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**AIRCRAFT
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Twenty-Five Group Reactor Nuclear Data Tape

Neutron Cross Sections

J.W. Zwick

T.J. Kostigen

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TWENTY-FIVE GROUP REACTOR NUCLEAR DATA
TAPE NEUTRON CROSS SECTIONS

J. W. Zwick
T. J. Kostigen

June 13, 1961

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ABSTRACT

A compilation is presented, in the twenty-five group Reactor Nuclear Data Tape (RNDT) format, of neutron cross sections for elements of major interest for GE-ANPD reactor analysis.

The tabulated data is a reproduction of neutron cross section information contained on the Reactor Nuclear Data Tape, which has been recently prepared. A brief outline of methods used in processing of the cross sections is also included.

ACKNOWLEDGMENTS

We wish to thank Dr. P. G. Fischer and W. B. Henderson for many discussions and suggestions. Thanks are due to D. E. Wetzel for computing the cross sections of hydrided zirconium and to F. D. Wenstrup for assistance in placing the cross sections on the Reactor Nuclear Data Tape.

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1.0 INTRODUCTION

Neutron cross sections form the basic physical data on which all nuclear design work is based. It is therefore necessary to constantly revise and improve basic neutron cross section data on all materials of interest in reactor technology. Accurate neutron cross sections coupled with improvements in computational techniques and the availability of larger, faster and more efficient computers offer the possibility of more exact theoretical predictions of reactor parameters and their behavior.

As a part of the effort to improve the reliability of theoretical predictions of reactor parameters, a program was initiated to improve the physical model to be used in reactor analysis calculations. The revised GE-ANPD multigroup energy lattice, the corresponding Reactor Nuclear Data Tape (RNDT)^{4,18} system and the diffusion theory Program ODD¹⁷ which uses these data were designed to provide the basis for an improved nuclear analysis procedure.

In conjunction with this effort basic neutron cross section data on elements of major interest in reactor nuclear calculations have been processed into the Reactor Nuclear Data Tape format. Cross sections, in the RNDT structure, of the following materials have been placed on magnetic tapes for use in multigroup or multilevel diffusion theory nuclear reactor calculations:

Microscopic Cross Sections

Uranium-235	Carbon	Lithium
Uranium-238	Hydrogen (gas)	Boron
Plutonium-239	Boron-10	Thorium-232
Nickel	Oxygen	Gadolinium
Iron	Aluminum	Europium
Chromium	Yttrium	Samarium-149
Beryllium	Zirconium	Rhodium
Niobium	Manganese	Platinum
Uranium-234	Cobalt	Xenon-135
Uranium-236	Lithium-6	Tantalum

Macroscopic Cross Sections

Hydrided zirconium

Other Data

U-235 fission spectral data

Group boundary energies and corresponding level energies, $1/v$ factors

Nuclear data contained on the RNDT tape are reproduced in this report. Microscopic cross sections are given in barns; macroscopic cross sections in inverse centimeters.

2.0 CROSS SECTION FORMAT

The RNDT format retains all of the data format of the earlier NDT, i.e. the format used in APEX-515⁸, so that the tape could be used by other ANPD nuclear analysis programs; this results in actually the same data being presented in several ways. Thus, for high energies where inelastic scattering occurs, a scatter transfer matrix is given, and the same data are represented in terms of an average logarithmic energy decrement, ξ , since this latter is the format used by Programs C₂¹⁶ and G₂¹ for example. Likewise, at low energies, conventional ANPD machine programs allow representation only of energy loss reactions (slowing down) so that the thermalization region is represented by an overlapping of a Maxwellian and a slowing down flux with a temperature dependent cut-off. Such a representation requires complete Maxwellian averaged cross sections (0 - 10 ev) for various temperatures. Program ODD¹⁷, however, provides for both energy gain and loss reactions in the thermalization region with temperature independent group boundaries. The lowest group (0 - 0.0253 ev) only is now Maxwell averaged and a complete five by five scatter transfer matrix must be given for each temperature. Thus, Maxwellian averaged cross sections are separately given for the energy ranges 0 - 10 ev and 0 - 0.0253 ev for each of ten temperatures.

Cross section detail is based upon twenty-four epithermal groups (levels) from 12.84 Mev to 0.0253 ev, and one thermal group corresponding to one of the ten temperatures: 68, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000 and 4500 degrees Fahrenheit. This group structure provides a more detailed energy lattice coverage of the resonance region (1 to 100 ev) and near source region (1 to 100 kev) than the nineteen-level Nuclear Data Tape (NDT)^{8, 14} energy lattice, and it covers more adequately the basic needs in epithermal, resonance and fast reactor systems. Furthermore, the RNDT energy lattice structure is designed to produce group-averaged cross sections consistent for use with both multi-group and multilevel calculations. This is achieved by flat-flux averaging (in lethargy) the cross sections over a band extending from the midpoint of the lethargy interval below to the midpoint of the interval above each level, and ascribing the averaged value to the level in question, i.e.

$$\sigma_n = \frac{\int_{\frac{1}{2}(u_n + u_{n-1})}^{\frac{1}{2}(u_n + u_{n+1})} \sigma(u) du}{\int_{\frac{1}{2}(u_n + u_{n-1})}^{\frac{1}{2}(u_n + u_{n+1})} du} \quad .$$

Lethargy levels are defined by

$$u_n \equiv \ln(10^7/E_n), \quad 0 < n \leq 24,$$

where E_n is the neutron energy, in electron volts, corresponding to the n-th level.

The RNDT cross section compilation consists of:

(1) Partial cross sections at each of the twenty-four epithermal groups (levels) and thermal cross sections averaged over a Maxwellian distribution for ten temperatures from 68°F to 4500°F.

σ_s	scattering cross section
$\xi\sigma_s$	slowing-down cross section
σ_{tr}	transport cross section
σ_a	absorption cross section
$(\xi\sigma_s)_1$	first-moment slowing-down cross section
$\nu\sigma_f$	fission-production cross section

(2) Near-thermal zeroth-moment scattering transfer matrices for each of the ten temperatures from 68°F to 4500°F, coupling the bottom five energy groups (0 - 1 ev).

(3) High energy scattering matrix providing for down-scattering from each energy level to all lower levels.

(4) Radiative source matrix, $\sigma(E_n/E_\gamma)$, which provides data on gamma ray production by neutron capture, neutron inelastic scattering, and by neutron induced fissioning.

(5) Resonance data, if applicable, for the energy region $1 \text{ ev} < E < 600 \text{ ev}$.

(6) The U-235 fission spectral data:

- U-235 prompt fission spectrum,
- U-235 total fission spectrum,
- U-235 fission spectra for each of the six delay groups.

3.0 SOURCES OF CROSS SECTION DATA

The basic cross section data were taken partially from C-FINE many-level nuclear cross section data tape^{2,15} and partially from more recent published information. Available data on high energy phenomena of anisotropic scattering and inelastic scattering were incorporated in the compilation.

The data used in preparing the C-FINE nuclear data tape and those on elements for which cross section information was obtained directly from other published sources are described in detail elsewhere^{6,15,20,21,22} and will not be discussed here.

4.0 CROSS SECTION PROCESSING METHODS

4.1 Epithermal Cross Sections

Energy-band averaged partial cross sections, σ_s , $\xi\sigma_s$, σ_{tr} , σ_a and $\nu\sigma_f$, at each of the twenty-four epithermal groups (levels) were computed, for a number of elements with Program C-FINE (ANP Program No. 180)¹² from C-FINE many-level nuclear cross section data tape. For elements, on which basic cross section information was obtained directly from

sources other than the C-FINE data tape, group-averaged cross sections were calculated, in the resonance region, with ANP Program No. 181⁹. ANP Program No. 421³ was employed to calculate, at energies outside the resonance region, group-averaged values of the absorption cross section, and ANP Program No. 335^{5,10} was used to compute energy-band values of the scattering cross section, slowing-down cross section and transport cross section.

4.2 Thermally Averaged Cross Sections

Thermal cross sections averaged over a Maxwellian distribution in the energy range 10^{-4} ev to 10 ev for temperatures of 65, 500, 1000, 1500, 2000, 2500 and 3000 degrees Fahrenheit were taken, for a number of elements, from APEX-515⁸. For these elements, the thermal cross sections for temperatures of 3500, 4000 and 4500 degrees Fahrenheit were set equal to the value at 3000°F. When this is the case, an appropriate footnote will so indicate.

For other elements, ANP Program No. 421³ was employed to compute thermal cross sections averaged over a Maxwellian distribution for all ten temperatures from 68°F to 4500°F. If an element had resonances close to the thermal region, ANP Program No. 181⁹ was used instead.

The thermal cross sections preceding each of the thermal scattering transfer matrices resulted from averaging over a Maxwellian distribution in the energy range 10^{-4} ev to 0.0253 ev.

4.3 Thermal Scattering Transfer Matrices

Near-thermal zeroth-moment scattering transfers in the energy groups from 10^{-4} ev to about 1 ev, for each of the ten temperatures from 68°F to 4500°F, were generated from a monoatomic gas model (ANP Program No. 396)¹⁹ except for hydrided zirconium where the bound oscillator model of McReynolds, et al., was used¹³. These thermal transfer matrices provide for both up-and down-scattering, and can be used in calculations of neutron thermalization.

The group to group transfers were obtained by averaging over a flat-in-lethargy flux for the four highest energy groups and over a Maxwellian characterized by the material temperature in the lowest energy group.

4.4 High Energy Scattering Transfer Matrices

The high energy scattering transfer matrices provide for down-scattering from each energy level to lower levels. They were computed from experimental information on inelastic scattering and elastic scattering, using the statistical model of nuclear level transitions (ANP Program No. 335)^{5,10}, except in the case of oxygen, for which sufficient experimental data are available on the cross sections for inducing individual transitions.

The values used for the parameter "a" which enters into the expression for nuclear temperature required in the statistical model calculations, are given in references 15 and 20.

Exit energy distributions for neutrons scattered by oxygen through three known states of the O-16 nucleus with excitation energies of 6.14, 6.9 and 7.1 Mev have been computed in the following manner[†]:

(1) The angular distribution of inelastically scattered neutrons is assumed to be isotropic in the center-of-mass system. No measured data is available, but this assumption is usually valid for incident energies up to several times the excitation energy. Designating the excitation energy by ϵ_1 for state 1, then

$$\sigma_{in}^1(E \rightarrow E') = \frac{(A+1)^2}{4A} \left[1 - \frac{A+1}{A} \frac{\epsilon_1}{E} \right]^{-\frac{1}{2}} \frac{dE'}{E} \sigma_{in}^1(E),$$

where A is the scatterer to neutron mass ratio.

(2) Partial cross sections, $\sigma_{in}^1(E)$, for excitation of state 1, were obtained from BNL-325, Supplement 1, Second Edition¹¹, as follows:

- (a) The cross section for excitation of the 6.14 Mev state is given from threshold (6.52 Mev) to 10 Mev, and the cross section was assumed constant from 10 Mev to 12.84 Mev, the upper limit of group 1.
- (b) The combined 6.9, 7.1 Mev state curve given from 7.7 to 9.4 Mev was divided using the relative excitation probabilities of 14 and 4 respectively measured by Hall and Bonner⁷ at 8.5 Mev. The cross sections were extrapolated to zero at the corresponding thresholds and assumed constant from 9.4 to 12.84 Mev.

(3) First Legendre moment scatter transfer cross sections were computed using the relation

$$\mu = \frac{A+1}{2} \sqrt{\frac{E'}{E}} - \frac{A^2}{2(A+1)} \left(1 - \frac{A+1}{A} \frac{\epsilon_1}{E} - \frac{1}{A^2} \right) \sqrt{\frac{E}{E'}},$$

where μ is the cosine of the laboratory scattering angle.

(4) Multigroup transfer cross sections were computed by integrating over the exit energy group and averaging over the incident group with a $1/E$ flux.

4.5 Radiative Source Matrices

Radiative source matrices, $\sigma(E_n/E_\gamma)$, provide cross section data on the production of gamma rays by radiative capture of a neutron, by inelastic scattering of a neutron, and by neutron induced fissioning. These cross sections for the production of gamma rays were processed by Mary S. Ferry⁶, and are tabulated, for individual elements, as a function of photon energy bands and neutron energy groups.

[†]This information was supplied by Dr. P. G. Fischer in a private communication.

A discussion of the methods used in generating the radiative source matrices and a summary of data are given in reference 6.

4.6 Resonance Data

In the energy range $1 \text{ ev} < E < 600 \text{ ev}$, the Reactor Nuclear Data Tape contains resonance data required in calculating energy self-shielding effects and resulting reduction in resonance absorption:

E_0	resonance energy (ev)
I_0	resonance integral (barns)
σ_0	peak cross section (barns)
R	Doppler temperature coefficient ($^{\circ}\text{K}^{-1}$)
η	number of neutrons produced per neutron absorbed.

Of these E_0 was supplied as input to Program RNDP¹⁸, the program which was used to compile the tape from input supplied nuclear data. Resonance data E_0 , Γ_n , Γ_γ , Γ_F and g supplied as input were used by this program in computing the four quantities I_0 , σ_0 , R and η for each resonance:

$$I_0 = \frac{2\pi^2 Q^2 \chi_0^2 g}{E_0 \Gamma} (\Gamma_\gamma + \Gamma_F) \Gamma_n,$$

$$\sigma_0 = \frac{2E_0 I_0}{\pi \Gamma},$$

$$R = \frac{4A_N Q E_0 k}{A \Gamma^2},$$

$$\eta = \frac{\nu \Gamma_F}{\Gamma_\gamma + \Gamma_F},$$

where

Γ_n is the neutron width (ev) at the resonance energy E_0

Γ_γ is the radiation width (ev)

Γ_F is the fission width (ev)

$\Gamma = \Gamma_n + \Gamma_\gamma + \Gamma_F$ is the total width (ev)

g is the statistical weight factor

$Q = \frac{A + A_N}{A}$ is the factor relating energy in the laboratory coordinate system to energy in the center-of-mass system

A is the atomic weight (in A.M.U.) of the scattering nucleus

A_N is the neutron mass (in A.M.U.)

$\chi_0 = \frac{4.5517359 \times 10^{-10}}{\sqrt{E_0}}$ is neutron wave length/ 2π

ν is the number of neutrons emitted per fission.

k is Boltzmann's constant.

The resonance data stored on RNDT is used by Program ODD¹⁷ in calculating self-shielded resonance absorption and Doppler broadening effects.

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6.0 REACTOR NUCLEAR DATA TAPE NEUTRON CROSS SECTION TABULATION

6.1 Reactor Nuclear Data Tape Index Record

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INDEX RECORD

24 LEVELS

DATA BLOCK NO.	CODE NO.	DESIGNATION	RECORD NO.
1	500.0000	35 SPECTRUM	3
2	92.2350	URANIUM 235	4
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4	94.2390	PLUTON 239	12
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29	3.6000	LITHIUM 6	80
30	3.7000	LITHIUM	83
31	5.1100	BORON	86
32	90.2320	THORIUM 232	88
33	64.1570	GADOLINIUM	91
34	63.1520	EUROPIUM	95
35	62.1490	SAMARIUM 149	99
36	45.1030	RHODIUM	103
37	78.1950	PLATINUM	107
38	54.1350	XENON-135	110
39	73.1810	TANTALUM	111
40	0.	000000000000	114

6.2 Reactor Nuclear Data Tape Group Structure Boundary Energies, Corresponding Lethargies and 1/v Factors

GROUP	LOWER ENERGY (EV)	UPPER LETHARGY	1/V FACTOR (2200 M/SEC)
0	1.2840254E 07	-2.5000000E-01	
1	7.7880077E 06	2.5000000E-01	5.0428001E-05
2	4.7236655E 06	7.5000000E-01	6.4750835E-05
3	2.8650479E 06	1.2500000E 00	8.3141723E-05
4	1.7377394E 06	1.7500000E 00	1.0675608E-04
5	1.0539922E 06	2.2500000E 00	1.3707754E-04
6	6.3927861E 05	2.7500000E 00	1.7601099E-04
7	3.8774208E 05	3.2500000E 00	2.2600263E-04
8	2.3517746E 05	3.7500000E 00	2.9019310E-04
9	1.1108997E 05	4.5000000E 00	3.9793803E-04
10	4.0867714E 04	5.5000000E 00	6.1914461E-04
11	1.5034392E 04	6.5000000E 00	1.0207969E-03
12	5.5308437E 03	7.5000000E 00	1.6830096E-03
13	2.0346837E 03	8.5000000E 00	2.7748135E-03
14	7.4851830E 02	9.5000000E 00	4.5748941E-03
15	1.9895839E 02	1.0825000E 01	8.2454356E-03
16	5.5595137E 01	1.2100000E 01	1.5773244E-02
17	2.1500919E 01	1.3050000E 01	2.7305059E-02
18	8.1099823E 00	1.4025000E 01	4.4204265E-02
19	2.6995785E 00	1.5125000E 01	7.4459925E-02
20	9.9311942E-01	1.6125000E 01	1.2559766E-01
21	4.1399378E-01	1.7000000E 01	2.0021685E-01
22	1.5229980E-01	1.8000000E 01	3.2072485E-01
23	4.8344435E-02	1.9147500E 01	5.5045328E-01
24	2.5301182E-02	1.9795000E 01	8.5441626E-01

3.3 Reactor Nuclear Data Tape Energy Levels and Corresponding Lethargies

LEVEL	ENERGY (EV)	LETHARGY
1	1.0000000E 07	0.
2	6.0653070E 06	5.0000000E-01
3	3.6787944E 06	1.0000000E 00
4	2.2313016E 06	1.5000000E 00
5	1.3533528E 06	2.0000000E 00
6	8.2084997E 05	2.5000000E 00
7	4.9787068E 05	3.0000000E 00
8	3.0197384E 05	3.5000000E 00
9	1.8315639E 05	4.0000000E 00
10	6.7379469E 04	5.0000000E 00
11	2.4787522E 04	6.0000000E 00
12	9.1188195E 03	7.0000000E 00
13	3.3546263E 03	8.0000000E 00
14	1.2340980E 03	9.0000000E 00
15	4.5399929E 02	1.0000000E 01
16	8.7190523E 01	1.1650000E 01
17	3.5449023E 01	1.2550000E 01
18	1.3040967E 01	1.3550000E 01
19	5.0434766E 00	1.4500000E 01
20	1.4449802E 00	1.5750000E 01
21	6.8256034E-01	1.6500000E 01
22	2.5109992E-01	1.7500000E 01
23	9.2374499E-02	1.8500000E 01
24	2.5301182E-02	1.9795000E 01
4500	3.0229500E-01	1.7314330E 01
4000	2.7182000E-01	1.7420610E 01
3500	2.4134500E-01	1.7539500E 01
3000	2.1087017E-01	1.7674512E 01
2500	1.8039517E-01	1.7830605E 01
2000	1.4992017E-01	1.8015652E 01
1500	1.1944517E-01	1.8242897E 01
1000	8.8970174E-02	1.8537454E 01
500	5.8495175E-02	1.8956811E 01
68	3.2164769E-02	1.9554883E 01

4.4 U-235 Fission Spectral Data

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 PROMPT	9.9343E-01	0.

LEVEL	ENERGY	SPECTRUM
1	1.000E 07	1.2128500E-02
2	6.065E 06	1.1298960E-01
3	3.679E 06	3.2997910E-01
4	2.231E 06	4.6580859E-01
5	1.353E 06	4.2193690E-01
6	8.208E 05	2.9330140E-01
7	4.979E 05	1.7435500E-01
8	3.020E 05	9.4492098E-02
9	1.832E 05	4.1751800E-02
10	6.738E 04	1.2477100E-02
11	2.479E 04	2.8765000E-03
12	9.119E 03	6.4959999E-04
13	3.355E 03	1.4560000E-04
14	1.234E 03	3.2499999E-05
15	4.540E 02	6.0999999E-06
16	8.719E 01	7.9999999E-07
17	3.545E 01	9.9999999E-08
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 SPECTRUM	1.0000E 00	0.

LEVEL	ENERGY	SPECTRUM
1	1.000E 07	1.2048800E-02
2	6.065E 06	1.1224720E-01
3	3.679E 06	3.2781140E-01
4	2.231E 06	4.6312220E-01
5	1.353E 06	4.2181799E-01
6	8.208E 05	2.9531380E-01
7	4.979E 05	1.7627380E-01
8	3.020E 05	9.5595700E-02
9	1.832E 05	4.2160000E-02
10	6.738E 04	1.2548800E-02
11	2.479E 04	2.8805000E-03
12	9.119E 03	6.4850000E-04
13	3.355E 03	1.4510000E-04
14	1.234E 03	3.2399999E-05
15	4.540E 02	5.9999999E-06
16	8.719E 01	7.9999999E-07
17	3.545E 01	9.9999999E-08
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 DELAY 1	2.3000E-04	7.9365E 01

LEVEL	ENERGY	SPECTRUM
1	1.000E 07	0.
2	6.065E 06	0.
3	3.679E 06	0.
4	2.231E 06	0.
5	1.353E 06	3.6520300E-02
6	8.208E 05	3.8080040E-01
7	4.979E 05	6.1925760E-01
8	3.020E 05	4.8315579E-01
9	1.832E 05	2.2905970E-01
10	6.738E 04	5.7746400E-02
11	2.479E 04	9.0855999E-03
12	9.119E 03	1.2986000E-03
13	3.355E 03	1.7930000E-04
14	1.234E 03	2.4400000E-05
15	4.540E 02	2.7000000E-06
16	8.719E 01	2.0000000E-07
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 DELAY 2	1.4200E-03	3.2154E 01
LEVEL	ENERGY	SPECTRUM
1	1.000E 07	0.
2	6.065E 06	0.
3	3.679E 06	1.1910000E-04
4	2.231E 06	8.0623599E-02
5	1.353E 06	4.6852309E-01
6	8.208E 05	6.1228739E-01
7	4.979E 05	4.3379799E-01
8	3.020E 05	2.2952270E-01
9	1.832E 05	8.7064899E-02
10	6.738E 04	1.9022200E-02
11	2.479E 04	2.7915000E-03
12	9.119E 03	3.8910000E-04
13	3.355E 03	5.3199999E-05
14	1.234E 03	7.1999999E-06
15	4.540E 02	7.9999999E-07
16	8.719E 01	9.9999999E-08
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 DELAY 3	1.2600E-03	8.8183E 00

LEVEL	ENERGY	SPECTRUM
1	1.000E 07	0.
2	6.065E 06	0.
3	3.679E 06	0.
4	2.231E 06	3.2296399E-02
5	1.353E 06	3.6558450E-01
6	8.208E 05	6.1830389E-01
7	4.979E 05	4.9066589E-01
8	3.020E 05	2.7483210E-01
9	1.832E 05	1.0786360E-01
10	6.738E 04	2.4104100E-02
11	2.479E 04	3.5769000E-03
12	9.119E 03	5.0060000E-04
13	3.355E 03	6.8599999E-05
14	1.234E 03	9.3000000E-06
15	4.540E 02	9.9999999E-07
16	8.719E 01	9.9999999E-08
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 DELAY 4	2.6400E-03	3.2680E 00

LEVEL	ENERGY	SPECTRUM
1	1.000E 07	0.
2	6.065E 06	0.
3	3.679E 06	4.6199999E-05
4	2.231E 06	6.9996899E-02
5	1.353E 06	4.5207509E-01
6	8.208E 05	6.1514749E-01
7	4.979E 05	4.4377530E-01
8	3.020E 05	2.3696780E-01
9	1.832E 05	9.0386899E-02
10	6.738E 04	1.9820800E-02
11	2.479E 04	2.9140000E-03
12	9.119E 03	4.0640000E-04
13	3.355E 03	5.5599999E-05
14	1.234E 03	7.5999999E-06
15	4.540E 02	7.9999999E-07
16	8.719E 01	9.9999999E-08
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 DELAY 5	8.0000E-04	7.9808E-01

LEVEL	ENERGY	SPECTRUM
1	1.000E 07	0.
2	6.065E 06	0.
3	3.679E 06	9.9999999E-08
4	2.231E 06	4.2521200E-02
5	1.353E 06	3.9667230E-01
6	8.208E 05	6.1941460E-01
7	4.979E 05	4.7482280E-01
8	3.020E 05	2.6141380E-01
9	1.832E 05	1.0155120E-01
10	6.738E 04	2.2540600E-02
11	2.479E 04	3.3337000E-03
12	9.119E 03	4.6600000E-04
13	3.355E 03	6.3799999E-05
14	1.234E 03	8.6999999E-06
15	4.540E 02	9.9999999E-07
16	8.719E 01	9.9999999E-08
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

DATE 12/07/60

DESIGNATION	DELAY FRACTION	PRECURSOR MEAN LIFE
35 DELAY 6	2.2000E-04	2.9577E-01
LEVEL	ENERGY	SPECTRUM
1	1.000E 07	0.
2	6.065E 06	0.
3	3.679E 06	0.
4	2.231E 06	0.
5	1.353E 06	3.6520300E-02
6	8.208E 05	3.8080040E-01
7	4.979E 05	6.1925760E-01
8	3.020E 05	4.8315579E-01
9	1.832E 05	2.2905970E-01
10	6.738E 04	5.7746400E-02
11	2.479E 04	9.0855999E-03
12	9.119E 03	1.2986000E-03
13	3.355E 03	1.7930000E-04
14	1.234E 03	2.4400000E-05
15	4.540E 02	2.7000000E-06
16	8.719E 01	2.0000000E-07
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

6.5 Microscopic Cross Sections

DATE DEC 01 1960

DESIGNATION		CODE NO.		DENSITY FACTOR			
URANIUM 235		92.2350		3.90255E 02			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I
1	1.000E 07	4.2674E 00	3.5234E 00	1.8065E 00	1.8753E 00	-2.2770E 00	
2	6.065E 06	5.5836E 00	4.0356E 00	2.6955E 00	1.4500E 00	-2.6724E 00	
3	3.679E 06	6.5600E 00	3.6298E 00	3.4476E 00	1.3100E 00	-2.8798E 00	
4	2.231E 06	6.0060E 00	2.8205E 00	3.6298E 00	1.4100E 00	-2.1988E 00	
5	1.353E 06	5.2747E 00	2.0257E 00	3.5451E 00	1.4000E 00	-1.6004E 00	
6	8.208E 05	5.4181E 00	1.4641E 00	3.8018E 00	1.3378E 00	-1.4956E 00	
7	4.979E 05	6.2158E 00	1.2757E 00	4.5950E 00	1.4239E 00	-1.4997E 00	
8	3.020E 05	7.4775E 00	1.0831E 00	5.8924E 00	1.5699E 00	-1.4667E 00	
9	1.832E 05	9.0132E 00	7.9060E-01	7.7903E 00	1.8439E 00	-1.1316E 00	
10	6.738E 04	1.0327E 01	2.8458E-01	1.0025E 01	2.2750E 00	-2.7964E-01	
11	2.479E 04	1.0462E 01	8.9530E-02	1.0431E 01	3.6903E 00	-2.8119E-02	
12	9.119E 03	1.0044E 01	8.5960E-02	1.0016E 01	5.2241E 00	-2.6582E-02	
13	3.355E 03	1.0034E 01	8.5871E-02	1.0005E 01	7.3008E 00	-2.6554E-02	
14	1.234E 03	1.1925E 01	1.0206E-01	1.1891E 01	1.0816E 01	-3.1559E-02	
15	4.540E 02	1.3353E 01	1.1428E-01	1.3315E 01	2.3062E 01	-3.5337E-02	
16	8.719E 01	1.6138E 01	1.3811E-01	1.6092E 01	3.6485E 01	-4.2710E-02	
17	3.545E 01	2.5994E 01	2.2246E-01	2.5920E 01	7.2663E 01	-6.8791E-02	
18	1.304E 01	1.1277E 01	9.6508E-02	1.1245E 01	1.0987E 02	-2.9843E-02	
19	5.043E 00	1.0183E 01	8.6379E-02	1.0155E 01	4.0863E 01	-2.6719E-02	
20	1.445E 00	1.1605E 01	9.8435E-02	1.1572E 01	4.2582E 01	-3.0447E-02	
21	6.826E-01	1.2827E 01	1.0880E-01	1.2790E 01	7.9234E 01	-3.3654E-02	
22	2.511E-01	1.3767E 01	1.1678E-01	1.3728E 01	2.0812E 02	-3.6122E-02	
23	9.237E-02	1.4351E 01	1.2173E-01	1.4311E 01	3.3004E 02	-3.7653E-02	
24	2.530E-02	1.4600E 01	1.2385E-01	1.4559E 01	5.6816E 02	-3.8307E-02	
4500	3.023E-01	1.3336E 01	1.1312E-01	1.3299E 01	1.6357E 02	-3.4990E-02	
4000	2.718E-01	1.3435E 01	1.1396E-01	1.3397E 01	1.7565E 02	-3.5249E-02	
3500	2.413E-01	1.3540E 01	1.1485E-01	1.3501E 01	1.8992E 02	-3.5524E-02	
3000	2.109E-01	1.3651E 01	1.1579E-01	1.3612E 01	2.0703E 02	-3.5816E-02	
2500	1.804E-01	1.3769E 01	1.1679E-01	1.3730E 01	2.2790E 02	-3.6125E-02	
2000	1.499E-01	1.3895E 01	1.1786E-01	1.3855E 01	2.5393E 02	-3.6456E-02	
1500	1.194E-01	1.4030E 01	1.1901E-01	1.3990E 01	2.8778E 02	-3.6808E-02	
1000	8.897E-02	1.4180E 01	1.2028E-01	1.4139E 01	3.3612E 02	-3.7202E-02	
500	5.850E-02	1.4355E 01	1.2176E-01	1.4314E 01	4.2093E 02	-3.7662E-02	
68	3.216E-02	1.4531E 01	1.2326E-01	1.4490E 01	5.9117E 02	-3.8125E-02	

NOTE: For a summary of the sources of data see APEX-704.

DESIGNATION	CODE NO.	DENSITY FACTOR
URANIUM 235	92.2350	3.90255E 02
LEVEL	ENERGY	NU SIGMA FISSION
1	1.000E 07	6.9925E 00
2	6.065E 06	4.5404E 00
3	3.679E 06	3.6346E 00
4	2.231E 06	3.6462E 00
5	1.353E 06	3.4147E 00
6	8.208E 05	3.1485E 00
7	4.979E 05	3.1571E 00
8	3.020E 05	3.4727E 00
9	1.832E 05	4.0151E 00
10	6.738E 04	5.2672E 00
11	2.479E 04	7.1501E 00
12	9.119E 03	9.7837E 00
13	3.355E 03	1.3226E 01
14	1.234E 03	1.8956E 01
15	4.540E 02	3.8800E 01
16	8.719E 01	5.8755E 01
17	3.545E 01	1.1692E 02
18	1.304E 01	1.6817E 02
19	5.043E 00	4.1692E 01
20	1.445E 00	7.8811E 01
21	6.826E-01	1.6651E 02
22	2.511E-01	4.2217E 02
23	9.237E-02	6.9597E 02
24	2.530E-02	1.1813E 03
4500	3.023E-01	3.3586E 02
4000	2.718E-01	3.6092E 02
3500	2.413E-01	3.9049E 02
3000	2.109E-01	4.2597E 02
2500	1.804E-01	4.6930E 02
2000	1.499E-01	5.2361E 02
1500	1.194E-01	5.9471E 02
1000	8.897E-02	6.9680E 02
500	5.850E-02	8.7503E 02
68	3.216E-02	1.2278E 03

URANIUM 235

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.5266E 01	1.5223E 01	9.4388E 02	1.9530E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
1.2029E 01	7.9735E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 25
7.4379E-01	1.2511E 01	5.3921E-01	3.2044E-06	0.
23 21	23 22	23 23	23 24	23 25
0.	1.6640E 00	1.2287E 01	4.6070E-01	1.5072E-02
24 21	24 22	24 23	24 24	24 25
0.	5.8352E-05	4.0938E 00	9.0732E 00	1.6364E 00
25 21	25 22	25 23	25 24	25 25
0.	0.	3.1019E-01	4.0124E 00	1.0943E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.5209E 01	1.5166E 01	9.4471E 02	1.9547E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
1.1971E 01	8.5606E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 26
6.6455E-01	1.2577E 01	5.5054E-01	1.3563E-06	0.
23 21	23 22	23 23	23 24	23 26
0.	1.5468E 00	1.2406E 01	4.5436E-01	1.2336E-02
24 21	24 22	24 23	24 24	24 26
0.	2.0541E-05	3.8851E 00	9.3140E 00	1.5840E 00
26 21	26 22	26 23	26 24	26 26
0.	0.	2.3944E-01	3.8469E 00	1.1122E 01

-----URANIUM 235-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.5152E 01	1.5109E 01	9.4575E 02	1.9569E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
1.1892E 01	9.3479E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 27
5.8011E-01	1.2641E 01	5.6801E-01	4.7133E-07	0.
23 21	23 22	23 23	23 24	23 27
0.	1.4213E 00	1.2533E 01	4.4896E-01	9.7505E-03
24 21	24 22	24 23	24 24	24 27
0.	5.7018E-06	3.6589E 00	9.5787E 00	1.5252E 00
27 21	27 22	27 23	27 24	27 27
0.	0.	1.7582E-01	3.6597E 00	1.1316E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.5094E 01	1.5051E 01	9.4710E 02	1.9596E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
1.1783E 01	1.0435E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 28
4.8987E-01	1.2702E 01	5.9492E-01	1.2359E-07	0.
23 21	23 22	23 23	23 24	23 28
0.	1.2854E 00	1.2667E 01	4.4518E-01	7.3546E-03
24 21	24 22	24 23	24 24	24 28
0.	1.1314E-06	3.4117E 00	9.8720E 00	1.4588E 00
28 21	28 22	28 23	28 24	28 28
0.	0.	1.2065E-01	3.4465E 00	1.1527E 01

 URANIUM 235

 THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.5037E 01	1.4994E 01	9.4891E 02	1.9634E 03

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
1.1628E 01	1.1991E 00	0.	0.	21	24
22	21	22	22	22	24
3.9342E-01	1.2754E 01	6.3722E-01	0.	22	29
23	21	23	22	23	24
0.	1.1365E 00	1.2812E 01	4.4432E-01	23	29
24	21	24	22	24	24
0.	1.3640E-07	3.1384E 00	1.0200E 01	24	29
29	21	29	22	29	24
0.	0.	7.5036E-02	3.2019E 00	29	29
					1.1760E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.4980E 01	1.4937E 01	9.5148E 02	1.9687E 03

		N1	N2		

SIGMA S (N1/N2)					

21	21	21	22	21	23
1.1405E 01		1.4216E 00		0.	
				0.	
22	21	22	22	22	23
2.9111E-01		1.2784E 01		7.0658E-01	
				0.	
23	21	23	22	23	23
0.		9.7085E-01		1.2967E 01	
				4.4901E-01	
24	21	24	22	24	23
0.		0.		2.8320E 00	
				1.0571E 01	
30	21	30	22	30	23
0.		0.		4.0195E-02	
				2.9183E 00	
					1.2021E 01

-----URANIUM 235-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.4922E 01	1.4880E 01	9.5541E 02	1.9767E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
1.1231E 01	1.5963E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.8563E-01	1.2765E 01	8.2879E-01	0.	0.
23 21	23 22	23 23	23 24	23 31
0.	7.8257E-01	1.3134E 01	4.6514E-01	1.8146E-03
24 21	24 22	24 23	24 24	24 31
0.	0.	2.4815E 00	1.0997E 01	1.2030E 00
31 21	31 22	31 23	31 24	31 31
0.	0.	1.6770E-02	2.5849E 00	1.2321E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.4865E 01	1.4823E 01	9.6215E 02	1.9906E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
1.1813E 01	1.0136E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
8.6243E-02	1.2620E 01	1.0708E 00	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	5.6306E-01	1.3303E 01	5.0881E-01	7.2575E-04
24 21	24 22	24 23	24 24	24 32
0.	0.	2.0681E 00	1.1497E 01	1.0961E 00
32 21	32 22	32 23	32 24	32 32
0.	0.	4.3602E-03	2.1840E 00	1.2677E 01

URANIUM 235

THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
5.0000E 02	1.4808E 01	1.4766E 01	9.7638E 02	2.0199E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
1.2242E 01	5.8504E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
1.1342E-01	1.2114E 01	1.5469E 00	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	3.0313E-01	1.3426E 01	6.3973E-01	1.3613E-04
24 21	24 22	24 23	24 24	24 33
0.	0.	1.5529E 00	1.2104E 01	9.8421E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	3.6961E-04	1.6797E 00	1.3128E 01

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
6.8000E 01	1.4761E 01	1.4719E 01	1.0130E 03	2.0951E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
1.2222E 01	6.0478E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
2.2358E-01	1.3094E 01	4.5215E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	7.0153E-02	1.3196E 01	1.0961E 00	3.3100E-06
24 21	24 22	24 23	24 24	24 34
0.	0.	9.4606E-01	1.2758E 01	9.1931E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	2.0326E-06	1.0814E 00	1.3680E 01

 URANIUM 235

 TRANSFERS FROM GROUPS 1 THROUGH 10 TO GROUPS 1 TO 16

N1 N2
 SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.6523E 00	5.6288E-02	1.2204E-01	3.2373E-01	4.1481E-01
1 6	1 7	1 8	1 9	1 10
3.3208E-01	1.9723E-01	9.7316E-02	5.3622E-02	1.5357E-02
1 11	1 12	1 13	1 14	1 15
2.2541E-03	3.1267E-04	4.3386E-05	5.7750E-06	8.5069E-07
1 16	2 1	2 2	2 3	2 4
6.5787E-08	0.	3.4958E 00	1.1877E-01	2.8291E-01
2 5	2 6	2 7	2 8	2 9
5.0790E-01	5.0491E-01	3.4359E-01	1.8443E-01	1.0762E-01
2 10	2 11	2 12	2 13	2 14
3.2121E-02	4.8168E-03	6.7356E-04	9.3737E-05	1.2491E-05
2 15	2 16	3 1	3 2	3 3
1.8408E-06	1.4238E-07	0.	0.	4.4606E 00
3 4	3 5	3 6	3 7	3 8
1.9993E-01	4.2854E-01	5.4878E-01	4.3871E-01	2.6039E-01
3 9	3 10	3 11	3 12	3 13
1.6276E-01	5.1049E-02	7.8551E-03	1.1091E-03	1.5490E-04
3 14	3 15	3 16	4 1	4 2
2.0670E-05	3.0476E-06	2.3576E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	4.1358E 00	3.1690E-01	4.7205E-01	4.6521E-01
4 8	4 9	4 10	4 11	4 12
3.1494E-01	2.1556E-01	7.2170E-02	1.1489E-02	1.6433E-03
4 13	4 14	4 15	4 16	5 1
2.3056E-04	3.0823E-05	4.5474E-06	3.5188E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	3.7148E 00	4.2245E-01
5 7	5 8	5 9	5 10	5 11
4.2491E-01	3.3915E-01	2.6036E-01	9.4652E-02	1.5731E-02
5 12	5 13	5 14	5 15	5 16
2.2870E-03	3.2279E-04	4.3251E-05	6.3864E-06	4.9433E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
4.1891E 00	4.0365E-01	3.5454E-01	3.1634E-01	1.2807E-01
6 11	6 12	6 13	6 14	6 15
2.2518E-02	3.3447E-03	4.7579E-04	6.3947E-05	9.4526E-06
6 16	7 1	7 2	7 3	7 4
7.3197E-07	0.	0.	0.	0.

URANIUM 235

N1		N2		SIGMA S0 (N1/N2)	
7	5	7	6	7	7
0.		0.		5.0022E-00	5.0657E-01
7	10	7	11	7	12
2.0918E-01		3.9491E-02		6.0281E-03	8.6606E-04
7	15	7	16	8	1
1.7297E-05		1.3401E-06		0.	8
8	4	8	5	8	2
0.		0.		0.	7
8	9	8	10	8	6
6.7463E-01		3.2932E-01		0.	8
8	14	8	15	8	7
2.1185E-04		3.1414E-05		0.	8
9	3	9	4	9	8
0.		0.		0.	8
9	8	9	9	9	11
0.		8.1023E-00		7.6682E-01	1.2043E-01
9	13	9	14	9	12
3.0024E-03		4.1060E-04		9	13
10	2	10	3	10	14
0.		0.		6.1074E-05	4.7406E-06
10	7	10	8	10	15
0.		0.		0.	10
10	12	10	13	10	16
1.6981E-02		2.6067E-03		9.8918E-00	4.1526E-01
				5.3931E-05	4.1933E-06

 URANIUM 235

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
1.1270E 00	2.4131E 01	1.1541E 02	7.3754E-05	8.0000E-01
2.0400E 00	3.8782E 00	1.1445E 02	1.5513E-03	3.1818E-01
2.8200E 00	6.5325E-01	1.1727E 01	4.1529E-04	7.0000E-01
3.1400E 00	5.9296E 00	7.1825E 01	1.6980E-04	8.1818E-01
3.6100E 00	7.2130E 00	1.7259E 02	5.7634E-04	6.8750E-01
4.8400E 00	4.6433E 00	3.0407E 02	3.2196E-03	3.6170E-01
5.4500E 00	1.4585E 00	5.6215E 01	9.9046E-04	6.6667E-01
6.1200E 00	1.4980E 00	6.4828E 01	1.1121E-03	6.6667E-01
6.4000E 00	1.5206E 01	1.0626E 03	2.7728E-03	4.8276E-01
7.1000E 00	4.4609E 00	3.5936E 02	3.3214E-03	4.6429E-01
8.8200E 00	3.1124E 01	1.7271E 03	1.2686E-03	7.0000E-01
9.2700E 00	3.0647E 00	2.0067E 02	1.6807E-03	6.6667E-01
9.7400E 00	7.4604E-01	5.1380E 01	1.7696E-03	6.6667E-01
1.0150E 01	1.2110E 00	8.6885E 01	1.8430E-03	6.6667E-01
1.0640E 01	5.9402E-01	4.4691E 01	1.9332E-03	6.6667E-01
1.1110E 01	7.7930E-01	6.1211E 01	2.0179E-03	6.6667E-01
1.1660E 01	8.7303E 00	9.5892E 02	3.7600E-03	2.6866E-01
1.2400E 01	1.7602E 01	2.0040E 03	3.7985E-03	4.4118E-01
1.3400E 01	8.4022E-01	7.9576E 01	2.4324E-03	6.6667E-01
1.3800E 01	1.6066E 00	1.5657E 02	2.5009E-03	6.6667E-01
1.4110E 01	2.0578E 00	2.0493E 02	2.5542E-03	6.6667E-01
1.4600E 01	1.6236E 00	1.6737E 02	2.6447E-03	6.6667E-01
1.5500E 01	2.3250E 00	2.5414E 02	2.8013E-03	6.6667E-01
1.6100E 01	2.2278E 00	2.5292E 02	2.9091E-03	6.6667E-01
1.6800E 01	2.0899E 00	2.4756E 02	3.0352E-03	6.6667E-01
1.8100E 01	2.9309E 00	3.7330E 02	3.2570E-03	6.6667E-01
1.8700E 01	1.2721E 00	1.6787E 02	3.3838E-03	6.6667E-01
1.9300E 01	1.7294E 01	1.7247E 03	1.8725E-03	7.5000E-01
2.0600E 01	1.7576E 00	2.5508E 02	3.7155E-03	6.6667E-01
2.1100E 01	4.2128E 00	6.2241E 02	3.7593E-03	6.6667E-01
2.2100E 01	3.9661E-01	6.1935E 01	4.0099E-03	6.6667E-01
2.2900E 01	2.6153E 00	4.2051E 02	4.1024E-03	6.6667E-01
2.3500E 01	6.5675E 00	1.0704E 03	4.1074E-03	6.6667E-01
2.4400E 01	1.4986E 00	2.5740E 02	4.3939E-03	6.6667E-01
2.5300E 01	1.2265E 00	2.1857E 02	4.5612E-03	6.6667E-01
2.5800E 01	9.4108E-01	1.7117E 02	4.6594E-03	6.6667E-01
2.6500E 01	1.4584E 00	2.7186E 02	4.7652E-03	6.6667E-01
2.7300E 01	3.0326E-01	5.8491E 01	4.9516E-03	6.6667E-01
2.7900E 01	2.0809E 00	4.0709E 02	4.9847E-03	6.6667E-01
3.0700E 01	9.5320E-01	2.0599E 02	5.5280E-03	6.6667E-01

URANIUM 235

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
3.1100E 01	3.6793E-01	8.0784E 01	5.6330E-03	6.6667E-01
3.2100E 01	2.2398E 00	5.0225E 02	5.6922E-03	6.6667E-01
3.3600E 01	3.9278E 00	9.1122E 02	5.8208E-03	6.6667E-01
3.4600E 01	7.7040E 00	1.7918E 03	5.6814E-03	6.6667E-01
3.5300E 01	1.1773E 01	2.7074E 03	5.4438E-03	6.6667E-01

URANIUM 235

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

1 1	1 2	1 3	1 4	1 5
0.	0.	2.6856E-02	6.6246E-02	2.7214E-01
1 6	1 7	1 8	1 9	1 10
8.3971E-01	1.9963E 00	4.3131E 00	8.0623E 00	9.3979E 00
1 11	2 1	2 2	2 3	2 4
7.1617E-02	0.	0.	1.9943E-02	4.9192E-02
2 5	2 6	2 7	2 8	2 9
2.0209E-01	6.2354E-01	1.4824E 00	3.2028E 00	5.9868E 00
2 10	2 11	3 1	3 2	3 3
6.9786E 00	5.3181E-02	0.	0.	1.8801E-02
3 4	3 5	3 6	3 7	3 8
4.6375E-02	1.9051E-01	5.8783E-01	1.3975E 00	3.0194E 00
3 9	3 10	3 11	4 1	4 2
5.6439E 00	6.5790E 00	5.0135E-02	0.	0.
4 3	4 4	4 5	4 6	4 7
1.9936E-02	4.9175E-02	2.0202E-01	6.2333E-01	1.4819E 00
4 8	4 9	4 10	4 11	5 1
3.2017E 00	5.9847E 00	6.9762E 00	5.3162E-02	0.
5 2	5 3	5 4	5 5	5 6
0.	1.9638E-02	4.8441E-02	1.9900E-01	6.1402E-01
5 7	5 8	5 9	5 10	5 11
1.4598E 00	3.1539E 00	5.8954E 00	6.8721E 00	5.2369E-02
6 1	6 2	6 3	6 4	6 5
0.	0.	1.8955E-02	4.6755E-02	1.9207E-01
6 6	6 7	6 8	6 9	6 10
5.9265E-01	1.4090E 00	3.0441E 00	5.6902E 00	6.6328E 00
6 11	7 1	7 2	7 3	7 4
5.0546E-02	0.	0.	1.9790E-02	4.8816E-02
7 5	7 6	7 7	7 8	7 9
2.0054E-01	6.1878E-01	1.4711E 00	3.1783E 00	5.9410E 00
7 10	7 11	8 1	8 2	8 3
6.9253E 00	5.2774E-02	0.	0.	2.1686E-02
8 4	8 5	8 6	8 7	8 8
5.3491E-02	2.1975E-01	6.7803E-01	1.6120E 00	3.4827E 00
8 9	8 10	8 11	9 1	9 2
6.5100E 00	7.5885E 00	5.7828E-02	0.	0.
9 3	9 4	9 5	9 6	9 7
2.5496E-02	6.2889E-02	2.5835E-01	7.9716E-01	1.8952E 00
9 8	9 9	9 10	9 11	10 1
4.0946E 00	7.6538E 00	8.9217E 00	6.7988E-02	0.

URANIUM 235

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		3.3653E-02		8.3010E-02	
10	7	10	8	10	9
2.5015E 00		5.4046E 00		1.0103E 01	
11	1	11	2	11	3
0.		0.		4.6870E-02	
11	6	11	7	11	8
1.4655E 00		3.4840E 00		7.5273E 00	
11	11	12	1	12	2
1.2499E-01		0.		0.	
12	5	12	6	12	7
6.8898E-01		2.1259E 00		5.0540E 00	
12	10	12	11	13	1
2.3792E 01		1.8131E-01		0.	
13	4	13	5	13	6
2.3023E-01		9.4581E-01		2.9183E 00	
13	9	13	10	13	11
2.8020E 01		3.2662E 01		2.4890E-01	
14	3	14	4	14	5
1.3825E-01		3.4101E-01		1.4009E 00	
14	8	14	9	14	10
2.2202E 01		4.1502E 01		4.8377E 01	
15	2	15	3	15	4
0.		2.8010E-01		6.9092E-01	
15	7	15	8	15	9
2.0821E 01		4.4985E 01		8.4087E 01	
16	1	16	2	16	3
0.		0.		4.4698E-01	
16	6	16	7	16	8
1.3976E 01		3.3226E 01		7.1786E 01	
16	11	17	1	17	2
1.1920E 00		0.		0.	
17	5	17	6	17	7
8.9607E 00		2.7648E 01		6.5731E 01	
17	10	17	11	18	1
3.0944E 02		2.3581E 00		0.	
18	4	18	5	18	6
3.2288E 00		1.3264E 01		4.0927E 01	
18	9	18	10	18	11
3.9295E 02		4.5805E 02		3.4906E 00	
				0.	
				0.	

URANIUM 235

N1		N2		SIGMA N,G (N1/N2)	
19	3	19	4	19	5
4.8909E-01		1.2064E 00		4.9561E 00	
19	8	19	9	19	10
7.8548E 01		1.4682E 02		1.7115E 02	
20	2	20	3	20	4
0.		5.7386E-01		1.4155E 00	
20	7	20	8	20	9
4.2657E 01		9.2162E 01		1.7227E 02	
21	1	21	2	21	3
0.		0.		1.1411E 00	
21	6	21	7	21	8
3.5679E 01		8.4823E 01		1.8326E 02	
21	11	22	1	22	2
3.0430E 00		0.		0.	
22	5	22	6	22	7
3.0569E 01		9.4321E 01		2.2424E 02	
22	10	22	11	23	1
1.0556E 03		8.0444E 00		0.	
23	4	23	5	23	6
1.1690E 01		4.8026E 01		1.4818E 02	
23	9	23	10	23	11
1.4228E 03		1.6585E 03		1.2638E 01	
24	3	24	4	24	5
7.7934E 00		1.9224E 01		7.8973E 01	
24	8	24	9	24	10
1.2516E 03		2.3396E 03		2.7272E 03	
25	2	25	3	25	4
0.		1.2917E 01		3.1861E 01	
25	7	25	8	25	9
9.6014E 02		2.0744E 03		3.8776E 03	
26	1	26	2	26	3
0.		0.		1.2926E 01	
26	6	26	7	26	8
4.0416E 02		9.6086E 02		2.0760E 03	
26	11	27	1	27	2
3.4470E 01		0.		0.	
27	5	27	6	27	7
1.3114E 02		4.0463E 02		9.6197E 02	
27	10	27	11	28	1
4.5286E 03		3.4510E 01		0.	
28	2	28	3	28	4
0.		0.		0.	
28	7	28	8	28	9
1.2959E 01		1.2959E 01		1.2959E 01	

URANIUM 235.

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
3.1966E 01	1.3132E 02	4.0519E 02	9.6330E 02	2.0812E 03	
28	9	28	10	28	11
3.8903E 03	4.5348E 03	3.4558E 01	0.	0.	
29	3	29	4	29	5
1.2984E 01	3.2026E 01	1.3157E 02	4.0596E 02	9.6512E 02	
29	8	29	9	29	10
2.0852E 03	3.8977E 03	4.5434E 03	3.4623E 01	0.	
30	2	30	3	30	4
0.	1.3020E 01	3.2116E 01	1.3194E 02	4.0710E 02	
30	7	30	8	30	9
9.6783E 02	2.0910E 03	3.9086E 03	4.5562E 03	3.4720E 01	
31	1	31	2	31	3
0.	0.	1.3074E 01	3.2249E 01	1.3248E 02	
31	6	31	7	31	8
4.0877E 02	9.7182E 02	2.0996E 03	3.9247E 03	4.5749E 03	
31	11	32	1	32	2
3.4863E 01	0.	0.	1.3166E 01	3.2476E 01	
32	5	32	6	32	7
1.3342E 02	4.1166E 02	9.7868E 02	2.1145E 03	3.9524E 03	
32	10	32	11	33	1
4.6072E 03	3.5109E 01	0.	0.	1.3359E 01	
33	4	33	5	33	6
3.2952E 01	1.3537E 02	4.1769E 02	9.9301E 02	2.1454E 03	
33	9	33	10	34	1
4.0103E 03	4.6747E 03	3.5624E 01	0.	0.	
34	3	34	4	34	5
1.3858E 01	3.4184E 01	1.4043E 02	4.3330E 02	1.0301E 03	
34	8	34	9	34	10
2.2257E 03	4.1603E 03	4.8495E 03	3.6956E 01		

DESIGNATION			CODE NO.			DENSITY FACTOR		
URANIUM 238			92.2380			3.95248E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER I		
1	1.000E 07	4.8740E 00	6.6945E 00	3.0369E 00	1.0150E 00	-1.8865E 00		
2	6.065E 06	6.2302E 00	5.8982E 00	3.1789E 00	7.2009E-01	-3.1333E 00		
3	3.679E 06	7.1895E 00	4.5506E 00	3.3671E 00	5.8228E-01	-3.9251E 00		
4	2.231E 06	6.6944E 00	3.2885E 00	3.7678E 00	5.9908E-01	-3.0052E 00		
5	1.353E 06	6.5531E 00	2.3073E 00	4.4849E 00	2.6659E-01	-2.1237E 00		
6	8.208E 05	6.9065E 00	1.3933E 00	5.0203E 00	1.5231E-01	-1.9369E 00		
7	4.979E 05	8.0344E 00	7.1225E-01	6.1540E 00	1.2705E-01	-1.9309E 00		
8	3.020E 05	9.3166E 00	3.6329E-01	7.5274E 00	1.3694E-01	-1.8373E 00		
9	1.832E 05	1.0966E 01	1.8854E-01	9.4947E 00	2.1059E-01	-1.5104E 00		
10	6.738E 04	1.2491E 01	1.2339E-01	1.1764E 01	3.1738E-01	-7.4715E-01		
11	2.479E 04	1.3270E 01	1.1148E-01	1.3232E 01	4.6493E-01	-3.8559E-02		
12	9.119E 03	1.4059E 01	1.1810E-01	1.4020E 01	6.3497E-01	-4.0422E-02		
13	3.355E 03	1.5074E 01	1.2662E-01	1.5032E 01	9.9544E-01	-4.3340E-02		
14	1.234E 03	1.2545E 01	1.0538E-01	1.2510E 01	2.4061E 00	-3.6070E-02		
15	4.540E 02	1.8221E 01	1.5305E-01	1.8170E 01	5.9857E 00	-5.2388E-02		
16	8.719E 01	5.2305E 01	4.3936E-01	5.2158E 01	2.1926E 01	-1.5039E-01		
17	3.545E 01	6.8678E 01	5.7690E-01	6.8486E 01	5.3591E 01	-1.9746E-01		
18	1.304E 01	2.9210E 01	2.4536E-01	2.9128E 01	6.6547E 01	-8.3981E-02		
19	5.043E 00	1.4091E 01	1.1836E-01	1.4052E 01	1.1796E 02	-4.0516E-02		
20	1.445E 00	8.1129E 00	6.8148E-02	8.0901E 00	4.9363E-01	-2.3326E-02		
21	6.826E-01	8.2894E 00	6.9631E-02	8.2662E 00	6.0122E-01	-2.3833E-02		
22	2.511E-01	8.3449E 00	7.0097E-02	8.3215E 00	8.8630E-01	-2.3993E-02		
23	9.237E-02	8.3671E 00	7.0283E-02	8.3436E 00	1.4741E 00	-2.4057E-02		
24	2.530E-02	8.3419E 00	7.0072E-02	8.3185E 00	2.2691E 00	-2.3984E-02		
*4500	3.023E-01	8.6576E 00	7.2724E-02	8.6334E 00	9.5250E-01	-2.4892E-02		
*4000	2.718E-01	8.6576E 00	7.2724E-02	8.6334E 00	9.5250E-01	-2.4892E-02		
*3500	2.413E-01	8.6576E 00	7.2724E-02	8.6334E 00	9.5250E-01	-2.4892E-02		
*3000	2.109E-01	8.6576E 00	7.2724E-02	8.6334E 00	9.5250E-01	-2.4892E-02		
2500	1.804E-01	8.6163E 00	7.2377E-02	8.5922E 00	1.0298E 00	-2.4774E-02		
2000	1.499E-01	8.5650E 00	7.1946E-02	8.5410E 00	1.1296E 00	-2.4626E-02		
1500	1.194E-01	8.4958E 00	7.1365E-02	8.4720E 00	1.2656E 00	-2.4427E-02		
1000	8.897E-02	8.3968E 00	7.0533E-02	8.3733E 00	1.4664E 00	-2.4143E-02		
500	5.850E-02	8.2340E 00	6.9166E-02	8.2109E 00	1.8085E 00	-2.3674E-02		
68	3.216E-02	7.9182E 00	6.6513E-02	7.8960E 00	2.4389E 00	-2.2766E-02		

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

DESIGNATION	CODE NO.	DENSITY FACTOR
URANIUM 238	92.2380	3.95248E 02
LEVEL	ENERGY	NU SIGMA FISSION
1	1.000E 07	3.7597E 00
2	6.065E 06	2.4033E 00
3	3.679E 06	1.6843E 00
4	2.231E 06	1.5530E 00
5	1.353E 06	4.5848E-01
6	8.208E 05	1.9001E-02
7	4.979E 05	4.2981E-04
8	3.020E 05	0.
9	1.832E 05	0.
10	6.738E 04	0.
11	2.479E 04	0.
12	9.119E 03	0.
13	3.355E 03	0.
14	1.234E 03	0.
15	4.540E 02	0.
16	8.719E 01	0.
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

 URANIUM 238

 THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	9.8729E 00	9.8453E 00	3.6394E 00	0.

 N1 N2
 SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 25
7.7760E 00	5.1339E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 25
4.4836E-01	7.5874E 00	3.2532E-01	1.7500E-06	0.
23 21	23 22	23 23	23 24	23 25
0.	9.6448E-01	7.1703E 00	2.6733E-01	8.5627E-03
24 21	24 22	24 23	24 24	24 25
0.	2.9808E-05	2.3264E 00	5.1991E 00	9.3090E-01
25 21	25 22	25 23	25 24	25 25
0.	0.	1.9518E-01	2.5850E 00	7.0928E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	9.8363E 00	9.8088E 00	3.6423E 00	0.

 N1 N2
 SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 26
7.7381E 00	5.5130E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 26
4.0062E-01	7.6268E 00	3.3220E-01	7.3368E-07	0.
23 21	23 22	23 23	23 24	23 26
0.	8.9661E-01	7.2392E 00	2.6366E-01	6.9945E-03
24 21	24 22	24 23	24 24	24 26
0.	1.0388E-05	2.2076E 00	5.3364E 00	9.0091E-01
26 21	26 22	26 23	26 24	26 26
0.	0.	1.5039E-01	2.4778E 00	7.2082E 00

----- URANIUM 238 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	9.7997E 00	9.7723E 00	3.6460E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
7.6872E 00	6.0214E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 27
3.4974E-01	7.6656E 00	3.4280E-01	2.5189E-07	0.
23 21	23 22	23 23	23 24	23 27
0.	8.2386E-01	7.3124E 00	2.6053E-01	5.5193E-03
24 21	24 22	24 23	24 24	24 27
0.	2.8475E-06	2.0790E 00	5.4873E 00	8.6723E-01
27 21	27 22	27 23	27 24	27 27
0.	0.	1.1024E-01	2.3567E 00	7.3328E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	9.7631E 00	9.7357E 00	3.6509E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
7.6171E 00	6.7234E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 28
2.9536E-01	7.7022E 00	3.5912E-01	0.	0.
23 21	23 22	23 23	23 24	23 28
0.	7.4513E-01	7.3904E 00	2.5834E-01	4.1560E-03
24 21	24 22	24 23	24 24	24 28
0.	5.5604E-07	1.9383E 00	5.6544E 00	8.2932E-01
28 21	28 22	28 23	28 24	28 28
0.	0.	7.5451E-02	2.2108E 00	7.4688E 00

URANIUM 238

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	9.7263E 00	9.6991E 00	3.6574E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
7.5166E 00	7.7284E-01	0.	0.	0.	0.
22	21	22	22	22	23
2.3724E-01	7.7332E 00	3.8475E-01	0.	0.	0.
23	21	23	22	23	23
0.	6.5888E-01	7.4742E 00	2.5786E-01	2.9288E-03	2.9288E-03
24	21	24	22	24	23
0.	0.	1.7829E 00	5.8411E 00	7.8650E-01	7.8650E-01
29	21	29	22	29	23
0.	0.	4.6791E-02	2.0609E 00	7.6186E 00	7.6186E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	9.6895E 00	9.6624E 00	3.6666E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
7.3727E 00	9.1665E-01	0.	0.	0.	0.
22	21	22	22	22	23
1.7557E-01	7.7513E 00	4.2678E-01	0.	0.	0.
23	21	23	22	23	23
0.	5.6287E-01	7.5643E 00	2.6062E-01	1.8699E-03	1.8699E-03
24	21	24	22	24	23
0.	0.	1.6087E 00	6.0522E 00	7.3809E-01	7.3809E-01
30	21	30	22	30	23
0.	0.	2.4942E-02	1.8779E 00	7.7867E 00	7.7867E 00

URANIUM 238

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	9.6527E 00	9.6257E 00	3.6806E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
7.2596E 00	1.0297E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.1198E-01	7.7394E 00	5.0083E-01	0.	0.
23 21	23 22	23 23	23 24	23 31
0.	4.5376E-01	7.6606E 00	2.7004E-01	1.0129E-03
24 21	24 22	24 23	24 24	24 31
0.	0.	1.4095E 00	6.2945E 00	6.8346E-01
31 21	31 22	31 23	31 24	31 31
0.	0.	1.0343E-02	1.6631E 00	7.9793E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	9.6157E 00	9.5888E 00	3.7047E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
7.6352E 00	6.5418E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
5.2046E-02	7.6512E 00	6.4747E-01	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	3.2655E-01	7.7587E 00	2.9551E-01	4.0150E-04
24 21	24 22	24 23	24 24	24 32
0.	0.	1.1746E 00	6.5787E 00	6.2267E-01
32 21	32 22	32 23	32 24	32 32
0.	0.	2.6615E-03	1.4050E 00	8.2081E 00

URANIUM 238

THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
5.0000E 02	9.5787E 00	9.5519E 00	3.7557E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 33
7.9118E 00	3.7757E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
6.8592E-02	7.3442E 00	9.3615E-01	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.7586E-01	7.8292E 00	3.7184E-01	7.3854E-05
24 21	24 22	24 23	24 24	24 33
0.	0.	8.8204E-01	6.9233E 00	5.5913E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	2.2116E-04	1.0805E 00	8.4980E 00

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
6.8000E 01	9.5466E 00	9.5198E 00	3.8896E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 34
7.8990E 00	3.9044E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
1.3548E-01	7.9373E 00	2.7384E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	4.0731E-02	7.6947E 00	6.3792E-01	1.7118E-06
24 21	24 22	24 23	24 24	24 34
0.	0.	5.3744E-01	7.2947E 00	5.2242E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	1.1617E-06	6.9576E-01	8.8508E 00

 URANIUM 238

 TRANSFERS FROM GROUPS 1 THROUGH 11 TO GROUPS 1 THROUGH 16

N1 N2
 SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.9707E 00	7.1438E-02	9.2508E-02	4.0548E-01	7.1541E-01
1 6	1 7	1 8	1 9	1 10
7.0023E-01	4.7105E-01	2.5088E-01	1.4557E-01	4.3269E-02
1 11	1 12	1 13	1 14	1 15
6.4742E-03	9.0456E-04	1.2584E-04	1.6768E-05	2.4709E-06
1 16	2 1	2 2	2 3	2 4
1.9111E-07	0.	3.3009E 00	2.6080E-01	2.5552E-01
2 5	2 6	2 7	2 8	2 9
5.9900E-01	7.0830E-01	5.3816E-01	3.0942E-01	1.8924E-01
2 10	2 11	2 12	2 13	2 14
5.8429E-02	8.9177E-03	1.2553E-03	1.7512E-04	2.3358E-05
2 15	2 16	3 1	3 2	3 3
3.4433E-06	2.6636E-07	0.	0.	4.7879E 00
3 4	3 5	3 6	3 7	3 8
1.5929E-01	3.7779E-01	6.0573E-01	5.5943E-01	3.6354E-01
3 9	3 10	3 11	3 12	3 13
2.4188E-01	7.9349E-02	1.2499E-02	1.7805E-03	2.4946E-04
3 14	3 15	3 16	4 1	4 2
3.3329E-05	4.9163E-06	3.8039E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	4.7133E 00	2.4851E-01	4.3135E-01	5.0868E-01
4 8	4 9	4 10	4 11	4 12
3.8588E-01	2.8588E-01	1.0131E-01	1.6613E-02	2.4030E-03
4 13	4 14	4 15	4 16	5 1
3.3854E-04	4.5329E-05	6.6915E-06	5.1790E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	4.9085E 00	3.8155E-01
5 7	5 8	5 9	5 10	5 11
4.1070E-01	3.7886E-01	3.2204E-01	1.2593E-01	2.1744E-02
5 12	5 13	5 14	5 15	5 16
3.2075E-03	4.5511E-04	6.1108E-05	9.0297E-06	6.9913E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
5.7906E 00	3.5909E-01	2.9672E-01	2.9923E-01	1.3220E-01
6 11	6 12	6 13	6 14	6 15
2.4335E-02	3.6787E-03	5.2665E-04	7.0961E-05	1.0499E-05
6 16	7 1	7 2	7 3	7 4
8.1326E-07	0.	0.	0.	0.

URANIUM 238

N1		N2		SIGMA S0 (N1/N2)	
7	5	7	6	7	7
0.		0.		7.3632E-00	3.0890E-01
7	10	7	11	7	12
1.1419E-01		2.2822E-02		3.5611E-03	5.1575E-04
7	15	7	16	8	1
1.0345E-05		8.0183E-07		0.	0.
8	4	8	5	8	6
0.		0.		0.	0.
8	9	8	10	8	11
2.4806E-01		9.0140E-02		1.9988E-02	3.2476E-03
8	14	8	15	8	16
6.4989E-05		9.6508E-06		7.4863E-07	0.
9	3	9	4	9	5
0.		0.		0.	0.
9	8	9	9	9	10
0.		1.0537E-01		4.0970E-01	1.5751E-02
9	13	9	14	9	15
4.1200E-04		5.6631E-05		8.4390E-06	6.5549E-07
10	2	10	3	10	4
0.		0.		0.	0.
10	7	10	8	10	9
0.		0.		0.	1.2096E-01
10	12	10	13	10	14
1.8350E-03		2.8988E-04		4.0597E-05	6.0905E-06
11	1	11	2	11	3
0.		0.		0.	0.
11	6	11	7	11	8
0.		0.		0.	0.
11	11	11	12	11	13
1.2931E-01		3.3830E-01		0.	0.
11	16				
0.					

URANIUM 238

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
6.6800E 00	1.2915E 02	2.0741E 04	1.3971E-02	0.
1.0200E 01	5.5496E-02	1.5334E 01	2.7084E-02	0.
2.1000E 01	6.1890E 01	2.4336E 04	2.6642E-02	0.
3.6800E 01	4.4289E 01	1.7586E 04	1.5504E-02	0.
6.6300E 01	1.0037E 01	9.8524E 03	5.2587E-02	0.
8.1100E 01	1.2088E 00	2.4379E 03	1.8149E-01	0.
9.0000E 00	4.0596E 00	9.8643E 02	2.3739E-02	0.
1.0280E 02	5.6200E 00	4.0866E 03	1.8613E-02	0.
1.1700E 02	2.6054E 00	5.6087E 03	1.4333E-01	0.
1.4590E 02	1.5171E-01	5.7965E 02	3.6207E-01	0.
1.6570E 02	4.4618E-01	1.7497E 03	3.3583E-01	0.
1.9000E 02	2.1657E 00	1.6475E 03	1.1022E-02	0.
2.0910E 02	1.6135E 00	2.8262E 03	5.3092E-02	0.
2.3800E 02	8.9615E-01	2.6112E 03	1.2908E-01	0.
2.6400E 02	1.3479E-02	9.5463E 01	6.8756E-01	0.
2.7450E 02	6.6353E-01	2.3664E 03	1.6767E-01	0.
2.9200E 02	4.5953E-01	2.2480E 03	2.9656E-01	0.
3.1250E 02	4.0510E-02	3.2894E 02	7.6352E-01	0.
3.4900E 02	4.6885E-01	1.6026E 03	1.2114E-01	0.
3.7800E 02	4.0700E-02	3.9176E 02	8.8698E-01	0.
3.9900E 02	2.0725E-01	1.0529E 03	2.3406E-01	0.
4.1200E 02	2.1243E-01	1.5919E 03	4.9325E-01	0.
4.3600E 02	1.7867E-01	1.4586E 03	5.5313E-01	0.
4.5600E 02	1.3483E-02	1.6174E 02	1.1419E 00	0.
4.6500E 02	9.6135E-02	1.1383E 03	1.0911E 00	0.
4.8000E 02	7.1377E-02	5.5218E 02	4.5118E-01	0.
4.9100E 02	1.6409E-02	2.0936E 02	1.1996E 00	0.
5.2000E 02	1.9645E-01	1.2507E 03	2.8203E-01	0.
5.3700E 02	2.3764E-01	1.0415E 03	1.2945E-01	0.
5.5800E 02	1.2705E-02	1.8422E 02	1.3633E 00	0.
5.8200E 02	1.8096E-01	1.0315E 03	2.0202E-01	0.
5.9700E 02	1.9737E-01	8.4286E 02	1.1053E-01	0.

----- URANIUM 238 -----

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
1	1	1	2	1	3
0.		0.		1.5225E-02	3.7555E-02
1	6	1	7	1	8
4.7624E-01		1.1325E 00		2.4470E 00	4.5742E 00
1	11	2	1	2	2
4.0608E-02		0.		0.	1.0882E-02
2	5	2	6	2	7
1.1028E-01		3.4066E-01		8.1055E-01	1.7515E 00
2	10	2	11	3	1
3.8610E 00		2.9035E-02		0.	0.
3	4	3	5	3	6
2.1016E-02		8.6336E-02		2.6718E-01	6.3649E-01
3	9	3	10	3	11
2.5721E 00		3.0849E 00		2.2750E-02	0.
4	3	4	4	4	5
8.4570E-03		2.0861E-02		8.5698E-02	2.6612E-01
4	8	4	9	4	10
1.3739E 00		2.5695E 00		3.1808E 00	2.2617E-02
5	2	5	3	5	4
0.		2.6175E-03		6.4565E-03	2.6524E-02
5	7	5	8	5	9
2.0895E-01		4.5361E-01		8.5089E-01	1.3853E 00
6	1	6	2	6	3
0.		0.		1.1250E-04	2.7750E-04
6	6	6	7	6	8
8.4202E-03		2.7996E-02		6.3454E-02	1.2268E-01
6	11	7	1	7	2
4.8683E-04		0.		0.	2.5500E-06
7	5	7	6	7	7
2.5840E-05		4.1427E-03		1.6460E-02	3.8022E-02
7	10	7	11	8	1
5.3193E-01		1.6163E-04		0.	0.
8	4	8	5	8	6
0.		0.		4.2124E-03	1.6869E-02
8	9	8	10	8	11
7.6391E-02		5.5058E-01		1.6053E-04	0.
9	3	9	4	9	5
0.		0.		0.	6.2353E-03
9	8	9	9	9	10
5.7723E-02		1.1308E-01		8.1497E-01	2.3761E-04
					0.

URANIUM 238

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		0.		0.	
10	7	10	8	10	10
3.7075E-02		8.5707E-02		1.6790E-01	
11	1	11	2	11	3
0.		0.		0.	
11	6	11	7	11	8
1.3753E-02		5.5074E-02		1.2732E-01	
11	11	12	1	12	2
5.2409E-04		0.		0.	
12	5	12	6	12	7
0.		1.8322E-02		7.3372E-02	
12	10	12	11	13	1
2.3947E 00		6.9821E-04		0.	
13	4	13	5	13	6
0.		0.		2.8684E-02	
13	9	13	10	13	11
5.2018E-01		3.7491E 00		1.0931E-03	
14	3	14	4	14	5
0.		0.		0.	
14	8	14	9	14	10
6.4155E-01		1.2568E 00		9.0579E 00	
15	2	15	3	15	4
0.		0.		0.	
15	7	15	8	15	9
6.9033E-01		1.5958E 00		3.1262E 00	
16	1	16	2	16	3
0.		0.		0.	
16	6	16	7	16	8
6.3150E-01		2.5289E 00		5.8461E 00	
16	11	17	1	17	2
2.4065E-02		0.		0.	
17	5	17	6	17	7
0.		1.5432E 00		6.1797E 00	
17	10	17	11	18	1
2.0170E 02		5.8807E-02		0.	
18	4	18	5	18	6
0.		0.		1.9163E 00	
18	9	18	10	18	11
3.4753E 01		2.5047E 02		7.3028E-02	
				0.	
10	5	10	6	10	11
0.		9.2582E-03		3.5281E-04	
11	4	11	5	11	10
0.		0.		1.7975E 00	
11	9	12	3	12	4
2.4940E-01		0.		0.	
12	8	12	9	13	2
1.6962E-01		0.		0.	
13	7	13	8	14	1
1.1487E-01		0.		0.	
14	6	14	7	14	10
6.9301E-02		2.7752E-01		15 1	
14	11	15	1	15	6
2.6409E-03		0.		1.7238E-01	
15	5	15	11	15	11
0.		6.5693E-03		0.	
15	10	16	5	16	10
2.2531E 01		8.2539E 01		17 4	
16	4	17	9	17	9
0.		2.7985E 01		18 3	
16	9	18	8	18	8
1.1452E 01		1.7741E 01		19 2	
17	3	19	2		
0.		0.			

URANIUM 238

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
0.		0.		1.0513E-01	4.2100E-01
28	9	28	10	28	11
1.9065E 00		1.3741E 01		4.0063E-03	0.
29	3	29	4	29	5
0.		0.		0.	1.0532E-01
29	8	29	9	29	10
9.7497E-01		1.9099E 00		1.3765E 01	4.0134E-03
30	2	30	3	30	4
0.		0.		0.	0.
30	7	30	8	30	9
4.2281E-01		9.7742E-01		1.9147E 00	1.3800E 01
31	1	31	2	31	3
0.		0.		0.	0.
31	6	31	7	31	8
1.0598E-01		4.2442E-01		9.8115E-01	1.9220E 00
31	11	32	1	32	2
4.0389E-03		0.		0.	0.
32	5	32	6	32	7
0.		1.0668E-01		4.2720E-01	9.8757E-01
32	10	32	11	33	1
1.3943E 01		4.0653E-03		0.	0.
33	4	33	5	33	6
0.		0.		1.0815E-01	4.3308E-01
33	9	33	10	33	11
1.9612E 00		1.4135E 01		4.1213E-03	0.
34	3	34	4	34	5
0.		0.		0.	1.1200E-01
34	8	34	9	34	10
1.0369E 00		2.0312E 00		1.4639E 01	4.2682E-03

DATE DEC 01 1960

DESIGNATION			CODE NO.			DENSITY FACTOR		
PLUTON 239			94.2390			3.96911E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1		
1	1.000E 07	4.0306E 00	1.3128E 00	9.2193E-01	2.3272E 00	-2.9553E 00		
2	6.065E 06	5.3809E 00	2.3094E 00	1.7899E 00	1.9331E 00	-3.4139E 00		
3	3.679E 06	6.0440E 00	2.8105E 00	2.6017E 00	1.8717E 00	-3.2725E 00		
4	2.231E 06	5.4784E 00	2.4783E 00	2.8143E 00	2.0243E 00	-2.5327E 00		
5	1.353E 06	5.0682E 00	1.7420E 00	3.1722E 00	1.9965E 00	-1.8026E 00		
6	8.208E 05	5.7145E 00	1.2257E 00	4.0592E 00	1.8456E 00	-1.5737E 00		
7	4.979E 05	6.7357E 00	7.4301E-01	5.5480E 00	1.8581E 00	-1.1291E 00		
8	3.020E 05	7.7366E 00	3.7484E-01	7.2383E 00	1.9316E 00	-4.7374E-01		
9	1.832E 05	8.8781E 00	1.1917E-01	8.7330E 00	2.0556E 00	-1.3792E-01		
10	6.738E 04	1.0112E 01	8.5951E-02	1.0084E 01	2.4064E 00	-2.6917E-02		
11	2.479E 04	1.0987E 01	9.3393E-02	1.0957E 01	3.1741E 00	-2.9248E-02		
12	9.119E 03	1.2099E 01	1.0284E-01	1.2065E 01	3.4447E 00	-3.2207E-02		
13	3.355E 03	1.3313E 01	1.1316E-01	1.3275E 01	4.7924E 00	-3.5438E-02		
14	1.234E 03	1.0701E 01	9.0958E-02	1.0671E 01	7.5652E 00	-2.8484E-02		
15	4.540E 02	1.0785E 01	9.1675E-02	1.0755E 01	1.9796E 01	-2.8709E-02		
16	8.719E 01	3.4636E 01	2.9441E-01	3.4539E 01	7.9339E 01	-9.2199E-02		
17	3.545E 01	2.1478E 01	1.8256E-01	2.1418E 01	6.5651E 01	-5.7170E-02		
18	1.304E 01	1.2515E 01	1.0638E-01	1.2480E 01	1.1358E 02	-3.3314E-02		
19	5.043E 00	1.0795E 01	9.0035E-02	1.0754E 01	4.4590E 01	-3.8875E-02		
20	1.445E 00	1.2092E 01	1.0086E-01	1.2047E 01	2.2500E 01	-4.3548E-02		
21	6.826E-01	1.4196E 01	1.1840E-01	1.4142E 01	1.6703E 02	-5.1123E-02		
22	2.511E-01	1.3748E 01	1.1466E-01	1.3696E 01	2.3490E 03	-4.9509E-02		
23	9.237E-02	1.0455E 01	8.7200E-02	1.0415E 01	6.7335E 02	-3.7651E-02		
24	2.530E-02	1.0885E 01	9.0782E-02	1.0843E 01	8.2054E 02	-3.9198E-02		
4500	3.023E-01	1.3858E 01	1.1558E-01	1.3806E 01	1.1393E 03	-4.9906E-02		
4000	2.718E-01	1.3791E 01	1.1502E-01	1.3739E 01	1.2323E 03	-4.9663E-02		
3500	2.413E-01	1.3658E 01	1.1391E-01	1.3606E 01	1.3262E 03	-4.9186E-02		
3000	2.109E-01	1.3432E 01	1.1203E-01	1.3381E 01	1.4129E 03	-4.8372E-02		
2500	1.804E-01	1.3077E 01	1.0907E-01	1.3028E 01	1.4773E 03	-4.7093E-02		
2000	1.499E-01	1.2556E 01	1.0473E-01	1.2509E 01	1.4923E 03	-4.5219E-02		
1500	1.194E-01	1.1859E 01	9.8913E-02	1.1814E 01	1.4163E 03	-4.2708E-02		
1000	8.897E-02	1.1089E 01	9.2491E-02	1.1047E 01	1.2084E 03	-3.9935E-02		
500	5.850E-02	1.0620E 01	8.8572E-02	1.0579E 01	9.2654E 02	-3.8244E-02		
68	3.216E-02	1.0759E 01	8.9732E-02	1.0718E 01	8.9489E 02	-3.8743E-02		

NOTE: For a summary of the sources of data see APEX-704.

DESIGNATION	CODE NO.	DENSITY FACTOR
PLUTON 239	94.2390	3.96911E 02
LEVEL	ENERGY	NU SIGMA FISSION
1	1.000E 07	8.8370E 00
2	6.065E 06	6.7725E 00
3	3.679E 06	6.0280E 00
4	2.231E 06	6.1268E 00
5	1.353E 06	5.7387E 00
6	8.208E 05	5.0794E 00
7	4.979E 05	4.8695E 00
8	3.020E 05	4.8388E 00
9	1.832E 05	4.8910E 00
10	6.738E 04	5.3781E 00
11	2.479E 04	6.6784E 00
12	9.119E 03	6.8959E 00
13	3.355E 03	9.1838E 00
14	1.234E 03	1.3908E 01
15	4.540E 02	3.4971E 01
16	8.719E 01	1.3428E 02
17	3.545E 01	7.3552E 01
18	1.304E 01	2.1560E 02
19	5.043E 00	7.5150E 01
20	1.445E 00	5.5300E 01
21	6.826E-01	3.1797E 02
22	2.511E-01	4.0500E 03
23	9.237E-02	1.2712E 03
24	2.530E-02	1.6225E 03
4500	3.023E-01	1.9912E 03
4000	2.718E-01	2.1531E 03
3500	2.413E-01	2.3173E 03
3000	2.109E-01	2.4706E 03
2500	1.804E-01	2.5874E 03
2000	1.499E-01	2.6230E 03
1500	1.194E-01	2.5081E 03
1000	8.897E-02	2.1769E 03
500	5.850E-02	1.7370E 03
68	3.216E-02	1.7570E 03

-----PLUTON 239-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.1409E 01	1.1377E 01	1.2487E 03	2.4719E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
1.3318E 01	8.7796E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 25
7.3710E-01	1.2502E 01	5.3498E-01	2.7680E-06	0.
23 21	23 22	23 23	23 24	23 25
0.	1.2024E 00	8.9628E 00	3.3344E-01	1.0591E-02
24 21	24 22	24 23	24 24	24 25
0.	3.7231E-05	3.0292E 00	6.7915E 00	1.2126E 00
25 21	25 22	25 23	25 24	25 25
0.	0.	2.2316E-01	2.9827E 00	8.2034E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.1367E 01	1.1336E 01	1.2497E 03	2.4739E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
1.3253E 01	9.4287E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 26
6.5862E-01	1.2567E 01	5.4633E-01	1.1562E-06	0.
23 21	23 22	23 23	23 24	23 26
0.	1.1178E 00	9.0487E 00	3.2885E-01	8.6502E-03
24 21	24 22	24 23	24 24	24 26
0.	1.2924E-05	2.8745E 00	6.9705E 00	1.1734E 00
26 21	26 22	26 23	26 24	26 26
0.	0.	1.7186E-01	2.8588E 00	8.3366E 00

 PLUTON 239

 THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.1325E 01	1.1294E 01	1.2509E 03	2.4764E 03

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.3166E 01	1.0299E 00	0.	0.	0.	0.
22	21	22	22	22	23
5.7499E-01	1.2631E 01	5.6380E-01	3.9508E-07	0.	0.
23	21	23	22	23	23
0.	1.0272E 00	9.1399E 00	3.2494E-01	6.8230E-03	0.
24	21	24	22	24	23
0.	3.5255E-06	2.7068E 00	7.1672E 00	1.1295E 00	0.
27	21	27	22	27	23
0.	0.	1.2587E-01	2.7189E 00	8.4804E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.1283E 01	1.1252E 01	1.2525E 03	2.4796E 03

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.3046E 01	1.1501E 00	0.	0.	0.	0.
22	21	22	22	22	23
4.8561E-01	1.2691E 01	5.9069E-01	1.0137E-07	0.	0.
23	21	23	22	23	23
0.	9.2901E-01	9.2372E 00	3.2223E-01	5.1303E-03	0.
24	21	24	22	24	23
0.	6.8412E-07	2.5236E 00	7.3850E 00	1.0800E 00	0.
28	21	28	22	28	23
0.	0.	8.6078E-02	2.5597E 00	8.6373E 00	0.

----- PLUTON 239 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.1241E 01	1.1210E 01	1.2547E 03	2.4840E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
1.2874E 01	1.3222E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
3.9006E-01	1.2742E 01	6.3292E-01	0.	0.
23 21	23 22	23 23	23 24	23 29
0.	8.2149E-01	9.3415E 00	3.2164E-01	3.6120E-03
24 21	24 22	24 23	24 24	24 29
0.	0.	2.3212E 00	7.6283E 00	1.0241E 00
29 21	29 22	29 23	29 24	29 29
0.	0.	5.3306E-02	2.3773E 00	8.8104E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.1199E 01	1.1168E 01	1.2577E 03	2.4901E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
1.2628E 01	1.5685E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
2.8869E-01	1.2771E 01	7.0214E-01	0.	0.
23 21	23 22	23 23	23 24	23 30
0.	7.0182E-01	9.4538E 00	3.2508E-01	2.3032E-03
24 21	24 22	24 23	24 24	24 30
0.	0.	2.0944E 00	7.9034E 00	9.6100E-01
30 21	30 22	30 23	30 24	30 30
0.	0.	2.8364E-02	2.1661E 00	9.0044E 00

PLUTON 239

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.1157E 01	1.1126E 01	1.2624E 03	2.4995E 03

		N1	N2			
SIGMA S (N1/N2)						
21	21	21	22	21	23	
1.2434E 01	1.7623E 00	0.		21	24	
22	21	22	22	22	24	
1.8415E-01	1.2752E 01	8.2414E-01	0.		22	31
23	21	23	22	23	24	
0.	5.6579E-01	9.5739E 00	3.3688E-01		23	31
24	21	24	22	24	24	
0.	0.	1.8349E 00	8.2190E 00		24	31
31	21	31	22	31	24	
0.	0.	1.1734E-02	1.9182E 00		31	31
					9.2269E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.1115E 01	1.1084E 01	1.2704E 03	2.5156E 03

		N1		N2					
		SIGMA S (N1/N2)							
21	21	21	22	21	23	21	24	21	32
1.3076E 01		1.1198E 00		0.		0.		0.	
22	21	22	22	22	23	22	24	22	32
8.5598E-02		1.2606E 01		1.0657E 00		0.		0.	
23	21	23	22	23	23	23	24	23	32
0.		4.0721E-01		9.6962E 00		3.6871E-01		4.9155E-04	
24	21	24	22	24	23	24	24	24	32
0.		0.		1.5292E 00		8.5890E 00		8.1066E-01	
32	21	32	22	32	23	32	24	32	32
0.		0.		3.0077E-03		1.6206E 00		9.4914E 00	

----- PLUTON 239 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.1074E 01	1.1043E 01	1.2873E 03	2.5497E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
1.3550E 01	6.4627E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
1.1291E-01	1.2100E 01	1.5414E 00	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	2.1933E-01	9.7839E 00	4.6408E-01	8.9729E-05
24 21	24 22	24 23	24 24	24 33
0.	0.	1.1483E 00	9.0377E 00	7.2796E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	2.4802E-04	1.2465E 00	9.8268E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.1039E 01	1.1009E 01	1.3308E 03	2.6373E 03

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
1.3528E 01	6.6839E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
2.2317E-01	1.3077E 01	4.5100E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	5.0813E-02	9.6154E 00	7.9656E-01	2.0410E-06
24 21	24 22	24 23	24 24	24 34
0.	0.	6.9971E-01	9.5211E 00	6.8024E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	1.2801E-06	8.0295E-01	1.0236E 01

PLUTON 239

TRANSFERS FROM GROUPS 1 THROUGH 9 TO GROUPS 1 THROUGH 16

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
3.3279E-00	1.1358E-01	3.8106E-02	1.1401E-01	1.5680E-01	
1	6	1	7	1	8
1.3090E-01	7.9709E-02	3.9920E-02	2.2216E-02	6.4075E-03	
1	11	1	12	1	13
2.4389E-04	1.3111E-04	1.8201E-05	2.4232E-06	3.5697E-07	
1	16	2	1	2	2
2.7607E-08	0.	3.9775E-00	2.5085E-01	1.6279E-01	
2	5	2	6	2	7
2.9583E-01	2.9629E-01	2.0255E-01	1.0902E-01	6.3730E-02	
2	10	2	11	2	12
1.9047E-02	2.8581E-03	3.9976E-04	5.5639E-05	7.4145E-06	
2	15	2	16	3	1
1.0927E-06	8.4514E-08	0.	0.	3	2
3	4	3	5	3	6
1.7609E-01	3.2994E-01	4.1933E-01	3.3361E-01	1.9740E-01	
3	9	3	10	3	11
1.2313E-01	3.8562E-02	5.9291E-03	8.3694E-04	1.1687E-04	
3	14	3	15	3	16
1.5595E-05	2.2993E-06	1.7787E-07	0.	0.	
4	3	4	4	4	5
0.	4.0312E-00	2.5569E-01	3.6382E-01	3.5693E-01	
4	8	4	9	4	10
2.4095E-01	1.6459E-01	5.5027E-02	8.7536E-03	1.2517E-03	
4	13	4	14	4	15
1.7560E-04	2.3474E-05	3.4632E-06	2.6798E-07	0.	
5	2	5	3	5	4
0.	0.	0.	3.7192E-00	3.8051E-01	
5	7	5	8	5	9
3.6276E-01	2.8871E-01	2.2119E-01	8.0296E-02	1.3334E-02	
5	12	5	13	5	14
1.9380E-03	2.7351E-04	3.6647E-05	5.4111E-06	4.1884E-07	
6	1	6	2	6	3
0.	0.	0.	0.	0.	
6	6	6	7	6	8
4.6486E-00	3.8844E-01	2.9258E-01	2.5909E-01	1.0432E-01	
6	11	6	12	6	13
1.8291E-02	2.7139E-03	3.8590E-04	5.1857E-05	7.6651E-06	
6	16	7	1	7	2
5.9354E-07	0.	0.	0.	0.	

 PLUTON 239

N1 N2
 SIGMA S0 (N1/N2)

0. 7 5	0. 7 6	6.0019E 00 7 7	3.5332E-01 7 8	2.4384E-01 7 9
1.1186E-01 7 10	2.1004E-02 7 11	3.1994E-03 7 12	4.5931E-04 7 13	6.1955E-05 7 14
9.1699E-06 7 15	7.1042E-07 7 16	0. 8 1	0. 8 2	0. 8 3
0. 8 4	0. 8 5	0. 8 6	0. 8 7	0. 8 8
2.6330E-01 8 9	9.0458E-02 8 10	1.8484E-02 8 11	2.9091E-03 8 12	4.2266E-04 8 13
5.7277E-05 8 14	8.4917E-06 8 15	6.5831E-07 8 16	0. 9 1	0. 9 2
0. 9 3	0. 9 4	0. 9 5	0. 9 6	0. 9 7
0. 9 8	0. 9 9	0. 9 10	0. 9 11	0. 9 12
0. 9 13	8.5832E 00 9 14	2.9128E-01 9 15	2.9945E-03 9 16	4.8535E-04
7.1277E-05	9.6999E-06	1.4402E-06	1.1172E-07	

PLUTON 239

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
7.9000E 00	4.2907E 01	2.6536E 03	1.7446E-03	1.5120E 00
1.1000E 01	4.6322E 01	1.7847E 03	4.8626E-04	2.3651E 00
1.1900E 01	2.2860E 01	2.6805E 03	4.1631E-03	1.0057E 00
1.4300E 01	8.0013E 00	7.4480E 02	2.1834E-03	1.7814E 00
1.4700E 01	2.9452E 00	3.9201E 02	4.3426E-03	1.3577E 00
1.5500E 01	1.0798E 01	1.3298E 02	3.5258E-05	2.7360E 00
1.7600E 01	1.5538E 01	1.9920E 03	3.3648E-03	1.5586E 00
2.2200E 01	9.8275E 00	1.2357E 03	2.5662E-03	1.9636E 00
2.3900E 01	4.6854E-01	9.0091E 01	5.5743E-03	1.5311E 00
2.6200E 01	7.8254E 00	1.7017E 03	6.5040E-03	1.4400E 00
2.7300E 01	5.5062E-01	2.3805E 02	2.4671E-02	2.1600E-01
3.2300E 01	8.4831E-01	7.6699E 01	9.1196E-04	2.4106E 00
3.5300E 01	7.6897E-01	4.1671E 02	2.9976E-02	2.8098E-01
4.1400E 01	1.6875E 01	5.8139E 03	1.0331E-02	5.4621E-01
4.4500E 01	8.2391E 00	4.2749E 03	2.1799E-02	2.5600E-01
4.7600E 01	2.4383E 00	2.1129E 02	5.6844E-04	2.5729E 00
5.0000E 01	5.1123E 00	2.1189E 03	1.2380E-02	1.3577E 00
5.2600E 01	1.0068E 01	5.9147E 03	2.3643E-02	6.5829E-01

DESIGNATION		CODE NO.		DENSITY FACTOR			
NICKEL		28.5900		9.74654E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I
1	1.000E 07	3.3468E 00	3.5434E 00	1.7268E 00	1.6843E-02	-1.5662E 00	
2	6.065E 06	3.6106E 00	3.3697E 00	1.9391E 00	1.8171E-02	-1.6160E 00	
3	3.679E 06	3.4104E 00	2.6464E 00	2.3021E 00	1.7150E-02	-1.0715E 00	
4	2.231E 06	3.2226E 00	1.3145E 00	2.4007E 00	1.6203E-02	-7.9470E-01	
5	1.353E 06	3.2580E 00	3.1851E-01	2.5198E 00	1.6393E-02	-7.1375E-01	
6	8.208E 05	3.3982E 00	1.0135E-01	2.7794E 00	1.7076E-02	-5.9825E-01	
7	4.979E 05	3.9376E 00	1.2479E-01	3.4082E 00	2.0004E-02	-5.1182E-01	
8	3.020E 05	4.9264E 00	1.6335E-01	4.4679E 00	2.4762E-02	-4.4327E-01	
9	1.832E 05	6.0904E 00	2.1176E-01	5.8152E 00	3.0609E-02	-2.6603E-01	
10	6.738E 04	7.5546E 00	2.6964E-01	7.4627E 00	3.7965E-02	-8.8834E-02	
11	2.479E 04	2.4875E 01	8.8803E-01	2.4576E 01	1.2508E-01	-2.8859E-01	
12	9.119E 03	2.1487E 01	7.6707E-01	2.1229E 01	1.0765E-01	-2.4928E-01	
13	3.355E 03	4.7541E 01	1.6972E 00	4.6971E 01	4.5349E-01	-5.5155E-01	
14	1.234E 03	1.5028E 01	5.3649E-01	1.4847E 01	2.4651E-02	-1.7435E-01	
15	4.540E 02	1.6477E 01	5.8824E-01	1.6280E 01	3.9997E-02	-1.9116E-01	
16	8.719E 01	1.7029E 01	6.0792E-01	1.6824E 01	7.7134E-02	-1.9756E-01	
17	3.545E 01	1.7206E 01	6.1426E-01	1.7000E 01	1.3885E-01	-1.9962E-01	
18	1.304E 01	1.7250E 01	6.1581E-01	1.7043E 01	2.1954E-01	-2.0012E-01	
19	5.043E 00	1.7343E 01	6.1916E-01	1.7135E 01	3.5914E-01	-2.0121E-01	
20	1.445E 00	1.7292E 01	6.1732E-01	1.7084E 01	6.1759E-01	-2.0061E-01	
21	6.826E-01	1.7299E 01	6.1756E-01	1.7091E 01	9.9434E-01	-2.0069E-01	
22	2.511E-01	1.7395E 01	6.2099E-01	1.7186E 01	1.5801E 00	-2.0180E-01	
23	9.237E-02	1.7218E 01	6.1467E-01	1.7011E 01	2.6670E 00	-1.9975E-01	
24	2.530E-02	1.6716E 01	5.9478E-01	1.6516E 01	4.1045E 00	-1.9337E-01	
*4500	3.023E-01	1.7464E 01	5.8765E-01	1.7266E 01	1.6602E 00	-1.9153E-01	
*4000	2.718E-01	1.7464E 01	5.8765E-01	1.7266E 01	1.6602E 00	-1.9153E-01	
*3500	2.413E-01	1.7464E 01	5.8765E-01	1.7266E 01	1.6602E 00	-1.9153E-01	
*3000	2.109E-01	1.7464E 01	5.8765E-01	1.7266E 01	1.6602E 00	-1.9153E-01	
2500	1.804E-01	1.7474E 01	5.8798E-01	1.7276E 01	1.7953E 00	-1.9164E-01	
2000	1.499E-01	1.7478E 01	5.8813E-01	1.7280E 01	1.9702E 00	-1.9168E-01	
1500	1.194E-01	1.7467E 01	5.8774E-01	1.7269E 01	2.2084E 00	-1.9155E-01	
1000	8.897E-02	1.7433E 01	5.8659E-01	1.7235E 01	2.5605E 00	-1.9118E-01	
500	5.850E-02	1.7372E 01	5.8454E-01	1.7175E 01	3.1620E 00	-1.9052E-01	
68	3.216E-02	1.7274E 01	5.8126E-01	1.7078E 01	4.2713E 00	-1.8944E-01	

* Thermal cross sections taken from XDC 60-1-139.

NOTE: For a summary of the sources of data see APEX-704 and XDC 60-1-139.

NICKEL

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.8577E 01	1.8367E 01	6.1775E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.5477E 01	1.8204E 00	7.3777E-04	0.	0.	0.
22	21	22	22	22	23
1.8056E 00	1.4484E 01	1.2348E 00	6.1429E-03	4.7108E-04	0.
23	21	23	22	23	23
2.0054E-03	3.8977E 00	1.2608E 01	9.0755E-01	1.6601E-01	0.
24	21	24	22	24	23
1.6990E-06	1.6278E-01	8.0000E 00	6.9303E 00	2.5529E 00	0.
25	21	25	22	25	23
0.	2.8401E-02	3.4015E 00	5.9627E 00	9.1846E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.8341E 01	1.8133E 01	6.1825E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.5375E 01	1.9233E 00	4.7390E-04	0.	0.	0.
22	21	22	22	22	23
1.6071E 00	1.4657E 01	1.2500E 00	4.7365E-03	3.0144E-04	0.
23	21	23	22	23	23
9.7212E-04	3.6222E 00	1.2870E 01	9.0222E-01	1.5104E-01	0.
24	21	24	22	24	23
3.6102E-07	1.1031E-01	7.6910E 00	7.2017E 00	2.5497E 00	0.
26	21	26	22	26	23
0.	1.6160E-02	2.9608E 00	5.8990E 00	9.4655E 00	0.

-----NICKEL-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.8103E 01	1.7898E 01	6.1889E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
1.5239E 01	2.0598E 00	2.7665E-04	0.	0.
22 21	22 22	22 23	22 24	22 27
1.3962E 00	1.4831E 01	1.2754E 00	3.4695E-03	1.7584E-04
23 21	23 22	23 23	23 24	23 27
4.0151E-04	3.3249E 00	1.3153E 01	8.9769E-01	1.3544E-01
24 21	24 22	24 23	24 24	24 27
0.	6.8786E-02	7.3395E 00	7.5113E 00	2.5399E 00
27 21	27 22	27 23	27 24	27 27
0.	7.8719E-03	2.5119E 00	5.8066E 00	9.7770E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.7864E 01	1.7661E 01	6.1970E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
1.5053E 01	2.2453E 00	1.4093E-04	0.	0.
22 21	22 22	22 23	22 24	22 28
1.1717E 00	1.5003E 01	1.3165E 00	2.3683E-03	9.0140E-05
23 21	23 22	23 23	23 24	23 28
1.3237E-04	3.0013E 00	1.3460E 01	8.9512E-01	1.1923E-01
24 21	24 22	24 23	24 24	24 28
0.	3.8192E-02	6.9372E 00	7.8695E 00	2.5214E 00
28 21	28 22	28 23	28 24	28 28
0.	3.2017E-03	2.0589E 00	5.6756E 00	1.0126E 01

NICKEL

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.7623E 01	1.7424E 01	6.2081E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.4794E 01	2.5048E 00	5.8476E-05	0.	21	24
22	21	22	22	22	24
9.3344E-01	1.5163E 01	1.3829E 00	1.4585E-03	22	29
23	21	23	22	23	24
3.1280E-05	2.6456E 00	1.3796E 01	8.9665E-01	23	29
24	21	24	22	24	24
0.	1.7894E-02	6.4730E 00	8.2913E 00	24	29
29	21	29	22	29	24
0.	9.9856E-04	1.6080E 00	5.4912E 00	29	29
					01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.7383E 01	1.7185E 01	6.2237E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.4439E 01	2.8601E 00	1.7278E-05	0.	21	24
22	21	22	22	22	24
6.8308E-01	1.5292E 01	1.4932E 00	7.6585E-04	22	30
23	21	23	22	23	24
4.3707E-06	2.2491E 00	1.4165E 01	9.0664E-01	23	30
24	21	24	22	24	24
0.	6.4359E-03	5.9307E 00	8.7990E 00	24	30
30	21	30	22	30	24
0.	2.0526E-04	1.1688E 00	5.2308E 00	30	30
					01

NICKEL

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.7142E 01	1.6948E 01	6.2475E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
1.4240E 01	3.0591E 00	2.5362E-06	0.	0.
22 21	22 22	22 23	22 24	22 31
4.2862E-01	1.5341E 01	1.6866E 00	3.0607E-04	2.2468E-06
23 21	23 22	23 23	23 24	23 31
2.4627E-07	1.7992E 00	1.4569E 01	9.3472E-01	6.7212E-02
24 21	24 22	24 23	24 24	24 31
0.	1.4761E-03	5.2835E 00	9.4286E 00	2.3729E 00
31 21	31 22	31 23	31 24	31 31
0.	2.0603E-05	7.5607E-01	4.8576E 00	1.1528E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.6905E 01	1.6713E 01	6.2885E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
1.5471E 01	1.8281E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
1.9410E-01	1.5190E 01	2.0593E 00	7.1044E-05	1.4745E-07
23 21	23 22	23 23	23 24	23 32
0.	1.2782E 00	1.5002E 01	1.0063E 00	4.8859E-02
24 21	24 22	24 23	24 24	24 32
0.	1.4118E-04	4.4828E 00	1.0241E 01	2.2689E 00
32 21	32 22	32 23	32 24	32 32
0.	5.0397E-07	3.9464E-01	4.3068E 00	1.2204E 01

NICKEL

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.6679E 01	1.6490E 01	6.3749E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 33
1.6135E 01	1.1637E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
1.8984E-01	1.4521E 01	2.7174E 00	3.8093E-06	0.
23 21	23 22	23 23	23 24	23 33
0.	6.7137E-01	1.5389E 01	1.2106E 00	2.9970E-02
24 21	24 22	24 23	24 24	24 33
0.	1.5929E-06	3.4240E 00	1.1353E 01	2.1226E 00
33 21	33 22	33 23	33 24	33 33
0.	0.	1.2625E-01	3.4521E 00	1.3101E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.6529E 01	1.6342E 01	6.6022E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 34
1.6185E 01	1.1139E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
2.9993E-01	1.6333E 01	7.2644E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	1.4737E-01	1.5242E 01	1.8677E 00	1.2756E-02
24 21	24 22	24 23	24 24	24 34
0.	0.	2.0970E 00	1.2723E 01	1.9991E 00
34 21	34 22	34 23	34 24	34 34
0.	0.	1.3552E-02	2.2472E 00	1.4269E 01

NICKEL

TRANSFERS FROM GROUPS 1 THROUGH 5 TO GROUPS 1 THROUGH 16

N1 N2

SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.6361E 00	2.2178E-01	4.4395E-02	2.0429E-01	3.7210E-01
1 6	1 7	1 8	1 9	1 10
3.7173E-01	2.5330E-01	1.3598E-01	7.9331E-02	2.3672E-02
1 11	1 12	1 13	1 14	1 15
3.5491E-03	4.9624E-04	6.9058E-05	9.2024E-06	1.3561E-06
1 16	2 1	2 2	2 3	2 4
1.0489E-07	0.	1.9766E 00	1.2111E-01	1.3593E-01
2 5	2 6	2 7	2 8	2 9
3.3154E-01	4.0232E-01	3.1077E-01	1.8053E-01	1.1119E-01
2 10	2 11	2 12	2 13	2 14
3.4508E-02	5.2806E-03	7.4408E-04	1.0384E-04	1.3852E-05
2 15	2 16	3 1	3 2	3 3
2.0421E-06	1.5797E-07	0.	0.	1.9010E 00
3 4	3 5	3 6	3 7	3 8
1.8986E-01	2.0920E-01	3.4323E-01	3.2171E-01	2.1100E-01
3 9	3 10	3 11	3 12	3 13
1.4129E-01	4.6563E-02	7.3519E-03	1.0483E-03	1.4692E-04
3 14	3 15	3 16	4 1	4 2
1.9631E-05	2.8959E-06	2.2407E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	2.3139E 00	2.5087E-01	1.6250E-01	1.9294E-01
4 8	4 9	4 10	4 11	4 12
1.4698E-01	1.0920E-01	3.8776E-02	6.3655E-03	9.2112E-04
4 13	4 14	4 15	4 16	5 1
1.2979E-04	1.7379E-05	2.5656E-06	1.9857E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	2.9063E 00	2.3233E-01
5 7	5 8	5 9	5 10	5 11
4.0279E-02	3.5827E-02	2.9634E-02	1.1356E-02	1.9397E-03
5 12	5 13	5 14	5 15	5 16
2.8493E-04	4.0367E-05	5.4168E-06	8.0026E-07	6.1955E-08

NICKEL

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 10

N1 N2
SIGMA N,G (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.3767E-02	6.4198E-02	1.8964E-02	1.8543E-02	1.1379E-02
1 6	1 7	1 8	1 9	1 10
7.1643E-03	2.8095E-03	5.6190E-04	1.8827E 00	9.8333E-04
2 1	2 2	2 3	2 4	2 5
1.0868E-02	5.0679E-02	1.4971E-02	1.4638E-02	8.9825E-03
2 6	2 7	2 8	2 9	2 10
5.6556E-03	2.2179E-03	4.4358E-04	1.8826E 00	7.7626E-04
3 1	3 2	3 3	3 4	3 5
9.1094E-03	4.2480E-02	1.2549E-02	1.2270E-02	7.5292E-03
3 6	3 7	3 8	3 9	3 10
4.7406E-03	1.8591E-03	3.7181E-04	1.8880E 00	6.5067E-04
4 1	4 2	4 3	4 4	4 5
8.0429E-03	3.7506E-02	1.1080E-02	1.0833E-02	6.6477E-03
4 6	4 7	4 8	4 9	4 10
4.1856E-03	1.6414E-03	3.2828E-04	1.6522E 00	5.7450E-04
5 1	5 2	5 3	5 4	5 5
7.3961E-03	3.4490E-02	1.0188E-02	9.9621E-03	6.1131E-03
5 6	5 7	5 8	5 9	5 10
3.8490E-03	1.5094E-03	3.0188E-04	3.0542E-01	5.2829E-04
6 1	6 2	6 3	6 4	6 5
7.1681E-03	3.3427E-02	9.8744E-03	9.6550E-03	5.9247E-03
6 6	6 7	6 8	6 9	6 10
3.7303E-03	1.4629E-03	2.9258E-04	4.3886E-04	5.1201E-04
7 1	7 2	7 3	7 4	7 5
7.5723E-03	3.5312E-02	1.0431E-02	1.0199E-02	6.2587E-03
7 6	7 7	7 8	7 9	7 10
3.9407E-03	1.5454E-03	3.0907E-04	4.6361E-04	5.4088E-04
8 1	8 2	8 3	8 4	8 5
8.2327E-03	3.8391E-02	1.1341E-02	1.1089E-02	6.8046E-03
8 6	8 7	8 8	8 9	8 10
4.2844E-03	1.6801E-03	3.3603E-04	5.0404E-04	5.8805E-04
9 1	9 2	9 3	9 4	9 5
6.9386E-03	3.2357E-02	9.5583E-03	9.3459E-03	5.7350E-03
9 6	9 7	9 8	9 9	9 10
3.6109E-03	1.4160E-03	2.8321E-04	4.2481E-04	4.9562E-04
10 1	10 2	10 3	10 4	10 5
3.2655E-02	1.5228E-01	4.4984E-02	4.3985E-02	2.6990E-02
10 6	10 7	10 8	10 9	10 10
1.6994E-02	6.6643E-03	1.3329E-03	1.9993E-03	2.3325E-03

NICKEL

N1		N2		SIGMA N,G (N1/N2)	
11	1	11	2	11	3
1.0705E-01		4.9920E-01		1.4747E-01	
11	6	11	7	11	8
5.5709E-02		2.1847E-02		4.3694E-03	
12	1	12	2	12	3
9.1904E-02		4.2857E-01		1.2660E-01	
12	6	12	7	12	8
4.7827E-02		1.8756E-02		3.7512E-03	
13	1	13	2	13	3
3.8708E-01		1.8051E 00		5.3322E-01	
13	6	13	7	13	8
2.0144E-01		7.8996E-02		1.5799E-02	
14	1	14	2	14	3
2.1034E-02		9.8089E-02		2.8976E-02	
14	6	14	7	14	8
1.0946E-02		4.2927E-03		8.5855E-04	
15	1	15	2	15	3
3.4130E-02		1.5916E-01		4.7015E-02	
15	6	15	7	15	8
1.7761E-02		6.9652E-03		1.3930E-03	
16	1	16	2	16	3
6.5808E-02		3.0688E-01		9.0654E-02	
16	6	16	7	16	8
3.4247E-02		1.3430E-02		2.6860E-03	
17	1	17	2	17	3
1.1842E-01		5.5224E-01		1.6314E-01	
17	6	17	7	17	8
6.1629E-02		2.4168E-02		4.8336E-03	
18	1	18	2	18	3
1.8728E-01		8.7332E-01		2.5798E-01	
18	6	18	7	18	8
9.7461E-02		3.8220E-02		7.6440E-03	
19	1	19	2	19	3
3.0638E-01		1.4287E 00		4.2206E-01	
19	6	19	7	19	8
1.5944E-01		6.2527E-02		1.2505E-02	
20	1	20	2	20	3
5.2685E-01		2.4568E 00		7.2576E-01	
20	6	20	7	20	8
2.7418E-01		1.0752E-01		2.1504E-02	
11	4	11	5	11	10
1.4419E-01		8.8480E-02		1.1	
11	9	11	10	11	15
6.5540E-03		7.6464E-03		1.2	
12	4	12	5	12	10
1.2379E-01		7.5961E-02		1.3	
12	9	12	10	12	15
5.6267E-03		6.5645E-03		1.4	
13	4	13	5	13	10
5.2137E-01		3.1993E-01		1.5	
13	9	13	10	13	15
2.3699E-02		2.7649E-02		1.6	
14	4	14	5	14	10
2.8332E-02		1.7386E-02		1.7	
14	9	14	10	14	15
1.2878E-03		1.5025E-03		1.8	
15	4	15	5	15	10
4.5970E-02		2.8209E-02		1.9	
15	9	15	10	15	15
2.0896E-03		2.4378E-03		2.0	
16	4	16	5	16	10
8.8639E-02		5.4392E-02		2.1	
16	9	16	10	16	15
4.0291E-03		4.7006E-03		2.2	
17	4	17	5	17	10
1.5951E-01		9.7881E-02		2.3	
17	9	17	10	17	15
7.2505E-03		8.4589E-03		2.4	
18	4	18	5	18	10
2.5225E-01		1.5479E-01		2.5	
18	9	18	10	18	15
1.1466E-02		1.3377E-02		2.6	
19	4	19	5	19	10
4.1268E-01		2.5324E-01		2.7	
19	9	19	10	19	15
1.8758E-02		2.1885E-02		2.8	
20	4	20	5	20	10
7.0963E-01		4.3546E-01		2.9	
20	9	20	10	20	15
3.2256E-02		3.7632E-02		3.0	

NICKEL

N1 N2
SIGMA N,G (N1/N2)

21 1	21 2	21 3	21 4	21 5
8.4834E-01	3.9560E 00	1.1686E 00	1.1427E 00	7.0117E-01
21 6	21 7	21 8	21 9	21 10
4.4148E-01	1.7313E-01	3.4626E-02	5.1939E-02	6.0595E-02
22 1	22 2	22 3	22 4	22 5
1.3481E 00	6.2863E 00	1.8570E 00	1.8157E 00	1.1142E 00
22 6	22 7	22 8	22 9	22 10
7.0154E-01	2.7511E-01	5.5023E-02	8.2534E-02	9.6290E-02
23 1	23 2	23 3	23 4	23 5
2.2755E 00	1.0611E 01	3.1346E 00	3.0648E 00	1.8808E 00
23 6	23 7	23 8	23 9	23 10
1.1842E 00	4.6438E-01	9.2877E-02	1.3932E-01	1.6253E-01
24 1	24 2	24 3	24 4	24 5
3.4990E 00	1.6317E 01	4.8200E 00	4.7129E 00	2.8920E 00
24 6	24 7	24 8	24 9	24 10
1.8209E 00	7.1407E-01	1.4281E-01	2.1422E-01	2.4993E-01
25 1	25 2	25 3	25 4	25 5
5.4997E 00	2.5647E 01	7.5761E 00	7.4078E 00	4.5457E 00
25 6	25 7	25 8	25 9	25 10
2.8621E 00	1.1224E 00	2.2448E-01	3.3672E-01	3.9284E-01
26 1	26 2	26 3	26 4	26 5
5.5040E 00	2.5667E 01	7.5820E 00	7.4135E 00	4.5492E 00
26 6	26 7	26 8	26 9	26 10
2.8643E 00	1.1233E 00	2.2465E-01	3.3698E-01	3.9314E-01
27 1	27 2	27 3	27 4	27 5
5.5100E 00	2.5694E 01	7.5902E 00	7.4216E 00	4.5541E 00
27 6	27 7	27 8	27 9	27 10
2.8674E 00	1.1245E 00	2.2490E-01	3.3734E-01	3.9357E-01
28 1	28 2	28 3	28 4	28 5
5.5168E 00	2.5726E 01	7.5996E 00	7.4308E 00	4.5598E 00
28 6	28 7	28 8	28 9	28 10
2.8710E 00	1.1259E 00	2.2517E-01	3.3776E-01	3.9406E-01
29 1	29 2	29 3	29 4	29 5
5.5270E 00	2.5774E 01	7.6138E 00	7.4446E 00	4.5683E 00
29 6	29 7	29 8	29 9	29 10
2.8763E 00	1.1280E 00	2.2559E-01	3.3839E-01	3.9479E-01
30 1	30 2	30 3	30 4	30 5
5.5407E 00	2.5838E 01	7.6326E 00	7.4629E 00	4.5795E 00
30 6	30 7	30 8	30 9	30 10
2.8834E 00	1.1307E 00	2.2615E-01	3.3922E-01	3.9576E-01

NICKEL

N1 N2
SIGMA N,G (N1/N2)

31 1	31 2	31 3	31 4	31 5
5.5620E 00	2.5937E 01	7.6619E 00	7.4917E 00	4.5972E 00
31 6	31 7	31 8	31 9	31 10
2.8945E 00	1.1351E 00	2.2702E-01	3.4053E-01	3.9729E-01
32 1	32 2	32 3	32 4	32 5
5.5987E 00	2.6108E 01	7.7125E 00	7.5411E 00	4.6275E 00
32 6	32 7	32 8	32 9	32 10
2.9136E 00	1.1426E 00	2.2852E-01	3.4278E-01	3.9991E-01
33 1	33 2	33 3	33 4	33 5
5.6755E 00	2.6466E 01	7.8183E 00	7.6445E 00	4.6910E 00
33 6	33 7	33 8	33 9	33 10
2.9536E 00	1.1583E 00	2.3165E-01	3.4748E-01	4.0539E-01
34 1	34 2	34 3	34 4	34 5
5.8777E 00	2.7409E 01	8.0968E 00	7.9169E 00	4.8581E 00
34 6	34 7	34 8	34 9	34 10
3.0588E 00	1.1995E 00	2.3991E-01	3.5986E-01	4.1983E-01

DATE DEC 01 1960

DESIGNATION		CODE NO.		DENSITY FACTOR			
IRON		26.5600		9.27183E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	3.2668E 00	3.3578E 00	1.6488E 00	1.6439E-02	-1.5609E 00	
2	6.065E 06	3.6356E 00	3.0707E 00	1.8401E 00	1.8295E-02	-1.7321E 00	
3	3.679E 06	3.4717E 00	2.4741E 00	2.2951E 00	1.7488E-02	-1.1351E 00	
4	2.231E 06	2.9818E 00	1.6410E 00	2.3346E 00	1.5002E-02	-6.2438E-01	
5	1.353E 06	2.7415E 00	9.0588E-01	2.3297E 00	1.3801E-02	-3.9722E-01	
6	8.208E 05	2.7234E 00	4.6490E-01	2.3175E 00	1.3570E-02	-3.9157E-01	
7	4.979E 05	3.2508E 00	2.6787E-01	2.9480E 00	1.6342E-02	-2.9208E-01	
8	3.020E 05	3.0188E 00	1.0577E-01	2.5602E 00	1.5164E-02	-4.4240E-01	
9	1.832E 05	4.0471E 00	1.4086E-01	3.8580E 00	2.2071E-02	-1.8235E-01	
10	6.738E 04	6.1814E 00	2.2070E-01	6.1072E 00	2.4200E-02	-7.1594E-02	
11	2.479E 04	1.3292E 01	4.7453E-01	1.3133E 01	6.6824E-02	-1.5388E-01	
12	9.119E 03	8.7627E 00	3.1283E-01	8.6575E 00	3.4990E-02	-1.0144E-01	
13	3.355E 03	5.9979E 00	2.1412E-01	5.9259E 00	1.1600E-02	-6.9436E-02	
14	1.234E 03	8.2483E 00	2.9446E-01	8.1493E 00	1.2161E-02	-9.5488E-02	
15	4.540E 02	1.0714E 01	3.8248E-01	1.0585E 01	2.0920E-02	-1.2403E-01	
16	8.719E 01	1.1360E 01	4.0554E-01	1.1223E 01	4.0375E-02	-1.3151E-01	
17	3.545E 01	1.1327E 01	4.0437E-01	1.1191E 01	7.3184E-02	-1.3113E-01	
18	1.304E 01	1.1284E 01	4.0284E-01	1.1149E 01	1.1586E-01	-1.3063E-01	
19	5.043E 00	1.1215E 01	4.0037E-01	1.1080E 01	1.9579E-01	-1.2983E-01	
20	1.445E 00	1.1135E 01	3.9753E-01	1.1002E 01	3.3376E-01	-1.2891E-01	
21	6.826E-01	1.1033E 01	3.9388E-01	1.0901E 01	5.1494E-01	-1.2773E-01	
22	2.511E-01	1.0929E 01	3.9017E-01	1.0798E 01	8.1342E-01	-1.2652E-01	
23	9.237E-02	1.0721E 01	3.8275E-01	1.0593E 01	1.3976E 00	-1.2412E-01	
24	2.530E-02	1.0657E 01	3.8045E-01	1.0529E 01	2.1667E 00	-1.2337E-01	
*4500	3.023E-01	1.0820E 01	3.8248E-01	1.0691E 01	8.7077E-01	-1.2445E-01	
*4000	2.718E-01	1.0820E 01	3.8248E-01	1.0691E 01	8.7077E-01	-1.2445E-01	
*3500	2.413E-01	1.0820E 01	3.8248E-01	1.0691E 01	8.7077E-01	-1.2445E-01	
*3000	2.109E-01	1.0820E 01	3.8248E-01	1.0691E 01	8.7077E-01	-1.2445E-01	
2500	1.804E-01	1.0810E 01	3.8215E-01	1.0681E 01	9.4168E-01	-1.2435E-01	
2000	1.499E-01	1.0800E 01	3.8179E-01	1.0671E 01	1.0334E 00	-1.2424E-01	
1500	1.194E-01	1.0785E 01	3.8126E-01	1.0657E 01	1.1585E 00	-1.2406E-01	
1000	8.897E-02	1.0767E 01	3.8062E-01	1.0639E 01	1.3442E 00	-1.2386E-01	
500	5.850E-02	1.0758E 01	3.8031E-01	1.0630E 01	1.6638E 00	-1.2375E-01	
68	3.216E-02	1.0753E 01	3.8013E-01	1.0625E 01	2.2563E 00	-1.2368E-01	

*Thermal cross sections taken from XDC 60-1-139.

NOTE: For a summary of the sources of data see APEX-704 and XDC 60-1-139.

-----IRON-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.2305E 01	1.2158E 01	3.5185E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
9.8462E 00	1.1864E 00	6.1536E-04	1.0089E-07	0.
22 21	22 22	22 23	22 24	22 25
1.1620E 00	9.0592E 00	7.9340E-01	4.4996E-03	3.7573E-04
23 21	23 22	23 23	23 24	23 25
1.6562E-03	2.4851E 00	7.7896E 00	5.7349E-01	1.0950E-01
24 21	24 22	24 23	24 24	24 25
2.0504E-06	1.2170E-01	5.1786E 00	4.3459E 00	1.6338E 00
25 21	25 22	25 23	25 24	25 25
0.	2.4413E-02	2.3731E 00	3.9381E 00	5.9693E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.2141E 01	1.1997E 01	3.5214E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
9.7798E 00	1.2530E 00	4.0361E-04	0.	0.
22 21	22 22	22 23	22 24	22 26
1.0342E 00	9.1701E 00	8.0317E-01	3.5080E-03	2.4488E-04
23 21	23 22	23 23	23 24	23 26
8.2134E-04	2.3098E 00	7.9552E 00	5.7055E-01	9.9910E-02
24 21	24 22	24 23	24 24	24 26
4.6348E-07	8.3477E-02	4.9827E 00	4.5176E 00	1.6338E 00
26 21	26 22	26 23	26 24	26 26
0.	1.3794E-02	2.0718E 00	3.9007E 00	6.1551E 00

IRON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.1977E 01	1.1834E 01	3.5250E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 27
9.6916E 00	1.3414E 00	2.4182E 00	0.	0.
22 21	22 22	22 23	22 24	22 27
8.9837E-01	9.2824E 00	8.1943E-01	2.6051E-03	1.4612E-04
23 21	23 22	23 23	23 24	23 27
3.4893E-04	2.1205E 00	8.1344E 00	5.6808E-01	8.9882E-02
24 21	24 22	24 23	24 24	24 27
0.	5.2836E-02	4.7587E 00	4.7137E 00	1.6298E 00
27 21	27 22	27 23	27 24	27 27
0.	6.8849E-03	1.7637E 00	3.8447E 00	6.3615E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.1811E 01	1.1670E 01	3.5296E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 28
9.5717E 00	1.4614E 00	1.2737E-04	0.	0.
22 21	22 22	22 23	22 24	22 28
7.5387E-01	9.3932E 00	8.4568E-01	1.8087E-03	7.7083E-05
23 21	23 22	23 23	23 24	23 28
1.1924E-04	1.9143E 00	8.3295E 00	5.6682E-01	7.9421E-02
24 21	24 22	24 23	24 24	24 28
0.	2.9892E-02	4.5015E 00	4.9408E 00	1.6204E 00
28 21	28 22	28 23	28 24	28 28
0.	2.8883E 00	1.4514E 00	3.7636E 00	6.5931E 00

IRON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.1644E 01	1.1505E 01	3.5359E 00	0.

		N1		N2					
		SIGMA S (N1/N2)							
21	21	21	22	21	23	21	24	21	29
9.4041E 00		1.6290E 00		5.5264E-05		0.		0.	
22	21	22	22	22	23	22	24	22	29
6.0046E-01		9.4966E 00		8.8811E-01		1.1386E-03		3.3941E-05	
23	21	23	22	23	23	23	24	23	29
2.9547E-05		1.6875E 00		8.5430E 00		5.6813E-01		6.8542E-02	
24	21	24	22	24	23	24	24	24	29
0.		1.4353E-02		4.2035E 00		5.2087E 00		1.6036E 00	
29	21	29	22	29	23	29	24	29	29
0.		9.3838E-04		1.1392E 00		3.6476E 00		6.8565E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.1477E 01	1.1340E 01	3.5449E 00	0.

		N1		N2					
		SIGMA S (N1/N2)							
21	21	21	22	21	23	21	24	21	30
9.1749E 00		1.8583E 00		1.7395E-05		0.		0.	
22	21	22	22	22	23	22	24	22	30
4.3930E-01		9.5796E 00		9.5848E-01		6.1614E-04		1.1249E-05	
23	21	23	22	23	23	23	24	23	30
4.4097E-06		1.4346E 00		8.7776E 00		5.7474E-01		5.7259E-02	
24	21	24	22	24	23	24	24	24	30
0.		5.3380E-03		3.8542E 00		5.5317E 00		1.5764E 00	
30	21	30	22	30	23	30	24	30	30
0.		2.0412E-04		8.3325E-01		3.4814E 00		7.1617E 00	

IRON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.1308E 01	1.1174E 01	3.5584E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 31
9.0484E 00	1.9848E 00	2.8118E-06	0.	0.
22 21	22 22	22 23	22 24	22 31
2.7555E-01	9.6121E 00	1.0818E 00	2.5737E-04	2.2777E-06
23 21	23 22	23 23	23 24	23 31
2.7411E-07	1.1475E 00	9.0354E 00	5.9276E-01	4.5591E-02
24 21	24 22	24 23	24 24	24 31
0.	1.2858E-03	3.4363E 00	5.9330E 00	1.5345E 00
31 21	31 22	31 23	31 24	31 31
0.	2.2290E-05	5.4375E-01	3.2403E 00	7.5244E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.1141E 01	1.1008E 01	3.5817E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 32
9.8489E 00	1.1843E 00	7.5634E-08	0.	0.
22 21	22 22	22 23	22 24	22 32
1.2471E-01	9.5175E 00	1.3190E 00	6.4287E-05	1.7108E-07
23 21	23 22	23 23	23 24	23 32
0.	8.1506E-01	9.3115E 00	6.3826E-01	3.3541E-02
24 21	24 22	24 23	24 24	24 32
0.	1.3319E-04	2.9181E 00	6.4529E 00	1.4715E 00
32 21	32 22	32 23	32 24	32 32
0.	6.2702E-07	2.8768E-01	2.8803E 00	7.9729E 00

IRON

THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
5.0000E 02	1.0979E 01	1.0848E 01	3.6309E 00	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
1.0273E 01	7.5978E-01	0.	22	23	21
22	21	22	22	22	24
1.2033E-01	9.0952E 00	1.7361E 00	4.0069E-06	0.	22
23	21	23	22	23	23
0.	4.2788E-01	9.5589E 00	7.6777E-01	2.1021E-02	23
24	21	24	22	24	23
0.	1.7595E-06	2.2316E 00	7.1674E 00	1.3812E 00	24
33	21	33	22	33	23
0.	0.	9.6319E-02	2.3147E 00	8.5675E 00	33

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
6.8000E 01	1.0847E 01	1.0718E 01	3.7604E 00	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
1.0307E 01	7.2627E-01	0.		0.	
22	21	22	22	22	24
1.8857E-01	1.0286E 01	4.6445E-01		0.	
23	21	23	22	23	24
0.	9.3813E-02	9.4698E 00		1.1825E 00	
24	21	24	22	24	24
0.	0.	1.3684E 00		8.0536E 00	
34	21	34	22	34	24
0.	0.	1.0393E-02		1.5074E 00	

IRON

TRANSFERS FROM GROUPS 1 THROUGH 7 TO GROUPS 1 THROUGH 16

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.6304E-00	2.2463E-01	4.2065E-02	1.9364E-01	3.5279E-01
1 6	1 7	1 8	1 9	1 10
3.5249E-01	2.4021E-01	1.2897E-01	7.5240E-02	2.2452E-02
1 11	1 12	1 13	1 14	1 15
3.3662E-03	4.7068E-04	6.5501E-05	8.7284E-06	1.2863E-06
1 16	2 1	2 2	2 3	2 4
9.9488E-08	0.	2.1156E-00	1.4016E-01	1.2428E-01
2 5	2 6	2 7	2 8	2 9
3.0265E-01	3.6690E-01	2.8323E-01	1.6447E-01	1.0128E-01
2 10	2 11	2 12	2 13	2 14
3.1424E-02	4.8084E-03	6.7751E-04	9.4547E-05	1.2613E-05
2 15	2 16	3 1	3 2	3 3
1.8594E-06	1.4384E-07	0.	0.	2.0836E-00
3 4	3 5	3 6	3 7	3 8
1.8850E-01	1.9435E-01	3.2060E-01	3.0157E-01	1.9824E-01
3 9	3 10	3 11	3 12	3 13
1.3295E-01	4.3866E-02	6.9302E-03	9.8836E-04	1.3853E-04
3 14	3 15	3 16	4 1	4 2
1.8512E-05	2.7307E-06	2.1129E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	1.9198E-00	2.2056E-01	2.0488E-01	2.4624E-01
4 8	4 9	4 10	4 11	4 12
1.8906E-01	1.4125E-01	5.0357E-02	8.2841E-03	1.1997E-03
4 13	4 14	4 15	4 16	5 1
1.6909E-04	2.2644E-05	3.3429E-06	2.5874E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	2.0271E-00	2.4843E-01
5 7	5 8	5 9	5 10	5 11
1.4955E-01	1.3974E-01	1.1987E-01	4.7184E-02	8.1748E-03
5 12	5 13	5 14	5 15	5 16
1.2074E-03	1.7141E-04	2.3019E-05	3.4017E-06	2.6339E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
2.2931E-00	2.1142E-01	8.4901E-02	8.6820E-02	3.8738E-02
6 11	6 12	6 13	6 14	6 15
7.1684E-03	1.0858E-03	1.5556E-04	2.0966E-05	3.1023E-06
6 16	7 1	7 2	7 3	7 4
2.4032E-07	0.	0.	0.	0.

IRON

		N1	N2		
		SIGMA S0 (N1/N2)			
7	5	7	7	7	9
0.		0.		2.7375E 00	5.5269E-02
7	10	7	11	7	13
2.8902E-02		5.8154E-03		9.0979E-04	1.7858E-05
7	15	7	16		
2.6468E-06		2.0516E-07			

IRON

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.4573E-03	1.8216E-03	1.9382E-02	4.8819E-03	6.1206E-03
1 6	1 7	1 8	1 9	1 10
3.2789E-03	2.6960E-03	1.4573E-03	3.5565E-01	1.1194E 00
1 11	2 1	2 2	2 3	2 4
1.2987E-02	1.1357E-03	1.4196E-03	1.5105E-02	3.8046E-03
2 5	2 6	2 7	2 8	2 9
4.7700E-03	2.5553E-03	2.1011E-03	1.1357E-03	3.8936E-01
2 10	2 11	3 1	3 2	3 3
1.1516E 00	1.0121E-02	9.4066E-04	1.1758E-03	1.2511E-02
3 4	3 5	3 6	3 7	3 8
3.1512E-03	3.9508E-03	2.1165E-03	1.7402E-03	9.4066E-04
3 9	3 10	3 11	4 1	4 2
4.3020E-01	1.0543E 00	8.3827E-03	8.2236E-04	1.0280E-03
4 3	4 4	4 5	4 6	4 7
1.0937E-02	2.7549E-03	3.4539E-03	1.8503E-03	1.5214E-03
4 8	4 9	4 10	4 11	5 1
8.2236E-04	8.8065E-02	7.7663E-01	7.3285E-03	7.5061E-04
5 2	5 3	5 4	5 5	5 6
9.3826E-04	9.9831E-03	2.5145E-03	3.1526E-03	1.6889E-03
5 7	5 8	5 9	5 10	5 11
1.3886E-03	7.5061E-04	1.1259E-03	4.8360E-01	6.6890E-03
6 1	6 2	6 3	6 4	6 5
1.0253E-03	1.2816E-03	1.3636E-02	3.4347E-03	4.3062E-03
6 6	6 7	6 8	6 9	6 10
2.3069E-03	1.8968E-03	1.0253E-03	1.5379E-03	8.7857E-02
6 11	7 1	7 2	7 3	7 4
9.1367E-03	1.1542E-03	1.4427E-03	1.5351E-02	3.8666E-03
7 5	7 6	7 7	7 8	7 9
4.8476E-03	2.5969E-03	2.1353E-03	1.1542E-03	1.7313E-03
7 10	7 11	8 1	8 2	8 3
2.8855E-04	1.0286E-02	1.2841E-03	1.6051E-03	1.7078E-02
8 4	8 5	8 6	8 7	8 8
4.3017E-03	5.3931E-03	2.8892E-03	2.3755E-03	1.2841E-03
8 9	8 10	8 11	9 1	9 2
1.9261E-03	3.2102E-04	1.1443E-02	1.3198E-03	1.6498E-03
9 3	9 4	9 5	9 6	9 7
1.7554E-02	4.4214E-03	5.5433E-03	2.9696E-03	2.4417E-03
9 8	9 9	9 10	9 11	10 1
1.3198E-03	1.9797E-03	3.2996E-04	1.1762E-02	4.8830E-03

IRON

N1 N2
SIGMA N,G (N1/N2)

10 2	10 3	10 4	10 5	10 6
6.1037E-03	6.4943E-02	1.6358E-02	2.0508E-02	1.0987E-02
10 7	10 8	10 9	10 10	10 11
9.0335E-03	4.8830E-03	7.3244E-03	1.2207E-03	4.3514E-02
11 1	11 2	11 3	11 4	11 5
1.3408E-02	1.6760E-02	1.7832E-01	4.4916E-02	5.6312E-02
11 6	11 7	11 8	11 9	11 10
3.0167E-02	2.4804E-02	1.3408E-02	2.0111E-02	3.3519E-03
11 11	12 1	12 2	12 3	12 4
1.1948E-01	7.0064E-03	8.7580E-03	9.3185E-02	2.3471E-02
12 5	12 6	12 7	12 8	12 9
2.9427E-02	1.5764E-02	1.2962E-02	7.0064E-03	1.0510E-02
12 10	12 11	13 1	13 2	13 3
1.7516E-03	6.2437E-02	2.3210E-03	2.9013E-03	3.0870E-02
13 4	13 5	13 6	13 7	13 8
7.7754E-03	9.7483E-03	5.2223E-03	4.2939E-03	2.3210E-03
13 9	13 10	13 11	14 1	14 2
3.4815E-03	5.8026E-04	2.0684E-02	2.4324E-03	3.0405E-03
14 3	14 4	14 5	14 6	14 7
3.2351E-02	8.1485E-03	1.0216E-02	5.4729E-03	4.4999E-03
14 8	14 9	14 10	14 11	15 1
2.4324E-03	3.6486E-03	6.0810E-04	2.1676E-02	4.1842E-03
15 2	15 3	15 4	15 5	15 6
5.2303E-03	5.5650E-02	1.4017E-02	1.7574E-02	9.4145E-03
15 7	15 8	15 9	15 10	15 11
7.7408E-03	4.1842E-03	6.2763E-03	1.0461E-03	3.7288E-02
16 1	16 2	16 3	16 4	16 5
8.0761E-03	1.0095E-02	1.0741E-01	2.7055E-02	3.3920E-02
16 6	16 7	16 8	16 9	16 10
1.8171E-02	1.4941E-02	8.0761E-03	1.2114E-02	2.0190E-03
16 11	17 1	17 2	17 3	17 4
7.1970E-02	1.4636E-02	1.8295E-02	1.9466E-01	4.9031E-02
17 5	17 6	17 7	17 8	17 9
6.1471E-02	3.2931E-02	2.7077E-02	1.4636E-02	2.1954E-02
17 10	17 11	18 1	18 2	18 3
3.6590E-03	1.3043E-01	2.3180E-02	2.8975E-02	3.0829E-01
18 4	18 5	18 6	18 7	18 8
7.7653E-02	9.7356E-02	5.2155E-02	4.2883E-02	2.3180E-02
18 9	18 10	18 11	19 1	19 2
3.4770E-02	5.7950E-03	2.0657E-01	3.9160E-02	4.8950E-02

IRON

N1		N2		SIGMA N,G (N1/N2)	
19	3	19	4	19	5
5.2083E-01		1.3119E-01		1.6447E-01	
19	8	19	9	19	10
3.9160E-02		5.8740E-02		9.7900E-03	
20	2	20	3	20	4
8.3450E-02		8.8791E-01		2.2365E-01	
20	7	20	8	20	9
1.2351E-01		6.6760E-02		1.0014E-01	
21	1	21	2	21	3
1.0298E-01		1.2873E-01		1.3696E 00	
21	6	21	7	21	8
2.3171E-01		1.9051E-01		1.0298E-01	
21	11	22	1	22	2
9.1770E-01		1.6268E-01		2.0335E-01	
22	5	22	6	22	7
6.8326E-01		3.6603E-01		3.0096E-01	
22	10	22	11	23	1
4.0670E-02		1.4497E 00		2.7960E-01	
23	4	23	5	23	6
9.3666E-01		1.1743E 00		6.2910E-01	
23	9	23	10	23	11
4.1940E-01		6.9900E-02		2.4917E 00	
24	3	24	4	24	5
5.7509E 00		1.4485E 00		1.8161E 00	
24	8	24	9	24	10
4.3240E-01		6.4860E-01		1.0810E-01	
25	2	25	3	25	4
8.4950E-01		9.0387E 00		2.2767E 00	
25	7	25	8	25	9
1.2573E 00		6.7960E-01		1.0194E 00	
26	1	26	2	26	3
6.8000E-01		8.5000E-01		9.0440E 00	
26	6	26	7	26	8
1.5300E 00		1.2580E 00		6.8000E-01	
26	11	27	1	27	2
6.0598E 00		6.8080E-01		8.5100E-01	
27	5	27	6	27	7
2.8594E 00		1.5318E 00		1.2595E 00	
27	10	27	11	28	1
1.7020E-01		6.0669E 00		6.8160E-01	
				8.5200E-01	
				9.0653E 00	

IRON

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
2.2834E 00	2.8627E 00	1.5336E 00	1.2610E 00	6.8160E-01
28 9	28 10	28 11	29 1	29 2
1.0224E 00	1.7040E-01	6.0741E 00	6.8280E-01	8.5350E-01
29 3	29 4	29 5	29 6	29 7
9.0812E 00	2.2874E 00	2.8678E 00	1.5363E 00	1.2632E 00
29 8	29 9	29 10	29 11	30 1
6.8280E-01	1.0242E 00	1.7070E-01	6.0848E 00	6.8460E-01
30 2	30 3	30 4	30 5	30 6
8.5575E-01	9.1052E 00	2.2934E 00	2.8753E 00	1.5403E 00
30 7	30 8	30 9	30 10	30 11
1.2665E 00	6.8460E-01	1.0269E 00	1.7115E-01	6.1008E 00
31 1	31 2	31 3	31 4	31 5
6.8720E-01	8.5900E-01	9.1398E 00	2.3021E 00	2.8862E 00
31 6	31 7	31 8	31 9	31 10
1.5462E 00	1.2713E 00	6.8720E-01	1.0308E 00	1.7180E-01
31 11	32 1	32 2	32 3	32 4
6.1240E 00	6.9180E-01	8.6475E-01	9.2009E 00	2.3175E 00
32 5	32 6	32 7	32 8	32 9
2.9056E 00	1.5565E 00	1.2798E 00	6.9180E-01	1.0377E 00
32 10	32 11	33 1	33 2	33 3
1.7295E-01	6.1650E 00	7.0120E-01	8.7650E-01	9.3260E 00
33 4	33 5	33 6	33 7	33 8
2.3490E 00	2.9450E 00	1.5777E 00	1.2972E 00	7.0120E-01
33 9	33 10	33 11	34 1	34 2
1.0518E 00	1.7530E-01	6.2487E 00	7.2620E-01	9.0775E-01
34 3	34 4	34 5	34 6	34 7
9.6585E 00	2.4328E 00	3.0500E 00	1.6339E 00	1.3435E 00
34 8	34 9	34 10	34 11	
7.2620E-01	1.0893E 00	1.8155E-01	6.4715E 00	

DATE DEC 01 1960

DESIGNATION		CODE NO.		DENSITY FACTOR			
CHROMIUM		24.5200		8.63279E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	3.2179E 00	3.0634E 00	1.5262E 00	1.6193E-02	-1.6293E 00	
2	6.065E 06	3.5840E 00	2.7681E 00	1.7260E 00	1.8039E-02	-1.7895E 00	
3	3.679E 06	3.7598E 00	2.3515E 00	2.3779E 00	1.8913E-02	-1.3310E 00	
4	2.231E 06	3.5300E 00	1.6052E 00	2.7005E 00	1.7759E-02	-7.9892E-01	
5	1.353E 06	2.7906E 00	3.1714E-01	2.1646E 00	1.4039E-02	-6.0291E-01	
6	8.208E 05	2.7980E 00	8.3374E-02	2.2868E 00	1.4082E-02	-4.9229E-01	
7	4.979E 05	3.4031E 00	1.0804E-01	2.9509E 00	1.7127E-02	-4.3549E-01	
8	3.020E 05	2.7910E 00	9.2480E-02	2.5286E 00	1.4230E-02	-2.5269E-01	
9	1.832E 05	5.1450E 00	1.7983E-01	4.9265E 00	1.7164E-02	-2.1046E-01	
10	6.738E 04	5.5301E 00	1.9749E-01	5.4628E 00	2.7806E-02	-6.4793E-02	
11	2.479E 04	3.1300E 00	1.1174E-01	3.0925E 00	1.5758E-02	-3.6176E-02	
12	9.119E 03	2.7274E 01	9.7369E-01	2.6947E 01	8.4428E-02	-3.1523E-01	
13	3.355E 03	3.5429E 01	1.2648E 00	3.5004E 01	1.5220E-01	-4.0947E-01	
14	1.234E 03	4.3102E 00	1.5387E-01	4.2584E 00	4.0682E-02	-4.9815E-02	
15	4.540E 02	4.2638E 00	1.5222E-01	4.2126E 00	4.6248E-02	-4.9279E-02	
16	8.719E 01	4.2493E 00	1.5170E-01	4.1983E 00	6.9987E-02	-4.9112E-02	
17	3.545E 01	4.2601E 00	1.5208E-01	4.2089E 00	9.0077E-02	-4.9236E-02	
18	1.304E 01	4.2259E 00	1.5087E-01	4.1752E 00	1.4106E-01	-4.8842E-02	
19	5.043E 00	4.2033E 00	1.5006E-01	4.1528E 00	2.3657E-01	-4.8580E-02	
20	1.445E 00	4.1812E 00	1.4927E-01	4.1310E 00	3.9086E-01	-4.8324E-02	
21	6.826E-01	4.0883E 00	1.4595E-01	4.0392E 00	6.2304E-01	-4.7251E-02	
22	2.511E-01	4.1194E 00	1.4706E-01	4.0699E 00	1.0038E 00	-4.7610E-02	
23	9.237E-02	4.1592E 00	1.4848E-01	4.1093E 00	1.7171E 00	-4.8071E-02	
24	2.530E-02	4.1273E 00	1.4811E-01	4.0775E 00	2.6488E 00	-4.7958E-02	
*4500	3.023E-01	4.0496E 00	1.5378E-01	3.9977E 00	1.0483E 00	-5.0006E-02	
*4000	2.718E-01	4.0496E 00	1.5378E-01	3.9977E 00	1.0483E 00	-5.0006E-02	
*3500	2.413E-01	4.0496E 00	1.5378E-01	3.9977E 00	1.0483E 00	-5.0006E-02	
*3000	2.109E-01	4.0496E 00	1.5378E-01	3.9977E 00	1.0483E 00	-5.0006E-02	
2500	1.804E-01	4.0951E 00	1.5551E-01	4.0426E 00	1.1388E 00	-5.0565E-02	
2000	1.499E-01	4.1201E 00	1.5646E-01	4.0673E 00	1.2526E 00	-5.0873E-02	
1500	1.194E-01	4.1295E 00	1.5682E-01	4.0766E 00	1.4058E 00	-5.0988E-02	
1000	8.897E-02	4.1283E 00	1.5677E-01	4.0753E 00	1.6328E 00	-5.0979E-02	
500	5.850E-02	4.1134E 00	1.5621E-01	4.0606E 00	2.0241E 00	-5.0796E-02	
68	3.216E-02	4.0633E 00	1.5430E-01	4.0112E 00	2.7581E 00	-5.0170E-02	

* Thermal cross sections taken from XDC 60-1-139.

NOTE: For a summary of the sources of data see APEX-704 and XDC 60-1-139.

CHROMIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	5.0457E 00	4.9810E 00	4.1631E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.6345E 00	4.5346E-01	3.2944E-04	8.5756E-08	0.	21 25
22	21	22	22	22	23
4.5325E-01	3.3917E 00	3.0875E-01	2.0940E-03	1.9646E-04	22 25
23	21	23	22	23	23
9.4589E-04	9.9701E-01	2.9874E 00	2.2707E-01	4.6023E-02	23 25
24	21	24	22	24	23
1.8886E-06	5.8652E-02	2.0485E 00	1.6436E 00	6.3573E-01	24 25
25	21	25	22	25	23
1.0802E-07	1.3613E-02	1.0452E 00	1.6062E 00	2.3807E 00	25 25

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	4.9747E 00	4.9109E 00	4.1665E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.6094E 00	4.7871E-01	2.2228E-04	2.9462E-08	0.	21 26
22	21	22	22	22	23
4.0337E-01	3.4349E 00	3.1257E-01	1.6578E-03	1.3128E-04	22 26
23	21	23	22	23	23
4.8378E-04	9.2696E-01	3.0531E 00	2.2616E-01	4.2164E-02	23 26
24	21	24	22	24	23
4.6411E-07	4.0903E-02	1.9733E 00	1.7093E 00	6.3686E-01	24 26
26	21	26	22	26	23
1.8742E-08	7.9005E-03	9.1641E-01	1.5937E 00	2.4567E 00	26 26

CHROMIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	4.9031E 00	4.8402E 00	4.1708E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.5760E 00	5.1218E-01	1.3793E-04	0.	21	24
22	21	22	22	22	24
3.5036E-01	3.4787E 00	3.1888E-01	1.2539E-03	22	27
23	21	23	22	23	24
2.1352E-04	8.5118E-01	3.1243E 00	2.2542E-01	23	27
24	21	24	22	24	24
8.1976E-08	2.6419E-02	1.8870E 00	1.7845E 00	24	27
27	21	27	22	27	24
0.	4.0758E-03	7.8391E-01	1.5739E 00	27	27
				2.5412E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	4.8308E 00	4.7689E 00	4.1763E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.5307E 00	5.5756E-01	7.5995E-05	0.	21	24
22	21	22	22	22	24
2.9396E-01	3.5220E 00	3.2904E-01	8.9093E-04	22	28
23	21	23	22	23	24
7.6603E-05	7.6857E-01	3.2020E 00	2.2515E-01	23	28
24	21	24	22	24	24
0.	1.5334E-02	1.7871E 00	1.8718E 00	24	28
28	21	28	22	28	24
0.	1.7832E-03	6.4878E-01	1.5440E 00	28	28
				2.6362E 00	

-----CHROMIUM-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	4.7579E 00	4.6969E 00	4.1837E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.4674E 00	6.2091E-01	3.5016E-05	0.	21	24
22	21	22	22	22	24
2.3409E-01	3.5624E 00	3.4543E-01	5.7804E-04	22	29
23	21	23	22	23	24
2.0239E-05	6.7759E-01	3.2872E 00	2.2588E-01	23	29
24	21	24	22	24	24
0.	7.6119E-03	1.6707E 00	1.9748E 00	24	29
29	21	29	22	29	24
0.	6.1227E-04	5.1269E-01	1.5001E 00	29	29
				29	29
				29	29

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	4.6844E 00	4.6243E 00	4.1942E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.3810E 00	7.0730E-01	1.1998E-05	0.	21	24
22	21	22	22	22	24
1.7120E-01	3.5951E 00	3.7257E-01	3.2587E-04	22	30
23	21	23	22	23	24
3.3020E-06	5.7604E-01	3.3810E 00	2.2868E-01	23	30
24	21	24	22	24	24
0.	2.9628E-03	1.5336E 00	2.0994E 00	24	30
30	21	30	22	30	24
0.	1.4379E-04	3.7830E-01	1.4358E 00	30	30
				30	30
				30	30

CHROMIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	4.6103E 00	4.5512E 00	4.2103E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
3.3343E 00	7.5395E-01	2.2076E-06	0.	0.
22 21	22 22	22 23	22 24	22 31
1.0733E-01	3.6083E 00	4.2004E-01	1.4454E-04	1.6471E-06
23 21	23 22	23 23	23 24	23 31
2.3439E-07	4.6073E-01	3.4843E 00	2.3600E-01	1.9928E-02
24 21	24 22	24 23	24 24	24 31
0.	7.6278E-04	1.3689E 00	2.2547E 00	6.0609E-01
31 21	31 22	31 23	31 24	31 31
0.	1.7596E-05	2.4986E-01	1.3408E 00	3.0196E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	4.5357E 00	4.4775E 00	4.2379E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
3.6393E 00	4.4900E-01	7.4072E-08	0.	0.
22 21	22 22	22 23	22 24	22 32
4.8538E-02	3.5726E 00	5.1121E-01	3.9860E-05	1.4830E-07
23 21	23 22	23 23	23 24	23 32
0.	3.2714E-01	3.5951E 00	2.5421E-01	1.4903E-02
24 21	24 22	24 23	24 24	24 32
0.	8.8045E-05	1.1640E 00	2.4568E 00	5.8363E-01
32 21	32 22	32 23	32 24	32 32
0.	5.9787E-07	1.3467E-01	1.1904E 00	3.2046E 00

CHROMIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	4.4608E 00	4.4036E 00	4.2962E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
3.7969E 00	2.9142E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
4.5913E-02	3.4121E 00	6.7049E-01	3.0414E-06	0.
23 21	23 22	23 23	23 24	23 33
0.	1.7161E-01	3.6947E 00	3.0575E-01	9.6197E-03
24 21	24 22	24 23	24 24	24 33
0.	1.4397E-06	8.9168E-01	2.7363E 00	5.5053E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	4.5707E-02	9.6555E-01	3.4495E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	4.3963E 00	4.3400E 00	4.4493E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
3.8102E 00	2.7812E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
7.1111E-02	3.8724E 00	1.7976E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	3.7565E-02	3.6615E 00	4.6993E-01	4.5633E-03
24 21	24 22	24 23	24 24	24 34
0.	0.	5.4781E-01	3.0863E 00	5.2195E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	5.4124E-03	6.3023E-01	3.7607E 00

CHROMIUM

TRANSFERS FROM GROUPS 1 THROUGH 5 TO GROUPS 1 THROUGH 16

N1 N2

SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.6308E-00	3.0208E-01	3.8239E-02	1.7615E-01	3.2106E-01
1 6	1 7	1 8	1 9	1 10
3.2088E-01	2.1871E-01	1.1744E-01	6.8519E-02	2.0447E-02
1 11	1 12	1 13	1 14	1 15
3.0657E-03	4.2867E-04	5.9655E-05	7.9494E-06	1.1715E-06
1 16	2 1	2 2	2 3	2 4
9.0609E-08	0.	2.1944E-00	1.4771E-01	1.1142E-01
2 5	2 6	2 7	2 8	2 9
2.7198E-01	3.3025E-01	2.5520E-01	1.4828E-01	9.1350E-02
2 10	2 11	2 12	2 13	2 14
2.8353E-02	4.3391E-03	6.1142E-04	8.5326E-05	1.1383E-05
2 15	2 16	3 1	3 2	3 3
1.6781E-06	1.2981E-07	0.	0.	2.3954E-00
3 4	3 5	3 6	3 7	3 8
2.2493E-01	1.8357E-01	3.0404E-01	2.8674E-01	1.8881E-01
3 9	3 10	3 11	3 12	3 13
1.2677E-01	4.1860E-02	6.6162E-03	9.4372E-04	1.3228E-04
3 14	3 15	3 16	4 1	4 2
1.7677E-05	2.6076E-06	2.0177E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	2.4752E-00	2.4125E-01	1.9884E-01	2.3822E-01
4 8	4 9	4 10	4 11	4 12
1.8251E-01	1.3613E-01	4.8479E-02	7.9702E-03	1.1540E-03
4 13	4 14	4 15	4 16	5 1
1.6263E-04	2.1779E-05	3.2151E-06	2.4884E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	2.4771E-00	1.9300E-01
5 7	5 8	5 9	5 10	5 11
4.1235E-02	3.6147E-02	2.9582E-02	1.1248E-02	1.2133E-03
5 12	5 13	5 14	5 15	5 16
2.8061E-04	3.9732E-05	5.3304E-06	7.8743E-07	6.0960E-08

CHROMIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

1 1	1 2	1 3	1 4	1 5
6.6127E-03	2.3412E-02	1.1140E-02	4.4680E-03	5.4429E-03
1 6	1 7	1 8	1 9	1 10
3.4542E-03	3.4007E-03	3.3053E-03	2.0550E-01	5.4539E-03
1 11	2 1	2 2	2 3	2 4
1.0905E-04	5.2630E-03	1.8634E-02	8.8665E-03	3.5561E-03
2 5	2 6	2 7	2 8	2 9
4.3320E-03	2.7492E-03	2.7066E-03	2.6306E-03	2.0471E-01
2 10	2 11	3 1	3 2	3 3
4.3407E-03	8.6791E-05	4.4444E-03	1.5735E-02	7.4873E-03
3 4	3 5	3 6	3 7	3 8
3.0028E-03	3.6582E-03	2.3216E-03	2.2856E-03	2.2215E-03
3 9	3 10	3 11	4 1	4 2
6.3989E-01	3.6656E-03	7.3292E-05	3.9478E-03	1.3978E-02
4 3	4 4	4 5	4 6	4 7
6.6509E-03	2.6675E-03	3.2495E-03	2.0622E-03	2.0302E-03
4 8	4 9	4 10	4 11	5 1
1.9733E-03	6.4397E-01	3.2561E-03	6.5104E-05	3.6467E-03
5 2	5 3	5 4	5 5	5 6
1.2911E-02	6.1435E-03	2.4640E-03	3.0016E-03	1.9049E-03
5 7	5 8	5 9	5 10	5 11
1.8754E-03	1.8228E-03	3.5233E-02	3.0077E-03	6.0137E-05
6 1	6 2	6 3	6 4	6 5
7.1865E-03	2.5444E-02	1.2107E-02	4.8557E-03	5.9152E-03
6 6	6 7	6 8	6 9	6 10
3.7540E-03	3.6958E-03	3.5921E-03	4.2412E-03	5.9272E-03
6 11	7 1	7 2	7 3	7 4
1.1851E-04	3.6351E-03	1.2870E-02	6.1240E-03	2.4561E-03
7 5	7 6	7 7	7 8	7 9
2.9921E-03	1.8989E-03	1.8694E-03	1.8170E-03	2.1453E-03
7 10	7 11	8 1	8 2	8 3
2.9981E-03	5.9946E-05	3.7772E-03	1.3373E-02	6.3634E-03
8 4	8 5	8 6	8 7	8 8
2.5521E-03	3.1090E-03	1.9731E-03	1.9425E-03	1.8880E-03
8 9	8 10	8 11	9 1	9 2
2.2292E-03	3.1153E-03	6.2289E-05	4.6453E-03	1.6447E-02
9 3	9 4	9 5	9 6	9 7
7.8258E-03	3.1387E-03	3.8235E-03	2.4265E-03	2.3889E-03
9 8	9 9	9 10	9 11	10 1
2.3219E-03	2.7415E-03	3.8313E-03	7.6604E-05	2.4099E-02

CHROMIUM

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
8.5325E-02		4.0600E-02		1.6283E-02	
10	7	10	8	10	9
1.2393E-02		1.2046E-02		1.4223E-02	
11	1	11	2	11	3
1.3593E-02		4.8126E-02		2.2900E-02	
11	6	11	7	11	8
7.1005E-03		6.9904E-03		6.7943E-03	
11	11	12	1	12	2
2.2416E-04		7.2694E-02		2.5738E-01	
12	5	12	6	12	7
5.9835E-02		3.7973E-02		3.7384E-02	
12	10	12	11	13	1
5.9956E-02		1.1988E-03		1.3096E-01	
13	4	13	5	13	6
8.8487E-02		1.0779E-01		6.8409E-02	
13	9	13	10	13	11
7.7288E-02		1.0801E-01		2.1597E-03	
14	3	14	4	14	5
5.8955E-02		2.3645E-02		2.8804E-02	
14	8	14	9	14	10
1.7492E-02		2.0653E-02		2.8863E-02	
15	2	15	3	15	4
1.4085E-01		6.7021E-02		2.6880E-02	
15	7	15	8	15	9
2.0459E-02		1.9885E-02		3.2745E-02	
16	1	16	2	16	3
6.0201E-02		2.1314E-01		3.2811E-02	
16	6	16	7	16	4
3.1447E-02		1.0142E-01		4.0676E-02	
16	11	16	8	16	5
9.9277E-04		4.0676E-02		4.9552E-02	
17	5	17	6	17	9
6.3775E-02		3.0959E-02		4.9652E-02	
17	10	17	11	17	3
6.3903E-02		3.0091E-02		3.5529E-02	
18	4	18	1	18	2
8.2003E-02		1.2777E-03		4.2969E-01	
18	9	18	5	18	7
7.1625E-02		9.9895E-02		6.2413E-02	
		1.0010E-01		6.0662E-02	
		2.0014E-03		7.2052E-01	

CHROMIUM

N1 N2
SIGMA N,G (N1/N2)

19 3	19 4	19 5	19 6	19 7
3.4284E-01	1.3750E-01	1.6751E-01	1.0630E-01	1.0466E-01
19 8	19 9	19 10	19 11	20 1
1.0172E-01	1.2010E-01	1.6785E-01	3.3560E-03	3.3622E-01
20 2	20 3	20 4	20 5	20 6
1.1904E 00	5.6643E-01	2.2718E-01	2.7675E-01	1.7563E-01
20 7	20 8	20 9	20 10	20 11
1.7291E-01	1.6806E-01	1.9843E-01	2.7731E-01	5.5446E-03
21 1	21 2	21 3	21 4	21 5
5.3586E-01	1.8972E 00	9.0275E-01	3.6207E-01	4.4107E-01
21 6	21 7	21 8	21 9	21 10
2.7992E-01	2.7557E-01	2.6784E-01	3.1625E-01	4.4196E-01
21 11	22 1	22 2	22 3	22 4
8.8368E-03	8.6357E-01	3.0575E 00	1.4548E 00	5.8349E-01
22 5	22 6	22 7	22 8	22 9
7.1081E-01	4.5110E-01	4.4410E-01	4.3164E-01	5.0965E-01
22 10	22 11	23 1	23 2	23 3
7.1224E-01	1.4241E-02	1.4768E 00	5.2288E 00	2.4880E 00
23 4	23 5	23 6	23 7	23 8
9.9786E-01	1.2156E 00	7.7145E-01	7.5949E-01	7.3818E-01
23 9	23 10	23 11	24 1	24 2
8.7158E-01	1.2180E 00	2.4354E-02	2.2785E 00	8.0670E 00
24 3	24 4	24 5	24 6	24 7
3.8385E 00	1.5395E 00	1.8754E 00	1.1902E 00	1.1717E 00
24 8	24 9	24 10	24 11	25 1
1.1389E 00	1.3447E 00	1.8792E 00	3.7574E-02	3.5807E 00
25 2	25 3	25 4	25 5	25 6
1.2678E 01	6.0324E 00	2.4194E 00	2.9473E 00	1.8704E 00
25 7	25 8	25 9	25 10	25 11
1.8414E 00	1.7898E 00	2.1132E 00	2.9533E 00	5.9049E-02
26 1	26 2	26 3	26 4	26 5
3.5833E 00	1.2687E 01	6.0367E 00	2.4211E 00	2.9494E 00
26 6	26 7	26 8	26 9	26 10
1.8718E 00	1.8428E 00	1.7911E 00	2.1147E 00	2.9554E 00
26 11	27 1	27 2	27 3	27 4
5.9092E-02	3.5876E 00	1.2702E 01	6.0440E 00	2.4240E 00
27 5	27 6	27 7	27 8	27 9
2.9530E 00	1.8740E 00	1.8450E 00	1.7932E 00	2.1173E 00
27 10	27 11	28 1	28 2	28 3
2.9589E 00	5.9163E-02	3.5919E 00	1.2717E 01	6.0512E 00

CHROMIUM

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
2.4270E 00	2.9565E 00	1.8763E 00	1.8472E 00	1.7954E 00	
28	9	28	10	28	11
2.1198E 00	2.9625E 00	5.9234E-02	3.5988E 00	1.2742E 01	
29	3	29	4	29	5
6.0628E 00	2.4316E 00	2.9622E 00	1.8799E 00	1.8507E 00	
29	8	29	9	29	10
1.7988E 00	2.1239E 00	2.9681E 00	5.9347E-02	3.6074E 00	
30	2	30	3	30	4
1.2772E 01	6.0773E 00	2.4374E 00	2.9692E 00	1.8844E 00	
30	7	30	8	30	9
1.8551E 00	1.8031E 00	2.1289E 00	2.9752E 00	5.9489E-02	
31	1	31	2	31	3
3.6211E 00	1.2821E 01	6.1005E 00	2.4467E 00	2.9806E 00	
31	6	31	7	31	8
1.8916E 00	1.8622E 00	1.8100E 00	2.1371E 00	2.9866E 00	
31	11	32	1	32	2
5.9716E-02	3.6452E 00	1.2906E 01	6.1410E 00	2.4630E 00	
32	5	32	6	32	7
3.0004E 00	1.9041E 00	1.8746E 00	1.8220E 00	2.1513E 00	
32	10	32	11	33	1
3.0065E 00	6.0113E-02	3.6951E 00	1.3083E 01	6.2251E 00	
33	4	33	5	33	6
2.4967E 00	3.0415E 00	1.9302E 00	1.9003E 00	1.8470E 00	
33	9	33	10	33	11
2.1807E 00	3.0476E 00	6.0936E-02	3.8267E 00	1.3549E 01	
34	3	34	4	34	5
6.4468E 00	2.5856E 00	3.1498E 00	1.9989E 00	1.9679E 00	
34	8	34	9	34	10
1.9127E 00	2.2584E 00	3.1561E 00	6.3106E-02		

DATE DEC 01 1960

DESIGNATION		CODE NO.		DENSITY FACTOR			
BERYLLIUM		4.9000		1.49634E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	1.6412E 00	5.6050E-01	8.2000E-01	2.3578E-02	-6.4490E-01	
2	6.065E 06	1.7819E 00	8.2710E-01	9.4580E-01	4.7408E-02	-6.5660E-01	
3	3.679E 06	2.2514E 00	8.6380E-01	1.4405E 00	9.4477E-02	-6.3681E-01	
4	2.231E 06	2.2437E 00	5.4170E-01	1.7805E 00	6.6817E-02	-3.6376E-01	
5	1.353E 06	2.5043E 00	4.2460E-01	1.8456E 00	1.2182E-02	-5.1729E-01	
6	8.208E 05	3.5611E 00	7.4320E-01	3.0829E 00	9.0399E-05	-3.7554E-01	
7	4.979E 05	3.9603E 00	8.5310E-01	3.7043E 00	2.2552E-06	-2.0104E-01	
8	3.020E 05	4.1120E 00	8.3870E-01	3.8220E 00	2.8959E-06	-2.2774E-01	
9	1.832E 05	4.9644E 00	1.3196E 00	4.5972E 00	3.9111E-06	-2.8837E-01	
10	6.738E 04	5.8291E 00	1.2124E 00	5.3941E 00	6.1080E-06	-3.4161E-01	
11	2.479E 04	5.9200E 00	1.2314E 00	5.4783E 00	8.9769E-06	-3.4687E-01	
12	9.119E 03	5.9525E 00	1.2382E 00	5.5083E 00	1.3173E-05	-3.4884E-01	
13	3.355E 03	6.0000E 00	1.2480E 00	5.5523E 00	2.4925E-05	-3.5158E-01	
14	1.234E 03	6.0000E 00	1.2480E 00	5.5523E 00	4.0296E-05	-3.5158E-01	
15	4.540E 02	6.0000E 00	1.2480E 00	5.5523E 00	5.1676E-05	-3.5158E-01	
16	8.719E 01	6.0000E 00	1.2480E 00	5.5523E 00	5.1676E-05	-3.5158E-01	
17	3.545E 01	6.0000E 00	1.2480E 00	5.5523E 00	5.1676E-05	-3.5158E-01	
18	1.304E 01	6.0000E 00	1.2480E 00	5.5523E 00	5.1676E-05	-3.5158E-01	
19	5.043E 00	5.9998E 00	1.2480E 00	5.5521E 00	2.9208E-04	-3.5158E-01	
20	1.445E 00	5.9988E 00	1.2478E 00	5.5513E 00	1.1447E-03	-3.5143E-01	
21	6.826E-01	5.9782E 00	1.2435E 00	5.5321E 00	1.8446E-03	-3.5033E-01	
22	2.511E-01	5.8967E 00	1.2265E 00	5.4568E 00	3.2215E-03	-3.4546E-01	
23	9.237E-02	5.8953E 00	1.2262E 00	5.4555E 00	4.6505E-03	-3.4538E-01	
24	2.530E-02	5.9827E 00	1.2444E 00	5.5363E 00	7.3323E-03	-3.5056E-01	
4500	3.023E-01	5.8677E 00	1.2205E 00	5.4308E 00	2.8936E-03	-3.4310E-01	
4000	2.718E-01	5.8240E 00	1.2114E 00	5.3904E 00	3.0520E-03	-3.4051E-01	
3500	2.413E-01	5.8244E 00	1.2115E 00	5.3908E 00	3.2380E-03	-3.4051E-01	
3000	2.109E-01	5.8249E 00	1.2116E 00	5.3912E 00	3.4637E-03	-3.4059E-01	
2500	1.804E-01	5.8257E 00	1.2117E 00	5.3920E 00	3.7448E-03	-3.4059E-01	
2000	1.499E-01	5.8270E 00	1.2120E 00	5.3932E 00	4.1078E-03	-3.4067E-01	
1500	1.194E-01	5.8292E 00	1.2125E 00	5.3952E 00	4.6022E-03	-3.4083E-01	
1000	8.897E-02	5.8337E 00	1.2134E 00	5.3994E 00	5.3324E-03	-3.4106E-01	
500	5.850E-02	5.8449E 00	1.2157E 00	5.4097E 00	6.5764E-03	-3.4177E-01	
68	3.216E-02	5.8586E 00	1.2186E 00	5.4224E 00	8.8688E-03	-3.4255E-01	

NOTE: For a summary of the sources of data see APEX-704.

BERYLLIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.0569E 01	9.7819E 00	1.3429E-02	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 25
4.5476E 00	1.3330E 00	9.1247E-02	4.6186E-03	1.7059E-03
22 21	22 22	22 23	22 24	22 25
1.3654E 00	3.5972E 00	8.4108E-01	6.4124E-02	2.8938E-02
23 21	23 22	23 23	23 24	23 25
3.0850E 00	2.7169E 00	2.2541E 00	4.0949E-01	2.0628E-01
24 21	24 22	24 23	24 24	24 25
1.0609E-01	1.4251E 00	2.8364E 00	1.0104E 00	6.0458E-01
25 21	25 22	25 23	25 24	25 25
1.2784E-01	2.0616E 00	4.5518E 00	1.9061E 00	1.9219E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.0192E 01	9.4323E 00	1.3440E-02	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 26
4.4782E 00	1.4067E 00	8.7924E-02	3.9935E-03	1.3796E-03
22 21	22 22	22 23	22 24	22 26
1.2230E 00	3.7123E 00	8.7118E-01	6.2881E-02	2.7321E-02
23 21	23 22	23 23	23 24	23 26
2.3305E-01	2.5886E 00	2.4412E 00	4.2365E-01	2.0879E-01
24 21	24 22	24 23	24 24	24 26
7.1176E-02	1.2728E 00	2.9081E 00	1.0858E 00	6.4482E-01
26 21	26 22	26 23	26 24	26 26
7.7742E-02	1.7163E 00	4.4176E 00	1.9654E 00	2.0148E 00

----- BERYLLIUM -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	9.8003E 00	9.0702E 00	1.3454E-02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
4.4500E 00	1.4996E 00	8.4209E-02	3.3468E-03	1.0634E-03
22 21	22 22	22 23	22 24	22 27
1.0675E 00	3.8336E 00	9.0868E-01	6.1451E-02	2.5475E-02
23 21	23 22	23 23	23 24	23 27
1.6572E-01	2.4349E 00	2.6437E 00	4.3996E-01	2.1104E-01
24 21	24 22	24 23	24 24	24 27
4.3417E-02	1.1023E 00	2.9718E 00	1.1742E 00	6.9088E-01
27 21	27 22	27 23	27 24	27 27
4.2222E-02	1.3688E 00	4.2377E 00	2.0289E 00	2.1227E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.2134E 01	1.1230E 01	1.3472E-02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
4.2754E 00	1.6194E 00	7.9933E-02	2.6819E-03	7.6581E-04
22 21	22 22	22 23	22 24	22 28
8.9822E-01	3.9580E 00	9.5732E-01	5.9828E-02	2.3376E-02
23 21	23 22	23 23	23 24	23 28
1.0832E-01	2.2498E 00	2.8650E 00	4.5925E-01	2.1287E-01
24 21	24 22	24 23	24 24	24 28
2.3210E-02	9.1505E-01	3.0209E 00	1.2793E 00	7.4413E-01
28 21	28 22	28 23	28 24	28 28
2.2552E-02	1.2420E 00	4.9641E 00	2.6369E 00	3.0899E 00

BERYLLIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	8.9678E 00	8.2997E 00	1.3496E-02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
4.1230E 00	1.7779E 00	7.4795E-02	2.0081E-03	4.9806E-04	
22	21	22	22	22	23
7.1526E-01	4.0787E 00	1.0237E 00	5.8018E-02	2.0991E-02	
23	21	23	22	23	23
6.2602E-02	2.0261E 00	3.1096E 00	4.8287E-01	2.1410E-01	
24	21	24	22	24	23
1.0502E-02	7.1435E-01	3.0446E 00	1.4070E 00	9.8653E-01	
29	21	29	22	29	23
7.1731E-03	7.1051E-01	3.6809E 00	2.1655E 00	2.4037E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	8.5223E 00	7.8874E 00	1.3530E-02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.9304E 00	1.9785E 00	6.7715E-02	1.3355E-03	2.7298E-04	
22	21	22	22	22	23
5.2088E-01	4.1808E 00	1.1207E 00	5.6039E-02	1.8278E-02	
23	21	23	22	23	23
2.9855E-02	1.7539E 00	3.3838E 00	5.1337E-01	2.1444E-01	
24	21	24	22	24	23
3.2993E-03	5.0758E-01	3.0250E 00	1.5663E 00	8.8053E-01	
30	21	30	22	30	23
1.8191E-03	4.3065E-01	3.2625E 00	2.2332E 00	2.5941E 00	

BERYLLIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	8.0530E 00	7.4531E 00	1.3582E-02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
3.8621E 00	2.0625E 00	5.2870E-02	6.5858E-04	1.0153E-04
22 21	22 22	22 23	22 24	22 31
3.2279E-01	4.2891E 00	1.2749E 00	5.3884E-02	1.5164E-02
23 21	23 22	23 23	23 24	23 31
1.0252E-02	1.4207E 00	3.6947E 00	5.5600E-01	2.1362E-01
24 21	24 22	24 23	24 24	24 31
6.2636E-04	3.0821E-01	2.9308E 00	1.7725E 00	9.7054E-01
31 21	31 22	31 23	31 24	31 31
2.4440E-04	2.1004E-01	2.7147E 00	2.2891E 00	2.8389E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	7.5541E 00	6.9913E 00	1.3671E-02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
4.5270E 00	1.4307E 00	2.0355E-02	1.1271E-04	1.0928E-05
22 21	22 22	22 23	22 24	22 32
1.4212E-01	4.1415E 00	1.5504E 00	5.1288E-02	1.1476E-02
23 21	23 22	23 23	23 24	23 32
1.8501E-03	1.0116E 00	4.0467E 00	6.2376E-01	2.1149E-01
24 21	24 22	24 23	24 24	24 32
4.6330E-05	1.5487E-01	3.0214E 00	1.5967E 00	1.2097E 00
32 21	32 22	32 23	32 24	32 32
9.3651E-06	6.7669E-02	2.0098E 00	2.3057E 00	3.1710E 00

BERYLLIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	7.0119E 00	6.4895E 00	1.3859E-02	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
4.6498E 00	1.3212E 00	7.1451E-03	7.5845E-06	0.
22 21	22 22	22 23	22 24	22 33
6.7557E-02	3.7220E 00	2.0565E 00	4.4823E-02	6.5972E-03
23 21	23 22	23 23	23 24	23 33
6.7974E-05	5.1996E-01	4.4075E 00	7.5866E-01	2.0911E-01
24 21	24 22	24 23	24 24	24 33
0.	3.2923E-02	2.4244E 00	2.1892E 00	1.3361E 00
33 21	33 22	33 23	33 24	33 33
0.	8.0672E-03	1.1468E 00	2.1971E 00	3.6600E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	6.4164E 00	5.9384E 00	1.4353E-02	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
4.6322E 00	1.3446E 00	1.4133E-03	0.	0.
22 21	22 22	22 23	22 24	22 34
8.6244E-02	4.6701E 00	1.0472E 00	6.3343E-03	3.4653E-04
23 21	23 22	23 23	23 24	23 34
0.	1.0587E-01	4.3951E 00	1.0852E 00	2.1240E-01
24 21	24 22	24 23	24 24	24 34
0.	1.1760E-03	1.5432E 00	2.9107E 00	1.5276E 00
34 21	34 22	34 23	34 24	34 34
0.	8.1057E-05	3.6850E-01	1.7463E 00	4.3015E 00

BERYLLIUM

TRANSFERS FROM GROUPS 1 THROUGH 4 TO GROUPS 1 THROUGH 21

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.0564E 00	3.7739E-01	1.3393E-01	2.1680E-01	2.5359E-01
1 6	1 7	1 8	1 9	1 10
1.0452E-01	1.3696E-02	8.3073E-03	6.7567E-03	3.8237E-03
1 11	1 12	1 13	1 14	1 15
1.4067E-03	5.1748E-04	1.9037E-04	7.0033E-05	2.9924E-05
1 16	1 17	1 18	1 19	1 20
7.8063E-06	1.8565E-06	7.2915E-07	0.	0.
1 21	2 1	2 2	2 3	2 4
0.	0.	9.9002E-01	4.6954E-01	3.1327E-01
2 5	2 6	2 7	2 8	2 9
3.5929E-01	1.6689E-01	2.7346E-02	1.6586E-02	1.3490E-02
2 10	2 11	2 12	2 13	2 14
7.6342E-03	2.8085E-03	1.0332E-03	3.8008E-04	1.3982E-04
2 15	2 16	2 17	2 18	2 19
5.9745E-05	1.5586E-05	3.7065E-06	1.4558E-06	5.8819E-07
2 20	2 21	3 1	3 2	3 3
1.8552E-07	0.	0.	0.	1.2810E 00
3 4	3 5	3 6	3 7	3 8
6.4684E-01	3.5334E-01	2.8288E-01	7.1141E-02	3.7308E-02
3 9	3 10	3 11	3 12	3 13
2.6802E-02	1.3581E-02	4.9583E-03	1.8018E-03	6.5934E-04
3 14	3 15	3 16	3 17	3 18
2.4256E-04	1.0364E-04	2.7037E-05	6.4298E-06	2.5254E-06
3 19	3 20	3 21	4 1	4 2
1.0203E-06	3.2182E-07	1.0922E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	1.2691E 00	9.0548E-01	1.0640E-01	2.4774E-02
4 8	4 9	4 10	4 11	4 12
1.7667E-02	1.5899E-02	8.1430E-03	3.3861E-03	1.0431E-03
4 13	4 14	4 15	4 16	4 17
3.5166E-04	1.2937E-04	5.5278E-05	1.4420E-05	3.4294E-06
4 18	4 19	4 20	4 21	
1.3469E-06	5.4421E-07	1.7164E-07	0.	

BERYLLIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

SIGMA N,G (N1/N2)

0. 1 1	0. 1 2	0. 1 3	4.9673E-06	9.8142E-08
0. 1 6	1.9111E-06	8.5360E-07	0. 1 9	0. 1 10
1.8773E-07	0. 2 1	0. 2 2	0. 2 3	4.9439E-06
9.7678E-08	0. 2 6	1.9021E-06	8.4957E-07	0. 2 9
0. 2 10	1.8685E-07	0. 3 1	0. 3 2	0. 3 3
5.2310E-06	1.0335E-07	0. 3 6	2.0125E-06	8.9890E-07
0. 3 9	0. 3 10	1.9770E-07	0. 4 1	0. 4 2
0. 4 3	5.8469E-06	1.1552E-07	0. 4 6	2.2495E-06
1.0047E-06	0. 4 9	0. 4 10	2.2098E-07	0. 5 1
0. 5 2	0. 5 3	6.8299E-06	1.3494E-07	0. 5 6
2.6277E-06	1.1737E-06	0. 5 9	0. 5 10	2.5813E-07
0. 6 1	0. 6 2	0. 6 3	8.2418E-06	1.6284E-07
0. 6 6	3.1709E-06	1.4163E-06	0. 6 9	0. 6 10
3.1149E-07	0. 7 1	0. 7 2	0. 7 3	1.0172E-05
2.0097E-07	0. 7 6	3.9134E-06	1.7479E-06	0. 7 9
0. 7 10	3.8443E-07	0. 8 1	0. 8 2	0. 8 3
1.2741E-05	2.5172E-07	0. 8 6	4.9018E-06	2.1894E-06
0. 8 9	0. 8 10	4.8152E-07	0. 9 1	0. 9 2
0. 9 3	1.7162E-05	3.3707E-07	0. 9 6	6.6027E-06
2.9491E-06	0. 9 9	0. 9 10	6.4860E-07	0. 10 1

BERYLLIUM

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		0.		2.6373E-05	5.2106E-07
10	7	10	8	10	9
1.0147E-05		4.5320E-06		0.	0.
11	1	11	2	11	3
0.		0.		0.	4.3229E-05
11	6	11	7	11	8
0.		1.6632E-05		7.4287E-06	0.
11	11	12	1	12	2
1.6338E-06		0.		0.	0.
12	5	12	6	12	7
1.4051E-06		0.		2.7362E-05	1.2221E-05
12	10	12	11	13	1
0.		2.6879E-06		0.	0.
13	4	13	5	13	6
1.1716E-04		2.3148E-06		0.	4.5077E-05
13	9	13	10	13	11
0.		0.		4.4280E-06	0.
14	3	14	4	14	5
0.		1.9311E-04		3.8154E-06	0.
14	8	14	9	14	10
3.3185E-05		0.		0.	7.2985E-06
15	2	15	3	15	4
0.		0.		3.4801E-04	6.8758E-06
15	7	15	8	15	9
1.3389E-04		5.9804E-05		0.	0.
16	1	16	2	16	3
0.		0.		0.	6.6570E-04
16	6	16	7	16	8
0.		2.5612E-04		1.1440E-04	0.
16	11	17	1	17	2
2.5159E-05		0.		0.	0.
17	5	17	6	17	7
2.2768E-05		0.		4.4337E-04	1.9803E-04
17	10	17	11	18	1
0.		4.3553E-05		0.	0.
18	4	18	5	18	6
1.8656E-03		3.6860E-05		0.	7.1777E-04
18	9	18	10	18	11
0.		0.		7.0508E-05	0.

BERYLLIUM

N1		N2		SIGMA N,G (N1/N2)	
19 3	19 4	19 5	19 6	19 7	
0.	3.1426E-03	6.2089E-05	0.	1.2091E-03	
19 8	19 9	19 10	19 11	20 1	
5.4003E-04	0.	0.	1.1877E-04	0.	
20 2	20 3	20 4	20 5	20 6	
0.	0.	5.3009E-03	1.0473E-04	0.	
20 7	20 8	20 9	20 10	20 11	
2.0394E-03	9.1092E-04	0.	0.	2.0034E-04	
21 1	21 2	21 3	21 4	21 5	
0.	0.	0.	8.4502E-03	1.6695E-04	
21 6	21 7	21 8	21 9	21 10	
0.	3.2511E-03	1.4521E-03	0.	0.	
21 11	22 1	22 2	22 3	22 4	
3.1936E-04	0.	0.	0.	1.3536E-02	
22 5	22 6	22 7	22 8	22 9	
2.6743E-04	0.	5.2077E-03	2.3260E-03	0.	
22 10	22 11	23 1	23 2	23 3	
0.	5.1157E-04	0.	0.	0.	
23 4	23 5	23 6	23 7	23 8	
2.3232E-02	4.5899E-04	0.	8.9380E-03	3.9922E-03	
23 9	23 10	23 11	24 1	24 2	
0.	0.	8.7800E-04	0.	0.	
24 3	24 4	24 5	24 6	24 7	
0.	3.6060E-02	7.1246E-04	0.	1.3874E-02	
24 8	24 9	24 10	24 11	25 1	
6.1967E-03	0.	0.	1.3629E-03	0.	
25 2	25 3	25 4	25 5	25 6	
0.	0.	5.6677E-02	1.1198E-03	0.	
25 7	25 8	25 9	25 10	25 11	
2.1806E-02	9.7395E-03	0.	0.	2.1420E-03	
26 1	26 2	26 3	26 4	26 5	
0.	0.	0.	5.6723E-02	1.1207E-03	
26 6	26 7	26 8	26 9	26 10	
0.	2.1823E-02	9.7474E-03	0.	0.	
26 11	27 1	27 2	27 3	27 4	
2.1438E-03	0.	0.	0.	5.6782E-02	
27 5	27 6	27 7	27 8	27 9	
1.1219E-03	0.	2.1846E-02	9.7576E-03	0.	
27 10	27 11	28 1	28 2	28 3	
0.	2.1460E-03	0.	0.	0.	

BERYLLIUM

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
5.6858E-02	1.1234E-03	0.		2.1875E-02	9.7706E-03
28	9	28	10	28	11
0.	0.	2.1489E-03	0.	29	1
29	3	29	4	29	5
0.	5.6959E-02	1.1254E-03	0.	29	6
29	8	29	9	29	10
9.7881E-03	0.	0.		29	11
30	2	30	3	30	4
0.	0.	5.7103E-02	1.1282E-03	30	5
30	7	30	8	30	9
2.1970E-02	9.8127E-03	0.		30	10
31	1	31	2	31	3
0.	0.	0.		31	4
31	6	31	7	31	8
0.	2.2054E-02	9.8504E-03	0.	31	9
31	11	32	1	32	2
2.1664E-03	0.	0.		32	3
32	5	32	6	32	7
1.1400E-03	0.	2.2198E-02	9.9150E-03	32	8
32	10	32	11	33	1
0.	2.1806E-03	0.		33	2
33	4	33	5	33	6
5.8491E-02	1.1556E-03	0.		33	7
33	9	33	10	33	11
0.	0.	2.2106E-03	0.	34	1
34	3	34	4	34	5
0.	6.0576E-02	1.1968E-03	0.	34	6
34	8	34	9	34	10
1.0410E-02	0.	0.		34	11
				2.2894E-03	

DATE DEC 01 1960

DESIGNATION		CODE NO.		DENSITY FACTOR					
NIOBIUM		41.9300		1.54257E 02					
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I		
1	1.000E 07	3.9282E 00	3.3687E 00	1.9084E 00	9.3198E-02	-1.9821E 00			
2	6.065E 06	4.0042E 00	3.3469E 00	2.3585E 00	2.0702E-02	-1.6150E 00			
3	3.679E 06	4.0970E 00	2.8076E 00	2.8840E 00	9.6444E-05	-1.1903E 00			
4	2.231E 06	4.8259E 00	2.2593E 00	3.4920E 00	7.4593E-03	-1.3090E 00			
5	1.353E 06	6.1264E 00	1.7832E 00	4.1984E 00	1.2523E-02	-1.8920E 00			
6	8.208E 05	7.6688E 00	3.5403E-01	4.9873E 00	3.6775E-02	-2.6314E 00			
7	4.979E 05	8.6493E 00	1.3942E-01	6.2913E 00	6.3926E-02	-2.3140E 00			
8	3.020E 05	8.9213E 00	1.6245E-01	7.4107E 00	6.7725E-02	-1.4824E 00			
9	1.832E 05	9.0449E 00	1.7547E-01	8.1459E 00	6.8582E-02	-8.8221E-01			
10	6.738E 04	8.4192E 00	1.7124E-01	7.9411E 00	9.9494E-02	-4.6917E-01			
11	2.479E 04	7.1495E 00	1.4984E-01	6.9414E 00	2.0450E-01	-2.0421E-01			
12	9.119E 03	6.3073E 00	1.3497E-01	6.2352E 00	7.6392E-01	-7.0753E-02			
13	3.355E 03	5.6056E 00	1.2087E-01	5.5652E 00	1.5843E 00	-3.9645E-02			
14	1.234E 03	8.6298E 00	1.8606E-01	8.5675E 00	2.4547E 00	-6.1136E-02			
15	4.540E 02	6.8924E 00	1.4859E-01	6.8421E 00	2.1152E 00	-4.9361E-02			
16	8.719E 01	6.3985E 00	1.3794E-01	6.3517E 00	2.1060E 00	-4.5926E-02			
17	3.545E 01	6.2504E 00	1.3475E-01	6.2048E 00	3.3034E-01	-4.4748E-02			
18	1.304E 01	6.1085E 00	1.3169E-01	6.0638E 00	4.3817E-02	-4.3865E-02			
19	5.043E 00	6.0730E 00	1.3093E-01	6.0290E 00	6.5725E-02	-4.3178E-02			
20	1.445E 00	6.0134E 00	1.2964E-01	5.9695E 00	1.2759E-01	-4.3080E-02			
21	6.826E-01	5.9267E 00	1.2779E-01	5.8841E 00	2.3331E-01	-4.1804E-02			
22	2.511E-01	5.7860E 00	1.2475E-01	5.7441E 00	3.7400E-01	-4.1117E-02			
23	9.237E-02	5.4885E 00	1.1832E-01	5.4483E 00	6.4332E-01	-3.9449E-02			
24	2.530E-02	5.1104E 00	1.1017E-01	5.0730E 00	9.9960E-01	-3.6701E-02			
4500	3.023E-01	5.8157E 00	1.2539E-01	5.7736E 00	3.3566E-01	-4.1314E-02			
4000	2.718E-01	5.8028E 00	1.2511E-01	5.7608E 00	3.5403E-01	-4.1216E-02			
3500	2.413E-01	5.7868E 00	1.2476E-01	5.7449E 00	3.7561E-01	-4.1117E-02			
3000	2.109E-01	5.7668E 00	1.2433E-01	5.7251E 00	4.0179E-01	-4.0921E-02			
2500	1.804E-01	5.7414E 00	1.2378E-01	5.6998E 00	4.3440E-01	-4.0823E-02			
2000	1.499E-01	5.7092E 00	1.2309E-01	5.6679E 00	4.7651E-01	-4.0529E-02			
1500	1.194E-01	5.6696E 00	1.2224E-01	5.6286E 00	5.3386E-01	-4.0234E-02			
1000	8.897E-02	5.6219E 00	1.2121E-01	5.5812E 00	6.1856E-01	-3.9940E-02			
500	5.850E-02	5.5761E 00	1.2022E-01	5.5357E 00	7.6286E-01	-3.9645E-02			
68	3.216E-02	5.6201E 00	1.2117E-01	5.5794E 00	1.0288E 00	-3.9940E-02			

NOTE: For a summary of the sources of data see APEX-704.

----- NIOBIUM -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	6.4422E 00	6.3956E 00	1.5578E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
5.4277E 00	4.9894E-01	1.0661E-05	0.	0.
22 21	22 22	22 23	22 24	22 25
4.7477E-01	4.9866E 00	3.2387E-01	3.4771E-04	9.8879E-06
23 21	23 22	23 23	23 24	23 25
2.6265E-05	9.7825E-01	4.2384E 00	2.4345E-01	2.8343E-02
24 21	24 22	24 23	24 24	24 25
0.	8.2690E-03	2.0192E 00	2.3730E 00	7.0990E-01
25 21	25 22	25 23	25 24	25 25
0.	6.5742E-04	6.7335E-01	2.0446E 00	3.7236E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	6.4423E 00	6.3957E 00	1.5591E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
5.4036E 00	5.2312E-01	5.1966E-06	0.	0.
22 21	22 22	22 23	22 24	22 26
4.2274E-01	5.0358E 00	3.2725E-01	2.3332E-04	5.0251E-06
23 21	23 22	23 23	23 24	23 26
9.7268E-06	9.0912E-01	4.3135E 00	2.4078E-01	2.5041E-02
24 21	24 22	24 23	24 24	24 26
0.	4.8941E-03	1.9362E 00	2.4659E 00	7.0342E-01
26 21	26 22	26 23	26 24	26 26
0.	2.9168E-04	5.7354E-01	2.0171E 00	3.8514E 00

NIOBIUM

THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
3.5000E 03	6.4424E 00	6.3958E 00	1.5607E 00	0.

N1		N2			
SIGMA S (N1/N2)					
21 21	21 22	21 23	21 24	21 27	
5.3709E 00	5.5581E-01	2.1567E-06	0.	0.	
22 21	22 22	22 23	22 24	22 27	
3.6741E-01	5.0852E 00	3.3320E-01	1.4406E-04	2.2028E-06	
23 21	23 22	23 23	23 24	23 27	
2.8741E-06	8.3463E-01	4.3938E 00	2.3834E-01	2.1691E-02	
24 21	24 22	24 23	24 24	24 27	
0.	2.5822E-03	1.8430E 00	2.5704E 00	6.9435E-01	
27 21	27 22	27 23	27 24	27 27	
0.	1.0767E-04	4.7379E-01	1.9777E 00	3.9908E 00	

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
3.0000E 03	6.4425E 00	6.3959E 00	1.5627E 00	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
5.3259E 00	6.0080E-01	7.1174E-07	0.	0.
22 21	22 22	22 23	22 24	22 28
3.0853E-01	5.1343E 00	3.4310E-01	7.9231E-05	7.8423E-07
23 21	23 22	23 23	23 24	23 28
6.1722E-07	7.5365E-01	4.4801E 00	2.3640E-01	1.8308E-02
24 21	24 22	24 23	24 24	24 28
0.	1.1599E-03	1.7378E 00	2.6895E 00	6.8196E-01
28 21	28 22	28 23	28 24	28 28
0.	3.0670E-05	3.7542E-01	1.9226E 00	4.1444E 00

----- NIOBIUM -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	6.4426E 00	6.3960E 00	1.5655E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
5.2624E 00	6.6432E-01	1.6641E-07	0.	0.
22 21	22 22	22 23	22 24	22 29
2.4596E-01	5.1806E 00	3.5936E-01	3.6790E-05	2.0519E-07
23 21	23 22	23 23	23 24	23 29
0.	6.6465E-01	4.5734E 00	2.3548E-01	1.4913E-02
24 21	24 22	24 23	24 24	24 29
0.	4.1146E-04	1.6175E 00	2.8272E 00	6.6532E-01
29 21	29 22	29 23	29 24	29 29
0.	5.9515E-06	2.8041E-01	1.8467E 00	4.3154E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	6.4428E 00	6.3962E 00	1.5694E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
5.1741E 00	7.5257E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
1.8018E-01	5.2193E 00	3.8652E-01	1.3110E-05	0.
23 21	23 22	23 23	23 24	23 30
0.	5.6542E-01	4.6749E 00	2.3658E-01	1.1538E-02
24 21	24 22	24 23	24 24	24 30
0.	1.0086E-04	1.4779E 00	2.9893E 00	6.4308E-01
30 21	30 22	30 23	30 24	30 30
0.	0.	1.9159E-01	1.7425E 00	4.5087E 00

 NIOBIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	6.4431E 00	6.3965E 00	1.5755E 00	0.

		N1	N2		
SIGMA S (N1/N2)					
21 21	21 22	21 23	21 24	21 31	
5.1307E 00	7.9599E-01	0.	0.	0.	
22 21	22 22	22 23	22 24	22 31	
1.1325E-01	5.2386E 00	4.3413E-01	2.9615E-06	0.	
23 21	23 22	23 23	23 24	23 31	
0.	4.5272E-01	4.7856E 00	2.4195E-01	8.2348E-03	
24 21	24 22	24 23	24 24	24 31	
0.	1.3124E-05	1.3120E 00	3.1849E 00	6.1348E-01	
31 21	31 22	31 23	31 24	31 31	
0.	0.	9.7673E-02	1.3801E 00	4.0863E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	6.4437E 00	6.3970E 00	1.5858E 00	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
5.4615E 00	4.6517E-01	0.	0.	21	24
22	21	22	22	22	24
5.1456E-02	5.2093E 00	5.2522E-01	0.	22	32
23	21	23	22	23	24
0.	3.2200E-01	4.9039E 00	2.5747E-01	23	32
24	21	24	22	24	24
0.	0.	1.1074E 00	3.4287E 00	24	32
32	21	32	22	32	24
0.	0.	5.0847E-02	1.3943E 00	32	32
					4.9985E 00

----- NIOBIUM -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	6.4447E 00	6.3980E 00	1.6076E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
5.6421E 00	2.8463E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
5.4276E-02	5.0478E 00	6.8395E-01	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.6946E-01	5.0128E 00	3.0391E-01	2.3065E-03
24 21	24 22	24 23	24 24	24 33
0.	0.	8.3948E-01	3.7465E 00	5.2446E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	1.2171E-02	1.0960E 00	5.3366E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	6.4469E 00	6.4000E 00	1.6649E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
5.6653E 00	2.6140E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
8.8400E-02	5.5256E 00	1.7201E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	3.7404E-02	4.9964E 00	4.5418E-01	5.0785E-04
24 21	24 22	24 23	24 24	24 34
0.	0.	5.1038E-01	4.1152E 00	4.8481E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	6.6707E-04	7.0134E-01	5.7449E 00

 NIOBIUM

TRANSFERS FROM GROUPS 1 THROUGH 6 TO GROUPS 1 THROUGH 21

N1 N2

 SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.5273E-00	4.1221E-02	4.6308E-02	1.9550E-01	3.3725E-01
1 6	1 7	1 8	1 9	1 10
3.3578E-01	2.2655E-01	1.2138E-01	7.0779E-02	2.2284E-02
1 11	1 12	1 13	1 14	1 15
3.3403E-03	4.5000E-04	5.9738E-05	8.2038E-06	1.2048E-06
1 16	1 17	1 18	1 19	1 20
0.	0.	0.	0.	0.
1 21	2 1	2 2	2 3	2 4
0.	0.	2.4421E-00	8.3130E-02	1.2307E-01
2 5	2 6	2 7	2 8	2 9
3.0838E-01	3.9345E-01	3.1096E-01	1.8379E-01	1.1474E-01
2 10	2 11	2 12	2 13	2 14
3.7836E-02	5.8302E-03	7.9373E-04	1.0577E-04	1.4544E-05
2 15	2 16	2 17	2 18	2 19
2.1369E-06	1.6506E-07	0.	0.	0.
2 20	2 21	3 1	3 2	3 3
0.	0.	0.	0.	2.5930E-00
3 4	3 5	3 6	3 7	3 8
1.5396E-01	2.0388E-01	3.5308E-01	3.4192E-01	2.2951E-01
3 9	3 10	3 11	3 12	3 13
1.5662E-01	5.4863E-02	8.7638E-03	1.2096E-03	1.6199E-04
3 14	3 15	3 16	3 17	3 18
2.2312E-05	3.2804E-06	2.5345E-07	0.	0.
3 19	3 20	3 21	4 1	4 2
0.	0.	0.	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	3.2612E-00	3.9885E-01	2.6747E-01	3.3600E-01
4 8	4 9	4 10	4 11	4 12
2.6601E-01	2.0400E-01	7.7361E-02	1.2956E-02	1.8210E-03
4 13	4 14	4 15	4 16	4 17
2.4546E-04	3.3885E-05	4.9860E-06	3.8536E-07	0.
4 18	4 19	4 20	4 21	5 1
0.	0.	0.	0.	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	4.5273E-00	6.7472E-01
5 7	5 8	5 9	5 10	5 11
2.9008E-01	2.7485E-01	2.3974E-01	9.9256E-02	1.7516E-02
5 12	5 13	5 14	5 15	5 16
2.5123E-03	3.4115E-04	4.7212E-05	6.9537E-06	5.3763E-07

NIOBIUM

		N1		N2	
SIGMA S0 (N1/N2)					
5 17		5 18		5 19	
0.		0.		0.	
6 1		6 2		6 3	
0.		0.		0.	
6 6		6 7		6 8	
7.1880E 00		3.5448E-01		4.9601E-02	
6 11		6 12		6 13	
4.1600E-03		6.0879E-04		8.3269E-05	
6 16		6 17		6 18	
1.3172E-07		0.		0.	
6 21					
0.					

 NIQBIUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
1.2550E 03	2.9680E-02	6.6987E 01	3.7881E-02	0.
1.2410E 03	8.2911E-02	1.6174E 02	2.8618E-02	0.
1.2050E 03	7.3057E-02	1.4370E 02	2.9967E-02	0.
1.1850E 03	2.8329E-01	2.7399E 02	7.3673E-03	0.
1.1600E 03	2.2581E-01	2.8264E 02	1.2605E-02	0.
1.1390E 03	5.8737E-02	1.1480E 02	3.1301E-02	0.
1.1190E 03	2.8483E-02	5.8306E 01	3.4950E-02	0.
1.0250E 03	3.7503E-02	6.9919E 01	3.1650E-02	0.
1.0180E 03	4.4579E-01	2.8890E 02	3.8506E-03	0.
9.6100E 02	3.8618E-02	6.7892E 01	3.0015E-02	0.
9.4200E 02	4.6810E-01	3.3821E 02	5.1722E-03	0.
9.2000E 02	2.0486E-02	3.3468E 01	2.7076E-02	0.
7.6300E 02	1.9435E-02	2.6555E 01	2.2836E-02	0.
7.4600E 02	5.3454E-01	4.3028E 02	8.1062E-03	0.
7.2700E 02	8.8792E-02	1.0988E 02	1.9659E-02	0.
6.8300E 02	1.1118E-02	1.3715E 01	2.0791E-02	0.
6.7700E 02	4.4322E-02	5.3062E 01	1.9759E-02	0.
6.4500E 02	3.2051E-02	3.6916E 01	1.9196E-02	0.
6.2100E 02	1.0775E-02	1.2101E 01	1.8958E-02	0.
6.0800E 02	2.5663E-02	2.8013E 01	1.8290E-02	0.
6.0300E 02	6.8722E-03	7.5117E 00	1.8492E-02	0.
5.0350E 02	4.8619E-02	4.3776E 01	1.5027E-02	0.
4.6300E 02	1.0395E-01	8.4875E 01	1.3438E-02	0.
3.9460E 02	4.2697E-01	2.7859E 02	1.0070E-02	0.
3.8440E 02	1.2240E 00	6.4415E 02	6.7245E-03	0.
3.6660E 02	7.7621E-03	5.3359E 00	1.2031E-02	0.
3.6440E 02	1.5689E-02	1.0705E 01	1.1923E-02	0.
3.3700E 02	4.1236E-01	2.4371E 02	9.6738E-03	0.
3.2050E 02	3.8424E-02	2.3982E 01	1.1344E-02	0.
2.4440E 02	7.9891E-02	3.7978E 01	8.6296E-03	0.
1.9400E 02	1.7993E 00	6.1558E 02	5.6308E-03	0.
1.1940E 02	6.5022E-01	1.5518E 02	4.4521E-03	0.
1.0620E 02	9.2496E-02	1.8100E 01	3.3652E-03	0.
9.4600E 01	3.8550E-02	1.7755E 01	3.9661E-03	0.
4.2200E 01	1.5646E-01	1.6411E 01	2.4332E-03	0.
3.5900E 01	2.4940E-01	2.7784E 01	3.2265E-03	0.

 NIOBIUM

 TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
 SIGMA N,G (N1/N2)

0.	1	1	0.	1	2	8.2983E-04	1	3	4.1492E-03	1	4	1.4107E-02	1	5
1.8256E-02	1	6	2.5310E-02	1	7	0.	1	8	1.0779E 00	1	9	1.9600E 00	1	10
8.7752E-02	1	11	0.	2	1	0.	2	2	7.5251E-04	2	3	3.7625E-03	2	4
1.2793E-02	2	5	1.6555E-02	2	6	2.2951E-02	2	7	0.	2	8	1.0779E 00	2	9
1.9600E 00	2	10	7.9574E-02	2	11	0.	3	1	0.	3	2	7.5584E-04	3	3
3.7792E-03	3	4	1.2849E-02	3	5	1.6629E-02	3	6	2.3053E-02	3	7	0.	3	8
1.0779E 00	3	9	1.9600E 00	3	10	7.9927E-02	3	11	0.	4	1	0.	4	2
8.5112E-04	4	3	4.2556E-03	4	4	1.4469E-02	4	5	1.8725E-02	4	6	2.5959E-02	4	7
0.	4	8	9.7492E-01	4	9	1.9030E 00	4	10	9.0003E-02	4	11	0.	5	1
0.	5	2	1.3376E-03	5	3	6.6881E-03	5	4	2.2740E-02	5	5	2.9428E-02	5	6
4.0798E-02	5	7	0.	5	8	2.6755E-01	5	9	1.4273E 00	5	10	1.4145E-01	5	11
0.	6	1	0.	6	2	2.2259E-03	6	3	1.1129E-02	6	4	3.7840E-02	6	5
4.8969E-02	6	6	6.7889E-02	6	7	0.	6	8	0.	6	9	2.5284E-01	6	10
2.3538E-01	6	11	0.	7	1	0.	7	2	2.6840E-03	7	3	1.3420E-02	7	4
4.5628E-02	7	5	5.9048E-02	7	6	8.1862E-02	7	7	0.	7	8	0.	7	9
0.	7	10	2.8382E-01	7	11	0.	8	1	0.	8	2	3.0927E-03	8	3
1.5463E-02	8	4	5.2576E-02	8	5	6.8039E-02	8	6	9.4327E-02	8	7	0.	8	8
0.	8	9	0.	8	10	3.2704E-01	8	11	0.	9	1	0.	9	2
3.2009E-03	9	3	1.6005E-02	9	4	5.4415E-02	9	5	7.0420E-02	9	6	9.7628E-02	9	7
0.	9	8	0.	9	9	0.	9	10	3.3848E-01	9	11	0.	10	1

NIOBIUM

		N1		N2	
SIGMA N,G (N1/N2)					
10	2	10	3	10	4
0.	5.6310E-03	2.8155E-02	9.5728E-02	1.2388E-01	
10	7	10	8	10	9
1.7175E-01	0.	0.	0.	5.9546E-01	
11	1	11	2	11	3
0.	0.	1.4547E-02	7.2733E-02	2.4729E-01	
11	6	11	7	11	8
3.2003E-01	4.4367E-01	0.	0.	0.	
11	11	12	1	12	2
1.5383E 00	0.	0.	2.5545E-02	1.2772E-01	
12	5	12	6	12	7
4.3426E-01	5.6198E-01	7.7911E-01	0.	0.	
12	10	12	11	13	1
0.	2.7012E 00	0.	0.	1.9604E-02	
13	4	13	5	13	6
9.8021E-02	3.3327E-01	4.3129E-01	5.9793E-01	0.	
13	9	13	10	13	11
0.	0.	2.0731E 00	0.	0.	
14	3	14	4	14	5
3.1957E-02	1.5978E-01	5.4327E-01	7.0305E-01	9.7468E-01	
14	8	14	9	14	10
0.	0.	0.	3.3793E 00	0.	
15	2	15	3	15	4
0.	6.7816E-02	3.3908E-01	1.1529E 00	1.4919E 00	
15	7	15	8	15	9
2.0684E 00	0.	0.	0.	7.1713E 00	
16	1	16	2	16	3
0.	0.	7.1505E-02	3.5753E-01	1.2156E 00	
16	6	16	7	16	8
1.5731E 00	2.1809E 00	0.	0.	0.	
16	11	17	1	17	2
7.5614E 00	0.	0.	1.7042E-02	8.5212E-02	
17	5	17	6	17	7
2.8972E-01	3.7493E-01	5.1980E-01	0.	0.	
17	10	17	11	18	1
0.	1.8022E 00	0.	0.	2.0511E-03	
18	4	18	5	18	6
1.0255E-02	3.4868E-02	4.5124E-02	6.2558E-02	0.	
18	9	18	10	18	11
0.	0.	2.1689E-01	0.	0.	

NIOBIUM

		N1		N2		SIGMA N,G (N1/N2)			
19	3	19	4	19	5	19	6	19	7
3.4550E-03		1.7275E-02		5.8734E-02		7.6009E-02		1.0538E-01	
19	8	19	9	19	10	19	11	20	1
0.		0.		0.		3.6535E-01		0.	
20	2	20	3	20	4	20	5	20	6
0.		5.8276E-03		2.9138E-02		9.9069E-02		1.2821E-01	
20	7	20	8	20	9	20	10	20	11
1.7774E-01		0.		0.		0.		6.1625E-01	
21	1	21	2	21	3	21	4	21	5
0.		0.		9.2900E-03		4.6450E-02		1.5793E-01	
21	6	21	7	21	8	21	9	21	10
2.0438E-01		2.8335E-01		0.		0.		0.	
21	11	22	1	22	2	22	3	22	4
9.8238E-01		0.		0.		1.4882E-02		7.4408E-02	
22	5	22	6	22	7	22	8	22	9
2.5299E-01		3.2740E-01		4.5389E-01		0.		0.	
22	10	22	11	23	1	23	2	23	3
0.		1.5737E 00		0.		0.		2.5541E-02	
23	4	23	5	23	6	23	7	23	8
1.2771E-01		4.3420E-01		5.6191E-01		7.7901E-01		0.	
23	9	23	10	23	11	24	1	24	2
0.		0.		2.7009E 00		0.		0.	
24	3	24	4	24	5	24	6	24	7
3.9645E-02		1.9822E-01		6.7396E-01		8.7219E-01		1.2092E 00	
24	8	24	9	24	10	24	11	25	1
0.		0.		0.		4.1923E 00		0.	
25	2	25	3	25	4	25	5	25	6
0.		6.2312E-02		3.1156E-01		1.0593E 00		1.3709E 00	
25	7	25	8	25	9	25	10	25	11
1.9005E 00		0.		0.		0.		6.5892E 00	
26	1	26	2	26	3	26	4	26	5
0.		0.		6.2364E-02		3.1182E-01		1.0602E 00	
26	6	26	7	26	8	26	9	26	10
1.3720E 00		1.9021E 00		0.		0.		0.	
26	11	27	1	27	2	27	3	27	4
6.5947E 00		0.		0.		6.2428E-02		3.1214E-01	
27	5	27	6	27	7	27	8	27	9
1.0613E 00		1.3734E 00		1.9041E 00		0.		0.	
27	10	27	11	28	1	28	2	28	3
0.		6.6015E 00		0.		0.		6.2508E-02	

NIOBIUM

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
3.1254E-01		1.0626E 00		1.3752E 00	
28	9	28	10	28	11
0.		0.		6.6100E 00	
29	3	29	4	29	5
6.2620E-02		3.1310E-01		1.0645E 00	
29	8	29	9	29	10
0.		0.		0.	
30	2	30	3	30	4
0.		6.2776E-02		3.1388E-01	
30	7	30	8	30	9
1.9147E 00		0.		0.	
31	1	31	2	31	3
0.		0.		6.3020E-02	
31	6	31	7	31	8
1.3864E 00		1.9221E 00		0.	
31	11	32	1	32	2
6.6641E 00		0.		0.	
32	5	32	6	32	7
1.0783E 00		1.3955E 00		1.9347E 00	
32	10	32	11	33	1
0.		6.7077E 00		0.	
33	4	33	5	33	6
3.2152E-01		1.0932E 00		1.4147E 00	
33	9	33	10	33	11
0.		0.		6.7999E 00	
34	3	34	4	34	5
6.6596E-02		3.3298E-01		1.1321E 00	
34	8	34	9	34	10
0.		0.		0.	
				7.0423E 00	

DATE 12/08/60

DESIGNATION			CODE NO.			DENSITY FACTOR		
URANIUM 234			92.2340			3.88590E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1		
1	1.000E 07	4.2244E 00	5.7907E 00	2.6318E 00	1.7428E 00	-1.5918E 00		
2	6.065E 06	5.5164E 00	5.2158E 00	2.8165E 00	1.6651E 00	-2.6986E 00		
3	3.679E 06	6.4020E 00	4.0463E 00	2.9985E 00	1.5636E 00	-3.4018E 00		
4	2.231E 06	5.7323E 00	2.7879E 00	3.2172E 00	1.5309E 00	-2.5139E 00		
5	1.353E 06	5.2326E 00	1.8184E 00	3.5812E 00	1.4141E 00	-1.6505E 00		
6	8.208E 05	5.7607E 00	1.1560E 00	4.1885E 00	1.2579E 00	-1.5715E 00		
7	4.979E 05	7.4460E 00	6.5472E-01	5.7060E 00	6.3672E-01	-1.7391E 00		
8	3.020E 05	8.7785E 00	3.4527E-01	7.0903E 00	2.6054E-01	-1.6874E 00		
9	1.832E 05	9.1999E 00	1.7051E-01	7.9568E 00	2.3551E-01	-1.2425E 00		
10	6.738E 04	9.3385E 00	8.8900E-02	8.7900E 00	3.2036E-01	-5.4827E-01		
11	2.479E 04	9.3638E 00	8.0481E-02	9.3372E 00	4.6156E-01	-2.6565E-02		
12	9.119E 03	9.6258E 00	8.2733E-02	9.5981E 00	6.3481E-01	-2.7644E-02		
13	3.355E 03	1.1939E 01	1.0262E-01	1.1905E 01	1.0121E 00	-3.4287E-02		
14	1.234E 03	1.6576E 01	1.4247E-01	1.6529E 01	2.5068E 00	-4.7604E-02		
15	4.540E 02	2.5057E 01	2.1536E-01	2.4985E 01	4.9531E 00	-7.1956E-02		
16	8.719E 01	3.5081E 01	3.0152E-01	3.4980E 01	2.1967E 01	-1.0074E-01		
17	3.545E 01	2.3727E 01	2.0393E-01	2.3659E 01	4.2316E 01	-6.8139E-02		
18	1.304E 01	1.0992E 01	9.4478E-02	1.0961E 01	4.1038E-01	-3.1569E-02		
19	5.043E 00	9.8837E 01	8.4950E-01	9.8553E 01	5.2858E 02	-2.8385E-01		
20	1.445E 00	1.0972E 01	9.4300E-02	1.0940E 01	6.1758E 00	-3.1509E-02		
21	6.826E-01	1.3772E 01	1.1837E-01	1.3732E 01	1.3565E 01	-3.9551E-02		
22	2.511E-01	1.5396E 01	1.3233E-01	1.5352E 01	2.8027E 01	-4.4215E-02		
23	9.237E-02	1.6277E 01	1.3990E-01	1.6231E 01	5.4915E 01	-4.6745E-02		
24	2.530E-02	1.6566E 01	1.4239E-01	1.6519E 01	8.3223E 01	-4.7576E-02		
*4500	3.023E-01	1.5186E 01	1.3052E-01	1.5143E 01	3.0954E 01	-4.3613E-02		
*4000	2.718E-01	1.5186E 01	1.3052E-01	1.5143E 01	3.0954E 01	-4.3613E-02		
*3500	2.413E-01	1.5186E 01	1.3052E-01	1.5143E 01	3.0954E 01	-4.3613E-02		
*3000	2.109E-01	1.5186E 01	1.3052E-01	1.5143E 01	3.0954E 01	-4.3613E-02		
2500	1.804E-01	1.5397E 01	1.3234E-01	1.5353E 01	3.4261E 01	-4.4218E-02		
2000	1.499E-01	1.5620E 01	1.3426E-01	1.5575E 01	3.8515E 01	-4.4858E-02		
1500	1.194E-01	1.5852E 01	1.3625E-01	1.5806E 01	4.4268E 01	-4.5524E-02		
1000	8.897E-02	1.6094E 01	1.3833E-01	1.6048E 01	5.2685E 01	-4.6219E-02		
500	5.850E-02	1.6353E 01	1.4055E-01	1.6306E 01	6.6813E 01	-4.6962E-02		
68	3.216E-02	1.6554E 01	1.4228E-01	1.6506E 01	9.2299E 01	-4.7539E-02		

* Thermal cross sections taken from XDC 59-11-72.

NOTE: For a summary of the sources of data see APEX-704.

DESIGNATION	CODE NO.	DENSITY FACTOR
URANIUM 234	92.2340	3.88590E 02
LEVEL	ENERGY	NU SIGMA FISSION
1	1.000E 07	6.6156E 00
2	6.065E 06	5.6631E 00
3	3.679E 06	4.7363E 00
4	2.231E 06	4.2546E 00
5	1.353E 06	3.5938E 00
6	8.208E 05	2.9442E 00
7	4.979E 05	1.3251E 00
8	3.020E 05	3.3288E-01
9	1.832E 05	1.0089E-01
10	6.738E 04	1.8643E-02
11	2.479E 04	0.
12	9.119E 03	0.
13	3.355E 03	0.
14	1.234E 03	0.
15	4.540E 02	0.
16	8.719E 01	0.
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

-----URANIUM 234-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
4.5000E 03	1.7371E 01	1.7321E 01	1.4101E 02	0.

		N1	N2								
		SIGMA S (N1/N2)									
21	21	21	22	21	23						
1.4590E 01	9.2312E-01	0.	22	23	21	24					
22	21	22	22	22	23	22	24				
8.8091E-01	1.4515E 01	6.1360E-01	3.1101E-06	0.	22	25	23	25			
23	21	23	22	23	23	23	24	23	25		
0.	1.9155E 00	1.3823E 01	5.2192E-01	1.6601E-02	24	21	24	24	25		
24	21	24	22	24	23	24	24	1.8699E 00	25	25	
0.	6.8490E-05	4.6814E 00	1.0015E 01	1.2473E 01	25	21	25	25	25	25	
25	21	25	22	25	23	25	24	4.5455E 00	1.2473E 01	25	25
0.	1.0820E-07	3.5225E-01	4.5455E 00	1.2473E 01	25	25	25	1.2473E 01	25	25	25

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
4.0000E 03	1.7305E 01	1.7255E 01	1.4112E 02	0.

		N1	N2								
		SIGMA S (N1/N2)									

21	21	21	22	21	23						
1.2954E 01	8.1813E-01	0.	22	23	21	24					
22	21	22	22	22	23	22	24				
7.8517E-01	1.3989E 01	6.2191E-01	1.2902E-06	0.	22	25	23	26			
23	21	23	22	23	23	23	24	23	26		
0.	1.7785E 00	1.3973E 01	5.1284E-01	1.3457E-02	24	21	24	24	26		
24	21	24	22	24	23	24	24	1.8096E 00	26	26	
0.	2.4133E-05	4.4418E 00	1.0315E 01	1.2678E 01	26	21	26	26	26	26	
26	21	26	22	26	23	26	24	4.3559E 00	1.2678E 01	26	26
0.	0.	2.7160E-01	4.3559E 00	1.2678E 01	26	26	26	1.2678E 01	26	26	26

URANIUM 234

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.7239E 01	1.7189E 01	1.4127E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
1.2893E 01	8.7828E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 27
6.8341E-01	1.4077E 01	6.3589E-01	4.3900E-07	0.
23 21	23 22	23 23	23 24	23 27
0.	1.6316E 00	1.4131E 01	5.0437E-01	1.0513E-02
24 21	24 22	24 23	24 24	24 27
0.	6.7058E-06	4.1821E 00	1.0642E 01	1.7417E 00
27 21	27 22	27 23	27 24	27 27
0.	0.	1.9924E-01	4.1413E 00	1.2899E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.7173E 01	1.7123E 01	1.4145E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
1.2811E 01	9.6123E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 28
5.7502E-01	1.4163E 01	6.5851E-01	0.	0.
23 21	23 22	23 23	23 24	23 28
0.	1.4728E 00	1.4300E 01	4.9712E-01	7.8101E-03
24 21	24 22	24 23	24 24	24 28
0.	1.3310E-06	3.8982E 00	1.1003E 01	1.6651E 00
28 21	28 22	28 23	28 24	28 28
0.	0.	1.3644E-01	3.8970E 00	1.3140E 01

----- URANIUM 234 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.7107E 01	1.7057E 01	1.4171E 02	0.

		N1 SIGMA S (N1/N2)	N2		
21	21	21	22	21	23
1.2693E 01	1.0793E 00	0.	0.	21	24
22	21	22	22	22	23
4.5968E-01	1.4242E 01	6.9510E-01	0.	22	24
23	21	23	22	23	23
0.	1.2989E 00	1.4481E 01	4.9223E-01	23	24
24	21	24	22	24	24
0.	0.	3.5844E 00	1.1404E 01	24	24
29	21	29	22	29	23
0.	0.	8.4636E-02	3.6163E 00	29	24
				29	29

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.7041E 01	1.6991E 01	1.4206E 02	0.

		N1 SIGMA S (N1/N2)	N2		
21	21	21	22	21	23
1.2525E 01	1.2468E 00	0.	0.	21	24
22	21	22	22	22	23
3.3807E-01	1.4302E 01	7.5589E-01	0.	22	24
23	21	23	22	23	23
0.	1.1058E 00	1.4676E 01	4.9194E-01	23	24
24	21	24	22	24	24
0.	0.	3.2324E 00	1.1854E 01	24	24
30	21	30	22	30	23
0.	0.	4.5127E-02	3.2910E 00	30	24
				30	24
				30	30

 URANIUM 234

 THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
1.5000E 03	1.6974E 01	1.6925E 01	1.4261E 02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.2419E 01	1.3525E 00	0.	0.	0.	0.
22	21	22	22	22	23
2.1377E-01	1.4320E 01	8.6298E-01	0.	0.	0.
23	21	23	22	23	23
0.	8.8691E-01	1.4887E 01	5.0141E-01	1.7587E-03	0.
24	21	24	22	24	23
0.	0.	2.8296E 00	1.2368E 01	1.3683E 00	0.
31	21	31	22	31	23
0.	0.	1.8689E-02	2.9083E 00	1.4047E 01	0.

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
1.0000E 03	1.6908E 01	1.6859E 01	1.4354E 02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.2952E 01	8.2017E-01	0.	0.	0.	0.
22	21	22	22	22	23
9.8102E-02	1.4227E 01	1.0718E 00	0.	0.	0.
23	21	23	22	23	23
0.	6.3317E-01	1.5109E 01	5.3444E-01	6.6382E-04	0.
24	21	24	22	24	23
0.	0.	2.3546E 00	1.2969E 01	1.2430E 00	0.
32	21	32	22	32	23
0.	0.	4.7888E-03	2.4479E 00	1.4455E 01	0.

----- URANIUM 234 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.6841E 01	1.6722E 01	1.4551E 02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.3305E 01	4.6728E-01	0.	0.	21	24
22	21	22	22	22	23
1.2151E-01	1.3811E 01	1.4638E 00	0.	22	24
23	21	23	22	23	23
0.	3.3604E-01	1.5300E 01	6.4108E-01	23	24
24	21	24	22	24	23
0.	0.	1.7628E 00	1.3694E 01	24	24
33	21	33	22	33	23
0.	0.	3.9191E-04	1.8688E 00	33	24
				33	33
				33	34

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.6784E 01	1.6735E 01	1.5070E 02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.3318E 01	4.5344E-01	0.	0.	21	24
22	21	22	22	22	23
2.2240E-01	1.4776E 01	3.9827E-01	0.	22	24
23	21	23	22	23	23
0.	7.5700E-02	1.5192E 01	1.0097E 00	23	24
24	21	24	22	24	23
0.	0.	1.0670E 00	1.6566E 01	24	24
34	21	34	22	34	23
0.	0.	1.9720E-06	1.1839E 00	34	24
				34	33
				34	34

URANIUM 234

TRANSFERS FROM GROUPS 1 THROUGH 10 TO GROUPS 1 THROUGH 16

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.7105E-00	6.3125E-02	7.9931E-02	3.5006E-01	6.1903E-01
1 6	1 7	1 8	1 9	1 10
6.0611E-01	4.0783E-01	2.1724E-01	1.2606E-01	3.7472E-02
1 11	1 12	1 13	1 14	1 15
5.6070E-03	7.8341E-04	1.0899E-04	1.4522E-05	2.1229E-06
1 16	2 1	2 2	2 3	2 4
1.4868E-07	0.	2.9189E-00	2.2922E-01	2.2688E-01
2 5	2 6	2 7	2 8	2 9
5.3129E-01	6.2778E-01	4.7676E-01	2.7404E-01	1.6757E-01
2 10	2 11	2 12	2 13	2 14
5.1731E-02	7.8948E-03	1.1113E-03	1.5503E-04	2.0678E-05
2 15	2 16	3 1	3 2	3 3
3.0238E-06	2.1181E-07	0.	0.	4.2132E-00
3 4	3 5	3 6	3 7	3 8
1.4125E-01	3.3601E-01	5.3913E-01	4.9813E-01	3.2378E-01
3 9	3 10	3 11	3 12	3 13
2.1546E-01	7.0691E-02	1.1135E-02	1.5864E-03	2.2226E-04
3 14	3 15	3 16	4 1	4 2
2.9696E-05	4.3452E-06	3.0444E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	4.0315E-00	2.0992E-01	3.7073E-01	4.3595E-01
4 8	4 9	4 10	4 11	4 12
3.3010E-01	2.4423E-01	8.6466E-02	1.4173E-02	2.0496E-03
4 13	4 14	4 15	4 16	5 1
2.8874E-04	3.8660E-05	5.6613E-06	3.9677E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	3.8685E-00	3.0504E-01
5 7	5 8	5 9	5 10	5 11
3.2788E-01	3.0251E-01	2.5717E-01	1.0057E-01	1.7366E-02
5 12	5 13	5 14	5 15	5 16
2.5617E-03	3.6348E-04	4.8805E-05	7.1541E-06	5.0160E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
4.7148E-00	3.0161E-01	2.4572E-01	2.4820E-01	1.0978E-01
6 11	6 12	6 13	6 14	6 15
2.0220E-02	3.0574E-03	4.3775E-04	5.8983E-05	8.6570E-06
6 16	7 1	7 2	7 3	7 4
6.0728E-07	0.	0.	0.	0.

URANIUM 234

N1 N2
SIGMA S0 (N1/N2)

0. 7 5	0. 7 6	6.8205E 00 7 7	2.8934E-01 7 8	2.0437E-01 7 9
1.0567E-01 7 10	2.1136E-02 7 11	3.2990E-03 7 12	4.7785E-04 7 13	6.4679E-05 7 14
9.5085E-06 7 15	6.6745E-07 7 16	0. 8 1	0. 8 2	0. 8 3
0. 8 4	0. 8 5	0. 8 6	0. 8 7	8.2541E 00 8 8
2.2935E-01 8 9	8.4742E-02 8 10	1.8779E-02 8 11	3.0502E-03 8 12	4.4832E-04 8 13
6.1031E-05 8 14	8.9905E-06 8 15	6.3161E-07 8 16	0. 9 1	0. 9 2
0. 9 3	0. 9 4	0. 9 5	0. 9 6	0. 9 7
0. 9 8	0. 9 9	0. 9 10	0. 9 11	0. 9 12
3.4989E-04 9 13	4.8086E-05 9 14	7.1080E-06 9 15	5.0005E-07 9 16	0. 10 1
0. 10 2	0. 10 3	0. 10 4	0. 10 5	0. 10 6
0. 10 7	0. 10 8	0. 10 9	0. 10 10	0. 10 11
1.3807E-03 10 12	2.1806E-04 10 13	3.0536E-05 10 14	4.5444E-06 10 15	3.2057E-07 10 16

URANIUM 234

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
3.6900E 02	7.0441E-01	6.7267E 02	9.0964E-03	0.
3.5700E 02	4.5081E-01	1.8296E 03	1.6983E-01	0.
3.1900E 02	8.5244E-01	1.2729E 03	2.5729E-02	0.
2.9500E 02	9.3011E-01	1.6479E 03	3.9167E-02	0.
2.7400E 02	7.1427E-01	2.3960E 03	1.5117E-01	0.
1.9100E 02	2.3778E 00	2.1260E 03	1.5405E-02	0.
1.8400E 02	1.3773E 00	3.5073E 03	1.2972E-01	0.
1.7900E 02	2.4407E 00	2.8972E 03	2.8975E-02	0.
1.5400E 02	1.9094E 00	4.1599E 03	1.1345E-01	0.
1.4600E 02	1.9891E 00	4.2996E 03	1.1780E-01	0.
1.3300E 02	2.1221E 00	4.4919E 03	1.2401E-01	0.
1.1200E 02	2.8499E 00	5.2104E 03	1.0985E-01	0.
1.0700E 02	9.6905E-01	2.2762E 03	1.8980E-01	0.
9.5000E 01	6.1618E 00	6.9011E 03	4.8601E-02	0.
8.9000E 01	4.5300E-01	9.5416E 02	1.8348E-01	0.
7.8300E 01	3.4554E 00	5.3162E 03	1.1127E-01	0.
4.9400E 01	1.3066E 01	1.1105E 04	5.3831E-02	0.
4.6400E 01	1.3376E-01	1.5156E 02	1.0185E-01	0.
3.1400E 01	2.5594E 01	1.5048E 04	4.0521E-02	0.
5.2000E 00	5.7407E 02	6.2514E 04	8.3940E-03	0.

DATE 12/08/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
URANIUM 236		92.2360		3.91920E 02			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I
1	1.000E 07	3.7484E 00	5.0724E 00	2.3311E 00	2.2349E 00	-1.3191E 00	
2	6.065E 06	6.0319E 00	5.6818E 00	3.0703E 00	1.1499E 00	-2.7562E 00	
3	3.679E 06	7.0650E 00	4.4854E 00	3.3095E 00	9.1841E-01	-3.4951E 00	
4	2.231E 06	6.5288E 00	3.1789E 00	3.6713E 00	8.0522E-01	-2.6594E 00	
5	1.353E 06	5.9287E 00	2.0693E 00	4.0569E 00	6.5842E-01	-1.7421E 00	
6	8.208E 05	6.7607E 00	1.3511E 00	4.9149E 00	2.9473E-01	-1.7178E 00	
7	4.979E 05	7.9908E 00	6.3032E-01	6.1212E 00	1.3623E-01	-1.7400E 00	
8	3.020E 05	8.9668E 00	7.6417E-02	7.2418E 00	1.3337E-01	-1.6055E 00	
9	1.832E 05	9.1865E 00	7.8289E-02	7.9452E 00	1.9862E-01	-1.1552E 00	
10	6.738E 04	9.3582E 00	7.9751E-02	8.8079E 00	3.1293E-01	-5.1207E-01	
11	2.479E 04	9.3638E 00	7.9799E-02	9.3373E 00	4.6156E-01	-2.4652E-02	
12	9.119E 03	9.6258E 00	8.2032E-02	9.5984E 00	6.3481E-01	-2.5521E-02	
13	3.355E 03	1.1939E 01	1.0175E-01	1.1905E 01	1.0121E 00	-3.1655E-02	
14	1.234E 03	1.6583E 01	1.4133E-01	1.6536E 01	2.4951E 00	-4.3967E-02	
15	4.540E 02	3.4623E 01	2.9506E-01	3.4524E 01	6.4670E 00	-9.1794E-02	
16	8.719E 01	5.2610E 01	4.4835E-01	5.2460E 01	2.8172E 01	-1.3948E-01	
17	3.545E 01	2.5812E 01	2.1997E-01	2.5739E 01	3.7772E 01	-6.8432E-02	
18	1.304E 01	9.2477E 00	7.8810E-02	9.2214E 00	2.1809E-01	-2.4518E-02	
19	5.043E 00	2.1721E 01	1.8511E-01	2.1659E 01	2.1159E 02	-5.7589E-02	
20	1.445E 00	8.6745E 00	7.3925E-02	8.6498E 00	1.3019E 00	-2.2998E-02	
21	6.826E-01	9.1010E 00	7.7560E-02	9.0750E 00	1.7002E 00	-2.4129E-02	
22	2.511E-01	9.2484E 00	7.8816E-02	9.2221E 00	2.6637E 00	-2.4520E-02	
23	9.237E-02	9.3106E 00	7.9346E-02	9.2841E 00	4.5660E 00	-2.4685E-02	
24	2.530E-02	9.3284E 00	7.9498E-02	9.3019E 00	6.6519E 00	-2.4732E-02	
*4500	3.023E-01	9.2061E 00	7.8455E-02	9.1799E 00	2.8807E 00	-2.4408E-02	
*4000	2.718E-01	9.2061E 00	7.8455E-02	9.1799E 00	2.8807E 00	-2.4408E-02	
*3500	2.413E-01	9.2061E 00	7.8455E-02	9.1799E 00	2.8807E 00	-2.4408E-02	
*3000	2.109E-01	9.2061E 00	7.8455E-02	9.1799E 00	2.8807E 00	-2.4408E-02	
2500	1.804E-01	9.2280E 00	7.8649E-02	9.2025E 00	3.1103E 00	-2.4468E-02	
2000	1.499E-01	9.2528E 00	7.8854E-02	9.2265E 00	3.4083E 00	-2.4532E-02	
1500	1.194E-01	9.2750E 00	7.9043E-02	9.2486E 00	3.8151E 00	-2.4591E-02	
1000	8.897E-02	9.2953E 00	7.9216E-02	9.2689E 00	4.4173E 00	-2.4645E-02	
500	5.850E-02	9.3164E 00	7.9395E-02	9.2898E 00	5.4441E 00	-2.4700E-02	
68	3.216E-02	9.3145E 00	7.9379E-02	9.2880E 00	7.3293E 00	-2.4696E-02	

*Thermal cross sections taken from XDC 59-11-72.

NOTE: For a summary of the sources of data see APEX-704.

DESIGNATION	CODE NO.	DENSITY FACTOR
URANIUM 236	92.2360	3.91920E 02

LEVEL	ENERGY	NU SIGMA FISSION
1	1.000E 07	8.4267E 00
2	6.065E 06	3.8902E 00
3	3.679E 06	2.7206E 00
4	2.231E 06	2.2157E 00
5	1.353E 06	1.6020E 00
6	8.208E 05	4.1370E-01
7	4.979E 05	2.4092E-02
8	3.020E 05	0.
9	1.832E 05	0.
10	6.738E 04	0.
11	2.479E 04	0.
12	9.119E 03	0.
13	3.355E 03	0.
14	1.234E 03	0.
15	4.540E 02	0.
16	8.719E 01	0.
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

URANIUM 236

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	9.6707E 00	9.6436E 00	9.4006E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.5886E 00	5.1233E-01	0.	0.	21	24
22	21	22	22	22	24
4.8857E-01	8.4194E 00	3.4042E-01	1.6080E-06	22	25
23	21	23	22	23	23
0.	1.0623E 00	7.9497E 00	2.8961E-01	23	24
24	21	24	22	24	24
0.	3.5273E-05	2.5972E 00	5.6931E 00	24	25
25	21	25	22	25	23
0.	0.	1.9237E-01	2.5236E 00	25	24
				25	25

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	9.6342E 00	9.6072E 00	9.4082E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.5572E 00	5.4376E-01	0.	0.	21	24
22	21	22	22	22	24
4.3549E-01	8.4679E 00	3.4505E-01	0.	22	26
23	21	23	22	23	24
0.	9.8628E-01	8.0324E 00	2.8457E-01	23	26
24	21	24	22	24	24
0.	1.2342E-05	2.4641E 00	5.8598E 00	24	26
26	21	26	22	26	24
0.	0.	1.4815E-01	2.4180E 00	26	26

----- URANIUM 236 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	9.5978E 00	9.5709E 00	9.4178E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
8.5153E 00	5.8568E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 27
3.9055E-01	8.5165E 00	3.5282E-01	0.	0.
23 21	23 22	23 23	23 24	23 27
0.	9.0484E-01	8.1202E 00	2.7987E-01	5.7293E-03
24 21	24 22	24 23	24 24	24 27
0.	3.3990E-06	2.3199E 00	6.0418E 00	9.6666E-01
27 21	27 22	27 23	27 24	27 27
0.	0.	1.0851E-01	2.2985E 00	7.1907E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	9.5613E 00	9.5345E 00	9.4303E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
8.4579E 00	6.4302E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 28
3.1894E-01	8.5641E 00	3.6541E-01	0.	0.
23 21	23 22	23 23	23 24	23 28
0.	8.1677E-01	8.2138E 00	2.7584E-01	4.2503E-03
24 21	24 22	24 23	24 24	24 28
0.	0.	2.1623E 00	6.2414E 00	9.2399E-01
28 21	28 22	28 23	28 24	28 28
0.	0.	7.4190E-02	2.1625E 00	7.3246E 00

URANIUM 236

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	9.5247E 00	9.4980E 00	9.4470E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.3769E 00	7.2405E-01	0.	0.	0.	0.
22	21	22	22	22	23
2.5498E-01	8.6077E 00	3.8575E-01	0.	0.	0.
23	21	23	22	23	23
0.	7.2038E-01	8.3142E 00	2.7312E-01	2.9347E-01	0.
24	21	24	22	24	23
0.	0.	1.9881E 00	6.4647E 00	8.7569E-01	0.
29	21	29	22	29	23
0.	0.	4.5916E-02	2.0065E 00	7.4723E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	9.4881E 00	9.4615E 00	9.4708E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.2639E 00	8.3709E-01	0.	0.	0.	0.
22	21	22	22	22	23
1.8753E-01	8.6413E 00	4.1955E-01	0.	0.	0.
23	21	23	22	23	23
0.	6.1328E-01	8.4226E 00	2.7296E-01	1.8218E-03	0.
24	21	24	22	24	23
0.	0.	1.7927E 00	6.7257E 00	8.2096E-01	0.
30	21	30	22	30	23
0.	0.	2.4399E-02	1.8256E 00	7.6380E 00	0.

----- URANIUM 236 -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
1.5000E 03	9.4514E 00	9.4250E 00	9.5071E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
8.1960E 00	9.0501E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.1859E-01	8.6507E 00	4.7909E-01	0.	0.
23 21	23 22	23 23	23 24	23 31
0.	4.9191E-01	8.5484E 00	2.7823E-01	9.4870E-04
24 21	24 22	24 23	24 24	24 31
0.	0.	1.5693E 00	7.0002E 00	7.5893E-01
31 21	31 22	31 23	31 24	31 31
0.	0.	1.0062E-02	1.6131E 00	7.8282E 00

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
1.0000E 03	9.4147E 00	9.3883E 00	9.5694E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
8.5556E 00	5.4561E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
5.4431E-02	8.5988E 00	5.9521E-01	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	3.5120E-01	8.6625E 00	2.9660E-01	3.5580E-04
24 21	24 22	24 23	24 24	24 32
0.	0.	1.3077E 00	7.3422E 00	6.8937E-01
32 21	32 22	32 23	32 24	32 32
0.	0.	2.5592E-03	1.3576E 00	8.0545E 00

URANIUM 236.

THERMAL TRANSFER MATRICES.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	9.3780E 00	9.3517E 00	9.7010E 00	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.7895E 00	3.1148E-01	0.	0.	0.	0.
22	21	22	22	22	23
6.7507E-02	8.3676E 00	8.1336E-01	0.	0.	0.
23	21	23	22	23	23
0.	1.8642E-01	8.7682E 00	3.5589E-01	6.1188E-05	0.
24	21	24	22	24	23
0.	0.	9.7757E-01	7.7357E 00	6.1511E-01	0.
33	21	33	22	33	23
0.	0.	2.0648E-01	1.0365E 00	8.3413E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	9.3463E 00	9.3201E 00	1.0047E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	24
8.7978E 00	3.0316E-01	0.	0.	0.	0.
22	21	22	22	22	24
1.2369E-01	8.9032E 00	2.2148E-01	0.	0.	0.
23	21	23	22	23	24
0.	4.2006E-02	8.7077E 00	5.6092E-01	1.3854E-06	0.
24	21	24	22	24	24
0.	0.	5.9174E-01	8.1425E 00	5.6591E-01	0.
34	21	34	22	34	24
0.	0.	1.0057E-06	6.5667E-01	8.6896E 00	0.

URANIUM 236

TRANSFERS FROM GROUPS 1 THROUGH 10 TO GROUPS 1 THROUGH 16

N1 N2
SIGMA S0 (N1/N2)

J 1	1 2	1 3	J 4	1 5
1.4996E 00	7.6436E-02	7.0487E-02	3.0951E-01	5.4749E-01
J 6	1 7	1 8	1 9	1 10
5.3757E-01	3.6242E-01	1.9330E-01	1.1233E-01	3.3413E-02
1 11	1 12	1 13	1 14	1 15
5.0455E-03	7.1805E-04	9.5597E-05	1.3372E-05	1.9132E-06
1 16	2 1	2 2	2 3	2 4
1.3254E-07	0.	3.2428E 00	2.1532E-01	2.4525E-01
2 5	2 6	2 7	2 8	2 9
5.7585E-01	6.8292E-01	5.2002E-01	2.9942E-01	1.8340E-01
2 10	2 11	2 12	2 13	2 14
5.6678E-02	8.7290E-03	1.2516E-03	1.6712E-04	2.3399E-05
2 15	2 16	3 1	3 2	3 3
3.3492E-06	2.3206E-07	0.	0.	4.6885E 00
3 4	3 5	3 6	3 7	3 8
1.7231E-01	3.7075E-01	5.9475E-01	5.4995E-01	3.5771E-01
3 9	3 10	3 11	3 12	3 13
2.3830E-01	7.8238E-02	1.2432E-02	1.8037E-03	2.4197E-04
3 14	3 15	3 16	4 1	4 2
3.3933E-05	4.8601E-06	3.3683E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	4.4654E 00	3.7328E-01	4.2103E-01	4.9595E-01
4 8	4 9	4 10	4 11	4 12
3.7612E-01	2.7877E-01	9.8828E-01	1.6340E-02	2.4068E-03
4 13	4 14	4 15	4 16	5 1
3.2482E-04	4.5643E-05	6.5425E-06	4.5357E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	4.2892E 00	5.0135E-01
5 7	5 8	5 9	5 10	5 11
3.7135E-01	3.4268E-01	2.9159E-01	1.1416E-01	1.9873E-02
5 12	5 13	5 14	5 15	5 16
2.9853E-03	4.0605E-04	5.7208E-05	8.2088E-06	5.6933E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
5.6699E 00	3.4931E-01	2.9025E-01	2.9318E-01	1.2975E-01
6 11	6 12	6 13	6 14	6 15
2.4076E-02	3.7063E-03	5.0905E-04	7.1953E-05	1.0338E-05
6 16	7 1	7 2	7 3	7 4
7.1740E-07	0.	0.	0.	0.

URANIUM 236

N1		N2		SIGMA S0 (N1/N2)	
7	5	7	6	7	7
0.		0.		7.2739E-00	3.5516E-01
7	10	7	11	7	12
1.1406E-01		2.2964E-02		3.6482E-03	5.0738E-04
7	15	7	16	8	1
1.0366E-05		7.1979E-07		0.	0.
8	4	8	5	8	6
0.		0.		0.	0.
8	9	8	10	8	11
4.9627E-01		8.6991E-02		1.9400E-02	3.2071E-03
8	14	8	15	8	16
6.4678E-05		9.3292E-06		6.4835E-07	0.
9	3	9	4	9	5
0.		0.		0.	0.
9	8	9	9	9	10
0.		8.8419E-00		3.2464E-01	1.3633E-02
9	13	9	14	9	15
3.4896E-04		5.0248E-05		7.2738E-06	5.0622E-07
10	2	10	3	10	4
0.		0.		0.	0.
10	7	10	8	10	9
0.		0.		0.	9.2601E-00
10	12	10	13	10	14
1.4277E-03		2.1800E-04		3.1945E-05	4.6572E-06
					3.2052E-07

URANIUM 236

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
3.8400E 02	7.0377E-01	7.8560E 02	1.1842E-02	0.
3.0700E 02	1.0377E 00	1.2755E 03	1.7961E-02	0.
2.8000E 02	1.1827E 00	1.6343E 03	2.4887E-02	0.
2.1600E 02	1.8817E 00	2.3738E 03	2.6890E-02	0.
1.9700E 02	2.3555E 00	2.4017E 03	1.9260E-02	0.
1.3300E 02	9.9443E-01	2.4764E 03	1.7017E-01	0.
1.2600E 02	1.6290E 00	3.5317E 03	1.3613E-01	0.
1.2100E 02	5.2805E 00	4.9605E 03	2.6616E-02	0.
8.7000E 01	9.5253E 00	7.2269E 03	2.4147E-02	0.
7.2000E 01	1.3376E 01	8.8858E 03	2.2368E-02	0.
4.4500E 01	2.3910E 01	1.4112E 04	2.8567E-02	0.
3.4600E 01	8.2209E 00	5.7305E 03	5.1250E-02	0.
3.0200E 01	2.6585E 00	1.7267E 03	5.0982E-02	0.
5.4900E 00	2.3193E 02	2.6319E 04	8.5597E-03	0.

DATE 12/08/60

DESIGNATION

CODE NO.

DENSITY FACTOR

CARBON

6.1200

1.99230E 01

LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1
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1	1.000E 07	1.3220E 00	3.6628E-01	9.2932E-01	1.8216E-07	-3.2874E-01
2	6.065E 06	1.1532E 00	3.5577E-01	8.9405E-01	2.2016E-07	-2.1695E-01
3	3.679E 06	1.9555E 00	3.2082E-01	1.8901E 00	2.8269E-07	-5.4756E-02
4	2.231E 06	1.8244E 00	2.7711E-01	1.6129E 00	3.6298E-07	-1.7710E-01
5	1.353E 06	2.2155E 00	3.4738E-01	2.0647E 00	4.6611E-07	-1.2624E-01

6	8.208E 05	2.8343E 00	4.5042E-01	2.6756E 00	5.9863E-07	-1.3288E-01
7	4.979E 05	3.4058E 00	5.4119E-01	3.2151E 00	7.6904E-07	-1.5967E-01
8	3.020E 05	3.9179E 00	6.2255E-01	3.6985E 00	9.8949E-07	-1.8367E-01
9	1.832E 05	4.2946E 00	6.8241E-01	4.0541E 00	1.3605E-06	-2.0133E-01
10	6.738E 04	4.5240E 00	7.1887E-01	4.2707E 00	2.1132E-06	-2.1209E-01

11	2.479E 04	4.6634E 00	7.4101E-01	4.4023E 00	7.0539E-06	-2.1862E-01
12	9.119E 03	4.7070E 00	7.4794E-01	4.4434E 00	7.3354E-05	-2.2067E-01
13	3.355E 03	4.7159E 00	7.4936E-01	4.4518E 00	1.6214E-04	-2.2109E-01
14	1.234E 03	4.7249E 00	7.5078E-01	4.4603E 00	2.5084E-04	-2.2151E-01
15	4.540E 02	4.7352E 00	7.5242E-01	4.4700E 00	3.5353E-04	-2.2199E-01

16	8.719E 01	4.7468E 00	7.5427E-01	4.4810E 00	4.6866E-04	-2.2253E-01
17	3.545E 01	4.7567E 00	7.5584E-01	4.4903E 00	5.6707E-04	-2.2300E-01
18	1.304E 01	4.7653E 00	7.5720E-01	4.4984E 00	6.5217E-04	-2.2340E-01
19	5.043E 00	4.7745E 00	7.5867E-01	4.5071E 00	7.4402E-04	-2.2383E-01
20	1.445E 00	4.7839E 00	7.6015E-01	4.5160E 00	8.3674E-04	-2.2427E-01

21	6.826E-01	4.7922E 00	7.6148E-01	4.5238E 00	9.1976E-04	-2.2466E-01
22	2.511E-01	4.8099E 00	7.6429E-01	4.5405E 00	1.1300E-03	-2.2549E-01
23	9.237E-02	4.8293E 00	7.6737E-01	4.5588E 00	1.8814E-03	-2.2640E-01
24	2.530E-02	4.6829E 00	7.4412E-01	4.4207E 00	2.7266E-03	-2.1954E-01

*4500	3.023E-01	4.7956E 00	7.6202E-01	4.5270E 00	1.1100E-03	-2.2482E-01
*4000	2.718E-01	4.7956E 00	7.6202E-01	4.5270E 00	1.1100E-03	-2.2482E-01
*3500	2.413E-01	4.7956E 00	7.6202E-01	4.5270E 00	1.1100E-03	-2.2482E-01
*3000	2.109E-01	4.7956E 00	7.6202E-01	4.5270E 00	1.1100E-03	-2.2482E-01
2500	1.804E-01	4.7916E 00	7.6139E-01	4.5233E 00	1.2000E-03	-2.2463E-01

2000	1.499E-01	4.7856E 00	7.6043E-01	4.5176E 00	1.3100E-03	-2.2435E-01
1500	1.194E-01	4.7762E 00	7.5894E-01	4.5087E 00	1.4700E-03	-2.2391E-01
1000	8.897E-02	4.7608E 00	7.5649E-01	4.4942E 00	1.7100E-03	-2.2319E-01
500	5.850E-02	4.7332E 00	7.5211E-01	4.4681E 00	2.1000E-03	-2.2190E-01
68	3.216E-02	4.6770E 00	7.4318E-01	4.4151E 00	2.8400E-03	-2.1926E-01

*Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

CARBON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	7.9286E 00	7.4846E 00	4.5660E-03	0.

		N1	N2		
		SIGMA S (N1/N2)			
21 21	21 22	21 23	21 24	21 25	
3.7704E 00	9.7615E-01	4.3749E-02	1.4954E-03	4.4205E-04	
22 21	22 22	22 23	22 24	22 25	
1.0113E 00	3.1152E 00	6.2999E-01	3.8294E-02	1.5053E-02	
23 21	23 22	23 23	23 24	23 25	
1.4728E-01	2.0547E 00	2.1424E 00	3.3132E-01	1.5357E-01	
24 21	24 22	24 23	24 24	24 25	
3.5289E-02	8.7969E-01	2.3359E 00	9.1109E-01	5.2086E-01	
25 21	25 22	25 23	25 24	25 25	
3.2747E-02	1.0872E 00	3.4048E 00	1.6377E 00	1.7661E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	7.6679E 00	7.2385E 00	4.5679E-03	0.

		N1	N2		
		SIGMA S (N1/N2)			
21 21	21 22	21 23	21 24	21 26	
3.7208E 00	1.0291E 00	4.0833E-02	1.2038E-03	3.2509E-04	
22 21	22 22	22 23	22 24	22 26	
9.0412E-01	3.2079E 00	6.4762E-01	3.6581E-02	1.3646E-02	
23 21	23 22	23 23	23 24	23 26	
1.0727E-01	1.9454E 00	2.2834E 00	3.4024E-01	1.5299E-01	
24 21	24 22	24 23	24 24	24 26	
2.1883E-02	7.6493E-01	2.3713E 00	9.7424E-01	5.5053E-01	
26 21	26 22	26 23	26 24	26 26	
1.7986E-02	8.7008E-01	3.2523E 00	1.6791E 00	1.8484E 00	

CARBON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	7.3987E 00	6.9843E 00	4.5744E-03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.6569E 00	1.0965E 00	3.7650E-02	9.2420E-04	2.2319E-04	2.2319E-04
22	21	22	22	22	23
7.8799E-01	3.3052E 00	6.6990E-01	3.4670E-02	1.2127E-02	1.2127E-02
23	21	23	22	23	23
7.2994E-02	1.8179E 00	2.4362E 00	3.5038E-01	1.5180E-01	1.5180E-01
24	21	24	22	24	23
1.2145E-02	6.4257E-01	2.3968E 00	1.0477E 00	5.8374E-01	5.8374E-01
27	21	27	22	27	23
8.6240E-03	6.6258E-01	3.0625E 00	1.7214E 00	1.9436E 00	1.9436E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	7.1201E 00	6.7214E 00	4.5804E-03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.5727E 00	1.1846E 00	3.4111E-02	6.6292E-04	1.3897E-04	1.3897E-04
22	21	22	22	22	23
6.6247E-01	3.4051E 00	6.9925E-01	3.2531E-02	1.0498E-02	1.0498E-02
23	21	23	22	23	23
4.5174E-02	1.6686E 00	2.6034E 00	3.6225E-01	1.4984E-01	1.4984E-01
24	21	24	22	24	23
5.7634E-03	5.1469E-01	2.4068E 00	1.1345E 00	6.2115E-01	6.2115E-01
28	21	28	22	28	23
3.4162E-03	4.7125E-01	2.8267E 00	1.7635E 00	2.0553E 00	2.0553E 00

CARBON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	6.8314E 00	6.4488E 00	4.5886E-03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.4592E 00	1.3025E 00	3.0081E-02	4.2916E-04	7.4788E-05	
22	21	22	22	22	23
5.2762E-01	3.5027E 00	7.4001E-01	3.0125E-02	8.7614E-03	
23	21	23	22	23	23
2.4330E-02	1.4928E 00	2.7885E 00	3.7673E-01	1.4689E-01	
24	21	24	22	24	23
2.1691E-03	3.8493E-01	2.3930E 00	1.2392E 00	6.6362E-01	
29	21	29	22	29	23
1.0208E-03	3.0378E-01	2.5348E 00	1.8028E 00	2.1890E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	6.5316E 00	6.1658E 00	4.6001E-03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	23	21	24
3.3223E 00	1.4537E 00	2.5173E-02	2.3358E-04	3.1639E-05	
22	21	22	23	22	24
3.8494E-01	3.5903E 00	8.0035E-01	2.7379E-02	6.9247E-03	
23	21	23	23	23	24
1.0546E-02	1.2847E 00	2.9958E 00	3.9556E-01	1.4271E-01	
24	21	24	23	24	24
5.6592E-04	2.5914E-01	2.3420E 00	1.3690E 00	7.1224E-01	
30	21	30	23	30	24
1.9565E-04	1.6844E-01	2.1756E 00	1.8340E 00	2.3534E 00	

CARBON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	6.2198E 00	5.8715E 00	4.6177E-03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.2645E 00	1.4989E 00	1.7334E-02	8.4545E-05	7.9392E-06	
22	21	22	22	22	23
2.3974E-01	3.6438E 00	8.9713E-01	2.4128E-02	5.0024E-03	
23	21	23	22	23	23
3.1524E-03	1.0366E 00	3.2298E 00	4.2264E-01	1.3713E-01	
24	21	24	22	24	23
7.8355E-05	1.4628E-01	2.2320E 00	1.5361E 00	7.6851E-01	
31	21	31	22	31	23
1.7432E-05	7.2583E-02	1.7388E 00	1.8459E 00	2.5625E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	5.8953E 00	5.5651E 00	4.6480E-03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.8181E 00	9.6871E-01	5.4126E-03	8.8599E-06	4.5963E-07	
22	21	22	22	22	23
1.0690E-01	3.6109E 00	1.0690E 00	1.9951E-02	3.0339E-03	
23	21	23	22	23	23
4.5476E-04	7.3860E-01	3.4874E 00	4.6846E-01	1.3030E-01	
24	21	24	22	24	23
3.0937E-06	5.8919E-02	2.0256E 00	1.7636E 00	8.3481E-01	
32	21	32	22	32	23
3.4146E-07	1.9307E-02	1.2216E 00	1.8119E 00	2.8425E 00	

CARBON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	5.5580E 00	5.2467E 00	4.7119E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
3.9346E 00	8.5635E-01	1.2205E-03	2.0077E-07	0.
22 21	22 22	22 23	22 24	22 33
5.8131E-02	3.4050E 00	1.3327E 00	1.2911E-02	1.1101E-03
23 21	23 22	23 23	23 24	23 33
1.0783E-05	3.8498E-01	3.7498E 00	5.7069E-01	1.2377E-01
24 21	24 22	24 23	24 24	24 33
0.	1.0538E-02	1.6533E 00	2.1022E 00	9.1691E-01
33 21	33 22	33 23	33 24	33 33
0.	1.6125E-03	6.4707E-01	1.6594E 00	3.2499E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	5.2585E 00	4.9640E 00	4.8800E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
3.9402E 00	8.5302E-01	1.0957E-04	0.	0.
22 21	22 22	22 23	22 24	22 34
6.5119E-02	4.2271E 00	5.1656E-01	8.6974E-04	2.1219E-05
23 21	23 22	23 23	23 24	23 34
0.	8.1841E-02	3.7703E 00	8.5504E-01	1.2209E-01
24 21	24 22	24 23	24 24	24 34
0.	2.4978E-04	1.0766E 00	2.5812E 00	1.0249E 00
34 21	34 22	34 23	34 24	34 34
0.	7.5175E-06	1.8551E-01	1.2491E 00	3.8239E 00

CARBON

TRANSFERS FROM GROUPS 1 THROUGH 2 TO GROUPS 1 THROUGH 21

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
4.9077E-01	4.7117E-01	2.4315E-02	7.0569E-02	9.5640E-02	
1	6	1	7	1	8
7.9381E-02	4.8122E-02	2.4085E-02	1.3388E-02	3.9057E-03	
1	11	1	12	1	13
5.6540E-04	8.0822E-05	1.0733E-05	1.5006E-06	2.1452E-07	
1	16	1	17	1	18
0.	0.	0.	0.	0.	
1	21	2	1	2	2
0.	0.	6.7605E-01	2.9481E-01	3.0008E-02	
2	5	2	6	2	7
4.8882E-02	4.5732E-02	2.9890E-02	1.5674E-02	8.9974E-03	
2	10	2	11	2	12
2.6855E-03	3.9361E-04	5.6512E-05	7.5180E-06	1.0517E-06	
2	15	2	16	2	17
1.5039E-07	0.	0.	0.	0.	
2	20	2	21		
0.	0.				

CARBON

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

1	1	1	2	1	3	1	4	1	5
0.		0.		0.		0.		0.	
1	6	1	7	1	8	1	9	1	10
1.3479E-00		4.9893E-07		0.		1.7083E-07		0.	
1	11	2	1	2	2	2	3	2	4
1.4376E-09		0.		0.		0.		0.	
2	5	2	6	2	7	2	8	2	9
0.		8.3962E-01		4.7599E-07		0.		1.6297E-07	
2	10	2	11	3	1	3	2	3	3
0.		1.3715E-09		0.		0.		0.	
3	4	3	5	3	6	3	7	3	8
0.		0.		1.9489E-06		4.8296E-07		0.	
3	9	3	10	3	11	4	1	4	2
1.6536E-07		0.		1.3916E-09		0.		0.	
4	3	4	4	4	5	4	6	4	7
0.		0.		0.		2.0995E-06		5.2027E-07	
4	8	4	9	4	10	4	11	5	1
0.		1.7814E-07		0.		1.4991E-09		0.	
5	2	5	3	5	4	5	5	5	6
0.		0.		0.		0.		2.3820E-06	
5	7	5	8	5	9	5	10	5	11
5.9028E-07		0.		2.0211E-07		0.		1.7008E-09	
6	1	6	2	6	3	6	4	6	5
0.		0.		0.		0.		0.	
6	6	6	7	6	8	6	9	6	10
2.8141E-06		6.9736E-07		0.		2.3877E-07		0.	
6	11	7	1	7	2	7	3	7	4
2.0093E-09		0.		0.		0.		0.	
7	5	7	6	7	7	7	8	7	9
0.		3.4230E-06		8.4826E-07		0.		2.9044E-07	
7	10	7	11	8	1	8	2	8	3
0.		2.4441E-09		0.		0.		0.	
8	4	8	5	8	6	8	7	8	8
0.		0.		4.2469E-06		1.0524E-06		0.	
8	9	8	10	8	11	9	1	9	2
3.6034E-07		0.		3.0324E-09		0.		0.	
9	3	9	4	9	5	9	6	9	7
0.		0.		0.		5.6804E-06		1.4077E-06	
9	8	9	9	9	10	9	11	10	1
0.		4.8197E-07		0.		4.0559E-09		0.	

CARBON

N1 N2
SIGMA N,G (N1/N2)

19 3	19 4	19 5	19 6	19 7
0.	0.	0.	1.0311E-03	2.5552E-04
19 8	19 9	19 10	19 11	20 1
0.	8.7488E-05	0.	7.3623E-07	0.
20 2	20 3	20 4	20 5	20 6
0.	0.	0.	0.	1.7392E-03
20 7	20 8	20 9	20 10	20 11
4.3100E-04	0.	1.4757E-04	0.	1.2418E-06
21 1	21 2	21 3	21 4	21 5
0.	0.	0.	0.	0.
21 6	21 7	21 8	21 9	21 10
2.7725E-03	6.8707E-04	0.	2.3525E-04	0.
21 11	22 1	22 2	22 3	22 4
1.9796E-06	0.	0.	0.	0.
22 5	22 6	22 7	22 8	22 9
0.	4.4413E-03	1.1006E-03	0.	3.7683E-04
22 10	22 11	23 1	23 2	23 3
0.	3.1711E-06	0.	0.	0.
23 4	23 5	23 6	23 7	23 8
0.	0.	7.6225E-03	1.8889E-03	0.
23 9	23 10	23 11	24 1	24 2
6.4676E-04	0.	5.4426E-06	0.	0.
24 3	24 4	24 5	24 6	24 7
0.	0.	0.	1.1832E-02	2.9320E-03
24 8	24 9	24 10	24 11	25 1
0.	1.0039E-03	0.	8.4480E-06	0.
25 2	25 3	25 4	25 5	25 6
0.	0.	0.	0.	1.8597E-02
25 7	25 8	25 9	25 10	25 11
4.6085E-03	0.	1.5779E-03	0.	1.3278E-05
26 1	26 2	26 3	26 4	26 5
0.	0.	0.	0.	0.
26 6	26 7	26 8	26 9	26 10
1.8612E-02	4.6121E-03	0.	1.5792E-03	0.
26 11	27 1	27 2	27 3	27 4
1.3289E-05	0.	0.	0.	0.
27 5	27 6	27 7	27 8	27 9
0.	1.8631E-02	4.6169E-03	0.	1.5808E-03
27 10	27 11	28 1	28 2	28 3
0.	1.3303E-05	0.	0.	0.

CARBON

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
0.	0.	1.8655E-02	4.6230E-03	0.
28 9	28 10	28 11	29 1	29 2
1.5828E-03	0.	1.3320E-05	0.	0.
29 3	29 4	29 5	29 6	29 7
0.	0.	0.	1.8688E-02	4.6312E-03
29 8	29 9	29 10	29 11	30 1
0.	1.5857E-03	0.	1.3344E-05	0.
30 2	30 3	30 4	30 5	30 6
0.	0.	0.	0.	1.8736E-02
30 7	30 8	30 9	30 10	30 11
4.6429E-03	0.	1.5897E-03	0.	1.3377E-05
31 1	31 2	31 3	31 4	31 5
0.	0.	0.	0.	0.
31 6	31 7	31 8	31 9	31 10
1.8807E-02	4.6606E-03	0.	1.5958E-03	0.
31 11	32 1	32 2	32 3	32 4
1.3429E-05	0.	0.	0.	0.
32 5	32 6	32 7	32 8	32 9
0.	1.8930E-02	4.6912E-03	0.	1.6062E-03
32 10	32 11	33 1	33 2	33 3
0.	1.3517E-05	0.	0.	0.
33 4	33 5	33 6	33 7	33 8
0.	0.	1.9191E-02	4.7557E-03	0.
33 9	33 10	33 11	34 1	34 2
1.6283E-03	0.	1.3702E-05	0.	0.
34 3	34 4	34 5	34 6	34 7
0.	0.	0.	1.9875E-02	4.9252E-03
34 8	34 9	34 10	34 11	
0.	1.6864E-03	0.	1.4191E-05	

DATE 12/08/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
H FREE		1.1000		1.67311E 00			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I
1	1.000E 07	1.0441E 00	1.0441E 00	3.4758E-01	1.7787E-05	-4.6435E-01	
2	6.065E 06	1.4139E 00	1.4139E 00	4.7069E-01	2.1498E-05	-6.2881E-01	
3	3.679E 06	1.9996E 00	1.9996E 00	6.6566E-01	2.7604E-05	-8.8928E-01	
4	2.231E 06	2.7149E 00	2.7149E 00	9.0379E-01	3.5444E-05	-1.2074E 00	
5	1.353E 06	3.5490E 00	3.5490E 00	1.1815E 00	4.5515E-05	-1.5784E 00	
6	8.208E 05	4.7487E 00	4.7487E 00	1.5808E 00	5.8438E-05	-2.1119E 00	
7	4.979E 05	6.1832E 00	6.1832E 00	2.0584E 00	7.5036E-05	-2.7499E 00	
8	3.020E 05	7.9209E 00	7.9209E 00	2.6369E 00	9.6351E-05	-3.5227E 00	
9	1.832E 05	1.0499E 01	1.0499E 01	3.4951E 00	1.3248E-04	-4.6692E 00	
10	6.738E 04	1.4229E 01	1.4229E 01	4.7367E 00	2.0587E-04	-6.3280E 00	
11	2.479E 04	1.7380E 01	1.7380E 01	5.7857E 00	3.3905E-04	-7.7293E 00	
12	9.119E 03	1.9114E 01	1.9114E 01	6.3632E 00	5.5893E-04	-8.5008E 00	
13	3.355E 03	1.9840E 01	1.9840E 01	6.6046E 00	9.2336E-04	-8.8233E 00	
14	1.234E 03	1.9998E 01	1.9998E 01	6.6575E 00	1.5221E-03	-8.8940E 00	
15	4.540E 02	1.9997E 01	1.9997E 01	6.6571E 00	2.7400E-03	-8.8934E 00	
16	8.719E 01	1.9995E 01	1.9995E 01	6.6563E 00	5.2417E-03	-8.8923E 00	
17	3.545E 01	1.9991E 01	1.9991E 01	6.6550E 00	9.0686E-03	-8.8906E 00	
18	1.304E 01	2.0001E 01	2.0001E 01	6.6582E 00	1.4671E-02	-8.8949E 00	
19	5.043E 00	2.0308E 01	2.0308E 01	6.7604E 00	2.4713E-02	-9.0314E 00	
20	1.445E 00	2.0769E 01	2.0767E 01	6.9157E 00	4.1619E-02	-9.2357E 00	
21	6.826E-01	2.0692E 01	1.9142E 01	8.0065E 00	6.6367E-02	-8.4573E 00	
22	2.511E-01	2.1369E 01	1.7529E 01	9.8471E 00	1.0649E-01	-7.6815E 00	
23	9.237E-02	2.3463E 01	1.4749E 01	1.3983E 01	1.8312E-01	-6.3203E 00	
24	2.530E-02	2.7344E 01	1.3134E 01	1.9156E 01	2.8414E-01	-5.4584E 00	
4500	3.023E-01	2.6640E 01	2.1060E 01	1.3080E 01	1.1430E-01	-9.0400E 00	
4000	2.718E-01	2.6640E 01	2.1060E 01	1.3080E 01	1.1430E-01	-9.0400E 00	
3500	2.413E-01	2.6640E 01	2.1060E 01	1.3080E 01	1.1430E-01	-9.0400E 00	
3000	2.109E-01	2.6640E 01	2.1060E 01	1.3080E 01	1.1430E-01	-9.0400E 00	
2500	1.804E-01	2.7690E 01	2.1220E 01	1.4040E 01	1.2360E-01	-9.1000E 00	
2000	1.499E-01	2.9040E 01	2.1420E 01	1.5300E 01	1.3560E-01	-9.1600E 00	
1500	1.194E-01	3.0870E 01	2.1630E 01	1.7040E 01	1.5190E-01	-9.2200E 00	
1000	8.897E-02	3.3480E 01	2.1830E 01	1.9620E 01	1.7600E-01	-9.2400E 00	
500	5.850E-02	3.7760E 01	2.1950E 01	2.3990E 01	2.1700E-01	-9.1800E 00	
68	3.216E-02	4.5240E 01	2.2040E 01	3.1720E 01	2.9270E-01	-9.0133E 00	

NOTE: For a summary of the sources of data see APEX-704.

H FREE

..THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
4.5000E 03	9.4141E 01	3.1380E 01	4.4585E-01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.2031E 01	7.4293E 00	2.1535E 00	3.1769E-01	1.9948E-01	
22	21	22	22	22	23
7.8584E 00	1.4199E 01	5.5611E 00	8.2040E-01	5.1513E-01	
23	21	23	22	23	23
7.9398E 00	1.7491E 01	1.3059E 01	2.4383E 00	1.5310E 00	
24	21	24	22	24	23
1.0467E 01	2.3059E 01	1.8968E 01	5.1685E 00	3.5042E 00	
25	21	25	22	25	23
1.5605E 01	3.4378E 01	2.8278E 01	8.1284E 00	7.7515E 00	

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
4.0000E 03	9.0071E 01	3.0024E 01	4.4622E-01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.1769E 01	7.5933E 00	2.2388E 00	3.3315E-01	2.0987E-01	
22	21	22	22	22	23
6.9108E 00	1.4266E 01	5.7814E 00	8.6032E-01	5.4197E-01	
23	21	23	22	23	23
6.5218E 00	1.6813E 01	1.3472E 01	2.5570E 00	1.6108E 00	
24	21	24	22	24	23
8.4466E 00	2.1775E 01	1.9335E 01	5.4126E 00	3.6868E 00	
26	21	26	22	26	23
1.2518E 01	3.2270E 01	2.8654E 01	8.4721E 00	8.1562E 00	

H. FREE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	8.5567E 01	2.8522E 01	4.4667E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
1.1452E 01	7.7619E 00	2.3345E 00	3.5109E-01	2.2208E-01
22 21	22 22	22 23	22 24	22 27
5.8956E 00	1.4280E 01	6.0287E 00	9.0666E-01	5.7350E-01
23 21	23 22	23 23	23 24	23 27
5.0951E 00	1.5919E 01	1.3914E 01	2.6947E 00	1.7045E 00
24 21	24 22	24 23	24 24	24 27
6.4517E 00	2.0158E 01	1.9672E 01	5.6943E 00	3.9013E 00
27 21	27 22	27 23	27 24	27 27
9.4899E 00	2.9650E 01	2.8935E 01	8.8602E 00	8.6317E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	8.0606E 01	2.6869E 01	4.4726E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
1.1074E 01	7.9326E 00	2.4428E 00	3.7226E-01	2.3670E-01
22 21	22 22	22 23	22 24	22 28
4.8283E 00	1.4218E 01	6.3082E 00	9.6132E-01	6.1126E-01
23 21	23 22	23 23	23 24	23 28
3.7099E 00	1.4750E 01	1.4381E 01	2.8571E 00	1.8167E 00
24 21	24 22	24 23	24 24	24 28
4.5606E 00	1.8133E 01	1.9941E 01	6.0243E 00	4.1581E 00
28 21	28 22	28 23	28 24	28 28
6.6432E 00	2.6412E 01	2.9047E 01	9.3016E 00	9.2012E 00

H FREE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	7.5159E 01	2.5053E 01	4.4806E-01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.0629E 01	8.1013E 00	2.5660E 00	3.9773E-01	2.5465E-01	
22	21	22	22	22	23
3.7372E 00	1.4043E 01	6.6264E 00	1.0271E 00	6.5760E-01	
23	21	23	22	23	23
2.4359E 00	1.3232E 01	1.4863E 01	3.0526E 00	1.9544E 00	
24	21	24	22	24	23
2.8754E 00	1.5619E 01	2.0079E 01	6.4175E 00	4.4733E 00	
29	21	29	22	29	23
4.1335E 00	2.2454E 01	2.8865E 01	9.8061E 00	9.9006E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	6.9184E 01	2.3061E 01	4.4919E-01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.0111E 01	8.2614E 00	2.7071E 00	4.2916E-01	2.7740E-01	
22	21	22	22	22	23
2.6682E 00	1.3706E 01	6.9907E 00	1.1083E 00	7.1636E-01	
23	21	23	22	23	23
1.3608E 00	1.1283E 01	1.5333E 01	3.2938E 00	2.1291E 00	
24	21	24	22	24	23
1.5143E 00	1.2555E 01	1.9964E 01	6.8958E 00	4.8730E 00	
30	21	30	22	30	23
2.1364E 00	1.7713E 01	2.8165E 01	1.0382E 01	1.0788E 01	

H FREE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	6.2596E 01	2.0865E 01	4.5091E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
9.5235E 00	8.4024E 00	2.8686E 00	4.6921E-01	3.0757E-01
22 21	22 22	22 23	22 24	22 31
1.6886E 00	1.3134E 01	7.4078E 00	1.2117E 00	7.9427E-01
23 21	23 22	23 23	23 24	23 31
5.7726E-01	8.8352E 00	1.5722E 01	3.6013E 00	2.3606E 00
24 21	24 22	24 23	24 24	24 31
5.8507E-01	8.9547E 00	1.9356E 01	7.4920E 00	5.4030E 00
31 21	31 22	31 23	31 24	31 31
8.0188E-01	1.2273E 01	2.6528E 01	1.1027E 01	1.1965E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	5.5222E 01	1.8407E 01	4.5386E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
8.8715E 00	8.5099E 00	3.0505E 00	5.2243E-01	3.5030E-01
22 21	22 22	22 23	22 24	22 32
8.8420E-01	1.2234E 01	7.8775E 00	1.3491E 00	9.0461E-01
23 21	23 22	23 23	23 24	23 32
1.4315E-01	5.9154E 00	1.5861E 01	4.0097E 00	2.6886E 00
24 21	24 22	24 23	24 24	24 32
1.2246E-01	5.0602E 00	1.7761E 01	8.2533E 00	6.1536E 00
32 21	32 22	32 23	32 24	32 32
1.5961E-01	6.5957E 00	2.3150E 01	1.1682E 01	1.3634E 01

H FREE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	4.6729E 01	1.5576E 01	4.6010E-01	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
8.1681E 00	8.5692E 00	3.2409E 00	5.9676E-01	4.1756E-01
22 21	22 22	22 23	22 24	22 33
3.3797E-01	1.0918E 01	8.3693E 00	1.5411E 00	1.0783E 00
23 21	23 22	23 23	23 24	23 33
9.5650E-03	2.8385E 00	1.5310E 01	4.5802E 00	3.2048E 00
24 21	24 22	24 23	24 24	24 33
5.5123E-03	1.6358E 00	1.4132E 01	9.2248E 00	7.3352E 00
33 21	33 22	33 23	33 24	33 33
6.4473E-03	1.9133E 00	1.6529E 01	1.2016E 01	1.6265E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	3.8008E 01	1.2669E 01	4.7651E-01	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
7.5290E 00	8.5824E 00	3.3735E 00	6.8551E-01	5.2200E-01
22 21	22 22	22 23	22 24	22 34
9.2745E-02	9.4466E 00	8.7117E 00	1.7702E 00	1.3480E 00
23 21	23 22	23 23	23 24	23 34
2.4200E-05	7.6374E-01	1.3432E 01	5.2613E 00	4.0061E 00
24 21	24 22	24 23	24 24	24 34
4.1916E-06	1.3229E-01	7.9731E 00	1.0069E 01	9.1698E 00
34 21	34 22	34 23	34 24	34 34
3.6696E-06	1.1581E-01	6.9801E 00	1.0572E 01	2.0340E 01

H FREE

TRANSFERS FROM GROUPS 1 THROUGH 20 TO GROUPS 1 THROUGH 25

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.2246E-01	3.2329E-01	1.9609E-01	1.1893E-01	7.2136E-02
1 6	1 7	1 8	1 9	1 10
4.3753E-02	2.6537E-02	1.6096E-02	1.3091E-02	7.4085E-03
1 11	1 12	1 13	1 14	1 15
2.7254E-03	1.0026E-03	3.6885E-04	1.3569E-04	5.7979E-05
1 16	1 17	1 18	1 19	1 20
1.5125E-05	3.5970E-06	1.4128E-06	5.7080E-07	1.8003E-07
1 21	1 22	1 23	1 24	1 25
6.1098E-08	2.7609E-08	1.0967E-08	0.	0.
2 1	2 2	2 3	2 4	2 5
0.	3.0125E-01	4.3780E-01	2.6554E-01	1.6106E-01
2 6	2 7	2 8	2 9	2 10
9.7686E-02	5.9250E-02	3.5937E-02	2.9229E-02	1.6541E-02
2 11	2 12	2 13	2 14	2 15
6.0851E-03	2.2386E-03	8.2352E-04	3.0296E-04	1.2945E-04
2 16	2 17	2 18	2 19	2 20
3.3769E-05	8.0309E-06	3.1542E-06	1.2744E-06	4.0196E-07
2 21	2 22	2 23	2 24	2 25
1.3641E-07	6.1642E-08	2.4487E-08	0.	0.
3 1	3 2	3 3	3 4	3 5
0.	0.	4.2603E-01	6.1914E-01	3.7553E-01
3 6	3 7	3 8	3 9	3 10
2.2777E-01	1.3815E-01	8.3792E-02	6.8152E-02	3.8568E-02
3 11	3 12	3 13	3 14	3 15
1.4188E-02	5.2196E-03	1.9202E-03	7.0639E-04	3.0183E-04
3 16	3 17	3 18	3 19	3 20
7.8738E-05	1.8725E-05	7.3546E-06	2.9715E-06	9.3723E-07
3 21	3 22	3 23	3 24	3 25
3.1807E-07	1.4373E-07	5.7095E-08	1.2656E-08	1.3896E-08
4 1	4 2	4 3	4 4	4 5
0.	0.	0.	5.7844E-01	8.4063E-01
4 6	4 7	4 8	4 9	4 10
5.0987E-01	3.0925E-01	1.8757E-01	1.5256E-01	8.6334E-02
4 11	4 12	4 13	4 14	4 15
3.1761E-02	1.1684E-02	4.2983E-03	1.5813E-03	6.7565E-04
4 16	4 17	4 18	4 19	4 20
1.7626E-04	4.1917E-05	1.6463E-05	6.6518E-06	2.0980E-06
4 21	4 22	4 23	4 24	4 25
7.1200E-07	3.2174E-07	1.2781E-07	2.8330E-08	3.1106E-08

H FREE

N1 N2
SIGMA S0 (N1/N2)

9 1	9 2	9 3	9 4	9 5
0.	0.	0.	0.	0.
9 6	9 7	9 8	9 9	9 10
0.	0.	0.	3.1128E 00	4.6689E 00
9 11	9 12	9 13	9 14	9 15
1.7176E 00	6.3186E-01	2.3245E-01	8.5513E-02	3.6539E-02
9 16	9 17	9 18	9 19	9 20
9.5318E-03	2.2668E-03	8.9032E-04	3.5972E-04	1.1346E-04
9 21	9 22	9 23	9 24	9 25
3.8504E-05	1.7399E-05	6.9117E-06	1.5321E-06	1.6822E-06
10 1	10 2	10 3	10 4	10 5
0.	0.	0.	0.	0.
10 6	10 7	10 8	10 9	10 10
0.	0.	0.	0.	5.2344E 00
10 11	10 12	10 13	10 14	10 15
5.6854E 00	2.0916E 00	7.6944E-01	2.8306E-01	1.2095E-01
10 16	10 17	10 18	10 19	10 20
3.1552E-02	7.5035E-03	2.9471E-03	1.1907E-03	3.7556E-04
10 21	10 22	10 23	10 24	10 25
1.2745E-04	5.7594E-05	2.2879E-05	5.0714E-06	5.5683E-06
11 1	11 2	11 3	11 4	11 5
0.	0.	0.	0.	0.
11 6	11 7	11 8	11 9	11 10
0.	0.	0.	0.	0.
11 11	11 12	11 13	11 14	11 15
6.3936E 00	6.9445E 00	2.5547E 00	9.3984E-01	4.0158E-01
11 16	11 17	11 18	11 19	11 20
1.0476E-01	2.4914E-02	9.7852E-03	3.9535E-03	1.2470E-03
11 21	11 22	11 23	11 24	11 25
4.2318E-04	1.9123E-04	7.5963E-05	1.6838E-05	1.8488E-05
12 1	12 2	12 3	12 4	12 5
0.	0.	0.	0.	0.
12 6	12 7	12 8	12 9	12 10
0.	0.	0.	0.	0.
12 11	12 12	12 13	12 14	12 15
0.	7.0318E 00	7.6377E 00	2.8098E 00	1.2006E 00
12 16	12 17	12 18	12 19	12 20
3.1319E-01	7.4482E-02	2.9254E-02	1.1820E-02	3.7279E-03
12 21	12 22	12 23	12 24	12 25
1.2652E-03	5.7170E-04	2.2710E-04	5.0340E-05	5.5273E-05

H.FREE

N1		N2		SIGMA S0 (N1/N2)	
13	1	13	2	13	3
0.		0.		0.	
13	6	13	7	13	8
0.		0.		0.	
13	11	13	12	13	13
0.		0.		7.2986E 00	
13	16	13	17	13	18
8.8363E-01		2.1014E-01		8.2536E-02	
13	21	13	22	13	23
3.5695E-03		1.6130E-03		6.4074E-04	
14	1	14	2	14	3
0.		0.		0.	
14	6	14	7	14	8
0.		0.		0.	
14	11	14	12	14	13
0.		0.		0.	
14	16	14	17	14	18
2.4212E 00		5.7580E-01		2.2615E-01	
14	21	14	22	14	23
9.7806E-03		4.4197E-03		1.7557E-03	
15	1	15	2	15	3
0.		0.		0.	
15	6	15	7	15	8
0.		0.		0.	
15	11	15	12	15	13
0.		0.		0.	
15	16	15	17	15	18
7.9844E 00		1.8988E 00		7.4579E-01	
15	21	15	22	15	23
3.2254E-02		1.4575E-02		5.7896E-03	
16	1	16	2	16	3
0.		0.		0.	
16	6	16	7	16	8
0.		0.		0.	
16	11	16	12	16	13
0.		0.		0.	
16	16	16	17	16	18
8.6947E 00		6.9299E 00		2.7218E 00	
16	21	16	22	16	23
1.1771E-01		5.3191E-02		2.1130E-02	
13	4	13	5	13	14
0.		0.		0.	
13	9	13	10	13	11
0.		0.		0.	
13	14	13	15	13	16
0.		0.		7.9274E 00	
13	19	13	20	13	21
3.3348E-02		1.0518E-02			
13	24	13	25	13	26
1.4203E-04		1.5595E-04			
14	4	14	5	14	6
0.		0.		0.	
14	9	14	10	14	11
0.		0.		0.	
14	14	14	15	14	16
0.		0.		7.3570E 00	
14	19	14	20	14	21
9.1374E-02		2.8820E-02			
14	24	14	25	14	26
3.8917E-04		4.2730E-04			
15	4	15	5	15	6
0.		0.		0.	
15	9	15	10	15	11
0.		0.		0.	
15	14	15	15	15	16
0.		0.		0.	
15	19	15	20	15	21
3.0132E-01		9.5039E-02			
15	24	15	25	15	26
1.2834E-03		1.4091E-03			
16	4	16	5	16	6
0.		0.		0.	
16	9	16	10	16	11
0.		0.		0.	
16	14	16	15	16	16
0.		0.		0.	
16	19	16	20	16	21
1.0997E 00		3.4685E-01			
16	24	16	25	16	26
4.6837E-03		5.1426E-03			

H FREE

N1 N2
SIGMA S0 (N1/N2)

17 1	17 2	17 3	17 4	17 5
0.	0.	0.	0.	0.
17 6	17 7	17 8	17 9	17 10
0.	0.	0.	0.	0.
17 11	17 12	17 13	17 14	17 15
0.	0.	0.	0.	0.
17 16	17 17	17 18	17 19	17 20
0.	7.0861E 00	8.0372E 00	3.2473E 00	1.0242E 00
17 21	17 22	17 23	17 24	17 25
3.4759E-01	1.5707E-01	6.2394E-02	1.3831E-02	1.5186E-02
18 1	18 2	18 3	18 4	18 5
0.	0.	0.	0.	0.
18 6	18 7	18 8	18 9	18 10
0.	0.	0.	0.	0.
18 11	18 12	18 13	18 14	18 15
0.	0.	0.	0.	0.
18 16	18 17	18 18	18 19	18 20
0.	0.	7.2247E 00	8.5232E 00	2.6882E 00
18 21	18 22	18 23	18 24	18 25
9.1232E-01	4.1226E-01	1.6376E-01	3.6301E-02	3.9858E-02
19 1	19 2	19 3	19 4	19 5
0.	0.	0.	0.	0.
19 6	19 7	19 8	19 9	19 10
0.	0.	0.	0.	0.
19 11	19 12	19 13	19 14	19 15
0.	0.	0.	0.	0.
19 16	19 17	19 18	19 19	19 20
0.	0.	0.	7.9914E 00	7.7853E 00
19 21	19 22	19 23	19 24	19 25
2.6421E 00	1.1939E 00	4.7427E-01	1.0513E-01	1.1543E-01
20 1	20 2	20 3	20 4	20 5
0.	0.	0.	0.	0.
20 6	20 7	20 8	20 9	20 10
0.	0.	0.	0.	0.
20 11	20 12	20 13	20 14	20 15
0.	0.	0.	0.	0.
20 16	20 17	20 18	20 19	20 20
0.	0.	0.	0.	7.6406E 00
20 21	20 22	20 23	20 24	20 25
7.6558E 00	3.4595E 00	1.3743E 00	3.0462E-01	3.3447E-01

H FREE

TRANSFERS FROM GROUPS 1 THROUGH 4 TO GROUPS 1 THROUGH 8

N1		N2		SIGMA N,G (N1/N2)	
1	1	1	2	1	3
0.		0.		0.	
1	6	1	7	1	8
0.		0.		1.2183E-04	
2	3	2	4	2	5
0.		0.		0.	
2	8	3	1	3	2
1.1371E-04		0.		0.	
3	5	3	6	3	7
0.		0.		0.	
4	2	4	3	4	4
0.		0.		1.1274E-04	
4	7	4	8	5	1
0.		1.1885E-04		0.	
5	4	5	5	5	6
0.		0.		0.	
6	1	6	2	6	3
0.		0.		0.	
6	6	6	7	6	8
0.		0.		1.5433E-04	
7	3	7	4	7	5
0.		0.		0.	
7	8	8	1	8	2
1.8592E-04		0.		0.	
8	5	8	6	8	7
0.		0.		0.	
9	2	9	3	9	4
0.		0.		2.2919E-04	
9	7	9	8	10	1
0.		3.0508E-04		0.	
10	4	10	5	10	6
0.		0.		0.	
11	1	11	2	11	3
0.		0.		0.	
11	6	11	7	11	8
0.		0.		7.5890E-04	
12	3	12	4	12	5
0.		0.		0.	
12	8	13	1	13	2
1.2467E-03		0.		0.	

H. FREE.

		N1		N2			
		SIGMA N,G (N1/N2)					
13	5	13	6	13	7	13	8
0.		0.		0.		2.0527E-03	0.
14	2	14	3	14	4	14	5
0.		0.		0.		0.	0.
14	7	14	8	15	1	15	2
0.		3.3826E-03		0.		0.	0.
15	4	15	5	15	6	15	7
0.		0.		0.		0.	0.
16	1	16	2	16	3	16	4
0.		0.		0.		0.	0.
16	6	16	7	16	8	17	1
0.		0.		1.1659E-02		0.	0.
17	3	17	4	17	5	17	6
0.		0.		0.		0.	0.
17	8	18	1	18	2	18	3
2.0183E-02		0.		0.		0.	0.
18	5	18	6	18	7	18	8
0.		0.		0.		3.2675E-02	0.
19	2	19	3	19	4	19	5
0.		0.		0.		0.	0.
19	7	19	8	20	1	20	2
0.		5.5039E-02		0.		0.	0.
20	4	20	5	20	6	20	7
0.		0.		0.		0.	0.
21	1	21	2	21	3	21	4
0.		0.		0.		0.	0.
21	6	21	7	21	8	22	1
0.		0.		1.4799E-01		0.	0.
22	3	22	4	22	5	22	6
0.		0.		0.		0.	0.
22	8	23	1	23	2	23	3
2.3707E-01		0.		0.		0.	0.
23	5	23	6	23	7	23	8
0.		0.		0.		4.0687E-01	0.
24	2	24	3	24	4	24	5
0.		0.		0.		0.	0.
24	7	24	8	25	1	25	2
0.		6.3156E-01		0.		0.	0.
25	4	25	5	25	6	25	7
0.		0.		0.		0.	0.
							9.9264E-01

H FREE

		N1		N2		SIGMA N,G (N1/N2)			
26	1	26	2	26	3	26	4	26	5
0.		0.		0.		0.		0.	
26	6	26	7	26	8	27	1	27	2
0.		0.		9.9346E-01		0.		0.	
27	3	27	4	27	5	27	6	27	7
0.		0.		0.		0.		0.	
27	8	28	1	28	2	28	3	28	4
9.9446E-01		0.		0.		0.		0.	
28	5	28	6	28	7	28	8	29	1
0.		0.		0.		9.9580E-01		0.	
29	2	29	3	29	4	29	5	29	6
0.		0.		0.		0.		0.	
29	7	29	8	30	1	30	2	30	3
0.		9.9756E-01		0.		0.		0.	
30	4	30	5	30	6	30	7	30	8
0.		0.		0.		0.		1.0001E 00	
31	1	31	2	31	3	31	4	31	5
0.		0.		0.		0.		0.	
31	6	31	7	31	8	32	1	32	2
0.		0.		1.0039E 00		0.		0.	
32	3	32	4	32	5	32	6	32	7
0.		0.		0.		0.		0.	
32	8	33	1	33	2	33	3	33	4
1.0105E 00		0.		0.		0.		0.	
33	5	33	6	33	7	33	8	34	1
0.		0.		0.		1.0244E 00		0.	
34	2	34	3	34	4	34	5	34	6
0.		0.		0.		0.		0.	
34	7	34	8						
0.		1.0609E 00							

DATE 12/08/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
BORON 10		5.1000		1.66249E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	1.4418E 00	9.6946E-01	8.9348E-01	1.3295E-02	-4.4194E-01	
2	6.065E 06	1.5061E 00	8.6203E-01	1.0003E 00	2.7842E-02	-4.0768E-01	
3	3.679E 06	1.7536E 00	7.0515E-01	1.0854E 00	1.1923E-01	-5.3861E-01	
4	2.231E 06	1.7641E 00	5.4703E-01	1.0968E 00	2.9118E-01	-5.3779E-01	
5	1.353E 06	2.0642E 00	4.4155E-01	1.2149E 00	2.1099E-01	-6.8453E-01	
6	8.208E 05	2.8525E 00	5.3596E-01	2.3583E 00	2.9473E-01	-3.9835E-01	
7	4.979E 05	3.8792E 00	6.5399E-01	3.4214E 00	5.9260E-01	-3.6900E-01	
8	3.020E 05	4.0036E 00	7.0303E-01	3.7549E 00	8.4595E-01	-2.0039E-01	
9	1.832E 05	3.4964E 00	6.1396E-01	3.2792E 00	1.4256E 00	-1.7500E-01	
10	6.738E 04	2.2623E 00	3.9726E-01	2.1218E 00	2.5507E 00	-1.1323E-01	
11	2.479E 04	1.6891E 00	2.9661E-01	1.5842E 00	4.1134E 00	-8.4547E-02	
12	9.119E 03	1.1708E 00	2.0559E-01	1.0981E 00	6.4281E 00	-5.8602E-02	
13	3.355E 03	1.4781E 00	2.5955E-01	1.3863E 00	1.0546E 01	-7.3982E-02	
14	1.234E 03	3.0324E 00	5.3249E-01	2.8441E 00	1.7407E 01	-1.5178E-01	
15	4.540E 02	4.0000E 00	7.0240E-01	3.7516E 00	3.1483E 01	-2.0021E-01	
16	8.719E 01	4.0000E 00	7.0240E-01	3.7516E 00	6.0278E 01	-2.0021E-01	
17	3.545E 01	4.0000E 00	7.0240E-01	3.7516E 00	1.0416E 02	-2.0021E-01	
18	1.304E 01	4.0000E 00	7.0240E-01	3.7516E 00	1.6855E 02	-2.0021E-01	
19	5.043E 00	4.0000E 00	7.0240E-01	3.7516E 00	2.8384E 02	-2.0021E-01	
20	1.445E 00	4.0000E 00	7.0240E-01	3.7516E 00	4.7818E 02	-2.0021E-01	
21	6.826E-01	4.0000E 00	7.0240E-01	3.7516E 00	7.6222E 02	-2.0021E-01	
22	2.511E-01	4.0000E 00	7.0240E-01	3.7516E 00	1.2231E 03	-2.0021E-01	
23	9.237E-02	4.0000E 00	7.0240E-01	3.7516E 00	2.1035E 03	-2.0021E-01	
24	2.530E-02	4.0000E 00	7.0429E-01	3.7509E 00	3.0711E 03	-2.0080E-01	
*4500	3.023E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.3889E 03	-2.1666E-01	
*4000	2.718E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.3889E 03	-2.1666E-01	
*3500	2.413E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.3889E 03	-2.1666E-01	
*3000	2.109E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.3889E 03	-2.1666E-01	
2500	1.804E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.5017E 03	-2.1666E-01	
2000	1.499E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.6472E 03	-2.1666E-01	
1500	1.194E-01	4.0000E 00	7.5520E-01	3.7312E 00	1.8455E 03	-2.1666E-01	
1000	8.897E-02	4.0000E 00	7.5520E-01	3.7312E 00	2.1383E 03	-2.1666E-01	
500	5.850E-02	4.0000E 00	7.5520E-01	3.7312E 00	2.6371E 03	-2.1666E-01	
68	3.216E-02	4.0000E 00	7.5520E-01	3.7312E 00	3.5564E 03	-2.1666E-01	

*Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

-----BORON 10-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	7.0242E 00	6.5522E 00	5.1206E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
3.0771E 00	8.6846E-01	5.1373E-02	2.2777E-03	7.8066E-04
22 21	22 22	22 23	22 24	22 25
9.0056E-01	2.4909E 00	5.5298E-01	3.8879E-02	1.6718E-02
23 21	23 22	23 23	23 24	23 25
1.5431E-01	1.6058E 00	1.8704E 00	2.5603E-01	1.2141E-01
24 21	24 22	24 23	24 24	24 25
5.3221E-02	8.8121E-01	1.9370E 00	7.1126E-01	4.1730E-01
25 21	25 22	25 23	25 24	25 25
5.8112E-02	1.2084E 00	3.0240E 00	1.3308E 00	1.4029E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	6.7782E 00	6.3227E 00	5.1248E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
3.0319E 00	9.1654E-01	4.8987E-02	1.9234E-03	6.1154E-04
22 21	22 22	22 23	22 24	22 26
8.0606E-01	2.5704E 00	5.7037E-01	3.7690E-02	1.5516E-02
23 21	23 22	23 23	23 24	23 26
1.1610E-01	1.5418E 00	1.9603E 00	2.5838E-01	1.2336E-01
24 21	24 22	24 23	24 24	24 26
3.4740E-02	7.7972E-01	1.9790E 00	7.6300E-01	4.4356E-01
26 21	26 22	26 23	26 24	26 26
3.4032E-02	9.9033E-01	2.9153E 00	1.3685E 00	1.4700E 00

BORON 10

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	6.5233E 00	6.0849E 00	5.1300E 03	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 27
2.9742E 00	9.7747E-01	4.6342E-02	1.5660E-03	4.5351E-04
22 21	22 22	22 23	22 24	22 27
7.0324E-01	2.6542E 00	5.9203E-01	3.6329E-02	1.4174E-02
23 21	23 22	23 23	23 24	23 27
9.0165E-02	1.6073E 00	1.8679E 00	2.9706E-01	1.3752E-01
24 21	24 22	24 23	24 24	24 27
2.0530E-02	6.6819E-01	2.0145E 00	8.2343E-01	4.7335E-01
27 21	27 22	27 23	27 24	27 27
1.7655E-02	7.7536E-01	2.7744E 00	1.4080E 00	1.5479E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	6.2587E 00	5.8381E 00	5.1368E 03	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 28
2.8986E 00	1.0565E 00	4.3333E-02	1.2100E-03	3.1114E-04
22 21	22 22	22 23	22 24	22 28
5.9167E-01	2.7408E 00	6.2011E-01	3.4774E-02	1.2679E-02
23 21	23 22	23 23	23 24	23 28
5.7642E-02	1.4805E 00	2.0158E 00	3.0859E-01	1.3743E-01
24 21	24 22	24 23	24 24	24 28
1.0546E-02	5.4786E-01	2.0390E 00	8.9515E-01	5.0745E-01
28 21	28 22	28 23	28 24	28 28
7.7207E-03	5.7004E-01	2.5927E 00	1.4486E 00	1.6396E 00

BORON 10

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	5.9834E 00	5.5813E 00	5.1459E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.7974E 00	1.1618E 00	3.9784E-02	8.6382E-04	1.9002E-04	
22	21	22	22	22	23
4.7144E-01	2.8261E 00	6.5845E-01	3.2996E-02	1.1017E-02	
23	21	23	22	23	23
3.2362E-02	1.3292E 00	2.1791E 00	3.2264E-01	1.3670E-01	
24	21	24	22	24	23
4.4031E-03	4.2143E-01	2.0452E 00	9.8204E-01	5.4689E-01	
29	21	29	22	29	23
2.6262E-03	3.8282E-01	2.3591E 00	1.4888E 00	1.7500E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	5.6961E 00	5.3133E 00	5.1589E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.6679E 00	1.2963E 00	3.5130E-02	5.3807E-04	9.5605E-05	
22	21	22	22	22	23
3.4396E-01	2.9017E 00	7.1425E-01	3.0939E-02	9.1740E-03	
23	21	23	22	23	23
1.4830E-02	1.1475E 00	2.3617E 00	3.4082E-01	1.3513E-01	
24	21	24	22	24	23
1.3250E-03	2.9401E-01	2.0213E 00	1.0902E 00	5.9310E-01	
30	21	30	22	30	23
6.0150E-04	2.2384E-01	2.0603E 00	1.5247E 00	1.8866E 00	

BORON 10

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	5.3956E 00	5.0330E 00	5.1787E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.6337E 00	1.3399E 00	2.6129E-02	2.3777E-04	3.0966E-05	
22	21	22	22	22	23
2.1409E-01	2.9479E 00	8.0243E-01	2.8472E-02	7.1259E-03	
23	21	23	22	23	23
4.8006E-03	9.2829E-01	2.5677E 00	3.6658E-01	1.3259E-01	
24	21	24	22	24	23
2.2638E-04	1.7421E-01	1.9474E 00	1.2300E 00	6.4816E-01	
31	21	31	22	31	23
6.9724E-05	1.0388E-01	1.6820E 00	1.5479E 00	2.0618E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	5.0808E 00	4.7394E 00	5.2126E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.0905E 00	9.0002E-01	9.3867E-03	3.4879E-05	2.7434E-06	
22	21	22	22	22	23
9.5289E-02	2.9175E 00	9.5713E-01	2.5186E-02	4.8379E-03	
23	21	23	22	23	23
7.8544E-04	6.6250E-01	2.7982E 00	4.0914E-01	1.2934E-01	
24	21	24	22	24	23
1.3843E-05	8.2918E-02	1.9616E 00	1.1704E 00	7.8505E-01	
32	21	32	22	32	23
2.1080E-06	3.1035E-02	1.2136E 00	1.5372E 00	2.2990E 00	

BORON 10

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	4.7510E 00	4.4317E 00	5.2843E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.1756E 00	8.2159E-01	2.8229E-03	1.6078E-06	0.	21 33
22	21	22	22	22	23
4.8076E-02	2.7384E 00	1.1928E 00	1.8501E-02	2.1885E-03	22 33
23	21	23	22	23	23
2.3652E-05	3.4530E-01	3.0262E 00	5.0116E-01	1.2734E-01	23 33
24	21	24	22	24	23
0.	1.5507E-02	1.4748E 00	1.7067E 00	8.0293E-01	24 33
33	21	33	22	33	23
0.	3.2313E-03	6.6690E-01	1.4317E 00	2.6491E 00	33 33

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	4.4558E 00	4.1564E 00	5.4726E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.1703E 00	8.2930E-01	4.2942E-04	0.	0.	21 34
22	21	22	22	22	23
5.0737E-02	3.4366E 00	5.1079E-01	1.7586E-03	7.0045E-05	22 34
23	21	23	22	23	23
0.	7.3129E-02	3.0432E 00	7.5087E-01	1.3282E-01	23 34
24	21	24	22	24	23
0.	5.1025E-04	1.0008E 00	2.0439E 00	9.5473E-01	24 34
34	21	34	22	34	23
0.	2.4610E-05	2.0281E-01	1.1016E 00	3.1513E 00	34 34

BORON 10

TRANSFERS FROM GROUPS 1 THROUGH 7 TO GROUPS 1 THROUGH 15

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
6.4009E-01	4.1716E-01	1.4452E-02	5.8408E-02	9.6989E-02
1 6	1 7	1 8	1 9	1 10
9.3810E-02	6.2010E-02	3.2744E-02	1.9025E-02	6.1225E-03
1 11	1 12	1 13	1 14	1 15
8.3001E-04	1.1916E-04	1.6317E-05	2.1746E-06	4.7663E-07
2 1	2 2	2 3	2 4	2 5
0.	9.0610E-01	2.3378E-01	3.6779E-02	8.0046E-02
2 6	2 7	2 8	2 9	2 10
9.3095E-02	6.9262E-02	3.9381E-02	2.4065E-02	8.0225E-03
2 11	2 12	2 13	2 14	2 15
1.1121E-03	1.6079E-04	2.2079E-05	2.9456E-06	6.4580E-07
3 1	3 2	3 3	3 4	3 5
0.	0.	1.0568E 00	4.0433E-01	5.1556E-02
3 6	3 7	3 8	3 9	3 10
8.0004E-02	7.1906E-02	4.6010E-02	3.0480E-02	1.0747E-02
3 11	3 12	3 13	3 14	3 15
1.5435E-03	2.2569E-04	3.1130E-05	4.1599E-06	9.1248E-07
4 1	4 2	4 3	4 4	4 5
0.	0.	0.	1.2313E 00	3.1790E-01
4 6	4 7	4 8	4 9	4 10
5.5461E-02	6.3029E-02	4.6775E-02	3.4328E-02	1.2993E-02
4 11	4 12	4 13	4 14	4 15
1.9519E-03	2.8954E-04	4.0165E-05	5.3785E-06	1.1805E-06
5 1	5 2	5 3	5 4	5 5
0.	0.	0.	0.	1.9340E 00
5 6	5 7	5 8	5 9	5 10
4.9639E-01	4.4652E-02	3.9764E-02	3.3177E-02	1.3722E-02
5 11	5 12	5 13	5 14	5 15
2.1822E-03	3.2967E-04	4.6065E-05	6.1852E-06	1.3586E-06
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
1.7325E 00	1.0215E 00	2.4031E-02	2.3517E-02	1.0834E-02
6 11	6 12	6 13	6 14	6 15
1.8459E-03	2.8511E-04	4.0192E-05	5.4140E-06	1.1904E-06
7 1	7 2	7 3	7 4	7 5
0.	0.	0.	0.	0.
7 6	7 7	7 8	7 9	7 10
0.	2.4408E 00	1.4179E 00	4.6454E-03	2.3790E-03
7 11	7 12	7 13	7 14	7 15
4.3379E-04	6.8479E-05	9.7379E-06	1.3159E-06	2.8962E-07

BORON 10

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

1 1	1 2	1 3	1 4	1 5
4.1520E-06	2.4274E-05	0.	8.7653E-05	0.
1 6	1 7	1 8	1 9	1 10
2.2681E-04	0.	0.	0.	5.0190E-02
1 11	2 1	2 2	2 3	2 4
1.7759E-04	4.3983E-06	2.5715E-05	0.	9.2854E-05
2 5	2 6	2 7	2 8	2 9
0.	2.4026E-04	0.	0.	0.
2 10	2 11	3 1	3 2	3 3
5.5811E-02	1.8813E-04	4.9212E-06	2.8771E-05	0.
3 4	3 5	3 6	3 7	3 8
1.0389E-04	0.	2.6882E-04	0.	0.
3 9	3 10	3 11	4 1	4 2
0.	4.3407E-02	2.1049E-04	5.7531E-06	3.3635E-05
4 3	4 4	4 5	4 6	4 7
0.	1.2145E-04	0.	3.1427E-04	0.
4 8	4 9	4 10	4 11	5 1
0.	0.	3.2215E-02	2.4607E-04	6.8465E-06
5 2	5 3	5 4	5 5	5 6
4.0612E-05	0.	1.4665E-04	0.	3.7946E-04
5 7	5 8	5 9	5 10	5 11
0.	0.	0.	1.8936E-03	2.9711E-04
6 1	6 2	6 3	6 4	6 5
8.5762E-06	5.0140E-05	0.	1.8105E-04	0.
6 6	6 7	6 8	6 9	6 10
4.6848E-04	0.	0.	0.	0.
6 11	7 1	7 2	7 3	7 4
3.6682E-04	1.0745E-05	6.2818E-05	0.	2.2683E-04
7 5	7 6	7 7	7 8	7 9
0.	5.8694E-04	0.	0.	0.
7 10	7 11	8 1	8 2	8 3
0.	4.5957E-04	1.3589E-05	7.9446E-05	0.
8 4	8 5	8 6	8 7	8 8
2.8687E-04	0.	7.4230E-04	0.	0.
8 9	8 10	8 11	9 1	9 2
0.	0.	5.8122E-04	1.8432E-05	1.0776E-04
9 3	9 4	9 5	9 6	9 7
0.	3.8913E-04	0.	1.0069E-03	0.
9 8	9 9	9 10	9 11	10 1
0.	0.	0.	7.8839E-04	2.8465E-05

BORON 10.

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
1.6642E-04	0.	6.0092E-04	0.	1.5549E-03	
10	7	10	8	10	9
0.	0.	0.	0.	1.2175E-03	
11	1	11	2	11	3
4.6767E-05	2.7342E-04	0.	9.8729E-04	0.	
11	6	11	7	11	8
2.5547E-03	0.	0.	0.	0.	
11	11	12	1	12	2
2.0003E-03	7.7005E-05	4.5020E-04	0.	1.6257E-03	
12	5	12	6	12	7
0.	4.2065E-03	0.	0.	0.	
12	10	12	11	13	1
0.	3.2937E-03	1.2690E-04	7.4191E-04	0.	
13	4	13	5	13	6
2.6790E-03	0.	6.9320E-03	0.	0.	
13	9	13	10	13	11
0.	0.	5.4277E-03	2.0918E-04	1.2230E-03	
14	3	14	4	14	5
0.	4.4160E-03	0.	1.1427E-02	0.	
14	8	14	9	14	10
0.	0.	0.	8.9471E-03	3.7699E-04	
15	2	15	3	15	4
2.2041E-03	0.	7.9587E-03	0.	2.0594E-02	
15	7	15	8	15	9
0.	0.	0.	0.	1.6125E-02	
16	1	16	2	16	3
7.2116E-04	4.2162E-03	0.	1.5224E-02	0.	
16	6	16	7	16	8
3.9394E-02	0.	0.	0.	0.	
16	11	17	1	17	2
3.0845E-02	1.2484E-03	7.2989E-03	0.	2.6356E-02	
17	5	17	6	17	7
0.	6.8197E-02	0.	0.	0.	
17	10	17	11	18	1
0.	5.3398E-02	2.0210E-03	1.1816E-02	0.	
18	4	18	5	18	6
4.2666E-02	0.	1.1040E-01	0.	0.	
18	9	18	10	18	11
0.	0.	8.6443E-02	3.4043E-03	1.9903E-02	

BORON 10

N1		N2		SIGMA N,G (N1/N2)	
19	3	19	4	19	5
0.		7.1869E-02		0.	
19	8	19	2	19	10
0.		0.		0.	
20	2	20	3	20	4
3.3572E-02		0.		1.2123E-01	
20	7	20	8	20	9
0.		0.		0.	
21	1	21	2	21	3
9.1541E-03		5.3519E-02		0.	
21	6	21	7	21	8
5.0005E-01		0.		0.	
21	11	22	1	22	2
3.9154E-01		1.4663E-02		8.5728E-02	
22	5	22	6	22	7
0.		8.0100E-01		0.	
22	10	22	11	23	1
0.		6.2718E-01		2.5167E-02	
23	4	23	5	23	6
5.3130E-01		0.		1.3748E 00	
23	9	23	10	23	11
0.		0.		1.0764E 00	
24	3	24	4	24	5
0.		8.2469E-01		0.	
24	8	24	9	24	10
0.		0.		0.	
25	2	25	3	25	4
3.5897E-01		0.		1.2962E 00	
25	7	25	8	25	9
0.		0.		0.	
26	1	26	2	26	3
6.1450E-02		3.5926E-01		0.	
26	6	26	7	26	8
3.3567E 00		0.		0.	
26	11	27	1	27	2
2.6283E 00		6.1512E-02		3.5963E-01	
27	5	27	6	27	7
0.		3.3601E 00		0.	
27	10	27	11	28	1
0.		2.6310E 00		6.1593E-02	
				28	2
				3.6010E-01	
				0.	

BORON 10

N1		N2	
SIGMA N,G (N1/N2)			
28 4	28 5	28 6	28 7
1.3003E 00	0.	3.3646E 00	0.
28 9	28 10	28 11	29 1
0.	0.	2.6345E 00	6.1703E-02
29 3	29 4	29 5	29 6
0.	1.3026E 00	0.	3.3706E 00
29 8	29 9	29 10	29 11
0.	0.	0.	2.6392E 00
30 2	30 3	30 4	30 5
3.6165E-01	0.	1.3059E 00	0.
30 7	30 8	30 9	30 10
0.	0.	0.	0.
31 1	31 2	31 3	31 4
6.2095E-02	3.6304E-01	0.	1.3109E 00
31 6	31 7	31 8	31 9
3.3920E 00	0.	0.	0.
31 11	32 1	32 2	32 3
2.6559E 00	6.2502E-02	3.6542E-01	0.
32 5	32 6	32 7	32 8
0.	3.4142E 00	0.	0.
32 10	32 11	33 1	33 2
0.	2.6733E 00	6.3362E-02	3.7044E-01
33 4	33 5	33 6	33 7
1.3376E 00	0.	3.4612E 00	0.
33 9	33 10	33 11	34 1
0.	0.	2.7101E 00	6.5620E-02
34 3	34 4	34 5	34 6
0.	1.3853E 00	0.	3.5846E 00
34 8	34 9	34 10	34 11
0.	0.	0.	2.8067E 00

DATE 12/08/60

DESIGNATION			CODE NO.			DENSITY FACTOR		
OXYGEN			8.1600			2.65640E 01		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I	
1	1.000E 07	9.2651E-01	4.3426E-01	7.0442E-01	2.5054E-01	-1.9475E-01		
2	6.065E 06	1.2480E 00	2.3928E-01	1.0226E 00	1.6399E-01	-1.9771E-01		
3	3.679E 06	2.1945E 00	2.3217E-01	1.7080E 00	2.6315E-02	-4.2661E-01		
4	2.231E 06	1.3575E 00	2.0891E-01	1.2630E 00	3.0000E-04	-8.2930E-02		
5	1.353E 06	2.7172E 00	4.1697E-01	2.6029E 00	4.0000E-04	-1.0023E-01		
6	8.208E 05	4.0768E 00	6.2474E-01	3.8266E 00	5.0000E-04	-2.1939E-01		
7	4.979E 05	6.6931E 00	8.1527E-01	5.1179E 00	6.0000E-04	-1.3813E 00		
8	3.020E 05	3.7219E 00	5.9109E-01	3.8984E 00	7.0000E-04	1.5473E-01		
9	1.832E 05	3.4271E 00	4.1471E-01	3.2870E 00	6.0307E-08	-1.2286E-01		
10	6.738E 04	3.4200E 00	4.1348E-01	3.2764E 00	1.2402E-07	-1.2596E-01		
11	2.479E 04	3.4386E 00	4.1573E-01	3.2942E 00	2.0425E-07	-1.2664E-01		
12	9.119E 03	3.6547E 00	4.4186E-01	3.5012E 00	3.3670E-07	-1.3460E-01		
13	3.355E 03	3.7837E 00	4.5745E-01	3.6248E 00	5.5624E-07	-1.3935E-01		
14	1.234E 03	3.8000E 00	4.5942E-01	3.6404E 00	9.1690E-07	-1.3995E-01		
15	4.540E 02	3.8000E 00	4.5942E-01	3.6404E 00	1.6506E-06	-1.3995E-01		
16	8.719E 01	3.8000E 00	4.5942E-01	3.6404E 00	3.1576E-06	-1.3995E-01		
17	3.545E 01	3.8000E 00	4.5942E-01	3.6404E 00	5.4630E-06	-1.3995E-01		
18	1.304E 01	3.8000E 00	4.5942E-01	3.6404E 00	8.8380E-06	-1.3995E-01		
19	5.043E 00	3.8000E 00	4.5942E-01	3.6404E 00	1.4887E-05	-1.3995E-01		
20	1.445E 00	3.8000E 00	4.5942E-01	3.6404E 00	2.5072E-05	-1.3995E-01		
21	6.826E-01	3.8000E 00	4.5942E-01	3.6404E 00	3.9980E-05	-1.3995E-01		
22	2.511E-01	3.7999E 00	4.5941E-01	3.6403E 00	6.4148E-05	-1.3995E-01		
23	9.237E-02	3.8683E 00	4.6768E-01	3.7058E 00	1.1031E-04	-1.4247E-01		
24	2.530E-02	4.0546E 00	4.9020E-01	3.8843E 00	1.6085E-04	-1.4933E-01		
*4500	3.023E-01	3.7624E 00	4.5487E-01	3.6044E 00	7.0000E-05	-1.3857E-01		
*4000	2.718E-01	3.7624E 00	4.5487E-01	3.6044E 00	7.0000E-05	-1.3857E-01		
*3500	2.413E-01	3.7624E 00	4.5487E-01	3.6044E 00	7.0000E-05	-1.3857E-01		
*3000	2.109E-01	3.7624E 00	4.5487E-01	3.6044E 00	7.0000E-05	-1.3857E-01		
2500	1.804E-01	3.7747E 00	4.5636E-01	3.6162E 00	7.0000E-05	-1.3902E-01		
2000	1.499E-01	3.7931E 00	4.5859E-01	3.6338E 00	8.0000E-05	-1.3970E-01		
1500	1.194E-01	3.8217E 00	4.6204E-01	3.6612E 00	9.0000E-05	-1.4075E-01		
1000	8.897E-02	3.8699E 00	4.6787E-01	3.7074E 00	1.1000E-04	-1.4253E-01		
500	5.850E-02	3.9634E 00	4.7918E-01	3.7969E 00	1.3000E-04	-1.4597E-01		
68	3.216E-02	4.1624E 00	5.0323E-01	3.9876E 00	1.8000E-04	-1.5330E-01		

*Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

OXYGEN

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	5.7349E 00	5.4940E 00	2.8705E-04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 25
3.0816E 00	6.9895E-01	1.8965E-02	3.9428E-04	8.7973E-05
22 21	22 22	22 23	22 24	22 25
7.1606E-01	2.7056E 00	4.5746E-01	2.1251E-02	7.0368E-03
23 21	23 22	23 23	23 24	23 25
6.3295E-02	1.5122E 00	2.2217E 00	2.6184E-01	1.0927E-01
24 21	24 22	24 23	24 24	24 25
1.2342E-02	6.7069E-01	2.5101E 00	1.0902E 00	5.9351E-01
25 21	25 22	25 23	25 24	25 25
6.1935E-03	5.0245E-01	2.3727E 00	1.3442E 00	1.5093E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	5.5676E 00	5.3338E 00	2.6881E-04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 26
3.0457E 00	7.3686E-01	1.7075E-02	2.9114E-04	5.7792E-05
22 21	22 22	22 23	22 24	22 26
6.3904E-01	2.7652E 00	4.6820E-01	1.9813E-02	6.1316E-03
23 21	23 22	23 23	23 24	23 26
4.4255E-02	1.4245E 00	2.2962E 00	2.6726E-01	1.0719E-01
24 21	24 22	24 23	24 24	24 26
6.8180E-03	5.5667E-01	2.4806E 00	1.1408E 00	6.1123E-01
26 21	26 22	26 23	26 24	26 26
3.0087E-03	3.8575E-01	2.2316E 00	1.3708E 00	1.5764E 00

OXYGEN

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	5.3957E 00	5.1691E 00	2.6908E-04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
2.9988E 00	7.8580E-01	1.5081E-02	2.0102E-04	3.4565E-05
22 21	22 22	22 23	22 24	22 27
5.5614E-01	2.8272E 00	4.8225E-01	1.8258E-02	5.2039E-03
23 21	23 22	23 23	23 24	23 27
2.8664E-02	1.3242E 00	2.3795E 00	2.7340E-01	1.0453E-01
24 21	24 22	24 23	24 24	24 27
3.2934E-03	4.4412E-01	2.4373E 00	1.1994E 00	6.3045E-01
27 21	27 22	27 23	27 24	27 27
1.2404E-03	2.7977E-01	2.0646E 00	1.3968E 00	1.6534E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	5.2189E 00	4.9997E 00	2.6944E-04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
2.9364E 00	8.5045E-01	1.2963E-02	1.2613E-04	1.8099E-05
22 21	22 22	22 23	22 24	22 28
4.6702E-01	2.8900E 00	5.0145E-01	1.6572E-02	4.2635E-03
23 21	23 22	23 23	23 24	23 28
1.6685E-02	1.2093E 00	2.4736E 00	2.8060E-01	1.0114E-01
24 21	24 22	24 23	24 24	24 28
1.3163E-03	3.3558E-01	2.3757E 00	1.2687E 00	6.5133E-01
28 21	28 22	28 23	28 24	28 28
4.0583E-04	1.8761E-01	1.8673E 00	1.4205E 00	1.7431E 00

OXYGEN

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	5.0368E 00	4.8252E 00	2.6991E-04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 29
2.8511E 00	9.3813E-01	1.0696E-02	6.8533E-05	7.7698E-06
22 21	22 22	22 23	22 24	22 29
3.7167E-01	2.9506E 00	5.2906E-01	1.4734E-02	3.3240E-03
23 21	23 22	23 23	23 24	23 29
8.3052E-03	1.0767E 00	2.5809E 00	2.8947E-01	9.6903E-02
24 21	24 22	24 23	24 24	24 29
3.9741E-04	2.3446E-01	2.2890E 00	1.3523E 00	6.7405E-01
29 21	29 22	29 23	29 24	29 29
9.4308E-05	1.1233E-01	1.6355E 00	1.4393E 00	1.8496E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	4.8491E 00	4.6455E 00	2.7059E-02	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 30
2.7389E 00	1.0528E 00	8.1999E-03	2.9323E-05	2.4101E-06
22 21	22 22	22 23	22 24	22 30
2.7107E-01	3.0020E 00	5.7125E-01	1.2704E-02	2.4048E-03
23 21	23 22	23 23	23 24	23 30
3.2374E-03	9.2266E-01	2.7045E 00	3.0131E-01	9.1670E-02
24 21	24 22	24 23	24 24	24 30
7.6998E-05	1.4525E-01	2.1673E 00	1.4561E 00	6.9872E-01
30 21	30 22	30 23	30 24	30 30
1.2768E-05	5.6502E-02	1.3654E 00	1.4483E 00	1.9789E 00

OXYGEN

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	4.6557E 00	4.4601E 00	2.7163E-04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.6967E 00	1.0982E 00	5.0217E-03	7.4879E-06	3.8435E-07	
22	21	22	22	22	23
1.6887E-01	3.0276E 00	6.4085E-01	1.0408E-02	1.5359E-03	
23	21	23	22	23	23
8.3077E-04	7.4194E-01	2.8472E 00	3.1905E-01	8.5361E-02	
24	21	24	22	24	23
6.9265E-06	7.3511E-02	1.9951E 00	1.5905E 00	7.2545E-01	
31	21	31	22	31	23
6.7888E-07	2.1194E-02	1.0555E 00	1.4376E 00	2.1413E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	4.4564E 00	4.2692E 00	2.7341E-04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.1152E 00	6.8345E-01	1.2821E-03	4.3850E-07	0.	
22	21	22	22	22	23
7.5386E-02	2.9874E 00	7.6775E-01	7.6922E-03	7.6954E-04	
23	21	23	22	23	23
9.3918E-05	5.2759E-01	3.0089E 00	3.5087E-01	7.8092E-02	
24	21	24	22	24	23
1.3626E-07	2.5228E-02	1.7474E 00	1.7745E 00	7.5432E-01	
32	21	32	22	32	23
0.	4.5206E-03	7.1115E-01	1.3856E 00	2.3551E 00	

OXYGEN

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	4.2515E 00	4.0730E 00	2.7717E-04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 33
3.2404E 00	5.5937E-01	1.6715E-04	0.	0.
22 21	22 22	22 23	22 24	22 33
4.7272E-02	2.8077E 00	9.6807E-01	4.0409E-03	1.9624E-04
23 21	23 22	23 23	23 24	23 33
1.3925E-06	2.7496E-01	3.1648E 00	4.2643E-01	7.0549E-02
24 21	24 22	24 23	24 24	24 33
0.	3.3975E-03	1.3783E 00	2.0501E 00	7.8669E-01
33 21	33 22	33 23	33 24	33 33
0.	2.4673E-04	3.5458E-01	1.2370E 00	2.6597E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	4.0717E 00	3.9007E 00	2.8705E-04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 34
3.2505E 00	5.4947E-01	5.8489E-06	0.	0.
22 21	22 22	22 23	22 24	22 34
5.7367E-02	3.4114E 00	3.4283E-01	1.6521E-04	1.6094E-06
23 21	23 22	23 23	23 24	23 34
0.	5.8661E-02	3.1410E 00	6.4733E-01	6.4620E-02
24 21	24 22	24 23	24 24	24 34
0.	4.4881E-05	8.7414E-01	2.4405E 00	8.3208E-01
34 21	34 22	34 23	34 24	34 34
0.	4.4133E-07	9.1517E-02	9.0171E-01	3.0784E 00

OXYGEN

TRANSFERS FROM GROUPS 1 THROUGH 2 TO GROUPS 1 THROUGH 15

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
4.7506E-01		1.7686E-01		1.3185E-01	
1	6	1	7	1	8
8.7891E-03		1.9074E-03		6.3759E-04	
1	11	1	12	1	13
0.		0.		0.	
2	1	2	2	2	3
0.		8.8982E-01		3.1852E-01	
2	6	2	7	2	8
1.7905E-02		9.3065E-03		3.9486E-03	
2	11	2	12	2	13
1.4535E-05		5.3473E-06		1.9672E-06	
1	4	1	5	1	10
8.8931E-02		4.2364E-02		0.	
1	9	1	14	1	15
1.1713E-04		0.		0.	
2	4	2	5	2	10
0.		7.1862E-03		2	10
2	9	2	10	2	15
1.2545E-03		8.3219E-05		2	15
2	14	2	15	2	15
7.2368E-07		1.8880E-07			

TRANSFERS FROM GROUPS 1 THROUGH 2 TO GROUPS 1 THROUGH 11

	N1	N2
SIGMA N,G	(N1/N2)	

0.	1	1	0.	1	2	7.9567E-02	1.9136E 00	0.	1	5	
0.	1	6	0.	1	7	0.	1	9	0.	1	10
0.	1	11	0.	2	1	0.	2	3	0.	2	4
0.	2	5	0.	2	6	0.	2	7	2.6230E-03	2.3933E-01	
0.	2	10	0.	2	11	0.	2	8	0.	2	9
0.			0.						0.		

DATE 12/08/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
ALUMINUM		13.2700		4.47823E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	1.5498E 00	1.6611E 00	1.0897E 00	1.4261E-01	-4.2618E-01	
2	6.065E 06	2.0550E 00	1.5337E 00	1.3808E 00	5.6933E-02	-6.2443E-01	
3	3.679E 06	2.4335E 00	1.0275E 00	1.7948E 00	1.0333E-02	-5.9162E-01	
4	2.231E 06	2.8664E 00	4.7472E-01	1.7925E 00	3.9555E-03	-9.9469E-01	
5	1.353E 06	3.1229E 00	2.5212E-01	1.9497E 00	3.9392E-03	-1.0866E 00	
6	8.208E 05	3.5846E 00	1.9387E-01	2.4666E 00	9.1684E-04	-1.0355E 00	
7	4.979E 05	3.9120E 00	2.2151E-01	2.9594E 00	9.9564E-04	-8.8236E-01	
8	3.020E 05	3.6077E 00	2.2151E-01	2.9589E 00	1.5481E-03	-6.0096E-01	
9	1.832E 05	7.3047E 00	4.9973E-01	6.6755E 00	3.1905E-03	-5.8284E-01	
10	6.738E 04	4.6342E 00	3.3818E-01	4.5172E 00	3.8965E-03	-1.0830E-01	
11	2.479E 04	5.9852E 00	4.3692E-01	5.8361E 00	5.5038E-03	-1.3804E-01	
12	9.119E 03	1.4250E 00	1.0402E-01	1.3895E 00	2.9998E-03	-3.2864E-02	
13	3.355E 03	1.4436E 00	1.0538E-01	1.4077E 00	3.6453E-03	-3.3295E-02	
14	1.234E 03	1.4056E 00	1.0261E-01	1.3706E 00	3.6500E-03	-3.2417E-02	
15	4.540E 02	1.4014E 00	1.0230E-01	1.3665E 00	3.6500E-03	-3.2320E-02	
16	8.719E 01	1.4024E 00	1.0237E-01	1.3675E 00	3.9380E-03	-3.2343E-02	
17	3.545E 01	1.4035E 00	1.0246E-01	1.3686E 00	6.4600E-03	-3.2370E-02	
18	1.304E 01	1.4019E 00	1.0234E-01	1.3670E 00	1.0336E-02	-3.2333E-02	
19	5.043E 00	1.4004E 00	1.0223E-01	1.3655E 00	1.7420E-02	-3.2297E-02	
20	1.445E 00	1.4336E 00	1.0465E-01	1.3979E 00	2.8859E-02	-3.3064E-02	
21	6.826E-01	1.4555E 00	1.0625E-01	1.4192E 00	4.6443E-02	-3.3568E-02	
22	2.511E-01	1.4822E 00	1.0820E-01	1.4453E 00	7.5450E-02	-3.4185E-02	
23	9.237E-02	1.4308E 00	1.0445E-01	1.3952E 00	1.2755E-01	-3.3000E-02	
24	2.530E-02	1.4062E 00	1.0266E-01	1.3712E 00	1.9767E-01	-3.2432E-02	
*4500	3.023E-01	1.4717E 00	1.0743E-01	1.4351E 00	7.9700E-02	-3.3942E-02	
*4000	2.718E-01	1.4717E 00	1.0743E-01	1.4351E 00	7.9700E-02	-3.3942E-02	
*3500	2.413E-01	1.4717E 00	1.0743E-01	1.4351E 00	7.9700E-02	-3.3942E-02	
*3000	2.109E-01	1.4717E 00	1.0743E-01	1.4351E 00	7.9700E-02	-3.3942E-02	
2500	1.804E-01	1.4735E 00	1.0757E-01	1.4368E 00	8.6100E-02	-3.3984E-02	
2000	1.499E-01	1.4758E 00	1.0773E-01	1.4391E 00	9.4500E-02	-3.4037E-02	
1500	1.194E-01	1.4784E 00	1.0792E-01	1.4416E 00	1.0590E-01	-3.4097E-02	
1000	8.897E-02	1.4815E 00	1.0815E-01	1.4446E 00	1.2260E-01	-3.4168E-02	
500	5.850E-02	1.4841E 00	1.0834E-01	1.4471E 00	1.5130E-01	-3.4228E-02	
68	3.216E-02	1.4753E 00	1.0770E-01	1.4386E 00	2.0400E-01	-3.4025E-02	

*Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

ALUMINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.6919E 00	1.6497E 00	3.2365E-01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.2385E 00	2.1530E-01	1.6991E-03	9.1346E-06	9.8260E-07	
22	21	22	22	22	23
2.2234E-01	1.1337E 00	1.4718E-01	3.5435E-03	7.6244E-04	
23	21	23	22	23	23
5.2680E-03	4.5932E-01	9.1232E-01	9.0626E-02	2.9157E-02	
24	21	24	22	24	23
2.4009E-04	9.8095E-02	8.1329E-01	4.4863E-01	2.1620E-01	
25	21	25	22	25	23
5.8232E-05	4.6292E-02	5.7656E-01	4.7659E-01	5.9235E-01	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.6545E 00	1.6133E 00	3.2365E-01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	23	21	24
1.2273E 00	2.2679E-01	1.3899E-03	5.3045E-06	4.7489E-07	
22	21	22	23	22	24
1.9798E-01	1.1540E 00	1.4956E-01	3.1214E-03	6.0612E-04	
23	21	23	23	23	24
3.3238E-03	4.2929E-01	9.3853E-01	9.1432E-02	2.7748E-02	
24	21	24	23	24	24
1.0288E-04	7.6724E-02	7.9418E-01	4.6834E-01	2.2010E-01	
26	21	26	23	26	24
2.0487E-05	3.2312E-02	5.2589E-01	4.8057E-01	6.1575E-01	

ALUMINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.6166E 00	1.5763E 00	3.2424E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
1.2125E 00	2.4185E-01	1.0929E-03	2.7204E-06	1.9431E-07
22 21	22 22	22 23	22 24	22 27
1.7199E-01	1.1748E 00	1.5301E-01	2.6885E-03	4.6106E-04
23 21	23 22	23 23	23 24	23 27
1.8996E-03	3.9606E-01	9.6748E-01	9.2355E-02	2.6156E-02
24 21	24 22	24 23	24 24	24 27
3.6260E-05	5.7018E-02	7.7024E-01	4.9109E-01	2.2402E-01
27 21	27 22	27 23	27 24	27 27
5.6640E-06	2.0906E-02	4.7010E-01	4.8329E-01	6.4226E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.5779E 00	1.5386E 00	3.2467E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
1.1927E 00	2.6201E-01	8.1289E-04	1.1688E-06	0.
22 21	22 22	22 23	22 24	22 28
1.4424E-01	1.1956E 00	1.5815E-01	2.2467E-03	3.3014E-04
23 21	23 22	23 23	23 24	23 28
9.4541E-04	3.5909E-01	9.9969E-01	9.3492E-02	2.4362E-02
24 21	24 22	24 23	24 24	24 28
9.6942E-06	3.9473E-02	7.4018E-01	5.1779E-01	2.2788E-01
28 21	28 22	28 23	28 24	28 28
1.1134E-06	1.2174E-02	4.0901E-01	4.8405E-01	6.7268E-01

ALUMINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.5389E 00	1.5005E 00	3.2525E-01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 29
1.1652E 00	2.8973E-01	5.5653E-04	3.8492E-07	0.
22 21	22 22	22 23	22 24	22 29
1.1471E-01	1.2155E 00	1.6604E-01	1.7978E-03	2.1675E-04
23 21	23 22	23 23	23 24	23 29
3.8404E-04	3.1764E-01	1.0358E 00	9.5036E-02	2.2350E-02
24 21	24 22	24 23	24 24	24 29
1.7196E-06	2.4651E-02	7.0227E-01	5.4980E-01	2.3155E-01
29 21	29 22	29 23	29 24	29 29
1.3184E-07	6.3405E-03	3.4268E-01	4.8170E-01	7.0814E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.4988E 00	1.4614E 00	3.2607E-01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 30
1.1285E 00	3.2667E-01	3.3116E-04	0.	0.
22 21	22 22	22 23	22 24	22 30
8.3698E-02	1.2321E 00	1.7869E-01	1.3464E-03	1.2444E-04
23 21	23 22	23 23	23 24	23 30
1.1350E-04	2.7068E-01	1.0766E 00	9.7404E-02	2.0107E-02
24 21	24 22	24 23	24 24	24 30
1.5925E-07	1.3122E-02	6.5408E-01	5.8920E-01	2.3478E-01
30 21	30 22	30 23	30 24	30 30
0.	2.4948E-03	2.7161E-01	4.7429E-01	7.5036E-01

ALUMINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.4582E 00	1.4219E 00	3.2732E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
1.1124E 00	3.4295E-01	1.4009E-04	0.	0.
22 21	22 22	22 23	22 24	22 31
5.2254E-02	1.2401E 00	2.0031E-01	9.0124E-04	5.6933E-05
23 21	23 22	23 23	23 24	23 31
1.9441E-05	2.1674E-01	1.1226E 00	1.0157E-01	1.7627E-02
24 21	24 22	24 23	24 24	24 31
0.	5.3310E-03	5.9205E-01	6.3953E-01	2.3718E-01
31 21	31 22	31 23	31 24	31 31
0.	6.5469E-04	1.9712E-01	4.5829E-01	8.0209E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.4172E 00	1.3819E 00	3.2946E-01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
1.2509E 00	2.0458E-01	1.9341E-05	0.	0.
22 21	22 22	22 23	22 24	22 32
2.3457E-02	1.2265E 00	2.4082E-01	4.8344E-04	1.6662E-05
23 21	23 22	23 23	23 24	23 32
1.1380E-06	1.5375E-01	1.1733E 00	1.1024E-01	1.4912E-02
24 21	24 22	24 23	24 24	24 32
0.	1.2854E-03	5.1035E-01	7.0725E-01	2.3812E-01
32 21	32 22	32 23	32 24	32 32
0.	7.8223E-05	1.2215E-01	4.2670E-01	8.6829E-01

ALUMINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.3764E 00	1.3421E 00	3.3399E-01	0.

		N1	N2		
SIGMA S (N1/N2)					
21	21	21	22	21	23
1.3051E 00		1.5042E-01		6.5422E-07	0.
22	21	22	22	22	23
1.7981E-02		1.1628E 00		3.0757E-01	1.3809E-04
23	21	23	22	23	23
0.		8.0236E-02		1.2207E 00	1.3297E-01
24	21	24	22	24	23
0.		8.8019E-05		3.9714E-01	8.0590E-01
33	21	33	22	33	23
0.		1.3694E-06		5.3246E-02	3.6355E-01
					9.5956E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.3421E 00	1.3087E 00	3.4590E-01	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
1.3112E 00	1.4432E-01	0.	0.	21	24
22	21	22	22	22	24
2.4712E-02	1.3694E 00	9.0788E-02	1.3691E-06	22	23
23	21	23	22	23	24
0.	1.7312E-02	1.2119E 00	2.0242E-01	23	23
24	21	24	22	24	24
0.	2.6134E-07	2.4883E-01	9.3964E-01	24	23
34	21	34	22	34	24
0.	0.	1.0594E-02	2.5072E-01	34	23
				34	34
				1.0808E 00	

ALUMINUM

 TRANSFERS FROM GROUPS 1 THROUGH 5 TO GROUPS 1 THROUGH 16

N1 N2

 SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
5.0487E-01	2.1854E-01	1.0022E-01	2.0274E-01	2.1645E-01
1 6	1 7	1 8	1 9	1 10
1.5391E-01	8.4819E-02	3.9948E-02	2.1326E-02	5.9693E-03
1 11	1 12	1 13	1 14	1 15
8.6578E-04	1.1956E-04	1.6563E-05	2.2032E-06	3.2448E-07
1 16	2 1	2 2	2 3	2 4
2.5091E-08	0.	1.0480E 00	2.2667E-01	1.7126E-01
2 5	2 6	2 7	2 8	2 9
2.2420E-01	1.8193E-01	1.0897E-01	5.4047E-02	2.9885E-02
2 10	2 11	2 12	2 13	2 14
8.5808E-03	1.2611E-03	1.7502E-04	2.4290E-05	3.2334E-06
2 15	2 16	3 1	3 2	3 3
4.7631E-07	3.6835E-08	0.	0.	1.5197E 00
3 4	3 5	3 6	3 7	3 8
4.0193E-01	1.5426E-01	1.5328E-01	1.0428E-01	5.5972E-02
3 9	3 10	3 11	3 12	3 13
3.2658E-02	9.7473E-03	1.4617E-03	2.0439E-04	2.8444E-05
3 14	3 15	3 16	4 1	4 2
3.7904E-06	5.5859E-07	4.3204E-08	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	2.2877E 00	3.7842E-01	7.4626E-02	5.9743E-02
4 8	4 9	4 10	4 11	4 12
3.5489E-02	2.2196E-02	6.9646E-03	1.0719E-03	1.5137E-04
4 13	4 14	4 15	4 16	5 1
2.1140E-05	2.8210E-06	4.1593E-07	3.2176E-08	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	2.6711E 00	4.1917E-01
5 7	5 8	5 9	5 10	5 11
1.4409E-02	9.4395E-03	6.3110E-03	2.0768E-03	3.2762E-04
5 12	5 13	5 14	5 15	5 16
4.6696E-05	6.5437E-06	8.7435E-07	1.2897E-07	9.9793E-09

ALUMINUM

		N1		N2	
SIGMA N,G (N1/N2)					
1	1	1	2	1	3
0.		0.		8.5914E-04	1.8992E-04
1	6	1	7	1	8
5.8331E-04		5.8331E-04		2.7131E-04	4.9200E-01
1	11	2	1	2	2
7.3160E-04		0.		0.	6.7061E-04
2	5	2	6	2	7
1.8001E-04		4.5531E-04		4.5531E-04	2.1177E-04
2	10	2	11	3	1
2.7107E-01		5.7106E-04		0.	0.
3	4	3	5	3	6
1.7024E-04		2.0672E-04		5.2289E-04	5.2289E-04
3	9	3	10	3	11
6.0702E-01		2.6042E-01		6.5582E-04	0.
4	3	4	4	4	5
1.0283E-03		2.2731E-04		2.7602E-04	6.9817E-04
4	8	4	9	4	10
2.5031E-01		4.3015E-01		1.2280E-01	8.7565E-04
5	2	5	3	5	4
0.		8.7592E-04		1.9362E-04	2.3512E-04
5	7	5	8	5	9
5.9470E-04		2.7661E-04		2.6011E-01	1.1967E-01
6	1	6	2	6	3
0.		0.		1.1011E-03	2.4339E-04
6	6	6	7	6	8
7.4756E-04		7.4756E-04		3.4770E-04	0.
6	11	7	1	7	2
9.3760E-04		0.		0.	1.6134E-03
7	5	7	6	7	7
4.3308E-04		1.0954E-03		1.0954E-03	5.0950E-04
7	10	7	11	8	1
8.2369E-05		1.3739E-03		0.	0.
8	4	8	5	8	6
4.7846E-04		5.8098E-04		1.4695E-03	1.4695E-03
8	9	8	10	8	11
0.		1.1050E-04		1.8431E-03	0.
9	3	9	4	9	5
4.6373E-03		1.0251E-03		1.2447E-03	3.1485E-03
9	8	9	9	9	10
1.4644E-03		0.		2.3675E-04	3.9488E-03
					0.

ALUMINUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		8.3378E-03		1.8431E-03	
10	7	10	8	10	9
5.6609E-03		2.6330E-03		0.	
11	1	11	2	11	3
0.		0.		1.0885E-02	
11	6	11	7	11	8
7.3907E-03		7.3907E-03		3.4375E-03	
11	11	12	1	12	2
9.2695E-03		0.		0.	
12	5	12	6	12	7
2.0711E-03		5.2386E-03		5.2386E-03	
12	10	12	11	13	1
3.9391E-04		6.5703E-03		0.	
13	4	13	5	13	6
2.8099E-03		3.4120E-03		8.6304E-03	
13	9	13	10	13	11
0.		6.4895E-04		1.0824E-02	
14	3	14	4	14	5
2.0951E-03		4.6312E-04		5.6237E-04	
14	8	14	9	14	10
6.6161E-04		0.		1.0696E-04	
15	2	15	3	15	4
0.		3.7759E-03		8.3467E-04	
15	7	15	8	15	9
2.5636E-03		1.1924E-03		0.	
16	1	16	2	16	3
0.		0.		7.2228E-03	
16	6	16	7	16	8
4.9039E-03		4.9039E-03		2.2809E-03	
16	11	17	1	17	2
6.1505E-03		0.		0.	
17	5	17	6	17	7
3.3561E-03		8.4889E-03		8.4889E-03	
17	10	17	11	18	1
6.3831E-04		1.0647E-02		0.	
18	4	18	5	18	6
4.4743E-03		5.4330E-03		1.3742E-02	
18	9	18	10	18	11
0.		1.0333E-03		1.7236E-02	
19	1	19	2	19	3
0.		0.		0.	

ALUMINUM

N1		N2		SIGMA N,G (N1/N2)	
19	3	19	4	19	5
3.4096E-02		7.5369E-03		9.1520E-03	
19	8	19	9	19	10
1.0767E-02		0.		1.7407E-03	
20	2	20	3	20	4
0.		5.7511E-02		1.2713E-02	
20	7	20	8	20	9
3.9047E-02		1.8161E-02		0.	
21	1	21	2	21	3
0.		0.		9.1679E-02	
21	6	21	7	21	8
6.2245E-02		6.2245E-02		2.8951E-02	
21	11	22	1	22	2
7.8068E-02		0.		0.	
22	5	22	6	22	7
3.9420E-02		9.9711E-02		9.9711E-02	
22	10	22	11	23	1
7.4976E-03		1.2506E-01		0.	
23	4	23	5	23	6
5.5717E-02		6.7657E-02		1.7113E-01	
23	9	23	10	23	11
0.		1.2868E-02		2.1463E-01	
24	3	24	4	24	5
3.9123E-01		8.6482E-02		1.0501E-01	
24	8	24	9	24	10
1.2355E-01		0.		1.9973E-02	
25	2	25	3	25	4
0.		6.1493E-01		1.3593E-01	
25	7	25	8	25	9
4.1751E-01		1.9419E-01		0.	
26	1	26	2	26	3
0.		0.		6.1543E-01	
26	6	26	7	26	8
4.1784E-01		4.1784E-01		1.9435E-01	
26	11	27	1	27	2
5.2406E-01		0.		0.	
27	5	27	6	27	7
1.6536E-01		4.1827E-01		4.1827E-01	
27	10	27	11	28	1
3.1451E-02		5.2460E-01		0.	
				0.	
				0.	
				6.1687E-01	

ALUMINUM

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
1.3636E-01	1.6558E-01	4.1882E-01	4.1882E-01	1.9480E-01
28 9	28 10	28 11	29 1	29 2
0.	3.1493E-02	5.2529E-01	0.	0.
29 3	29 4	29 5	29 6	29 7
6.1797E-01	1.3660E-01	1.6588E-01	4.1957E-01	4.1957E-01
29 8	29 9	29 10	29 11	30 1
1.9515E-01	0.	3.1549E-02	5.2623E-01	0.
30 2	30 3	30 4	30 5	30 6
0.	6.1953E-01	1.3695E-01	1.6630E-01	4.2063E-01
30 7	30 8	30 9	30 10	30 11
4.2063E-01	1.9564E-01	0.	3.1629E-02	5.2756E-01
31 1	31 2	31 3	31 4	31 5
0.	0.	6.2191E-01	1.3747E-01	1.6693E-01
31 6	31 7	31 8	31 9	31 10
4.2224E-01	4.2224E-01	1.9639E-01	0.	3.1750E-02
31 11	32 1	32 2	32 3	32 4
5.2958E-01	0.	0.	6.2597E-01	1.3837E-01
32 5	32 6	32 7	32 8	32 9
1.6802E-01	4.2500E-01	4.2500E-01	1.9768E-01	0.
32 10	32 11	33 1	33 2	33 3
3.1958E-02	5.3304E-01	0.	0.	6.3458E-01
33 4	33 5	33 6	33 7	33 8
1.4028E-01	1.7033E-01	4.3085E-01	4.3085E-01	2.0039E-01
33 9	33 10	33 11	34 1	34 2
0.	3.2397E-02	5.4037E-01	0.	0.
34 3	34 4	34 5	34 6	34 7
6.5721E-01	1.4528E-01	1.7641E-01	4.4621E-01	4.4621E-01
34 8	34 9	34 10	34 11	
2.0754E-01	0.	3.3552E-02	5.5964E-01	

DATE 12/08/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
YTTRIUM		39.8900		1.47592E 02			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	3.9827E 00	3.9295E 00	2.0081E 00	4.2567E-03	-1.9475E 00	
2	6.065E 06	4.0665E 00	3.8031E 00	2.4557E 00	5.2569E-03	-1.5887E 00	
3	3.679E 06	4.2277E 00	3.0305E 00	2.8824E 00	6.0470E-03	-1.3268E 00	
4	2.231E 06	4.6019E 00	1.7388E 00	3.2203E 00	6.4869E-03	-1.3626E 00	
5	1.353E 06	5.8895E 00	7.6949E-01	3.9401E 00	6.8167E-03	-1.9227E 00	
6	8.208E 05	7.4861E 00	2.2418E-01	5.0810E 00	7.0740E-03	-2.3721E 00	
7	4.979E 05	8.7557E 00	1.9700E-01	6.5991E 00	7.0945E-03	-2.1270E 00	
8	3.020E 05	8.4674E 00	1.9052E-01	7.2466E 00	6.9775E-03	-1.2040E 00	
9	1.832E 05	7.5581E 00	1.7006E-01	6.8724E 00	6.8779E-03	-6.7635E-01	
10	6.738E 04	7.4003E 00	1.6651E-01	7.1017E 00	6.8278E-03	-2.9449E-01	
11	2.479E 04	7.2938E 00	1.6411E-01	7.1769E 00	2.2046E-02	-1.1527E-01	
12	9.119E 03	8.7841E 00	1.9764E-01	8.7160E 00	2.5044E-02	-6.7187E-02	
13	3.355E 03	7.6762E 00	1.7272E-01	7.6179E 00	8.2402E-02	-5.7538E-02	
14	1.234E 03	6.0751E 00	1.3669E-01	6.0289E 00	6.0182E-03	-4.5537E-02	
15	4.540E 02	6.4193E 00	1.4443E-01	6.3705E 00	1.0888E-02	-4.8116E-02	
16	8.719E 01	6.7450E 00	1.5176E-01	6.6938E 00	2.0745E-02	-5.0558E-02	
17	3.545E 01	7.0104E 00	1.5773E-01	6.9571E 00	3.6026E-02	-5.2547E-02	
18	1.304E 01	7.2785E 00	1.6377E-01	7.2232E 00	5.8348E-02	-5.4557E-02	
19	5.043E 00	7.4547E 00	1.6773E-01	7.3980E 00	9.8183E-02	-5.5878E-02	
20	1.445E 00	7.4005E 00	1.6651E-01	7.3443E 00	1.6580E-01	-5.5472E-02	
21	6.826E-01	7.4262E 00	1.6709E-01	7.3697E 00	2.6252E-01	-5.5664E-02	
22	2.511E-01	7.4572E 00	1.6779E-01	7.4005E 00	4.2417E-01	-5.5897E-02	
23	9.237E-02	7.3382E 00	1.6511E-01	7.2824E 00	7.2586E-01	-5.5004E-02	
24	2.530E-02	7.1187E 00	1.6017E-01	7.0646E 00	1.1207E 00	-5.3359E-02	
*4500	3.023E-01	6.2000E 00	1.3950E-01	6.1529E 00	4.1560E-01	-4.6473E-02	
*4000	2.718E-01	6.2000E 00	1.3950E-01	6.1529E 00	4.1560E-01	-4.6473E-02	
*3500	2.413E-01	6.2000E 00	1.3950E-01	6.1529E 00	4.1560E-01	-4.6473E-02	
*3000	2.109E-01	6.2000E 00	1.3950E-01	6.1529E 00	4.1560E-01	-4.6473E-02	
2500	1.804E-01	6.2000E 00	1.3950E-01	6.1529E 00	4.4940E-01	-4.6473E-02	
2000	1.499E-01	6.2000E 00	1.3950E-01	6.1529E 00	4.9290E-01	-4.6473E-02	
1500	1.194E-01	6.2000E 00	1.3950E-01	6.1529E 00	5.5230E-01	-4.6473E-02	
1000	8.897E-02	6.2000E 00	1.3950E-01	6.1529E 00	6.3990E-01	-4.6473E-02	
500	5.850E-02	6.2000E 00	1.3950E-01	6.1529E 00	7.8920E-01	-4.6473E-02	
68	3.216E-02	6.2000E 00	1.3950E-01	6.1529E 00	1.0643E 00	-4.6473E-02	

*Thermal cross sections taken from APEX-S15.

NOTE: For a summary of the sources of data see APEX-704.

YTIIRIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	8.0541E 00	7.9929E 00	1.7592E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
6.7698E 00	6.5629E-01	2.2350E-05	0.	0.
22 21	22 22	22 23	22 24	22 25
6.3437E-01	6.4215E 00	4.3944E-01	5.9034E-04	1.9294E-05
23 21	23 22	23 23	23 24	23 25
5.1812E-05	1.3609E 00	5.6999E 00	3.3818E-01	4.1577E-02
24 21	24 22	24 23	24 24	24 25
0.	1.4485E-02	2.9605E 00	3.3730E 00	1.0322E 00
25 21	25 22	25 23	25 24	25 25
0.	1.1196E-03	8.9691E-01	2.5720E 00	4.5840E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	7.9810E 00	7.9203E 00	1.7607E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
6.7304E 00	6.9574E-01	1.1535E-05	0.	0.
22 21	22 22	22 23	22 24	22 26
9.6500E-01	6.4817E 00	4.4524E-01	4.0727E-01	1.0229E-05
23 21	23 22	23 23	23 24	23 26
1.9851E-05	1.2638E 00	5.7953E 00	3.3465E-01	3.6902E-02
24 21	24 22	24 23	24 24	24 26
0.	8.6815E-03	2.8306E 00	3.4941E 00	1.0204E 00
26 21	26 22	26 23	26 24	26 26
0.	5.0622E-04	7.5995E-01	2.5185E 00	4.7020E 00

YTTRIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	7.9076E 00	7.8475E 00	1.7625E 00	0.

N1	N2
SIGMA S (N1/N2)	

21 21	21 22	21 23	21 24	21 27
6.6778E 00	7.4832E-01	5.1200E-06	0.	0.
22 21	22 22	22 23	22 24	22 27
4.9128E-01	6.5423E 00	4.5498E-01	2.6037E-04	4.7263E-06
23 21	23 22	23 23	23 24	23 27
6.1237E-06	1.1594E 00	5.8976E 00	3.3154E-01	3.2158E-02
24 21	24 22	24 23	24 24	24 27
0.	4.6554E-03	2.6868E 00	3.6311E 00	1.0051E 00
27 21	27 22	27 23	27 24	27 27
0.	1.9173E-04	6.2481E-01	2.4509E 00	4.8316E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	7.8338E 00	7.7743E 00	1.7648E 00	0.

N1	N2
SIGMA S (N1/N2)	

21 21	21 22	21 23	21 24	21 28
6.6060E 00	8.2013E-01	1.8305E-06	0.	0.
22 21	22 22	22 23	22 24	22 28
4.1281E-01	6.6016E 00	4.7074E-01	1.4972E-04	1.7985E-06
23 21	23 22	23 23	23 24	23 28
1.3910E-06	1.0464E 00	6.0078E 00	3.2932E-01	2.7361E-02
24 21	24 22	24 23	24 24	24 28
0.	2.1367E-03	2.5261E 00	3.7879E 00	9.8531E-01
28 21	28 22	28 23	28 24	28 28
0.	5.6585E-05	4.9319E-01	2.3652E 00	4.9753E 00

YTIUUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	7.7597E 00	7.7007E 00	1.7679E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
6.5048E 00	9.2134E-01	4.7156E-07	0.	0.
22 21	22 22	22 23	22 24	22 29
3.2939E-01	6.6560E 00	4.9626E-01	7.3695E-05	5.1305E-07
23 21	23 22	23 23	23 24	23 29
2.0065E-07	9.2249E-01	6.1271E 00	3.2878E-01	2.2541E-02
24 21	24 22	24 23	24 24	24 29
0.	7.8058E-04	2.3447E 00	3.9702E 00	9.5960E 00
29 21	29 22	29 23	29 24	29 29
0.	1.1547E-05	3.6747E-01	2.2555E 00	5.1367E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	7.6853E 00	7.6268E 00	1.7724E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
6.3642E 00	1.0619E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
2.4159E-01	6.6979E 00	5.3869E-01	2.8410E 00	0.
23 21	23 22	23 23	23 24	23 30
0.	7.8471E-01	6.2571E 00	3.3155E-01	1.7731E-02
24 21	24 22	24 23	24 24	24 30
0.	1.9955E-04	2.1366E 00	4.1860E 00	9.2621E-01
30 21	30 22	30 23	30 24	30 30
0.	1.3160E-06	2.5102E-01	2.1132E 00	5.3210E 00

YTTRIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	7.6106E 00	7.5527E 00	1.7792E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 31
6.2757E 00	1.1505E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.5210E-01	6.7091E 00	6.1343E-01	7.1632E-06	0.
23 21	23 22	23 23	23 24	23 31
0.	6.2855E-01	6.3985E 00	3.4118E-01	1.2987E-02
24 21	24 22	24 23	24 24	24 31
0.	2.7696E-05	1.8920E 00	4.4481E 00	8.8270E-01
31 21	31 22	31 23	31 24	31 31
0.	0.	1.4874E-01	1.9252E 00	5.5366E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	7.5357E 00	7.4784E 00	1.7908E 00	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 32
6.7274E 00	6.9872E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
6.9246E-01	6.6428E 00	7.5889E-01	7.6549E-07	0.
23 21	23 22	23 23	23 24	23 32
0.	4.4764E-01	6.5481E 00	3.6716E-01	8.4066E-03
24 21	24 22	24 23	24 24	24 32
0.	1.1610E-06	1.5936E 00	4.7769E 00	8.2605E-01
32 21	32 22	32 23	32 24	32 32
0.	0.	6.7677E-02	1.6696E 00	5.7984E 00

YTIIRIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	7.4607E 00	7.4040E 00	1.8155E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
7.0045E 00	4.2168E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
7.5061E-02	6.3665E 00	1.0253E 00	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	2.3628E-01	6.6774E 00	4.4367E-01	4.1633E-03
24 21	24 22	24 23	24 24	24 33
0.	0.	1.2063E 00	5.2090E 00	7.5514E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	1.6747E-02	1.3061E 00	6.1378E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	7.3962E 00	7.3400E 00	1.8802E 00	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
7.0145E 00	4.1161E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
1.2675E-01	7.0568E 00	2.7782E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	5.2429E-02	6.6014E 00	6.9796E-01	1.0981E-03
24 21	24 22	24 23	24 24	24 34
0.	0.	7.3326E-01	5.7134E 00	7.0110E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	1.0078E-03	8.3487E-01	6.5603E 00

YTIUM

TRANSFERS FROM GROUPS 1 THROUGH 10 TO GROUPS 1 THROUGH 16

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
2.6677E-00		1.8982E-01		3.6196E-02	
1	6	1	7	1	8
2.7866E-01		1.8787E-01		1.0019E-01	
1	11	1	12	1	13
2.5905E-03		3.6198E-04		5.0362E-05	
1	16	2	1	2	2
7.6484E-08		0.		2.7985E-00	
2	5	2	6	2	7
2.4583E-01		2.9251E-01		2.2314E-01	
2	10	2	11	2	12
2.4360E-02		3.7203E-03		5.2383E-04	
2	15	2	16	3	1
1.4370E-06		1.1116E-07		0.	
3	4	3	5	3	6
1.6921E-01		1.7439E-01		2.8193E-01	
3	9	3	10	3	11
1.1381E-01		3.7397E-02		5.8957E-03	
3	14	3	15	3	16
1.5729E-05		2.3202E-06		1.7952E-07	
4	3	4	4	4	5
0.		3.4672E-00		2.6053E-01	
4	8	4	9	4	10
1.9502E-01		1.4468E-01		5.1323E-02	
4	13	4	14	4	15
1.7164E-04		2.2983E-05		3.3928E-06	
5	2	5	3	5	4
0.		0.		0.	
5	7	5	8	5	9
1.1893E-01		1.0663E-01		8.8780E-02	
5	12	5	13	5	14
8.6153E-04		1.2211E-04		1.6388E-05	
6	1	6	2	6	3
0.		0.		0.	
6	6	6	7	6	8
7.1642E-00		3.0997E-01		4.9488E-03	
6	11	6	12	6	13
3.4998E-04		5.2348E-05		7.4654E-06	
6	16	7	1	7	2
1.1502E-08		0.		0.	
1	4	1	5	1	5
1.5995E-01		2.8373E-01			
1	9	1	10	1	10
5.8189E-02		1.7307E-02			
1	14	1	15	1	15
6.7105E-06		9.8887E-07			
2	3	2	4	2	4
1.6674E-01		1.0388E-01			
2	8	2	9	2	9
1.2862E-01		7.8798E-02			
2	13	2	14	2	14
7.3081E-05		9.7480E-06			
3	2	3	3	3	3
0.		3.0117E-00			
3	7	3	8	3	8
2.6176E-01		1.7067E-01			
3	12	3	13	3	13
8.4015E-04		1.1772E-04			
4	1	4	2	4	2
0.		0.			
4	6	4	7	4	7
2.1678E-01		2.5653E-01			
4	11	4	12	4	12
8.4208E-03		1.2183E-03			
4	16	5	1	5	1
2.6259E-07		0.			
5	5	5	6	5	6
5.1150E-00		4.1911E-01			
5	10	5	11	5	11
3.4200E-02		5.8583E-03			
5	15	5	16	5	16
2.4213E-06		1.8746E-07			
6	4	6	5	6	5
0.		0.			
6	9	6	10	6	10
4.6550E-03		1.9540E-03			
6	14	6	15	6	15
1.0044E-06		1.4851E-07			
7	3	7	4	7	4
0.		0.			

YTTRIUM

N1 N2
SIGMA S0 (N1/N2)

0. 7 5	0. 7 6	8.3642E 00 7 7	3.9150E-01 7 8	0. 7 9
0. 7 10	0. 7 11	0. 7 12	0. 7 13	0. 7 14
0. 7 15	0. 7 16	0. 8 1	0. 8 2	0. 8 3
0. 8 4	0. 8 5	0. 8 6	0. 8 7	0. 8 8
0. 8 9	0. 8 10	0. 8 11	0. 8 12	8.0839E 00 8 13
3.8208E-01 8 14	0. 8 15	0. 8 16	0. 9 1	0. 9 2
0. 9 3	0. 9 4	0. 9 5	0. 9 6	0. 9 7
0. 9 8	0. 9 9	0. 9 10	0. 9 11	0. 9 12
0. 9 13	7.3455E 00 9 14	2.1650E-01 9 15	0. 9 16	0. 10 1
0. 10 2	0. 10 3	0. 10 4	0. 10 5	0. 10 6
0. 10 7	0. 10 8	0. 10 9	0. 10 10	0. 10 11
0. 10 12	0. 10 13	0. 10 14	7.2319E 00 10 15	1.7411E-01 10 16
0.	0.	0.	0.	0.

YTRIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
1 1	1 2	1 3	1 4	1 5	
0.	0.	0.	3.4509E-02	1.3635E-03	
1 6	1 7	1 8	1 9	1 10	
8.0844E-03	8.6753E-01	8.7993E-01	1.4911E 00	5.2134E-01	
1 11	2 1	2 2	2 3	2 4	
1.9694E-02	0.	0.	0.	3.7873E-02	
2 5	2 6	2 7	2 8	2 9	
1.4964E-03	8.8724E-03	8.6883E-01	8.8010E-01	1.4915E 00	
2 10	2 11	3 1	3 2	3 3	
6.2153E-01	2.1614E-02	0.	0.	0.	
3 4	3 5	3 6	3 7	3 8	
3.6715E-02	1.4506E-03	8.6011E-03	9.3593E-01	7.0104E-01	
3 9	3 10	3 11	4 1	4 2	
1.5519E 00	5.2310E-01	2.0953E-02	0.	0.	
4 3	4 4	4 5	4 6	4 7	
0.	3.4836E-02	1.3764E-03	8.1609E-03	1.3399E-02	
4 8	4 9	4 10	4 11	5 1	
1.8027E-03	3.3760E-01	2.3119E-01	1.9881E-02	0.	
5 2	5 3	5 4	5 5	5 6	
0.	0.	3.3264E-02	1.3143E-03	7.7926E-03	
5 7	5 8	5 9	5 10	5 11	
1.2794E-02	1.7213E-03	1.5835E-02	8.3040E-02	1.8984E-02	
6 1	6 2	6 3	6 4	6 5	
0.	0.	0.	3.2230E-02	1.2734E-03	
6 6	6 7	6 8	6 9	6 10	
7.5504E-03	1.2396E-02	1.6679E-03	3.2681E-03	8.7111E-03	
6 11	7 1	7 2	7 3	7 4	
1.8394E-02	0.	0.	0.	3.3903E-02	
7 5	7 6	7 7	7 8	7 9	
1.3395E-03	7.9423E-03	1.3040E-02	1.7544E-03	3.4377E-03	
7 10	7 11	8 1	8 2	8 3	
6.2708E-03	1.9348E-02	0.	0.	0.	
8 4	8 5	8 6	8 7	8 8	
3.3917E-02	1.3401E-03	7.9456E-03	1.3045E-02	1.7551E-03	
8 9	8 10	8 11	9 1	9 2	
3.4391E-03	6.2735E-03	1.9356E-02	0.	0.	
9 3	9 4	9 5	9 6	9 7	
0.	5.8641E-02	2.3169E-03	1.3738E-02	2.2554E-02	
9 8	9 9	9 10	9 11	10 1	
3.0346E-03	5.9461E-03	1.0847E-02	3.3466E-02	0.	

YTTRIUM

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		0.		7.5837E-02	2.9964E-03
10	7	10	8	10	9
2.9168E-02		3.9244E-03		7.6898E-03	1.4027E-02
11	1	11	2	11	3
0.		0.		0.	7.9980E-02
11	6	11	7	11	8
1.8737E-02		3.0761E-02		4.1388E-03	8.1098E-03
11	11	12	1	12	2
4.5644E-02		0.		0.	12 3
12	5	12	6	12	7
2.8336E-03		1.6801E-02		2.7584E-02	3.7113E-03
12	10	12	11	13	1
1.3265E-02		4.0929E-02		0.	13 2
13	4	13	5	13	6
2.3578E-01		9.3158E-03		5.5235E-02	9.0685E-02
13	9	13	10	13	11
2.3908E-02		4.3611E-02		1.3456E-01	0.
14	3	14	4	14	5
0.		1.7215E-02		6.8017E-04	4.0329E-03
14	8	14	9	14	10
8.9085E-04		1.7456E-03		3.1842E-03	9.8246E-03
15	2	15	3	15	4
0.		0.		3.1141E-02	1.2304E-03
15	7	15	8	15	9
1.1977E-02		1.6115E-03		3.1577E-03	5.7601E-03
16	1	16	2	16	3
0.		0.		0.	5.9332E-02
16	6	16	7	16	8
1.3899E-02		2.2820E-02		3.0703E-03	6.0161E-03
16	11	17	1	17	2
3.3860E-02		0.		0.	17 3
17	5	17	6	17	7
4.0710E-03		2.4138E-02		3.9629E-02	5.3319E-03
17	10	17	11	18	1
1.9058E-02		5.8802E-02		0.	18 2
18	4	18	5	18	6
1.6688E-01		6.5933E-03		3.9093E-02	6.4183E-02
18	9	18	10	18	11
1.6921E-02		3.0866E-02		9.5235E-02	0.
19	1	19	2	19	3
0.		0.		0.	19 4
19	6	19	7	19	8
0.		0.		0.	19 9
20	1	20	2	20	3
0.		0.		0.	20 4
20	6	20	7	20	8
0.		0.		0.	20 9
21	1	21	2	21	3
0.		0.		0.	21 4
21	6	21	7	21	8
0.		0.		0.	21 9
22	1	22	2	22	3
0.		0.		0.	22 4
22	6	22	7	22	8
0.		0.		0.	22 9
23	1	23	2	23	3
0.		0.		0.	23 4
23	6	23	7	23	8
0.		0.		0.	23 9
24	1	24	2	24	3
0.		0.		0.	24 4
24	6	24	7	24	8
0.		0.		0.	24 9
25	1	25	2	25	3
0.		0.		0.	25 4
25	6	25	7	25	8
0.		0.		0.	25 9
26	1	26	2	26	3
0.		0.		0.	26 4
26	6	26	7	26	8
0.		0.		0.	26 9
27	1	27	2	27	3
0.		0.		0.	27 4
27	6	27	7	27	8
0.		0.		0.	27 9
28	1	28	2	28	3
0.		0.		0.	28 4
28	6	28	7	28	8
0.		0.		0.	28 9
29	1	29	2	29	3
0.		0.		0.	29 4
29	6	29	7	29	8
0.		0.		0.	29 9
30	1	30	2	30	3
0.		0.		0.	30 4
30	6	30	7	30	8
0.		0.		0.	30 9
31	1	31	2	31	3
0.		0.		0.	31 4
31	6	31	7	31	8
0.		0.		0.	31 9
32	1	32	2	32	3
0.		0.		0.	32 4
32	6	32	7	32	8
0.		0.		0.	32 9
33	1	33	2	33	3
0.		0.		0.	33 4
33	6	33	7	33	8
0.		0.		0.	33 9
34	1	34	2	34	3
0.		0.		0.	34 4
34	6	34	7	34	8
0.		0.		0.	34 9
35	1	35	2	35	3
0.		0.		0.	35 4
35	6	35	7	35	8
0.		0.		0.	35 9
36	1	36	2	36	3
0.		0.		0.	36 4
36	6	36	7	36	8
0.		0.		0.	36 9
37	1	37	2	37	3
0.		0.		0.	37 4
37	6	37	7	37	8
0.		0.		0.	37 9
38	1	38	2	38	3
0.		0.		0.	38 4
38	6	38	7	38	8
0.		0.		0.	38 9
39	1	39	2	39	3
0.		0.		0.	39 4
39	6	39	7	39	8
0.		0.		0.	39 9
40	1	40	2	40	3
0.		0.		0.	40 4
40	6	40	7	40	8
0.		0.		0.	40 9
41	1	41	2	41	3
0.		0.		0.	41 4
41	6	41	7	41	8
0.		0.		0.	41 9
42	1	42	2	42	3
0.		0.		0.	42 4
42	6	42	7	42	8
0.		0.		0.	42 9
43	1	43	2	43	3
0.		0.		0.	43 4
43	6	43	7	43	8
0.		0.		0.	43 9
44	1	44	2	44	3
0.		0.		0.	44 4
44	6	44	7	44	8
0.		0.		0.	44 9
45	1	45	2	45	3
0.		0.		0.	45 4
45	6	45	7	45	8
0.		0.		0.	45 9
46	1	46	2	46	3
0.		0.		0.	46 4
46	6	46	7	46	8
0.		0.		0.	46 9
47	1	47	2	47	3
0.		0.		0.	47 4
47	6	47	7	47	8
0.		0.		0.	47 9
48	1	48	2	48	3
0.		0.		0.	48 4
48	6	48	7	48	8
0.		0.		0.	48 9
49	1	49	2	49	3
0.		0.		0.	49 4
49	6	49	7	49	8
0.		0.		0.	49 9
50	1	50	2	50	3
0.		0.		0.	50 4
50	6	50	7	50	8
0.		0.		0.	50 9
51	1	51	2	51	3
0.		0.		0.	51 4
51	6	51	7	51	8
0.		0.		0.	51 9
52	1	52	2	52	3
0.		0.		0.	52 4
52	6	52	7	52	8
0.		0.		0.	52 9
53	1	53	2	53	3
0.		0.		0.	53 4
53	6	53	7	53	8
0.		0.		0.	53 9
54	1	54	2	54	3
0.		0.		0.	54 4
54	6	54	7	54	8
0.		0.		0.	54 9
55	1	55	2	55	3
0.		0.		0.	55 4
55	6	55	7	55	8
0.		0.		0.	55 9
56	1	56	2	56	3
0.		0.		0.	56 4
56	6	56	7	56	8
0.		0.		0.	56 9
57	1	57	2	57	3
0.		0.		0.	57 4
57	6	57	7	57	8
0.		0.		0.	57 9
58	1	58	2	58	3
0.		0.		0.	58 4
58	6	58	7	58	8
0.		0.		0.	58 9
59	1	59	2	59	3
0.		0.		0.	59 4
59	6	59	7	59	8
0.		0.		0.	59 9
60	1	60	2	60	3
0.		0.		0.	60 4
60	6	60	7	60	8
0.		0.		0.	60 9
61	1	61	2	61	3
0.		0.		0.	61 4
61	6	61	7	61	8
0.		0.		0.	61 9
62	1	62	2	62	3
0.		0.		0.	62 4
62	6	62	7	62	8
0.		0.		0.	62 9
63	1	63	2	63	3
0.		0.		0.	63 4
63	6	63	7	63	8
0.		0.		0.	63 9
64	1	64	2	64	3
0.		0.		0.	64 4
64	6	64	7	64	8
0.		0.		0.	64 9
65	1	65	2	65	3
0.		0.		0.	65 4
65	6	65	7	65	8
0.		0.		0.	65 9
66	1	66	2	66	3
0.		0.		0.	66 4
66	6	66	7	66	8
0.		0.		0.	66 9
67	1	67	2	67	3
0.		0.		0.	67 4
67	6	67	7	67	8
0.		0.		0.	67 9
68	1	68	2	68	3
0.		0.		0.	68 4
68	6	68	7	68	8
0.		0.		0.	68 9
69	1	69	2	69	3
0.		0.		0.	69 4
69	6	69	7	69	8
0.		0.		0.	69 9
70	1	70	2	70	3
0.		0.		0.	70 4
70	6	70	7	70	8
0.		0.		0.	70 9
71	1	71	2	71	3
0.		0.		0.	71 4
71	6	71	7	71	8
0.		0.		0.	71 9
72	1	72	2	72	3
0.		0.		0.	72 4
72	6	72	7	72	8
0.		0.		0.	72 9
73	1	73	2	73	3
0.		0.		0.	73 4
73	6	73	7	73	8
0.		0.		0.	73 9
74	1	74	2	74	3
0.		0.		0.	74 4
74	6	74	7	74	8
0.		0.		0.	74 9
75	1	75	2	75	3
0.		0.		0.	75 4
75	6	75	7	75	8
0.		0.		0.	75 9
76	1	76	2	76	3
0.		0.		0.	76 4
76	6	76	7	76	8
0.		0.		0.	76 9
77	1	77	2		

YTRIUM

N1		N2		SIGMA N,G (N1/N2)	
19 3	19 4	19 5	19 6	19 7	
0.	2.8080E-01	1.1095E-02	6.5783E-02	1.0800E-01	
19 8	19 9	19 10	19 11	20 1	
1.4531E-02	2.8473E-02	5.1939E-02	1.6025E-01	0.	
20 2	20 3	20 4	20 5	20 6	
0.	0.	4.7419E-01	1.8735E-02	1.1109E-01	
20 7	20 8	20 9	20 10	20 11	
1.8238E-01	2.4538E-02	4.8082E-02	8.7708E-02	2.7062E-01	
21 1	21 2	21 3	21 4	21 5	
0.	0.	0.	7.5081E-01	2.9665E-02	
21 6	21 7	21 8	21 9	21 10	
1.7589E-01	2.8877E-01	3.8853E-02	7.6131E-02	1.3887E-01	
21 11	22 1	22 2	22 3	22 4	
4.2848E-01	0.	0.	0.	1.2131E 00	
22 5	22 6	22 7	22 8	22 9	
4.7931E-02	2.8419E-01	4.6659E-01	6.2777E-02	1.2301E-01	
22 10	22 11	23 1	23 2	23 3	
2.2439E-01	6.9233E-01	0.	0.	0.	
23 4	23 5	23 6	23 7	23 8	
2.0760E 00	8.2022E-02	4.8633E-01	7.9845E-01	1.0743E-01	
23 9	23 10	23 11	24 1	24 2	
2.1050E-01	3.8398E-01	1.1847E 00	0.	0.	
24 3	24 4	24 5	24 6	24 7	
0.	3.2012E 00	1.2648E-01	7.4993E-01	1.2312E 00	
24 8	24 9	24 10	24 11	25 1	
1.6566E-01	3.2460E-01	5.9211E-01	1.8269E 00	0.	
25 2	25 3	25 4	25 5	25 6	
0.	0.	5.0313E 00	1.9879E-01	1.1787E 00	
25 7	25 8	25 9	25 10	25 11	
1.9351E 00	2.6036E-01	5.1017E-01	9.3062E-01	2.8714E 00	
26 1	26 2	26 3	26 4	26 5	
0.	0.	0.	5.0356E 00	1.9896E-01	
26 6	26 7	26 8	26 9	26 10	
1.1797E 00	1.9368E 00	2.6058E-01	5.1060E-01	9.3141E-01	
26 11	27 1	27 2	27 3	27 4	
2.8738E 00	0.	0.	0.	5.0407E 00	
27 5	27 6	27 7	27 8	27 9	
1.9916E-01	1.1809E 00	1.9387E 00	2.6085E-01	5.1112E-01	
27 10	27 11	28 1	28 2	28 3	
9.3236E-01	2.8767E 00	0.	0.	0.	

YTTRIUM

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
5.0473E 00	1.9942E-01	1.1824E 00	1.9413E 00	2.6119E-01
28 9	28 10	28 11	29 1	29 2
5.1179E-01	9.3358E-01	2.8805E 00	0.	0.
29 3	29 4	29 5	29 6	29 7
0.	5.0562E 00	1.9977E-01	1.1845E 00	1.9447E 00
29 8	29 9	29 10	29 11	30 1
2.6165E-01	5.1269E-01	9.3522E-01	2.8856E 00	0.
30 2	30 3	30 4	30 5	30 6
0.	0.	5.0691E 00	2.0028E-01	1.1875E 00
30 7	30 8	30 9	30 10	30 11
1.9496E 00	2.6232E-01	5.1400E-01	9.3760E-01	2.8929E 00
31 1	31 2	31 3	31 4	31 5
0.	0.	0.	5.0885E 00	2.0105E-01
31 6	31 7	31 8	31 9	31 10
1.1921E 00	1.9571E 00	2.6332E-01	5.1597E-01	9.4120E-01
31 11	32 1	32 2	32 3	32 4
2.9040E 00	0.	0.	0.	5.1217E 00
32 5	32 6	32 7	32 8	32 9
2.0236E-01	1.1998E 00	1.9699E 00	2.6504E-01	5.1933E-01
32 10	32 11	33 1	33 2	33 3
9.4733E-01	2.9229E 00	0.	0.	0.
33 4	33 5	33 6	33 7	33 8
5.1923E 00	2.0515E-01	1.2164E 00	1.9970E 00	2.6869E-01
33 9	33 10	33 11	34 1	34 2
5.2649E-01	9.6040E-01	2.9632E 00	0.	0.
34 3	34 4	34 5	34 6	34 7
0.	5.3774E 00	2.1246E-01	1.2597E 00	2.0682E 00
34 8	34 9	34 10	34 11	
2.7827E-01	5.4526E-01	9.9463E-01	3.0688E 00	

DATE 12/08/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
ZIRCONIUM		40.9100		1.51410E 02			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	4.2378E 00	4.1804E 00	2.1372E 00	4.6133E-03	-2.0607E 00	
2	6.065E 06	4.0071E 00	3.7490E 00	2.4121E 00	5.3605E-03	-1.5647E 00	
3	3.679E 06	4.1420E 00	2.9542E 00	2.8261E 00	6.5609E-03	-1.2909E 00	
4	2.231E 06	4.7147E 00	1.7754E 00	3.2992E 00	7.8022E-03	-1.3886E 00	
5	1.353E 06	6.0945E 00	7.9343E-01	4.0768E 00	9.5087E-03	-1.9794E 00	
6	8.208E 05	7.6936E 00	2.1954E-01	5.2004E 00	1.1505E-02	-2.4459E 00	
7	4.979E 05	8.6717E 00	1.9078E-01	6.5365E 00	1.3890E-02	-2.0946E 00	
8	3.020E 05	7.9743E 00	1.7544E-01	6.8122E 00	1.6830E-02	-1.1401E 00	
9	1.832E 05	8.5632E 00	1.8839E-01	7.7948E 00	2.1334E-02	-7.5386E-01	
10	6.738E 04	8.6817E 00	1.9100E-01	8.3505E 00	2.9573E-02	-3.2491E-01	
11	2.479E 04	8.3987E 00	1.8477E-01	8.2790E 00	4.1846E-02	-1.1735E-01	
12	9.119E 03	8.0998E 00	1.7820E-01	8.0387E 00	4.0716E-02	-5.9920E-02	
13	3.355E 03	7.3383E 00	1.6144E-01	7.2840E 00	3.6890E-02	-5.3273E-02	
14	1.234E 03	6.2049E 00	1.3651E-01	6.1590E 00	3.1193E-02	-4.5045E-02	
15	4.540E 02	8.1422E 00	1.7913E-01	8.0820E 00	4.5049E-01	-5.9109E-02	
16	8.719E 01	6.1929E 00	1.3624E-01	6.1471E 00	3.9649E-03	-4.4958E-02	
17	3.545E 01	6.2038E 00	1.3648E-01	6.1579E 00	4.9183E-03	-4.5037E-02	
18	1.304E 01	6.2135E 00	1.3670E-01	6.1676E 00	8.0150E-03	-4.5107E-02	
19	5.043E 00	6.2450E 00	1.3739E-01	6.1987E 00	1.3422E-02	-4.5336E-02	
20	1.445E 00	6.2745E 00	1.3804E-01	6.2281E 00	2.2755E-02	-4.5550E-02	
21	6.826E-01	6.1877E 00	1.3613E-01	6.1419E 00	3.6004E-02	-4.4920E-02	
22	2.511E-01	6.1473E 00	1.3524E-01	6.1018E 00	5.7994E-02	-4.4626E-02	
23	9.237E-02	6.1054E 00	1.3432E-01	6.0603E 00	9.9540E-02	-4.4323E-02	
24	2.530E-02	6.0747E 00	1.3364E-01	6.0298E 00	1.5416E-01	-4.4100E-02	
*4500	3.023E-01	6.1579E 00	1.3547E-01	6.1123E 00	6.2300E-02	-4.4704E-02	
*4000	2.718E-01	6.1579E 00	1.3547E-01	6.1123E 00	6.2300E-02	-4.4704E-02	
*3500	2.413E-01	6.1579E 00	1.3547E-01	6.1123E 00	6.2300E-02	-4.4704E-02	
*3000	2.109E-01	6.1579E 00	1.3547E-01	6.1123E 00	6.2300E-02	-4.4704E-02	
2500	1.804E-01	6.1528E 00	1.3536E-01	6.1073E 00	6.7400E-02	-4.4667E-02	
2000	1.499E-01	6.1460E 00	1.3521E-01	6.1005E 00	7.3900E-02	-4.4617E-02	
1500	1.194E-01	6.1357E 00	1.3499E-01	6.0903E 00	8.2800E-02	-4.4542E-02	
1000	8.897E-02	6.1204E 00	1.3465E-01	6.0751E 00	9.6000E-02	-4.4431E-02	
500	5.850E-02	6.0918E 00	1.3402E-01	6.0467E 00	1.1840E-01	-4.4224E-02	
68	3.216E-02	6.0253E 00	1.3256E-01	5.9807E 00	1.5960E-01	-4.3741E-02	

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

-----ZIRCONIUM-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	6.7152E 00	6.6662E 00	2.4963E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
5.6463E 00	5.4139E-01	1.5478E-05	0.	0.
22 21	22 22	22 23	22 24	22 25
5.1682E-01	5.3028E 00	3.5829E-01	4.3910E-04	1.3513E-05
23 21	23 22	23 23	23 24	23 25
3.5436E-05	1.1188E 00	4.7573E 00	2.7898E-01	3.3416E-02
24 21	24 22	24 23	24 24	24 25
0.	1.1092E-02	2.5037E 00	2.9005E 00	8.7712E-01
25 21	25 22	25 23	25 24	25 25
0.	7.8893E-04	7.2333E-01	2.1404E 00	3.8506E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	6.6555E 00	6.6063E 00	2.4865E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
5.6136E 00	5.7407E-01	7.8611E-06	0.	0.
22 21	22 22	22 23	22 24	22 26
4.6032E-01	5.3519E 00	3.6306E-01	3.0057E-04	7.0676E-06
23 21	23 22	23 23	23 24	23 26
1.3348E-05	1.0390E 00	4.8359E 00	2.7601E-01	2.9610E-02
24 21	24 22	24 23	24 24	24 26
0.	6.5899E-03	2.3933E 00	3.0041E 00	8.6664E-01
26 21	26 22	26 23	26 24	26 26
0.	1.3074E-04	5.0198E-01	2.0371E 00	4.0564E 00

ZIRCONIUM

--- THERMAL TRANSFER MATRICES ---

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	6.5956E 00	6.5468E 00	2.4890E-03	0.

		N1	N2		

SIGMA S (N1/N2)					

21 21	21 22	21 23	21 24	21 27	
5.5701E 00	6.1763E-01	3.4194E-06	0.	0.	
22 21	22 22	22 23	22 24	22 27	
4.0029E-01	5.4012E 00	3.7105E-01	1.9032E-04	3.2108E-06	
23 21	23 22	23 23	23 24	23 27	
4.0315E-06	9.5321E-01	4.9201E 00	2.7340E-01	2.5757E-02	
24 21	24 22	24 23	24 24	24 27	
0.	3.4962E-03	2.2711E 00	3.1211E 00	8.5310E-01	
27 21	27 22	27 23	27 24	27 27	
0.	0.	0.	0.	0.	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	6.5354E 00	6.4870E 00	2.4923E-03	0.

		N1	N2		
		SIGMA S (N1/N2)			
21 21	21 22	21 23	21 24	21 28	
5.5106E 00	6.7714E-01	1.1908E-06	0.	0.	
22 21	22 22	22 23	22 24	22 28	
3.3638E-01	5.4494E 00	3.8398E-01	1.0811E-04	1.1957E-06	
23 21	23 22	23 23	23 24	23 28	
8.9135E-07	8.6028E-01	5.0108E 00	2.7153E-01	2.1866E-02	
24 21	24 22	24 23	24 24	24 28	
0.	1.5831E-03	2.1347E 00	3.2550E 00	8.3565E-01	
28 21	28 22	28 23	28 24	28 28	
0.	3.7703E-05	3.9524E-01	1.9644E 00	4.1757E 00	

ZIRCONIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	6.4749E 00	6.4270E 00	2.4967E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
5.4267E 00	7.6106E-01	2.9613E-07	0.	0.
22 21	22 22	22 23	22 24	22 29
2.6844E-01	5.4936E 00	4.0491E-01	5.2367E-05	3.3130E-07
23 21	23 22	23 23	23 24	23 29
1.2406E-07	7.5845E-01	5.1089E 00	2.7105E-01	1.7964E-02
24 21	24 22	24 23	24 24	24 29
0.	5.6816E-04	1.9809E 00	3.4105E 00	8.1319E-01
29 21	29 22	29 23	29 24	29 29
0.	7.4611E-06	2.9355E-01	1.8718E 00	4.3096E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	6.4142E 00	6.3667E 00	2.5030E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
5.3100E 00	8.7772E-01	4.2318E-08	0.	0.
22 21	22 22	22 23	22 24	22 30
1.9692E-01	5.5275E 00	4.3970E-01	1.9742E-05	0.
23 21	23 22	23 23	23 24	23 30
0.	6.4520E-01	5.2158E 00	2.7330E-01	1.4078E-02
24 21	24 22	24 23	24 24	24 30
0.	1.4174E-04	1.8045E 00	3.5944E 00	7.8418E-01
30 21	30 22	30 23	30 24	30 30
0.	8.1472E-07	1.9967E-01	1.7521E 00	4.4624E 00

ZIRCONIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	6.3533E 00	6.3063E 00	2.5126E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
5.2360E 00	9.5171E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.2400E-01	5.5363E 00	5.0099E-01	4.8130E-06	0.
23 21	23 22	23 23	23 24	23 31
0.	5.1686E-01	5.3320E 00	2.8123E-01	1.0258E-02
24 21	24 22	24 23	24 24	24 31
0.	1.8975E-05	1.5974E 00	3.8174E 00	7.4657E-01
31 21	31 22	31 23	31 24	31 31
0.	0.	1.1761E-01	1.5946E 00	4.6411E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	6.2922E 00	6.2456E 00	2.5291E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
5.6091E 00	5.7864E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
5.6473E-02	5.4815E 00	6.2034E-01	4.8566E-07	0.
23 21	23 22	23 23	23 24	23 32
0.	3.6815E-01	5.4550E 00	3.0267E-01	6.5875E-03
24 21	24 22	24 23	24 24	24 32
0.	7.4935E-07	1.3449E 00	4.0968E 00	6.9787E-01
32 21	32 22	32 23	32 24	32 32
0.	0.	5.3003E-02	1.3813E 00	4.8578E 00

ZIRCONIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	6.2310E 00	6.1849E 00	2.5638E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
5.8394E 00	3.4834E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
6.1560E-02	5.2541E 00	8.3935E-01	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.9440E-01	5.5609E 00	3.6591E-01	3.2136E-03
24 21	24 22	24 23	24 24	24 33
0.	0.	1.0176E 00	4.4630E 00	6.3727E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	1.2883E-02	1.0794E 00	5.1387E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	6.1785E 00	6.1327E 00	2.6552E-03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
5.8472E 00	3.4055E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
1.0436E-01	5.8184E 00	2.2782E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	4.3166E-02	5.4969E 00	5.7650E-01	8.1840E-04
24 21	24 22	24 23	24 24	24 34
0.	0.	6.1838E-01	4.8892E 00	5.9139E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	7.4572E-04	6.8967E-01	5.4880E 00

ZIRCONIUM

TRANSFERS FROM GROUPS 1 THROUGH 6 TO GROUPS 1 THROUGH 16

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.3327E-00	1.6805E-01	4.2181E-02	2.1620E-01	4.2260E-01
1 6	1 7	1 8	1 9	1 10
4.4176E-01	3.0973E-01	1.6924E-01	9.9931E-02	3.0078E-02
1 11	1 12	1 13	1 14	1 15
4.5298E-03	6.3445E-04	8.8346E-05	1.1775E-05	1.7354E-06
1 16	2 1	2 2	2 3	2 4
1.3423E-07	0.	2.2169E-00	1.2960E-01	1.3109E-01
2 5	2 6	2 7	2 8	2 9
3.4601E-01	4.4211E-01	3.5294E-01	2.0930E-01	1.3075E-01
2 10	2 11	2 12	2 13	2 14
4.0993E-02	6.3064E-03	8.9040E-04	1.2435E-04	1.6593E-05
2 15	2 16	3 1	3 2	3 3
2.4464E-06	1.8925E-07	0.	0.	2.5416E-00
3 4	3 5	3 6	3 7	3 8
1.5878E-01	2.1266E-01	3.7492E-01	3.6815E-01	2.4866E-01
3 9	3 10	3 11	3 12	3 13
1.6992E-01	5.6824E-02	9.0407E-03	1.2928E-03	1.8137E-04
3 14	3 15	3 16	4 1	4 2
2.4246E-05	3.5771E-06	2.7679E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	3.5593E-00	2.5929E-01	2.0681E-01	2.5994E-01
4 8	4 9	4 10	4 11	4 12
2.0534E-01	1.5648E-01	5.6586E-02	9.3782E-03	1.3620E-03
4 13	4 14	4 15	4 16	5 1
1.9216E-04	2.5744E-05	3.8011E-06	2.9421E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	5.3735E-00	4.0842E-01
5 7	5 8	5 9	5 10	5 11
9.7547E-02	9.3687E-02	8.1925E-02	3.2690E-02	5.7043E-03
5 12	5 13	5 14	5 15	5 16
8.4484E-04	1.2005E-04	1.6128E-05	2.3837E-06	1.8458E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
7.3360E-00	3.2934E-01	1.1222E-02	1.1155E-02	4.8699E-03
6 11	6 12	6 13	6 14	6 15
8.9035E-04	1.3423E-04	1.9197E-05	2.5855E-06	3.8248E-07
6 16				
2.9626E-08				

ZIRCONIUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
2.9600E 02	5.5481E-01	7.2102E 01	5.4264E-04	0.

ZIRCONIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2

SIGMA N,G (N1/N2)

1 1	1 2	1 3	1 4	1 5
0.	1.1418E-03	1.5570E-03	1.1937E-02	1.1107E-02
1 6	1 7	1 8	1 9	1 10
1.7750E-02	2.6158E-02	0.	0.	7.9900E-01
1 11	2 1	2 2	2 3	2 4
1.3336E-02	0.	1.0367E-03	1.4137E-03	1.0839E-02
2 5	2 6	2 7	2 8	2 9
1.0085E-02	1.6116E-02	2.3751E-02	0.	0.
2 10	2 11	3 1	3 2	3 3
7.9900E-01	1.2109E-02	0.	1.0536E-03	1.4367E-03
3 4	3 5	3 6	3 7	3 8
1.1015E-02	1.0249E-02	1.6379E-02	2.4137E-02	0.
3 9	3 10	3 11	4 1	4 2
0.	7.9900E-01	1.2306E-02	0.	1.0976E-03
4 3	4 4	4 5	4 6	4 7
1.4968E-03	1.1475E-02	1.0677E-02	1.7063E-02	2.5146E-02
4 8	4 9	4 10	4 11	5 1
0.	0.	7.9831E-01	1.2820E-02	0.
5 2	5 3	5 4	5 5	5 6
1.2229E-03	1.6676E-03	1.2785E-02	1.1896E-02	1.9011E-02
5 7	5 8	5 9	5 10	5 11
2.8016E-02	0.	0.	7.0989E-01	1.4283E-02
6 1	6 2	6 3	6 4	6 5
0.	1.3954E-03	1.9028E-03	1.4588E-02	1.3574E-02
6 6	6 7	6 8	6 9	6 10
2.1692E-02	3.1968E-02	0.	0.	4.0882E-02
6 11	7 1	7 2	7 3	7 4
1.6298E-02	0.	1.6230E-03	2.2132E-03	1.6968E-02
7 5	7 6	7 7	7 8	7 9
1.5787E-02	2.5230E-02	3.7181E-02	0.	0.
7 10	7 11	8 1	8 2	8 3
0.	1.8956E-02	0.	1.9212E-03	2.6198E-03
8 4	8 5	8 6	8 7	8 8
2.0085E-02	1.8688E-02	2.9866E-02	4.4013E-02	0.
8 9	8 10	8 11	9 1	9 2
0.	0.	2.2439E-02	0.	2.3948E-03
9 3	9 4	9 5	9 6	9 7
3.2656E-03	2.5036E-02	2.3295E-02	3.7228E-02	5.4862E-02
9 8	9 9	9 10	9 11	10 1
0.	0.	0.	2.7970E-02	0.

ZIRCONIUM

		N1		N2	
SIGMA N,G (N1/N2)					
19	3	19	4	19	5
2.0133E-03		1.5435E-02		1.4362E-02	
19	8	19	9	19	10
0.		0.		0.	
20	2	20	3	20	4
2.5031E-03		3.4133E-03		2.6168E-02	
20	7	20	8	20	9
5.7343E-02		0.		0.	
21	1	21	2	21	3
0.		3.9604E-03		5.4006E-03	
21	6	21	7	21	8
6.1567E-02		9.0730E-02		0.	
21	11	22	1	22	2
4.6257E-02		0.		6.3793E-03	
22	5	22	6	22	7
6.2054E-02		9.9170E-02		1.4614E-01	
22	10	22	11	23	1
0.		7.4508E-02		0.	
23	4	23	5	23	6
1.1447E-01		1.0651E-01		1.7021E-01	
23	9	23	10	23	11
0.		0.		1.2789E-01	
24	3	24	4	24	5
2.3068E-02		1.7686E-01		1.6456E-01	
24	8	24	9	24	10
0.		0.		0.	
25	2	25	3	25	4
2.6590E-02		3.6259E-02		2.7799E-01	
25	7	25	8	25	9
6.0916E-01		0.		0.	
26	1	26	2	26	3
0.		2.6612E-02		3.6289E-02	
26	6	26	7	26	8
4.1370E-01		6.0966E-01		0.	
26	11	27	1	27	2
3.1082E-01		0.		2.6639E-02	
27	5	27	6	27	7
2.5912E-01		4.1411E-01		6.1027E-01	
27	10	27	11	28	1
0.		3.1113E-01		0.	
				2.6674E-02	
				3.6373E-02	

ZIRCONIUM

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
2.7886E-01	2.5946E-01	4.1466E-01	6.1107E-01	0.
28 9	28 10	28 11	29 1	29 2
0.	0.	3.1154E-01	0.	2.6721E-02
29 3	29 4	29 5	29 6	29 7
3.6438E-02	2.7936E-01	2.5992E-01	4.1539E-01	6.1216E-01
29 8	29 9	29 10	29 11	30 1
0.	0.	0.	3.1209E-01	0.
30 2	30 3	30 4	30 5	30 6
2.6788E-02	3.6529E-02	2.8006E-01	2.6058E-01	4.1644E-01
30 7	30 8	30 9	30 10	30 11
6.1370E-01	0.	0.	0.	3.1288E-01
31 1	31 2	31 3	31 4	31 5
0.	2.6892E-02	3.6670E-02	2.8114E-01	2.6158E-01
31 6	31 7	31 8	31 9	31 10
4.1804E-01	6.1606E-01	0.	0.	0.
31 11	32 1	32 2	32 3	32 4
3.1409E-01	0.	2.7068E-02	3.6910E-02	2.8298E-01
32 5	32 6	32 7	32 8	32 9
2.6329E-01	4.2078E-01	6.2010E-01	0.	0.
32 10	32 11	33 1	33 2	33 3
0.	3.1614E-01	0.	2.7439E-02	3.7417E-02
33 4	33 5	33 6	33 7	33 8
2.8687E-01	2.6691E-01	4.2656E-01	6.2861E-01	0.
33 9	33 10	33 11	34 1	34 2
0.	0.	3.2048E-01	0.	2.8418E-02
34 3	34 4	34 5	34 6	34 7
3.8752E-02	2.9710E-01	2.7643E-01	4.4178E-01	6.5104E-01
34 8	34 9	34 10	34 11	
0.	0.	0.	3.3192E-01	

DATE 12/15/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
MANGANESE		25.5500		9.11913E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	3.1120E 00	3.3118E 00	1.6126E 00	8.9451E-04	-1.4480E 00	
2	6.065E 06	3.5469E 00	3.0615E 00	1.8194E 00	1.0805E-03	-1.6682E 00	
3	3.679E 06	3.6637E 00	2.6073E 00	2.4295E 00	1.5654E-03	-1.1919E 00	
4	2.231E 06	3.5897E 00	2.0026E 00	2.7626E 00	2.3266E-03	-7.9864E-01	
5	1.353E 06	3.3744E 00	1.3195E 00	2.7562E 00	3.1797E-03	-5.9696E-01	
6	8.208E 05	3.1353E 00	7.6477E-01	2.6654E 00	3.8223E-03	-4.5375E-01	
7	4.979E 05	3.6374E 00	4.5716E-01	3.1931E 00	4.5851E-03	-4.2907E-01	
8	3.020E 05	3.5140E 00	2.8781E-01	3.2072E 00	7.7249E-03	-2.9630E-01	
9	1.832E 05	4.2162E 00	1.9879E-01	4.0274E 00	1.2538E-02	-1.8233E-01	
10	6.738E 04	7.4041E 00	2.6858E-01	7.3125E 00	2.4089E-02	-8.8475E-02	
11	2.479E 04	1.1866E 01	4.3074E-01	1.1721E 01	3.1511E-02	-1.3980E-01	
12	9.119E 03	3.2075E 01	1.1643E 00	3.1684E 01	3.7314E-02	-3.7790E-01	
13	3.355E 03	1.0839E 02	3.9346E 00	1.0707E 02	1.5267E-01	-1.2770E 00	
14	1.234E 03	4.2119E 01	1.5289E 00	4.1605E 01	9.4735E-01	-4.9622E-01	
15	4.540E 02	3.4689E 02	1.2592E 01	3.4266E 02	6.7451E 00	-4.0869E 00	
16	8.719E 01	6.3845E 00	2.3176E-01	6.3066E 00	3.6667E-01	-7.5219E-02	
17	3.545E 01	2.8327E 00	1.0283E-01	2.7982E 00	3.6177E-01	-3.3374E-02	
18	1.304E 01	2.3977E 00	8.7036E-02	2.3684E 00	5.8587E-01	-2.8248E-02	
19	5.043E 00	2.1728E 00	7.8871E-02	2.1462E 00	9.8430E-01	-2.5598E-02	
20	1.445E 00	2.2211E 00	8.0625E-02	2.1940E 00	1.6687E 00	-2.6168E-02	
21	6.826E-01	2.2551E 00	8.1861E-02	2.2276E 00	2.6453E 00	-2.6569E-02	
22	2.511E-01	2.4597E 00	8.9287E-02	2.4297E 00	4.2740E 00	-2.8979E-02	
23	9.237E-02	2.7907E 00	1.0130E-01	2.7566E 00	7.3140E 00	-3.2878E-02	
24	2.530E-02	2.8422E 00	1.0317E-01	2.8075E 00	1.1336E 01	-3.3486E-02	
* 4500	3.023E-01	2.4640E 00	8.9443E-02	2.4339E 00	4.5720E 00	-2.9030E-02	
* 4000	2.718E-01	2.4640E 00	8.9443E-02	2.4339E 00	4.5720E 00	-2.9030E-02	
* 3500	2.413E-01	2.4640E 00	8.9443E-02	2.4339E 00	4.5720E 00	-2.9030E-02	
* 3000	2.109E-01	2.4640E 00	8.9443E-02	2.4339E 00	4.5720E 00	-2.9030E-02	
2500	1.804E-01	2.4960E 00	9.0605E-02	2.4655E 00	4.9430E 00	-2.9407E-02	
2000	1.499E-01	2.5360E 00	9.2057E-02	2.5051E 00	5.4220E 00	-2.9878E-02	
1500	1.194E-01	2.5820E 00	9.3727E-02	2.5505E 00	6.0750E 00	-3.0420E-02	
1000	8.897E-02	2.6310E 00	9.5505E-02	2.5989E 00	7.0390E 00	-3.0997E-02	
500	5.850E-02	2.6600E 00	9.6558E-02	2.6275E 00	8.6810E 00	-3.1339E-02	
68	3.216E-02	2.5630E 00	9.3037E-02	2.5317E 00	1.1710E 01	-3.0196E-02	

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

MANGANESE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	2.9113E 00	2.8758E 00	1.7727E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.0108E 00	2.4422E-01	1.3710E-04	0.	0.	0.
22	21	22	22	22	23
2.6359E-01	2.0358E 00	1.7988E-01	1.0640E 00	9.1297E-05	9.1297E-05
23	21	23	22	23	23
4.7200E-04	6.5187E-01	2.0223E 00	1.4999E-01	2.9039E-02	2.9039E-02
24	21	24	22	24	23
6.7052E-07	3.4162E-02	1.3880E 00	1.1528E 00	4.3626E-01	4.3626E-01
25	21	25	22	25	23
0.	6.1110E-03	5.7095E-01	9.3076E-01	1.4035E 00	1.4035E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	2.8721E 00	2.8370E 00	1.7741E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.9971E 00	2.5791E-01	9.0524E-05	0.	0.	0.
22	21	22	22	22	23
2.3459E-01	2.0609E 00	1.8210E-01	8.3241E-04	5.9854E-05	5.9854E-05
23	21	23	22	23	23
2.3578E-04	6.0594E-01	2.0656E 00	1.4925E-01	2.6521E-02	2.6521E-02
24	21	24	22	24	23
1.5458E-07	2.3525E-02	1.3358E 00	1.1984E 00	4.3643E-01	4.3643E-01
26	21	26	22	26	23
0.	3.4745E-03	4.9895E-01	9.2226E-01	1.4474E 00	1.4474E 00

-----MANGANESE-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	2.8325E 00	2.7979E 00	1.7759E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
1.9790E 00	2.7606E-01	5.4687E-05	0.	0.
22 21	22 22	22 23	22 24	22 27
2.0378E-01	2.0864E 00	1.8578E-01	6.2083E-04	3.5972E-05
23 21	23 22	23 23	23 24	23 27
1.0107E-04	5.5630E-01	2.1125E 00	1.4865E-01	2.3884E-02
24 21	24 22	24 23	24 24	24 27
0.	1.4961E-02	1.2761E 00	1.2506E 00	4.3556E-01
27 21	27 22	27 23	27 24	27 27
0.	1.7477E-03	4.2520E-01	9.0939E-01	1.4962E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	2.7476E 00	2.7140E 00	1.7783E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
1.9544E 00	3.0070E-01	2.9112E-05	0.	0.
22 21	22 22	22 23	22 24	22 28
1.7100E-01	2.1115E 00	1.9172E-01	4.3337E-04	1.9152E-05
23 21	23 22	23 23	23 24	23 28
3.4938E-05	5.0224E-01	2.1636E 00	1.4835E-01	2.1130E-02
24 21	24 22	24 23	24 24	24 28
0.	8.5152E-03	1.2075E 00	1.3111E 00	4.3327E-01
28 21	28 22	28 23	28 24	28 28
0.	7.4042E-04	3.5036E-01	8.9060E-01	1.5509E 00

MANGANESE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	2.7523E 00	2.7187E 00	1.7814E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.9200E 00	3.3512E-01	1.2812E-05	0.	21	24
22	21	22	22	22	24
1.3619E-01	2.1350E 00	2.0132E-01	2.7477E-04	22	29
23	21	23	22	23	24
8.7891E-06	4.4275E-01	2.2196E 00	1.4872E-01	23	29
24	21	24	22	24	24
0.	4.1207E-03	1.1278E 00	1.3824E 00	24	29
29	21	29	22	29	24
0.	2.4369E-04	2.7540E-01	8.6356E-01	29	29
					1.6131E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	2.7118E 00	2.6787E 00	1.7859E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.8730E 00	3.8216E-01	4.1144E-06	0.	21	24
22	21	22	22	22	24
9.9631E 00	2.1539E 00	2.1724E-01	1.5013E-04	22	30
23	21	23	22	23	24
1.3396E-06	3.7639E-01	2.2811E 00	1.5048E-01	23	30
24	21	24	22	24	24
0.	1.5490E-03	1.0344E 00	1.4685E 00	24	30
30	21	30	22	30	24
0.	5.3968E-05	2.0183E-01	8.2467E-01	30	30
					1.6852E 00

MANGANESE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	2.6709E 00	2.6383E 00	1.7928E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
1.8471E 00	4.0798E-01	6.8576E-07	0.	0.
22 21	22 22	22 23	22 24	22 31
6.2486E-02	2.1613E 00	2.4513E-01	6.3603E-05	5.9745E-07
23 21	23 22	23 23	23 24	23 31
0.	3.0106E-01	2.3487E 00	1.5522E-01	1.2201E-02
24 21	24 22	24 23	24 24	24 31
0.	3.7901E-04	9.2246E-01	1.5755E 00	4.1114E-01
31 21	31 22	31 23	31 24	31 31
0.	6.0528E-06	1.3206E-01	7.6800E-01	1.7708E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	2.6298E 00	2.5977E 00	1.8045E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
2.0118E 00	2.4332E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
2.8275E-02	2.1400E 00	2.9875E-01	1.6262E-05	0.
23 21	23 22	23 23	23 24	23 32
0.	2.1382E-01	2.4211E 00	1.6715E-01	9.0105E-03
24 21	24 22	24 23	24 24	24 32
0.	4.0274E-05	7.8350E-01	1.7143E 00	3.9463E-01
32 21	32 22	32 23	32 24	32 32
0.	1.7797E-07	7.0154E-02	6.8309E-01	1.8765E 00

MANGANESE

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	2.5885E 00	2.5569E 00	1.8293E 01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 33
2.0986E 00	1.5652E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
2.7160E-02	2.0448E 00	3.9290E-01	1.0632E-06	0.
23 21	23 22	23 23	23 24	23 33
0.	1.1223E-01	2.4861E 00	2.0105E-01	5.6863E-03
24 21	24 22	24 23	24 24	24 33
0.	5.5947E-07	5.9947E-01	1.9053E 00	3.7083E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	2.3181E-02	5.4918E-01	2.0162E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	2.5530E 00	2.5219E 00	1.8945E 01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 34
2.1056E 00	1.4955E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
4.2447E-02	2.3143E 00	1.0515E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	2.4597E-02	2.4631E 00	3.0951E-01	2.5718E-03
24 21	24 22	24 23	24 24	24 34
0.	0.	3.6775E-01	2.1428E 00	3.5048E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	2.5939E-03	3.5734E-01	2.1931E 00

MANGANESE

TRANSFERS FROM GROUPS 1 THROUGH 9 TO GROUPS 1 THROUGH 16

N1 N2
SIGMA S0 (N1/N2)

1.4618E 00	2.0256E-01	4.3134E-02	1.9857E-01	3.6177E-01
3.6147E-01	2.4633E-01	1.3225E-01	7.7158E-02	2.3024E-02
3.4520E-03	4.8268E-04	6.7170E-05	8.9508E-06	1.3191E-06
1.0202E-07	0.	1.9380E 00	1.2647E-01	1.3263E-01
3.2432E-01	3.9424E-01	3.0486E-01	1.7722E-01	1.0921E-01
3.3903E-02	5.1890E-03	7.3122E-04	1.0205E-04	1.3613E-05
2.0069E-06	1.5525E-07	0.	0.	1.9717E 00
1.9152E-01	2.4085E-01	3.9997E-01	3.7784E-01	2.4904E-01
1.6733E-01	5.5280E-02	8.7394E-03	1.2467E-03	1.7476E-04
2.3353E-05	3.4450E-06	2.6656E-07	0.	0.
0.	2.0834E 00	2.7028E-01	2.9946E-01	3.6141E-01
2.7822E-01	2.0824E-01	7.4338E-02	1.2237E-02	1.7727E-03
2.4987E-04	3.3464E-05	4.9402E-06	3.8237E-07	0.
0.	0.	0.	2.3701E 00	2.9343E-01
2.2837E-01	2.1321E-01	1.8277E-01	7.1908E-02	1.2455E-02
1.8395E-03	2.6112E-04	3.5067E-05	5.1821E-06	4.0123E-07
0.	0.	0.	0.	0.
2.4343E 00	3.2159E-01	1.4604E-01	1.5080E-01	6.7759E-02
1.2585E-02	1.9090E-03	2.7363E-04	3.6887E-05	5.4585E-06
4.2285E-07	0.	0.	0.	0.

MANGANESE

N1		N2		
SIGMA S0 (N1/N2)				
7 5	7 6	7 7	7 8	7 9
0.	0.	2.9944E-00	3.6753E-01	1.6664E-01
7 10	7 11	7 12	7 13	7 14
8.7822E-02	1.7743E-02	2.7803E-03	4.0329E-04	5.4618E-05
7 15	7 16	8 1	8 2	8 3
8.0957E-06	6.2755E-07	0.	0.	0.
8 4	8 5	8 6	8 7	8 8
0.	0.	0.	0.	3.0528E-00
8 9	8 10	8 11	8 12	8 13
3.5003E-01	8.7813E-02	1.9656E-02	3.2052E-03	4.7177E-04
8 14	8 15	8 16	9 1	9 2
6.4259E-05	9.5443E-06	7.4042E-07	0.	0.
9 3	9 4	9 5	9 6	9 7
0.	0.	0.	0.	0.
9 8	9 9	9 10	9 11	9 12
0.	3.9948E-00	1.9752E-01	1.9906E-02	3.4024E-03
9 13	9 14	9 15	9 16	
5.0953E-04	6.9872E-05	1.0403E-05	8.0780E-07	

MANGANESE

RESONANCE	RESONANCE	PEAK		
ENERGY	INTEGRAL	CROSS SECTION	R	ETA
3.3700E 02	9.1191E 00	9.0996E 01	4.6994E-06	0.

MANGANESE

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
1	1	1	2	1	3
0.		0.		3.7685E-03	2.3500E-03
1	6	1	7	1	8
2.6252E-03		5.2928E-04		8.0450E-04	4.4459E-04
1	11	2	1	2	2
2.6749E-03		0.		0.	3.5177E-03
2	5	2	6	2	7
1.9367E-03		2.4505E-03		4.9406E-04	7.5097E-04
2	10	2	11	3	1
9.1183E-05		2.4969E-03		0.	0.
3	4	3	5	3	6
2.6113E-03		2.3055E-03		2.9171E-03	5.8813E-04
3	9	3	10	3	11
4.9403E-04		1.0854E-04		2.9723E-03	0.
4	3	4	4	4	5
5.4043E-03		3.3701E-03		2.9754E-03	3.7648E-03
4	8	4	9	4	10
1.1537E-03		4.1925E-01		2.9311E-01	3.8361E-03
5	2	5	3	5	4
0.		6.7068E-03		4.1823E-03	3.6925E-03
5	7	5	8	5	9
9.4197E-04		1.4318E-03		6.4089E-02	2.7835E-01
6	1	6	2	6	3
0.		0.		7.5670E-03	4.7188E-03
6	6	6	7	6	8
5.2714E-03		1.0628E-03		1.6154E-03	8.9274E-04
6	11	7	1	7	2
5.3712E-03		0.		0.	8.7169E-03
7	5	7	6	7	7
4.7992E-03		6.0724E-03		1.2243E-03	1.8609E-03
7	10	7	11	8	1
7.4560E-02		6.1873E-03		0.	0.
8	4	8	5	8	6
8.9285E-03		7.8829E-03		9.9742E-03	2.0109E-03
8	9	8	10	8	11
1.6892E-03		6.5722E-02		1.0163E-02	0.
9	3	9	4	9	5
2.2817E-02		1.4229E-02		1.2562E-02	1.5895E-02
9	8	9	9	9	10
4.8711E-03		2.6919E-03		2.1378E-02	1.6196E-02
					0.

MANGANESE

N1 N2
SIGMA N,G (N1/N2)

10 2	10 3	10 4	10 5	10 6
0.	4.3286E-02	2.6993E-02	2.3831E-02	3.0154E-02
10 7	10 8	10 9	10 10	10 11
6.0795E-03	9.2408E-03	5.1067E-03	1.1220E-03	3.0725E-02
11 1	11 2	11 3	11 4	11 5
0.	0.	5.6286E-02	3.5099E-02	3.0989E-02
11 6	11 7	11 8	11 9	11 10
3.9210E-02	7.9053E-03	1.2016E-02	6.6404E-03	1.4590E-03
11 11	12 1	12 2	12 3	12 4
3.9952E-02	0.	0.	6.6504E-02	4.1472E-02
12 5	12 6	12 7	12 8	12 9
3.6615E-02	4.6329E-02	9.3405E-03	1.4198E-02	7.8460E-03
12 10	12 11	13 1	13 2	13 3
1.7239E-03	4.7206E-02	0.	0.	2.7188E-01
13 4	13 5	13 6	13 7	13 8
1.6954E-01	1.4969E-01	1.8940E-01	3.8186E-02	5.8042E-02
13 9	13 10	13 11	14 1	14 2
3.2076E-02	7.0475E-03	1.9298E-01	0.	0.
14 3	14 4	14 5	14 6	14 7
1.6866E 00	1.0517E 00	9.2856E-01	1.1749E 00	2.3688E-01
14 8	14 9	14 10	14 11	15 1
3.6006E-01	1.9898E-01	4.3718E-02	1.1972E 00	0.
15 2	15 3	15 4	15 5	15 6
0.	1.2007E 01	7.4875E 00	6.6106E 00	8.3644E 00
15 7	15 8	15 9	15 10	15 11
1.6864E 00	2.5633E 00	1.4166E 00	3.1124E-01	8.5227E 00
16 1	16 2	16 3	16 4	16 5
0.	0.	6.5268E-01	4.0701E-01	3.5934E-01
16 6	16 7	16 8	16 9	16 10
4.5468E-01	9.1669E-02	1.3934E-01	7.7002E-02	1.6918E-02
16 11	17 1	17 2	17 3	17 4
4.6328E-01	0.	0.	6.4395E-01	4.0157E-01
17 5	17 6	17 7	17 8	17 9
3.5454E-01	4.4860E-01	9.0443E-02	1.3747E-01	7.5972E-02
17 10	17 11	18 1	18 2	18 3
1.6692E-02	4.5709E-01	0.	0.	1.0429E 00
18 4	18 5	18 6	18 7	18 8
6.5032E-01	5.7415E-01	7.2648E-01	1.4647E-01	2.2263E-01
18 9	18 10	18 11	19 1	19 2
1.2303E-01	2.7032E-02	7.4023E-01	0.	0.

MANGANESE.

N1		N2		SIGMA N,G (N1/N2)	
19 3	19 4	19 5	19 6	19 7	
1.7521E-00	1.0926E-00	9.6461E-01	1.2205E-00	2.4608E-01	
19 8	19 9	19 10	19 11	20 1	
3.7403E-01	2.0670E-01	4.5416E-02	1.2436E-00	0.	
20 2	20 3	20 4	20 5	20 6	
0.	2.9703E-00	1.8523E-00	1.6353E-00	2.0692E-00	
20 7	20 8	20 9	20 10	20 11	
4.1718E-01	6.3411E-01	3.5043E-01	7.6994E-02	2.1083E-00	
21 1	21 2	21 3	21 4	21 5	
0.	0.	4.7086E-00	2.9363E-00	2.5924E-00	
21 6	21 7	21 8	21 9	21 10	
3.2802E-00	6.6133E-01	1.0052E-00	5.5551E-01	1.2205E-01	
21 11	22 1	22 2	22 3	22 4	
3.3422E-00	0.	0.	7.6077E-00	4.7441E-00	
22 5	22 6	22 7	22 8	22 9	
4.1885E-00	5.2998E-00	1.0685E-00	1.6241E-00	8.9754E-01	
22 10	22 11	23 1	23 2	23 3	
1.9720E-01	5.4001E-00	0.	0.	1.3019E-01	
23 4	23 5	23 6	23 7	23 8	
8.1185E-00	7.1677E-00	9.0694E-00	1.8285E-00	2.7793E-00	
23 9	23 10	23 11	24 1	24 2	
1.5359E-00	3.3747E-01	9.2410E-00	0.	0.	
24 3	24 4	24 5	24 6	24 7	
2.0075E-01	1.2519E-01	1.1052E-01	1.3985E-01	2.8195E-00	
24 8	24 9	24 10	24 11	25 1	
4.2856E-00	2.3684E-00	5.2037E-01	1.4249E-01	0.	
25 2	25 3	25 4	25 5	25 6	
0.	3.1554E-01	1.9677E-01	1.7372E-01	2.1981E-01	
25 7	25 8	25 9	25 10	25 11	
4.4317E-00	6.7363E-00	3.7227E-00	8.1792E-01	2.2397E-01	
26 1	26 2	26 3	26 4	26 5	
0.	0.	3.1579E-01	1.9693E-01	1.7386E-01	
26 6	26 7	26 8	26 9	26 10	
2.1999E-01	4.4352E-00	6.7416E-00	3.7256E-00	8.1857E-01	
26 11	27 1	27 2	27 3	27 4	
2.2415E-01	0.	0.	3.1611E-01	1.9712E-01	
27 5	27 6	27 7	27 8	27 9	
1.7404E-01	2.2021E-01	4.4397E-00	6.7484E-00	3.7294E-00	
27 10	27 11	28 1	28 2	28 3	
8.1940E-01	2.2438E-01	0.	0.	3.1654E-01	

MANGANESE

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
1.9739E 01		1.7427E 01		2.2051E 01	
28	9	28	10	28	11
3.7344E 00		8.2051E-01		2.2468E 01	
29	3	29	4	29	5
3.1709E 01		1.9774E 01		1.7458E 01	
29	8	29	9	29	10
6.7693E 00		3.7409E 00		8.2194E-01	
30	2	30	3	30	4
0.		3.1789E 01		1.9823E 01	
30	7	30	8	30	9
4.4647E 00		6.7864E 00		3.7504E 00	
31	1	31	2	31	3
0.		0.		3.1912E 01	
31	6	31	7	31	8
2.2231E 01		4.4820E 00		6.8126E 00	
31	11	32	1	32	2
2.2651E 01		0.		0.	
32	5	32	6	32	7
1.7684E 01		2.2376E 01		4.5112E 00	
32	10	32	11	33	1
8.3260E-01		2.2799E 01		0.	
33	4	33	5	33	6
2.0305E 01		1.7927E 01		2.2683E 01	
33	9	33	10	33	11
3.8415E 00		8.4404E-01		2.3113E 01	
34	3	34	4	34	5
3.3722E 01		2.1029E 01		1.8566E 01	
34	8	34	9	34	10
7.1991E 00		3.9784E 00		8.7412E-01	
				2.3936E 01	

DATE 12/15/60

DESIGNATION	CODE NO.	DENSITY FACTOR
COBALT	27.5900	9.78503E 01

LEVEL	ENERGY	SIGMA SCATTER	XL SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1
1	1.000E 07	3.3880E 00	3.3118E 00	1.6126E 00	8.9451E-04	-1.7180E 00
2	6.065E 06	3.6677E 00	3.0615E 00	1.8194E 00	1.0805E-03	-1.7886E 00
3	3.679E 06	3.6172E 00	2.6073E 00	2.4295E 00	1.5654E-03	-1.1494E 00
4	2.231E 06	3.4062E 00	2.0026E 00	2.7626E 00	2.3266E-03	-6.2274E-01
5	1.353E 06	3.3459E 00	1.3195E 00	2.7562E 00	3.1797E-03	-5.7070E-01
6	8.208E 05	3.5688E 00	7.6477E-01	2.6654E 00	3.8223E-03	-8.7423E-01
7	4.979E 05	3.9720E 00	4.5716E-01	3.1931E 00	4.5851E-03	-7.5373E-01
8	3.020E 05	4.3013E 00	2.8781E-01	3.2072E 00	7.7249E-03	-1.0588E 00
9	1.832E 05	5.6056E 00	2.1710E-01	4.6771E 00	1.2538E-02	-8.9846E-01
10	6.738E 04	5.7003E 00	1.9265E-01	5.6318E 00	2.4125E-02	-6.6326E-02
11	2.479E 04	1.1486E 01	3.8823E-01	1.1355E 01	3.0792E-02	-1.2671E-01
12	9.119E 03	1.9730E 01	6.6689E-01	1.9505E 01	2.8275E-02	-2.1766E-01
13	3.355E 03	5.7191E 01	1.9330E 00	5.6539E 01	9.7961E-02	-6.3093E-01
14	1.234E 03	3.5418E 00	1.1971E-01	3.5015E 00	6.8352E-03	-3.9073E-02
15	4.540E 02	1.0191E 01	3.4446E-01	1.0075E 01	2.0355E-01	-1.1243E-01
16	8.719E 01	4.2708E 02	1.4435E 01	4.2221E 02	4.3027E 01	-4.7116E 00
17	3.545E 01	8.5954E 00	2.9053E-01	8.4975E 00	1.0415E 00	-9.4825E-02
18	1.304E 01	7.3703E 00	2.4911E-01	7.2862E 00	1.6479E 00	-8.1308E-02
19	5.043E 00	6.8683E 00	2.3215E-01	6.7900E 00	2.7731E 00	-7.5771E-02
20	1.445E 00	6.7494E 00	2.2813E-01	6.6724E 00	4.6830E 00	-7.4459E-02
21	6.826E-01	6.2916E 00	2.1265E-01	6.2198E 00	7.4148E 00	-6.9408E-02
22	2.511E-01	6.2534E 00	2.1137E-01	6.1822E 00	1.1980E 01	-6.8988E-02
23	9.237E-02	5.8223E 00	1.9679E-01	5.7559E 00	2.0501E 01	-6.4231E-02
24	2.530E-02	5.6982E 00	1.9260E-01	5.6353E 00	3.1774E 01	-6.0870E-02
*4500	3.023E-01	4.6200E 00	1.5616E-01	4.6131E 00	1.2816E 01	-6.7062E-03
*4000	2.718E-01	4.6200E 00	1.5616E-01	4.6131E 00	1.2816E 01	-6.7062E-03
*3500	2.413E-01	4.6200E 00	1.5616E-01	4.6131E 00	1.2816E 01	-6.7062E-03
*3000	2.109E-01	4.6200E 00	1.5616E-01	4.6131E 00	1.2816E 01	-6.7062E-03
2500	1.804E-01	4.3400E 00	1.4669E-01	4.3335E 00	1.3856E 01	-6.2998E-03
2000	1.499E-01	4.3300E 00	1.4635E-01	4.3235E 00	1.5197E 01	-6.2417E-03
1500	1.194E-01	3.8000E 00	1.2844E-01	3.7943E 00	1.7028E 01	-5.5160E-03
1000	8.897E-02	3.2000E 00	1.0816E-01	3.1952E 00	1.9730E 01	-4.6450E-03
500	5.850E-02	2.5600E 00	8.6548E-02	2.5562E 00	2.4333E 01	-3.7160E-03
68	3.216E-02	3.0000E 00	1.0140E-01	2.9955E 00	3.2815E 01	-4.3547E-03

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

COBALI

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	4.6157E 00	4.6088E 00	5.1032E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
5.6301E 00	6.6122E-01	2.6385E-04	0.	0.
22 21	22 22	22 23	22 24	22 25
6.4818E-01	5.2086E 00	4.4331E-01	2.1871E-03	1.6684E-04
23 21	23 22	23 23	23 24	23 25
6.6621E-04	1.3161E 00	4.2656E 00	3.0661E-01	5.5935E-02
24 21	24 22	24 23	24 24	24 25
5.5633E-07	5.4934E-02	2.7244E 00	2.3648E 00	8.7000E-01
25 21	25 22	25 23	25 24	25 25
0.	6.9508E-03	8.4240E-01	1.4817E 00	2.2847E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	4.5568E 00	4.5500E 00	5.1073E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
5.5928E 00	6.9859E-01	1.6925E-04	0.	0.
22 21	22 22	22 23	22 24	22 26
5.7691E-01	5.2705E 00	4.4877E-01	1.6854E-03	1.0664E-04
23 21	23 22	23 23	23 24	23 26
3.2248E-04	1.2231E 00	4.3539E 00	3.0480E-01	5.0881E-02
24 21	24 22	24 23	24 24	24 26
1.1775E-07	3.7199E-02	2.6191E 00	2.4573E 00	8.6885E-01
26 21	26 22	26 23	26 24	26 26
0.	3.8455E-03	7.3306E-01	1.4657E 00	2.3542E 00

COBALT

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	4.4974E 00	4.4907E 00	5.1125E 01	0.

		N1	N2	SIGMA S (N1/N2)	
21 21	21 22	21 23	21 24	21 27	
5.5433E 00	7.4820E-01	9.8645E-05	0.	0.	
22 21	22 22	22 23	22 24	22 27	
5.0119E-01	5.3331E 00	4.5788E-01	1.2336E-03	6.2117E-05	
23 21	23 22	23 23	23 24	23 27	
1.3296E-04	1.1227E 00	4.4495E 00	3.0326E-01	4.5618E-02	
24 21	24 22	24 23	24 24	24 27	
0.	2.3175E-02	2.4993E 00	2.5629E 00	8.6546E-01	
27 21	27 22	27 23	27 24	27 27	
0.	1.8701E-03	6.2171E-01	1.4424E 00	2.4314E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	4.4376E 00	4.4309E 00	5.1193E 01	0.

		N1	N2	SIGMA S (N1/N2)	
21 21	21 22	21 23	21 24	21 28	
5.4759E 00	8.1560E-01	5.0146E-05	0.	0.	
22 21	22 22	22 23	22 24	22 28	
4.2063E-01	5.3948E 00	4.7263E-01	8.4102E-04	3.1785E-05	
23 21	23 22	23 23	23 24	23 28	
4.3736E-05	1.0134E 00	4.5533E 00	3.0237E-01	4.0148E-02	
24 21	24 22	24 23	24 24	24 28	
0.	1.2852E-02	2.3622E 00	2.6851E 00	8.5905E-01	
28 21	28 22	28 23	28 24	28 28	
0.	7.5906E-04	5.0940E-01	1.4096E 00	2.5178E 00	

COBALT

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	4.3773E 00	4.3707E 00	5.1284E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
5.3816E 00	9.0990E-01	2.0748E-05	0.	0.
22 21	22 22	22 23	22 24	22 29
3.3509E-01	5.4524E 00	4.9649E-01	5.1726E-04	1.3443E-05
23 21	23 22	23 23	23 24	23 29
1.0304E-05	8.9330E-01	4.6668E 00	3.0288E-01	3.4482E-02
24 21	24 22	24 23	24 24	24 29
0.	6.0124E-03	2.2040E 00	2.8289E 00	8.4854E-01
29 21	29 22	29 23	29 24	29 29
0.	2.3609E-04	3.9767E-01	1.3634E 00	2.6160E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	4.3165E 00	4.3101E 00	5.1413E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
5.2525E 00	1.0390E 00	6.1060E-06	0.	0.
22 21	22 22	22 23	22 24	22 30
2.4522E-01	5.4984E 00	5.3611E-01	2.7108E-04	4.2119E-06
23 21	23 22	23 23	23 24	23 30
1.4338E-06	7.5941E-01	4.7913E 00	3.0625E-01	2.8631E-02
24 21	24 22	24 23	24 24	24 30
0.	2.1579E-03	2.0193E 00	3.0020E 00	8.3235E-01
30 21	30 22	30 23	30 24	30 30
0.	4.8343E-05	2.8886E-01	1.2983E 00	2.7294E 00

COBALT

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	4.2554E 00	4.2490E 00	5.1610E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
5.1801E 00	1.1114E 00	8.9083E-07	0.	0.
22 21	22 22	22 23	22 24	22 31
1.5387E-01	5.5159E 00	6.0559E-01	1.0804E-04	7.8377E-07
23 21	23 22	23 23	23 24	23 31
0.	6.0751E-01	4.9279E 00	3.1572E-01	2.2607E-02
24 21	24 22	24 23	24 24	24 31
0.	4.9341E-04	1.7988E 00	3.2166E 00	8.0815E-01
31 21	31 22	31 23	31 24	31 31
0.	4.8250E-06	1.8668E-01	1.2050E 00	2.8637E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	4.1939E 00	4.1876E 00	5.1948E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
5.6273E 00	6.6424E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
6.9684E-02	5.4617E 00	7.3946E-01	2.4961E-05	0.
23 21	23 22	23 23	23 24	23 32
0.	4.3160E-01	5.0741E 00	3.3988E-01	1.6422E-02
24 21	24 22	24 23	24 24	24 32
0.	4.6952E-05	1.5261E 00	3.4936E 00	7.7261E-01
32 21	32 22	32 23	32 24	32 32
0.	1.1691E-07	9.7293E-02	1.0675E 00	3.0291E 00

COBALT

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	4.1323E 00	4.1261E 00	5.2663E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
5.8689E 00	4.2265E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
6.8210E-02	5.2215E 00	9.7593E-01	1.3257E-06	0.
23 21	23 22	23 23	23 24	23 33
0.	2.2670E-01	5.2046E 00	4.0892E-01	1.0060E-02
24 21	24 22	24 23	24 24	24 33
0.	5.2450E-07	1.1656E 00	3.8725E 00	7.2264E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	3.1031E-02	8.5427E-01	3.2470E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	4.0792E 00	4.0731E 00	5.4540E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
5.8869E 00	4.0460E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
1.0782E-01	5.8900E 00	2.6088E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	4.9766E-02	5.1550E 00	6.3092E-01	4.2694E-03
24 21	24 22	24 23	24 24	24 34
0.	0.	7.1379E-01	4.3370E 00	6.8050E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	3.2210E-03	5.5384E-01	3.5222E 00

COBALT

TRANSFERS FROM GROUPS 1 THROUGH 7 TO GROUPS 1 THROUGH 16

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
1.6997E-00	2.4059E-01	4.3246E-02	1.9881E-01	3.6188E-01
1 6	1 7	1 8	1 9	1 10
3.6137E-01	2.4617E-01	1.3214E-01	7.7079E-02	2.2998E-02
1 11	1 12	1 13	1 14	1 15
3.4479E-03	4.8209E-04	6.7089E-05	8.9399E-06	1.3174E-06
1 16	2 1	2 2	2 3	2 4
1.0190E-07	0.	2.0607E-00	1.2463E-01	1.3285E-01
2 5	2 6	2 7	2 8	2 9
3.2452E-01	3.9421E-01	3.0470E-01	1.7708E-01	1.0910E-01
2 10	2 11	2 12	2 13	2 14
3.3865E-02	5.1829E-03	7.3034E-04	1.0192E-04	1.3597E-05
2 15	2 16	3 1	3 2	3 3
2.0045E-06	1.5506E-07	0.	0.	1.9957E-00
3 4	3 5	3 6	3 7	3 8
1.8481E-01	2.3271E-01	3.8400E-01	3.6119E-01	2.3741E-01
3 9	3 10	3 11	3 12	3 13
1.5920E-01	5.2519E-02	8.2268E-03	1.1832E-03	1.6584E-04
3 14	3 15	3 16	4 1	4 2
2.2161E-05	3.2691E-06	2.5294E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	2.3805E-00	2.4567E-01	1.9212E-01	2.2868E-01
4 8	4 9	4 10	4 11	4 12
1.7447E-01	1.2977E-01	4.6114E-02	7.5733E-03	1.0960E-03
4 13	4 14	4 15	4 16	5 1
1.5444E-04	2.0681E-05	3.0530E-06	2.3630E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	2.8909E-00	2.3969E-01
5 7	5 8	5 9	5 10	5 11
7.1075E-02	6.4633E-02	5.4346E-02	2.1080E-02	3.6240E-03
5 12	5 13	5 14	5 15	5 16
5.3367E-04	7.5677E-05	1.0159E-05	1.5010E-06	1.1621E-07
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
3.3405E-00	2.2833E-01	0.	0.	0.
6 11	6 12	6 13	6 14	6 15
0.	0.	0.	3.7332E-00	2.3880E-01
6 16	7 1	7 2	7 3	7 4
0.	0.	0.	0.	0.

COBALT

N1		N2	
SIGMA S0 (N1/N2)			
7	5	7	6
0.		0.	
7	10	7	11
0.		0.	
7	15	7	16
0.		0.	

COBALT

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
1.3200E 02	5.5083E 01	8.5719E 02	2.7160E-05	0.

COBAL T

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
1	1	1	2	1	3
0.		0.		1.3315E-03	3.9712E-03
1	6	1	7	1	8
2.0323E-03		1.7987E-03		1.8688E-04	5.8400E-04
1	11	2	1	2	2
3.0038E-03		0.		0.	1.0319E-03
2	5	2	6	2	7
2.8422E-03		1.5750E-03		1.3940E-03	1.4483E-04
2	10	2	11	3	1
6.1551E-04		2.3279E-03		0.	0.
3	4	3	5	3	6
2.5355E-03		2.3416E-03		1.2976E-03	1.1484E-03
3	9	3	10	3	11
3.7287E-04		5.0711E-04		1.9179E-03	0.
4	3	4	4	4	5
1.4296E-03		4.2637E-03		3.9377E-03	2.1820E-03
4	8	4	9	4	10
2.0065E-04		6.2702E-04		8.5274E-04	3.2251E-03
5	2	5	3	5	4
0.		2.3721E-03		7.0748E-03	6.5338E-03
5	7	5	8	5	9
3.2045E-03		3.3293E-04		1.0404E-03	1.4150E-03
6	1	6	2	6	3
0.		0.		2.6884E-03	8.0179E-03
6	6	6	7	6	8
4.1033E-03		3.6316E-03		3.7731E-04	1.1791E-03
6	11	7	1	7	2
6.0647E-03		0.		0.	2.8437E-03
7	5	7	6	7	7
7.8327E-03		4.3404E-03		3.8415E-03	3.9912E-04
7	10	7	11	8	1
1.6962E-03		6.4152E-03		0.	0.
8	4	8	5	8	6
1.1647E-02		1.0756E-02		5.9605E-03	5.2754E-03
8	9	8	10	8	11
1.7128E-03		2.3294E-03		8.8098E-03	0.
9	3	9	4	9	5
4.2520E-03		1.2681E-02		1.1712E-02	6.4899E-03
9	8	9	9	9	10
5.9678E-04		1.8649E-03		2.5363E-03	9.5923E-03
					0.

COBALI.

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		1.3879E-02		4.1393E-02	
10	7	10	8	10	9
1.8749E-02		1.9479E-03		6.0872E-03	
11	1	11	2	11	3
0.		0.		1.7611E-02	
11	6	11	7	11	8
2.6881E-02		2.3791E-02		2.4718E-03	
11	11	12	1	12	2
3.9730E-02		0.		0.	
12	5	12	6	12	7
4.4448E-02		2.4630E-02		2.1799E-02	
12	10	12	11	13	1
9.6256E-03		3.6404E-02		0.	
13	4	13	5	13	6
1.6661E-02		1.5387E-02		8.5265E-03	
13	9	13	10	13	11
2.4502E-03		3.3322E-03		1.2602E-02	
14	3	14	4	14	5
3.8967E-03		1.1622E-02		1.0733E-02	
14	8	14	9	14	10
5.4691E-04		1.7091E-03		2.3244E-03	
15	2	15	3	15	4
0.		1.1603E-01		3.4605E-01	
15	7	15	8	15	9
1.5674E-01		1.6285E-02		5.0890E-02	
16	1	16	2	16	3
0.		0.		2.4526E 01	
16	6	16	7	16	8
3.7434E 01		3.3131E 01		3.4422E 00	
16	11	17	1	17	2
5.5328E 01		0.		0.	
17	5	17	6	17	7
1.6352E 00		9.0611E-01		8.0196E-01	
17	10	17	11	18	1
3.5411E-01		1.3392E 00		0.	
18	4	18	5	18	6
2.8557E 00		2.6373E 00		1.4614E 00	
18	9	18	10	18	11
4.1995E-01		5.7113E-01		2.1600E 00	
				0.	
				0.	

COBALT

N1 N2
SIGMA N,G (N1/N2)

19 3	19 4	19 5	19 6	19 7
1.6128E 00	4.8102E 00	4.4423E 00	2.4617E 00	2.1787E 00
19 8	19 9	19 10	19 11	20 1
2.2636E-01	7.0738E-01	9.6203E-01	3.6384E 00	0.
20 2	20 3	20 4	20 5	20 6
0.	2.7204E 00	8.1136E 00	7.4931E 00	4.1522E 00
20 7	20 8	20 9	20 10	20 11
3.6750E 00	3.8182E-01	1.1932E 00	1.6227E 00	6.1371E 00
21 1	21 2	21 3	21 4	21 5
0.	0.	4.3367E 00	1.2934E 01	1.1945E 01
21 6	21 7	21 8	21 9	21 10
6.6191E 00	5.8583E 00	6.0866E-01	1.9021E 00	2.5868E 00
21 11	22 1	22 2	22 3	22 4
9.7832E 00	0.	0.	6.9472E 00	2.0720E 01
22 5	22 6	22 7	22 8	22 9
1.9135E 01	1.0604E 01	9.3848E 00	9.7504E-01	3.0470E 00
22 10	22 11	23 1	23 2	23 3
4.1439E 00	1.5672E 01	0.	0.	1.1923E 01
23 4	23 5	23 6	23 7	23 8
3.5559E 01	3.2840E 01	1.8198E 01	1.6106E 01	1.6734E 00
23 9	23 10	23 11	24 1	24 2
5.2292E 00	7.1118E 00	2.6897E 01	0.	0.
24 3	24 4	24 5	24 6	24 7
1.8507E 01	5.5196E 01	5.0775E 01	2.8247E 01	2.5000E 01
24 8	24 9	24 10	24 11	25 1
2.5974E 00	8.1170E 00	1.1039E 01	4.1750E 01	0.
25 2	25 3	25 4	25 5	25 6
0.	2.9088E 01	8.6754E 01	8.0120E 01	4.4398E 01
25 7	25 8	25 9	25 10	25 11
3.9295E 01	4.0826E 00	1.2758E 01	1.7351E 01	6.5621E 01
26 1	26 2	26 3	26 4	26 5
0.	0.	2.9112E 01	8.6824E 01	8.0185E 01
26 6	26 7	26 8	26 9	26 10
4.4434E 01	3.9326E 01	4.0858E 00	1.2768E 01	1.7365E 01
26 11	27 1	27 2	27 3	27 4
6.5674E 01	0.	0.	2.9141E 01	8.6912E 01
27 5	27 6	27 7	27 8	27 9
8.0266E 01	4.4472E 01	3.9366E 01	4.0900E 00	1.2781E 01
27 10	27 11	28 1	28 2	28 3
1.7382E 01	6.5741E 01	0.	0.	2.9180E 01

COBALT

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
8.7028E 01	8.0373E 01	4.4538E 01	3.9419E 01	4.0954E 00
28 9	28 10	28 11	29 1	29 2
1.2798E 01	1.7406E 01	6.5828E 01	0.	0.
29 3	29 4	29 5	29 6	29 7
2.9232E 01	8.7183E 01	8.0516E 01	4.4617E 01	3.9489E 01
29 8	29 9	29 10	29 11	30 1
4.1027E 00	1.2821E 01	1.7437E 01	6.5945E 01	0.
30 2	30 3	30 4	30 5	30 6
0.	2.9305E 01	8.7402E 01	8.0718E 01	4.4729E 01
30 7	30 8	30 9	30 10	30 11
3.9588E 01	4.1130E 00	1.2853E 01	1.7480E 01	6.6111E 01
31 1	31 2	31 3	31 4	31 5
0.	0.	2.9418E 01	8.7737E 01	8.1028E 01
31 6	31 7	31 8	31 9	31 10
4.4901E 01	3.9740E 01	4.1288E 00	1.2902E 01	1.7547E 01
31 11	32 1	32 2	32 3	32 4
6.6364E 01	0.	0.	2.9610E 01	8.8312E 01
32 5	32 6	32 7	32 8	32 9
8.1558E 01	4.5195E 01	4.0000E 01	4.1558E 00	1.2987E 01
32 10	32 11	33 1	33 2	33 3
1.7662E 01	6.6799E 01	0.	0.	3.0018E 01
33 4	33 5	33 6	33 7	33 8
8.9527E 01	8.2681E 01	4.5817E 01	4.0551E 01	4.2130E 00
33 9	33 10	33 11	34 1	34 2
1.3166E 01	1.7905E 01	6.7718E 01	0.	0.
34 3	34 4	34 5	34 6	34 7
3.1088E 01	9.2718E 01	8.5628E 01	4.7450E 01	4.1996E 01
34 8	34 9	34 10	34 11	
4.3632E 00	1.3635E 01	1.8544E 01	7.0132E 01	

DATE 12/15/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
LITHIUM 6		3.6000		9.98722E 00			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	I
1	1.000E 07	1.6955E 00	1.0989E 00	1.3454E 00	4.3949E-02	-2.3957E-01	
2	6.065E 06	1.8615E 00	8.4400E-01	1.4898E 00	6.8132E-02	-2.5437E-01	
3	3.679E 06	1.8716E 00	5.4448E-01	1.5245E 00	1.2016E-01	-2.3754E-01	
4	2.231E 06	1.3196E 00	3.5150E-01	1.1516E 00	1.9982E-01	-1.1491E-01	
5	1.353E 06	1.1368E 00	3.0046E-01	1.0267E 00	2.5378E-01	-7.5381E-02	
6	8.208E 05	1.2757E 00	3.3717E-01	1.1521E 00	3.2251E-01	-8.4592E-02	
7	4.979E 05	1.7414E 00	4.6025E-01	1.5727E 00	5.5043E-01	-1.1547E-01	
8	3.020E 05	5.0025E 00	1.3222E 00	4.5178E 00	1.9960E 00	-3.3171E-01	
9	1.832E 05	2.4012E 00	6.3464E-01	2.1685E 00	1.2158E 00	-1.5921E-01	
10	6.738E 04	8.8721E-01	2.3449E-01	8.0124E-01	7.1440E-01	-5.8829E-02	
11	2.479E 04	8.1340E-01	2.1498E-01	7.3458E-01	7.8158E-01	-5.3934E-02	
12	9.119E 03	1.1097E 00	2.9329E-01	1.0021E 00	1.6066E 00	-7.3575E-02	
13	3.355E 03	1.2000E 00	3.1716E-01	1.0837E 00	2.6323E 00	-7.9569E-02	
14	1.234E 03	1.2000E 00	3.1716E-01	1.0837E 00	4.3603E 00	-7.9569E-02	
15	4.540E 02	1.2000E 00	3.1716E-01	1.0837E 00	7.8027E 00	-7.9569E-02	
16	8.719E 01	1.2000E 00	3.1716E-01	1.0837E 00	1.4939E 01	-7.9569E-02	
17	3.545E 01	1.2000E 00	3.1716E-01	1.0837E 00	2.5815E 01	-7.9569E-02	
18	1.304E 01	1.2000E 00	3.1716E-01	1.0837E 00	4.1773E 01	-7.9569E-02	
19	5.043E 00	1.2000E 00	3.1716E-01	1.0837E 00	7.0345E 01	-7.9569E-02	
20	1.445E 00	1.2000E 00	3.1716E-01	1.0837E 00	1.1851E 02	-7.9569E-02	
21	6.826E-01	1.2000E 00	3.1716E-01	1.0837E 00	1.8891E 02	-7.9569E-02	
22	2.511E-01	1.2000E 00	3.1716E-01	1.0837E 00	3.0313E 02	-7.9569E-02	
23	9.237E-02	1.2000E 00	3.1716E-01	1.0837E 00	5.2132E 02	-7.9569E-02	
24	2.530E-02	1.3718E 00	3.7037E-01	1.2357E 00	7.5954E 02	-9.3152E-02	
*4500	3.023E-01	1.4000E 00	4.2000E-01	1.2400E 00	3.2400E 02	-1.0949E-01	
*4000	2.718E-01	1.4000E 00	4.2000E-01	1.2400E 00	3.2400E 02	-1.0949E-01	
*3500	2.413E-01	1.4000E 00	4.2000E-01	1.2400E 00	3.2400E 02	-1.0949E-01	
*3000	2.109E-01	1.4000E 00	4.2000E-01	1.2400E 00	3.2400E 02	-1.0949E-01	
2500	1.804E-01	1.4000E 00	4.2000E-01	1.2400E 00	3.5000E 02	-1.0949E-01	
2000	1.499E-01	1.4000E 00	4.2000E-01	1.2400E 00	3.8400E 02	-1.0949E-01	
1500	1.194E-01	1.4000E 00	4.2000E-01	1.2400E 00	4.3000E 02	-1.0949E-01	
1000	8.897E-02	1.4000E 00	4.2000E-01	1.2400E 00	4.9800E 02	-1.0949E-01	
500	5.850E-02	1.4000E 00	4.2000E-01	1.2400E 00	6.1400E 02	-1.0949E-01	
68	3.216E-02	1.4000E 00	4.2000E-01	1.2400E 00	8.2900E 02	-1.0949E-01	

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

LITHIUM 6

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	2.5476E 00	2.2628E 00	1.2691E 03	0.

N1	N2
SIGMA S (N1/N2)	

21 21	21 22	21 23	21 24	21 25
8.5710E-01	3.0564E-01	3.3539E-02	2.5471E-03	1.1753E-03
22 21	22 22	22 23	22 24	22 25
3.1748E-01	6.6674E-01	1.8830E-01	1.8130E-02	9.3409E-03
23 21	23 22	23 23	23 24	23 25
9.4526E-02	5.1119E-01	4.8476E-01	7.0791E-02	3.8725E-02
24 21	24 22	24 23	24 24	24 25
6.0004E-02	4.1190E-01	5.9248E-01	1.8984E-01	1.1761E-01
25 21	25 22	25 23	25 24	25 25
8.8171E-02	6.7598E-01	1.0324E 00	3.7460E-01	3.7646E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	2.4456E 00	2.1722E 00	1.2701E 03	0.

N1	N2
SIGMA S (N1/N2)	

21 21	21 22	21 23	21 24	21 26
8.3968E-01	3.2337E-01	3.3513E-02	2.3790E-03	1.0542E-03
22 21	22 22	22 23	22 24	22 26
2.8497E-01	6.9167E-01	1.9598E-01	1.8210E-02	9.1682E-03
23 21	23 22	23 23	23 24	23 26
7.4959E-02	4.9778E-01	5.1201E-01	7.4836E-02	4.0412E-02
24 21	24 22	24 23	24 24	24 26
4.3676E-02	3.8041E-01	6.1559E-01	2.0538E-01	1.2675E-01
26 21	26 22	26 23	26 24	26 26
5.9223E-02	5.8602E-01	1.0171E 00	3.8780E-01	3.9544E-01

LITHIUM 6

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	2.3390E 00	2.0775E 00	1.2714E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
8.1794E-01	3.4545E-01	3.3504E-02	2.1887E-03	9.2130E-04
22 21	22 22	22 23	22 24	22 27
2.4912E-01	7.1832E-01	2.0533E-01	1.8279E-02	8.9392E-03
23 21	23 22	23 23	23 24	23 27
5.6303E-02	4.7894E-01	5.4299E-01	7.9516E-02	4.2249E-02
24 21	24 22	24 23	24 24	24 27
2.9478E-02	3.4239E-01	6.3868E-01	2.2380E-01	1.3748E-01
27 21	27 22	27 23	27 24	27 27
3.6287E-02	4.8993E-01	9.9293E-01	4.0223E-01	4.1761E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	2.2273E 00	1.9783E 00	1.2731E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
7.9018E-01	3.7357E-01	3.3502E-02	1.9706E-03	7.7583E-04
22 21	22 22	22 23	22 24	22 28
2.0981E-01	7.4608E-01	2.1713E-01	1.8344E-02	8.6397E-03
23 21	23 22	23 23	23 24	23 28
3.9202E-02	4.5298E-01	5.7853E-01	8.5033E-02	4.4250E-02
24 21	24 22	24 23	24 24	24 28
1.7860E-02	2.9719E-01	6.6055E-01	2.4600E-01	1.5023E-01
28 21	28 22	28 23	28 24	28 28
1.9546E-02	3.8942E-01	9.5637E-01	4.1794E-01	4.4400E-01

LITHIUM 6

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	2.1098E 00	1.8739E 00	1.2753E 03	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 29
7.5386E-01	4.1033E-01	3.3470E-02	1.7168E-03	6.1768E-04
22 21	22 22	22 23	22 24	22 29
1.6710E-01	7.7352E-01	2.3271E-01	1.8415E-02	8.2505E-03
23 21	23 22	23 23	23 24	23 29
2.4422E-02	4.1774E-01	6.1969E-01	9.1721E-01	4.6436E-02
24 21	24 22	24 23	24 24	24 29
9.2354E-02	2.4462E-01	6.7901E-01	2.7330E-01	1.6566E-01
29 21	29 22	29 23	29 24	29 29
8.7114E-03	2.8767E-01	9.0247E-01	4.3484E-01	4.7614E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.9858E 00	1.7638E 00	1.2786E 03	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 30
7.0834E-01	4.5675E-01	3.3057E-02	1.4053E-03	4.4560E-04
22 21	22 22	22 23	22 24	22 30
1.2163E-01	7.9754E-01	2.5456E-01	1.8523E-02	7.7443E-03
23 21	23 22	23 23	23 24	23 30
1.2782E-02	3.7033E-01	6.6786E-01	1.0018E-01	4.8844E-02
24 21	24 22	24 23	24 24	24 30
3.7210E-03	1.8548E-01	6.9008E-01	3.0783E-01	1.8473E-01
30 21	30 22	30 23	30 24	30 30
2.8838E-03	1.8989E-01	8.2408E-01	4.5244E-01	5.1648E-01

LITHIUM 6

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.8540E 00	1.6467E 00	1.2835E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
6.9284E-01	4.7698E-01	2.9003E-02	9.3168E-04	2.4453E-04
22 21	22 22	22 23	22 24	22 31
7.5339E-02	8.1111E-01	2.8776E-01	1.8715E-02	7.0732E-03
23 21	23 22	23 23	23 24	23 31
4.9603E-03	3.0713E-01	7.2465E-01	1.1168E-01	5.1575E-02
24 21	24 22	24 23	24 24	24 31
9.7474E-04	1.2257E-01	6.8613E-01	3.5312E-01	2.0903E-01
31 21	31 22	31 23	31 24	31 31
5.7284E-04	1.0390E-01	7.1117E-01	4.6911E-01	5.6926E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.7132E 00	1.5217E 00	1.2919E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
8.2113E-01	3.6374E-01	1.4791E-02	2.8255E-04	5.3593E-05
22 21	22 22	22 23	22 24	22 32
3.3233E-02	7.9778E-01	3.4381E-01	1.9042E-02	6.1286E-03
23 21	23 22	23 23	23 24	23 32
1.1377E-03	2.3886E-01	7.6334E-01	1.3801E-01	5.8651E-02
24 21	24 22	24 23	24 24	24 32
1.1070E-04	6.3354E-02	6.6248E-01	4.0068E-01	2.4521E-01
32 21	32 22	32 23	32 24	32 32
4.1686E-05	3.9837E-02	5.5089E-01	4.7979E-01	6.4263E-01

LITHIUM 6

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.5619E 00	1.3873E 00	1.3096E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.3115E-01	3.6123E-01	8.2405E-03	5.7297E-05	5.8318E-06	
22	21	22	22	22	23
1.3708E-02	7.3588E-01	4.2797E-01	1.8117E-02	4.3294E-02	
23	21	23	22	23	23
5.4880E-05	1.2397E-01	8.4089E-01	1.7164E-01	6.3445E-02	
24	21	24	22	24	23
1.4149E-06	1.6474E-02	5.3890E-01	5.3743E-01	2.7902E-01	
33	21	33	22	33	23
2.5285E-07	6.5653E-03	3.3320E-01	4.6694E-01	7.5518E-01	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.4225E 00	1.2635E 00	1.3563E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	23	21	34
8.1533E-01	3.8108E-01	3.5797E-03	2.8787E-06	0.	
22	21	22	23	22	34
1.1991E-02	9.3657E-01	2.4685E-01	4.1216E-03	4.6748E-04	
23	21	23	23	23	34
0.	2.5826E-02	8.4277E-01	2.5600E-01	7.5399E-02	
24	21	24	23	24	34
0.	9.0548E-04	3.4293E-01	6.9712E-01	3.3087E-01	
34	21	34	23	34	34
0.	1.3496E-04	1.1613E-01	3.8144E-01	9.2483E-01	

LITHIUM 6

TRANSFERS FROM GROUPS 1 THROUGH 4 TO GROUPS 1 THROUGH 13

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
3.5582E-01	9.0203E-01	1.0459E-01	5.2916E-02	8.6446E-02	
1	6	1	7	1	8
8.2644E-02	5.4310E-02	2.8523E-02	1.6565E-02	4.8439E-03	
1	11	1	12	1	13
7.3675E-04	1.0326E-04	1.4772E-05	0.	7.3815E-01	
2	3	2	4	2	5
8.4384E-01	7.4195E-02	5.1102E-02	5.8004E-02	4.2562E-02	
2	8	2	9	2	10
2.3957E-02	1.4581E-02	4.4173E-03	6.8388E-04	9.6515E-05	
2	13	3	1	3	2
1.3842E-05	0.	0.	8.3392E-01	8.6996E-01	
3	5	3	6	3	7
8.3055E-02	2.2164E-02	1.9332E-02	1.2123E-02	7.9374E-03	
3	10	3	11	3	12
2.5400E-03	4.0419E-04	5.7652E-05	8.3009E-06	0.	
4	2	4	3	4	4
0.	0.	6.5161E-01	6.2719E-01	4.1216E-02	
4	7	4	8	4	9
1.2683E-03	8.7882E-04	6.1522E-04	2.0690E-04	3.3749E-05	
4	12	4	13		
4.8602E-06	7.0228E-07				

LITHIUM 6

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2	
SIGMA N,G (N1/N2)			
1 1	1 2	1 3	1 4
0.	0.	1.2852E-05	8.9810E-06
1 6	1 7	1 8	1 9
0.	0.	0.	0.
1 11	2 1	2 2	2 3
6.2524E-07	0.	0.	1.2969E-05
2 5	2 6	2 7	2 8
0.	0.	0.	0.
2 10	2 11	3 1	3 2
0.	6.3094E-07	0.	0.
3 4	3 5	3 6	3 7
9.7148E-06	0.	0.	0.
3 9	3 10	3 11	4 1
0.	0.	6.7633E-07	0.
4 3	4 4	4 5	4 6
1.5707E-05	1.0976E-05	0.	0.
4 8	4 9	4 10	4 11
0.	0.	0.	7.6413E-07
5 2	5 3	5 4	5 5
0.	1.8500E-05	1.2928E-05	0.
5 7	5 8	5 9	5 10
0.	0.	0.	0.
6 1	6 2	6 3	6 4
0.	0.	2.2454E-05	1.5691E-05
6 6	6 7	6 8	6 9
0.	0.	0.	0.
6 11	7 1	7 2	7 3
1.0924E-06	0.	0.	2.7821E-05
7 5	7 6	7 7	7 8
0.	0.	0.	0.
7 10	7 11	8 1	8 2
0.	1.3535E-06	0.	0.
8 4	8 5	8 6	8 7
2.4412E-05	0.	0.	0.
8 9	8 10	8 11	9 1
0.	0.	1.6995E-06	0.
9 3	9 4	9 5	9 6
4.7134E-05	3.2937E-05	0.	0.
9 8	9 9	9 10	9 11
0.	0.	0.	2.2930E-06
			0.

LITHIUM 6

N1 N2
SIGMA N,G (N1/N2)

10 2	10 3	10 4	10 5	10 6
0.	7.2558E-05	5.0703E-05	0.	0.
10 7	10 8	10 9	10 10	10 11
0.	0.	0.	0.	3.5298E-06
11 1	11 2	11 3	11 4	11 5
0.	0.	1.1897E-04	8.3135E-05	0.
11 6	11 7	11 8	11 9	11 10
0.	0.	0.	0.	0.
11 11	12 1	12 2	12 3	12 4
5.7877E-06	0.	0.	1.9577E-04	1.3680E-04
12 5	12 6	12 7	12 8	12 9
0.	0.	0.	0.	0.
12 10	12 11	13 1	13 2	13 3
0.	9.5238E-06	0.	0.	3.2255E-04
13 4	13 5	13 6	13 7	13 8
2.2539E-04	0.	0.	0.	0.
13 9	13 10	13 11	14 1	14 2
0.	0.	1.5691E-05	0.	0.
14 3	14 4	14 5	14 6	14 7
5.3170E-04	3.7155E-04	0.	0.	0.
14 8	14 9	14 10	14 11	15 1
0.	0.	0.	2.5866E-05	0.
15 2	15 3	15 4	15 5	15 6
0.	9.5828E-04	6.6964E-04	0.	0.
15 7	15 8	15 9	15 10	15 11
0.	0.	0.	0.	4.6619E-05
16 1	16 2	16 3	16 4	16 5
0.	0.	1.8331E-03	1.2809E-03	0.
16 6	16 7	16 8	16 9	16 10
0.	0.	0.	0.	0.
16 11	17 1	17 2	17 3	17 4
8.9177E-05	0.	0.	3.1727E-03	2.2171E-03
17 5	17 6	17 7	17 8	17 9
0.	0.	0.	0.	0.
17 10	17 11	18 1	18 2	18 3
0.	1.5435E-04	0.	0.	5.1377E-03
18 4	18 5	18 6	18 7	18 8
3.5902E-03	0.	0.	0.	0.
18 9	18 10	18 11	19 1	19 2
0.	0.	2.4994E-04	0.	0.

LITHIUM 6

N1		N2	
SIGMA N,G (N1/N2)			
19 3	19 4	19 5	19 6
8.6528E-03	6.0465E-03	0.	0.
19 8	19 9	19 10	19 11
0.	0.	0.	4.2094E-04
20 2	20 3	20 4	20 5
0.	1.4596E-02	1.0199E-02	0.
20 7	20 8	20 9	20 10
0.	0.	0.	0.
21 1	21 2	21 3	21 4
0.	0.	2.3265E-02	1.6257E-02
21 6	21 7	21 8	21 9
0.	0.	0.	0.
21 11	22 1	22 2	22 3
1.1318E-03	0.	0.	3.7267E-02
22 5	22 6	22 7	22 8
0.	0.	0.	0.
22 10	22 11	23 1	23 2
0.	1.8130E-03	0.	0.
23 4	23 5	23 6	23 7
4.4689E-02	0.	0.	0.
23 9	23 10	23 11	24 1
0.	0.	3.1112E-03	0.
24 3	24 4	24 5	24 6
9.9268E-02	6.9368E-02	0.	0.
24 8	24 9	24 10	24 11
0.	0.	0.	4.8293E-03
25 2	25 3	25 4	25 5
0.	1.5604E-01	1.0904E-01	0.
25 7	25 8	25 9	25 10
0.	0.	0.	0.
26 1	26 2	26 3	26 4
0.	0.	1.5616E-01	1.0913E-01
26 6	26 7	26 8	26 9
0.	0.	0.	0.
26 11	27 1	27 2	27 3
7.5972E-03	0.	0.	1.5633E-01
27 5	27 6	27 7	27 8
0.	0.	0.	0.
27 10	27 11	28 1	28 2
0.	7.6053E-03	0.	0.
			1.5654E-01

LITHIUM 6

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
1.0939E-01	0.	0.	0.	0.
28 9	28 10	28 11	29 1	29 2
0.	0.	7.6154E-03	0.	0.
29 3	29 4	29 5	29 6	29 7
1.5683E-01	1.0959E-01	0.	0.	0.
29 8	29 9	29 10	29 11	30 1
0.	0.	0.	7.6295E-03	0.
30 2	30 3	30 4	30 5	30 6
0.	1.5720E-01	1.0985E-01	0.	0.
30 7	30 8	30 9	30 10	30 11
0.	0.	0.	0.	7.6477E-03
31 1	31 2	31 3	31 4	31 5
0.	0.	1.5782E-01	1.1029E-01	0.
31 6	31 7	31 8	31 9	31 10
0.	0.	0.	0.	0.
31 11	32 1	32 2	32 3	32 4
7.6780E-03	0.	0.	1.5886E-01	1.1101E-01
32 5	32 6	32 7	32 8	32 9
0.	0.	0.	0.	0.
32 10	32 11	33 1	33 2	33 3
0.	7.7284E-03	0.	0.	1.6102E-01
33 4	33 5	33 6	33 7	33 8
1.1252E-01	0.	0.	0.	0.
33 9	33 10	33 11	34 1	34 2
0.	0.	7.8334E-03	0.	0.
34 3	34 4	34 5	34 6	34 7
1.6679E-01	1.1655E-01	0.	0.	0.
34 8	34 9	34 10	34 11	
0.	0.	0.	8.1140E-03	

DATE 12/15/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
LITHIUM		3.7000		1.15192E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XI1 SIGMA SCATTER 1	
1	1.000E 07	1.8265E 00	9.4559E-01	1.4173E 00	3.8110E-03	-2.9642E-01	
2	6.065E 06	2.1741E 00	8.6681E-01	1.6799E 00	4.7583E-03	-3.5795E-01	
3	3.679E 06	2.2447E 00	5.5596E-01	1.7780E 00	9.0640E-03	-3.3801E-01	
4	2.231E 06	1.7834E 00	5.0030E-01	1.5507E 00	1.4685E-02	-1.6852E-01	
5	1.353E 06	1.5834E 00	4.6919E-01	1.2803E 00	1.8552E-02	-2.1954E-01	
6	8.208E 05	1.3518E 00	4.8409E-01	1.3169E 00	2.4467E-02	-2.5292E-02	
7	4.979E 05	1.1737E 00	4.0553E-01	1.3153E 00	4.6470E-02	1.0258E-01	
8	3.020E 05	4.3260E 00	1.1434E 00	3.9068E 00	1.5319E-01	-3.0363E-01	
9	1.832E 05	1.6540E 00	4.3716E-01	1.4937E 00	9.5600E-02	-1.1609E-01	
10	6.738E 04	9.4660E-01	2.5019E-01	8.5487E-01	5.3533E-02	-6.6435E-02	
11	2.479E 04	1.0041E 00	2.6538E-01	9.0677E-01	7.2675E-02	-7.0470E-02	
12	9.119E 03	1.1021E 00	2.9128E-01	9.9530E-01	9.7330E-02	-7.7350E-02	
13	3.355E 03	1.1200E 00	2.9602E-01	1.0115E 00	9.7258E-02	-7.8605E-02	
14	1.234E 03	1.1200E 00	2.9602E-01	1.0115E 00	1.4959E-01	-7.8605E-02	
15	4.540E 02	1.1200E 00	2.9602E-01	1.0115E 00	3.3426E-01	-7.8605E-02	
16	8.719E 01	1.1200E 00	2.9602E-01	1.0115E 00	7.5883E-01	-7.8605E-02	
17	3.545E 01	1.1200E 00	2.9602E-01	1.0115E 00	1.4764E 00	-7.8605E-02	
18	1.304E 01	1.1200E 00	2.9602E-01	1.0115E 00	2.6447E 00	-7.8605E-02	
19	5.043E 00	1.1200E 00	2.9602E-01	1.0115E 00	4.7158E 00	-7.8605E-02	
20	1.445E 00	1.1200E 00	2.9602E-01	1.0115E 00	8.5617E 00	-7.8605E-02	
21	6.826E-01	1.1200E 00	2.9602E-01	1.0115E 00	1.4214E 01	-7.8605E-02	
22	2.511E-01	1.1200E 00	2.9602E-01	1.0115E 00	2.2807E 01	-7.8605E-02	
23	9.237E-02	1.1200E 00	2.9602E-01	1.0115E 00	3.9223E 01	-7.8605E-02	
24	2.530E-02	1.1193E 00	2.9583E-01	1.0108E 00	5.7145E 01	-7.8569E-02	
*4500	3.023E-01	1.1000E 00	2.9073E-01	9.9341E-01	2.4592E 01	-7.7200E-02	
*4000	2.718E-01	1.1000E 00	2.9703E-01	9.9341E-01	2.4592E 01	-7.7200E-02	
*3500	2.413E-01	1.1000E 00	2.9703E-01	9.9341E-01	2.4592E 01	-7.7200E-02	
*3000	2.109E-01	1.1000E 00	2.9703E-01	9.9341E-01	2.4592E 01	-7.7200E-02	
2500	1.804E-01	1.1000E 00	2.9703E-01	9.9341E-01	2.6588E 01	-7.7200E-02	
2000	1.499E-01	1.1000E 00	2.9703E-01	9.9341E-01	2.9165E 01	-7.7200E-02	
1500	1.194E-01	1.1000E 00	2.9703E-01	9.9341E-01	3.2676E 01	-7.7200E-02	
1000	8.897E-02	1.1000E 00	2.9703E-01	9.9341E-01	3.7860E 01	-7.7200E-02	
500	5.850E-02	1.1000E 00	2.9703E-01	9.9341E-01	4.6692E 01	-7.7200E-02	
68	3.216E-02	1.1000E 00	2.9703E-01	9.9341E-01	6.2968E 00	-7.7200E-02	

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

LITHIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	2.2492E 00	2.1800E 00	9.5348E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
8.1800E-01	2.7373E-01	2.5797E-02	1.7260E-03	7.4411E-04
22 21	22 22	22 23	22 24	22 25
2.8422E-01	6.4310E-01	1.7000E-01	1.5178E-02	7.5040E-03
23 21	23 22	23 23	23 24	23 25
7.2911E-02	4.6315E-01	4.6276E-01	6.5993E-02	3.5186E-02
24 21	24 22	24 23	24 24	24 25
3.6964E-02	3.1385E-01	5.0097E-01	1.6598E-01	1.0152E-01
25 21	25 22	25 23	25 24	25 25
5.5736E-02	5.4285E-01	9.3451E-01	3.5515E-01	3.6098E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	2.1619E 00	2.0953E 00	9.5426E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
8.0284E-01	2.8946E-01	2.5486E-02	1.5735E-03	6.4597E-04
22 21	22 22	22 23	22 24	22 26
2.5496E-01	6.6617E-01	1.7650E-01	1.5106E-02	7.2609E-03
23 21	23 22	23 23	23 24	23 26
5.8109E-02	4.5742E-01	4.9660E-01	7.0751E-02	3.7128E-02
24 21	24 22	24 23	24 24	24 26
2.6216E-02	2.8666E-01	5.1821E-01	1.7917E-01	1.0902E-01
26 21	26 22	26 23	26 24	26 26
3.6221E-02	4.6397E-01	9.1570E-01	3.6707E-01	3.7896E-01

LITHIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	2.0709E 00	2.0071E 00	9.5524E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
7.8378E-01	3.0913E-01	2.5142E-02	1.4062E-03	5.4270E-04	
22	21	22	22	22	23
2.2281E-01	6.9075E-01	1.8446E-01	1.5006E-02	6.9633E-03	
23	21	23	22	23	23
4.2990E-02	4.3827E-01	5.2540E-01	7.4839E-02	3.8503E-02	
24	21	24	22	24	23
1.7133E-02	2.5475E-01	5.3492E-01	1.9474E-01	1.1775E-01	
27	21	27	22	27	23
2.1324E-02	3.8149E-01	8.8820E-01	3.7998E-01	3.9992E-01	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.9758E 00	1.9150E 00	9.5650E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
7.5926E-01	3.3434E-01	2.4742E-02	1.2213E-03	4.3516E-04	
22	21	22	22	22	23
1.8765E-01	7.1631E-01	1.9457E-01	1.4878E-02	6.5989E-03	
23	21	23	22	23	23
2.9396E-02	4.1271E-01	5.5832E-01	7.9629E-02	3.5512E-02	
24	21	24	22	24	23
9.9819E-02	2.1787E-01	5.5000E-01	2.1340E-01	1.2802E-01	
28	21	28	22	28	23
1.0930E-02	2.9729E-01	8.4893E-01	3.9387E-01	4.2482E-01	

LITHIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.8761E 00	1.8184E 00	9.5820E 01	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
7.2695E-01	3.6747E-01	2.4231E-02	1.0156E-03	3.2527E-04	
22	21	22	22	22	23
1.4953E-01	7.4159E-01	2.0801E-01	1.4724E-02	6.1527E-03	
23	21	23	22	23	23
1.7908E-02	3.7888E-01	5.9636E-01	8.5408E-02	4.1447E-02	
24	21	24	22	24	23
4.9080E-03	1.7622E-01	5.6158E-01	2.3626E-01	1.4031E-01	
29	21	29	22	29	23
4.5686E-03	2.1438E-01	7.9360E-01	4.0855E-01	4.5506E-01	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.7712E 00	1.7166E 00	9.6061E 01	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
6.8620E-01	4.0949E-01	2.3313E-02	7.8037E-04	2.1546E-04	
22	21	22	22	22	23
1.0897E-01	7.6364E-01	2.2703E-01	1.4554E-02	5.6037E-03	
23	21	23	22	23	23
9.1053E-03	3.3441E-01	6.4077E-01	9.2705E-02	4.3002E-02	
24	21	24	22	24	23
1.8471E-03	1.3081E-01	5.6631E-01	2.6501E-01	1.5530E-01	
30	21	30	22	30	23
1.3865E-03	1.3727E-01	7.1627E-01	4.2340E-01	4.9287E-01	

LITHIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.6602E 00	1.6091E 00	9.6429E 01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 31
6.7346E-01	4.2631E-01	1.9654E-02	4.7068E-04	1.0437E-04
22 21	22 22	22 23	22 24	22 31
6.7632E-02	7.7683E-01	2.5625E-01	1.4375E-02	4.9163E-03
23 21	23 22	23 23	23 24	23 31
3.3949E-03	2.7627E-01	6.9306E-01	1.0263E-01	4.4646E-02
24 21	24 22	24 23	24 24	24 31
4.3815E-04	8.4122E-02	5.5810E-01	3.0256E-01	1.7407E-01
31 21	31 22	31 23	31 24	31 31
2.4274E-04	7.2109E-02	6.0907E-01	4.3666E-01	5.4210E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.5422E 00	1.4947E 00	9.7061E 01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 32
7.9738E-01	3.1336E-01	9.1243E-03	1.1939E-04	1.8336E-05
22 21	22 22	22 23	22 24	22 32
2.9937E-02	7.6577E-01	3.0613E-01	1.4152E-02	4.0143E-03
23 21	23 22	23 23	23 24	23 32
7.2658E-04	2.1250E-01	7.3264E-01	1.2485E-01	4.9287E-02
24 21	24 22	24 23	24 24	24 32
4.1702E-05	4.1181E-02	5.2521E-01	3.5434E-01	1.9851E-01
32 21	32 22	32 23	32 24	32 32
1.4401E-05	2.6024E-02	4.6285E-01	4.4320E-01	6.1009E-01

LITHIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.4163E 00	1.3727E 00	9.8396E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
8.1122E-01	3.0437E-01	4.3846E-03	1.7071E-05	1.2856E-06
22 21	22 22	22 23	22 24	22 33
1.3038E-02	7.1043E-01	3.8130E-01	1.2680E-02	2.5495E-03
23 21	23 22	23 23	23 24	23 33
3.1500E-05	1.1052E-01	8.0282E-01	1.5466E-01	5.1975E-02
24 21	24 22	24 23	24 24	24 33
4.0834E-07	1.0505E-02	4.4372E-01	4.3221E-01	2.3285E-01
33 21	33 22	33 23	33 24	33 33
0.	3.8463E-03	2.7282E-01	4.2632E-01	7.1334E-01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.3014E 00	1.2613E 00	1.0190E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
8.0168E-01	3.1682E-01	1.4979E-03	4.2561E-07	0.
22 21	22 22	22 23	22 24	22 34
1.2038E-02	9.0315E-01	2.0232E-01	2.2871E-03	2.0085E-04
23 21	23 22	23 23	23 24	23 34
0.	2.3164E-02	8.0593E-01	2.3116E-01	5.9745E-02
24 21	24 22	24 23	24 24	24 34
0.	5.2628E-04	2.9373E-01	5.4283E-01	2.8219E-01
34 21	34 22	34 23	34 24	34 34
0.	6.2800E-05	9.1849E-02	3.4265E-01	8.6687E-01

LITHIUM

TRANSFERS FROM GROUPS 1 THROUGH 7 TO GROUPS 1 THROUGH 15

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
4.4670E-01	1.0482E-00	4.7124E-02	4.0580E-02	6.6404E-02
1 6	1 7	1 8	1 9	1 10
6.2171E-02	4.0622E-02	2.1273E-02	1.2330E-02	3.6002E-03
1 11	1 12	1 13	1 14	1 15
5.4717E-04	7.6670E-05	1.0967E-05	1.4914E-06	2.2602E-07
2 1	2 2	2 3	2 4	2 5
0.	9.2863E-01	9.2543E-01	4.0052E-02	5.0773E-02
2 6	2 7	2 8	2 9	2 10
5.6924E-02	4.1754E-02	2.3506E-02	1.4311E-02	4.3364E-03
2 11	2 12	2 13	2 14	2 15
6.7144E-04	9.4763E-05	1.3591E-05	1.8502E-06	2.8050E-07
3 1	3 2	3 3	3 4	3 5
0.	0.	1.0196E-00	9.2473E-01	5.7078E-02
3 6	3 7	3 8	3 9	3 10
4.7501E-02	4.2018E-02	2.6589E-02	1.7526E-02	5.6368E-03
3 11	3 12	3 13	3 14	3 15
8.9927E-04	1.2839E-04	1.8494E-05	2.5218E-06	3.8256E-07
4 1	4 2	4 3	4 4	4 5
0.	0.	0.	9.0316E-01	7.3349E-01
4 6	4 7	4 8	4 9	4 10
4.8211E-02	4.2261E-02	3.1096E-02	2.2728E-02	7.8986E-03
4 11	4 12	4 13	4 14	4 15
1.3102E-03	1.8991E-04	2.7508E-05	3.7593E-06	5.7076E-07
5 1	5 2	5 3	5 4	5 5
0.	0.	0.	0.	6.8822E-01
5 6	5 7	5 8	5 9	5 10
5.5807E-01	6.1868E-02	4.2347E-02	3.5236E-02	1.3490E-02
5 11	5 12	5 13	5 14	5 15
2.3498E-03	3.4717E-04	5.0643E-05	6.9400E-06	1.0548E-06
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
6.0737E-01	6.4763E-01	3.7927E-02	2.4862E-02	1.0594E-02
6 11	6 12	6 13	6 14	6 15
1.9482E-03	2.9402E-04	4.3229E-05	5.9424E-06	9.0419E-07
7 1	7 2	7 3	7 4	7 5
0.	0.	0.	0.	0.
7 6	7 7	7 8	7 9	7 10
0.	6.8829E-01	5.9921E-01	2.6629E-02	1.2440E-03
7 11	7 12	7 13	7 14	7 15
2.4089E-04	3.7097E-05	5.4954E-06	7.5703E-07	1.1541E-07

LITHIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

0. 1 1	0. 1 2	3.2946E-05 1 3	2.3022E-05 1 4	0. 1 5
0. 1 6	0. 1 7	0. 1 8	0. 1 9	0. 1 10
0. 1 11	0. 2 1	0. 2 2	2.2729E-05 2 3	1.5883E-05 2 4
0. 2 5	0. 2 6	0. 2 7	0. 2 8	0. 2 9
0. 2 10	0. 2 11	0. 3 1	0. 3 2	0. 3 3
0. 3 4	0. 3 5	0. 3 6	0. 3 7	1.6532E-05 3 8
1.1552E-05 3 9	0. 3 10	0. 3 11	0. 4 1	0. 4 2
0. 4 3	0. 4 4	0. 4 5	0. 4 6	0. 4 7
1.2773E-05 4 8	8.9259E-06 4 9	0. 4 10	0. 4 11	0. 5 1
0. 5 2	0. 5 3	0. 5 4	0. 5 5	0. 5 6
0. 5 7	1.0494E-05 5 8	7.3329E-06 5 9	0. 5 10	0. 5 11
0. 6 1	0. 6 2	0. 6 3	8.5227E-02 6 4	0. 6 5
0. 6 6	0. 6 7	1.0191E-05 6 8	7.1217E-06 6 9	0. 6 10
0. 6 11	0. 7 1	0. 7 2	0. 7 3	4.1036E-02 7 4
0. 7 5	0. 7 6	0. 7 7	1.4635E-05 7 8	1.0227E-05 7 9
0. 7 10	0. 7 11	0. 8 1	0. 8 2	0. 8 3
3.9822E-03 8 4	0. 8 5	0. 8 6	0. 8 7	3.7063E-05 8 8
2.5899E-05 8 9	0. 8 10	0. 8 11	0. 9 1	0. 9 2
0. 9 3	0. 9 4	0. 9 5	0. 9 6	0. 9 7
3.4861E-05 9 8	2.4360E-05 9 9	0. 9 10	0. 9 11	0. 10 1
0.	0.	0.	0.	0.

..LIJHUM..

		N1		N2			
SIGMA N,G (N1/N2)							
10	2	10	3	10	4	10	5
0.		4.7513E-05		3.3202E-05		0.	
10	7	10	8	10	9	10	10
0.		0.		0.		0.	
11	1	11	2	11	3	11	4
0.		0.		4.6897E-05		3.2771E-05	
11	6	11	7	11	8	11	9
0.		0.		0.		0.	
11	11	12	1	12	2	12	3
0.		0.		0.		7.6860E-05	
12	5	12	6	12	7	12	8
0.		0.		0.		0.	
12	10	12	11	13	1	13	2
0.		0.		0.		0.	
13	4	13	5	13	6	13	7
8.8351E-05		0.		0.		0.	
13	9	13	10	13	11	14	1
0.		0.		0.		0.	
14	3	14	4	14	5	14	6
2.0822E-04		1.4551E-04		0.		0.	
14	8	14	9	14	10	14	11
0.		0.		0.		0.	
15	2	15	3	15	4	15	5
0.		3.7527E-04		2.6224E-04		0.	
15	7	15	8	15	9	15	10
0.		0.		0.		0.	
16	1	16	2	16	3	16	4
0.		0.		7.1779E-04		5.0159E-04	
16	6	16	7	16	8	16	9
0.		0.		0.		0.	
16	11	17	1	17	2	17	3
0.		0.		0.		1.2425E-03	
17	5	17	6	17	7	17	8
0.		0.		0.		0.	
17	10	17	11	18	1	18	2
0.		0.		0.		0.	
18	4	18	5	18	6	18	7
1.4056E-03		0.		0.		0.	
18	9	18	10	18	11	19	1
0.		0.		0.		0.	

LITHIUM

N1		N2		SIGMA N,G (N1/N2)	
19	3	19	4	19	5
3.3878E-03		2.3674E-03		0.	
19	8	19	9	19	10
0.		0.		0.	
20	2	20	3	20	4
0.		5.7147E-03		3.9934E-03	
20	7	20	8	20	9
0.		0.		0.	
21	1	21	2	21	3
0.		0.		9.1109E-03	
21	6	21	7	21	8
0.		0.		0.	
21	11	22	1	22	2
0.		0.		0.	
22	5	22	6	22	7
0.		0.		0.	
22	10	22	11	23	1
0.		0.		0.	
23	4	23	5	23	6
1.7499E-02		0.		0.	
23	9	23	10	23	11
0.		0.		0.	
24	3	24	4	24	5
3.8875E-02		2.7166E-02		0.	
24	8	24	9	24	10
0.		0.		0.	
25	2	25	3	25	4
0.		6.1112E-02		4.2704E-02	
25	7	25	8	25	9
0.		0.		0.	
26	1	26	2	26	3
0.		0.		6.1167E-02	
26	6	26	7	26	8
0.		0.		0.	
26	11	27	1	27	2
0.		0.		0.	
27	5	27	6	27	7
0.		0.		0.	
27	10	27	11	28	1
0.		0.		0.	

LITHIUM

N1		N2		SIGMA N,C (N1/N2)	
28	4	28	5	28	6
4.2841E-07	0.	0.	0.	28	7
28	9	28	10	28	11
0.	0.	0.	0.	29	1
29	3	29	4	29	5
6.1419E-02	4.2919E-02	0.	0.	29	6
29	8	29	9	29	10
0.	0.	0.	0.	29	11
30	2	30	3	30	4
0.	6.1572E-02	4.3026E-02	0.	30	5
30	7	30	8	30	9
0.	0.	0.	0.	30	10
31	1	31	2	31	3
0.	0.	6.1809E-02	4.3192E-02	31	4
31	6	31	7	31	8
0.	0.	0.	0.	31	9
31	11	32	1	32	2
0.	0.	0.	0.	32	3
32	5	32	6	32	7
0.	0.	0.	0.	32	8
32	10	32	11	33	1
0.	0.	0.	0.	33	2
33	4	33	5	33	6
4.4070E-02	0.	0.	0.	33	7
33	9	33	10	33	11
0.	0.	0.	0.	34	1
34	3	34	4	34	5
6.5299E-02	4.5631E-02	0.	0.	34	6
34	8	34	9	34	10
0.	0.	0.	0.	34	11

DATE 12/15/60

DESIGNATION		CODE NO.		DENSITY FACTOR			
BORON		5.1100		1.79594E 01			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XI1 SIGMA SCATTER 1	
1	1.000E 07	1.3581E 00	1.1805E 00	1.1361E 00	5.8735E-02	-1.8208E-01	
2	6.065E 06	1.4598E 00	8.2095E-01	1.1586E 00	6.0964E-02	-2.4697E-01	
3	3.679E 06	1.5292E 00	5.3186E-01	1.4668E 00	5.2945E-02	-5.1157E-02	
4	2.231E 06	2.0243E 00	3.9028E-01	1.6588E 00	6.5036E-02	-2.9968E-01	
5	1.353E 06	2.4675E 00	2.7935E-01	1.2621E 00	4.3127E-02	-9.8833E-01	
6	8.208E 05	1.9717E 00	2.6419E-01	1.3628E 00	5.3098E-02	-4.9930E-01	
7	4.979E 05	3.6623E 00	6.3940E-01	3.4151E 00	1.2850E-01	-2.0271E-01	
8	3.020E 05	3.3993E 00	5.9691E-01	3.1882E 00	2.1869E-01	-1.7309E-01	
9	1.832E 05	3.7554E 00	6.5944E-01	3.5221E 00	2.9448E-01	-1.9122E-01	
10	6.738E 04	4.2502E 00	7.4633E-01	3.9862E 00	4.4203E-01	-2.1641E-01	
11	2.479E 04	4.5250E 00	7.9459E-01	4.2440E 00	7.1209E-01	-2.3041E-01	
12	9.119E 03	4.4169E 00	7.7561E-01	4.1426E 00	1.1051E 00	-2.2491E-01	
13	3.355E 03	4.4000E 00	7.7264E-01	4.1268E 00	1.4717E 00	-2.2404E-01	
14	1.234E 03	4.4000E 00	7.7264E-01	4.1268E 00	1.9053E 00	-2.2404E-01	
15	4.540E 02	4.4000E 00	7.7264E-01	4.1268E 00	3.0247E 00	-2.2404E-01	
16	8.719E 01	4.4000E 00	7.7264E-01	4.1268E 00	7.2821E 00	-2.2404E-01	
17	3.545E 01	4.4000E 00	7.7264E-01	4.1268E 00	1.5750E 01	-2.2404E-01	
18	1.304E 01	4.4000E 00	7.7264E-01	4.1268E 00	2.8759E 01	-2.2404E-01	
19	5.043E 00	4.4000E 00	7.7264E-01	4.1268E 00	5.2024E 01	-2.2404E-01	
20	1.445E 00	4.4000E 00	7.7264E-01	4.1268E 00	9.3556E 01	-2.2404E-01	
21	6.826E-01	4.4000E 00	7.7264E-01	4.1268E 00	1.5092E 02	-2.2404E-01	
22	2.511E-01	4.4000E 00	7.7264E-01	4.1268E 00	2.4219E 02	-2.2404E-01	
23	9.237E-02	4.4000E 00	7.7264E-01	4.1268E 00	4.1650E 02	-2.2404E-01	
24	2.530E-02	4.3857E 00	7.7013E-01	4.1133E 00	6.0685E 02	-2.2331E-01	
*4500	3.023E-01	4.0000E 00	7.0240E-01	3.7516E 00	2.6151E 02	-2.0368E-01	
*4000	2.718E-01	4.0000E 00	7.0240E-01	3.7516E 00	2.6151E 02	-2.0368E-01	
*3500	2.413E-01	4.0000E 00	7.0240E-01	3.7516E 00	2.6151E 02	-2.0368E-01	
*3000	2.109E-01	4.0000E 00	7.0240E-01	3.7516E 00	2.6151E 02	-2.0368E-01	
2500	1.804E-01	4.0000E 00	7.0240E-01	3.7516E 00	2.8273E 02	-2.0368E-01	
2000	1.499E-01	4.0000E 00	7.0240E-01	3.7516E 00	3.1014E 02	-2.0368E-01	
1500	1.194E-01	4.0000E 00	7.0240E-01	3.7516E 00	3.4747E 02	-2.0368E-01	
1000	8.897E-02	4.0000E 00	7.0240E-01	3.7516E 00	4.0260E 02	-2.0368E-01	
500	5.850E-02	4.0000E 00	7.0240E-01	3.7516E 00	4.9652E 02	-2.0368E-01	
68	3.216E-02	4.0000E 00	7.0240E-01	3.7516E 00	6.6959E 02	-2.0368E-01	

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

BORON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	7.6360E 00	7.1610E 00	1.0139E 03	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 25
3.3999E 00	9.4394E-01	5.3135E-02	2.2505E-03	7.5157E-04
22 21	22 22	22 23	22 24	22 25
9.7868E-01	2.7600E 00	6.0256E-01	4.1281E-02	1.7473E-02
23 21	23 22	23 23	23 24	23 25
1.6012E-01	1.7561E 00	2.0778E 00	2.7339E-01	1.3255E-01
24 21	24 22	24 23	24 24	24 25
5.2780E-02	9.4432E-01	2.1368E 00	7.9320E-01	4.6325E-01
25 21	25 22	25 23	25 24	25 25
5.5902E-02	1.2628E 00	3.2896E 00	1.4708E 00	1.5568E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	7.3715E 00	6.9130E 00	1.0147E 03	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 26
3.3511E 00	9.9599E-01	5.0474E-02	1.8845E-03	5.8220E-04
22 21	22 22	22 23	22 24	22 26
8.7578E-01	2.8470E 00	6.2112E-01	3.9912E-02	1.6148E-02
23 21	23 22	23 23	23 24	23 26
1.1997E-01	1.6845E 00	2.1766E 00	2.8454E-01	1.3442E-01
24 21	24 22	24 23	24 24	24 26
3.4142E-02	8.2880E-01	2.1805E 00	8.5038E-01	4.9188E-01
26 21	26 22	26 23	26 24	26 26
3.2369E-02	1.0305E 00	3.1661E 00	1.5117E 00	1.6309E 00

-----BORON-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	7.0977E 00	6.6562E 00	1.0158E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
3.2885E 00	1.0620E 00	4.7532E-02	1.5185E-03	4.2592E-04
22 21	22 22	22 23	22 24	22 27
7.6392E-01	2.9388E 00	6.4428E-01	3.8353E-02	1.4678E-02
23 21	23 22	23 23	23 24	23 27
9.2424E-02	1.7490E 00	2.0837E 00	3.2578E-01	1.4906E-01
24 21	24 22	24 23	24 24	24 27
1.9955E-02	7.0766E-01	2.2167E 00	9.1712E-01	5.2429E-01
27 21	27 22	27 23	27 24	27 27
1.6558E-02	8.0275E-01	3.0072E 00	1.5543E 00	1.7168E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	6.7269E 00	6.3085E 00	1.0171E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
3.2289E 00	1.1298E 00	4.0098E-02	9.6728E-04	2.2892E-04
22 21	22 22	22 23	22 24	22 28
6.3233E-01	3.0565E 00	6.6468E-01	3.4533E-02	1.1981E-02
23 21	23 22	23 23	23 24	23 28
5.3246E-02	1.5866E 00	2.2784E 00	3.3641E-01	1.4539E-01
24 21	24 22	24 23	24 24	24 28
8.4892E-02	5.4929E-01	2.2454E 00	1.0151E 00	5.6738E-01
28 21	28 22	28 23	28 24	28 28
5.6599E-03	5.3834E-01	2.7427E 00	1.6035E 00	1.8367E 00

BORON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	6.4407E 00	6.0400E 00	1.0189E 03	0.
<div> <div>N1 N2</div> <div>SIGMA S (N1/N2)</div> </div>				
21 21	21 22	21 23	21 24	21 29
3.1207E 00	1.2423E 00	3.6216E-02	6.6380E-04	1.3282E-04
22 21	22 22	22 23	22 24	22 29
5.0376E-01	3.1488E 00	7.0476E-01	3.2441E-02	1.0239E-02
23 21	23 22	23 23	23 24	23 29
2.9394E-02	1.4223E 00	2.4536E 00	3.5095E-01	1.4373E-01
24 21	24 22	24 23	24 24	24 29
3.3987E-03	4.1765E-01	2.2438E 00	1.1116E 00	6.0923E-01
29 21	29 22	29 23	29 24	29 29
1.8268E-03	3.5548E-01	2.4804E 00	1.6443E 00	1.9587E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	6.1427E 00	5.7606E 00	1.0215E 03	0.
<div> <div>N1 N2</div> <div>SIGMA S (N1/N2)</div> </div>				
21 21	21 22	21 23	21 24	21 30
2.9819E 00	1.3863E 00	3.1290E-02	3.9157E-04	6.2300E-05
22 21	22 22	22 23	22 24	22 30
3.6754E-01	3.2306E 00	7.6350E-01	3.0032E-02	8.3453E-03
23 21	23 22	23 23	23 24	23 30
1.3169E-02	1.2262E 00	2.6498E 00	3.6978E-01	1.4105E-01
24 21	24 22	24 23	24 24	24 30
9.6543E-03	2.8712E-01	2.2083E 00	1.2314E 00	6.5780E-01
30 21	30 22	30 23	30 24	30 30
3.8934E-04	2.0338E-01	2.1505E 00	1.6793E 00	2.1091E 00

BORON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	5.8318E 00	5.4691E 00	1.0254E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
2.9460E 00	1.4313E 00	2.2555E-02	1.5965E-04	1.8201E-05
22 21	22 22	22 23	22 24	22 31
2.2884E-01	3.2808E 00	8.5693E-01	2.7155E-02	6.2929E-03
23 21	23 22	23 23	23 24	23 31
4.1278E-03	9.9084E-01	2.8712E 00	3.9661E-01	1.3718E-01
24 21	24 22	24 23	24 24	24 31
1.5153E-04	1.6678E-01	2.1177E 00	1.3861E 00	7.1499E-01
31 21	31 22	31 23	31 24	31 31
4.0583E-05	9.1571E-02	1.7399E 00	1.6987E 00	2.3015E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	5.5069E 00	5.1644E 00	1.0321E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
3.4471E 00	9.4518E-01	7.6456E-03	2.0432E-05	1.3574E-06
22 21	22 22	22 23	22 24	22 32
1.0194E-01	3.2489E 00	1.0217E 00	2.3374E-02	4.0807E-03
23 21	23 22	23 23	23 24	23 32
6.4188E-04	7.0667E-01	3.1190E 00	4.4135E-01	1.3234E-01
24 21	24 22	24 23	24 24	24 32
7.3728E-06	7.0430E-02	1.9408E 00	1.6023E 00	7.8644E-01
32 21	32 22	32 23	32 24	32 32
1.0301E-06	2.6096E-02	1.2414E 00	1.6787E 00	2.5607E 00

BORON

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	5.1677E 00	4.8463E 00	1.0463E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.5467E 00	8.5121E-01	2.0449E-03	7.0622E-07	0.	21 33
22	21	22	22	22	23
5.3089E-02	3.0555E 00	1.2734E 00	1.6312E-02	1.6939E-03	22 33
23	21	23	22	23	23
1.7558E-05	3.6834E-01	3.3639E 00	5.3935E-01	1.2835E-01	23 33
24	21	24	22	24	23
0.	1.3670E-02	1.5936E 00	1.9182E 00	8.7448E-01	24 33
33	21	33	22	33	23
0.	2.4851E-03	6.7172E-01	1.5525E 00	2.9411E 00	33 33

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	4.8652E 00	4.5636E 00	1.0836E 03	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
3.5455E 00	8.5429E-01	2.5161E-03	0.	0.	21 34
22	21	22	22	22	23
5.7502E-02	3.8188E 00	5.2229E-01	1.3432E-03	4.3870E-05	22 34
23	21	23	22	23	23
0.	7.8139E-02	3.3829E 00	8.0814E-01	1.3083E-01	23 34
24	21	24	22	24	23
0.	3.9863E-04	1.0761E 00	2.2837E 00	1.0255E 00	24 34
34	21	34	22	34	23
0.	1.5529E-05	1.9939E-01	1.1834E 00	3.4824E 00	34 34

BORON

TRANSFERS FROM GROUPS 1 THROUGH 6 TO GROUPS 1 THROUGH 15

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
1.7838E-01		2.5414E-01		1.7767E-02	
1	6	1	7	1	8
1.1270E-01		7.4283E-02		3.9077E-02	
1	11	1	12	1	13
1.0002E-03		1.4742E-04		2.4637E-05	
2	1	2	2	2	3
0.		5.2498E-01		3.0065E-01	
2	6	2	7	2	8
8.3139E-02		6.1286E-02		3.4590E-02	
2	11	2	12	2	13
9.8001E-04		1.4542E-04		2.4361E-05	
3	1	3	2	3	3
0.		0.		7.7225E-01	
3	6	3	7	3	8
4.2954E-02		3.8006E-02		2.4055E-02	
3	11	3	12	3	13
8.0379E-04		1.2059E-04		2.0281E-05	
4	1	4	2	4	3
0.		0.		0.	
4	6	4	7	4	8
1.4863E-02		1.6529E-02		1.2098E-02	
4	11	4	12	4	13
4.9953E-04		7.6014E-05		1.2849E-05	
5	1	5	2	5	3
0.		0.		0.	
5	6	5	7	5	8
4.8068E-01		9.1016E-03		8.0924E-03	
5	11	5	12	5	13
4.4615E-04		6.9234E-05		1.1785E-05	
6	1	6	2	6	3
0.		0.		0.	
6	6	6	7	6	8
1.2164E 00		7.2778E-01		4.5119E-03	
6	11	6	12	6	13
3.4115E-04		5.4063E-05		9.2719E-06	
6	14	6	14	6	14
				1.2779E-06	
6	15	6	15	6	15
				2.1752E-07	

DATE 01/11/61

DESIGNATION		CODE NO.		DENSITY FACTOR			
THORIUM 232		90.2320		3.85164E 02			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	6.3065E 00	5.5245E 00	2.8624E 00	3.1980E-01	-3.4929E 00	
2	6.065E 06	6.9353E 00	5.2829E 00	3.2728E 00	2.3575E-01	-3.7144E 00	
3	3.679E 06	7.2214E 00	4.8137E 00	3.8085E 00	1.6935E-01	-3.4612E 00	
4	2.231E 06	6.6523E 00	4.1088E 00	4.1133E 00	1.6930E-01	-2.5749E 00	
5	1.353E 06	6.4994E 00	2.7469E 00	4.2790E 00	1.4513E-01	-2.2518E 00	
6	8.208E 05	6.9512E 00	7.2642E-01	4.4140E 00	1.4193E-01	-2.5731E 00	
7	4.979E 05	7.8331E 00	1.5822E-01	5.7192E 00	1.6759E-01	-2.1438E 00	
8	3.020E 05	9.2441E 00	8.9143E-02	8.9191E 00	1.9260E-01	-3.2959E-01	
9	1.832E 05	1.0777E 01	9.1608E-02	1.0747E 01	2.8337E-01	-3.0603E-02	
10	6.738E 04	1.2288E 01	1.0445E-01	1.2254E 01	4.4001E-01	-3.4893E-02	
11	2.479E 04	1.3347E 01	1.1345E-01	1.3309E 01	5.3355E-01	-3.7900E-02	
12	9.119E 03	1.3979E 01	1.1882E-01	1.3940E 01	5.4120E-01	-3.9697E-02	
13	3.355E 03	1.4005E 01	1.1904E-01	1.3966E 01	4.2271E-01	-3.9768E-02	
14	1.234E 03	1.3722E 01	1.1664E-01	1.3684E 01	2.9740E-01	-3.8967E-02	
15	4.540E 02	1.7321E 01	1.4723E-01	1.7272E 01	2.2628E 00	-4.9186E-02	
16	8.719E 01	7.5397E 01	6.4088E-01	7.5186E 01	3.1485E 01	-2.1410E-01	
17	3.545E 01	1.4600E 01	1.2410E-01	1.4559E 01	4.6923E 01	-4.1461E-02	
18	1.304E 01	1.0596E 01	9.0067E-02	1.0566E 01	5.8862E-01	-3.0090E-02	
19	5.043E 00	1.1467E 01	9.7465E-02	1.1434E 01	5.6342E-01	-3.2561E-02	
20	1.445E 00	1.1731E 01	9.9716E-02	1.1698E 01	9.5569E-01	-3.3313E-02	
21	6.826E-01	1.2232E 01	1.0397E-01	1.2198E 01	1.5122E 00	-3.4735E-02	
22	2.511E-01	1.2257E 01	1.0419E-01	1.2223E 01	2.4305E 00	-3.4806E-02	
23	9.237E-02	1.2112E 01	1.0295E-01	1.2078E 01	4.1751E 00	-3.4392E-02	
24	2.530E-02	1.1801E 01	1.0039E-01	1.1768E 01	6.5066E 00	-3.3556E-02	
*4500	3.023E-01	1.2439E 01	1.0786E-01	1.2403E 01	2.4225E 00	-3.6584E-02	
*4000	2.718E-01	1.2439E 01	1.0786E-01	1.2403E 01	2.4225E 00	-3.6584E-02	
*3500	2.413E-01	1.2439E 01	1.0786E-01	1.2403E 01	2.4225E 00	-3.6584E-02	
*3000	2.109E-01	1.2439E 01	1.0786E-01	1.2403E 01	2.4225E 00	-3.6584E-02	
2500	1.804E-01	1.2444E 01	1.0790E-01	1.2408E 01	2.6207E 00	-3.6599E-02	
2000	1.499E-01	1.2445E 01	1.0791E-01	1.2409E 01	2.8756E 00	-3.6602E-02	
1500	1.194E-01	1.2439E 01	1.0786E-01	1.2403E 01	3.3210E 00	-3.6584E-02	
1000	8.897E-02	1.2424E 01	1.0773E-01	1.2388E 01	3.7289E 00	-3.6540E-02	
500	5.850E-02	1.2405E 01	1.0756E-01	1.2369E 01	4.5919E 00	-3.6484E-02	
68	3.216E-02	1.2401E 01	1.0753E-01	1.2365E 01	6.1823E 00	-3.6472E-02	

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

DESIGNATION	CODE NO.	DENSITY FACTOR
THORIUM 232	90.2320	3.85164E 02
LEVEL	ENERGY	NU SIGMA FISSION
1	1.000E 07	9.6875E-01
2	6.065E 06	6.1361E-01
3	3.679E 06	3.3527E-01
4	2.231E 06	2.4753E-01
5	1.353E 06	9.5928E-02
6	8.208E 05	0.
7	4.979E 05	0.
8	3.020E 05	0.
9	1.832E 05	0.
10	6.738E 04	0.
11	2.479E 04	0.
12	9.119E 03	0.
13	3.355E 03	0.
14	1.234E 03	0.
15	4.540E 02	0.
16	8.719E 01	0.
17	3.545E 01	0.
18	1.304E 01	0.
19	5.043E 00	0.
20	1.445E 00	0.
21	6.826E-01	0.
22	2.511E-01	0.
23	9.237E-02	0.
24	2.530E-02	0.
4500	3.023E-01	0.
4000	2.718E-01	0.
3500	2.413E-01	0.
3000	2.109E-01	0.
2500	1.804E-01	0.
2000	1.499E-01	0.
1500	1.194E-01	0.
1000	8.897E-02	0.
500	5.850E-02	0.
68	3.216E-02	0.

THORIUM 232

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.1443E 01	1.1410E 01	1.0153E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
1.1469E 01	7.6338E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 25
6.6606E-01	1.1133E 01	4.8245E-01	3.1815E-06	0.
23 21	23 22	23 23	23 24	23 25
0.	1.4129E 00	1.0360E 01	3.9075E-01	1.3077E-02
24 21	24 22	24 23	24 24	24 25
0.	5.3016E-05	3.3276E 00	7.3110E 00	1.3288E 00
25 21	25 22	25 23	25 24	25 25
0.	0.	2.3927E-01	3.0195E 00	8.1838E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.1399E 01	1.1366E 01	1.0161E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
1.1413E 01	8.1942E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 26
5.9507E-01	1.1192E 01	4.9251E-01	1.3600E-06	0.
23 21	23 22	23 23	23 24	23 26
0.	1.3134E 00	1.0461E 01	3.8538E-01	1.0714E-02
24 21	24 22	24 23	24 24	24 26
0.	1.8860E-05	3.1583E 00	7.5060E 00	1.2866E 00
26 21	26 22	26 23	26 24	26 26
0.	0.	1.8500E-01	2.8957E 00	8.3184E 00

THORIUM 232

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.1356E 01	1.1323E 01	1.0171E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.1338E 01	8.9455E-01	0.	0.	0.	0.
22	21	22	22	22	23
5.1942E-01	1.1250E 01	5.0805E-01	4.7864E-07	0.	0.
23	21	23	22	23	23
0.	1.2067E 00	1.0568E 01	3.8078E-01	8.4851E-03	0.
24	21	24	22	24	23
0.	5.3040E-06	2.9747E 00	7.7204E 00	1.2390E 00	0.
27	21	27	22	27	23
0.	0.	1.3615E-01	2.7555E 00	8.4641E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.1312E 01	1.1280E 01	1.0185E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.1234E 01	9.9828E-01	0.	0.	0.	0.
22	21	22	22	22	23
4.3857E-01	1.1304E 01	5.3201E-01	1.2758E-07	0.	0.
23	21	23	22	23	23
0.	1.0913E 00	1.0682E 01	3.7756E-01	6.4139E-03	0.
24	21	24	22	24	23
0.	1.0702E-06	2.7739E 00	7.9582E 00	1.1854E 00	0.
28	21	28	22	28	23
0.	0.	9.3665E-02	2.5955E 00	8.6230E 00	0.

-----THORIUM 232-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.1269E 01	1.1236E 01	1.0203E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
1.1085E 01	1.1467E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
3.5218E-01	1.1351E 01	5.6966E-01	0.	0.
23 21	23 22	23 23	23 24	23 29
0.	9.6489E-01	1.0805E 01	3.7680E-01	4.5458E-03
24 21	24 22	24 23	24 24	24 29
0.	1.3192E-07	2.5519E 00	8.2241E 00	1.1248E 00
29 21	29 22	29 23	29 24	29 29
0.	0.	5.8459E-02	2.4118E 00	8.7983E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.1225E 01	1.1193E 01	1.0228E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
1.0873E 01	1.3590E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
2.6055E-01	1.1378E 01	6.3144E-01	0.	0.
23 21	23 22	23 23	23 24	23 30
0.	8.2416E-01	1.0937E 01	3.8073E-01	2.9244E-03
24 21	24 22	24 23	24 24	24 30
0.	0.	2.3030E 00	8.5252E 00	1.0560E 00
30 21	30 22	30 23	30 24	30 30
0.	0.	3.1446E-02	2.1987E 00	8.9948E 00

THORIUM 232

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.1181E 01	1.1149E 01	1.0268E 01	0.

		N1 SIGMA S (N1/N2)	N2		
21	21	21	22	21	23
1.0707E 01	1.5253E 00	0.	0.	21	24
22	21	22	22	22	23
1.6610E-01	1.1362E 01	7.4030E-01	0.	22	24
23	21	23	22	23	23
0.	6.6424E-01	1.1079E 01	3.9432E-01	23	24
24	21	24	22	24	23
0.	0.	2.0181E 00	8.8712E 00	24	24
31	21	31	22	31	23
0.	0.	1.3210E-02	1.9478E 00	31	24
				31	31
				9.2202E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.1137E 01	1.1105E 01	1.0335E 01	0.

		N1 SIGMA S (N1/N2)	N2		
21	21	21	22	21	23
1.1264E 01	9.6799E-01	0.	0.	21	24
22	21	22	22	22	23
7.7142E-02	1.1233E 01	9.5581E-01	0.	22	24
23	21	23	22	23	23
0.	4.7784E-01	1.1223E 01	4.3115E-01	23	24
24	21	24	22	24	23
0.	0.	1.6820E 00	9.2775E 00	24	24
32	21	32	22	32	23
0.	0.	3.4711E-03	1.6458E 00	32	24
				32	32
				9.4881E 00	

THORIUM 232

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.1093E 01	1.1062E 01	1.0477E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.1673E 01	5.5874E-01	0.	0.	21	24
22	21	22	22	22	24
1.0121E-01	1.0782E 01	1.3795E 00	0.	22	33
23	21	23	22	23	24
0.	2.5715E-01	1.1327E 01	5.4165E-01	23	33
24	21	24	22	24	24
0.	0.	1.2630E 00	9.7708E 00	24	33
33	21	33	22	33	24
0.	0.	3.0038E-04	1.2656E 00	33	33
					9.8728E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.1055E 01	1.1024E 01	1.0851E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
1.1655E 01	5.7738E-01	0.	0.	21	24
22	21	22	22	22	24
1.9913E-01	1.1658E 01	4.0291E-01	0.	22	34
23	21	23	22	23	24
0.	5.9465E-02	1.1135E 01	9.2678E-01	23	34
24	21	24	22	24	24
0.	0.	7.6929E-01	1.0303E 01	24	34
34	21	34	22	34	24
0.	0.	1.7322E-06	8.1439E-01	34	34
					1.0241E 01

THORIUM 232

TRANSFERS FROM GROUPS 1 THROUGH 7 TO GROUPS 1 THROUGH 16

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
3.6565E-00	1.2084E-01	1.6374E-01	4.8964E-01	6.7313E-01	
1	6	1	7	1	8
5.6180E-01	3.4205E-01	1.7129E-01	9.5316E-02	2.7490E-02	
1	11	1	12	1	13
4.0494E-03	5.6246E-04	7.8086E-05	1.0396E-05	1.5315E-06	
1	16	2	1	2	2
1.1844E-07	0.	4.0473E-00	3.2154E-01	3.7793E-01	
2	5	2	6	2	7
6.6681E-01	6.5566E-01	4.4316E-01	2.3688E-01	1.3783E-01	
2	10	2	11	2	12
4.1057E-02	6.1504E-03	8.5970E-04	1.1962E-04	1.5940E-05	
2	15	2	16	3	1
2.3490E-06	1.8168E-07	0.	0.	3	2
3	4	3	5	3	6
2.6771E-01	5.7229E-01	7.3014E-01	5.8230E-01	3.4509E-01	
3	9	3	10	3	11
2.1548E-01	6.7533E-02	1.0388E-02	1.4665E-03	2.0480E-04	
3	14	3	15	3	16
2.7328E-05	4.0292E-06	3.1170E-07	0.	4	1
4	3	4	4	4	6
0.	3.9463E-00	4.4477E-01	6.9052E-01	6.7738E-01	
4	8	4	9	4	10
4.5724E-01	3.1233E-01	1.0441E-01	1.6609E-02	2.3749E-03	
4	13	4	14	4	15
3.3319E-04	4.4540E-05	6.5711E-06	5.0847E-07	0.	
5	2	5	3	5	5
0.	0.	0.	4.4790E-00	5.6043E-01	
5	7	5	8	5	9
5.5157E-01	4.3480E-01	3.3088E-01	1.1953E-01	1.9801E-02	
5	12	5	13	5	14
2.8750E-03	4.0561E-04	5.4339E-05	8.0231E-06	6.2100E-07	
6	1	6	2	6	3
0.	0.	0.	0.	6	4
6	6	6	7	6	8
6.2856E-00	2.8559E-01	1.6718E-01	1.4420E-01	5.6976E-02	
6	11	6	12	6	13
9.8905E-03	1.4619E-03	2.0759E-04	2.7881E-05	4.1204E-06	
6	16	7	1	7	2
3.1903E-07	0.	0.	0.	7	3

THORIUM 232

N1		N2		SIGMA S0 (N1/N2)	
7	5	7	6	7	7
0.		0.		7.6602E 00	1.4024E-01
7	10	7	11	7	12
9.3607E-03		1.7217E-03		2.6017E-04	3.7241E-05
7	15	7	16		
7.4233E-07		5.7502E-08			

THORIUM 232

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
2.1900E 01	9.6410E 00	3.6927E 03	2.4878E-02	0.
2.3600E 01	1.3294E 01	5.1214E 03	2.3354E-02	0.
5.9600E 01	2.1911E 00	3.2475E 03	1.3688E-01	0.
6.9700E 01	8.6831E 00	4.6987E 03	1.5602E-02	0.
1.1400E 02	1.0174E 00	1.7623E 03	9.7735E-02	0.
1.2200E 02	1.9012E 00	2.5906E 03	5.6518E-02	0.
1.3000E 02	7.9042E-01	1.5575E 03	1.1092E-01	0.
1.7200E 02	1.5725E 00	1.7048E 03	2.5378E-02	0.
1.9500E 02	7.2455E-01	1.6062E 03	9.3591E-02	0.
2.0100E 02	5.3138E-01	1.3877E 03	1.2600E-01	0.
2.1200E 02	5.3195E-02	2.0396E 02	2.5753E-01	0.
2.2400E 02	5.9223E-01	1.4314E 03	9.6854E-02	0.
2.3500E 02	6.0471E-02	2.5341E 02	2.7753E-01	0.
2.5400E 02	5.4351E-01	1.2924E 03	8.2678E-02	0.
2.6600E 02	4.4761E-01	1.2226E 03	1.0415E-01	0.
2.9000E 02	4.4011E-01	1.1285E 03	8.4199E-02	0.
3.1000E 02	5.5253E-01	7.7888E 02	2.3806E-02	0.

DATE 01/11/61

DESIGNATION			CODE NO.			DENSITY FACTOR		
GADOLINIUM			64.1570			2.60428E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1		
1	1.000E 07	5.2261E 00	4.3738E 00	1.7120E 00	1.0095E-02	-3.5527E 00		
2	6.065E 06	5.3430E 00	4.4117E 00	2.5957E 00	1.4938E-02	-2.7774E 00		
3	3.679E 06	5.6979E 00	4.4159E 00	3.1601E 00	2.5619E-02	-2.5657E 00		
4	2.231E 06	6.5685E 00	3.7698E 00	3.4312E 00	5.8838E-02	-3.1717E 00		
5	1.353E 06	7.1973E 00	2.6320E 00	4.0365E 00	1.2198E-01	-3.1956E 00		
6	8.208E 05	7.2459E 00	1.2804E 00	5.2907E 00	1.8110E-01	-1.9766E 00		
7	4.979E 05	7.2643E 00	5.0250E-01	5.5054E 00	2.4800E-01	-1.7782E 00		
8	3.020E 05	7.3844E 00	2.3162E-01	5.9604E 00	3.9458E-01	-1.4397E 00		
9	1.832E 05	8.1040E 00	1.3034E-01	6.7601E 00	5.0232E-01	-1.3587E 00		
10	6.738E 04	1.0605E 01	1.5445E-01	1.0199E 01	5.3348E-01	-4.1053E-01		
11	2.479E 04	1.1499E 01	1.5754E-01	1.1447E 01	1.1341E 00	-5.3478E-02		
12	9.119E 03	1.0616E 01	1.4544E-01	1.0567E 01	2.2741E 00	-4.9372E-02		
13	3.355E 03	1.2720E 01	1.7426E-01	1.2661E 01	4.1162E 00	-5.9153E-02		
14	1.234E 03	1.3610E 01	1.8646E-01	1.3547E 01	6.3822E 00	-6.3294E-02		
15	4.540E 02	1.8120E 01	2.4824E-01	1.8036E 01	1.3758E 01	-8.4268E-02		
16	8.719E 01	1.7173E 01	2.3527E-01	1.7094E 01	2.4235E 01	-7.9866E-02		
17	3.545E 01	1.3498E 01	1.8492E-01	1.3436E 01	3.1759E 01	-6.2771E-02		
18	1.304E 01	1.6010E 01	2.1934E-01	1.5937E 01	3.9795E 01	-7.4457E-02		
19	5.043E 00	1.0401E 01	1.4250E-01	1.0353E 01	5.9019E 01	-4.8372E-02		
20	1.445E 00	1.3605E 01	1.8638E-01	1.3542E 01	1.2078E 02	-6.3270E-02		
21	6.826E-01	2.5919E 01	3.5509E-01	2.5799E 01	1.3987E 02	-1.2054E-01		
22	2.511E-01	6.6316E 01	9.0853E-01	6.6011E 01	2.1886E 03	-3.0841E-01		
23	9.237E-02	1.3984E 02	1.9158E 00	1.3920E 02	1.6462E 04	-6.5033E-01		
24	2.530E-02	1.6541E 02	2.2612E 00	1.6465E 02	3.8061E 04	-7.6758E-01		
4500	3.023E-01	2.9974E 01	3.8295E-01	2.9846E 01	2.4309E 03	-1.2970E-01		
4000	2.718E-01	3.3228E 01	4.2452E-01	3.3086E 01	2.8761E 03	-1.4378E-01		
3500	2.413E-01	3.7311E 01	4.7668E-01	3.7151E 01	3.4606E 03	-1.6144E-01		
3000	2.109E-01	4.2544E 01	5.4355E-01	4.2362E 01	4.2501E 03	-1.8410E-01		
2500	1.804E-01	4.9430E 01	6.3151E-01	4.9218E 01	5.3548E 03	-2.1384E-01		
2000	1.499E-01	5.8778E 01	7.5095E-01	5.8527E 01	6.9722E 03	-2.5436E-01		
1500	1.194E-01	7.1971E 01	9.1950E-01	7.1663E 01	9.4854E 03	-3.1144E-01		
1000	8.897E-02	9.1463E 01	1.1685E 00	9.1071E 01	1.3723E 04	-3.9579E-01		
500	5.850E-02	1.2160E 02	1.5536E 00	1.2108E 02	2.1769E 04	-5.2672E-01		
68	3.216E-02	1.5989E 02	2.0428E 00	1.5921E 02	3.6525E 04	-6.9151E-01		

NOTE: For a summary of the sources of data see APEX-704.

GADOLINIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.6948E 02	1.6875E 02	6.0519E 04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 25
2.4076E 01	1.8423E 00	3.7039E-07	0.	0.
22 21	22 22	22 23	22 24	22 25
4.3147E 00	5.9141E 01	3.0555E 00	2.9348E-04	1.6187E-06
23 21	23 22	23 23	23 24	23 25
3.4744E-06	1.9696E 00	1.1568E 02	5.2418E 00	3.2356E-01
24 21	24 22	24 23	24 24	24 25
0.	1.5631E-02	5.5130E 01	9.2610E 01	2.1103E 01
25 21	25 22	25 23	25 24	25 25
0.	1.8261E-04	7.7789E 00	4.9700E 01	1.1200E 02

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.6855E 02	1.6782E 02	6.0560E 04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 26
2.3953E 01	1.9659E 00	1.1616E-07	0.	0.
22 21	22 22	22 23	22 24	22 26
3.8487E 00	5.9538E 01	3.1070E 00	1.6087E-04	5.6853E-07
23 21	23 22	23 23	23 24	23 26
7.9893E-07	1.8296E 01	1.1710E 02	5.1723E 00	2.7547E-01
24 21	24 22	24 23	24 24	24 26
0.	7.2622E-03	5.2460E 01	9.5452E 01	2.0594E 01
26 21	26 22	26 23	26 24	26 26
0.	5.3295E-05	6.2892E 00	4.8034E 01	1.1423E 02

GADOLINIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.6762E 02	1.6690E 02	6.0612E 04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.3787E 01	2.1313E 00	0.	0.	0.	0.
22	21	22	22	22	23
3.3529E 00	5.9933E 01	3.1897E 00	7.7339E-05	1.5678E-07	1.5678E-07
23	21	23	22	23	23
1.3052E-07	1.6795E 01	1.1860E 02	5.1116E 00	2.2845E-01	2.2845E-01
24	21	24	22	24	23
0.	2.8446E-03	4.9549E 01	9.8617E 01	1.9999E 01	1.9999E 01
27	21	27	22	27	23
0.	1.1711E-05	4.8872E 00	4.6084E 01	1.1665E 02	1.1665E 02

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.6669E 02	1.6597E 02	6.0678E 04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.3560E 01	2.3588E 00	0.	0.	0.	0.
22	21	22	22	22	23
2.8241E 00	6.0313E 01	3.3201E 00	3.0890E-05	0.	0.
23	21	23	22	23	23
0.	1.5171E 01	1.2020E 02	5.0669E 00	1.8294E-01	1.8294E-01
24	21	24	22	24	23
0.	8.7646E-04	4.6345E 01	1.0218E 02	1.9300E 01	1.9300E 01
28	21	28	22	28	23
0.	1.7220E-06	3.5983E 00	4.3784E 01	1.1931E 02	1.1931E 02

GADOLINIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.6576E 02	1.6504E 02	6.0768E 04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.3236E 01	2.6824E 00	0.	0.	0.	0.
22	21	22	22	22	23
2.2605E 00	6.0651E 01	3.5281E 00	9.3537E-06	0.	0.
23	21	23	22	23	23
0.	1.3393E 01	1.2193E 02	5.0514E 00	1.3957E-01	1.3957E-01
24	21	24	22	24	23
0.	1.8942E-04	4.2775E 01	1.0622E 02	1.8478E 01	1.8478E 01
29	21	29	22	29	23
0.	1.3928E-07	2.4521E 00	4.1048E 01	1.2226E 02	1.2226E 02

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.6482E 02	1.6411E 02	6.0896E 04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.2778E 01	3.1403E 00	0.	0.	0.	0.
22	21	22	22	22	23
1.6651E 00	6.0885E 01	3.8716E 00	1.8183E-06	0.	0.
23	21	23	22	23	23
0.	1.1415E 01	1.2381E 02	5.0916E 00	9.9143E-02	9.9143E-02
24	21	24	22	24	23
0.	2.3402E-05	3.8733E 01	1.1089E 02	1.7505E 01	1.7505E 01
30	21	30	22	30	23
0.	0.	1.4857E 00	3.7752E 01	1.2558E 02	1.2558E 02

GADOLINIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.6388E 02	1.6318E 02	6.1090E 04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
2.2446E 01	3.4724E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.0549E 00	6.0871E 01	4.4776E 00	1.6171E-07	0.
23 21	23 22	23 23	23 24	23 31
0.	9.1709E 00	1.2582E 02	5.2469E 00	6.2824E-02
24 21	24 22	24 23	24 24	24 31
0.	1.1003E-06	3.4054E 01	1.1638E 02	1.6352E 01
31 21	31 22	31 23	31 24	31 31
0.	0.	7.4131E-01	3.3718E 01	1.2943E 02

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.6295E 02	1.6225E 02	6.1424E 04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
2.3753E 01	2.1656E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
4.8506E-01	6.0230E 01	5.6704E 00	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	6.5637E 00	1.2792E 02	5.6794E 00	3.2345E-02
24 21	24 22	24 23	24 24	24 32
0.	0.	2.8458E 01	1.2299E 02	1.4996E 01
32 21	32 22	32 23	32 24	32 32
0.	0.	2.5671E-01	2.8665E 01	1.3403E 02

GADOLINIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.6201E 02	1.6131E 02	6.2128E 04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.4660E 01	1.2585E 00	0.	0.	0.	0.
22	21	22	22	22	23
5.9192E-01	5.7815E 01	7.9578E 00	0.	0.	0.
23	21	23	22	23	23
0.	3.4980E 00	1.2960E 02	6.9852E 00	1.0219E-02	0.
24	21	24	22	24	23
0.	0.	2.1385E 01	1.3122E 02	1.3487E 01	0.
33	21	33	22	33	23
0.	0.	3.7823E-02	2.2069E 01	1.3990E 02	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.6120E 02	1.6050E 02	6.3935E 04	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	24
2.4642E 01	1.2768E 00	0.	0.	0.	0.
22	21	22	22	22	24
1.0943E 00	6.2986E 01	2.2570E 00	0.	0.	0.
23	21	23	22	23	24
0.	7.9234E-01	1.2772E 02	1.1489E 01	9.0529E-04	0.
24	21	24	22	24	24
0.	0.	1.2981E 01	1.4031E 02	1.2504E 01	0.
34	21	34	22	34	24
0.	0.	7.2764E-04	1.4091E 01	1.4711E 02	0.

GADOLINIUM

TRANSFERS FROM GROUPS 1 THROUGH 10 TO GROUPS 1 THROUGH 16

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
2.8999E 00	6.7656E-02	6.8190E-02	3.1171E-01	5.6530E-01	
1	6	1	7	1	8
5.6315E-01	3.8306E-01	2.0542E-01	1.1975E-01	3.5714E-02	
1	11	1	12	1	13
5.3531E-03	7.4841E-04	1.0415E-04	1.3878E-05	2.0451E-06	
1	16	2	1	2	2
1.5818E-07	0.	2.8639E 00	1.6346E-01	2.0946E-01	
2	5	2	6	2	7
5.0872E-01	6.1566E-01	4.7474E-01	2.7549E-01	1.6956E-01	
2	10	2	11	2	12
5.2593E-02	8.0460E-03	1.1336E-03	1.5819E-04	2.1103E-05	
2	15	2	16	3	1
3.1111E-06	2.4066E-07	0.	0.	3.1971E 00	
3	4	3	5	3	6
1.7812E-01	3.7527E-01	6.2025E-01	5.8416E-01	3.8431E-01	
3	9	3	10	3	11
2.5788E-01	8.5115E-02	1.3450E-02	1.9183E-03	2.6887E-04	
3	14	3	15	3	16
3.5930E-05	5.3002E-06	4.1010E-07	0.	0.	
4	3	4	4	4	5
0.	4.0972E 00	3.3695E-01	5.1660E-01	6.2397E-01	
4	8	4	9	4	10
4.8061E-01	3.5986E-01	1.2850E-01	2.1157E-02	3.0649E-03	
4	13	4	14	4	15
4.3203E-04	5.7859E-05	8.5418E-06	6.6113E-07	0.	
5	2	5	3	5	4
0.	0.	0.	4.8920E 00	4.8022E-01	
5	7	5	8	5	9
5.8621E-01	5.5078E-01	4.7430E-01	1.8721E-01	3.2481E-02	
5	12	5	13	5	14
4.8002E-03	6.8157E-04	9.1538E-05	1.3528E-05	1.0474E-06	
6	1	6	2	6	3
0.	0.	0.	0.	0.	
6	6	6	7	6	8
5.3292E 00	5.6519E-01	5.2224E-01	5.3659E-01	2.4023E-01	
6	11	6	12	6	13
4.4532E-02	6.7499E-03	9.6729E-04	1.3038E-04	1.9293E-05	
6	16	7	1	7	2
1.4945E-06	0.	0.	0.	0.	

GADOLINIUM

N1		N2		SIGMA S0 (N1/N2)	
7	5	7	6	7	7
0.	0.	5.9330E-00	4.9663E-01	5.0596E-01	
7	10	7	11	7	12
2.6541E-01	5.3491E-02	8.3736E-03	1.2142E-03	1.6442E-04	
7	15	7	16	8	1
2.4369E-05	1.8890E-06	0.	0.	0.	
8	4	8	5	8	6
0.	0.	0.	0.	0.	
8	9	8	10	8	11
5.8466E-01	2.3715E-01	5.3055E-02	8.6499E-03	1.2731E-03	
8	14	8	15	9	1
1.7340E-04	2.5755E-05	1.9980E-06	0.	0.	
9	3	9	4	9	5
0.	0.	0.	0.	0.	
9	8	9	9	9	10
0.	7.7189E-00	3.5930E-01	2.1525E-02	3.6876E-03	
9	13	9	14	9	15
5.5275E-04	7.5827E-05	1.1291E-05	8.7681E-07	0.	
10	2	10	3	10	4
0.	0.	0.	0.	0.	
10	7	10	8	10	9
0.	0.	0.	1.0104E-01	3.4455E-01	
10	12	10	13	10	14
0.	0.	0.	0.	0.	
10	15	10	16	10	17
0.	0.	0.	0.	0.	

GADOLINIUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
2.0100E 00	2.1095E 01	2.2442E 02	3.0991E-04	0.
2.6400E 00	1.0636E 02	1.4595E 03	3.9256E-04	0.
2.9000E 00	1.3857E 01	2.3180E 02	5.3114E-04	0.
6.4900E 00	2.2164E 01	7.4366E 02	9.5473E-04	0.
7.9500E 00	7.3396E 00	3.0563E 02	1.2005E-03	0.
1.0100E 01	5.3753E-01	2.8759E 01	1.5599E-03	0.
1.1670E 01	1.0710E 00	6.6043E 01	1.7934E-03	0.
1.2100E 01	1.8614E 00	1.1860E 02	1.8466E-03	0.
1.4700E 01	3.0502E 00	2.3359E 02	2.1959E-03	0.
1.7100E 01	1.9585E 01	1.6275E 03	2.2227E-03	0.
2.0200E 01	3.6578E 00	3.7600E 02	2.8792E-03	0.
2.1300E 01	1.0525E 01	1.0342E 03	2.4949E-03	0.
2.3900E 01	3.1488E 00	3.7963E 02	3.3474E-03	0.
2.7900E 01	3.5012E-01	5.1437E 01	4.2578E-03	0.
2.9900E 01	3.0334E 00	4.4553E 02	3.9709E-03	0.
3.0500E 01	3.7397E 00	5.4761E 02	3.8694E-03	0.
3.2100E 01	4.6750E-01	7.8566E 01	4.8425E-03	0.
3.5000E 01	1.7801E 00	3.1084E 02	4.7951E-03	0.
3.5600E 01	5.2006E-01	9.6453E 01	5.3179E-03	0.
3.7300E 01	2.6787E 00	4.7611E 02	4.6615E-03	0.
3.9400E 01	7.2390E-01	1.4667E 02	5.7344E-03	0.
4.0400E 01	2.9514E-01	6.2425E 01	6.0946E-03	0.
4.4300E 01	2.8902E 00	5.7402E 02	4.9007E-03	0.
4.4300E 01	1.5170E 00	3.5651E 02	6.8624E-03	0.
4.6300E 01	4.7055E-01	1.1240E 02	6.7824E-03	0.
4.7100E 01	1.5116E 00	3.4312E 02	6.0207E-03	0.
4.9000E 01	2.7553E 00	6.3667E 02	5.9974E-03	0.

GADOLINIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
1	1	1	2	1	3
0.		0.		6.9325E-04	1.3298E-02
1	6	1	7	1	8
4.6543E-02		7.7227E-02		1.1770E-01	8.2517E-02
1	11	2	1	2	2
4.8360E-04		0.		0.	6.9429E-04
2	5	2	6	2	7
2.7563E-02		4.6613E-02		7.7343E-02	1.1787E-01
2	10	2	11	3	1
2.4531E-02		4.8432E-04		0.	0.
3	4	3	5	3	6
1.4188E-02		2.9362E-02		4.9656E-02	8.2392E-02
3	9	3	10	3	11
8.8036E-02		2.6133E-02		5.1594E-04	0.
4	3	4	4	4	5
8.3419E-04		1.6002E-02		3.3117E-02	5.6006E-02
4	8	4	9	4	10
1.4162E-01		9.9294E-02		2.9474E-02	5.8192E-04
5	2	5	3	5	4
0.		9.8637E-04		1.8921E-02	3.9159E-02
5	7	5	8	5	9
1.0988E-01		1.6746E-01		1.1741E-01	3.4851E-02
6	1	6	2	6	3
0.		0.		1.2085E-03	2.3182E-02
6	6	6	7	6	8
8.1136E-02		1.3462E-01		2.0517E-01	1.4385E-01
6	11	7	1	7	2
8.4302E-04		0.		0.	1.5180E-03
7	5	7	6	7	7
6.0265E-02		1.0192E-01		1.6910E-01	2.5772E-01
7	10	7	11	8	1
5.3635E-02		1.0589E-03		0.	0.
8	4	8	5	8	6
3.7189E-02		7.6965E-02		1.3016E-01	2.1597E-01
8	9	8	10	8	11
2.3076E-01		6.8499E-02		1.3524E-03	0.
9	3	9	4	9	5
3.0744E-03		5.8976E-02		1.2205E-01	2.0641E-01
9	8	9	9	9	10
5.2196E-01		3.6595E-01		1.0863E-01	2.1447E-03
					0.

GADOLINIUM

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		6.6904E-03		1.2834E-01	
10	7	10	8	10	9
7.4530E-01		1.1359E 00		7.9635E-01	
11	1	11	2	11	3
0.		0.		1.3393E-02	
11	6	11	7	11	8
8.9918E-01		1.4920E 00		2.2738E 00	
11	11	12	1	12	2
9.3427E-03		0.		0.	
12	5	12	6	12	7
8.5672E-01		1.4488E 00		2.4040E 00	
12	10	12	11	13	1
7.6248E-01		1.5054E-02		0.	
13	4	13	5	13	6
9.2371E-01		1.9117E 00		3.2329E 00	
13	9	13	10	13	11
5.7317E 00		1.7014E 00		3.3591E-02	
14	3	14	4	14	5
7.4637E-02		1.4317E 00		2.9631E 00	
14	8	14	9	14	10
1.2672E 01		8.8841E 00		2.6371E 00	
15	2	15	3	15	4
0.		1.6087E-01		3.0860E 00	
15	7	15	8	15	9
1.7921E 01		2.7312E 01		1.9149E 01	
16	1	16	2	16	3
0.		0.		2.8337E-01	
16	6	16	7	16	8
1.9025E 01		3.1567E 01		4.8109E 01	
16	11	17	1	17	2
1.9767E-01		0.		0.	
17	5	17	6	17	7
1.4742E 01		2.4931E 01		4.1367E 01	
17	10	17	11	18	1
1.3120E 01		2.5904E-01		0.	
18	4	18	5	18	6
8.9257E 00		1.8472E 01		3.1239E 01	
18	9	18	10	18	11
5.5385E 01		1.6440E 01		3.2458E-01	
				0.	
				0.	

GADOLINIUM

N1		N2		SIGMA N,G (N1/N2)	
19 3	19 4	19 5	19 6	19 7	
6.9007E-01	1.3237E 01	2.7396E 01	4.6330E 01	7.6873E 01	
19 8	19 9	19 10	19 11	20 1	
1.1716E 02	8.2139E 01	2.4382E 01	4.8138E-01	0.	
20 2	20 3	20 4	20 5	20 6	
0.	1.4122E 00	2.7090E 01	5.6064E 01	9.4813E 01	
20 7	20 8	20 9	20 10	20 11	
1.5732E 02	2.3976E 02	1.6809E 02	4.9897E 01	9.8513E-01	
21 1	21 2	21 3	21 4	21 5	
0.	0.	1.6354E 00	3.1372E 01	6.4925E 01	
21 6	21 7	21 8	21 9	21 10	
1.0980E 02	1.8218E 02	2.7765E 02	1.9466E 02	5.7784E 01	
21 11	22 1	22 2	22 3	22 4	
1.1408E 00	0.	0.	2.5590E 01	4.9088E 02	
22 5	22 6	22 7	22 8	22 9	
1.0159E 03	1.7181E 03	2.8507E 03	4.3445E 03	3.0460E 03	
22 10	22 11	23 1	23 2	23 3	
9.0416E 02	1.7851E 01	0.	0.	1.9248E 02	
23 4	23 5	23 6	23 7	23 8	
3.6923E 03	7.6414E 03	1.2923E 04	2.1442E 04	3.2678E 04	
23 9	23 10	23 11	24 1	24 2	
2.2911E 04	6.8008E 03	1.3427E 02	0.	0.	
24 3	24 4	24 5	24 6	24 7	
4.0608E 02	7.7896E 03	1.6121E 04	2.7263E 04	4.5236E 04	
24 8	24 9	24 10	24 11	25 1	
6.8941E 04	4.8335E 04	1.4348E 04	2.8327E 02	0.	
25 2	25 3	25 4	25 5	25 6	
0.	7.0761E 02	1.3574E 04	2.8092E 04	4.7508E 04	
25 7	25 8	25 9	25 10	25 11	
7.8827E 04	1.2013E 05	8.4227E 04	2.5002E 04	4.9362E 02	
26 1	26 2	26 3	26 4	26 5	
0.	0.	7.0809E 02	1.3583E 04	2.8111E 04	
26 6	26 7	26 8	26 9	26 10	
4.7540E 04	7.8880E 04	1.2022E 05	8.4284E 04	2.5019E 04	
26 11	27 1	27 2	27 3	27 4	
4.9395E 02	0.	0.	7.0870E 02	1.3595E 04	
27 5	27 6	27 7	27 8	27 9	
2.8135E 04	4.7581E 04	7.8948E 04	1.2032E 05	8.4356E 04	
27 10	27 11	28 1	28 2	28 3	
2.5040E 04	4.9437E 02	0.	0.	7.0947E 02	

GADOLINIUM

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
1.3810E 04		2.8166E 04		4.7633E 04	
28	9	28	10	28	11
8.4448E 04		2.5068E 04		4.9491E 02	
29	3	29	4	29	5
7.1052E 02		1.3630E 04		2.8208E 04	
29	8	29	9	29	10
1.2063E 05		8.4573E 04		2.5105E 04	
30	2	30	3	30	4
0.		7.1202E 02		1.3658E 04	
30	7	30	8	30	9
7.9318E 04		1.2088E 05		8.4752E 04	
31	1	31	2	31	3
0.		0.		7.1429E 02	
31	6	31	7	31	8
4.7956E 04		7.9571E 04		1.2127E 05	
31	11	32	1	32	2
4.9827E 02		0.		0.	
32	5	32	6	32	7
2.8512E 04		4.8218E 04		8.0006E 04	
32	10	32	11	33	1
2.5376E 04		5.0100E 02		0.	
33	4	33	5	33	6
1.3935E 04		2.8839E 04		4.8771E 04	
33	9	33	10	33	11
8.6466E 04		2.5667E 04		5.0674E 02	
34	3	34	4	34	5
7.4755E 02		1.4340E 04		2.9678E 04	
34	8	34	9	34	10
1.2692E 05		8.8981E 04		2.6413E 04	
				5.2148E 02	

DATE 01/11/61

DESIGNATION			CODE NO.			DENSITY FACTOR		
EUROPIUM			63.1520			2.52295E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER	1	
1	1.000E 07	5.2261E 00	4.3738E 00	1.7120E 00	1.0095E-02	-3.5115E 00		
2	6.065E 06	5.3430E 00	4.4117E 00	2.5957E 00	1.4938E-02	-2.7452E 00		
3	3.679E 06	5.6979E 00	4.4159E 00	3.1601E 00	2.5619E-02	-2.5359E 00		
4	2.231E 06	6.5685E 00	3.7698E 00	3.4312E 00	5.8838E-02	-3.1350E 00		
5	1.353E 06	7.1973E 00	2.6320E 00	4.0365E 00	1.2198E-01	-3.1585E 00		
6	8.208E 05	7.2459E 00	1.2804E 00	5.2907E 00	1.8110E-01	-1.9537E 00		
7	4.979E 05	7.2643E 00	5.0250E-01	5.5054E 00	2.4800E-01	-1.7576E 00		
8	3.020E 05	7.3844E 00	2.3162E-01	5.9604E 00	3.9458E-01	-1.4230E 00		
9	1.832E 05	8.1040E 00	1.3034E-01	6.7601E 00	5.0232E-01	-1.3429E 00		
10	6.738E 04	1.0605E 01	1.5445E-01	1.0199E 01	5.3348E-01	-4.0577E-01		
11	2.479E 04	1.1294E 01	1.5472E-01	1.1242E 01	1.1149E 00	-5.1912E-02		
12	9.119E 03	1.4941E 01	2.0470E-01	1.4873E 01	2.1512E 00	-6.8680E-02		
13	3.355E 03	2.2120E 01	3.0305E-01	2.2018E 01	4.6639E 00	-1.0168E-01		
14	1.234E 03	2.9710E 01	4.0703E-01	2.9574E 01	9.5585E 00	-1.3657E-01		
15	4.540E 02	4.2574E 01	5.8327E-01	4.2378E 01	2.3725E 01	-1.9569E-01		
16	8.719E 01	3.6727E 01	5.0316E-01	3.6558E 01	4.9127E 01	-1.6883E-01		
17	3.545E 01	3.7126E 01	5.0863E-01	3.6956E 01	1.3184E 02	-1.7066E-01		
18	1.304E 01	1.7593E 01	2.4103E-01	1.7512E 01	2.2022E 02	-8.0869E-02		
19	5.043E 00	1.4280E 01	1.9564E-01	1.4214E 01	4.7670E 02	-6.5640E-02		
20	1.445E 00	9.1859E 00	1.2585E-01	9.1436E 00	4.5825E 02	-4.2225E-02		
21	6.826E-01	3.1194E 01	4.2736E-01	3.1050E 01	2.7458E 03	-1.4339E-01		
22	2.511E-01	1.0883E 01	1.4910E-01	1.0833E 01	2.0167E 03	-5.0025E-02		
23	9.237E-02	8.5506E 00	1.1714E-01	8.5113E 00	1.4610E 03	-3.9304E-02		
24	2.530E-02	7.7703E 00	1.0626E-01	7.7347E 00	3.4063E 03	-3.5642E-02		
*4500	3.023E-01	2.5370E 01	3.3488E-01	2.5258E 01	2.5780E 03	-1.1155E-01		
*4000	2.718E-01	2.5370E 01	3.3488E-01	2.5258E 01	2.5780E 03	-1.1155E-01		
*3500	2.413E-01	2.5370E 01	3.3488E-01	2.5258E 01	2.5780E 03	-1.1155E-01		
*3000	2.109E-01	2.5370E 01	3.3488E-01	2.5258E 01	2.5780E 03	-1.1155E-01		
2500	1.804E-01	2.3170E 01	3.0584E-01	2.3068E 01	2.4920E 03	-1.0187E-01		
2000	1.499E-01	2.0060E 01	2.6479E-01	1.9972E 01	2.3330E 03	-8.8199E-02		
1500	1.194E-01	1.6140E 01	2.1305E-01	1.6069E 01	2.1310E 03	-7.0964E-02		
1000	8.897E-02	1.2170E 01	1.6064E-01	1.2116E 01	2.0280E 03	-5.3509E-02		
500	5.850E-02	9.8800E 00	1.3042E-01	9.8365E 00	2.3970E 03	-4.3440E-02		
68	3.216E-02	1.0560E 01	1.3939E-01	1.0514E 01	3.8070E 03	-4.6430E-02		

* Thermal cross sections taken from APEX-515.

NOTE: For a summary of the sources of data see APEX-704.

EUROPIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	8.4888E 00	8.4514E 00	5.3125E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
2.8951E 01	2.2424E 00	6.4418E-07	0.	0.
22 21	22 22	22 23	22 24	22 25
7.1855E-01	9.6896E 00	5.0809E-01	5.8407E-05	3.6492E-07
23 21	23 22	23 23	23 24	23 25
3.1264E-07	1.2228E 00	7.0524E 00	3.2434E-01	2.0916E-02
24 21	24 22	24 23	24 24	24 25
0.	9.0277E-04	2.6236E 00	4.3129E 00	1.0001E 00
25 21	25 22	25 23	25 24	25 25
0.	1.2756E-05	4.1218E-01	2.5067E 00	5.5699E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	8.4410E 00	8.4038E 00	5.3168E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
2.8802E 01	2.3918E 00	2.0941E-07	0.	0.
22 21	22 22	22 23	22 24	22 26
6.4088E-01	9.7558E 00	5.1652E-01	3.2533E-05	1.3201E-07
23 21	23 22	23 23	23 24	23 26
0.	1.1358E 00	7.1399E 00	3.2007E-01	1.7853E-02
24 21	24 22	24 23	24 24	24 26
0.	4.2688E-04	2.4971E 00	4.4466E 00	9.7662E-01
26 21	26 22	26 23	26 24	26 26
0.	3.8394E-06	3.3427E-01	2.4243E 00	5.6824E 00

EUROPIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	8.3931E 00	8.3562E 00	5.3222E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
2.8602E 01	2.5917E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 27
5.5825E-01	9.8219E 00	5.3009E-01	1.5959E-05	0.
23 21	23 22	23 23	23 24	23 27
0.	1.0426E 00	7.2332E 00	3.1633E-01	1.4855E-02
24 21	24 22	24 23	24 24	24 27
0.	1.7090E-04	2.3591E 00	4.5956E 00	9.4907E-01
27 21	27 22	27 23	27 24	27 27
0.	8.7674E-07	2.6075E-01	2.3275E 00	5.8048E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	8.3451E 00	8.3084E 00	5.3293E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
2.8327E 01	2.8665E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 28
4.7013E-01	9.8855E 00	5.5153E-01	6.5408E-06	0.
23 21	23 22	23 23	23 24	23 28
0.	9.4171E-01	7.3330E 00	3.1359E-01	1.1941E-02
24 21	24 22	24 23	24 24	24 28
0.	5.4138E-05	2.2071E 00	4.7634E 00	9.1667E-01
28 21	28 22	28 23	28 24	28 28
0.	1.3542E-07	1.9286E-01	2.2132E 00	5.9391E 00

EUROPIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	8.2970E 00	8.2605E 00	5.3388E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
2.7936E 01	3.2574E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
3.7623E-01	9.9421E 00	5.8577E-01	2.0507E-06	0.
23 21	23 22	23 23	23 24	23 29
0.	8.3123E-01	7.4404E 00	3.1262E-01	9.1575E-03
24 21	24 22	24 23	24 24	24 29
0.	1.2138E-05	2.0377E 00	4.9544E 00	8.7835E-01
29 21	29 22	29 23	29 24	29 29
0.	0.	1.3221E-01	2.0766E 00	6.0882E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	8.2487E 00	8.2124E 00	5.3522E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
2.7384E 01	3.8099E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
2.7706E-01	9.9817E 00	6.4235E-01	4.1886E-07	0.
23 21	23 22	23 23	23 24	23 30
0.	7.0838E-01	7.5567E 00	3.1508E-01	6.5493E-03
24 21	24 22	24 23	24 24	24 30
0.	1.5782E-06	1.8457E 00	5.1751E 00	8.3284E-01
30 21	30 22	30 23	30 24	30 30
0.	0.	8.0759E-02	1.9115E 00	6.2565E 00

EUROPIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	8.2004E 00	8.1643E 00	5.3727E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
2.6986E 01	4.2077E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.7544E-01	9.9805E 00	7.4215E-01	0.	0.
23 21	23 22	23 23	23 24	23 31
0.	5.6901E-01	7.6822E 00	3.2462E-01	4.1909E-03
24 21	24 22	24 23	24 24	24 31
0.	0.	1.6233E 00	5.4349E 00	7.7866E-01
31 21	31 22	31 23	31 24	31 31
0.	0.	4.0764E-02	1.7087E 00	6.4510E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	8.1520E 00	8.1161E 00	5.4079E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
2.8574E 01	2.6203E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
8.0619E-02	9.8759E 00	9.3850E-01	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	4.0711E-01	7.8128E 00	3.5118E-01	2.1915E-03
24 21	24 22	24 23	24 24	24 32
0.	0.	1.3570E 00	5.7485E 00	7.1466E-01
32 21	32 22	32 23	32 24	32 32
0.	0.	1.4381E-02	1.4537E 00	6.6839E 00

EUROPIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	8.1036E 00	8.0679E 00	5.4823E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
2.9669E 01	1.5245E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
9.7784E-02	9.4795E 00	1.3141E 00	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	2.1682E-01	7.9177E 00	4.3131E-01	7.1493E-04
24 21	24 22	24 23	24 24	24 33
0.	0.	1.0199E 00	6.1405E 00	6.4302E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	2.1955E-03	1.1197E 00	6.9817E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	8.0618E 00	8.0263E 00	5.6777E 03	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
2.9650E 01	1.5435E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
1.7987E-01	1.0335E 01	3.7173E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	4.9043E-02	7.8043E 00	7.0732E-01	6.8563E-05
24 21	24 22	24 23	24 24	24 34
0.	0.	6.1900E-01	6.5740E 00	5.9594E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	4.5716E-05	7.1467E-01	7.3471E 00

EUROPIUM

TRANSFERS FROM GROUPS 1 THROUGH 10 TO GROUPS 1 THROUGH 16

N1		N2		SIGMA S0 (N1/N2)	
1	1	1	2	1	3
3.6675E-00	1.4637E-01	4.1999E-02	1.9350E-01	3.5280E-01	
1	6	1	7	1	8
3.5269E-01	2.4044E-01	1.2912E-01	7.5341E-02	2.2484E-02	
1	11	1	12	1	13
3.3713E-03	4.7140E-04	6.5602E-05	8.7419E-06	1.2883E-06	
1	16	2	1	2	2
9.9642E-08	0.	2.9436E-00	1.7806E-01	1.9825E-01	
2	5	2	6	2	7
4.8557E-01	5.9081E-01	4.5711E-01	2.6581E-01	1.6383E-01	
2	10	2	11	2	12
5.0866E-02	7.7858E-03	1.0972E-03	1.5312E-04	2.0426E-05	
2	15	2	16	3	1
3.0114E-06	2.3295E-07	0.	0.	3	2
3	4	3	5	3	6
1.7649E-01	3.9568E-01	6.5413E-01	6.1616E-01	4.0539E-01	
3	9	3	10	3	11
2.7204E-01	8.9793E-02	1.4189E-02	2.0237E-03	2.8366E-04	
3	14	3	15	3	16
3.7906E-05	5.5917E-06	4.3266E-07	0.	0.	
4	3	4	4	4	5
0.	3.9915E-00	3.4627E-01	5.4049E-01	6.5228E-01	
4	8	4	9	4	10
5.0214E-01	3.7583E-01	1.3416E-01	2.2086E-02	3.1992E-03	
4	13	4	14	4	15
4.5096E-04	6.0394E-05	8.9160E-06	6.9008E-07	0.	
5	2	5	3	5	4
0.	0.	0.	5.1577E-00	4.4805E-01	
5	7	5	8	5	9
5.1092E-01	4.7738E-01	4.0946E-01	1.6115E-01	2.7919E-02	
5	12	5	13	5	14
4.1236E-03	5.8537E-04	7.8612E-05	1.1617E-05	8.9948E-07	
6	1	6	2	6	3
0.	0.	0.	0.	0.	
6	6	6	7	6	8
6.0240E-00	4.1117E-01	3.1503E-01	3.2139E-01	1.4316E-01	
6	11	6	12	6	13
2.6469E-02	4.0080E-03	5.7415E-04	7.7378E-05	1.1449E-05	
6	16	7	1	7	2
8.8691E-07	0.	0.	0.	0.	

EUROPIUM

N1		N2		SIGMA S0 (N1/N2)	
7	5	7	6	7	7
0.		0.		6.7893E 00	2.3123E-01
7	10	7	11	7	12
7.6996E-02		1.5419E-02		2.4078E-03	3.4882E-04
7	15	7	16	8	1
6.9976E-06		5.4240E-07		0.	0.
8	4	8	5	8	6
0.		0.		0.	0.
8	9	8	10	8	11
3.0262E-01		5.3882E-02		1.2039E-02	1.9618E-03
8	14	8	15	8	16
3.9316E-05		5.8393E-06		4.5299E-07	0.
9	3	9	4	9	5
0.		0.		0.	0.
9	8	9	9	9	10
0.		7.8167E 00		2.8175E-01	4.6689E-03
9	13	9	14	9	15
1.2244E-04		1.6835E-05		2.5090E-06	1.9489E-07
10	2	10	3	10	4
0.		0.		0.	0.
10	7	10	8	10	9
0.		0.		0.	1.0257E 01
10	12	10	13	10	14
8.3119E-05		1.2823E-05		1.7791E-06	2.6600E-07
					2.0687E-08

EUROPIUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
1.0550E 00	2.0844E 02	1.5515E 03	2.9840E-04	0.
1.7300E 00	2.2043E 01	2.6371E 02	4.7011E-04	0.
1.8300E 00	1.0341E 01	1.3234E 02	5.0855E-04	0.
2.4560E 00	2.2996E 02	3.8954E 03	6.6394E-04	0.
2.7120E 00	3.0876E 01	5.7799E 02	7.3425E-04	0.
3.2940E 00	9.1860E 01	2.0081E 03	8.2436E-04	0.
3.3610E 00	1.5891E 02	3.6229E 03	8.7882E-04	0.
3.7100E 00	5.2772E 01	1.4046E 03	1.0850E-03	0.
3.9440E 00	7.6379E 01	1.8967E 03	8.8848E-04	0.
4.8100E 00	2.8049E 00	8.8491E 01	1.1759E-03	0.
4.8500E 00	4.2033E 00	1.4246E 02	1.3459E-03	0.
5.4700E 00	4.6243E 00	1.7669E 02	1.5166E-03	0.
6.0000E 00	9.8592E 00	4.1221E 02	1.6555E-03	0.
6.1700E 00	2.0637E 01	6.2006E 02	8.3145E-04	0.
7.2500E 00	3.8654E 01	1.9163E 03	1.9264E-03	0.
7.4400E 00	3.8411E 01	1.9521E 03	1.9726E-03	0.
7.6000E 00	2.9929E 00	1.4904E 02	1.8541E-03	0.
8.8700E 00	5.0375E 01	2.7143E 03	1.8600E-03	0.
9.0600E 00	1.1928E 01	7.4778E 02	2.4652E-03	0.
1.0500E 01	1.6709E 01	1.2023E 03	2.8019E-03	0.
1.1100E 01	3.9948E 00	3.0852E 02	3.0534E-03	0.
1.1700E 01	2.8177E 01	2.0842E 03	2.6572E-03	0.
1.2300E 01	7.7489E 00	6.5810E 02	3.3323E-03	0.
1.2700E 01	1.3182E 01	1.1436E 03	3.3672E-03	0.
1.3300E 01	1.2211E 00	1.0637E 02	3.2421E-03	0.
1.3800E 01	1.0372E 00	9.9917E 01	3.8211E-03	0.
1.4800E 01	8.4103E 00	8.5298E 02	3.9494E-03	0.
1.5200E 01	9.2027E 00	9.5549E 02	4.0301E-03	0.
1.6300E 01	2.4425E-01	2.6113E 01	3.9848E-03	0.
1.6800E 01	5.6641E 00	6.1501E 02	3.9878E-03	0.
1.7800E 01	4.6101E 00	5.6476E 02	4.7911E-03	0.
1.8100E 01	1.1159E 01	1.2795E 03	4.1271E-03	0.
1.8800E 01	1.1480E 01	1.3617E 03	4.2528E-03	0.
2.0100E 01	2.7540E 01	3.2480E 03	3.9322E-03	0.
2.1100E 01	1.4495E 00	1.9950E 02	5.1013E-03	0.
2.4100E 01	5.4222E 00	8.3191E 02	5.5503E-03	0.

EUROPIUM

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		0.		2.4115E-02	1.9407E-01
10	7	10	8	10	9
8.8456E-01		1.5828E 00		1.3553E 00	4.7833E-01
11	1	11	2	11	3
0.		0.		0.	5.8624E-02
11	6	11	7	11	8
8.9359E-01		2.1503E 00		3.8479E 00	3.2946E 00
11	11	12	1	12	2
1.6324E 00		0.		0.	1.0568E-01
12	5	12	6	12	7
8.5049E-01		1.6109E 00		3.8764E 00	6.9366E 00
12	10	12	11	13	1
2.0962E 00		2.9428E 00		0.	0.
13	4	13	5	13	6
1.4314E-01		1.1519E 00		2.1818E 00	5.2503E 00
13	9	13	10	13	11
8.0442E 00		2.8391E 00		3.9857E 00	0.
14	3	14	4	14	5
0.		2.9326E-01		2.3601E 00	4.4701E 00
14	8	14	9	14	10
1.9249E 01		1.6481E 01		5.8169E 00	8.1660E 00
15	2	15	3	15	4
0.		0.		7.2781E-01	5.8572E 00
15	7	15	8	15	9
2.6696E 01		4.7771E 01		4.0903E 01	1.4436E 01
16	1	16	2	16	3
0.		0.		0.	1.5070E 00
16	6	16	7	16	8
2.2971E 01		5.5277E 01		9.8914E 01	8.4693E 01
16	11	17	1	17	2
4.1963E 01		0.		0.	0.
17	5	17	6	17	7
3.2547E 01		6.1645E 01		1.4834E 02	2.6545E 02
17	10	17	11	18	1
8.0218E 01		1.1261E 02		0.	0.
18	4	18	5	18	6
6.7553E 00		5.4364E 01		1.0297E 02	2.4779E 02
18	9	18	10	18	11
3.7964E 02		1.3399E 02		1.8810E 02	0.
				0.	0.

EUROPIUM

N1 N2
SIGMA N,G (N1/N2)

19 3	19 4	19 5	19 6	19 7
0.	1.4623E 01	1.1768E 02	2.2289E 02	5.3637E 02
19 8	19 9	19 10	19 11	20 1
9.5979E 02	8.2180E 02	2.9005E 02	4.0718E 02	0.
20 2	20 3	20 4	20 5	20 6
0.	0.	1.4057E 01	1.1313E 02	2.1427E 02
20 7	20 8	20 9	20 10	20 11
5.1561E 02	9.2265E 02	7.8999E 02	2.7882E 02	3.9142E 02
21 1	21 2	21 3	21 4	21 5
0.	0.	0.	8.4228E 01	6.7784E 02
21 6	21 7	21 8	21 9	21 10
1.2839E 03	3.0895E 03	5.5284E 03	4.7336E 03	1.6707E 03
21 11	22 1	22 2	22 3	22 4
2.3454E 03	0.	0.	0.	6.1862E 01
22 5	22 6	22 7	22 8	22 9
4.9785E 02	9.4296E 02	2.2691E 03	4.0604E 03	3.4766E 03
22 10	22 11	23 1	23 2	23 3
1.2271E 03	1.7226E 03	0.	0.	0.
23 4	23 5	23 6	23 7	23 8
4.4816E 01	3.6067E 02	6.8313E 02	1.6439E 03	2.9416E 03
23 9	23 10	23 11	24 1	24 2
2.5187E 03	8.8895E 02	1.2479E 03	0.	0.
24 3	24 4	24 5	24 6	24 7
0.	9.0550E 01	7.2872E 02	1.3802E 03	3.3214E 03
24 8	24 9	24 10	24 11	25 1
5.9434E 03	5.0889E 03	1.7961E 03	2.5214E 03	0.
25 2	25 3	25 4	25 5	25 6
0.	0.	1.6296E 02	1.3115E 03	2.4840E 03
25 7	25 8	25 9	25 10	25 11
5.9775E 03	1.0696E 04	9.1584E 03	3.2324E 03	4.5377E 03
26 1	26 2	26 3	26 4	26 5
0.	0.	0.	1.6309E 02	1.3125E 03
26 6	26 7	26 8	26 9	26 10
2.4860E 03	5.9823E 03	1.0705E 04	9.1658E 03	3.2350E 03
26 11	27 1	27 2	27 3	27 4
4.5414E 03	0.	0.	0.	1.6326E 02
27 5	27 6	27 7	27 8	27 9
1.3139E 03	2.4886E 03	5.9885E 03	1.0716E 04	9.1753E 03
27 10	27 11	28 1	28 2	28 3
3.2384E 03	4.5461E 03	0.	0.	0.

EUROPIUM.

N1		N2		SIGMA N,G (N1/N2)	
28	4	28	5	28	6
1.6348E 02		1.3156E 03		2.4918E 03	
28	9	28	10	28	11
9.1873E 03		3.2426E 03		4.5521E 03	
29	3	29	4	29	5
0.		1.6377E 02		1.3180E 03	
29	8	29	9	29	10
1.0749E 04		9.2037E 03		3.2484E 03	
30	2	30	3	30	4
0.		0.		1.6418E 02	
30	7	30	8	30	9
6.0221E 03		1.0776E 04		9.2268E 03	
31	1	31	2	31	3
0.		0.		0.	
31	6	31	7	31	8
2.5121E 03		6.0452E 03		1.0817E 04	
31	11	32	1	32	2
4.5892E 03		0.		0.	
32	5	32	6	32	7
1.3350E 03		2.5286E 03		6.0848E 03	
32	10	32	11	33	1
3.2904E 03		4.6192E 03		0.	
33	4	33	5	33	6
1.6817E 02		1.3534E 03		2.5634E 03	
33	9	33	10	33	11
9.4511E 03		3.3357E 03		4.6828E 03	
34	3	34	4	34	5
0.		1.7416E 02		1.4016E 03	
34	8	34	9	34	10
1.1432E 04		9.7879E 03		3.4546E 03	
				4.8497E 03	

DATE 2/21/61

DESIGNATION		CODE NO.		DENSITY FACTOR		
SAMARIUM 149		62.1490		2.47254E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1
1	1.000E 07	5.2261E 00	4.3737E 00	1.7120E 00	1.0095E-02	-3.5184E 00
2	6.065E 06	5.3430E 00	4.4117E 00	2.5957E 00	1.4938E-02	-2.7506E 00
3	3.679E 06	5.6979E 00	4.4159E 00	3.1601E 00	2.5619E-02	-2.5409E 00
4	2.231E 06	6.5685E 00	3.7698E 00	3.4312E 00	5.8838E-02	-3.1411E 00
5	1.353E 06	7.1973E 00	2.6320E 00	4.0365E 00	1.2198E-01	-3.1647E 00
6	8.208E 05	7.2459E 00	1.2804E 00	5.2907E 00	1.8110E-01	-1.9575E 00
7	4.979E 05	7.2643E 00	5.0250E-01	5.5054E 00	2.4800E-01	-1.7611E 00
8	3.020E 05	7.3844E 00	2.3162E-01	5.9604E 00	3.9458E-01	-1.4258E 00
9	1.832E 05	8.1040E 00	1.3034E-01	6.7601E 00	5.0232E-01	-1.3455E 00
10	6.738E 04	1.0605E 01	1.5185E-01	1.0200E 01	5.3348E-01	-4.0569E-01
11	2.479E 04	1.1294E 01	1.5133E-01	1.1243E 01	1.1149E 00	-5.0862E-02
12	9.119E 03	1.5473E 01	2.0734E-01	1.5403E 01	2.0947E 00	-6.9685E-02
13	3.355E 03	2.9880E 01	4.0039E-01	2.9745E 01	3.6492E 00	-1.3456E-01
14	1.234E 03	4.6288E 01	6.2026E-01	4.6079E 01	6.2916E 00	-2.0855E-01
15	4.540E 02	8.6532E 01	1.1595E 00	8.6143E 01	1.2163E 01	-3.8988E-01
16	8.719E 01	2.6294E 02	3.5233E 00	2.6175E 02	1.2892E 02	-1.1854E 00
17	3.545E 01	6.0723E 01	8.1369E-01	6.0450E 01	1.7136E 02	-2.7353E-01
18	1.304E 01	6.8471E 01	9.1751E-01	6.8163E 01	3.7743E 02	-3.0858E-01
19	5.043E 00	1.9321E 01	2.6007E-01	1.9234E 01	2.1144E 02	-8.7006E-02
20	1.445E 00	2.6157E 01	3.5207E-01	2.6039E 01	1.1863E 02	-1.1784E-01
21	6.826E-01	5.3237E 01	7.1656E-01	5.2997E 01	2.5505E 03	-2.3989E-01
22	2.511E-01	1.2206E 02	1.6429E 00	1.2151E 02	5.7013E 03	-5.4967E-01
23	9.237E-02	5.6102E 02	7.5513E 00	5.5850E 02	7.7018E 04	-2.5271E 00
24	2.530E-02	1.1530E 02	1.5520E 00	1.1478E 02	4.1663E 04	-5.1963E-01
4500	3.023E-01	1.3561E 02	1.8253E 00	1.3500E 02	1.2035E 04	-6.1074E-01
4000	2.718E-01	1.5002E 02	2.0193E 00	1.4935E 02	1.3845E 04	-6.7583E-01
3500	2.413E-01	1.6824E 02	2.2645E 00	1.6748E 02	1.6176E 04	-7.5792E-01
3000	2.109E-01	1.9580E 02	2.6350E 00	1.9492E 02	1.9424E 04	-8.8207E-01
2500	1.804E-01	2.2624E 02	3.0450E 00	2.2522E 02	2.3548E 04	-1.0192E 00
2000	1.499E-01	2.6560E 02	3.5750E 00	2.6440E 02	2.9177E 04	-1.1965E 00
1500	1.194E-01	3.1447E 02	4.2330E 00	3.1306E 02	3.6682E 04	-1.4167E 00
1000	8.897E-02	3.6623E 02	4.9300E 00	3.6459E 02	4.6994E 04	-1.6500E 00
500	5.850E-02	3.8192E 02	5.1410E 00	3.8020E 02	5.7322E 04	-1.7211E 00
68	3.216E-02	2.5853E 02	3.4800E 00	2.5736E 02	5.5879E 04	-1.1644E 00

NOTE: For a summary of the sources of data for energies $E > 21.5$ ev, see APEX-704;
for energies $E \leq 21.5$ ev, see XDC 61-1-113.

SAMARIUM 149

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	6.2206E 01	6.1926E 01	4.1109E 04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 25
4.9382E 01	3.8550E 00	1.3857E-06	0.	0.
22 21	22 22	22 23	22 24	22 25
8.1355E 00	1.0856E 02	5.7473E 00	7.3982E-04	4.9992E-06
23 21	23 22	23 23	23 24	23 25
2.6163E-05	8.1019E 01	4.6181E 02	2.1443E 01	1.4216E 00
24 21	24 22	24 23	24 24	24 25
0.	1.5261E-02	3.9255E 01	6.3639E 01	1.4923E 01
25 21	25 22	25 23	25 24	25 25
0.	1.1525E-04	3.1303E 00	1.8448E 01	4.0627E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	6.1814E 01	6.1536E 01	4.1125E 04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 26
4.9126E 01	4.1108E 00	4.6085E-07	0.	0.
22 21	22 22	22 23	22 24	22 26
7.2556E 00	1.0931E 02	5.8417E 00	4.1627E-04	1.8422E-06
23 21	23 22	23 23	23 24	23 26
6.3800E-06	7.5255E 01	4.6761E 02	2.1162E 01	1.2158E 00
24 21	24 22	24 23	24 24	24 26
0.	7.2966E-03	3.7367E 01	6.5625E 01	1.4579E 00
26 21	26 22	26 23	26 24	26 26
0.	3.5348E-05	2.5422E 00	1.7840E 01	4.1432E 01

-----SAMARIUM 149-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	6.1414E 01	6.1138E 01	4.1145E 04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 27
4.8784E 01	4.4529E 00	1.1757E-07	0.	0.
22 21	22 22	22 23	22 24	22 27
6.3196E 00	1.1006E 02	5.9938E 00	2.0679E-04	5.3961E-07
23 21	23 22	23 23	23 24	23 27
1.1214E-06	6.9076E 01	4.7379E 02	2.0917E 01	1.0135E 00
24 21	24 22	24 23	24 24	24 27
0.	2.9614E-03	3.5308E 01	6.7840E 01	1.4175E 01
27 21	27 22	27 23	27 24	27 27
0.	8.2632E-06	1.9862E 00	1.7124E 01	4.2304E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	6.1001E 01	6.0727E 01	4.1171E 04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 28
4.8313E 01	4.9231E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 28
5.3215E 00	1.1078E 02	6.2347E 00	8.6142E-05	1.1394E-07
23 21	23 22	23 23	23 24	23 28
1.2391E-07	6.2388E 01	4.8040E 02	2.0735E 01	8.1677E-01
24 21	24 22	24 23	24 24	24 28
0.	9.5466E-04	3.3039E 01	7.0334E 01	1.3698E 01
28 21	28 22	28 23	28 24	28 28
0.	1.3152E-06	1.4721E 00	1.6276E 01	4.3253E 01

SAMARIUM 149

THERMAL TRANSFER MATRICES

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
2.5000E 03	6.0569E 01	6.0296E 01	4.1206E 04	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
4.7645E 01	5.5917E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
4.2581E 00	1.1142E 02	6.6195E 00	2.7605E-05	0.
23 21	23 22	23 23	23 24	23 29
0.	5.5066E 01	4.8752E 02	2.0672E 01	6.2834E-01
24 21	24 22	24 23	24 24	24 29
0.	2.1903E-04	3.0508E 01	7.3177E 01	1.3132E 01
29 21	29 22	29 23	29 24	29 29
0.	1.1820E-07	1.0118E 00	1.5261E 01	4.4296E 01

TEMPERATURE	SIGMA	SIGMA	SIGMA	NU SIGMA
DEG. F.	SCATTER	TRANSPORT	ABSORPTION	FISSION
2.0000E 03	6.0107E 01	5.9837E 01	4.1255E 04	0.

N1		N2		
SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
4.6700E 01	6.5362E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
3.1351E 00	1.1188E 02	7.2556E 00	5.8149E-06	0.
23 21	23 22	23 23	23 24	23 30
0.	4.6923E 01	4.9523E 02	2.0833E 01	4.5131E-01
24 21	24 22	24 23	24 24	24 30
0.	2.9408E-05	2.7640E 01	7.6465E 01	1.2459E 01
30 21	30 22	30 23	30 24	30 30
0.	0.	6.2012E-01	1.4032E 01	4.5455E 01

-----SAMARIUM 149-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	5.9593E 01	5.9325E 01	4.1331E 04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 31
4.6023E 01	7.2131E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.9847E 00	1.1187E 02	8.3776E 00	5.8459E-07	0.
23 21	23 22	23 23	23 24	23 31
0.	3.7686E 01	5.0355E 02	2.1461E 01	2.9056E-01
24 21	24 22	24 23	24 24	24 31
0.	1.5658E-06	2.4315E 01	8.0341E 01	1.1655E 01
31 21	31 22	31 23	31 24	31 31
0.	0.	3.1450E-01	1.2518E 01	4.6760E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	5.8972E 01	5.8707E 01	4.1462E 04	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 32
4.8749E 01	4.4876E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
9.1163E-01	1.1070E 02	1.0584E 01	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	2.6957E 01	5.1222E 02	2.3208E 01	1.5346E-01
24 21	24 22	24 23	24 24	24 32
0.	0.	2.0330E 01	8.5024E 01	1.0703E 01
32 21	32 22	32 23	32 24	32 32
0.	0.	1.1176E-01	1.0609E 01	4.8252E 01

SAMARIUM 149

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	5.8077E 01	5.7816E 01	4.1742E 04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 33
5.0624E 01	2.6128E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
1.1014E 00	1.0626E 02	1.4799E 01	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.4351E 01	5.1921E 02	2.8479E 01	5.1073E-02
24 21	24 22	24 23	24 24	24 33
0.	0.	1.5282E 01	9.0888E 01	9.6331E 00
33 21	33 22	33 23	33 24	33 33
0.	0.	1.7287E-02	8.0985E 00	4.9961E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.0000E 01	5.6463E 01	5.6209E 01	4.2476E 04	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 34
5.0595E 01	2.6420E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
2.0194E 00	1.1590E 02	4.1792E 00	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	3.2433E 00	5.1183E 02	4.6617E 01	5.1474E-03
24 21	24 22	24 23	24 24	24 34
0.	0.	9.2745E 00	9.7304E 01	8.9260E 00
34 21	34 22	34 23	34 24	34 34
0.	0.	3.6977E-04	5.0500E 00	5.1412E 01

SAMARIUM 149

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.8913E 00	9.8060E-02	4.5396E-02	2.5134E-01	5.2370E-01
1 6	1 7	1 8	1 9	1 10
5.7365E-01	4.1518E-01	2.3158E-01	1.3872E-01	4.2196E-02
1 11	1 12	1 13	1 14	1 15
6.3903E-03	8.9691E-04	1.2499E-04	1.6664E-05	2.4562E-06
1 16	2 1	2 2	2 3	2 4
1.8999E-07	0.	2.8428E 00	1.6617E-01	1.3045E-01
2 5	2 6	2 7	2 8	2 9
4.2140E-01	6.1478E-01	5.3431E-01	3.3419E-01	2.1657E-01
2 10	2 11	2 12	2 13	2 14
6.9711E-02	1.0873E-02	1.5431E-03	2.1590E-04	2.8831E-05
2 15	2 16	3 1	3 2	3 3
4.2520E-06	3.2897E-07	0.	0.	3.1972E 00
3 4	3 5	3 6	3 7	3 8
1.2749E-01	2.7348E-01	5.6961E-01	6.2331E-01	4.5088E-01
3 9	3 10	3 11	3 12	3 13
3.2313E-01	1.1181E-01	1.8109E-02	2.6071E-03	3.6667E-04
3 14	3 15	3 16	4 1	4 2
4.9063E-05	7.2410E-06	5.6037E-07	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	4.0851E 00	2.5495E-01	4.2725E-01	6.2199E-01
4 8	4 9	4 10	4 11	4 12
5.3985E-01	4.3954E-01	1.6666E-01	2.8315E-02	4.1512E-03
4 13	4 14	4 15	4 16	5 1
5.8769E-04	7.8840E-05	1.1646E-05	9.0162E-07	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	0.	4.8550E 00	3.7861E-01
5 7	5 8	5 9	5 10	5 11
5.3426E-01	5.8289E-01	5.5832E-01	2.3777E-01	4.2933E-02
5 12	5 13	5 14	5 15	5 16
6.4424E-03	9.1983E-04	1.2381E-04	1.8310E-05	1.4182E-06
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
5.2912E 00	4.8042E-01	5.1044E-01	6.0010E-01	2.9566E-01
6 11	6 12	6 13	6 14	6 15
5.7645E-02	8.9090E-03	1.2858E-03	1.7379E-04	2.5742E-05
6 16	7 1	7 2	7 3	7 4
1.9949E-06	0.	0.	0.	0.

---SAMARIUM_149---

N1		N2	
SIGMA S0 (N1/N2)			
7 5	7 6	7 7	7 8
0.	0.	5.8994E-00	4.4583E-01
7 10	7 11	7 12	7 13
3.1200E-01	6.7009E-02	1.0752E-02	1.5733E-03
7 15	7 16	8 1	8 2
3.1729E-05	2.4607E-06	0.	0.
8 4	8 5	8 6	8 7
0.	0.	0.	0.
8 9	8 10	8 11	8 12
5.5992E-01	2.6330E-01	6.3798E-02	1.0733E-02
8 14	8 15	8 16	9 1
2.1864E-04	3.2526E-05	2.5249E-06	0.
9 3	9 4	9 5	9 6
0.	0.	0.	0.
9 8	9 9	9 10	9 11
0.	7.7070E-00	3.5653E-01	2.4697E-02
9 13	9 14	9 15	9 16
6.6932E-04	9.2345E-05	1.3779E-05	1.0708E-06

SAMARIUM 149

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
4.9500E 00	1.8493E 02	8.4142E 03	2.4253E-03	0.
6.4800E 00	3.8984E 01	2.5609E 03	3.8617E-03	0.
9.0000E 00	2.0110E 02	1.6228E 04	4.1961E-03	0.
1.2200E 01	1.9065E 01	2.3355E 03	7.1335E-03	0.
1.4900E 01	5.0294E 01	7.0261E 03	7.5958E-03	0.
1.7100E 01	2.0283E 01	3.3969E 03	9.5125E-03	0.
2.3200E 01	4.5331E 00	1.0594E 03	1.3651E-02	0.
2.5300E 01	3.8118E 00	9.7144E 02	1.4887E-02	0.
2.6100E 01	9.2583E 00	2.3594E 03	1.4430E-02	0.
3.0900E 01	1.7390E 01	4.8046E 03	1.4326E-02	0.
3.4000E 01	9.6590E 00	3.0791E 03	1.7333E-02	0.
4.0200E 01	2.2191E 01	6.6035E 03	1.2775E-02	0.
4.1300E 01	3.0852E 01	7.7255E 03	8.8043E-03	0.
4.5100E 01	6.8176E 00	2.8165E 03	2.1945E-02	0.
5.1800E 01	1.6636E 01	5.7747E 03	1.3490E-02	0.
5.7500E 01	1.4769E 01	5.4064E 03	1.3514E-02	0.
5.9700E 01	1.8726E 01	5.5171E 03	8.4318E-03	0.
6.2100E 01	1.4368E 01	5.2113E 03	1.2285E-02	0.
6.4800E 01	1.5050E 01	5.0892E 03	1.0232E-02	0.
6.8200E 01	8.5952E 00	4.1465E 03	1.9789E-02	0.
7.0700E 01	1.4639E 01	4.5757E 03	8.0134E-03	0.
7.3000E 01	1.6486E 01	3.9089E 03	4.4662E-03	0.
7.5300E 01	6.1324E 00	3.4585E 03	2.4495E-02	0.
9.0500E 01	9.0269E 00	3.5622E 03	9.9785E-03	0.
9.5000E 01	1.2042E 01	1.8117E 03	1.3816E-03	0.
9.9000E 01	9.6073E 00	2.6099E 03	4.3230E-03	0.

SAMARIUM 149

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		SIGMA N,G (N1/N2)	
1	1	1	2	1	3
0.		0.		1.1678E-03	5.9529E-04
1	6	1	7	1	8
1.4016E-03		0.		0.	5.9816E-03
1	11	2	1	2	2
1.5966E-01		0.		0.	1.3591E-03
2	5	2	6	2	7
1.3332E-03		1.6312E-03		0.	0.
2	10	2	11	3	1
1.9505E-02		1.8582E-01		0.	0.
3	4	3	5	3	6
9.9252E-04		1.9100E-03		2.3369E-03	0.
3	9	3	10	3	11
9.9730E-03		2.7943E-02		2.6621E-01	0.
4	3	4	4	4	5
3.9370E-03		2.0070E-03		3.8621E-03	4.7253E-03
4	8	4	9	4	10
0.		2.0166E-02		5.6503E-02	5.3829E-01
5	2	5	3	5	4
0.		7.4898E-03		3.8180E-03	7.3473E-03
5	7	5	8	5	9
0.		0.		3.8364E-02	1.0749E-01
6	1	6	2	6	3
0.		0.		1.0515E-02	5.3599E-03
6	6	6	7	6	8
1.2620E-02		0.		0.	5.3858E-02
6	11	7	1	7	2
1.4376E-00		0.		0.	1.3896E-02
7	5	7	6	7	7
1.3631E-02		1.6678E-02		0.	0.
7	10	7	11	8	1
1.9943E-01		1.8999E-00		0.	0.
8	4	8	5	8	6
1.1023E-02		2.1212E-02		2.5954E-02	0.
8	9	8	10	8	11
1.1076E-01		3.1034E-01		2.9566E-00	0.
9	3	9	4	9	5
2.7093E-02		1.3811E-02		2.6577E-02	3.2517E-02
9	8	9	9	9	10
0.		1.3877E-01		3.8882E-01	3.7042E-00
					0.

SAMARIUM 149

N1		N2		SIGMA N,G (N1/N2)	
10	2	10	3	10	4
0.		2.8458E-02		1.4507E-02	
10	7	10	8	10	9
0.		0.		1.4577E-01	
11	1	11	2	11	3
0.		0.		5.9165E-02	
11	6	11	7	11	8
7.1011E-02		0.		0.	
11	11	12	1	12	2
8.0894E 00		0.		0.	
12	5	12	6	12	7
1.0884E-01		1.3316E-01		0.	
12	10	12	11	13	1
1.5923E 00		1.5169E 01		0.	
13	4	13	5	13	6
9.8459E-02		1.8947E-01		2.3182E-01	
13	9	13	10	13	11
9.8934E-01		2.7720E 00		2.6408E 01	
14	3	14	4	14	5
3.3292E-01		1.6971E-01		3.2658E-01	
14	8	14	9	14	10
0.		1.7053E 00		4.7779E 00	
15	2	15	3	15	4
0.		6.4354E-01		3.2805E-01	
15	7	15	8	15	9
0.		0.		3.2963E 00	
16	1	16	2	16	3
0.		0.		6.8209E 00	
16	6	16	7	16	8
8.1865E 00		0.		0.	
16	11	17	1	17	2
9.3259E 02		0.		0.	
17	5	17	6	17	7
8.8936E 00		1.0881E 01		0.	
17	10	17	11	18	1
1.3011E 02		1.2396E 03		0.	
18	4	18	5	18	6
1.0179E 01		1.9589E 01		2.3967E 01	
18	9	18	10	18	11
1.0228E 02		2.8658E 02		2.7302E 03	
				0.	
				0.	

SAMARIUM 149:

N1		N2		SIGMA N,G (N1/N2)	
19 3	19 4	19 5	19 6	19 7	
1.1187E 01	5.7025E 00	1.0974E 01	1.3426E 01	0.	
19 8	19 9	19 10	19 11	20 1	
0.	5.7300E 01	1.6055E 02	1.5295E 03	0.	
20 2	20 3	20 4	20 5	20 6	
0.	6.2764E 00	3.1995E 00	6.1569E 00	7.5330E 00	
20 7	20 8	20 9	20 10	20 11	
0.	0.	3.2149E 01	9.0076E 01	8.5814E 02	
21 1	21 2	21 3	21 4	21 5	
0.	0.	1.3494E 02	6.8787E 01	1.3237E 02	
21 6	21 7	21 8	21 9	21 10	
1.6196E 02	0.	0.	6.9119E 02	1.9366E 03	
21 11	22 1	22 2	22 3	22 4	
1.8450E 04	0.	0.	3.0164E 02	1.5376E 02	
22 5	22 6	22 7	22 8	22 9	
2.9590E 02	3.6203E 02	0.	0.	1.5451E 03	
22 10	22 11	23 1	23 2	23 3	
4.3290E 03	4.1242E 04	0.	0.	4.0748E 03	
23 4	23 5	23 6	23 7	23 8	
2.0772E 03	3.9972E 03	4.8906E 03	0.	0.	
23 9	23 10	23 11	24 1	24 2	
2.0872E 04	5.8480E 04	5.5713E 05	0.	0.	
24 3	24 4	24 5	24 6	24 7	
2.2043E 03	1.1237E 03	2.1623E 03	2.6456E 03	0.	
24 8	24 9	24 10	24 11	25 1	
0.	1.1291E 04	3.1635E 04	3.0138E 05	0.	
25 2	25 3	25 4	25 5	25 6	
0.	2.1750E 03	1.1087E 03	2.1336E 03	2.6104E 03	
25 7	25 8	25 9	25 10	25 11	
0.	0.	1.1141E 04	3.1214E 04	2.9737E 05	
26 1	26 2	26 3	26 4	26 5	
0.	0.	2.1758E 03	1.1091E 03	2.1344E 03	
26 6	26 7	26 8	26 9	26 10	
2.6114E 03	0.	0.	1.1145E 04	3.1226E 04	
26 11	27 1	27 2	27 3	27 4	
2.9749E 05	0.	0.	2.1769E 03	1.1097E 03	
27 5	27 6	27 7	27 8	27 9	
2.1354E 03	2.6127E 03	0.	0.	1.1150E 04	
27 10	27 11	28 1	28 2	28 3	
3.1241E 04	2.9763E 05	0.	0.	2.1782E 03	

DATE 2/21/61

DESIGNATION			CODE NO.			DENSITY FACTOR		
RHODIUM			45.1030			1.70858E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1		
1	1.000E 07	4.3373E 00	4.0956E 00	1.9402E 00	1.6464E-02	-2.3728E 00		
2	6.065E 06	4.0561E 00	4.0143E 00	2.4933E 00	2.3454E-02	-1.5470E 00		
3	3.679E 06	5.1051E 00	3.6208E 00	3.3985E 00	3.3893E-02	-1.6893E 00		
4	2.231E 06	4.9566E 00	3.0281E 00	3.7063E 00	4.8709E-02	-1.2376E 00		
5	1.353E 06	5.9961E 00	2.3843E 00	4.3780E 00	7.0175E-02	-1.6017E 00		
6	8.208E 05	6.8330E 00	1.9872E 00	5.0652E 00	9.5459E-02	-1.7499E 00		
7	4.979E 05	7.2786E 00	1.5689E 00	5.7976E 00	1.5716E-01	-1.4660E 00		
8	3.020E 05	7.3363E 00	2.5179E-01	6.3232E 00	2.7369E-01	-1.0028E 00		
9	1.832E 05	7.2494E 00	1.5489E-01	6.5973E 00	4.4376E-01	-6.4549E-01		
10	6.738E 04	7.1157E 00	1.5447E-01	6.8303E 00	7.3785E-01	-2.8251E-01		
11	2.479E 04	6.4762E 00	1.3605E-01	6.3617E 00	1.2321E 00	-1.1334E-01		
12	9.119E 03	4.6649E 00	9.0856E-02	4.6313E 00	2.0575E 00	-3.3260E-02		
13	3.355E 03	3.2500E 00	6.3299E-02	3.2287E 00	3.2222E 00	-2.1084E-02		
14	1.234E 03	1.8431E 00	3.5898E-02	1.8311E 00	4.7280E 00	-1.1878E-02		
15	4.540E 02	3.4556E 00	6.7303E-02	3.4330E 00	3.4919E 00	-2.2371E-02		
16	8.719E 01	8.5809E 00	1.6561E-01	8.5253E 00	7.4602E 00	-5.5037E-02		
17	3.545E 01	4.8413E 00	9.3437E-02	4.8099E 00	6.1190E-01	-3.1082E-02		
18	1.304E 01	4.9511E 00	9.5557E-02	4.9191E 00	1.0678E-01	-3.1676E-02		
19	5.043E 00	5.3063E 00	1.0241E-01	5.2719E 00	2.8309E 00	-3.4051E-02		
20	1.445E 00	1.0260E 01	1.9801E-01	1.0193E 01	8.8922E 02	-6.5727E-02		
21	6.826E-01	3.1597E 00	6.0982E-02	3.1392E 00	1.5530E 02	-2.0292E-02		
22	2.511E-01	3.7403E 00	7.2189E-02	3.7161E 00	7.2244E 01	-2.3955E-02		
23	9.237E-02	3.8858E 00	7.4996E-02	3.8606E 00	9.0238E 01	-2.4945E-02		
24	2.530E-02	3.9247E 00	7.5746E-02	3.8992E 00	1.2845E 02	-2.5242E-02		
4500	3.023E-01	4.1375E 00	7.9853E-02	4.1107E 00	2.2261E 02	-2.6529E-02		
4000	2.718E-01	3.9609E 00	7.6445E-02	3.9352E 00	1.8232E 02	-2.5440E-02		
3500	2.413E-01	3.8311E 00	7.3941E-02	3.8063E 00	1.4642E 02	-2.4549E-02		
3000	2.109E-01	3.7562E 00	7.2495E-02	3.7319E 00	1.1771E 02	-2.4054E-02		
2500	1.804E-01	3.7355E 00	7.2095E-02	3.7113E 00	9.8258E 01	-2.3955E-02		
2000	1.499E-01	3.7566E 00	7.2502E-02	3.7322E 00	8.8491E 01	-2.4153E-02		
1500	1.194E-01	3.7987E 00	7.3314E-02	3.7741E 00	8.6965E 01	-2.4351E-02		
1000	8.897E-02	3.8434E 00	7.4177E-02	3.8184E 00	9.1992E 01	-2.4747E-02		
500	5.850E-02	3.8833E 00	7.4948E-02	3.8582E 00	1.0530E 02	-2.4846E-02		
68	3.216E-02	3.9140E 00	7.5540E-02	3.8886E 00	1.3399E 02	-2.5143E-02		

NOTE: For a summary of the sources of data see XDC 61-4-35.

----- RHODIUM -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	4.2898E 00	4.2619E 00	1.9335E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
2.8964E 00	2.6335E-01	3.0240E-06	0.	0.
22 21	22 22	22 23	22 24	22 25
2.9686E-01	3.2535E 00	2.0663E-01	1.5722E-04	3.5327E-06
23 21	23 22	23 23	23 24	23 25
8.1484E-06	6.7152E-01	3.0731E 00	1.7016E-01	1.7850E-02
24 21	24 22	24 23	24 24	24 25
0.	4.0907E-03	1.5463E 00	1.9448E 00	5.5413E-01
25 21	25 22	25 23	25 24	25 25
0.	2.1015E-04	3.8993E-01	1.3514E 00	2.5482E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	4.2554E 00	4.2277E 00	1.9351E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
2.8801E 00	2.7960E-01	1.4106E-06	0.	0.
22 21	22 22	22 23	22 24	22 26
2.6448E-01	3.2815E 00	2.0951E-01	1.0331E-04	1.7205E-06
23 21	23 22	23 23	23 24	23 26
2.8073E-06	6.2358E-01	3.1207E 00	1.6820E-01	1.5693E-02
24 21	24 22	24 23	24 24	24 26
0.	2.3225E-03	1.4763E 00	2.0122E 00	5.4594E-01
26 21	26 22	26 23	26 24	26 26
0.	8.6723E-05	3.2692E-01	1.3187E 00	2.6098E 00

RHODIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	4.2210E 00	4.1936E 00	1.9371E 02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.8584E 00	3.0126E-01	5.5132E-07	0.	21	24
22	21	22	22	22	24
2.3006E-01	3.3096E 00	2.1429E-01	6.2209E-01	22	27
23	21	23	22	23	24
7.5886E-07	5.7213E-01	3.1715E 00	1.6649E-01	23	27
24	21	24	22	24	24
0.	1.1652E-03	1.3993E 00	2.0882E 00	24	27
27	21	27	22	27	24
0.	2.9325E-05	2.6543E-01	1.2784E 00	27	27
				27	27
				27	27
				27	27

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	4.1865E 00	4.1577E 00	1.9397E 02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
2.8006E 00	3.3091E-01	1.6709E-07	0.	21	24
22	21	22	22	22	24
1.9342E-01	3.3371E 00	2.2199E-01	3.3155E-05	22	27
23	21	23	22	23	24
1.4558E-07	5.1641E-01	3.2261E 00	1.6524E-01	23	27
24	21	24	22	24	24
0.	4.9163E-04	1.3137E 00	2.1747E 00	24	27
27	21	27	22	27	24
0.	7.4874E-06	2.0632E-01	1.2285E 00	27	27
				27	27
				27	27
				27	27

RHODIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	4.1518E 00	4.1248E 00	1.9433E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
2.7710E 00	3.7281E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
1.5444E-01	3.3621E 00	2.3442E-01	1.4763E-05	0.
23 21	23 22	23 23	23 24	23 29
0.	4.5537E-01	3.2851E 00	1.6486E-01	9.1922E-03
24 21	24 22	24 23	24 24	24 29
0.	1.6082E-04	1.2175E 00	2.2748E 00	5.0687E-01
29 21	29 22	29 23	29 24	29 29
0.	1.2608E-06	1.5074E-01	1.6600E 00	2.8351E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	4.1170E 00	4.0902E 00	1.9482E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
2.7163E 00	4.3128E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
1.1338E-01	3.3810E 00	2.5507E-01	4.9474E-06	0.
23 21	23 22	23 23	23 24	23 30
0.	3.8751E-01	3.3493E 00	1.6617E-01	7.0687E-03
24 21	24 22	24 23	24 24	24 30
0.	3.5305E-05	1.1075E 00	2.3926E 00	4.8666E-01
30 21	30 22	30 23	30 24	30 30
0.	1.0994E-07	1.0031E-01	1.0867E 00	2.9300E 00

RHODIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	4.0821E 00	4.0555E 00	1.9559E 02	0.

		N1	N2	SIGMA S (N1/N2)	
21 21	21 22	21 23	21 24	21 31	
2.6628E 00	4.6958E-01	0.	0.	0.	
22 21	22 22	22 23	22 24	22 31	
7.1477E-02	3.3849E 00	2.9147E-01	1.0094E-06	0.	
23 21	23 22	23 23	23 24	23 31	
0.	3.1059E-01	3.4189E 00	1.7097E-01	5.0159E-03	
24 21	24 22	24 23	24 24	24 31	
0.	3.9106E-06	9.7879E-01	2.5344E 00	4.6107E-01	
31 21	31 22	31 23	31 24	31 31	
0.	0.	5.7261E-02	9.8424E-01	3.0406E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	4.0471E 00	4.0208E 00	1.9690E 02	0.

		N1	N2	SIGMA S (N1/N2)	
21 21	21 22	21 23	21 24	21 32	
2.8726E 00	2.8708E-01	0.	0.	0.	
22 21	22 22	22 23	22 24	22 32	
3.2612E-02	3.3512E 00	3.6255E-01	0.	0.	
23 21	23 22	23 23	23 24	23 32	
0.	2.2143E-01	3.4924E 00	1.8411E-01	3.0901E-03	
24 21	24 22	24 23	24 24	24 32	
0.	1.1286E-07	8.2248E-01	2.7106E 00	4.2875E-01	
32 21	32 22	32 23	32 24	32 32	
0.	0.	2.4562E-02	8.4822E-01	3.1743E 00	

RHODIUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	4.0120E 00	3.9860E 00	1.9967E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
2.9888E 00	1.7093E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
3.6517E-02	3.2137E 00	4.9433E-01	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.1712E-01	3.5548E 00	2.2316E-01	1.3934E-03
24 21	24 22	24 23	24 24	24 33
0.	0.	6.2097E-01	2.9387E 00	3.8963E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	5.4385E-03	6.5967E-01	3.3469E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	3.9816E 00	3.9558E 00	2.0678E 02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
2.9913E 00	1.6845E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
6.3109E-02	3.5437E 00	1.3535E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	2.6105E-02	3.5117E 00	3.5443E-01	2.9475E-04
24 21	24 22	24 23	24 24	24 34
0.	0.	3.7699E-01	3.2005E 00	3.6098E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	2.5700E-04	4.2079E-01	3.5609E 00

RHODIUM

TRANSFERS FROM GROUPS 1 THROUGH 14 TO GROUPS 1 THROUGH 15

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.6605E-00	4.6076E-02	4.8374E-02	2.2037E-01	4.0347E-01
1 6	1 7	1 8	1 9	1 10
4.0751E-01	2.7990E-01	1.5122E-01	8.8746E-02	2.6468E-02
1 11	1 12	1 13	1 14	1 15
3.9887E-03	5.6127E-04	7.7526E-05	1.0345E-05	1.5031E-06
2 1	2 2	2 3	2 4	2 5
0.	2.1934E-00	1.0406E-01	1.2919E-01	3.5538E-01
2 6	2 7	2 8	2 9	2 10
4.6784E-01	3.8039E-01	2.2833E-01	1.4408E-01	4.5272E-02
2 11	2 12	2 13	2 14	2 15
7.0098E-03	9.9647E-04	1.3816E-04	1.8462E-05	2.6838E-06
3 1	3 2	3 3	3 4	3 5
0.	0.	3.2571E-00	1.1634E-01	2.4260E-01
3 6	3 7	3 8	3 9	3 10
4.4312E-01	4.4518E-01	3.0528E-01	2.1126E-01	7.0929E-02
3 11	3 12	3 13	3 14	3 15
1.1368E-02	1.6371E-03	2.2807E-04	3.0535E-05	2.4417E-06
4 1	4 2	4 3	4 4	4 5
0.	0.	0.	3.1772E-00	2.2060E-01
4 6	4 7	4 8	4 9	4 10
3.4181E-01	4.4754E-01	3.6316E-01	2.8273E-01	1.0329E-01
4 11	4 12	4 13	4 14	4 15
1.7301E-02	2.5334E-03	3.5511E-04	4.7655E-05	6.9381E-06
5 1	5 2	5 3	5 4	5 5
0.	0.	0.	0.	4.3154E-00
5 6	5 7	5 8	5 9	5 10
4.0022E-01	3.8152E-01	3.8261E-01	3.4618E-01	1.4084E-01
5 11	5 12	5 13	5 14	5 15
2.4961E-02	3.7341E-03	5.2760E-04	7.1019E-05	1.0351E-05
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
5.2785E-00	4.5858E-01	4.0050E-01	4.4178E-01	2.0700E-01
6 11	6 12	6 13	6 14	6 15
3.9515E-02	6.0812E-03	8.6833E-04	1.1736E-04	1.7130E-05
7 1	7 2	7 3	7 4	7 5
0.	0.	0.	0.	0.
7 6	7 7	7 8	7 9	7 10
0.	5.5928E-00	8.8515E-01	4.7761E-01	2.5951E-01

RHODIUM

N1		N2		SIGMA S0 (N1/N2)	
7	11	7	12	7	13
3.3559E-02	8.4933E-03	1.2264E-03	1.6646E-04	2.4334E-05	
8	1	8	2	8	3
0.	0.	0.	0.	0.	0.
8	6	8	7	8	8
0.	0.	7.0242E 00	2.7669E-01	2.8008E-02	
8	11	8	12	8	13
6.2344E-03	1.0178E-03	1.4856E-04	2.0248E-05	2.9645E-06	
9	1	9	2	9	3
0.	0.	0.	0.	0.	0.
9	6	9	7	9	8
0.	0.	0.	6.9444E 00	3.0509E-01	
9	11	9	12	9	13
0.	0.	0.	9	14	9
10	1	10	2	10	3
0.	0.	0.	10	4	10
10	6	10	7	10	8
0.	0.	0.	10	9	10
10	11	10	12	10	13
3.0727E-01	0.	0.	10	14	10
11	1	11	2	11	3
0.	0.	0.	11	4	11
11	6	11	7	11	8
0.	0.	0.	11	9	11
11	11	11	12	11	13
6.1236E 00	3.5265E-01	0.	11	14	11
12	1	12	2	12	3
0.	0.	0.	12	4	12
12	6	12	7	12	8
0.	0.	0.	12	9	12
12	11	12	12	12	13
0.	4.3921E 00	2.7281E-01	0.	12	14
13	1	13	2	13	3
0.	0.	0.	13	4	13
13	6	13	7	13	8
0.	0.	0.	13	9	13
13	11	13	12	13	13
0.	0.	3.2002E 00	4.9779E-02	13	14
14	1	14	2	14	3
0.	0.	0.	14	4	14

RHODIUM

N1		N2	
SIGMA S0 (N1/N2)			
14	6	14	7
0.		0.	
14	11	14	12
0.		0.	
14	8	14	13
0.		0.	
14	9	14	14
0.		1.8297E 00	
14	10	14	15
0.		1.3424E-02	

RHODIUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
1.2570E 00	1.0242E 03	5.2611E 03	1.7670E-04	0.
4.3800E 01	7.2789E-02	1.3089E 01	6.2140E-03	0.
4.7300E 01	4.8301E-01	9.3521E 01	6.6715E-03	0.
6.9000E 01	1.0495E-01	2.9696E 01	9.7674E-03	0.
9.6000E 01	7.3105E-01	2.8224E 02	1.3069E-02	0.
1.2600E 02	4.8714E-01	2.4607E 02	1.7045E-02	0.
1.5600E 02	5.5126E 00	2.0659E 03	7.5782E-03	0.
1.8900E 02	2.4013E 00	1.3693E 03	1.4482E-02	0.
2.2300E 02	7.4606E-02	6.7548E 01	3.0942E-02	0.
2.5800E 02	1.1112E 00	9.0800E 02	2.1785E-02	0.

RHODIUM

TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1		N2		
SIGMA N,G (N1/N2)				
1 1	1 2	1 3	1 4	1 5
0.	0.	0.	1.1305E-02	3.2559E-02
1 6	1 7	1 8	1 9	1 10
4.0310E-02	4.7929E-02	5.8090E-02	5.6786E-02	4.5469E-01
1 11	2 1	2 2	2 3	2 4
2.7644E-02	0.	0.	0.	1.2461E-02
2 5	2 6	2 7	2 8	2 9
3.5890E-02	4.4434E-02	5.2833E-02	6.4034E-02	6.2596E-02
2 10	2 11	3 1	3 2	3 3
4.5591E-01	3.0473E-02	0.	0.	0.
3 4	3 5	3 6	3 7	3 8
1.4815E-02	4.2668E-02	5.2826E-02	6.2811E-02	7.6127E-02
3 9	3 10	3 11	4 1	4 2
7.4418E-02	4.5840E-01	3.6228E-02	0.	0.
4 3	4 4	4 5	4 6	4 7
0.	1.8508E-02	5.3305E-02	6.5994E-02	7.8469E-02
4 8	4 9	4 10	4 11	5 1
9.5103E-02	9.2968E-02	4.6230E-01	4.5259E-02	0.
5 2	5 3	5 4	5 5	5 6
0.	0.	2.4232E-02	6.9791E-02	8.6406E-02
5 7	5 8	5 9	5 10	5 11
1.0274E-01	1.2452E-01	1.2172E-01	4.6765E-01	5.9257E-02
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	3.0956E-02	8.9158E-02
6 6	6 7	6 8	6 9	6 10
1.1038E-01	1.3125E-01	1.5907E-01	1.5550E-01	4.8352E-01
6 11	7 1	7 2	7 3	7 4
7.5700E-02	0.	0.	0.	4.8961E-02
7 5	7 6	7 7	7 8	7 9
1.4102E-01	1.7459E-01	2.0759E-01	2.5159E-01	2.4594E-01
7 10	7 11	8 1	8 2	8 3
4.4726E-01	1.1973E-01	0.	0.	0.
8 4	8 5	8 6	8 7	8 8
8.3148E-02	2.3948E-01	2.9649E-01	3.5253E-01	4.2727E-01
8 9	8 10	8 11	9 1	9 2
4.1767E-01	1.2159E-01	2.0333E-01	0.	0.
9 3	9 4	9 5	9 6	9 7
0.	1.3239E-01	3.8132E-01	4.7209E-01	5.6133E-01
9 8	9 9	9 10	9 11	10 1
6.8032E-01	6.6505E-01	1.3984E-01	3.2376E-01	0.

RHODIUM

N1 N2
SIGMA N,G (N1/N2)

10 2	10 3	10 4	10 5	10 6
0.	0.	2.1739E-01	6.2612E-01	7.7517E-01
10 7	10 8	10 9	10 10	10 11
9.2169E-01	1.1171E 00	1.0920E 00	2.2961E-01	5.3161E-01
11 1	11 2	11 3	11 4	11 5
0.	0.	0.	3.6087E-01	1.0394E 00
11 6	11 7	11 8	11 9	11 10
1.2868E 00	1.5300E 00	1.8544E 00	1.8128E 00	3.8116E-01
11 11	12 1	12 2	12 3	12 4
8.8248E-01	0.	0.	0.	6.0131E-01
12 5	12 6	12 7	12 8	12 9
1.7319E 00	2.1442E 00	2.5495E 00	3.0899E 00	3.0205E 00
12 10	12 11	13 1	13 2	13 3
6.3511E-01	1.4705E 00	0.	0.	0.
13 4	13 5	13 6	13 7	13 8
9.4095E-01	2.7101E 00	3.3552E 00	3.9894E 00	4.8352E 00
13 9	13 10	13 11	14 1	14 2
4.7266E 00	9.9384E-01	2.3010E 00	0.	0.
14 3	14 4	14 5	14 6	14 7
0.	1.3803E 00	3.9754E 00	4.9217E 00	5.8520E 00
14 8	14 9	14 10	14 11	15 1
7.0926E 00	6.9334E 00	1.4578E 00	3.3753E 00	0.
15 2	15 3	15 4	15 5	15 6
0.	0.	1.0193E 00	2.9357E 00	3.6346E 00
15 7	15 8	15 9	15 10	15 11
4.3216E 00	5.2377E 00	5.1201E 00	1.0766E 00	2.4926E 00
16 1	16 2	16 3	16 4	16 5
0.	0.	0.	2.1775E 00	6.2716E 00
16 6	16 7	16 8	16 9	16 10
7.7647E 00	9.2324E 00	1.1190E 01	1.0938E 01	2.2999E 00
16 11	17 1	17 2	17 3	17 4
5.3250E 00	0.	0.	0.	1.7860E-01
17 5	17 6	17 7	17 8	17 9
5.1441E-01	6.3687E-01	7.5725E-01	9.1778E-01	8.9717E-01
17 10	17 11	18 1	18 2	18 3
1.8864E-01	4.3676E-01	0.	0.	0.
18 4	18 5	18 6	18 7	18 8
3.1167E-02	8.9767E-02	1.1114E-01	1.3214E-01	1.6016E-01
18 9	18 10	18 11	19 1	19 2
1.5656E-01	3.2919E-02	7.6217E-02	0.	0.

RHODIUM.

N1 N2

SIGMA N,G (N1/N2)

19 3	19 4	19 5	19 6	19 7
0.	8.2629E-01	2.3798E 00	2.9464E 00	3.5033E 00
19 8	19 9	19 10	19 11	20 1
4.2460E 00	4.1507E 00	8.7274E-01	2.0206E 00	0.
20 2	20 3	20 4	20 5	20 6
0.	0.	2.5955E 02	7.4754E 02	9.2550E 02
20 7	20 8	20 9	20 10	20 11
1.1004E 03	1.3337E 03	1.3038E 03	2.7414E 02	6.3470E 02
21 1	21 2	21 3	21 4	21 5
0.	0.	0.	4.5329E 01	1.3056E 02
21 6	21 7	21 8	21 9	21 10
1.6164E 02	1.9219E 02	2.3293E 02	2.2770E 02	4.7878E 01
21 11	22 1	22 2	22 3	22 4
1.1085E 02	0.	0.	0.	2.1087E 01
22 5	22 6	22 7	22 8	22 9
6.0733E 01	7.5192E 01	8.9404E 01	1.0836E 02	1.0592E 02
22 10	22 11	23 1	23 2	23 3
2.2272E 01	5.1566E 01	0.	0.	0.
23 4	23 5	23 6	23 7	23 8
2.6339E 01	7.5860E 01	9.3920E 01	1.1167E 02	1.3535E 02
23 9	23 10	23 11	24 1	24 2
1.3231E 02	2.7820E 01	6.4410E 01	0.	0.
24 3	24 4	24 5	24 6	24 7
0.	3.7492E 01	1.0798E 02	1.3369E 02	1.5896E 02
24 8	24 9	24 10	24 11	25 1
1.9266E 02	1.8833E 02	3.9600E 01	9.1685E 01	0.
25 2	25 3	25 4	25 5	25 6
0.	0.	5.6436E 01	1.6254E 02	2.0124E 02
25 7	25 8	25 9	25 10	25 11
2.3928E 02	2.9000E 02	2.8349E 02	5.9608E 01	1.3801E 02
26 1	26 2	26 3	26 4	26 5
0.	0.	0.	5.6482E 01	1.6268E 02
26 6	26 7	26 8	26 9	26 10
2.0141E 02	2.3947E 02	2.9024E 02	2.8372E 02	5.9657E 01
26 11	27 1	27 2	27 3	27 4
1.3812E 02	0.	0.	0.	5.6541E 01
27 5	27 6	27 7	27 8	27 9
1.6285E 02	2.0161E 02	2.3972E 02	2.9054E 02	2.8402E 02
27 10	27 11	28 1	28 2	28 3
5.9719E 01	1.3827E 02	0.	0.	0.

RHODIUM

N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
5.6617E 01	1.6306E 02	2.0188E 02	2.4004E 02	2.9093E 02
28 9	28 10	28 11	29 1	29 2
2.8440E 02	5.9799E 01	1.3845E 02	0.	0.
29 3	29 4	29 5	29 6	29 7
0.	5.6722E 01	1.6337E 02	2.0226E 02	2.4049E 02
29 8	29 9	29 10	29 11	30 1
2.9147E 02	2.8493E 02	5.9910E 01	1.3871E 02	0.
30 2	30 3	30 4	30 5	30 6
0.	0.	5.6865E 01	1.6378E 02	2.0277E 02
30 7	30 8	30 9	30 10	30 11
2.4110E 02	2.9221E 02	2.8565E 02	6.0061E 01	1.3906E 02
31 1	31 2	31 3	31 4	31 5
0.	0.	0.	5.7089E 01	1.6443E 02
31 6	31 7	31 8	31 9	31 10
2.0357E 02	2.4205E 02	2.9336E 02	2.8677E 02	6.0299E 01
31 11	32 1	32 2	32 3	32 4
1.3961E 02	0.	0.	0.	5.7472E 01
32 5	32 6	32 7	32 8	32 9
1.6553E 02	2.0493E 02	2.4367E 02	2.9533E 02	2.8870E 02
32 10	32 11	33 1	33 2	33 3
6.0702E 01	1.4054E 02	0.	0.	0.
33 4	33 5	33 6	33 7	33 8
5.8280E 01	1.6786E 02	2.0782E 02	2.4710E 02	2.9948E 02
33 9	33 10	33 11	34 1	34 2
2.9276E 02	6.1556E 01	1.4252E 02	0.	0.
34 3	34 4	34 5	34 6	34 7
0.	6.0356E 01	1.7383E 02	2.1522E 02	2.5590E 02
34 8	34 9	34 10	34 11	
3.1014E 02	3.0318E 02	6.3748E 01	1.4759E 02	

DATE 2/21/61

DESIGNATION		CODE NO.		DENSITY FACTOR			
PLATINUM		78.1950		3.23900E 02			
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1	
1	1.000E 07	5.1831E 00	1.1566E 00	5.1652E 00	8.1167E-04	-1.7713E-02	
2	6.065E 06	5.8288E 00	1.1051E 00	5.8087E 00	4.4071E-03	-1.9923E-02	
3	3.679E 06	6.3522E 00	9.8486E-01	6.3303E 00	1.3415E-02	-2.1708E-02	
4	2.231E 06	6.1079E 00	7.8911E-01	6.0869E 00	3.1117E-02	-2.0875E-02	
5	1.353E 06	5.4346E 00	5.3623E-01	5.4159E 00	5.4041E-02	-1.8575E-02	
6	8.208E 05	5.4996E 00	3.0366E-01	5.4806E 00	8.2669E-02	-1.8803E-02	
7	4.979E 05	6.1577E 00	1.4166E-01	6.1364E 00	1.1721E-01	-2.1053E-02	
8	3.020E 05	7.2260E 00	7.4485E-02	7.2011E 00	1.6290E-01	-2.4701E-02	
9	1.832E 05	8.6606E 00	8.9272E-02	8.6308E 00	2.1608E-01	-2.9598E-02	
10	6.738E 04	1.0791E 01	1.1123E-01	1.0754E 01	2.7856E-01	-3.6873E-02	
11	2.479E 04	1.3302E 01	1.3712E-01	1.3256E 01	4.4880E-01	-4.5497E-02	
12	9.119E 03	1.5079E 01	1.5543E-01	1.5027E 01	8.8481E-01	-5.1543E-02	
13	3.355E 03	1.7470E 01	1.8008E-01	1.7410E 01	1.8487E 00	-5.9770E-02	
14	1.234E 03	1.8451E 01	1.9019E-01	1.8387E 01	4.1692E 00	-6.3041E-02	
15	4.540E 02	1.9548E 01	2.0149E-01	1.9480E 01	5.5579E 00	-6.6808E-02	
16	8.719E 01	3.0546E 01	3.1487E-01	3.0441E 01	1.3368E 01	-1.0437E-01	
17	3.545E 01	3.1191E 01	3.2152E-01	3.1084E 01	1.7590E 01	-1.0656E-01	
18	1.304E 01	1.1200E 01	1.1545E-01	1.1161E 01	1.5600E 01	-3.8261E-02	
19	5.043E 00	1.1195E 01	1.1540E-01	1.1157E 01	1.1722E 01	-3.8261E-02	
20	1.445E 00	1.1432E 01	1.1784E-01	1.1393E 01	1.0509E 00	-3.9054E-02	
21	6.826E-01	1.1578E 01	1.1934E-01	1.1538E 01	1.6898E 00	-3.9549E-02	
22	2.511E-01	1.1316E 01	1.1665E-01	1.1277E 01	2.7087E 00	-3.8756E-02	
23	9.237E-02	1.0842E 01	1.1176E-01	1.0805E 01	4.5876E 00	-3.7071E-02	
24	2.530E-02	9.7380E 00	1.0038E-01	9.7044E 00	7.1120E 00	-3.3285E-02	
4500	3.023E-01	1.1368E 01	1.1718E-01	1.1329E 01	2.4306E 00	-3.8856E-02	
4000	2.718E-01	1.1344E 01	1.1693E-01	1.1305E 01	2.5637E 00	-3.8756E-02	
3500	2.413E-01	1.1314E 01	1.1663E-01	1.1275E 01	2.7199E 00	-3.8657E-02	
3000	2.109E-01	1.1277E 01	1.1624E-01	1.1238E 01	2.9095E 00	-3.8558E-02	
2500	1.804E-01	1.1229E 01	1.1575E-01	1.1191E 01	3.1456E 00	-3.8360E-02	
2000	1.499E-01	1.1169E 01	1.1512E-01	1.1130E 01	3.4505E 00	-3.8162E-02	
1500	1.194E-01	1.1089E 01	1.1431E-01	1.1051E 01	3.8658E 00	-3.7864E-02	
1000	8.897E-02	1.0984E 01	1.1322E-01	1.0985E 01	4.4792E 00	-5.9471E-04	
500	5.850E-02	1.0847E 01	1.1181E-01	1.0810E 01	5.5242E 00	-3.7071E-02	
68	3.216E-02	1.0785E 01	1.1117E-01	1.0748E 01	7.4498E 00	-3.6873E-02	

NOTE: Basic cross section data were obtained from BNL-325, Second Edition and from Supplement 1 to BNL-325, Second Edition.

PLATINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	1.1959E 01	1.1918E 01	1.1281E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
9.1506E 00	2.4275E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 25
1.5720E 00	8.7857E 00	9.9890E-01	3.9018E-05	0.
23 21	23 22	23 23	23 24	23 25
0.	2.2736E 00	7.9243E 00	6.0834E-01	3.5728E-02
24 21	24 22	24 23	24 24	24 25
0.	4.7617E-04	3.9913E 00	4.3225E 00	1.4198E 00
25 21	25 22	25 23	25 24	25 25
0.	1.1137E-06	3.8205E-01	3.4098E 00	8.1671E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	1.1906E 01	1.1865E 01	1.1290E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
8.9175E 00	2.6606E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 26
1.4612E 00	8.7931E 00	1.0618E 00	1.9368E-05	0.
23 21	23 22	23 23	23 24	23 26
0.	2.1911E 00	7.9964E 00	6.2677E-01	3.1672E-02
24 21	24 22	24 23	24 24	24 26
0.	2.1661E-04	4.0464E 00	4.2131E 00	1.4783E 00
26 21	26 22	26 23	26 24	26 26
0.	2.5700E-07	3.0377E-01	3.2945E 00	8.3079E 00

PLATINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	1.1854E 01	1.1813E 01	1.1301E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.6258E 00	2.9523E 00	0.	0.	0.	0.
22	21	22	22	22	23
1.3315E 00	8.8401E 00	1.1446E 00	8.1350E-06	0.	0.
23	21	23	22	23	23
0.	2.0993E 00	8.0636E 00	6.5169E-01	2.7433E-02	0.
24	21	24	22	24	23
0.	7.8359E-05	3.9450E 00	4.3055E 00	1.4866E 00	0.
27	21	27	22	27	23
0.	0.	2.3119E-01	3.1619E 00	8.4606E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	1.1802E 01	1.1761E 01	1.1316E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
8.2565E 00	3.3216E 00	0.	0.	0.	0.
22	21	22	22	22	23
1.1779E 00	8.8820E 00	1.2564E 00	2.6900E-06	0.	0.
23	21	23	22	23	23
0.	1.9943E 00	8.1386E 00	6.8610E-01	2.2987E-02	0.
24	21	24	22	24	23
0.	2.1574E-05	3.8359E 00	4.4019E 00	1.5002E 00	0.
28	21	28	22	28	23
0.	0.	1.6571E-01	3.0078E 00	8.6285E 00	0.

-----PLATINUM-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	1.1751E 01	1.1711E 01	1.1336E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
7.7864E 00	3.7916E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
9.9431E-01	8.9087E 00	1.4133E 00	6.2000E-07	0.
23 21	23 22	23 23	23 24	23 29
0.	1.8698E 00	8.2188E 00	7.3510E-01	1.8342E-02
24 21	24 22	24 23	24 24	24 29
0.	3.9500E-06	3.7166E 00	4.4995E 00	1.5219E 00
29 21	29 22	29 23	29 24	29 29
0.	0.	1.0893E-01	2.8270E 00	8.8153E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	1.1702E 01	1.1662E 01	1.1365E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
7.2591E 00	4.3190E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
7.7515E-01	8.8937E 00	1.6447E 00	0.	0.
23 21	23 22	23 23	23 24	23 30
0.	1.7145E 00	8.3058E 00	8.0813E-01	1.3547E-02
24 21	24 22	24 23	24 24	24 30
0.	0.	3.5823E 00	4.5982E 00	1.5575E 00
30 21	30 22	30 23	30 24	30 30
0.	0.	6.2737E-02	2.6116E 00	9.0280E 00

PLATINUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	1.1657E 01	1.1616E 01	1.1408E 01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 31
6.7795E 00	4.7986E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
5.2031E-01	8.7504E 00	2.0105E 00	0.	0.
23 21	23 22	23 23	23 24	23 31
0.	1.5079E-01	8.4003E 00	9.2502E-01	8.7658E-03
24 21	24 22	24 23	24 24	24 31
0.	0.	3.4234E 00	4.6969E 00	1.6176E 00
31 21	31 22	31 23	31 24	31 31
0.	0.	2.9016E-02	2.3495E 00	9.2781E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	1.1618E 01	1.1578E 01	1.1483E 01	0.

N1 N2
SIGMA S (N1/N2)

21 21	21 22	21 23	21 24	21 32
8.4396E 00	3.1384E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
2.5186E-01	8.4195E 00	2.6449E 00	0.	0.
23 21	23 22	23 23	23 24	23 32
0.	1.2093E 00	8.4921E 00	1.1362E 00	4.3666E-03
24 21	24 22	24 23	24 24	24 32
0.	0.	3.2163E 00	4.7954E 00	1.7263E 00
32 21	32 22	32 23	32 24	32 32
0.	0.	8.8925E-03	2.0202E 00	9.5885E 00

----- PLATINUM -----

----- THERMAL TRANSFER MATRICES -----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	1.1596E 01	1.1556E 01	1.1641E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
9.2470E 00	2.3311E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
3.6912E-01	7.3317E 00	3.6154E 00	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	7.4330E-01	8.4843E 00	1.6132E 00	1.1332E-03
24 21	24 22	24 23	24 24	24 33
0.	0.	2.8852E 00	4.8992E 00	1.9536E 00
33 21	33 22	33 23	33 24	33 33
0.	0.	1.0541E-03	1.5819E 00	1.0013E 01

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	1.1627E 01	1.1586E 01	1.2056E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
9.1207E 00	2.4574E 00	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
9.9012E-01	9.0137E 00	1.3124E 00	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	1.8951E-01	7.7860E 00	2.8665E 00	4.9895E-05
24 21	24 22	24 23	24 24	24 34
0.	0.	2.2406E 00	5.0131E 00	2.4843E 00
34 21	34 22	34 23	34 24	34 34
0.	0.	1.2894E-05	1.0310E 00	1.0595E 01

PLATINUM

TRANSFERS FROM GROUPS 1 THROUGH 7 TO GROUPS 1 THROUGH 15

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
4.6254E-00	1.0502E-01	1.7692E-02	6.9310E-02	1.1485E-01
1 6	1 7	1 8	1 9	1 10
1.0985E-01	7.2772E-02	3.8393E-02	2.2148E-02	6.5536E-03
1 11	1 12	1 13	1 14	1 15
9.7425E-04	1.3617E-04	1.8630E-05	2.5378E-06	3.7090E-07
2 1	2 2	2 3	2 4	2 5
0.	5.1074E-00	2.4876E-01	4.2103E-02	1.0241E-01
2 6	2 7	2 8	2 9	2 10
1.2567E-01	9.7620E-02	5.6886E-02	3.5127E-02	1.0916E-02
2 11	2 12	2 13	2 14	2 15
1.6648E-03	2.3492E-04	3.2250E-05	4.3990E-06	6.4327E-07
3 1	3 2	3 3	3 4	3 5
0.	0.	5.5172E-00	3.7945E-01	7.2831E-02
3 6	3 7	3 8	3 9	3 10
1.2102E-01	1.1477E-01	7.5848E-02	5.1083E-02	1.6898E-02
3 11	3 12	3 13	3 14	3 15
2.6627E-03	3.8035E-04	5.2459E-05	7.1670E-06	1.0486E-06
4 1	4 2	4 3	4 4	4 5
0.	0.	0.	5.2005E-00	5.2073E-01
4 6	4 7	4 8	4 9	4 10
9.2869E-02	1.1286E-01	8.7318E-02	6.5630E-02	2.3491E-02
4 11	4 12	4 13	4 14	4 15
3.8579E-03	5.5969E-04	7.7639E-05	1.0630E-05	1.5566E-06
5 1	5 2	5 3	5 4	5 5
0.	0.	0.	0.	4.7476E-00
5 6	5 7	5 8	5 9	5 10
4.2103E-01	8.4854E-02	7.9692E-02	6.8735E-02	2.7166E-02
5 11	5 12	5 13	5 14	5 15
4.7008E-03	6.9557E-04	9.7197E-05	1.3343E-05	1.9559E-06
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
5.1043E-00	2.5597E-01	5.3862E-02	5.5337E-02	2.4768E-02
6 11	6 12	6 13	6 14	6 15
4.5758E-03	6.9406E-04	9.7882E-05	1.3482E-05	1.9788E-06
7 1	7 2	7 3	7 4	7 5
0.	0.	0.	0.	0.
7 6	7 7	7 8	7 9	7 10
0.	5.9366E-00	1.7953E-01	2.5440E-02	1.3074E-02
7 11	7 12	7 13	7 14	7 15
2.5980E-03	4.0507E-04	5.7720E-05	7.9808E-06	1.1730E-06

PLATINUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
2.2300E 02	1.2805E 00	7.5118E 02	6.8209E-03	0.
2.0300E 02	1.5104E 00	8.2361E 02	6.4739E-03	0.
1.8900E 02	1.5668E 00	8.4919E 02	6.8694E-03	0.
1.5500E 02	3.4959E 00	9.9988E 02	2.3327E-03	0.
1.5100E 02	2.5469E 00	1.1078E 03	5.5380E-03	0.
1.4000E 02	1.9199E 00	9.7782E 02	8.1887E-03	0.
1.2050E 02	3.8249E 00	1.3711E 03	4.7133E-03	0.
1.1300E 02	5.8631E 00	1.4799E 03	2.4920E-03	0.
9.5000E 01	2.8088E 00	3.0498E 02	5.4850E-04	0.
6.8900E 01	1.2262E 01	2.4011E 03	2.4597E-03	0.
5.3000E 01	1.9695E-01	5.5331E 01	6.5819E-03	0.
4.6000E 01	5.4779E-01	1.0417E 02	3.4744E-03	0.
3.3000E 01	6.4419E-01	1.0397E 02	3.4886E-03	0.
1.9400E 01	1.8929E 01	1.9779E 03	2.4873E-03	0.
1.1800E 01	7.5781E 00	4.7834E 02	1.4924E-03	0.

DATE 3/1/61

DESIGNATION			CODE NO.			DENSITY FACTOR		
XENON-135			54.1350			2.23995E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER		
1	1.000E 07	4.6888E 00	4.3738E 00	1.7120E 00	5.2639E-03	-2.9921E 00		
2	6.065E 06	4.6187E 00	4.4117E 00	2.5957E 00	6.4765E-03	-2.0333E 00		
3	3.679E 06	5.2307E 00	4.4159E 00	3.1601E 00	8.4975E-03	-2.0811E 00		
4	2.231E 06	6.5605E 00	3.7698E 00	3.4312E 00	1.1174E-02	-3.1453E 00		
5	1.353E 06	7.2737E 00	2.6320E 00	4.0365E 00	1.4667E-02	-3.2538E 00		
6	8.208E 05	7.4595E 00	1.2804E 00	5.2907E 00	1.9333E-02	-2.1799E 00		
7	4.979E 05	7.4788E 00	5.0250E-01	5.5054E 00	2.5636E-02	-1.9835E 00		
8	3.020E 05	7.4840E 00	2.3162E-01	5.9604E 00	3.4094E-02	-1.5314E 00		
9	1.832E 05	7.4906E 00	1.3034E-01	6.7601E 00	4.7979E-02	-7.3422E-01		
10	6.738E 04	7.7174E 00	1.2975E-01	7.6868E 00	7.8083E-02	-3.0769E-02		
11	2.479E 04	8.1764E 00	1.2510E-01	8.1347E 00	1.3642E-01	-4.1913E-02		
12	9.119E 03	8.5571E 00	1.3092E-01	8.5134E 00	2.3123E-01	-4.3865E-02		
13	3.355E 03	8.6339E 00	1.3210E-01	8.5899E 00	3.9642E-01	-4.4259E-02		
14	1.234E 03	8.4967E 00	1.3000E-01	8.4534E 00	6.9222E-01	-4.3555E-02		
15	4.540E 02	8.2623E 00	1.2641E-01	8.2202E 00	1.3405E 00	-4.2356E-02		
16	8.719E 01	7.3374E 00	1.1226E-01	7.2999E 00	2.8169E 00	-3.7611E-02		
17	3.545E 01	1.0139E 01	1.5512E-01	1.0087E 01	5.3701E 00	-5.1972E-02		
18	1.304E 01	3.2529E 01	4.9769E-01	3.2363E 01	1.0611E 01	-1.6675E-01		
19	5.043E 00	2.2022E 02	3.3693E 00	2.1909E 02	9.2281E 01	-1.1289E 00		
20	1.445E 00	1.4732E 03	2.2541E 01	1.4657E 03	1.2893E 03	-7.5521E 00		
21	6.826E-01	1.0208E 04	1.5190E 02	1.0157E 04	1.3570E 04	-5.1302E 01		
22	2.511E-01	1.1343E 05	1.6879E 03	1.1286E 05	2.5607E 05	-5.7006E 02		
23	9.237E-02	6.3107E 05	9.3903E 03	6.2791E 05	2.2669E 06	-3.1715E 03		
24	2.530E-02	4.5405E 05	6.7563E 03	4.5178E 05	2.4765E 06	-2.2819E 03		
4500	3.023E-01	1.1773E 05	1.7519E 03	1.1714E 05	3.6242E 05	-5.9169E 02		
4000	2.718E-01	1.3564E 05	2.0184E 03	1.3497E 05	4.2351E 05	-6.8148E 02		
3500	2.413E-01	1.5804E 05	2.3517E 03	1.5725E 05	5.0154E 05	-7.9506E 02		
3000	2.109E-01	1.8651E 05	2.7753E 03	1.8558E 05	6.0327E 05	-9.3678E 02		
2500	1.804E-01	2.2332E 05	3.3230E 03	2.2220E 05	7.3910E 05	-1.1227E 03		
2000	1.499E-01	2.7162E 05	4.0418E 03	2.7027E 05	9.2531E 05	-1.3650E 03		
1500	1.194E-01	3.3542E 05	4.9911E 03	3.3374E 05	1.1875E 06	-1.6856E 03		
1000	8.897E-02	4.1718E 05	6.2077E 03	4.1510E 05	1.5633E 06	-2.0967E 03		
500	5.850E-02	5.0288E 05	7.4828E 03	5.0036E 05	2.0840E 06	-2.5269E 03		
68	3.216E-02	5.0282E 05	7.4819E 03	5.0030E 05	2.5648E 06	-2.5269E 03		

NOTE: For a summary of the sources of data see APEX-704.

-----XENON-135-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	3.5142E 05	3.4967E 05	2.7698E 06	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
9.4417E 03	7.6646E 02	7.7754E-04	0.	0.
22 21	22 22	22 23	22 24	22 25
7.9184E 03	1.0033E 05	5.5694E 03	1.2136E 00	1.1770E-02
23 21	23 22	23 23	23 24	23 25
9.1127E-02	9.5602E 04	5.1435E 05	2.5028E 04	1.8919E 03
24 21	24 22	24 23	24 24	24 25
0.	1.1036E 00	1.6090E 05	2.4373E 05	6.0309E 04
25 21	25 22	25 23	25 24	25 25
0.	1.7226E 00	2.0941E 04	1.0629E 05	2.2419E 05

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	3.4912E 05	3.4737E 05	2.7711E 06	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
9.3918E 03	8.1628E 02	2.8678E-04	0.	0.
22 21	22 22	22 23	22 24	22 26
7.0599E 03	1.0107E 05	5.6566E 03	7.1546E-01	4.7211E-03
23 21	23 22	23 23	23 24	23 26
2.4665E-02	8.8790E 04	5.2118E 05	2.4708E 04	1.6306E 03
24 21	24 22	24 23	24 24	24 26
0.	5.5546E 01	1.5328E 05	2.5157E 05	5.9046E 04
26 21	26 22	26 23	26 24	26 26
0.	5.7784E-01	1.7167E 04	1.0304E 05	2.2892E 05

XENON-135

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	3.4678E 05	3.4505E 05	2.7727E 06	0.

		N1	N2		
SIGMA S (N1/N2)					
21 21	21 22	21 23	21 24	21 27	
9.3252E 03	8.8288E 02	8.3360E-05	0.	0.	
22 21	22 22	22 23	22 24	22 27	
6.1468E 03	1.0180E 05	5.7984E 03	3.7663E-01	1.5385E-03	
23 21	23 22	23 23	23 24	23 27	
4.9378E-03	8.1487E 04	5.2846E 05	2.4428E 04	1.3725E 03	
24 21	24 22	24 23	24 24	24 27	
0.	2.4021E 01	1.4494E 05	2.6033E 05	5.7545E 04	
27 21	27 22	27 23	27 24	27 27	
0.	1.5102E-01	1.3566E 04	9.9170E 04	2.3405E 05	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	3.4441E 05	3.4269E 05	2.7749E 06	0.

		N1		N2	
SIGMA S (N1/N2)					
21 21	21 22	21 23	21 24	21 28	
9.2338E 03	9.7430E 02	1.7205E-05	0.	0.	
22 21	22 22	22 23	22 24	22 28	
5.1735E 03	1.0251E 05	6.0240E 03	1.6903E-01	3.7310E-04	
23 21	23 22	23 23	23 24	23 28	
6.4469E-04	7.3582E 04	5.3627E 05	2.4221E 04	1.1193E 03	
24 21	24 22	24 23	24 24	24 28	
0.	8.3940E 00	1.3574E 05	2.7024E 05	5.5751E 04	
28 21	28 22	28 23	28 24	28 28	
0.	2.7729E-02	1.0198E 04	9.4541E 04	2.3967E 05	

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-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	3.4198E 05	3.4027E 05	2.7777E 06	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
9.1040E 03	1.1041E 03	2.1148E-06	0.	0.
22 21	22 22	22 23	22 24	22 29
4.1371E 03	1.0315E 05	6.3856E 03	5.9867E-02	5.8058E-05
23 21	23 22	23 23	23 24	23 29
4.4539E-05	6.4927E 04	5.4468E 05	2.8158E 05	5.3598E 04
24 21	24 22	24 23	24 24	24 29
0.	2.1425E 00	1.2546E 05	2.8158E 05	5.3598E 04
29 21	29 22	29 23	29 24	29 29
0.	3.0137E-03	7.1370E 03	8.8943E 04	2.4590E 05

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	3.3946E 05	3.3776E 05	2.7817E 06	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
8.9213E 03	1.2868E 03	1.1155E-07	0.	0.
22 21	22 22	22 23	22 24	22 30
3.0434E 03	1.0361E 05	6.9844E 03	1.4533E-02	4.4317E-06
23 21	23 22	23 23	23 24	23 30
1.1176E-06	5.5303E 04	5.5379E 05	2.4334E 04	6.4029E 02
24 21	24 22	24 23	24 24	24 30
0.	3.3357E-01	1.1378E 05	2.9475E 05	5.1000E 04
30 21	30 22	30 23	30 24	30 30
0.	1.4258E-04	4.4831E 03	8.2086E 04	2.5289E 05

XENON-135

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	3.3678E 05	3.3510E 05	2.7879E 06	0.

N1	N2
SIGMA S (N1/N2)	

21 21	21 22	21 23	21 24	21 31
8.7933E 03	1.4149E 03	0.	0.	0.
22 21	22 22	22 23	22 24	22 31
1.9243E 03	1.0364E 05	8.0405E 00	1.8139E-03	0.
23 21	23 22	23 23	23 24	23 31
0.	4.4390E 04	5.6364E 05	2.5053E 04	4.2427E 02
24 21	24 22	24 23	24 24	24 31
0.	2.2157E-02	1.0021E 05	3.1037E 05	4.7854E 04
31 21	31 22	31 23	31 24	31 31
0.	1.5893E-06	2.3556E 03	7.3541E 04	2.6088E 05

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	3.3379E 05	3.3213E 05	2.7986E 06	0.

N1	N2
SIGMA S (N1/N2)	

21 21	21 22	21 23	21 24	21 32
9.3320E 03	8.7614E 02	0.	0.	0.
22 21	22 22	22 23	22 24	22 32
8.8212E 02	1.0257E 05	1.0113E 04	5.8429E-05	0.
23 21	23 22	23 23	23 24	23 32
0.	3.1721E 04	5.7394E 05	2.7052E 04	2.3457E 02
24 21	24 22	24 23	24 24	24 32
0.	2.7331E-04	8.3884E 04	3.2938E 05	4.4068E 04
32 21	32 22	32 23	32 24	32 32
0.	0.	8.8581E 02	6.2630E 04	2.7028E 05

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-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	3.3001E 05	3.2836E 05	2.8211E 06	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
9.6958E 03	5.1235E 02	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
1.0452E 03	9.8439E 04	1.4043E 04	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.6855E 04	5.8239E 05	3.3065E 04	8.5590E 01
24 21	24 22	24 23	24 24	24 33
0.	0.	6.3110E 04	3.5338E 05	3.9735E 04
33 21	33 22	33 23	33 24	33 33
0.	0.	1.5271E 02	4.8111E 04	2.8175E 05

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	3.2431E 05	3.2269E 05	2.8800E 06	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
9.6935E 03	5.1463E 02	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
1.8863E 03	1.0765E 05	3.9325E 03	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	3.7935E 03	5.7445E 05	5.3649E 04	1.0829E 01
24 21	24 22	24 23	24 24	24 34
0.	0.	3.8289E 04	3.8019E 05	3.6793E 04
34 21	34 22	34 23	34 24	34 34
0.	0.	4.1589E 00	3.0322E 04	2.9399E 05

DATE 03/28/61

DESIGNATION			CODE NO.			DENSITY FACTOR		
TANTALUM			73.1810			3.00435E 02		
LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER 1		
1	1.000E 07	4.9066E 00	5.5242E 00	2.6944E 00	1.8313E-02	-2.1636E 00		
2	6.065E 06	5.3411E 00	5.6087E 00	3.0199E 00	2.6107E-02	-2.2702E 00		
3	3.679E 06	6.3682E 00	5.3891E 00	3.5376E 00	3.9556E-02	-2.7684E 00		
4	2.231E 06	7.1656E 00	4.7665E 00	3.9441E 00	7.7549E-02	-3.1507E 00		
5	1.353E 06	7.4031E 00	3.7325E 00	4.6116E 00	1.2326E-01	-2.7302E 00		
6	8.208E 05	7.5674E 00	2.4819E 00	5.6510E 00	1.7159E-01	-1.8743E 00		
7	4.979E 05	7.6247E 00	1.3438E 00	6.0114E 00	2.2313E-01	-1.5779E 00		
8	3.020E 05	7.7310E 00	5.9900E-01	6.3571E 00	2.8074E-01	-1.3437E 00		
9	1.832E 05	8.0343E 00	2.1367E-01	7.0524E 00	3.0204E-01	-9.6033E-01		
10	6.738E 04	8.5190E 00	9.6306E-02	8.1159E 00	4.6191E-01	-3.9424E-01		
11	2.479E 04	9.0203E 00	1.0019E-01	8.9132E 00	1.0162E 00	-1.0475E-01		
12	9.119E 03	1.0208E 01	1.1338E-01	1.0167E 01	2.1453E 00	-4.0490E-02		
13	3.355E 03	1.2820E 01	1.4239E-01	1.2772E 01	4.0486E 00	-4.6847E-02		
14	1.234E 03	1.5701E 01	1.7439E-01	1.5643E 01	7.8679E 00	-5.7117E-02		
15	4.540E 02	1.7837E 01	1.9657E-01	1.7771E 01	2.0520E 01	-6.4256E-02		
16	8.719E 01	3.8138E 01	4.2295E-01	3.7998E 01	3.7710E 01	-1.3741E-01		
17	3.545E 01	5.0244E 01	5.5614E-01	4.9963E 01	1.1293E 02	-2.7453E-01		
18	1.304E 01	1.1303E 01	1.2536E-01	1.1262E 01	1.0130E 02	-4.0686E-02		
19	5.043E 00	3.1357E 01	3.4775E-01	3.1241E 01	4.0539E 02	-1.1296E-01		
20	1.445E 00	4.4375E 00	4.9212E-02	4.4212E 00	6.3744E 00	-1.5942E-02		
21	6.826E-01	5.9949E 00	6.6483E-02	5.9728E 00	5.0584E 00	-2.1614E-02		
22	2.511E-01	5.6433E 00	6.2584E-02	5.6225E 00	6.8535E 00	-2.0343E-02		
23	9.237E-02	5.2810E 00	5.8566E-02	5.2616E 00	1.1592E 01	-1.8974E-02		
24	2.530E-02	5.0000E 00	5.5450E-02	4.9816E 00	1.8005E 01	-1.7996E-02		
4500	3.023E-01	5.7331E 00	6.3580E-02	5.7120E 00	6.6193E 00	-2.0636E-02		
4000	2.718E-01	5.7485E 00	6.3751E-02	5.7273E 00	6.8494E 00	-2.0734E-02		
3500	2.413E-01	5.7478E 00	6.3743E-02	5.7266E 00	7.1491E 00	-2.0734E-02		
3000	2.109E-01	5.7255E 00	6.3496E-02	5.7044E 00	7.5402E 00	-2.0636E-02		
2500	1.804E-01	5.6761E 00	6.2948E-02	5.6552E 00	8.0586E 00	-2.0441E-02		
2000	1.499E-01	5.5953E 00	6.2052E-02	5.5747E 00	8.7634E 00	-2.0147E-02		
1500	1.194E-01	5.4843E 00	6.0821E-02	5.4641E 00	9.7600E 00	-1.9756E-02		
1000	8.897E-02	5.3558E 00	5.9396E-02	5.3361E 00	1.1265E 01	-1.9267E-02		
500	5.850E-02	5.2284E 00	5.7983E-02	5.2091E 00	1.3845E 01	-1.8876E-02		
68	3.216E-02	5.0968E 00	5.6524E-02	5.0780E 00	1.8613E 01	-1.8387E-02		

NOTE: For a summary of sources of data see XDC 61-4-35.

TANTALUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	5.2572E 00	5.2378E 00	2.8202E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 25
5.5895E 00	4.0540E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 25
3.4360E-01	5.0690E 00	2.4510E-01	9.7896E-06	0.
23 21	23 22	23 23	23 24	23 25
0.	6.9420E-01	4.4261E 00	1.8748E-01	9.3984E-03
24 21	24 22	24 23	24 24	24 25
0.	1.7295E-04	1.5697E 00	2.9089E 00	6.1148E-01
25 21	25 22	25 23	25 24	25 25
0.	1.1124E-06	1.8457E-01	1.4895E 00	3.5831E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	5.2320E 00	5.2127E 00	2.8225E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 26
5.5613E 00	4.3353E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 26
3.0665E-01	5.1002E 00	2.4958E-01	4.9555E-06	0.
23 21	23 22	23 23	23 24	23 26
0.	6.4500E-01	4.4759E 00	1.8494E-01	7.8979E-03
24 21	24 22	24 23	24 24	24 26
0.	7.3688E-05	1.4922E 00	2.9940E 00	5.9491E-01
26 21	26 22	26 23	26 24	26 26
0.	2.7878E-07	1.4703E-01	1.4352E 00	3.6498E 00

TANTALUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	5.2068E 00	5.1876E 00	2.8253E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
5.5238E 00	4.7114E-01	0.	0.	0.	0.
22	21	22	22	22	23
2.6732E-01	5.1311E 00	2.5663E-01	2.1567E-06	0.	0.
23	21	23	22	23	23
0.	5.9226E-01	4.5288E 00	1.8273E-01	6.4490E-03	0.
24	21	24	22	24	23
0.	2.5927E-05	1.4079E 00	3.0884E 00	5.7586E-01	0.
27	21	27	22	27	23
0.	0.	1.1222E-01	1.3726E 00	3.7220E 00	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	5.1815E 00	5.1624E 00	2.8291E 01	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
5.4720E 00	5.2292E-01	0.	0.	0.	0.
22	21	22	22	22	23
2.2534E-01	5.1607E 00	2.6766E-01	7.5719E-07	0.	0.
23	21	23	22	23	23
0.	5.3519E-01	4.5853E 00	1.8112E-01	5.0673E-03	0.
24	21	24	22	24	23
0.	6.9665E-06	1.3153E 00	3.1940E 00	5.5385E-01	0.
28	21	28	22	28	23
0.	0.	8.0776E-02	1.2997E 00	3.8011E 00	0.

TANTALUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	5.1562E 00	5.1372E 00	2.8341E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 29
5.3981E 00	5.9678E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 29
1.8056E-01	5.1867E 00	2.8516E-01	1.9278E-07	0.
23 21	23 22	23 23	23 24	23 29
0.	4.7269E-01	4.6462E 00	1.8059E-01	3.7725E-03
24 21	24 22	24 23	24 24	24 29
0.	1.2560E-06	1.2125E 00	3.3133E 00	5.2835E-01
29 21	29 22	29 23	29 24	29 29
0.	0.	5.3468E-02	1.2141E 00	3.8886E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	5.1308E 00	5.1119E 00	2.8412E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 30
5.2932E 00	7.0173E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 30
1.3319E-01	5.2039E 00	3.1400E-01	0.	0.
23 21	23 22	23 23	23 24	23 30
0.	4.0316E-01	4.7118E 00	1.8213E-01	2.5929E-03
24 21	24 22	24 23	24 24	24 30
0.	1.2054E-07	1.0964E 00	3.4500E 00	4.9866E-01
30 21	30 22	30 23	30 24	30 30
0.	0.	3.1151E-02	1.1125E 00	3.9871E 00

TANTALUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	5.1054E 00	5.0866E 00	2.8521E 01	0.

		N1	N2		

SIGMA S (N1/N2)					

21	21	21	22	21	23
5.2147E 00	7.8016E-01	0.	0.	21	24
22	21	22	22	22	24
8.4553E-02	5.2004E 00	3.6487E-01	0.	22	31
23	21	23	22	23	24
0.	3.2424E-01	4.7825E 00	1.8795E-01	23	31
24	21	24	22	24	24
0.	0.	9.6259E-01	3.6093E 00	24	31
31	21	31	22	31	24
0.	0.	1.4686E-02	9.9012E-01	31	31
					4.1006E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	5.0799E 00	5.0612E 00	2.8708E 01	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
5.5051E 00	4.8980E-01	0.	0.	21	24
22	21	22	22	22	24
3.9007E-02	5.1442E 00	4.6522E-01	0.	22	32
23	21	23	22	23	24
0.	2.3245E-01	4.8555E 00	2.0406E-01	23	32
24	21	24	22	24	24
0.	0.	8.0338E-01	3.7992E 00	24	32
32	21	32	22	32	24
0.	0.	4.6454E-03	8.3925E-01	32	32
					4.2360E 00

TANTALUM

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E 02	5.0545E 00	5.0359E 00	2.9103E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
5.7113E 00	2.8356E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 33
4.8909E-02	4.9384E 00	6.5962E-01	0.	0.
23 21	23 22	23 23	23 24	23 33
0.	1.2428E-01	4.9121E 00	2.5272E-01	2.0113E-04
24 21	24 22	24 23	24 24	24 33
0.	0.	6.0330E-01	4.0334E 00	3.8112E-01
33 21	33 22	33 23	33 24	33 33
0.	0.	5.7526E-04	6.4535E-01	4.4085E 00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E 01	5.0324E 00	5.0139E 00	3.0140E 01	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
5.7049E 00	2.9004E-01	0.	0.	0.
22 21	22 22	22 23	22 24	22 34
9.2507E-02	5.3631E 00	1.8926E-01	0.	0.
23 21	23 22	23 23	23 24	23 34
0.	2.8342E-02	4.8364E 00	4.2148E-01	1.1992E-05
24 21	24 22	24 23	24 24	24 34
0.	0.	3.6656E-01	4.2894E 00	3.5405E-01
34 21	34 22	34 23	34 24	34 34
0.	0.	7.4947E-06	4.1296E-01	4.6194E 00

TANTALUM

TRANSFERS FROM GROUPS 1 THROUGH 12 TO GROUPS 1 THROUGH 14

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
2.6325E-00	4.9856E-02	7.2623E-02	3.1457E-01	5.5693E-01
1 6	1 7	1 8	1 9	1 10
5.5037E-01	3.7286E-01	1.9972E-01	1.1652E-01	3.4605E-02
1 11	1 12	1 13	1 14	2 1
5.2034E-03	7.3160E-04	1.0102E-04	1.3479E-05	0.
2 2	2 3	2 4	2 5	2 6
2.6961E-00	1.5625E-01	1.9624E-01	5.1740E-01	6.6251E-01
2 7	2 8	2 9	2 10	2 11
5.2920E-01	3.1415E-01	1.9672E-01	6.1472E-02	9.4909E-03
2 12	2 13	2 14	3 1	3 2
1.3477E-03	1.8678E-04	2.4956E-05	0.	0.
3 3	3 4	3 5	3 6	3 7
3.6218E-00	1.2178E-01	3.8525E-01	6.8135E-01	6.7031E-01
3 8	3 9	3 10	3 11	3 12
4.5359E-01	3.1101E-01	1.0373E-01	1.6568E-02	2.3829E-03
3 13	3 14	4 1	4 2	4 3
3.3180E-04	4.4413E-05	0.	0.	0.
4 4	4 5	4 6	4 7	4 8
4.3324E-00	3.3244E-01	5.6774E-01	7.2269E-01	5.7596E-01
4 9	4 10	4 11	4 12	4 13
4.4276E-01	1.6029E-01	2.6722E-02	3.9058E-03	5.4713E-04
4 14	5 1	5 2	5 3	5 4
7.3404E-05	0.	0.	0.	0.
5 5	5 6	5 7	5 8	5 9
4.7968E-00	5.5420E-01	6.2672E-01	6.1400E-01	5.4635E-01
5 10	5 11	5 12	5 13	5 14
2.1965E-01	3.8685E-02	5.7734E-03	8.1501E-04	1.0967E-04
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
5.6653E-00	5.2603E-01	5.1617E-01	5.5132E-01	2.5247E-01
6 11	6 12	6 13	6 14	7 1
4.7613E-02	7.2936E-03	1.0396E-03	1.4042E-04	0.
7 2	7 3	7 4	7 5	7 6
0.	0.	0.	0.	0.
7 7	7 8	7 9	7 10	7 11
6.4244E-00	4.8314E-01	4.2919E-01	2.3152E-01	4.7613E-02
7 12	7 13	7 14	8 1	8 2
7.5404E-03	1.0882E-03	1.4768E-04	0.	0.

TANTALUM

N1		N2		SIGMA S0 (N1/N2)	
8	3	8	4	8	5
0.		0.		0.	
8	8	8	9	8	10
7.0375E 00		4.8545E-01		1.6338E-01	
8	13	8	14	9	1
9.0716E-04		1.2386E-04		0.	
9	4	9	5	9	6
0.		0.		0.	
9	9	9	10	9	11
7.5959E 00		4.1554E-01		1.8975E-02	
9	14	10	1	10	2
6.8863E-05		0.		0.	
10	5	10	6	10	7
0.		0.		0.	
10	10	10	11	10	12
8.1285E 00		3.9036E-01		1.0645E-04	
11	1	11	2	11	3
0.		0.		0.	
11	6	11	7	11	8
0.		0.		0.	
11	11	11	12	11	13
8.4284E 00		5.9195E-01		0.	
12	2	12	3	12	4
0.		0.		0.	
12	7	12	8	12	9
0.		0.		0.	
12	12	12	13	12	14
9.5057E 00		7.0250E-01		0.	

TANTALUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
4.2800E 00	4.2953E 02	1.9637E 04	2.3278E-03	0.
1.0340E 01	7.3959E 01	7.5364E 03	4.7869E-03	0.
1.3950E 01	1.1649E 01	1.9476E 03	9.5512E-03	0.
1.8600E 01	4.6194E 00	6.3766E 02	4.8836E-03	0.
2.0400E 01	5.2769E 00	1.0530E 03	9.3054E-03	0.
2.2800E 01	9.5013E-01	2.6215E 02	1.6777E-02	0.
2.4100E 01	2.0620E 01	4.6939E 03	1.0249E-02	0.
2.9900E 01	5.5286E-01	1.7470E 02	1.5918E-02	0.
3.5200E 01	1.8891E 01	5.6520E 03	1.2122E-02	0.
3.5900E 01	2.1467E 01	5.7316E 03	9.4656E-03	0.
3.9200E 01	3.9864E 01	9.1352E 03	6.3860E-03	0.
4.9100E 01	9.1669E-01	5.1086E 02	3.0152E-02	0.
5.5900E 01	1.3189E-01	7.9285E 01	3.0815E-02	0.
5.7500E 01	1.8667E-01	1.1523E 02	3.1591E-02	0.
6.3000E 01	2.9319E 00	1.7499E 03	2.6953E-02	0.
7.6900E 01	3.4182E 00	2.4323E 03	3.1387E-02	0.
7.7700E 01	1.7230E 00	1.3214E 03	3.6083E-02	0.
7.9000E 01	7.0267E-01	5.7744E 02	4.0750E-02	0.
8.3000E 01	3.5960E 00	2.5993E 03	3.0008E-02	0.
8.5200E 01	1.1663E 00	9.9781E 02	4.0951E-02	0.
8.5800E 01	8.3835E-02	7.7222E 01	4.7139E-02	0.
8.9700E 01	8.4561E-01	8.2545E 02	5.0638E-02	0.
9.1500E 01	5.6955E-01	5.4034E 02	4.6890E-02	0.
9.7100E 01	8.2151E-01	8.0607E 02	4.7265E-02	0.
9.9400E 01	7.4710E 00	2.7810E 03	6.6449E-03	0.
1.0360E 02	1.8944E-01	2.0823E 02	5.5598E-02	0.
1.0560E 02	3.4992E 00	3.0159E 03	3.3533E-02	0.
1.1520E 02	3.3525E 00	2.8260E 03	2.9404E-02	0.
1.1840E 02	3.2651E-01	4.0149E 02	6.0874E-02	0.
1.2660E 02	3.1396E 00	2.5821E 03	2.5467E-02	0.
1.3660E 02	1.9046E 00	2.0703E 03	4.1235E-02	0.
1.3850E 02	1.1707E 00	1.3066E 03	4.2874E-02	0.
1.4430E 02	1.6408E-01	2.4832E 02	7.5664E-02	0.
1.4850E 02	4.1620E-01	6.1672E 02	7.0483E-02	0.
1.4950E 02	5.0384E-01	7.3773E 02	6.8362E-02	0.
1.6000E 02	2.8102E-02	4.8230E 01	8.7756E-02	0.
1.6650E 02	5.8242E-01	9.0787E 02	6.9566E-02	0.
1.7520E 02	2.4006E 00	1.7970E 03	1.5246E-02	0.
1.7600E 02	1.8066E 00	1.8570E 03	2.8619E-02	0.
1.7870E 02	6.3670E-02	1.2072E 02	9.5901E-02	0.

TANTALUM

RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
1.8300E 02	5.1735E-02	1.0071E 02	9.8701E-02	0.
1.8600E 02	3.5499E-02	7.0528E 01	1.0116E-01	0.
1.9000E 02	3.9623E-02	8.0281E 01	1.0299E-01	0.
1.9500E 02	1.7850E 00	1.6661E 03	2.1298E-02	0.
2.0050E 02	1.2584E 00	1.5595E 03	3.6512E-02	0.
2.0500E 02	1.3600E-01	2.8673E 02	1.0336E-01	0.
2.0850E 02	5.0668E-01	9.3409E 02	7.7703E-02	0.
2.1550E 02	1.1522E 00	1.4637E 03	3.5694E-02	0.
2.1700E 02	5.2514E-01	9.8035E 02	7.6559E-02	0.
2.2000E 02	5.7659E-01	1.0556E 03	7.2627E-02	0.
2.2250E 02	7.2663E-02	1.9131E 02	1.4851E-01	0.
2.2550E 02	7.7211E-01	1.2741E 03	5.7558E-02	0.
2.3100E 02	8.0393E-01	1.2992E 03	5.3893E-02	0.
2.3250E 02	1.1830E 00	1.4121E 03	2.9213E-02	0.
2.3750E 02	5.0130E-02	1.2549E 02	1.2577E-01	0.
2.4300E 02	2.9941E-01	6.7129E 02	9.8607E-02	0.
2.4700E 02	2.2017E-01	5.2217E 02	1.0856E-01	0.
2.4850E 02	4.5790E-02	1.1993E 02	1.3160E-01	0.
2.5300E 02	9.6418E-03	2.6188E 01	1.3900E-01	0.
2.5950E 02	2.8468E-01	6.7185E 02	1.0232E-01	0.
2.6000E 02	1.8167E-02	5.0454E 01	1.4141E-01	0.
2.6350E 02	1.0839E 00	1.1806E 03	2.1465E-02	0.
2.6450E 02	3.3442E-01	7.7138E 02	9.5891E-02	0.
2.7220E 02	3.1576E-01	7.4956E 02	9.8683E-02	0.
2.7400E 02	1.0220E 00	1.1212E 03	2.0939E-02	0.
2.7750E 02	4.7149E-01	9.9159E 02	7.5981E-02	0.
2.8050E 02	5.2264E-01	1.0486E 03	6.8415E-02	0.
2.8800E 02	4.6176E-01	9.8444E 02	7.5231E-02	0.
2.9100E 02	3.3677E-01	8.1024E 02	9.4822E-02	0.
2.9150E 02	3.3561E-01	8.0885E 02	9.4985E-02	0.
3.0450E 02	5.7576E-02	1.8089E 02	1.5453E-01	0.
3.0650E 02	4.4729E-01	9.6975E 02	7.3105E-02	0.
3.1200E 02	3.7298E-01	8.8194E 02	8.5427E-02	0.
3.1380E 02	5.0056E-01	1.0101E 03	6.1856E-02	0.
3.2300E 02	1.0794E-01	3.4146E 02	1.4770E-01	0.
3.2900E 02	3.3543E-01	8.3637E 02	9.0082E-02	0.
3.2950E 02	4.8619E-01	9.8063E 02	5.8856E-02	0.

3.6 Macroscopic Cross SectionsMACROSCOPIC CROSS SECTIONSCONSTITUENT TABLES

MACROSCOPIC CODE NO.		DESIGNATION
140.1910		4-H 1-ZR
CONSTITUENT CODE NO.	DESIGNATION	WEIGHT FRACTION
1.1000	H FREE	1.1670E-02
40.9100	ZIRCONIUM	9.8833E-01

DATE 02/15/61

HYDRIDED ZIRCONIUM

DESIGNATION	CODE NO.	DENSITY FACTOR
4-H 1-ZR	140.1910	5.92000E 00

LEVEL	ENERGY	SIGMA SCATTER	XI SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	XII SIGMA SCATTER I
1	1.000E 07	2.0687E-01	2.0466E-01	9.6938E-02	1.7900E-04	-9.8807E-02
2	6.065E 06	2.1323E-01	2.0325E-01	1.1265E-01	2.0803E-04	-8.6430E-02
3	3.679E 06	2.4263E-01	1.9673E-01	1.3670E-01	2.5467E-04	-8.6605E-02
4	2.231E 06	2.9429E-01	1.8071E-01	1.6481E-01	3.0296E-04	-1.0352E-01
5	1.353E 06	3.8205E-01	1.7721E-01	2.0632E-01	3.6932E-04	-1.4166E-01
6	8.208E 05	4.9338E-01	2.0457E-01	2.6623E-01	4.4700E-04	-1.8172E-01
7	4.979E 05	5.9042E-01	2.6269E-01	3.3758E-01	5.3983E-04	-1.9449E-01
8	3.020E 05	6.3522E-01	3.3385E-01	3.7212E-01	6.5435E-04	-1.8951E-01
9	1.832E 05	7.6442E-01	4.4080E-01	4.4553E-01	8.2988E-04	-2.2193E-01
10	6.738E 04	9.2302E-01	5.9491E-01	5.1828E-01	1.1513E-03	-2.7385E-01
11	2.479E 04	1.0422E 00	7.2479E-01	5.5883E-01	1.6311E-03	-3.2370E-01
12	9.119E 03	1.1023E 00	7.9616E-01	5.7339E-01	1.5965E-03	-3.5333E-01
13	3.355E 03	1.1028E 00	8.2545E-01	5.5419E-01	1.4637E-03	-3.6639E-01
14	1.234E 03	1.0656E 00	8.3106E-01	5.1290E-01	1.2682E-03	-3.6899E-01
15	4.540E 02	1.1404E 00	8.3265E-01	5.8720E-01	1.7521E-02	-3.6951E-01
16	8.719E 01	1.0649E 00	8.3089E-01	5.1239E-01	3.6966E-04	-3.6892E-01
17	3.545E 01	1.0652E 00	8.3074E-01	5.1276E-01	5.6452E-04	-3.6885E-01
18	1.304E 01	1.0660E 00	8.3115E-01	5.1326E-01	9.1552E-04	-3.6903E-01
19	5.043E 00	1.0799E 00	8.4385E-01	5.1869E-01	1.5391E-03	-3.7468E-01
20	1.445E 00	1.1001E 00	8.6287E-01	5.2623E-01	2.5979E-03	-3.8312E-01
21	6.826E-01	1.0935E 00	7.9568E-01	5.6795E-01	4.1318E-03	-3.5096E-01
22	2.511E-01	1.1971E 00	7.7929E-01	7.5374E-01	6.6380E-03	-3.1891E-01
23	9.237E-02	1.4812E 00	7.5543E-01	1.0519E 00	1.1408E-02	-2.6269E-01
24	2.530E-02	2.2686E 00	9.0972E-01	1.9313E 00	1.7690E-02	-2.2709E-01
4500	3.023E-01	1.3380E 00	8.7485E-01	7.7630E-01	7.1271E-03	-3.7501E-01
4000	2.718E-01	1.3380E 00	8.7485E-01	7.7630E-01	7.1271E-03	-3.7501E-01
3500	2.413E-01	1.3380E 00	8.7485E-01	7.7630E-01	7.1271E-03	-3.7501E-01
3000	2.109E-01	1.3380E 00	8.7485E-01	7.7630E-01	7.1271E-03	-3.7501E-01
2500	1.804E-01	1.3811E 00	8.8145E-01	8.1574E-01	7.7082E-03	-3.7748E-01
2000	1.499E-01	1.4366E 00	8.8970E-01	8.6751E-01	8.4549E-03	-3.7996E-01
1500	1.194E-01	1.5118E 00	8.9837E-01	9.3896E-01	9.4719E-03	-3.8243E-01
1000	8.897E-02	1.6190E 00	9.0661E-01	1.0449E 00	1.0977E-02	-3.8326E-01
500	5.850E-02	1.7946E 00	9.1154E-01	1.2243E 00	1.3536E-02	-3.8077E-01
68	3.216E-02	2.1009E 00	9.1520E-01	1.5409E 00	1.8254E-02	-3.7387E-01

4-H 1-ZR

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.5000E 03	0.	0.	0.	0.

		N1		N2					
		SIGMA S (N1/N2)							
21	21	21	22	21	23	21	24	21	25
0.		0.		0.		0.		0.	
22	21	22	22	22	23	22	24	22	25
0.		0.		0.		0.		0.	
23	21	23	22	23	23	23	24	23	25
0.		0.		0.		0.		0.	
24	21	24	22	24	23	24	24	24	25
0.		0.		0.		0.		0.	
25	21	25	22	25	23	25	24	25	25
0.		0.		0.		0.		0.	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
4.0000E 03	0.	0.	0.	0.

		N1		N2					
		SIGMA S (N1/N2)							
21	21	21	22	21	23	21	24	21	26
0.		0.		0.		0.		0.	
22	21	22	22	22	23	22	24	22	26
0.		0.		0.		0.		0.	
23	21	23	22	23	23	23	24	23	26
0.		0.		0.		0.		0.	
24	21	24	22	24	23	24	24	24	26
0.		0.		0.		0.		0.	
26	21	26	22	26	23	26	24	26	26
0.		0.		0.		0.		0.	

4-H 1-ZR

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.5000E 03	0.	0.	0.	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
0.	0.	0.	0.	0.	0.
22	21	22	22	22	23
0.	0.	0.	0.	0.	0.
23	21	23	22	23	23
0.	0.	0.	0.	0.	0.
24	21	24	22	24	23
0.	0.	0.	0.	0.	0.
27	21	27	22	27	23
0.	0.	0.	0.	0.	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
3.0000E 03	0.	0.	0.	0.

		N1	N2		
		SIGMA S (N1/N2)			
21	21	21	22	21	23
0.	0.	0.	0.	0.	0.
22	21	22	22	22	23
0.	0.	0.	0.	0.	0.
23	21	23	22	23	23
0.	0.	0.	0.	0.	0.
24	21	24	22	24	23
0.	0.	0.	0.	0.	0.
28	21	28	22	28	23
0.	0.	0.	0.	0.	0.

4-H 1-ZR

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.5000E 03	0.	0.	0.	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
0.	0.	0.	0.	0.	0.
22	21	22	22	22	23
0.	0.	0.	0.	0.	0.
23	21	23	22	23	23
0.	0.	0.	0.	0.	0.
24	21	24	22	24	23
0.	0.	0.	0.	0.	0.
29	21	29	22	29	23
0.	0.	0.	0.	0.	0.

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
2.0000E 03	0.	0.	0.	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
0.	0.	0.	0.	0.	0.
22	21	22	22	22	23
0.	0.	0.	0.	0.	0.
23	21	23	22	23	23
0.	0.	0.	0.	0.	0.
24	21	24	22	24	23
0.	0.	0.	0.	0.	0.
30	21	30	22	30	23
0.	0.	0.	0.	0.	0.

4-H 1-ZR

THERMAL TRANSFER MATRICES

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.5000E 03	3.5607E 00	3.2175E 00	1.8716E-02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
5.9558E-01	3.8373E-01	1.1845E-01	1.9375E-02	1.2700E-02	
22	21	22	22	22	23
6.6784E-02	8.2248E-01	2.7630E-01	5.9788E-02	3.3448E-02	
23	21	23	22	23	23
1.9415E-02	3.4082E-01	1.1430E 00	1.0933E-01	2.3728E-02	
24	21	24	22	24	23
2.5679E-02	4.6604E-01	3.9669E-01	1.3346E 00	3.1563E-01	
31	21	31	22	31	23
3.4904E-02	5.3059E-01	4.0351E-01	5.2964E-01	2.0621E 00	

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
1.0000E 03	3.2770E 00	2.9903E 00	1.8839E-02	0.

N1		N2		SIGMA S (N1/N2)	
21	21	21	22	21	23
5.8307E-01	3.7375E-01	1.2596E-01	2.1572E-02	1.4465E-02	
22	21	22	22	22	23
3.3062E-02	8.0490E-01	2.9053E-01	6.5479E-02	3.6317E-02	
23	21	23	22	23	23
4.9452E-03	2.1254E-01	1.2170E 00	1.0878E-01	2.3167E-02	
24	21	24	22	24	23
5.8129E-03	2.8203E-01	3.2972E-01	1.4918E 00	3.1218E-01	
32	21	32	22	32	23
7.4323E-03	2.9215E-01	2.6608E-01	4.8422E-01	2.2271E 00	

-----4-H 1-ZR-----

-----THERMAL TRANSFER MATRICES-----

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
5.0000E-02	3.0142E-00	2.7705E-00	1.9098E-02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 33
5.6293E-01	3.6730E-01	1.3382E-01	2.4641E-02	1.7242E-02
22 21	22 22	22 23	22 24	22 33
1.2009E-02	7.7774E-01	3.0633E-01	7.1301E-02	3.9023E-02
23 21	23 22	23 23	23 24	23 33
3.1550E-04	8.6122E-02	1.2935E-00	1.0459E-01	2.2488E-02
24 21	24 22	24 23	24 24	24 33
2.7780E-04	1.0145E-01	2.4564E-01	1.6789E-00	2.9403E-01
33 21	33 22	33 23	33 24	33 33
3.2860E-04	9.0999E-02	1.0621E-01	3.9641E-01	2.4203E-00

TEMPERATURE DEG. F.	SIGMA SCATTER	SIGMA TRANSPORT	SIGMA ABSORPTION	NU SIGMA FISSION
6.8000E-01	2.8970E-00	2.6876E-00	1.9779E-02	0.

N1 N2 SIGMA S (N1/N2)				
21 21	21 22	21 23	21 24	21 34
5.3684E-01	3.6755E-01	1.3930E-01	2.8306E-02	2.1554E-02
22 21	22 22	22 23	22 24	22 34
5.9948E-03	7.9288E-01	2.8389E-01	7.4136E-02	4.0162E-02
23 21	23 22	23 23	23 24	23 34
1.1300E-06	1.7792E-02	1.3409E-00	9.7845E-02	2.4724E-02
24 21	24 22	24 23	24 24	24 34
2.0000E-07	9.0276E-03	1.5857E-01	1.8476E-00	2.5340E-01
34 21	34 22	34 23	34 24	34 34
2.1000E-07	6.7011E-03	1.0665E-02	2.5737E-01	2.6223E-00

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TRANSFERS FROM GROUPS 1 THROUGH 20 TO GROUPS 1 THROUGH 25

N1 N2
SIGMA S0 (N1/N2)

1 1	1 2	1 3	1 4	1 5
9.9329E-02	1.9843E-02	9.7268E-03	1.3265E-02	1.9309E-02
1 6	1 7	1 8	1 9	1 10
1.8878E-02	1.3065E-02	7.2047E-03	4.4022E-03	1.4682E-03
1 11	1 12	1 13	1 14	1 15
2.8759E-04	6.5918E-05	1.8644E-05	6.0580E-06	2.4611E-06
1 16	1 17	1 18	1 19	1 20
6.2973E-07	1.4853E-07	5.8336E-08	2.3570E-08	7.4340E-09
1 21	1 22	1 23	1 24	1 25
2.5229E-09	1.1400E-09	4.5287E-10	0.	0.
2 1	2 2	2 3	2 4	2 5
0.	9.8108E-02	2.3086E-02	1.6030E-02	2.0021E-02
2 6	2 7	2 8	2 9	2 10
2.1118E-02	1.6085E-02	9.5719E-03	6.2596E-03	2.2671E-03
2 11	2 12	2 13	2 14	2 15
4.9496E-04	1.2684E-04	3.8810E-05	1.3151E-05	5.4398E-06
2 16	2 17	2 18	2 19	2 20
1.4017E-06	3.3161E-07	1.3025E-07	5.2624E-08	1.6598E-08
2 21	2 22	2 23	2 24	2 25
5.6328E-09	2.5453E-09	1.0111E-09	0.	0.
3 1	3 2	3 3	3 4	3 5
0.	0.	1.1581E+01	3.1702E-02	2.3724E-02
3 6	3 7	3 8	3 9	3 10
2.3893E-02	1.9931E-02	1.3069E-02	9.3805E-03	3.7884E-03
3 11	3 12	3 13	3 14	3 15
9.3522E-04	2.6548E-04	8.6297E-05	3.0105E-05	1.2601E-05
3 16	3 17	3 18	3 19	3 20
3.2620E-06	7.7321E-07	3.0369E-07	1.2270E-07	3.8700E-08
3 21	3 22	3 23	3 24	3 25
1.3134E-08	5.9348E-09	2.3576E-09	5.2259E-10	5.7379E-10
4 1	4 2	4 3	4 4	4 5
0.	0.	0.	1.6143E-01	4.4731E-02
4 6	4 7	4 8	4 9	4 10
2.9045E-02	2.2814E-02	1.5680E-02	1.2346E-02	5.7516E-03
4 11	4 12	4 13	4 14	4 15
1.6739E-03	5.3509E-04	1.8491E-04	6.6289E-05	2.8046E-05
4 16	4 17	4 18	4 19	4 20
7.2894E-06	1.7308E-06	6.7981E-07	2.7467E-07	8.6631E-08
4 21	4 22	4 23	4 24	4 25
2.9400E-08	1.3285E-08	5.2774E-09	1.1698E-09	1.2844E-09

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N1 N2
SIGMA S0 (N1/N2)

5 1	5 2	5 3	5 4	5 5
0.	0.	0.	0.	2.3887E-01
5 6	5 7	5 8	5 9	5 10
6.1158E-02	3.1291E-02	2.0313E-02	1.6743E-02	8.9466E-03
5 11	5 12	5 13	5 14	5 15
3.0470E-03	1.0725E-03	3.8717E-04	1.4135E-04	6.0222E-05
5 16	5 17	5 18	5 19	5 20
1.5693E-05	3.7304E-06	1.4652E-06	5.9198E-07	1.8671E-07
5 21	5 22	5 23	5 24	5 25
6.3365E-08	2.8633E-08	1.1374E-08	2.5213E-09	2.7683E-09
6 1	6 2	6 3	6 4	6 5
0.	0.	0.	0.	0.
6 6	6 7	6 8	6 9	6 10
3.2526E-01	7.3441E-02	3.7259E-02	3.0382E-02	1.7138E-02
6 11	6 12	6 13	6 14	6 15
6.2699E-03	2.2991E-03	8.4462E-04	3.1055E-04	1.3266E-04
6 16	6 17	6 18	6 19	6 20
3.4605E-05	8.2294E-06	3.2322E-06	1.3059E-06	4.1189E-07
6 21	6 22	6 23	6 24	6 25
1.3979E-07	6.3166E-08	2.5092E-08	5.5620E-09	6.1070E-09
7 1	7 2	7 3	7 4	7 5
0.	0.	0.	0.	0.
7 6	7 7	7 8	7 9	7 10
0.	3.7475E-01	9.3801E-02	6.4300E-02	3.6388E-02
7 11	7 12	7 13	7 14	7 15
1.3386E-02	4.9246E-03	1.8116E-03	6.6647E-04	2.8477E-04
7 16	7 17	7 18	7 19	7 20
7.4288E-05	1.7667E-05	6.9389E-06	2.8036E-06	8.8426E-07
7 21	7 22	7 23	7 24	7 25
3.0009E-07	1.3561E-07	5.3868E-08	1.1941E-08	1.3111E-08
8 1	8 2	8 3	8 4	8 5
0.	0.	0.	0.	0.
8 6	8 7	8 8	8 9	8 10
0.	0.	3.6428E-01	1.4936E-01	7.6853E-02
8 11	8 12	8 13	8 14	8 15
2.8273E-02	1.0401E-02	3.8263E-03	1.4076E-03	6.0145E-04
8 16	8 17	8 18	8 19	8 20
1.5690E-04	3.7314E-05	1.4655E-05	5.9213E-06	1.8676E-06
8 21	8 22	8 23	8 24	8 25
6.3381E-07	2.8640E-07	1.1377E-07	2.5219E-08	2.7690E-08

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N1		N2		SIGMA S0 (N1/N2)	
9	1	9	2	9	3
0.		0.		0.	
9	6	9	7	9	8
0.		0.		0.	
9	11	9	12	9	13
7.0923E-02		2.6091E-02		9.5983E-03	
9	16	9	17	9	18
3.9359E-04		9.3602E-05		3.6763E-05	
9	21	9	22	9	23
1.5899E-06		7.1845E-07		2.8540E-07	
10	1	10	2	10	3
0.		0.		0.	
10	6	10	7	10	8
0.		0.		0.	
10	11	10	12	10	13
2.4214E-01		8.6365E-02		3.1772E-02	
10	16	10	17	10	18
1.3028E-03		3.0984E-04		1.2169E-04	
10	21	10	22	10	23
5.2629E-06		2.3782E-06		9.4471E-07	
11	1	11	2	11	3
0.		0.		0.	
11	6	11	7	11	8
0.		0.		0.	
11	11	11	12	11	13
5.8142E-01		2.9389E-01		1.0549E-01	
11	16	11	17	11	18
4.3258E-03		1.0287E-03		4.0405E-04	
11	21	11	22	11	23
1.7474E-05		7.8962E-06		3.1367E-06	
12	1	12	2	12	3
0.		0.		0.	
12	6	12	7	12	8
0.		0.		0.	
12	11	12	12	12	13
0.		5.9647E-01		3.2227E-01	
12	16	12	17	12	18
1.2932E-02		3.0755E-03		1.2080E-03	
12	21	12	22	12	23
5.2241E-05		2.3607E-05		9.3775E-06	
				2.0787E-06	
				2.2823E+06	

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N1 N2
SIGMA S0 (N1/N2)

13 1	13 2	13 3	13 4	13 5
0.	0.	0.	0.	0.
13 6	13 7	13 8	13 9	13 10
0.	0.	0.	0.	0.
13 11	13 12	13 13	13 14	13 15
0.	0.	5.7870E-01	3.3358E-01	1.3987E-01
13 16	13 17	13 18	13 19	13 20
3.6487E-02	8.6773E-03	3.4081E-03	1.3770E-03	4.3431E-04
13 21	13 22	13 23	13 24	13 25
1.4739E-04	6.6603E-05	2.6457E-05	5.8647E-06	6.4394E-06
14 1	14 2	14 3	14 4	14 5
0.	0.	0.	0.	0.
14 6	14 7	14 8	14 9	14 10
0.	0.	0.	0.	0.
14 11	14 12	14 13	14 14	14 15
0.	0.	0.	5.3829E-01	3.8852E-01
14 16	14 17	14 18	14 19	14 20
9.9977E-02	2.3776E-02	9.3384E-03	3.7730E-03	1.1900E-03
14 21	14 22	14 23	14 24	14 25
4.0386E-04	1.8250E-04	7.2495E-05	1.6070E-05	1.7644E-05
15 1	15 2	15 3	15 4	15 5
0.	0.	0.	0.	0.
15 6	15 7	15 8	15 9	15 10
0.	0.	0.	0.	0.
15 11	15 12	15 13	15 14	15 15
0.	0.	0.	0.	6.7759E-01
15 16	15 17	15 18	15 19	15 20
3.3491E-01	7.8407E-02	3.0795E-02	1.2442E-02	3.9244E-03
15 21	15 22	15 23	15 24	15 25
1.3318E-03	6.0182E-04	2.3907E-04	5.2993E-05	5.8185E-05
16 1	16 2	16 3	16 4	16 5
0.	0.	0.	0.	0.
16 6	16 7	16 8	16 9	16 10
0.	0.	0.	0.	0.
16 11	16 12	16 13	16 14	16 15
0.	0.	0.	0.	0.
16 16	16 17	16 18	16 19	16 20
5.9420E-01	2.9028E-01	1.1239E-01	4.5409E-02	1.4322E-02
16 21	16 22	16 23	16 24	16 25
4.8605E-03	2.1964E-03	8.7249E-04	1.9340E-04	2.1235E-04

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RESONANCE ENERGY	RESONANCE INTEGRAL	PEAK CROSS SECTION	R	ETA
-0.0000E-20	0.5975E 36	-0.4189E-28	0.1087E 29	0.

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TRANSFERS FROM GROUPS 1 THROUGH 34 TO GROUPS 1 THROUGH 11

N1 N2
SIGMA N,G (N1/N2)

1	1	1	2	1	3	1	4	1	5
0.		4.4122E-05		6.0167E-05		4.6128E-04		4.2921E-04	
1	6	1	7	1	8	1	9	1	10
6.8591E-04		1.0108E-03		5.0306E-06		0.		3.0876E-02	
1	11	2	1	2	2	2	3	2	4
5.1534E-04		0.		4.0061E-05		5.4629E-05		4.1885E-04	
2	5	2	6	2	7	2	8	2	9
3.8971E-04		6.2277E-04		9.1781E-04		4.6953E-06		0.	
2	10	2	11	3	1	3	2	3	3
3.0876E-02		4.6793E-04		0.		4.0714E-05		5.5518E-05	
3	4	3	5	3	6	3	7	3	8
4.2565E-04		3.9605E-04		6.3293E-04		9.3272E-04		4.6553E-06	
3	9	3	10	3	11	4	1	4	2
0.		3.0876E-02		4.7554E-04		0.		4.2414E-05	
4	3	4	4	4	5	4	6	4	7
5.7841E-05		4.4343E-04		4.1259E-04		6.5936E-04		9.7171E-04	
4	8	4	9	4	10	4	11	5	1
4.9076E-06		0.		3.0849E-02		4.9540E-04		0.	
5	2	5	3	5	4	5	5	5	6
4.7256E-05		6.4441E-05		4.9405E-04		4.5970E-04		7.3464E-04	
5	7	5	8	5	9	5	10	5	11
1.0826E-03		5.4683E-06		0.		2.7432E-02		5.5194E-04	
6	1	6	2	6	3	6	4	6	5
0.		5.3922E-05		7.3530E-05		5.6372E-04		5.2454E-04	
6	6	6	7	6	8	6	9	6	10
8.3824E-04		1.2353E-03		6.3726E-06		0.		1.5798E-03	
6	11	7	1	7	2	7	3	7	4
6.2980E-04		0.		6.2717E-05		8.5524E-05		6.5569E-04	
7	5	7	6	7	7	7	8	7	9
6.1005E-04		9.7496E-04		1.4368E-03		7.6770E-06		0.	
7	10	7	11	8	1	8	2	8	3
0.		7.3251E-04		0.		7.4241E-05		1.0124E-04	
8	4	8	5	8	6	8	7	8	8
7.7614E-04		7.2216E-04		1.1541E-03		1.7008E-03		9.4637E-06	
8	9	8	10	8	11	9	1	9	2
0.		0.		8.6711E-04		0.		9.2542E-05	
9	3	9	4	9	5	9	6	9	7
1.2619E-04		9.6746E-04		9.0018E-04		1.4386E-03		2.1200E-03	
9	8	9	9	9	10	9	11	10	1
1.2597E-05		0.		0.		1.0808E-03		0.	

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N1		N2	
SIGMA N,G (N1/N2)			
10 2	10 3	10 4	10 5
1.2680E-04	1.7291E-04	1.3256E-03	1.2334E-03
10 7	10 8	10 9	10 10
2.9048E-03	1.9195E-05	0.	1.4809E-03
11 1	11 2	11 3	11 4
0.	1.7844E-04	2.4333E-04	1.8656E-03
11 6	11 7	11 8	11 9
2.7740E-03	4.0880E-03	3.1337E-05	0.
11 11	12 1	12 2	12 3
2.0842E-03	0.	1.7327E-04	2.3629E-04
12 5	12 6	12 7	12 8
1.6855E-03	2.6936E-03	3.9694E-03	5.1479E-05
12 10	12 11	13 1	13 2
0.	2.0238E-03	0.	1.5688E-04
13 4	13 5	13 6	13 7
1.6401E-03	1.5260E-03	2.4387E-03	3.5939E-03
13 9	13 10	13 11	14 1
0.	0.	1.8323E-03	0.
14 3	14 4	14 5	14 6
1.8084E-04	1.3864E-03	1.2900E-03	2.0616E-03
14 8	14 9	14 10	14 11
1.3967E-04	0.	0.	1.5489E-03
15 2	15 3	15 4	15 5
1.9150E-03	2.6114E-03	2.0020E-02	1.8628E-02
15 7	15 8	15 9	15 10
4.3871E-02	2.5169E-04	0.	0.
16 1	16 2	16 3	16 4
0.	1.6854E-05	2.2982E-05	1.7620E-04
16 6	16 7	16 8	16 9
2.6200E-04	3.8611E-04	4.8143E-04	0.
16 11	17 1	17 2	17 3
1.9685E-04	0.	2.0907E-05	2.8509E-05
17 5	17 6	17 7	17 8
2.0336E-04	3.2500E-04	4.7894E-04	8.3340E-04
17 10	17 11	18 1	18 2
0.	2.4418E-04	0.	3.4069E-05
18 4	18 5	18 6	18 7
3.5618E-04	3.3140E-04	5.2964E-04	7.8051E-04
18 9	18 10	18 11	19 1
0.	0.	3.9791E-04	0.
			5.7052E-05

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N1 N2
SIGMA N,G (N1/N2)

19 3	19 4	19 5	19 6	19 7
7.7800E-05	5.9645E-04	5.5499E-04	8.8693E-04	1.3070E-03
19 8	19 9	19 10	19 11	20 1
2.2727E-03	0.	0.	6.6636E-04	0.
20 2	20 3	20 4	20 5	20 6
9.6727E-05	1.3190E-04	1.0112E-03	9.4088E-04	1.5036E-03
20 7	20 8	20 9	20 10	20 11
2.2159E-03	3.8334E-03	0.	0.	1.1297E-03
21 1	21 2	21 3	21 4	21 5
0.	1.5304E-04	2.0869E-04	1.6000E-03	1.4887E-03
21 6	21 7	21 8	21 9	21 10
2.3791E-03	3.5061E-03	6.1108E-03	0.	0.
21 11	22 1	22 2	22 3	22 4
1.7875E-03	0.	2.4651E-04	3.3616E-04	2.5772E-03
22 5	22 6	22 7	22 8	22 9
2.3979E-03	3.8322E-03	5.6473E-03	9.7891E-03	0.
22 10	22 11	23 1	23 2	23 3
0.	2.8792E-03	0.	4.2310E-04	5.7698E-04
23 4	23 5	23 6	23 7	23 8
4.4234E-03	4.1158E-03	6.5774E-03	9.6932E-03	1.6801E-02
23 9	23 10	23 11	24 1	24 2
0.	0.	4.9420E-03	0.	6.5372E-04
24 3	24 4	24 5	24 6	24 7
8.9141E-04	6.8344E-03	6.3591E-03	1.0162E-02	1.4976E-02
24 8	24 9	24 10	24 11	25 1
2.6078E-02	0.	0.	7.6351E-03	0.
25 2	25 3	25 4	25 5	25 6
1.0275E-03	1.4012E-03	1.0742E-02	9.9950E-03	1.5973E-02
25 7	25 8	25 9	25 10	25 11
2.3540E-02	4.0988E-02	0.	0.	1.2001E-02
26 1	26 2	26 3	26 4	26 5
0.	1.0284E-03	1.4023E-03	1.0751E-02	1.0003E-02
26 6	26 7	26 8	26 9	26 10
1.5987E-02	2.3559E-02	4.1022E-02	0.	0.
26 11	27 1	27 2	27 3	27 4
1.2011E-02	0.	1.0294E-03	1.4037E-03	1.0762E-02
27 5	27 6	27 7	27 8	27 9
1.0013E-02	1.6002E-02	2.3583E-02	4.1063E-02	0.
27 10	27 11	28 1	28 2	28 3
0.	1.2023E-02	0.	1.0308E-03	1.4056E-03

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N1 N2
SIGMA N,G (N1/N2)

28 4	28 5	28 6	28 7	28 8
1.0776E-02	1.0026E-02	1.6024E-02	2.3613E-02	4.1119E-02
28 9	28 10	28 11	29 1	29 2
0.	0.	1.2039E-02	0.	1.0326E-03
29 3	29 4	29 5	29 6	29 7
1.4081E-03	1.0795E-02	1.0044E-02	1.6052E-02	2.3656E-02
29 8	29 9	29 10	29 11	30 1
4.1191E-02	0.	0.	1.2060E-02	0.
30 2	30 3	30 4	30 5	30 6
1.0352E-03	1.4116E-03	1.0822E-02	1.0070E-02	1.6092E-02
30 7	30 8	30 9	30 10	30 11
2.3715E-02	4.1296E-02	0.	0.	1.2091E-02
31 1	31 2	31 3	31 4	31 5
0.	1.0392E-03	1.4170E-03	1.0864E-02	1.0108E-02
31 6	31 7	31 8	31 9	31 10
1.6154E-02	2.3806E-02	4.1453E-02	0.	0.
31 11	32 1	32 2	32 3	32 4
1.2137E-02	0.	1.0460E-03	1.4263E-03	1.0935E-02
32 5	32 6	32 7	32 8	32 9
1.0174E-02	1.6260E-02	2.3962E-02	4.1726E-02	0.
32 10	32 11	33 1	33 2	33 3
0.	1.2217E-02	0.	1.0603E-03	1.4459E-03
33 4	33 5	33 6	33 7	33 8
1.1085E-02	1.0314E-02	1.6483E-02	2.4291E-02	4.2300E-02
33 9	33 10	33 11	34 1	34 2
0.	0.	1.2384E-02	0.	1.0982E-03
34 3	34 4	34 5	34 6	34 7
1.4975E-03	1.1481E-02	1.0682E-02	1.7072E-02	2.5158E-02
34 8	34 9	34 10	34 11	
4.3807E-02	0.	0.	1.2826E-02	

AIRCRAFT NUCLEAR PROPULSION DEPARTMENT

GENERAL ELECTRIC