.4681+3	1.3641+2	8.2511+1	5.3765+1	1.3142–1
	4.5000–3	8.4202–8	1.1794+6	2.2424–5	4.4455+8	2.0856+8	3.1909+7	2.0408+8	9.4177+3	1.3383+2	8.1161+1	5.2531+1	1.3435–1
M2	4.6547–3	8.6058–8	1.1539+6	2.3590–5	4.3497+8	2.0460+8	3.1006+7	1.9935+8	9.3697+3	1.3142+2	7.9904+1	5.1378+1	1.3724–1
	4.7410–3	8.7145–8	1.1395+6	2.4251–5	4.2954+8	2.0247+8	3.0526+7	1.9653+8	9.3438+3	1.3007+2	7.9239+1	5.0693+1	1.3885–1
	4.8705–3	8.8762–8	1.1188+6	2.5254–5	4.2172+8	1.9940+8	2.9835+7	1.9247+8	9.3058+3	1.2813+2	7.8288+1	4.9705+1	1.4126–1
M1	4.9743–3	9.0048–8	1.1028+6	2.6068–5	4.1569+8	1.9703+8	2.9305+7	1.8935+8	9.2762+3	1.2665+2	7.7564+1	4.8947+1	1.4318–1
	5.0000–3	9.0371–8	1.0989+6	2.6271–5	4.1421+8	1.9646+8	2.9177+7	1.8856+8	9.2690+3	1.2629+2	7.7390+1	4.8757+1	1.4366–1
	5.1250–3	9.1935–8	1.0802+6	2.7268–5	4.0716+8	1.9369+8	2.8567+7	1.8489+8	9.2337+3	1.2446+2	7.6465+1	4.7850+1	1.4594–1
	5.2500–3	9.3487–8	1.0622+6	2.8280–5	4.0040+8	1.9103+8	2.7985+7	1.8138+8	9.1993+3	1.2272+2	7.5586+1	4.6982+1	1.4822–1
	5.3438–3	9.4643–8	1.0493+6	2.9048–5	3.9551+8	1.8910+8	2.7564+7	1.7884+8	9.1742+3	1.2146+2	7.4954+1	4.6355+1	1.4993–1
	5.5000–3	9.6555–8	1.0285+6	3.0345–5	3.8768+8	1.8599+8	2.6894+7	1.7479+8	9.1333+3	1.1946+2	7.3949+1	4.5353+1	1.5276–1
	5.6250–3	9.8072–8	1.0126+6	3.1398–5	3.8168+8	1.8360+8	2.6382+7	1.7169+8	9.1016+3	1.1793+2	7.3183+1	4.4588+1	1.5502–1

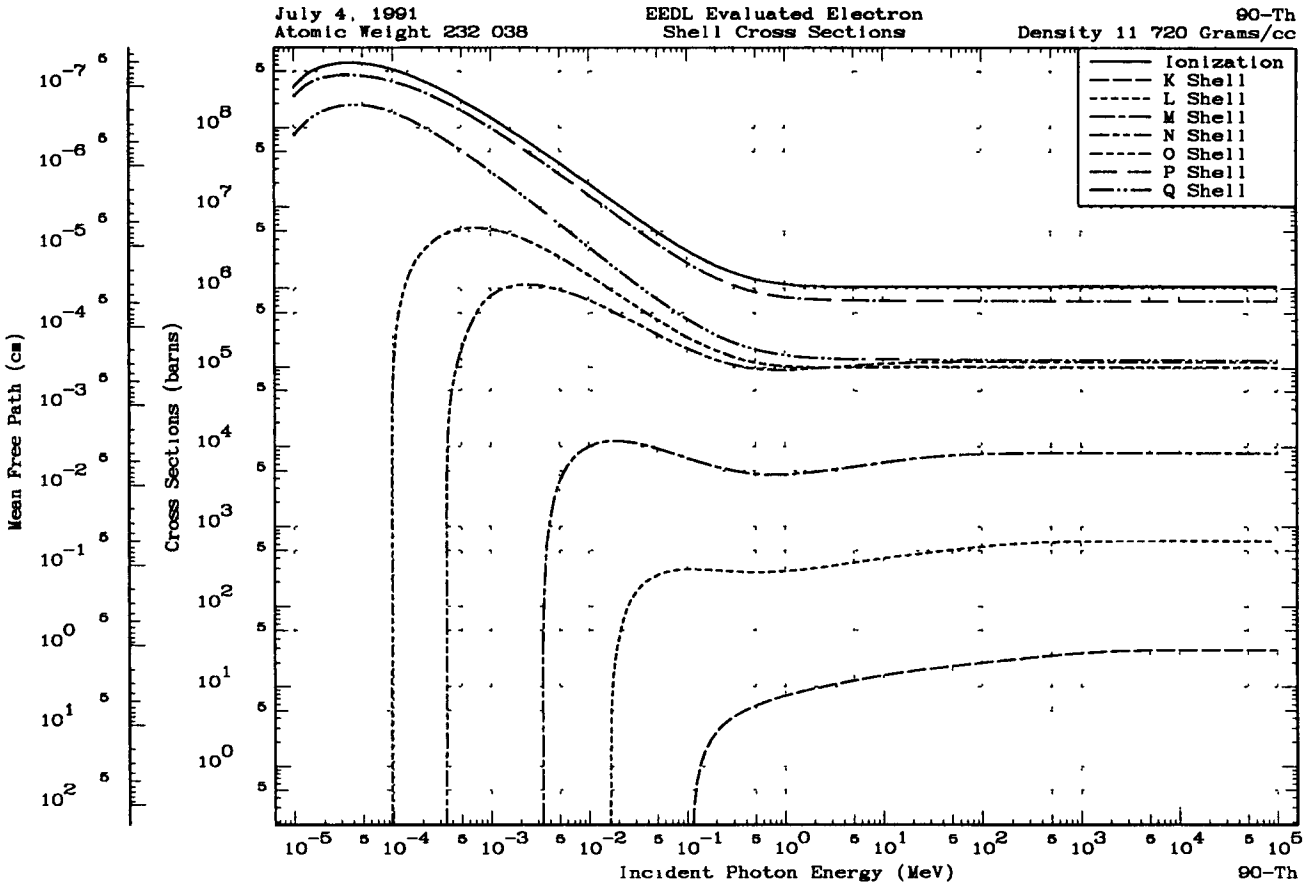
Atomic Weight 227.000 Density 10.070 Grams/cc

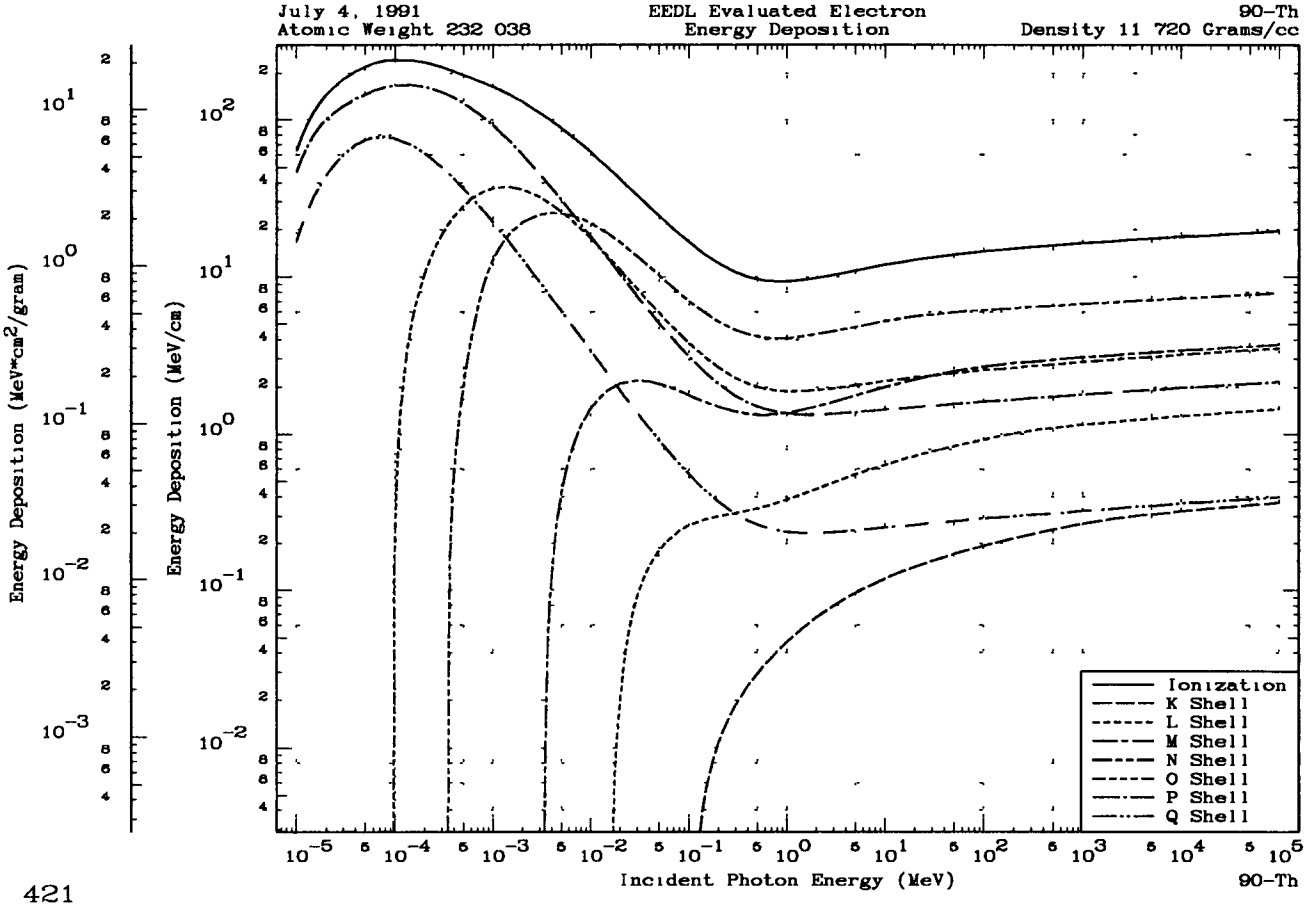
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.6719–3	9.8638–8	1.0068+6	3.1797–5	3.7949+8	1.8273+8	2.6196+7	1.7056+8	9.0899+3	1.1737+2	7.2905+1	4.4309+1	1.5587–1
6.0000–3	1.0256–7	9.6829+5	3.4637–5	3.6499+8	1.7692+8	2.4968+7	1.6309+8	9.0112+3	1.1371+2	7.1082+1	4.2466+1	1.6177–1
6.5000–3	1.0843–7	9.1581+5	3.9143–5	3.4521+8	1.6888+8	2.3301+7	1.5302+8	8.8492+3	1.0827+2	6.8142+1	3.9955+1	1.6886–1
7.0000–3	1.1417–7	8.6982+5	4.3864–5	3.2787+8	1.6176+8	2.1859+7	1.4425+8	8.7018+3	1.0356+2	6.5618+1	3.7769+1	1.7588–1
7.2500–3	1.1698–7	8.4889+5	4.6303–5	3.1998+8	1.5850+8	2.1208+7	1.4027+8	8.6329+3	1.0143+2	6.4474+1	3.6779+1	1.7936–1
8.0000–3	1.2525–7	7.9287+5	5.3910–5	2.9887+8	1.4968+8	1.9485+7	1.2969+8	8.4424+3	9.5807+1	6.1470+1	3.4147+1	1.8971–1
9.0000–3	1.3606–7	7.2985+5	6.4735–5	2.7511+8	1.3960+8	1.7594+7	1.1791+8	8.1744+3	8.9048+1	5.7666+1	3.1181+1	2.0115–1
1.0000–2	1.4650–7	6.7785+5	7.6326–5	2.5551+8	1.3116+8	1.6061+7	1.0828+8	7.9419+3	8.3558+1	5.4587+1	2.8759+1	2.1239–1
1.1250–2	1.5924–7	6.2362+5	9.1865–5	2.3507+8	1.2226+8	1.4500+7	9.8297+7	7.6375+3	7.7403+1	5.0970+1	2.6210+1	2.2314–1
1.2500–2	1.7154–7	5.7889+5	1.0856–4	2.1821+8	1.1482+8	1.3234+7	9.0149+7	7.3750+3	7.2398+1	4.8033+1	2.4132+1	2.3372–1
1.3125–2	1.7755–7	5.5931+5	1.1733–4	2.1083+8	1.1152+8	1.2687+7	8.6608+7	7.2566+3	7.0220+1	4.6752+1	2.3229+1	2.3895–1
1.5000–2	1.9505–7	5.0912+5	1.4513–4	1.9191+8	1.0299+8	1.1302+7	7.7613+7	6.9421+3	6.4705+1	4.3513+1	2.0938+1	2.5436–1
L3 1.5883–2	2.0307–7	4.8903+5	1.5904–4	1.8434+8	9.9498+7	1.0756+7	7.4074+7	6.7945+3	6.2338+1	4.2057+1	2.0021+1	2.6008–1
1.6398–2	2.0774–7	4.7802+5	1.6738–4	1.8019+8	9.7555+7	1.0464+7	7.2160+7	6.7125+3	6.1059+1	4.1270+1	1.9526+1	2.6324–1
1.7298–2	2.1582–7	4.6012+5	1.8238–4	1.7344+8	9.4382+7	9.9925+6	6.9060+7	6.5771+3	5.8990+1	3.9997+1	1.8724+1	2.6875–1
1.8649–2	2.2771–7	4.3611+5	2.0583–4	1.6439+8	9.0093+7	9.3652+6	6.4924+7	6.3914+3	5.6237+1	3.8305+1	1.7655+1	2.7692–1
L2 1.9163–2	2.3216–7	4.2775+5	2.1505–4	1.6124+8	8.8591+7	9.1483+6	6.3491+7	6.3256+3	5.5284+1	3.7720+1	1.7285+1	2.8000–1
1.9582–2	2.3577–7	4.2120+5	2.2267–4	1.5877+8	8.7415+7	8.9799+6	6.2368+7	6.2715+3	5.4537+1	3.7260+1	1.6995+1	2.8216–1
L1 1.9848–2	2.3805–7	4.1716+5	2.2758–4	1.5725+8	8.6687+7	8.8762+6	6.1676+7	6.2378+3	5.4076+1	3.6976+1	1.6816+1	2.8353–1
2.0000–2	2.3935–7	4.1489+5	2.3040–4	1.5639+8	8.6278+7	8.8181+6	6.1289+7	6.2189+3	5.3819+1	3.6818+1	1.6716+1	2.8431–1
2.1250–2	2.4987–7	3.9743+5	2.5409–4	1.4981+8	8.3060+7	8.3743+6	5.8367+7	6.0584+3	5.1711+1	3.5472+1	1.5950+1	2.8972–1
2.2500–2	2.6020–7	3.8164+5	2.7872–4	1.4386+8	8.0135+7	7.9765+6	5.5740+7	5.9108+3	4.9819+1	3.4262+1	1.5261+1	2.9510–1
2.3438–2	2.6784–7	3.7076+5	2.9778–4	1.3976+8	7.8110+7	7.7042+6	5.3937+7	5.8076+3	4.8522+1	3.3433+1	1.4789+1	2.9912–1
2.5000–2	2.8036–7	3.5421+5	3.3066–4	1.3352+8	7.5012+7	7.2925+6	5.1204+7	5.6481+3	4.6558+1	3.2179+1	1.4073+1	3.0576–1
2.5078–2	2.8098–7	3.5342+5	3.3234–4	1.3322+8	7.4866+7	7.2732+6	5.1076+7	5.6405+3	4.6466+1	3.2120+1	1.4040+1	3.0609–1
2.6250–2	2.9021–7	3.4218+5	3.5792–4	1.2898+8	7.2752+7	6.9961+6	4.9230+7	5.5305+3	4.5139+1	3.1272+1	1.3557+1	3.1103–1
2.7539–2	3.0021–7	3.3078+5	3.8691–4	1.2469+8	7.0598+7	6.7166+6	4.7365+7	5.4172+3	4.3800+1	3.0415+1	1.3069+1	3.1642–1
3.0000–2	3.1893–7	3.1137+5	4.4460–4	1.1737+8	6.6909+7	6.2454+6	4.4209+7	5.2208+3	4.1541+1	2.8970+1	1.2244+1	3.2658–1
3.5000–2	3.5556–7	2.7929+5	5.7101–4	1.0528+8	6.0678+7	5.4939+6	3.9099+7	4.8631+3	3.7633+1	2.6403+1	1.0888+1	3.4241–1
4.0000–2	3.9063–7	2.5422+5	7.0948–4	9.5826+7	5.5752+7	4.9169+6	3.5153+7	4.5731+3	3.4622+1	2.4423+1	9.8418+0	3.5791–1
4.5000–2	4.2431–7	2.3404+5	8.5933–4	8.8220+7	5.1733+7	4.4695+6	3.2013+7	4.3299+3	3.2144+1	2.2775+1	8.9980+0	3.7092–1
5.0000–2	4.5685–7	2.1737+5	1.0200–3	8.1935+7	4.8384+7	4.1041+6	2.9442+7	4.1233+3	3.0117+1	2.1425+1	8.3081+0	3.8374–1
6.0000–2	5.1901–7	1.9133+5	1.3709–3	7.2122+7	4.3094+7	3.5550+6	2.5469+7	3.7938+3	2.6940+1	1.9299+1	7.2344+0	4.0598–1
8.0000–2	6.3043–7	1.5752+5	2.1770–3	5.9376+7	3.5944+7	2.8596+6	2.0569+7	3.3353+3	2.2798+1	1.6451+1	5.9022+0	4.4489–1
1.0000–1	7.3193–7	1.3568+5	3.1099–3	5.1142+7	3.1298+7	2.4369+6	1.7404+7	3.0278+3	2.0133+1	1.4624+1	5.0323+0	4.7749–1
K 1.0719–1	7.6565–7	1.2970+5	3.4737–3	4.8890+7	3.0040+7	2.3254+6	1.6521+7	2.9392+3	1.9399+1	1.4124+1	4.7865+0	4.8843–1
1.0853–1	7.7172–7	1.2868+5	3.5429–3	4.8505+7	2.9829+7	2.3066+6	1.6367+7	2.9253+3	1.9273+1	1.4039+1	4.7436+0	4.9023–1
1.1112–1	7.8340–7	1.2676+5	3.6782–3	4.7782+7	2.9430+7	2.2715+6	1.6077+7	2.8990+3	1.9036+1	1.3879+1	4.6630+0	4.9372–1
1.1598–1	8.0504–7	1.2335+5	3.9364–3	4.6497+7	2.8720+7	2.2091+6	1.5565+7	2.8520+3	1.8616+1	1.3596+1	4.5205+0	5.0026–1
1.2449–1	8.4210–7	1.1792+5	4.4016–3	4.4451+7	2.7584+7	2.1096+6	1.4754+7	2.7760+3	1.7950+1	1.3144+1	4.2950+0	5.1170–1
1.3724–1	8.9596–7	1.1084+5	5.1300–3	4.1779+7	2.6092+7	1.9799+6	1.3705+7	2.6745+3	1.7087+1	1.2554+1	4.0036+0	5.2878–1
1.5000–1	9.4796–7	1.0476+5	5.8932–3	3.9487+7	2.4802+7	1.8687+6	1.2814+7	2.5853+3	1.6351+1	1.2049+1	3.7564+0	5.4575–1
1.7500–1	1.0386–6	9.5613+4	7.4749–3	3.6041+7	2.2827+7	1.7104+6	1.1500+7	2.4408+3	1.5272+1	1.1310+1	3.3879+0	5.7466–1
2.0000–1	1.1240–6	8.8350+4	9.1590–3	3.3303+7	2.1244+7	1.5842+6	1.0472+7	2.3223+3	1.4425+1	1.0722+1	3.1000+0	6.0326–1
2.2500–1	1.2025–6	8.2579+4	1.0929–2	3.1128+7	1.9915+7	1.4968+6	9.7133+6	2.2304+3	1.3824+1	1.0310+1	2.8855+0	6.2898–1
2.6250–1	1.3136–6	7.5596+4	1.3715–2	2.8495+7	1.8301+7	1.3896+6	8.8029+6	2.1156+3	1.3104+1	9.8084+0	2.6287+0	6.6715–1
3.0000–1	1.4080–6	7.0527+4	1.6634–2	2.6585+7	1.7008+7	1.3031+6	8.2714+6	2.0209+3	1.2595+1	9.4073+0	2.4828+0	7.0470–1
4.0000–1	1.6448–6	6.0375+4	2.4833–2	2.2758+7	1.4344+7	1.1666+6	7.2454+6	1.8590+3	1.1806+1	8.8074+0	2.1962+0	8.0217–1
5.0000–1	1.8459–6	5.3796+4	3.3430–2	2.0278+7	1.2497+7	1.0884+6	6.6908+6	1.7593+3	1.1460+1	8.5166+0	2.0440+0	8.9956–1
6.0000–1	2.0261–6	4.9012+4	4.2228–2	1.8475+7	1.1124+7	1.0376+6	6.3116+6	1.6950+3	1.1272+1	8.3340+0	1.9407+0	9.9750–1
8.0000–1	2.3255–6	4.2702+4	5.9982–2	1.6096+7	9.2450+6	9.7982+5	5.8698+6	1.6186+3	1.1258+1	8.2364+0	1.8236+0	1.1983+0
1.0000+0	2.5747–6	3.8569+4	7.7661–2	1.4538+7	8.0074+6	9.4749+5	5.5819+6	1.5780+3	1.1367+1	8.2143+0	1.7482+0	1.4048+0
1.5000+0	3.0332–6	3.2739+4	1.2037–1	1.2341+7	6.1810+6	9.1516+5	5.2432+6	1.5300+3	1.2054+1	8.4479+0	1.6657+0	1.9404+0
2.0000+0	3.3585–6	2.9568+4	1.6065–1	1.1145+7	5.1700+6	9.0508+5	5.0688+6	1.5117+3	1.2782+1	8.6638+0	1.6225+0	2.4957+0
3.0000+0	3.7919–6	2.6189+4	2.3463–1	9.8717+6	4.0873+6	8.9399+5	4.8888+6	1.4997+3	1.4280+1	9.0455+0	1.5893+0	3.6448+0
4.0000+0	4.0712–6	2.4392+4	3.0121–1	9.1944+6	3.5057+6	8.9395+5	4.7932+6	1.5009+3	1.5784+1	9.3594+0	1.5661+0	4.8586+0
5.0000+0	4.2556–6	2.3335+4	3.6172–1	8.7960+6	3.1501+6	8.9438+5	4.7501+6	1.5040+3	1.7288+1	9.6267+0	1.5600+0	6.1015+0
6.0000+0	4.3893–6	2.2624+4	4.1721–1	8.5280+6	2.9119+6	8.9498+5	4.7196+6	1.5083+3	1.8778+1	9.8474+0	1.5579+0	7.3730+0
8.0000+0	4.5822–6	2.1672+4	5.1605–1	8.1691+6	2.6082+6	8.9734+5	4.6620+6	1.5177+3	2.1763+1	1.0209+1	1.5547+0	1.0000+1
1.0000+1	4.6976–6	2.1139+4	6.0216–1	7.9683+6	2.4340+6	8.9925+5	4.6336+6	1.5272+3	2.4753+1	1.0491+1	1.5521+0	1.2710+1
1.5000+1	4.8241–6	2.0585+4	7.7888–1	7.7594+6	2.2380+6	9.0225+5	4.6176+6	1.5478+3	3.2155+1	1.0922+1	1.5513+0	1.9682+1
2.0000+1	4.8705–6	2.0389+4	9.1861–1	7.6856+6	2.1772+6	9.0443+5	4.6024+6	1.5650+3	3.9678+1	1.1273+1	1.5507+0	2.6854+1
3.0000+1	4.8893–6	2.0311+4	1.1318+0	7.6560+6	2.1753+6	9.0571+5	4.5734+6	1.5955+3	5.4973+1	1.1641+1	1.5499+0	4.1782+1
4.0000+1	4.9114–6	2.0219+4	1.2920+0	7.6214+6	2.1748+6	9.0675+5	4.5382+6	1.6188+3	7.0494+1	1.1927+1	1.5469+0	5.7020+1
5.0000+1	4.9230–6	2.0172+4	1.4201+0	7.6035+6	2.1740+6	9.0738+5	4.5205+6	1.6379+3	8.6199+1	1.2145+1	1.5421+0	7.2512+1
6.0000+1	4.9329–6	2.0131+4	1.5266+0	7.5883+6	2.1734+6	9.0787+5	4.5054+6	1.6540+3	1.0203+2	1.2319+1	1.5383+0	8.8176+1
8.0000+1	4.9498–6	2.0062+4	1.6971+0	7.5623+6	2.1724+6	9.0827+5	4.4800+6	1.6799+3	1.3401+2	1.2562+1	1.5321+0	1.1992+2
1.0000+2	4.9641–6	2.0005+4	1.8308+0	7.5406+6	2.1716+6	9.0856+5	4.4588+6	1.7002+3	1.6627+2	1.2772+1	1.5274+0	1.5197+2
1.5000+2	4.9849–6	1.9921+4	2.0756+0	7.5092+6	2.1702+6	9.0876+5	4.4285+6	1.7366+3	2.4756+2	1.3010+1	1.5173+0	2.3304+2
2.0000+2	4.9924–6	1.9891+4	2.2501+0	7.4978+6	2.1692+6	9.0891+5	4.4180+6	1.7587+3	3.2934+2	1.3228+1	1.5140+0	3.1460+2
3.0000+2	5.0025–6	1.9851+4	2.4968+0	7.4827+6	2.1677+6	9.0902+5	4.4042+6	1.7879+3	4.9244+2	1.3536+1	1.5098+0	4.7739+2
4.0000+2	5.0105–6	1.9819+4	2.6722+0	7.4708+6	2.1667+6	9.0907+5	4.3932+6	1.8086+3	6.5581+2	1.3726+1	1.5066+0	6.4057+2
5.0000+2	5.0187–6	1.9787+4	2.8082+0	7.4585+6	2.1660+6	9.0910+5	4.3816+6	1.8247+3	8.2038+2	1.3864+1	1.5031+0	8.0501+2
6.0000+2	5.0223–6	1.9773+4	2.9194+0	7.4533+6	2.1653+6	9.0912+5	4.3770+6	1.8381+3	9.8322+2	1.3983+1	1.5021+0	9.6774+2
8.0000+2	5.0291–6	1.9746+4	3.0949+0	7.4431+6	2.1643+6	9.0913+5	4.3678+6	1.8594+3	1.3119+3	1.4191+1	1.5000+0	1.2962+3
1.0000+3	5.0345–6	1.9725+4	3.2309+0	7.4351+6	2.1635+6	9.0914+5	4.3606+6	1.8763+3	1.6403+3	1.4375+1	1.4986+0	1.6244+3
1.5000+3	5.0406–6	1.9701+4	3.4778+0	7.4262+6	2.1621+6	9.0915+5	4.3530+6	1.9074+3	2.4659+3	1.4547+1	1.4961+0	2.4498+3
2.0000+3	5.0453–6	1.9682+4	3.6529+0	7.4192+6	2.1611+6	9.0915+5	4.3470+6	1.9304+3	3.2868+3	1.4715+1	1.4940+0	3.2706+3
3.0000+3	5.0512–6	1.9660+4	3.8995+0	7.4105+6	2.1597+6	9.0916+5	4.3397+6	1.9638+3	4.9320+3	1.5044+1	1.4916+0	4.9155+3
4.0000+3	5.0557–6	1.9642+4	4.0745+0	7.4040+6	2.1587+6	9.0916+5	4.3341+6	1.9882+3	6.5785+3	1.5188+1	1.4897+0	6.5618+3

Atomic Weight 227.000												Density 10.070 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+3	5.0612–6	1.9621+4	4.2100+0	7.3959+6	2.1579+6	9.0916+5	4.3268+6	2.0074+3	8.2423+3	1.5296+1	1.4872+0	8.2255+3
6.0000+3	5.0624–6	1.9616+4	4.3207+0	7.3941+6	2.1573+6	9.0916+5	4.3257+6	2.0213+3	9.8781+3	1.5404+1	1.4868+0	9.8612+3
8.0000+3	5.0654–6	1.9605+4	4.4954+0	7.3899+6	2.1563+6	9.0916+5	4.3224+6	2.0434+3	1.3178+4	1.5620+1	1.4858+0	1.3161+4
1.0000+4	5.0675–6	1.9596+4	4.6307+0	7.3867+6	2.1555+6	9.0916+5	4.3200+6	2.0608+3	1.6509+4	1.5801+1	1.4851+0	1.6492+4
1.5000+4	5.0708–6	1.9583+4	4.8767+0	7.3818+6	2.1541+6	9.0916+5	4.3165+6	2.0941+3	2.4683+4	1.5965+1	1.4839+0	2.4665+4
2.0000+4	5.0736–6	1.9573+4	5.0514+0	7.3778+6	2.1531+6	9.0916+5	4.3135+6	2.1181+3	3.2962+4	1.6130+1	1.4828+0	3.2945+4
3.0000+4	5.0763–6	1.9563+4	5.2977+0	7.3740+6	2.1516+6	9.0916+5	4.3110+6	2.1517+3	4.9334+4	1.6452+1	1.4820+0	4.9316+4
4.0000+4	5.0789–6	1.9553+4	5.4725+0	7.3702+6	2.1507+6	9.0916+5	4.3082+6	2.1759+3	6.5881+4	1.6589+1	1.4810+0	6.5863+4
5.0000+4	5.0827–6	1.9538+4	5.6081+0	7.3647+6	2.1499+6	9.0916+5	4.3034+6	2.1945+3	8.2275+4	1.6696+1	1.4794+0	8.2257+4
6.0000+4	5.0830–6	1.9537+4	5.7189+0	7.3642+6	2.1492+6	9.0916+5	4.3036+6	2.2096+3	9.8655+4	1.6799+1	1.4794+0	9.8637+4
8.0000+4	5.0844–6	1.9531+4	5.8937+0	7.3622+6	2.1483+6	9.0916+5	4.3025+6	2.2337+3	1.3170+5	1.7006+1	1.4791+0	1.3168+5
1.0000+5	5.0858–6	1.9526+4	6.0292+0	7.3601+6	2.1475+6	9.0916+5	4.3013+6	2.2524+3	1.6481+5	1.7203+1	1.4787+0	1.6479+5


July 4, 1991
Atomic Weight 232 038
EEDL Evaluated Electron
Cross Sections
90-Th
Density 11 720 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
90-Th


July 4, 1991
Atomic Weight 232 038
EEDL Evaluated Electron
Energy Deposition
90-Th
Density 11 720 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
90-Th


July 4, 1991
Atomic Weight 232 038
EEDL Evaluated Electron
Shell Cross Sections
90-Th
Density 11 720 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
90-Th


July 4, 1991
Atomic Weight 232 038
EEDL Evaluated Electron
Energy Deposition
90-Th
Density 11 720 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
90-Th

421

Atomic Weight 232.038 Density 11.720 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.8545–9	1.4574+7		5.6155+9	5.2251+9	3.2358+8	6.6778+7	4.7530+3	7.7203+1	6.3283+1	1.3920+1	3.1255–4
	1.1250–5	6.0739–9	1.4048+7		5.4127+9	4.9135+9	3.8054+8	1.1862+8	4.8696+3	1.0276+2	7.7303+1	2.5455+1	3.5051–4
	1.3125–5	6.3081–9	1.3526+7		5.2117+9	4.5336+9	4.4922+8	2.2890+8	5.0266+3	1.4754+2	9.6317+1	5.1224+1	4.0870–4
	1.5000–5	6.4434–9	1.3242+7		5.1023+9	4.2283+9	5.0189+8	3.7206+8	5.1667+3	1.9942+2	1.1274+2	8.6683+1	4.6828–4
	1.7500–5	6.5046–9	1.3118+7		5.0543+9	3.9014+9	5.5143+8	6.0150+8	5.3332+3	2.7431+2	1.3041+2	1.4390+2	5.4971–4
	2.0000–5	6.4735–9	1.3181+7		5.0786+9	3.6387+9	5.8506+8	8.5484+8	5.4819+3	3.5497+2	1.4512+2	2.0985+2	6.3321–4
P3	2.5010–5	6.2750–9	1.3597+7		5.2392+9	3.2379+9	6.2155+8	1.3797+9	5.7161+3	5.1368+2	1.6626+2	3.4743+2	7.9322–4
	2.5322–5	6.2663–9	1.3616+7		5.2465+9	3.2170+9	6.2289+8	1.4066+9	5.7291+3	5.2186+2	1.6736+2	3.5451+2	8.0321–4
	2.5907–5	6.2482–9	1.3656+7		5.2617+9	3.1789+9	6.2535+8	1.4574+9	5.7531+3	5.3735+2	1.6941+2	3.6794+2	8.2201–4
	2.6930–5	6.2116–9	1.3736+7		5.2927+9	3.1153+9	6.2953+8	1.5479+9	5.7942+3	5.6492+2	1.7297+2	3.9194+2	8.5507–4
	2.8465–5	6.1461–9	1.3883+7		5.3491+9	3.0264+9	6.3551+8	1.6872+9	5.8535+3	6.0738+2	1.7825+2	4.2912+2	9.0501–4
	3.0000–5	6.0697–9	1.4057+7		5.4165+9	2.9446+9	6.4119+8	1.8307+9	5.9102+3	6.5117+2	1.8347+2	4.6769+2	9.5538–4
P2	3.3520–5	5.9794–9	1.4270+7		5.4982+9	2.7789+9	6.4320+8	2.0761+9	6.0317+3	7.2455+2	1.9106+2	5.3349+2	1.0724–3
	3.3925–5	5.9745–9	1.4282+7		5.5028+9	2.7615+9	6.4353+8	2.0978+9	6.0450+3	7.3143+2	1.9204+2	5.3939+2	1.0860–3
	3.4684–5	5.9643–9	1.4306+7		5.5121+9	2.7298+9	6.4419+8	2.1382+9	6.0697+3	7.4435+2	1.9390+2	5.5045+2	1.1115–3
	3.6013–5	5.9442–9	1.4354+7		5.5308+9	2.6767+9	6.4543+8	2.2086+9	6.1117+3	7.6702+2	1.9724+2	5.6978+2	1.1565–3
	3.6250–5	5.9404–9	1.4363+7		5.5344+9	2.6676+9	6.4566+8	2.2211+9	6.1191+3	7.7106+2	1.9784+2	5.7322+2	1.1645–3
	3.8007–5	5.9096–9	1.4438+7		5.5631+9	2.6025+9	6.4704+8	2.3136+9	6.1724+3	8.0083+2	2.0207+2	5.9876+2	1.2244–3
	4.0000–5	5.8902–9	1.4486+7		5.5815+9	2.5339+9	6.4871+8	2.3988+9	6.2306+3	8.2975+2	2.0699+2	6.2276+2	1.2929–3
	4.5000–5	5.8835–9	1.4502+7		5.5878+9	2.3828+9	6.4088+8	2.5641+9	6.3600+3	8.8211+2	2.1343+2	6.6868+2	1.4608–3
	4.6250–5	5.8961–9	1.4471+7		5.5759+9	2.3490+9	6.3908+8	2.5878+9	6.3904+3	8.9067+2	2.1504+2	6.7562+2	1.5032–3
	5.0000–5	5.9278–9	1.4394+7		5.5461+9	2.2553+9	6.3429+8	2.6565+9	6.4779+3	9.1610+2	2.2021+2	6.9588+2	1.6315–3
P1	5.0550–5	5.9322–9	1.4383+7		5.5420+9	2.2425+9	6.3333+8	2.6662+9	6.4900+3	9.1955+2	2.2077+2	6.9877+2	1.6502–3
	5.1141–5	5.9455–9	1.4351+7		5.5296+9	2.2289+9	6.3236+8	2.6683+9	6.5029+3	9.2114+2	2.2142+2	6.9971+2	1.6702–3
	5.2248–5	5.9700–9	1.4292+7		5.5069+9	2.2041+9	6.3059+8	2.6722+9	6.5266+3	9.2413+2	2.2268+2	7.0145+2	1.7079–3
	5.4186–5	6.0113–9	1.4194+7		5.4691+9	2.1626+9	6.2764+8	2.6789+9	6.5672+3	9.2939+2	2.2493+2	7.0445+2	1.7742–3
	5.5000–5	6.0280–9	1.4155+7		5.4539+9	2.1458+9	6.2646+8	2.6816+9	6.5838+3	9.3159+2	2.2589+2	7.0570+2	1.8021–3
	5.7093–5	6.0699–9	1.4057+7		5.4162+9	2.1044+9	6.2341+8	2.6884+9	6.6258+3	9.3714+2	2.2828+2	7.0886+2	1.8742–3
	6.0000–5	6.1249–9	1.3931+7		5.3676+9	2.0505+9	6.1948+8	2.6976+9	6.6820+3	9.4487+2	2.3170+2	7.1316+2	1.9751–3
	6.5000–5	6.2660–9	1.3617+7		5.2468+9	1.9666+9	6.0728+8	2.6729+9	6.7736+3	9.4222+2	2.3387+2	7.0834+2	2.1502–3
	7.0000–5	6.3978–9	1.3337+7		5.1387+9	1.8920+9	5.9644+8	2.6502+9	6.8595+3	9.4046+2	2.3643+2	7.0403+2	2.3274–3
	7.2500–5	6.4609–9	1.3206+7		5.0885+9	1.8577+9	5.9124+8	2.6396+9	6.9006+3	9.3962+2	2.3758+2	7.0204+2	2.4168–3
	8.0000–5	6.6994–9	1.2736+7		4.9073+9	1.7646+9	5.7708+8	2.5656+9	7.0171+3	9.2618+2	2.4137+2	6.8481+2	2.6877–3
	9.0000–5	7.0223–9	1.2150+7		4.6817+9	1.6594+9	5.5470+8	2.4676+9	7.1574+3	9.0427+2	2.4209+2	6.6218+2	3.0549–3
O5	9.7110–5	7.2382–9	1.1788+7		4.5420+9	1.5948+9	5.4093+8	2.4063+9	7.2495+3	8.9135+2	2.4315+2	6.4819+2	3.3199–3
	9.8555–5	7.2868–9	1.1709+7		4.5117+9	1.5825+9	5.3833+8	2.3908+9	7.2672+3	8.8805+2	2.4350+2	6.4454+2	3.3742–3
	1.0000–4	7.3351–9	1.1632+7	0.0000+0	4.4820+9	1.5706+9	5.3580+8	2.3757+9	7.2847+3	8.8485+2	2.4387+2	6.4098+2	3.4285–3
	1.0313–4	7.4377–9	1.1472+7	3.5478–9	4.4202+9	1.5455+9	5.2894+8	2.3458+9	7.3219+3	8.7680+2	2.4336+2	6.3344+2	3.5465–3
O4	1.0423–4	7.4736–9	1.1417+7	4.8101–9	4.3990+9	1.5369+9	5.2658+8	2.3355+9	7.3349+3	8.7404+2	2.4319+2	6.3085+2	3.5883–3
	1.0566–4	7.5216–9	1.1344+7	6.4497–9	4.3709+9	1.5260+9	5.2355+8	2.3213+9	7.3514+3	8.7031+2	2.4300+2	6.2731+2	3.6425–3
	1.0843–4	7.6136–9	1.1207+7	9.6475–9	4.3181+9	1.5055+9	5.1785+8	2.2947+9	7.3830+3	8.6337+2	2.4272+2	6.2065+2	3.7480–3
	1.0898–4	7.6318–9	1.1180+7	1.0287–8	4.3078+9	1.5015+9	5.1675+8	2.2895+9	7.3892+3	8.6203+2	2.4267+2	6.1935+2	3.7691–3
	1.1250–4	7.7464–9	1.1015+7	1.4386–8	4.2440+9	1.4768+9	5.0988+8	2.2574+9	7.4282+3	8.5369+2	2.4237+2	6.1132+2	3.9036–3
	1.1363–4	7.7828–9	1.0963+7	1.5709–8	4.2242+9	1.4691+9	5.0775+8	2.2474+9	7.4405+3	8.5112+2	2.4230+2	6.0882+2	3.9469–3
	1.1635–4	7.8699–9	1.0842+7	1.8924–8	4.1775+9	1.4510+9	5.0272+8	2.2237+9	7.4697+3	8.4507+2	2.4214+2	6.0293+2	4.0518–3
	1.2500–4	8.1388–9	1.0484+7	2.9262–8	4.0394+9	1.3976+9	4.8793+8	2.1539+9	7.5589+3	8.2757+2	2.4202+2	5.8554+2	4.3870–3
	1.3125–4	8.3274–9	1.0246+7	3.6868–8	3.9479+9	1.3624+9	4.7794+8	2.1075+9	7.6201+3	8.1596+2	2.4190+2	5.7405+2	4.6316–3
	1.3181–4	8.3442–9	1.0226+7	3.7559–8	3.9400+9	1.3594+9	4.7708+8	2.1035+9	7.6255+3	8.1496+2	2.4191+2	5.7305+2	4.6538–3
	1.3318–4	8.3846–9	1.0176+7	3.9234–8	3.9210+9	1.3521+9	4.7501+8	2.0939+9	7.6385+3	8.1258+2	2.4190+2	5.7067+2	4.7074–3
	1.5000–4	8.8657–9	9.6241+6	6.0278–8	3.7083+9	1.2706+9	4.5184+8	1.9858+9	7.7904+3	7.8642+2	2.4241+2	5.4401+2	5.3763–3
	1.6250–4	9.2470–9	9.2273+6	7.6419–8	3.5553+9	1.2185+9	4.3373+8	1.9031+9	7.8942+3	7.6253+2	2.3986+2	5.2267+2	5.8849–3
	1.7500–4	9.6143–9	8.8747+6	9.3040–8	3.4195+9	1.1722+9	4.1772+8	1.8296+9	7.9915+3	7.4173+2	2.3798+2	5.0374+2	6.3998–3
	1.8125–4	9.7931–9	8.7127+6	1.0152–7	3.3571+9	1.1509+9	4.1038+8	1.7958+9	8.0380+3	7.3231+2	2.3725+2	4.9506+2	6.6595–3
O3	1.8941–4	1.0022–8	8.5135+6	1.1275–7	3.2803+9	1.1247+9	4.0137+8	1.7542+9	8.0967+3	7.2083+2	2.3643+2	4.8439+2	7.0007–3
	1.9206–4	1.0098–8	8.4493+6	1.1643–7	3.2556+9	1.1166+9	3.9859+8	1.7404+9	8.1150+3	7.1713+2	2.3625+2	4.8087+2	7.1181–3
	1.9603–4	1.0212–8	8.3556+6	1.2199–7	3.2195+9	1.1047+9	3.9453+8	1.7203+9	8.1422+3	7.1176+2	2.3601+2	4.7574+2	7.2949–3
	2.0000–4	1.0324–8	8.2649+6	1.2759–7	3.1845+9	1.0932+9	3.9060+8	1.7007+9	8.1689+3	7.0659+2	2.3581+2	4.7077+2	7.4722–3
	2.0625–4	1.0505–8	8.1219+6	1.3650–7	3.1294+9	1.0757+9	3.8386+8	1.6698+9	8.2100+3	6.9713+2	2.3448+2	4.6265+2	7.7524–3
	2.1797–4	1.0840–8	7.8714+6	1.5351–7	3.0329+9	1.0451+9	3.7209+8	1.6157+9	8.2844+3	6.8074+2	2.3229+2	4.4844+2	8.2817–3
	2.2500–4	1.1037–8	7.7311+6	1.6391–7	2.9788+9	1.0279+9	3.6552+8	1.5854+9	8.3274+3	6.7166+2	2.3116+2	4.4050+2	8.6016–3
O2	2.3743–4	1.1378–8	7.4992+6	1.8262–7	2.8895+9	9.9942+8	3.5469+8	1.5354+9	8.4008+3	6.5684+2	2.2944+2	4.2739+2	9.1712–3
	2.4134–4	1.1490–8	7.4261+6	1.8860–7	2.8613+9	9.9092+8	3.5126+8	1.5192+9	8.4233+3	6.5176+2	2.2865+2	4.2310+2	9.3515–3
	2.4867–4	1.1698–8	7.2942+6	1.9993–7	2.8105+9	9.7554+8	3.4508+8	1.4899+9	8.4645+3	6.4266+2	2.2729+2	4.1536+2	9.6907–3
	2.6150–4	1.2055–8	7.0778+6	2.2013–7	2.7271+9	9.5021+8	3.3498+8	1.4419+9	8.5343+3	6.2792+2	2.2523+2	4.0268+2	1.0288–2
	2.6250–4	1.2083–8	7.0618+6	2.2171–7	2.7210+9	9.4833+8	3.3424+8	1.4384+9	8.5396+3	6.2683+2	2.2508+2	4.0174+2	1.0335–2
	2.6924–4	1.2267–8	6.9555+6	2.3252–7	2.6800+9	9.3585+8	3.2927+8	1.4149+9	8.5750+3	6.1960+2	2.2406+2	3.9553+2	1.0651–2
	2.8075–4	1.2578–8	6.7834+6	2.5128–7	2.6137+9	9.1558+8	3.2124+8	1.3769+9	8.6338+3	6.0800+2	2.2249+2	3.8550+2	1.1194–2
O1	2.9476–4	1.2950–8	6.5889+6	2.7457–7	2.5388+9	8.9257+8	3.1219+8	1.3340+9	8.7027+3	5.9507+2	2.2086+2	3.7419+2	1.1860–2
	3.0000–4	1.3092–8	6.5174+6	2.8341–7	2.5112+9	8.8439+8	3.0893+8	1.3179+9	8.7277+3	5.9020+2	2.2026+2	3.6993+2	1.2110–2
	3.0625–4	1.3263–8	6.4332+6	2.9406–7	2.4788+9	8.7491+8	3.0491+8	1.2989+9	8.7571+3	5.8392+2	2.1908+2	3.6483+2	1.2410–2
	3.1797–4	1.3581–8	6.2828+6	3.1432–7	2.4208+9	8.5790+8	2.9774+8	1.2652+9	8.8110+3	5.7277+2	2.1705+2	3.5571+2	1.2974–2
	3.2500–4	1.3769–8	6.1969+6	3.2667–7	2.3877+9	8.4815+8	2.9366+8	1.2459+9	8.8425+3	5.6645+2	2.1592+2	3.5052+2	1.3315–2
	3.3848–4	1.4125–8	6.0405+6	3.5070–7	2.3275+9	8.3032+8	2.8622+8	1.2109+9	8.9013+3	5.5504+2	2.1395+2	3.4108+2	1.3971–2
N7	3.4869–4	1.4392–8	5.9287+6	3.6924–7	2.2844+9	8.1752+8	2.8092+8	1.1859+9	8.9446+3	5.4697+2	2.1261+2	3.3435+2	1.4470–2
	3.5510–4	1.4559–8	5.8606+6	3.8102–7	2.2581+9	8.0977+8	2.7763+8	1.1707+9	8.9712+3	5.4199+2	2.1170+2	3.3028+2	1.4786–2
N6	3.5855–4	1.4648–8	5.8249+6	3.8739–7	2.2444+9	8.0569+8	2.7590+8	1.1628+9	8.9854+3	5.3938+2	2.1123+2	3.2814+2	1.4955–2
	3.6633–4	1.4851–8	5.7452+6	4.0189–7	2.2137+9	7.9670+8	2.7210+8	1.1449+9	9.0164+3	5.3360+2	2.1023+2	3.2335+2	1.5348–2
	3.6891–4	1.4919–8	5.7193+6	4.0674–7	2.2037+9	7.9378+8	2.7087+8	1.1391+9	9.0266+3	5.3173+2	2.0991+2	3.2180+2	1.5478–2
	3.6924–4	1.4927–8	5.7161+6	4.0735–7	2.2025+9	7.9341+8	2.7071+8	1.1383+9	9.0279+3	5.3149+2	2.0987+2	3.2160+2	1.5495–2
	3.8316–4	1.5286–8	5.5819+6	4.3379–7	2.1508+9	7.7821+8	2.6432+8	1.1082+9	9.0817+3	5.2183+2	2.0825+2	3.1357+2	1.6202–2

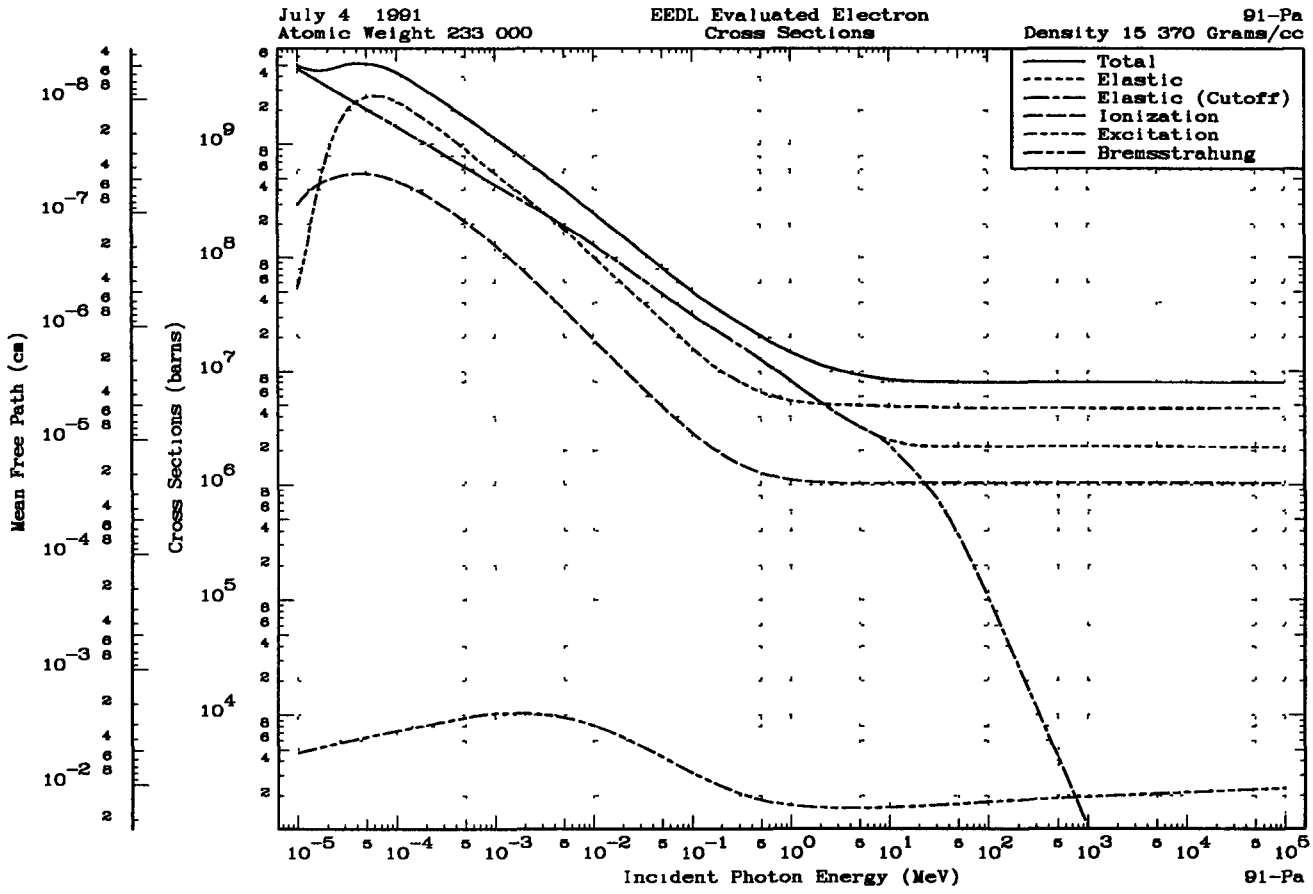
Atomic Weight 232.038 Density 11.720 Grams/cc

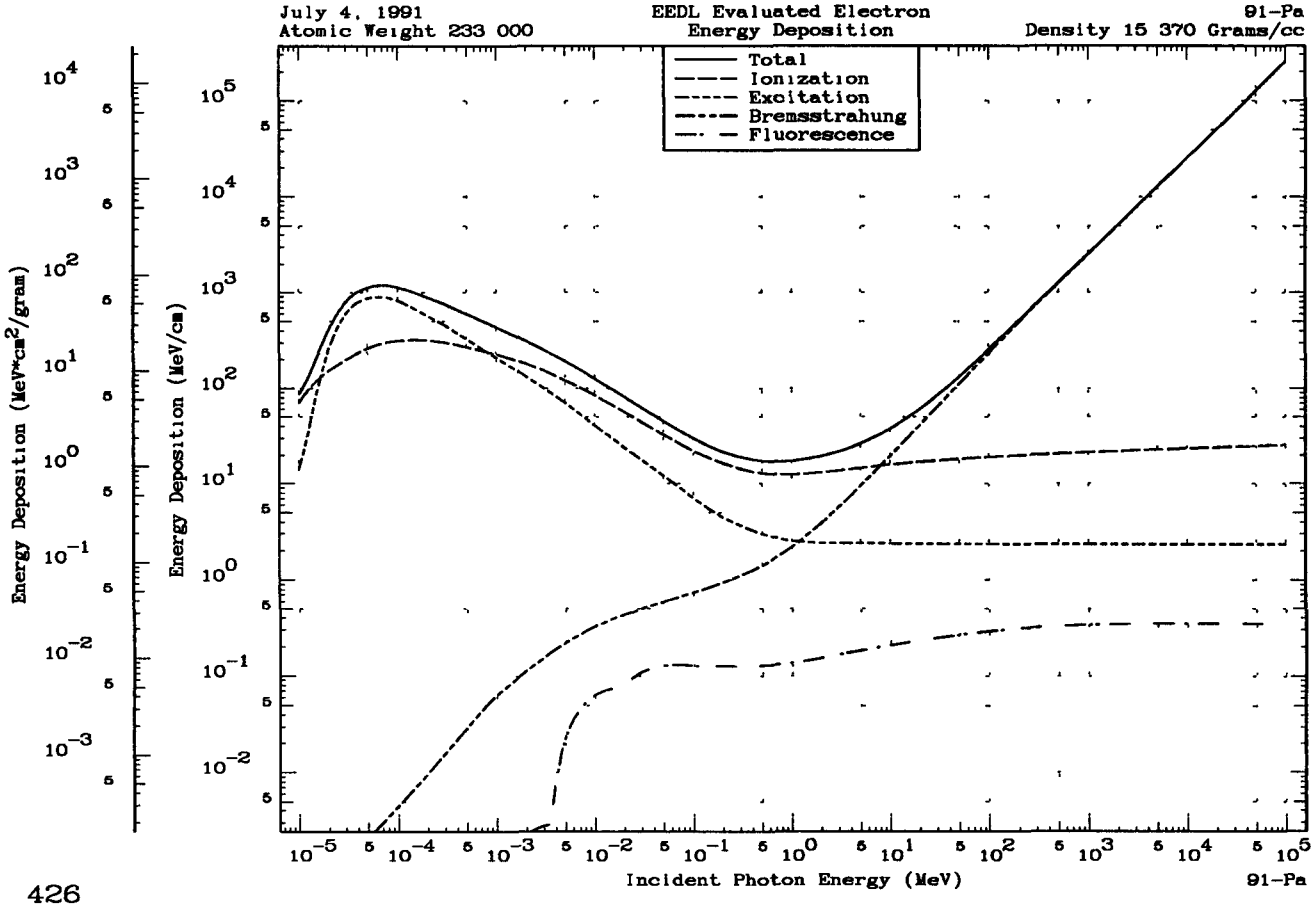
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.0000–4	1.5713–8	5.4302+6	4.6640–7	2.0923+9	7.6091+8	2.5712+8	1.0743+9	9.1446+3	5.1108+2	2.0656+2	3.0451+2	1.7062–2
	4.2500–4	1.6353–8	5.2175+6	5.1613–7	2.0103+9	7.3717+8	2.4668+8	1.0265+9	9.2317+3	4.9439+2	2.0287+2	2.9151+2	1.8391–2
	4.5000–4	1.6980–8	5.0249+6	5.6747–7	1.9361+9	7.1547+8	2.3727+8	9.8339+8	9.3146+3	4.7956+2	1.9976+2	2.7979+2	1.9733–2
	4.7188–4	1.7518–8	4.8706+6	6.1365–7	1.8767+9	6.9794+8	2.2975+8	9.4897+8	9.3840+3	4.6789+2	1.9743+2	2.7043+2	2.0917–2
	4.7500–4	1.7594–8	4.8495+6	6.2034–7	1.8686+9	6.9553+8	2.2872+8	9.4429+8	9.3937+3	4.6631+2	1.9713+2	2.6916+2	2.1087–2
	5.0000–4	1.8197–8	4.6890+6	6.7464–7	1.8067+9	6.7713+8	2.2093+8	9.0863+8	9.4694+3	4.5444+2	1.9494+2	2.5948+2	2.2454–2
	5.5000–4	1.9350–8	4.4096+6	7.8731–7	1.6990+9	6.4422+8	2.0674+8	8.4806+8	9.6040+3	4.3334+2	1.9039+2	2.4291+2	2.5193–2
	6.0000–4	2.0464–8	4.1695+6	9.0507–7	1.6065+9	6.1558+8	1.9466+8	7.9630+8	9.7286+3	4.1592+2	1.8711+2	2.2878+2	2.7972–2
N5	6.7664–4	2.2114–8	3.8584+6	1.0950–6	1.4867+9	5.7809+8	1.7846+8	7.3013+8	9.8869+3	3.9145+2	1.8087+2	2.1055+2	3.2221–2
	6.8435–4	2.2276–8	3.8303+6	1.1147–6	1.4758+9	5.7467+8	1.7700+8	7.2417+8	9.8999+3	3.8929+2	1.8035+2	2.0891+2	3.2639–2
	6.9881–4	2.2579–8	3.7790+6	1.1521–6	1.4561+9	5.6843+8	1.7435+8	7.1328+8	9.9240+3	3.8539+2	1.7944+2	2.0591+2	3.3425–2
N4	7.1481–4	2.2911–8	3.7241+6	1.1938–6	1.4349+9	5.6174+8	1.7151+8	7.0168+8	9.9501+3	3.8126+2	1.7851+2	2.0272+2	3.4297–2
	7.2411–4	2.3103–8	3.6932+6	1.2183–6	1.4230+9	5.5796+8	1.6990+8	6.9515+8	9.9647+3	3.7889+2	1.7795+2	2.0091+2	3.4801–2
	7.2546–4	2.3131–8	3.6887+6	1.2218–6	1.4213+9	5.5741+8	1.6967+8	6.9420+8	9.9668+3	3.7855+2	1.7786+2	2.0065+2	3.4874–2
	7.4409–4	2.3513–8	3.6288+6	1.2714–6	1.3982+9	5.5007+8	1.6656+8	6.8157+8	9.9954+3	3.7401+2	1.7681+2	1.9717+2	3.5886–2
	7.6205–4	2.3878–8	3.5734+6	1.3196–6	1.3769+9	5.4326+8	1.6369+8	6.6989+8	1.0022+4	3.6987+2	1.7589+2	1.9394+2	3.6863–2
	7.7205–4	2.4079–8	3.5434+6	1.3468–6	1.3653+9	5.3957+8	1.6214+8	6.6360+8	1.0037+4	3.6765+2	1.7541+2	1.9221+2	3.7409–2
	8.0000–4	2.4638–8	3.4631+6	1.4234–6	1.3344+9	5.2963+8	1.5800+8	6.4672+8	1.0078+4	3.6179+2	1.7420+2	1.8755+2	3.8938–2
	8.5000–4	2.5623–8	3.3300+6	1.5637–6	1.2831+9	5.1311+8	1.5095+8	6.1899+8	1.0117+4	3.5099+2	1.7111+2	1.7984+2	4.1321–2
	9.0000–4	2.6587–8	3.2093+6	1.7081–6	1.2366+9	4.9800+8	1.4461+8	5.9394+8	1.0155+4	3.4143+2	1.6851+2	1.7288+2	4.3712–2
N3	9.5616–4	2.7645–8	3.0864+6	1.8750–6	1.1892+9	4.8249+8	1.3820+8	5.6852+8	1.0194+4	3.3179+2	1.6593+2	1.6582+2	4.6407–2
	9.6712–4	2.7851–8	3.0636+6	1.9081–6	1.1805+9	4.7963+8	1.3702+8	5.6379+8	1.0202+4	3.3004+2	1.6548+2	1.6452+2	4.6934–2
	1.0000–3	2.8461–8	2.9979+6	2.0085–6	1.1551+9	4.7132+8	1.3364+8	5.5015+8	1.0224+4	3.2506+2	1.6424+2	1.6076+2	4.8518–2
	1.0313–3	2.9003–8	2.9419+6	2.1053–6	1.1335+9	4.6380+8	1.3049+8	5.3924+8	1.0227+4	3.2036+2	1.6260+2	1.5771+2	4.9727–2
	1.0898–3	3.0001–8	2.8441+6	2.2906–6	1.0958+9	4.5060+8	1.2505+8	5.2019+8	1.0231+4	3.1228+2	1.5985+2	1.5238+2	5.1995–2
	1.1250–3	3.0589–8	2.7894+6	2.4040–6	1.0748+9	4.4319+8	1.2203+8	5.0955+8	1.0234+4	3.0786+2	1.5840+2	1.4940+2	5.3356–2
N2	1.1623–3	3.1205–8	2.7343+6	2.5260–6	1.0536+9	4.3570+8	1.1900+8	4.9884+8	1.0236+4	3.0344+2	1.5697+2	1.4641+2	5.4801–2
	1.1834–3	3.1550–8	2.7044+6	2.5958–6	1.0420+9	4.3163+8	1.1734+8	4.9304+8	1.0237+4	3.0094+2	1.5609+2	1.4479+2	5.5618–2
	1.1924–3	3.1697–8	2.6919+6	2.6257–6	1.0372+9	4.2993+8	1.1666+8	4.9062+8	1.0238+4	2.9990+2	1.5573+2	1.4412+2	5.5966–2
	1.2230–3	3.2192–8	2.6505+6	2.7283–6	1.0213+9	4.2427+8	1.1438+8	4.8260+8	1.0240+4	2.9648+2	1.5454+2	1.4188+2	5.7151–2
	1.2693–3	3.2931–8	2.5910+6	2.8858–6	9.9832+8	4.1611+8	1.1113+8	4.7107+8	1.0243+4	2.9162+2	1.5289+2	1.3867+2	5.8945–2
	1.2922–3	3.3294–8	2.5628+6	2.9648–6	9.8745+8	4.1224+8	1.0959+8	4.6561+8	1.0244+4	2.8935+2	1.5214+2	1.3715+2	5.9835–2
N1	1.3106–3	3.3582–8	2.5408+6	3.0285–6	9.7898+8	4.0921+8	1.0840+8	4.6136+8	1.0246+4	2.8759+2	1.5156+2	1.3597+2	6.0546–2
	1.3343–3	3.3952–8	2.5131+6	3.1112–6	9.6830+8	4.0540+8	1.0688+8	4.5601+8	1.0247+4	2.8519+2	1.5065+2	1.3447+2	6.1464–2
	1.3757–3	3.4594–8	2.4664+6	3.2575–6	9.5034+8	3.9898+8	1.0433+8	4.4702+8	1.0250+4	2.8119+2	1.4917+2	1.3196+2	6.3070–2
	1.3846–3	3.4731–8	2.4567+6	3.2893–6	9.4659+8	3.9763+8	1.0380+8	4.4514+8	1.0250+4	2.8035+2	1.4886+2	1.3143+2	6.3416–2
	1.3961–3	3.4907–8	2.4443+6	3.3303–6	9.4181+8	3.9592+8	1.0313+8	4.4276+8	1.0251+4	2.7930+2	1.4847+2	1.3076+2	6.3861–2
	1.4378–3	3.5542–8	2.4007+6	3.4807–6	9.2500+8	3.8987+8	1.0077+8	4.3435+8	1.0253+4	2.7562+2	1.4713+2	1.2841+2	6.5479–2
	1.5000–3	3.6473–8	2.3394+6	3.7083–6	9.0138+8	3.8135+8	9.7468+7	4.2255+8	1.0256+4	2.7052+2	1.4533+2	1.2512+2	6.7890–2
	1.6250–3	3.8307–8	2.2274+6	4.1796–6	8.5824+8	3.6573+8	9.1374+7	4.0112+8	1.0244+4	2.6004+2	1.4090+2	1.1906+2	7.2353–2
	1.7500–3	4.0083–8	2.1287+6	4.6688–6	8.2020+8	3.5184+8	8.6084+7	3.8226+8	1.0232+4	2.5102+2	1.3720+2	1.1374+2	7.6812–2
	1.8125–3	4.0952–8	2.0835+6	4.9198–6	8.0279+8	3.4545+8	8.3690+7	3.7364+8	1.0226+4	2.4695+2	1.3556+2	1.1131+2	7.9040–2
	2.0000–3	4.3489–8	1.9620+6	5.6960–6	7.5596+8	3.2814+8	7.7338+7	3.5048+8	1.0211+4	2.3624+2	1.3137+2	1.0479+2	8.5718–2
	2.2500–3	4.6840–8	1.8216+6	6.7878–6	7.0188+8	3.0850+8	7.0139+7	3.2323+8	1.0142+4	2.2190+2	1.2483+2	9.6974+1	9.3517–2
	2.5000–3	5.0049–8	1.7048+6	7.9450–6	6.5688+8	2.9193+8	6.4282+7	3.0066+8	1.0082+4	2.1026+2	1.1965+2	9.0508+1	1.0128–1
	2.6250–3	5.1606–8	1.6534+6	8.5469–6	6.3706+8	2.8456+8	6.1739+7	2.9075+8	1.0054+4	2.0514+2	1.1737+2	8.7673+1	1.0515–1
	3.0000–3	5.6112–8	1.5206+6	1.0435–5	5.8590+8	2.6533+8	5.5295+7	2.6527+8	9.9776+3	1.9226+2	1.1175+2	8.0393+1	1.1670–1
M5	3.3386–3	6.0065–8	1.4205+6	1.2248–5	5.4735+8	2.5071+8	5.0515+7	2.4611+8	9.8813+3	1.8134+2	1.0637+2	7.4841+1	1.2614–1
	3.3593–3	6.0303–8	1.4149+6	1.2362–5	5.4518+8	2.4989+8	5.0252+7	2.4504+8	9.8758+3	1.8074+2	1.0608+2	7.4533+1	1.2671–1
	3.4394–3	6.1221–8	1.3937+6	1.2808–5	5.3701+8	2.4675+8	4.9262+7	2.4098+8	9.8547+3	1.7849+2	1.0500+2	7.3367+1	1.2893–1
M4	3.5024–3	6.1938–8	1.3776+6	1.3163–5	5.3079+8	2.4436+8	4.8513+7	2.3791+8	9.8384+3	1.7679+2	1.0417+2	7.2481+1	1.3067–1
	3.5335–3	6.2289–8	1.3698+6	1.3339–5	5.2780+8	2.4321+8	4.8151+7	2.3643+8	9.8303+3	1.7595+2	1.0376+2	7.2052+1	1.3153–1
	3.5795–3	6.2807–8	1.3585+6	1.3602–5	5.2345+8	2.4153+8	4.7626+7	2.3428+8	9.8183+3	1.7474+2	1.0317+2	7.1430+1	1.3279–1
	3.5918–3	6.2945–8	1.3555+6	1.3672–5	5.2230+8	2.4108+8	4.7488+7	2.3372+8	9.8152+3	1.7442+2	1.0302+2	7.1266+1	1.3312–1
	3.6939–3	6.4083–8	1.3315+6	1.4262–5	5.1303+8	2.3749+8	4.6375+7	2.2916+8	9.7893+3	1.7184+2	1.0177+2	6.9940+1	1.3591–1
	3.7898–3	6.5141–8	1.3098+6	1.4823–5	5.0469+8	2.3425+8	4.5380+7	2.2506+8	9.7658+3	1.6955+2	1.0066+2	6.8750+1	1.3853–1
	4.0000–3	6.7426–8	1.2655+6	1.6081–5	4.8759+8	2.2756+8	4.3355+7	2.1667+8	9.7163+3	1.6488+2	9.8418+1	6.6315+1	1.4424–1
M3	4.0362–3	6.7819–8	1.2581+6	1.6301–5	4.8476+8	2.2642+8	4.3021+7	2.1531+8	9.7020+3	1.6403+2	9.7971+1	6.5917+1	1.4504–1
	4.0964–3	6.8478–8	1.2460+6	1.6670–5	4.8010+8	2.2456+8	4.2477+7	2.1305+8	9.6785+3	1.6265+2	9.7249+1	6.5255+1	1.4636–1
	4.2094–3	6.9704–8	1.2241+6	1.7369–5	4.7165+8	2.2118+8	4.1498+7	2.0897+8	9.6354+3	1.6016+2	9.5952+1	6.4058+1	1.4883–1
	4.4070–3	7.1821–8	1.1880+6	1.8620–5	4.5775+8	2.1559+8	3.9897+7	2.0225+8	9.5631+3	1.5609+2	9.3850+1	6.2091+1	1.5314–1
	4.5000–3	7.2805–8	1.1720+6	1.9219–5	4.5156+8	2.1310+8	3.9190+7	1.9927+8	9.5304+3	1.5430+2	9.2930+1	6.1218+1	1.5516–1
	4.7035–3	7.4933–8	1.1387+6	2.0554–5	4.3874+8	2.0791+8	3.7732+7	1.9309+8	9.4615+3	1.5059+2	9.1025+1	5.9410+1	1.5956–1
M2	4.8316–3	7.6256–8	1.1189+6	2.1410–5	4.3113+8	2.0481+8	3.6874+7	1.8943+8	9.4200+3	1.4841+2	8.9912+1	5.8340+1	1.6232–1
	4.9158–3	7.7174–8	1.1056+6	2.1980–5	4.2600+8	2.0285+8	3.6332+7	1.8681+8	9.3933+3	1.4695+2	8.9214+1	5.7576+1	1.6413–1
	5.0000–3	7.8086–8	1.0927+6	2.2556–5	4.2102+8	2.0094+8	3.5808+7	1.8427+8	9.3672+3	1.4554+2	8.8541+1	5.6835+1	1.6593–1
M1	5.1579–3	7.9786–8	1.0694+6	2.3651–5	4.1206+8	1.9741+8	3.4859+7	1.7978+8	9.3195+3	1.4286+2	8.7189+1	5.5499+1	1.6931–1
	5.2500–3	8.0775–8	1.0563+6	2.4299–5	4.0701+8	1.9542+8	3.4331+7	1.7725+8	9.2918+3	1.4136+2	8.6440+1	5.4751+1	1.7125–1
	5.2632–3	8.0916–8	1.0545+6	2.4392–5	4.0630+8	1.9514+8	3.4257+7	1.7689+8	9.2879+3	1.4115+2	8.6336+1	5.4646+1	1.7153–1
	5.4375–3	8.2771–8	1.0308+6	2.5639–5	3.9719+8	1.9155+8	3.3307+7	1.7233+8	9.2372+3	1.3847+2	8.4998+1	5.3298+1	1.7519–1
	5.4474–3	8.2876–8	1.0295+6	2.5711–5	3.9669+8	1.9135+8	3.3256+7	1.7208+8	9.2344+3	1.3832+2	8.4925+1	5.3224+1	1.7539–1
	5.5000–3	8.3431–8	1.0227+6	2.6092–5	3.9405+8	1.9030+8	3.2981+7	1.7076+8	9.2194+3	1.3755+2	8.4540+1	5.2834+1	1.7649–1
	5.7187–3	8.5724–8	9.9534+5	2.7701–5	3.8351+8	1.8611+8	3.1890+7	1.6551+8	9.1592+3	1.3447+2	8.3007+1	5.1282+1	1.8106–1
	5.7237–3	8.5775–8	9.9474+5	2.7738–5	3.8328+8	1.8602+8	3.1867+7	1.6539+8	9.1579+3	1.3440+2	8.2974+1	5.1248+1	1.8116–1
	6.0000–3	8.8629–8	9.6271+5	2.9821–5	3.7094+8	1.8107+8	3.0598+7	1.5926+8	9.0856+3	1.3083+2	8.1207+1	4.9437+1	1.8689–1
	6.5000–3	9.3709–8	9.1052+5	3.3738–5	3.5083+8	1.7290+8	2.8538+7	1.4939+8	8.9178+3	1.2450+2	7.7813+1	4.6490+1	1.9512–1
	7.0000–3	9.8663–8	8.6480+5	3.7845–5	3.3321+8	1.6566+8	2.6757+7	1.4079+8	8.7652+3	1.1903+2	7.4901+1	4.3925+1	2.0326–1
	7.2500–3	1.0110–7	8.4398+5	3.9968–5	3.2519+8	1.6234+8	2.5953+7	1.3689+8	8.6939+3	1.1656+2	7.3584+1	4.2764+1	2.0730–1
	8.0000–3	1.0824–7	7.8830+5	4.6590–5	3.0374+8	1.5338+8	2.3825+7	1.2653+8	8.4969+3	1.1002+2	7.0128+1	3.9676+1	2.1929–1
	9.0000–3	1.1757–7	7.2573+5	5.6018–5	2.7963+8	1.4307+8	2.1493+7	1.1507+8	8.2264+3	1.0221+2	6.5755+1	3.6220+1	2.3257–1

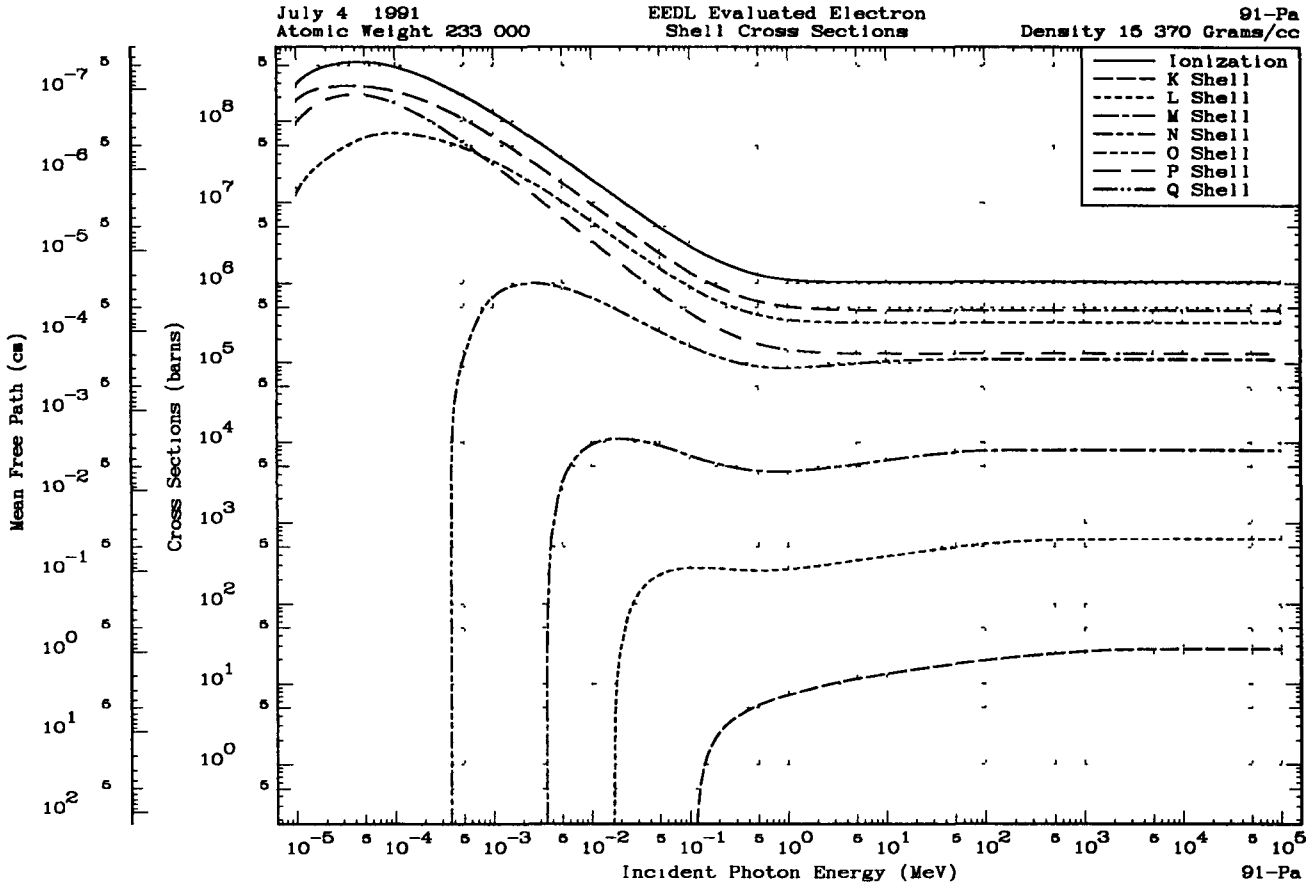
Atomic Weight 232.038 Density 11.720 Grams/cc

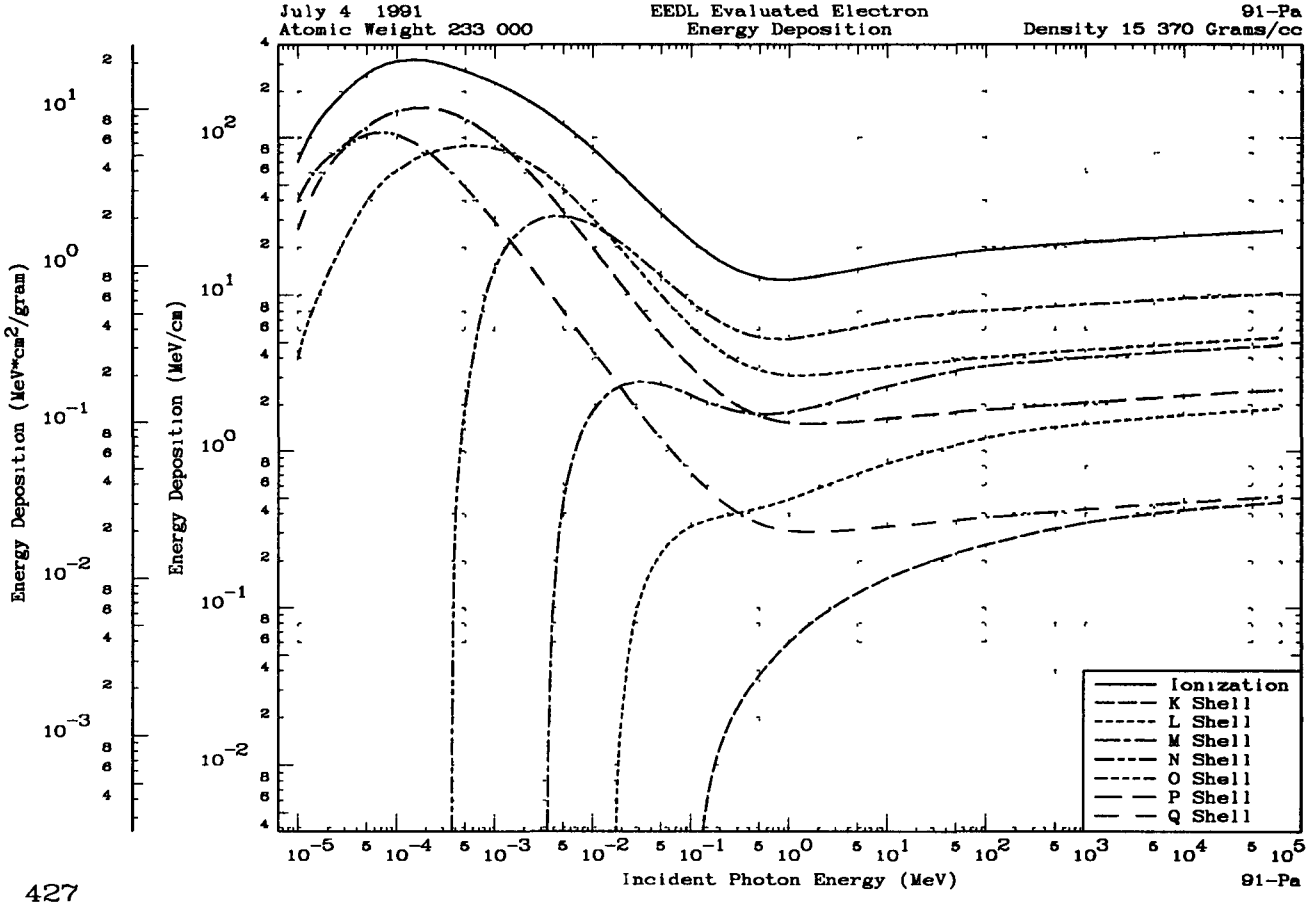
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–2	1.2658–7	6.7410+5	6.6118–5	2.5974+8	1.3443+8	1.9603+7	1.0569+8	7.9917+3	9.5869+1	6.2225+1	3.3398+1	2.4563–1
	1.1250–2	1.3759–7	6.2015+5	7.9664–5	2.3895+8	1.2524+8	1.7681+7	9.6016+7	7.6907+3	8.8788+1	5.8080+1	3.0450+1	2.5815–1
	1.2500–2	1.4822–7	5.7565+5	9.4219–5	2.2180+8	1.1756+8	1.6124+7	8.8111+7	7.4310+3	8.3039+1	5.4724+1	2.8044+1	2.7047–1
	1.3125–2	1.5342–7	5.5616+5	1.0186–4	2.1430+8	1.1416+8	1.5451+7	8.4674+7	7.3138+3	8.0535+1	5.3259+1	2.6999+1	2.7655–1
	1.5000–2	1.6855–7	5.0623+5	1.2611–4	1.9505+8	1.0536+8	1.3749+7	7.5938+7	7.0023+3	7.4202+1	4.9563+1	2.4344+1	2.9451–1
L3	1.6315–2	1.7886–7	4.7704+5	1.4432–4	1.8381+8	1.0009+8	1.2776+7	7.0931+7	6.7895+3	7.0247+1	4.7143+1	2.2800+1	3.0440–1
	1.6776–2	1.8245–7	4.6766+5	1.5094–4	1.8020+8	9.8379+7	1.2470+7	6.9339+7	6.7187+3	6.8989+1	4.6373+1	2.2308+1	3.0759–1
	1.7582–2	1.8865–7	4.5229+5	1.6280–4	1.7427+8	9.5557+7	1.1970+7	6.6737+7	6.6010+3	6.6934+1	4.5116+1	2.1505+1	3.1315–1
	1.8791–2	1.9779–7	4.3138+5	1.8125–4	1.6621+8	9.1696+7	1.1297+7	6.3215+7	6.4378+3	6.4161+1	4.3421+1	2.0418+1	3.2141–1
L2	1.9780–2	2.0514–7	4.1593+5	1.9692–4	1.6026+8	8.8825+7	1.0804+7	6.0626+7	6.3147+3	6.2129+1	4.2180+1	1.9620+1	3.2810–1
	2.0000–2	2.0677–7	4.1266+5	2.0047–4	1.5900+8	8.8217+7	1.0700+7	6.0079+7	6.2875+3	6.1700+1	4.1919+1	1.9451+1	3.2942–1
L1	2.0478–2	2.1027–7	4.0579+5	2.0828–4	1.5635+8	8.6924+7	1.0484+7	5.8941+7	6.2297+3	6.0752+1	4.1323+1	1.9097+1	3.3229–1
	2.0625–2	2.1133–7	4.0375+5	2.1070–4	1.5557+8	8.6535+7	1.0419+7	5.8609+7	6.2115+3	6.0467+1	4.1141+1	1.8993+1	3.3303–1
	2.1073–2	2.1455–7	3.9769+5	2.1816–4	1.5323+8	8.5376+7	1.0229+7	5.7623+7	6.1570+3	5.9620+1	4.0600+1	1.8685+1	3.3527–1
	2.1797–2	2.1971–7	3.8835+5	2.3044–4	1.4963+8	8.3586+7	9.9356+6	5.6107+7	6.0723+3	5.8320+1	3.9769+1	1.8212+1	3.3889–1
	2.2189–2	2.2248–7	3.8351+5	2.3720–4	1.4777+8	8.2656+7	9.7844+6	5.5323+7	6.0281+3	5.7648+1	3.9340+1	1.7967+1	3.4084–1
	2.2500–2	2.2467–7	3.7977+5	2.4262–4	1.4633+8	8.1938+7	9.6680+6	5.4718+7	5.9937+3	5.7130+1	3.9009+1	1.7779+1	3.4239–1
	2.3848–2	2.3405–7	3.6455+5	2.6665–4	1.4047+8	7.9001+7	9.1962+6	5.2262+7	5.8524+3	5.5029+1	3.7668+1	1.7013+1	3.4908–1
	2.4142–2	2.3608–7	3.6143+5	2.7202–4	1.3926+8	7.8396+7	9.0998+6	5.1759+7	5.8231+3	5.4600+1	3.7394+1	1.6856+1	3.5054–1
	2.5000–2	2.4194–7	3.5266+5	2.8791–4	1.3588+8	7.6697+7	8.8306+6	5.0351+7	5.7403+3	5.3399+1	3.6627+1	1.6417+1	3.5477–1
	2.5386–2	2.4456–7	3.4889+5	2.9517–4	1.3443+8	7.5964+7	8.7152+6	4.9746+7	5.7043+3	5.2882+1	3.6297+1	1.6228+1	3.5667–1
	2.6250–2	2.5038–7	3.4078+5	3.1169–4	1.3131+8	7.4385+7	8.4679+6	4.8449+7	5.6265+3	5.1775+1	3.5591+1	1.5824+1	3.6091–1
	2.7071–2	2.5585–7	3.3350+5	3.2770–4	1.2850+8	7.2962+7	8.2468+6	4.7285+7	5.5559+3	5.0784+1	3.4958+1	1.5461+1	3.6492–1
	2.7693–2	2.5996–7	3.2822+5	3.4003–4	1.2647+8	7.1929+7	8.0874+6	4.6445+7	5.5044+3	5.0069+1	3.4501+1	1.5200+1	3.6794–1
	3.0000–2	2.7496–7	3.1031+5	3.8726–4	1.1956+8	6.8407+7	7.5501+6	4.3602+7	5.3267+3	4.7657+1	3.2963+1	1.4315+1	3.7907–1
	3.2500–2	2.9082–7	2.9339+5	4.4108–4	1.1305+8	6.5038+7	7.0594+6	4.0944+7	5.1396+3	4.5261+1	3.1398+1	1.3475+1	3.8832–1
	3.5000–2	3.0630–7	2.7856+5	4.9763–4	1.0733+8	6.2066+7	6.6336+6	3.8627+7	4.9723+3	4.3179+1	3.0038+1	1.2743+1	3.9750–1
	3.6250–2	3.1391–7	2.7181+5	5.2690–4	1.0473+8	6.0707+7	6.4411+6	3.7577+7	4.8949+3	4.2235+1	2.9422+1	1.2412+1	4.0207–1
	4.0000–2	3.3628–7	2.5373+5	6.1843–4	9.7765+7	5.7050+7	5.9305+6	3.4780+7	4.6844+3	3.9730+1	2.7785+1	1.1529+1	4.1562–1
	4.5000–2	3.6505–7	2.3373+5	7.4900–4	9.0059+7	5.2962+7	5.3858+6	3.1707+7	4.4393+3	3.6889+1	2.5908+1	1.0550+1	4.3093–1
	5.0000–2	3.9284–7	2.1720+5	8.8900–4	8.3689+7	4.9553+7	4.9414+6	2.9190+7	4.2309+3	3.4565+1	2.4372+1	9.7478+0	4.4603–1
	6.0000–2	4.4459–7	1.9192+5	1.1944–3	7.3947+7	4.4166+7	4.2741+6	2.5503+7	3.8918+3	3.0993+1	2.1954+1	8.5673+0	4.7208–1
	7.0000–2	4.9311–7	1.7303+5	1.5319–3	6.6671+7	4.0113+7	3.7992+6	2.2755+7	3.6284+3	2.8303+1	2.0129+1	7.6793+0	4.9512–1
	8.0000–2	5.3936–7	1.5820+5	1.8989–3	6.0954+7	3.6905+7	3.4308+6	2.0615+7	3.4146+3	2.6216+1	1.8709+1	6.9890+0	5.1769–1
	1.0000–1	6.2513–7	1.3649+5	2.7102–3	5.2591+7	3.2185+7	2.9201+6	1.7482+7	3.0919+3	2.3155+1	1.6631+1	5.9679+0	5.5593–1
K	1.1011–1	6.6483–7	1.2834+5	3.1581–3	4.9451+7	3.0424+7	2.7349+6	1.6289+7	2.9651+3	2.1998+1	1.5850+1	5.5746+0	5.7378–1
	1.1260–1	6.7394–7	1.2661+5	3.2720–3	4.8782+7	3.0046+7	2.6951+6	1.6039+7	2.9391+3	2.1749+1	1.5679+1	5.4923+0	5.7769–1
	1.1728–1	6.9081–7	1.2351+5	3.4892–3	4.7591+7	2.9369+7	2.6243+6	1.5594+7	2.8926+3	2.1307+1	1.5376+1	5.3461+0	5.8501–1
	1.2546–1	7.1970–7	1.1856+5	3.8796–3	4.5680+7	2.8282+7	2.5111+6	1.4884+7	2.8171+3	2.0601+1	1.4890+1	5.1129+0	5.9781–1
	1.3773–1	7.6167–7	1.1202+5	4.4890–3	4.3163+7	2.6844+7	2.3624+6	1.3955+7	2.7159+3	1.9678+1	1.4253+1	4.8078+0	6.1691–1
	1.5000–1	8.0216–7	1.0637+5	5.1255–3	4.0984+7	2.5592+7	2.2342+6	1.3155+7	2.6264+3	1.8886+1	1.3704+1	4.5459+0	6.3585–1
	1.7500–1	8.7731–7	9.7256+4	6.4944–3	3.7474+7	2.3555+7	2.0432+6	1.1873+7	2.4773+3	1.7654+1	1.2863+1	4.1210+0	6.6976–1
	2.0000–1	9.4801–7	9.0003+4	7.9508–3	3.4679+7	2.1921+7	1.8910+6	1.0864+7	2.3550+3	1.6687+1	1.2197+1	3.7872+0	7.0325–1
	2.2500–1	1.0140–6	8.4144+4	9.4812–3	3.2421+7	2.0544+7	1.7855+6	1.0089+7	2.2634+3	1.5988+1	1.1726+1	3.5281+0	7.3343–1
	2.6250–1	1.1074–6	7.7050+4	1.1890–2	2.9688+7	1.8872+7	1.6562+6	9.1580+6	2.1488+3	1.5150+1	1.1154+1	3.2174+0	7.7827–1
	3.0000–1	1.1951–6	7.1393+4	1.4421–2	2.7508+7	1.7533+7	1.5519+6	8.4211+6	2.0543+3	1.4492+1	1.0697+1	2.9723+0	8.2237–1
	4.0000–1	1.4009–6	6.0905+4	2.1555–2	2.3467+7	1.4773+7	1.3870+6	7.3050+6	1.8958+3	1.3552+1	1.0014+1	2.6014+0	9.3678–1
	5.0000–1	1.5734–6	5.4230+4	2.9046–2	2.0895+7	1.2858+7	1.2922+6	6.7436+6	1.7980+3	1.3151+1	9.6819+0	2.4182+0	1.0509+0
	6.0000–1	1.7273–6	4.9398+4	3.6712–2	1.9034+7	1.1431+7	1.2306+6	6.3704+6	1.7343+3	1.2938+1	9.4747+0	2.2973+0	1.1654+0
	8.0000–1	1.9742–6	4.3220+4	5.2162–2	1.6653+7	9.4800+6	1.1597+6	6.0116+6	1.6572+3	1.2952+1	9.3641+0	2.1879+0	1.3998+0
	1.0000+0	2.1822–6	3.9101+4	6.7525–2	1.5066+7	8.1972+6	1.1200+6	5.7470+6	1.6151+3	1.3087+1	9.3397+0	2.1066+0	1.6405+0
	1.5000+0	2.5530–6	3.3421+4	1.0459–1	1.2878+7	6.3073+6	1.0780+6	5.4906+6	1.5640+3	1.3903+1	9.6037+0	2.0384+0	2.2609+0
	2.0000+0	2.8203–6	3.0254+4	1.3950–1	1.1657+7	5.2621+6	1.0650+6	5.3283+6	1.5436+3	1.4747+1	9.8505+0	1.9914+0	2.9051+0
	3.0000+0	3.1899–6	2.6748+4	2.0365–1	1.0306+7	4.1450+6	1.0492+6	5.1105+6	1.5280+3	1.6463+1	1.0286+1	1.9363+0	4.2414+0
	4.0000+0	3.4092–6	2.5027+4	2.6137–1	9.6433+6	3.5463+6	1.0483+6	5.0472+6	1.5258+3	1.8213+1	1.0643+1	1.9209+0	5.6491+0
	5.0000+0	3.5643–6	2.3938+4	3.1382–1	9.2237+6	3.1807+6	1.0480+6	4.9935+6	1.5269+3	1.9950+1	1.0949+1	1.9090+0	7.0925+0
	6.0000+0	3.6809–6	2.3180+4	3.6190–1	8.9316+6	2.9362+6	1.0479+6	4.9460+6	1.5300+3	2.1670+1	1.1199+1	1.8993+0	8.5717+0
	8.0000+0	3.8422–6	2.2207+4	4.4754–1	8.5567+6	2.6241+6	1.0490+6	4.8820+6	1.5382+3	2.5121+1	1.1609+1	1.8916+0	1.1620+1
	1.0000+1	3.9370–6	2.1672+4	5.2213–1	8.3506+6	2.4451+6	1.0506+6	4.8534+6	1.5472+3	2.8576+1	1.1932+1	1.8879+0	1.4757+1
	1.5000+1	4.0407–6	2.1116+4	6.7517–1	8.1363+6	2.2455+6	1.0532+6	4.8360+6	1.5683+3	3.7143+1	1.2421+1	1.8851+0	2.2836+1
	2.0000+1	4.0784–6	2.0921+4	7.9609–1	8.0611+6	2.1834+6	1.0552+6	4.8209+6	1.5867+3	4.5860+1	1.2818+1	1.8831+0	3.1159+1
	3.0000+1	4.0926–6	2.0848+4	9.8043–1	8.0330+6	2.1815+6	1.0562+6	4.7937+6	1.6204+3	6.3601+1	1.3241+1	1.8803+0	4.8480+1
	4.0000+1	4.1077–6	2.0772+4	1.1189+0	8.0036+6	2.1809+6	1.0571+6	4.7639+6	1.6463+3	8.1607+1	1.3563+1	1.8764+0	6.6167+1
	5.0000+1	4.1244–6	2.0688+4	1.2295+0	7.9711+6	2.1801+6	1.0577+6	4.7317+6	1.6677+3	9.9842+1	1.3814+1	1.8714+0	8.4157+1
	6.0000+1	4.1314–6	2.0653+4	1.3214+0	7.9577+6	2.1794+6	1.0581+6	4.7186+6	1.6853+3	1.1822+2	1.4006+1	1.8673+0	1.0235+2
	8.0000+1	4.1430–6	2.0595+4	1.4685+0	7.9353+6	2.1783+6	1.0585+6	4.6968+6	1.7131+3	1.5534+2	1.4281+1	1.8609+0	1.3920+2
	1.0000+2	4.1528–6	2.0546+4	1.5839+0	7.9166+6	2.1774+6	1.0587+6	4.6788+6	1.7341+3	1.9280+2	1.4524+1	1.8559+0	1.7642+2
	1.5000+2	4.1684–6	2.0469+4	1.7950+0	7.8871+6	2.1759+6	1.0589+6	4.6505+6	1.7704+3	2.8716+2	1.4798+1	1.8450+0	2.7051+2
	2.0000+2	4.1743–6	2.0440+4	1.9454+0	7.8759+6	2.1748+6	1.0590+6	4.6402+6	1.7926+3	3.8206+2	1.5050+1	1.8412+0	3.6516+2
	3.0000+2	4.1821–6	2.0402+4	2.1580+0	7.8611+6	2.1732+6	1.0591+6	4.6269+6	1.8223+3	5.7134+2	1.5416+1	1.8365+0	5.5409+2
	4.0000+2	4.1883–6	2.0372+4	2.3092+0	7.8495+6	2.1721+6	1.0592+6	4.6163+6	1.8434+3	7.6041+2	1.5601+1	1.8329+0	7.4298+2
	5.0000+2	4.1948–6	2.0340+4	2.4266+0	7.8374+6	2.1713+6	1.0592+6	4.6050+6	1.8598+3	9.5082+2	1.5759+1	1.8290+0	9.3323+2
	6.0000+2	4.1976–6	2.0327+4	2.5225+0	7.8321+6	2.1706+6	1.0592+6	4.6004+6	1.8736+3	1.1402+3	1.5905+1	1.8278+0	1.1224+3
	8.0000+2	4.2029–6	2.0301+4	2.6738+0	7.8222+6	2.1695+6	1.0592+6	4.5915+6	1.8956+3	1.5224+3	1.6151+1	1.8254+0	1.5044+3
	1.0000+3	4.2072–6	2.0280+4	2.7910+0	7.8142+6	2.1687+6	1.0592+6	4.5843+6	1.9128+3	1.9038+3	1.6359+1	1.8238+0	1.8856+3
	1.5000+3	4.2120–6	2.0257+4	3.0037+0	7.8054+6	2.1672+6	1.0593+6	4.5770+6	1.9446+3	2.8623+3	1.6555+1	1.8209+0	2.8439+3
	2.0000+3	4.2160–6	2.0238+4	3.1545+0	7.7980+6	2.1661+6	1.0593+6	4.5707+6	1.9681+3	3.8150+3	1.6749+1	1.8184+0	3.7964+3
	3.0000+3	4.2205–6	2.0216+4	3.3670+0	7.7896+6	2.1645+6	1.0593+6	4.5638+6	2.0021+3	5.7246+3	1.7127+1	1.8157+0	5.7057+3
	4.0000+3	4.2243–6	2.0198+4	3.5178+0	7.7826+6	2.1634+6	1.0593+6	4.5579+6	2.0270+3	7.6359+3	1.7295+1	1.8133+0	7.6168+3
	5.0000+3	4.2286–6	2.0178+4	3.6345+0	7.7748+6	2.1626+6	1.0593+6	4.5509+6	2.0465+3	9.5672+3	1.7419+1	1.8106+0	9.5480+3

Atomic Weight 232.038												Density 11.720 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
6.0000+3	4.2295–6	2.0173+4	3.7299+0	7.7730+6	2.1619+6	1.0593+6	4.5498+6	2.0607+3	1.1466+4	1.7544+1	1.8102+0	1.1447+4
8.0000+3	4.2319–6	2.0162+4	3.8803+0	7.7687+6	2.1608+6	1.0593+6	4.5465+6	2.0833+3	1.5297+4	1.7793+1	1.8090+0	1.5277+4
1.0000+4	4.2337–6	2.0154+4	3.9969+0	7.7654+6	2.1600+6	1.0593+6	4.5440+6	2.1010+3	1.9163+4	1.7999+1	1.8081+0	1.9143+4
1.5000+4	4.2363–6	2.0141+4	4.2089+0	7.7606+6	2.1584+6	1.0593+6	4.5408+6	2.1350+3	2.8652+4	1.8188+1	1.8068+0	2.8632+4
2.0000+4	4.2385–6	2.0131+4	4.3594+0	7.7566+6	2.1574+6	1.0593+6	4.5378+6	2.1594+3	3.8263+4	1.8377+1	1.8057+0	3.8243+4
3.0000+4	4.2406–6	2.0121+4	4.5715+0	7.7527+6	2.1558+6	1.0593+6	4.5354+6	2.1937+3	5.7267+4	1.8747+1	1.8047+0	5.7247+4
4.0000+4	4.2426–6	2.0111+4	4.7221+0	7.7490+6	2.1548+6	1.0593+6	4.5328+6	2.2183+3	7.6476+4	1.8908+1	1.8036+0	7.6455+4
5.0000+4	4.2458–6	2.0096+4	4.8389+0	7.7432+6	2.1539+6	1.0593+6	4.5278+6	2.2373+3	9.5505+4	1.9030+1	1.8017+0	9.5485+4
6.0000+4	4.2460–6	2.0095+4	4.9344+0	7.7429+6	2.1532+6	1.0593+6	4.5282+6	2.2527+3	1.1452+5	1.9149+1	1.8018+0	1.1450+5
8.0000+4	4.2472–6	2.0089+4	5.0850+0	7.7406+6	2.1521+6	1.0593+6	4.5269+6	2.2773+3	1.5288+5	1.9387+1	1.8013+0	1.5286+5
1.0000+5	4.2483–6	2.0084+4	5.2017+0	7.7386+6	2.1513+6	1.0593+6	4.5258+6	2.2964+3	1.9131+5	1.9614+1	1.8009+0	1.9129+5


July 4 1991
Atomic Weight 233 000
EEDL Evaluated Electron
Cross Sections
91-Pa
Density 15 370 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
91-Pa


July 4, 1991
Atomic Weight 233 000
EEDL Evaluated Electron
Energy Deposition
91-Pa
Density 15 370 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
91-Pa


July 4 1991
Atomic Weight 233 000
EEDL Evaluated Electron
Shell Cross Sections
91-Pa
Density 15 370 Grams/cc
Mean Free Path (cm)
Cross Sections (barns)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Incident Photon Energy (MeV)
91-Pa


July 4 1991
Atomic Weight 233 000
EEDL Evaluated Electron
Energy Deposition
91-Pa
Density 15 370 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Incident Photon Energy (MeV)
91-Pa

427

Atomic Weight 233.000 Density 15.370 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.0285–9	1.2939+7		5.0061+9	4.6558+9	2.9527+8	5.5045+7	4.7343+3	8.5167+1	7.0729+1	1.4438+1	4.0661–4
	1.1250–5	5.2398–9	1.2417+7		4.8041+9	4.3842+9	3.3642+8	8.3510+7	4.8507+3	1.0674+2	8.4185+1	2.2551+1	4.5600–4
	1.2188–5	5.3692–9	1.2118+7		4.6884+9	4.2088+9	3.6285+8	1.1677+8	4.9314+3	1.2580+2	9.3586+1	3.2212+1	4.9363–4
	1.2500–5	5.4063–9	1.2034+7		4.6562+9	4.1547+9	3.7159+8	1.2984+8	4.9572+3	1.3285+2	9.6782+1	3.6067+1	5.0628–4
	1.3125–5	5.4665–9	1.1902+7		4.6049+9	4.0526+9	3.8712+8	1.6522+8	5.0073+3	1.4931+2	1.0278+2	4.6536+1	5.3173–4
	1.5000–5	5.5802–9	1.1659+7		4.5111+9	3.7857+9	4.2567+8	2.9978+8	5.1471+3	2.0688+2	1.1896+2	8.7920+1	6.0928–4
	1.7500–5	5.5939–9	1.1631+7		4.5000+9	3.4993+9	4.6272+8	5.3800+8	5.3133+3	2.9908+2	1.3690+2	1.6218+2	7.1527–4
	2.0000–5	5.5015–9	1.1826+7		4.5756+9	3.2688+9	4.8839+8	8.1840+8	5.4616+3	4.0596+2	1.5257+2	2.5339+2	8.2395–4
P3	2.3820–5	5.2986–9	1.2279+7		4.7508+9	2.9899+9	5.1128+8	1.2496+9	5.6448+3	5.6593+2	1.7076+2	3.9517+2	9.8285–4
	2.4206–5	5.2787–9	1.2325+7		4.7688+9	2.9655+9	5.1315+8	1.2902+9	5.6615+3	5.8112+2	1.7260+2	4.0852+2	9.9886–4
	2.4931–5	5.2381–9	1.2421+7		4.8057+9	2.9212+9	5.1659+8	1.3679+9	5.6923+3	6.1023+2	1.7603+2	4.3419+2	1.0290–3
	2.6198–5	5.1582–9	1.2613+7		4.8801+9	2.8482+9	5.2242+8	1.5095+9	5.7446+3	6.6314+2	1.8201+2	4.8113+2	1.0820–3
	2.9050–5	5.0261–9	1.2945+7		5.0084+9	2.7020+9	5.3478+8	1.7716+9	5.8550+3	7.6535+2	1.9533+2	5.7002+2	1.2028–3
	3.0000–5	4.9757–9	1.3076+7		5.0592+9	2.6579+9	5.3892+8	1.8623+9	5.8898+3	8.0103+2	1.9998+2	6.0105+2	1.2435–3
P2	3.2610–5	4.8805–9	1.3331+7		5.1578+9	2.5472+9	5.4324+8	2.0674+9	5.9810+3	8.7945+2	2.0912+2	6.7033+2	1.3563–3
	3.3072–5	4.8734–9	1.3350+7		5.1653+9	2.5290+9	5.4396+8	2.0924+9	5.9965+3	8.8980+2	2.1081+2	6.7898+2	1.3764–3
	3.3938–5	4.8593–9	1.3389+7		5.1804+9	2.4958+9	5.4535+8	2.1392+9	6.0251+3	9.0925+2	2.1405+2	6.9519+2	1.4142–3
	3.5000–5	4.8406–9	1.3441+7		5.2004+9	2.4569+9	5.4714+8	2.1963+9	6.0594+3	9.3319+2	2.1813+2	7.1507+2	1.4608–3
	3.5453–5	4.8324–9	1.3464+7		5.2092+9	2.4408+9	5.4777+8	2.2206+9	6.0738+3	9.4328+2	2.1973+2	7.2354+2	1.4808–3
	3.6590–5	4.8108–9	1.3524+7		5.2325+9	2.4018+9	5.4932+8	2.2814+9	6.1092+3	9.6853+2	2.2374+2	7.4479+2	1.5310–3
	3.7727–5	4.7881–9	1.3588+7		5.2574+9	2.3646+9	5.5088+8	2.3419+9	6.1438+3	9.9381+2	2.2778+2	7.6603+2	1.5815–3
	4.0000–5	4.7921–9	1.3577+7		5.2529+9	2.2951+9	5.5424+8	2.4036+9	6.2103+3	1.0255+3	2.3621+2	7.8926+2	1.6832–3
	4.2500–5	4.7938–9	1.3572+7		5.2511+9	2.2252+9	5.5296+8	2.4730+9	6.2768+3	1.0562+3	2.4219+2	8.1401+2	1.7921–3
	4.5000–5	4.7916–9	1.3578+7		5.2535+9	2.1612+9	5.5215+8	2.5402+9	6.3401+3	1.0867+3	2.4857+2	8.3816+2	1.9020–3
	5.0000–5	4.8273–9	1.3478+7		5.2147+9	2.0481+9	5.5084+8	2.6157+9	6.4584+3	1.1287+3	2.6141+2	8.6729+2	2.1247–3
P1	5.0010–5	4.8274–9	1.3478+7		5.2146+9	2.0479+9	5.5083+8	2.6158+9	6.4587+3	1.1288+3	2.6143+2	8.6733+2	2.1251–3
	5.0634–5	4.8333–9	1.3461+7		5.2082+9	2.0350+9	5.5025+8	2.6229+9	6.4724+3	1.1329+3	2.6268+2	8.7022+2	2.1527–3
	5.1805–5	4.8440–9	1.3431+7		5.1967+9	2.0114+9	5.4922+8	2.6361+9	6.4978+3	1.1407+3	2.6506+2	8.7560+2	2.2046–3
	5.3854–5	4.8615–9	1.3383+7		5.1780+9	1.9719+9	5.4758+8	2.6585+9	6.5412+3	1.1542+3	2.6933+2	8.8485+2	2.2958–3
	5.5000–5	4.8706–9	1.3358+7		5.1684+9	1.9509+9	5.4673+8	2.6707+9	6.5648+3	1.1617+3	2.7175+2	8.8995+2	2.3471–3
	5.6927–5	4.8851–9	1.3318+7		5.1530+9	1.9169+9	5.4518+8	2.6909+9	6.6037+3	1.1740+3	2.7560+2	8.9838+2	2.4337–3
	6.0000–5	4.9410–9	1.3168+7		5.0947+9	1.8662+9	5.4297+8	2.6856+9	6.6635+3	1.1812+3	2.8186+2	8.9934+2	2.5727–3
	6.5000–5	5.0257–9	1.2946+7		5.0088+9	1.7915+9	5.3447+8	2.6829+9	6.7555+3	1.1882+3	2.8742+2	9.0079+2	2.8012–3
	7.0000–5	5.1036–9	1.2748+7		4.9324+9	1.7250+9	5.2705+8	2.6803+9	6.8419+3	1.1957+3	2.9339+2	9.0229+2	3.0324–3
	7.2500–5	5.1405–9	1.2657+7		4.8970+9	1.6944+9	5.2342+8	2.6791+9	6.8832+3	1.1992+3	2.9613+2	9.0306+2	3.1489–3
	8.0000–5	5.3155–9	1.2240+7		4.7357+9	1.6114+9	5.1365+8	2.6107+9	7.0003+3	1.1881+3	3.0470+2	8.8341+2	3.5024–3
	9.0000–5	5.5736–9	1.1673+7		4.5164+9	1.5174+9	4.9636+8	2.5027+9	7.1417+3	1.1613+3	3.0941+2	8.5185+2	3.9819–3
O5	9.8400–5	5.7768–9	1.1263+7		4.3576+9	1.4499+9	4.8387+8	2.4238+9	7.2508+3	1.1429+3	3.1384+2	8.2907+2	4.3914–3
	1.0000–4	5.8213–9	1.1177+7	0.0000+0	4.3243+9	1.4380+9	4.8172+8	2.4046+9	7.2704+3	1.1382+3	3.1489+2	8.2331+2	4.4700–3
	1.0313–4	5.9058–9	1.1017+7	2.7584–9	4.2624+9	1.4156+9	4.7627+8	2.3706+9	7.3081+3	1.1276+3	3.1523+2	8.1240+2	4.6242–3
O4	1.0608–4	5.9844–9	1.0872+7	5.3900–9	4.2064+9	1.3953+9	4.7134+8	2.3398+9	7.3429+3	1.1181+3	3.1559+2	8.0253+2	4.7707–3
	1.0745–4	6.0213–9	1.0805+7	6.6195–9	4.1806+9	1.3862+9	4.6899+8	2.3254+9	7.3588+3	1.1137+3	3.1572+2	7.9799+2	4.8389–3
	1.0898–4	6.0622–9	1.0732+7	7.9980–9	4.1524+9	1.3762+9	4.6643+8	2.3097+9	7.3763+3	1.1089+3	3.1590+2	7.9302+2	4.9152–3
	1.1011–4	6.0922–9	1.0680+7	9.0168–9	4.1320+9	1.3690+9	4.6458+8	2.2984+9	7.3891+3	1.1055+3	3.1603+2	7.8942+2	4.9716–3
	1.1250–4	6.1550–9	1.0571+7	1.1184–8	4.0898+9	1.3541+9	4.6074+8	2.2749+9	7.4158+3	1.0983+3	3.1631+2	7.8200+2	5.0911–3
	1.1411–4	6.1970–9	1.0499+7	1.2654–8	4.0621+9	1.3443+9	4.5823+8	2.2595+9	7.4335+3	1.0937+3	3.1654+2	7.7712+2	5.1720–3
	1.1510–4	6.2226–9	1.0456+7	1.3558–8	4.0454+9	1.3384+9	4.5672+8	2.2502+9	7.4443+3	1.0909+3	3.1669+2	7.7419+2	5.2216–3
	1.1946–4	6.3342–9	1.0271+7	1.7579–8	3.9741+9	1.3133+9	4.5027+8	2.2105+9	7.4910+3	1.0791+3	3.1745+2	7.6166+2	5.4418–3
	1.2308–4	6.4252–9	1.0126+7	2.0950–8	3.9178+9	1.2934+9	4.4521+8	2.1792+9	7.5287+3	1.0700+3	3.1822+2	7.5178+2	5.6256–3
	1.2500–4	6.4728–9	1.0052+7	2.2745–8	3.8890+9	1.2833+9	4.4262+8	2.1631+9	7.5483+3	1.0654+3	3.1865+2	7.4672+2	5.7233–3
	1.2710–4	6.5245–9	9.9719+6	2.4716–8	3.8582+9	1.2724+9	4.3976+8	2.1460+9	7.5694+3	1.0602+3	3.1882+2	7.4134+2	5.8303–3
	1.3125–4	6.6257–9	9.8196+6	2.8654–8	3.7992+9	1.2517+9	4.3428+8	2.1133+9	7.6104+3	1.0503+3	3.1922+2	7.3104+2	6.0433–3
	1.3654–4	6.7729–9	9.6062+6	3.3730–8	3.7167+9	1.2267+9	4.2769+8	2.0623+9	7.6612+3	1.0346+3	3.1995+2	7.1468+2	6.3161–3
	1.5000–4	7.1356–9	9.1179+6	4.6963–8	3.5278+9	1.1693+9	4.1258+8	1.9459+9	7.7832+3	9.9971+2	3.2231+2	6.7740+2	7.0175–3
	1.6250–4	7.4617–9	8.7194+6	5.9671–8	3.3736+9	1.1225+9	3.9715+8	1.8539+9	7.8885+3	9.6766+2	3.2047+2	6.4718+2	7.6873–3
	1.7500–4	7.7766–9	8.3664+6	7.2778–8	3.2370+9	1.0809+9	3.8349+8	1.7727+9	7.9874+3	9.3980+2	3.1926+2	6.2053+2	8.3656–3
	1.8125–4	7.9301–9	8.2045+6	7.9474–8	3.1744+9	1.0617+9	3.7723+8	1.7354+9	8.0346+3	9.2724+2	3.1889+2	6.0834+2	8.7078–3
O3	1.9407–4	8.2375–9	7.8982+6	9.3477–8	3.0559+9	1.0253+9	3.6539+8	1.6652+9	8.1274+3	9.0384+2	3.1847+2	5.8535+2	9.4157–3
	1.9704–4	8.3080–9	7.8312+6	9.6767–8	3.0299+9	1.0174+9	3.6284+8	1.6497+9	8.1481+3	8.9887+2	3.1851+2	5.8035+2	9.5890–3
	2.0000–4	8.3780–9	7.7658+6	1.0007–7	3.0046+9	1.0097+9	3.6035+8	1.6346+9	8.1685+3	8.9406+2	3.1859+2	5.7546+2	9.7628–3
	2.0625–4	8.5249–9	7.6320+6	1.0711–7	2.9529+9	9.9395+8	3.5444+8	1.6045+9	8.2108+3	8.8260+2	3.1713+2	5.6546+2	1.0131–2
	2.1797–4	8.7949–9	7.3977+6	1.2054–7	2.8622+9	9.6632+8	3.4412+8	1.5518+9	8.2872+3	8.6280+2	3.1483+2	5.4796+2	1.0825–2
	2.2500–4	8.9537–9	7.2664+6	1.2874–7	2.8114+9	9.5080+8	3.3836+8	1.5223+9	8.3315+3	8.5186+2	3.1367+2	5.3818+2	1.1245–2
	2.3848–4	9.2522–9	7.0321+6	1.4474–7	2.7208+9	9.2300+8	3.2807+8	1.4697+9	8.4132+3	8.3245+2	3.1166+2	5.2077+2	1.2056–2
O2	2.4589–4	9.4131–9	6.9119+6	1.5370–7	2.6742+9	9.0870+8	3.2281+8	1.4427+9	8.4565+3	8.2262+2	3.1075+2	5.1186+2	1.2506–2
	2.4927–4	9.4846–9	6.8597+6	1.5782–7	2.6541+9	9.0239+8	3.2033+8	1.4313+9	8.4759+3	8.1811+2	3.1004+2	5.0806+2	1.2712–2
	2.5561–4	9.6176–9	6.7649+6	1.6561–7	2.6174+9	8.9089+8	3.1583+8	1.4106+9	8.5117+3	8.0996+2	3.0879+2	5.0116+2	1.3099–2
	2.6250–4	9.7604–9	6.6659+6	1.7416–7	2.5791+9	8.7889+8	3.1116+8	1.3890+9	8.5497+3	8.0154+2	3.0756+2	4.9396+2	1.3522–2
	2.6671–4	9.8468–9	6.6074+6	1.7943–7	2.5565+9	8.7179+8	3.0840+8	1.3763+9	8.5725+3	7.9658+2	3.0685+2	4.8971+2	1.3781–2
	2.6924–4	9.8984–9	6.5730+6	1.8261–7	2.5431+9	8.6760+8	3.0677+8	1.3687+9	8.5861+3	7.9367+2	3.0644+2	4.8721+2	1.3937–2
	2.8336–4	1.0182–8	6.3896+6	2.0057–7	2.4722+9	8.4528+8	2.9814+8	1.3287+9	8.6600+3	7.7830+2	3.0437+2	4.7391+2	1.4813–2
	3.0000–4	1.0509–8	6.1910+6	2.2218–7	2.3953+9	8.2102+8	2.8886+8	1.2854+9	8.7433+3	7.6201+2	3.0245+2	4.5954+2	1.5855–2
O1	3.0517–4	1.0619–8	6.1268+6	2.2900–7	2.3705+9	8.1389+8	2.8587+8	1.2707+9	8.7684+3	7.5575+2	3.0124+2	4.5450+2	1.6180–2
	3.1110–4	1.0745–8	6.0549+6	2.3688–7	2.3427+9	8.0594+8	2.8253+8	1.2542+9	8.7968+3	7.4875+2	2.9988+2	4.4885+2	1.6555–2
	3.2221–4	1.0979–8	5.9259+6	2.5184–7	2.2928+9	7.9164+8	2.7654+8	1.2246+9	8.8487+3	7.3628+2	2.9753+2	4.3874+2	1.7261–2
	3.2500–4	1.1037–8	5.8947+6	2.5564–7	2.2807+9	7.8817+8	2.7510+8	1.2174+9	8.8615+3	7.3328+2	2.9697+2	4.3629+2	1.7438–2
	3.4166–4	1.1381–8	5.7168+6	2.7862–7	2.2119+9	7.6832+8	2.6687+8	1.1767+9	8.9361+3	7.1633+2	2.9392+2	4.2239+2	1.8505–2
	3.5000–4	1.1550–8	5.6330+6	2.9033–7	2.1794+9	7.5893+8	2.6300+8	1.1575+9	8.9723+3	7.0842+2	2.9255+2	4.1585+2	1.9043–2
N7	3.6704–4	1.1891–8	5.4715+6	3.1465–7	2.1170+9	7.4074+8	2.5557+8	1.1206+9	9.0442+3	6.9335+2	2.9004+2	4.0329+2	2.0148–2
	3.7083–4	1.1967–8	5.4369+6	3.2012–7	2.1035+9	7.3687+8	2.5396+8	1.1127+9	9.0597+3	6.9011+2	2.8948+2	4.0061+2	2.0395–2

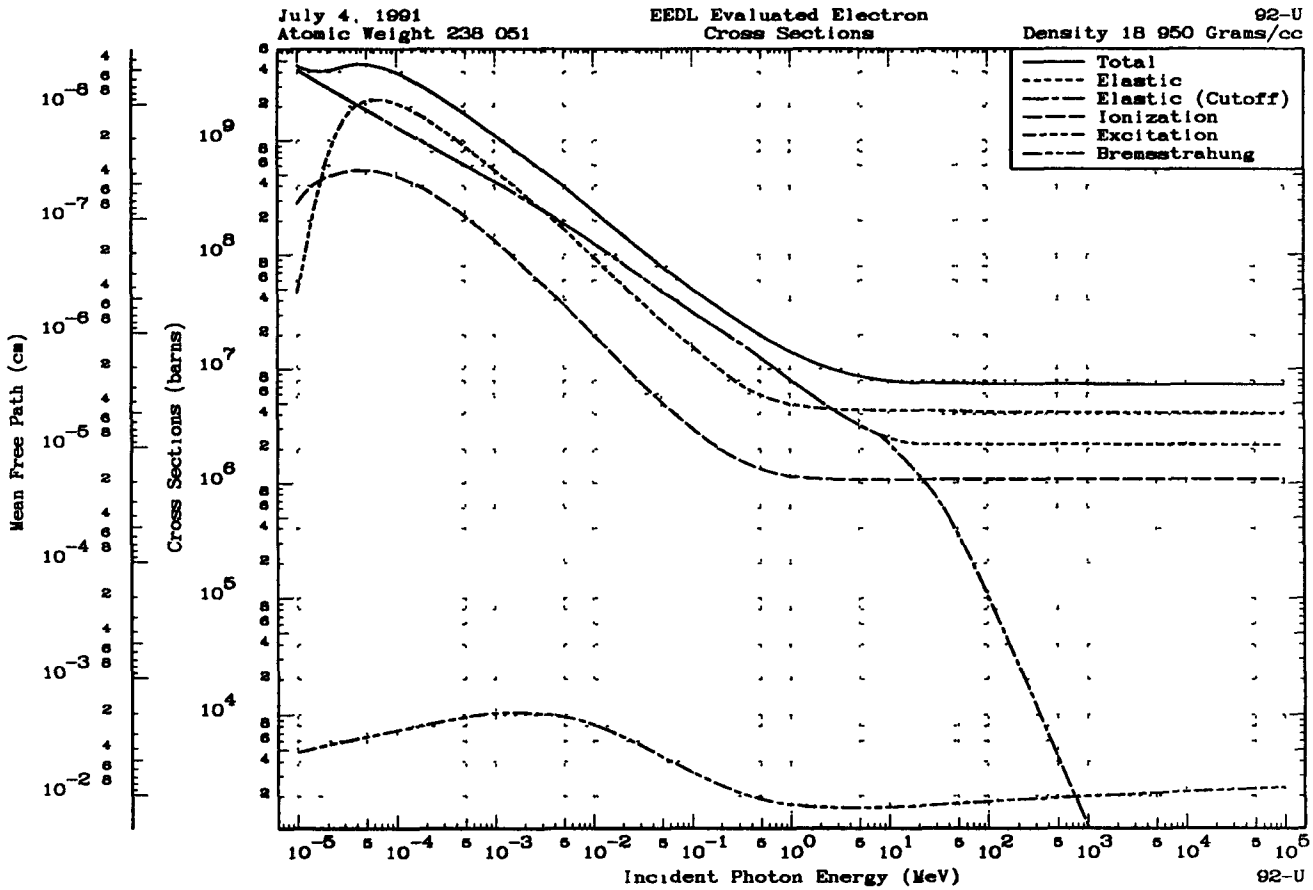
Atomic Weight 233.000 Density 15.370 Grams/cc

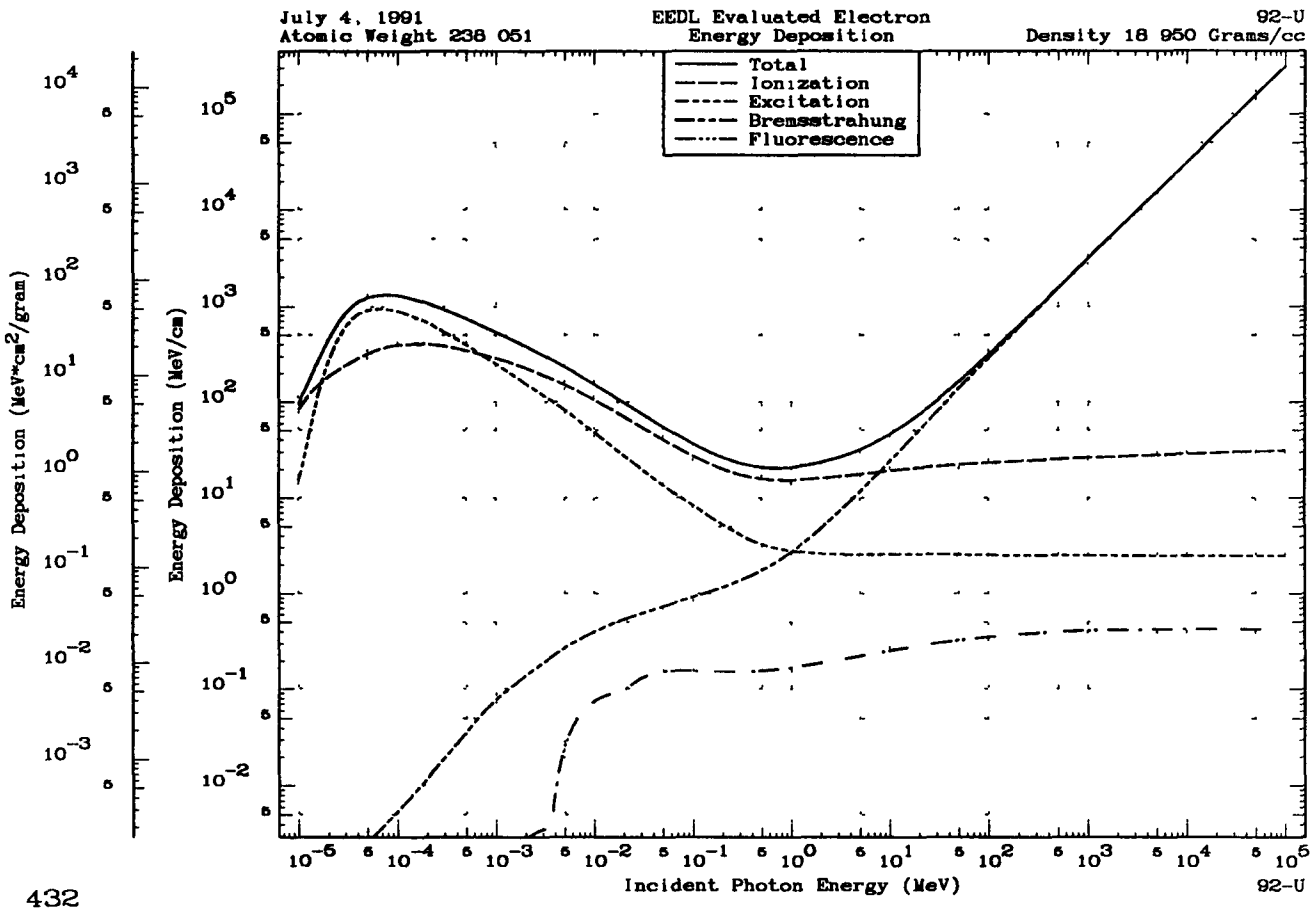
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.7528–4	1.2055–8	5.3969+6	3.2659–7	2.0881+9	7.3240+8	2.5211+8	1.1036+9	9.0779+3	6.8638+2	2.8884+2	3.9752+2	2.0686–2
N6	3.7763–4	1.2102–8	5.3761+6	3.3002–7	2.0801+9	7.3007+8	2.5115+8	1.0988+9	9.0874+3	6.8444+2	2.8850+2	3.9592+2	2.0840–2
	3.8322–4	1.2213–8	5.3274+6	3.3822–7	2.0612+9	7.2462+8	2.4890+8	1.0877+9	9.1093+3	6.7996+2	2.8778+2	3.9216+2	2.1220–2
	3.8764–4	1.2300–8	5.2897+6	3.4473–7	2.0466+9	7.2039+8	2.4716+8	1.0791+9	9.1263+3	6.7652+2	2.8724+2	3.8926+2	2.1521–2
	4.0000–4	1.2541–8	5.1880+6	3.6313–7	2.0073+9	7.0895+8	2.4248+8	1.0558+9	9.1733+3	6.6731+2	2.8585+2	3.8143+2	2.2366–2
	4.2500–4	1.3024–8	4.9954+6	4.0115–7	1.9328+9	6.8736+8	2.3302+8	1.0124+9	9.2638+3	6.4763+2	2.8112+2	3.6648+2	2.4112–2
	4.5000–4	1.3496–8	4.8207+6	4.4029–7	1.8651+9	6.6760+8	2.2448+8	9.7306+8	9.3499+3	6.3011+2	2.7712+2	3.5297+2	2.5875–2
	4.7500–4	1.3958–8	4.6612+6	4.8047–7	1.8034+9	6.4944+8	2.1672+8	9.3727+8	9.4321+3	6.1439+2	2.7369+2	3.4067+2	2.7655–2
	5.0000–4	1.4410–8	4.5149+6	5.2163–7	1.7469+9	6.3267+8	2.0964+8	9.0454+8	9.5107+3	6.0030+2	2.7083+2	3.2944+2	2.9451–2
	5.6250–4	1.5512–8	4.1943+6	6.2865–7	1.6228+9	5.9577+8	1.9368+8	8.3334+8	9.6857+3	5.6799+2	2.6320+2	3.0476+2	3.3978–2
	6.0000–4	1.6150–8	4.0287+6	6.9562–7	1.5587+9	5.7648+8	1.8551+8	7.9673+8	9.7828+3	5.5201+2	2.5988+2	2.9209+2	3.6734–2
	6.5000–4	1.6982–8	3.8312+6	7.8798–7	1.4823+9	5.5341+8	1.7532+8	7.5357+8	9.8911+3	5.3092+2	2.5385+2	2.7703+2	4.0364–2
N5	7.0321–4	1.7841–8	3.6468+6	8.9003–7	1.4110+9	5.3164+8	1.6590+8	7.1343+8	9.9986+3	5.1195+2	2.4887+2	2.6304+2	4.4271–2
	7.1531–4	1.8032–8	3.6081+6	9.1376–7	1.3960+9	5.2703+8	1.6390+8	7.0504+8	1.0020+4	5.0797+2	2.4783+2	2.6009+2	4.5142–2
	7.2500–4	1.8185–8	3.5778+6	9.3289–7	1.3843+9	5.2343+8	1.6235+8	6.9850+8	1.0036+4	5.0487+2	2.4704+2	2.5779+2	4.5841–2
	7.3648–4	1.8364–8	3.5429+6	9.5572–7	1.3707+9	5.1925+8	1.6055+8	6.9094+8	1.0056+4	5.0130+2	2.4612+2	2.5513+2	4.6671–2
N4	7.4375–4	1.8477–8	3.5211+6	9.7025–7	1.3623+9	5.1665+8	1.5944+8	6.8625+8	1.0068+4	4.9909+2	2.4556+2	2.5348+2	4.7197–2
	7.5781–4	1.8696–8	3.4800+6	9.9854–7	1.3464+9	5.1174+8	1.5735+8	6.7733+8	1.0090+4	4.9497+2	2.4456+2	2.5037+2	4.8204–2
	7.6824–4	1.8857–8	3.4503+6	1.0197–6	1.3349+9	5.0818+8	1.5584+8	6.7090+8	1.0107+4	4.9203+2	2.4387+2	2.4812+2	4.8953–2
	7.7891–4	1.9021–8	3.4206+6	1.0414–6	1.3234+9	5.0462+8	1.5433+8	6.6448+8	1.0123+4	4.8911+2	2.4319+2	2.4587+2	4.9720–2
	8.0000–4	1.9342–8	3.3638+6	1.0848–6	1.3015+9	4.9779+8	1.5146+8	6.5220+8	1.0155+4	4.8360+2	2.4197+2	2.4158+2	5.1240–2
	8.5000–4	2.0094–8	3.2378+6	1.1897–6	1.2527+9	4.8263+8	1.4485+8	6.2524+8	1.0200+4	4.6973+2	2.3761+2	2.3207+2	5.4412–2
	9.0000–4	2.0830–8	3.1235+6	1.2975–6	1.2085+9	4.6876+8	1.3890+8	6.0084+8	1.0242+4	4.5745+2	2.3393+2	2.2347+2	5.7596–2
	9.2500–4	2.1191–8	3.0702+6	1.3525–6	1.1879+9	4.6225+8	1.3614+8	5.8949+8	1.0263+4	4.5174+2	2.3222+2	2.1946+2	5.9192–2
N3	9.9057–4	2.2122–8	2.9411+6	1.4999–6	1.1379+9	4.4638+8	1.2949+8	5.6204+8	1.0314+4	4.3823+2	2.2836+2	2.0980+2	6.3393–2
	1.0000–3	2.2255–8	2.9235+6	1.5215–6	1.1311+9	4.4423+8	1.2860+8	5.5829+8	1.0321+4	4.3644+2	2.2788+2	2.0850+2	6.3998–2
	1.0313–3	2.2685–8	2.8680+6	1.5936–6	1.1097+9	4.3731+8	1.2563+8	5.4670+8	1.0325+4	4.2999+2	2.2556+2	2.0436+2	6.5599–2
	1.0898–3	2.3479–8	2.7710+6	1.7317–6	1.0721+9	4.2515+8	1.2047+8	5.2650+8	1.0333+4	4.1891+2	2.2168+2	1.9716+2	6.8603–2
	1.1250–3	2.3947–8	2.7169+6	1.8162–6	1.0512+9	4.1832+8	1.1761+8	5.1523+8	1.0337+4	4.1284+2	2.1962+2	1.9315+2	7.0406–2
	1.1411–3	2.4160–8	2.6929+6	1.8553–6	1.0419+9	4.1530+8	1.1635+8	5.1026+8	1.0339+4	4.1012+2	2.1867+2	1.9138+2	7.1232–2
N2	1.2101–3	2.5058–8	2.5965+6	2.0258–6	1.0046+9	4.0304+8	1.1129+8	4.9025+8	1.0347+4	3.9931+2	2.1498+2	1.8426+2	7.4772–2
	1.2282–3	2.5290–8	2.5726+6	2.0714–6	9.9535+8	4.0000+8	1.1002+8	4.8532+8	1.0349+4	3.9647+2	2.1390+2	1.8249+2	7.5702–2
	1.2308–3	2.5324–8	2.5692+6	2.0780–6	9.9404+8	3.9957+8	1.0984+8	4.8462+8	1.0350+4	3.9607+2	2.1375+2	1.8224+2	7.5836–2
	1.2622–3	2.5723–8	2.5293+6	2.1576–6	9.7861+8	3.9447+8	1.0773+8	4.7639+8	1.0353+4	3.9137+2	2.1199+2	1.7930+2	7.7446–2
	1.3125–3	2.6356–8	2.4686+6	2.2873–6	9.5512+8	3.8668+8	1.0453+8	4.6389+8	1.0359+4	3.8431+2	2.0939+2	1.7484+2	8.0030–2
	1.3216–3	2.6469–8	2.4580+6	2.3111–6	9.5101+8	3.8532+8	1.0398+8	4.6171+8	1.0360+4	3.8308+2	2.0894+2	1.7406+2	8.0499–2
N1	1.3621–3	2.6970–8	2.4124+6	2.4175–6	9.3337+8	3.7943+8	1.0159+8	4.5234+8	1.0364+4	3.7784+2	2.0705+2	1.7071+2	8.2578–2
	1.3966–3	2.7394–8	2.3751+6	2.5093–6	9.1893+8	3.7462+8	9.9639+7	4.4466+8	1.0367+4	3.7341+2	2.0536+2	1.6797+2	8.4351–2
	1.4108–3	2.7567–8	2.3601+6	2.5475–6	9.1314+8	3.7269+8	9.8857+7	4.4158+8	1.0369+4	3.7165+2	2.0469+2	1.6687+2	8.5082–2
	1.4483–3	2.8021–8	2.3219+6	2.6489–6	8.9834+8	3.6774+8	9.6867+7	4.3373+8	1.0372+4	3.6717+2	2.0302+2	1.6407+2	8.7009–2
	1.5000–3	2.8640–8	2.2717+6	2.7909–6	8.7893+8	3.6122+8	9.4270+7	4.2343+8	1.0377+4	3.6138+2	2.0089+2	1.6040+2	8.9669–2
	1.5625–3	2.9379–8	2.2146+6	2.9657–6	8.5684+8	3.5377+8	9.1246+7	4.1181+8	1.0372+4	3.5390+2	1.9761+2	1.5620+2	9.2629–2
	1.6250–3	3.0105–8	2.1611+6	3.1440–6	8.3615+8	3.4676+8	8.8436+7	4.0094+8	1.0367+4	3.4699+2	1.9461+2	1.5228+2	9.5587–2
	1.6719–3	3.0643–8	2.1232+6	3.2801–6	8.2148+8	3.4177+8	8.6455+7	3.9325+8	1.0364+4	3.4213+2	1.9253+2	1.4950+2	9.7806–2
	1.7500–3	3.1526–8	2.0637+6	3.5110–6	7.9847+8	3.3389+8	8.3370+7	3.8119+8	1.0358+4	3.3461+2	1.8936+2	1.4516+2	1.0150–1
	1.8125–3	3.2222–8	2.0192+6	3.6993–6	7.8124+8	3.2797+8	8.1076+7	3.7218+8	1.0354+4	3.2903+2	1.8701+2	1.4191+2	1.0446–1
	1.8359–3	3.2480–8	2.0031+6	3.7708–6	7.7503+8	3.2583+8	8.0253+7	3.6894+8	1.0352+4	3.2703+2	1.8618+2	1.4074+2	1.0557–1
	2.0000–3	3.4252–8	1.8995+6	4.2824–6	7.3493+8	3.1190+8	7.4988+7	3.4802+8	1.0342+4	3.1436+2	1.8103+2	1.3322+2	1.1332–1
	2.2500–3	3.6944–8	1.7611+6	5.1034–6	6.8137+8	2.9352+8	6.8063+7	3.1978+8	1.0274+4	2.9484+2	1.7186+2	1.2285+2	1.2367–1
	2.5000–3	3.9524–8	1.6461+6	5.9749–6	6.3689+8	2.7800+8	6.2428+7	2.9646+8	1.0214+4	2.7908+2	1.6463+2	1.1431+2	1.3397–1
	2.6250–3	4.0778–8	1.5955+6	6.4285–6	6.1732+8	2.7109+8	5.9977+7	2.8624+8	1.0186+4	2.7208+2	1.6137+2	1.1057+2	1.3910–1
	3.0000–3	4.4407–8	1.4651+6	7.8533–6	5.6687+8	2.5305+8	5.3764+7	2.6005+8	1.0110+4	2.5448+2	1.5332+2	1.0101+2	1.5444–1
M5	3.4436–3	4.8559–8	1.3398+6	9.6642–6	5.1839+8	2.3544+8	4.7893+7	2.3505+8	9.9842+3	2.3569+2	1.4378+2	9.1738+1	1.7082–1
	3.4610–3	4.8719–8	1.3355+6	9.7381–6	5.1670+8	2.3481+8	4.7690+7	2.3418+8	9.9796+3	2.3504+2	1.4345+2	9.1416+1	1.7146–1
	3.5284–3	4.9332–8	1.3188+6	1.0026–5	5.1027+8	2.3244+8	4.6923+7	2.3090+8	9.9621+3	2.3256+2	1.4219+2	9.0194+1	1.7394–1
M4	3.6161–3	5.0125–8	1.2980+6	1.0406–5	5.0220+8	2.2945+8	4.5963+7	2.2678+8	9.9398+3	2.2947+2	1.4063+2	8.8663+1	1.7715–1
	3.6401–3	5.0341–8	1.2924+6	1.0511–5	5.0004+8	2.2865+8	4.5707+7	2.2568+8	9.9336+3	2.2865+2	1.4022+2	8.8254+1	1.7802–1
	3.6463–3	5.0397–8	1.2910+6	1.0538–5	4.9949+8	2.2844+8	4.5642+7	2.2540+8	9.9320+3	2.2844+2	1.4011+2	8.8150+1	1.7824–1
	3.7301–3	5.1147–8	1.2721+6	1.0907–5	4.9216+8	2.2571+8	4.4775+7	2.2167+8	9.9104+3	2.2564+2	1.3870+2	8.6761+1	1.8127–1
	3.8231–3	5.1973–8	1.2518+6	1.1322–5	4.8434+8	2.2279+8	4.3855+7	2.1768+8	9.8872+3	2.2267+2	1.3721+2	8.5281+1	1.8463–1
	3.8650–3	5.2343–8	1.2430+6	1.1511–5	4.8092+8	2.2151+8	4.3454+7	2.1595+8	9.8769+3	2.2138+2	1.3656+2	8.4636+1	1.8614–1
	4.0000–3	5.3522–8	1.2156+6	1.2126–5	4.7032+8	2.1753+8	4.2216+7	2.1056+8	9.8446+3	2.1740+2	1.3457+2	8.2637+1	1.9099–1
M3	4.1594–3	5.4910–8	1.1849+6	1.2868–5	4.5843+8	2.1292+8	4.0831+7	2.0467+8	9.7818+3	2.1252+2	1.3191+2	8.0412+1	1.9564–1
	4.2119–3	5.5366–8	1.1751+6	1.3116–5	4.5466+8	2.1146+8	4.0396+7	2.0279+8	9.7617+3	2.1099+2	1.3108+2	7.9708+1	1.9716–1
	4.3105–3	5.6216–8	1.1574+6	1.3586–5	4.4779+8	2.0879+8	3.9607+7	1.9938+8	9.7248+3	2.0821+2	1.2958+2	7.8428+1	2.0002–1
	4.4828–3	5.7686–8	1.1279+6	1.4423–5	4.3638+8	2.0435+8	3.8304+7	1.9371+8	9.6626+3	2.0365+2	1.2713+2	7.6307+1	2.0501–1
	4.5000–3	5.7831–8	1.1250+6	1.4507–5	4.3528+8	2.0392+8	3.8179+7	1.9317+8	9.6565+3	2.0321+2	1.2690+2	7.6104+1	2.0550–1
	4.7414–3	5.9853–8	1.0870+6	1.5713–5	4.2057+8	1.9816+8	3.6516+7	1.8589+8	9.5743+3	1.9736+2	1.2377+2	7.3380+1	2.1244–1
	5.0000–3	6.1978–8	1.0497+6	1.7042–5	4.0615+8	1.9247+8	3.4902+7	1.7877+8	9.4913+3	1.9171+2	1.2077+2	7.0719+1	2.1983–1
M2	5.0018–3	6.1992–8	1.0495+6	1.7051–5	4.0606+8	1.9243+8	3.4891+7	1.7873+8	9.4908+3	1.9167+2	1.2074+2	7.0703+1	2.1988–1
	5.0642–3	6.2529–8	1.0405+6	1.7378–5	4.0258+8	1.9110+8	3.4521+7	1.7695+8	9.4715+3	1.9024+2	1.1999+2	7.0025+1	2.2166–1
	5.1812–3	6.3531–8	1.0241+6	1.7997–5	3.9623+8	1.8866+8	3.3851+7	1.7371+8	9.4362+3	1.8765+2	1.1863+2	6.8792+1	2.2498–1
M1	5.3349–3	6.4835–8	1.0035+6	1.8824–5	3.8826+8	1.8558+8	3.3013+7	1.6965+8	9.3911+3	1.8441+2	1.1693+2	6.7247+1	2.2933–1
	5.3859–3	6.5269–8	9.9682+5	1.9101–5	3.8568+8	1.8459+8	3.2745+7	1.6833+8	9.3760+3	1.8337+2	1.1639+2	6.6745+1	2.3075–1
	5.4180–3	6.5543–8	9.9266+5	1.9277–5	3.8407+8	1.8398+8	3.2578+7	1.6750+8	9.3666+3	1.8272+2	1.1605+2	6.6434+1	2.3164–1
	5.5000–3	6.6237–8	9.8225+5	1.9727–5	3.8004+8	1.8243+8	3.2161+7	1.6544+8	9.3429+3	1.8111+2	1.1522+2	6.5653+1	2.3392–1
	5.5635–3	6.6773–8	9.7437+5	2.0079–5	3.7699+8	1.8125+8	3.1846+7	1.6388+8	9.3248+3	1.7988+2	1.1458+2	6.5063+1	2.3567–1
	5.6929–3	6.7859–8	9.5878+5	2.0803–5	3.7096+8	1.7892+8	3.1225+7	1.6080+8	9.2887+3	1.7747+2	1.1334+2	6.3899+1	2.3925–1
	5.7818–3	6.8599–8	9.4843+5	2.1306–5	3.6696+8	1.7737+8	3.0813+7	1.5876+8	9.2644+3	1.7588+2	1.1251+2	6.3127+1	2.4170–1
	6.0000–3	7.0403–8	9.2414+5	2.2560–5	3.5756+8	1.7371+8	2.9851+7	1.5398+8	9.2066+3	1.7217+2	1.1060+2	6.1320+1	2.4769–1

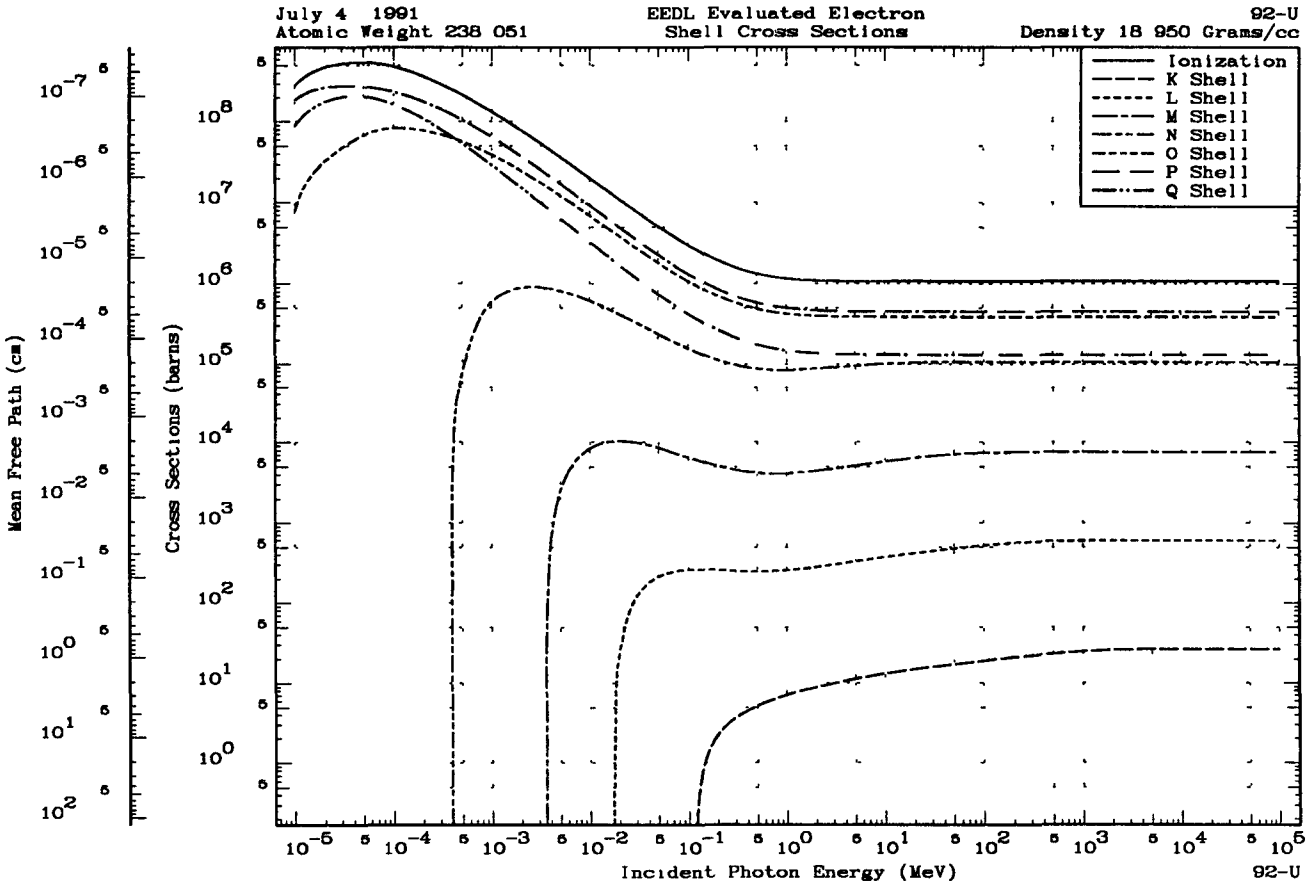
Atomic Weight 233.000 Density 15.370 Grams/cc

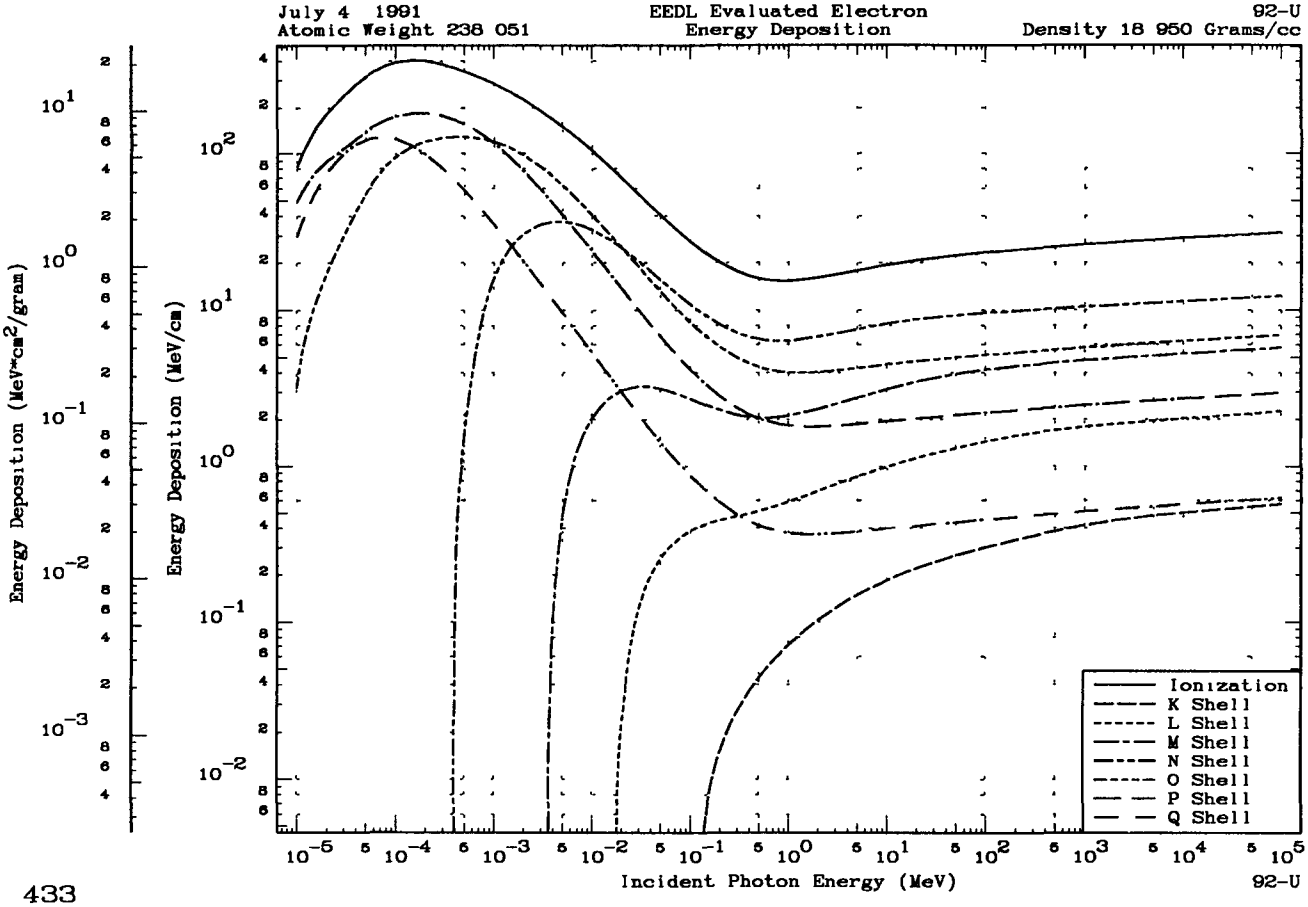
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.5000–3	7.4470–8	8.7366+5	2.5538–5	3.3802+8	1.6598+8	2.7852+7	1.4418+8	9.0382+3	1.6374+2	1.0591+2	5.7569+1	2.5864–1
	7.0000–3	7.8438–8	8.2947+5	2.8662–5	3.2093+8	1.5913+8	2.6123+7	1.3566+8	8.8849+3	1.5646+2	1.0188+2	5.4310+1	2.6949–1
	7.2500–3	8.0387–8	8.0936+5	3.0276–5	3.1315+8	1.5599+8	2.5342+7	1.3181+8	8.8133+3	1.5317+2	1.0006+2	5.2836+1	2.7486–1
	8.0000–3	8.6106–8	7.5560+5	3.5317–5	2.9235+8	1.4749+8	2.3276+7	1.2157+8	8.6154+3	1.4450+2	9.5284+1	4.8922+1	2.9084–1
	9.0000–3	9.3517–8	6.9572+5	4.2496–5	2.6918+8	1.3767+8	2.1011+7	1.1049+8	8.3436+3	1.3422+2	8.9277+1	4.4639+1	3.0855–1
	1.0000–2	1.0067–7	6.4630+5	5.0188–5	2.5006+8	1.2944+8	1.9174+7	1.0143+8	8.1077+3	1.2588+2	8.4414+1	4.1144+1	3.2595–1
	1.1250–2	1.0931–7	5.9521+5	6.0500–5	2.3029+8	1.2069+8	1.7304+7	9.2290+7	7.8046+3	1.1666+2	7.8740+1	3.7575+1	3.4267–1
	1.2500–2	1.1765–7	5.5302+5	7.1575–5	2.1397+8	1.1336+8	1.5787+7	8.4814+7	7.5431+3	1.0916+2	7.4146+1	3.4660+1	3.5912–1
	1.3125–2	1.2172–7	5.3454+5	7.7388–5	2.0682+8	1.1012+8	1.5131+7	8.1560+7	7.4250+3	1.0590+2	7.2139+1	3.3391+1	3.6725–1
	1.5000–2	1.3356–7	4.8712+5	9.5823–5	1.8847+8	1.0171+8	1.3472+7	7.3279+7	7.1111+3	9.7634+1	6.7075+1	3.0167+1	3.9123–1
L3	1.6743–2	1.4423–7	4.5110+5	1.1432–4	1.7453+8	9.5158+7	1.2247+7	6.7122+7	6.8315+3	9.0947+1	6.2805+1	2.7733+1	4.0873–1
	1.7150–2	1.4669–7	4.4354+5	1.1883–4	1.7161+8	9.3767+7	1.1994+7	6.5841+7	6.7701+3	8.9553+1	6.1915+1	2.7226+1	4.1242–1
	1.7863–2	1.5094–7	4.3103+5	1.2689–4	1.6677+8	9.1457+7	1.1579+7	6.3727+7	6.6672+3	8.7257+1	6.0450+1	2.6389+1	4.1885–1
	1.8931–2	1.5723–7	4.1380+5	1.3936–4	1.6010+8	8.8257+7	1.1011+7	6.0826+7	6.5231+3	8.4115+1	5.8446+1	2.5241+1	4.2843–1
	2.0000–2	1.6341–7	3.9815+5	1.5228–4	1.5405+8	8.5335+7	1.0500+7	5.8206+7	6.3898+3	8.1288+1	5.6646+1	2.4205+1	4.3793–1
L2	2.0402–2	1.6570–7	3.9265+5	1.5726–4	1.5192+8	8.4300+7	1.0322+7	5.7292+7	6.3406+3	8.0240+1	5.5960+1	2.3839+1	4.4116–1
	2.1002–2	1.6909–7	3.8477+5	1.6481–4	1.4887+8	8.2814+7	1.0067+7	5.5983+7	6.2697+3	7.8747+1	5.4985+1	2.3316+1	4.4597–1
L1	2.1113–2	1.6972–7	3.8335+5	1.6622–4	1.4832+8	8.2547+7	1.0022+7	5.5748+7	6.2569+3	7.8478+1	5.4810+1	2.3222+1	4.4686–1
	2.1668–2	1.7282–7	3.7647+5	1.7336–4	1.4566+8	8.1235+7	9.8015+6	5.4615+7	6.1908+3	7.7154+1	5.3936+1	2.2767+1	4.5052–1
	2.2127–2	1.7536–7	3.7101+5	1.7934–4	1.4355+8	8.0193+7	9.6278+6	5.3719+7	6.1381+3	7.6108+1	5.3247+1	2.2407+1	4.5354–1
	2.2500–2	1.7742–7	3.6670+5	1.8427–4	1.4188+8	7.9370+7	9.4911+6	5.3012+7	6.0962+3	7.5284+1	5.2705+1	2.2124+1	4.5599–1
	2.2710–2	1.7858–7	3.6433+5	1.8707–4	1.4096+8	7.8917+7	9.4161+6	5.2625+7	6.0731+3	7.4832+1	5.2407+1	2.1968+1	4.5737–1
	2.4095–2	1.8610–7	3.4960+5	2.0593–4	1.3526+8	7.6087+7	8.9517+6	5.0218+7	5.9278+3	7.2030+1	5.0561+1	2.1003+1	4.6645–1
	2.4375–2	1.8761–7	3.4679+5	2.0983–4	1.3418+8	7.5547+7	8.8638+6	4.9761+7	5.8999+3	7.1499+1	5.0211+1	2.0820+1	4.6828–1
	2.4532–2	1.8845–7	3.4524+5	2.1204–4	1.3358+8	7.5247+7	8.8153+6	4.9509+7	5.8844+3	7.1205+1	5.0017+1	2.0718+1	4.6931–1
	2.5000–2	1.9095–7	3.4073+5	2.1865–4	1.3183+8	7.4376+7	8.6742+6	4.8775+7	5.8391+3	7.0353+1	4.9456+1	2.0424+1	4.7236–1
	2.5571–2	1.9398–7	3.3541+5	2.2682–4	1.2977+8	7.3347+7	8.5085+6	4.7911+7	5.7854+3	6.9348+1	4.8794+1	2.0078+1	4.7607–1
	2.7188–2	2.0243–7	3.2140+5	2.5059–4	1.2435+8	7.0626+7	8.0747+6	4.5645+7	5.6422+3	6.6717+1	4.7060+1	1.9170+1	4.8652–1
	2.7266–2	2.0284–7	3.2075+5	2.5177–4	1.2410+8	7.0500+7	8.0548+6	4.5541+7	5.6355+3	6.6596+1	4.6981+1	1.9128+1	4.8703–1
	2.7786–2	2.0552–7	3.1657+5	2.5961–4	1.2248+8	6.9684+7	7.9261+6	4.4866+7	5.5922+3	6.5815+1	4.6466+1	1.8858+1	4.9036–1
	3.0000–2	2.1678–7	3.0013+5	2.9406–4	1.1612+8	6.6466+7	7.4241+6	4.2227+7	5.4196+3	6.2765+1	4.4459+1	1.7801+1	5.0449–1
	3.5000–2	2.4134–7	2.6958+5	3.7772–4	1.0430+8	6.0364+7	6.5268+6	3.7408+7	5.0612+3	5.6865+1	4.0491+1	1.5845+1	5.2925–1
	4.0000–2	2.6482–7	2.4568+5	4.6936–4	9.5056+7	5.5533+7	5.8380+6	3.3680+7	4.7699+3	5.2321+1	3.7434+1	1.4333+1	5.5358–1
	4.5000–2	2.8736–7	2.2641+5	5.6851–4	8.7600+7	5.1587+7	5.3046+6	3.0704+7	4.5218+3	4.8582+1	3.4894+1	1.3113+1	5.7418–1
	5.0000–2	3.0912–7	2.1048+5	6.7481–4	8.1434+7	4.8295+7	4.8690+6	2.8266+7	4.3108+3	4.5525+1	3.2815+1	1.2115+1	5.9449–1
	6.0000–2	3.5058–7	1.8558+5	9.0692–4	7.1803+7	4.3087+7	4.2146+6	2.4498+7	3.9671+3	4.0731+1	2.9542+1	1.0560+1	6.2958–1
	7.0000–2	3.8952–7	1.6703+5	1.1640–3	6.4626+7	3.9186+7	3.7480+6	2.1688+7	3.6998+3	3.7123+1	2.7073+1	9.3891+0	6.6060–1
	8.0000–2	4.2667–7	1.5249+5	1.4440–3	5.8998+7	3.6093+7	3.3860+6	1.9516+7	3.4829+3	3.4329+1	2.5153+1	8.4850+0	6.9099–1
	1.0000–1	4.9558–7	1.3128+5	2.0643–3	5.0795+7	3.1549+7	2.8830+6	1.6360+7	3.1552+3	3.0248+1	2.2346+1	7.1605+0	7.4243–1
K	1.1308–1	5.3663–7	1.2124+5	2.5112–3	4.6909+7	2.9402+7	2.6522+6	1.4852+7	2.9950+3	2.8305+1	2.1011+1	6.5213+0	7.7292–1
	1.1539–1	5.4336–7	1.1974+5	2.5931–3	4.6328+7	2.9079+7	2.6175+6	1.4628+7	2.9714+3	2.8012+1	2.0808+1	6.4268+0	7.7775–1
	1.1971–1	5.5584–7	1.1705+5	2.7491–3	4.5288+7	2.8499+7	2.5556+6	1.4230+7	2.9290+3	2.7489+1	2.0444+1	6.2583+0	7.8682–1
	1.2729–1	5.7725–7	1.1271+5	3.0288–3	4.3608+7	2.7559+7	2.4556+6	1.3591+7	2.8596+3	2.6646+1	1.9856+1	5.9877+0	8.0266–1
	1.3864–1	6.0844–7	1.0693+5	3.4642–3	4.1373+7	2.6300+7	2.3229+6	1.2747+7	2.7657+3	2.5534+1	1.9076+1	5.6310+0	8.2630–1
	1.5000–1	6.3862–7	1.0188+5	3.9176–3	3.9417+7	2.5191+7	2.2069+6	1.2016+7	2.6819+3	2.4568+1	1.8396+1	5.3225+0	8.4975–1
	1.6250–1	6.6812–7	9.7381+4	4.4352–3	3.7677+7	2.4147+7	2.1071+6	1.1420+7	2.6020+3	2.3735+1	1.7793+1	5.0688+0	8.7259–1
	1.8125–1	7.1055–7	9.1566+4	5.2435–3	3.5427+7	2.2792+7	1.9782+6	1.0654+7	2.4969+3	2.2667+1	1.7017+1	4.7435+0	9.0663–1
	2.0000–1	7.5108–7	8.6624+4	6.0875–3	3.3515+7	2.1636+7	1.8688+6	1.0008+7	2.4058+3	2.1770+1	1.6360+1	4.4695+0	9.4031–1
	2.2500–1	7.9911–7	8.1418+4	7.2586–3	3.1501+7	2.0301+7	1.7645+6	9.4338+6	2.3124+3	2.0931+1	1.5725+1	4.2252+0	9.8098–1
	2.6250–1	8.6663–7	7.5075+4	9.0948–3	2.9047+7	1.8676+7	1.6370+6	8.7318+6	2.1957+3	1.9922+1	1.4953+1	3.9275+0	1.0414+0
	3.0000–1	9.2970–7	6.9982+4	1.1016–2	2.7076+7	1.7374+7	1.5340+6	8.1660+6	2.0994+3	1.9126+1	1.4337+1	3.6888+0	1.1007+0
	4.0000–1	1.0836–6	6.0043+4	1.6414–2	2.3231+7	1.4686+7	1.3712+6	7.1716+6	1.9376+3	1.7934+1	1.3413+1	3.2665+0	1.2547+0
	5.0000–1	1.2185–6	5.3393+4	2.2079–2	2.0658+7	1.2816+7	1.2774+6	6.5628+6	1.8376+3	1.7378+1	1.2961+1	3.0083+0	1.4081+0
	6.0000–1	1.3357–6	4.8711+4	2.7879–2	1.8847+7	1.1420+7	1.2165+6	6.2084+6	1.7724+3	1.7102+1	1.2680+1	2.8613+0	1.5616+0
	8.0000–1	1.5391–6	4.2273+4	3.9592–2	1.6356+7	9.5043+6	1.1463+6	5.7031+6	1.6932+3	1.7048+1	1.2522+1	2.6507+0	1.8754+0
	1.0000+0	1.7015–6	3.8239+4	5.1262–2	1.4795+7	8.2406+6	1.1069+6	5.4457+6	1.6499+3	1.7229+1	1.2485+1	2.5477+0	2.1969+0
	1.5000+0	1.9893–6	3.2706+4	7.9406–2	1.2654+7	6.3700+6	1.0651+6	5.2174+6	1.5969+3	1.8313+1	1.2819+1	2.4701+0	3.0234+0
	2.0000+0	2.1926–6	2.9674+4	1.0590–1	1.1481+7	5.3288+6	1.0519+6	5.0986+6	1.5758+3	1.9448+1	1.3139+1	2.4287+0	3.8802+0
	3.0000+0	2.4483–6	2.6574+4	1.5444–1	1.0282+7	4.2107+6	1.0361+6	5.0334+6	1.5610+3	2.1793+1	1.3706+1	2.4281+0	5.6596+0
	4.0000+0	2.6069–6	2.4958+4	1.9804–1	9.6563+6	3.6087+6	1.0350+6	5.0111+6	1.5588+3	2.4125+1	1.4171+1	2.4257+0	7.5287+0
	5.0000+0	2.7193–6	2.3926+4	2.3762–1	9.2571+6	3.2351+6	1.0344+6	4.9861+6	1.5597+3	2.6434+1	1.4566+1	2.4219+0	9.4462+0
	6.0000+0	2.8016–6	2.3223+4	2.7390–1	8.9853+6	2.9869+6	1.0342+6	4.9627+6	1.5624+3	2.8723+1	1.4893+1	2.4188+0	1.1411+1
	8.0000+0	2.9195–6	2.2285+4	3.3851–1	8.6223+6	2.6669+6	1.0351+6	4.9188+6	1.5706+3	3.3299+1	1.5426+1	2.4139+0	1.5459+1
	1.0000+1	2.9978–6	2.1703+4	3.9479–1	8.3972+6	2.4821+6	1.0361+6	4.8774+6	1.5801+3	3.7876+1	1.5842+1	2.4101+0	1.9624+1
	1.5000+1	3.0844–6	2.1094+4	5.1022–1	8.1613+6	2.2671+6	1.0383+6	4.8544+6	1.6022+3	4.9253+1	1.6470+1	2.4026+0	3.0380+1
	2.0000+1	3.1188–6	2.0861+4	6.0137–1	8.0714+6	2.1940+6	1.0399+6	4.8359+6	1.6217+3	6.0867+1	1.6983+1	2.3972+0	4.1488+1
	3.0000+1	3.1337–6	2.0762+4	7.4026–1	8.0330+6	2.1850+6	1.0408+6	4.8056+6	1.6535+3	8.4414+1	1.7528+1	2.3896+0	6.4496+1
	4.0000+1	3.1421–6	2.0706+4	8.4455–1	8.0114+6	2.1847+6	1.0416+6	4.7834+6	1.6782+3	1.0835+2	1.7943+1	2.3861+0	8.8018+1
	5.0000+1	3.1490–6	2.0661+4	9.2783–1	7.9938+6	2.1839+6	1.0420+6	4.7663+6	1.6991+3	1.3262+2	1.8263+1	2.3850+0	1.1197+2
	6.0000+1	3.1557–6	2.0617+4	9.9702–1	7.9769+6	2.1832+6	1.0424+6	4.7496+6	1.7164+3	1.5713+2	1.8513+1	2.3841+0	1.3624+2
	8.0000+1	3.1588–6	2.0597+4	1.1076+0	7.9690+6	2.1820+6	1.0427+6	4.7425+6	1.7441+3	2.0674+2	1.8870+1	2.3826+0	1.8549+2
	1.0000+2	3.1616–6	2.0578+4	1.1943+0	7.9619+6	2.1812+6	1.0429+6	4.7361+6	1.7650+3	2.5644+2	1.9184+1	2.3815+0	2.3487+2
	1.5000+2	3.1671–6	2.0543+4	1.3531+0	7.9483+6	2.1796+6	1.0431+6	4.7238+6	1.8013+3	3.8157+2	1.9538+1	2.3757+0	3.5966+2
	2.0000+2	3.1683–6	2.0535+4	1.4663+0	7.9453+6	2.1786+6	1.0432+6	4.7217+6	1.8264+3	5.0827+2	1.9865+1	2.3750+0	4.8603+2
	3.0000+2	3.1701–6	2.0523+4	1.6261+0	7.9406+6	2.1770+6	1.0433+6	4.7185+6	1.8571+3	7.6002+2	2.0341+1	2.3740+0	7.3730+2
	4.0000+2	3.1723–6	2.0510+4	1.7397+0	7.9353+6	2.1759+6	1.0433+6	4.7143+6	1.8782+3	1.0125+3	2.0587+1	2.3726+0	9.8950+2
	5.0000+2	3.1751–6	2.0492+4	1.8278+0	7.9283+6	2.1750+6	1.0433+6	4.7080+6	1.8946+3	1.2668+3	2.0800+1	2.3701+0	1.2437+3
	6.0000+2	3.1756–6	2.0488+4	1.8998+0	7.9269+6	2.1743+6	1.0433+6	4.7074+6	1.9086+3	1.5183+3	2.0989+1	2.3704+0	1.4949+3
	8.0000+2	3.1771–6	2.0479+4	2.0135+0	7.9233+6	2.1732+6	1.0433+6	4.7048+6	1.9309+3	2.0258+3	2.1315+1	2.3705+0	2.0022+3
	1.0000+3	3.1785–6	2.0469+4	2.1016+0	7.9197+6	2.1724+6	1.0433+6	4.7020+6	1.9485+3	2.5329+3	2.1580+1	2.3704+0	2.5090+3

Atomic Weight 233.000												Density 15.370 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000+3	3.1793–6	2.0464+4	2.2615+0	7.9176+6	2.1708+6	1.0433+6	4.7014+6	1.9811+3	3.8080+3	2.1842+1	2.3701+0	3.7838+3
2.0000+3	3.1803–6	2.0458+4	2.3748+0	7.9152+6	2.1697+6	1.0433+6	4.7001+6	2.0050+3	5.0757+3	2.2101+1	2.3695+0	5.0512+3
3.0000+3	3.1811–6	2.0452+4	2.5345+0	7.9131+6	2.1682+6	1.0433+6	4.6996+6	2.0396+3	7.6166+3	2.2579+1	2.3692+0	7.5916+3
4.0000+3	3.1820–6	2.0447+4	2.6478+0	7.9111+6	2.1671+6	1.0433+6	4.6986+6	2.0649+3	1.0160+4	2.2808+1	2.3688+0	1.0135+4
5.0000+3	3.1837–6	2.0436+4	2.7356+0	7.9067+6	2.1662+6	1.0433+6	4.6950+6	2.0847+3	1.2730+4	2.2989+1	2.3670+0	1.2704+4
6.0000+3	3.1833–6	2.0439+4	2.8072+0	7.9078+6	2.1655+6	1.0433+6	4.6968+6	2.0993+3	1.5256+4	2.3150+1	2.3680+0	1.5230+4
8.0000+3	3.1832–6	2.0439+4	2.9203+0	7.9080+6	2.1644+6	1.0433+6	4.6981+6	2.1224+3	2.0353+4	2.3470+1	2.3687+0	2.0327+4
1.0000+4	3.1831–6	2.0440+4	3.0079+0	7.9083+6	2.1636+6	1.0433+6	4.6992+6	2.1406+3	2.5498+4	2.3742+1	2.3694+0	2.5472+4
1.5000+4	3.1825–6	2.0444+4	3.1672+0	7.9098+6	2.1621+6	1.0433+6	4.7022+6	2.1752+3	3.8123+4	2.3991+1	2.3709+0	3.8097+4
2.0000+4	3.1824–6	2.0444+4	3.2803+0	7.9101+6	2.1610+6	1.0433+6	4.7036+6	2.2001+3	5.0912+4	2.4239+1	2.3716+0	5.0885+4
3.0000+4	3.1815–6	2.0450+4	3.4398+0	7.9123+6	2.1594+6	1.0433+6	4.7073+6	2.2350+3	7.6199+4	2.4726+1	2.3735+0	7.6172+4
4.0000+4	3.1812–6	2.0452+4	3.5530+0	7.9130+6	2.1583+6	1.0433+6	4.7091+6	2.2601+3	1.0176+5	2.4939+1	2.3744+0	1.0173+5
5.0000+4	3.1821–6	2.0446+4	3.6407+0	7.9107+6	2.1575+6	1.0433+6	4.7076+6	2.2794+3	1.2708+5	2.5105+1	2.3736+0	1.2705+5
6.0000+4	3.1811–6	2.0453+4	3.7125+0	7.9132+6	2.1568+6	1.0433+6	4.7108+6	2.2951+3	1.5238+5	2.5262+1	2.3753+0	1.5235+5
8.0000+4	3.1803–6	2.0458+4	3.8257+0	7.9151+6	2.1557+6	1.0433+6	4.7137+6	2.3202+3	2.0342+5	2.5575+1	2.3768+0	2.0339+5
1.0000+5	3.1797–6	2.0462+4	3.9134+0	7.9167+6	2.1549+6	1.0433+6	4.7162+6	2.3396+3	2.5455+5	2.5874+1	2.3780+0	2.5453+5


July 4, 1991
Atomic Weight 238 051
EEDL Evaluated Electron
Cross Sections
92-U
Density 18 950 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
92-U


July 4, 1991
Atomic Weight 238 051
EEDL Evaluated Electron
Energy Deposition
92-U
Density 18 950 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
92-U


July 4 1991
Atomic Weight 238 051
EEDL Evaluated Electron
Shell Cross Sections
92-U
Density 18 950 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
92-U


July 4 1991
Atomic Weight 238 051
EEDL Evaluated Electron
Energy Deposition
92-U
Density 18 950 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
92-U

Atomic Weight 238.051 — Density 18.950 Grams/cc

Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.0000–5	4.6737–9	1.1291+7		4.4632+9	4.1328+9	2.8409+8	4.6364+7	4.7937+3	9.7025+1	8.2142+1	1.4883+1	4.9683–4
1.0625–5	4.7680–9	1.1068+7		4.3750+9	4.0108+9	3.0514+8	5.9050+7	4.8540+3	1.0955+2	9.0316+1	1.9235+1	5.2686–4
1.1250–5	4.8515–9	1.0877+7		4.2997+9	3.8991+9	3.2639+8	7.4175+7	4.9115+3	1.2332+2	9.8809+1	2.4514+1	5.5717–4
1.1719–5	4.9083–9	1.0751+7		4.2499+9	3.8212+9	3.3866+8	8.9966+7	4.9530+3	1.3428+2	1.0422+2	3.0053+1	5.8008–4
1.2188–5	4.9584–9	1.0643+7		4.2070+9	3.7479+9	3.5078+8	1.0829+8	4.9932+3	1.4625+2	1.0969+2	3.6560+1	6.0314–4
1.3125–5	5.0368–9	1.0477+7		4.1415+9	3.6132+9	3.7458+8	1.5373+8	5.0700+3	1.7377+2	1.2078+2	5.2994+1	6.4969–4
1.3359–5	5.0525–9	1.0444+7		4.1286+9	3.5817+9	3.7972+8	1.6712+8	5.0885+3	1.8118+2	1.2327+2	5.7909+1	6.6140–4
1.5000–5	5.1311–9	1.0285+7		4.0654+9	3.3825+9	4.1493+8	2.6800+8	5.2114+3	2.3725+2	1.4105+2	9.6204+1	7.4443–4
1.7500–5	5.1548–9	1.0237+7		4.0467+9	3.1344+9	4.4927+8	4.6298+8	5.3796+3	3.3283+2	1.6202+2	1.7081+2	8.7391–4
2.0000–5	5.0847–9	1.0378+7		4.1024+9	2.9343+9	4.7815+8	6.8999+8	5.5297+3	4.4360+2	1.8217+2	2.6144+2	1.0067–3
P3 2.4570–5	4.8926–9	1.0786+7		4.2636+9	2.6506+9	5.0598+8	1.1070+9	5.7476+3	6.3895+2	2.0905+2	4.2991+2	1.2388–3
2.4909–5	4.8774–9	1.0819+7		4.2768+9	2.6327+9	5.0753+8	1.1366+9	5.7621+3	6.5285+2	2.1097+2	4.4188+2	1.2560–3
2.5546–5	4.8470–9	1.0887+7		4.3036+9	2.6001+9	5.1041+8	1.1931+9	5.7889+3	6.7935+2	2.1456+2	4.6479+2	1.2885–3
2.6659–5	4.7884–9	1.1021+7		4.3563+9	2.5459+9	5.1532+8	1.2952+9	5.8345+3	7.2716+2	2.2083+2	5.0634+2	1.3456–3
2.8330–5	4.7248–9	1.1169+7		4.4149+9	2.4705+9	5.2241+8	1.4220+9	5.9001+3	7.8905+2	2.3018+2	5.5886+2	1.4320–3
3.0000–5	4.6523–9	1.1343+7		4.4837+9	2.4016+9	5.2927+8	1.5529+9	5.9626+3	8.5311+2	2.3958+2	6.1352+2	1.5191–3
P2 3.4090–5	4.5400–9	1.1623+7		4.5947+9	2.2548+9	5.3696+8	1.8029+9	6.1045+3	9.7524+2	2.5778+2	7.1746+2	1.7357–3
3.4459–5	4.5349–9	1.1636+7		4.5998+9	2.2429+9	5.3761+8	1.8193+9	6.1166+3	9.8396+2	2.5952+2	7.2444+2	1.7555–3
3.5000–5	4.5273–9	1.1656+7		4.6076+9	2.2257+9	5.3858+8	1.8432+9	6.1341+3	9.9675+2	2.6209+2	7.3466+2	1.7845–3
3.5152–5	4.5251–9	1.1662+7		4.6098+9	2.2210+9	5.3881+8	1.8500+9	6.1390+3	1.0003+3	2.6276+2	7.3753+2	1.7926–3
3.6364–5	4.5071–9	1.1708+7		4.6282+9	2.1842+9	5.4058+8	1.9034+9	6.1774+3	1.0284+3	2.6802+2	7.6041+2	1.8580–3
3.8182–5	4.4775–9	1.1786+7		4.6588+9	2.1323+9	5.4334+8	1.9831+9	6.2331+3	1.0708+3	2.7612+2	7.9469+2	1.9566–3
4.0000–5	4.4454–9	1.1871+7		4.6924+9	2.0840+9	5.4625+8	2.0621+9	6.2867+3	1.1134+3	2.8449+2	8.2891+2	2.0560–3
4.4258–5	4.4627–9	1.1825+7		4.6743+9	1.9827+9	5.4529+8	2.1463+9	6.3990+3	1.1642+3	2.9794+2	8.6628+2	2.2833–3
4.5000–5	4.4647–9	1.1820+7		4.6722+9	1.9665+9	5.4526+8	2.1604+9	6.4177+3	1.1730+3	3.0042+2	8.7262+2	2.3232–3
5.0000–5	4.4722–9	1.1800+7		4.6644+9	1.8670+9	5.4504+8	2.2523+9	6.5372+3	1.2311+3	3.1703+2	9.1410+2	2.5950–3
P1 5.2230–5	4.5065–9	1.1710+7		4.6288+9	1.8273+9	5.4348+8	2.2580+9	6.5861+3	1.2412+3	3.2276+2	9.1842+2	2.7157–3
5.3201–5	4.5211–9	1.1672+7		4.6139+9	1.8108+9	5.4286+8	2.2603+9	6.6069+3	1.2456+3	3.2535+2	9.2021+2	2.7684–3
5.4901–5	4.5457–9	1.1609+7		4.5889+9	1.7829+9	5.4188+8	2.2641+9	6.6425+3	1.2533+3	3.2996+2	9.2332+2	2.8612–3
5.7450–5	4.5809–9	1.1520+7		4.5537+9	1.7435+9	5.4061+8	2.2696+9	6.6943+3	1.2650+3	3.3705+2	9.2791+2	3.0011–3
6.0000–5	4.6139–9	1.1437+7		4.5210+9	1.7066+9	5.3957+8	2.2749+9	6.7441+3	1.2768+3	3.4434+2	9.3242+2	3.1419–3
6.5000–5	4.6868–9	1.1259+7		4.4508+9	1.6406+9	5.3212+8	2.2781+9	6.8370+3	1.2885+3	3.5235+2	9.3615+2	3.4208–3
7.0000–5	4.7533–9	1.1102+7		4.3885+9	1.5818+9	5.2570+8	2.2811+9	6.9241+3	1.3007+3	3.6089+2	9.3979+2	3.7029–3
7.2500–5	4.7847–9	1.1029+7		4.3597+9	1.5546+9	5.2255+8	2.2825+9	6.9658+3	1.3065+3	3.6488+2	9.4158+2	3.8452–3
8.0000–5	4.9156–9	1.0735+7		4.2436+9	1.4810+9	5.1417+8	2.2484+9	7.0840+3	1.3084+3	3.7729+2	9.3107+2	4.2766–3
9.0000–5	5.1117–9	1.0324+7		4.0808+9	1.3975+9	4.9830+8	2.1850+9	7.2264+3	1.2953+3	3.8514+2	9.1012+2	4.8616–3
1.0000–4	5.2923–9	9.9712+6	0.0000+0	3.9415+9	1.3268+9	4.8490+8	2.1298+9	7.3561+3	1.2861+3	3.9376+2	8.9229+2	5.4571–3
O5 1.0402–4	5.3715–9	9.8241+6	3.1370–9	3.8834+9	1.3014+9	4.7825+8	2.1037+9	7.4048+3	1.2769+3	3.9453+2	8.8237+2	5.6991–3
1.0546–4	5.3995–9	9.7733+6	4.2637–9	3.8633+9	1.2927+9	4.7600+8	2.0946+9	7.4218+3	1.2739+3	3.9498+2	8.7892+2	5.7860–3
1.0824–4	5.4529–9	9.6776+6	6.4539–9	3.8255+9	1.2763+9	4.7177+8	2.0774+9	7.4541+3	1.2683+3	3.9591+2	8.7242+2	5.9549–3
O4 1.1235–4	5.5300–9	9.5425+6	9.7034–9	3.7721+9	1.2532+9	4.6583+8	2.0531+9	7.5007+3	1.2606+3	3.9739+2	8.6324+2	6.2053–3
1.1346–4	5.5541–9	9.5013+6	1.0586–8	3.7558+9	1.2472+9	4.6411+8	2.0445+9	7.5130+3	1.2576+3	3.9760+2	8.5997+2	6.2733–3
1.1353–4	5.5555–9	9.4988+6	1.0638–8	3.7548+9	1.2468+9	4.6400+8	2.0440+9	7.5138+3	1.2574+3	3.9761+2	8.5977+2	6.2773–3
1.1581–4	5.6043–9	9.4161+6	1.2455–8	3.7221+9	1.2347+9	4.6054+8	2.0268+9	7.5388+3	1.2512+3	3.9796+2	8.5322+2	6.4171–3
1.2008–4	5.6944–9	9.2671+6	1.5886–8	3.6632+9	1.2130+9	4.5434+8	1.9959+9	7.5846+3	1.2402+3	3.9882+2	8.4142+2	6.6804–3
1.2260–4	5.7465–9	9.1831+6	1.7920–8	3.6300+9	1.2007+9	4.5086+8	1.9784+9	7.6109+3	1.2342+3	3.9943+2	8.3476+2	6.8361–3
1.2382–4	5.7716–9	9.1431+6	1.8913–8	3.6142+9	1.1949+9	4.4920+8	1.9701+9	7.6235+3	1.2313+3	3.9973+2	8.3160+2	6.9120–3
1.2500–4	5.7957–9	9.1050+6	1.9872–8	3.5992+9	1.1893+9	4.4762+8	1.9622+9	7.6356+3	1.2286+3	4.0002+2	8.2859+2	6.9853–3
1.3125–4	5.9213–9	8.9119+6	2.4988–8	3.5228+9	1.1612+9	4.3959+8	1.9220+9	7.6981+3	1.2147+3	4.0140+2	8.1334+2	7.3755–3
1.3630–4	6.0202–9	8.7655+6	2.9161–8	3.4650+9	1.1400+9	4.3355+8	1.8914+9	7.7468+3	1.2046+3	4.0282+2	8.0179+2	7.6927–3
1.3691–4	6.0333–9	8.7465+6	2.9669–8	3.4574+9	1.1375+9	4.3283+8	1.8871+9	7.7526+3	1.2031+3	4.0299+2	8.0013+2	7.7313–3
1.5000–4	6.3064–9	8.3678+6	4.0682–8	3.3077+9	1.0877+9	4.1873+8	1.8013+9	7.8718+3	1.1742+3	4.0712+2	7.6712+2	8.5633–3
1.6250–4	6.5585–9	8.0461+6	5.1464–8	3.1806+9	1.0458+9	4.0358+8	1.7312+9	7.9776+3	1.1445+3	4.0518+2	7.3932+2	9.3847–3
1.7500–4	6.8006–9	7.7597+6	6.2511–8	3.0673+9	1.0085+9	3.9016+8	1.6687+9	8.0769+3	1.1187+3	4.0404+2	7.1462+2	1.0216–2
1.8125–4	6.9183–9	7.6277+6	6.8128–8	3.0152+9	9.9133+8	3.8400+8	1.6398+9	8.1243+3	1.1070+3	4.0372+2	7.0326+2	1.0636–2
2.0000–4	7.2589–9	7.2697+6	8.5305–8	2.8737+9	9.4463+8	3.6739+8	1.5617+9	8.2588+3	1.0762+3	4.0365+2	6.7254+2	1.1909–2
O3 2.0339–4	7.3193–9	7.2098+6	8.8464–8	2.8500+9	9.3688+8	3.6416+8	1.5489+9	8.2819+3	1.0700+3	4.0259+2	6.6741+2	1.2152–2
2.0641–4	7.3791–9	7.1513+6	9.1294–8	2.8269+9	9.3014+8	3.6133+8	1.5354+9	8.3022+3	1.0636+3	4.0169+2	6.6189+2	1.2368–2
2.1226–4	7.4940–9	7.0417+6	9.6825–8	2.7835+9	9.1749+8	3.5603+8	1.5100+9	8.3408+3	1.0517+3	4.0008+2	6.5157+2	1.2790–2
2.2323–4	7.7055–9	6.8484+6	1.0736–7	2.7071+9	8.9511+8	3.4673+8	1.4653+9	8.4108+3	1.0309+3	3.9749+2	6.3341+2	1.3585–2
2.2500–4	7.7392–9	6.8186+6	1.0908–7	2.6953+9	8.9165+8	3.4530+8	1.4584+9	8.4219+3	1.0277+3	3.9711+2	6.3061+2	1.3714–2
2.4242–4	8.0644–9	6.5436+6	1.2628–7	2.5867+9	8.5964+8	3.3209+8	1.3949+9	8.5268+3	9.9858+2	3.9369+2	6.0488+2	1.4993–2
O2 2.5938–4	8.3706–9	6.3043+6	1.4347–7	2.4920+9	8.3162+8	3.2065+8	1.3398+9	8.6230+3	9.7384+2	3.9127+2	5.8256+2	1.6253–2
2.6446–4	8.4613–9	6.2367+6	1.4871–7	2.4653+9	8.2376+8	3.1726+8	1.3243+9	8.6508+3	9.6641+2	3.9016+2	5.7623+2	1.6633–2
2.7121–4	8.5807–9	6.1499+6	1.5573–7	2.4310+9	8.1364+8	3.1292+8	1.3044+9	8.6871+3	9.5695+2	3.8881+2	5.6812+2	1.7140–2
2.7334–4	8.6181–9	6.1232+6	1.5796–7	2.4204+9	8.1052+8	3.1158+8	1.2983+9	8.6984+3	9.5405+2	3.8840+2	5.6563+2	1.7301–2
2.8667–4	8.8491–9	5.9634+6	1.7206–7	2.3573+9	7.9183+8	3.0362+8	1.2618+9	8.7675+3	9.3685+2	3.8611+2	5.5073+2	1.8309–2
3.0000–4	9.0750–9	5.8149+6	1.8641–7	2.2986+9	7.7439+8	2.9625+8	1.2279+9	8.8338+3	9.2119+2	3.8425+2	5.3692+2	1.9326–2
O1 3.2065–4	9.4222–9	5.6006+6	2.0914–7	2.2139+9	7.4957+8	2.8475+8	1.1796+9	8.9320+3	8.9534+2	3.7858+2	5.1674+2	2.0916–2
3.2500–4	9.4948–9	5.5578+6	2.1402–7	2.1970+9	7.4467+8	2.8246+8	1.1698+9	8.9520+3	8.9018+2	3.7744+2	5.1271+2	2.1256–2
3.2561–4	9.5049–9	5.5519+6	2.1470–7	2.1946+9	7.4400+8	2.8214+8	1.1685+9	8.9547+3	8.8947+2	3.7729+2	5.1216+2	2.1303–2
3.3491–4	9.6584–9	5.4637+6	2.2522–7	2.1598+9	7.3388+8	2.7742+8	1.1485+9	8.9965+3	8.7888+2	3.7498+2	5.0387+2	2.2031–2
3.5000–4	9.9035–9	5.3285+6	2.4255–7	2.1063+9	7.1832+8	2.7021+8	1.1178+9	9.0624+3	8.6284+2	3.7162+2	4.9120+2	2.3220–2
3.5118–4	9.9225–9	5.3183+6	2.4392–7	2.1023+9	7.1715+8	2.6967+8	1.1155+9	9.0675+3	8.6164+2	3.7137+2	4.9025+2	2.3313–2
3.6250–4	1.0103–8	5.2233+6	2.5714–7	2.0647+9	7.0617+8	2.6463+8	1.0939+9	9.1152+3	8.5050+2	3.6911+2	4.8137+2	2.4211–2
3.7559–4	1.0308–8	5.1191+6	2.7264–7	2.0236+9	6.9410+8	2.5911+8	1.0703+9	9.1689+3	8.3843+2	3.6676+2	4.7164+2	2.5255–2
N7 3.9075–4	1.0542–8	5.0055+6	2.9087–7	1.9786+9	6.8087+8	2.5312+8	1.0446+9	9.2291+3	8.2543+2	3.6435+2	4.6105+2	2.6472–2
3.9538–4	1.0614–8	4.9719+6	2.9648–7	1.9653+9	6.7699+8	2.5135+8	1.0370+9	9.2465+3	8.2162+2	3.6366+2	4.5794+2	2.6863–2
4.0000–4	1.0685–8	4.9388+6	3.0212–7	1.9523+9	6.7317+8	2.4962+8	1.0295+9	9.2638+3	8.1790+2	3.6299+2	4.5488+2	2.7255–2
N6 4.0209–4	1.0717–8	4.9242+6	3.0468–7	1.9465+9	6.7147+8	2.4878+8	1.0263+9	9.2716+3	8.1600+2	3.6245+2	4.5351+2	2.7433–2

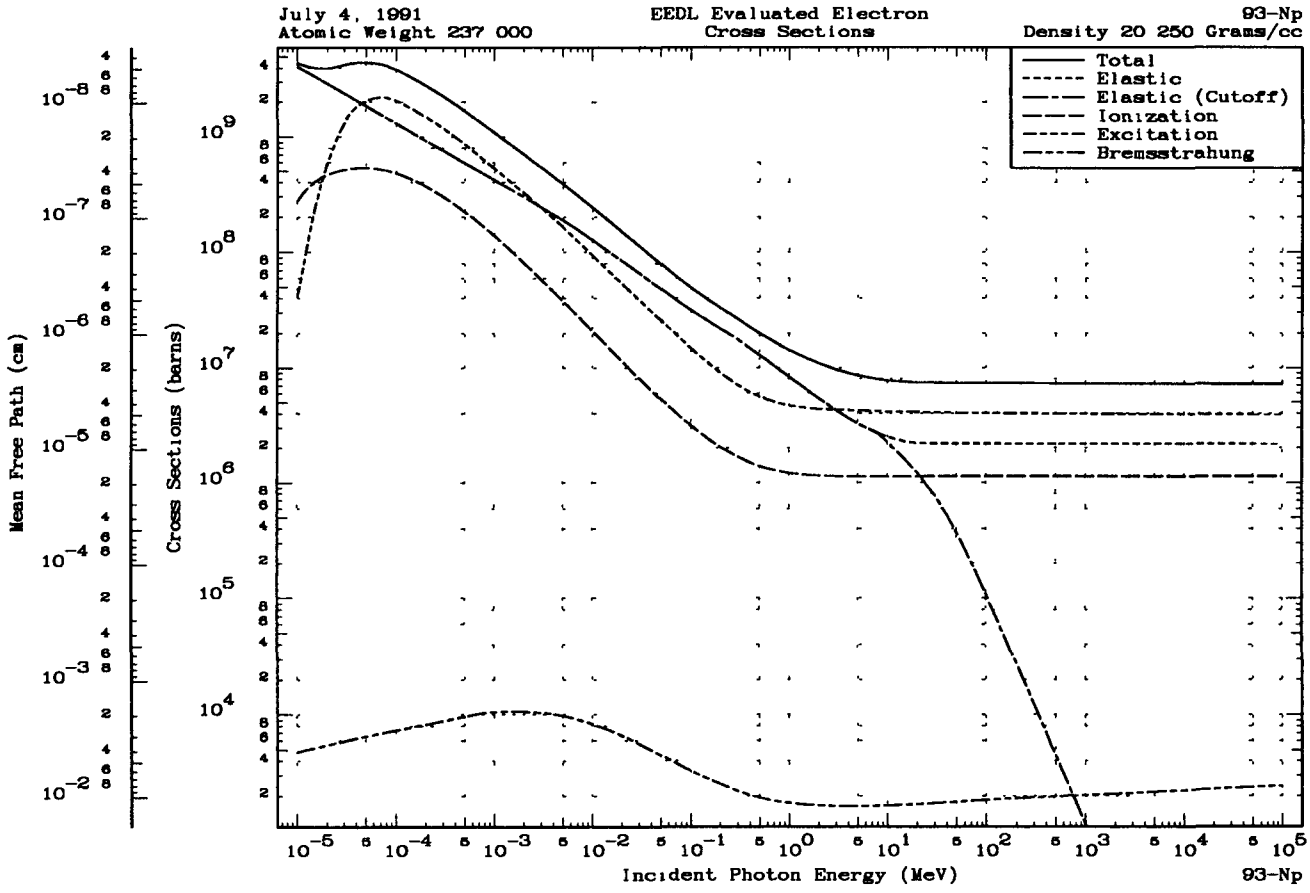
Atomic Weight 238.051 — Density 18.950 Grams/cc

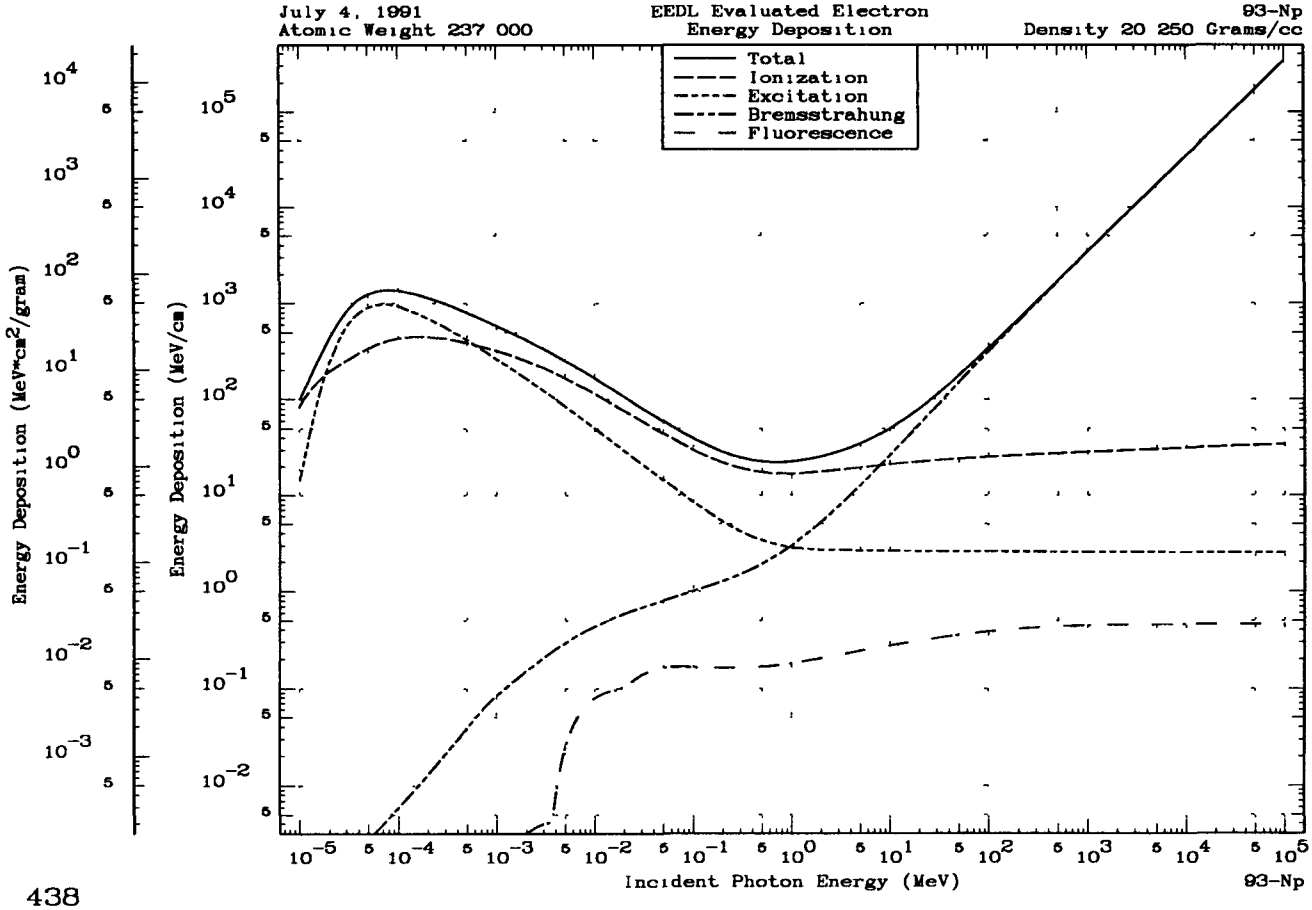
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.1250–4	1.0883–8	4.8491+6	3.1752–7	1.9168+9	6.6318+8	2.4473+8	1.0089+9	9.3097+3	8.0621+2	3.5996+2	4.4622+2	2.8318–2
	4.1433–4	1.0912–8	4.8362+6	3.1979–7	1.9117+9	6.6175+8	2.4403+8	1.0059+9	9.3163+3	8.0453+2	3.5954+2	4.4497+2	2.8474–2
	4.3438–4	1.1226–8	4.7007+6	3.4498–7	1.8582+9	6.4672+8	2.3676+8	9.7468+8	9.3873+3	7.8710+2	3.5521+2	4.3186+2	3.0192–2
	4.3575–4	1.1247–8	4.6918+6	3.4672–7	1.8547+9	6.4573+8	2.3628+8	9.7263+8	9.3921+3	7.8596+2	3.5494+2	4.3099+2	3.0310–2
	4.5000–4	1.1467–8	4.6020+6	3.6499–7	1.8191+9	6.3571+8	2.3147+8	9.5195+8	9.4407+3	7.7448+2	3.5213+2	4.2232+2	3.1540–2
	5.0000–4	1.2215–8	4.3202+6	4.3106–7	1.7077+9	6.0397+8	2.1648+8	8.8729+8	9.6018+3	7.3942+2	3.4415+2	3.9523+2	3.5907–2
	5.2500–4	1.2590–8	4.1915+6	4.6526–7	1.6569+9	5.8981+8	2.0956+8	8.5751+8	9.6744+3	7.2230+2	3.3968+2	3.8259+2	3.8114–2
	5.6250–4	1.3139–8	4.0164+6	5.1802–7	1.5877+9	5.7035+8	2.0019+8	8.1710+8	9.7779+3	6.9943+2	3.3395+2	3.6544+2	4.1456–2
	6.0000–4	1.3673–8	3.8595+6	5.7241–7	1.5256+9	5.5274+8	1.9185+8	7.8103+8	9.8758+3	6.7958+2	3.2939+2	3.5015+2	4.4835–2
	6.5000–4	1.4370–8	3.6722+6	6.4743–7	1.4516+9	5.3164+8	1.8142+8	7.3853+8	9.9810+3	6.5355+2	3.2154+2	3.3196+2	4.9236–2
N5	7.3514–4	1.5509–8	3.4025+6	7.8143–7	1.3450+9	5.0076+8	1.6656+8	6.7764+8	1.0145+4	6.1754+2	3.1153+2	3.0595+2	5.6837–2
	7.4325–4	1.5616–8	3.3793+6	7.9459–7	1.3358+9	4.9810+8	1.6529+8	6.7243+8	1.0158+4	6.1448+2	3.1069+2	3.0373+2	5.7547–2
	7.5744–4	1.5800–8	3.3399+6	8.1778–7	1.3202+9	4.9354+8	1.6313+8	6.6356+8	1.0181+4	6.0930+2	3.0930+2	2.9993+2	5.8791–2
N4	7.7818–4	1.6067–8	3.2843+6	8.5203–7	1.2983+9	4.8710+8	1.6009+8	6.5107+8	1.0214+4	6.0209+2	3.0743+2	2.9460+2	6.0615–2
	7.8909–4	1.6207–8	3.2560+6	8.7021–7	1.2871+9	4.8381+8	1.5855+8	6.4470+8	1.0229+4	5.9848+2	3.0653+2	2.9189+2	6.1549–2
	8.0000–4	1.6346–8	3.2283+6	8.8849–7	1.2761+9	4.8059+8	1.5704+8	6.3848+8	1.0244+4	5.9499+2	3.0569+2	2.8924+2	6.2485–2
	8.2500–4	1.6663–8	3.1670+6	9.3082–7	1.2519+9	4.7346+8	1.5356+8	6.2487+8	1.0267+4	5.8614+2	3.0272+2	2.8336+2	6.4426–2
	8.5000–4	1.6975–8	3.1087+6	9.7378–7	1.2289+9	4.6664+8	1.5026+8	6.1194+8	1.0289+4	5.7784+2	3.0000+2	2.7778+2	6.6371–2
	8.6875–4	1.7207–8	3.0668+6	1.0064–6	1.2123+9	4.6171+8	1.4790+8	6.0266+8	1.0305+4	5.7194+2	2.9810+2	2.7377+2	6.7831–2
	9.0000–4	1.7589–8	3.0002+6	1.0615–6	1.1859+9	4.5385+8	1.4415+8	5.8793+8	1.0332+4	5.6269+2	2.9521+2	2.6741+2	7.0271–2
	9.2500–4	1.7891–8	2.9495+6	1.1062–6	1.1659+9	4.4784+8	1.4132+8	5.7675+8	1.0352+4	5.5564+2	2.9298+2	2.6259+2	7.2227–2
	9.3438–4	1.8004–8	2.9311+6	1.1231–6	1.1587+9	4.4565+8	1.4029+8	5.7270+8	1.0359+4	5.5310+2	2.9218+2	2.6084+2	7.2961–2
	1.0000–3	1.8778–8	2.8103+6	1.2435–6	1.1109+9	4.3119+8	1.3357+8	5.4611+8	1.0410+4	5.3671+2	2.8725+2	2.4939+2	7.8115–2
N3	1.0305–3	1.9131–8	2.7584+6	1.3008–6	1.0904+9	4.2492+8	1.3058+8	5.3487+8	1.0414+4	5.2881+2	2.8427+2	2.4446+2	8.0024–2
	1.0452–3	1.9302–8	2.7340+6	1.3286–6	1.0807+9	4.2200+8	1.2920+8	5.2952+8	1.0416+4	5.2512+2	2.8291+2	2.4213+2	8.0942–2
	1.0736–3	1.9630–8	2.6883+6	1.3831–6	1.0626+9	4.1652+8	1.2661+8	5.1951+8	1.0420+4	5.1825+2	2.8040+2	2.3776+2	8.2721–2
	1.1250–3	2.0215–8	2.6104+6	1.4834–6	1.0319+9	4.0713+8	1.2223+8	5.0252+8	1.0426+4	5.0675+2	2.7630+2	2.3036+2	8.5940–2
	1.1269–3	2.0237–8	2.6077+6	1.4872–6	1.0308+9	4.0680+8	1.2208+8	5.0191+8	1.0426+4	5.0633+2	2.7615+2	2.3010+2	8.6059–2
	1.1735–3	2.0758–8	2.5422+6	1.5802–6	1.0049+9	3.9883+8	1.1841+8	4.8764+8	1.0432+4	4.9664+2	2.7266+2	2.2389+2	8.8981–2
	1.2500–3	2.1596–8	2.4436+6	1.7364–6	9.6593+8	3.8675+8	1.1293+8	4.6624+8	1.0440+4	4.8238+2	2.6771+2	2.1458+2	9.3773–2
	1.2551–3	2.1651–8	2.4373+6	1.7471–6	9.6345+8	3.8598+8	1.1259+8	4.6487+8	1.0441+4	4.8149+2	2.6741+2	2.1399+2	9.4096–2
N2	1.2642–3	2.1749–8	2.4264+6	1.7659–6	9.5913+8	3.8463+8	1.1198+8	4.6251+8	1.0441+4	4.7993+2	2.6688+2	2.1296+2	9.4663–2
	1.2937–3	2.2065–8	2.3915+6	1.8277–6	9.4536+8	3.8033+8	1.1000+8	4.5501+8	1.0445+4	4.7442+2	2.6467+2	2.0966+2	9.6512–2
	1.3453–3	2.2613–8	2.3336+6	1.9375–6	9.2247+8	3.7315+8	1.0673+8	4.4257+8	1.0450+4	4.6537+2	2.6108+2	2.0419+2	9.9748–2
	1.3776–3	2.2952–8	2.2992+6	2.0073–6	9.0885+8	3.6886+8	1.0480+8	4.3519+8	1.0453+4	4.6004+2	2.5900+2	2.0094+2	1.0178–1
N1	1.4199–3	2.3391–8	2.2560+6	2.1000–6	8.9180+8	3.6346+8	1.0238+8	4.2595+8	1.0457+4	4.5345+2	2.5646+2	1.9688+2	1.0443–1
	1.4399–3	2.3598–8	2.2363+6	2.1443–6	8.8398+8	3.6098+8	1.0128+8	4.2170+8	1.0459+4	4.5043+2	2.5530+2	1.9503+2	1.0569–1
	1.4700–3	2.3906–8	2.2074+6	2.2113–6	8.7257+8	3.5737+8	9.9683+7	4.1551+8	1.0462+4	4.4607+2	2.5364+2	1.9232+2	1.0758–1
	1.5000–3	2.4212–8	2.1795+6	2.2789–6	8.6154+8	3.5386+8	9.8143+7	4.0953+8	1.0464+4	4.4189+2	2.5207+2	1.8971+2	1.0946–1
	1.5625–3	2.4845–8	2.1240+6	2.4219–6	8.3960+8	3.4678+8	9.5012+7	3.9780+8	1.0460+4	4.3255+2	2.4792+2	1.8452+2	1.1308–1
	1.6250–3	2.5468–8	2.0720+6	2.5678–6	8.1906+8	3.4010+8	9.2102+7	3.8685+8	1.0456+4	4.2393+2	2.4413+2	1.7968+2	1.1671–1
	1.6719–3	2.5929–8	2.0352+6	2.6792–6	8.0450+8	3.3534+8	9.0050+7	3.7910+8	1.0453+4	4.1787+2	2.4151+2	1.7625+2	1.1942–1
	1.7500–3	2.6686–8	1.9775+6	2.8683–6	7.8168+8	3.2783+8	8.6854+7	3.6698+8	1.0448+4	4.0851+2	2.3750+2	1.7089+2	1.2394–1
	1.8125–3	2.7282–8	1.9342+6	3.0226–6	7.6460+8	3.2218+8	8.4475+7	3.5793+8	1.0444+4	4.0144+2	2.3442+2	1.6689+2	1.2756–1
	1.8359–3	2.7504–8	1.9187+6	3.0812–6	7.5844+8	3.2013+8	8.3620+7	3.5467+8	1.0443+4	3.9891+2	2.3333+2	1.6545+2	1.2892–1
	2.0000–3	2.9024–8	1.8182+6	3.5010–6	7.1872+8	3.0684+8	7.8155+7	3.3372+8	1.0433+4	3.8287+2	2.2653+2	1.5620+2	1.3841–1
	2.2500–3	3.1336–8	1.6840+6	4.1754–6	6.6568+8	2.8856+8	7.0968+7	3.0614+8	1.0370+4	3.5880+2	2.1484+2	1.4381+2	1.5109–1
	2.5000–3	3.3554–8	1.5727+6	4.8917–6	6.2168+8	2.7314+8	6.5116+7	2.8341+8	1.0313+4	3.3938+2	2.0560+2	1.3362+2	1.6371–1
	2.6250–3	3.4632–8	1.5237+6	5.2648–6	6.0233+8	2.6628+8	6.2571+7	2.7346+8	1.0287+4	3.3078+2	2.0145+2	1.2916+2	1.7001–1
	3.0000–3	3.7756–8	1.3977+6	6.4373–6	5.5249+8	2.4838+8	5.6115+7	2.4799+8	1.0216+4	3.0912+2	1.9117+2	1.1776+2	1.8882–1
M5	3.5552–3	4.2258–8	1.2488+6	8.3207–6	4.9363+8	2.2690+8	4.8685+7	2.1803+8	1.0068+4	2.8088+2	1.7650+2	1.0417+2	2.1392–1
	3.5830–3	4.2477–8	1.2423+6	8.4199–6	4.9109+8	2.2596+8	4.8368+7	2.1675+8	1.0061+4	2.7966+2	1.7586+2	1.0359+2	2.1517–1
	3.6351–3	4.2885–8	1.2305+6	8.6071–6	4.8641+8	2.2421+8	4.7784+7	2.1441+8	1.0048+4	2.7742+2	1.7469+2	1.0251+2	2.1751–1
	3.7263–3	4.3594–8	1.2105+6	8.9381–6	4.7850+8	2.2126+8	4.6799+7	2.1043+8	1.0027+4	2.7364+2	1.7273+2	1.0069+2	2.2160–1
M4	3.7368–3	4.3675–8	1.2083+6	8.9764–6	4.7761+8	2.2093+8	4.6689+7	2.0999+8	1.0024+4	2.7322+2	1.7251+2	1.0049+2	2.2207–1
	3.7697–3	4.3930–8	1.2012+6	9.0971–6	4.7484+8	2.1989+8	4.6346+7	2.0859+8	1.0016+4	2.7191+2	1.7183+2	9.9855+1	2.2352–1
	3.8632–3	4.4651–8	1.1819+6	9.4431–6	4.6718+8	2.1702+8	4.5402+7	2.0475+8	9.9936+3	2.6830+2	1.6997+2	9.8102+1	2.2763–1
	3.8848–3	4.4817–8	1.1775+6	9.5241–6	4.6545+8	2.1637+8	4.5190+7	2.0388+8	9.9884+3	2.6749+2	1.6956+2	9.7706+1	2.2858–1
	4.0000–3	4.5694–8	1.1549+6	9.9579–6	4.5651+8	2.1301+8	4.4095+7	1.9940+8	9.9615+3	2.6332+2	1.6742+2	9.5667+1	2.3363–1
	4.2500–3	4.7575–8	1.1092+6	1.0924–5	4.3846+8	2.0604+8	4.1879+7	1.9053+8	9.8654+3	2.5409+2	1.6228+2	9.1570+1	2.4255–1
M3	4.2896–3	4.7870–8	1.1024+6	1.1081–5	4.3576+8	2.0500+8	4.1550+7	1.8921+8	9.8508+3	2.5272+2	1.6152+2	9.0960+1	2.4396–1
	4.3784–3	4.8531–8	1.0874+6	1.1434–5	4.2983+8	2.0271+8	4.0832+7	1.8628+8	9.8186+3	2.4973+2	1.5987+2	8.9619+1	2.4711–1
	4.5000–3	4.9428–8	1.0676+6	1.1925–5	4.2202+8	1.9969+8	3.9892+7	1.8243+8	9.7756+3	2.4583+2	1.5772+2	8.7859+1	2.5142–1
	4.5338–3	4.9676–8	1.0623+6	1.2063–5	4.1991+8	1.9887+8	3.9639+7	1.8140+8	9.7640+3	2.4478+2	1.5714+2	8.7385+1	2.5262–1
	4.7669–3	5.1369–8	1.0273+6	1.3029–5	4.0608+8	1.9348+8	3.7985+7	1.7460+8	9.6860+3	2.3792+2	1.5338+2	8.4278+1	2.6083–1
	5.0000–3	5.3033–8	9.9505+5	1.4021–5	3.9334+8	1.8848+8	3.6476+7	1.6837+8	9.6124+3	2.3169+2	1.4999+2	8.1429+1	2.6900–1
M2	5.1815–3	5.4309–8	9.7168+5	1.4813–5	3.8410+8	1.8478+8	3.5377+7	1.6393+8	9.5577+3	2.2692+2	1.4728+2	7.9359+1	2.7533–1
	5.2838–3	5.5031–8	9.5892+5	1.5266–5	3.7905+8	1.8279+8	3.4789+7	1.6147+8	9.5279+3	2.2434+2	1.4584+2	7.8216+1	2.7889–1
	5.4629–3	5.6284–8	9.3757+5	1.6072–5	3.7062+8	1.7944+8	3.3810+7	1.5736+8	9.4773+3	2.2005+2	1.4346+2	7.6309+1	2.8509–1
M1	5.5213–3	5.6690–8	9.3086+5	1.6339–5	3.6796+8	1.7838+8	3.3503+7	1.5607+8	9.4612+3	2.1871+2	1.4272+2	7.5710+1	2.8711–1
	5.6410–3	5.7542–8	9.1708+5	1.6889–5	3.6251+8	1.7627+8	3.2893+7	1.5335+8	9.4273+3	2.1597+2	1.4124+2	7.4448+1	2.9115–1
	5.7314–3	5.8182–8	9.0699+5	1.7310–5	3.5853+8	1.7472+8	3.2448+7	1.5136+8	9.4022+3	2.1398+2	1.4016+2	7.3527+1	2.9419–1
	5.8205–3	5.8809–8	8.9732+5	1.7728–5	3.5471+8	1.7323+8	3.2023+7	1.4945+8	9.3780+3	2.1208+2	1.3913+2	7.2645+1	2.9718–1
	6.0000–3	6.0062–8	8.7859+5	1.8582–5	3.4730+8	1.7033+8	3.1201+7	1.4577+8	9.3304+3	2.0841+2	1.3716+2	7.0941+1	3.0319–1
	6.2500–3	6.1795–8	8.5396+5	1.9797–5	3.3756+8	1.6646+8	3.0119+7	1.4098+8	9.2437+3	2.0312+2	1.3411+2	6.8697+1	3.0994–1
	6.5000–3	6.3505–8	8.3097+5	2.1043–5	3.2848+8	1.6283+8	2.9114+7	1.3652+8	9.1611+3	1.9821+2	1.3129+2	6.6611+1	3.1666–1
	6.6875–3	6.4773–8	8.1470+5	2.1997–5	3.2204+8	1.6025+8	2.8408+7	1.3338+8	9.1017+3	1.9477+2	1.2930+2	6.5141+1	3.2167–1
	7.0000–3	6.6860–8	7.8926+5	2.3624–5	3.1199+8	1.5618+8	2.7309+7	1.2849+8	9.0072+3	1.8942+2	1.2624+2	6.2851+1	3.2998–1
	7.2500–3	6.8508–8	7.7028+5	2.4958–5	3.0448+8	1.5313+8	2.6493+7	1.2485+8	8.9351+3	1.8545+2	1.2396+2	6.1149+1	3.3659–1
	7.3437–3	6.9122–8	7.6344+5	2.5465–5	3.0178+8	1.5203+8	2.6201+7	1.2354+8	8.9089+3	1.8402+2	1.2315+2	6.0538+1	3.3906–1

Atomic Weight 238.051 Density 18.950 Grams/cc

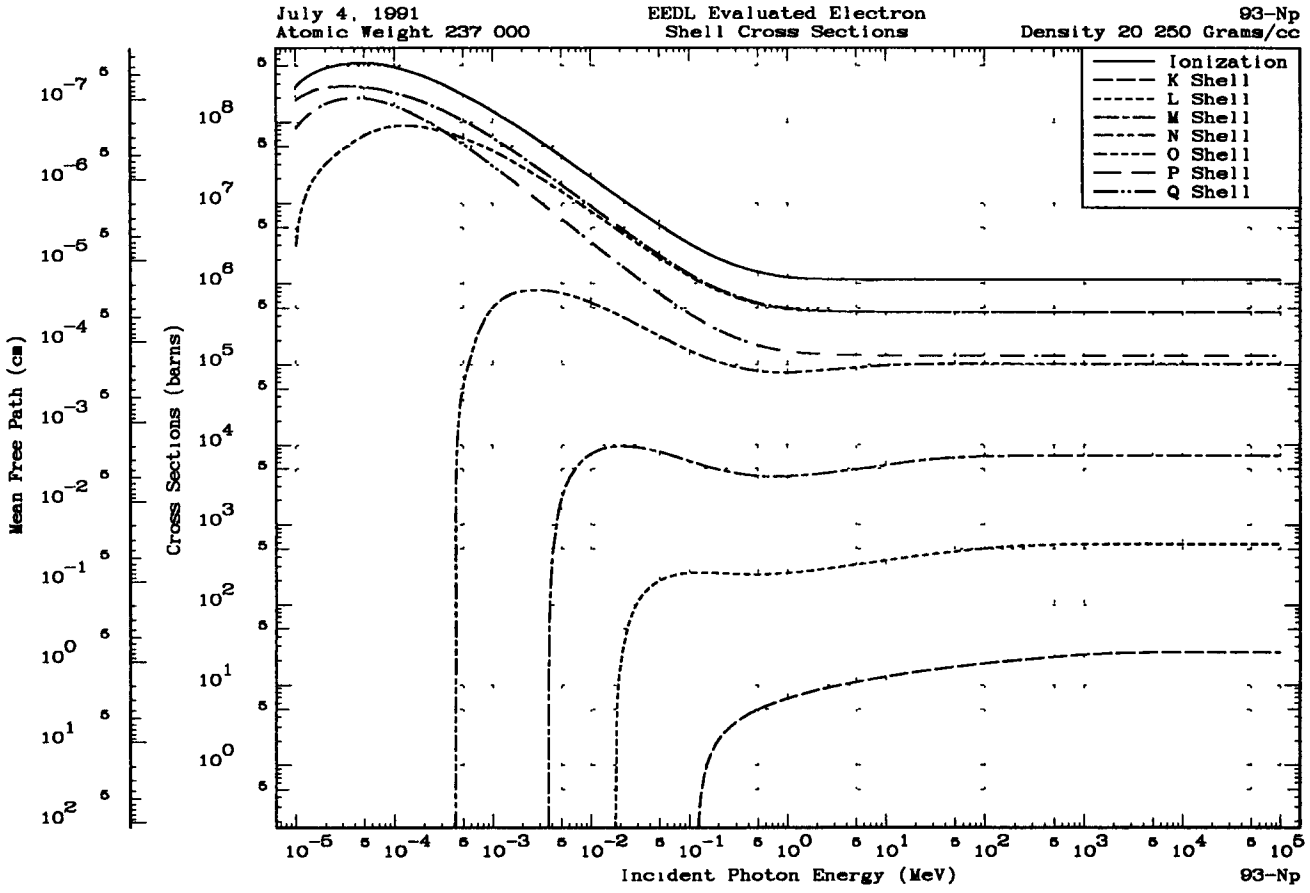
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000–3	7.3342–8	7.1951+5	2.9122–5	2.8442+8	1.4489+8	2.4336+7	1.1519+8	8.7362+3	1.7496+2	1.1798+2	5.6630+1	3.5623–1
9.0000–3	7.9644–8	6.6258+5	3.5052–5	2.6191+8	1.3533+8	2.1967+7	1.0461+8	8.4624+3	1.6249+2	1.1048+2	5.1631+1	3.7804–1
1.0000–2	8.5723–8	6.1560+5	4.1406–5	2.4334+8	1.2731+8	2.0046+7	9.5977+7	8.2248+3	1.5236+2	1.0441+2	4.7553+1	3.9948–1
1.1250–2	9.3112–8	5.6674+5	4.9929–5	2.2403+8	1.1876+8	1.8093+7	8.7164+7	7.9196+3	1.4111+2	9.7350+1	4.3339+1	4.2012–1
1.2500–2	1.0024–7	5.2643+5	5.9088–5	2.0809+8	1.1161+8	1.6509+7	7.9968+7	7.6561+3	1.3197+2	9.1626+1	3.9902+1	4.4044–1
1.3125–2	1.0372–7	5.0877+5	6.3896–5	2.0111+8	1.0844+8	1.5824+7	7.6840+7	7.5371+3	1.2799+2	8.9134+1	3.8409+1	4.5047–1
1.5000–2	1.1385–7	4.6350+5	7.9153–5	1.8322+8	1.0023+8	1.4091+7	6.8891+7	7.2208+3	1.1793+2	8.2836+1	3.4618+1	4.8007–1
L3 1.7182–2	1.2524–7	4.2137+5	9.8481–5	1.6656+8	9.2365+7	1.2526+7	6.1666+7	6.8742+3	1.0800+2	7.6363+1	3.1125+1	5.0712–1
1.7887–2	1.2880–7	4.0971+5	1.0509–4	1.6195+8	9.0141+7	1.2098+7	5.9708+7	6.7713+3	1.0526+2	7.4566+1	3.0176+1	5.1487–1
1.8943–2	1.3407–7	3.9362+5	1.1531–4	1.5559+8	8.7057+7	1.1513+7	5.7018+7	6.6269+3	1.0151+2	7.2107+1	2.8873+1	5.2642–1
2.0000–2	1.3924–7	3.7900+5	1.2590–4	1.4982+8	8.4237+7	1.0985+7	5.4587+7	6.4932+3	9.8128+1	6.9895+1	2.7695+1	5.3787–1
L2 2.1044–2	1.4425–7	3.6583+5	1.3672–4	1.4461+8	8.1674+7	1.0515+7	5.2414+7	6.3670+3	9.4933+1	6.7752+1	2.6634+1	5.4824–1
2.1604–2	1.4691–7	3.5920+5	1.4266–4	1.4199+8	8.0383+7	1.0280+7	5.1322+7	6.3029+3	9.3339+1	6.6684+1	2.6101+1	5.5376–1
L1 2.1768–2	1.4769–7	3.5732+5	1.4443–4	1.4125+8	8.0014+7	1.0213+7	5.1011+7	6.2846+3	9.2885+1	6.6380+1	2.5950+1	5.5538–1
2.2283–2	1.5011–7	3.5155+5	1.5001–4	1.3896+8	7.8882+7	1.0011+7	5.0065+7	6.2249+3	9.1473+1	6.5428+1	2.5485+1	5.5950–1
2.2500–2	1.5113–7	3.4918+5	1.5239–4	1.3803+8	7.8415+7	9.9286+6	4.9677+7	6.2003+3	9.0894+1	6.5038+1	2.5295+1	5.6124–1
2.2653–2	1.5184–7	3.4753+5	1.5408–4	1.3738+8	7.8091+7	9.8712+6	4.9408+7	6.1831+3	9.0492+1	6.4766+1	2.5163+1	5.6247–1
2.3247–2	1.5461–7	3.4132+5	1.6070–4	1.3492+8	7.6867+7	9.6555+6	4.8394+7	6.1181+3	8.8978+1	6.3746+1	2.4665+1	5.6722–1
2.4375–2	1.5979–7	3.3025+5	1.7357–4	1.3055+8	7.4677+7	9.2729+6	4.6592+7	6.0009+3	8.6293+1	6.1936+1	2.3781+1	5.7620–1
2.4490–2	1.6031–7	3.2918+5	1.7491–4	1.3012+8	7.4462+7	9.2357+6	4.6417+7	5.9893+3	8.6032+1	6.1760+1	2.3695+1	5.7711–1
2.4935–2	1.6233–7	3.2508+5	1.8011–4	1.2850+8	7.3648+7	9.0947+6	4.5752+7	5.9454+3	8.5042+1	6.1093+1	2.3368+1	5.8065–1
2.5000–2	1.6263–7	3.2449+5	1.8087–4	1.2827+8	7.3531+7	9.0747+6	4.5657+7	5.9391+3	8.4901+1	6.0998+1	2.3322+1	5.8116–1
2.7188–2	1.7239–7	3.0611+5	2.0733–4	1.2100+8	6.9862+7	8.4479+6	4.2690+7	5.7391+3	8.0491+1	5.8025+1	2.1867+1	5.9842–1
2.7245–2	1.7264–7	3.0567+5	2.0805–4	1.2083+8	6.9772+7	8.4327+6	4.2618+7	5.7342+3	8.0383+1	5.7953+1	2.1832+1	5.9887–1
2.7468–2	1.7362–7	3.0394+5	2.1083–4	1.2015+8	6.9426+7	8.3743+6	4.2341+7	5.7152+3	7.9972+1	5.7676+1	2.1696+1	6.0061–1
3.0000–2	1.8458–7	2.8590+5	2.4337–4	1.1301+8	6.5788+7	7.7677+6	3.9453+7	5.5130+3	7.5699+1	5.4798+1	2.0281+1	6.2032–1
3.2500–2	1.9513–7	2.7044+5	2.7726–4	1.0690+8	6.2623+7	7.2656+6	3.7008+7	5.3216+3	7.1874+1	5.2171+1	1.9067+1	6.3581–1
3.5000–2	2.0543–7	2.5688+5	3.1287–4	1.0154+8	5.9830+7	6.8299+6	3.4880+7	5.1503+3	6.8550+1	4.9889+1	1.8010+1	6.5118–1
3.6250–2	2.1048–7	2.5071+5	3.3131–4	9.9104+7	5.8551+7	6.6329+6	3.3915+7	5.0711+3	6.7045+1	4.8854+1	1.7531+1	6.5881–1
4.0000–2	2.2534–7	2.3418+5	3.8898–4	9.2570+7	5.5107+7	6.1100+6	3.1349+7	4.8554+3	6.3049+1	4.6109+1	1.6259+1	6.8147–1
4.5000–2	2.4442–7	2.1590+5	4.7127–4	8.5343+7	5.1247+7	5.5521+6	2.8540+7	4.6036+3	5.8529+1	4.2973+1	1.4850+1	7.0694–1
5.0000–2	2.6283–7	2.0078+5	5.5951–4	7.9365+7	4.8024+7	5.0965+6	2.6240+7	4.3894+3	5.4836+1	4.0407+1	1.3697+1	7.3204–1
6.0000–2	2.9749–7	1.7738+5	7.5213–4	7.0118+7	4.2918+7	4.4115+6	2.2785+7	4.0405+3	4.9099+1	3.6366+1	1.1957+1	7.7569–1
7.0000–2	3.2882–7	1.6048+5	9.6508–4	6.3439+7	3.9116+7	3.9228+6	2.0396+7	3.7696+3	4.4882+1	3.3320+1	1.0747+1	8.1427–1
8.0000–2	3.5858–7	1.4717+5	1.1964–3	5.8173+7	3.6097+7	3.5436+6	1.8530+7	3.5496+3	4.1608+1	3.0953+1	9.8035+0	8.5206–1
1.0000–1	4.1332–7	1.2768+5	1.7072–3	5.0469+7	3.1660+7	3.0175+6	1.5789+7	3.2190+3	3.6808+1	2.7488+1	8.4042+0	9.1592–1
K 1.1611–1	4.5351–7	1.1636+5	2.1621–3	4.5996+7	2.9077+7	2.7267+6	1.4190+7	3.0275+3	3.4047+1	2.5504+1	7.5811+0	9.6195–1
1.1823–1	4.5849–7	1.1510+5	2.2246–3	4.5496+7	2.8788+7	2.6950+6	1.4011+7	3.0067+3	3.3740+1	2.5284+1	7.4888+0	9.6743–1
1.2220–1	4.6774–7	1.1282+5	2.3433–3	4.4597+7	2.8266+7	2.6379+6	1.3689+7	2.9691+3	3.3189+1	2.4888+1	7.3232+0	9.7769–1
1.2915–1	4.8364–7	1.0911+5	2.5556–3	4.3130+7	2.7415+7	2.5452+6	1.3168+7	2.9072+3	3.2294+1	2.4244+1	7.0546+0	9.9564–1
1.3958–1	5.0686–7	1.0411+5	2.8846–3	4.1155+7	2.6263+7	2.4205+6	1.2469+7	2.8224+3	3.1097+1	2.3379+1	6.6950+0	1.0224+0
1.5000–1	5.2939–7	9.9682+4	3.2256–3	3.9404+7	2.5237+7	2.3103+6	1.1854+7	2.7460+3	3.0044+1	2.2616+1	6.3788+0	1.0491+0
1.6250–1	5.5486–7	9.5106+4	3.6490–3	3.7595+7	2.4160+7	2.2058+6	1.1226+7	2.6657+3	2.9002+1	2.1872+1	6.0523+0	1.0774+0
1.8125–1	5.9158–7	8.9202+4	4.3109–3	3.5261+7	2.2765+7	2.0708+6	1.0422+7	2.5599+3	2.7669+1	2.0915+1	5.6352+0	1.1197+0
2.0000–1	6.2674–7	8.4198+4	5.0026–3	3.3283+7	2.1577+7	1.9563+6	9.7472+6	2.4682+3	2.6552+1	2.0105+1	5.2853+0	1.1615+0
2.2500–1	6.7109–7	7.8634+4	5.9643–3	3.1083+7	2.0202+7	1.8472+6	9.0317+6	2.3718+3	2.5444+1	1.9322+1	4.9106+0	1.2122+0
2.6250–1	7.3388–7	7.1906+4	7.4779–3	2.8424+7	1.8534+7	1.7136+6	8.1740+6	2.2513+3	2.4119+1	1.8370+1	4.4624+0	1.2873+0
3.0000–1	7.9297–7	6.6548+4	9.0672–3	2.6306+7	1.7201+7	1.6058+6	7.4971+6	2.1519+3	2.3080+1	1.7609+1	4.1095+0	1.3611+0
4.0000–1	9.3238–7	5.6598+4	1.3547–2	2.2373+7	1.4490+7	1.4352+6	6.4455+6	1.9815+3	2.1583+1	1.6471+1	3.5599+0	1.5521+0
5.0000–1	1.0509–6	5.0213+4	1.8252–2	1.9849+7	1.2615+7	1.3368+6	5.8952+6	1.8775+3	2.0927+1	1.5910+1	3.2754+0	1.7421+0
6.0000–1	1.1570–6	4.5610+4	2.3070–2	1.8030+7	1.1227+7	1.2729+6	5.5280+6	1.8104+3	2.0581+1	1.5562+1	3.0866+0	1.9325+0
8.0000–1	1.3283–6	3.9729+4	3.2786–2	1.5704+7	9.3395+6	1.1991+6	5.1641+6	1.7296+3	2.0590+1	1.5363+1	2.9054+0	2.3211+0
1.0000+0	1.4737–6	3.5808+4	4.2449–2	1.4155+7	8.0971+6	1.1577+6	4.8984+6	1.6853+3	2.0805+1	1.5314+1	2.7723+0	2.7180+0
1.5000+0	1.7353–6	3.0409+4	6.5764–2	1.2021+7	6.2648+6	1.1128+6	4.6413+6	1.6299+3	2.2100+1	1.5709+1	2.6552+0	3.7360+0
2.0000+0	1.9191–6	2.7498+4	8.7709–2	1.0870+7	5.2514+6	1.0993+6	4.5174+6	1.6070+3	2.3482+1	1.6098+1	2.5986+0	4.7855+0
3.0000+0	2.1598–6	2.4433+4	1.2790–1	9.6582+6	4.1610+6	1.0818+6	4.4138+6	1.5921+3	2.6341+1	1.6785+1	2.5681+0	6.9877+0
4.0000+0	2.3126–6	2.2819+4	1.6397–1	9.0201+6	3.5750+6	1.0802+6	4.3634+6	1.5854+3	2.9146+1	1.7352+1	2.5466+0	9.2468+0
5.0000+0	2.4126–6	2.1873+4	1.9671–1	8.6462+6	3.2136+6	1.0793+6	4.3516+6	1.5876+3	3.1991+1	1.7817+1	2.5476+0	1.1626+1
6.0000+0	2.4838–6	2.1246+4	2.2668–1	8.3982+6	2.9708+6	1.0787+6	4.3472+6	1.5893+3	3.4773+1	1.8212+1	2.5529+0	1.4008+1
8.0000+0	2.5838–6	2.0424+4	2.7999–1	8.0734+6	2.6584+6	1.0790+6	4.3344+6	1.5990+3	4.0408+1	1.8859+1	2.5612+0	1.8988+1
1.0000+1	2.6477–6	1.9931+4	3.2638–1	7.8786+6	2.4784+6	1.0800+6	4.3185+6	1.6065+3	4.5925+1	1.9363+1	2.5678+0	2.3995+1
1.5000+1	2.7213–6	1.9392+4	4.2132–1	7.6653+6	2.2686+6	1.0820+6	4.3131+6	1.6312+3	6.0040+1	2.0116+1	2.5682+0	3.7356+1
2.0000+1	2.7488–6	1.9198+4	4.9609–1	7.5887+6	2.1961+6	1.0834+6	4.3076+6	1.6490+3	7.4196+1	2.0731+1	2.5685+0	5.0897+1
3.0000+1	2.7554–6	1.9152+4	6.0989–1	7.5705+6	2.1886+6	1.0841+6	4.2961+6	1.6829+3	1.0313+2	2.1385+1	2.5690+0	7.9181+1
4.0000+1	2.7626–6	1.9101+4	6.9519–1	7.5507+6	2.1882+6	1.0848+6	4.2759+6	1.7087+3	1.3258+2	2.1881+1	2.5641+0	1.0813+2
5.0000+1	2.7727–6	1.9032+4	7.6321–1	7.5232+6	2.1874+6	1.0852+6	4.2489+6	1.7300+3	1.6246+2	2.2260+1	2.5551+0	1.3764+2
6.0000+1	2.7818–6	1.8970+4	8.1967–1	7.4987+6	2.1867+6	1.0855+6	4.2248+6	1.7476+3	1.9260+2	2.2565+1	2.5478+0	1.6749+2
8.0000+1	2.7905–6	1.8911+4	9.0992–1	7.4754+6	2.1855+6	1.0857+6	4.2023+6	1.7766+3	2.5341+2	2.2995+1	2.5362+0	2.2787+2
1.0000+2	2.7975–6	1.8863+4	9.8060–1	7.4566+6	2.1847+6	1.0859+6	4.1842+6	1.7986+3	3.1471+2	2.3372+1	2.5273+0	2.8881+2
1.5000+2	2.8079–6	1.8794+4	1.1099+0	7.4290+6	2.1831+6	1.0861+6	4.1580+6	1.8371+3	4.6903+2	2.3802+1	2.5118+0	4.4272+2
2.0000+2	2.8104–6	1.8777+4	1.2020+0	7.4223+6	2.1820+6	1.0862+6	4.1523+6	1.8604+3	6.2410+2	2.4200+1	2.5087+0	5.9739+2
3.0000+2	2.8140–6	1.8753+4	1.3321+0	7.4129+6	2.1804+6	1.0862+6	4.1443+6	1.8911+3	9.3366+2	2.4767+1	2.5045+0	9.0639+2
4.0000+2	2.8172–6	1.8731+4	1.4246+0	7.4043+6	2.1793+6	1.0863+6	4.1368+6	1.9129+3	1.2440+3	2.5074+1	2.5006+0	1.2164+3
5.0000+2	2.8211–6	1.8706+4	1.4963+0	7.3943+6	2.1785+6	1.0863+6	4.1276+6	1.9299+3	1.5566+3	2.5332+1	2.4957+0	1.5288+3
6.0000+2	2.8223–6	1.8698+4	1.5549+0	7.3910+6	2.1778+6	1.0863+6	4.1250+6	1.9441+3	1.8657+3	2.5557+1	2.4948+0	1.8377+3
8.0000+2	2.8251–6	1.8679+4	1.6474+0	7.3837+6	2.1767+6	1.0863+6	4.1188+6	1.9669+3	2.4897+3	2.5948+1	2.4923+0	2.4613+3
1.0000+3	2.8277–6	1.8662+4	1.7191+0	7.3770+6	2.1758+6	1.0863+6	4.1130+6	1.9848+3	3.1131+3	2.6275+1	2.4901+0	3.0844+3
1.5000+3	2.8306–6	1.8643+4	1.8491+0	7.3693+6	2.1742+6	1.0863+6	4.1068+6	2.0181+3	4.6807+3	2.6593+1	2.4863+0	4.6517+3
2.0000+3	2.8333–6	1.8625+4	1.9413+0	7.3624+6	2.1731+6	1.0863+6	4.1009+6	2.0424+3	6.2396+3	2.6907+1	2.4828+0	6.2101+3
3.0000+3	2.8365–6	1.8604+4	2.0713+0	7.3542+6	2.1716+6	1.0863+6	4.0942+6	2.0777+3	9.3635+3	2.7489+1	2.4788+0	9.3335+3

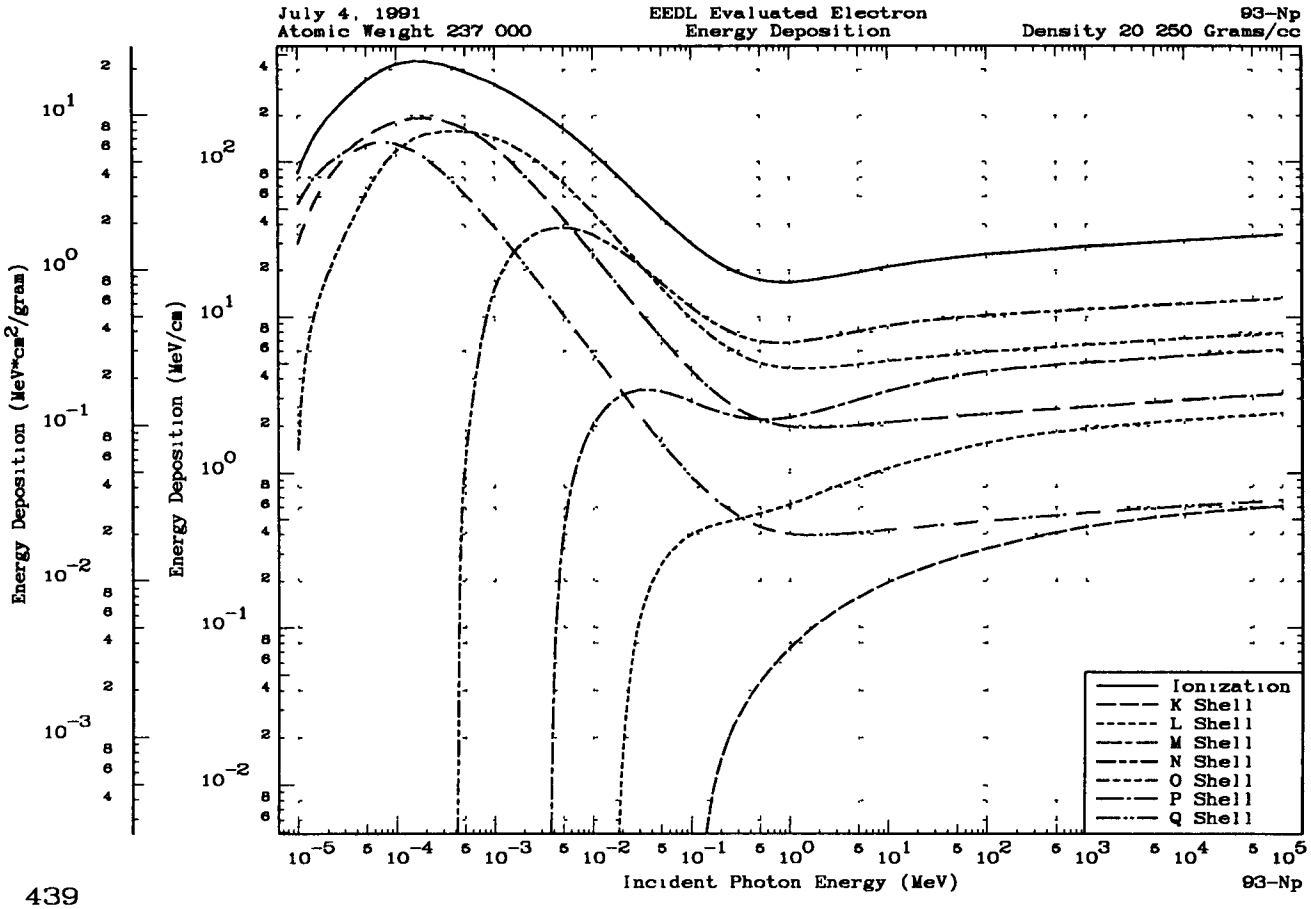
Atomic Weight 238.051												Density 18.950 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+3	2.8389–6	1.8589+4	2.1634+0	7.3480+6	2.1705+6	1.0863+6	4.0891+6	2.1035+3	1.2490+4	2.7770+1	2.4757+0	1.2459+4
5.0000+3	2.8419–6	1.8569+4	2.2348+0	7.3400+6	2.1696+6	1.0863+6	4.0820+6	2.1237+3	1.5649+4	2.7993+1	2.4715+0	1.5618+4
6.0000+3	2.8426–6	1.8564+4	2.2931+0	7.3383+6	2.1689+6	1.0863+6	4.0809+6	2.1385+3	1.8754+4	2.8188+1	2.4709+0	1.8723+4
8.0000+3	2.8440–6	1.8555+4	2.3851+0	7.3346+6	2.1678+6	1.0863+6	4.0783+6	2.1621+3	2.5020+4	2.8578+1	2.4693+0	2.4989+4
1.0000+4	2.8453–6	1.8546+4	2.4564+0	7.3313+6	2.1669+6	1.0863+6	4.0759+6	2.1805+3	3.1344+4	2.8910+1	2.4679+0	3.1313+4
1.5000+4	2.8472–6	1.8534+4	2.5860+0	7.3265+6	2.1654+6	1.0863+6	4.0726+6	2.2158+3	4.6864+4	2.9212+1	2.4660+0	4.6832+4
2.0000+4	2.8487–6	1.8524+4	2.6780+0	7.3226+6	2.1643+6	1.0863+6	4.0697+6	2.2412+3	6.2585+4	2.9514+1	2.4643+0	6.2554+4
3.0000+4	2.8504–6	1.8514+4	2.8077+0	7.3183+6	2.1627+6	1.0863+6	4.0670+6	2.2768+3	9.3671+4	3.0107+1	2.4626+0	9.3638+4
4.0000+4	2.8518–6	1.8504+4	2.8997+0	7.3145+6	2.1616+6	1.0863+6	4.0643+6	2.3023+3	1.2509+5	3.0369+1	2.4609+0	1.2506+5
5.0000+4	2.8541–6	1.8489+4	2.9711+0	7.3087+6	2.1608+6	1.0863+6	4.0593+6	2.3220+3	1.5622+5	3.0574+1	2.4579+0	1.5618+5
6.0000+4	2.8543–6	1.8488+4	3.0295+0	7.3083+6	2.1601+6	1.0863+6	4.0596+6	2.3380+3	1.8732+5	3.0765+1	2.4581+0	1.8729+5
8.0000+4	2.8552–6	1.8482+4	3.1216+0	7.3059+6	2.1590+6	1.0863+6	4.0582+6	2.3635+3	2.5007+5	3.1147+1	2.4573+0	2.5003+5
1.0000+5	2.8561–6	1.8477+4	3.1929+0	7.3037+6	2.1581+6	1.0863+6	4.0568+6	2.3833+3	3.1292+5	3.1511+1	2.4565+0	3.1289+5


July 4, 1991
Atomic Weight 237 000
EEDL Evaluated Electron
Cross Sections
93-Np
Density 20 250 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
93-Np


July 4, 1991
Atomic Weight 237 000
EEDL Evaluated Electron
Energy Deposition
93-Np
Density 20 250 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
93-Np

438


July 4, 1991
Atomic Weight 237 000
EEDL Evaluated Electron
Shell Cross Sections
93-Np
Density 20 250 Grams/cc
Mean Free Path (cm)
Cross Sections (barns)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Incident Photon Energy (MeV)
93-Np


July 4, 1991
Atomic Weight 237 000
EEDL Evaluated Electron
Energy Deposition
93-Np
Density 20 250 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Incident Photon Energy (MeV)
93-Np

Atomic Weight 237.000 Density 20.250 Grams/cc

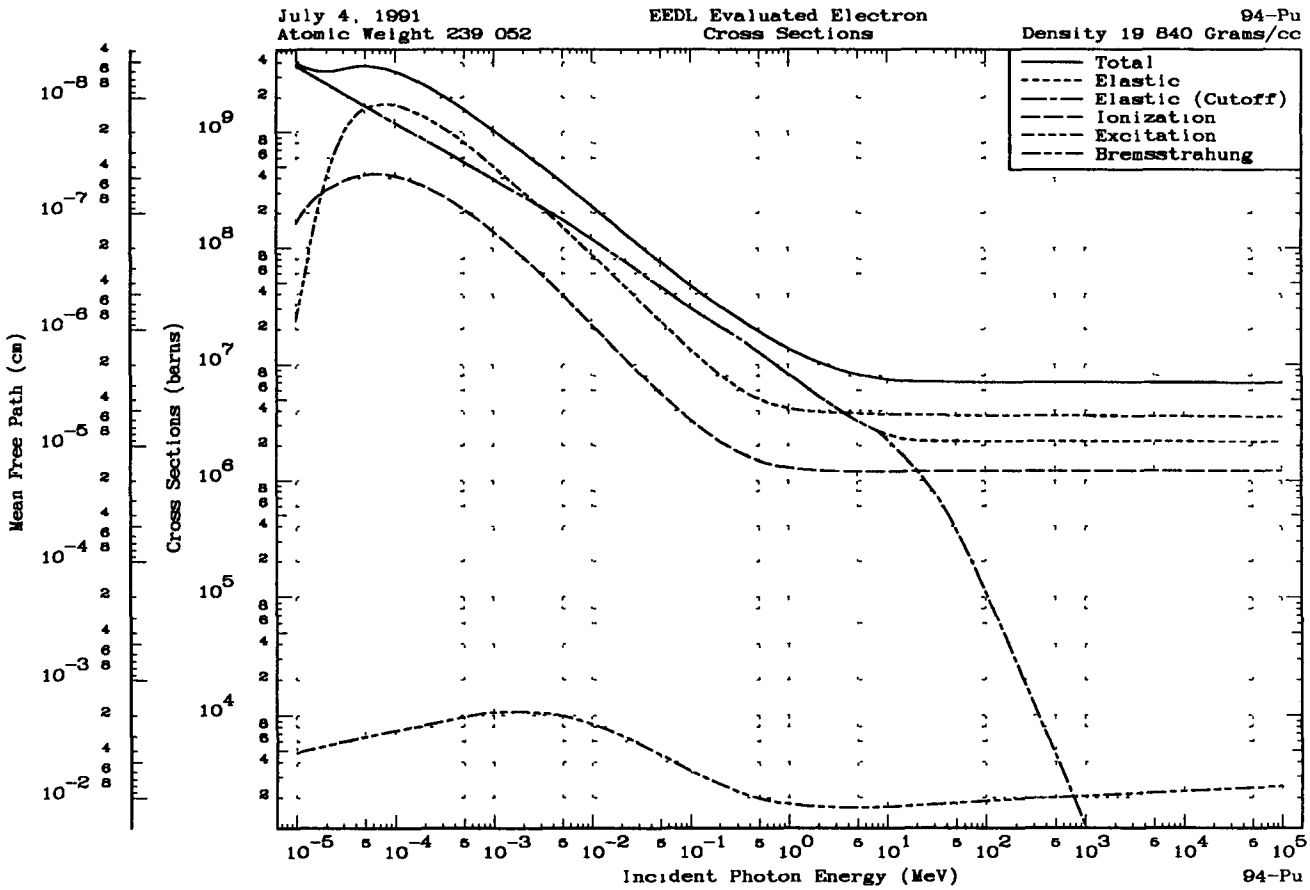
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	4.4075–9	1.1204+7		4.4095+9	4.0928+9	2.7537+8	4.1293+7	4.7683+3	9.9244+1	8.4838+1	1.4405+1	5.3043–4
O6	1.0120–5	4.4258–9	1.1158+7		4.3912+9	4.0687+9	2.7920+8	4.3295+7	4.7801+3	1.0161+2	8.6427+1	1.5180+1	5.3656–4
	1.0273–5	4.4483–9	1.1101+7		4.3690+9	4.0387+9	2.8438+8	4.5934+7	4.7949+3	1.0476+2	8.8599+1	1.6162+1	5.4438–4
	1.0568–5	4.4901–9	1.0998+7		4.3282+9	3.9823+9	2.9453+8	5.1389+7	4.8230+3	1.1111+2	9.2910+1	1.8204+1	5.5957–4
	1.0625–5	4.4980–9	1.0979+7		4.3207+9	3.9717+9	2.9648+8	5.2494+7	4.8284+3	1.1236+2	9.3743+1	1.8620+1	5.6251–4
	1.1122–5	4.5612–9	1.0827+7		4.2608+9	3.8828+9	3.1329+8	6.4690+7	4.8741+3	1.2422+2	1.0101+2	2.3206+1	5.8822–4
	1.1250–5	4.5764–9	1.0791+7		4.2467+9	3.8609+9	3.1761+8	6.8163+7	4.8857+3	1.2742+2	1.0290+2	2.4523+1	5.9488–4
	1.1719–5	4.6319–9	1.0661+7		4.1957+9	3.7836+9	3.2999+8	8.2144+7	4.9270+3	1.3869+2	1.0883+2	2.9865+1	6.1935–4
	1.2092–5	4.6719–9	1.0570+7		4.1599+9	3.7254+9	3.3966+8	9.4779+7	4.9589+3	1.4830+2	1.1355+2	3.4745+1	6.3892–4
	1.3125–5	4.7620–9	1.0370+7		4.0811+9	3.5771+9	3.6612+8	1.3788+8	5.0436+3	1.7857+2	1.2687+2	5.1697+1	6.9369–4
	1.3359–5	4.7808–9	1.0329+7		4.0651+9	3.5459+9	3.7139+8	1.4781+8	5.0620+3	1.8535+2	1.2964+2	5.5702+1	7.0621–4
	1.3546–5	4.7948–9	1.0299+7		4.0532+9	3.5217+9	3.7546+8	1.5608+8	5.0765+3	1.9086+2	1.3181+2	5.9053+1	7.1619–4
	1.5000–5	4.8736–9	1.0133+7		3.9877+9	3.3482+9	4.0647+8	2.3302+8	5.1845+3	2.3974+2	1.4883+2	9.0911+1	7.9488–4
	1.7500–5	4.9358–9	1.0005+7		3.9374+9	3.1021+9	4.4104+8	3.9421+8	5.3520+3	3.2973+2	1.7167+2	1.5806+2	9.3317–4
	2.0000–5	4.9149–9	1.0048+7		3.9542+9	2.9037+9	4.6970+8	5.8084+8	5.5016+3	4.3247+2	1.9331+2	2.3916+2	1.0750–3
P3	2.5250–5	4.7631–9	1.0368+7		4.0803+9	2.5871+9	5.0125+8	9.9188+8	5.7480+3	6.4646+2	2.2653+2	4.1993+2	1.3600–3
	2.5547–5	4.7550–9	1.0385+7		4.0872+9	2.5722+9	5.0252+8	1.0124+9	5.7604+3	6.5732+2	2.2830+2	4.2902+2	1.3762–3
	2.6104–5	4.7387–9	1.0421+7		4.1012+9	2.5449+9	5.0486+8	1.0515+9	5.7834+3	6.7791+2	2.3159+2	4.4632+2	1.4067–3
	2.7078–5	4.7064–9	1.0493+7		4.1293+9	2.4991+9	5.0888+8	1.1213+9	5.8226+3	7.1473+2	2.3735+2	4.7738+2	1.4602–3
	2.8539–5	4.6501–9	1.0620+7		4.1794+9	2.4349+9	5.1473+8	1.2297+9	5.8794+3	7.7180+2	2.4597+2	5.2584+2	1.5411–3
	3.0000–5	4.5970–9	1.0742+7		4.2276+9	2.3754+9	5.2039+8	1.3318+9	5.9338+3	8.2654+2	2.5456+2	5.7197+2	1.6226–3
	3.0625–5	4.5757–9	1.0792+7		4.2473+9	2.3513+9	5.2136+8	1.3746+9	5.9564+3	8.4836+2	2.5732+2	5.9104+2	1.6577–3
	3.1250–5	4.5533–9	1.0845+7		4.2682+9	2.3279+9	5.2229+8	1.4180+9	5.9787+3	8.7038+2	2.6003+2	6.1034+2	1.6928–3
	3.5313–5	4.4593–9	1.1074+7		4.3582+9	2.1912+9	5.2930+8	1.6376+9	6.1151+3	9.8924+2	2.7930+2	7.0994+2	1.9241–3
P2	3.5520–5	4.4539–9	1.1088+7		4.3635+9	2.1849+9	5.2963+8	1.6490+9	6.1217+3	9.9538+2	2.8025+2	7.1512+2	1.9361–3
	3.6080–5	4.4476–9	1.1103+7		4.3697+9	2.1680+9	5.3059+8	1.6710+9	6.1394+3	1.0084+3	2.8298+2	7.2537+2	1.9683–3
	3.7060–5	4.4358–9	1.1133+7		4.3813+9	2.1395+9	5.3231+8	1.7095+9	6.1699+3	1.0311+3	2.8782+2	7.4330+2	2.0250–3
	3.8530–5	4.4164–9	1.1182+7		4.4005+9	2.0987+9	5.3496+8	1.7669+9	6.2144+3	1.0654+3	2.9524+2	7.7018+2	2.1105–3
	4.0000–5	4.3952–9	1.1236+7		4.4218+9	2.0601+9	5.3770+8	1.8239+9	6.2575+3	1.0999+3	3.0286+2	7.9704+2	2.1964–3
	4.2500–5	4.3882–9	1.1254+7		4.4288+9	1.9992+9	5.3739+8	1.8922+9	6.3247+3	1.1404+3	3.1159+2	8.2885+2	2.3387–3
	4.5000–5	4.3773–9	1.1282+7		4.4398+9	1.9435+9	5.3744+8	1.9589+9	6.3887+3	1.1808+3	3.2071+2	8.6012+2	2.4822–3
	4.5781–5	4.3733–9	1.1292+7		4.4439+9	1.9270+9	5.3742+8	1.9794+9	6.4081+3	1.1933+3	3.2347+2	8.6978+2	2.5273–3
	5.0000–5	4.3710–9	1.1298+7		4.4462+9	1.8447+9	5.3795+8	2.0636+9	6.5084+3	1.2497+3	3.3929+2	9.1039+2	2.7729–3
P1	5.4390–5	4.4037–9	1.1214+7		4.4132+9	1.7694+9	5.3575+8	2.1080+9	6.6034+3	1.2863+3	3.5238+2	9.3396+2	3.0278–3
	5.5091–5	4.4085–9	1.1202+7		4.4084+9	1.7583+9	5.3545+8	2.1147+9	6.6180+3	1.2921+3	3.5454+2	9.3757+2	3.0688–3
	5.6318–5	4.4166–9	1.1181+7		4.4004+9	1.7392+9	5.3497+8	2.1262+9	6.6431+3	1.3022+3	3.5836+2	9.4383+2	3.1408–3
	5.8159–5	4.4277–9	1.1153+7		4.3893+9	1.7117+9	5.3435+8	2.1432+9	6.6800+3	1.3173+3	3.6420+2	9.5310+2	3.2491–3
	6.0000–5	4.4380–9	1.1127+7		4.3791+9	1.6855+9	5.3384+8	2.1597+9	6.7160+3	1.3324+3	3.7017+2	9.6221+2	3.3581–3
	6.5000–5	4.4926–9	1.0992+7		4.3259+9	1.6201+9	5.2721+8	2.1786+9	6.8092+3	1.3530+3	3.7988+2	9.7310+2	3.6565–3
	6.8750–5	4.5296–9	1.0902+7		4.2906+9	1.5757+9	5.2291+8	2.1920+9	6.8753+3	1.3685+3	3.8758+2	9.8092+2	3.8826–3
	7.0000–5	4.5412–9	1.0874+7		4.2796+9	1.5617+9	5.2159+8	2.1963+9	6.8966+3	1.3737+3	3.9022+2	9.8347+2	3.9584–3
	7.4375–5	4.6021–9	1.0730+7		4.2229+9	1.5155+9	5.1686+8	2.1905+9	6.9690+3	1.3819+3	3.9878+2	9.8308+2	4.2255–3
	8.0000–5	4.6751–9	1.0563+7		4.1570+9	1.4618+9	5.1154+8	2.1837+9	7.0571+3	1.3930+3	4.1023+2	9.8279+2	4.5724–3
	9.0000–5	4.8640–9	1.0153+7		3.9956+9	1.3790+9	4.9690+8	2.1196+9	7.2005+3	1.3804+3	4.2086+2	9.5950+2	5.1991–3
	1.0000–4	5.0380–9	9.8020+6	0.0000+0	3.8576+9	1.3090+9	4.8463+8	2.0640+9	7.3314+3	1.3720+3	4.3236+2	9.3967+2	5.8370–3
O5	1.0947–4	5.2409–9	9.4226+6	6.9763–9	3.7082+9	1.2517+9	4.7053+8	1.9860+9	7.4448+3	1.3430+3	4.3636+2	9.0664+2	6.4509–3
	1.1074–4	5.2673–9	9.3753+6	7.9209–9	3.6896+9	1.2446+9	4.6881+8	1.9762+9	7.4593+3	1.3396+3	4.3707+2	9.0251+2	6.5336–3
	1.1319–4	5.3180–9	9.2859+6	9.7572–9	3.6544+9	1.2312+9	4.6556+8	1.9577+9	7.4871+3	1.3332+3	4.3848+2	8.9472+2	6.6944–3
	1.1779–4	5.4113–9	9.1258+6	1.3223–8	3.5914+9	1.2071+9	4.5977+8	1.9245+9	7.5379+3	1.3220+3	4.4127+2	8.8076+2	6.9974–3
O4	1.1848–4	5.4251–9	9.1026+6	1.3743–8	3.5823+9	1.2037+9	4.5893+8	1.9197+9	7.5453+3	1.3204+3	4.4169+2	8.7875+2	7.0428–3
	1.2045–4	5.4657–9	9.0350+6	1.5238–8	3.5557+9	1.1939+9	4.5614+8	1.9057+9	7.5665+3	1.3151+3	4.4213+2	8.7291+2	7.1732–3
	1.2182–4	5.4937–9	8.9890+6	1.6280–8	3.5376+9	1.1873+9	4.5425+8	1.8961+9	7.5810+3	1.3114+3	4.4246+2	8.6894+2	7.2640–3
	1.2414–4	5.5408–9	8.9125+6	1.8058–8	3.5075+9	1.1762+9	4.5110+8	1.8802+9	7.6053+3	1.3054+3	4.4304+2	8.6234+2	7.4187–3
	1.2886–4	5.6349–9	8.7637+6	2.1689–8	3.4489+9	1.1547+9	4.4500+8	1.8492+9	7.6536+3	1.2939+3	4.4437+2	8.4951+2	7.7340–3
	1.3061–4	5.6692–9	8.7107+6	2.3040–8	3.4281+9	1.1471+9	4.4284+8	1.8382+9	7.6711+3	1.2899+3	4.4491+2	8.4494+2	7.8511–3
	1.3125–4	5.6818–9	8.6914+6	2.3538–8	3.4205+9	1.1443+9	4.4205+8	1.8342+9	7.6775+3	1.2884+3	4.4510+2	8.4329+2	7.8943–3
	1.4030–4	5.8551–9	8.4341+6	3.0617–8	3.3192+9	1.1071+9	4.3157+8	1.7805+9	7.7649+3	1.2694+3	4.4821+2	8.2114+2	8.5062–3
	1.5000–4	6.0337–9	8.1845+6	3.8308–8	3.2210+9	1.0712+9	4.2153+8	1.7283+9	7.8534+3	1.2521+3	4.5240+2	7.9971+2	9.1686–3
	1.7500–4	6.5181–9	7.5763+6	5.8766–8	2.9816+9	9.9254+8	3.9360+8	1.5955+9	8.0613+3	1.1924+3	4.5003+2	7.4235+2	1.0944–2
	2.0000–4	6.9678–9	7.0872+6	8.0141–8	2.7892+9	9.2912+8	3.7136+8	1.4887+9	8.2458+3	1.1471+3	4.5063+2	6.9649+2	1.2762–2
O3	2.1256–4	7.1839–9	6.8741+6	9.1204–8	2.7053+9	9.0155+8	3.5996+8	1.4438+9	8.3313+3	1.1236+3	4.4683+2	6.7679+2	1.3733–2
	2.1529–4	7.2326–9	6.8278+6	9.3642–8	2.6871+9	8.9587+8	3.5757+8	1.4336+9	8.3493+3	1.1183+3	4.4602+2	6.7231+2	1.3945–2
	2.2059–4	7.3260–9	6.7407+6	9.8396–8	2.6528+9	8.8518+8	3.5308+8	1.4145+9	8.3837+3	1.1085+3	4.4456+2	6.6390+2	1.4358–2
	2.2500–4	7.4032–9	6.6705+6	1.0239–7	2.6252+9	8.7655+8	3.4947+8	1.3991+9	8.4118+3	1.1006+3	4.4344+2	6.5713+2	1.4704–2
	2.3051–4	7.4985–9	6.5857+6	1.0742–7	2.5918+9	8.6612+8	3.4511+8	1.3806+9	8.4463+3	1.0910+3	4.4203+2	6.4896+2	1.5138–2
	2.4789–4	7.7918–9	6.3378+6	1.2355–7	2.4942+9	8.3555+8	3.3240+8	1.3263+9	8.5508+3	1.0634+3	4.3832+2	6.2511+2	1.6515–2
	2.6091–4	8.0052–9	6.1688+6	1.3591–7	2.4277+9	8.1465+8	3.2379+8	1.2893+9	8.6253+3	1.0451+3	4.3622+2	6.0890+2	1.7560–2
	2.6250–4	8.0308–9	6.1491+6	1.3743–7	2.4200+9	8.1222+8	3.2279+8	1.2850+9	8.6341+3	1.0430+3	4.3600+2	6.0701+2	1.7688–2
O2	2.7295–4	8.1978–9	6.0239+6	1.4751–7	2.3707+9	7.9669+8	3.1643+8	1.2576+9	8.6913+3	1.0297+3	4.3465+2	5.9503+2	1.8533–2
	2.7633–4	8.2545–9	5.9825+6	1.5080–7	2.3544+9	7.9185+8	3.1436+8	1.2482+9	8.7095+3	1.0249+3	4.3400+2	5.9086+2	1.8807–2
	2.8046–4	8.3233–9	5.9330+6	1.5484–7	2.3349+9	7.8607+8	3.1189+8	1.2370+9	8.7313+3	1.0192+3	4.3326+2	5.8590+2	1.9143–2
	2.8225–4	8.3531–9	5.9119+6	1.5660–7	2.3266+9	7.8360+8	3.1084+8	1.2322+9	8.7407+3	1.0167+3	4.3295+2	5.8378+2	1.9289–2
	2.9112–4	8.4990–9	5.8104+6	1.6538–7	2.2867+9	7.7169+8	3.0578+8	1.2092+9	8.7867+3	1.0051+3	4.3153+2	5.7359+2	2.0016–2
	3.0000–4	8.6430–9	5.7136+6	1.7426–7	2.2486+9	7.6032+8	3.0097+8	1.1873+9	8.8314+3	9.9422+2	4.3031+2	5.6389+2	2.0746–2
	3.2500–4	9.0400–9	5.4627+6	1.9982–7	2.1498+9	7.3083+8	2.8727+8	1.1317+9	8.9518+3	9.6180+2	4.2302+2	5.3875+2	2.2822–2
O1	3.3625–4	9.2141–9	5.3594+6	2.1160–7	2.1092+9	7.1865+8	2.8166+8	1.1089+9	9.0035+3	9.4869+2	4.2023+2	5.2844+2	2.3766–2
	3.4023–4	9.2759–9	5.3238+6	2.1581–7	2.0952+9	7.1448+8	2.7971+8	1.1010+9	9.0215+3	9.4412+2	4.1920+2	5.2490+2	2.4106–2
	3.4771–4	9.3908–9	5.2586+6	2.2376–7	2.0695+9	7.0686+8	2.7616+8	1.0865+9	9.0548+3	9.3581+2	4.1736+2	5.1842+2	2.4747–2
	3.5000–4	9.4259–9	5.2391+6	2.2621–7	2.0618+9	7.0457+8	2.7509+8	1.0821+9	9.0648+3	9.3333+2	4.1682+2	5.1648+2	2.4944–2
	3.6078–4	9.5893–9	5.1498+6	2.3783–7	2.0267+9	6.9409+8	2.7024+8	1.0624+9	9.1115+3	9.2205+2	4.1439+2	5.0764+2	2.5873–2

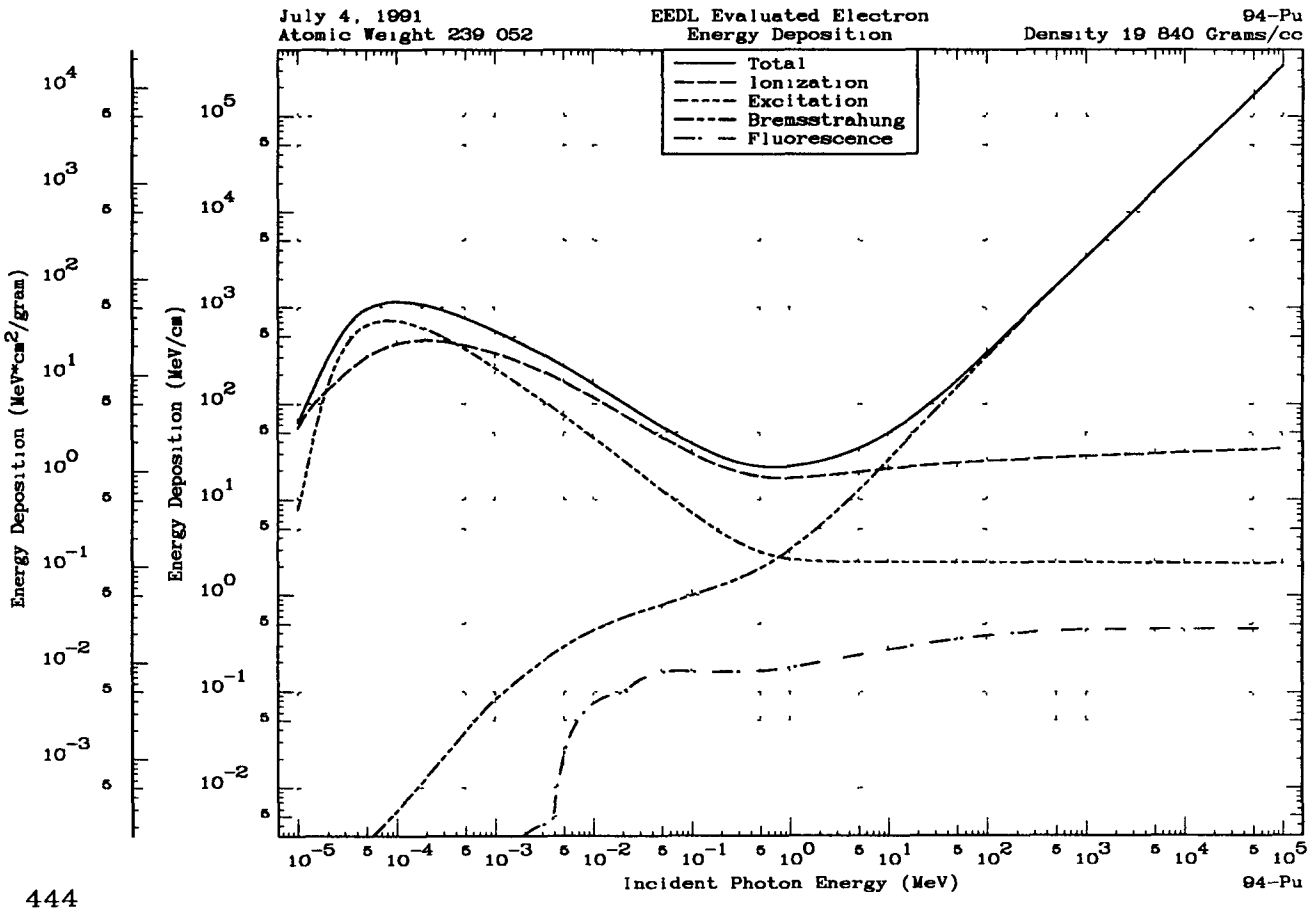
Atomic Weight 237.000 — Density 20.250 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.6250–4	9.6151–9	5.1359+6	2.3970–7	2.0212+9	6.9246+8	2.6948+8	1.0593+9	9.1189+3	9.2031+2	4.1402+2	5.0626+2	2.6022–2
	3.8039–4	9.8810–9	4.9978+6	2.5932–7	1.9669+9	6.7619+8	2.6200+8	1.0287+9	9.1936+3	9.0310+2	4.1047+2	4.9260+2	2.7576–2
	4.0000–4	1.0166–8	4.8577+6	2.8125–7	1.9117+9	6.5961+8	2.5445+8	9.9766+8	9.2722+3	8.8597+2	4.0716+2	4.7878+2	2.9295–2
N7	4.1460–4	1.0375–8	4.7600+6	2.9786–7	1.8733+9	6.4804+8	2.4871+8	9.7651+8	9.3288+3	8.7211+2	4.0297+2	4.6911+2	3.0638–2
	4.1994–4	1.0450–8	4.7255+6	3.0399–7	1.8597+9	6.4396+8	2.4671+8	9.6905+8	9.3491+3	8.6731+2	4.0157+2	4.6571+2	3.1131–2
N6	4.2675–4	1.0546–8	4.6826+6	3.1188–7	1.8428+9	6.3886+8	2.4420+8	9.5974+8	9.3747+3	8.6134+2	3.9984+2	4.6147+2	3.1762–2
	4.2995–4	1.0594–8	4.6612+6	3.1559–7	1.8344+9	6.3651+8	2.4305+8	9.5483+8	9.3866+3	8.5835+2	3.9909+2	4.5923+2	3.2058–2
	4.3591–4	1.0684–8	4.6220+6	3.2256–7	1.8190+9	6.3220+8	2.4095+8	9.4583+8	9.4086+3	8.5285+2	3.9769+2	4.5513+2	3.2613–2
	4.4746–4	1.0857–8	4.5485+6	3.3619–7	1.7901+9	6.2408+8	2.3700+8	9.2897+8	9.4504+3	8.4260+2	3.9512+2	4.4744+2	3.3691–2
	4.5000–4	1.0895–8	4.5328+6	3.3921–7	1.7839+9	6.2234+8	2.3616+8	9.2536+8	9.4595+3	8.4041+2	3.9457+2	4.4580+2	3.3929–2
	4.6795–4	1.1159–8	4.4256+6	3.6076–7	1.7417+9	6.1044+8	2.3042+8	9.0080+8	9.5226+3	8.2565+2	3.9100+2	4.3461+2	3.5617–2
	4.7373–4	1.1243–8	4.3925+6	3.6777–7	1.7286+9	6.0675+8	2.2865+8	8.9324+8	9.5424+3	8.2112+2	3.8992+2	4.3117+2	3.6162–2
	5.0000–4	1.1620–8	4.2499+6	4.0015–7	1.6725+9	5.9079+8	2.2105+8	8.6070+8	9.6303+3	8.0185+2	3.8545+2	4.1636+2	3.8657–2
	5.2500–4	1.1976–8	4.1234+6	4.3169–7	1.6227+9	5.7673+8	2.1413+8	8.3187+8	9.7071+3	7.8360+2	3.8049+2	4.0307+2	4.1049–2
	5.6250–4	1.2499–8	3.9510+6	4.8030–7	1.5549+9	5.5741+8	2.0475+8	7.9275+8	9.8167+3	7.5926+2	3.7417+2	3.8505+2	4.4673–2
	6.0000–4	1.3007–8	3.7966+6	5.3039–7	1.4942+9	5.3993+8	1.9639+8	7.5782+8	9.9204+3	7.3812+2	3.6910+2	3.6897+2	4.8338–2
	6.5000–4	1.3672–8	3.6120+6	5.9946–7	1.4215+9	5.1901+8	1.8585+8	7.1664+8	1.0032+4	7.0994+2	3.6006+2	3.4983+2	5.3127–2
	7.0000–4	1.4316–8	3.4494+6	6.7111–7	1.3575+9	5.0036+8	1.7663+8	6.8050+8	1.0136+4	6.8582+2	3.5270+2	3.3306+2	5.7969–2
	7.2500–4	1.4632–8	3.3751+6	7.0785–7	1.3282+9	4.9176+8	1.7244+8	6.6404+8	1.0186+4	6.7510+2	3.4963+2	3.2542+2	6.0410–2
N5	7.6729–4	1.5155–8	3.2585+6	7.7128–7	1.2824+9	4.7819+8	1.6590+8	6.3827+8	1.0267+4	6.5844+2	3.4491+2	3.1347+2	6.4565–2
	7.7547–4	1.5255–8	3.2371+6	7.8373–7	1.2739+9	4.7569+8	1.6470+8	6.3354+8	1.0280+4	6.5542+2	3.4407+2	3.1128+2	6.5340–2
	8.0000–4	1.5553–8	3.1751+6	8.2141–7	1.2495+9	4.6843+8	1.6123+8	6.1986+8	1.0319+4	6.4676+2	3.4177+2	3.0492+2	6.7673–2
N4	8.1294–4	1.5709–8	3.1436+6	8.4149–7	1.2372+9	4.6474+8	1.5938+8	6.1304+8	1.0332+4	6.4173+2	3.3997+2	3.0170+2	6.8760–2
	8.2463–4	1.5850–8	3.1157+6	8.5977–7	1.2262+9	4.6147+8	1.5774+8	6.0696+8	1.0343+4	6.3733+2	3.3842+2	2.9884+2	6.9742–2
	8.2500–4	1.5854–8	3.1148+6	8.6035–7	1.2258+9	4.6137+8	1.5769+8	6.0677+8	1.0344+4	6.3720+2	3.3837+2	2.9875+2	6.9773–2
	8.4655–4	1.6111–8	3.0651+6	8.9438–7	1.2063+9	4.5553+8	1.5479+8	5.9594+8	1.0364+4	6.2941+2	3.3567+2	2.9367+2	7.1587–2
	8.6875–4	1.6373–8	3.0160+6	9.2987–7	1.1869+9	4.4974+8	1.5194+8	5.8526+8	1.0385+4	6.2182+2	3.3309+2	2.8866+2	7.3459–2
	8.8491–4	1.6563–8	2.9816+6	9.5597–7	1.1734+9	4.4567+8	1.4994+8	5.7778+8	1.0400+4	6.1655+2	3.3133+2	2.8515+2	7.4824–2
	9.0000–4	1.6738–8	2.9503+6	9.8053–7	1.1611+9	4.4197+8	1.4813+8	5.7100+8	1.0414+4	6.1181+2	3.2976+2	2.8197+2	7.6100–2
	9.3438–4	1.7133–8	2.8823+6	1.0372–6	1.1343+9	4.3386+8	1.4420+8	5.5625+8	1.0444+4	6.0143+2	3.2629+2	2.7506+2	7.9013–2
	9.4246–4	1.7225–8	2.8669+6	1.0507–6	1.1283+9	4.3202+8	1.4331+8	5.5291+8	1.0451+4	5.9910+2	3.2553+2	2.7350+2	7.9699–2
	1.0000–3	1.7872–8	2.7632+6	1.1480–6	1.0874+9	4.1956+8	1.3737+8	5.3050+8	1.0499+4	5.8369+2	3.2061+2	2.6300+2	8.4594–2
N3	1.0708–3	1.8652–8	2.6476+6	1.2713–6	1.0419+9	4.0560+8	1.3054+8	5.0578+8	1.0513+4	5.6450+2	3.1317+2	2.5124+2	8.9420–2
	1.0842–3	1.8800–8	2.6267+6	1.2951–6	1.0338+9	4.0311+8	1.2933+8	5.0130+8	1.0515+4	5.6102+2	3.1182+2	2.4911+2	9.0335–2
	1.1102–3	1.9084–8	2.5876+6	1.3417–6	1.0184+9	3.9842+8	1.2705+8	4.9288+8	1.0520+4	5.5455+2	3.0933+2	2.4512+2	9.2109–2
	1.1250–3	1.9245–8	2.5660+6	1.3685–6	1.0099+9	3.9582+8	1.2580+8	4.8823+8	1.0523+4	5.5099+2	3.0798+2	2.4291+2	9.3119–2
	1.1589–3	1.9610–8	2.5182+6	1.4305–6	9.9105+8	3.9004+8	1.2303+8	4.7797+8	1.0529+4	5.4304+2	3.0489+2	2.3805+2	9.5434–2
	1.2016–3	2.0063–8	2.4613+6	1.5097–6	9.6866+8	3.8314+8	1.1974+8	4.6577+8	1.0536+4	5.3370+2	3.0133+2	2.3227+2	9.8346–2
	1.2500–3	2.0571–8	2.4007+6	1.6013–6	9.4477+8	3.7572+8	1.1625+8	4.5279+8	1.0544+4	5.2389+2	2.9767+2	2.2612+2	1.0166–1
	1.2762–3	2.0841–8	2.3695+6	1.6515–6	9.3250+8	3.7189+8	1.1447+8	4.4613+8	1.0548+4	5.1891+2	2.9583+2	2.2297+2	1.0345–1
	1.2813–3	2.0894–8	2.3635+6	1.6613–6	9.3016+8	3.7116+8	1.1413+8	4.4486+8	1.0549+4	5.1796+2	2.9549+2	2.2237+2	1.0379–1
N2	1.3195–3	2.1285–8	2.3201+6	1.7357–6	9.1306+8	3.6580+8	1.1165+8	4.3560+8	1.0555+4	5.1108+2	2.9299+2	2.1799+2	1.0641–1
	1.3421–3	2.1515–8	2.2953+6	1.7800–6	9.0331+8	3.6274+8	1.1021+8	4.3034+8	1.0558+4	5.0678+2	2.9119+2	2.1549+2	1.0795–1
	1.3815–3	2.1914–8	2.2535+6	1.8585–6	8.8687+8	3.5758+8	1.0779+8	4.2150+8	1.0564+4	4.9960+2	2.8822+2	2.1127+2	1.1066–1
	1.3881–3	2.1979–8	2.2468+6	1.8716–6	8.8423+8	3.5674+8	1.0740+8	4.2007+8	1.0565+4	4.9846+2	2.8775+2	2.1060+2	1.1110–1
	1.4408–3	2.2503–8	2.1945+6	1.9782–6	8.6363+8	3.5023+8	1.0438+8	4.0901+8	1.0572+4	4.8958+2	2.8413+2	2.0533+2	1.1471–1
N1	1.4789–3	2.2878–8	2.1585+6	2.0566–6	8.4949+8	3.4573+8	1.0232+8	4.0143+8	1.0578+4	4.8356+2	2.8172+2	2.0173+2	1.1732–1
	1.5000–3	2.3085–8	2.1392+6	2.1004–6	8.4188+8	3.4332+8	1.0122+8	3.9734+8	1.0581+4	4.8037+2	2.8046+2	1.9979+2	1.1877–1
	1.5312–3	2.3388–8	2.1114+6	2.1658–6	8.3095+8	3.3983+8	9.9583+7	3.9152+8	1.0579+4	4.7517+2	2.7806+2	1.9700+2	1.2074–1
	1.5898–3	2.3951–8	2.0618+6	2.2903–6	8.1143+8	3.3358+8	9.6679+7	3.8116+8	1.0577+4	4.6597+2	2.7384+2	1.9201+2	1.2444–1
	1.6250–3	2.4285–8	2.0335+6	2.3662–6	8.0027+8	3.2999+8	9.5028+7	3.7524+8	1.0575+4	4.6077+2	2.7148+2	1.8916+2	1.2667–1
	1.6411–3	2.4437–8	2.0208+6	2.4012–6	7.9530+8	3.2838+8	9.4293+7	3.7261+8	1.0574+4	4.5846+2	2.7043+2	1.8789+2	1.2768–1
	1.7308–3	2.5273–8	1.9540+6	2.5995–6	7.6899+8	3.1985+8	9.0429+7	3.5870+8	1.0571+4	4.4637+2	2.6503+2	1.8121+2	1.3335–1
	1.7500–3	2.5449–8	1.9405+6	2.6426–6	7.6366+8	3.1811+8	8.9650+7	3.5589+8	1.0570+4	4.4395+2	2.6396+2	1.7986+2	1.3456–1
	1.8125–3	2.6019–8	1.8979+6	2.7846–6	7.4693+8	3.1264+8	8.7211+7	3.4707+8	1.0568+4	4.3624+2	2.6048+2	1.7562+2	1.3850–1
	1.8654–3	2.6496–8	1.8638+6	2.9068–6	7.3350+8	3.0822+8	8.5262+7	3.4001+8	1.0566+4	4.3011+2	2.5774+2	1.7223+2	1.4184–1
	2.0000–3	2.7684–8	1.7838+6	3.2249–6	7.0202+8	2.9778+8	8.0731+7	3.2350+8	1.0561+4	4.1600+2	2.5154+2	1.6431+2	1.5033–1
	2.2500–3	2.9876–8	1.6529+6	3.8458–6	6.5049+8	2.8066+8	7.3340+7	2.9648+8	1.0498+4	3.8964+2	2.3834+2	1.5113+2	1.6415–1
	2.5000–3	3.1978–8	1.5443+6	4.5056–6	6.0775+8	2.6618+8	6.7321+7	2.7424+8	1.0442+4	3.6837+2	2.2789+2	1.4030+2	1.7790–1
	2.6250–3	3.2998–8	1.4965+6	4.8493–6	5.8895+8	2.5973+8	6.4702+7	2.6451+8	1.0416+4	3.5898+2	2.2323+2	1.3557+2	1.8476–1
	3.0000–3	3.5953–8	1.3735+6	5.9299–6	5.4055+8	2.4287+8	5.8058+7	2.3961+8	1.0346+4	3.3534+2	2.1166+2	1.2347+2	2.0526–1
M5	3.6681–3	4.0961–8	1.2056+6	8.0369–6	4.7447+8	2.1926+8	4.9096+7	2.0610+8	1.0167+4	2.9953+2	1.9235+2	1.0694+2	2.3811–1
	3.7096–3	4.1261–8	1.1969+6	8.1758–6	4.7102+8	2.1801+8	4.8635+7	2.0437+8	1.0157+4	2.9767+2	1.9135+2	1.0608+2	2.4014–1
	3.7822–3	4.1782–8	1.1819+6	8.4210–6	4.6514+8	2.1586+8	4.7851+7	2.0141+8	1.0140+4	2.9452+2	1.8966+2	1.0462+2	2.4368–1
M4	3.8592–3	4.2332–8	1.1666+6	8.6839–6	4.5910+8	2.1365+8	4.7049+7	1.9839+8	1.0122+4	2.9131+2	1.8793+2	1.0313+2	2.4743–1
	3.8911–3	4.2559–8	1.1603+6	8.7937–6	4.5665+8	2.1275+8	4.6725+7	1.9716+8	1.0114+4	2.9001+2	1.8724+2	1.0252+2	2.4894–1
	3.8944–3	4.2583–8	1.1597+6	8.8050–6	4.5640+8	2.1266+8	4.6692+7	1.9704+8	1.0113+4	2.8988+2	1.8717+2	1.0246+2	2.4909–1
	4.0000–3	4.3330–8	1.1397+6	9.1720–6	4.4852+8	2.0976+8	4.5657+7	1.9309+8	1.0086+4	2.8575+2	1.8498+2	1.0052+2	2.5406–1
	4.1250–3	4.4209–8	1.1170+6	9.6134–6	4.3961+8	2.0639+8	4.4480+7	1.8873+8	1.0037+4	2.8060+2	1.8202+2	9.8328+1	2.5893–1
M3	4.4216–3	4.6254–8	1.0676+6	1.0692–5	4.2017+8	1.9899+8	4.1937+7	1.7923+8	9.9261+3	2.6951+2	1.7567+2	9.3571+1	2.7043–1
	4.4939–3	4.6755–8	1.0562+6	1.0961–5	4.1566+8	1.9729+8	4.1364+7	1.7700+8	9.9005+3	2.6699+2	1.7425+2	9.2457+1	2.7322–1
	4.5000–3	4.6798–8	1.0552+6	1.0984–5	4.1529+8	1.9715+8	4.1316+7	1.7681+8	9.8983+3	2.6678+2	1.7414+2	9.2365+1	2.7346–1
	4.5625–3	4.7228–8	1.0456+6	1.1219–5	4.1150+8	1.9573+8	4.0836+7	1.7493+8	9.8766+3	2.6466+2	1.7295+2	9.1429+1	2.7587–1
	4.6204–3	4.7626–8	1.0369+6	1.1439–5	4.0807+8	1.9443+8	4.0402+7	1.7323+8	9.8567+3	2.6274+2	1.7188+2	9.0583+1	2.7810–1
	4.8102–3	4.8915–8	1.0096+6	1.2170–5	3.9732+8	1.9036+8	3.9047+7	1.6790+8	9.7936+3	2.5677+2	1.6855+2	8.7937+1	2.8538–1
	5.0000–3	5.0185–8	9.8401+5	1.2917–5	3.8726+8	1.8652+8	3.7788+7	1.6294+8	9.7334+3	2.5125+2	1.6549+2	8.5472+1	2.9263–1
M2	5.3655–3	5.2640–8	9.3811+5	1.4403–5	3.6919+8	1.7958+8	3.5577+7	1.5403+8	9.6244+3	2.4090+2	1.5963+2	8.0964+1	3.0651–1
	5.4448–3	5.3167–8	9.2882+5	1.4733–5	3.6553+8	1.7817+8	3.5134+7	1.5222+8	9.6020+3	2.3883+2	1.5847+2	8.0056+1	3.0951–1
	5.5000–3	5.3533–8	9.2248+5	1.4965–5	3.6304+8	1.7720+8	3.4833+7	1.5099+8	9.5865+3	2.3743+2	1.5768+2	7.9438+1	3.1159–1
	5.5836–3	5.4083–8	9.1309+5	1.5319–5	3.5934+8	1.7577+8	3.4387+7	1.4917+8	9.5635+3	2.3534+2	1.5651+2	7.8522+1	3.1474–1

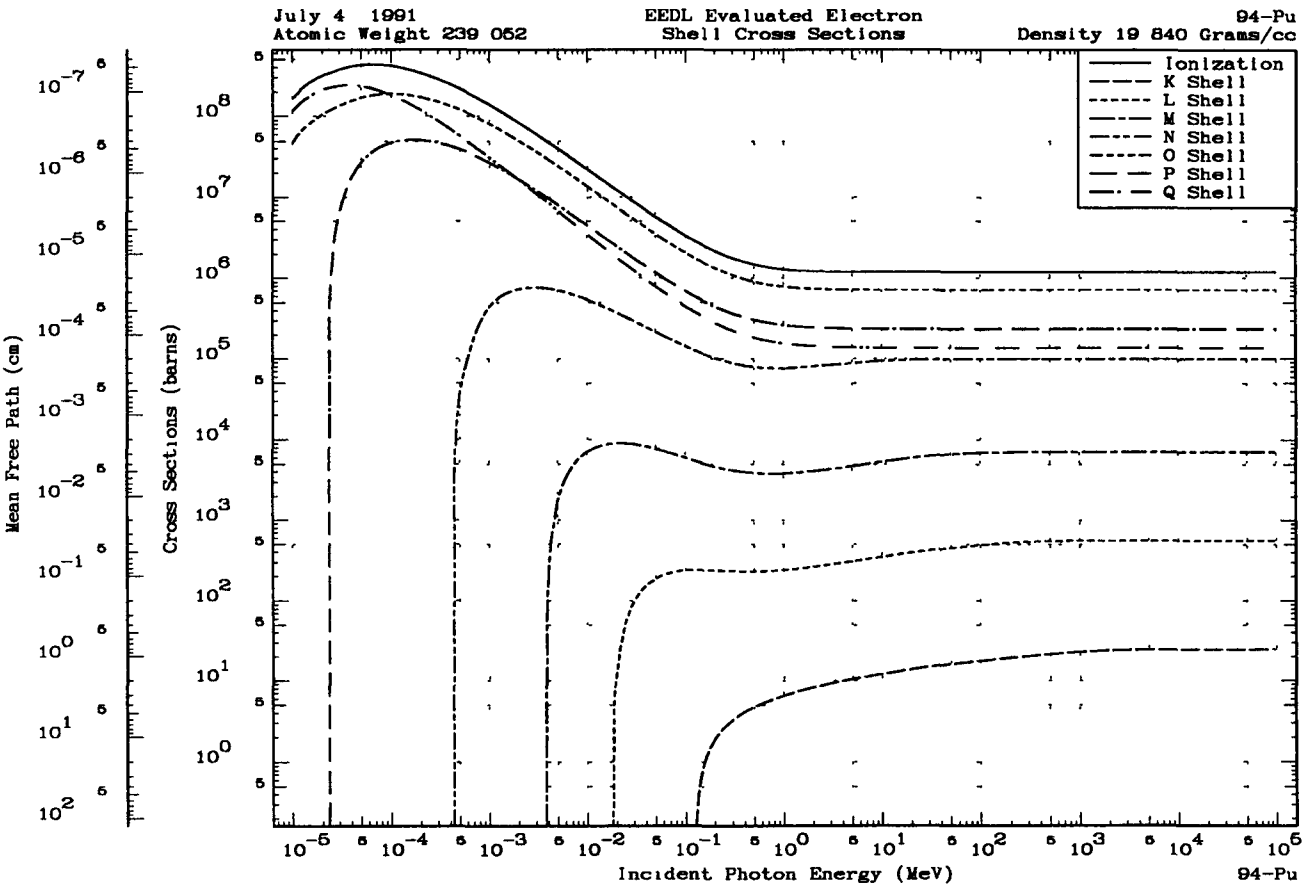
Atomic Weight 237.000													Density 20.250 Grams/cc
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M1	5.7122–3	5.4925–8	8.9910+5	1.5869–5	3.5384+8	1.7363+8	3.3726+7	1.4647+8	9.5288+3	2.3226+2	1.5477+2	7.7162+1	3.1957–1
	5.7842–3	5.5394–8	8.9147+5	1.6180–5	3.5084+8	1.7247+8	3.3368+7	1.4499+8	9.5083+3	2.3059+2	1.5384+2	7.6422+1	3.2217–1
	5.7918–3	5.5444–8	8.9067+5	1.6213–5	3.5052+8	1.7235+8	3.3330+7	1.4484+8	9.5062+3	2.3041+2	1.5374+2	7.6345+1	3.2244–1
	5.8921–3	5.6095–8	8.8034+5	1.6650–5	3.4646+8	1.7076+8	3.2846+7	1.4284+8	9.4782+3	2.2816+2	1.5249+2	7.5344+1	3.2605–1
	6.0000–3	5.6791–8	8.6955+5	1.7126–5	3.4221+8	1.6910+8	3.2341+7	1.4075+8	9.4487+3	2.2581+2	1.5118+2	7.4301+1	3.2993–1
	6.2500–3	5.8400–8	8.4559+5	1.8247–5	3.3278+8	1.6533+8	3.1222+7	1.3622+8	9.3619+3	2.2012+2	1.4778+2	7.1996+1	3.3731–1
	6.6875–3	6.1164–8	8.0739+5	2.0276–5	3.1774+8	1.5925+8	2.9454+7	1.2903+8	9.2197+3	2.1113+2	1.4244+2	6.8341+1	3.5015–1
	7.0000–3	6.3100–8	7.8261+5	2.1777–5	3.0800+8	1.5527+8	2.8317+7	1.2440+8	9.1250+3	2.0537+2	1.3902+2	6.5985+1	3.5924–1
	7.3437–3	6.5195–8	7.5746+5	2.3475–5	2.9810+8	1.5121+8	2.7172+7	1.1971+8	9.0266+3	1.9955+2	1.3558+2	6.3603+1	3.6918–1
	8.0000–3	6.9104–8	7.1461+5	2.6847–5	2.8123+8	1.4421+8	2.5244+7	1.1177+8	8.8536+3	1.8979+2	1.2983+2	5.9575+1	3.8796–1
	9.0000–3	7.5004–8	6.5840+5	3.2311–5	2.5911+8	1.3462+8	2.2794+7	1.0169+8	8.5791+3	1.7635+2	1.2153+2	5.4411+1	4.1187–1
	1.0000–2	8.0694–8	6.1197+5	3.8165–5	2.4084+8	1.2658+8	2.0808+7	9.3447+7	8.3408+3	1.6544+2	1.1481+2	5.0191+1	4.3536–1
	1.1250–2	8.7626–8	5.6356+5	4.6012–5	2.2179+8	1.1797+8	1.8785+7	8.5026+7	8.0338+3	1.5329+2	1.0701+2	4.5822+1	4.5803–1
	1.2500–2	9.4316–8	5.2359+5	5.4441–5	2.0606+8	1.1077+8	1.7143+7	7.8139+7	7.7688+3	1.4341+2	1.0068+2	4.2251+1	4.8034–1
	1.3125–2	9.7580–8	5.0607+5	5.8866–5	1.9916+8	1.0758+8	1.6433+7	7.5141+7	7.6490+3	1.3912+2	9.7926+1	4.0698+1	4.9136–1
	1.5000–2	1.0709–7	4.6115+5	7.2901–5	1.8148+8	9.9327+7	1.4637+7	6.7512+7	7.3306+3	1.2823+2	9.0959+1	3.6749+1	5.2387–1
L3	1.7626–2	1.1982–7	4.1214+5	9.4464–5	1.6220+8	9.0240+7	1.2729+7	5.9221+7	6.9172+3	1.1555+2	8.2590+1	3.2402+1	5.5959–1
	1.8220–2	1.2261–7	4.0278+5	9.9655–5	1.5851+8	8.8485+7	1.2371+7	5.7649+7	6.8317+3	1.1312+2	8.0978+1	3.1574+1	5.6660–1
	1.9110–2	1.2673–7	3.8967+5	1.0765–4	1.5335+8	8.6016+7	1.1872+7	5.5458+7	6.7103+3	1.0973+2	7.8737+1	3.0420+1	5.7706–1
	2.0000–2	1.3079–7	3.7757+5	1.1587–4	1.4859+8	8.3725+7	1.1415+7	5.3445+7	6.5965+3	1.0663+2	7.6683+1	2.9360+1	5.8744–1
	2.1250–2	1.3639–7	3.6208+5	1.2783–4	1.4250+8	8.0769+7	1.0836+7	5.0884+7	6.4451+3	1.0249+2	7.3886+1	2.8003+1	6.0109–1
L2	2.1702–2	1.3838–7	3.5686+5	1.3227–4	1.4044+8	7.9768+7	1.0642+7	5.0024+7	6.3934+3	1.0110+2	7.2947+1	2.7547+1	6.0600–1
	2.2221–2	1.4066–7	3.5107+5	1.3744–4	1.3816+8	7.8659+7	1.0429+7	4.9071+7	6.3358+3	9.9571+1	7.1915+1	2.7044+1	6.1159–1
L1	2.2440–2	1.4162–7	3.4869+5	1.3965–4	1.3723+8	7.8202+7	1.0341+7	4.8679+7	6.3120+3	9.8943+1	7.1492+1	2.6837+1	6.1395–1
	2.3193–2	1.4489–7	3.4082+5	1.4734–4	1.3413+8	7.6674+7	1.0054+7	4.7394+7	6.2275+3	9.6821+1	7.0049+1	2.6152+1	6.2044–1
	2.3385–2	1.4572–7	3.3888+5	1.4933–4	1.3337+8	7.6297+7	9.9840+6	4.7078+7	6.2066+3	9.6300+1	6.9694+1	2.5983+1	6.2210–1
	2.3438–2	1.4595–7	3.3836+5	1.4988–4	1.3316+8	7.6195+7	9.9650+6	4.6993+7	6.2009+3	9.6159+1	6.9599+1	2.5938+1	6.2254–1
	2.4895–2	1.5217–7	3.2453+5	1.6533–4	1.2772+8	7.3497+7	9.4659+6	4.4751+7	6.0501+3	9.2459+1	6.7082+1	2.4742+1	6.3505–1
	2.5000–2	1.5261–7	3.2359+5	1.6647–4	1.2735+8	7.3312+7	9.4320+6	4.4598+7	6.0398+3	9.2208+1	6.6911+1	2.4661+1	6.3595–1
	2.5039–2	1.5277–7	3.2324+5	1.6689–4	1.2721+8	7.3244+7	9.4196+6	4.4542+7	6.0359+3	9.2116+1	6.6848+1	2.4631+1	6.3629–1
	2.6719–2	1.5978–7	3.0907+5	1.8551–4	1.2163+8	7.0455+7	8.9129+6	4.2258+7	5.8781+3	8.8353+1	6.4289+1	2.3414+1	6.5061–1
	2.7447–2	1.6277–7	3.0338+5	1.9383–4	1.1940+8	6.9331+7	8.7111+6	4.1346+7	5.8139+3	8.6854+1	6.3270+1	2.2928+1	6.5679–1
	2.7519–2	1.6307–7	3.0283+5	1.9466–4	1.1918+8	6.9223+7	8.6917+6	4.1259+7	5.8077+3	8.6710+1	6.3171+1	2.2881+1	6.5739–1
	3.0000–2	1.7307–7	2.8534+5	2.2405–4	1.1229+8	6.5743+7	8.0762+6	3.8471+7	5.6067+3	8.2137+1	6.0062+1	2.1397+1	6.7825–1
	3.2500–2	1.8302–7	2.6982+5	2.5529–4	1.0619+8	6.2566+7	7.5550+6	3.6060+7	5.4132+3	7.7967+1	5.7175+1	2.0097+1	6.9534–1
	3.5000–2	1.9274–7	2.5622+5	2.8812–4	1.0083+8	5.9762+7	7.1026+6	3.3963+7	5.2399+3	7.4345+1	5.4667+1	1.8966+1	7.1229–1
	3.6250–2	1.9751–7	2.5002+5	3.0512–4	9.8395+7	5.8479+7	6.8980+6	3.3013+7	5.1598+3	7.2705+1	5.3530+1	1.8454+1	7.2070–1
	4.0000–2	2.1154–7	2.3344+5	3.5831–4	9.1872+7	5.5024+7	6.3551+6	3.0488+7	4.9416+3	6.8354+1	5.0514+1	1.7094+1	7.4569–1
	4.5000–2	2.2960–7	2.1509+5	4.3422–4	8.4647+7	5.1127+7	5.7755+6	2.7740+7	4.6868+3	6.3446+1	4.7069+1	1.5603+1	7.7382–1
	5.0000–2	2.4703–7	1.9991+5	5.1563–4	7.8674+7	4.7875+7	5.3022+6	2.5492+7	4.4699+3	5.9436+1	4.4250+1	1.4384+1	8.0152–1
	6.0000–2	2.8010–7	1.7631+5	6.9342–4	6.9385+7	4.2730+7	4.5907+6	2.2060+7	4.1165+3	5.3170+1	3.9812+1	1.2509+1	8.4975–1
	7.0000–2	3.1088–7	1.5885+5	8.9031–4	6.2515+7	3.8894+7	4.0832+6	1.9533+7	3.8418+3	4.8480+1	3.6468+1	1.1119+1	8.9239–1
	8.0000–2	3.4021–7	1.4515+5	1.1047–3	5.7125+7	3.5852+7	3.6894+6	1.7580+7	3.6187+3	4.4849+1	3.3869+1	1.0046+1	9.3415–1
	1.0000–1	3.9383–7	1.2539+5	1.5792–3	4.9348+7	3.1443+7	3.1423+6	1.4759+7	3.2830+3	3.9558+1	3.0071+1	8.4829+0	1.0047+0
K	1.1920–1	4.3862–7	1.1259+5	2.0871–3	4.4309+7	2.8514+7	2.7898+6	1.3002+7	3.0574+3	3.6104+1	2.7534+1	7.5047+0	1.0647+0
	1.2112–1	4.4280–7	1.1152+5	2.1406–3	4.3890+7	2.8273+7	2.7612+6	1.2852+7	3.0388+3	3.5816+1	2.7325+1	7.4210+0	1.0701+0
	1.2473–1	4.5056–7	1.0960+5	2.2421–3	4.3134+7	2.7839+7	2.7095+6	1.2583+7	3.0050+3	3.5296+1	2.6946+1	7.2701+0	1.0804+0
	1.3105–1	4.6393–7	1.0644+5	2.4233–3	4.1891+7	2.7122+7	2.6248+6	1.2141+7	2.9491+3	3.4447+1	2.6325+1	7.0233+0	1.0982+0
	1.4052–1	4.8348–7	1.0214+5	2.7030–3	4.0197+7	2.6140+7	2.5096+6	1.1544+7	2.8719+3	3.3296+1	2.5481+1	6.6897+0	1.1250+0
	1.5000–1	5.0248–7	9.8278+4	2.9921–3	3.8677+7	2.5255+7	2.4066+6	1.1013+7	2.8015+3	3.2272+1	2.4728+1	6.3928+0	1.1515+0
	1.6250–1	5.2589–7	9.3902+4	3.3862–3	3.6955+7	2.4230+7	2.2978+6	1.0424+7	2.7197+3	3.1158+1	2.3913+1	6.0621+0	1.1828+0
	1.8125–1	5.5957–7	8.8250+4	4.0022–3	3.4731+7	2.2899+7	2.1573+6	9.6723+6	2.6120+3	2.9732+1	2.2863+1	5.6396+0	1.2295+0
	2.0000–1	5.9175–7	8.3453+4	4.6459–3	3.2843+7	2.1761+7	2.0380+6	9.0409+6	2.5186+3	2.8537+1	2.1976+1	5.2855+0	1.2756+0
	2.2500–1	6.3119–7	7.8237+4	5.5401–3	3.0790+7	2.0440+7	1.9245+6	8.4229+6	2.4206+3	2.7386+1	2.1118+1	4.9363+0	1.3317+0
	2.6250–1	6.8680–7	7.1903+4	6.9451–3	2.8297+7	1.8832+7	1.7855+6	7.6774+6	2.2981+3	2.6005+1	2.0074+1	4.5161+0	1.4148+0
	3.0000–1	7.3890–7	6.6833+4	8.4181–3	2.6302+7	1.7541+7	1.6732+6	7.0852+6	2.1970+3	2.4921+1	1.9241+1	4.1831+0	1.4965+0
	4.0000–1	8.6749–7	5.6926+4	1.2563–2	2.2403+7	1.4768+7	1.4956+6	6.1379+6	2.0237+3	2.3348+1	1.7991+1	3.6495+0	1.7077+0
	5.0000–1	9.7648–7	5.0572+4	1.6909–2	1.9902+7	1.2854+7	1.3930+6	5.6532+6	1.9177+3	2.2672+1	1.7375+1	3.3800+0	1.9174+0
	6.0000–1	1.0743–6	4.5968+4	2.1357–2	1.8091+7	1.1477+7	1.3266+6	5.2856+6	1.8490+3	2.2296+1	1.6994+1	3.1746+0	2.1273+0
	8.0000–1	1.2335–6	4.0035+4	3.0330–2	1.5755+7	9.5969+6	1.2494+6	4.9075+6	1.7658+3	2.2284+1	1.6764+1	2.9688+0	2.5509+0
	1.0000+0	1.3667–6	3.6133+4	3.9255–2	1.4220+7	8.3534+6	1.2062+6	4.6589+6	1.7202+3	2.2533+1	1.6711+1	2.8342+0	2.9881+0
	1.5000+0	1.6052–6	3.0765+4	6.0764–2	1.2107+7	6.4908+6	1.1590+6	4.4559+6	1.6631+3	2.3974+1	1.7131+1	2.7378+0	4.1051+0
	2.0000+0	1.7797–6	2.7748+4	8.0988–2	1.0920+7	5.4271+6	1.1448+6	4.3465+6	1.6392+3	2.5489+1	1.7551+1	2.6840+0	5.2537+0
	3.0000+0	2.0131–6	2.4531+4	1.1799–1	9.6539+6	4.2501+6	1.1262+6	4.2761+6	1.6224+3	2.8615+1	1.8294+1	2.6681+0	7.6527+0
	4.0000+0	2.1566–6	2.2898+4	1.5118–1	9.0115+6	3.6380+6	1.1243+6	4.2476+6	1.6172+3	3.1712+1	1.8908+1	2.6578+0	1.0147+1
	5.0000+0	2.2577–6	2.1873+4	1.8129–1	8.6081+6	3.2592+6	1.1232+6	4.2241+6	1.6159+3	3.4742+1	1.9408+1	2.6504+0	1.2684+1
	6.0000+0	2.3324–6	2.1173+4	2.0887–1	8.3325+6	3.0057+6	1.1224+6	4.2028+6	1.6202+3	3.7815+1	1.9834+1	2.6444+0	1.5337+1
	8.0000+0	2.4384–6	2.0252+4	2.5796–1	7.9702+6	2.6816+6	1.1224+6	4.1646+6	1.6270+3	4.3827+1	2.0531+1	2.6351+0	2.0662+1
	1.0000+1	2.5083–6	1.9687+4	3.0065–1	7.7479+6	2.4930+6	1.1233+6	4.1300+6	1.6384+3	5.0010+1	2.1075+1	2.6278+0	2.6307+1
	1.5000+1	2.5873–6	1.9087+4	3.8804–1	7.5115+6	2.2751+6	1.1251+6	4.1097+6	1.6593+3	6.5074+1	2.1886+1	2.6183+0	4.0569+1
	2.0000+1	2.6182–6	1.8861+4	4.5690–1	7.4229+6	2.2009+6	1.1265+6	4.0939+6	1.6807+3	8.0702+1	2.2550+1	2.6116+0	5.5541+1
	3.0000+1	2.6301–6	1.8776+4	5.6153–1	7.3892+6	2.1918+6	1.1271+6	4.0686+6	1.7140+3	1.1219+2	2.3258+1	2.6022+0	8.6325+1
	4.0000+1	2.6363–6	1.8732+4	6.3991–1	7.3719+6	2.1915+6	1.1277+6	4.0510+6	1.7400+3	1.4433+2	2.3788+1	2.5975+0	1.1794+2
	5.0000+1	2.6411–6	1.8698+4	7.0234–1	7.3584+6	2.1906+6	1.1281+6	4.0378+6	1.7626+3	1.7712+2	2.4199+1	2.5958+0	1.5033+2
	6.0000+1	2.6458–6	1.8665+4	7.5411–1	7.3454+6	2.1899+6	1.1285+6	4.0253+6	1.7807+3	2.1015+2	2.4531+1	2.5944+0	1.8303+2
	8.0000+1	2.6484–6	1.8646+4	8.3678–1	7.3381+6	2.1888+6	1.1287+6	4.0189+6	1.8087+3	2.7676+2	2.4992+1	2.5921+0	2.4918+2
	1.0000+2	2.6507–6	1.8630+4	9.0148–1	7.3317+6	2.1879+6	1.1288+6	4.0132+6	1.8323+3	3.4387+2	2.5401+1	2.5904+0	3.1588+2
	1.5000+2	2.6561–6	1.8592+4	1.0198+0	7.3170+6	2.1863+6	1.1289+6	3.9999+6	1.8703+3	5.1235+2	2.5864+1	2.5821+0	4.8390+2
	2.0000+2	2.6581–6	1.8578+4	1.1041+0	7.3115+6	2.1852+6	1.1290+6	3.9954+6	1.8945+3	6.8236+2	2.6294+1	2.5795+0	6.5348+2
	3.0000+2	2.6613–6	1.8556+4	1.2231+0	7.3027+6	2.1836+6	1.1291+6	3.9881+6	1.9256+3	1.0204+3	2.6905+1	2.5754+0	9.9097+2

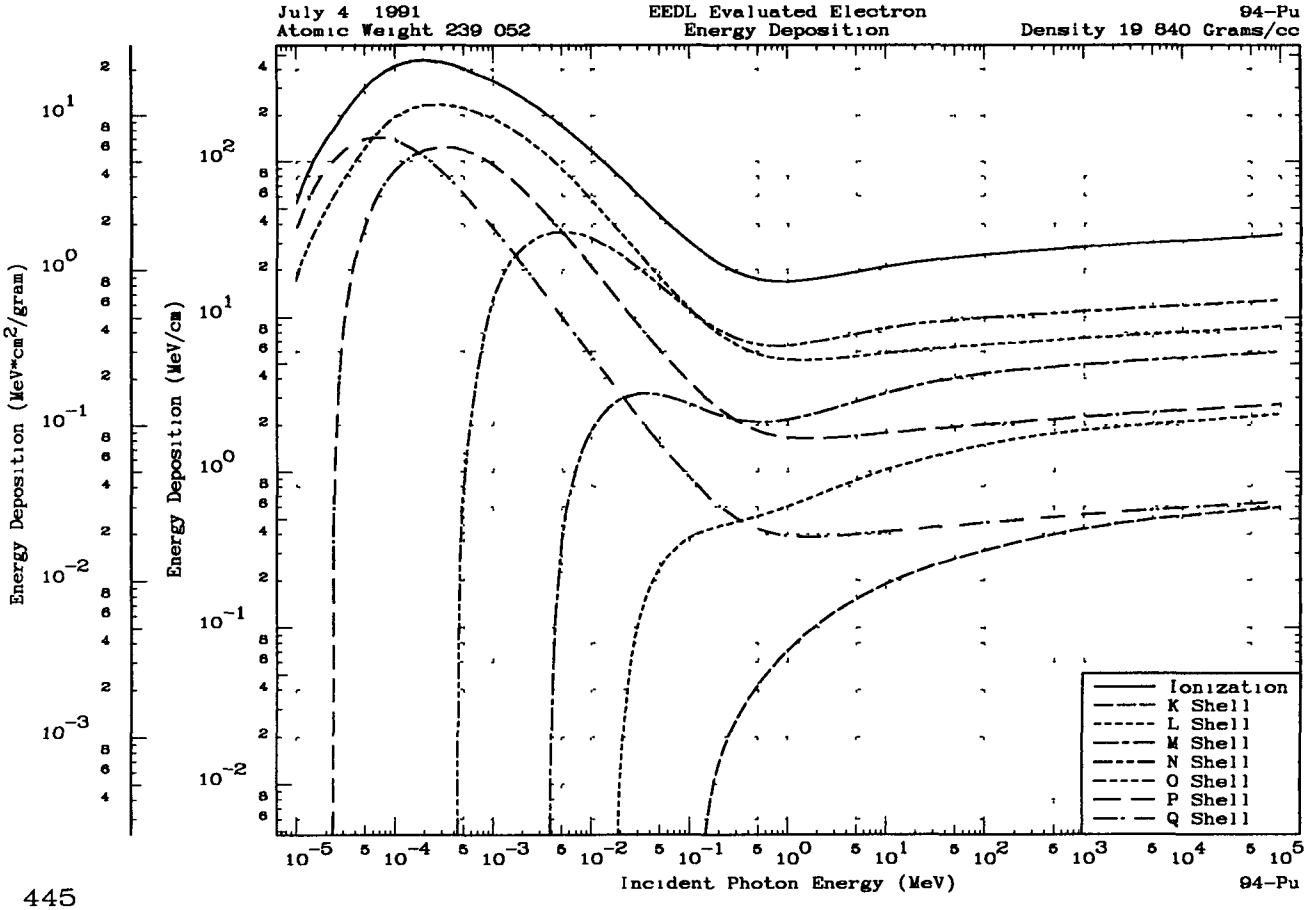
Atomic Weight 237.000												Density 20.250 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+2	2.6642–6	1.8536+4	1.3078+0	7.2946+6	2.1825+6	1.1291+6	3.9810+6	1.9479+3	1.3582+3	2.7239+1	2.5714+0	1.3283+3
5.0000+2	2.6677–6	1.8512+4	1.3735+0	7.2852+6	2.1816+6	1.1291+6	3.9725+6	1.9653+3	1.6983+3	2.7515+1	2.5665+0	1.6682+3
6.0000+2	2.6689–6	1.8503+4	1.4272+0	7.2819+6	2.1809+6	1.1292+6	3.9698+6	1.9799+3	2.0370+3	2.7768+1	2.5653+0	2.0067+3
8.0000+2	2.6714–6	1.8486+4	1.5118+0	7.2751+6	2.1798+6	1.1292+6	3.9642+6	2.0032+3	2.7208+3	2.8190+1	2.5629+0	2.6901+3
1.0000+3	2.6736–6	1.8471+4	1.5774+0	7.2690+6	2.1789+6	1.1292+6	3.9589+6	2.0215+3	3.4030+3	2.8543+1	2.5607+0	3.3719+3
1.5000+3	2.6766–6	1.8450+4	1.6964+0	7.2608+6	2.1774+6	1.1292+6	3.9522+6	2.0553+3	5.1176+3	2.8887+1	2.5563+0	5.0862+3
2.0000+3	2.6792–6	1.8432+4	1.7807+0	7.2537+6	2.1762+6	1.1292+6	3.9462+6	2.0802+3	6.8229+3	2.9227+1	2.5525+0	6.7911+3
3.0000+3	2.6823–6	1.8410+4	1.8996+0	7.2453+6	2.1747+6	1.1292+6	3.9394+6	2.1162+3	1.0238+4	2.9857+1	2.5481+0	1.0206+4
4.0000+3	2.6848–6	1.8394+4	1.9839+0	7.2388+6	2.1736+6	1.1292+6	3.9339+6	2.1424+3	1.3654+4	3.0164+1	2.5446+0	1.3622+4
5.0000+3	2.6878–6	1.8373+4	2.0491+0	7.2306+6	2.1727+6	1.1292+6	3.9266+6	2.1630+3	1.7106+4	3.0409+1	2.5399+0	1.7073+4
6.0000+3	2.6884–6	1.8369+4	2.1025+0	7.2291+6	2.1720+6	1.1292+6	3.9257+6	2.1781+3	2.0501+4	3.0620+1	2.5394+0	2.0468+4
8.0000+3	2.6900–6	1.8358+4	2.1866+0	7.2247+6	2.1709+6	1.1292+6	3.9225+6	2.2020+3	2.7350+4	3.1042+1	2.5374+0	2.7317+4
1.0000+4	2.6912–6	1.8349+4	2.2518+0	7.2214+6	2.1700+6	1.1292+6	3.9200+6	2.2207+3	3.4263+4	3.1402+1	2.5359+0	3.4229+4
1.5000+4	2.6931–6	1.8337+4	2.3704+0	7.2164+6	2.1684+6	1.1292+6	3.9165+6	2.2567+3	5.1227+4	3.1729+1	2.5336+0	5.1193+4
2.0000+4	2.6948–6	1.8325+4	2.4546+0	7.2119+6	2.1673+6	1.1292+6	3.9131+6	2.2825+3	6.8412+4	3.2056+1	2.5314+0	6.8377+4
3.0000+4	2.6964–6	1.8315+4	2.5732+0	7.2077+6	2.1658+6	1.1292+6	3.9104+6	2.3187+3	1.0239+5	3.2697+1	2.5297+0	1.0236+5
4.0000+4	2.6979–6	1.8304+4	2.6574+0	7.2036+6	2.1647+6	1.1292+6	3.9075+6	2.3448+3	1.3673+5	3.2984+1	2.5278+0	1.3670+5
5.0000+4	2.7003–6	1.8288+4	2.7228+0	7.1972+6	2.1638+6	1.1292+6	3.9019+6	2.3648+3	1.7076+5	3.3210+1	2.5242+0	1.7072+5
6.0000+4	2.7005–6	1.8286+4	2.7762+0	7.1966+6	2.1631+6	1.1292+6	3.9020+6	2.3811+3	2.0476+5	3.3417+1	2.5242+0	2.0472+5
8.0000+4	2.7015–6	1.8280+4	2.8604+0	7.1941+6	2.1620+6	1.1292+6	3.9005+6	2.4071+3	2.7334+5	3.3830+1	2.5233+0	2.7331+5
1.0000+5	2.7023–6	1.8274+4	2.9257+0	7.1917+6	2.1611+6	1.1292+6	3.8990+6	2.4273+3	3.4205+5	3.4225+1	2.5223+0	3.4201+5


July 4, 1991
Atomic Weight 239 052
EEDL Evaluated Electron
Cross Sections
94-Pu
Density 19 840 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
94-Pu


July 4, 1991
Atomic Weight 239 052
EEDL Evaluated Electron
Energy Deposition
94-Pu
Density 19 840 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
94-Pu

444


July 4 1991
Atomic Weight 239 052
EEDL Evaluated Electron
Shell Cross Sections
94-Pu
Density 19 840 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
94-Pu


July 4 1991
Atomic Weight 239 052
EEDL Evaluated Electron
Energy Deposition
94-Pu
Density 19 840 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
94-Pu

445

Atomic Weight 239.052 — Density 19.840 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	5.1656–9	9.7575+6		3.8733+9	3.6854+9	1.6326+8	2.4575+7	4.7935+3	6.3226+1	5.5372+1	7.8529+0	5.1794–4
	1.1250–5	5.3895–9	9.3522+6		3.7124+9	3.4804+9	1.9205+8	4.0001+7	4.9115+3	8.1122+1	6.7961+1	1.3160+1	5.8087–4
	1.2500–5	5.5715–9	9.0467+6		3.5911+9	3.3066+9	2.1886+8	6.5683+7	5.0195+3	1.0276+2	8.0531+1	2.2231+1	6.4493–4
	1.3125–5	5.6492–9	8.9222+6		3.5417+9	3.2291+9	2.2999+8	8.2641+7	5.0703+3	1.1456+2	8.6195+1	2.8361+1	6.7736–4
	1.5000–5	5.8301–9	8.6454+6		3.4318+9	3.0261+9	2.5972+8	1.4598+8	5.2120+3	1.5457+2	1.0240+2	5.2170+1	7.7618–4
	1.7500–5	5.9557–9	8.4631+6		3.3595+9	2.8076+9	2.9165+8	2.6017+8	5.3805+3	2.1767+2	1.2198+2	9.5689+1	9.1123–4
	2.0000–5	5.9808–9	8.4275+6		3.3453+9	2.6312+9	3.1574+8	3.9840+8	5.5309+3	2.9030+2	1.3962+2	1.5068+2	1.0497–3
P3	2.3420–5	5.9278–9	8.5028+6		3.3752+9	2.4368+9	3.3870+8	5.9973+8	5.6990+3	3.9135+2	1.5976+2	2.3159+2	1.2312–3
	2.3831–5	5.9180–9	8.5170+6		3.3808+9	2.4163+9	3.4123+8	6.2333+8	5.7174+3	4.0341+2	1.6233+2	2.4107+2	1.2528–3
	2.4602–5	5.8950–9	8.5501+6		3.3940+9	2.3792+9	3.4589+8	6.6893+8	5.7511+3	4.2660+2	1.6714+2	2.5945+2	1.2936–3
	2.6205–5	5.8298–9	8.6457+6		3.4320+9	2.3073+9	3.5526+8	7.6940+8	5.8186+3	4.7730+2	1.7712+2	3.0018+2	1.3790–3
	2.7154–5	5.8015–9	8.6879+6		3.4487+9	2.2677+9	3.6095+8	8.2001+8	5.8569+3	5.0444+2	1.8341+2	3.2103+2	1.4300–3
	3.0000–5	5.6865–9	8.8637+6		3.5185+9	2.1605+9	3.7776+8	9.8028+8	5.9658+3	5.9067+2	2.0291+2	3.8777+2	1.5845–3
	3.2500–5	5.6148–9	8.9769+6		3.5634+9	2.0780+9	3.8770+8	1.0977+9	6.0546+3	6.5359+2	2.1727+2	4.3632+2	1.7221–3
P2	3.3920–5	5.5665–9	9.0547+6		3.5943+9	2.0353+9	3.9295+8	1.1661+9	6.1027+3	6.8999+2	2.2520+2	4.6478+2	1.8011–3
	3.4300–5	5.5598–9	9.0656+6		3.5986+9	2.0243+9	3.9418+8	1.1802+9	6.1152+3	6.9802+2	2.2728+2	4.7074+2	1.8223–3
	3.5013–5	5.5465–9	9.0873+6		3.6073+9	2.0041+9	3.9650+8	1.2066+9	6.1385+3	7.1317+2	2.3123+2	4.8194+2	1.8622–3
	3.6250–5	5.5212–9	9.1290+6		3.6238+9	1.9706+9	4.0057+8	1.2526+9	6.1780+3	7.3972+2	2.3822+2	5.0149+2	1.9318–3
	3.6259–5	5.5210–9	9.1293+6		3.6239+9	1.9703+9	4.0059+8	1.2530+9	6.1783+3	7.3992+2	2.3827+2	5.0164+2	1.9323–3
	3.8130–5	5.4790–9	9.1993+6		3.6517+9	1.9227+9	4.0618+8	1.3228+9	6.2360+3	7.7979+2	2.4833+2	5.3146+2	2.0382–3
	4.0000–5	5.4323–9	9.2785+6		3.6831+9	1.8785+9	4.1177+8	1.3929+9	6.2914+3	8.2020+2	2.5862+2	5.6158+2	2.1449–3
	4.0625–5	5.4275–9	9.2866+6		3.6864+9	1.8644+9	4.1284+8	1.4091+9	6.3086+3	8.2986+2	2.6134+2	5.6853+2	2.1796–3
	4.2969–5	5.4063–9	9.3231+6		3.7009+9	1.8142+9	4.1702+8	1.4696+9	6.3714+3	8.6639+2	2.7196+2	5.9442+2	2.3101–3
	4.5000–5	5.3843–9	9.3611+6		3.7159+9	1.7740+9	4.2063+8	1.5213+9	6.4235+3	8.9798+2	2.8129+2	6.1669+2	2.4241–3
	5.0000–5	5.3933–9	9.3455+6		3.7097+9	1.6854+9	4.2893+8	1.5954+9	6.5440+3	9.5430+2	3.0410+2	6.5020+2	2.7080–3
P1	5.3120–5	5.4049–9	9.3255+6		3.7018+9	1.6365+9	4.3074+8	1.6345+9	6.6127+3	9.8330+2	3.1486+2	6.6844+2	2.8846–3
	5.3980–5	5.4114–9	9.3143+6		3.6974+9	1.6238+9	4.3131+8	1.6423+9	6.6311+3	9.9023+2	3.1798+2	6.7224+2	2.9336–3
	5.5000–5	5.4187–9	9.3017+6		3.6924+9	1.6091+9	4.3199+8	1.6513+9	6.6525+3	9.9842+2	3.2170+2	6.7671+2	2.9918–3
	5.5485–5	5.4220–9	9.2960+6		3.6901+9	1.6022+9	4.3231+8	1.6556+9	6.6626+3	1.0023+3	3.2347+2	6.7882+2	3.0195–3
	5.7743–5	5.4365–9	9.2713+6		3.6803+9	1.5715+9	4.3380+8	1.6750+9	6.7086+3	1.0202+3	3.3168+2	6.8854+2	3.1491–3
	6.0000–5	5.4491–9	9.2498+6		3.6717+9	1.5424+9	4.3535+8	1.6939+9	6.7531+3	1.0381+3	3.4001+2	6.9808+2	3.2795–3
	6.2500–5	5.4822–9	9.1939+6		3.6496+9	1.5121+9	4.3474+8	1.7027+9	6.8008+3	1.0489+3	3.4623+2	7.0270+2	3.4248–3
	6.6875–5	5.5355–9	9.1055+6		3.6145+9	1.4632+9	4.3395+8	1.7173+9	6.8806+3	1.0678+3	3.5732+2	7.1052+2	3.6812–3
	7.0000–5	5.5703–9	9.0485+6		3.5919+9	1.4311+9	4.3358+8	1.7272+9	6.9351+3	1.0813+3	3.6540+2	7.1591+2	3.8660–3
	7.3438–5	5.6065–9	8.9902+6		3.5687+9	1.3981+9	4.3288+8	1.7377+9	6.9926+3	1.0954+3	3.7367+2	7.2168+2	4.0708–3
	8.0000–5	5.6686–9	8.8916+6		3.5296+9	1.3411+9	4.3188+8	1.7566+9	7.0966+3	1.1219+3	3.8964+2	7.3226+2	4.4658–3
	9.0000–5	5.8347–9	8.6386+6		3.4291+9	1.2665+9	4.2484+8	1.7378+9	7.2413+3	1.1336+3	4.0440+2	7.2921+2	5.0780–3
	1.0000–4	5.9843–9	8.4226+6	0.0000+0	3.3434+9	1.2033+9	4.1895+8	1.7212+9	7.3731+3	1.1464+3	4.1938+2	7.2697+2	5.7012–3
O5	1.0985–4	6.1599–9	8.1824+6	8.6079–9	3.2481+9	1.1496+9	4.1003+8	1.6885+9	7.4920+3	1.1422+3	4.2681+2	7.1542+2	6.3252–3
	1.1111–4	6.1842–9	8.1503+6	9.7071–9	3.2353+9	1.1432+9	4.0900+8	1.6831+9	7.5064+3	1.1413+3	4.2789+2	7.1344+2	6.4054–3
	1.1354–4	6.2307–9	8.0894+6	1.1839–8	3.2112+9	1.1313+9	4.0707+8	1.6728+9	7.5341+3	1.1397+3	4.3003+2	7.0968+2	6.5611–3
	1.1809–4	6.3160–9	7.9802+6	1.5842–8	3.1678+9	1.1098+9	4.0361+8	1.6543+9	7.5848+3	1.1370+3	4.3411+2	7.0293+2	6.8545–3
O4	1.1950–4	6.3419–9	7.9477+6	1.7079–8	3.1549+9	1.1035+9	4.0258+8	1.6488+9	7.6001+3	1.1363+3	4.3536+2	7.0093+2	6.9453–3
	1.2141–4	6.3793–9	7.9011+6	1.8758–8	3.1364+9	1.0950+9	4.0080+8	1.6406+9	7.6206+3	1.1342+3	4.3625+2	6.9794+2	7.0688–3
	1.2498–4	6.4482–9	7.8166+6	2.1915–8	3.1028+9	1.0797+9	3.9759+8	1.6256+9	7.6583+3	1.1306+3	4.3802+2	6.9252+2	7.3011–3
	1.2607–4	6.4690–9	7.7915+6	2.2879–8	3.0929+9	1.0751+9	3.9664+8	1.6211+9	7.6696+3	1.1295+3	4.3858+2	6.9091+2	7.3722–3
	1.3124–4	6.5658–9	7.6767+6	2.7461–8	3.0473+9	1.0544+9	3.9229+8	1.6006+9	7.7222+3	1.1248+3	4.4129+2	6.8355+2	7.7104–3
	1.3125–4	6.5661–9	7.6763+6	2.7475–8	3.0472+9	1.0543+9	3.9228+8	1.6006+9	7.7223+3	1.1248+3	4.4130+2	6.8353+2	7.7113–3
	1.3803–4	6.6893–9	7.5349+6	3.3521–8	2.9910+9	1.0288+9	3.8697+8	1.5752+9	7.7889+3	1.1196+3	4.4511+2	6.7448+2	8.1589–3
	1.4062–4	6.7352–9	7.4836+6	3.5830–8	2.9706+9	1.0196+9	3.8506+8	1.5660+9	7.8135+3	1.1178+3	4.4660+2	6.7120+2	8.3301–3
	1.5000–4	6.8970–9	7.3080+6	4.4243–8	2.9009+9	9.8805+8	3.7856+8	1.5343+9	7.8998+3	1.1124+3	4.5238+2	6.5999+2	8.9566–3
	1.7500–4	7.3733–9	6.8359+6	6.7083–8	2.7136+9	9.1673+8	3.5813+8	1.4387+9	8.1098+3	1.0770+3	4.5425+2	6.2278+2	1.0692–2
	2.0000–4	7.8109–9	6.4530+6	9.0579–8	2.5615+9	8.5913+8	3.4173+8	1.3607+9	8.2962+3	1.0510+3	4.5829+2	5.9272+2	1.2469–2
O3	2.1642–4	8.1005–9	6.2222+6	1.0637–7	2.4699+9	8.2681+8	3.3007+8	1.3131+9	8.4083+3	1.0284+3	4.5478+2	5.7363+2	1.3711–2
	2.1903–4	8.1491–9	6.1851+6	1.0892–7	2.4552+9	8.2200+8	3.2830+8	1.3049+9	8.4255+3	1.0246+3	4.5425+2	5.7032+2	1.3911–2
	2.2409–4	8.2424–9	6.1151+6	1.1387–7	2.4274+9	8.1293+8	3.2498+8	1.2895+9	8.4583+3	1.0174+3	4.5331+2	5.6408+2	1.4298–2
	2.2500–4	8.2591–9	6.1028+6	1.1477–7	2.4225+9	8.1133+8	3.2439+8	1.2868+9	8.4641+3	1.0162+3	4.5315+2	5.6299+2	1.4367–2
	2.3358–4	8.4146–9	5.9900+6	1.2326–7	2.3777+9	7.9671+8	3.1902+8	1.2620+9	8.5182+3	1.0046+3	4.5160+2	5.5296+2	1.5028–2
	2.5000–4	8.7041–9	5.7907+6	1.3977–7	2.2987+9	7.7083+8	3.0957+8	1.2183+9	8.6173+3	9.8463+2	4.4932+2	5.3530+2	1.6304–2
	2.5019–4	8.7073–9	5.7886+6	1.3996–7	2.2978+9	7.7055+8	3.0947+8	1.2178+9	8.6183+3	9.8442+2	4.4930+2	5.3511+2	1.6318–2
	2.6250–4	8.9180–9	5.6518+6	1.5255–7	2.2435+9	7.5277+8	3.0300+8	1.1877+9	8.6891+3	9.7107+2	4.4804+2	5.2302+2	1.7285–2
	2.6264–4	8.9204–9	5.6504+6	1.5269–7	2.2429+9	7.5257+8	3.0293+8	1.1874+9	8.6899+3	9.7093+2	4.4803+2	5.2289+2	1.7296–2
O2	2.8133–4	9.2306–9	5.4604+6	1.7213–7	2.1675+9	7.2784+8	2.9394+8	1.1458+9	8.7921+3	9.5263+2	4.4646+2	5.0615+2	1.8778–2
	2.8600–4	9.3113–9	5.4131+6	1.7704–7	2.1488+9	7.2205+8	2.9177+8	1.1349+9	8.8168+3	9.4775+2	4.4598+2	5.0175+2	1.9150–2
	2.9300–4	9.4312–9	5.3443+6	1.8446–7	2.1215+9	7.1361+8	2.8862+8	1.1192+9	8.8532+3	9.4074+2	4.4536+2	4.9536+2	1.9712–2
	3.0000–4	9.5496–9	5.2781+6	1.9192–7	2.0952+9	7.0547+8	2.8559+8	1.1041+9	8.8888+3	9.3407+2	4.4484+2	4.8921+2	2.0275–2
	3.1250–4	9.7587–9	5.1649+6	2.0541–7	2.0503+9	6.9161+8	2.7962+8	1.0790+9	8.9508+3	9.2012+2	4.4137+2	4.7873+2	2.1287–2
	3.3438–4	1.0115–8	4.9829+6	2.2947–7	1.9780+9	6.6923+8	2.7006+8	1.0387+9	9.0544+3	8.9810+2	4.3618+2	4.6190+2	2.3075–2
O1	3.4664–4	1.0310–8	4.8887+6	2.4321–7	1.9406+9	6.5762+8	2.6512+8	1.0179+9	9.1101+3	8.8693+2	4.3369+2	4.5321+2	2.4086–2
	3.5331–4	1.0416–8	4.8389+6	2.5076–7	1.9208+9	6.5156+8	2.6251+8	1.0068+9	9.1397+3	8.8094+2	4.3228+2	4.4865+2	2.4649–2
	3.6498–4	1.0600–8	4.7552+6	2.6409–7	1.8876+9	6.4134+8	2.5814+8	9.8811+8	9.1905+3	8.7100+2	4.2999+2	4.4098+2	2.5638–2
	3.6719–4	1.0634–8	4.7399+6	2.6662–7	1.8815+9	6.3947+8	2.5733+8	9.8470+8	9.2000+3	8.6919+2	4.2959+2	4.3957+2	2.5825–2
	3.8249–4	1.0869–8	4.6371+6	2.8435–7	1.8407+9	6.2690+8	2.5198+8	9.6185+8	9.2643+3	8.5718+2	4.2697+2	4.3019+2	2.7131–2
	4.0000–4	1.1133–8	4.5272+6	3.0493–7	1.7971+9	6.1341+8	2.4626+8	9.3741+8	9.3352+3	8.4458+2	4.2438+2	4.2017+2	2.8637–2
	4.2500–4	1.1502–8	4.3820+6	3.3488–7	1.7394+9	5.9560+8	2.3787+8	9.0596+8	9.4327+3	8.2485+2	4.1791+2	4.0691+2	3.0893–2
N7	4.3309–4	1.1620–8	4.3378+6	3.4472–7	1.7219+9	5.9017+8	2.3533+8	8.9639+8	9.4633+3	8.1891+2	4.1600+2	4.0288+2	3.1629–2
	4.4145–4	1.1748–8	4.2904+6	3.5497–7	1.7031+9	5.8471+8	2.3278+8	8.8559+8	9.4943+3	8.1254+2	4.1420+2	3.9831+2	3.2392–2
N6	4.4608–4	1.1819–8	4.2648+6	3.6068–7	1.6929+9	5.8175+8	2.3141+8	8.7975+8	9.5113+3	8.0911+2	4.1323+2	3.9584+2	3.2815–2
	4.5282–4	1.1924–8	4.2272+6	3.6904–7	1.6780+9	5.7753+8	2.2945+8	8.7101+8	9.5358+3	8.0410+2	4.1190+2	3.9217+2	3.3432–2
	4.5609–4	1.1974–8	4.2093+6	3.7311–7	1.6709+9	5.7551+8	2.2852+8	8.6685+8	9.5475+3	8.0173+2	4.1128+2	3.9041+2	3.3733–2

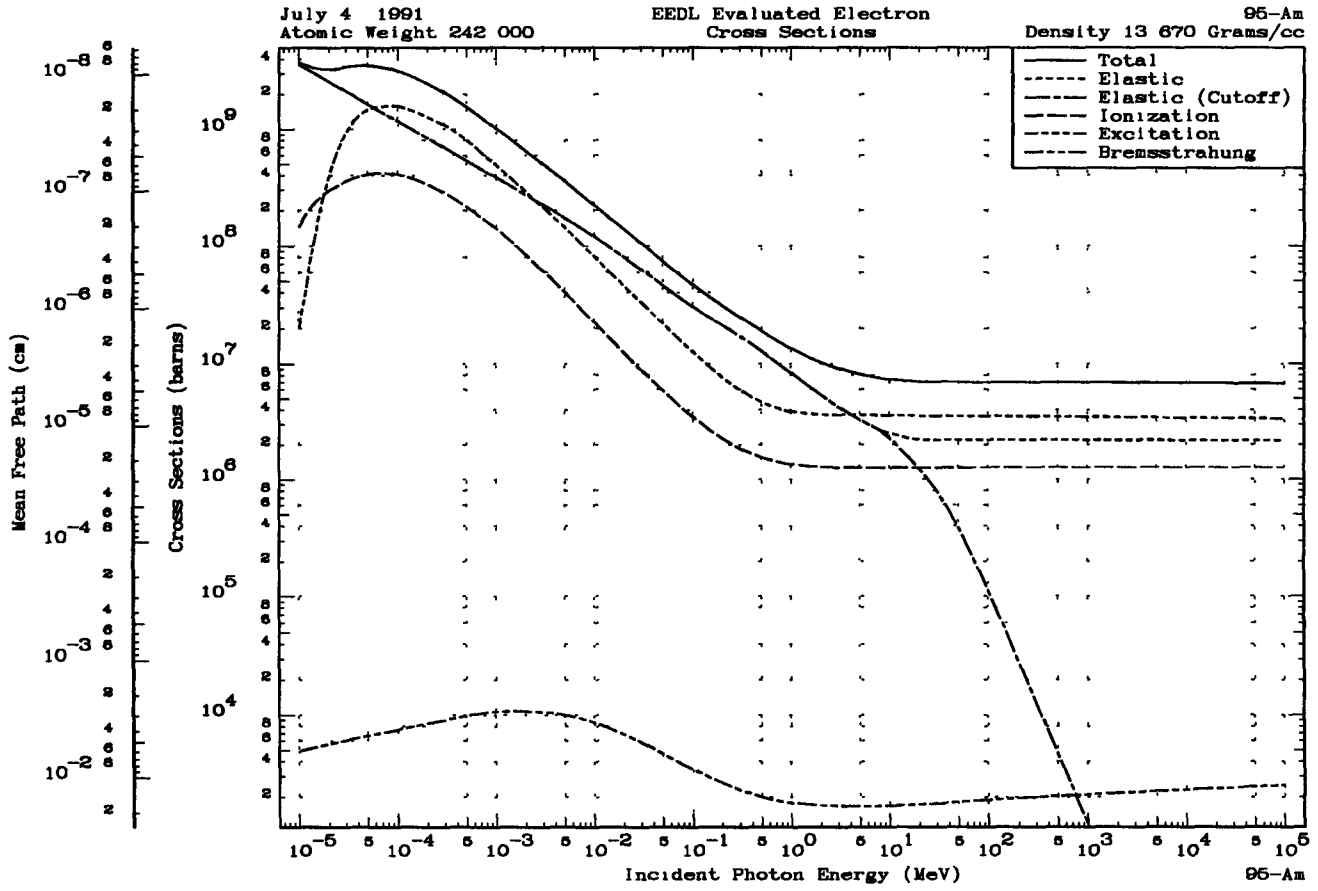
Atomic Weight 239.052 Density 19.840 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.6250–4	1.2073–8	4.1748+6	3.8113–7	1.6572+9	5.7162+8	2.2672+8	8.5884+8	9.5704+3	7.9716+2	4.1008+2	3.8704+2	3.4322–2
	4.6462–4	1.2106–8	4.1635+6	3.8378–7	1.6527+9	5.7036+8	2.2613+8	8.5623+8	9.5779+3	7.9568+2	4.0970+2	3.8595+2	3.4517–2
	4.7804–4	1.2311–8	4.0941+6	4.0076–7	1.6252+9	5.6251+8	2.2252+8	8.4014+8	9.6248+3	7.8658+2	4.0736+2	3.7918+2	3.5759–2
	5.0000–4	1.2641–8	3.9872+6	4.2892–7	1.5827+9	5.5037+8	2.1697+8	8.1540+8	9.6991+3	7.7279+2	4.0397+2	3.6879+2	3.7802–2
	5.5000–4	1.3373–8	3.7690+6	4.9494–7	1.4961+9	5.2546+8	2.0495+8	7.6570+8	9.8523+3	7.4207+2	3.9447+2	3.4756+2	4.2506–2
	6.0000–4	1.4077–8	3.5805+6	5.6351–7	1.4213+9	5.0370+8	1.9462+8	7.2298+8	9.9943+3	7.1652+2	3.8713+2	3.2934+2	4.7284–2
	6.6875–4	1.5044–8	3.3505+6	6.6189–7	1.3300+9	4.7783+8	1.8151+8	6.7063+8	1.0148+4	6.8135+2	3.7460+2	3.0669+2	5.3738–2
	6.8750–4	1.5300–8	3.2943+6	6.8958–7	1.3077+9	4.7145+8	1.7832+8	6.5791+8	1.0187+4	6.7300+2	3.7176+2	3.0119+2	5.5515–2
	7.0000–4	1.5470–8	3.2582+6	7.0823–7	1.2934+9	4.6734+8	1.7628+8	6.4974+8	1.0213+4	6.6770+2	3.6998+2	2.9766+2	5.6704–2
	7.3438–4	1.5929–8	3.1643+6	7.6024–7	1.2561+9	4.5658+8	1.7097+8	6.2852+8	1.0282+4	6.5408+2	3.6552+2	2.8850+2	5.9989–2
	7.4375–4	1.6053–8	3.1399+6	7.7461–7	1.2464+9	4.5377+8	1.6959+8	6.2302+8	1.0300+4	6.5058+2	3.6439+2	2.8613+2	6.0889–2
N5	7.9417–4	1.6707–8	3.0168+6	8.5316–7	1.1975+9	4.3953+8	1.6267+8	5.9534+8	1.0395+4	6.3325+2	3.5899+2	2.7419+2	6.5756–2
	8.0000–4	1.6784–8	3.0031+6	8.6238–7	1.1921+9	4.3798+8	1.6192+8	5.9220+8	1.0402+4	6.3136+2	3.5845+2	2.7284+2	6.6247–2
	8.2500–4	1.7109–8	2.9461+6	9.0227–7	1.1695+9	4.3147+8	1.5855+8	5.7942+8	1.0428+4	6.2212+2	3.5485+2	2.6720+2	6.8311–2
N4	8.4255–4	1.7335–8	2.9077+6	9.3062–7	1.1542+9	4.2708+8	1.5629+8	5.7084+8	1.0445+4	6.1597+2	3.5248+2	2.6342+2	6.9763–2
	8.5239–4	1.7461–8	2.8866+6	9.4664–7	1.1458+9	4.2468+8	1.5506+8	5.6609+8	1.0455+4	6.1265+2	3.5123+2	2.6135+2	7.0578–2
	8.6875–4	1.7671–8	2.8524+6	9.7346–7	1.1323+9	4.2077+8	1.5307+8	5.5841+8	1.0471+4	6.0730+2	3.4924+2	2.5799+2	7.1935–2
	8.7084–4	1.7697–8	2.8481+6	9.7691–7	1.1306+9	4.2028+8	1.5282+8	5.5744+8	1.0473+4	6.0663+2	3.4899+2	2.5757+2	7.2109–2
	9.0000–4	1.8066–8	2.7899+6	1.0253–6	1.1075+9	4.1361+8	1.4945+8	5.4440+8	1.0500+4	5.9766+2	3.4571+2	2.5187+2	7.4532–2
	9.0156–4	1.8086–8	2.7869+6	1.0280–6	1.1063+9	4.1326+8	1.4927+8	5.4372+8	1.0502+4	5.9718+2	3.4554+2	2.5157+2	7.4662–2
	9.0313–4	1.8106–8	2.7838+6	1.0306–6	1.1051+9	4.1291+8	1.4909+8	5.4304+8	1.0503+4	5.9671+2	3.4536+2	2.5128+2	7.4792–2
	9.5078–4	1.8698–8	2.6956+6	1.1114–6	1.0701+9	4.0272+8	1.4399+8	5.2334+8	1.0547+4	5.8313+2	3.4038+2	2.4267+2	7.8765–2
	9.5157–4	1.8708–8	2.6943+6	1.1127–6	1.0695+9	4.0256+8	1.4391+8	5.2303+8	1.0547+4	5.8292+2	3.4030+2	2.4254+2	7.8831–2
	1.0000–3	1.9297–8	2.6119+6	1.1967–6	1.0368+9	3.9296+8	1.3916+8	5.0469+8	1.0589+4	5.7056+2	3.3594+2	2.3454+2	8.2885–2
N3	1.1060–3	2.0553–8	2.4524+6	1.3870–6	9.7349+8	3.7418+8	1.2953+8	4.6977+8	1.0612+4	5.4367+2	3.2452+2	2.1906+2	8.9999–2
	1.1183–3	2.0696–8	2.4354+6	1.4097–6	9.6673+8	3.7217+8	1.2850+8	4.6605+8	1.0615+4	5.4070+2	3.2320+2	2.1741+2	9.0826–2
	1.1250–3	2.0774–8	2.4262+6	1.4221–6	9.6311+8	3.7110+8	1.2795+8	4.6406+8	1.0616+4	5.3911+2	3.2249+2	2.1653+2	9.1276–2
	1.1422–3	2.0973–8	2.4032+6	1.4540–6	9.5397+8	3.6837+8	1.2655+8	4.5904+8	1.0620+4	5.3513+2	3.2072+2	2.1431+2	9.2430–2
	1.1869–3	2.1486–8	2.3459+6	1.5384–6	9.3121+8	3.6156+8	1.2309+8	4.4655+8	1.0628+4	5.2528+2	3.1640+2	2.0878+2	9.5437–2
	1.2260–3	2.1928–8	2.2986+6	1.6135–6	9.1243+8	3.5590+8	1.2024+8	4.3627+8	1.0636+4	5.1728+2	3.1295+2	2.0424+2	9.8069–2
	1.2500–3	2.2196–8	2.2708+6	1.6600–6	9.0140+8	3.5257+8	1.1858+8	4.3024+8	1.0640+4	5.1264+2	3.1096+2	2.0158+2	9.9682–2
	1.2945–3	2.2689–8	2.2215+6	1.7476–6	8.8183+8	3.4662+8	1.1563+8	4.1957+8	1.0648+4	5.0448+2	3.0752+2	1.9686+2	1.0268–1
	1.3125–3	2.2886–8	2.2024+6	1.7833–6	8.7424+8	3.4431+8	1.1449+8	4.1543+8	1.0651+4	5.0135+2	3.0622+2	1.9504+2	1.0389–1
N2	1.3705–3	2.3515–8	2.1435+6	1.9002–6	8.5087+8	3.3714+8	1.1098+8	4.0273+8	1.0661+4	4.9158+2	3.0204+2	1.8943+2	1.0780–1
	1.3973–3	2.3803–8	2.1175+6	1.9548–6	8.4057+8	3.3399+8	1.0941+8	3.9716+8	1.0666+4	4.8705+2	2.9998+2	1.8696+2	1.0960–1
	1.4029–3	2.3863–8	2.1122+6	1.9664–6	8.3845+8	3.3334+8	1.0909+8	3.9601+8	1.0667+4	4.8612+2	2.9956+2	1.8645+2	1.0998–1
	1.4514–3	2.4379–8	2.0675+6	2.0671–6	8.2070+8	3.2787+8	1.0640+8	3.8641+8	1.0674+4	4.7839+2	2.9608+2	1.8220+2	1.1326–1
	1.5000–3	2.4889–8	2.0252+6	2.1694–6	8.0389+8	3.2267+8	1.0386+8	3.7736+8	1.0682+4	4.7119+2	2.9288+2	1.7819+2	1.1654–1
N1	1.5337–3	2.5237–8	1.9972+6	2.2413–6	7.9278+8	3.1920+8	1.0213+8	3.7144+8	1.0687+4	4.6585+2	2.9021+2	1.7552+2	1.1881–1
	1.5625–3	2.5535–8	1.9739+6	2.3034–6	7.8355+8	3.1633+8	1.0068+8	3.6652+8	1.0686+4	4.6136+2	2.8793+2	1.7331+2	1.2059–1
	1.5628–3	2.5538–8	1.9736+6	2.3042–6	7.8344+8	3.1630+8	1.0067+8	3.6647+8	1.0686+4	4.6131+2	2.8791+2	1.7328+2	1.2062–1
	1.6175–3	2.6097–8	1.9314+6	2.4237–6	7.6668+8	3.1106+8	9.8059+7	3.5755+8	1.0684+4	4.5322+2	2.8382+2	1.6927+2	1.2400–1
	1.6719–3	2.6645–8	1.8916+6	2.5447–6	7.5090+8	3.0610+8	9.5615+7	3.4918+8	1.0682+4	4.4569+2	2.8006+2	1.6551+2	1.2736–1
	1.7131–3	2.7056–8	1.8629+6	2.6378–6	7.3949+8	3.0249+8	9.3855+7	3.4313+8	1.0680+4	4.4030+2	2.7738+2	1.6279+2	1.2991–1
	1.7500–3	2.7421–8	1.8382+6	2.7220–6	7.2967+8	2.9938+8	9.2344+7	3.3794+8	1.0679+4	4.3570+2	2.7511+2	1.6046+2	1.3219–1
	1.8359–3	2.8258–8	1.7837+6	2.9216–6	7.0805+8	2.9248+8	8.9032+7	3.2652+8	1.0675+4	4.2556+2	2.7009+2	1.5533+2	1.3751–1
	1.8566–3	2.8456–8	1.7712+6	2.9701–6	7.0311+8	2.9090+8	8.8279+7	3.2392+8	1.0675+4	4.2326+2	2.6896+2	1.5417+2	1.3878–1
	2.0000–3	2.9814–8	1.6906+6	3.3150–6	6.7109+8	2.8056+8	8.3424+7	3.0710+8	1.0670+4	4.0863+2	2.6186+2	1.4662+2	1.4765–1
	2.2500–3	3.2163–8	1.5671+6	3.9470–6	6.2208+8	2.6475+8	7.5959+7	2.8136+8	1.0610+4	3.8279+2	2.4777+2	1.3486+2	1.6127–1
	2.5000–3	3.4412–8	1.4647+6	4.6185–6	5.8142+8	2.5137+8	6.9864+7	2.6018+8	1.0556+4	3.6198+2	2.3662+2	1.2519+2	1.7484–1
	2.6250–3	3.5504–8	1.4196+6	4.9683–6	5.6353+8	2.4540+8	6.7209+7	2.5091+8	1.0531+4	3.5277+2	2.3163+2	1.2096+2	1.8161–1
	3.0000–3	3.8665–8	1.3036+6	6.0678–6	5.1747+8	2.2979+8	6.0458+7	2.2721+8	1.0463+4	3.2965+2	2.1927+2	1.1017+2	2.0184–1
	3.5000–3	4.2729–8	1.1796+6	7.6520–6	4.6825+8	2.1265+8	5.3276+7	2.0231+8	1.0328+4	3.0199+2	2.0312+2	9.8637+1	2.2615–1
M5	3.7769–3	4.4884–8	1.1230+6	8.5881–6	4.4577+8	2.0467+8	5.0056+7	1.9104+8	1.0262+4	2.8969+2	1.9603+2	9.3423+1	2.3952–1
	3.8327–3	4.5313–8	1.1123+6	8.7814–6	4.4155+8	2.0316+8	4.9454+7	1.8893+8	1.0249+4	2.8738+2	1.9469+2	9.2447+1	2.4220–1
	3.9163–3	4.5952–8	1.0969+6	9.0743–6	4.3541+8	2.0096+8	4.8580+7	1.8586+8	1.0230+4	2.8403+2	1.9275+2	9.1028+1	2.4622–1
M4	3.9778–3	4.6418–8	1.0859+6	9.2916–6	4.3104+8	1.9938+8	4.7960+7	1.8369+8	1.0217+4	2.8165+2	1.9138+2	9.0020+1	2.4916–1
	4.0000–3	4.6587–8	1.0819+6	9.3705–6	4.2947+8	1.9880+8	4.7741+7	1.8292+8	1.0208+4	2.8082+2	1.9090+2	8.9665+1	2.5002–1
	4.0625–3	4.7064–8	1.0709+6	9.5941–6	4.2512+8	1.9718+8	4.7125+7	1.8080+8	1.0183+4	2.7824+2	1.8932+2	8.8672+1	2.5243–1
	4.1797–3	4.7951–8	1.0511+6	1.0019–5	4.1726+8	1.9424+8	4.6017+7	1.7699+8	1.0137+4	2.7361+2	1.8647+2	8.6881+1	2.5694–1
	4.2500–3	4.8479–8	1.0397+6	1.0277–5	4.1272+8	1.9253+8	4.5380+7	1.7480+8	1.0111+4	2.7095+2	1.8484+2	8.5849+1	2.5964–1
	4.3848–3	4.9481–8	1.0186+6	1.0779–5	4.0435+8	1.8938+8	4.4211+7	1.7076+8	1.0061+4	2.6607+2	1.8185+2	8.3952+1	2.6480–1
M3	4.5499–3	5.0694–8	9.9427+5	1.1406–5	3.9468+8	1.8571+8	4.2866+7	1.6609+8	1.0003+4	2.6046+2	1.7843+2	8.1762+1	2.7110–1
	4.6062–3	5.1115–8	9.8608+5	1.1623–5	3.9143+8	1.8451+8	4.2428+7	1.6449+8	9.9836+3	2.5861+2	1.7732+2	8.1014+1	2.7324–1
	4.7046–3	5.1846–8	9.7217+5	1.2006–5	3.8591+8	1.8246+8	4.1685+7	1.6176+8	9.9504+3	2.5546+2	1.7545+2	7.9742+1	2.7698–1
	4.8523–3	5.2934–8	9.5220+5	1.2589–5	3.7798+8	1.7950+8	4.0623+7	1.5785+8	9.9021+3	2.5099+2	1.7278+2	7.7922+1	2.8257–1
	5.0000–3	5.4009–8	9.3323+5	1.3183–5	3.7045+8	1.7667+8	3.9619+7	1.5415+8	9.8555+3	2.4678+2	1.7029+2	7.6200+1	2.8814–1
	5.2500–3	5.5845–8	9.0256+5	1.4211–5	3.5828+8	1.7205+8	3.8023+7	1.4819+8	9.7801+3	2.3965+2	1.6598+2	7.3371+1	2.9754–1
M2	5.5485–3	5.7998–8	8.6906+5	1.5477–5	3.4498+8	1.6696+8	3.6292+7	1.4172+8	9.6953+3	2.3196+2	1.6136+2	7.0297+1	3.0869–1
	5.6250–3	5.8546–8	8.6092+5	1.5808–5	3.4175+8	1.6572+8	3.5876+7	1.4015+8	9.6744+3	2.3012+2	1.6025+2	6.9555+1	3.1153–1
	5.6614–3	5.8805–8	8.5712+5	1.5966–5	3.4024+8	1.6514+8	3.5682+7	1.3941+8	9.6646+3	2.2926+2	1.5973+2	6.9209+1	3.1288–1
	5.8307–3	6.0006–8	8.3997+5	1.6711–5	3.3343+8	1.6251+8	3.4808+7	1.3610+8	9.6199+3	2.2539+2	1.5742+2	6.7648+1	3.1916–1
M1	5.9021–3	6.0509–8	8.3299+5	1.7029–5	3.3066+8	1.6144+8	3.4453+7	1.3476+8	9.6015+3	2.2382+2	1.5648+2	6.7014+1	3.2180–1
	6.0000–3	6.1198–8	8.2361+5	1.7468–5	3.2694+8	1.6000+8	3.3980+7	1.3295+8	9.5708+3	2.2173+2	1.5524+2	6.6164+1	3.2501–1
	6.1250–3	6.2072–8	8.1202+5	1.8036–5	3.2234+8	1.5820+8	3.3387+7	1.3074+8	9.5267+3	2.1887+2	1.5343+2	6.5109+1	3.2867–1
	6.2500–3	6.2939–8	8.0082+5	1.8611–5	3.1789+8	1.5645+8	3.2817+7	1.2862+8	9.4836+3	2.1611+2	1.5169+2	6.4093+1	3.3232–1
	6.3594–3	6.3693–8	7.9134+5	1.9119–5	3.1413+8	1.5496+8	3.2335+7	1.2682+8	9.4468+3	2.1378+2	1.5022+2	6.3234+1	3.3550–1
	6.6875–3	6.5930–8	7.6449+5	2.0678–5	3.0347+8	1.5073+8	3.0977+7	1.2176+8	9.3408+3	2.0725+2	1.4609+2	6.0810+1	3.4501–1
	6.7695–3	6.6484–8	7.5813+5	2.1076–5	3.0094+8	1.4972+8	3.0657+7	1.2056+8	9.3153+3	2.0571+2	1.4512+2	6.0238+1	3.4738–1
	7.0000–3	6.8026–8	7.4094+5	2.2207–5	2.9412+8	1.4699+8	2.9794+7	1.1733+8	9.2456+3	2.0157+2	1.4252+2	5.8695+1	3.5401–1

Atomic Weight 239.052 — Density 19.840 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	7.3437–3	7.0294–8	7.1703+5	2.3937–5	2.8463+8	1.4316+8	2.8602+7	1.1286+8	9.1467+3	1.9584+2	1.3892+2	5.6558+1	3.6384–1
	7.3848–3	7.0563–8	7.1430+5	2.4147–5	2.8355+8	1.4272+8	2.8467+7	1.1235+8	9.1353+3	1.9519+2	1.3851+2	5.6315+1	3.6501–1
	8.0000–3	7.4526–8	6.7632+5	2.7374–5	2.6847+8	1.3657+8	2.6593+7	1.0530+8	8.9728+3	1.8622+2	1.3289+2	5.2945+1	3.8242–1
	9.0000–3	8.0837–8	6.2352+5	3.2944–5	2.4751+8	1.2775+8	2.4038+7	9.5711+7	8.6966+3	1.7299+2	1.2427+2	4.8317+1	4.0609–1
	1.0000–2	8.6917–8	5.7990+5	3.8912–5	2.3020+8	1.2035+8	2.1964+7	8.7877+7	8.4568+3	1.6226+2	1.1729+2	4.4540+1	4.2935–1
	1.1250–2	9.4293–8	5.3454+5	4.6915–5	2.1219+8	1.1245+8	1.9847+7	7.9888+7	8.1477+3	1.5029+2	1.0921+2	4.0629+1	4.5184–1
	1.2500–2	1.0140–7	4.9707+5	5.5513–5	1.9731+8	1.0582+8	1.8128+7	7.3359+7	7.8808+3	1.4057+2	1.0266+2	3.7435+1	4.7396–1
	1.3125–2	1.0487–7	4.8064+5	6.0027–5	1.9079+8	1.0288+8	1.7383+7	7.0520+7	7.7602+3	1.3634+2	9.9812+1	3.6047+1	4.8488–1
	1.5000–2	1.1495–7	4.3850+5	7.4349–5	1.7406+8	9.5260+7	1.5499+7	6.3297+7	7.4394+3	1.2565+2	9.2614+1	3.2520+1	5.1713–1
L3	1.8071–2	1.3092–7	3.8500+5	1.0029–4	1.5283+8	8.5330+7	1.3210+7	5.4282+7	6.9606+3	1.1137+2	8.2743+1	2.8064+1	5.5854–1
	1.8553–2	1.3335–7	3.7798+5	1.0466–4	1.5004+8	8.4002+7	1.2916+7	5.3116+7	6.8918+3	1.0950+2	8.1450+1	2.7485+1	5.6401–1
	1.9277–2	1.3696–7	3.6801+5	1.1135–4	1.4608+8	8.2111+7	1.2500+7	5.1466+7	6.7931+3	1.0686+2	7.9626+1	2.6666+1	5.7219–1
	2.0000–2	1.4053–7	3.5866+5	1.1820–4	1.4237+8	8.0329+7	1.2112+7	4.9925+7	6.6994+3	1.0441+2	7.7925+1	2.5901+1	5.8032–1
	2.1250–2	1.4660–7	3.4382+5	1.3041–4	1.3648+8	7.7478+7	1.1502+7	4.7496+7	6.5467+3	1.0034+2	7.5055+1	2.4687+1	5.9391–1
L2	2.2371–2	1.5194–7	3.3174+5	1.4177–4	1.3168+8	7.5140+7	1.1009+7	4.5529+7	6.4199+3	9.7042+1	7.2732+1	2.3704+1	6.0599–1
	2.2848–2	1.5418–7	3.2691+5	1.4672–4	1.2977+8	7.4201+7	1.0814+7	4.4749+7	6.3669+3	9.5730+1	7.1807+1	2.3312+1	6.1038–1
L1	2.3122–2	1.5546–7	3.2422+5	1.4959–4	1.2870+8	7.3676+7	1.0705+7	4.4314+7	6.3371+3	9.4998+1	7.1292+1	2.3093+1	6.1290–1
	2.3438–2	1.5694–7	3.2117+5	1.5293–4	1.2749+8	7.3079+7	1.0583+7	4.3822+7	6.3023+3	9.4153+1	7.0692+1	2.2846+1	6.1560–1
	2.3742–2	1.5835–7	3.1830+5	1.5617–4	1.2635+8	7.2515+7	1.0468+7	4.3360+7	6.2693+3	9.3358+1	7.0127+1	2.2613+1	6.1819–1
	2.3982–2	1.5947–7	3.1608+5	1.5875–4	1.2547+8	7.2079+7	1.0380+7	4.3003+7	6.2437+3	9.2744+1	6.9691+1	2.2433+1	6.2024–1
	2.5078–2	1.6451–7	3.0639+5	1.7075–4	1.2162+8	7.0171+7	9.9950+6	4.1450+7	6.1313+3	9.0077+1	6.7796+1	2.1652+1	6.2956–1
	2.5306–2	1.6555–7	3.0446+5	1.7329–4	1.2086+8	6.9791+7	9.9188+6	4.1143+7	6.1087+3	8.9548+1	6.7421+1	2.1497+1	6.3149–1
	2.5486–2	1.6637–7	3.0297+5	1.7530–4	1.2026+8	6.9495+7	9.8596+6	4.0903+7	6.0912+3	8.9138+1	6.7129+1	2.1376+1	6.3302–1
	2.7539–2	1.7557–7	2.8708+5	1.9891–4	1.1396+8	6.6338+7	9.2353+6	3.8378+7	5.9023+3	8.4809+1	6.4053+1	2.0106+1	6.5032–1
	2.7653–2	1.7608–7	2.8626+5	2.0026–4	1.1363+8	6.6174+7	9.2031+6	3.8248+7	5.8924+3	8.4586+1	6.3894+1	2.0040+1	6.5128–1
	2.7743–2	1.7647–7	2.8561+5	2.0132–4	1.1337+8	6.6045+7	9.1779+6	3.8146+7	5.8846+3	8.4411+1	6.3770+1	1.9989+1	6.5203–1
	3.0000–2	1.8632–7	2.7052+5	2.2872–4	1.0738+8	6.3017+7	8.5916+6	3.5769+7	5.7004+3	8.0348+1	6.0883+1	1.8794+1	6.7084–1
	3.2500–2	1.9696–7	2.5590+5	2.6066–4	1.0158+8	6.0038+7	8.0402+6	3.3498+7	5.5048+3	7.6257+1	5.7932+1	1.7637+1	6.8791–1
	3.5000–2	2.0735–7	2.4309+5	2.9423–4	9.6495+7	5.7405+7	7.5614+6	3.1523+7	5.3296+3	7.2706+1	5.5369+1	1.6632+1	7.0484–1
	3.6250–2	2.1245–7	2.3725+5	3.1161–4	9.4179+7	5.6199+7	7.3447+6	3.0629+7	5.2486+3	7.1097+1	5.4207+1	1.6177+1	7.1325–1
	4.0000–2	2.2742–7	2.2163+5	3.6601–4	8.7979+7	5.2950+7	6.7697+6	2.8255+7	5.0280+3	6.6830+1	5.1123+1	1.4969+1	7.3819–1
	4.5000–2	2.4659–7	2.0440+5	4.4365–4	8.1138+7	4.9303+7	6.1551+6	2.5675+7	4.7700+3	6.2028+1	4.7617+1	1.3645+1	7.6630–1
	5.0000–2	2.6508–7	1.9015+5	5.2692–4	7.5479+7	4.6254+7	5.6529+6	2.3567+7	4.5505+3	5.8109+1	4.4750+1	1.2565+1	7.9398–1
	6.0000–2	3.0009–7	1.6796+5	7.0881–4	6.6672+7	4.1417+7	4.8967+6	2.0354+7	4.1925+3	5.1960+1	4.0214+1	1.0904+1	8.4218–1
	7.0000–2	3.3264–7	1.5152+5	9.1028–4	6.0148+7	3.7786+7	4.3566+6	1.8001+7	3.9140+3	4.7379+1	3.6814+1	9.6804+0	8.8479–1
	8.0000–2	3.6362–7	1.3862+5	1.1297–3	5.5025+7	3.4899+7	3.9374+6	1.6184+7	3.6878+3	4.3836+1	3.4173+1	8.7366+0	9.2650–1
	1.0000–1	4.2072–7	1.1980+5	1.6151–3	4.7556+7	3.0646+7	3.3544+6	1.3552+7	3.3471+3	3.8670+1	3.0316+1	7.3571+0	9.9701–1
K	1.2235–1	4.7593–7	1.0591+5	2.2238–3	4.2040+7	2.7415+7	2.9264+6	1.1695+7	3.0873+3	3.4834+1	2.7387+1	6.3800+0	1.0664+0
	1.2408–1	4.7985–7	1.0504+5	2.2736–3	4.1696+7	2.7218+7	2.9003+6	1.1575+7	3.0709+3	3.4593+1	2.7205+1	6.3169+0	1.0713+0
	1.2732–1	4.8713–7	1.0347+5	2.3678–3	4.1073+7	2.6858+7	2.8529+6	1.1359+7	3.0411+3	3.4157+1	2.6874+1	6.2025+0	1.0804+0
	1.3299–1	4.9970–7	1.0087+5	2.5356–3	4.0040+7	2.6260+7	2.7747+6	1.1002+7	2.9913+3	3.3437+1	2.6327+1	6.0141+0	1.0963+0
	1.4149–1	5.1811–7	9.7282+4	2.7938–3	3.8617+7	2.5433+7	2.6670+6	1.0513+7	2.9219+3	3.2452+1	2.5575+1	5.7564+0	1.1202+0
	1.5000–1	5.3606–7	9.4026+4	3.0596–3	3.7324+7	2.4678+7	2.5695+6	1.0073+7	2.8580+3	3.1563+1	2.4895+1	5.5243+0	1.1439+0
	1.6250–1	5.6116–7	8.9820+4	3.4627–3	3.5655+7	2.3695+7	2.4531+6	9.5039+6	2.7749+3	3.0465+1	2.4069+1	5.2208+0	1.1752+0
	1.8125–1	5.9725–7	8.4393+4	4.0927–3	3.3500+7	2.2416+7	2.3028+6	8.7788+6	2.6654+3	2.9062+1	2.3006+1	4.8345+0	1.2219+0
	2.0000–1	6.3171–7	7.9789+4	4.7513–3	3.1673+7	2.1322+7	2.1752+6	8.1726+6	2.5705+3	2.7887+1	2.2107+1	4.5118+0	1.2681+0
	2.2500–1	6.7334–7	7.4856+4	5.6663–3	2.9715+7	2.0051+7	2.0538+6	7.6072+6	2.4708+3	2.6769+1	2.1235+1	4.2093+0	1.3243+0
	2.6250–1	7.3197–7	6.8860+4	7.1034–3	2.7334+7	1.8501+7	1.9050+6	6.9257+6	2.3461+3	2.5430+1	2.0177+1	3.8455+0	1.4075+0
	3.0000–1	7.8684–7	6.4058+4	8.6094–3	2.5428+7	1.7256+7	1.7850+6	6.3850+6	2.2432+3	2.4379+1	1.9332+1	3.5575+0	1.4892+0
	4.0000–1	9.1883–7	5.4856+4	1.2844–2	2.1775+7	1.4649+7	1.5950+6	5.5295+6	2.0666+3	2.2864+1	1.8063+1	3.1021+0	1.6996+0
	5.0000–1	1.0328–6	4.8803+4	1.7283–2	1.9373+7	1.2816+7	1.4844+6	5.0704+6	1.9583+3	2.2200+1	1.7431+1	2.8599+0	1.9084+0
	6.0000–1	1.1375–6	4.4309+4	2.1824–2	1.7589+7	1.1444+7	1.4132+6	4.7297+6	1.8881+3	2.1840+1	1.7042+1	2.6795+0	2.1183+0
	8.0000–1	1.3115–6	3.8431+4	3.0983–2	1.5256+7	9.5508+6	1.3308+6	4.3720+6	1.8029+3	2.1831+1	1.6797+1	2.4942+0	2.5396+0
	1.0000+0	1.4591–6	3.4544+4	4.0092–2	1.3712+7	8.2868+6	1.2845+6	4.1393+6	1.7562+3	2.2082+1	1.6734+1	2.3742+0	2.9737+0
	1.5000+0	1.7243–6	2.9231+4	6.2034–2	1.1604+7	6.4147+6	1.2338+6	3.9534+6	1.6974+3	2.3509+1	1.7138+1	2.2894+0	4.0813+0
	2.0000+0	1.9115–6	2.6368+4	8.2647–2	1.0467+7	5.3706+6	1.2178+6	3.8767+6	1.6713+3	2.5019+1	1.7545+1	2.2559+0	5.2184+0
	3.0000+0	2.1604–6	2.3330+4	1.2034–1	9.2610+6	4.2430+6	1.1977+6	3.8186+6	1.6511+3	2.8102+1	1.8268+1	2.2443+0	7.5896+0
	4.0000+0	2.3175–6	2.1749+4	1.5412–1	8.6334+6	3.6339+6	1.1955+6	3.8023+6	1.6452+3	3.1158+1	1.8864+1	2.2408+0	1.0054+1
	5.0000+0	2.4275–6	2.0763+4	1.8476–1	8.2421+6	3.2590+6	1.1941+6	3.7874+6	1.6433+3	3.4165+1	1.9368+1	2.2381+0	1.2560+1
	6.0000+0	2.5087–6	2.0091+4	2.1280–1	7.9752+6	3.0072+6	1.1931+6	3.7734+6	1.6468+3	3.7203+1	1.9786+1	2.2359+0	1.5181+1
	8.0000+0	2.6243–6	1.9206+4	2.6267–1	7.6240+6	2.6825+6	1.1929+6	3.7469+6	1.6523+3	4.3143+1	2.0472+1	2.2324+0	2.0438+1
	1.0000+1	2.6989–6	1.8676+4	3.0603–1	7.4134+6	2.4961+6	1.1937+6	3.7219+6	1.6633+3	4.9253+1	2.1004+1	2.2297+0	2.6019+1
	1.5000+1	2.7880–6	1.8079+4	3.9474–1	7.1764+6	2.2778+6	1.1956+6	3.7013+6	1.6834+3	6.4130+1	2.1799+1	2.2202+0	4.0111+1
	2.0000+1	2.8233–6	1.7853+4	4.6459–1	7.0867+6	2.2025+6	1.1970+6	3.6855+6	1.7056+3	7.9575+1	2.2447+1	2.2135+0	5.4914+1
	3.0000+1	2.8361–6	1.7772+4	5.7065–1	7.0546+6	2.1948+6	1.1976+6	3.6604+6	1.7408+3	1.1071+2	2.3151+1	2.2040+0	8.5358+1
	4.0000+1	2.8390–6	1.7754+4	6.5004–1	7.0475+6	2.1944+6	1.1982+6	3.6530+6	1.7687+3	1.4254+2	2.3689+1	2.2051+0	1.1665+2
	5.0000+1	2.8414–6	1.7739+4	7.1325–1	7.0414+6	2.1936+6	1.1986+6	3.6475+6	1.7930+3	1.7497+2	2.4088+1	2.2073+0	1.4867+2
	6.0000+1	2.8441–6	1.7722+4	7.6565–1	7.0349+6	2.1929+6	1.1989+6	3.6414+6	1.8124+3	2.0769+2	2.4409+1	2.2092+0	1.8107+2
	8.0000+1	2.8436–6	1.7725+4	8.4925–1	7.0362+6	2.1917+6	1.1992+6	3.6434+6	1.8422+3	2.7380+2	2.4871+1	2.2120+0	2.4672+2
	1.0000+2	2.8434–6	1.7726+4	9.1468–1	7.0366+6	2.1908+6	1.1994+6	3.6445+6	1.8644+3	3.3995+2	2.5271+1	2.2143+0	3.1247+2
	1.5000+2	2.8435–6	1.7726+4	1.0344+0	7.0363+6	2.1892+6	1.1995+6	3.6456+6	1.9023+3	5.0635+2	2.5722+1	2.2152+0	4.7841+2
	2.0000+2	2.8447–6	1.7718+4	1.1197+0	7.0335+6	2.1881+6	1.1996+6	3.6438+6	1.9279+3	6.7464+2	2.6140+1	2.2144+0	6.4629+2
	3.0000+2	2.8468–6	1.7705+4	1.2400+0	7.0282+6	2.1865+6	1.1997+6	3.6401+6	1.9603+3	1.0090+3	2.6747+1	2.2126+0	9.8002+2
	4.0000+2	2.8495–6	1.7688+4	1.3257+0	7.0215+6	2.1854+6	1.1997+6	3.6345+6	1.9828+3	1.3429+3	2.7072+1	2.2097+0	1.3137+3
	5.0000+2	2.8530–6	1.7667+4	1.3921+0	7.0129+6	2.1845+6	1.1997+6	3.6267+6	2.0004+3	1.6793+3	2.7361+1	2.2055+0	1.6497+3
	6.0000+2	2.8540–6	1.7661+4	1.4464+0	7.0104+6	2.1838+6	1.1997+6	3.6249+6	2.0153+3	2.0162+3	2.7596+1	2.2049+0	1.9864+3
	8.0000+2	2.8566–6	1.7644+4	1.5319+0	7.0040+6	2.1827+6	1.1997+6	3.6196+6	2.0392+3	2.6912+3	2.8011+1	2.2027+0	2.6610+3
	1.0000+3	2.8587–6	1.7631+4	1.5982+0	6.9989+6	2.1818+6	1.1997+6	3.6153+6	2.0579+3	3.3665+3	2.8363+1	2.2011+0	3.3360+3
	1.5000+3	2.8617–6	1.7613+4	1.7187+0	6.9915+6	2.1802+6	1.1997+6	3.6094+6	2.0920+3	5.0517+3	2.8700+1	2.1976+0	5.0208+3
	2.0000+3	2.8646–6	1.7595+4	1.8041+0	6.9845+6	2.1791+6	1.1997+6	3.6036+6	2.1173+3	6.7400+3	2.9032+1	2.1940+0	6.7087+3

Atomic Weight 239.052												Density 19.840 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+3	2.8680–6	1.7575+4	1.9242+0	6.9763+6	2.1775+6	1.1997+6	3.5970+6	2.1542+3	1.0143+4	2.9648+1	2.1900+0	1.0111+4
4.0000+3	2.8707–6	1.7558+4	2.0093+0	6.9696+6	2.1764+6	1.1997+6	3.5913+6	2.1809+3	1.3518+4	2.9951+1	2.1866+0	1.3486+4
5.0000+3	2.8741–6	1.7537+4	2.0753+0	6.9614+6	2.1755+6	1.1997+6	3.5839+6	2.2018+3	1.6914+4	3.0198+1	2.1822+0	1.6882+4
6.0000+3	2.8749–6	1.7532+4	2.1292+0	6.9596+6	2.1748+6	1.1997+6	3.5828+6	2.2171+3	2.0271+4	3.0405+1	2.1815+0	2.0239+4
8.0000+3	2.8767–6	1.7521+4	2.2143+0	6.9551+6	2.1737+6	1.1997+6	3.5794+6	2.2414+3	2.7043+4	3.0818+1	2.1795+0	2.7010+4
1.0000+4	2.8781–6	1.7513+4	2.2803+0	6.9519+6	2.1728+6	1.1997+6	3.5771+6	2.2605+3	3.3879+4	3.1171+1	2.1782+0	3.3845+4
1.5000+4	2.8802–6	1.7500+4	2.4001+0	6.9466+6	2.1712+6	1.1997+6	3.5734+6	2.2970+3	5.0652+4	3.1491+1	2.1760+0	5.0618+4
2.0000+4	2.8821–6	1.7488+4	2.4853+0	6.9420+6	2.1701+6	1.1997+6	3.5698+6	2.3233+3	6.7643+4	3.1811+1	2.1738+0	6.7609+4
3.0000+4	2.8841–6	1.7476+4	2.6053+0	6.9373+6	2.1685+6	1.1997+6	3.5667+6	2.3602+3	1.0124+5	3.2438+1	2.1719+0	1.0120+5
4.0000+4	2.8858–6	1.7466+4	2.6905+0	6.9333+6	2.1674+6	1.1997+6	3.5637+6	2.3867+3	1.3520+5	3.2721+1	2.1701+0	1.3516+5
5.0000+4	2.8884–6	1.7450+4	2.7565+0	6.9268+6	2.1665+6	1.1997+6	3.5582+6	2.4071+3	1.6884+5	3.2949+1	2.1667+0	1.6880+5
6.0000+4	2.8887–6	1.7448+4	2.8105+0	6.9261+6	2.1658+6	1.1997+6	3.5582+6	2.4237+3	2.0245+5	3.3151+1	2.1667+0	2.0242+5
8.0000+4	2.8898–6	1.7442+4	2.8957+0	6.9236+6	2.1647+6	1.1997+6	3.5567+6	2.4502+3	2.7027+5	3.3556+1	2.1658+0	2.7024+5
1.0000+5	2.8907–6	1.7436+4	2.9618+0	6.9215+6	2.1639+6	1.1997+6	3.5554+6	2.4707+3	3.3821+5	3.3943+1	2.1651+0	3.3817+5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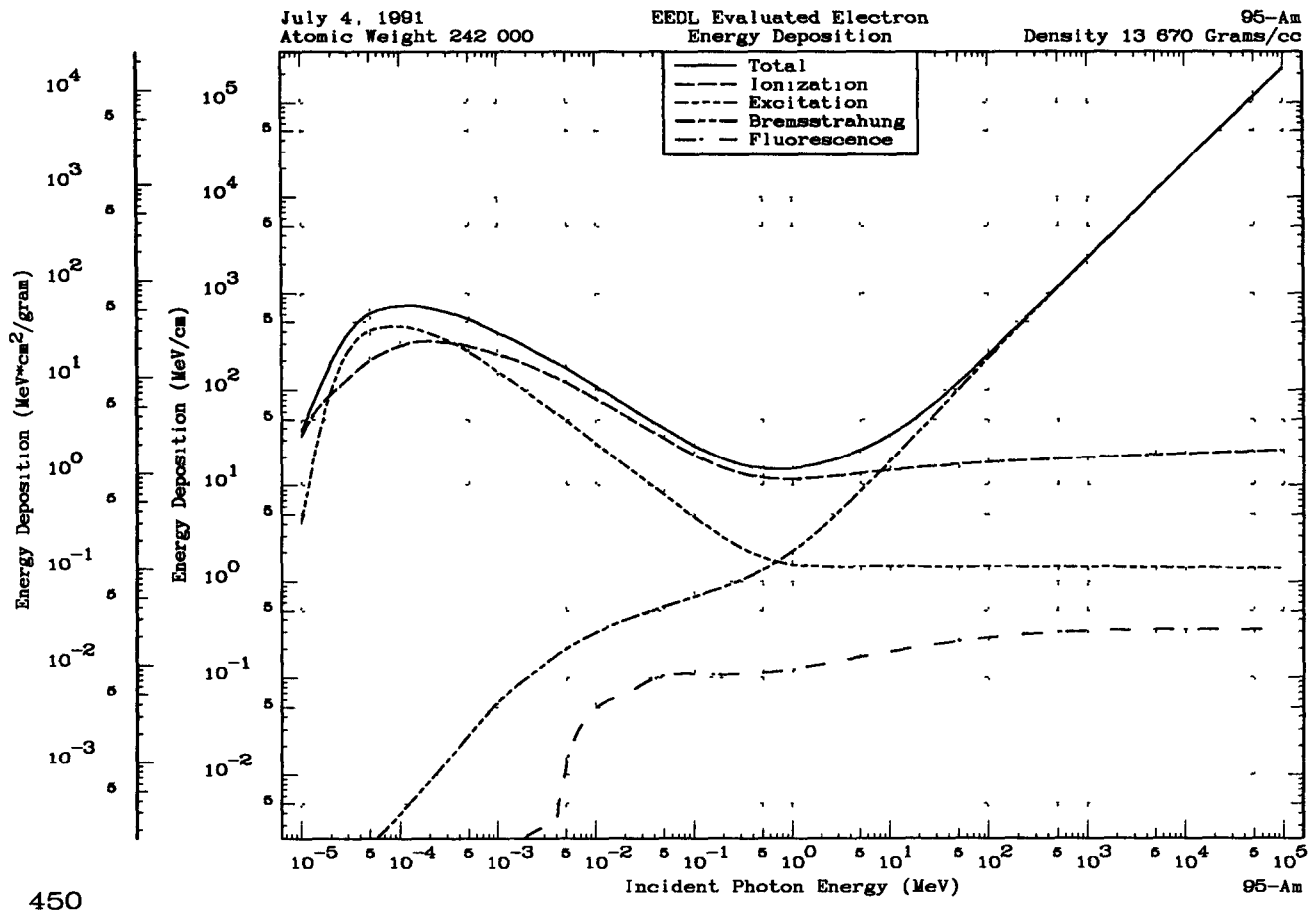
EEDL Evaluated Electron
Cross Sections
95-Am
Density 13 670 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
95-Am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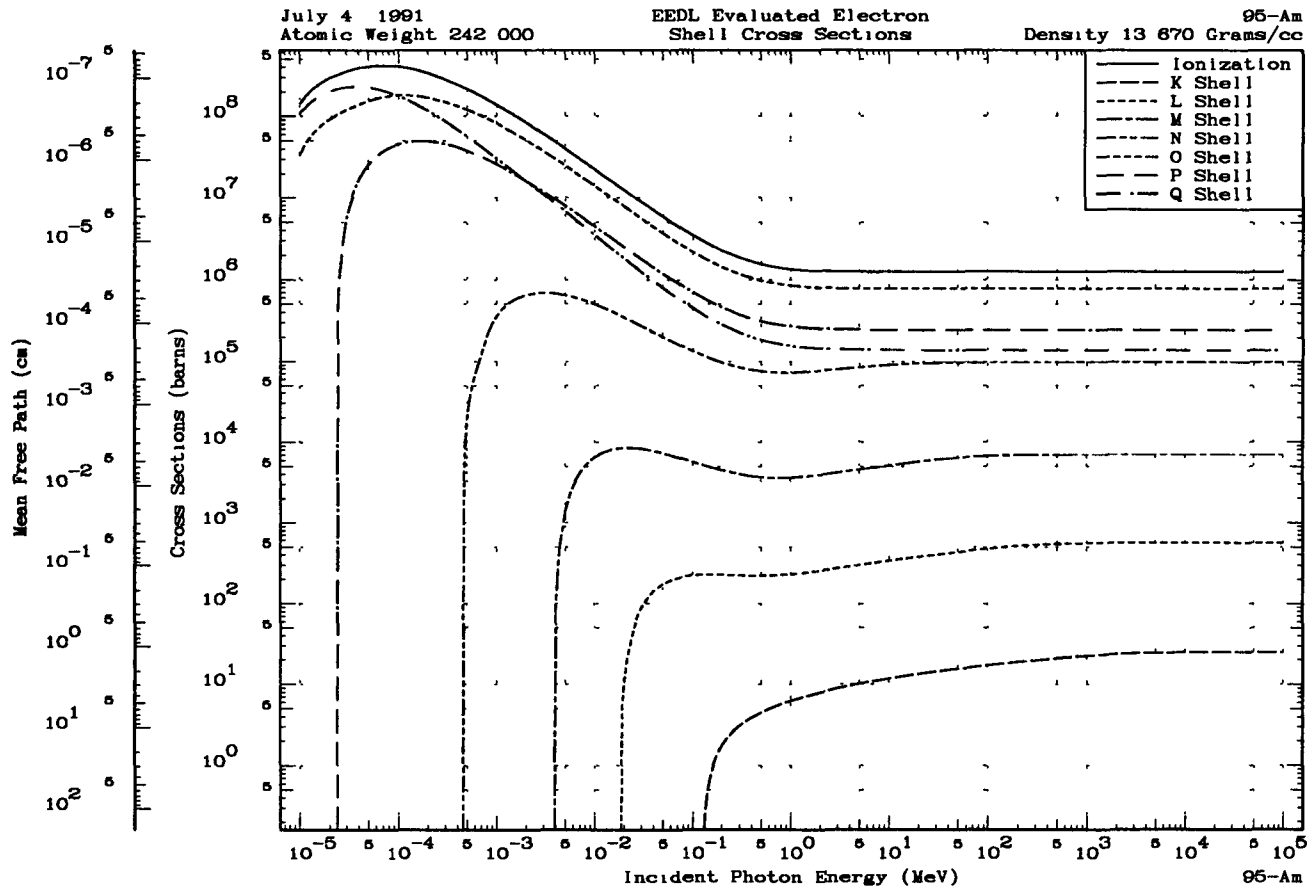
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
95-Am

450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Shell Cross Sections
95-Am
Density 13 670 Grams/cc
Ionization
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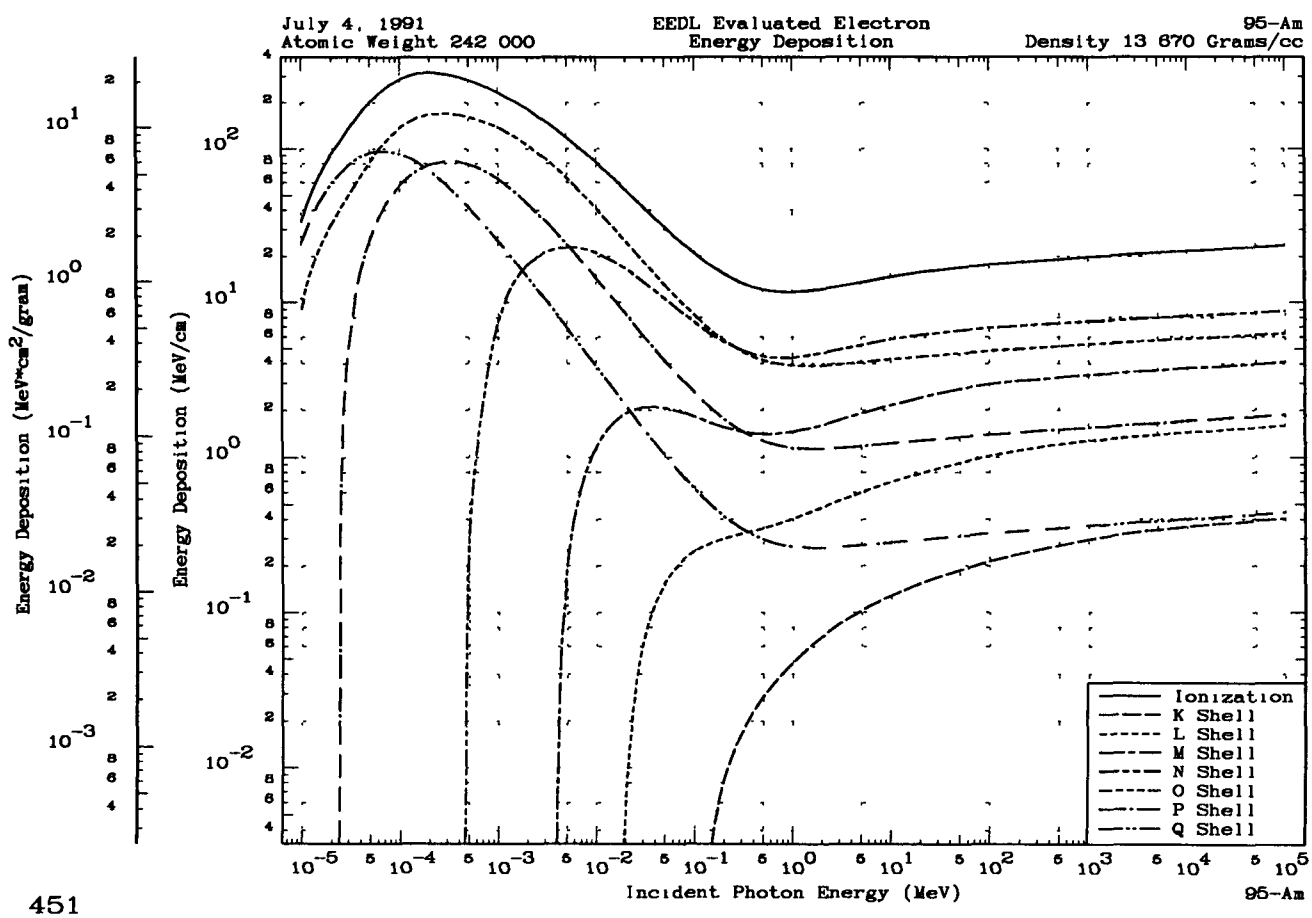
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
95-Am


July 4, 1991
Atomic Weight 242 000
EEDL Evaluated Electron
Energy Deposition
95-Am
Density 13 670 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
95-Am

451

Atomic Weight 242.000 Density 13.670 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	7.8463–9	9.3233+6		3.7466+9	3.5834+9	1.4333+8	1.9800+7	4.8842+3	3.8061+1	3.3715+1	4.3464+0	3.5918–4
	1.0625–5	8.0246–9	9.1161+6		3.6633+9	3.4797+9	1.5740+8	2.6193+7	4.9456+3	4.3736+1	3.7901+1	5.8352+0	3.8089–4
	1.1250–5	8.1881–9	8.9341+6		3.5902+9	3.3847+9	1.7220+8	3.3310+7	5.0042+3	4.9953+1	4.2424+1	7.5290+0	4.0281–4
	1.2188–5	8.4006–9	8.7080+6		3.4993+9	3.2559+9	1.9248+8	5.0950+7	5.0875+3	6.0673+1	4.8908+1	1.1765+1	4.3604–4
	1.2500–5	8.4627–9	8.6441+6		3.4736+9	3.2162+9	1.9917+8	5.8280+7	5.1141+3	6.4658+1	5.1105+1	1.3552+1	4.4721–4
	1.3125–5	8.5786–9	8.5274+6		3.4267+9	3.1411+9	2.1016+8	7.5513+7	5.1658+3	7.2759+1	5.4953+1	1.7805+1	4.6969–4
	1.3594–5	8.6600–9	8.4472+6		3.3945+9	3.0881+9	2.1791+8	8.8508+7	5.2032+3	7.8844+1	5.7758+1	2.1086+1	4.8667–4
	1.5000–5	8.8463–9	8.2693+6		3.3230+9	2.9443+9	2.4060+8	1.3817+8	5.3099+3	1.0022+2	6.6289+1	3.3928+1	5.3818–4
	1.7500–5	9.0298–9	8.1013+6		3.2555+9	2.7324+9	2.7203+8	2.5113+8	5.4813+3	1.4299+2	7.9520+1	6.3466+1	6.3178–4
	2.0000–5	9.0672–9	8.0679+6		3.2421+9	2.5612+9	2.9588+8	3.8504+8	5.6342+3	1.9150+2	9.1435+1	1.0007+2	7.2776–4
P3	2.3890–5	8.9559–9	8.1681+6		3.2824+9	2.3498+9	3.2164+8	6.1087+8	5.8263+3	2.6937+2	1.0689+2	1.6248+2	8.7062–4
	2.4272–5	8.9448–9	8.1782+6		3.2864+9	2.3319+9	3.2390+8	6.3068+8	5.8433+3	2.7646+2	1.0848+2	1.6798+2	8.8460–4
	2.4988–5	8.9189–9	8.2020+6		3.2960+9	2.2992+9	3.2807+8	6.6867+8	5.8746+3	2.9002+2	1.1145+2	1.7857+2	9.1091–4
	2.6241–5	8.8587–9	8.2578+6		3.3184+9	2.2454+9	3.3517+8	7.3785+8	5.9278+3	3.1457+2	1.1663+2	1.9793+2	9.5722–4
	2.7181–5	8.8013–9	8.3116+6		3.3400+9	2.2074+9	3.4064+8	7.9199+8	5.9663+3	3.3394+2	1.2077+2	2.1318+2	9.9219–4
	2.8590–5	8.7344–9	8.3752+6		3.3656+9	2.1540+9	3.4884+8	8.6278+8	6.0221+3	3.6055+2	1.2714+2	2.3341+2	1.0450–3
	3.0000–5	8.6530–9	8.4541+6		3.3973+9	2.1043+9	3.5692+8	9.3603+8	6.0757+3	3.8815+2	1.3365+2	2.5450+2	1.0982–3
P2	3.5140–5	8.4620–9	8.6449+6		3.4739+9	1.9490+9	3.7697+8	1.1479+9	6.2551+3	4.6890+2	1.5366+2	3.1524+2	1.2954–3
	3.5748–5	8.4539–9	8.6531+6		3.4773+9	1.9329+9	3.7876+8	1.1656+9	6.2749+3	4.7626+2	1.5581+2	3.2045+2	1.3191–3
	3.6811–5	8.4376–9	8.6698+6		3.4840+9	1.9056+9	3.8190+8	1.1964+9	6.3089+3	4.8921+2	1.5961+2	3.2959+2	1.3606–3
	3.8405–5	8.4086–9	8.6997+6		3.4960+9	1.8668+9	3.8665+8	1.2425+9	6.3583+3	5.0875+2	1.6544+2	3.4331+2	1.4232–3
	4.0000–5	8.3747–9	8.7350+6		3.5102+9	1.8303+9	3.9142+8	1.2884+9	6.4061+3	5.2847+2	1.7142+2	3.5705+2	1.4863–3
	4.1797–5	8.3628–9	8.7474+6		3.5151+9	1.7918+9	3.9470+8	1.3287+9	6.4556+3	5.4573+2	1.7681+2	3.6892+2	1.5553–3
	4.3848–5	8.3435–9	8.7676+6		3.5233+9	1.7506+9	3.9863+8	1.3740+9	6.5101+3	5.6563+2	1.8328+2	3.8234+2	1.6346–3
	4.5000–5	8.3305–9	8.7813+6		3.5288+9	1.7287+9	4.0083+8	1.3992+9	6.5398+3	5.7678+2	1.8694+2	3.8983+2	1.6794–3
	5.0000–5	8.3402–9	8.7711+6		3.5247+9	1.6426+9	4.0968+8	1.4724+9	6.6617+3	6.1502+2	2.0263+2	4.1240+2	1.8759–3
P1	5.5060–5	8.4124–9	8.6959+6		3.4944+9	1.5676+9	4.1355+8	1.5133+9	6.7726+3	6.4125+2	2.1504+2	4.2621+2	2.0745–3
	5.5678–5	8.4202–9	8.6878+6		3.4912+9	1.5592+9	4.1405+8	1.5180+9	6.7855+3	6.4444+2	2.1661+2	4.2782+2	2.0990–3
	5.6758–5	8.4334–9	8.6742+6		3.4857+9	1.5447+9	4.1493+8	1.5261+9	6.8079+3	6.5001+2	2.1937+2	4.3063+2	2.1418–3
	5.8379–5	8.4519–9	8.6552+6		3.4781+9	1.5237+9	4.1628+8	1.5381+9	6.8408+3	6.5835+2	2.2356+2	4.3479+2	2.2064–3
	6.0000–5	8.4689–9	8.6378+6		3.4711+9	1.5036+9	4.1765+8	1.5498+9	6.8729+3	6.6669+2	2.2779+2	4.3890+2	2.2712–3
	6.5000–5	8.5802–9	8.5258+6		3.4261+9	1.4464+9	4.1736+8	1.5623+9	6.9678+3	6.8053+2	2.3682+2	4.4370+2	2.4727–3
	6.8750–5	8.6558–9	8.4513+6		3.3962+9	1.4076+9	4.1740+8	1.5712+9	7.0350+3	6.9093+2	2.4377+2	4.4716+2	2.6255–3
	7.0000–5	8.6796–9	8.4281+6		3.3868+9	1.3953+9	4.1745+8	1.5740+9	7.0567+3	6.9440+2	2.4611+2	4.4829+2	2.6767–3
	7.4375–5	8.7598–9	8.3510+6		3.3558+9	1.3549+9	4.1725+8	1.5837+9	7.1303+3	7.0592+2	2.5377+2	4.5215+2	2.8570–3
	8.0000–5	8.8532–9	8.2629+6		3.3204+9	1.3079+9	4.1725+8	1.5953+9	7.2199+3	7.2072+2	2.6380+2	4.5692+2	3.0913–3
	9.0000–5	9.1059–9	8.0336+6		3.2283+9	1.2352+9	4.1156+8	1.5815+9	7.3654+3	7.3084+2	2.7495+2	4.5589+2	3.5142–3
	1.0000–4	9.3327–9	7.8383+6	0.0000+0	3.1498+9	1.1737+9	4.0689+8	1.5692+9	7.4980+3	7.4156+2	2.8630+2	4.5526+2	3.9445–3
O5	1.1490–4	9.7163–9	7.5289+6	2.0078–8	3.0255+9	1.0971+9	3.9564+8	1.5327+9	7.6747+3	7.4262+2	2.9583+2	4.4679+2	4.5981–3
	1.1709–4	9.7775–9	7.4817+6	2.3033–8	3.0065+9	1.0871+9	3.9420+8	1.5252+9	7.6991+3	7.4233+2	2.9738+2	4.4495+2	4.6955–3
	1.2121–4	9.8900–9	7.3967+6	2.8575–8	2.9723+9	1.0690+9	3.9161+8	1.5117+9	7.7438+3	7.4196+2	3.0033+2	4.4163+2	4.8789–3
O4	1.2529–4	9.9990–9	7.3161+6	3.4079–8	2.9400+9	1.0520+9	3.8917+8	1.4988+9	7.7869+3	7.4172+2	3.0323+2	4.3849+2	5.0620–3
	1.2683–4	1.0042–8	7.2850+6	3.6162–8	2.9275+9	1.0457+9	3.8788+8	1.4939+9	7.8029+3	7.4109+2	3.0378+2	4.3730+2	5.1315–3
	1.2973–4	1.0120–8	7.2283+6	4.0072–8	2.9047+9	1.0343+9	3.8552+8	1.4848+9	7.8325+3	7.3999+2	3.0484+2	4.3514+2	5.2621–3
	1.3480–4	1.0255–8	7.1332+6	4.6929–8	2.8665+9	1.0153+9	3.8162+8	1.4696+9	7.8830+3	7.3838+2	3.0686+2	4.3152+2	5.4919–3
	1.3560–4	1.0276–8	7.1186+6	4.8020–8	2.8606+9	1.0123+9	3.8102+8	1.4672+9	7.8909+3	7.3815+2	3.0719+2	4.3097+2	5.5286–3
	1.5000–4	1.0639–8	6.8758+6	6.7564–8	2.7630+9	9.6392+8	3.7117+8	1.4279+9	8.0256+3	7.3504+2	3.1328+2	4.2175+2	6.1894–3
	1.7500–4	1.1330–8	6.4566+6	1.0202–7	2.5946+9	8.9439+8	3.5218+8	1.3480+9	8.2357+3	7.1635+2	3.1576+2	4.0058+2	7.3843–3
	2.0000–4	1.1961–8	6.1157+6	1.3724–7	2.4576+9	8.3822+8	3.3696+8	1.2824+9	8.4221+3	7.0313+2	3.1971+2	3.8341+2	8.6078–3
O3	2.2525–4	1.2580–8	5.8151+6	1.7363–7	2.3368+9	7.9119+8	3.2042+8	1.2252+9	8.5914+3	6.8469+2	3.1678+2	3.6790+2	9.9261–3
	2.2759–4	1.2638–8	5.7881+6	1.7705–7	2.3260+9	7.8724+8	3.1899+8	1.2197+9	8.6062+3	6.8289+2	3.1648+2	3.6640+2	1.0049–2
	2.3211–4	1.2751–8	5.7370+6	1.8369–7	2.3054+9	7.7974+8	3.1626+8	1.2094+9	8.6347+3	6.7952+2	3.1594+2	3.6356+2	1.0289–2
	2.4060–4	1.2959–8	5.6449+6	1.9624–7	2.2684+9	7.6626+8	3.1138+8	1.1907+9	8.6867+3	6.7354+2	3.1507+2	3.5845+2	1.0740–2
	2.5000–4	1.3185–8	5.5483+6	2.1026–7	2.2296+9	7.5213+8	3.0629+8	1.1712+9	8.7427+3	6.6738+2	3.1428+2	3.5309+2	1.1243–2
	2.5545–4	1.3313–8	5.4947+6	2.1844–7	2.2081+9	7.4429+8	3.0346+8	1.1603+9	8.7743+3	6.6403+2	3.1390+2	3.5013+2	1.1536–2
	2.6250–4	1.3477–8	5.4278+6	2.2910–7	2.1812+9	7.3451+8	2.9995+8	1.1467+9	8.8144+3	6.5989+2	3.1346+2	3.4642+2	1.1917–2
	2.7772–4	1.3824–8	5.2919+6	2.5231–7	2.1266+9	7.1467+8	2.9281+8	1.1191+9	8.8980+3	6.5154+2	3.1262+2	3.3891+2	1.2745–2
O2	2.9506–4	1.4205–8	5.1499+6	2.7909–7	2.0695+9	6.9396+8	2.8540+8	1.0901+9	8.9886+3	6.4315+2	3.1207+2	3.3107+2	1.3698–2
	3.0000–4	1.4312–8	5.1113+6	2.8679–7	2.0540+9	6.8839+8	2.8336+8	1.0822+9	9.0136+3	6.4084+2	3.1190+2	3.2893+2	1.3971–2
	3.0625–4	1.4465–8	5.0573+6	2.9658–7	2.0323+9	6.8152+8	2.8042+8	1.0703+9	9.0448+3	6.3623+2	3.1069+2	3.2553+2	1.4318–2
	3.1797–4	1.4747–8	4.9604+6	3.1512–7	1.9933+9	6.6918+8	2.7515+8	1.0490+9	9.1018+3	6.2804+2	3.0859+2	3.1943+2	1.4971–2
	3.2500–4	1.4914–8	4.9049+6	3.2635–7	1.9710+9	6.6210+8	2.7214+8	1.0368+9	9.1352+3	6.2339+2	3.0743+2	3.1594+2	1.5365–2
	3.3848–4	1.5230–8	4.8034+6	3.4812–7	1.9302+9	6.4914+8	2.6665+8	1.0144+9	9.1976+3	6.1498+2	3.0540+2	3.0957+2	1.6125–2
	3.5386–4	1.5582–8	4.6948+6	3.7331–7	1.8866+9	6.3526+8	2.6079+8	9.9055+8	9.2663+3	6.0615+2	3.0337+2	3.0277+2	1.6998–2
O1	3.6244–4	1.5775–8	4.6373+6	3.8752–7	1.8635+9	6.2789+8	2.5770+8	9.7790+8	9.3035+3	6.0154+2	3.0235+2	2.9917+2	1.7487–2
	3.6714–4	1.5885–8	4.6051+6	3.9535–7	1.8506+9	6.2397+8	2.5604+8	9.7055+8	9.3234+3	5.9886+2	3.0176+2	2.9709+2	1.7763–2
	3.7535–4	1.6077–8	4.5502+6	4.0912–7	1.8285+9	6.1728+8	2.5320+8	9.5802+8	9.3576+3	5.9435+2	3.0078+2	2.9355+2	1.8247–2
	3.8768–4	1.6360–8	4.4714+6	4.2997–7	1.7968+9	6.0765+8	2.4913+8	9.4003+8	9.4078+3	5.8793+2	2.9943+2	2.8848+2	1.8976–2
	4.0000–4	1.6640–8	4.3963+6	4.5104–7	1.7667+9	5.9846+8	2.4526+8	9.2293+8	9.4567+3	5.8192+2	2.9824+2	2.8366+2	1.9709–2
	4.2500–4	1.7196–8	4.2539+6	4.9451–7	1.7095+9	5.8106+8	2.3703+8	8.9135+8	9.5508+3	5.6822+2	2.9369+2	2.7451+2	2.1253–2
N7	4.5717–4	1.7891–8	4.0889+6	5.5192–7	1.6431+9	5.6078+8	2.2754+8	8.5478+8	9.6652+3	5.5268+2	2.8873+2	2.6393+2	2.3264–2
	4.6252–4	1.8012–8	4.0614+6	5.6163–7	1.6321+9	5.5761+8	2.2606+8	8.4839+8	9.6836+3	5.5011+2	2.8800+2	2.6208+2	2.3601–2
N6	4.7103–4	1.8203–8	4.0188+6	5.7714–7	1.6150+9	5.5269+8	2.2378+8	8.3848+8	9.7125+3	5.4613+2	2.8690+2	2.5921+2	2.4138–2
	4.7189–4	1.8222–8	4.0145+6	5.7872–7	1.6132+9	5.5220+8	2.2355+8	8.3746+8	9.7154+3	5.4573+2	2.8679+2	2.5891+2	2.4192–2
	4.7827–4	1.8368–8	3.9827+6	5.9045–7	1.6005+9	5.4860+8	2.2189+8	8.2997+8	9.7367+3	5.4280+2	2.8602+2	2.5675+2	2.4596–2
	4.8595–4	1.8541–8	3.9454+6	6.0463–7	1.5855+9	5.4436+8	2.1993+8	8.2118+8	9.7620+3	5.3937+2	2.8513+2	2.5422+2	2.5083–2
	5.0000–4	1.8856–8	3.8796+6	6.3083–7	1.5590+9	5.3686+8	2.1648+8	8.0567+8	9.8076+3	5.3339+2	2.8362+2	2.4974+2	2.5979–2
	5.2500–4	1.9411–8	3.7686+6	6.7819–7	1.5144+9	5.2426+8	2.1042+8	7.7973+8	9.8832+3	5.2239+2	2.8024+2	2.4212+2	2.7581–2
	5.5000–4	1.9955–8	3.6659+6	7.2651–7	1.4731+9	5.1252+8	2.0482+8	7.5578+8	9.9559+3	5.1238+2	2.7726+2	2.3509+2	2.9195–2
	6.0000–4	2.1013–8	3.4814+6	8.2580–7	1.3990+9	4.9126+8	1.9478+8	7.1295+8	1.0093+4	4.9486+2	2.7231+2	2.2253+2	3.2461–2

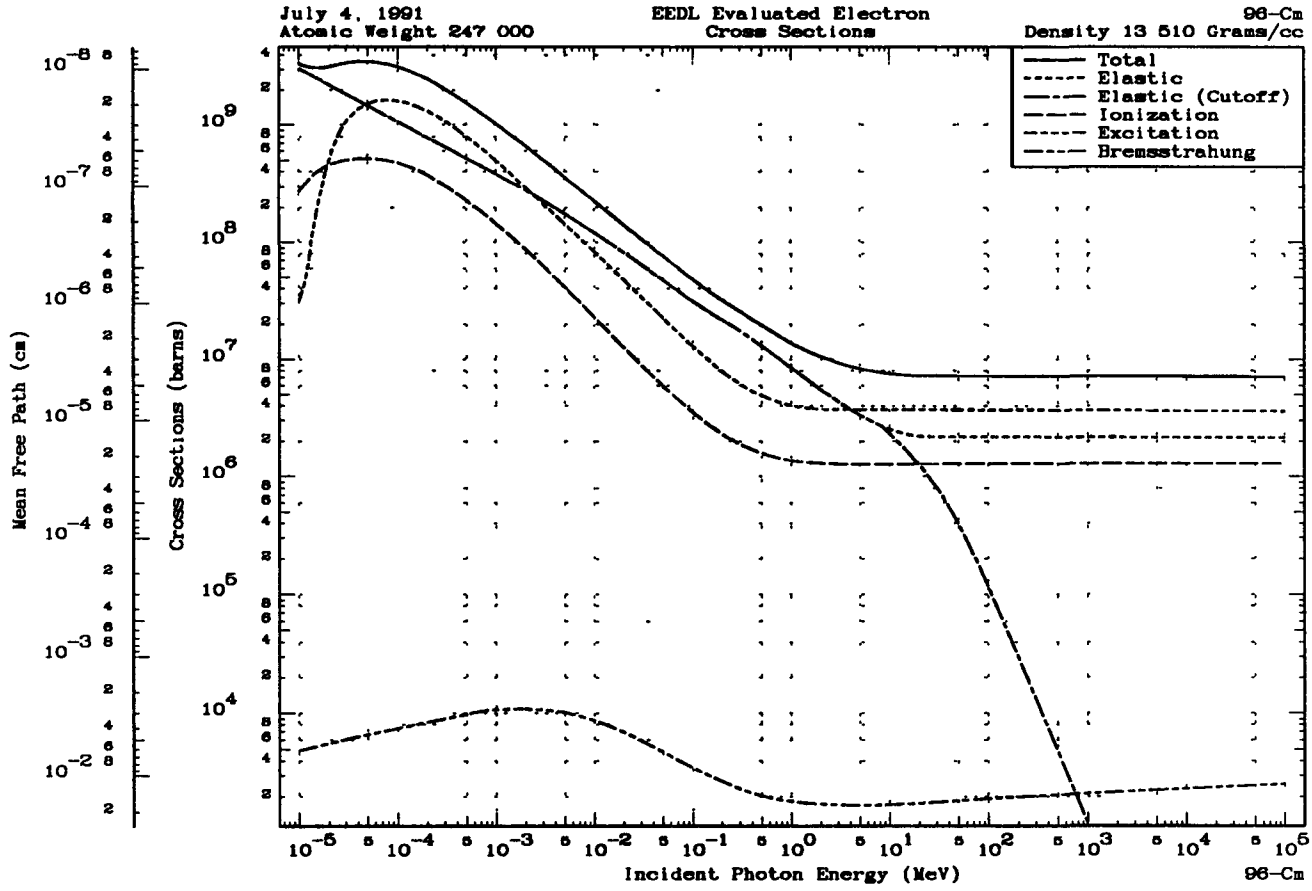
Atomic Weight 242.000 Density 13.670 Grams/cc

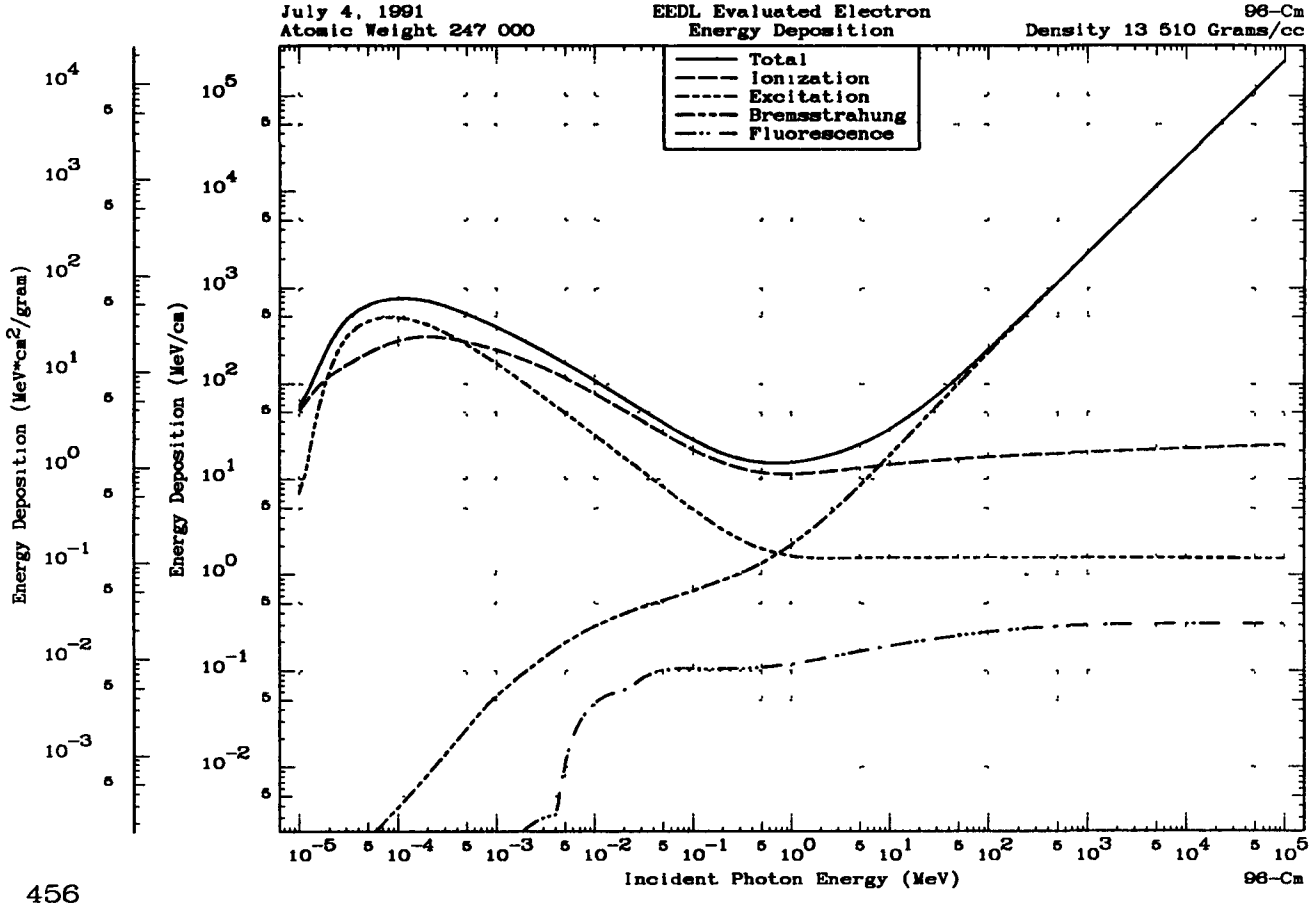
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	6.8750–4	2.2904–8	3.1939+6	1.0085–6	1.2835+9	4.5976+8	1.7874+8	6.4495+8	1.0279+4	4.6359+2	2.6129+2	2.0225+2	3.8072–2
	7.0000–4	2.3166–8	3.1577+6	1.0355–6	1.2689+9	4.5575+8	1.7672+8	6.3645+8	1.0304+4	4.5978+2	2.6001+2	1.9972+2	3.8882–2
	7.4375–4	2.4070–8	3.0392+6	1.1320–6	1.2213+9	4.4249+8	1.7014+8	6.0867+8	1.0388+4	4.4748+2	2.5599+2	1.9145+2	4.1732–2
	8.0000–4	2.5200–8	2.9028+6	1.2596–6	1.1665+9	4.2706+8	1.6257+8	5.7686+8	1.0489+4	4.3382+2	2.5179+2	1.8199+2	4.5431–2
N5	8.2668–4	2.5728–8	2.8433+6	1.3216–6	1.1426+9	4.2030+8	1.5904+8	5.6325+8	1.0516+4	4.2695+2	2.4904+2	1.7786+2	4.6943–2
	8.3751–4	2.5940–8	2.8200+6	1.3471–6	1.1332+9	4.1764+8	1.5766+8	5.5791+8	1.0526+4	4.2430+2	2.4800+2	1.7625+2	4.7558–2
	8.5782–4	2.6337–8	2.7776+6	1.3952–6	1.1162+9	4.1280+8	1.5515+8	5.4823+8	1.0546+4	4.1953+2	2.4616+2	1.7332+2	4.8713–2
N4	8.7790–4	2.6724–8	2.7373+6	1.4433–6	1.1000+9	4.0818+8	1.5278+8	5.3903+8	1.0564+4	4.1505+2	2.4446+2	1.7054+2	4.9857–2
	8.9316–4	2.7019–8	2.7075+6	1.4803–6	1.0880+9	4.0477+8	1.5103+8	5.3221+8	1.0578+4	4.1179+2	2.4325+2	1.6849+2	5.0727–2
	8.9337–4	2.7023–8	2.7071+6	1.4808–6	1.0878+9	4.0472+8	1.5101+8	5.3212+8	1.0578+4	4.1175+2	2.4324+2	1.6846+2	5.0739–2
	9.0000–4	2.7150–8	2.6944+6	1.4969–6	1.0827+9	4.0327+8	1.5027+8	5.2921+8	1.0584+4	4.1037+2	2.4272+2	1.6759+2	5.1117–2
	9.1987–4	2.7529–8	2.6573+6	1.5456–6	1.0678+9	3.9900+8	1.4809+8	5.2074+8	1.0602+4	4.0628+2	2.4118+2	1.6505+2	5.2253–2
	9.4668–4	2.8035–8	2.6093+6	1.6120–6	1.0486+9	3.9346+8	1.4529+8	5.0979+8	1.0626+4	4.0106+2	2.3924+2	1.6177+2	5.3788–2
	9.5994–4	2.8284–8	2.5864+6	1.6451–6	1.0393+9	3.9081+8	1.4395+8	5.0458+8	1.0637+4	3.9860+2	2.3834+2	1.6020+2	5.4548–2
	1.0000–3	2.9026–8	2.5202+6	1.7465–6	1.0128+9	3.8310+8	1.4010+8	4.8955+8	1.0670+4	3.9159+2	2.3584+2	1.5570+2	5.6849–2
	1.0625–3	3.0163–8	2.4252+6	1.9085–6	9.7459+8	3.7199+8	1.3427+8	4.6831+8	1.0684+4	3.8011+2	2.3083+2	1.4923+2	5.9745–2
N3	1.1470–3	3.1659–8	2.3107+6	2.1349–6	9.2854+8	3.5843+8	1.2729+8	4.4281+8	1.0700+4	3.6665+2	2.2512+2	1.4146+2	6.3665–2
	1.1691–3	3.2048–8	2.2826+6	2.1953–6	9.1726+8	3.5513+8	1.2556+8	4.3656+8	1.0704+4	3.6315+2	2.2353+2	1.3956+2	6.4689–2
	1.2104–3	3.2771–8	2.2323+6	2.3102–6	8.9704+8	3.4918+8	1.2248+8	4.2537+8	1.0712+4	3.5694+2	2.2073+2	1.3615+2	6.6610–2
	1.2500–3	3.3453–8	2.1868+6	2.4219–6	8.7875+8	3.4377+8	1.1969+8	4.1528+8	1.0719+4	3.5140+2	2.1826+2	1.3308+2	6.8449–2
	1.2813–3	3.3985–8	2.1525+6	2.5114–6	8.6498+8	3.3967+8	1.1760+8	4.0770+8	1.0725+4	3.4727+2	2.1643+2	1.3077+2	6.9901–2
	1.2828–3	3.4012–8	2.1508+6	2.5159–6	8.6430+8	3.3947+8	1.1749+8	4.0732+8	1.0725+4	3.4707+2	2.1635+2	1.3065+2	6.9974–2
	1.3125–3	3.4513–8	2.1196+6	2.6019–6	8.5175+8	3.3572+8	1.1559+8	4.0043+8	1.0730+4	3.4333+2	2.1471+2	1.2855+2	7.1354–2
	1.3750–3	3.5554–8	2.0575+6	2.7859–6	8.2681+8	3.2823+8	1.1181+8	3.8677+8	1.0740+4	3.3587+2	2.1139+2	1.2440+2	7.4262–2
	1.3914–3	3.5824–8	2.0420+6	2.8349–6	8.2058+8	3.2634+8	1.1087+8	3.8335+8	1.0743+4	3.3402+2	2.1058+2	1.2336+2	7.5027–2
N2	1.4282–3	3.6426–8	2.0083+6	2.9457–6	8.0703+8	3.2223+8	1.0883+8	3.7596+8	1.0748+4	3.3003+2	2.0885+2	1.2111+2	7.6740–2
	1.4641–3	3.7012–8	1.9765+6	3.0552–6	7.9424+8	3.1837+8	1.0689+8	3.6898+8	1.0754+4	3.2615+2	2.0708+2	1.1899+2	7.8412–2
	1.5000–3	3.7593–8	1.9459+6	3.1659–6	7.8197+8	3.1465+8	1.0503+8	3.6228+8	1.0759+4	3.2246+2	2.0542+2	1.1696+2	8.0086–2
	1.5625–3	3.8587–8	1.8958+6	3.3618–6	7.6182+8	3.0848+8	1.0187+8	3.5146+8	1.0768+4	3.1568+2	2.0199+2	1.1361+2	8.3000–2
N1	1.5952–3	3.9102–8	1.8708+6	3.4659–6	7.5180+8	3.0539+8	1.0031+8	3.4609+8	1.0773+4	3.1235+2	2.0032+2	1.1195+2	8.4526–2
	1.6205–3	3.9499–8	1.8520+6	3.5472–6	7.4424+8	3.0306+8	9.9122+7	3.4204+8	1.0771+4	3.0978+2	1.9900+2	1.1070+2	8.5592–2
	1.6250–3	3.9569–8	1.8487+6	3.5618–6	7.4291+8	3.0266+8	9.8915+7	3.4133+8	1.0771+4	3.0933+2	1.9876+2	1.1048+2	8.5782–2
	1.6679–3	4.0237–8	1.8180+6	3.7015–6	7.3058+8	2.9885+8	9.6985+7	3.3474+8	1.0769+4	3.0516+2	1.9663+2	1.0844+2	8.7591–2
	1.6719–3	4.0298–8	1.8153+6	3.7144–6	7.2947+8	2.9851+8	9.6812+7	3.3414+8	1.0768+4	3.0479+2	1.9644+2	1.0826+2	8.7757–2
	1.7500–3	4.1496–8	1.7629+6	3.9738–6	7.0843+8	2.9196+8	9.3533+7	3.2292+8	1.0764+4	2.9776+2	1.9288+2	1.0479+2	9.1048–2
	1.7509–3	4.1510–8	1.7623+6	3.9769–6	7.0818+8	2.9188+8	9.3495+7	3.2279+8	1.0764+4	2.9767+2	1.9283+2	1.0475+2	9.1088–2
	1.8125–3	4.2439–8	1.7237+6	4.1855–6	6.9268+8	2.8703+8	9.1091+7	3.1455+8	1.0760+4	2.9255+2	1.9025+2	1.0220+2	9.3680–2
	1.8359–3	4.2789–8	1.7096+6	4.2659–6	6.8701+8	2.8524+8	9.0214+7	3.1154+8	1.0759+4	2.9068+2	1.8931+2	1.0128+2	9.4667–2
	1.8755–3	4.3376–8	1.6865+6	4.4026–6	6.7771+8	2.8231+8	8.8778+7	3.0662+8	1.0757+4	2.8765+2	1.8780+2	9.9755+1	9.6332–2
	2.0000–3	4.5194–8	1.6186+6	4.8423–6	6.5045+8	2.7364+8	8.4590+7	2.9222+8	1.0751+4	2.7889+2	1.8347+2	9.5314+1	1.0157–1
	2.2500–3	4.8797–8	1.4991+6	5.7687–6	6.0243+8	2.5849+8	7.7086+7	2.6684+8	1.0695+4	2.6100+2	1.7353+2	8.7354+1	1.1098–1
	2.5000–3	5.2248–8	1.4001+6	6.7541–6	5.6263+8	2.4566+8	7.0954+7	2.4601+8	1.0645+4	2.4655+2	1.6560+2	8.0828+1	1.2036–1
	2.6250–3	5.3924–8	1.3566+6	7.2678–6	5.4515+8	2.3993+8	6.8281+7	2.3693+8	1.0621+4	2.4020+2	1.6210+2	7.7984+1	1.2504–1
	3.0000–3	5.8774–8	1.2447+6	8.8833–6	5.0016+8	2.2494+8	6.1481+7	2.1374+8	1.0559+4	2.2423+2	1.5335+2	7.0733+1	1.3902–1
	3.5000–3	6.5003–8	1.1254+6	1.1214–5	4.5223+8	2.0848+8	5.4230+7	1.8952+8	1.0431+4	2.0516+2	1.4197+2	6.3035+1	1.5583–1
M5	3.8925–3	6.9657–8	1.0502+6	1.3183–5	4.2202+8	1.9784+8	4.9744+7	1.7443+8	1.0344+4	1.9349+2	1.3507+2	5.8248+1	1.6893–1
	4.0000–3	7.0911–8	1.0316+6	1.3743–5	4.1456+8	1.9516+8	4.8647+7	1.7074+8	1.0317+4	1.9063+2	1.3338+2	5.7078+1	1.7235–1
M4	4.1036–3	7.2119–8	1.0143+6	1.4291–5	4.0761+8	1.9258+8	4.7626+7	1.6740+8	1.0277+4	1.8773+2	1.3155+2	5.6000+1	1.7511–1
	4.1250–3	7.2367–8	1.0109+6	1.4405–5	4.0621+8	1.9206+8	4.7421+7	1.6672+8	1.0269+4	1.8714+2	1.3119+2	5.5782+1	1.7568–1
	4.1316–3	7.2444–8	1.0098+6	1.4440–5	4.0578+8	1.9190+8	4.7358+7	1.6651+8	1.0266+4	1.8697+2	1.3107+2	5.5715+1	1.7585–1
	4.2402–3	7.3699–8	9.9259+5	1.5025–5	3.9887+8	1.8933+8	4.6349+7	1.6318+8	1.0226+4	1.8410+2	1.2928+2	5.4646+1	1.7874–1
	4.3437–3	7.4885–8	9.7687+5	1.5592–5	3.9255+8	1.8697+8	4.5430+7	1.6014+8	1.0188+4	1.8150+2	1.2765+2	5.3671+1	1.8148–1
	4.4301–3	7.5867–8	9.6423+5	1.6071–5	3.8748+8	1.8507+8	4.4695+7	1.5770+8	1.0157+4	1.7942+2	1.2634+2	5.2889+1	1.8376–1
M3	4.6855–3	7.8727–8	9.2919+5	1.7517–5	3.7340+8	1.7975+8	4.2666+7	1.5097+8	1.0071+4	1.7368+2	1.2277+2	5.0727+1	1.9049–1
	4.7641–3	7.9602–8	9.1899+5	1.7972–5	3.6930+8	1.7821+8	4.2082+7	1.4900+8	1.0045+4	1.7204+2	1.2174+2	5.0101+1	1.9255–1
	4.8821–3	8.0904–8	9.0420+5	1.8662–5	3.6335+8	1.7595+8	4.1238+7	1.4615+8	1.0008+4	1.6967+2	1.2028+2	4.9196+1	1.9564–1
	5.0000–3	8.2194–8	8.9001+5	1.9362–5	3.5765+8	1.7378+8	4.0431+7	1.4343+8	9.9712+3	1.6741+2	1.1889+2	4.8329+1	1.9872–1
	5.2500–3	8.4981–8	8.6081+5	2.0878–5	3.4592+8	1.6931+8	3.8813+7	1.3779+8	9.8971+3	1.6255+2	1.1585+2	4.6500+1	2.0522–1
	5.5000–3	8.7723–8	8.3391+5	2.2437–5	3.3511+8	1.6515+8	3.7332+7	1.3262+8	9.8269+3	1.5813+2	1.1309+2	4.4824+1	2.1169–1
	5.6250–3	8.9077–8	8.2123+5	2.3233–5	3.3001+8	1.6318+8	3.6637+7	1.3019+8	9.7932+3	1.5605+2	1.1180+2	4.4037+1	2.1491–1
M2	5.7416–3	9.0331–8	8.0983+5	2.3984–5	3.2543+8	1.6140+8	3.6014+7	1.2801+8	9.7625+3	1.5420+2	1.1065+2	4.3332+1	2.1791–1
	5.8062–3	9.1026–8	8.0365+5	2.4405–5	3.2295+8	1.6044+8	3.5678+7	1.2682+8	9.7443+3	1.5320+2	1.1003+2	4.2950+1	2.1950–1
	5.9031–3	9.2062–8	7.9460+5	2.5040–5	3.1931+8	1.5902+8	3.5188+7	1.2509+8	9.7173+3	1.5174+2	1.0913+2	4.2393+1	2.2187–1
	6.0000–3	9.3093–8	7.8580+5	2.5682–5	3.1578+8	1.5764+8	3.4713+7	1.2341+8	9.6909+3	1.5034+2	1.0826+2	4.1852+1	2.2425–1
M1	6.1021–3	9.4167–8	7.7684+5	2.6364–5	3.1218+8	1.5623+8	3.4222+7	1.2172+8	9.6547+3	1.4876+2	1.0724+2	4.1297+1	2.2632–1
	6.2207–3	9.5417–8	7.6667+5	2.7167–5	3.0808+8	1.5461+8	3.3669+7	1.1980+8	9.6135+3	1.4697+2	1.0607+2	4.0671+1	2.2872–1
	6.2500–3	9.5724–8	7.6420+5	2.7366–5	3.0710+8	1.5421+8	3.3536+7	1.1934+8	9.6034+3	1.4654+2	1.0579+2	4.0520+1	2.2931–1
	6.4431–3	9.7739–8	7.4845+5	2.8697–5	3.0077+8	1.5169+8	3.2684+7	1.1638+8	9.5387+3	1.4379+2	1.0400+2	3.9555+1	2.3320–1
	6.5000–3	9.8328–8	7.4397+5	2.9093–5	2.9897+8	1.5097+8	3.2442+7	1.1554+8	9.5201+3	1.4301+2	1.0349+2	3.9280+1	2.3435–1
	6.6875–3	1.0026–7	7.2965+5	3.0416–5	2.9321+8	1.4866+8	3.1671+7	1.1287+8	9.4601+3	1.4052+2	1.0187+2	3.8407+1	2.3811–1
	6.8323–3	1.0174–7	7.1905+5	3.1454–5	2.8895+8	1.4695+8	3.1103+7	1.1089+8	9.4152+3	1.3868+2	1.0068+2	3.7762+1	2.4101–1
	7.0000–3	1.0343–7	7.0725+5	3.2671–5	2.8421+8	1.4503+8	3.0472+7	1.0870+8	9.3646+3	1.3665+2	9.9361+1	3.7046+1	2.4435–1
	7.2500–3	1.0594–7	6.9053+5	3.4520–5	2.7749+8	1.4230+8	2.9582+7	1.0560+8	9.2919+3	1.3379+2	9.7505+1	3.6035+1	2.4931–1
	7.3437–3	1.0687–7	6.8451+5	3.5224–5	2.7507+8	1.4131+8	2.9263+7	1.0449+8	9.2654+3	1.3276+2	9.6840+1	3.5672+1	2.5116–1
	7.4162–3	1.0759–7	6.7995+5	3.5771–5	2.7324+8	1.4057+8	2.9021+7	1.0365+8	9.2452+3	1.3199+2	9.6336+1	3.5397+1	2.5259–1
	8.0000–3	1.1327–7	6.4580+5	4.0294–5	2.5951+8	1.3491+8	2.7223+7	9.7370+7	9.0908+3	1.2623+2	9.2612+1	3.3351+1	2.6405–1
	9.0000–3	1.2280–7	5.9569+5	4.8512–5	2.3938+8	1.2637+8	2.4626+7	8.8369+7	8.8129+3	1.1723+2	8.6571+1	3.0383+1	2.8047–1
	1.0000–2	1.3198–7	5.5429+5	5.7319–5	2.2274+8	1.1919+8	2.2515+7	8.1025+7	8.5715+3	1.0994+2	8.1683+1	2.7964+1	2.9662–1
	1.1250–2	1.4310–7	5.1120+5	6.9130–5	2.0543+8	1.1152+8	2.0359+7	7.3540+7	8.2596+3	1.0182+2	7.6041+1	2.5468+1	3.1218–1
	1.2500–2	1.5381–7	4.7561+5	8.1823–5	1.9113+8	1.0508+8	1.8607+7	6.7432+7	7.9901+3	9.5220+1	7.1460+1	2.3433+1	3.2749–1

Atomic Weight 242.000 — Density 13.670 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.3125–2	1.5902–7	4.6001+5	8.8487–5	1.8486+8	1.0222+8	1.7848+7	6.4778+7	7.8684+3	9.2356+1	6.9472+1	2.2549+1	3.3505–1
	1.5000–2	1.7419–7	4.1997+5	1.0963–4	1.6877+8	9.4794+7	1.5926+7	5.8037+7	7.5445+3	8.5102+1	6.4439+1	2.0306+1	3.5737–1
L3	1.8527–2	2.0128–7	3.6344+5	1.5395–4	1.4605+8	8.3858+7	1.3304+7	4.8878+7	6.9986+3	7.4302+1	5.6700+1	1.7213+1	3.8990–1
	1.9264–2	2.0672–7	3.5387+5	1.6399–4	1.4220+8	8.1968+7	1.2871+7	4.7357+7	6.8967+3	7.2496+1	5.5401+1	1.6700+1	3.9564–1
	2.0000–2	2.1209–7	3.4491+5	1.7426–4	1.3860+8	8.0189+7	1.2467+7	4.5938+7	6.8001+3	7.0815+1	5.4193+1	1.6221+1	4.0135–1
	2.1250–2	2.2110–7	3.3086+5	1.9227–4	1.3296+8	7.7361+7	1.1844+7	4.3743+7	6.6457+3	6.8072+1	5.2187+1	1.5474+1	4.1065–1
L2	2.3062–2	2.3385–7	3.1282+5	2.1959–4	1.2571+8	7.3701+7	1.1052+7	4.0946+7	6.4427+3	6.4587+1	4.9639+1	1.4523+1	4.2400–1
	2.3438–2	2.3645–7	3.0938+5	2.2544–4	1.2433+8	7.2999+7	1.0902+7	4.0418+7	6.4021+3	6.3927+1	4.9158+1	1.4342+1	4.2637–1
	2.3496–2	2.3685–7	3.0886+5	2.2634–4	1.2412+8	7.2892+7	1.0879+7	4.0338+7	6.3959+3	6.3826+1	4.9085+1	1.4315+1	4.2674–1
L1	2.3827–2	2.3912–7	3.0592+5	2.3156–4	1.2293+8	7.2290+7	1.0751+7	3.9886+7	6.3610+3	6.3262+1	4.8673+1	1.4160+1	4.2884–1
	2.4599–2	2.4442–7	2.9929+5	2.4388–4	1.2027+8	7.0923+7	1.0468+7	3.8874+7	6.2794+3	6.1965+1	4.7719+1	1.3813+1	4.3339–1
	2.5078–2	2.4768–7	2.9535+5	2.5167–4	1.1869+8	7.0108+7	1.0300+7	3.8273+7	6.2304+3	6.1197+1	4.7154+1	1.3607+1	4.3621–1
	2.5122–2	2.4798–7	2.9500+5	2.5238–4	1.1854+8	7.0035+7	1.0285+7	3.8219+7	6.2260+3	6.1128+1	4.7104+1	1.3588+1	4.3647–1
	2.5949–2	2.5355–7	2.8851+5	2.6606–4	1.1594+8	6.8689+7	1.0009+7	3.7233+7	6.1448+3	5.9867+1	4.6176+1	1.3250+1	4.4132–1
	2.7539–2	2.6411–7	2.7698+5	2.9313–4	1.1130+8	6.6286+7	9.5228+6	3.5488+7	5.9985+3	5.7642+1	4.4539+1	1.2653+1	4.5060–1
	2.7561–2	2.6426–7	2.7682+5	2.9350–4	1.1124+8	6.6254+7	9.5165+6	3.5466+7	5.9966+3	5.7613+1	4.4517+1	1.2645+1	4.5073–1
	2.7975–2	2.6697–7	2.7401+5	3.0072–4	1.1011+8	6.5666+7	9.3985+6	3.5042+7	5.9605+3	5.7073+1	4.4120+1	1.2500+1	4.5313–1
	3.0000–2	2.8007–7	2.6120+5	3.3699–4	1.0496+8	6.2974+7	8.8640+6	3.3120+7	5.7940+3	5.4630+1	4.2323+1	1.1842+1	4.6483–1
	3.2500–2	2.9593–7	2.4720+5	3.8395–4	9.9336+7	5.9977+7	8.2992+6	3.1054+7	5.5964+3	5.1873+1	4.0270+1	1.1126+1	4.7676–1
	3.5000–2	3.1140–7	2.3491+5	4.3329–4	9.4400+7	5.7330+7	7.8086+6	2.9256+7	5.4195+3	4.9479+1	3.8487+1	1.0504+1	4.8859–1
	3.6250–2	3.1901–7	2.2932+5	4.5883–4	9.2151+7	5.6118+7	7.5866+6	2.8441+7	5.3376+3	4.8394+1	3.7678+1	1.0222+1	4.9447–1
	4.0000–2	3.4131–7	2.1433+5	5.3872–4	8.6129+7	5.2852+7	6.9969+6	2.6274+7	5.1146+3	4.5516+1	3.5532+1	9.4722+0	5.1190–1
	4.5000–2	3.7000–7	1.9771+5	6.5270–4	7.9451+7	4.9180+7	6.3659+6	2.3901+7	4.8538+3	4.2262+1	3.3087+1	8.6434+0	5.3156–1
	5.0000–2	3.9765–7	1.8396+5	7.7489–4	7.3925+7	4.6111+7	5.8499+6	2.1960+7	4.6317+3	3.9606+1	3.1088+1	7.9662+0	5.5092–1
	6.0000–2	4.4990–7	1.6260+5	1.0416–3	6.5340+7	4.1247+7	5.0727+6	1.9016+7	4.2691+3	3.5455+1	2.7937+1	6.9328+0	5.8463–1
	7.0000–2	4.9846–7	1.4676+5	1.3368–3	5.8975+7	3.7622+7	4.5165+6	1.6832+7	3.9870+3	3.2346+1	2.5573+1	6.1586+0	6.1446–1
	8.0000–2	5.4465–7	1.3431+5	1.6581–3	5.3973+7	3.4741+7	4.0844+6	1.5144+7	3.7577+3	2.9940+1	2.3736+1	5.5609+0	6.4364–1
	1.0000–1	6.2919–7	1.1627+5	2.3685–3	4.6721+7	3.0542+7	3.4838+6	1.2692+7	3.4121+3	2.6435+1	2.1055+1	4.6866+0	6.9305–1
K	1.2557–1	7.2241–7	1.0126+5	3.3935–3	4.0693+7	2.6970+7	2.9911+6	1.0729+7	3.1174+3	2.3513+1	1.8781+1	3.9835+0	7.4839–1
	1.2862–1	7.3247–7	9.9871+4	3.5242–3	4.0133+7	2.6644+7	2.9462+6	1.0540+7	3.0893+3	2.3240+1	1.8570+1	3.9156+0	7.5438–1
	1.3397–1	7.4984–7	9.7558+4	3.7564–3	3.9204+7	2.6100+7	2.8718+6	1.0229+7	3.0422+3	2.2787+1	1.8219+1	3.8032+0	7.6485–1
	1.4198–1	7.7532–7	9.4351+4	4.1131–3	3.7915+7	2.5343+7	2.7687+6	9.8001+6	2.9763+3	2.2162+1	1.7733+1	3.6486+0	7.8048–1
	1.5000–1	8.0018–7	9.1421+4	4.4795–3	3.6738+7	2.4648+7	2.6748+6	9.4115+6	2.9152+3	2.1596+1	1.7291+1	3.5086+0	7.9604–1
	1.6250–1	8.3740–7	8.7357+4	5.0686–3	3.5105+7	2.3675+7	2.5549+6	8.8721+6	2.8308+3	2.0848+1	1.6717+1	3.3131+0	8.1804–1
	1.8125–1	8.9089–7	8.2112+4	5.9892–3	3.2997+7	2.2408+7	2.3999+6	8.1858+6	2.7196+3	1.9892+1	1.5976+1	3.0646+0	8.5082–1
	2.0000–1	9.4194–7	7.7662+4	6.9513–3	3.1209+7	2.1325+7	2.2683+6	7.6128+6	2.6230+3	1.9091+1	1.5351+1	2.8572+0	8.8324–1
	2.2500–1	1.0033–6	7.2909+4	8.2874–3	2.9299+7	2.0063+7	2.1430+6	7.0901+6	2.5216+3	1.8335+1	1.4746+1	2.6673+0	9.2261–1
	2.6250–1	1.0898–6	6.7128+4	1.0385–2	2.6975+7	1.8524+7	1.9894+6	6.4600+6	2.3947+3	1.7430+1	1.4010+1	2.4388+0	9.8094–1
	3.0000–1	1.1706–6	6.2494+4	1.2582–2	2.5113+7	1.7286+7	1.8653+6	5.9595+6	2.2900+3	1.6719+1	1.3423+1	2.2577+0	1.0382+0
	4.0000–1	1.3698–6	5.3403+4	1.8759–2	2.1460+7	1.4685+7	1.6690+6	5.1035+6	2.1100+3	1.5670+1	1.2538+1	1.9462+0	1.1854+0
	5.0000–1	1.5394–6	4.7519+4	2.5232–2	1.9096+7	1.2855+7	1.5555+6	4.6837+6	1.9994+3	1.5226+1	1.2100+1	1.7954+0	1.3312+0
	6.0000–1	1.6956–6	4.3142+4	3.1852–2	1.7336+7	1.1486+7	1.4823+6	4.3663+6	1.9276+3	1.4989+1	1.1831+1	1.6808+0	1.4776+0
	8.0000–1	1.9564–6	3.7392+4	4.5190–2	1.5026+7	9.5793+6	1.3971+6	4.0479+6	1.8403+3	1.4999+1	1.1659+1	1.5685+0	1.7710+0
	1.0000+0	2.1764–6	3.3612+4	5.8443–2	1.3507+7	8.3159+6	1.3496+6	3.8399+6	1.7922+3	1.5185+1	1.1616+1	1.4956+0	2.0729+0
	1.5000+0	2.5743–6	2.8417+4	9.0332–2	1.1419+7	6.4363+6	1.2976+6	3.6835+6	1.7312+3	1.6184+1	1.1895+1	1.4473+0	2.8420+0
	2.0000+0	2.8548–6	2.5624+4	1.2026–1	1.0297+7	5.3876+6	1.2815+6	3.6265+6	1.7039+3	1.7240+1	1.2177+1	1.4317+0	3.6312+0
	3.0000+0	3.2251–6	2.2682+4	1.7493–1	9.1149+6	4.2542+6	1.2610+6	3.5980+6	1.6820+3	1.9385+1	1.2677+1	1.4345+0	5.2738+0
	4.0000+0	3.4581–6	2.1154+4	2.2389–1	8.5008+6	3.6457+6	1.2590+6	3.5944+6	1.6753+3	2.1505+1	1.3088+1	1.4368+0	6.9801+0
	5.0000+0	3.6212–6	2.0201+4	2.6826–1	8.1178+6	3.2681+6	1.2579+6	3.5902+6	1.6729+3	2.3598+1	1.3444+1	1.4390+0	8.7146+0
	6.0000+0	3.7418–6	1.9550+4	3.0885–1	7.8563+6	3.0125+6	1.2571+6	3.5851+6	1.6762+3	2.5704+1	1.3739+1	1.4408+0	1.0524+1
	8.0000+0	3.9088–6	1.8715+4	3.8103–1	7.5206+6	2.6888+6	1.2573+6	3.5728+6	1.6813+3	2.9820+1	1.4225+1	1.4436+0	1.4151+1
	1.0000+1	4.0167–6	1.8212+4	4.4373–1	7.3186+6	2.4992+6	1.2585+6	3.5591+6	1.6924+3	3.4071+1	1.4604+1	1.4459+0	1.8021+1
	1.5000+1	4.1485–6	1.7633+4	5.7190–1	7.0860+6	2.2808+6	1.2609+6	3.5425+6	1.7128+3	4.4407+1	1.5172+1	1.4410+0	2.7794+1
	2.0000+1	4.1991–6	1.7421+4	6.7276–1	7.0008+6	2.2067+6	1.2627+6	3.5296+6	1.7354+3	5.5123+1	1.5637+1	1.4376+0	3.8049+1
	3.0000+1	4.2123–6	1.7367+4	8.2582–1	6.9788+6	2.1975+6	1.2636+6	3.5159+6	1.7715+3	7.6731+1	1.6150+1	1.4357+0	5.9146+1
	4.0000+1	4.2192–6	1.7338+4	9.4037–1	6.9673+6	2.1971+6	1.2646+6	3.5037+6	1.8001+3	9.8797+1	1.6529+1	1.4344+0	8.0833+1
	5.0000+1	4.2227–6	1.7324+4	1.0316+0	6.9616+6	2.1963+6	1.2652+6	3.4983+6	1.8249+3	1.2129+2	1.6823+1	1.4359+0	1.0303+2
	6.0000+1	4.2267–6	1.7307+4	1.1072+0	6.9549+6	2.1955+6	1.2654+6	3.4922+6	1.8447+3	1.4392+2	1.7023+1	1.4370+0	1.2546+2
	8.0000+1	4.2259–6	1.7310+4	1.2278+0	6.9562+6	2.1944+6	1.2658+6	3.4942+6	1.8751+3	1.8966+2	1.7360+1	1.4389+0	1.7086+2
	1.0000+2	4.2257–6	1.7312+4	1.3223+0	6.9567+6	2.1935+6	1.2660+6	3.4952+6	1.8977+3	2.3557+2	1.7647+1	1.4404+0	2.1649+2
	1.5000+2	4.2305–6	1.7292+4	1.4950+0	6.9487+6	2.1919+6	1.2662+6	3.4887+6	1.9362+3	3.5094+2	1.7967+1	1.4378+0	3.3153+2
	2.0000+2	4.2325–6	1.7284+4	1.6180+0	6.9455+6	2.1908+6	1.2663+6	3.4864+6	1.9623+3	4.6753+2	1.8261+1	1.4371+0	4.4783+2
	3.0000+2	4.2355–6	1.7272+4	1.7918+0	6.9406+6	2.1892+6	1.2664+6	3.4830+6	1.9953+3	6.9916+2	1.8681+1	1.4361+0	6.7904+2
	4.0000+2	4.2399–6	1.7254+4	1.9153+0	6.9334+6	2.1880+6	1.2665+6	3.4769+6	2.0184+3	9.3056+2	1.8911+1	1.4339+0	9.1021+2
	5.0000+2	4.2461–6	1.7228+4	2.0112+0	6.9233+6	2.1872+6	1.2665+6	3.4676+6	2.0364+3	1.1636+3	1.9116+1	1.4304+0	1.1430+3
	6.0000+2	4.2483–6	1.7219+4	2.0895+0	6.9195+6	2.1864+6	1.2665+6	3.4646+6	2.0516+3	1.3968+3	1.9281+1	1.4295+0	1.3761+3
	8.0000+2	4.2533–6	1.7199+4	2.2131+0	6.9114+6	2.1853+6	1.2665+6	3.4576+6	2.0759+3	1.8643+3	1.9567+1	1.4273+0	1.8433+3
	1.0000+3	4.2576–6	1.7182+4	2.3088+0	6.9044+6	2.1844+6	1.2665+6	3.4514+6	2.0950+3	2.3328+3	1.9810+1	1.4255+0	2.3116+3
	1.5000+3	4.2640–6	1.7156+4	2.4825+0	6.8942+6	2.1828+6	1.2665+6	3.4427+6	2.1299+3	3.5004+3	2.0040+1	1.4219+0	3.4790+3
	2.0000+3	4.2695–6	1.7134+4	2.6058+0	6.8852+6	2.1817+6	1.2665+6	3.4349+6	2.1551+3	4.6708+3	2.0267+1	1.4187+0	4.6491+3
	3.0000+3	4.2768–6	1.7105+4	2.7791+0	6.8735+6	2.1801+6	1.2665+6	3.4247+6	2.1913+3	7.0293+3	2.0701+1	1.4146+0	7.0072+3
	4.0000+3	4.2827–6	1.7081+4	2.9018+0	6.8641+6	2.1790+6	1.2665+6	3.4164+6	2.2177+3	9.3814+3	2.0909+1	1.4111+0	9.3591+3
	5.0000+3	4.2893–6	1.7055+4	2.9968+0	6.8535+6	2.1781+6	1.2665+6	3.4067+6	2.2385+3	1.1750+4	2.1073+1	1.4071+0	1.1728+4
	6.0000+3	4.2915–6	1.7046+4	3.0745+0	6.8499+6	2.1774+6	1.2665+6	3.4038+6	2.2549+3	1.4069+4	2.1218+1	1.4060+0	1.4046+4
	8.0000+3	4.2962–6	1.7028+4	3.1972+0	6.8425+6	2.1762+6	1.2665+6	3.3975+6	2.2809+3	1.8749+4	2.1507+1	1.4034+0	1.8726+4
	1.0000+4	4.2997–6	1.7013+4	3.2924+0	6.8368+6	2.1753+6	1.2665+6	3.3926+6	2.3012+3	2.3474+4	2.1748+1	1.4015+0	2.3451+4
	1.5000+4	4.3056–6	1.6990+4	3.4654+0	6.8274+6	2.1738+6	1.2665+6	3.3848+6	2.3385+3	3.5101+4	2.1968+1	1.3983+0	3.5078+4
	2.0000+4	4.3103–6	1.6971+4	3.5882+0	6.8200+6	2.1726+6	1.2665+6	3.3785+6	2.3653+3	4.6880+4	2.2187+1	1.3956+0	4.6856+4
	3.0000+4	4.3156–6	1.6951+4	3.7614+0	6.8117+6	2.1710+6	1.2665+6	3.3717+6	2.4029+3	7.0165+4	2.2618+1	1.3929+0	7.0141+4
	4.0000+4	4.3201–6	1.6933+4	3.8843+0	6.8046+6	2.1699+6	1.2665+6	3.3657+6	2.4298+3	9.3699+4	2.2814+1	1.3904+0	9.3675+4

Atomic Weight 242.000													Density 13.670 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+4	4.3255–6	1.6912+4	3.9796+0	6.7960+6	2.1690+6	1.2665+6	3.3580+6	2.4506+3	1.1702+5	2.2973+1	1.3872+0	1.1699+5
6.0000+4	4.3270–6	1.6906+4	4.0575+0	6.7938+6	2.1683+6	1.2665+6	3.3565+6	2.4675+3	1.4031+5	2.3112+1	1.3866+0	1.4029+5
8.0000+4	4.3305–6	1.6893+4	4.1805+0	6.7883+6	2.1672+6	1.2665+6	3.3521+6	2.4944+3	1.8731+5	2.3390+1	1.3848+0	1.8729+5
1.0000+5	4.3333–6	1.6881+4	4.2757+0	6.7838+6	2.1663+6	1.2665+6	3.3484+6	2.5153+3	2.3440+5	2.3656+1	1.3833+0	2.3437+5


July 4, 1991
Atomic Weight 247 000
EEDL Evaluated Electron
Cross Sections
96-Cm
Density 13 510 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
96-Cm


July 4, 1991
Atomic Weight 247 000
EEDL Evaluated Electron
Energy Deposition
96-Cm
Density 13 510 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
96-Cm

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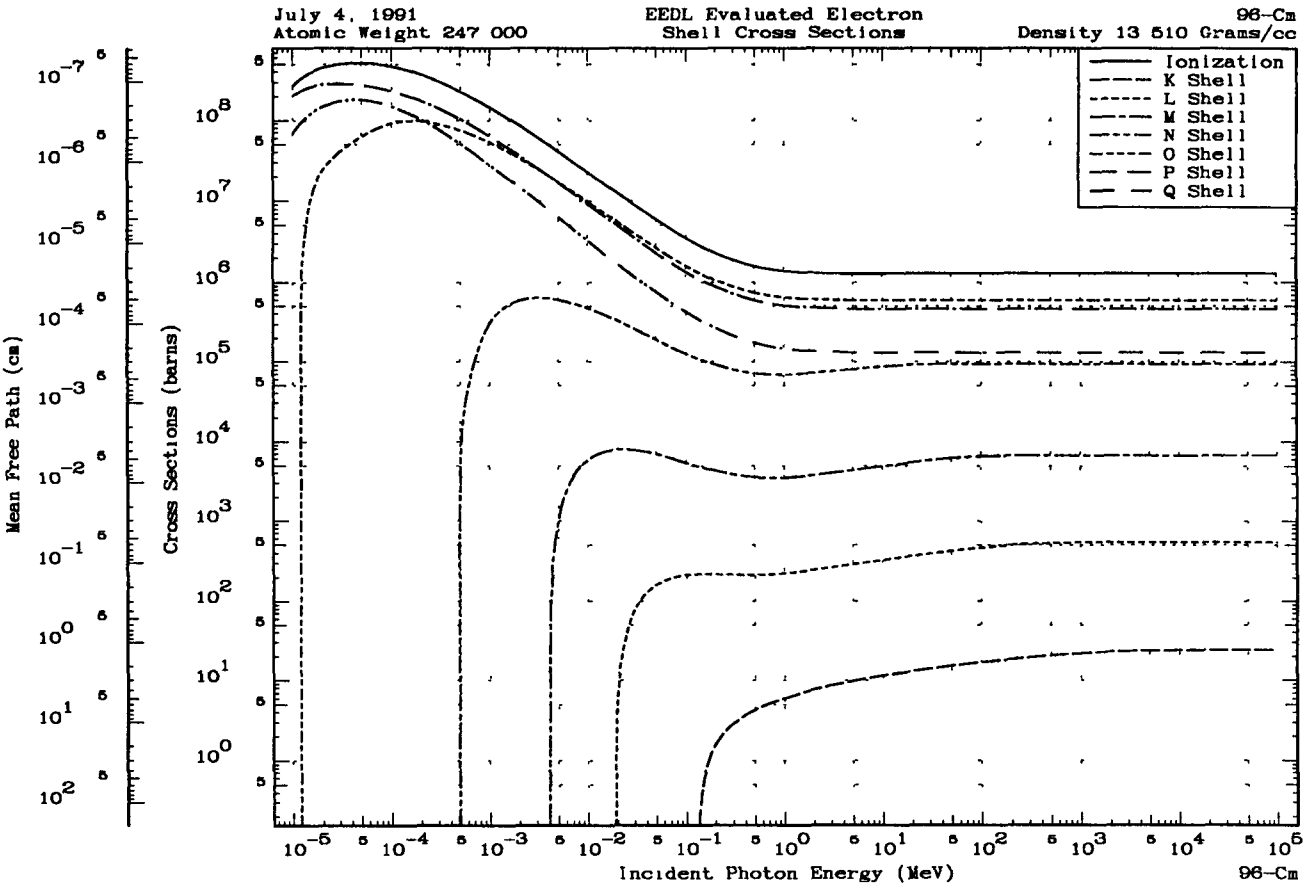
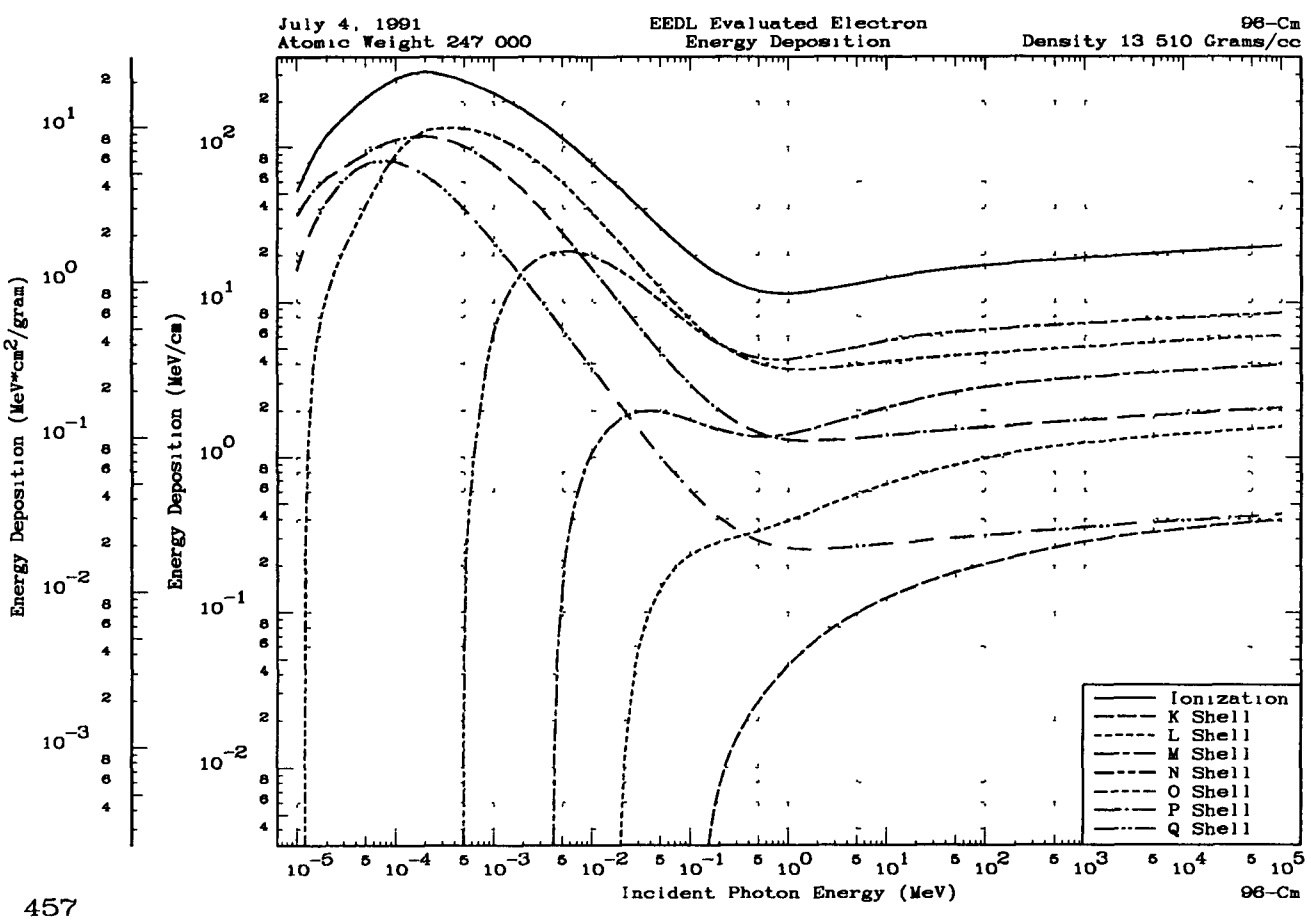

July 4, 1991
Atomic Weight 247 000
EEDL Evaluated Electron
Shell Cross Sections
96-Cm
Density 13 510 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
96-Cm


July 4, 1991
Atomic Weight 247 000
EEDL Evaluated Electron
Energy Deposition
96-Cm
Density 13 510 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
96-Cm

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Atomic Weight 247.000 Density 13.510 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	9.0673–9	8.1633+6		3.3482+9	3.0437+9	2.7319+8	3.1281+7	4.8650+3	5.9662+1	5.2420+1	7.2423+0	3.4644–4
	1.1250–5	9.3812–9	7.8902+6		3.2362+9	2.8849+9	3.0747+8	4.3801+7	4.9847+3	7.2278+1	6.1761+1	1.0516+1	3.8853–4
O7	1.1950–5	9.5259–9	7.7703+6		3.1870+9	2.8068+9	3.2476+8	5.5506+7	5.0472+3	8.0366+1	6.6773+1	1.3593+1	4.1243–4
	1.2141–5	9.5575–9	7.7446+6		3.1765+9	2.7866+9	3.2935+8	6.0505+7	5.0637+3	8.3108+1	6.8237+1	1.4870+1	4.1898–4
	1.2498–5	9.6109–9	7.7016+6		3.1588+9	2.7501+9	3.3788+8	7.0869+7	5.0941+3	8.8527+1	7.0993+1	1.7534+1	4.3131–4
	1.3124–5	9.6847–9	7.6429+6		3.1348+9	2.6896+9	3.5265+8	9.2476+7	5.1457+3	9.9000+1	7.5855+1	2.3145+1	4.5302–4
O6	1.3480–5	9.7153–9	7.6188+6		3.1249+9	2.6570+9	3.6082+8	1.0702+8	5.1743+3	1.0555+2	7.8584+1	2.6961+1	4.6547–4
	1.3670–5	9.7328–9	7.6051+6		3.1193+9	2.6402+9	3.6482+8	1.1427+8	5.1892+3	1.0892+2	8.0035+1	2.8887+1	4.7213–4
	1.4003–5	9.7579–9	7.5856+6		3.1112+9	2.6115+9	3.7189+8	1.2789+8	5.2150+3	1.1515+2	8.2628+1	3.2525+1	4.8381–4
	1.4062–5	9.7617–9	7.5826+6		3.1100+9	2.6064+9	3.7314+8	1.3045+8	5.2196+3	1.1630+2	8.3088+1	3.3211+1	4.8590–4
	1.4501–5	9.7838–9	7.5655+6		3.1030+9	2.5702+9	3.8212+8	1.5068+8	5.2529+3	1.2509+2	8.6424+1	3.8664+1	5.0144–4
	1.5000–5	9.7938–9	7.5577+6		3.0998+9	2.5310+9	3.9232+8	1.7655+8	5.2896+3	1.3599+2	9.0287+1	4.5706+1	5.1916–4
	1.6250–5	9.8098–9	7.5455+6		3.0948+9	2.4404+9	4.1042+8	2.4393+8	5.3777+3	1.6200+2	9.7976+1	6.4021+1	5.6402–4
	1.7500–5	9.7764–9	7.5712+6		3.1053+9	2.3595+9	4.2742+8	3.1840+8	5.4606+3	1.9023+2	1.0553+2	8.4701+1	6.0949–4
	1.8125–5	9.7365–9	7.6022+6		3.1181+9	2.3221+9	4.3470+8	3.6120+8	5.5003+3	2.0584+2	1.0911+2	9.6734+1	6.3244–4
	2.0000–5	9.6016–9	7.7090+6		3.1619+9	2.2204+9	4.5479+8	4.8666+8	5.6132+3	2.5240+2	1.1946+2	1.3294+2	7.0212–4
	2.2500–5	9.3993–9	7.8750+6		3.2300+9	2.1046+9	4.6907+8	6.5631+8	5.7384+3	3.1087+2	1.2932+2	1.8155+2	7.8964–4
	2.5000–5	9.1951–9	8.0499+6		3.3017+9	2.0061+9	4.8174+8	8.1388+8	5.8527+3	3.6685+2	1.3890+2	2.2795+2	8.7868–4
P3	2.7000–5	9.0558–9	8.1737+6		3.3525+9	1.9370+9	4.9157+8	9.2386+8	5.9376+3	4.0789+2	1.4658+2	2.6130+2	9.5093–4
	2.7375–5	9.0367–9	8.1910+6		3.3595+9	1.9249+9	4.9299+8	9.4163+8	5.9528+3	4.1458+2	1.4797+2	2.6661+2	9.6443–4
	2.8031–5	9.0015–9	8.2230+6		3.3727+9	1.9043+9	4.9543+8	9.7297+8	5.9789+3	4.2638+2	1.5039+2	2.7598+2	9.8814–4
	2.9016–5	8.9446–9	8.2753+6		3.3942+9	1.8746+9	4.9905+8	1.0205+9	6.0171+3	4.4429+2	1.5403+2	2.9026+2	1.0239–3
	3.0000–5	8.8834–9	8.3323+6		3.4175+9	1.8464+9	5.0251+8	1.0687+9	6.0543+3	4.6238+2	1.5759+2	3.0478+2	1.0598–3
	3.1250–5	8.8183–9	8.3938+6		3.4427+9	1.8125+9	5.0430+8	1.1259+9	6.1001+3	4.8290+2	1.6107+2	3.2183+2	1.1057–3
	3.3438–5	8.7826–9	8.4279+6		3.4568+9	1.7577+9	5.0770+8	1.1913+9	6.1767+3	5.0927+2	1.6744+2	3.4183+2	1.1867–3
	3.6719–5	8.7096–9	8.4986+6		3.4857+9	1.6846+9	5.1297+8	1.2882+9	6.2844+3	5.4902+2	1.7729+2	3.7173+2	1.3097–3
P2	3.9640–5	8.6300–9	8.5770+6		3.5179+9	1.6271+9	5.1765+8	1.3731+9	6.3739+3	5.8448+2	1.8621+2	3.9826+2	1.4208–3
	4.0000–5	8.6303–9	8.5767+6		3.5178+9	1.6204+9	5.1829+8	1.3790+9	6.3845+3	5.8761+2	1.8740+2	4.0021+2	1.4346–3
	4.1250–5	8.6419–9	8.5652+6		3.5130+9	1.5980+9	5.1808+8	1.3970+9	6.4192+3	5.9606+2	1.9016+2	4.0589+2	1.4810–3
	4.3438–5	8.6577–9	8.5495+6		3.5066+9	1.5610+9	5.1796+8	1.4277+9	6.4780+3	6.1083+2	1.9517+2	4.1566+2	1.5626–3
	4.5000–5	8.6661–9	8.5413+6		3.5032+9	1.5361+9	5.1802+8	1.4490+9	6.5184+3	6.2132+2	1.9883+2	4.2249+2	1.6213–3
	5.0000–5	8.6801–9	8.5275+6		3.4976+9	1.4645+9	5.1839+8	1.5147+9	6.6406+3	6.5420+2	2.1051+2	4.4369+2	1.8112–3
	5.5000–5	8.7192–9	8.4892+6		3.4819+9	1.4025+9	5.1670+8	1.5626+9	6.7505+3	6.8061+2	2.2068+2	4.5994+2	2.0010–3
	6.0000–5	8.7449–9	8.4642+6		3.4716+9	1.3483+9	5.1561+8	1.6077+9	6.8525+3	7.0667+2	2.3120+2	4.7547+2	2.1934–3
P1	6.0690–5	8.7578–9	8.4518+6		3.4666+9	1.3413+9	5.1478+8	1.6105+9	6.8660+3	7.0856+2	2.3213+2	4.7643+2	2.2202–3
	6.1897–5	8.7852–9	8.4254+6		3.4557+9	1.3294+9	5.1341+8	1.6129+9	6.8893+3	7.1129+2	2.3386+2	4.7743+2	2.2671–3
	6.4160–5	8.8348–9	8.3781+6		3.4363+9	1.3080+9	5.1101+8	1.6173+9	6.9321+3	7.1645+2	2.3718+2	4.7927+2	2.3554–3
	6.8120–5	8.9159–9	8.3019+6		3.4051+9	1.2730+9	5.0729+8	1.6248+9	7.0040+3	7.2564+2	2.4324+2	4.8240+2	2.5112–3
	7.0000–5	8.9521–9	8.2683+6		3.3913+9	1.2574+9	5.0572+8	1.6282+9	7.0369+3	7.3005+2	2.4621+2	4.8385+2	2.5856–3
	7.4060–5	9.0269–9	8.1999+6		3.3632+9	1.2257+9	5.0228+8	1.6352+9	7.1056+3	7.3919+2	2.5229+2	4.8689+2	2.7474–3
	8.0000–5	9.1263–9	8.1106+6		3.3266+9	1.1836+9	4.9803+8	1.6449+9	7.2006+3	7.5276+2	2.6157+2	4.9118+2	2.9867–3
	9.0000–5	9.3861–9	7.8860+6		3.2345+9	1.1225+9	4.8594+8	1.6260+9	7.3471+3	7.5959+2	2.7137+2	4.8822+2	3.3961–3
	1.0000–4	9.6198–9	7.6944+6	0.0000+0	3.1559+9	1.0705+9	4.7603+8	1.6093+9	7.4807+3	7.6770+2	2.8185+2	4.8585+2	3.8128–3
	1.1250–4	9.9375–9	7.4485+6	1.6286–8	3.0550+9	1.0153+9	4.6015+8	1.5796+9	7.6318+3	7.6731+2	2.8874+2	4.7857+2	4.3434–3
O5	1.2523–4	1.0232–8	7.2342+6	3.2862–8	2.9671+9	9.6744+8	4.4668+8	1.5530+9	7.7719+3	7.6871+2	2.9649+2	4.7221+2	4.8936–3
	1.2678–4	1.0276–8	7.2030+6	3.4877–8	2.9543+9	9.6211+8	4.4489+8	1.5473+9	7.7881+3	7.6779+2	2.9707+2	4.7072+2	4.9612–3
	1.2968–4	1.0358–8	7.1459+6	3.8662–8	2.9309+9	9.5236+8	4.4162+8	1.5369+9	7.8181+3	7.6617+2	2.9817+2	4.6799+2	5.0882–3
	1.3476–4	1.0499–8	7.0502+6	4.5303–8	2.8917+9	9.3603+8	4.3617+8	1.5195+9	7.8693+3	7.6361+2	3.0019+2	4.6341+2	5.3115–3
O4	1.3646–4	1.0545–8	7.0193+6	4.7529–8	2.8790+9	9.3076+8	4.3442+8	1.5138+9	7.8861+3	7.6281+2	3.0087+2	4.6194+2	5.3866–3
	1.3815–4	1.0593–8	6.9874+6	4.9750–8	2.8659+9	9.2561+8	4.3271+8	1.5076+9	7.9026+3	7.6190+2	3.0159+2	4.6030+2	5.4614–3
	1.4111–4	1.0676–8	6.9330+6	5.3640–8	2.8436+9	9.1682+8	4.2980+8	1.4970+9	7.9311+3	7.6041+2	3.0289+2	4.5752+2	5.5928–3
	1.4238–4	1.0712–8	6.9102+6	5.5306–8	2.8342+9	9.1314+8	4.2859+8	1.4925+9	7.9431+3	7.5981+2	3.0345+2	4.5636+2	5.6491–3
	1.4556–4	1.0799–8	6.8542+6	5.9491–8	2.8113+9	9.0411+8	4.2562+8	1.4815+9	7.9729+3	7.5838+2	3.0487+2	4.5350+2	5.7908–3
	1.5000–4	1.0919–8	6.7788+6	6.5356–8	2.7804+9	8.9196+8	4.2164+8	1.4667+9	8.0138+3	7.5658+2	3.0693+2	4.4965+2	5.9897–3
	1.6250–4	1.1261–8	6.5733+6	8.1993–8	2.6961+9	8.6040+8	4.0795+8	1.4277+9	8.1234+3	7.4614+2	3.0731+2	4.3883+2	6.5660–3
	1.7500–4	1.1585–8	6.3892+6	9.8844–8	2.6205+9	8.3217+8	3.9589+8	1.3925+9	8.2262+3	7.3752+2	3.0840+2	4.2911+2	7.1498–3
	1.8125–4	1.1742–8	6.3040+6	1.0734–7	2.5856+9	8.1913+8	3.9038+8	1.3761+9	8.2754+3	7.3382+2	3.0919+2	4.2462+2	7.4443–3
	1.8750–4	1.1895–8	6.2229+6	1.1588–7	2.5524+9	8.0673+8	3.8516+8	1.3605+9	8.3231+3	7.3045+2	3.1010+2	4.2034+2	7.7405–3
	2.0000–4	1.2191–8	6.0717+6	1.3306–7	2.4903+9	7.8363+8	3.7550+8	1.3312+9	8.4148+3	7.2442+2	3.1205+2	4.1236+2	8.3380–3
	2.2500–4	1.2871–8	5.7510+6	1.6813–7	2.3588+9	7.4317+8	3.5519+8	1.2604+9	8.5847+3	7.0157+2	3.0962+2	3.9194+2	9.6078–3
O3	2.3965–4	1.3250–8	5.5865+6	1.8918–7	2.2913+9	7.2237+8	3.4488+8	1.2241+9	8.6770+3	6.9027+2	3.0876+2	3.8150+2	1.0364–2
	2.4342–4	1.3353–8	5.5431+6	1.9466–7	2.2735+9	7.1734+8	3.4211+8	1.2141+9	8.7001+3	6.8663+2	3.0806+2	3.7857+2	1.0560–2
	2.5049–4	1.3546–8	5.4643+6	2.0501–7	2.2412+9	7.0820+8	3.3709+8	1.1959+9	8.7424+3	6.8010+2	3.0684+2	3.7325+2	1.0928–2
	2.6250–4	1.3867–8	5.3380+6	2.2279–7	2.1894+9	6.9352+8	3.2909+8	1.1668+9	8.8122+3	6.6980+2	3.0504+2	3.6475+2	1.1558–2
	2.6287–4	1.3876–8	5.3342+6	2.2335–7	2.1878+9	6.9308+8	3.2885+8	1.1659+9	8.8143+3	6.6949+2	3.0499+2	3.6449+2	1.1578–2
	2.8144–4	1.4357–8	5.1555+6	2.5138–7	2.1146+9	6.7224+8	3.1758+8	1.1247+9	8.9169+3	6.5505+2	3.0254+2	3.5250+2	1.2562–2
	3.0000–4	1.4822–8	4.9939+6	2.8000–7	2.0483+9	6.5329+8	3.0745+8	1.0875+9	9.0141+3	6.4238+2	3.0069+2	3.4168+2	1.3558–2
O2	3.1480–4	1.5203–8	4.8688+6	3.0324–7	1.9970+9	6.3939+8	2.9944+8	1.0581+9	9.0880+3	6.3099+2	2.9813+2	3.3285+2	1.4360–2
	3.2013–4	1.5339–8	4.8257+6	3.1171–7	1.9793+9	6.3463+8	2.9668+8	1.0480+9	9.1139+3	6.2709+2	2.9726+2	3.2982+2	1.4650–2
	3.2500–4	1.5462–8	4.7872+6	3.1951–7	1.9635+9	6.3038+8	2.9422+8	1.0389+9	9.1373+3	6.2363+2	2.9651+2	3.2711+2	1.4916–2
	3.3011–4	1.5590–8	4.7478+6	3.2772–7	1.9473+9	6.2602+8	2.9170+8	1.0296+9	9.1616+3	6.2010+2	2.9574+2	3.2434+2	1.5196–2
	3.4758–4	1.6022–8	4.6198+6	3.5616–7	1.8948+9	6.1182+8	2.8357+8	9.9944+8	9.2421+3	6.0880+2	2.9340+2	3.1538+2	1.6160–2
	3.5000–4	1.6081–8	4.6029+6	3.6014–7	1.8879+9	6.0993+8	2.8250+8	9.9546+8	9.2530+3	6.0732+2	2.9311+2	3.1420+2	1.6294–2
	3.6250–4	1.6382–8	4.5182+6	3.8084–7	1.8532+9	6.0049+8	2.7713+8	9.7554+8	9.3082+3	5.9990+2	2.9161+2	3.0828+2	1.6989–2
	3.7379–4	1.6650–8	4.4456+6	3.9976–7	1.8234+9	5.9235+8	2.7254+8	9.5846+8	9.3568+3	5.9362+2	2.9039+2	3.0321+2	1.7620–2
O1	3.8430–4	1.6896–8	4.3809+6	4.1755–7	1.7968+9	5.8509+8	2.6846+8	9.4328+8	9.4009+3	5.8809+2	2.8937+2	2.9870+2	1.8211–2
	3.8823–4	1.6988–8	4.3572+6	4.2424–7	1.7871+9	5.8245+8	2.6697+8	9.3768+8	9.4173+3	5.8607+2	2.8899+2	2.9706+2	1.8445–2
	4.0000–4	1.7261–8	4.2882+6	4.4443–7	1.7588+9	5.7476+8	2.6264+8	9.2140+8	9.4655+3	5.8024+2	2.8794+2	2.9228+2	1.9150–2
	4.1250–4	1.7565–8	4.2140+6	4.6612–7	1.7284+9	5.6694+8	2.5774+8	9.0369+8	9.5155+3	5.7244+2	2.8550+2	2.8692+2	1.9902–2
	4.3438–4	1.8087–8	4.0924+6	5.0476–7	1.6785+9	5.5406+8	2.4975+8	8.7472+8	9.5999+3	5.5980+2	2.8162+2	2.7816+2	2.1229–2

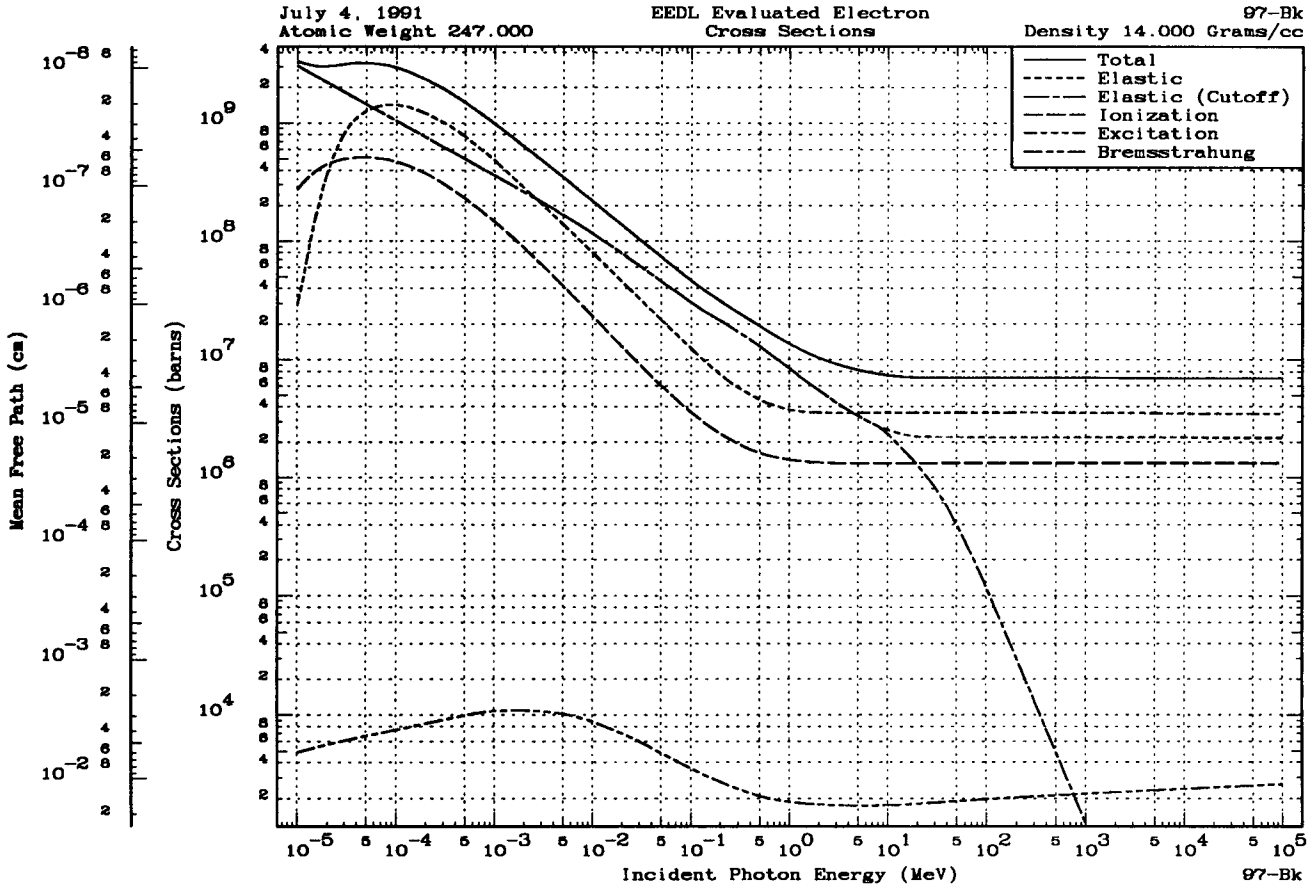
Atomic Weight 247.000 Density 13.510 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.5000–4	1.8452–8	4.0115+6	5.3288–7	1.6453+9	5.4542+8	2.4445+8	8.5543+8	9.6581+3	5.5148+2	2.7913+2	2.7233+2	2.2184–2
	4.6719–4	1.8847–8	3.9273+6	5.6429–7	1.6108+9	5.3640+8	2.3896+8	8.3545+8	9.7202+3	5.4294+2	2.7662+2	2.6630+2	2.3242–2
N7	4.8747–4	1.9305–8	3.8342+6	6.0197–7	1.5726+9	5.2635+8	2.3290+8	8.1335+8	9.7911+3	5.3359+2	2.7394+2	2.5963+2	2.4499–2
	4.9374–4	1.9449–8	3.8058+6	6.1375–7	1.5610+9	5.2337+8	2.3112+8	8.0645+8	9.8125+3	5.3078+2	2.7320+2	2.5756+2	2.4889–2
	5.0000–4	1.9593–8	3.7779+6	6.2558–7	1.5495+9	5.2045+8	2.2937+8	7.9970+8	9.8336+3	5.2805+2	2.7249+2	2.5554+2	2.5281–2
N6	5.0225–4	1.9643–8	3.7682+6	6.2984–7	1.5455+9	5.1941+8	2.2874+8	7.9737+8	9.8412+3	5.2702+2	2.7217+2	2.5482+2	2.5421–2
	5.1447–4	1.9919–8	3.7159+6	6.5315–7	1.5241+9	5.1388+8	2.2535+8	7.8485+8	9.8801+3	5.2161+2	2.7058+2	2.5100+2	2.6186–2
	5.2500–4	2.0155–8	3.6725+6	6.7343–7	1.5063+9	5.0927+8	2.2255+8	7.7445+8	9.9130+3	5.1715+2	2.6930+2	2.4783+2	2.6848–2
	5.3585–4	2.0396–8	3.6292+6	6.9450–7	1.4885+9	5.0466+8	2.1975+8	7.6409+8	9.9463+3	5.1273+2	2.6803+2	2.4467+2	2.7532–2
	5.5000–4	2.0706–8	3.5748+6	7.2224–7	1.4662+9	4.9884+8	2.1625+8	7.5110+8	9.9890+3	5.0721+2	2.6648+2	2.4071+2	2.8428–2
	5.6250–4	2.0977–8	3.5285+6	7.4700–7	1.4472+9	4.9388+8	2.1328+8	7.4007+8	1.0026+4	5.0257+2	2.6520+2	2.3735+2	2.9223–2
	6.0000–4	2.1775–8	3.3992+6	8.2258–7	1.3942+9	4.7990+8	2.0501+8	7.0929+8	1.0133+4	4.8982+2	2.6181+2	2.2797+2	3.1626–2
	6.2500–4	2.2308–8	3.3181+6	8.7411–7	1.3609+9	4.7129+8	1.9951+8	6.9012+8	1.0190+4	4.8045+2	2.5834+2	2.2208+2	3.3185–2
	6.4688–4	2.2766–8	3.2513+6	9.2001–7	1.3335+9	4.6415+8	1.9499+8	6.7438+8	1.0239+4	4.7284+2	2.5557+2	2.1723+2	3.4556–2
	7.0000–4	2.3851–8	3.1034+6	1.0344–6	1.2729+9	4.4819+8	1.8506+8	6.3960+8	1.0353+4	4.5635+2	2.4977+2	2.0655+2	3.7913–2
	7.1387–4	2.4129–8	3.0677+6	1.0649–6	1.2582+9	4.4430+8	1.8268+8	6.3124+8	1.0381+4	4.5246+2	2.4844+2	2.0398+2	3.8796–2
	7.2463–4	2.4342–8	3.0408+6	1.0888–6	1.2472+9	4.4136+8	1.8088+8	6.2493+8	1.0403+4	4.4954+2	2.4745+2	2.0204+2	3.9483–2
	7.5693–4	2.4975–8	2.9638+6	1.1613–6	1.2156+9	4.3291+8	1.7576+8	6.0691+8	1.0466+4	4.4131+2	2.4475+2	1.9652+2	4.1552–2
	8.0000–4	2.5800–8	2.8690+6	1.2600–6	1.1767+9	4.2241+8	1.6950+8	5.8480+8	1.0547+4	4.3147+2	2.4169+2	1.8974+2	4.4331–2
N5	8.6544–4	2.7032–8	2.7382+6	1.4144–6	1.1231+9	4.0802+8	1.6046+8	5.5458+8	1.0615+4	4.1591+2	2.3555+2	1.8031+2	4.7968–2
	8.7385–4	2.7188–8	2.7225+6	1.4347–6	1.1166+9	4.0628+8	1.5939+8	5.5095+8	1.0623+4	4.1409+2	2.3486+2	1.7918+2	4.8436–2
	9.0000–4	2.7669–8	2.6752+6	1.4983–6	1.0972+9	4.0103+8	1.5616+8	5.4003+8	1.0649+4	4.0868+2	2.3285+2	1.7579+2	4.9896–2
	9.0539–4	2.7767–8	2.6657+6	1.5115–6	1.0934+9	3.9998+8	1.5552+8	5.3784+8	1.0654+4	4.0760+2	2.3244+2	1.7511+2	5.0198–2
N4	9.1964–4	2.8026–8	2.6411+6	1.5466–6	1.0833+9	3.9723+8	1.5384+8	5.3217+8	1.0668+4	4.0476+2	2.3137+2	1.7334+2	5.0995–2
	9.2969–4	2.8218–8	2.6231+6	1.5714–6	1.0759+9	3.9533+8	1.5269+8	5.2785+8	1.0677+4	4.0270+2	2.3065+2	1.7200+2	5.1558–2
	9.4726–4	2.8552–8	2.5924+6	1.6153–6	1.0633+9	3.9208+8	1.5073+8	5.2048+8	1.0694+4	3.9922+2	2.2945+2	1.6972+2	5.2543–2
	9.5269–4	2.8655–8	2.5831+6	1.6289–6	1.0595+9	3.9109+8	1.5013+8	5.1825+8	1.0698+4	3.9817+2	2.2909+2	1.6903+2	5.2848–2
	9.7363–4	2.9048–8	2.5481+6	1.6817–6	1.0451+9	3.8736+8	1.4789+8	5.0986+8	1.0717+4	3.9425+2	2.2777+2	1.6642+2	5.4024–2
	1.0000–3	2.9539–8	2.5058+6	1.7490–6	1.0278+9	3.8282+8	1.4519+8	4.9974+8	1.0741+4	3.8956+2	2.2622+2	1.6328+2	5.5509–2
	1.0625–3	3.0699–8	2.4111+6	1.9120–6	9.8893+8	3.7267+8	1.3897+8	4.7728+8	1.0757+4	3.7769+2	2.2143+2	1.5621+2	5.8338–2
	1.1250–3	3.1832–8	2.3253+6	2.0798–6	9.5374+8	3.6334+8	1.3336+8	4.5703+8	1.0773+4	3.6717+2	2.1727+2	1.4983+2	6.1171–2
	1.1719–3	3.2665–8	2.2660+6	2.2087–6	9.2942+8	3.5682+8	1.2949+8	4.4309+8	1.0784+4	3.5991+2	2.1440+2	1.4545+2	6.3298–2
N3	1.1944–3	3.3060–8	2.2389+6	2.2716–6	9.1831+8	3.5382+8	1.2773+8	4.3674+8	1.0789+4	3.5662+2	2.1311+2	1.4345+2	6.4320–2
	1.2135–3	3.3396–8	2.2164+6	2.3254–6	9.0908+8	3.5133+8	1.2624+8	4.3150+8	1.0793+4	3.5371+2	2.1185+2	1.4179+2	6.5188–2
	1.2493–3	3.4019–8	2.1758+6	2.4274–6	8.9242+8	3.4682+8	1.2355+8	4.2204+8	1.0801+4	3.4848+2	2.0961+2	1.3881+2	6.6815–2
	1.2813–3	3.4569–8	2.1412+6	2.5196–6	8.7822+8	3.4294+8	1.2127+8	4.1400+8	1.0808+4	3.4408+2	2.0774+2	1.3627+2	6.8266–2
	1.3120–3	3.5093–8	2.1092+6	2.6095–6	8.6511+8	3.3934+8	1.1916+8	4.0660+8	1.0815+4	3.4004+2	2.0604+2	1.3393+2	6.9664–2
	1.3125–3	3.5102–8	2.1087+6	2.6110–6	8.6490+8	3.3928+8	1.1913+8	4.0648+8	1.0815+4	3.3998+2	2.0602+2	1.3389+2	6.9688–2
	1.3359–3	3.5498–8	2.0852+6	2.6802–6	8.5524+8	3.3662+8	1.1758+8	4.0103+8	1.0819+4	3.3697+2	2.0473+2	1.3217+2	7.0754–2
	1.4060–3	3.6665–8	2.0188+6	2.8907–6	8.2801+8	3.2905+8	1.1323+8	3.8572+8	1.0833+4	3.2861+2	2.0119+2	1.2734+2	7.3943–2
N2	1.4932–3	3.8086–8	1.9435+6	3.1600–6	7.9712+8	3.2035+8	1.0832+8	3.6844+8	1.0850+4	3.1933+2	1.9736+2	1.2189+2	7.7918–2
	1.5000–3	3.8196–8	1.9379+6	3.1813–6	7.9483+8	3.1970+8	1.0796+8	3.6716+8	1.0851+4	3.1864+2	1.9707+2	1.2149+2	7.8229–2
	1.5312–3	3.8700–8	1.9126+6	3.2799–6	7.8448+8	3.1673+8	1.0627+8	3.6146+8	1.0857+4	3.1515+2	1.9539+2	1.1967+2	7.9654–2
	1.5898–3	3.9634–8	1.8676+6	3.4677–6	7.6599+8	3.1139+8	1.0327+8	3.5131+8	1.0867+4	3.0897+2	1.9244+2	1.1644+2	8.2329–2
	1.6250–3	4.0188–8	1.8418+6	3.5821–6	7.5543+8	3.0832+8	1.0157+8	3.4554+8	1.0873+4	3.0547+2	1.9079+2	1.1460+2	8.3935–2
	1.6411–3	4.0440–8	1.8303+6	3.6350–6	7.5072+8	3.0694+8	1.0080+8	3.4296+8	1.0876+4	3.0392+2	1.9006+2	1.1378+2	8.4671–2
N1	1.6641–3	4.0798–8	1.8143+6	3.7109–6	7.4413+8	3.0502+8	9.9743+7	3.3936+8	1.0880+4	3.0175+2	1.8904+2	1.1263+2	8.5722–2
	1.7061–3	4.1454–8	1.7856+6	3.8510–6	7.3237+8	3.0153+8	9.7846+7	3.3299+8	1.0873+4	2.9781+2	1.8712+2	1.1060+2	8.7344–2
	1.7308–3	4.1837–8	1.7692+6	3.9343–6	7.2566+8	2.9953+8	9.6767+7	3.2936+8	1.0869+4	2.9557+2	1.8604+2	1.0944+2	8.8299–2
	1.7500–3	4.2132–8	1.7569+6	3.9994–6	7.2058+8	2.9801+8	9.5950+7	3.2661+8	1.0866+4	2.9388+2	1.8523+2	1.0856+2	8.9039–2
	1.7796–3	4.2585–8	1.7382+6	4.1005–6	7.1291+8	2.9571+8	9.4720+7	3.2247+8	1.0861+4	2.9133+2	1.8400+2	1.0724+2	9.0181–2
	1.8125–3	4.3086–8	1.7180+6	4.2140–6	7.0463+8	2.9322+8	9.3394+7	3.1800+8	1.0856+4	2.8860+2	1.8269+2	1.0582+2	9.1451–2
	1.8347–3	4.3421–8	1.7047+6	4.2911–6	6.9919+8	2.9158+8	9.2525+7	3.1508+8	1.0852+4	2.8681+2	1.8183+2	1.0488+2	9.2306–2
	1.8654–3	4.3883–8	1.6867+6	4.3987–6	6.9182+8	2.8935+8	9.1351+7	3.1112+8	1.0848+4	2.8440+2	1.8068+2	1.0362+2	9.3492–2
	1.9173–3	4.4656–8	1.6575+6	4.5826–6	6.7984+8	2.8570+8	8.9445+7	3.0468+8	1.0840+4	2.8050+2	1.7884+2	1.0157+2	9.5493–2
	2.0000–3	4.5871–8	1.6137+6	4.8803–6	6.6185+8	2.8019+8	8.6596+7	2.9505+8	1.0828+4	2.7473+2	1.7613+2	9.8500+1	9.8677–2
	2.1250–3	4.7741–8	1.5504+6	5.3433–6	6.3592+8	2.7192+8	8.2505+7	2.8149+8	1.0810+4	2.6535+2	1.7113+2	9.4118+1	1.0344–1
	2.2500–3	4.9570–8	1.4932+6	5.8219–6	6.1246+8	2.6435+8	7.8831+7	2.6927+8	1.0792+4	2.5698+2	1.6670+2	9.0173+1	1.0819–1
	2.3438–3	5.0916–8	1.4537+6	6.1909–6	5.9626+8	2.5907+8	7.6310+7	2.6087+8	1.0779+4	2.5125+2	1.6367+2	8.7461+1	1.1175–1
	2.5000–3	5.3117–8	1.3935+6	6.8237–6	5.7156+8	2.5094+8	7.2493+7	2.4812+8	1.0759+4	2.4264+2	1.5917+2	8.3348+1	1.1768–1
	2.6250–3	5.4840–8	1.3497+6	7.3457–6	5.5360+8	2.4496+8	6.9732+7	2.3889+8	1.0744+4	2.3632+2	1.5583+2	8.0374+1	1.2242–1
	2.6719–3	5.5478–8	1.3342+6	7.5450–6	5.4723+8	2.4283+8	6.8757+7	2.3563+8	1.0739+4	2.3409+2	1.5465+2	7.9323+1	1.2419–1
	3.0000–3	5.9831–8	1.2371+6	8.9893–6	5.0741+8	2.2933+8	6.2714+7	2.1536+8	1.0703+4	2.2041+2	1.4748+2	7.2795+1	1.3660–1
	3.5000–3	6.6287–8	1.1166+6	1.1361–5	4.5800+8	2.1198+8	5.5252+7	1.9076+8	1.0542+4	2.0153+2	1.3661+2	6.4769+1	1.5210–1
	4.0000–3	7.2409–8	1.0222+6	1.3935–5	4.1927+8	1.9801+8	4.9522+7	1.7173+8	1.0405+4	1.8713+2	1.2839+2	5.8569+1	1.6745–1
M5	4.0156–3	7.2597–8	1.0196+6	1.4018–5	4.1819+8	1.9761+8	4.9362+7	1.7121+8	1.0400+4	1.8669+2	1.2812+2	5.8398+1	1.6791–1
	4.1386–3	7.4073–8	9.9928+5	1.4684–5	4.0986+8	1.9449+8	4.8135+7	1.6722+8	1.0365+4	1.8332+2	1.2607+2	5.7079+1	1.7150–1
M4	4.2372–3	7.5243–8	9.8373+5	1.5225–5	4.0348+8	1.9209+8	4.7200+7	1.6418+8	1.0337+4	1.8075+2	1.2451+2	5.6072+1	1.7437–1
	4.2849–3	7.5808–8	9.7640+5	1.5490–5	4.0047+8	1.9096+8	4.6761+7	1.6274+8	1.0324+4	1.7955+2	1.2378+2	5.5599+1	1.7576–1
	4.3540–3	7.6623–8	9.6602+5	1.5876–5	3.9622+8	1.8936+8	4.6141+7	1.6071+8	1.0305+4	1.7786+2	1.2276+2	5.4930+1	1.7777–1
	4.3743–3	7.6861–8	9.6303+5	1.5991–5	3.9499+8	1.8889+8	4.5963+7	1.6012+8	1.0300+4	1.7737+2	1.2246+2	5.4737+1	1.7836–1
	4.5307–3	7.8685–8	9.4070+5	1.6882–5	3.8583+8	1.8543+8	4.4636+7	1.5576+8	1.0259+4	1.7375+2	1.2027+2	5.3302+1	1.8289–1
	4.6770–3	8.0370–8	9.2098+5	1.7731–5	3.7774+8	1.8235+8	4.3470+7	1.5192+8	1.0222+4	1.7058+2	1.1835+2	5.2038+1	1.8712–1
M3	4.8290–3	8.2101–8	9.0156+5	1.8631–5	3.6978+8	1.7930+8	4.2327+7	1.4814+8	1.0185+4	1.6747+2	1.1648+2	5.0798+1	1.9150–1
	4.9145–3	8.3071–8	8.9103+5	1.9144–5	3.6546+8	1.7765+8	4.1713+7	1.4609+8	1.0164+4	1.6580+2	1.1548+2	5.0127+1	1.9396–1
	5.0000–3	8.4036–8	8.8081+5	1.9662–5	3.6127+8	1.7604+8	4.1118+7	1.4410+8	1.0144+4	1.6419+2	1.1452+2	4.9477+1	1.9642–1
	5.2500–3	8.6835–8	8.5241+5	2.1207–5	3.4962+8	1.7152+8	3.9464+7	1.3862+8	1.0051+4	1.5948+2	1.1162+2	4.7665+1	2.0213–1
	5.4375–3	8.8904–8	8.3258+5	2.2395–5	3.4148+8	1.6834+8	3.8316+7	1.3482+8	9.9840+3	1.5623+2	1.0962+2	4.6404+1	2.0639–1
	5.5000–3	8.9588–8	8.2622+5	2.2796–5	3.3888+8	1.6732+8	3.7949+7	1.3360+8	9.9623+3	1.5519+2	1.0898+2	4.6001+1	2.0780–1
	5.7187–3	9.1959–8	8.0492+5	2.4222–5	3.3014+8	1.6388+8	3.6725+7	1.2953+8	9.8888+3	1.5172+2	1.0685+2	4.4654+1	2.1274–1

Atomic Weight 247.000 Density 13.510 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M2	5.9456–3	9.4384–8	7.8424+5	2.5734–5	3.2166+8	1.6052+8	3.5544+7	1.2559+8	9.8160+3	1.4838+2	1.0481+2	4.3351+1	2.1784–1
	6.0000–3	9.4966–8	7.7943+5	2.6101–5	3.1969+8	1.5974+8	3.5273+7	1.2467+8	9.7990+3	1.4762+2	1.0435+2	4.3048+1	2.1906–1
	6.1250–3	9.6291–8	7.6870+5	2.6953–5	3.1528+8	1.5799+8	3.4662+7	1.2262+8	9.7607+3	1.4574+2	1.0315+2	4.2365+1	2.2186–1
M1	6.3131–3	9.8268–8	7.5324+5	2.8256–5	3.0894+8	1.5546+8	3.3785+7	1.1969+8	9.7048+3	1.4305+2	1.0144+2	4.1384+1	2.2605–1
	6.3594–3	9.8755–8	7.4952+5	2.8580–5	3.0742+8	1.5485+8	3.3576+7	1.1898+8	9.6892+3	1.4240+2	1.0102+2	4.1150+1	2.2698–1
	6.4185–3	9.9375–8	7.4485+5	2.8997–5	3.0550+8	1.5408+8	3.3312+7	1.1810+8	9.6696+3	1.4158+2	1.0050+2	4.0855+1	2.2816–1
	6.5000–3	1.0023–7	7.3852+5	2.9575–5	3.0291+8	1.5303+8	3.2957+7	1.1690+8	9.6429+3	1.4049+2	9.9801+1	4.0456+1	2.2980–1
	6.6162–3	1.0143–7	7.2972+5	3.0406–5	2.9930+8	1.5158+8	3.2465+7	1.1525+8	9.6055+3	1.3896+2	9.8826+1	3.9903+1	2.3212–1
	6.7695–3	1.0302–7	7.1852+5	3.1517–5	2.9470+8	1.4972+8	3.1839+7	1.1314+8	9.5574+3	1.3702+2	9.7589+1	3.9200+1	2.3517–1
	6.9622–3	1.0499–7	7.0504+5	3.2935–5	2.8917+8	1.4747+8	3.1089+7	1.1061+8	9.4988+3	1.3471+2	9.6112+1	3.8356+1	2.3899–1
	7.0000–3	1.0537–7	7.0246+5	3.3217–5	2.8812+8	1.4703+8	3.0947+7	1.1013+8	9.4875+3	1.3427+2	9.5831+1	3.8196+1	2.3974–1
	7.2500–3	1.0789–7	6.8603+5	3.5098–5	2.8138+8	1.4428+8	3.0038+7	1.0706+8	9.4148+3	1.3146+2	9.4045+1	3.7172+1	2.4468–1
	7.3848–3	1.0924–7	6.7757+5	3.6129–5	2.7791+8	1.4285+8	2.9572+7	1.0548+8	9.3769+3	1.3002+2	9.3130+1	3.6646+1	2.4733–1
	7.4811–3	1.1020–7	6.7169+5	3.6873–5	2.7549+8	1.4185+8	2.9249+7	1.0438+8	9.3503+3	1.2903+2	9.2496+1	3.6281+1	2.4922–1
	8.0000–3	1.1528–7	6.4206+5	4.0974–5	2.6334+8	1.3681+8	2.7631+7	9.8890+7	9.2139+3	1.2405+2	8.9341+1	3.4451+1	2.5934–1
	9.0000–3	1.2486–7	5.9281+5	4.9335–5	2.4314+8	1.2821+8	2.4985+7	8.9935+7	8.9327+3	1.1526+2	8.3539+1	3.1442+1	2.7559–1
	1.0000–2	1.3407–7	5.5209+5	5.8292–5	2.2644+8	1.2098+8	2.2835+7	8.2614+7	8.6885+3	1.0812+2	7.8845+1	2.8983+1	2.9157–1
	1.1250–2	1.4527–7	5.0951+5	7.0301–5	2.0898+8	1.1322+8	2.0641+7	7.5113+7	8.3744+3	1.0016+2	7.3423+1	2.6430+1	3.0705–1
	1.2500–2	1.5605–7	4.7432+5	8.3202–5	1.9454+8	1.0669+8	1.8859+7	6.8982+7	8.1031+3	9.3690+1	6.9024+1	2.4344+1	3.2228–1
	1.3125–2	1.6131–7	4.5888+5	8.9975–5	1.8821+8	1.0380+8	1.8087+7	6.6314+7	7.9804+3	9.0879+1	6.7112+1	2.3438+1	3.2980–1
	1.5000–2	1.7656–7	4.1924+5	1.1146–4	1.7195+8	9.6280+7	1.6133+7	5.9531+7	7.6542+3	8.3762+1	6.2277+1	2.1133+1	3.5199–1
	1.7500–2	1.9625–7	3.7717+5	1.4282–4	1.5470+8	8.8005+7	1.4143+7	5.2544+7	7.2440+3	7.5807+1	5.6702+1	1.8731+1	3.7452–1
L3	1.8994–2	2.0756–7	3.5661+5	1.6304–4	1.4627+8	8.3901+7	1.3188+7	4.9170+7	7.0350+3	7.1988+1	5.4029+1	1.7572+1	3.8773–1
	1.9497–2	2.1132–7	3.5027+5	1.7009–4	1.4366+8	8.2622+7	1.2897+7	4.8136+7	6.9662+3	7.0813+1	5.3205+1	1.7216+1	3.9151–1
	2.0000–2	2.1505–7	3.4419+5	1.7725–4	1.4117+8	8.1395+7	1.2621+7	4.7149+7	6.8999+3	6.9692+1	5.2420+1	1.6877+1	3.9528–1
	2.1250–2	2.2419–7	3.3016+5	1.9554–4	1.3542+8	7.8527+7	1.1989+7	4.4894+7	6.7429+3	6.6986+1	5.0487+1	1.6095+1	4.0411–1
	2.3438–2	2.3977–7	3.0871+5	2.2924–4	1.2662+8	7.4105+7	1.1034+7	4.1476+7	6.4966+3	6.2896+1	4.7567+1	1.4909+1	4.1941–1
L2	2.3776–2	2.4213–7	3.0570+5	2.3464–4	1.2538+8	7.3479+7	1.0900+7	4.0998+7	6.4613+3	6.2325+1	4.7160+1	1.4743+1	4.2176–1
L1	2.4554–2	2.4752–7	2.9904+5	2.4725–4	1.2265+8	7.2092+7	1.0608+7	3.9948+7	6.3811+3	6.1069+1	4.6264+1	1.4378+1	4.2663–1
	2.5078–2	2.5112–7	2.9475+5	2.5589–4	1.2089+8	7.1192+7	1.0422+7	3.9274+7	6.3269+3	6.0237+1	4.5665+1	1.4143+1	4.2967–1
	2.5235–2	2.5220–7	2.9350+5	2.5850–4	1.2038+8	7.0928+7	1.0367+7	3.9077+7	6.3110+3	5.9995+1	4.5490+1	1.4075+1	4.3058–1
	2.5916–2	2.5684–7	2.8820+5	2.6994–4	1.1820+8	6.9813+7	1.0138+7	3.8247+7	6.2435+3	5.8973+1	4.4752+1	1.3786+1	4.3451–1
	2.6426–2	2.6029–7	2.8438+5	2.7866–4	1.1664+8	6.9007+7	9.9739+6	3.7651+7	6.1945+3	5.8238+1	4.4223+1	1.3578+1	4.3746–1
	2.7539–2	2.6773–7	2.7646+5	2.9802–4	1.1339+8	6.7333+7	9.6348+6	3.6419+7	6.0921+3	5.6724+1	4.3131+1	1.3149+1	4.4385–1
	2.7958–2	2.7051–7	2.7363+5	3.0544–4	1.1223+8	6.6731+7	9.5138+6	3.5979+7	6.0551+3	5.6183+1	4.2741+1	1.2996+1	4.4625–1
	2.8213–2	2.7219–7	2.7193+5	3.0999–4	1.1154+8	6.6371+7	9.4416+6	3.5716+7	6.0329+3	5.5861+1	4.2508+1	1.2905+1	4.4771–1
	3.0000–2	2.8386–7	2.6076+5	3.4260–4	1.0695+8	6.3988+7	8.9679+6	3.3991+7	5.8851+3	5.3745+1	4.0983+1	1.2304+1	4.5787–1
	3.2500–2	2.9973–7	2.4696+5	3.9034–4	1.0129+8	6.1016+7	8.3955+6	3.1873+7	5.6859+3	5.1031+1	3.9002+1	1.1559+1	4.6976–1
	3.5000–2	3.1519–7	2.3484+5	4.4049–4	9.6321+7	5.8387+7	7.8983+6	3.0030+7	5.5076+3	4.8672+1	3.7280+1	1.0912+1	4.8156–1
	3.6250–2	3.2278–7	2.2932+5	4.6646–4	9.4055+7	5.7182+7	7.6733+6	2.9195+7	5.4251+3	4.7604+1	3.6498+1	1.0618+1	4.8741–1
	4.0000–2	3.4504–7	2.1452+5	5.4768–4	8.7987+7	5.3932+7	7.0760+6	2.6974+7	5.2002+3	4.4766+1	3.4423+1	9.8379+0	5.0478–1
	4.5000–2	3.7356–7	1.9815+5	6.6357–4	8.1270+7	5.0289+7	6.4378+6	2.4538+7	4.9375+3	4.1568+1	3.2068+1	8.9754+0	5.2438–1
	5.0000–2	4.0101–7	1.8458+5	7.8780–4	7.5706+7	4.7239+7	5.9161+6	2.2547+7	4.7138+3	3.8956+1	3.0142+1	8.2706+0	5.4367–1
	6.0000–2	4.5292–7	1.6343+5	1.0590–3	6.7030+7	4.2392+7	5.1306+6	1.9504+7	4.3489+3	3.4856+1	2.7094+1	7.1857+0	5.7720–1
	7.0000–2	5.0181–7	1.4751+5	1.3593–3	6.0500+7	3.8663+7	4.5697+6	1.7263+7	4.0644+3	3.1798+1	2.4809+1	6.3821+0	6.0685–1
	8.0000–2	5.4831–7	1.3499+5	1.6861–3	5.5368+7	3.5699+7	4.1338+6	1.5532+7	3.8331+3	2.9430+1	2.3032+1	5.7617+0	6.3587–1
	1.0000–1	6.3510–7	1.1655+5	2.4090–3	4.7803+7	3.1249+7	3.5273+6	1.3023+7	3.4902+3	2.5978+1	2.0438+1	4.8545+0	6.8528–1
K	1.2886–1	7.4163–7	9.9806+4	3.5933–3	4.0936+7	2.7123+7	2.9811+6	1.0828+7	3.1560+3	2.2825+1	1.8019+1	4.0587+0	7.4735–1
	1.3150–1	7.5042–7	9.8637+4	3.7097–3	4.0456+7	2.6840+7	2.9434+6	1.0670+7	3.1315+3	2.2602+1	1.7849+1	4.0008+0	7.5246–1
	1.3613–1	7.6562–7	9.6679+4	3.9160–3	3.9653+7	2.6365+7	2.8804+6	1.0405+7	3.0901+3	2.2230+1	1.7564+1	3.9042+0	7.6139–1
	1.4306–1	7.8800–7	9.3933+4	4.2317–3	3.8527+7	2.5696+7	2.7922+6	1.0036+7	3.0316+3	2.1710+1	1.7166+1	3.7695+0	7.7473–1
	1.5000–1	8.0992–7	9.1391+4	4.5548–3	3.7484+7	2.5074+7	2.7106+6	9.6964+6	2.9769+3	2.1232+1	1.6799+1	3.6457+0	7.8800–1
	1.6250–1	8.4731–7	8.7358+4	5.1539–3	3.5830+7	2.4088+7	2.5896+6	9.1492+6	2.8899+3	2.0497+1	1.6242+1	3.4453+0	8.0999–1
	1.8125–1	9.0104–7	8.2149+4	6.0903–3	3.3694+7	2.2806+7	2.4332+6	8.4522+6	2.7754+3	1.9558+1	1.5525+1	3.1903+0	8.4272–1
	2.0000–1	9.5229–7	7.7728+4	7.0688–3	3.1880+7	2.1708+7	2.3004+6	7.8694+6	2.6759+3	1.8771+1	1.4919+1	2.9772+0	8.7506–1
	2.2500–1	1.0141–6	7.2989+4	8.4279–3	2.9937+7	2.0437+7	2.1740+6	7.3228+6	2.5723+3	1.8024+1	1.4333+1	2.7763+0	9.1434–1
	2.6250–1	1.1011–6	6.7223+4	1.0562–2	2.7572+7	1.8886+7	2.0190+6	6.6644+6	2.4427+3	1.7129+1	1.3622+1	2.5347+0	9.7250–1
	3.0000–1	1.1792–6	6.2770+4	1.2796–2	2.5745+7	1.7638+7	1.8937+6	6.2114+6	2.3358+3	1.6453+1	1.3053+1	2.3699+0	1.0296+0
	4.0000–1	1.3772–6	5.3747+4	1.9072–2	2.2045+7	1.5007+7	1.6961+6	5.3388+6	2.1531+3	1.5422+1	1.2197+1	2.0492+0	1.1760+0
	5.0000–1	1.5458–6	4.7883+4	2.5650–2	1.9639+7	1.3151+7	1.5820+6	4.9047+6	2.0410+3	1.4986+1	1.1774+1	1.8912+0	1.3208+0
	6.0000–1	1.7009–6	4.3519+4	3.2375–2	1.7849+7	1.1759+7	1.5084+6	4.5796+6	1.9679+3	1.4754+1	1.1516+1	1.7726+0	1.4659+0
	8.0000–1	1.9658–6	3.7653+4	4.5934–2	1.5444+7	9.8136+6	1.4227+6	4.2055+6	1.8786+3	1.4746+1	1.1352+1	1.6376+0	1.7566+0
	1.0000+0	2.1860–6	3.3861+4	5.9414–2	1.3888+7	8.5229+6	1.3750+6	3.9886+6	1.8287+3	1.4928+1	1.1312+1	1.5600+0	2.0551+0
	1.2500+0	2.4009–6	3.0830+4	7.5892–2	1.2645+7	7.4038+6	1.3458+6	3.8938+6	1.7934+3	1.5419+1	1.1452+1	1.5292+0	2.4377+0
	1.5000+0	2.5856–6	2.8628+4	9.1854–2	1.1742+7	6.5995+6	1.3225+6	3.8181+6	1.7650+3	1.5908+1	1.1588+1	1.5055+0	2.8148+0
	2.0000+0	2.8664–6	2.5823+4	1.2230–1	1.0591+7	5.5251+6	1.3063+6	3.7582+6	1.7365+3	1.6947+1	1.1866+1	1.4882+0	3.5931+0
	3.0000+0	3.2367–6	2.2869+4	1.7791–1	9.3798+6	4.3569+6	1.2857+6	3.7354+6	1.7142+3	1.9062+1	1.2357+1	1.4921+0	5.2130+0
	4.0000+0	3.4694–6	2.1335+4	2.2769–1	8.7505+6	3.7285+6	1.2838+6	3.7365+6	1.7059+3	2.1152+1	1.2758+1	1.4961+0	6.8973+0
	5.0000+0	3.6310–6	2.0385+4	2.7280–1	8.3611+6	3.3386+6	1.2827+6	3.7380+6	1.7020+3	2.3218+1	1.3108+1	1.5003+0	8.6097+0
	6.0000+0	3.7503–6	1.9737+4	3.1404–1	8.0952+6	3.0738+6	1.2819+6	3.7377+6	1.7042+3	2.5307+1	1.3398+1	1.5038+0	1.0405+1
	8.0000+0	3.9163–6	1.8900+4	3.8731–1	7.7521+6	2.7351+6	1.2820+6	3.7333+6	1.7078+3	2.9386+1	1.3874+1	1.5092+0	1.4003+1
	1.0000+1	4.0225–6	1.8401+4	4.5093–1	7.5474+6	2.5366+6	1.2833+6	3.7257+6	1.7186+3	3.3582+1	1.4244+1	1.5135+0	1.7824+1
	1.5000+1	4.1518–6	1.7828+4	5.8093–1	7.3123+6	2.3015+6	1.2857+6	3.7233+6	1.7384+3	4.3787+1	1.4805+1	1.5138+0	2.7469+1
	2.0000+1	4.2015–6	1.7617+4	6.8323–1	7.2259+6	2.2158+6	1.2875+6	3.7207+6	1.7666+3	5.4354+1	1.5263+1	1.5141+0	3.7577+1
	3.0000+1	4.2134–6	1.7568+4	8.3843–1	7.2055+6	2.2001+6	1.2885+6	3.7151+6	1.8060+3	7.5681+1	1.5763+1	1.5144+0	5.8404+1
	4.0000+1	4.2150–6	1.7561+4	9.5458–1	7.2027+6	2.1996+6	1.2895+6	3.7117+6	1.8336+3	9.7434+1	1.6135+1	1.5157+0	7.9783+1
	5.0000+1	4.2162–6	1.7556+4	1.0471+0	7.2006+6	2.1987+6	1.2901+6	3.7099+6	1.8573+3	1.1959+2	1.6423+1	1.5175+0	1.0165+2
	6.0000+1	4.2180–6	1.7548+4	1.1237+0	7.1975+6	2.1980+6	1.2903+6	3.7073+6	1.8770+3	1.4192+2	1.6626+1	1.5191+0	1.2378+2
	8.0000+1	4.2225–6	1.7530+4	1.2462+0	7.1899+6	2.1968+6	1.2907+6	3.7005+6	1.9080+3	1.8684+2	1.6953+1	1.5215+0	1.6837+2
	1.0000+2	4.2212–6	1.7535+4	1.3420+0	7.1921+6	2.1959+6	1.2910+6	3.7032+6	1.9311+3	2.3212+2	1.7235+1	1.5234+0	2.1336+2

Atomic Weight 247.000													Density 13.510 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
1.5000+2	4.2239–6	1.7524+4	1.5173+0	7.1875+6	2.1943+6	1.2911+6	3.7000+6	1.9706+3	3.4602+2	1.7551+1	1.5223+0	3.2695+2
2.0000+2	4.2235–6	1.7526+4	1.6421+0	7.1882+6	2.1932+6	1.2913+6	3.7018+6	1.9973+3	4.6068+2	1.7839+1	1.5232+0	4.4132+2
3.0000+2	4.2238–6	1.7524+4	1.8184+0	7.1877+6	2.1916+6	1.2914+6	3.7027+6	2.0330+3	6.8903+2	1.8252+1	1.5239+0	6.6925+2
4.0000+2	4.2260–6	1.7515+4	1.9436+0	7.1839+6	2.1904+6	1.2914+6	3.7000+6	2.0574+3	9.1853+2	1.8480+1	1.5231+0	8.9853+2
5.0000+2	4.2305–6	1.7496+4	2.0407+0	7.1762+6	2.1895+6	1.2915+6	3.6932+6	2.0763+3	1.1500+3	1.8674+1	1.5207+0	1.1298+3
6.0000+2	4.2317–6	1.7492+4	2.1201+0	7.1743+6	2.1888+6	1.2915+6	3.6920+6	2.0909+3	1.3778+3	1.8838+1	1.5205+0	1.3575+3
8.0000+2	4.2349–6	1.7478+4	2.2453+0	7.1688+6	2.1876+6	1.2915+6	3.6876+6	2.1142+3	1.8376+3	1.9119+1	1.5194+0	1.8169+3
1.0000+3	4.2380–6	1.7466+4	2.3425+0	7.1636+6	2.1868+6	1.2915+6	3.6832+6	2.1329+3	2.2979+3	1.9357+1	1.5183+0	2.2770+3
1.5000+3	4.2419–6	1.7449+4	2.5187+0	7.1569+6	2.1852+6	1.2915+6	3.6781+6	2.1678+3	3.4557+3	1.9583+1	1.5162+0	3.4346+3
2.0000+3	4.2457–6	1.7434+4	2.6436+0	7.1505+6	2.1840+6	1.2915+6	3.6728+6	2.1942+3	4.6060+3	1.9805+1	1.5141+0	4.5847+3
3.0000+3	4.2505–6	1.7414+4	2.8196+0	7.1426+6	2.1824+6	1.2915+6	3.6665+6	2.2322+3	6.9119+3	2.0229+1	1.5115+0	6.8902+3
4.0000+3	4.2548–6	1.7397+4	2.9444+0	7.1353+6	2.1813+6	1.2915+6	3.6602+6	2.2599+3	9.2199+3	2.0434+1	1.5089+0	9.1980+3
5.0000+3	4.2601–6	1.7375+4	3.0411+0	7.1264+6	2.1804+6	1.2915+6	3.6523+6	2.2817+3	1.1552+4	2.0594+1	1.5057+0	1.1530+4
6.0000+3	4.2614–6	1.7370+4	3.1201+0	7.1243+6	2.1797+6	1.2915+6	3.6508+6	2.2976+3	1.3845+4	2.0736+1	1.5051+0	1.3822+4
8.0000+3	4.2644–6	1.7357+4	3.2447+0	7.1192+6	2.1785+6	1.2915+6	3.6469+6	2.3229+3	1.8470+4	2.1019+1	1.5035+0	1.8448+4
1.0000+4	4.2667–6	1.7348+4	3.3412+0	7.1154+6	2.1776+6	1.2915+6	3.6439+6	2.3427+3	2.3139+4	2.1255+1	1.5024+0	2.3116+4
1.5000+4	4.2705–6	1.7333+4	3.5168+0	7.1090+6	2.1760+6	1.2915+6	3.6391+6	2.3806+3	3.4595+4	2.1470+1	1.5004+0	3.4572+4
2.0000+4	4.2736–6	1.7320+4	3.6414+0	7.1039+6	2.1749+6	1.2915+6	3.6351+6	2.4078+3	4.6200+4	2.1685+1	1.4987+0	4.6177+4
3.0000+4	4.2766–6	1.7308+4	3.8171+0	7.0989+6	2.1733+6	1.2915+6	3.6316+6	2.4461+3	6.9147+4	2.2105+1	1.4973+0	6.9123+4
4.0000+4	4.2796–6	1.7296+4	3.9419+0	7.0940+6	2.1721+6	1.2915+6	3.6279+6	2.4735+3	9.2340+4	2.2299+1	1.4958+0	9.2317+4
5.0000+4	4.2836–6	1.7280+4	4.0386+0	7.0874+6	2.1713+6	1.2915+6	3.6221+6	2.4946+3	1.1532+5	2.2454+1	1.4934+0	1.1529+5
6.0000+4	4.2842–6	1.7277+4	4.1176+0	7.0864+6	2.1706+6	1.2915+6	3.6218+6	2.5118+3	1.3828+5	2.2590+1	1.4932+0	1.3825+5
8.0000+4	4.2859–6	1.7270+4	4.2424+0	7.0835+6	2.1694+6	1.2915+6	3.6200+6	2.5392+3	1.8460+5	2.2862+1	1.4925+0	1.8457+5
1.0000+5	4.2876–6	1.7263+4	4.3390+0	7.0807+6	2.1685+6	1.2915+6	3.6181+6	2.5605+3	2.3100+5	2.3122+1	1.4917+0	2.3097+5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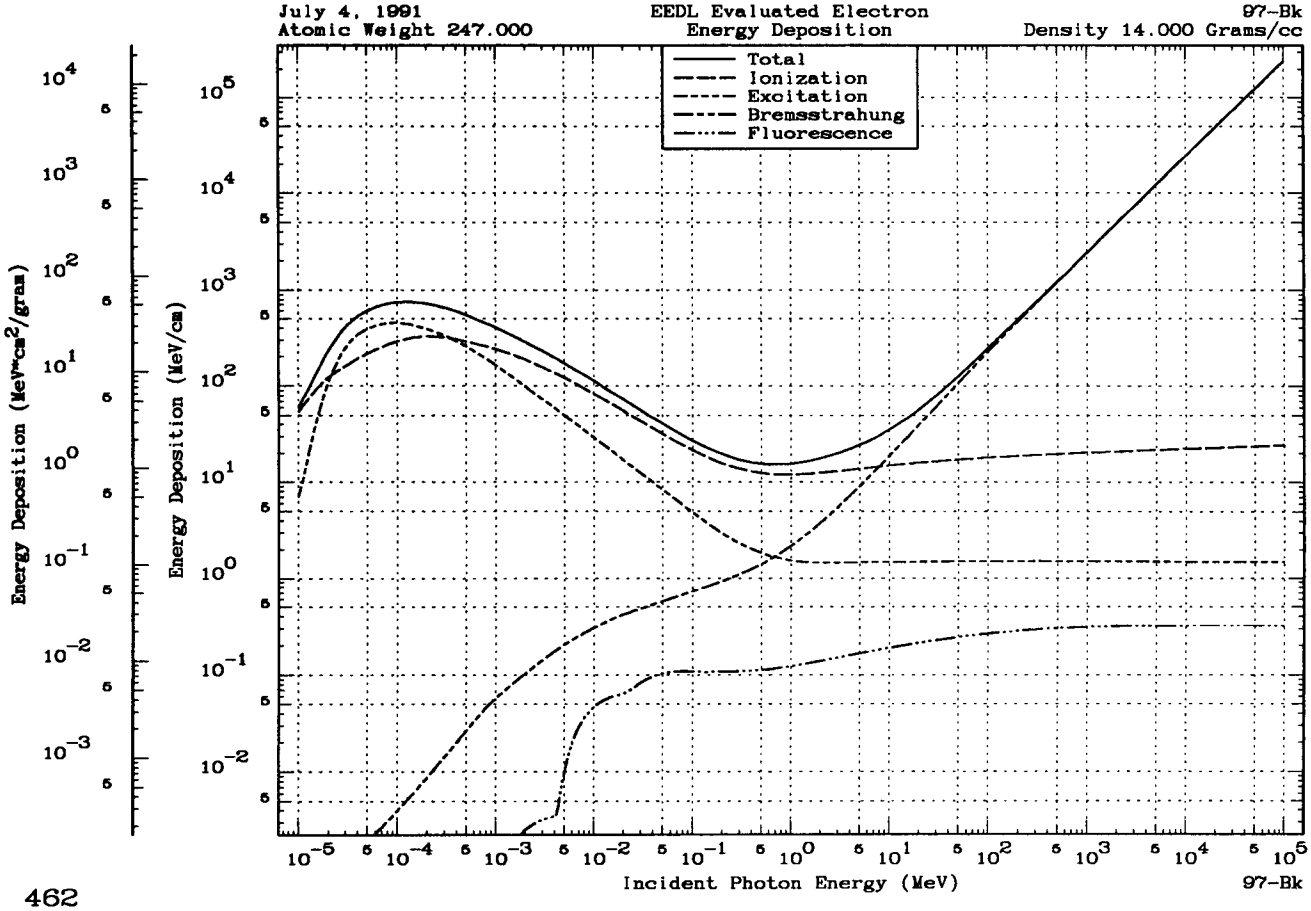
EEDL Evaluated Electron
Cross Sections
97-Bk
Density 14.000 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
97-Bk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Total
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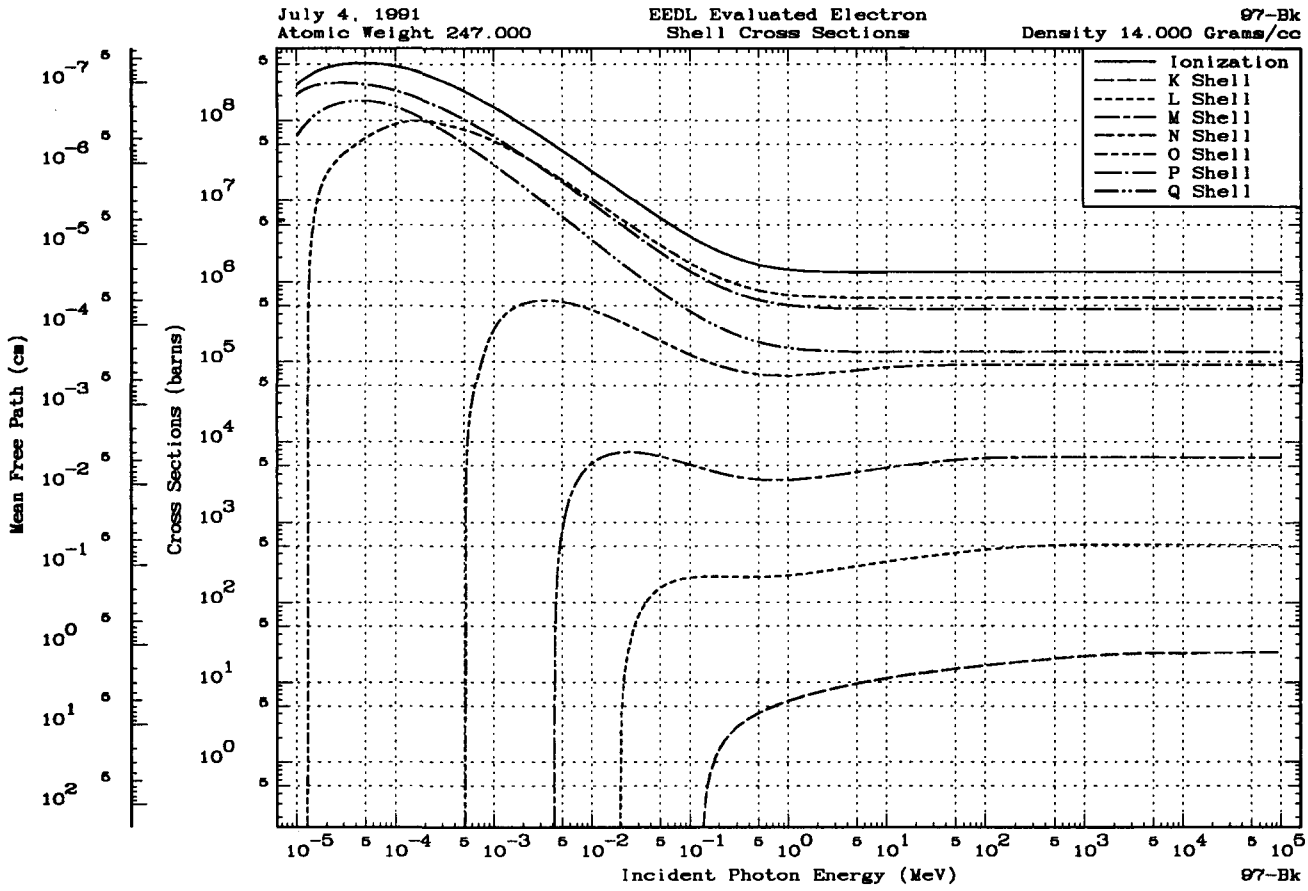
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
97-Bk

462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Atomic Weight 247.000
EEDL Evaluated Electron
Shell Cross Sections
97-Bk
Density 14.000 Grams/cc
Ionization
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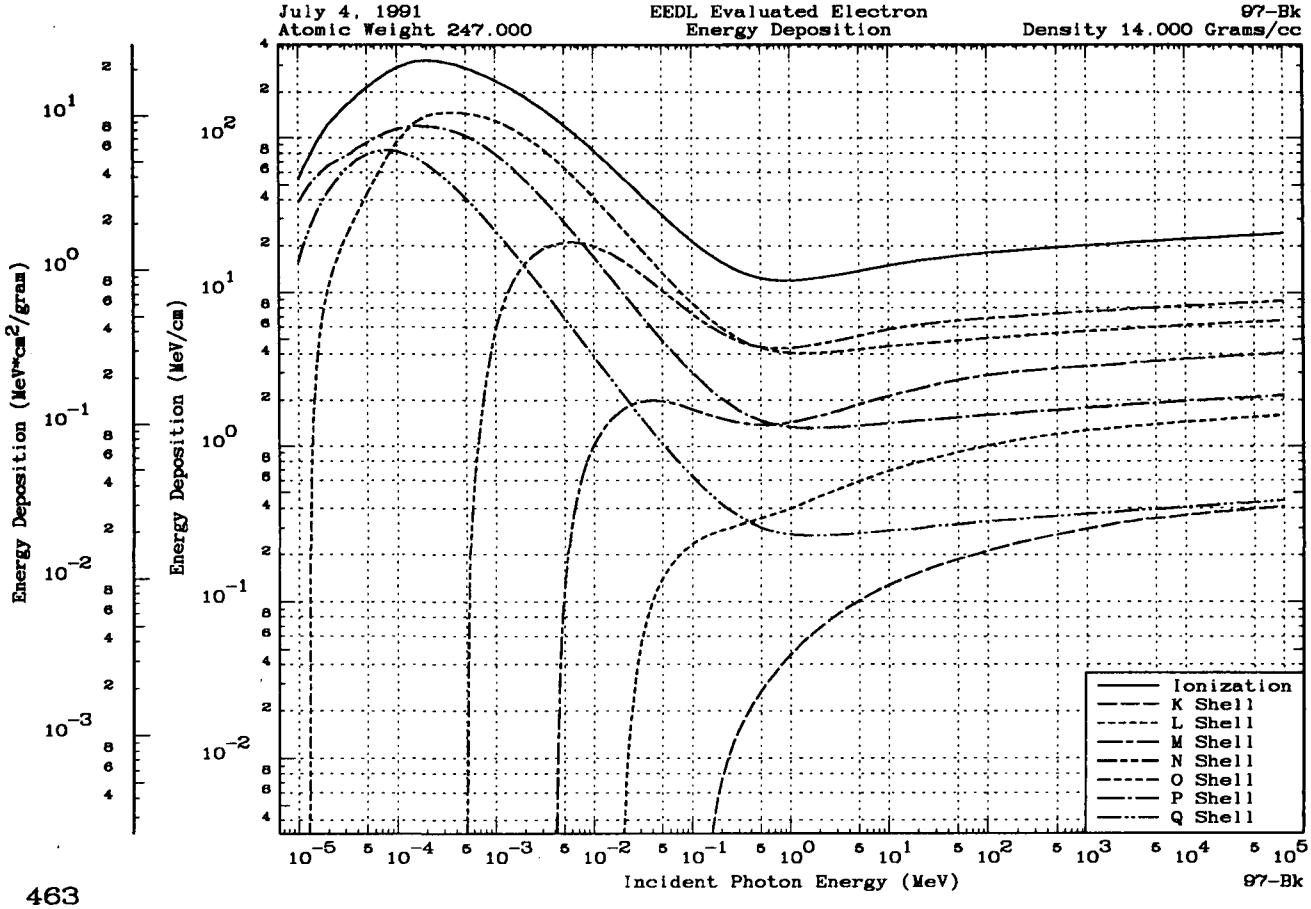
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
97-Bk


July 4, 1991
Atomic Weight 247.000
EEDL Evaluated Electron
Energy Deposition
97-Bk
Density 14.000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
97-Bk

463

Atomic Weight 247.000 Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	8.7626–9	8.1515+6		3.3434+9	3.0396+9	2.7508+8	2.8715+7	4.8811+3	6.1086+1	5.4116+1	6.9701+0	3.6019–4
	1.1250–5	9.0622–9	7.8820+6		3.2328+9	2.8781+9	3.1059+8	4.4161+7	5.0013+3	7.5177+1	6.3966+1	1.1211+1	4.0396–4
O7	1.2840–5	9.3526–9	7.6373+6		3.1325+9	2.7070+9	3.4497+8	8.0468+7	5.1396+3	9.5927+1	7.4954+1	2.0973+1	4.6076–4
	1.2975–5	9.3728–9	7.6209+6		3.1257+9	2.6939+9	3.4777+8	8.4023+7	5.1507+3	9.7918+1	7.5960+1	2.1958+1	4.6564–4
	1.3481–5	9.4410–9	7.5658+6		3.1031+9	2.6465+9	3.5817+8	9.8427+7	5.1916+3	1.0572+2	7.9738+1	2.5979+1	4.8400–4
	1.4241–5	9.5209–9	7.5023+6		3.0771+9	2.5802+9	3.7345+8	1.2344+8	5.2506+3	1.1850+2	8.5429+1	3.3066+1	5.1177–4
O6	1.4530–5	9.5445–9	7.4837+6		3.0695+9	2.5562+9	3.7910+8	1.3415+8	5.2725+3	1.2370+2	8.7566+1	3.6134+1	5.2241–4
	1.4765–5	9.5630–9	7.4693+6		3.0635+9	2.5373+9	3.8391+8	1.4235+8	5.2900+3	1.2796+2	8.9472+1	3.8487+1	5.3109–4
	1.5000–5	9.5789–9	7.4568+6		3.0584+9	2.5188+9	3.8876+8	1.5091+8	5.3073+3	1.3237+2	9.1414+1	4.0953+1	5.3978–4
	1.5625–5	9.6272–9	7.4194+6		3.0431+9	2.4716+9	3.9759+8	1.7394+8	5.3522+3	1.4291+2	9.5376+1	4.7530+1	5.6303–4
	1.6250–5	9.6601–9	7.3942+6		3.0328+9	2.4270+9	4.0634+8	1.9938+8	5.3957+3	1.5424+2	9.9385+1	5.4853+1	5.8643–4
	1.6719–5	9.6750–9	7.3828+6		3.0281+9	2.3953+9	4.1271+8	2.2012+8	5.4275+3	1.6323+2	1.0237+2	6.0867+1	6.0409–4
	1.7500–5	9.6925–9	7.3695+6		3.0226+9	2.3451+9	4.2294+8	2.5459+8	5.4789+3	1.7824+2	1.0724+2	7.0994+1	6.3371–4
	1.8125–5	9.6935–9	7.3687+6		3.0223+9	2.3073+9	4.3036+8	2.8470+8	5.5187+3	1.9096+2	1.1103+2	7.9922+1	6.5757–4
	1.8359–5	9.6907–9	7.3708+6		3.0232+9	2.2936+9	4.3302+8	2.9657+8	5.5333+3	1.9588+2	1.1242+2	8.3463+1	6.6654–4
	2.0000–5	9.6731–9	7.3843+6		3.0287+9	2.2043+9	4.5091+8	3.7343+8	5.6320+3	2.2893+2	1.2201+2	1.0692+2	7.3002–4
	2.2500–5	9.6065–9	7.4354+6		3.0497+9	2.0872+9	4.6572+8	4.9673+8	5.7576+3	2.7661+2	1.3262+2	1.4399+2	8.2098–4
	2.5000–5	9.5186–9	7.5041+6		3.0779+9	1.9877+9	4.7885+8	6.1128+8	5.8722+3	3.2223+2	1.4287+2	1.7936+2	9.1351–4
	2.6250–5	9.4499–9	7.5586+6		3.1002+9	1.9433+9	4.8399+8	6.7292+8	5.9261+3	3.4604+2	1.4740+2	1.9864+2	9.6032–4
P3	2.7510–5	9.3989–9	7.5997+6		3.1170+9	1.9015+9	4.8890+8	7.2662+8	5.9784+3	3.6770+2	1.5191+2	2.1579+2	1.0079–3
	2.7821–5	9.3885–9	7.6081+6		3.1205+9	1.8916+9	4.9004+8	7.3881+8	5.9908+3	3.7270+2	1.5310+2	2.1960+2	1.0196–3
	2.8366–5	9.3689–9	7.6240+6		3.1270+9	1.8747+9	4.9203+8	7.6030+8	6.0123+3	3.8151+2	1.5518+2	2.2633+2	1.0401–3
	2.9183–5	9.3359–9	7.6509+6		3.1381+9	1.8502+9	4.9496+8	7.9292+8	6.0439+3	3.9488+2	1.5830+2	2.3658+2	1.0710–3
	3.0000–5	9.2991–9	7.6812+6		3.1505+9	1.8266+9	4.9786+8	8.2597+8	6.0748+3	4.0843+2	1.6143+2	2.4700+2	1.1020–3
	3.2344–5	9.2292–9	7.7394+6		3.1744+9	1.7641+9	5.0096+8	9.0934+8	6.1599+3	4.4114+2	1.6808+2	2.7306+2	1.1917–3
	3.3437–5	9.1887–9	7.7735+6		3.1883+9	1.7371+9	5.0243+8	9.4881+8	6.1978+3	4.5669+2	1.7122+2	2.8546+2	1.2339–3
	3.5000–5	9.1404–9	7.8146+6		3.2052+9	1.7007+9	5.0476+8	9.9974+8	6.2503+3	4.7758+2	1.7597+2	3.0161+2	1.2946–3
	3.6172–5	9.1295–9	7.8240+6		3.2090+9	1.6749+9	5.0669+8	1.0274+9	6.2885+3	4.9034+2	1.7974+2	3.1059+2	1.3404–3
	4.0000–5	9.0760–9	7.8701+6		3.2279+9	1.5986+9	5.1257+8	1.1168+9	6.4064+3	5.3163+2	1.9176+2	3.3987+2	1.4918–3
P2	4.1010–5	9.0614–9	7.8828+6		3.2331+9	1.5802+9	5.1229+8	1.1406+9	6.4360+3	5.4138+2	1.9393+2	3.4745+2	1.5321–3
	4.1572–5	9.0664–9	7.8784+6		3.2313+9	1.5703+9	5.1222+8	1.1488+9	6.4514+3	5.4536+2	1.9523+2	3.5013+2	1.5538–3
	4.2625–5	9.0747–9	7.8712+6		3.2284+9	1.5522+9	5.1214+8	1.1641+9	6.4798+3	5.5283+2	1.9770+2	3.5513+2	1.5945–3
	4.4469–5	9.0856–9	7.8618+6		3.2245+9	1.5220+9	5.1216+8	1.1903+9	6.5281+3	5.6593+2	2.0215+2	3.6377+2	1.6660–3
	4.5000–5	9.0879–9	7.8597+6		3.2237+9	1.5137+9	5.1221+8	1.1978+9	6.5417+3	5.6970+2	2.0346+2	3.6624+2	1.6867–3
	4.5852–5	9.0914–9	7.8567+6		3.2225+9	1.5006+9	5.1218+8	1.2097+9	6.5633+3	5.7561+2	2.0544+2	3.7016+2	1.7200–3
	4.7926–5	9.0967–9	7.8522+6		3.2206+9	1.4701+9	5.1223+8	1.2383+9	6.6144+3	5.8998+2	2.1035+2	3.7963+2	1.8015–3
	5.0000–5	9.0978–9	7.8512+6		3.2202+9	1.4415+9	5.1246+8	1.2662+9	6.6638+3	6.0434+2	2.1539+2	3.8895+2	1.8834–3
	5.0625–5	9.1051–9	7.8449+6		3.2176+9	1.4332+9	5.1217+8	1.2722+9	6.6780+3	6.0767+2	2.1664+2	3.9103+2	1.9080–3
	5.2969–5	9.1293–9	7.8241+6		3.2091+9	1.4035+9	5.1133+8	1.2943+9	6.7304+3	6.2024+2	2.2153+2	3.9871+2	2.0003–3
	5.5000–5	9.1470–9	7.8090+6		3.2029+9	1.3792+9	5.1075+8	1.3129+9	6.7742+3	6.3110+2	2.2586+2	4.0524+2	2.0809–3
	6.0000–5	9.1802–9	7.7807+6		3.1913+9	1.3247+9	5.0957+8	1.3570+9	6.8767+3	6.5744+2	2.3657+2	4.2087+2	2.2810–3
P1	6.2790–5	9.1998–9	7.7641+6		3.1845+9	1.2971+9	5.0649+8	1.3809+9	6.9308+3	6.6953+2	2.4071+2	4.2882+2	2.3939–3
	6.3866–5	9.2209–9	7.7463+6		3.1772+9	1.2869+9	5.0538+8	1.3849+9	6.9511+3	6.7265+2	2.4237+2	4.3028+2	2.4376–3
	6.5882–5	9.2590–9	7.7145+6		3.1641+9	1.2685+9	5.0344+8	1.3922+9	6.9885+3	6.7853+2	2.4555+2	4.3297+2	2.5199–3
	6.9412–5	9.3208–9	7.6633+6		3.1431+9	1.2382+9	5.0040+8	1.4046+9	7.0517+3	6.8889+2	2.5133+2	4.3756+2	2.6648–3
	7.0000–5	9.3306–9	7.6553+6		3.1398+9	1.2333+9	4.9994+8	1.4066+9	7.0620+3	6.9062+2	2.5231+2	4.3831+2	2.6890–3
	7.4706–5	9.4052–9	7.5946+6		3.1149+9	1.1967+9	4.9609+8	1.4221+9	7.1417+3	7.0390+2	2.5973+2	4.4417+2	2.8843–3
	8.0000–5	9.4796–9	7.5350+6		3.0905+9	1.1593+9	4.9246+8	1.4387+9	7.2266+3	7.1894+2	2.6845+2	4.5049+2	3.1063–3
	9.0000–5	9.7192–9	7.3493+6		3.0143+9	1.0977+9	4.8091+8	1.4357+9	7.3739+3	7.3125+2	2.7924+2	4.5200+2	3.5323–3
	1.0000–4	9.9314–9	7.1922+6	0.0000+0	2.9499+9	1.0454+9	4.7151+8	1.4330+9	7.5083+3	7.4438+2	2.9078+2	4.5360+2	3.9659–3
	1.1250–4	1.0266–8	6.9575+6	1.6780–8	2.8536+9	9.8989+8	4.5579+8	1.4080+9	7.6604+3	7.4551+2	2.9822+2	4.4728+2	4.5181–3
O5	1.3035–4	1.0693–8	6.6797+6	4.0651–8	2.7397+9	9.2461+8	4.3779+8	1.3773+9	7.8550+3	7.4999+2	3.1021+2	4.3978+2	5.3237–3
	1.3281–4	1.0760–8	6.6382+6	4.3927–8	2.7227+9	9.1664+8	4.3524+8	1.3708+9	7.8800+3	7.4944+2	3.1139+2	4.3805+2	5.4360–3
	1.3711–4	1.0875–8	6.5682+6	4.9666–8	2.6939+9	9.0322+8	4.3095+8	1.3598+9	7.9229+3	7.4865+2	3.1351+2	4.3513+2	5.6334–3
O4	1.4239–4	1.1012–8	6.4862+6	5.6729–8	2.6603+9	8.8753+8	4.2597+8	1.3468+9	7.9740+3	7.4793+2	3.1620+2	4.3172+2	5.8775–3
	1.4355–4	1.1046–8	6.4667+6	5.8283–8	2.6523+9	8.8419+8	4.2493+8	1.3432+9	7.9851+3	7.4759+2	3.1684+2	4.3074+2	5.9314–3
	1.4429–4	1.1067–8	6.4544+6	5.9275–8	2.6473+9	8.8209+8	4.2427+8	1.3409+9	7.9921+3	7.4737+2	3.1724+2	4.3012+2	5.9657–3
	1.4715–4	1.1147–8	6.4079+6	6.3094–8	2.6282+9	8.7412+8	4.2177+8	1.3323+9	8.0188+3	7.4660+2	3.1881+2	4.2779+2	6.0984–3
	1.5000–4	1.1226–8	6.3627+6	6.6918–8	2.6097+9	8.6638+8	4.1936+8	1.3239+9	8.0451+3	7.4594+2	3.2042+2	4.2551+2	6.2315–3
	1.5625–4	1.1404–8	6.2635+6	7.5323–8	2.5690+9	8.5015+8	4.1251+8	1.3063+9	8.1012+3	7.4134+2	3.2094+2	4.2039+2	6.5305–3
	1.6250–4	1.1577–8	6.1698+6	8.3777–8	2.5306+9	8.3484+8	4.0610+8	1.2896+9	8.1556+3	7.3718+2	3.2163+2	4.1555+2	6.8315–3
	1.7500–4	1.1911–8	5.9970+6	1.0082–7	2.4597+9	8.0666+8	3.9440+8	1.2586+9	8.2592+3	7.3007+2	3.2346+2	4.0661+2	7.4393–3
	1.7813–4	1.1991–8	5.9566+6	1.0510–7	2.4431+9	8.0008+8	3.9169+8	1.2513+9	8.2842+3	7.2854+2	3.2402+2	4.0451+2	7.5924–3
	1.8125–4	1.2071–8	5.9172+6	1.0939–7	2.4269+9	7.9366+8	3.8906+8	1.2442+9	8.3088+3	7.2707+2	3.2459+2	4.0247+2	7.7460–3
	2.0000–4	1.2533–8	5.6993+6	1.3532–7	2.3376+9	7.5828+8	3.7464+8	1.2047+9	8.4493+3	7.1968+2	3.2850+2	3.9117+2	8.6764–3
	2.2500–4	1.3194–8	5.4136+6	1.7052–7	2.2204+9	7.1801+8	3.5477+8	1.1476+9	8.6210+3	7.0082+2	3.2671+2	3.7410+2	9.9992–3
O3	2.4862–4	1.3781–8	5.1833+6	2.0457–7	2.1259+9	6.8556+8	3.3899+8	1.1014+9	8.7692+3	6.8653+2	3.2617+2	3.6035+2	1.1273–2
	2.5183–4	1.3861–8	5.1533+6	2.0925–7	2.1136+9	6.8150+8	3.3674+8	1.0954+9	8.7884+3	6.8409+2	3.2555+2	3.5853+2	1.1448–2
	2.5785–4	1.4010–8	5.0985+6	2.1808–7	2.0912+9	6.7408+8	3.3265+8	1.0844+9	8.8239+3	6.7968+2	3.2446+2	3.5521+2	1.1777–2
	2.6250–4	1.4124–8	5.0574+6	2.2494–7	2.0743+9	6.6852+8	3.2960+8	1.0762+9	8.8509+3	6.7641+2	3.2367+2	3.5272+2	1.2031–2
	2.6839–4	1.4266–8	5.0069+6	2.3367–7	2.0536+9	6.6169+8	3.2584+8	1.0661+9	8.8845+3	6.7236+2	3.2268+2	3.4966+2	1.2355–2
	2.8420–4	1.4640–8	4.8791+6	2.5736–7	2.0012+9	6.4438+8	3.1640+8	1.0404+9	8.9717+3	6.6229+2	3.2035+2	3.4192+2	1.3231–2
	3.0000–4	1.5002–8	4.7613+6	2.8138–7	1.9529+9	6.2842+8	3.0778+8	1.0167+9	9.0550+3	6.5329+2	3.1848+2	3.3480+2	1.4115–2
	3.2500–4	1.5565–8	4.5890+6	3.2010–7	1.8822+9	6.0555+8	2.9478+8	9.8185+8	9.1796+3	6.3838+2	3.1435+2	3.2402+2	1.5530–2
O2	3.2926–4	1.5659–8	4.5616+6	3.2678–7	1.8709+9	6.0191+8	2.9273+8	9.7630+8	9.2001+3	6.3606+2	3.1374+2	3.2230+2	1.5773–2
	3.3368–4	1.5769–8	4.5296+6	3.3375–7	1.8578+9	5.9820+8	2.9060+8	9.6903+8	9.2211+3	6.3314+2	3.1308+2	3.2004+2	1.6030–2
	3.4197–4	1.5974–8	4.4715+6	3.4690–7	1.8340+9	5.9144+8	2.8675+8	9.5580+8	9.2599+3	6.2788+2	3.1193+2	3.1593+2	1.6512–2
	3.5000–4	1.6170–8	4.4172+6	3.5973–7	1.8117+9	5.8511+8	2.8317+8	9.4345+8	9.2968+3	6.2302+2	3.1090+2	3.1210+2	1.6981–2
	3.5648–4	1.6327–8	4.3748+6	3.7016–7	1.7943+9	5.8016+8	2.8037+8	9.3381+8	9.3260+3	6.1924+2	3.1011+2	3.0911+2	1.7361–2
	3.6250–4	1.6472–8	4.3365+6	3.7991–7	1.7786+9	5.7568+8	2.7784+8	9.2508+8	9.3528+3	6.1584+2	3.0942+2	3.0641+2	1.7715–2

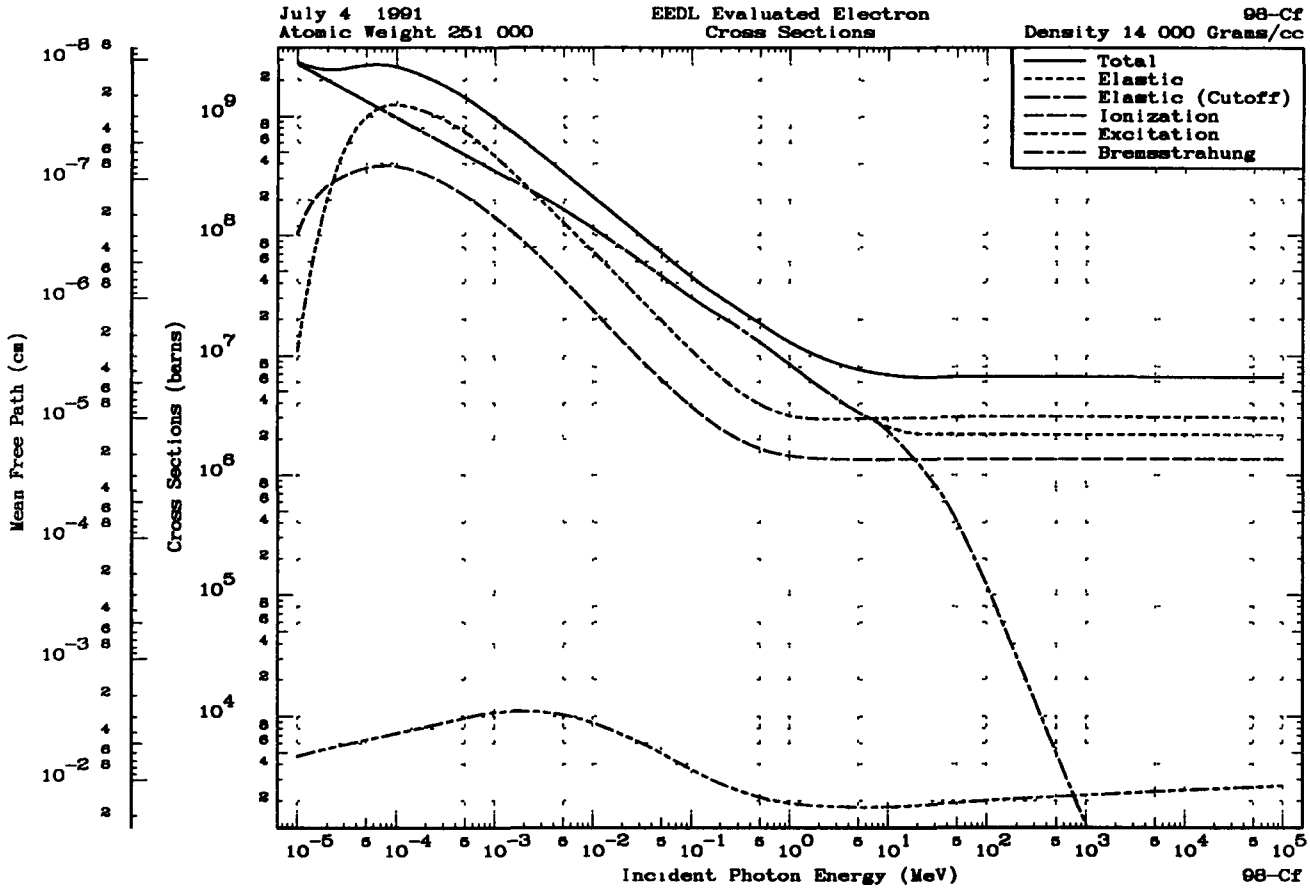
Atomic Weight 247.000 Density 14.000 Grams/cc

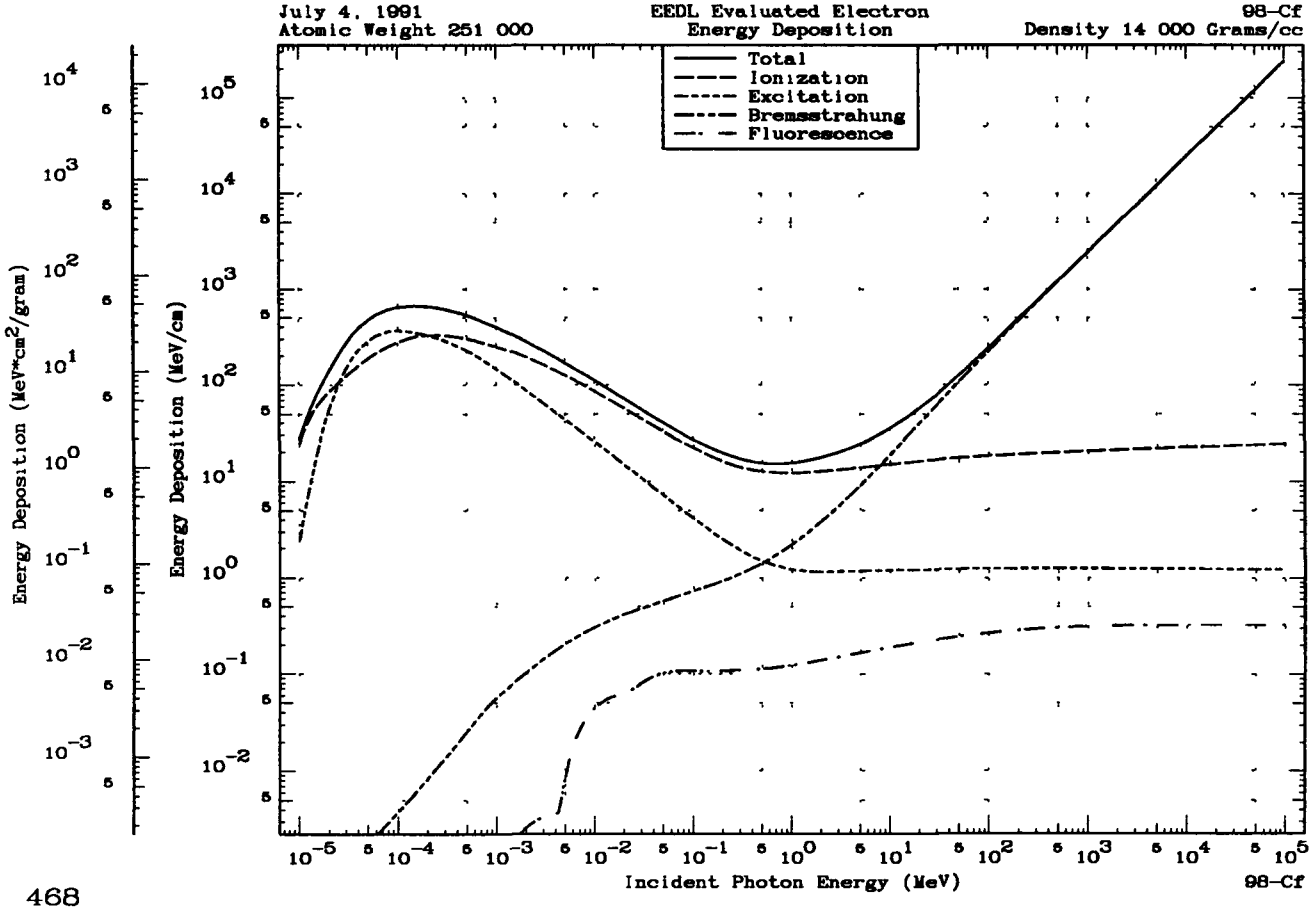
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.7824–4	1.6844–8	4.2407+6	4.0565–7	1.7393+9	5.6445+8	2.7155+8	9.0332+8	9.4211+3	6.0746+2	3.0778+2	2.9967+2	1.8646–2
	4.0000–4	1.7345–8	4.1180+6	4.4178–7	1.6890+9	5.5001+8	2.6354+8	8.7545+8	9.5117+3	5.9699+2	3.0591+2	2.9106+2	1.9943–2
O1	4.0087–4	1.7365–8	4.1133+6	4.4324–7	1.6871+9	5.4946+8	2.6320+8	8.7440+8	9.5153+3	5.9648+2	3.0574+2	2.9073+2	1.9998–2
	4.0707–4	1.7510–8	4.0794+6	4.5366–7	1.6732+9	5.4557+8	2.6077+8	8.6681+8	9.5405+3	5.9286+2	3.0450+2	2.8833+2	2.0387–2
	4.1868–4	1.7777–8	4.0180+6	4.7336–7	1.6480+9	5.3850+8	2.5640+8	8.5307+8	9.5870+3	5.8633+2	3.0231+2	2.8400+2	2.1118–2
	4.3901–4	1.8237–8	3.9166+6	5.0835–7	1.6064+9	5.2680+8	2.4920+8	8.3039+8	9.6658+3	5.7569+2	2.9880+2	2.7686+2	2.2408–2
	4.5000–4	1.8482–8	3.8648+6	5.2753–7	1.5852+9	5.2081+8	2.4555+8	8.1881+8	9.7072+3	5.7031+2	2.9707+2	2.7322+2	2.3109–2
	4.6951–4	1.8909–8	3.7776+6	5.6200–7	1.5494+9	5.1067+8	2.3941+8	7.9930+8	9.7786+3	5.6135+2	2.9424+2	2.6709+2	2.4362–2
	5.0000–4	1.9559–8	3.6519+6	6.1695–7	1.4978+9	4.9600+8	2.3063+8	7.7122+8	9.8854+3	5.4869+2	2.9039+2	2.5828+2	2.6340–2
N7	5.1227–4	1.9842–8	3.5999+6	6.3943–7	1.4765+9	4.9046+8	2.2720+8	7.5886+8	9.9269+3	5.4289+2	2.8856+2	2.5431+2	2.7142–2
	5.2324–4	2.0092–8	3.5551+6	6.5972–7	1.4581+9	4.8567+8	2.2426+8	7.4818+8	9.9633+3	5.3798+2	2.8707+2	2.5089+2	2.7862–2
N6	5.2802–4	2.0201–8	3.5360+6	6.6863–7	1.4503+9	4.8362+8	2.2301+8	7.4365+8	9.9790+3	5.3589+2	2.8643+2	2.4943+2	2.8177–2
	5.3702–4	2.0405–8	3.5006+6	6.8548–7	1.4358+9	4.7985+8	2.2071+8	7.3522+8	1.0007+4	5.3208+2	2.8531+2	2.4674+2	2.8769–2
	5.4243–4	2.0527–8	3.4798+6	6.9567–7	1.4273+9	4.7763+8	2.1936+8	7.3026+8	1.0023+4	5.2986+2	2.8467+2	2.4517+2	2.9126–2
	5.5000–4	2.0696–8	3.4513+6	7.1000–7	1.4155+9	4.7457+8	2.1750+8	7.2347+8	1.0046+4	5.2681+2	2.8378+2	2.4300+2	2.9627–2
	5.5276–4	2.0758–8	3.4410+6	7.1525–7	1.4114+9	4.7347+8	2.1684+8	7.2103+8	1.0054+4	5.2572+2	2.8347+2	2.4222+2	2.9810–2
	5.7121–4	2.1167–8	3.3746+6	7.5058–7	1.3841+9	4.6632+8	2.1253+8	7.0523+8	1.0108+4	5.1869+2	2.8147+2	2.3719+2	3.1037–2
	6.0000–4	2.1793–8	3.2776+6	8.0663–7	1.3443+9	4.5582+8	2.0627+8	6.8223+8	1.0189+4	5.0860+2	2.7870+2	2.2987+2	3.2964–2
	6.2500–4	2.2332–8	3.1985+6	8.5625–7	1.3119+9	4.4728+8	2.0077+8	6.6381+8	1.0249+4	4.9898+2	2.7503+2	2.2392+2	3.4592–2
	6.5000–4	2.2862–8	3.1243+6	9.0681–7	1.2815+9	4.3923+8	1.9563+8	6.4658+8	1.0306+4	4.9008+2	2.7169+2	2.1835+2	3.6230–2
	7.0000–4	2.3897–8	2.9891+6	1.0105–6	1.2260+9	4.2441+8	1.8633+8	6.1523+8	1.0415+4	4.7418+2	2.6590+2	2.0824+2	3.9534–2
	7.1563–4	2.4213–8	2.9500+6	1.0436–6	1.2099+9	4.2009+8	1.8365+8	6.0619+8	1.0447+4	4.6967+2	2.6430+2	2.0532+2	4.0573–2
	7.4976–4	2.4895–8	2.8692+6	1.1170–6	1.1768+9	4.1112+8	1.7814+8	5.8755+8	1.0516+4	4.6051+2	2.6115+2	1.9931+2	4.2855–2
	7.5781–4	2.5054–8	2.8510+6	1.1346–6	1.1694+9	4.0909+8	1.7690+8	5.8335+8	1.0532+4	4.5847+2	2.6046+2	1.9796+2	4.3396–2
	8.0000–4	2.5875–8	2.7606+6	1.2276–6	1.1323+9	3.9895+8	1.7076+8	5.6254+8	1.0613+4	4.4851+2	2.5720+2	1.9126+2	4.6242–2
N5	8.9882–4	2.7740–8	2.5749+6	1.4538–6	1.0561+9	3.7799+8	1.5758+8	5.2052+8	1.0718+4	4.2541+2	2.4782+2	1.7754+2	5.1999–2
	9.1147–4	2.7980–8	2.5528+6	1.4836–6	1.0470+9	3.7556+8	1.5608+8	5.1540+8	1.0731+4	4.2272+2	2.4679+2	1.7587+2	5.2739–2
	9.3360–4	2.8398–8	2.5153+6	1.5363–6	1.0316+9	3.7140+8	1.5353+8	5.0671+8	1.0753+4	4.1818+2	2.4508+2	1.7305+2	5.4037–2
N4	9.5612–4	2.8818–8	2.4786+6	1.5904–6	1.0166+9	3.6733+8	1.5104+8	4.9822+8	1.0774+4	4.1380+2	2.4345+2	1.7029+2	5.5360–2
	9.6680–4	2.9027–8	2.4608+6	1.6163–6	1.0093+9	3.6544+8	1.4990+8	4.9395+8	1.0784+4	4.1169+2	2.4273+2	1.6890+2	5.5988–2
	9.6709–4	2.9032–8	2.4603+6	1.6170–6	1.0091+9	3.6539+8	1.4987+8	4.9384+8	1.0785+4	4.1163+2	2.4271+2	1.6886+2	5.6005–2
	1.0000–3	2.9669–8	2.4075+6	1.6975–6	9.8746+8	3.5977+8	1.4648+8	4.8120+8	1.0815+4	4.0545+2	2.4064+2	1.6476+2	5.7945–2
	1.0313–3	3.0267–8	2.3599+6	1.7752–6	9.6794+8	3.5468+8	1.4327+8	4.6998+8	1.0825+4	3.9908+2	2.3797+2	1.6105+2	5.9430–2
	1.0625–3	3.0858–8	2.3147+6	1.8541–6	9.4939+8	3.4980+8	1.4023+8	4.5934+8	1.0834+4	3.9310+2	2.3550+2	1.5754+2	6.0915–2
	1.0898–3	3.1370–8	2.2770+6	1.9241–6	9.3390+8	3.4571+8	1.3770+8	4.5048+8	1.0842+4	3.8816+2	2.3347+2	1.5462+2	6.2216–2
	1.1250–3	3.2021–8	2.2307+6	2.0154–6	9.1492+8	3.4066+8	1.3461+8	4.3964+8	1.0851+4	3.8217+2	2.3106+2	1.5105+2	6.3889–2
	1.1719–3	3.2877–8	2.1726+6	2.1393–6	8.9111+8	3.3428+8	1.3073+8	4.2609+8	1.0864+4	3.7463+2	2.2798+2	1.4658+2	6.6122–2
	1.1924–3	3.3247–8	2.1484+6	2.1942–6	8.8119+8	3.3160+8	1.2912+8	4.2046+8	1.0869+4	3.7152+2	2.2673+2	1.4472+2	6.7099–2
N3	1.2366–3	3.4036–8	2.0986+6	2.3143–6	8.6075+8	3.2605+8	1.2581+8	4.0888+8	1.0881+4	3.6517+2	2.2420+2	1.4091+2	6.9208–2
	1.2531–3	3.4329–8	2.0807+6	2.3595–6	8.5341+8	3.2406+8	1.2459+8	4.0475+8	1.0885+4	3.6270+2	2.2309+2	1.3954+2	6.9994–2
	1.2839–3	3.4874–8	2.0482+6	2.4452–6	8.4007+8	3.2042+8	1.2237+8	3.9726+8	1.0892+4	3.5825+2	2.2112+2	1.3705+2	7.1468–2
	1.3125–3	3.5374–8	2.0192+6	2.5254–6	8.2819+8	3.1717+8	1.2041+8	3.9060+8	1.0899+4	3.5431+2	2.1940+2	1.3484+2	7.2832–2
	1.3359–3	3.5781–8	1.9962+6	2.5918–6	8.1877+8	3.1458+8	1.1885+8	3.8533+8	1.0905+4	3.5116+2	2.1799+2	1.3309+2	7.3952–2
	1.3379–3	3.5816–8	1.9943+6	2.5975–6	8.1797+8	3.1436+8	1.1872+8	3.8488+8	1.0905+4	3.5089+2	2.1787+2	1.3295+2	7.4048–2
	1.3462–3	3.5959–8	1.9864+6	2.6211–6	8.1473+8	3.1347+8	1.1818+8	3.8307+8	1.0907+4	3.4981+2	2.1739+2	1.3235+2	7.4442–2
	1.3785–3	3.6513–8	1.9563+6	2.7138–6	8.0236+8	3.1005+8	1.1614+8	3.7617+8	1.0914+4	3.4570+2	2.1557+2	1.3006+2	7.5985–2
	1.4392–3	3.7543–8	1.9026+6	2.8915–6	7.8035+8	3.0391+8	1.1251+8	3.6391+8	1.0928+4	3.3847+2	2.1240+2	1.2599+2	7.8894–2
	1.5000–3	3.8556–8	1.8526+6	3.0728–6	7.5984+8	2.9814+8	1.0915+8	3.5253+8	1.0941+4	3.3186+2	2.0955+2	1.2223+2	8.1805–2
N2	1.5540–3	3.9445–8	1.8109+6	3.2371–6	7.4273+8	2.9330+8	1.0626+8	3.4316+8	1.0952+4	3.2568+2	2.0651+2	1.1908+2	8.4394–2
	1.5819–3	3.9900–8	1.7902+6	3.3230–6	7.3425+8	2.9089+8	1.0484+8	3.3851+8	1.0954+4	3.2266+2	2.0504+2	1.1753+2	8.5673–2
	1.6250–3	4.0598–8	1.7594+6	3.4577–6	7.2162+8	2.8729+8	1.0273+8	3.3159+8	1.0959+4	3.1818+2	2.0287+2	1.1523+2	8.7652–2
	1.6341–3	4.0746–8	1.7530+6	3.4864–6	7.1902+8	2.8654+8	1.0230+8	3.3017+8	1.0960+4	3.1727+2	2.0243+2	1.1475+2	8.8071–2
	1.7256–3	4.2200–8	1.6926+6	3.7787–6	6.9423+8	2.7940+8	9.8170+7	3.1665+8	1.0968+4	3.0862+2	1.9828+2	1.1024+2	9.2272–2
N1	1.7288–3	4.2250–8	1.6906+6	3.7891–6	6.9341+8	2.7916+8	9.8033+7	3.1621+8	1.0968+4	3.0833+2	1.9815+2	1.1009+2	9.2418–2
	1.7627–3	4.2783–8	1.6696+6	3.8996–6	6.8478+8	2.7666+8	9.6582+7	3.1153+8	1.0963+4	3.0520+2	1.9658+2	1.0853+2	9.3779–2
	1.8125–3	4.3558–8	1.6399+6	4.0639–6	6.7259+8	2.7311+8	9.4539+7	3.0494+8	1.0955+4	3.0080+2	1.9439+2	1.0632+2	9.5778–2
	1.8220–3	4.3705–8	1.6343+6	4.0956–6	6.7033+8	2.7245+8	9.4159+7	3.0371+8	1.0953+4	2.9999+2	1.9398+2	1.0591+2	9.6160–2
	1.8628–3	4.4332–8	1.6112+6	4.2323–6	6.6085+8	2.6967+8	9.2575+7	2.9859+8	1.0947+4	2.9660+2	1.9231+2	1.0420+2	9.7796–2
	1.9110–3	4.5066–8	1.5850+6	4.3959–6	6.5008+8	2.6649+8	9.0780+7	2.9280+8	1.0940+4	2.9278+2	1.9042+2	1.0226+2	9.9729–2
	2.0000–3	4.6403–8	1.5393+6	4.7033–6	6.3135+8	2.6093+8	8.7673+7	2.8274+8	1.0927+4	2.8622+2	1.8723+2	9.8892+1	1.0330–1
	2.1250–3	4.8266–8	1.4799+6	5.1477–6	6.0698+8	2.5360+8	8.3549+7	2.6982+8	1.0910+4	2.7651+2	1.8188+2	9.4520+1	1.0830–1
	2.2500–3	5.0087–8	1.4261+6	5.6070–6	5.8491+8	2.4688+8	7.9845+7	2.5818+8	1.0893+4	2.6784+2	1.7715+2	9.0583+1	1.1330–1
	2.3438–3	5.1427–8	1.3889+6	5.9609–6	5.6967+8	2.4219+8	7.7303+7	2.5017+8	1.0882+4	2.6191+2	1.7392+2	8.7877+1	1.1704–1
	2.5000–3	5.3614–8	1.3323+6	6.5679–6	5.4644+8	2.3496+8	7.3453+7	2.3801+8	1.0863+4	2.5300+2	1.6911+2	8.3771+1	1.2328–1
	2.6250–3	5.5326–8	1.2911+6	7.0684–6	5.2953+8	2.2963+8	7.0668+7	2.2922+8	1.0849+4	2.4647+2	1.6554+2	8.0801+1	1.2826–1
	2.6719–3	5.5959–8	1.2764+6	7.2595–6	5.2354+8	2.2773+8	6.9685+7	2.2611+8	1.0845+4	2.4416+2	1.6428+2	7.9752+1	1.3012–1
	3.0000–3	6.0276–8	1.1850+6	8.6439–6	4.8604+8	2.1567+8	6.3587+7	2.0677+8	1.0812+4	2.3001+2	1.5664+2	7.3230+1	1.4317–1
	3.5000–3	6.6661–8	1.0715+6	1.0916–5	4.3949+8	2.0015+8	5.6061+7	1.8326+8	1.0653+4	2.1040+2	1.4505+2	6.5190+1	1.5949–1
	4.0000–3	7.2701–8	9.8250+5	1.3381–5	4.0298+8	1.8762+8	5.0278+7	1.6507+8	1.0518+4	1.9545+2	1.3630+2	5.8976+1	1.7564–1
M5	4.1343–3	7.4299–8	9.6137+5	1.4075–5	3.9431+8	1.8449+8	4.8917+7	1.6089+8	1.0479+4	1.9160+2	1.3389+2	5.7529+1	1.7977–1
	4.1884–3	7.4938–8	9.5317+5	1.4359–5	3.9094+8	1.8327+8	4.8391+7	1.5927+8	1.0464+4	1.9012+2	1.3297+2	5.6968+1	1.8143–1
	4.2899–3	7.6129–8	9.3826+5	1.4896–5	3.8483+8	1.8105+8	4.7439+7	1.5633+8	1.0436+4	1.8744+2	1.3130+2	5.5951+1	1.8454–1
M4	4.3669–3	7.7026–8	9.2733+5	1.5309–5	3.8035+8	1.7941+8	4.6743+7	1.5418+8	1.0416+4	1.8548+2	1.3008+2	5.5207+1	1.8689–1
	4.4065–3	7.7487–8	9.2182+5	1.5523–5	3.7809+8	1.7859+8	4.6393+7	1.5309+8	1.0405+4	1.8450+2	1.2948+2	5.4833+1	1.8810–1
	4.4674–3	7.8193–8	9.1349+5	1.5855–5	3.7467+8	1.7735+8	4.5867+7	1.5145+8	1.0389+4	1.8302+2	1.2856+2	5.4268+1	1.8996–1
	4.5548–3	7.9201–8	9.0187+5	1.6335–5	3.6990+8	1.7560+8	4.5134+7	1.4916+8	1.0367+4	1.8096+2	1.2729+2	5.3481+1	1.9263–1
	4.7337–3	8.1239–8	8.7924+5	1.7334–5	3.6062+8	1.7219+8	4.3714+7	1.4471+8	1.0322+4	1.7699+2	1.2484+2	5.1954+1	1.9807–1
	4.7774–3	8.1733–8	8.7392+5	1.7582–5	3.5844+8	1.7139+8	4.3381+7	1.4367+8	1.0312+4	1.7606+2	1.2427+2	5.1596+1	1.9939–1
M3	4.9686–3	8.3873–8	8.5163+5	1.8680–5	3.4930+8	1.6799+8	4.1992+7	1.3930+8	1.0267+4	1.7218+2	1.2188+2	5.0098+1	2.0518–1
	5.0000–3	8.4222–8	8.4810+5	1.8863–5	3.4785+8	1.6745+8	4.1773+7	1.3861+8	1.0260+4	1.7158+2	1.2151+2	4.9862+1	2.0613–1

Atomic Weight 247.000 — Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.1250–3	8.5624–8	8.3421+5	1.9597–5	3.4216+8	1.6530+8	4.0916+7	1.3593+8	1.0212+4	1.6905+2	1.1991+2	4.8930+1	2.0914–1
	5.3438–3	8.8047–8	8.1125+5	2.0907–5	3.3274+8	1.6172+8	3.9505+7	1.3150+8	1.0132+4	1.6491+2	1.1731+2	4.7393+1	2.1439–1
	5.5000–3	8.9756–8	7.9580+5	2.1862–5	3.2640+8	1.5930+8	3.8562+7	1.2853+8	1.0078+4	1.6215+2	1.1557+2	4.6363+1	2.1813–1
	5.6719–3	9.1616–8	7.7965+5	2.2932–5	3.1978+8	1.5675+8	3.7580+7	1.2543+8	1.0020+4	1.5928+2	1.1377+2	4.5289+1	2.2222–1
	6.0000–3	9.5110–8	7.5101+5	2.5025–5	3.0803+8	1.5220+8	3.5850+7	1.1997+8	9.9143+3	1.5425+2	1.1062+2	4.3394+1	2.3000–1
M2	6.1488–3	9.6680–8	7.3881+5	2.5997–5	3.0303+8	1.5026+8	3.5115+7	1.1764+8	9.8688+3	1.5192+2	1.0911+2	4.2579+1	2.3350–1
	6.2645–3	9.7898–8	7.2962+5	2.6763–5	2.9926+8	1.4879+8	3.4566+7	1.1589+8	9.8343+3	1.5018+2	1.0798+2	4.1967+1	2.3622–1
	6.4814–3	1.0016–7	7.1314+5	2.8223–5	2.9250+8	1.4614+8	3.3586+7	1.1276+8	9.7717+3	1.4709+2	1.0597+2	4.0874+1	2.4130–1
M1	6.5233–3	1.0059–7	7.1007+5	2.8508–5	2.9124+8	1.4564+8	3.3404+7	1.1218+8	9.7599+3	1.4651+2	1.0560+2	4.0670+1	2.4228–1
	6.6156–3	1.0155–7	7.0338+5	2.9140–5	2.8850+8	1.4456+8	3.3008+7	1.1092+8	9.7295+3	1.4524+2	1.0477+2	4.0228+1	2.4420–1
	6.7886–3	1.0333–7	6.9126+5	3.0341–5	2.8352+8	1.4259+8	3.2293+7	1.0863+8	9.6740+3	1.4296+2	1.0328+2	3.9429+1	2.4777–1
	6.8611–3	1.0407–7	6.8635+5	3.0850–5	2.8151+8	1.4179+8	3.2003+7	1.0771+8	9.6513+3	1.4203+2	1.0268+2	3.9105+1	2.4927–1
	7.0915–3	1.0641–7	6.7127+5	3.2488–5	2.7532+8	1.3932+8	3.1119+7	1.0488+8	9.5809+3	1.3922+2	1.0085+2	3.8115+1	2.5401–1
	7.2500–3	1.0800–7	6.6138+5	3.3634–5	2.7127+8	1.3769+8	3.0541+7	1.0302+8	9.5341+3	1.3738+2	9.9651+1	3.7468+1	2.5725–1
	7.4305–3	1.0980–7	6.5055+5	3.4958–5	2.6682+8	1.3591+8	2.9911+7	1.0100+8	9.4823+3	1.3537+2	9.8347+1	3.6760+1	2.6094–1
	7.5457–3	1.1094–7	6.4387+5	3.5813–5	2.6408+8	1.3480+8	2.9523+7	9.9754+7	9.4501+3	1.3414+2	9.7548+1	3.6325+1	2.6328–1
	8.0000–3	1.1537–7	6.1914+5	3.9258–5	2.5394+8	1.3067+8	2.8097+7	9.5161+7	9.3285+3	1.2961+2	9.4620+1	3.4721+1	2.7248–1
	8.5000–3	1.2019–7	5.9430+5	4.3190–5	2.4376+8	1.2644+8	2.6681+7	9.0630+7	9.1822+3	1.2476+2	9.1357+1	3.3122+1	2.8110–1
	9.0000–3	1.2491–7	5.7184+5	4.7269–5	2.3454+8	1.2256+8	2.5413+7	8.6556+7	9.0464+3	1.2042+2	8.8447+1	3.1685+1	2.8964–1
	9.2500–3	1.2724–7	5.6139+5	4.9363–5	2.3025+8	1.2075+8	2.4826+7	8.4669+7	8.9820+3	1.1841+2	8.7100+1	3.1020+1	2.9389–1
	1.0000–2	1.3408–7	5.3272+5	5.5847–5	2.1850+8	1.1574+8	2.3232+7	7.9521+7	8.8014+3	1.1297+2	8.3455+1	2.9206+1	3.0651–1
	1.1250–2	1.4525–7	4.9176+5	6.7341–5	2.0170+8	1.0840+8	2.1003+7	7.2288+7	8.4858+3	1.0464+2	7.7693+1	2.6626+1	3.2289–1
	1.2500–2	1.5600–7	4.5789+5	7.9690–5	1.8781+8	1.0223+8	1.9193+7	6.6376+7	8.2131+3	9.7879+1	7.3020+1	2.4520+1	3.3901–1
	1.3125–2	1.6122–7	4.4304+5	8.6173–5	1.8171+8	9.9490+7	1.8409+7	6.3805+7	8.0898+3	9.4941+1	7.0990+1	2.3604+1	3.4696–1
	1.5000–2	1.7641–7	4.0489+5	1.0674–4	1.6607+8	9.2369+7	1.6424+7	5.7267+7	7.7617+3	8.7504+1	6.5857+1	2.1277+1	3.7044–1
	1.7500–2	1.9604–7	3.6436+5	1.3676–4	1.4944+8	8.4509+7	1.4401+7	5.0527+7	7.3469+3	7.9181+1	5.9939+1	1.8849+1	3.9396–1
L3	1.9462–2	2.1078–7	3.3888+5	1.6238–4	1.3899+8	7.9483+7	1.3154+7	4.6349+7	7.0739+3	7.4048+1	5.6291+1	1.7345+1	4.1205–1
	2.0000–2	2.1475–7	3.3261+5	1.6971–4	1.3642+8	7.8233+7	1.2852+7	4.5328+7	7.0023+3	7.2793+1	5.5399+1	1.6978+1	4.1633–1
	2.1250–2	2.2385–7	3.1910+5	1.8722–4	1.3088+8	7.5505+7	1.2210+7	4.3155+7	6.8436+3	6.9964+1	5.3351+1	1.6188+1	4.2556–1
	2.3438–2	2.3934–7	2.9843+5	2.1948–4	1.2240+8	7.1297+7	1.1240+7	3.9862+7	6.5947+3	6.5689+1	5.0257+1	1.4991+1	4.4157–1
L2	2.4503–2	2.4671–7	2.8952+5	2.3593–4	1.1875+8	6.9465+7	1.0825+7	3.8451+7	6.4847+3	6.3864+1	4.8936+1	1.4478+1	4.4928–1
	2.5190–2	2.5141–7	2.8412+5	2.4679–4	1.1653+8	6.8348+7	1.0576+7	3.7601+7	6.4160+3	6.2749+1	4.8127+1	1.4169+1	4.5385–1
L1	2.5294–2	2.5211–7	2.8332+5	2.4844–4	1.1620+8	6.8183+7	1.0539+7	3.7476+7	6.4059+3	6.2586+1	4.8007+1	1.4124+1	4.5453–1
	2.5882–2	2.5610–7	2.7891+5	2.5791–4	1.1440+8	6.7266+7	1.0338+7	3.6786+7	6.3467+3	6.1661+1	4.7330+1	1.3872+1	4.5810–1
	2.6393–2	2.5953–7	2.7522+5	2.6624–4	1.1288+8	6.6496+7	1.0171+7	3.6210+7	6.2968+3	6.0888+1	4.6766+1	1.3662+1	4.6119–1
	2.6912–2	2.6300–7	2.7159+5	2.7482–4	1.1139+8	6.5737+7	1.0006+7	3.5644+7	6.2474+3	6.0131+1	4.6212+1	1.3455+1	4.6433–1
	2.7539–2	2.6717–7	2.6736+5	2.8533–4	1.0966+8	6.4850+7	9.8148+6	3.4987+7	6.1895+3	5.9251+1	4.5568+1	1.3215+1	4.6811–1
	2.8196–2	2.7149–7	2.6310+5	2.9651–4	1.0791+8	6.3955+7	9.6229+6	3.4326+7	6.1308+3	5.8368+1	4.4921+1	1.2974+1	4.7205–1
	2.8456–2	2.7319–7	2.6146+5	3.0097–4	1.0724+8	6.3610+7	9.5493+6	3.4073+7	6.1082+3	5.8029+1	4.4674+1	1.2882+1	4.7361–1
	3.0000–2	2.8320–7	2.5222+5	3.2802–4	1.0345+8	6.1659+7	9.1361+6	3.2648+7	5.9792+3	5.6128+1	4.3283+1	1.2362+1	4.8282–1
	3.2500–2	2.9895–7	2.3893+5	3.7373–4	9.7999+7	5.8829+7	8.5541+6	3.0610+7	5.7780+3	5.3292+1	4.1186+1	1.1611+1	4.9548–1
	3.5000–2	3.1429–7	2.2727+5	4.2176–4	9.3215+7	5.6325+7	8.0485+6	2.8836+7	5.5979+3	5.0829+1	3.9363+1	1.0958+1	5.0803–1
	3.6250–2	3.2182–7	2.2195+5	4.4662–4	9.1034+7	5.5177+7	7.8197+6	2.8032+7	5.5146+3	4.9713+1	3.8537+1	1.0662+1	5.1426–1
	4.0000–2	3.4389–7	2.0771+5	5.2440–4	8.5191+7	5.2079+7	7.2121+6	2.5895+7	5.2873+3	4.6751+1	3.6343+1	9.8755+0	5.3273–1
	4.5000–2	3.7216–7	1.9193+5	6.3536–4	7.8721+7	4.8604+7	6.5622+6	2.3549+7	5.0217+3	4.3412+1	3.3852+1	9.0065+0	5.5359–1
	5.0000–2	3.9935–7	1.7886+5	7.5431–4	7.3361+7	4.5693+7	6.0308+6	2.1632+7	4.7954+3	4.0684+1	3.1813+1	8.2965+0	5.7412–1
	5.5000–2	4.2545–7	1.6789+5	8.8084–4	6.8861+7	4.3210+7	5.5991+6	2.0047+7	4.5986+3	3.8372+1	3.0074+1	7.7059+0	5.9208–1
	6.0000–2	4.5072–7	1.5848+5	1.0146–3	6.5000+7	4.1061+7	5.2321+6	1.8702+7	4.4260+3	3.6409+1	2.8595+1	7.2049+0	6.0983–1
	7.0000–2	4.9910–7	1.4311+5	1.3021–3	5.8699+7	3.7492+7	4.6609+6	1.6542+7	4.1380+3	3.3215+1	2.6180+1	6.3934+0	6.4140–1
	8.0000–2	5.4509–7	1.3104+5	1.6149–3	5.3747+7	3.4652+7	4.2169+6	1.4873+7	3.9036+3	3.0742+1	2.4303+1	5.7672+0	6.7231–1
	1.0000–1	6.3084–7	1.1323+5	2.3069–3	4.6441+7	3.0382+7	3.5992+6	1.2457+7	3.5486+3	2.7137+1	2.1560+1	4.8528+0	7.2473–1
K	1.3221–1	7.4822–7	9.5465+4	3.5807–3	3.9155+7	2.6079+7	2.9936+6	1.0080+7	3.1833+3	2.3522+1	1.8774+1	3.9496+0	7.9844–1
	1.3443–1	7.5552–7	9.4542+4	3.6756–3	3.8777+7	2.5858+7	2.9624+6	9.9530+6	3.1633+3	2.3333+1	1.8628+1	3.9012+0	8.0297–1
	1.3832–1	7.6818–7	9.2985+4	3.8435–3	3.8138+7	2.5485+7	2.9100+6	9.7396+6	3.1294+3	2.3014+1	1.8383+1	3.8199+0	8.1089–1
	1.4416–1	7.8687–7	9.0775+4	4.0997–3	3.7232+7	2.4955+7	2.8356+6	9.4385+6	3.0810+3	2.2564+1	1.8036+1	3.7052+0	8.2274–1
	1.5000–1	8.0524–7	8.8705+4	4.3609–3	3.6383+7	2.4455+7	2.7660+6	9.1581+6	3.0352+3	2.2144+1	1.7711+1	3.5984+0	8.3455–1
	1.6250–1	8.4131–7	8.4901+4	4.9352–3	3.4823+7	2.3510+7	2.6428+6	8.6670+6	2.9468+3	2.1392+1	1.7124+1	3.4104+0	8.5802–1
	1.8125–1	8.9308–7	7.9980+4	5.8319–3	3.2804+7	2.2278+7	2.4836+6	8.0391+6	2.8304+3	2.0431+1	1.6368+1	3.1702+0	8.9295–1
	2.0000–1	9.4240–7	7.5794+4	6.7683–3	3.1087+7	2.1224+7	2.3484+6	7.5122+6	2.7294+3	1.9625+1	1.5728+1	2.9689+0	9.2746–1
	2.2500–1	1.0042–6	7.1128+4	8.0687–3	2.9173+7	2.0002+7	2.2197+6	6.9493+6	2.6246+3	1.8831+1	1.5110+1	2.7517+0	9.6934–1
	2.6250–1	1.0912–6	6.5458+4	1.0112–2	2.6848+7	1.8508+7	2.0619+6	6.2758+6	2.4934+3	1.7883+1	1.4359+1	2.4922+0	1.0314+0
	3.0000–1	1.1682–6	6.1144+4	1.2251–2	2.5078+7	1.7304+7	1.9344+6	5.8376+6	2.3850+3	1.7176+1	1.3759+1	2.3248+0	1.0922+0
	4.0000–1	1.3596–6	5.2535+4	1.8259–2	2.1547+7	1.4758+7	1.7330+6	5.0543+6	2.1964+3	1.6128+1	1.2856+1	2.0240+0	1.2482+0
	5.0000–1	1.5269–6	4.6781+4	2.4550–2	1.9187+7	1.2954+7	1.6167+6	4.6141+6	2.0829+3	1.5664+1	1.2406+1	1.8555+0	1.4022+0
	6.0000–1	1.6812–6	4.2486+4	3.0985–2	1.7426+7	1.1600+7	1.5416+6	4.2825+6	2.0083+3	1.5416+1	1.2132+1	1.7284+0	1.5562+0
	8.0000–1	1.9361–6	3.6894+4	4.3951–2	1.5132+7	9.6990+6	1.4543+6	3.9770+6	1.9169+3	1.5433+1	1.1956+1	1.6136+0	1.8643+0
	1.0000+0	2.1539–6	3.3163+4	5.6832–2	1.3602+7	8.4357+6	1.4055+6	3.7587+6	1.8654+3	1.5621+1	1.1911+1	1.5315+0	2.1778+0
	1.2500+0	2.3650–6	3.0202+4	7.2576–2	1.2387+7	7.3388+6	1.3757+6	3.6711+6	1.8288+3	1.6140+1	1.2055+1	1.5014+0	2.5836+0
	1.5000+0	2.5466–6	2.8048+4	8.7823–2	1.1504+7	6.5493+6	1.3520+6	3.6010+6	1.7994+3	1.6658+1	1.2196+1	1.4783+0	2.9834+0
	2.0000+0	2.8233–6	2.5300+4	1.1689–1	1.0377+7	5.4926+6	1.3355+6	3.5469+6	1.7696+3	1.7753+1	1.2486+1	1.4617+0	3.8049+0
	3.0000+0	3.1892–6	2.2397+4	1.6996–1	9.1862+6	4.3400+6	1.3143+6	3.5301+6	1.7459+3	1.9978+1	1.2999+1	1.4664+0	5.5128+0
	4.0000+0	3.4199–6	2.0886+4	2.1745–1	8.5666+6	3.7181+6	1.3123+6	3.5345+6	1.7364+3	2.2178+1	1.3418+1	1.4715+0	7.2881+0
	5.0000+0	3.5793–6	1.9956+4	2.6046–1	8.1850+6	3.3324+6	1.3111+6	3.5398+6	1.7317+3	2.4351+1	1.3782+1	1.4770+0	9.0923+0
	6.0000+0	3.6968–6	1.9321+4	2.9978–1	7.9248+6	3.0701+6	1.3102+6	3.5428+6	1.7336+3	2.6551+1	1.4084+1	1.4814+0	1.0985+1
	8.0000+0	3.8600–6	1.8505+4	3.6960–1	7.5897+6	2.7338+6	1.3101+6	3.5440+6	1.7367+3	3.0847+1	1.4583+1	1.4885+0	1.4775+1
	1.0000+1	3.9635–6	1.8021+4	4.3019–1	7.3915+6	2.5370+6	1.3113+6	3.5415+6	1.7476+3	3.5267+1	1.4969+1	1.4941+0	1.8804+1
	1.5000+1	4.0898–6	1.7465+4	5.5393–1	7.1633+6	2.3032+6	1.3137+6	3.5446+6	1.7674+3	4.6023+1	1.5554+1	1.4966+0	2.8972+1
	2.0000+1	4.1372–6	1.7265+4	6.5123–1	7.0812+6	2.2180+6	1.3155+6	3.5460+6	1.7967+3	5.7158+1	1.6030+1	1.4984+0	3.9629+1
	3.0000+1	4.1457–6	1.7230+4	7.9876–1	7.0668+6	2.2023+6	1.3164+6	3.5463+6	1.8371+3	7.9651+1	1.6556+1	1.5009+0	6.1594+1
	4.0000+1	4.1451–6	1.7232+4	9.0909–1	7.0678+6	2.2018+6	1.3174+6	3.5467+6	1.8653+3	1.0259+2	1.6943+1	1.5035+0	8.4144+1

Atomic Weight 247.000													Density 14.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
5.0000+1	4.1448–6	1.7233+4	9.9692–1	7.0683+6	2.2009+6	1.3180+6	3.5475+6	1.8895+3	1.2592+2	1.7245+1	1.5062+0	1.0717+2
6.0000+1	4.1453–6	1.7231+4	1.0697+0	7.0675+6	2.2002+6	1.3182+6	3.5471+6	1.9096+3	1.4942+2	1.7453+1	1.5085+0	1.3046+2
8.0000+1	4.1475–6	1.7222+4	1.1860+0	7.0637+6	2.1990+6	1.3186+6	3.5442+6	1.9413+3	1.9686+2	1.7795+1	1.5121+0	1.7755+2
1.0000+2	4.1451–6	1.7232+4	1.2769+0	7.0679+6	2.1981+6	1.3189+6	3.5489+6	1.9648+3	2.4464+2	1.8092+1	1.5148+0	2.2503+2
1.5000+2	4.1461–6	1.7228+4	1.4432+0	7.0660+6	2.1965+6	1.3190+6	3.5485+6	2.0049+3	3.6475+2	1.8421+1	1.5148+0	3.4482+2
2.0000+2	4.1449–6	1.7233+4	1.5616+0	7.0682+6	2.1953+6	1.3191+6	3.5516+6	2.0321+3	4.8565+2	1.8721+1	1.5163+0	4.6541+2
3.0000+2	4.1443–6	1.7235+4	1.7288+0	7.0691+6	2.1937+6	1.3193+6	3.5541+6	2.0684+3	7.2640+2	1.9154+1	1.5177+0	7.0573+2
4.0000+2	4.1462–6	1.7228+4	1.8477+0	7.0660+6	2.1925+6	1.3193+6	3.5520+6	2.0931+3	9.6753+2	1.9396+1	1.5171+0	9.4662+2
5.0000+2	4.1503–6	1.7210+4	1.9399+0	7.0589+6	2.1917+6	1.3193+6	3.5458+6	2.1123+3	1.2105+3	1.9600+1	1.5147+0	1.1894+3
6.0000+2	4.1513–6	1.7206+4	2.0153+0	7.0571+6	2.1909+6	1.3193+6	3.5448+6	2.1272+3	1.4513+3	1.9770+1	1.5146+0	1.4300+3
8.0000+2	4.1543–6	1.7194+4	2.1341+0	7.0522+6	2.1898+6	1.3193+6	3.5409+6	2.1510+3	1.9372+3	2.0066+1	1.5136+0	1.9157+3
1.0000+3	4.1571–6	1.7182+4	2.2262+0	7.0474+6	2.1889+6	1.3194+6	3.5370+6	2.1700+3	2.4229+3	2.0311+1	1.5125+0	2.4010+3
1.5000+3	4.1607–6	1.7167+4	2.3934+0	7.0412+6	2.1873+6	1.3194+6	3.5324+6	2.2056+3	3.6436+3	2.0547+1	1.5105+0	3.6216+3
2.0000+3	4.1645–6	1.7152+4	2.5118+0	7.0349+6	2.1861+6	1.3194+6	3.5273+6	2.2326+3	4.8565+3	2.0778+1	1.5084+0	4.8342+3
3.0000+3	4.1695–6	1.7131+4	2.6788+0	7.0264+6	2.1845+6	1.3194+6	3.5203+6	2.2714+3	7.2879+3	2.1222+1	1.5054+0	7.2652+3
4.0000+3	4.1737–6	1.7114+4	2.7971+0	7.0194+6	2.1833+6	1.3194+6	3.5144+6	2.2996+3	9.7216+3	2.1438+1	1.5029+0	9.6987+3
5.0000+3	4.1789–6	1.7093+4	2.8888+0	7.0107+6	2.1824+6	1.3194+6	3.5066+6	2.3218+3	1.2181+4	2.1608+1	1.4996+0	1.2158+4
6.0000+3	4.1802–6	1.7087+4	2.9637+0	7.0084+6	2.1817+6	1.3194+6	3.5050+6	2.3379+3	1.4598+4	2.1756+1	1.4989+0	1.4575+4
8.0000+3	4.1834–6	1.7074+4	3.0819+0	7.0031+6	2.1806+6	1.3194+6	3.5008+6	2.3635+3	1.9475+4	2.2051+1	1.4972+0	1.9452+4
1.0000+4	4.1858–6	1.7065+4	3.1735+0	6.9991+6	2.1797+6	1.3194+6	3.4977+6	2.3836+3	2.4398+4	2.2298+1	1.4959+0	2.4374+4
1.5000+4	4.1896–6	1.7049+4	3.3400+0	6.9927+6	2.1781+6	1.3194+6	3.4928+6	2.4221+3	3.6478+4	2.2523+1	1.4938+0	3.6454+4
2.0000+4	4.1927–6	1.7036+4	3.4582+0	6.9875+6	2.1769+6	1.3194+6	3.4888+6	2.4499+3	4.8715+4	2.2747+1	1.4921+0	4.8691+4
3.0000+4	4.1959–6	1.7023+4	3.6248+0	6.9822+6	2.1753+6	1.3194+6	3.4850+6	2.4888+3	7.2911+4	2.3187+1	1.4905+0	7.2886+4
4.0000+4	4.1988–6	1.7012+4	3.7431+0	6.9773+6	2.1742+6	1.3194+6	3.4813+6	2.5167+3	9.7366+4	2.3391+1	1.4889+0	9.7341+4
5.0000+4	4.2031–6	1.6994+4	3.8348+0	6.9702+6	2.1733+6	1.3194+6	3.4751+6	2.5382+3	1.2160+5	2.3556+1	1.4862+0	1.2157+5
6.0000+4	4.2036–6	1.6992+4	3.9098+0	6.9694+6	2.1725+6	1.3194+6	3.4749+6	2.5557+3	1.4580+5	2.3698+1	1.4862+0	1.4578+5
8.0000+4	4.2056–6	1.6984+4	4.0281+0	6.9661+6	2.1714+6	1.3194+6	3.4727+6	2.5836+3	1.9464+5	2.3982+1	1.4853+0	1.9462+5
1.0000+5	4.2073–6	1.6977+4	4.1198+0	6.9634+6	2.1705+6	1.3194+6	3.4709+6	2.6053+3	2.4357+5	2.4254+1	1.4845+0	2.4354+5


July 4 1991
Atomic Weight 251 000
EEDL Evaluated Electron
Cross Sections
98-Cf
Density 14 000 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
98-Cf


July 4, 1991
Atomic Weight 251 000
EEDL Evaluated Electron
Energy Deposition
98-Cf
Density 14 000 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
98-Cf

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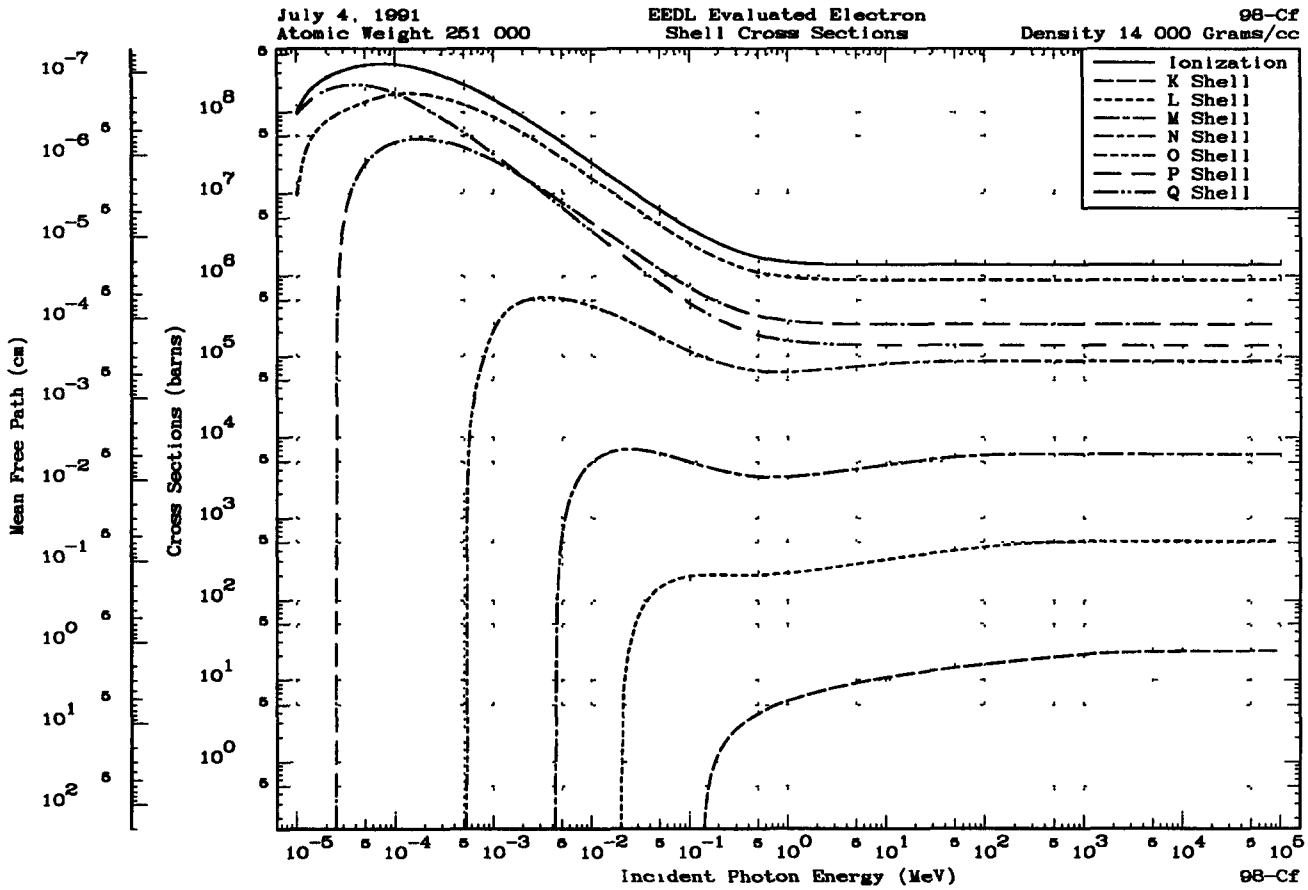
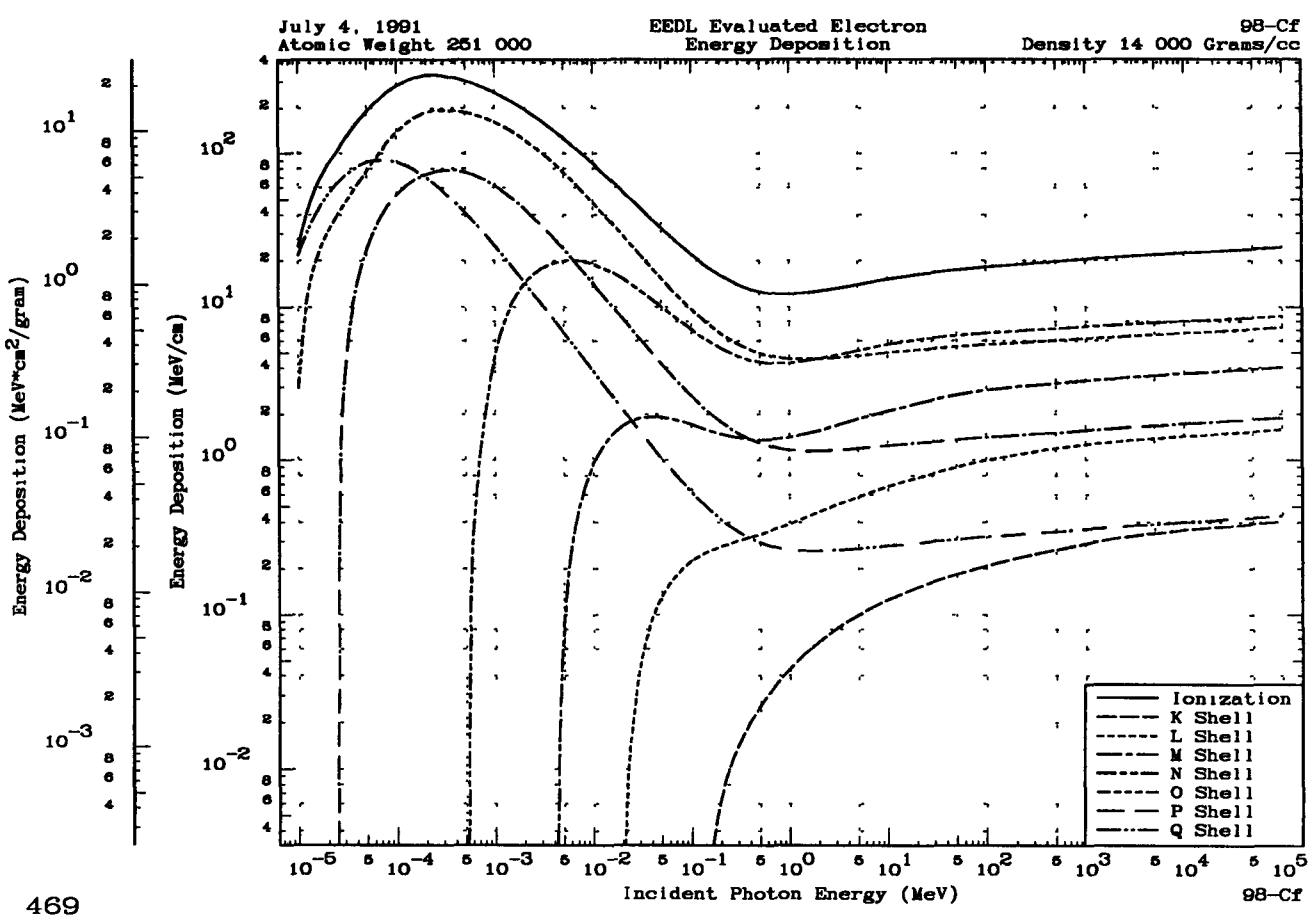

July 4, 1991
Atomic Weight 251 000
EEDL Evaluated Electron
Shell Cross Sections
98-Cf
Density 14 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
98-Cf


July 4, 1991
Atomic Weight 251 000
EEDL Evaluated Electron
Energy Deposition
98-Cf
Density 14 000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
98-Cf

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Atomic Weight 251.000 Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0498–8	6.8042+6		2.8360+9	2.7209+9	1.0409+8	1.0953+7	4.6881+3	2.6902+1	2.4459+1	2.4426+0	3.4047–4
	1.0625–5	1.0705–8	6.6726+6		2.7811+9	2.6480+9	1.1801+8	1.5146+7	4.7475+3	3.2075+1	2.8632+1	3.4426+0	3.6109–4
O6	1.0780–5	1.0753–8	6.6424+6		2.7685+9	2.6308+9	1.2131+8	1.6365+7	4.7618+3	3.3375+1	2.9637+1	3.7372+0	3.6623–4
	1.0912–5	1.0792–8	6.6184+6		2.7585+9	2.6165+9	1.2454+8	1.7455+7	4.7738+3	3.4674+1	3.0675+1	3.9978+0	3.7062–4
	1.1167–5	1.0865–8	6.5743+6		2.7401+9	2.5895+9	1.3090+8	1.9735+7	4.7968+3	3.7283+1	3.2738+1	4.5453+0	3.7914–4
	1.1172–5	1.0866–8	6.5735+6		2.7398+9	2.5890+9	1.3100+8	1.9777+7	4.7972+3	3.7328+1	3.2772+1	4.5554+0	3.7929–4
	1.1250–5	1.0889–8	6.5600+6		2.7342+9	2.5810+9	1.3267+8	2.0521+7	4.8041+3	3.8050+1	3.3315+1	4.7350+0	3.8190–4
	1.1646–5	1.0997–8	6.4955+6		2.7073+9	2.5412+9	1.4188+8	2.4230+7	4.8388+3	4.1995+1	3.6355+1	5.6390+0	3.9520–4
	1.2066–5	1.1102–8	6.4338+6		2.6816+9	2.5012+9	1.5167+8	2.8707+7	4.8744+3	4.6377+1	3.9635+1	6.7417+0	4.0934–4
	1.2129–5	1.1117–8	6.4250+6		2.6779+9	2.4954+9	1.5311+8	2.9436+7	4.8797+3	4.7044+1	4.0121+1	6.9221+0	4.1148–4
	1.2799–5	1.1271–8	6.3374+6		2.6414+9	2.4359+9	1.6739+8	3.8099+7	4.9345+3	5.4106+1	4.5017+1	9.0879+0	4.3428–4
	1.3125–5	1.1338–8	6.2999+6		2.6258+9	2.4086+9	1.7418+8	4.2980+7	4.9603+3	5.7706+1	4.7383+1	1.0323+1	4.4543–4
	1.3564–5	1.1429–8	6.2498+6		2.6049+9	2.3733+9	1.8219+8	4.9408+7	4.9943+3	6.2336+1	5.0360+1	1.1976+1	4.6055–4
	1.3900–5	1.1494–8	6.2145+6		2.5902+9	2.3475+9	1.8792+8	5.4784+7	5.0197+3	6.5911+1	5.2539+1	1.3371+1	4.7214–4
	1.5000–5	1.1674–8	6.1187+6		2.5502+9	2.2686+9	2.0598+8	7.5628+7	5.0997+3	7.8463+1	5.9584+1	1.8878+1	5.1050–4
	1.6250–5	1.1850–8	6.0276+6		2.5123+9	2.1886+9	2.2214+8	1.0146+8	5.1851+3	9.2027+1	6.6330+1	2.5697+1	5.5468–4
	1.7500–5	1.1966–8	5.9694+6		2.4880+9	2.1171+9	2.3769+8	1.3319+8	5.2654+3	1.0732+2	7.3104+1	3.4218+1	5.9945–4
	1.8125–5	1.2010–8	5.9476+6		2.4789+9	2.0841+9	2.4387+8	1.5099+8	5.3039+3	1.1516+2	7.6097+1	3.9063+1	6.2205–4
	2.0000–5	1.2099–8	5.9038+6		2.4607+9	1.9941+9	2.6135+8	2.0525+8	5.4134+3	1.3918+2	8.4957+1	5.4224+1	6.9067–4
P3	2.5100–5	1.2056–8	5.9246+6		2.4694+9	1.8010+9	2.9395+8	3.7440+8	5.6524+3	2.0659+2	1.0472+2	1.0187+2	8.6906–4
	2.5406–5	1.2047–8	5.9293+6		2.4713+9	1.7912+9	2.9550+8	3.8456+8	5.6652+3	2.1063+2	1.0588+2	1.0474+2	8.7982–4
	2.6555–5	1.1998–8	5.9534+6		2.4813+9	1.7561+9	3.0126+8	4.2399+8	5.7122+3	2.2617+2	1.1024+2	1.1593+2	9.2038–4
	2.6985–5	1.1974–8	5.9652+6		2.4862+9	1.7435+9	3.0346+8	4.3932+8	5.7294+3	2.3225+2	1.1195+2	1.2030+2	9.3566–4
	2.7739–5	1.1926–8	5.9892+6		2.4963+9	1.7221+9	3.0735+8	4.6687+8	5.7590+3	2.4319+2	1.1502+2	1.2817+2	9.6249–4
	2.8870–5	1.1876–8	6.0145+6		2.5068+9	1.6915+9	3.1321+8	5.0211+8	5.8021+3	2.5811+2	1.1974+2	1.3837+2	1.0029–3
	3.0000–5	1.1814–8	6.0458+6		2.5199+9	1.6626+9	3.1876+8	5.3850+8	5.8439+3	2.7329+2	1.2432+2	1.4897+2	1.0437–3
	3.2500–5	1.1691–8	6.1095+6		2.5464+9	1.6041+9	3.2789+8	6.1448+8	5.9320+3	3.0433+2	1.3350+2	1.7082+2	1.1346–3
	3.5000–5	1.1529–8	6.1954+6		2.5822+9	1.5517+9	3.3619+8	6.9435+8	6.0148+3	3.3629+2	1.4232+2	1.9397+2	1.2266–3
	3.6250–5	1.1481–8	6.2213+6		2.5930+9	1.5275+9	3.4048+8	7.2504+8	6.0543+3	3.5002+2	1.4698+2	2.0303+2	1.2730–3
P2	3.8790–5	1.1370–8	6.2820+6		2.6183+9	1.4818+9	3.4833+8	7.8816+8	6.1315+3	3.7769+2	1.5589+2	2.2180+2	1.3682–3
	3.9395–5	1.1345–8	6.2961+6		2.6242+9	1.4716+9	3.5027+8	8.0231+8	6.1492+3	3.8418+2	1.5815+2	2.2604+2	1.3910–3
	4.0000–5	1.1319–8	6.3107+6		2.6303+9	1.4616+9	3.5221+8	8.1649+8	6.1668+3	3.9072+2	1.6042+2	2.3029+2	1.4139–3
	4.1250–5	1.1287–8	6.3287+6		2.6378+9	1.4416+9	3.5444+8	8.4173+8	6.2010+3	4.0174+2	1.6401+2	2.3773+2	1.4598–3
	4.5000–5	1.1171–8	6.3943+6		2.6651+9	1.3865+9	3.6120+8	9.1743+8	6.2990+3	4.3520+2	1.7505+2	2.6014+2	1.5988–3
	4.5078–5	1.1168–8	6.3958+6		2.6658+9	1.3854+9	3.6133+8	9.1900+8	6.3010+3	4.3589+2	1.7528+2	2.6061+2	1.6017–3
	4.7539–5	1.1118–8	6.4247+6		2.6778+9	1.3528+9	3.6547+8	9.5949+8	6.3616+3	4.5524+2	1.8243+2	2.7280+2	1.6939–3
	5.0000–5	1.1060–8	6.4582+6		2.6917+9	1.3226+9	3.6955+8	9.9959+8	6.4197+3	4.7459+2	1.8965+2	2.8494+2	1.7869–3
	5.5000–5	1.1011–8	6.4873+6		2.7039+9	1.2673+9	3.7442+8	1.0621+9	6.5288+3	5.0662+2	2.0218+2	3.0444+2	1.9753–3
	6.0000–5	1.0942–8	6.5280+6		2.7208+9	1.2189+9	3.7932+8	1.1226+9	6.6300+3	5.3849+2	2.1494+2	3.2355+2	2.1663–3
P1	6.0880–5	1.0941–8	6.5286+6		2.7211+9	1.2110+9	3.7946+8	1.1307+9	6.6471+3	5.4260+2	2.1658+2	3.2602+2	2.2002–3
	6.2075–5	1.0953–8	6.5216+6		2.7182+9	1.2005+9	3.7972+8	1.1380+9	6.6700+3	5.4724+2	2.1890+2	3.2834+2	2.2463–3
	6.4316–5	1.0973–8	6.5097+6		2.7132+9	1.1815+9	3.8026+8	1.1514+9	6.7119+3	5.5593+2	2.2331+2	3.3262+2	2.3332–3
	6.5000–5	1.0978–8	6.5064+6		2.7118+9	1.1760+9	3.8043+8	1.1554+9	6.7245+3	5.5857+2	2.2466+2	3.3391+2	2.3598–3
	6.8237–5	1.1002–8	6.4924+6		2.7060+9	1.1507+9	3.8125+8	1.1741+9	6.7825+3	5.7094+2	2.3101+2	3.3993+2	2.4864–3
	7.0000–5	1.1013–8	6.4861+6		2.7034+9	1.1376+9	3.8173+8	1.1841+9	6.8132+3	5.7764+2	2.3449+2	3.4315+2	2.5558–3
	7.2500–5	1.1027–8	6.4779+6		2.7000+9	1.1198+9	3.8224+8	1.1979+9	6.8556+3	5.8690+2	2.3927+2	3.4763+2	2.6546–3
	7.4118–5	1.1034–8	6.4733+6		2.6980+9	1.1088+9	3.8257+8	1.2067+9	6.8824+3	5.9283+2	2.4234+2	3.5049+2	2.7189–3
	8.0000–5	1.1055–8	6.4610+6		2.6929+9	1.0715+9	3.8387+8	1.2375+9	6.9760+3	6.1420+2	2.5358+2	3.6062+2	2.9544–3
	9.0000–5	1.1272–8	6.3367+6		2.6411+9	1.0165+9	3.8094+8	1.2437+9	7.1236+3	6.3166+2	2.6694+2	3.6471+2	3.3628–3
	1.0000–4	1.1461–8	6.2324+6	0.0000+0	2.5976+9	9.6964+8	3.7878+8	1.2492+9	7.2583+3	6.4926+2	2.8061+2	3.6865+2	3.7787–3
	1.1250–4	1.1808–8	6.0492+6	1.9163–8	2.5213+9	9.1993+8	3.7165+8	1.2297+9	7.4127+3	6.5533+2	2.9093+2	3.6439+2	4.3102–3
O5	1.2966–4	1.2233–8	5.8392+6	4.5155–8	2.4337+9	8.6339+8	3.6377+8	1.2066+9	7.6031+3	6.6514+2	3.0556+2	3.5958+2	5.0561–3
	1.3220–4	1.2300–8	5.8071+6	4.8976–8	2.4204+9	8.5593+8	3.6223+8	1.2022+9	7.6296+3	6.6565+2	3.0703+2	3.5862+2	5.1682–3
	1.3665–4	1.2416–8	5.7530+6	5.5655–8	2.3978+9	8.4337+8	3.5966+8	1.1948+9	7.6748+3	6.6664+2	3.0963+2	3.5700+2	5.3650–3
O4	1.4247–4	1.2563–8	5.6858+6	6.4373–8	2.3698+9	8.2780+8	3.5649+8	1.1855+9	7.7322+3	6.6811+2	3.1310+2	3.5501+2	5.6242–3
	1.4333–4	1.2584–8	5.6761+6	6.5654–8	2.3658+9	8.2559+8	3.5605+8	1.1841+9	7.7405+3	6.6836+2	3.1364+2	3.5472+2	5.6625–3
	1.4435–4	1.2610–8	5.6646+6	6.7188–8	2.3610+9	8.2296+8	3.5552+8	1.1825+9	7.7504+3	6.6865+2	3.1428+2	3.5437+2	5.7084–3
	1.4718–4	1.2679–8	5.6334+6	7.1409–8	2.3480+9	8.1587+8	3.5410+8	1.1780+9	7.7772+3	6.6949+2	3.1605+2	3.5343+2	5.8351–3
	1.5000–4	1.2748–8	5.6031+6	7.5625–8	2.3354+9	8.0897+8	3.5273+8	1.1737+9	7.8037+3	6.7039+2	3.1786+2	3.5252+2	5.9623–3
	1.5625–4	1.2924–8	5.5267+6	8.4960–8	2.3035+9	7.9435+8	3.4846+8	1.1607+9	7.8614+3	6.6855+2	3.1940+2	3.4914+2	6.2515–3
	1.6719–4	1.3221–8	5.4026+6	1.0135–7	2.2518+9	7.7069+8	3.4163+8	1.1394+9	7.9580+3	6.6612+2	3.2245+2	3.4366+2	6.7627–3
	1.7500–4	1.3425–8	5.3208+6	1.1309–7	2.2177+9	7.5513+8	3.3718+8	1.1253+9	8.0239+3	6.6495+2	3.2490+2	3.4004+2	7.1315–3
	1.8359–4	1.3641–8	5.2364+6	1.2603–7	2.1825+9	7.3913+8	3.3262+8	1.1107+9	8.0936+3	6.6361+2	3.2729+2	3.3631+2	7.5406–3
	2.0000–4	1.4034–8	5.0896+6	1.5077–7	2.1213+9	7.1139+8	3.2480+8	1.0851+9	8.2196+3	6.6217+2	3.3233+2	3.2984+2	8.3309–3
	2.2500–4	1.4662–8	4.8715+6	1.8884–7	2.0304+9	6.7493+8	3.1082+8	1.0447+9	8.4009+3	6.5139+2	3.3241+2	3.1897+2	9.6218–3
	2.4375–4	1.5104–8	4.7292+6	2.1777–7	1.9711+9	6.5121+8	3.0181+8	1.0181+9	8.5264+3	6.4502+2	3.3312+2	3.1189+2	1.0608–2
O3	2.5158–4	1.5281–8	4.6742+6	2.2993–7	1.9482+9	6.4208+8	2.9836+8	1.0078+9	8.5765+3	6.4274+2	3.3358+2	3.0915+2	1.1025–2
	2.5461–4	1.5357–8	4.6511+6	2.3464–7	1.9385+9	6.3866+8	2.9681+8	1.0031+9	8.5955+3	6.4104+2	3.3318+2	3.0785+2	1.1186–2
	2.6028–4	1.5499–8	4.6087+6	2.4351–7	1.9209+9	6.3240+8	2.9397+8	9.9449+8	8.6307+3	6.3795+2	3.3247+2	3.0546+2	1.1490–2
	2.6250–4	1.5554–8	4.5924+6	2.4700–7	1.9141+9	6.3001+8	2.9289+8	9.9120+8	8.6443+3	6.3677+2	3.3221+2	3.0455+2	1.1609–2
	2.7021–4	1.5742–8	4.5376+6	2.5914–7	1.8912+9	6.2191+8	2.8924+8	9.8009+8	8.6908+3	6.3281+2	3.3134+2	3.0146+2	1.2025–2
	2.7188–4	1.5782–8	4.5260+6	2.6178–7	1.8864+9	6.2021+8	2.8847+8	9.7774+8	8.7007+3	6.3199+2	3.3116+2	3.0081+2	1.2115–2
	2.8510–4	1.6096–8	4.4377+6	2.8281–7	1.8496+9	6.0718+8	2.8261+8	9.5981+8	8.7776+3	6.2575+2	3.2989+2	2.9585+2	1.2834–2
	3.0000–4	1.6439–8	4.3450+6	3.0674–7	1.8110+9	5.9352+8	2.7651+8	9.4095+8	8.8608+3	6.1945+2	3.2879+2	2.9065+2	1.3652–2
	3.2500–4	1.7050–8	4.1893+6	3.4755–7	1.7461+9	5.7271+8	2.6630+8	9.0709+8	8.9931+3	6.0579+2	3.2488+2	2.8089+2	1.5041–2
O2	3.3787–4	1.7354–8	4.1159+6	3.6890–7	1.7155+9	5.6288+8	2.6151+8	8.9110+8	9.0581+3	5.9951+2	3.2320+2	2.7629+2	1.5764–2
	3.4175–4	1.7446–8	4.0943+6	3.7539–7	1.7065+9	5.6002+8	2.6010+8	8.8633+8	9.0775+3	5.9765+2	3.2270+2	2.7494+2	1.5987–2
	3.4903–4	1.7617–8	4.0546+6	3.8761–7	1.6899+9	5.5479+8	2.5754+8	8.7760+8	9.1134+3	5.9429+2	3.2181+2	2.7246+2	1.6406–2
	3.6177–4	1.7911–8	3.9881+6	4.0915–7	1.6622+9	5.4600+8	2.5324+8	8.6296+8	9.1748+3	5.8873+2	3.2040+2	2.6832+2	1.7144–2
	3.6250–4	1.7927–8	3.9844+6	4.1038–7	1.6607+9	5.4552+8	2.5301+8	8.6215+8	9.1783+3	5.8843+2	3.2032+2	2.6809+2	1.7186–2

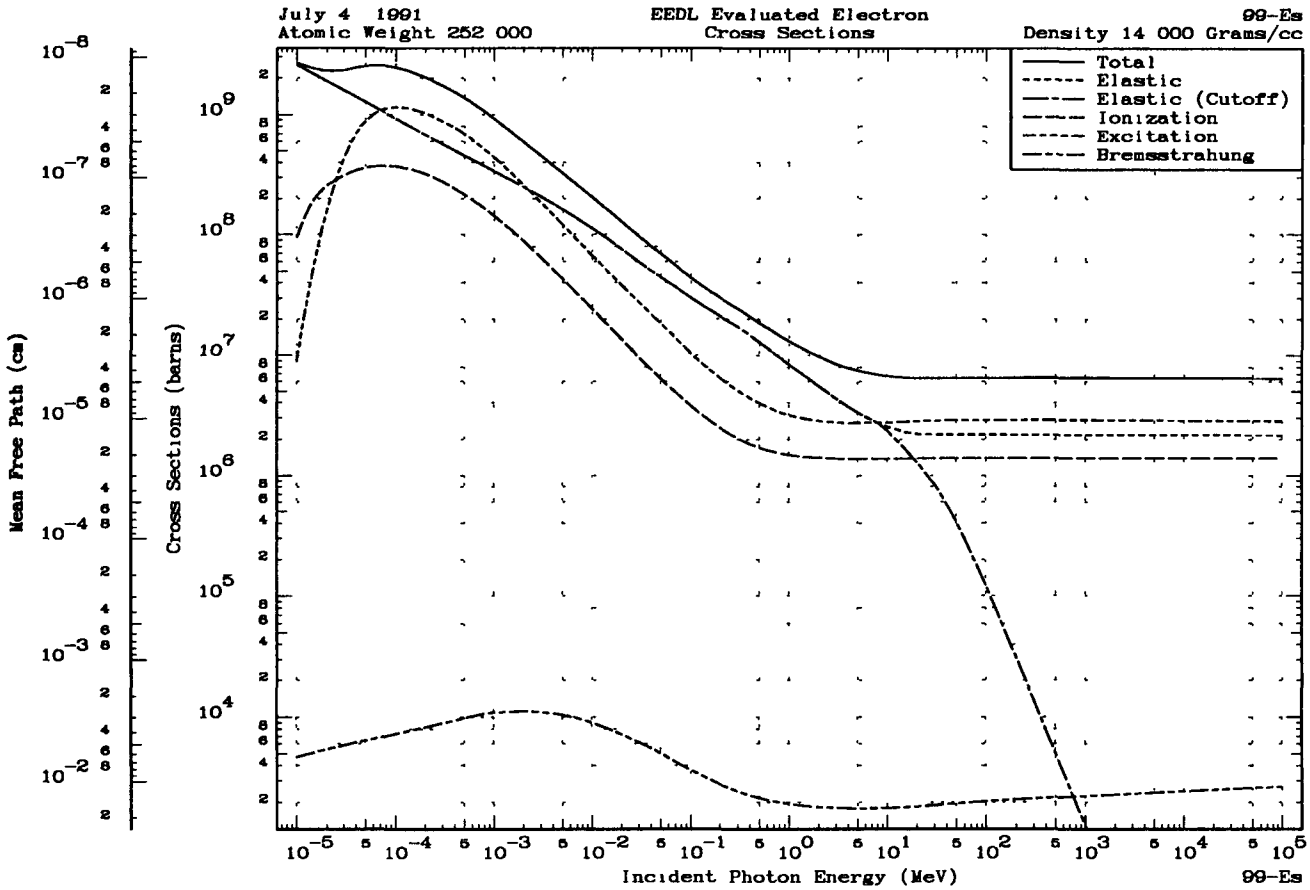
Atomic Weight 251.000 — Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	3.8089–4	1.8341–8	3.8945+6	4.4183–7	1.6232+9	5.3363+8	2.4723+8	8.4235+8	9.2638+3	5.8109+2	3.1857+2	2.6250+2	1.8261–2
	4.0000–4	1.8759–8	3.8077+6	4.7491–7	1.5870+9	5.2212+8	2.4168+8	8.2321+8	9.3492+3	5.7421+2	3.1708+2	2.5711+2	1.9388–2
O1	4.1158–4	1.9009–8	3.7577+6	4.9517–7	1.5662+9	5.1553+8	2.3810+8	8.1256+8	9.4010+3	5.6914+2	3.1511+2	2.5400+2	2.0108–2
	4.1711–4	1.9137–8	3.7324+6	5.0490–7	1.5557+9	5.1248+8	2.3644+8	8.0672+8	9.4253+3	5.6655+2	3.1423+2	2.5230+2	2.0453–2
	4.2747–4	1.9377–8	3.6863+6	5.2327–7	1.5365+9	5.0691+8	2.3344+8	7.9609+8	9.4702+3	5.6188+2	3.1266+2	2.4919+2	2.1103–2
	4.4560–4	1.9788–8	3.6097+6	5.5576–7	1.5045+9	4.9762+8	2.2845+8	7.7841+8	9.5467+3	5.5420+2	3.1014+2	2.4403+2	2.2248–2
	4.5000–4	1.9887–8	3.5918+6	5.6371–7	1.4970+9	4.9545+8	2.2729+8	7.7429+8	9.5649+3	5.5242+2	3.0957+2	2.4283+2	2.2527–2
	4.7280–4	2.0390–8	3.5032+6	6.0531–7	1.4601+9	4.8467+8	2.2155+8	7.5387+8	9.6568+3	5.4375+2	3.0683+2	2.3689+2	2.3983–2
	5.0000–4	2.0974–8	3.4056+6	6.5577–7	1.4194+9	4.7275+8	2.1527+8	7.3141+8	9.7620+3	5.3442+2	3.0403+2	2.3036+2	2.5738–2
N7	5.3098–4	2.1635–8	3.3016+6	7.1437–7	1.3761+9	4.6026+8	2.0826+8	7.0755+8	9.8763+3	5.2300+2	2.9970+2	2.2327+2	2.7762–2
	5.3961–4	2.1821–8	3.2733+6	7.3091–7	1.3643+9	4.5697+8	2.0643+8	7.0090+8	9.9072+3	5.1997+2	2.9864+2	2.2130+2	2.8330–2
N6	5.4773–4	2.1996–8	3.2474+6	7.4657–7	1.3535+9	4.5394+8	2.0475+8	6.9479+8	9.9359+3	5.1718+2	2.9767+2	2.1949+2	2.8866–2
	5.5471–4	2.2146–8	3.2254+6	7.6009–7	1.3443+9	4.5139+8	2.0334+8	6.8961+8	9.9589+3	5.1488+2	2.9689+2	2.1796+2	2.9327–2
	5.6080–4	2.2275–8	3.2066+6	7.7194–7	1.3365+9	4.4920+8	2.0213+8	6.8516+8	9.9788+3	5.1290+2	2.9622+2	2.1665+2	2.9730–2
	5.7735–4	2.2625–8	3.1571+6	8.0439–7	1.3159+9	4.4342+8	1.9895+8	6.7347+8	1.0032+4	5.0775+2	2.9452+2	2.1320+2	3.0830–2
	5.8040–4	2.2689–8	3.1482+6	8.1039–7	1.3122+9	4.4238+8	1.9838+8	6.7138+8	1.0042+4	5.0684+2	2.9422+2	2.1259+2	3.1034–2
	6.0000–4	2.3095–8	3.0928+6	8.4928–7	1.2890+9	4.3589+8	1.9483+8	6.5832+8	1.0103+4	5.0115+2	2.9237+2	2.0874+2	3.2346–2
	6.5000–4	2.4222–8	2.9489+6	9.5086–7	1.2291+9	4.2063+8	1.8565+8	6.2280+8	1.0237+4	4.8339+2	2.8536+2	1.9800+2	3.5610–2
	7.0000–4	2.5312–8	2.8220+6	1.0560–6	1.1762+9	4.0698+8	1.7757+8	5.9163+8	1.0362+4	4.6814+2	2.7952+2	1.8858+2	3.8918–2
	7.5781–4	2.6530–8	2.6924+6	1.1815–6	1.1222+9	3.9285+8	1.6934+8	5.5997+8	1.0498+4	4.5300+2	2.7392+2	1.7903+2	4.2792–2
	8.0000–4	2.7393–8	2.6076+6	1.2756–6	1.0868+9	3.8349+8	1.6398+8	5.3934+8	1.0592+4	4.4342+2	2.7056+2	1.7281+2	4.5651–2
	8.5000–4	2.8408–8	2.5143+6	1.3900–6	1.0480+9	3.7328+8	1.5771+8	5.1698+8	1.0660+4	4.3126+2	2.6524+2	1.6597+2	4.8555–2
	9.0000–4	2.9398–8	2.4297+6	1.5074–6	1.0127+9	3.6390+8	1.5204+8	4.9674+8	1.0724+4	4.2052+2	2.6069+2	1.5978+2	5.1476–2
N5	9.2620–4	2.9907–8	2.3883+6	1.5701–6	9.9544+8	3.5928+8	1.4928+8	4.8688+8	1.0756+4	4.1534+2	2.5852+2	1.5677+2	5.3013–2
	9.3542–4	3.0087–8	2.3741+6	1.5923–6	9.8952+8	3.5770+8	1.4834+8	4.8347+8	1.0767+4	4.1358+2	2.5780+2	1.5573+2	5.3555–2
	9.6771–4	3.0708–8	2.3261+6	1.6709–6	9.6950+8	3.5233+8	1.4516+8	4.7200+8	1.0806+4	4.0771+2	2.5540+2	1.5226+2	5.5457–2
N4	9.8674–4	3.1070–8	2.2990+6	1.7178–6	9.5820+8	3.4929+8	1.4337+8	4.6553+8	1.0828+4	4.0445+2	2.5409+2	1.5030+2	5.6580–2
	1.0000–3	3.1321–8	2.2805+6	1.7507–6	9.5051+8	3.4722+8	1.4215+8	4.6112+8	1.0843+4	4.0227+2	2.5324+2	1.4897+2	5.7365–2
	1.0313–3	3.1940–8	2.2363+6	1.8290–6	9.3208+8	3.4248+8	1.3922+8	4.5037+8	1.0858+4	3.9610+2	2.5040+2	1.4564+2	5.8842–2
	1.0625–3	3.2552–8	2.1943+6	1.9084–6	9.1457+8	3.3794+8	1.3643+8	4.4018+8	1.0873+4	3.9031+2	2.4777+2	1.4248+2	6.0322–2
	1.0898–3	3.3081–8	2.1592+6	1.9789–6	8.9994+8	3.3412+8	1.3411+8	4.3169+8	1.0885+4	3.8553+2	2.4562+2	1.3985+2	6.1617–2
	1.1250–3	3.3754–8	2.1162+6	2.0708–6	8.8200+8	3.2941+8	1.3127+8	4.2131+8	1.0901+4	3.7974+2	2.4304+2	1.3664+2	6.3285–2
	1.1411–3	3.4059–8	2.0972+6	2.1134–6	8.7409+8	3.2732+8	1.3001+8	4.1675+8	1.0908+4	3.7716+2	2.4187+2	1.3522+2	6.4049–2
	1.1719–3	3.4638–8	2.0622+6	2.1955–6	8.5950+8	3.2345+8	1.2770+8	4.0833+8	1.0921+4	3.7243+2	2.3975+2	1.3262+2	6.5511–2
	1.2308–3	3.5729–8	1.9992+6	2.3556–6	8.3325+8	3.1643+8	1.2355+8	3.9326+8	1.0946+4	3.6406+2	2.3604+2	1.2795+2	6.8315–2
N3	1.2729–3	3.6495–8	1.9572+6	2.4720–6	8.1577+8	3.1172+8	1.2079+8	3.8325+8	1.0962+4	3.5858+2	2.3365+2	1.2486+2	7.0319–2
	1.3013–3	3.7022–8	1.9294+6	2.5516–6	8.0415+8	3.0866+8	1.1893+8	3.7656+8	1.0973+4	3.5460+2	2.3176+2	1.2277+2	7.1672–2
	1.3125–3	3.7229–8	1.9187+6	2.5833–6	7.9969+8	3.0748+8	1.1822+8	3.7398+8	1.0977+4	3.5308+2	2.3104+2	1.2196+2	7.2207–2
	1.3510–3	3.7933–8	1.8830+6	2.6931–6	7.8483+8	3.0353+8	1.1584+8	3.6544+8	1.0992+4	3.4795+2	2.2857+2	1.1930+2	7.4043–2
	1.4255–3	3.9276–8	1.8186+6	2.9101–6	7.5800+8	2.9633+8	1.1156+8	3.5010+8	1.1019+4	3.3882+2	2.2423+2	1.1451+2	7.7606–2
	1.5000–3	4.0591–8	1.7597+6	3.1327–6	7.3344+8	2.8966+8	1.0766+8	3.3612+8	1.1044+4	3.3064+2	2.2041+2	1.1015+2	8.1175–2
N2	1.6099–3	4.2488–8	1.6811+6	3.4713–6	7.0069+8	2.8064+8	1.0227+8	3.1777+8	1.1079+4	3.1854+2	2.1409+2	1.0436+2	8.6452–2
	1.6250–3	4.2746–8	1.6710+6	3.5188–6	6.9647+8	2.7947+8	1.0158+8	3.1540+8	1.1080+4	3.1699+2	2.1328+2	1.0362+2	8.7106–2
	1.6343–3	4.2904–8	1.6648+6	3.5482–6	6.9390+8	2.7876+8	1.0115+8	3.1397+8	1.1080+4	3.1604+2	2.1279+2	1.0317+2	8.7508–2
	1.6800–3	4.3677–8	1.6354+6	3.6939–6	6.8162+8	2.7535+8	9.9143+7	3.0712+8	1.1082+4	3.1156+2	2.1045+2	1.0102+2	8.9488–2
	1.7600–3	4.5009–8	1.5870+6	3.9537–6	6.6144+8	2.6968+8	9.5845+7	2.9591+8	1.1084+4	3.0428+2	2.0670+2	9.7492+1	9.2954–2
N1	1.7887–3	4.5481–8	1.5705+6	4.0484–6	6.5458+8	2.6774+8	9.4725+7	2.9211+8	1.1085+4	3.0184+2	2.0544+2	9.6298+1	9.4197–2
	1.8151–3	4.5914–8	1.5557+6	4.1362–6	6.4841+8	2.6599+8	9.3704+7	2.8870+8	1.1081+4	2.9953+2	2.0421+2	9.5224+1	9.5255–2
	1.8613–3	4.6666–8	1.5306+6	4.2915–6	6.3796+8	2.6301+8	9.1980+7	2.8296+8	1.1075+4	2.9566+2	2.0215+2	9.3411+1	9.7107–2
	1.8800–3	4.6967–8	1.5208+6	4.3548–6	6.3387+8	2.6184+8	9.1304+7	2.8071+8	1.1072+4	2.9415+2	2.0135+2	9.2701+1	9.7854–2
	1.9307–3	4.7780–8	1.4950+6	4.5283–6	6.2309+8	2.5874+8	8.9529+7	2.7481+8	1.1065+4	2.9020+2	1.9926+2	9.0838+1	9.9883–2
	2.0000–3	4.8877–8	1.4614+6	4.7693–6	6.0910+8	2.5469+8	8.7230+7	2.6717+8	1.1056+4	2.8513+2	1.9660+2	8.8428+1	1.0266–1
	2.1250–3	5.0858–8	1.4045+6	5.2153–6	5.8537+8	2.4764+8	8.3249+7	2.5448+8	1.1040+4	2.7539+2	1.9090+2	8.4377+1	1.0765–1
	2.2500–3	5.2795–8	1.3530+6	5.6765–6	5.6391+8	2.4116+8	7.9667+7	2.4307+8	1.1025+4	2.6671+2	1.8586+2	8.0735+1	1.1264–1
	2.3438–3	5.4219–8	1.3174+6	6.0320–6	5.4909+8	2.3664+8	7.7205+7	2.3523+8	1.1014+4	2.6076+2	1.8241+2	7.8236+1	1.1638–1
	2.5000–3	5.6545–8	1.2632+6	6.6417–6	5.2651+8	2.2967+8	7.3472+7	2.2336+8	1.0997+4	2.5184+2	1.7727+2	7.4449+1	1.2261–1
	2.6250–3	5.8365–8	1.2238+6	7.1446–6	5.1009+8	2.2453+8	7.0768+7	2.1478+8	1.0984+4	2.4531+2	1.7347+2	7.1715+1	1.2759–1
	2.6719–3	5.9038–8	1.2099+6	7.3366–6	5.0427+8	2.2270+8	6.9812+7	2.1175+8	1.0979+4	2.4300+2	1.7212+2	7.0750+1	1.2945–1
	3.0000–3	6.3628–8	1.1226+6	8.7278–6	4.6789+8	2.1106+8	6.3876+7	1.9295+8	1.0949+4	2.2885+2	1.6395+2	6.4764+1	1.4249–1
	3.5000–3	7.0432–8	1.0142+6	1.1012–5	4.2270+8	1.9601+8	5.6465+7	1.7021+8	1.0780+4	2.0916+2	1.5159+2	5.7412+1	1.5880–1
	4.0000–3	7.6868–8	9.2923+5	1.3493–5	3.8730+8	1.8385+8	5.0756+7	1.5269+8	1.0636+4	1.9417+2	1.4224+2	5.1755+1	1.7493–1
M5	4.2481–3	8.0005–8	8.9280+5	1.4794–5	3.7212+8	1.7833+8	4.8321+7	1.4545+8	1.0561+4	1.8721+2	1.3764+2	4.9383+1	1.8254–1
	4.4361–3	8.2342–8	8.6746+5	1.5811–5	3.6155+8	1.7447+8	4.6644+7	1.4043+8	1.0507+4	1.8244+2	1.3451+2	4.7743+1	1.8827–1
M4	4.4922–3	8.3033–8	8.6024+5	1.6120–5	3.5854+8	1.7336+8	4.6168+7	1.3901+8	1.0491+4	1.8109+2	1.3362+2	4.7278+1	1.8998–1
	4.5239–3	8.3424–8	8.5621+5	1.6296–5	3.5687+8	1.7275+8	4.5903+7	1.3821+8	1.0483+4	1.8034+2	1.3313+2	4.7018+1	1.9095–1
	4.6429–3	8.4881–8	8.4152+5	1.6961–5	3.5074+8	1.7049+8	4.4941+7	1.3530+8	1.0451+4	1.7762+2	1.3135+2	4.6075+1	1.9456–1
	4.7180–3	8.5793–8	8.3257+5	1.7385–5	3.4701+8	1.6911+8	4.4357+7	1.3353+8	1.0431+4	1.7597+2	1.3027+2	4.5502+1	1.9684–1
	4.8215–3	8.7040–8	8.2064+5	1.7977–5	3.4204+8	1.6727+8	4.3580+7	1.3118+8	1.0404+4	1.7378+2	1.2884+2	4.4740+1	1.9997–1
	5.0000–3	8.9170–8	8.0104+5	1.9015–5	3.3387+8	1.6422+8	4.2308+7	1.2734+8	1.0360+4	1.7021+2	1.2651+2	4.3492+1	2.0535–1
M3	5.1038–3	9.0401–8	7.9013+5	1.9628–5	3.2932+8	1.6248+8	4.1596+7	1.2524+8	1.0319+4	1.6811+2	1.2510+2	4.2800+1	2.0786–1
	5.1598–3	9.1064–8	7.8437+5	1.9963–5	3.2692+8	1.6156+8	4.1223+7	1.2414+8	1.0298+4	1.6701+2	1.2436+2	4.2436+1	2.0921–1
	5.2648–3	9.2301–8	7.7386+5	2.0595–5	3.2254+8	1.5987+8	4.0543+7	1.2212+8	1.0258+4	1.6501+2	1.2302+2	4.1774+1	2.1173–1
	5.4486–3	9.4445–8	7.5630+5	2.1720–5	3.1522+8	1.5705+8	3.9412+7	1.1876+8	1.0191+4	1.6169+2	1.2081+2	4.0670+1	2.1613–1
	5.5000–3	9.5039–8	7.5157+5	2.2039–5	3.1325+8	1.5628+8	3.9108+7	1.1785+8	1.0173+4	1.6081+2	1.2022+2	4.0374+1	2.1736–1
	5.7243–3	9.7611–8	7.3177+5	2.3450–5	3.0500+8	1.5307+8	3.7840+7	1.1408+8	1.0096+4	1.5711+2	1.1775+2	3.9136+1	2.2270–1
	6.0000–3	1.0072–7	7.0917+5	2.5229–5	2.9558+8	1.4937+8	3.6401+7	1.0980+8	1.0006+4	1.5293+2	1.1497+2	3.7731+1	2.2922–1
M2	6.3509–3	1.0460–7	6.8285+5	2.7564–5	2.8461+8	1.4501+8	3.4716+7	1.0487+8	9.8976+3	1.4764+2	1.1131+2	3.6095+1	2.3747–1
	6.4540–3	1.0574–7	6.7553+5	2.8265–5	2.8156+8	1.4379+8	3.4253+7	1.0351+8	9.8672+3	1.4620+2	1.1031+2	3.5645+1	2.3988–1
	6.5000–3	1.0624–7	6.7232+5	2.8581–5	2.8022+8	1.4325+8	3.4051+7	1.0291+8	9.8539+3	1.4556+2	1.0987+2	3.5448+1	2.4096–1
	6.6472–3	1.0785–7	6.6232+5	2.9599–5	2.7605+8	1.4157+8	3.3421+7	1.0105+8	9.8119+3	1.4359+2	1.0852+2	3.4834+1	2.4439–1

Atomic Weight 251.000 Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
M1	6.7325–3	1.0877–7	6.5670+5	3.0195–5	2.7371+8	1.4062+8	3.3068+7	1.0001+8	9.7880+3	1.4249+2	1.0775+2	3.4490+1	2.4637–1
	6.8117–3	1.0962–7	6.5158+5	3.0753–5	2.7158+8	1.3976+8	3.2746+7	9.9062+7	9.7619+3	1.4147+2	1.0705+2	3.4176+1	2.4798–1
	6.9602–3	1.1122–7	6.4225+5	3.1810–5	2.6769+8	1.3818+8	3.2160+7	9.7341+7	9.7138+3	1.3962+2	1.0577+2	3.3604+1	2.5098–1
	6.9854–3	1.1148–7	6.4071+5	3.1991–5	2.6704+8	1.3792+8	3.2064+7	9.7055+7	9.7058+3	1.3932+2	1.0556+2	3.3510+1	2.5148–1
	7.0000–3	1.1164–7	6.3981+5	3.2095–5	2.6667+8	1.3776+8	3.2008+7	9.6891+7	9.7012+3	1.3914+2	1.0543+2	3.3455+1	2.5178–1
	7.2202–3	1.1397–7	6.2672+5	3.3693–5	2.6121+8	1.3553+8	3.1190+7	9.4482+7	9.6327+3	1.3656+2	1.0364+2	3.2656+1	2.5620–1
	7.2391–3	1.1417–7	6.2563+5	3.3831–5	2.6076+8	1.3535+8	3.1122+7	9.4282+7	9.6269+3	1.3634+2	1.0350+2	3.2590+1	2.5658–1
	7.2500–3	1.1429–7	6.2500+5	3.3911–5	2.6050+8	1.3524+8	3.1082+7	9.4166+7	9.6236+3	1.3622+2	1.0341+2	3.2552+1	2.5680–1
	7.6101–3	1.1804–7	6.0512+5	3.6593–5	2.5221+8	1.3182+8	2.9849+7	9.0527+7	9.5174+3	1.3233+2	1.0072+2	3.1345+1	2.6399–1
	8.0000–3	1.2203–7	5.8532+5	3.9583–5	2.4396+8	1.2840+8	2.8629+7	8.6924+7	9.4093+3	1.2850+2	9.8079+1	3.0151+1	2.7172–1
	8.5000–3	1.2710–7	5.6198+5	4.3549–5	2.3423+8	1.2427+8	2.7202+7	8.2749+7	9.2618+3	1.2368+2	9.4644+1	2.8755+1	2.8036–1
	9.0000–3	1.3206–7	5.4086+5	4.7664–5	2.2543+8	1.2050+8	2.5923+7	7.8997+7	9.1249+3	1.1937+2	9.1580+1	2.7500+1	2.8893–1
	9.2500–3	1.3451–7	5.3104+5	4.9776–5	2.2134+8	1.1874+8	2.5332+7	7.7259+7	9.0600+3	1.1737+2	9.0162+1	2.6920+1	2.9318–1
	1.0000–2	1.4170–7	5.0409+5	5.6318–5	2.1010+8	1.1385+8	2.3722+7	7.2520+7	8.8778+3	1.1197+2	8.6324+1	2.5337+1	3.0583–1
	1.1250–2	1.5339–7	4.6566+5	6.7914–5	1.9409+8	1.0671+8	2.1471+7	6.5892+7	8.5621+3	1.0372+2	8.0303+1	2.3096+1	3.2229–1
	1.2500–2	1.6463–7	4.3388+5	8.0373–5	1.8084+8	1.0071+8	1.9640+7	6.0478+7	8.2893+3	9.7016+1	7.5411+1	2.1266+1	3.3848–1
	1.3125–2	1.7010–7	4.1993+5	8.6914–5	1.7503+8	9.8047+7	1.8846+7	5.8124+7	8.1659+3	9.4112+1	7.3294+1	2.0471+1	3.4648–1
	1.5000–2	1.8596–7	3.8410+5	1.0766–4	1.6009+8	9.1110+7	1.6835+7	5.2139+7	7.8376+3	8.6751+1	6.7929+1	1.8452+1	3.7007–1
	1.7500–2	2.0646–7	3.4597+5	1.3794–4	1.4420+8	8.3471+7	1.4778+7	4.5943+7	7.4316+3	7.8484+1	6.1762+1	1.6329+1	3.9341–1
L3	1.9929–2	2.2542–7	3.1687+5	1.7018–4	1.3207+8	7.7530+7	1.3241+7	4.1294+7	7.1057+3	7.2310+1	5.7156+1	1.4738+1	4.1565–1
	2.0000–2	2.2596–7	3.1611+5	1.7116–4	1.3175+8	7.7371+7	1.3201+7	4.1173+7	7.0968+3	7.2149+1	5.7036+1	1.4697+1	4.1622–1
	2.1250–2	2.3545–7	3.0338+5	1.8883–4	1.2645+8	7.4712+7	1.2547+7	3.9180+7	6.9445+3	6.9337+1	5.4904+1	1.4007+1	4.2536–1
	2.3438–2	2.5159–7	2.8391+5	2.2139–4	1.1833+8	7.0606+7	1.1558+7	3.6161+7	6.7054+3	6.5087+1	5.1684+1	1.2962+1	4.4124–1
L2	2.5242–2	2.6452–7	2.7003+5	2.4977–4	1.1255+8	6.7649+7	1.0862+7	3.4031+7	6.5299+3	6.2100+1	4.9420+1	1.2226+1	4.5421–1
	2.5837–2	2.6874–7	2.6579+5	2.5942–4	1.1078+8	6.6738+7	1.0654+7	3.3384+7	6.4750+3	6.1168+1	4.8708+1	1.2002+1	4.5816–1
L1	2.6047–2	2.7022–7	2.6434+5	2.6287–4	1.1017+8	6.6424+7	1.0582+7	3.3162+7	6.4560+3	6.0848+1	4.8463+1	1.1926+1	4.5955–1
	2.7035–2	2.7712–7	2.5776+5	2.7930–4	1.0743+8	6.4999+7	1.0260+7	3.2167+7	6.3642+3	5.9404+1	4.7360+1	1.1579+1	4.6541–1
	2.7539–2	2.8060–7	2.5456+5	2.8784–4	1.0610+8	6.4304+7	1.0104+7	3.1684+7	6.3192+3	5.8706+1	4.6826+1	1.1411+1	4.6840–1
	2.7918–2	2.8321–7	2.5221+5	2.9433–4	1.0512+8	6.3794+7	9.9900+6	3.1331+7	6.2860+3	5.8195+1	4.6436+1	1.1288+1	4.7064–1
	2.8518–2	2.8730–7	2.4862+5	3.0469–4	1.0362+8	6.3010+7	9.8156+6	3.0792+7	6.2349+3	5.7413+1	4.5839+1	1.1100+1	4.7418–1
	3.0000–2	2.9731–7	2.4025+5	3.3093–4	1.0014+8	6.1178+7	9.4115+6	2.9541+7	6.1146+3	5.5605+1	4.4458+1	1.0665+1	4.8289–1
	3.2500–2	3.1382–7	2.2761+5	3.7707–4	9.4868+7	5.8377+7	8.8158+6	2.7669+7	5.9188+3	5.2789+1	4.2285+1	1.0008+1	4.9556–1
	3.6250–2	3.3779–7	2.1146+5	4.5061–4	8.8135+7	5.4761+7	8.0636+6	2.5305+7	5.6618+3	4.9236+1	3.9542+1	9.1800+0	5.1439–1
	4.0000–2	3.6091–7	1.9791+5	5.2913–4	8.2488+7	5.1694+7	7.4408+6	2.3348+7	5.4397+3	4.6300+1	3.7272+1	8.4945+0	5.3298–1
	4.5000–2	3.9054–7	1.8290+5	6.4118–4	7.6231+7	4.8244+7	6.7744+6	2.1207+7	5.1718+3	4.2992+1	3.4700+1	7.7378+0	5.5399–1
	5.0000–2	4.1904–7	1.7046+5	7.6129–4	7.1047+7	4.5353+7	6.2292+6	1.9459+7	4.9434+3	4.0291+1	3.2596+1	7.1203+0	5.7469–1
	5.5000–2	4.4647–7	1.5999+5	8.8907–4	6.6681+7	4.2888+7	5.7849+6	1.8004+7	4.7364+3	3.7994+1	3.0798+1	6.6026+0	5.9294–1
	6.0000–2	4.7304–7	1.5100+5	1.0242–3	6.2936+7	4.0754+7	5.4071+6	1.6770+7	4.5551+3	3.6046+1	2.9271+1	6.1640+0	6.1093–1
	7.0000–2	5.2381–7	1.3636+5	1.3145–3	5.6835+7	3.7214+7	4.8192+6	1.4798+7	4.2466+3	3.2883+1	2.6783+1	5.4574+0	6.4314–1
	8.0000–2	5.7207–7	1.2486+5	1.6305–3	5.2041+7	3.4396+7	4.3620+6	1.3278+7	3.9964+3	3.0437+1	2.4849+1	4.9132+0	6.7449–1
	1.0000–1	6.6122–7	1.0803+5	2.3293–3	4.5025+7	3.0208+7	3.7254+6	1.1088+7	3.6150+3	2.6881+1	2.2030+1	4.1231+0	7.2799–1
K	1.3563–1	7.9543–7	8.9798+4	3.7601–3	3.7428+7	2.5628+7	3.0514+6	8.7455+6	3.1860+3	2.3021+1	1.8940+1	3.2724+0	8.0942–1
	1.3922–1	8.0756–7	8.8450+4	3.9172–3	3.6866+7	2.5291+7	3.0020+6	8.5690+6	3.1541+3	2.2734+1	1.8710+1	3.2081+0	8.1669–1
	1.4461–1	8.2548–7	8.6529+4	4.1563–3	3.6065+7	2.4811+7	2.9317+6	8.3191+6	3.1083+3	2.2327+1	1.8383+1	3.1170+0	8.2756–1
	1.5000–1	8.4312–7	8.4719+4	4.3998–3	3.5311+7	2.4357+7	2.8656+6	8.0852+6	3.0648+3	2.1946+1	1.8076+1	3.0318+0	8.3839–1
	1.6250–1	8.8095–7	8.1082+4	4.9793–3	3.3795+7	2.3422+7	2.7381+6	7.6313+6	2.9752+3	2.1200+1	1.7472+1	2.8656+0	8.6226–1
	1.8125–1	9.3521–7	7.6377+4	5.8842–3	3.1834+7	2.2205+7	2.5733+6	7.0528+6	2.8571+3	2.0247+1	1.6695+1	2.6539+0	8.9774–1
	2.0000–1	9.8689–7	7.2377+4	6.8290–3	3.0166+7	2.1161+7	2.4334+6	6.5691+6	2.7546+3	1.9448+1	1.6038+1	2.4770+0	9.3276–1
	2.2500–1	1.0510–6	6.7962+4	8.1408–3	2.8326+7	1.9951+7	2.3001+6	6.0727+6	2.6518+3	1.8673+1	1.5403+1	2.2945+0	9.7513–1
	2.6250–1	1.1411–6	6.2594+4	1.0201–2	2.6089+7	1.8470+7	2.1367+6	5.4793+6	2.5231+3	1.7746+1	1.4632+1	2.0767+0	1.0379+0
	3.0000–1	1.2253–6	5.8294+4	1.2358–2	2.4297+7	1.7277+7	2.0047+6	5.0124+6	2.4167+3	1.7021+1	1.4016+1	1.9055+0	1.0996+0
	3.5000–1	1.3307–6	5.3677+4	1.5347–2	2.2372+7	1.5871+7	1.8898+6	4.6090+6	2.3176+3	1.6435+1	1.3499+1	1.7570+0	1.1793+0
	4.0000–1	1.4292–6	4.9976+4	1.8433–2	2.0830+7	1.4746+7	1.7957+6	4.2859+6	2.2351+3	1.5980+1	1.3084+1	1.6383+0	1.2576+0
	5.0000–1	1.6075–6	4.4436+4	2.4781–2	1.8521+7	1.2950+7	1.6752+6	3.8930+6	2.1249+3	1.5527+1	1.2620+1	1.4944+0	1.4125+0
	6.0000–1	1.7718–6	4.0314+4	3.1271–2	1.6803+7	1.1600+7	1.5975+6	3.6032+6	2.0507+3	1.5290+1	1.2334+1	1.3881+0	1.5674+0
	8.0000–1	2.0514–6	3.4820+4	4.4345–2	1.4513+7	9.7026+6	1.5070+6	3.3012+6	1.9568+3	1.5304+1	1.2147+1	1.2788+0	1.8783+0
	1.0000+0	2.2889–6	3.1206+4	5.7332–2	1.3007+7	8.4409+6	1.4568+6	3.1070+6	1.9019+3	1.5497+1	1.2096+1	1.2084+0	2.1929+0
	1.2500+0	2.5224–6	2.8318+4	7.3199–2	1.1803+7	7.3450+6	1.4260+6	3.0300+6	1.8642+3	1.6016+1	1.2234+1	1.1828+0	2.5999+0
	1.5000+0	2.7243–6	2.6219+4	8.8561–2	1.0928+7	6.5560+6	1.4014+6	2.9685+6	1.8339+3	1.6534+1	1.2370+1	1.1630+0	3.0008+0
	2.0000+0	3.0346–6	2.3538+4	1.1784–1	9.8106+6	5.4991+6	1.3843+6	2.9253+6	1.8024+3	1.7631+1	1.2656+1	1.1504+0	3.8249+0
	3.0000+0	3.4484–6	2.0713+4	1.7126–1	8.6332+6	4.3455+6	1.3623+6	2.9236+6	1.7760+3	1.9856+1	1.3163+1	1.1586+0	5.5344+0
	4.0000+0	3.7114–6	1.9246+4	2.1903–1	8.0216+6	3.7228+6	1.3601+6	2.9370+6	1.7644+3	2.2045+1	1.3578+1	1.1663+0	7.3004+0
	5.0000+0	3.8930–6	1.8348+4	2.6227–1	7.6473+6	3.3364+6	1.3588+6	2.9504+6	1.7608+3	2.4248+1	1.3942+1	1.1741+0	9.1316+0
	6.0000+0	4.0267–6	1.7739+4	3.0176–1	7.3934+6	3.0737+6	1.3578+6	2.9602+6	1.7605+3	2.6429+1	1.4246+1	1.1805+0	1.1003+1
	8.0000+0	4.2114–6	1.6961+4	3.7184–1	7.0692+6	2.7369+6	1.3576+6	2.9730+6	1.7645+3	3.0758+1	1.4735+1	1.1906+0	1.4833+1
	1.0000+1	4.3270–6	1.6508+4	4.3269–1	6.8804+6	2.5397+6	1.3588+6	2.9801+6	1.7711+3	3.5071+1	1.5122+1	1.1985+0	1.8750+1
	1.5000+1	4.4696–6	1.5981+4	5.5683–1	6.6608+6	2.3054+6	1.3612+6	2.9924+6	1.7989+3	4.5972+1	1.5704+1	1.2042+0	2.9064+1
	2.0000+1	4.5209–6	1.5800+4	6.5427–1	6.5853+6	2.2200+6	1.3630+6	3.0006+6	1.8240+3	5.7050+1	1.6179+1	1.2083+0	3.9663+1
	3.0000+1	4.5238–6	1.5789+4	8.0198–1	6.5809+6	2.2042+6	1.3640+6	3.0109+6	1.8665+3	7.9600+1	1.6705+1	1.2140+0	6.1681+1
	4.0000+1	4.5101–6	1.5838+4	9.1236–1	6.6010+6	2.2038+6	1.3649+6	3.0305+6	1.8968+3	1.0257+2	1.7093+1	1.2235+0	8.4255+1
	5.0000+1	4.5004–6	1.5872+4	1.0002+0	6.6152+6	2.2029+6	1.3655+6	3.0449+6	1.9217+3	1.2593+2	1.7394+1	1.2309+0	1.0731+2
	6.0000+1	4.4932–6	1.5897+4	1.0730+0	6.6258+6	2.2021+6	1.3657+6	3.0559+6	1.9424+3	1.4947+2	1.7594+1	1.2370+0	1.3064+2
	8.0000+1	4.4918–6	1.5902+4	1.1892+0	6.6279+6	2.2010+6	1.3661+6	3.0589+6	1.9748+3	1.9698+2	1.7940+1	1.2414+0	1.7779+2
	1.0000+2	4.4924–6	1.5900+4	1.2801+0	6.6270+6	2.2001+6	1.3664+6	3.0586+6	1.9991+3	2.4482+2	1.8237+1	1.2445+0	2.2534+2
	1.5000+2	4.4908–6	1.5905+4	1.4462+0	6.6293+6	2.1984+6	1.3665+6	3.0623+6	2.0410+3	3.6510+2	1.8562+1	1.2461+0	3.4529+2
	2.0000+2	4.4868–6	1.5920+4	1.5645+0	6.6352+6	2.1972+6	1.3667+6	3.0693+6	2.0694+3	4.8606+2	1.8860+1	1.2491+0	4.6595+2
	3.0000+2	4.4826–6	1.5935+4	1.7316+0	6.6415+6	2.1956+6	1.3668+6	3.0770+6	2.1057+3	7.2709+2	1.9289+1	1.2525+0	7.0654+2
	4.0000+2	4.4826–6	1.5934+4	1.8503+0	6.6414+6	2.1944+6	1.3668+6	3.0780+6	2.1300+3	9.6852+2	1.9527+1	1.2532+0	9.4774+2
	5.0000+2	4.4863–6	1.5921+4	1.9425+0	6.6360+6	2.1936+6	1.3668+6	3.0734+6	2.1488+3	1.2118+3	1.9742+1	1.2516+0	1.1908+3
	6.0000+2	4.4864–6	1.5921+4	2.0177+0	6.6358+6	2.1928+6	1.3669+6	3.0740+6	2.1640+3	1.4528+3	1.9909+1	1.2521+0	1.4317+3

Atomic Weight 251.000												Density 14.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
8.0000+2	4.4889–6	1.5912+4	2.1365+0	6.6321+6	2.1916+6	1.3669+6	3.0714+6	2.1882+3	1.9393+3	2.0199+1	1.2515+0	1.9178+3
1.0000+3	4.4915–6	1.5903+4	2.2285+0	6.6283+6	2.1907+6	1.3669+6	3.0684+6	2.2076+3	2.4254+3	2.0447+1	1.2509+0	2.4037+3
1.5000+3	4.4950–6	1.5891+4	2.3954+0	6.6231+6	2.1891+6	1.3669+6	3.0649+6	2.2440+3	3.6476+3	2.0680+1	1.2494+0	3.6256+3
2.0000+3	4.4990–6	1.5877+4	2.5137+0	6.6173+6	2.1880+6	1.3669+6	3.0601+6	2.2713+3	4.8619+3	2.0910+1	1.2475+0	4.8397+3
3.0000+3	4.5043–6	1.5858+4	2.6805+0	6.6094+6	2.1863+6	1.3669+6	3.0539+6	2.3108+3	7.2958+3	2.1350+1	1.2450+0	7.2733+3
4.0000+3	4.5092–6	1.5840+4	2.7988+0	6.6023+6	2.1852+6	1.3669+6	3.0478+6	2.3395+3	9.7319+3	2.1566+1	1.2426+0	9.7091+3
5.0000+3	4.5153–6	1.5819+4	2.8904+0	6.5933+6	2.1843+6	1.3669+6	3.0398+6	2.3621+3	1.2194+4	2.1738+1	1.2393+0	1.2171+4
6.0000+3	4.5170–6	1.5813+4	2.9652+0	6.5909+6	2.1835+6	1.3669+6	3.0381+6	2.3785+3	1.4620+4	2.1885+1	1.2386+0	1.4597+4
8.0000+3	4.5208–6	1.5800+4	3.0832+0	6.5853+6	2.1824+6	1.3669+6	3.0336+6	2.4047+3	1.9517+4	2.2178+1	1.2368+0	1.9494+4
1.0000+4	4.5236–6	1.5790+4	3.1745+0	6.5813+6	2.1815+6	1.3669+6	3.0305+6	2.4253+3	2.4460+4	2.2424+1	1.2356+0	2.4436+4
1.5000+4	4.5283–6	1.5774+4	3.3407+0	6.5745+6	2.1799+6	1.3669+6	3.0253+6	2.4644+3	3.6529+4	2.2646+1	1.2335+0	3.6506+4
2.0000+4	4.5320–6	1.5761+4	3.4587+0	6.5690+6	2.1787+6	1.3669+6	3.0209+6	2.4926+3	4.8755+4	2.2868+1	1.2317+0	4.8731+4
3.0000+4	4.5362–6	1.5746+4	3.6252+0	6.5631+6	2.1771+6	1.3669+6	3.0166+6	2.5321+3	7.2966+4	2.3304+1	1.2299+0	7.2942+4
4.0000+4	4.5395–6	1.5735+4	3.7434+0	6.5583+6	2.1759+6	1.3669+6	3.0129+6	2.5606+3	9.7441+4	2.3508+1	1.2284+0	9.7416+4
5.0000+4	4.5447–6	1.5717+4	3.8351+0	6.5507+6	2.1750+6	1.3669+6	3.0062+6	2.5824+3	1.2169+5	2.3676+1	1.2257+0	1.2166+5
6.0000+4	4.5453–6	1.5715+4	3.9100+0	6.5499+6	2.1743+6	1.3669+6	3.0061+6	2.6002+3	1.4592+5	2.3817+1	1.2257+0	1.4589+5
8.0000+4	4.5477–6	1.5707+4	4.0282+0	6.5464+6	2.1732+6	1.3669+6	3.0038+6	2.6286+3	1.9479+5	2.4098+1	1.2247+0	1.9477+5
1.0000+5	4.5498–6	1.5699+4	4.1198+0	6.5434+6	2.1723+6	1.3669+6	3.0016+6	2.6506+3	2.4376+5	2.4368+1	1.2238+0	2.4373+5


July 4 1991
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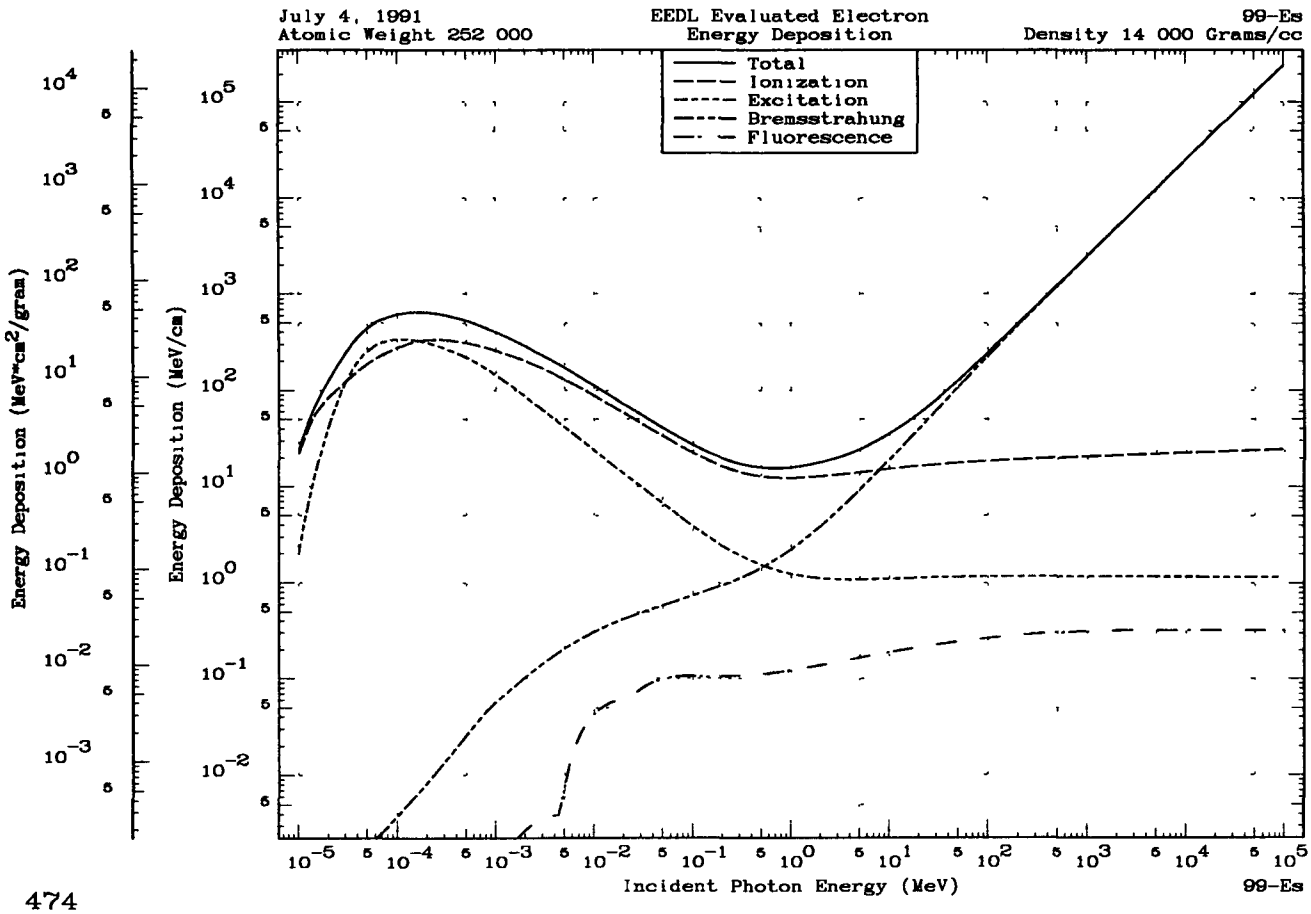
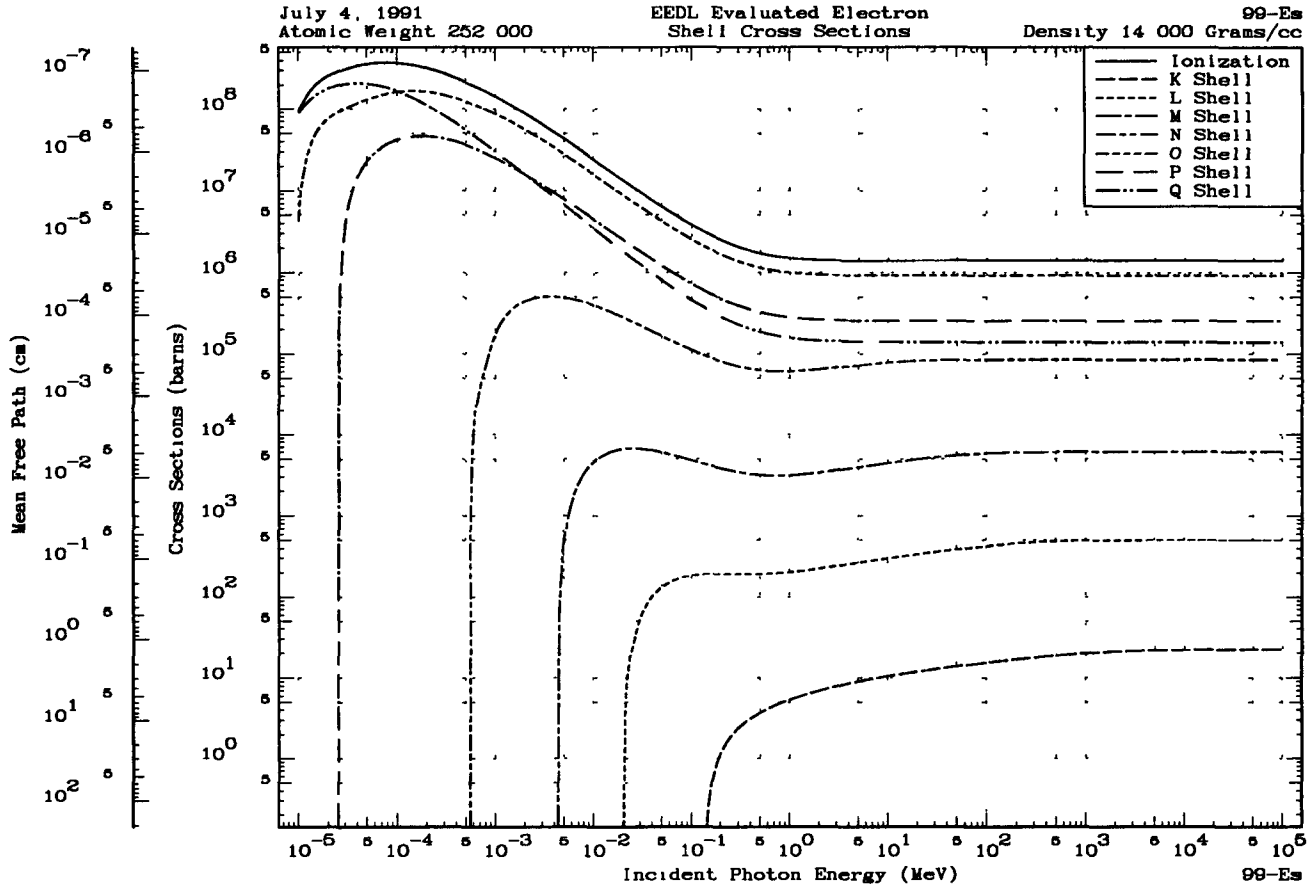
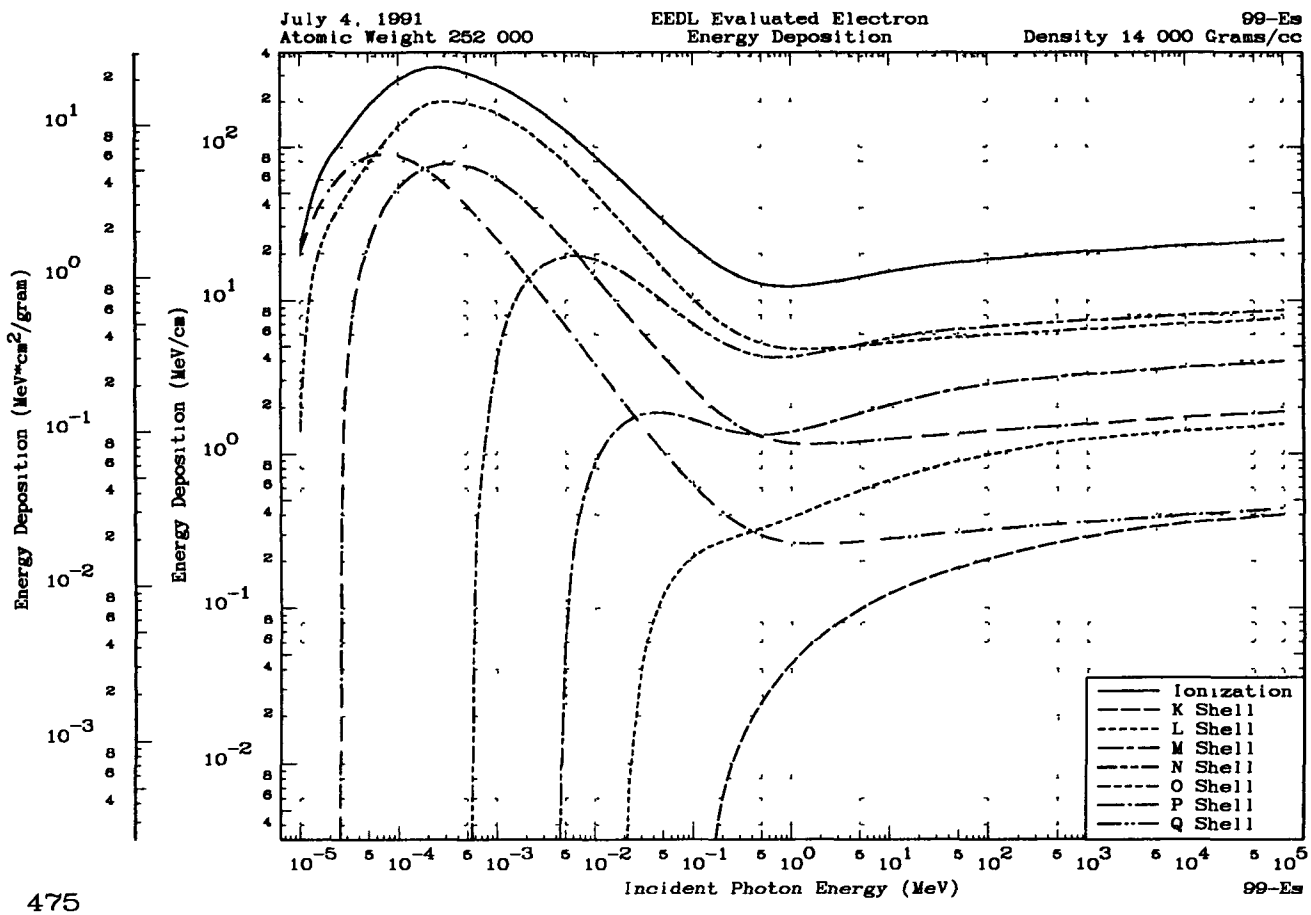
EEDL Evaluated Electron
Cross Sections
99-Es
Density 14 000 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
99-Es


July 4, 1991
Atomic Weight 252 000
EEDL Evaluated Electron
Energy Deposition
99-Es
Density 14 000 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
99-Es

474


July 4, 1991
Atomic Weight 252 000
EEDL Evaluated Electron
Shell Cross Sections
99-Es
Density 14 000 Grams/cc
Mean Free Path (cm)
Cross Sections (barns)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Incident Photon Energy (MeV)
99-Es


July 4, 1991
Atomic Weight 252 000
EEDL Evaluated Electron
Energy Deposition
99-Es
Density 14 000 Grams/cc
Energy Deposition (MeV*cm²/gram)
Energy Deposition (MeV/cm)
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Incident Photon Energy (MeV)
99-Es

475

Atomic Weight 252.000 — Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.1226–8	6.3626+6		2.6625+9	2.5592+9	9.4473+7	8.8245+6	4.6957+3	2.3959+1	2.1982+1	1.9774+0	3.3967–4
	1.0312–5	1.1334–8	6.3023+6		2.6372+9	2.5247+9	1.0184+8	1.0705+7	4.7258+3	2.6641+1	2.4221+1	2.4198+0	3.4991–4
	1.0898–5	1.1524–8	6.1984+6		2.5938+9	2.4638+9	1.1531+8	1.4603+7	4.7803+3	3.1746+1	2.8391+1	3.3550+0	3.6928–4
	1.1411–5	1.1679–8	6.1158+6		2.5592+9	2.4143+9	1.2668+8	1.8196+7	4.8262+3	3.6222+1	3.1983+1	4.2393+0	3.8638–4
O6	1.1540–5	1.1717–8	6.0960+6		2.5509+9	2.4024+9	1.2932+8	1.9200+7	4.8375+3	3.7313+1	3.2824+1	4.4888+0	3.9070–4
	1.1648–5	1.1747–8	6.0804+6		2.5444+9	2.3925+9	1.3183+8	2.0034+7	4.8468+3	3.8371+1	3.3676+1	4.6945+0	3.9432–4
	1.1858–5	1.1804–8	6.0513+6		2.5322+9	2.3737+9	1.3674+8	2.1730+7	4.8648+3	4.0466+1	3.5352+1	5.1144+0	4.0137–4
	1.2250–5	1.1903–8	6.0010+6		2.5112+9	2.3398+9	1.4611+8	2.5212+7	4.8978+3	4.4567+1	3.8583+1	5.9827+0	4.1462–4
	1.2308–5	1.1917–8	5.9938+6		2.5082+9	2.3350+9	1.4744+8	2.5760+7	4.9026+3	4.5164+1	3.9044+1	6.1201+0	4.1658–4
	1.2516–5	1.1969–8	5.9679+6		2.4973+9	2.3178+9	1.5171+8	2.7802+7	4.9197+3	4.7167+1	4.0533+1	6.6338+0	4.2363–4
	1.2938–5	1.2067–8	5.9195+6		2.4770+9	2.2841+9	1.6095+8	3.1981+7	4.9537+3	5.1510+1	4.3812+1	7.6974+0	4.3799–4
	1.3125–5	1.2108–8	5.8992+6		2.4685+9	2.2697+9	1.6490+8	3.3982+7	4.9685+3	5.3433+1	4.5223+1	8.2103+0	4.4439–4
	1.3453–5	1.2180–8	5.8644+6		2.4540+9	2.2450+9	1.7123+8	3.7721+7	4.9940+3	5.6772+1	4.7597+1	9.1750+0	4.5565–4
	1.3654–5	1.2222–8	5.8442+6		2.4455+9	2.2304+9	1.7498+8	4.0158+7	5.0094+3	5.8823+1	4.9015+1	9.8073+0	4.6256–4
	1.4069–5	1.2306–8	5.8042+6		2.4288+9	2.2011+9	1.8212+8	4.5570+7	5.0406+3	6.2985+1	5.1762+1	1.1222+1	4.7689–4
	1.4227–5	1.2337–8	5.7898+6		2.4228+9	2.1903+9	1.8489+8	4.7567+7	5.0523+3	6.4592+1	5.2841+1	1.1751+1	4.8236–4
	1.5000–5	1.2474–8	5.7260+6		2.3961+9	2.1397+9	1.9804+8	5.8317+7	5.1082+3	7.2663+1	5.8034+1	1.4629+1	5.0932–4
	1.6250–5	1.2669–8	5.6379+6		2.3592+9	2.0654+9	2.1513+8	7.8638+7	5.1937+3	8.5204+1	6.5189+1	2.0015+1	5.5339–4
	1.7500–5	1.2822–8	5.5706+6		2.3311+9	1.9990+9	2.3041+8	1.0168+8	5.2743+3	9.8171+1	7.1919+1	2.6251+1	5.9807–4
	1.8125–5	1.2883–8	5.5444+6		2.3201+9	1.9682+9	2.3700+8	1.1483+8	5.3129+3	1.0495+2	7.5091+1	2.9858+1	6.2061–4
	2.0000–5	1.3019–8	5.4864+6		2.2958+9	1.8845+9	2.5456+8	1.5671+8	5.4226+3	1.2563+2	8.4019+1	4.1606+1	6.8909–4
	2.2500–5	1.3110–8	5.4483+6		2.2799+9	1.7890+9	2.7102+8	2.1982+8	5.5454+3	1.5285+2	9.3639+1	5.9214+1	7.7549–4
P3	2.5440–5	1.3067–8	5.4662+6		2.2874+9	1.6946+9	2.8864+8	3.0408+8	5.6765+3	1.8814+2	1.0485+2	8.3293+1	8.7904–4
	2.5725–5	1.3064–8	5.4677+6		2.2880+9	1.6863+9	2.9006+8	3.1160+8	5.6884+3	1.9135+2	1.0591+2	8.5435+1	8.8906–4
	2.6259–5	1.3054–8	5.4719+6		2.2898+9	1.6711+9	2.9268+8	3.2597+8	5.7103+3	1.9744+2	1.0790+2	8.9537+1	9.0789–4
	2.6493–5	1.3048–8	5.4744+6		2.2908+9	1.6646+9	2.9384+8	3.3237+8	5.7198+3	2.0015+2	1.0878+2	9.1366+1	9.1615–4
	2.6932–5	1.3034–8	5.4800+6		2.2931+9	1.6525+9	2.9604+8	3.4455+8	5.7373+3	2.0534+2	1.1049+2	9.4854+1	9.3166–4
	2.7699–5	1.3004–8	5.4930+6		2.2986+9	1.6322+9	2.9993+8	3.6644+8	5.7676+3	2.1470+2	1.1355+2	1.0114+2	9.5891–4
	2.8274–5	1.2975–8	5.5051+6		2.3037+9	1.6174+9	3.0286+8	3.8334+8	5.7898+3	2.2191+2	1.1590+2	1.0601+2	9.7942–4
	3.0000–5	1.2862–8	5.5535+6		2.3239+9	1.5757+9	3.1168+8	4.3654+8	5.8544+3	2.4458+2	1.2316+2	1.2142+2	1.0414–3
	3.2500–5	1.2734–8	5.6092+6		2.3472+9	1.5210+9	3.2043+8	5.0576+8	5.9427+3	2.7338+2	1.3201+2	1.4136+2	1.1321–3
	3.5000–5	1.2557–8	5.6884+6		2.3804+9	1.4721+9	3.2864+8	5.7960+8	6.0257+3	3.0353+2	1.4073+2	1.6279+2	1.2239–3
	3.6250–5	1.2497–8	5.7157+6		2.3918+9	1.4495+9	3.3289+8	6.0938+8	6.0654+3	3.1694+2	1.4536+2	1.7158+2	1.2703–3
	4.0000–5	1.2282–8	5.8158+6		2.4336+9	1.3879+9	3.4437+8	7.0134+8	6.1782+3	3.5741+2	1.5850+2	1.9891+2	1.4109–3
P2	4.0020–5	1.2281–8	5.8161+6		2.4338+9	1.3876+9	3.4440+8	7.0176+8	6.1788+3	3.5759+2	1.5856+2	1.9903+2	1.4116–3
	4.0644–5	1.2257–8	5.8277+6		2.4386+9	1.3782+9	3.4552+8	7.1492+8	6.1961+3	3.6324+2	1.6034+2	2.0290+2	1.4345–3
	4.1813–5	1.2208–8	5.8511+6		2.4484+9	1.3611+9	3.4764+8	7.3970+8	6.2279+3	3.7390+2	1.6370+2	2.1020+2	1.4774–3
	4.3860–5	1.2114–8	5.8966+6		2.4675+9	1.3327+9	3.5136+8	7.8341+8	6.2818+3	3.9279+2	1.6969+2	2.2310+2	1.5531–3
	4.5000–5	1.2057–8	5.9243+6		2.4791+9	1.3177+9	3.5345+8	8.0793+8	6.3110+3	4.0344+2	1.7308+2	2.3036+2	1.5954–3
	4.5971–5	1.2007–8	5.9488+6		2.4893+9	1.3054+9	3.5503+8	8.2890+8	6.3353+3	4.1238+2	1.7579+2	2.3658+2	1.6316–3
	4.7985–5	1.1973–8	5.9658+6		2.4964+9	1.2809+9	3.5843+8	8.5711+8	6.3845+3	4.2679+2	1.8163+2	2.4516+2	1.7072–3
	5.0000–5	1.1933–8	5.9858+6		2.5048+9	1.2579+9	3.6185+8	8.8505+8	6.4321+3	4.4129+2	1.8760+2	2.5369+2	1.7833–3
	5.5000–5	1.1873–8	6.0159+6		2.5174+9	1.2061+9	3.6666+8	9.4459+8	6.5417+3	4.7221+2	1.9996+2	2.7225+2	1.9713–3
	6.0000–5	1.1795–8	6.0560+6		2.5342+9	1.1607+9	3.7102+8	1.0024+9	6.6434+3	5.0256+2	2.1205+2	2.9050+2	2.1620–3
P1	6.2850–5	1.1766–8	6.0707+6		2.5403+9	1.1372+9	3.7163+8	1.0315+9	6.6983+3	5.1677+2	2.1740+2	2.9936+2	2.2719–3
	6.3922–5	1.1775–8	6.0663+6		2.5385+9	1.1288+9	3.7191+8	1.0378+9	6.7184+3	5.2087+2	2.1949+2	3.0138+2	2.3134–3
	6.5932–5	1.1789–8	6.0590+6		2.5354+9	1.1135+9	3.7249+8	1.0495+9	6.7554+3	5.2857+2	2.2346+2	3.0511+2	2.3915–3
	6.9449–5	1.1809–8	6.0489+6		2.5312+9	1.0882+9	3.7360+8	1.0693+9	6.8179+3	5.4203+2	2.3053+2	3.1150+2	2.5293–3
	7.0000–5	1.1811–8	6.0476+6		2.5307+9	1.0845+9	3.7379+8	1.0724+9	6.8275+3	5.4413+2	2.3164+2	3.1249+2	2.5509–3
	7.4724–5	1.1830–8	6.0377+6		2.5265+9	1.0537+9	3.7484+8	1.0980+9	6.9070+3	5.6135+2	2.4055+2	3.2079+2	2.7379–3
	8.0000–5	1.1842–8	6.0318+6		2.5240+9	1.0224+9	3.7618+8	1.1254+9	6.9910+3	5.8046+2	2.5070+2	3.2976+2	2.9490–3
	9.0000–5	1.2040–8	5.9324+6		2.4825+9	9.7071+8	3.7372+8	1.1380+9	7.1396+3	5.9996+2	2.6439+2	3.3556+2	3.3568–3
	1.0000–4	1.2210–8	5.8501+6	0.0000+0	2.4480+9	9.2665+8	3.7194+8	1.1494+9	7.2751+3	6.1935+2	2.7830+2	3.4105+2	3.7723–3
	1.1250–4	1.2526–8	5.7025+6	2.0029–8	2.3863+9	8.7987+8	3.6514+8	1.1412+9	7.4306+3	6.2885+2	2.8880+2	3.4004+2	4.3034–3
O5	1.3448–4	1.3006–8	5.4921+6	5.4493–8	2.2982+9	8.1346+8	3.5582+8	1.1289+9	7.6726+3	6.4680+2	3.0795+2	3.3885+2	5.2612–3
	1.3642–4	1.3063–8	5.4680+6	5.7491–8	2.2881+9	8.0835+8	3.5480+8	1.1250+9	7.6924+3	6.4713+2	3.0921+2	3.3791+2	5.3471–3
	1.3982–4	1.3162–8	5.4269+6	6.2735–8	2.2709+9	7.9966+8	3.5308+8	1.1182+9	7.7264+3	6.4777+2	3.1144+2	3.3633+2	5.4980–3
	1.4491–4	1.3307–8	5.3679+6	7.0590–8	2.2462+9	7.8717+8	3.5063+8	1.1084+9	7.7762+3	6.4889+2	3.1484+2	3.3405+2	5.7254–3
O4	1.4817–4	1.3397–8	5.3316+6	7.5614–8	2.2310+9	7.7950+8	3.4912+8	1.1024+9	7.8074+3	6.4966+2	3.1701+2	3.3265+2	5.8719–3
	1.5000–4	1.3448–8	5.3115+6	7.8430–8	2.2226+9	7.7531+8	3.4832+8	1.0990+9	7.8246+3	6.5016+2	3.1828+2	3.3187+2	5.9543–3
	1.5313–4	1.3536–8	5.2770+6	8.3238–8	2.2082+9	7.6831+8	3.4627+8	1.0936+9	7.8539+3	6.4965+2	3.1916+2	3.3049+2	6.0986–3
	1.5898–4	1.3697–8	5.2149+6	9.2262–8	2.1822+9	7.5572+8	3.4262+8	1.0838+9	7.9077+3	6.4893+2	3.2092+2	3.2800+2	6.3706–3
	1.6250–4	1.3792–8	5.1791+6	9.7682–8	2.1672+9	7.4849+8	3.4053+8	1.0782+9	7.9391+3	6.4861+2	3.2204+2	3.2656+2	6.5347–3
	1.6411–4	1.3835–8	5.1631+6	1.0017–7	2.1605+9	7.4525+8	3.3959+8	1.0757+9	7.9534+3	6.4848+2	3.2255+2	3.2592+2	6.6101–3
	1.7308–4	1.4068–8	5.0775+6	1.1401–7	2.1247+9	7.2801+8	3.3464+8	1.0621+9	8.0306+3	6.4798+2	3.2548+2	3.2250+2	7.0324–3
	1.7500–4	1.4116–8	5.0601+6	1.1696–7	2.1174+9	7.2449+8	3.3363+8	1.0593+9	8.0467+3	6.4794+2	3.2613+2	3.2180+2	7.1231–3
	1.8125–4	1.4272–8	5.0049+6	1.2661–7	2.0943+9	7.1339+8	3.3047+8	1.0504+9	8.0981+3	6.4791+2	3.2832+2	3.1959+2	7.4202–3
	2.0000–4	1.4715–8	4.8540+6	1.5553–7	2.0312+9	6.8317+8	3.2195+8	1.0260+9	8.2442+3	6.4884+2	3.3528+2	3.1356+2	8.3224–3
	2.2500–4	1.5426–8	4.6305+6	1.9443–7	1.9377+9	6.4868+8	3.0825+8	9.8072+8	8.4276+3	6.3649+2	3.3549+2	3.0099+2	9.6138–3
O3	2.6036–4	1.6350–8	4.3688+6	2.5055–7	1.8281+9	6.0835+8	2.9246+8	9.2732+8	8.6605+3	6.2384+2	3.3750+2	2.8633+2	1.1488–2
	2.6532–4	1.6476–8	4.3353+6	2.5850–7	1.8141+9	6.0333+8	2.9019+8	9.2062+8	8.6911+3	6.2159+2	3.3712+2	2.8446+2	1.1754–2
	2.7399–4	1.6693–8	4.2789+6	2.7249–7	1.7905+9	5.9485+8	2.8637+8	9.0931+8	8.7435+3	6.1789+2	3.3656+2	2.8131+2	1.2223–2
	2.8699–4	1.7011–8	4.1989+6	2.9363–7	1.7571+9	5.8284+8	2.8099+8	8.9324+8	8.8195+3	6.1282+2	3.3594+2	2.7686+2	1.2932–2
	3.0000–4	1.7320–8	4.1240+6	3.1494–7	1.7257+9	5.7159+8	2.7598+8	8.7814+8	8.8929+3	6.0827+2	3.3557+2	2.7269+2	1.3647–2
	3.2500–4	1.7926–8	3.9846+6	3.5647–7	1.6674+9	5.5187+8	2.6561+8	8.4989+8	9.0269+3	5.9550+2	3.3090+2	2.6459+2	1.5037–2
O2	3.5276–4	1.8568–8	3.8470+6	4.0357–7	1.6098+9	5.3238+8	2.5549+8	8.2190+8	9.1661+3	5.8337+2	3.2675+2	2.5660+2	1.6605–2
	3.5867–4	1.8707–8	3.8182+6	4.1372–7	1.5978+9	5.2853+8	2.5346+8	8.1577+8	9.1951+3	5.8081+2	3.2593+2	2.5486+2	1.6950–2
	3.6250–4	1.8797–8	3.8000+6	4.2033–7	1.5901+9	5.2607+8	2.5218+8	8.1187+8	9.2137+3	5.7920+2	3.2542+2	2.5376+2	1.7174–2
	3.6900–4	1.8948–8	3.7697+6	4.3157–7	1.5774+9	5.2199+8	2.5005+8	8.0539+8	9.2448+3	5.7653+2	3.2458+2	2.5194+2	1.7555–2
	3.8450–4	1.9303–8	3.7004+6	4.5860–7	1.5485+9	5.1266+8	2.4520+8	7.9060+8	9.3173+3	5.7054+2	3.2276+2	2.4777+2	1.8469–2

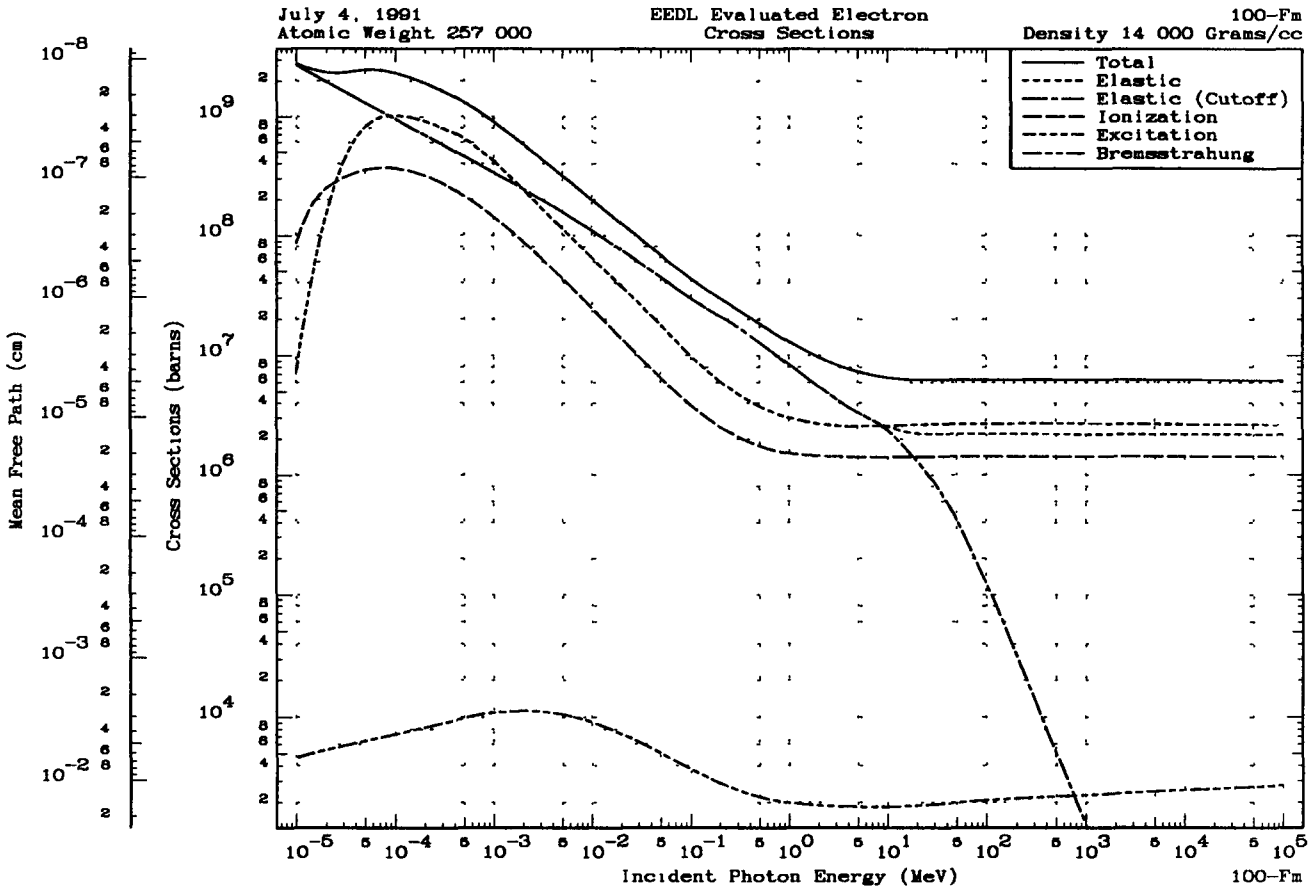
Atomic Weight 252.000 — Density 14.000 Grams/cc

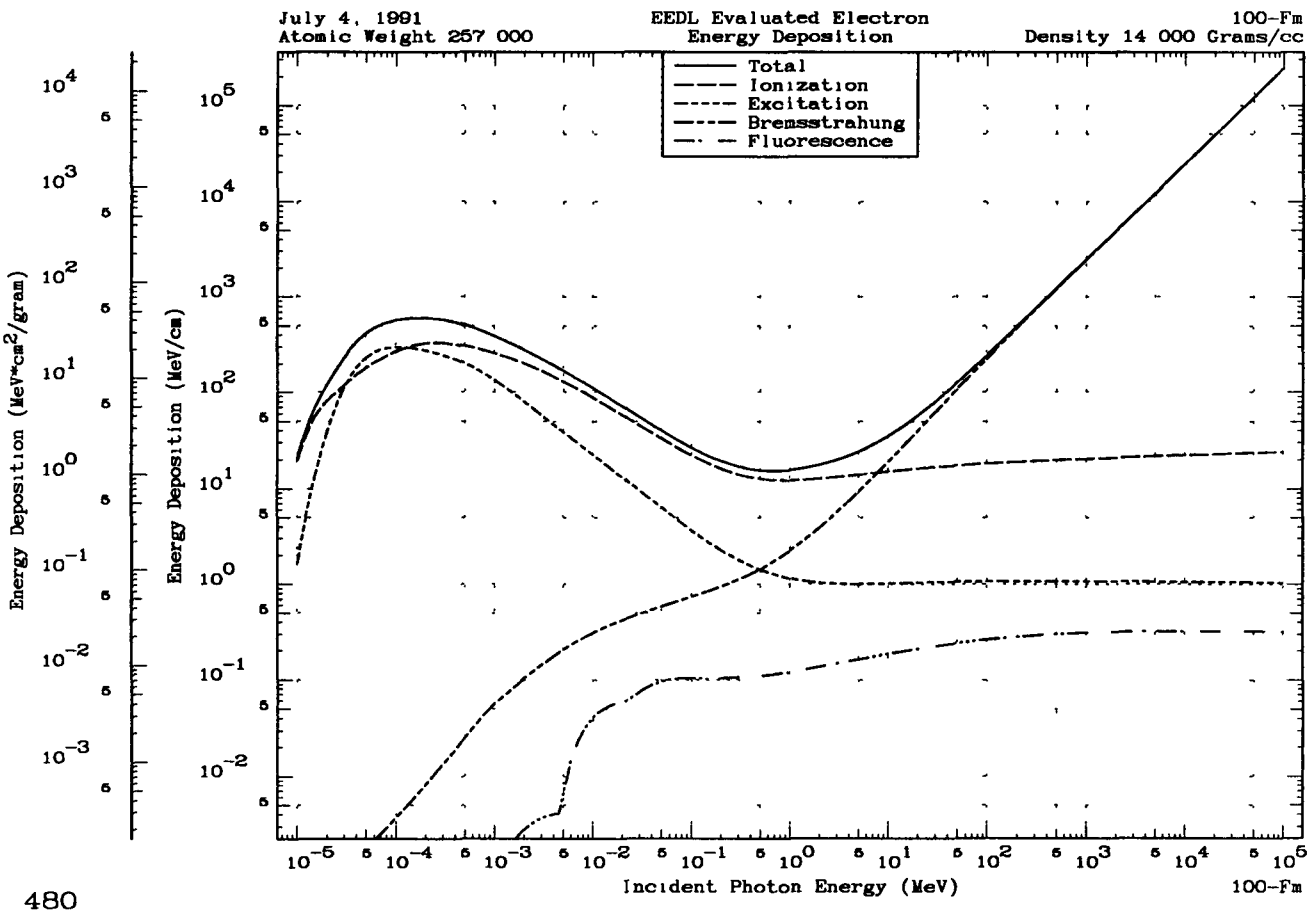
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	4.0000–4	1.9649–8	3.6352+6	4.8590–7	1.5212+9	5.0387+8	2.4065+8	7.7664+8	9.3875+3	5.6503+2	3.2117+2	2.4384+2	1.9390–2
	4.2500–4	2.0189–8	3.5380+6	5.3052–7	1.4805+9	4.9066+8	2.3350+8	7.5634+8	9.4997+3	5.5567+2	3.1773+2	2.3792+2	2.0954–2
O1	4.2863–4	2.0266–8	3.5246+6	5.3706–7	1.4749+9	4.8883+8	2.3251+8	7.5353+8	9.5156+3	5.5440+2	3.1728+2	2.3710+2	2.1182–2
	4.3309–4	2.0371–8	3.5064+6	5.4512–7	1.4673+9	4.8662+8	2.3132+8	7.4934+8	9.5349+3	5.5264+2	3.1674+2	2.3587+2	2.1464–2
	4.4145–4	2.0566–8	3.4731+6	5.6029–7	1.4534+9	4.8256+8	2.2914+8	7.4165+8	9.5707+3	5.4943+2	3.1578+2	2.3362+2	2.1993–2
	4.5609–4	2.0903–8	3.4172+6	5.8706–7	1.4299+9	4.7572+8	2.2549+8	7.2872+8	9.6321+3	5.4409+2	3.1423+2	2.2984+2	2.2924–2
	4.6250–4	2.1049–8	3.3935+6	5.9887–7	1.4200+9	4.7281+8	2.2394+8	7.2325+8	9.6585+3	5.4186+2	3.1359+2	2.2824+2	2.3334–2
	4.7804–4	2.1398–8	3.3381+6	6.2769–7	1.3968+9	4.6602+8	2.2034+8	7.1047+8	9.7213+3	5.3670+2	3.1217+2	2.2451+2	2.4333–2
	5.0000–4	2.1882–8	3.2643+6	6.6886–7	1.3660+9	4.5694+8	2.1555+8	6.9348+8	9.8072+3	5.2999+2	3.1041+2	2.1955+2	2.5755–2
	5.5000–4	2.3000–8	3.1055+6	7.6482–7	1.2995+9	4.3825+8	2.0460+8	6.5668+8	9.9913+3	5.1216+2	3.0357+2	2.0857+2	2.9041–2
N7	5.5613–4	2.3134–8	3.0876+6	7.7682–7	1.2920+9	4.3613+8	2.0336+8	6.5252+8	1.0013+4	5.1019+2	3.0283+2	2.0733+2	2.9448–2
	5.6710–4	2.3373–8	3.0561+6	7.9838–7	1.2788+9	4.3242+8	2.0121+8	6.4520+8	1.0049+4	5.0678+2	3.0159+2	2.0516+2	3.0178–2
N6	5.7393–4	2.3520–8	3.0369+6	8.1189–7	1.2708+9	4.3015+8	1.9991+8	6.4075+8	1.0071+4	5.0472+2	3.0085+2	2.0384+2	3.0633–2
	5.8045–4	2.3660–8	3.0189+6	8.2483–7	1.2633+9	4.2803+8	1.9869+8	6.3656+8	1.0092+4	5.0281+2	3.0018+2	2.0260+2	3.1069–2
	5.8355–4	2.3727–8	3.0105+6	8.3101–7	1.2598+9	4.2703+8	1.9812+8	6.3459+8	1.0102+4	5.0193+2	2.9987+2	2.0202+2	3.1277–2
	6.0000–4	2.4076–8	2.9667+6	8.6393–7	1.2414+9	4.2186+8	1.9516+8	6.2442+8	1.0154+4	4.9734+2	2.9829+2	1.9902+2	3.2382–2
	6.2500–4	2.4648–8	2.8980+6	9.1464–7	1.2127+9	4.1438+8	1.9048+8	6.0781+8	1.0223+4	4.8866+2	2.9464+2	1.9398+2	3.4015–2
	7.0000–4	2.6302–8	2.7157+6	1.0718–6	1.1364+9	3.9431+8	1.7813+8	5.6397+8	1.0419+4	4.6610+2	2.8537+2	1.8070+2	3.8980–2
	7.0156–4	2.6335–8	2.7123+6	1.0751–6	1.1350+9	3.9393+8	1.7789+8	5.6314+8	1.0423+4	4.6569+2	2.8520+2	1.8044+2	3.9084–2
	7.1250–4	2.6569–8	2.6884+6	1.0987–6	1.1250+9	3.9127+8	1.7628+8	5.5742+8	1.0450+4	4.6279+2	2.8404+2	1.7871+2	3.9816–2
	8.0000–4	2.8386–8	2.5163+6	1.2920–6	1.0530+9	3.7191+8	1.6470+8	5.1636+8	1.0655+4	4.4254+2	2.7619+2	1.6630+2	4.5742–2
	8.5000–4	2.9428–8	2.4272+6	1.4066–6	1.0157+9	3.6216+8	1.5848+8	4.9504+8	1.0724+4	4.3055+2	2.7075+2	1.5975+2	4.8662–2
	9.1250–4	3.0694–8	2.3271+6	1.5540–6	9.7381+8	3.5108+8	1.5153+8	4.7119+8	1.0806+4	4.1750+2	2.6502+2	1.5243+2	5.2335–2
	9.2500–4	3.0942–8	2.3085+6	1.5840–6	9.6599+8	3.4899+8	1.5024+8	4.6675+8	1.0822+4	4.1511+2	2.6399+2	1.5107+2	5.3073–2
N5	9.6007–4	3.1632–8	2.2581+6	1.6691–6	9.4493+8	3.4335+8	1.4676+8	4.5482+8	1.0866+4	4.0869+2	2.6123+2	1.4741+2	5.5148–2
	9.7005–4	3.1827–8	2.2442+6	1.6936–6	9.3912+8	3.4179+8	1.4580+8	4.5151+8	1.0878+4	4.0696+2	2.6050+2	1.4641+2	5.5741–2
	1.0000–3	3.2410–8	2.2039+6	1.7677–6	9.2224+8	3.3727+8	1.4304+8	4.4192+8	1.0913+4	4.0200+2	2.5845+2	1.4349+2	5.7520–2
N4	1.0240–3	3.2870–8	2.1731+6	1.8277–6	9.0934+8	3.3377+8	1.4080+8	4.3476+8	1.0924+4	3.9758+2	2.5626+2	1.4126+2	5.8634–2
	1.0313–3	3.3014–8	2.1636+6	1.8460–6	9.0537+8	3.3274+8	1.4013+8	4.3249+8	1.0927+4	3.9621+2	2.5559+2	1.4056+2	5.8970–2
	1.0389–3	3.3165–8	2.1537+6	1.8652–6	9.0124+8	3.3166+8	1.3943+8	4.3014+8	1.0930+4	3.9479+2	2.5491+2	1.3982+2	5.9324–2
	1.0677–3	3.3732–8	2.1175+6	1.9387–6	8.8608+8	3.2769+8	1.3689+8	4.2150+8	1.0942+4	3.8960+2	2.5241+2	1.3713+2	6.0663–2
	1.0898–3	3.4164–8	2.0908+6	1.9958–6	8.7489+8	3.2474+8	1.3501+8	4.1513+8	1.0951+4	3.8582+2	2.5060+2	1.3515+2	6.1692–2
	1.1217–3	3.4779–8	2.0538+6	2.0791–6	8.5943+8	3.2065+8	1.3242+8	4.0635+8	1.0964+4	3.8064+2	2.4816+2	1.3242+2	6.3176–2
	1.1250–3	3.4841–8	2.0501+6	2.0877–6	8.5788+8	3.2024+8	1.3216+8	4.0547+8	1.0965+4	3.8012+2	2.4791+2	1.3215+2	6.3328–2
	1.1690–3	3.5677–8	2.0021+6	2.2045–6	8.3778+8	3.1487+8	1.2879+8	3.9410+8	1.0982+4	3.7337+2	2.4469+2	1.2861+2	6.5378–2
	1.1924–3	3.6116–8	1.9778+6	2.2674–6	8.2761+8	3.1214+8	1.2709+8	3.8836+8	1.0991+4	3.6999+2	2.4310+2	1.2682+2	6.6466–2
	1.2188–3	3.6606–8	1.9513+6	2.3390–6	8.1652+8	3.0915+8	1.2524+8	3.8212+8	1.1000+4	3.6634+2	2.4139+2	1.2488+2	6.7696–2
	1.2518–3	3.7214–8	1.9194+6	2.4296–6	8.0319+8	3.0554+8	1.2302+8	3.7462+8	1.1012+4	3.6195+2	2.3933+2	1.2255+2	6.9237–2
N3	1.3159–3	3.8375–8	1.8613+6	2.6088–6	7.7888+8	2.9889+8	1.1898+8	3.6100+8	1.1034+4	3.5410+2	2.3570+2	1.1832+2	7.2234–2
	1.3389–3	3.8811–8	1.8404+6	2.6741–6	7.7013+8	2.9662+8	1.1755+8	3.5595+8	1.1042+4	3.5100+2	2.3419+2	1.1674+2	7.3310–2
	1.3462–3	3.8948–8	1.8339+6	2.6948–6	7.6742+8	2.9592+8	1.1711+8	3.5439+8	1.1044+4	3.5005+2	2.3373+2	1.1625+2	7.3651–2
	1.3759–3	3.9505–8	1.8081+6	2.7801–6	7.5661+8	2.9309+8	1.1535+8	3.4816+8	1.1054+4	3.4625+2	2.3188+2	1.1430+2	7.5041–2
	1.3792–3	3.9566–8	1.8053+6	2.7896–6	7.5543+8	2.9278+8	1.1515+8	3.4749+8	1.1055+4	3.4584+2	2.3168+2	1.1408+2	7.5195–2
	1.4396–3	4.0683–8	1.7557+6	2.9662–6	7.3469+8	2.8731+8	1.1178+8	3.3560+8	1.1074+4	3.3865+2	2.2822+2	1.1036+2	7.8026–2
	1.5000–3	4.1781–8	1.7096+6	3.1463–6	7.1539+8	2.8216+8	1.0864+8	3.2458+8	1.1092+4	3.3208+2	2.2509+2	1.0690+2	8.0861–2
	1.6250–3	4.4006–8	1.6232+6	3.5307–6	6.7922+8	2.7239+8	1.0255+8	3.0427+8	1.1128+4	3.1838+2	2.1782+2	1.0047+2	8.6738–2
N2	1.6736–3	4.4852–8	1.5925+6	3.6845–6	6.6641+8	2.6888+8	1.0041+8	2.9711+8	1.1141+4	3.1360+2	2.1531+2	9.8201+1	8.9028–2
	1.7144–3	4.5557–8	1.5679+6	3.8154–6	6.5609+8	2.6605+8	9.8660+7	2.9138+8	1.1152+4	3.0968+2	2.1320+2	9.6381+1	9.0951–2
	1.7500–3	4.6167–8	1.5472+6	3.9310–6	6.4743+8	2.6365+8	9.7197+7	2.8657+8	1.1161+4	3.0640+2	2.1145+2	9.4857+1	9.2630–2
	1.7858–3	4.6775–8	1.5271+6	4.0484–6	6.3900+8	2.6131+8	9.5777+7	2.8191+8	1.1170+4	3.0323+2	2.0975+2	9.3380+1	9.4321–2
	1.8125–3	4.7226–8	1.5125+6	4.1368–6	6.3291+8	2.5961+8	9.4750+7	2.7854+8	1.1177+4	3.0095+2	2.0854+2	9.2313+1	9.5582–2
N1	1.8563–3	4.7959–8	1.4894+6	4.2833–6	6.2323+8	2.5690+8	9.3121+7	2.7320+8	1.1187+4	2.9734+2	2.0662+2	9.0623+1	9.7653–2
	1.8922–3	4.8557–8	1.4710+6	4.4047–6	6.1556+8	2.5474+8	9.1822+7	2.6898+8	1.1196+4	2.9443+2	2.0505+2	8.9285+1	9.9352–2
	1.8929–3	4.8568–8	1.4707+6	4.4070–6	6.1541+8	2.5470+8	9.1798+7	2.6891+8	1.1196+4	2.9438+2	2.0502+2	8.9260+1	9.9384–2
	1.9461–3	4.9446–8	1.4446+6	4.5890–6	6.0449+8	2.5161+8	8.9953+7	2.6292+8	1.1209+4	2.9027+2	2.0280+2	8.7362+1	1.0190–1
	2.0000–3	5.0325–8	1.4193+6	4.7759–6	5.9393+8	2.4860+8	8.8174+7	2.5715+8	1.1221+4	2.8634+2	2.0070+2	8.5534+1	1.0446–1
	2.1250–3	5.2380–8	1.3637+6	5.2201–6	5.7063+8	2.4179+8	8.4173+7	2.4466+8	1.1197+4	2.7650+2	1.9487+2	8.1521+1	1.0938–1
	2.2344–3	5.4140–8	1.3193+6	5.6214–6	5.5209+8	2.3630+8	8.1003+7	2.3477+8	1.1177+4	2.6877+2	1.9031+2	7.8347+1	1.1368–1
	2.2500–3	5.4388–8	1.3133+6	5.6796–6	5.4956+8	2.3555+8	8.0573+7	2.3343+8	1.1174+4	2.6773+2	1.8970+2	7.7917+1	1.1429–1
	2.3438–3	5.5866–8	1.2786+6	6.0337–6	5.3503+8	2.3119+8	7.8098+7	2.2573+8	1.1158+4	2.6173+2	1.8617+2	7.5445+1	1.1797–1
	2.4258–3	5.7139–8	1.2501+6	6.3501–6	5.2310+8	2.2758+8	7.6074+7	2.1944+8	1.1144+4	2.5686+2	1.8331+2	7.3426+1	1.2119–1
	2.5000–3	5.8277–8	1.2257+6	6.6414–6	5.1289+8	2.2446+8	7.4345+7	2.1407+8	1.1132+4	2.5272+2	1.8089+2	7.1705+1	1.2410–1
	2.6250–3	6.0165–8	1.1872+6	7.1426–6	4.9680+8	2.1950+8	7.1625+7	2.0566+8	1.1113+4	2.4614+2	1.7700+2	6.9007+1	1.2899–1
	2.6719–3	6.0863–8	1.1736+6	7.3339–6	4.9110+8	2.1773+8	7.0664+7	2.0269+8	1.1106+4	2.4381+2	1.7563+2	6.8054+1	1.3083–1
	2.7129–3	6.1470–8	1.1620+6	7.5028–6	4.8625+8	2.1622+8	6.9847+7	2.0017+8	1.1100+4	2.4185+2	1.7447+2	6.7247+1	1.3243–1
	3.0000–3	6.5623–8	1.0885+6	8.7212–6	4.5548+8	2.0649+8	6.4691+7	1.8429+8	1.1060+4	2.2957+2	1.6727+2	6.2158+1	1.4363–1
	3.5000–3	7.2730–8	9.8211+5	1.1000–5	4.1097+8	1.9190+8	5.7222+7	1.6184+8	1.0890+4	2.0963+2	1.5462+2	5.4850+1	1.6003–1
	4.0000–3	7.9454–8	8.9899+5	1.3475–5	3.7619+8	1.8010+8	5.1465+7	1.4461+8	1.0744+4	1.9447+2	1.4505+2	4.9248+1	1.7626–1
M5	4.3696–3	8.4319–8	8.4712+5	1.5428–5	3.5448+8	1.7228+8	4.7898+7	1.3430+8	1.0634+4	1.8428+2	1.3824+2	4.5848+1	1.8771–1
	4.4484–3	8.5339–8	8.3699+5	1.5857–5	3.5024+8	1.7074+8	4.7207+7	1.3229+8	1.0613+4	1.8232+2	1.3694+2	4.5189+1	1.9014–1
	4.5173–3	8.6227–8	8.2838+5	1.6237–5	3.4664+8	1.6942+8	4.6621+7	1.3058+8	1.0594+4	1.8066+2	1.3583+2	4.4630+1	1.9226–1
M4	4.6255–3	8.7609–8	8.1531+5	1.6840–5	3.4117+8	1.6742+8	4.5735+7	1.2801+8	1.0565+4	1.7814+2	1.3416+2	4.3784+1	1.9559–1
	4.6380–3	8.7769–8	8.1383+5	1.6910–5	3.4055+8	1.6720+8	4.5634+7	1.2771+8	1.0561+4	1.7786+2	1.3398+2	4.3689+1	1.9597–1
	4.6723–3	8.8206–8	8.0980+5	1.7104–5	3.3886+8	1.6658+8	4.5362+7	1.2691+8	1.0553+4	1.7709+2	1.3347+2	4.3428+1	1.9702–1
	4.8362–3	9.0277–8	7.9122+5	1.8038–5	3.3109+8	1.6372+8	4.4111+7	1.2325+8	1.0510+4	1.7356+2	1.3113+2	4.2233+1	2.0204–1
	5.0000–3	9.2322–8	7.7369+5	1.8991–5	3.2376+8	1.6100+8	4.2935+7	1.1981+8	1.0470+4	1.7027+2	1.2895+2	4.1111+1	2.0704–1
M3	5.2472–3	9.5379–8	7.4889+5	2.0465–5	3.1338+8	1.5704+8	4.1263+7	1.1507+8	1.0376+4	1.6533+2	1.2559+2	3.9535+1	2.1307–1
	5.3413–3	9.6534–8	7.3993+5	2.1037–5	3.0963+8	1.5561+8	4.0663+7	1.1335+8	1.0341+4	1.6358+2	1.2439+2	3.8969+1	2.1536–1
	5.5000–3	9.8465–8	7.2542+5	2.2016–5	3.0356+8	1.5327+8	3.9696+7	1.1058+8	1.0284+4	1.6075+2	1.2247+2	3.8055+1	2.1920–1
	5.5060–3	9.8537–8	7.2489+5	2.2053–5	3.0333+8	1.5318+8	3.9660+7	1.1048+8	1.0282+4	1.6064+2	1.2240+2	3.8022+1	2.1935–1

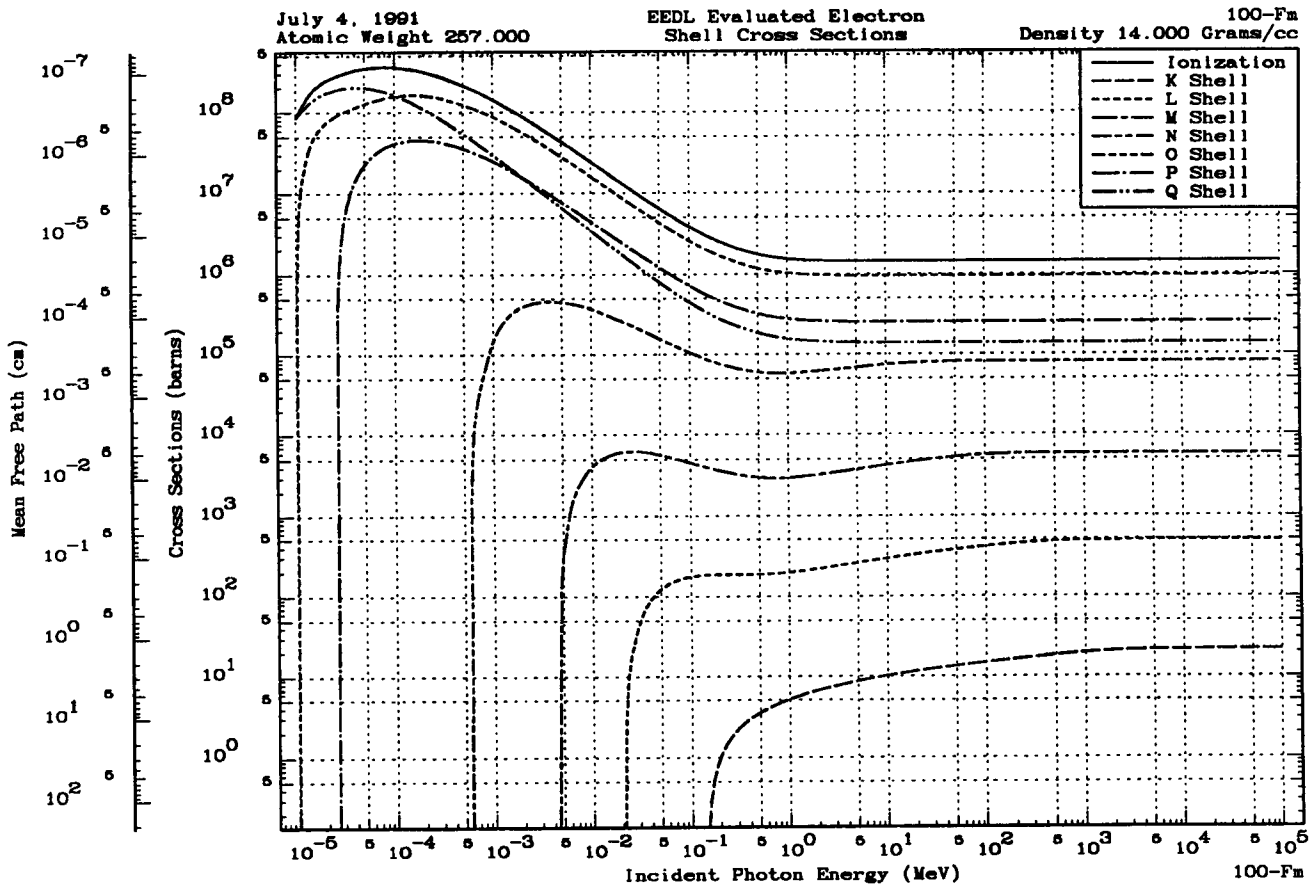
Atomic Weight 252.000 — Density 14.000 Grams/cc

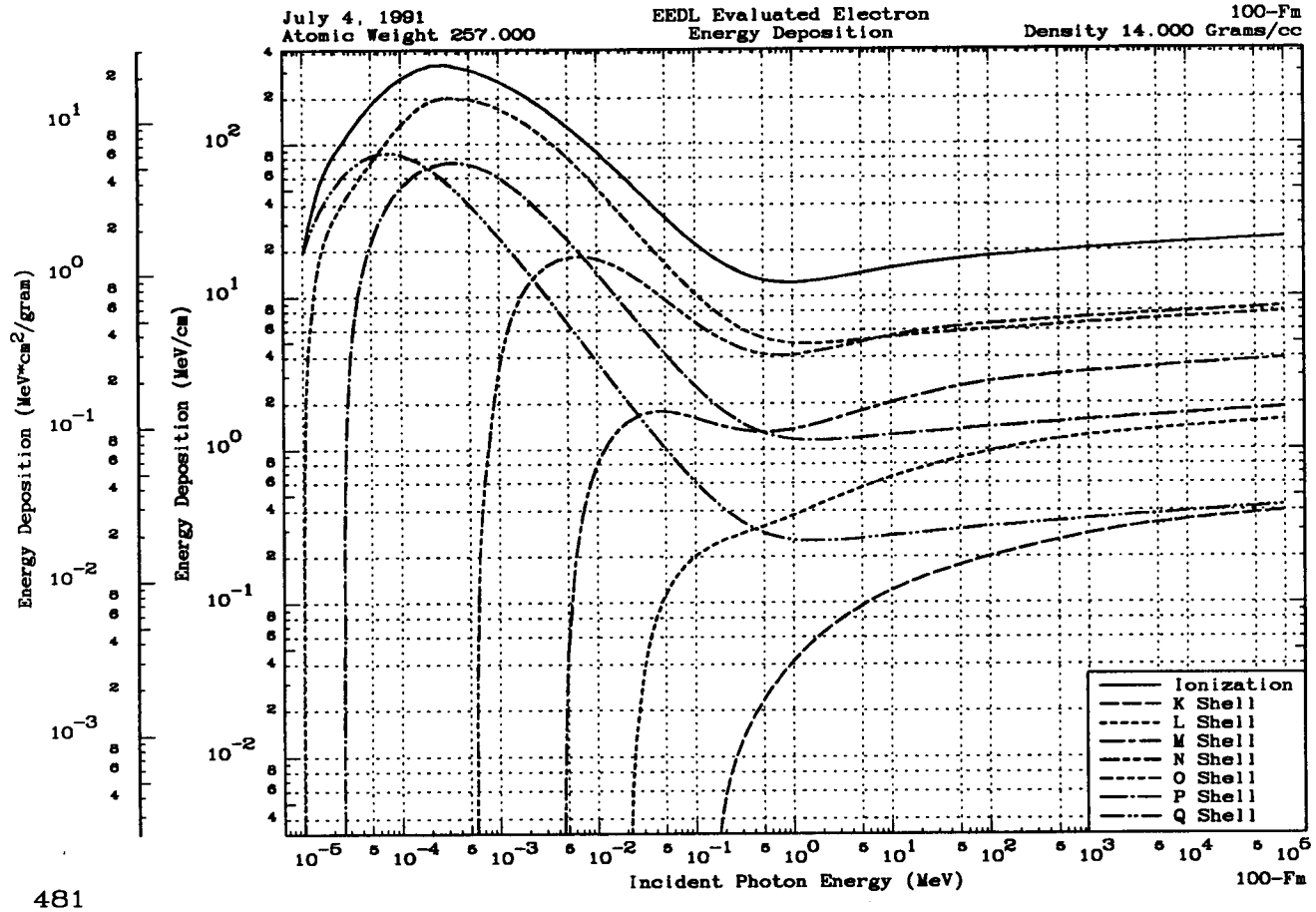
	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	5.7530–3	1.0150–7	7.0372+5	2.3610–5	2.9448+8	1.4975+8	3.8254+7	1.0646+8	1.0198+4	1.5654+2	1.1962+2	3.6695+1	2.2530–1
	6.0000–3	1.0442–7	6.8405+5	2.5208–5	2.8625+8	1.4653+8	3.6955+7	1.0275+8	1.0118+4	1.5277+2	1.1707+2	3.5470+1	2.3122–1
	6.5000–3	1.1017–7	6.4834+5	2.8562–5	2.7130+8	1.4060+8	3.4578+7	9.6115+7	9.9666+3	1.4538+2	1.1187+2	3.3260+1	2.4312–1
M2	6.5646–3	1.1090–7	6.4407+5	2.9008–5	2.6951+8	1.3988+8	3.4296+7	9.5326+7	9.9481+3	1.4450+2	1.1126+2	3.2997+1	2.4464–1
	6.6543–3	1.1192–7	6.3824+5	2.9631–5	2.6708+8	1.3890+8	3.3911+7	9.4250+7	9.9228+3	1.4331+2	1.1042+2	3.2641+1	2.4676–1
	6.8225–3	1.1380–7	6.2767+5	3.0814–5	2.6265+8	1.3712+8	3.3216+7	9.2303+7	9.8763+3	1.4116+2	1.0891+2	3.1995+1	2.5072–1
M1	6.9531–3	1.1525–7	6.1977+5	3.1744–5	2.5935+8	1.3579+8	3.2698+7	9.0851+7	9.8412+3	1.3956+2	1.0779+2	3.1514+1	2.5379–1
	7.0840–3	1.1669–7	6.1211+5	3.2688–5	2.5614+8	1.3449+8	3.2193+7	8.9451+7	9.7983+3	1.3797+2	1.0667+2	3.1047+1	2.5638–1
	7.1169–3	1.1705–7	6.1022+5	3.2927–5	2.5535+8	1.3416+8	3.2069+7	8.9107+7	9.7876+3	1.3758+2	1.0639+2	3.0932+1	2.5703–1
	7.2500–3	1.1851–7	6.0273+5	3.3900–5	2.5221+8	1.3288+8	3.1577+7	8.7743+7	9.7452+3	1.3603+2	1.0530+2	3.0476+1	2.5965–1
	7.3130–3	1.1919–7	5.9926+5	3.4364–5	2.5077+8	1.3229+8	3.1350+7	8.7113+7	9.7254+3	1.3532+2	1.0479+2	3.0266+1	2.6089–1
	7.5584–3	1.2184–7	5.8623+5	3.6196–5	2.4531+8	1.3005+8	3.0499+7	8.4752+7	9.6504+3	1.3265+2	1.0291+2	2.9477+1	2.6570–1
	7.6565–3	1.2289–7	5.8123+5	3.6938–5	2.4322+8	1.2919+8	3.0174+7	8.3847+7	9.6213+3	1.3163+2	1.0218+2	2.9176+1	2.6762–1
	8.0000–3	1.2653–7	5.6453+5	3.9582–5	2.3623+8	1.2629+8	2.9090+7	8.0839+7	9.5227+3	1.2825+2	9.9801+1	2.8171+1	2.7431–1
	8.5000–3	1.3176–7	5.4213+5	4.3556–5	2.2686+8	1.2234+8	2.7645+7	7.6865+7	9.3751+3	1.2341+2	9.6294+1	2.6834+1	2.8308–1
	9.0000–3	1.3687–7	5.2187+5	4.7680–5	2.1838+8	1.1872+8	2.6349+7	7.3297+7	9.2380+3	1.1909+2	9.3166+1	2.5635+1	2.9177–1
	9.2500–3	1.3939–7	5.1244+5	4.9797–5	2.1444+8	1.1703+8	2.5750+7	7.1646+7	9.1729+3	1.1710+2	9.1720+1	2.5079+1	2.9608–1
	1.0000–2	1.4679–7	4.8659+5	5.6355–5	2.0362+8	1.1234+8	2.4118+7	6.7149+7	8.9904+3	1.1168+2	8.7804+1	2.3568+1	3.0893–1
	1.1250–2	1.5892–7	4.4947+5	6.7982–5	1.8808+8	1.0532+8	2.1834+7	6.0924+7	8.6732+3	1.0344+2	8.1658+1	2.1451+1	3.2565–1
	1.2500–2	1.7057–7	4.1877+5	8.0476–5	1.7524+8	9.9405+7	1.9976+7	5.5845+7	8.3990+3	9.6731+1	7.6663+1	1.9726+1	3.4209–1
	1.3125–2	1.7624–7	4.0530+5	8.7036–5	1.6960+8	9.6782+7	1.9171+7	5.3639+7	8.2749+3	9.3831+1	7.4504+1	1.8977+1	3.5022–1
	1.5000–2	1.9268–7	3.7071+5	1.0785–4	1.5512+8	8.9950+7	1.7129+7	4.8037+7	7.9447+3	8.6480+1	6.9030+1	1.7076+1	3.7419–1
	1.7500–2	2.1444–7	3.3310+5	1.3822–4	1.3939+8	8.1980+7	1.5043+7	4.2358+7	7.5357+3	7.8268+1	6.2750+1	1.5120+1	3.9791–1
	2.0000–2	2.3520–7	3.0369+5	1.7152–4	1.2708+8	7.5648+7	1.3443+7	3.7984+7	7.1985+3	7.1976+1	5.7939+1	1.3616+1	4.2116–1
L3	2.0409–2	2.3853–7	2.9945+5	1.7724–4	1.2531+8	7.4717+7	1.3217+7	3.7364+7	7.1476+3	7.1027+1	5.7202+1	1.3401+1	4.2448–1
	2.1008–2	2.4339–7	2.9347+5	1.8576–4	1.2281+8	7.3405+7	1.2901+7	3.6493+7	7.0744+3	6.9691+1	5.6164+1	1.3098+1	4.2887–1
	2.2132–2	2.5237–7	2.8303+5	2.0216–4	1.1843+8	7.1100+7	1.2351+7	3.4975+7	6.9443+3	6.7366+1	5.4358+1	1.2571+1	4.3709–1
	2.4099–2	2.6775–7	2.6677+5	2.3216–4	1.1163+8	6.7490+7	1.1503+7	3.2630+7	6.7370+3	6.3784+1	5.1577+1	1.1756+1	4.5137–1
L2	2.6007–2	2.8229–7	2.5303+5	2.6280–4	1.0588+8	6.4416+7	1.0794+7	3.0666+7	6.5568+3	6.0793+1	4.9254+1	1.1074+1	4.6509–1
	2.6506–2	2.8603–7	2.4973+5	2.7106–4	1.0450+8	6.3671+7	1.0625+7	3.0198+7	6.5121+3	6.0055+1	4.8677+1	1.0910+1	4.6846–1
L1	2.6824–2	2.8839–7	2.4768+5	2.7637–4	1.0364+8	6.3208+7	1.0521+7	2.9908+7	6.4842+3	5.9598+1	4.8319+1	1.0809+1	4.7060–1
	2.7050–2	2.9006–7	2.4626+5	2.8017–4	1.0305+8	6.2885+7	1.0448+7	2.9708+7	6.4632+3	5.9281+1	4.8070+1	1.0739+1	4.7192–1
	2.7618–2	2.9424–7	2.4276+5	2.8982–4	1.0158+8	6.2089+7	1.0270+7	2.9219+7	6.4114+3	5.8502+1	4.7459+1	1.0568+1	4.7526–1
	2.8253–2	2.9887–7	2.3900+5	3.0075–4	1.0001+8	6.1231+7	1.0078+7	2.8693+7	6.3551+3	5.7667+1	4.6804+1	1.0384+1	4.7899–1
	2.8809–2	3.0290–7	2.3582+5	3.1045–4	9.8679+7	6.0505+7	9.9170+6	2.8250+7	6.3073+3	5.6963+1	4.6252+1	1.0229+1	4.8224–1
	3.0000–2	3.1145–7	2.2934+5	3.3162–4	9.5970+7	5.9024+7	9.5898+6	2.7350+7	6.2091+3	5.5538+1	4.5134+1	9.9148+0	4.8919–1
	3.2500–2	3.2829–7	2.1758+5	3.7781–4	9.1047+7	5.6398+7	8.9838+6	2.5658+7	6.0116+3	5.2746+1	4.2925+1	9.3190+0	5.0214–1
	3.6250–2	3.5270–7	2.0252+5	4.5139–4	8.4746+7	5.3004+7	8.2185+6	2.3517+7	5.7523+3	4.9223+1	4.0136+1	8.5656+0	5.2139–1
	4.0000–2	3.7620–7	1.8987+5	5.2992–4	7.9451+7	5.0119+7	7.5849+6	2.1741+7	5.5282+3	4.6310+1	3.7829+1	7.9409+0	5.4039–1
	4.5000–2	4.0529–7	1.7624+5	6.4191–4	7.3749+7	4.7044+7	6.9065+6	1.9793+7	5.2576+3	4.3022+1	3.5211+1	7.2497+0	5.6188–1
	5.0000–2	4.3313–7	1.6491+5	7.6192–4	6.9009+7	4.4453+7	6.3514+6	1.8199+7	5.0268+3	4.0336+1	3.3069+1	6.6846+0	5.8305–1
	6.0000–2	4.8546–7	1.4714+5	1.0238–3	6.1570+7	4.0302+7	5.5149+6	1.5749+7	4.6340+3	3.6123+1	2.9693+1	5.8101+0	6.2013–1
	7.0000–2	5.3612–7	1.3323+5	1.3135–3	5.5752+7	3.6927+7	4.9161+6	1.3905+7	4.3217+3	3.2963+1	2.7163+1	5.1470+0	6.5309–1
	8.0000–2	5.8412–7	1.2228+5	1.6287–3	5.1171+7	3.4232+7	4.4503+6	1.2484+7	4.0683+3	3.0519+1	2.5197+1	4.6360+0	6.8516–1
	1.0000–1	6.7405–7	1.0597+5	2.3254–3	4.4344+7	3.0109+7	3.8019+6	1.0429+7	3.6817+3	2.6965+1	2.2334+1	3.8913+0	7.3994–1
K	1.3911–1	8.1966–7	8.7145+4	3.8977–3	3.6466+7	2.5166+7	3.0662+6	8.2308+6	3.2150+3	2.2894+1	1.8972+1	3.0913+0	8.3060–1
	1.4183–1	8.2866–7	8.6197+4	4.0172–3	3.6070+7	2.4920+7	3.0295+6	8.1168+6	3.1912+3	2.2687+1	1.8801+1	3.0497+0	8.3624–1
	1.4592–1	8.4202–7	8.4830+4	4.1984–3	3.5498+7	2.4565+7	2.9764+6	7.9526+6	3.1567+3	2.2390+1	1.8555+1	2.9900+0	8.4467–1
	1.5000–1	8.5522–7	8.3521+4	4.3819–3	3.4950+7	2.4225+7	2.9257+6	7.7961+6	3.1235+3	2.2107+1	1.8321+1	2.9330+0	8.5309–1
	1.6250–1	8.9232–7	8.0048+4	4.9570–3	3.3496+7	2.3304+7	2.7958+6	7.3940+6	3.0324+3	2.1371+1	1.7708+1	2.7856+0	8.7757–1
	1.8125–1	9.4551–7	7.5545+4	5.8542–3	3.1612+7	2.2103+7	2.6279+6	6.8787+6	2.9125+3	2.0430+1	1.6920+1	2.5968+0	9.1395–1
	2.0000–1	9.9610–7	7.1708+4	6.7902–3	3.0007+7	2.1074+7	2.4852+6	6.4450+6	2.8085+3	1.9641+1	1.6253+1	2.4380+0	9.4984–1
	2.2500–1	1.0579–6	6.7517+4	8.0883–3	2.8253+7	1.9882+7	2.3496+6	6.0184+6	2.7041+3	1.8883+1	1.5609+1	2.2808+0	9.9329–1
	2.6250–1	1.1446–6	6.2402+4	1.0124–2	2.6113+7	1.8424+7	2.1833+6	5.5026+6	2.5732+3	1.7975+1	1.4827+1	2.0911+0	1.0577+0
	3.0000–1	1.2255–6	5.8287+4	1.2252–2	2.4391+7	1.7248+7	2.0488+6	5.0916+6	2.4649+3	1.7263+1	1.4202+1	1.9402+0	1.1209+0
	3.5000–1	1.3284–6	5.3768+4	1.5198–2	2.2500+7	1.5848+7	1.9318+6	4.7175+6	2.3641+3	1.6682+1	1.3677+1	1.8025+0	1.2024+0
	4.0000–1	1.4246–6	5.0141+4	1.8237–2	2.0982+7	1.4728+7	1.8360+6	4.4158+6	2.2801+3	1.6230+1	1.3256+1	1.6918+0	1.2826+0
	5.0000–1	1.6090–6	4.4393+4	2.4489–2	1.8577+7	1.2867+7	1.7132+6	3.9938+6	2.1677+3	1.5760+1	1.2783+1	1.5365+0	1.4408+0
	6.0000–1	1.7688–6	4.0382+4	3.0881–2	1.6898+7	1.1523+7	1.6339+6	3.7385+6	2.0919+3	1.5534+1	1.2492+1	1.4432+0	1.5988+0
	8.0000–1	2.0471–6	3.4893+4	4.3760–2	1.4601+7	9.6825+6	1.5417+6	3.3750+6	1.9959+3	1.5525+1	1.2300+1	1.3095+0	1.9154+0
	1.0000+0	2.2773–6	3.1366+4	5.6563–2	1.3125+7	8.4596+6	1.4901+6	3.1735+6	1.9394+3	1.5719+1	1.2247+1	1.2362+0	2.2353+0
	1.2500+0	2.5125–6	2.8430+4	7.2218–2	1.1897+7	7.3903+6	1.4586+6	3.0459+6	1.9002+3	1.6222+1	1.2382+1	1.1906+0	2.6486+0
	1.5000+0	2.7176–6	2.6284+4	8.7394–2	1.0999+7	6.6177+6	1.4335+6	2.9454+6	1.8688+3	1.6729+1	1.2518+1	1.1553+0	3.0558+0
	2.0000+0	3.0460–6	2.3450+4	1.1635–1	9.8129+6	5.5594+6	1.4163+6	2.8354+6	1.8359+3	1.7812+1	1.2804+1	1.1159+0	3.8915+0
	3.0000+0	3.5101–6	2.0350+4	1.6927–1	8.5154+6	4.3643+6	1.3939+6	2.7554+6	1.8079+3	2.0028+1	1.3313+1	1.0921+0	5.6225+0
	4.0000+0	3.8093–6	1.8751+4	2.1664–1	7.8464+6	3.7329+6	1.3916+6	2.7202+6	1.7959+3	2.2228+1	1.3729+1	1.0802+0	7.4191+0
	5.0000+0	4.0042–6	1.7839+4	2.5955–1	7.4647+6	3.3421+6	1.3902+6	2.7306+6	1.7894+3	2.4421+1	1.4093+1	1.0865+0	9.2419+0
	6.0000+0	4.1464–6	1.7226+4	2.9874–1	7.2085+6	3.0794+6	1.3891+6	2.7382+6	1.7897+3	2.6638+1	1.4397+1	1.0916+0	1.1149+1
	8.0000+0	4.3443–6	1.6442+4	3.6821–1	6.8803+6	2.7418+6	1.3889+6	2.7478+6	1.7947+3	3.1056+1	1.4895+1	1.0998+0	1.5062+1
	1.0000+1	4.4687–6	1.5984+4	4.2843–1	6.6887+6	2.5440+6	1.3901+6	2.7528+6	1.8024+3	3.5464+1	1.5284+1	1.1062+0	1.9074+1
	1.5000+1	4.6021–6	1.5521+4	5.5126–1	6.4948+6	2.3085+6	1.3925+6	2.7920+6	1.8280+3	4.6442+1	1.5870+1	1.1226+0	2.9449+1
	2.0000+1	4.6429–6	1.5384+4	6.4767–1	6.4377+6	2.2220+6	1.3942+6	2.8196+6	1.8547+3	5.7690+1	1.6346+1	1.1343+0	4.0209+1
	3.0000+1	4.6262–6	1.5440+4	7.9371–1	6.4610+6	2.2060+6	1.3952+6	2.8579+6	1.8972+3	8.0526+1	1.6878+1	1.1511+0	6.2497+1
	4.0000+1	4.6138–6	1.5482+4	9.0279–1	6.4783+6	2.2055+6	1.3962+6	2.8747+6	1.9288+3	1.0380+2	1.7266+1	1.1593+0	8.5377+1
	5.0000+1	4.6124–6	1.5486+4	9.8958–1	6.4804+6	2.2046+6	1.3968+6	2.8770+6	1.9543+3	1.2747+2	1.7568+1	1.1616+0	1.0874+2
	6.0000+1	4.6118–6	1.5488+4	1.0615+0	6.4811+6	2.2039+6	1.3971+6	2.8782+6	1.9754+3	1.5132+2	1.7776+1	1.1635+0	1.3238+2
	8.0000+1	4.6120–6	1.5488+4	1.1762+0	6.4809+6	2.2027+6	1.3974+6	2.8788+6	2.0085+3	1.9946+2	1.8123+1	1.1665+0	1.8017+2
	1.0000+2	4.6133–6	1.5483+4	1.2660+0	6.4791+6	2.2018+6	1.3977+6	2.8776+6	2.0331+3	2.4794+2	1.8422+1	1.1688+0	2.2835+2
	1.5000+2	4.6123–6	1.5487+4	1.4300+0	6.4805+6	2.2001+6	1.3979+6	2.8804+6	2.0757+3	3.6980+2	1.8751+1	1.1701+0	3.4987+2
	2.0000+2	4.6059–6	1.5508+4	1.5468+0	6.4895+6	2.1989+6	1.3980+6	2.8905+6	2.1046+3	4.9233+2	1.9053+1	1.1742+0	4.7211+2

Atomic Weight 252.000												Density 14.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
3.0000+2	4.5992–6	1.5531+4	1.7118+0	6.4990+6	2.1973+6	1.3981+6	2.9014+6	2.1415+3	7.3648+2	1.9474+1	1.1789+0	7.1583+2
4.0000+2	4.5978–6	1.5535+4	1.8290+0	6.5009+6	2.1961+6	1.3981+6	2.9044+6	2.1663+3	9.8109+2	1.9719+1	1.1804+0	9.6019+2
5.0000+2	4.6009–6	1.5525+4	1.9199+0	6.4966+6	2.1952+6	1.3982+6	2.9010+6	2.1854+3	1.2275+3	1.9939+1	1.1792+0	1.2064+3
6.0000+2	4.6006–6	1.5526+4	1.9942+0	6.4969+6	2.1945+6	1.3982+6	2.9021+6	2.2009+3	1.4718+3	2.0108+1	1.1799+0	1.4505+3
8.0000+2	4.6023–6	1.5520+4	2.1115+0	6.4945+6	2.1933+6	1.3982+6	2.9007+6	2.2255+3	1.9646+3	2.0395+1	1.1798+0	1.9430+3
1.0000+3	4.6046–6	1.5512+4	2.2023+0	6.4913+6	2.1924+6	1.3982+6	2.8984+6	2.2453+3	2.4571+3	2.0646+1	1.1794+0	2.4353+3
1.5000+3	4.6080–6	1.5501+4	2.3671+0	6.4865+6	2.1907+6	1.3982+6	2.8952+6	2.2822+3	3.6952+3	2.0883+1	1.1781+0	3.6731+3
2.0000+3	4.6118–6	1.5488+4	2.4839+0	6.4811+6	2.1896+6	1.3982+6	2.8910+6	2.3100+3	4.9254+3	2.1117+1	1.1764+0	4.9031+3
3.0000+3	4.6171–6	1.5470+4	2.6485+0	6.4737+6	2.1879+6	1.3982+6	2.8852+6	2.3501+3	7.3913+3	2.1550+1	1.1740+0	7.3686+3
4.0000+3	4.6222–6	1.5453+4	2.7652+0	6.4666+6	2.1868+6	1.3982+6	2.8792+6	2.3794+3	9.8594+3	2.1772+1	1.1716+0	9.8364+3
5.0000+3	4.6285–6	1.5432+4	2.8556+0	6.4577+6	2.1859+6	1.3982+6	2.8712+6	2.4023+3	1.2353+4	2.1952+1	1.1684+0	1.2330+4
6.0000+3	4.6303–6	1.5426+4	2.9295+0	6.4553+6	2.1851+6	1.3982+6	2.8695+6	2.4190+3	1.4806+4	2.2097+1	1.1677+0	1.4783+4
8.0000+3	4.6342–6	1.5414+4	3.0460+0	6.4499+6	2.1840+6	1.3982+6	2.8652+6	2.4456+3	1.9755+4	2.2387+1	1.1660+0	1.9732+4
1.0000+4	4.6372–6	1.5403+4	3.1363+0	6.4456+6	2.1831+6	1.3982+6	2.8619+6	2.4665+3	2.4750+4	2.2636+1	1.1646+0	2.4726+4
1.5000+4	4.6423–6	1.5386+4	3.3004+0	6.4385+6	2.1814+6	1.3982+6	2.8563+6	2.5064+3	3.7008+4	2.2860+1	1.1624+0	3.6984+4
2.0000+4	4.6463–6	1.5373+4	3.4169+0	6.4330+6	2.1803+6	1.3982+6	2.8520+6	2.5351+3	4.9426+4	2.3083+1	1.1606+0	4.9402+4
3.0000+4	4.6508–6	1.5358+4	3.5811+0	6.4267+6	2.1786+6	1.3982+6	2.8473+6	2.5753+3	7.3976+4	2.3520+1	1.1587+0	7.3951+4
4.0000+4	4.6546–6	1.5346+4	3.6977+0	6.4216+6	2.1775+6	1.3982+6	2.8433+6	2.6042+3	9.8789+4	2.3728+1	1.1571+0	9.8764+4
5.0000+4	4.6599–6	1.5328+4	3.7881+0	6.4142+6	2.1766+6	1.3982+6	2.8368+6	2.6265+3	1.2337+5	2.3898+1	1.1544+0	1.2335+5
6.0000+4	4.6609–6	1.5325+4	3.8620+0	6.4129+6	2.1758+6	1.3982+6	2.8362+6	2.6446+3	1.4793+5	2.4040+1	1.1542+0	1.4791+5
8.0000+4	4.6633–6	1.5317+4	3.9786+0	6.4095+6	2.1747+6	1.3982+6	2.8340+6	2.6734+3	1.9749+5	2.4324+1	1.1533+0	1.9746+5
1.0000+5	4.6655–6	1.5310+4	4.0690+0	6.4066+6	2.1738+6	1.3982+6	2.8319+6	2.6959+3	2.4713+5	2.4593+1	1.1525+0	2.4710+5


July 4, 1991
Atomic Weight 257 000
EEDL Evaluated Electron
Cross Sections
100-Fm
Density 14 000 Grams/cc
Total
Elastic
Elastic (Cutoff)
Ionization
Excitation
Bremsstrahung
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
100-Fm


July 4, 1991
Atomic Weight 257 000
EEDL Evaluated Electron
Energy Deposition
100-Fm
Density 14 000 Grams/cc
Total
Ionization
Excitation
Bremsstrahung
Fluorescence
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
100-Fm


July 4, 1991
Atomic Weight 257.000
EEDL Evaluated Electron
Shell Cross Sections
100-Fm
Density 14.000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Mean Free Path (cm)
Cross Sections (barns)
Incident Photon Energy (MeV)
100-Fm


July 4, 1991
Atomic Weight 257.000
EEDL Evaluated Electron
Energy Deposition
100-Fm
Density 14.000 Grams/cc
Ionization
K Shell
L Shell
M Shell
N Shell
O Shell
P Shell
Q Shell
Energy Deposition (MeV*cm2/gram)
Energy Deposition (MeV/cm)
Incident Photon Energy (MeV)
100-Fm

481

Atomic Weight 257.000 Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	1.0000–5	1.0910–8	6.5471+6		2.7940+9	2.7008+9	8.5928+7	7.3386+6	4.6904+3	2.1010+1	1.9383+1	1.6266+0	3.3269–4
O7	1.0180–5	1.0984–8	6.5032+6		2.7753+9	2.6790+9	8.8327+7	8.0189+6	4.7078+3	2.1833+1	2.0043+1	1.7895+0	3.3847–4
	1.0255–5	1.1010–8	6.4877+6		2.7687+9	2.6700+9	9.0266+7	8.4000+6	4.7150+3	2.2511+1	2.0633+1	1.8783+0	3.4090–4
	1.0404–5	1.1061–8	6.4577+6		2.7559+9	2.6526+9	9.4045+7	9.1954+6	4.7291+3	2.3850+1	2.1785+1	2.0643+0	3.4568–4
	1.0691–5	1.1157–8	6.4021+6		2.7322+9	2.6200+9	1.0124+8	1.0917+7	4.7559+3	2.6467+1	2.3998+1	2.4694+0	3.5498–4
	1.0896–5	1.1225–8	6.3633+6		2.7156+9	2.5975+9	1.0582+8	1.2306+7	4.7748+3	2.8200+1	2.5401+1	2.7985+0	3.6164–4
	1.1230–5	1.1328–8	6.3055+6		2.6909+9	2.5621+9	1.1436+8	1.4429+7	4.8047+3	3.1392+1	2.8082+1	3.3097+0	3.7252–4
	1.1250–5	1.1334–8	6.3019+6		2.6894+9	2.5600+9	1.1481+8	1.4568+7	4.8066+3	3.1568+1	2.8224+1	3.3435+0	3.7319–4
	1.1409–5	1.1385–8	6.2738+6		2.6774+9	2.5437+9	1.1797+8	1.5688+7	4.8206+3	3.2867+1	2.9251+1	3.6154+0	3.7839–4
	1.1701–5	1.1475–8	6.2249+6		2.6565+9	2.5147+9	1.2414+8	1.7649+7	4.8460+3	3.5382+1	3.1284+1	4.0977+0	3.8797–4
O6	1.2290–5	1.1649–8	6.1319+6		2.6168+9	2.4592+9	1.3543+8	2.2193+7	4.8957+3	4.0285+1	3.5054+1	5.2302+0	4.0744–4
	1.2375–5	1.1670–8	6.1206+6		2.6120+9	2.4516+9	1.3755+8	2.2907+7	4.9027+3	4.1200+1	3.5792+1	5.4073+0	4.1025–4
	1.2526–5	1.1709–8	6.1004+6		2.6034+9	2.4381+9	1.4107+8	2.4223+7	4.9150+3	4.2747+1	3.7012+1	5.7349+0	4.1527–4
	1.2703–5	1.1752–8	6.0779+6		2.5938+9	2.4226+9	1.4540+8	2.5845+7	4.9294+3	4.4691+1	3.8550+1	6.1399+0	4.2117–4
	1.3125–5	1.1853–8	6.0264+6		2.5718+9	2.3868+9	1.5491+8	3.0048+7	4.9630+3	4.9121+1	4.1924+1	7.1969+0	4.3529–4
	1.3144–5	1.1857–8	6.0241+6		2.5708+9	2.3853+9	1.5533+8	3.0251+7	4.9645+3	4.9328+1	4.2079+1	7.2483+0	4.3593–4
	1.3277–5	1.1888–8	6.0083+6		2.5641+9	2.3744+9	1.5804+8	3.1687+7	4.9749+3	5.0710+1	4.3098+1	7.6117+0	4.4039–4
	1.3333–5	1.1902–8	6.0016+6		2.5612+9	2.3699+9	1.5906+8	3.2307+7	4.9792+3	5.1249+1	4.3480+1	7.7689+0	4.4227–4
	1.3708–5	1.1989–8	5.9580+6		2.5426+9	2.3402+9	1.6617+8	3.6288+7	5.0080+3	5.4957+1	4.6167+1	8.7889+0	4.5491–4
	1.4072–5	1.2068–8	5.9188+6		2.5259+9	2.3125+9	1.7295+8	4.0502+7	5.0354+3	5.8629+1	4.8751+1	9.8776+0	4.6724–4
	1.4354–5	1.2126–8	5.8903+6		2.5137+9	2.2917+9	1.7800+8	4.4011+7	5.0562+3	6.1503+1	5.0712+1	1.0790+1	4.7682–4
	1.5000–5	1.2249–8	5.8314+6		2.4886+9	2.2463+9	1.8933+8	5.2929+7	5.1026+3	6.8299+1	5.5165+1	1.3134+1	4.9889–4
	1.6250–5	1.2469–8	5.7286+6		2.4447+9	2.1661+9	2.0703+8	7.1573+7	5.1882+3	8.0539+1	6.2518+1	1.8021+1	5.4208–4
	1.7500–5	1.2639–8	5.6512+6		2.4117+9	2.0944+9	2.2269+8	9.4644+7	5.2687+3	9.3513+1	6.9339+1	2.4173+1	5.8585–4
	1.8125–5	1.2716–8	5.6172+6		2.3972+9	2.0612+9	2.2954+8	1.0639+8	5.3072+3	9.9954+1	7.2588+1	2.7366+1	6.0794–4
	2.0000–5	1.2882–8	5.5449+6		2.3663+9	1.9711+9	2.4752+8	1.4772+8	5.4169+3	1.2039+2	8.1593+1	3.8799+1	6.7503–4
	2.2500–5	1.3020–8	5.4859+6		2.3412+9	1.8684+9	2.6392+8	2.0887+8	5.5397+3	1.4671+2	9.1049+1	5.5658+1	7.5964–4
P3	2.5770–5	1.3039–8	5.4779+6		2.3377+9	1.7566+9	2.8336+8	2.9772+8	5.6846+3	1.8410+2	1.0328+2	8.0819+1	8.7255–4
	2.6282–5	1.3039–8	5.4783+6		2.3379+9	1.7410+9	2.8583+8	3.1107+8	5.7056+3	1.8972+2	1.0513+2	8.4584+1	8.9024–4
	2.6515–5	1.3037–8	5.4791+6		2.3382+9	1.7341+9	2.8696+8	3.1723+8	5.7150+3	1.9231+2	1.0598+2	8.6326+1	8.9829–4
	2.6950–5	1.3031–8	5.4816+6		2.3393+9	1.7213+9	2.8910+8	3.2896+8	5.7325+3	1.9727+2	1.0762+2	8.9646+1	9.1340–4
	2.7332–5	1.3023–8	5.4849+6		2.3407+9	1.7103+9	2.9100+8	3.3942+8	5.7476+3	2.0170+2	1.0909+2	9.2612+1	9.2666–4
	2.7999–5	1.3004–8	5.4929+6		2.3442+9	1.6917+9	2.9434+8	3.5815+8	5.7737+3	2.0965+2	1.1171+2	9.7937+1	9.4993–4
	2.8999–5	1.2963–8	5.5103+6		2.3516+9	1.6649+9	2.9938+8	3.8728+8	5.8118+3	2.2200+2	1.1575+2	1.0625+2	9.8499–4
	3.0000–5	1.2919–8	5.5291+6		2.3596+9	1.6394+9	3.0442+8	4.1574+8	5.8489+3	2.3431+2	1.1988+2	1.1443+2	1.0203–3
	3.2500–5	1.2840–8	5.5628+6		2.3740+9	1.5809+9	3.1319+8	4.7986+8	5.9373+3	2.6130+2	1.2856+2	1.3274+2	1.1092–3
	3.5000–5	1.2712–8	5.6191+6		2.3980+9	1.5286+9	3.2139+8	5.4802+8	6.0203+3	2.8942+2	1.3708+2	1.5234+2	1.1992–3
	3.6250–5	1.2673–8	5.6361+6		2.4053+9	1.5044+9	3.2566+8	5.7518+8	6.0600+3	3.0191+2	1.4162+2	1.6028+2	1.2446–3
	4.0000–5	1.2521–8	5.7048+6		2.4346+9	1.4387+9	3.3712+8	6.5878+8	6.1729+3	3.3939+2	1.5446+2	1.8493+2	1.3824–3
P2	4.1270–5	1.2480–8	5.7234+6		2.4425+9	1.4184+9	3.3925+8	6.8489+8	6.2091+3	3.5034+2	1.5783+2	1.9251+2	1.4296–3
	4.1816–5	1.2471–8	5.7278+6		2.4444+9	1.4099+9	3.4021+8	6.9422+8	6.2238+3	3.5460+2	1.5935+2	1.9525+2	1.4492–3
	4.2839–5	1.2450–8	5.7370+6		2.4483+9	1.3946+9	3.4202+8	7.1173+8	6.2509+3	3.6262+2	1.6222+2	2.0039+2	1.4860–3
	4.4629–5	1.2409–8	5.7562+6		2.4565+9	1.3689+9	3.4520+8	7.4241+8	6.2971+3	3.7676+2	1.6733+2	2.0943+2	1.5508–3
	4.5000–5	1.2400–8	5.7606+6		2.4584+9	1.3637+9	3.4586+8	7.4877+8	6.3065+3	3.7970+2	1.6839+2	2.1131+2	1.5643–3
	4.6979–5	1.2346–8	5.7856+6		2.4691+9	1.3374+9	3.4898+8	7.8272+8	6.3555+3	3.9508+2	1.7372+2	2.2135+2	1.6365–3
	4.8489–5	1.2323–8	5.7963+6		2.4736+9	1.3183+9	3.5143+8	8.0392+8	6.3918+3	4.0566+2	1.7794+2	2.2771+2	1.6919–3
	5.0000–5	1.2297–8	5.8088+6		2.4790+9	1.3001+9	3.5391+8	8.2501+8	6.4272+3	4.1629+2	1.8223+2	2.3406+2	1.7476–3
	5.5000–5	1.2290–8	5.8119+6		2.4803+9	1.2450+9	3.5887+8	8.7643+8	6.5371+3	4.4434+2	1.9431+2	2.5002+2	1.9320–3
	6.0000–5	1.2260–8	5.8261+6		2.4863+9	1.1968+9	3.6336+8	9.2618+8	6.6390+3	4.7182+2	2.0615+2	2.6567+2	2.1190–3
P1	6.4850–5	1.2331–8	5.7925+6		2.4720+9	1.1553+9	3.6457+8	9.5215+8	6.7314+3	4.8899+2	2.1518+2	2.7381+2	2.3029–3
	6.5797–5	1.2345–8	5.7862+6		2.4693+9	1.1477+9	3.6484+8	9.5677+8	6.7488+3	4.9226+2	2.1698+2	2.7529+2	2.3391–3
	6.7572–5	1.2368–8	5.7751+6		2.4646+9	1.1339+9	3.6536+8	9.6530+8	6.7808+3	4.9839+2	2.2037+2	2.7802+2	2.4071–3
	7.0000–5	1.2398–8	5.7614+6		2.4587+9	1.1159+9	3.6612+8	9.7672+8	6.8235+3	5.0676+2	2.2506+2	2.8169+2	2.5005–3
	7.0679–5	1.2406–8	5.7577+6		2.4572+9	1.1110+9	3.6628+8	9.7987+8	6.8352+3	5.0904+2	2.2633+2	2.8270+2	2.5268–3
	7.2500–5	1.2426–8	5.7485+6		2.4532+9	1.0982+9	3.6674+8	9.8822+8	6.8662+3	5.1514+2	2.2973+2	2.8540+2	2.5974–3
	7.3009–5	1.2431–8	5.7460+6		2.4522+9	1.0948+9	3.6685+8	9.9053+8	6.8748+3	5.1682+2	2.3067+2	2.8615+2	2.6172–3
	7.5340–5	1.2454–8	5.7354+6		2.4476+9	1.0793+9	3.6740+8	1.0010+9	6.9133+3	5.2449+2	2.3495+2	2.8954+2	2.7080–3
	7.6505–5	1.2485–8	5.7210+6		2.4415+9	1.0718+9	3.6769+8	1.0020+9	6.9322+3	5.2716+2	2.3711+2	2.9004+2	2.7536–3
	8.0000–5	1.2575–8	5.6802+6		2.4241+9	1.0502+9	3.6860+8	1.0052+9	6.9875+3	5.3517+2	2.4365+2	2.9152+2	2.8910–3
	9.0000–5	1.2839–8	5.5634+6		2.3742+9	9.9555+8	3.6638+8	1.0123+9	7.1366+3	5.5259+2	2.5717+2	2.9542+2	3.2913–3
	1.0000–4	1.3069–8	5.4656+6	0.0000+0	2.3325+9	9.4905+8	3.6480+8	1.0186+9	7.2727+3	5.7005+2	2.7091+2	2.9913+2	3.6991–3
	1.1250–4	1.3450–8	5.3107+6	2.1764–8	2.2664+9	8.9972+8	3.5816+8	1.0085+9	7.4291+3	5.7865+2	2.8124+2	2.9741+2	4.2206–3
	1.3125–4	1.3953–8	5.1191+6	5.3782–8	2.1846+9	8.3900+8	3.5022+8	9.9538+8	7.6390+3	5.9262+2	2.9721+2	2.9540+2	5.0215–3
O5	1.3929–4	1.4148–8	5.0486+6	6.7276–8	2.1545+9	8.1669+8	3.4744+8	9.9037+8	7.7215+3	5.9900+2	3.0428+2	2.9471+2	5.3712–3
	1.4197–4	1.4231–8	5.0193+6	7.1743–8	2.1420+9	8.0968+8	3.4635+8	9.8601+8	7.7481+3	6.0002+2	3.0629+2	2.9372+2	5.4884–3
	1.4598–4	1.4352–8	4.9769+6	7.8427–8	2.1239+9	7.9950+8	3.4478+8	9.7965+8	7.7872+3	6.0162+2	3.0932+2	2.9229+2	5.6650–3
	1.5000–4	1.4471–8	4.9361+6	8.5094–8	2.1065+9	7.8973+8	3.4327+8	9.7351+8	7.8255+3	6.0329+2	3.1237+2	2.9092+2	5.8424–3
O4	1.5389–4	1.4585–8	4.8974+6	9.1540–8	2.0900+9	7.8062+8	3.4102+8	9.6837+8	7.8618+3	6.0354+2	3.1392+2	2.8962+2	6.0150–3
	1.5677–4	1.4670–8	4.8689+6	9.6315–8	2.0779+9	7.7408+8	3.3930+8	9.6447+8	7.8886+3	6.0354+2	3.1489+2	2.8865+2	6.1467–3
	1.6217–4	1.4827–8	4.8175+6	1.0527–7	2.0559+9	7.6228+8	3.3623+8	9.5740+8	7.9377+3	6.0370+2	3.1679+2	2.8691+2	6.3946–3
	1.6250–4	1.4836–8	4.8145+6	1.0580–7	2.0546+9	7.6159+8	3.3605+8	9.5699+8	7.9406+3	6.0372+2	3.1691+2	2.8681+2	6.4096–3
	1.7163–4	1.5092–8	4.7330+6	1.2092–7	2.0199+9	7.4295+8	3.3121+8	9.4570+8	8.0205+3	6.0427+2	3.2022+2	2.8405+2	6.8322–3
	1.7500–4	1.5183–8	4.7045+6	1.2650–7	2.0077+9	7.3643+8	3.2953+8	9.4172+8	8.0491+3	6.0457+2	3.2149+2	2.8308+2	6.9891–3
	1.8125–4	1.5349–8	4.6535+6	1.3683–7	1.9859+9	7.2481+8	3.2655+8	9.3457+8	8.1010+3	6.0528+2	3.2392+2	2.8135+2	7.2817–3
	1.8582–4	1.5468–8	4.6178+6	1.4437–7	1.9707+9	7.1669+8	3.2446+8	9.2953+8	8.1380+3	6.0587+2	3.2572+2	2.8014+2	7.4966–3
	2.0000–4	1.5823–8	4.5143+6	1.6773–7	1.9265+9	6.9319+8	3.1850+8	9.1481+8	8.2484+3	6.0819+2	3.3154+2	2.7664+2	8.1703–3
	2.2500–4	1.6529–8	4.3215+6	2.0912–7	1.8442+9	6.5715+8	3.0517+8	8.8189+8	8.4341+3	5.9983+2	3.3203+2	2.6780+2	9.4414–3
	2.6250–4	1.7495–8	4.0828+6	2.7208–7	1.7424+9	6.1281+8	2.8897+8	8.4060+8	8.6835+3	5.9146+2	3.3460+2	2.5685+2	1.1399–2
O3	2.6917–4	1.7657–8	4.0454+6	2.8337–7	1.7264+9	6.0588+8	2.8646+8	8.3406+8	8.7248+3	5.9035+2	3.3521+2	2.5513+2	1.1754–2
	2.7302–4	1.7757–8	4.0226+6	2.8991–7	1.7167+9	6.0199+8	2.8484+8	8.2985+8	8.7482+3	5.8905+2	3.3505+2	2.5399+2	1.1959–2

Atomic Weight 257.000													Density 14.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
2.7977–4	1.7930–8	3.9838+6	3.0138–7	1.7001+9	5.9536+8	2.8209+8	8.2268+8	8.7887+3	5.8689+2	3.3484+2	2.5204+2	1.2320–2
2.8988–4	1.8184–8	3.9281+6	3.1866–7	1.6764+9	5.8586+8	2.7816+8	8.1234+8	8.8479+3	5.8388+2	3.3463+2	2.4924+2	1.2865–2
3.0000–4	1.8433–8	3.8751+6	3.3602–7	1.6537+9	5.7682+8	2.7444+8	8.0248+8	8.9054+3	5.8115+2	3.3456+2	2.4657+2	1.3413–2
3.2500–4	1.9052–8	3.7491+6	3.7945–7	1.6000+9	5.5631+8	2.6427+8	7.7939+8	9.0412+3	5.7016+2	3.3004+2	2.4010+2	1.4783–2
3.5000–4	1.9643–8	3.6364+6	4.2367–7	1.5518+9	5.3796+8	2.5527+8	7.5860+8	9.1687+3	5.6071+2	3.2639+2	2.3431+2	1.6173–2
3.6250–4	1.9929–8	3.5842+6	4.4605–7	1.5296+9	5.2949+8	2.5114+8	7.4896+8	9.2297+3	5.5647+2	3.2483+2	2.3163+2	1.6875–2
O2 3.6806–4	2.0054–8	3.5618+6	4.5605–7	1.5201+9	5.2586+8	2.4937+8	7.4481+8	9.2563+3	5.5467+2	3.2418+2	2.3048+2	1.7189–2
3.7205–4	2.0150–8	3.5449+6	4.6326–7	1.5128+9	5.2330+8	2.4811+8	7.4140+8	9.2758+3	5.5326+2	3.2370+2	2.2954+2	1.7423–2
3.7904–4	2.0316–8	3.5159+6	4.7592–7	1.5005+9	5.1892+8	2.4596+8	7.3557+8	9.3093+3	5.5086+2	3.2292+2	2.2793+2	1.7833–2
3.8952–4	2.0561–8	3.4739+6	4.9500–7	1.4825+9	5.1256+8	2.4286+8	7.2710+8	9.3588+3	5.4743+2	3.2182+2	2.2559+2	1.8452–2
4.0000–4	2.0803–8	3.4335+6	5.1420–7	1.4653+9	5.0644+8	2.3988+8	7.1895+8	9.4072+3	5.4420+2	3.2083+2	2.2335+2	1.9074–2
4.2500–4	2.1363–8	3.3436+6	5.6050–7	1.4269+9	4.9275+8	2.3286+8	7.0130+8	9.5216+3	5.3588+2	3.1758+2	2.1829+2	2.0616–2
O1 4.4611–4	2.1820–8	3.2735+6	6.0012–7	1.3970+9	4.8207+8	2.2743+8	6.8749+8	9.6140+3	5.2958+2	3.1522+2	2.1434+2	2.1934–2
4.5285–4	2.1987–8	3.2487+6	6.1287–7	1.3864+9	4.7881+8	2.2578+8	6.8180+8	9.6427+3	5.2727+2	3.1455+2	2.1269+2	2.2357–2
4.6250–4	2.2224–8	3.2141+6	6.3124–7	1.3716+9	4.7427+8	2.2349+8	6.7387+8	9.6834+3	5.2406+2	3.1364+2	2.1040+2	2.2966–2
4.6463–4	2.2276–8	3.2066+6	6.3531–7	1.3684+9	4.7328+8	2.2300+8	6.7215+8	9.6923+3	5.2337+2	3.1345+2	2.0990+2	2.3101–2
4.8232–4	2.2702–8	3.1464+6	6.6928–7	1.3427+9	4.6536+8	2.1902+8	6.5837+8	9.7647+3	5.1791+2	3.1197+2	2.0592+2	2.4224–2
5.0000–4	2.3120–8	3.0895+6	7.0359–7	1.3185+9	4.5784+8	2.1526+8	6.4536+8	9.8350+3	5.1285+2	3.1067+2	2.0216+2	2.5356–2
5.2500–4	2.3710–8	3.0126+6	7.5275–7	1.2857+9	4.4785+8	2.0967+8	6.2811+8	9.9292+3	5.0425+2	3.0714+2	1.9708+2	2.6970–2
5.5000–4	2.4286–8	2.9411+6	8.0272–7	1.2551+9	4.3853+8	2.0449+8	6.1210+8	1.0020+4	4.9640+2	3.0400+2	1.9237+2	2.8600–2
5.6250–4	2.4570–8	2.9072+6	8.2799–7	1.2407+9	4.3410+8	2.0205+8	6.0452+8	1.0064+4	4.9272+2	3.0255+2	1.9014+2	2.9421–2
N7 5.8162–4	2.4997–8	2.8575+6	8.6701–7	1.2195+9	4.2759+8	1.9847+8	5.9340+8	1.0130+4	4.8740+2	3.0049+2	1.8688+2	3.0683–2
5.9081–4	2.5201–8	2.8343+6	8.8591–7	1.2096+9	4.2457+8	1.9681+8	5.8819+8	1.0160+4	4.8498+2	2.9959+2	1.8536+2	3.1292–2
6.0000–4	2.5404–8	2.8117+6	9.0490–7	1.1999+9	4.2162+8	1.9520+8	5.8310+8	1.0189+4	4.8264+2	2.9873+2	1.8388+2	3.1903–2
N6 6.0052–4	2.5415–8	2.8105+6	9.0598–7	1.1994+9	4.2145+8	1.9510+8	5.8282+8	1.0191+4	4.8248+2	2.9865+2	1.8380+2	3.1938–2
6.1299–4	2.5711–8	2.7782+6	9.3193–7	1.1856+9	4.1756+8	1.9277+8	5.7528+8	1.0226+4	4.7839+2	2.9682+2	1.8154+2	3.2733–2
6.2500–4	2.5993–8	2.7480+6	9.5714–7	1.1727+9	4.1391+8	1.9059+8	5.6825+8	1.0260+4	4.7460+2	2.9513+2	1.7943+2	3.3501–2
6.3636–4	2.6257–8	2.7204+6	9.8117–7	1.1609+9	4.1055+8	1.8859+8	5.6179+8	1.0291+4	4.7113+2	2.9360+2	1.7750+2	3.4230–2
6.5000–4	2.6571–8	2.6882+6	1.0102–6	1.1472+9	4.0663+8	1.8627+8	5.5429+8	1.0328+4	4.6712+2	2.9183+2	1.7525+2	3.5108–2
6.6875–4	2.6999–8	2.6456+6	1.0506–6	1.1290+9	4.0144+8	1.8320+8	5.4439+8	1.0378+4	4.6187+2	2.8954+2	1.7229+2	3.6321–2
7.0000–4	2.7699–8	2.5787+6	1.1189–6	1.1005+9	3.9324+8	1.7840+8	5.2886+8	1.0458+4	4.5372+2	2.8604+2	1.6764+2	3.8354–2
7.0795–4	2.7875–8	2.5625+6	1.1364–6	1.0935+9	3.9123+8	1.7723+8	5.2509+8	1.0477+4	4.5176+2	2.8520+2	1.6651+2	3.8874–2
7.2500–4	2.8249–8	2.5285+6	1.1743–6	1.0791+9	3.8705+8	1.7480+8	5.1723+8	1.0520+4	4.4768+2	2.8348+2	1.6417+2	3.9992–2
7.3438–4	2.8453–8	2.5104+6	1.1953–6	1.0713+9	3.8480+8	1.7350+8	5.1303+8	1.0542+4	4.4552+2	2.8257+2	1.6291+2	4.0609–2
7.5398–4	2.8875–8	2.4737+6	1.2395–6	1.0557+9	3.8025+8	1.7087+8	5.0454+8	1.0589+4	4.4118+2	2.8077+2	1.6038+2	4.1903–2
8.0000–4	2.9848–8	2.3931+6	1.3450–6	1.0213+9	3.7020+8	1.6512+8	4.8594+8	1.0696+4	4.3187+2	2.7700+2	1.5483+2	4.4964–2
8.2500–4	3.0388–8	2.3506+6	1.4033–6	1.0031+9	3.6508+8	1.6196+8	4.7607+8	1.0734+4	4.2606+2	2.7417+2	1.5184+2	4.6425–2
8.5000–4	3.0921–8	2.3101+6	1.4623–6	9.8584+8	3.6019+8	1.5896+8	4.6668+8	1.0771+4	4.2059+2	2.7155+2	1.4900+2	4.7891–2
9.1250–4	3.2223–8	2.2167+6	1.6131–6	9.4600+8	3.4882+8	1.5207+8	4.4510+8	1.0860+4	4.0830+2	2.6578+2	1.4247+2	5.1575–2
9.2500–4	3.2478–8	2.1993+6	1.6438–6	9.3856+8	3.4668+8	1.5078+8	4.4108+8	1.0877+4	4.0604+2	2.6474+2	1.4125+2	5.2315–2
N5 9.9436–4	3.3870–8	2.1089+6	1.8171–6	9.0000+8	3.3553+8	1.4415+8	4.2031+8	1.0969+4	3.9458+2	2.5954+2	1.3498+2	5.6441–2
1.0000–3	3.3992–8	2.1014+6	1.8314–6	8.9677+8	3.3468+8	1.4365+8	4.1844+8	1.0976+4	3.9364+2	2.5917+2	1.3441+2	5.6778–2
1.0313–3	3.4663–8	2.0606+6	1.9114–6	8.7940+8	3.3004+8	1.4075+8	4.0859+8	1.0991+4	3.8776+2	2.5634+2	1.3136+2	5.8214–2
N4 1.0618–3	3.5312–8	2.0228+6	1.9907–6	8.6324+8	3.2570+8	1.3807+8	3.9947+8	1.1005+4	3.8236+2	2.5376+2	1.2854+2	5.9620–2
1.0755–3	3.5602–8	2.0063+6	2.0267–6	8.5620+8	3.2381+8	1.3689+8	3.9550+8	1.1012+4	3.7995+2	2.5258+2	1.2731+2	6.0250–2
1.1020–3	3.6161–8	1.9753+6	2.0969–6	8.4298+8	3.2025+8	1.3467+8	3.8805+8	1.1024+4	3.7546+2	2.5039+2	1.2501+2	6.1472–2
1.1155–3	3.6442–8	1.9601+6	2.1329–6	8.3648+8	3.1850+8	1.3358+8	3.8440+8	1.1030+4	3.7328+2	2.4933+2	1.2388+2	6.2092–2
1.1250–3	3.6640–8	1.9495+6	2.1584–6	8.3196+8	3.1727+8	1.3282+8	3.8186+8	1.1034+4	3.7176+2	2.4860+2	1.2310+2	6.2531–2
1.1518–3	3.7193–8	1.9205+6	2.2308–6	8.1958+8	3.1391+8	1.3075+8	3.7492+8	1.1046+4	3.6757+2	2.4655+2	1.2096+2	6.3767–2
1.1953–3	3.8082–8	1.8756+6	2.3503–6	8.0045+8	3.0867+8	1.2754+8	3.6423+8	1.1064+4	3.6118+2	2.4346+2	1.1766+2	6.5777–2
1.2116–3	3.8412–8	1.8596+6	2.3956–6	7.9358+8	3.0678+8	1.2639+8	3.6040+8	1.1071+4	3.5892+2	2.4237+2	1.1647+2	6.6531–2
1.2188–3	3.8555–8	1.8526+6	2.4155–6	7.9062+8	3.0596+8	1.2590+8	3.5875+8	1.1074+4	3.5794+2	2.4191+2	1.1597+2	6.6861–2
1.2500–3	3.9181–8	1.8231+6	2.5033–6	7.7800+8	3.0247+8	1.2379+8	3.5174+8	1.1086+4	3.5375+2	2.3988+2	1.1380+2	6.8306–2
1.2715–3	3.9607–8	1.8034+6	2.5643–6	7.6964+8	3.0014+8	1.2239+8	3.4710+8	1.1095+4	3.5099+2	2.3855+2	1.1237+2	6.9301–2
1.3125–3	4.0412–8	1.7675+6	2.6820–6	7.5429+8	2.9585+8	1.1982+8	3.3861+8	1.1111+4	3.4599+2	2.3617+2	1.0975+2	7.1202–2
N3 1.3596–3	4.1325–8	1.7285+6	2.8192–6	7.3764+8	2.9116+8	1.1704+8	3.2943+8	1.1128+4	3.4064+2	2.3365+2	1.0692+2	7.3386–2
1.3857–3	4.1829–8	1.7076+6	2.8963–6	7.2874+8	2.8866+8	1.1552+8	3.2455+8	1.1138+4	3.3754+2	2.3205+2	1.0541+2	7.4600–2
1.3947–3	4.2002–8	1.7006+6	2.9229–6	7.2575+8	2.8781+8	1.1501+8	3.2292+8	1.1141+4	3.3650+2	2.3152+2	1.0491+2	7.5016–2
1.4473–3	4.3004–8	1.6610+6	3.0807–6	7.0883+8	2.8302+8	1.1212+8	3.1368+8	1.1159+4	3.3068+2	2.2855+2	1.0205+2	7.7464–2
1.5000–3	4.3992–8	1.6237+6	3.2412–6	6.9292+8	2.7847+8	1.0941+8	3.0503+8	1.1177+4	3.2529+2	2.2583+2	9.9377+1	7.9915–2
1.5625–3	4.5152–8	1.5820+6	3.4354–6	6.7512+8	2.7336+8	1.0627+8	2.9548+8	1.1198+4	3.1852+2	2.2205+2	9.6394+1	8.2828–2
1.6719–3	4.7137–8	1.5154+6	3.7846–6	6.4669+8	2.6510+8	1.0126+8	2.8031+8	1.1232+4	3.0791+2	2.1616+2	9.1656+1	8.7937–2
N2 1.7390–3	4.8329–8	1.4780+6	4.0047–6	6.3074+8	2.6041+8	9.8468+7	2.7185+8	1.1252+4	3.0206+2	2.1296+2	8.9014+1	9.1078–2
1.7716–3	4.8903–8	1.4606+6	4.1133–6	6.2333+8	2.5823+8	9.7145+7	2.6794+8	1.1261+4	2.9920+2	2.1131+2	8.7789+1	9.2607–2
1.8287–3	4.9898–8	1.4315+6	4.3056–6	6.1090+8	2.5454+8	9.4931+7	2.6142+8	1.1277+4	2.9442+2	2.0859+2	8.5738+1	9.5284–2
1.8359–3	5.0023–8	1.4279+6	4.3302–6	6.0937+8	2.5409+8	9.4660+7	2.6062+8	1.1279+4	2.9384+2	2.0826+2	8.5487+1	9.5623–2
1.9144–3	5.1367–8	1.3905+6	4.5998–6	5.9343+8	2.4931+8	9.1829+7	2.5227+8	1.1300+4	2.8780+2	2.0483+2	8.2868+1	9.9306–2
N1 1.9258–3	5.1562–8	1.3853+6	4.6396–6	5.9119+8	2.4864+8	9.1432+7	2.5111+8	1.1303+4	2.8696+2	2.0436+2	8.2502+1	9.9844–2
1.9629–3	5.2191–8	1.3686+6	4.7695–6	5.8406+8	2.4650+8	9.0174+7	2.4738+8	1.1313+4	2.8429+2	2.0285+2	8.1338+1	1.0159–1
2.0000–3	5.2815–8	1.3524+6	4.9006–6	5.7716+8	2.4441+8	8.8957+7	2.4378+8	1.1323+4	2.8173+2	2.0141+2	8.0212+1	1.0334–1
2.0625–3	5.3917–8	1.3248+6	5.1245–6	5.6536+8	2.4093+8	8.6898+7	2.3752+8	1.1312+4	2.7671+2	1.9839+2	7.8219+1	1.0578–1
2.1250–3	5.5007–8	1.2985+6	5.3523–6	5.5416+8	2.3760+8	8.4948+7	2.3160+8	1.1301+4	2.7199+2	1.9555+2	7.6335+1	1.0823–1
2.1797–3	5.5951–8	1.2766+6	5.5548–6	5.4481+8	2.3480+8	8.3324+7	2.2668+8	1.1291+4	2.6808+2	1.9320+2	7.4769+1	1.1037–1
2.2500–3	5.7150–8	1.2498+6	5.8194–6	5.3338+8	2.3136+8	8.1339+7	2.2067+8	1.1280+4	2.6332+2	1.9035+2	7.2859+1	1.1312–1
2.3438–3	5.8728–8	1.2163+6	6.1796–6	5.1905+8	2.2700+8	7.8858+7	2.1318+8	1.1265+4	2.5739+2	1.8680+2	7.0477+1	1.1678–1
2.3848–3	5.9411–8	1.2023+6	6.3397–6	5.1309+8	2.2517+8	7.7827+7	2.1008+8	1.1259+4	2.5494+2	1.8533+2	6.9490+1	1.1838–1
2.5000–3	6.1304–8	1.1652+6	6.7975–6	4.9724+8	2.2027+8	7.5093+7	2.0186+8	1.1242+4	2.4849+2	1.8149+2	6.6877+1	1.2287–1
2.5386–3	6.1931–8	1.1534+6	6.9534–6	4.9221+8	2.1871+8	7.4225+7	1.9926+8	1.1236+4	2.4641+2	1.8024+2	6.6052+1	1.2437–1
2.6250–3	6.3321–8	1.1280+6	7.3073–6	4.8140+8	2.1532+8	7.2364+7	1.9370+8	1.1224+4	2.4198+2	1.7757+2	6.4284+1	1.2774–1
2.6719–3	6.4068–8	1.1149+6	7.5020–6	4.7579+8	2.1355+8	7.1400+7	1.9082+8	1.1218+4	2.3969+2	1.7619+2	6.3369+1	1.2956–1

Atomic Weight 257.000 — Density 14.000 Grams/cc

	Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
	MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
	2.7693–3	6.5604–8	1.0888+6	7.9123–6	4.6465+8	2.1002+8	6.9488+7	1.8513+8	1.1205+4	2.3517+2	1.7347+2	6.1561+1	1.3335–1
	3.0000–3	6.9158–8	1.0328+6	8.9137–6	4.4077+8	2.0233+8	6.5405+7	1.7302+8	1.1176+4	2.2564+2	1.6778+2	5.7714+1	1.4231–1
	3.5000–3	7.6481–8	9.3394+5	1.1230–5	3.9857+8	1.8800+8	5.7899+7	1.5267+8	1.1006+4	2.0641+2	1.5508+2	5.1173+1	1.5865–1
	4.0000–3	8.3401–8	8.5645+5	1.3742–5	3.6550+8	1.7640+8	5.2108+7	1.3698+8	1.0862+4	1.9178+2	1.4547+2	4.6138+1	1.7482–1
M5	4.4927–3	9.0015–8	7.9352+5	1.6402–5	3.3864+8	1.6648+8	4.7427+7	1.2472+8	1.0719+4	1.7892+2	1.3658+2	4.2148+1	1.9001–1
	4.7463–3	9.3326–8	7.6537+5	1.7842–5	3.2663+8	1.6199+8	4.5365+7	1.1927+8	1.0652+4	1.7330+2	1.3272+2	4.0384+1	1.9778–1
M4	4.7608–3	9.3512–8	7.6384+5	1.7925–5	3.2598+8	1.6174+8	4.5253+7	1.1897+8	1.0648+4	1.7300+2	1.3251+2	4.0288+1	1.9822–1
	4.8206–3	9.4284–8	7.5759+5	1.8272–5	3.2331+8	1.6074+8	4.4798+7	1.1776+8	1.0633+4	1.7176+2	1.3166+2	3.9899+1	2.0005–1
	5.0000–3	9.6576–8	7.3961+5	1.9328–5	3.1564+8	1.5784+8	4.3494+7	1.1429+8	1.0589+4	1.6824+2	1.2925+2	3.8783+1	2.0551–1
	5.2500–3	9.9727–8	7.1624+5	2.0836–5	3.0566+8	1.5398+8	4.1786+7	1.0988+8	1.0492+4	1.6338+2	1.2583+2	3.7336+1	2.1159–1
M3	5.3926–3	1.0150–7	7.0374+5	2.1715–5	3.0033+8	1.5191+8	4.0877+7	1.0753+8	1.0439+4	1.6080+2	1.2402+2	3.6565+1	2.1505–1
	5.4685–3	1.0244–7	6.9729+5	2.2189–5	2.9757+8	1.5084+8	4.0411+7	1.0632+8	1.0412+4	1.5948+2	1.2310+2	3.6169+1	2.1688–1
	5.6014–3	1.0407–7	6.8635+5	2.3028–5	2.9290+8	1.4901+8	3.9623+7	1.0426+8	1.0365+4	1.5726+2	1.2154+2	3.5499+1	2.2008–1
	5.8007–3	1.0649–7	6.7074+5	2.4309–5	2.8624+8	1.4639+8	3.8504+7	1.0134+8	1.0297+4	1.5412+2	1.1935+2	3.4546+1	2.2487–1
	6.0000–3	1.0888–7	6.5602+5	2.5614–5	2.7996+8	1.4391+8	3.7452+7	9.8592+7	1.0232+4	1.5119+2	1.1731+2	3.3652+1	2.2963–1
	6.5000–3	1.1477–7	6.2234+5	2.9003–5	2.6559+8	1.3812+8	3.5051+7	9.2404+7	1.0079+4	1.4393+2	1.1208+2	3.1617+1	2.4150–1
M2	6.7840–3	1.1804–7	6.0510+5	3.1002–5	2.5823+8	1.3513+8	3.3832+7	8.9259+7	9.9983+3	1.4027+2	1.0943+2	3.0583+1	2.4818–1
	6.8600–3	1.1891–7	6.0067+5	3.1546–5	2.5634+8	1.3436+8	3.3521+7	8.8456+7	9.9758+3	1.3932+2	1.0875+2	3.0319+1	2.4988–1
	7.0000–3	1.2051–7	5.9273+5	3.2557–5	2.5295+8	1.3296+8	3.2964+7	8.7017+7	9.9352+3	1.3764+2	1.0754+2	2.9846+1	2.5300–1
	7.0025–3	1.2054–7	5.9259+5	3.2575–5	2.5289+8	1.3294+8	3.2954+7	8.6992+7	9.9345+3	1.3761+2	1.0752+2	2.9838+1	2.5305–1
M1	7.1797–3	1.2254–7	5.8292+5	3.3872–5	2.4877+8	1.3123+8	3.2278+7	8.5245+7	9.8844+3	1.3556+2	1.0604+2	2.9263+1	2.5699–1
	7.2500–3	1.2332–7	5.7919+5	3.4392–5	2.4718+8	1.3057+8	3.2018+7	8.4573+7	9.8614+3	1.3477+2	1.0547+2	2.9042+1	2.5834–1
	7.2519–3	1.2335–7	5.7909+5	3.4406–5	2.4713+8	1.3056+8	3.2011+7	8.4556+7	9.8607+3	1.3475+2	1.0545+2	2.9036+1	2.5837–1
	7.2822–3	1.2369–7	5.7750+5	3.4632–5	2.4645+8	1.3027+8	3.1900+7	8.4269+7	9.8508+3	1.3441+2	1.0521+2	2.8941+1	2.5896–1
	7.4617–3	1.2568–7	5.6832+5	3.5977–5	2.4254+8	1.2865+8	3.1260+7	8.2622+7	9.7934+3	1.3245+2	1.0379+2	2.8398+1	2.6239–1
	7.6259–3	1.2750–7	5.6024+5	3.7225–5	2.3909+8	1.2721+8	3.0699+7	8.1175+7	9.7423+3	1.3074+2	1.0256+2	2.7920+1	2.6552–1
	7.7308–3	1.2865–7	5.5524+5	3.8031–5	2.3695+8	1.2631+8	3.0352+7	8.0280+7	9.7104+3	1.2969+2	1.0179+2	2.7625+1	2.6752–1
	8.0000–3	1.3157–7	5.4290+5	4.0127–5	2.3169+8	1.2409+8	2.9500+7	7.8082+7	9.6309+3	1.2710+2	9.9929+1	2.6900+1	2.7262–1
	8.5000–3	1.3696–7	5.2152+5	4.4136–5	2.2256+8	1.2018+8	2.8037+7	7.4340+7	9.4827+3	1.2234+2	9.6406+1	2.5656+1	2.8137–1
	9.0000–3	1.4224–7	5.0217+5	4.8296–5	2.1431+8	1.1660+8	2.6725+7	7.0976+7	9.3450+3	1.1809+2	9.3262+1	2.4539+1	2.9004–1
	9.2500–3	1.4484–7	4.9317+5	5.0431–5	2.1046+8	1.1492+8	2.6117+7	6.9418+7	9.2797+3	1.1612+2	9.1809+1	2.4022+1	2.9434–1
	1.0000–2	1.5248–7	4.6846+5	5.7042–5	1.9992+8	1.1027+8	2.4465+7	6.5169+7	9.0964+3	1.1080+2	8.7877+1	2.2611+1	3.0716–1
	1.1250–2	1.6489–7	4.3319+5	6.8760–5	1.8487+8	1.0348+8	2.2153+7	5.9222+7	8.7790+3	1.0265+2	8.1714+1	2.0613+1	3.2384–1
	1.2500–2	1.7681–7	4.0399+5	8.1348–5	1.7241+8	9.7762+7	2.0272+7	5.4363+7	8.5045+3	9.6028+1	7.6705+1	1.8982+1	3.4026–1
	1.3125–2	1.8260–7	3.9117+5	8.7956–5	1.6694+8	9.5221+7	1.9456+7	5.2251+7	8.3804+3	9.3156+1	7.4535+1	1.8273+1	3.4837–1
	1.5000–2	1.9940–7	3.5822+5	1.0891–4	1.5287+8	8.8599+7	1.7388+7	4.6879+7	8.0497+3	8.5879+1	6.9034+1	1.6472+1	3.7231–1
	1.7500–2	2.2098–7	3.2323+5	1.3950–4	1.3794+8	8.1306+7	1.5274+7	4.1354+7	7.6310+3	7.7738+1	6.2750+1	1.4592+1	3.9606–1
	2.0000–2	2.4148–7	2.9579+5	1.7302–4	1.2623+8	7.5475+7	1.3652+7	3.7098+7	7.2859+3	7.1491+1	5.7926+1	1.3145+1	4.1932–1
L3	2.0894–2	2.4864–7	2.8728+5	1.8571–4	1.2260+8	7.3623+7	1.3162+7	3.5807+7	7.1707+3	6.9476+1	5.6347+1	1.2702+1	4.2656–1
	2.1463–2	2.5315–7	2.8216+5	1.9397–4	1.2042+8	7.2503+7	1.2871+7	3.5034+7	7.1011+3	6.8263+1	5.5397+1	1.2436+1	4.3071–1
	2.2530–2	2.6149–7	2.7316+5	2.0985–4	1.1657+8	7.0524+7	1.2361+7	3.3681+7	6.9771+3	6.6143+1	5.3734+1	1.1970+1	4.3847–1
	2.4398–2	2.7577–7	2.5902+5	2.3881–4	1.1054+8	6.7392+7	1.1568+7	3.1572+7	6.7784+3	6.2847+1	5.1150+1	1.1245+1	4.5195–1
	2.5000–2	2.8029–7	2.5484+5	2.4847–4	1.0876+8	6.6461+7	1.1336+7	3.0952+7	6.7187+3	6.1881+1	5.0393+1	1.1032+1	4.5627–1
L2	2.6792–2	2.9351–7	2.4336+5	2.7807–4	1.0386+8	6.3887+7	1.0701+7	2.9260+7	6.5520+3	5.9247+1	4.8327+1	1.0451+1	4.6904–1
	2.7199–2	2.9648–7	2.4092+5	2.8496–4	1.0281+8	6.3334+7	1.0569+7	2.8906+7	6.5153+3	5.8679+1	4.7879+1	1.0328+1	4.7172–1
	2.7594–2	2.9935–7	2.3861+5	2.9173–4	1.0183+8	6.2810+7	1.0443+7	2.8571+7	6.4803+3	5.8141+1	4.7455+1	1.0212+1	4.7430–1
L1	2.7622–2	2.9955–7	2.3845+5	2.9221–4	1.0176+8	6.2773+7	1.0435+7	2.8547+7	6.4778+3	5.8104+1	4.7425+1	1.0204+1	4.7449–1
	2.8797–2	3.0801–7	2.3190+5	3.1270–4	9.8967+7	6.1282+7	1.0082+7	2.7597+7	6.3694+3	5.6589+1	4.6232+1	9.8758+0	4.8126–1
	2.8811–2	3.0811–7	2.3183+5	3.1295–4	9.8935+7	6.1265+7	1.0078+7	2.7586+7	6.3681+3	5.6571+1	4.6218+1	9.8721+0	4.8134–1
	3.0000–2	3.1654–7	2.2565+5	3.3424–4	9.6299+7	5.9852+7	9.7466+6	2.6694+7	6.2646+3	5.5152+1	4.5100+1	9.5641+0	4.8817–1
	3.2500–2	3.3401–7	2.1385+5	3.8075–4	9.1263+7	5.7106+7	9.1318+6	2.5019+7	6.0610+3	5.2370+1	4.2888+1	8.9803+0	5.0134–1
	3.6250–2	3.5936–7	1.9877+5	4.5487–4	8.4825+7	5.3562+7	8.3553+6	2.2902+7	5.7939+3	4.8859+1	4.0095+1	8.2429+0	5.2087–1
	4.0000–2	3.8381–7	1.8610+5	5.3399–4	7.9422+7	5.0556+7	7.7122+6	2.1148+7	5.5632+3	4.5957+1	3.7785+1	7.6321+0	5.4011–1
	4.5000–2	4.1518–7	1.7204+5	6.4685–4	7.3420+7	4.7164+7	7.0238+6	1.9227+7	5.2911+3	4.2687+1	3.5167+1	6.9577+0	5.6187–1
	5.0000–2	4.4536–7	1.6039+5	7.6781–4	6.8446+7	4.4323+7	6.4603+6	1.7657+7	5.0590+3	4.0016+1	3.3026+1	6.4069+0	5.8329–1
	6.0000–2	5.0350–7	1.4186+5	1.0320–3	6.0541+7	3.9806+7	5.6106+6	1.5120+7	4.6757+3	3.5776+1	2.9646+1	5.5097+0	6.2056–1
	7.0000–2	5.5728–7	1.2817+5	1.3245–3	5.4699+7	3.6405+7	5.0029+6	1.3287+7	4.3736+3	3.2632+1	2.7121+1	4.8572+0	6.5356–1
	8.0000–2	6.0834–7	1.1742+5	1.6430–3	5.0108+7	3.3694+7	4.5301+6	1.1880+7	4.1277+3	3.0201+1	2.5158+1	4.3566+0	6.8580–1
	1.0000–1	7.0109–7	1.0188+5	2.3472–3	4.3479+7	2.9722+7	3.8712+6	9.8817+6	3.7498+3	2.6676+1	2.2295+1	3.6411+0	7.4059–1
	1.2500–1	7.9671–7	8.9654+4	3.3377–3	3.8261+7	2.6496+7	3.3497+6	8.4112+6	3.4268+3	2.3857+1	1.9946+1	3.1115+0	7.9890–1
K	1.4268–1	8.5929–7	8.3125+4	4.1026–3	3.5474+7	2.4752+7	3.0744+6	7.6449+6	3.2485+3	2.2387+1	1.8712+1	2.8359+0	8.3921–1
	1.4634–1	8.7133–7	8.1976+4	4.2670–3	3.4984+7	2.4449+7	3.0263+6	7.5057+6	3.2171+3	2.2126+1	1.8494+1	2.7858+0	8.4684–1
	1.5000–1	8.8323–7	8.0872+4	4.4334–3	3.4513+7	2.4157+7	2.9801+6	7.3723+6	3.1866+3	2.1877+1	1.8284+1	2.7379+0	8.5443–1
	1.5625–1	9.0252–7	7.9143+4	4.7215–3	3.3775+7	2.3685+7	2.9121+6	7.1748+6	3.1386+3	2.1502+1	1.7968+1	2.6663+0	8.6681–1
	1.6719–1	9.3541–7	7.6360+4	5.2375–3	3.2587+7	2.2923+7	2.8027+6	6.8591+6	3.0606+3	2.0902+1	1.7462+1	2.5520+0	8.8837–1
	1.8359–1	9.8286–7	7.2674+4	6.0375–3	3.1014+7	2.1908+7	2.6582+6	6.4450+6	2.9558+3	2.0117+1	1.6794+1	2.4022+0	9.2040–1
	2.0000–1	1.0283–6	6.9463+4	6.8670–3	2.9644+7	2.1020+7	2.5326+6	6.0884+6	2.8631+3	1.9443+1	1.6217+1	2.2733+0	9.5203–1
	2.2500–1	1.0924–6	6.5388+4	8.1782–3	2.7905+7	1.9823+7	2.3947+6	5.6847+6	2.7561+3	1.8696+1	1.5573+1	2.1265+0	9.9593–1
	2.6250–1	1.1823–6	6.0416+4	1.0234–2	2.5783+7	1.8359+7	2.2254+6	5.1965+6	2.6220+3	1.7801+1	1.4791+1	1.9493+0	1.0609+0
	3.0000–1	1.2661–6	5.6417+4	1.2383–2	2.4076+7	1.7178+7	2.0886+6	4.8077+6	2.5111+3	1.7101+1	1.4167+1	1.8085+0	1.1247+0
	3.5000–1	1.3728–6	5.2031+4	1.5356–2	2.2205+7	1.5777+7	1.9699+6	4.4557+6	2.4082+3	1.6531+1	1.3644+1	1.6804+0	1.2069+0
	4.0000–1	1.4724–6	4.8511+4	1.8422–2	2.0702+7	1.4656+7	1.8726+6	4.1717+6	2.3224+3	1.6089+1	1.3225+1	1.5773+0	1.2877+0
	5.0000–1	1.6631–6	4.2949+4	2.4728–2	1.8329+7	1.2803+7	1.7479+6	3.7759+6	2.2073+3	1.5630+1	1.2750+1	1.4330+0	1.4468+0
	6.0000–1	1.8286–6	3.9062+4	3.1171–2	1.6670+7	1.1464+7	1.6675+6	3.5361+6	2.1295+3	1.5410+1	1.2459+1	1.3463+0	1.6051+0
	8.0000–1	2.1167–6	3.3745+4	4.4150–2	1.4401+7	9.6310+6	1.5740+6	3.1941+6	2.0316+3	1.5409+1	1.2265+1	1.2220+0	1.9224+0
	1.0000+0	2.3553–6	3.0327+4	5.7046–2	1.2942+7	8.4134+6	1.5221+6	3.0048+6	1.9767+3	1.5609+1	1.2212+1	1.1537+0	2.2435+0
	1.2500+0	2.5992–6	2.7481+4	7.2812–2	1.1728+7	7.3526+6	1.4902+6	2.8832+6	1.9393+3	1.6109+1	1.2343+1	1.1106+0	2.6559+0
	1.5000+0	2.8121–6	2.5401+4	8.8092–2	1.0840+7	6.5858+6	1.4647+6	2.7875+6	1.9093+3	1.6614+1	1.2475+1	1.0773+0	3.0626+0
	2.0000+0	3.1532–6	2.2652+4	1.1725–1	9.6671+6	5.5358+6	1.4480+6	2.6815+6	1.8794+3	1.7698+1	1.2757+1	1.0397+0	3.9014+0
	3.0000+0	3.6377–6	1.9636+4	1.7050–1	8.3798+6	4.3494+6	1.4264+6	2.6022+6	1.8492+3	1.9902+1	1.3262+1	1.0158+0	5.6234+0

Atomic Weight 257.000													Density 14.000 Grams/cc
Energy	Mean Free Path		Range	Cross Sections (barns)					Energy Deposition (MeV/cm)			
MeV	cm	cm*cm/gr	cm	Total	Elastic	Ionize	Excite	Brems	Total	Ionize	Excite	Brems
4.0000+0	3.9526–6	1.8071+4	2.1817–1	7.7121+6	3.7230+6	1.4214+6	2.5659+6	1.8357+3	2.2089+1	1.3677+1	1.0034+0	7.4083+0
5.0000+0	4.1582–6	1.7178+4	2.6130–1	7.3307+6	3.3353+6	1.4203+6	2.5733+6	1.8309+3	2.4317+1	1.4035+1	1.0082+0	9.2732+0
6.0000+0	4.3088–6	1.6577+4	3.0070–1	7.0745+6	3.0746+6	1.4196+6	2.5785+6	1.8269+3	2.6480+1	1.4334+1	1.0121+0	1.1134+1
8.0000+0	4.5189–6	1.5807+4	3.7054–1	6.7456+6	2.7395+6	1.4196+6	2.5847+6	1.8293+3	3.0910+1	1.4829+1	1.0182+0	1.5063+1
1.0000+1	4.6519–6	1.5355+4	4.3109–1	6.5528+6	2.5432+6	1.4205+6	2.5873+6	1.8312+3	3.5238+1	1.5218+1	1.0231+0	1.8997+1
1.5000+1	4.7963–6	1.4892+4	5.5456–1	6.3555+6	2.3093+6	1.4230+6	2.6213+6	1.8583+3	4.6256+1	1.5800+1	1.0371+0	2.9419+1
2.0000+1	4.8420–6	1.4752+4	6.5133–1	6.2955+6	2.2234+6	1.4248+6	2.6454+6	1.8813+3	5.7487+1	1.6269+1	1.0472+0	4.0171+1
3.0000+1	4.8278–6	1.4795+4	7.9787–1	6.3140+6	2.2075+6	1.4258+6	2.6788+6	1.9193+3	8.0259+1	1.6806+1	1.0616+0	6.2391+1
4.0000+1	4.8167–6	1.4829+4	9.0729–1	6.3286+6	2.2070+6	1.4268+6	2.6929+6	1.9552+3	1.0350+2	1.7187+1	1.0684+0	8.5245+1
5.0000+1	4.8161–6	1.4831+4	9.9435–1	6.3294+6	2.2061+6	1.4274+6	2.6939+6	1.9834+3	1.2703+2	1.7485+1	1.0700+0	1.0848+2
6.0000+1	4.8162–6	1.4831+4	1.0665+0	6.3292+6	2.2053+6	1.4276+6	2.6942+6	2.0066+3	1.5075+2	1.7691+1	1.0713+0	1.3199+2
8.0000+1	4.8173–6	1.4827+4	1.1817+0	6.3277+6	2.2041+6	1.4280+6	2.6935+6	2.0439+3	1.9886+2	1.8037+1	1.0734+0	1.7975+2
1.0000+2	4.8193–6	1.4821+4	1.2717+0	6.3252+6	2.2032+6	1.4283+6	2.6916+6	2.0675+3	2.4707+2	1.8334+1	1.0750+0	2.2766+2
1.5000+2	4.8202–6	1.4819+4	1.4364+0	6.3240+6	2.2016+6	1.4285+6	2.6918+6	2.1099+3	3.6800+2	1.8661+1	1.0752+0	3.4826+2
2.0000+2	4.8149–6	1.4835+4	1.5538+0	6.3309+6	2.2004+6	1.4286+6	2.6998+6	2.1398+3	4.9021+2	1.8960+1	1.0785+0	4.7017+2
3.0000+2	4.8091–6	1.4853+4	1.7193+0	6.3386+6	2.1987+6	1.4287+6	2.7090+6	2.1776+3	7.3426+2	1.9376+1	1.0824+0	7.1380+2
4.0000+2	4.8090–6	1.4853+4	1.8369+0	6.3387+6	2.1976+6	1.4287+6	2.7102+6	2.2027+3	9.7824+2	1.9620+1	1.0830+0	9.5754+2
5.0000+2	4.8131–6	1.4840+4	1.9281+0	6.3333+6	2.1967+6	1.4288+6	2.7057+6	2.2221+3	1.2239+3	1.9840+1	1.0814+0	1.2030+3
6.0000+2	4.8129–6	1.4841+4	2.0026+0	6.3335+6	2.1959+6	1.4288+6	2.7066+6	2.2378+3	1.4684+3	2.0009+1	1.0820+0	1.4473+3
8.0000+2	4.8155–6	1.4833+4	2.1201+0	6.3301+6	2.1947+6	1.4288+6	2.7043+6	2.2629+3	1.9591+3	2.0293+1	1.0815+0	1.9377+3
1.0000+3	4.8187–6	1.4823+4	2.2112+0	6.3259+6	2.1938+6	1.4288+6	2.7010+6	2.2828+3	2.4515+3	2.0541+1	1.0806+0	2.4298+3
1.5000+3	4.8229–6	1.4810+4	2.3765+0	6.3204+6	2.1922+6	1.4288+6	2.6971+6	2.3208+3	3.6784+3	2.0776+1	1.0790+0	3.6565+3
2.0000+3	4.8277–6	1.4796+4	2.4938+0	6.3141+6	2.1910+6	1.4288+6	2.6920+6	2.3484+3	4.9082+3	2.1007+1	1.0770+0	4.8861+3
3.0000+3	4.8338–6	1.4777+4	2.6587+0	6.3062+6	2.1893+6	1.4288+6	2.6856+6	2.3881+3	7.3870+3	2.1435+1	1.0745+0	7.3645+3
4.0000+3	4.8396–6	1.4759+4	2.7757+0	6.2986+6	2.1882+6	1.4288+6	2.6792+6	2.4165+3	9.8363+3	2.1656+1	1.0719+0	9.8135+3
5.0000+3	4.8469–6	1.4737+4	2.8664+0	6.2891+6	2.1872+6	1.4288+6	2.6706+6	2.4388+3	1.2298+4	2.1836+1	1.0685+0	1.2275+4
6.0000+3	4.8488–6	1.4731+4	2.9405+0	6.2867+6	2.1865+6	1.4288+6	2.6689+6	2.4571+3	1.4779+4	2.1979+1	1.0678+0	1.4756+4
8.0000+3	4.8532–6	1.4718+4	3.0572+0	6.2809+6	2.1853+6	1.4288+6	2.6643+6	2.4858+3	1.9714+4	2.2266+1	1.0660+0	1.9690+4
1.0000+4	4.8568–6	1.4707+4	3.1478+0	6.2764+6	2.1844+6	1.4288+6	2.6606+6	2.5080+3	2.4610+4	2.2513+1	1.0646+0	2.4586+4
1.5000+4	4.8624–6	1.4690+4	3.3125+0	6.2691+6	2.1828+6	1.4288+6	2.6549+6	2.5486+3	3.6963+4	2.2734+1	1.0623+0	3.6939+4
2.0000+4	4.8670–6	1.4676+4	3.4294+0	6.2632+6	2.1816+6	1.4288+6	2.6502+6	2.5776+3	4.9188+4	2.2955+1	1.0604+0	4.9164+4
3.0000+4	4.8719–6	1.4661+4	3.5940+0	6.2569+6	2.1800+6	1.4288+6	2.6455+6	2.6191+3	7.3958+4	2.3387+1	1.0585+0	7.3934+4
4.0000+4	4.8761–6	1.4649+4	3.7108+0	6.2514+6	2.1788+6	1.4288+6	2.6411+6	2.6481+3	9.8375+4	2.3594+1	1.0568+0	9.8351+4
5.0000+4	4.8821–6	1.4631+4	3.8016+0	6.2437+6	2.1779+6	1.4288+6	2.6343+6	2.6708+3	1.2302+5	2.3764+1	1.0541+0	1.2299+5
6.0000+4	4.8830–6	1.4628+4	3.8756+0	6.2427+6	2.1772+6	1.4288+6	2.6340+6	2.6895+3	1.4785+5	2.3905+1	1.0539+0	1.4782+5
8.0000+4	4.8859–6	1.4619+4	3.9924+0	6.2389+6	2.1760+6	1.4288+6	2.6314+6	2.7186+3	1.9699+5	2.4186+1	1.0529+0	1.9697+5
1.0000+5	4.8883–6	1.4612+4	4.0830+0	6.2358+6	2.1751+6	1.4288+6	2.6292+6	2.7414+3	2.4648+5	2.4452+1	1.0520+0	2.4646+5

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