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UCRL-50400 Volume 15
Part A

An Integrated System for Production of Neutronics and Photonics Computational Constants

Volume 15 Part A

**THE LLL EVALUATED NUCLEAR DATA LIBRARY (ENDL):
EVALUATION TECHNIQUES, REACTION INDEX, AND
DESCRIPTIONS OF INDIVIDUAL EVALUATIONS**

R. J. Howerton, D. E. Cullen, R. C. Haight, M. H. MacGregor
S. T. Perkins, and E. F. Piechaty

September 1, 1975

Prepared for U.S. Energy Research & Development
Administration under contract No. W-7405-Eng-48

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Price: Printed Copy \$ *; Microfiche \$2.25

<u>* Pages</u>	<u>NTIS Selling Price</u>
1-50	\$4.00
51-150	\$5.45
151-325	\$7.60
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University of California Livermore, California 94550

1. The first step in the process of identifying a problem is to determine the nature of the problem. This involves a thorough understanding of the situation and the people involved. It is important to gather all relevant information and to consider the perspectives of all stakeholders. Once the nature of the problem is understood, the next step is to identify the causes of the problem. This involves a careful analysis of the situation and the people involved, and a determination of the factors that are contributing to the problem. Once the causes of the problem are identified, the next step is to develop a plan to address the problem. This involves determining the goals of the plan, the steps that need to be taken to achieve those goals, and the resources that will be needed to implement the plan. Once a plan has been developed, the next step is to implement the plan. This involves putting the plan into action and monitoring the progress of the implementation. Finally, the last step in the process is to evaluate the results of the implementation. This involves determining whether the goals of the plan have been achieved and whether the problem has been resolved. If the goals have not been achieved, then the process must be repeated.

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UCRL-50400, Volume 15, Part A

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R. J. Howerton, D. E. Cullen, R. C. Haight, T. H. MacGregor,
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Foreword

The ECRL-50400 series describes an integrated and computer-oriented system for the production and application of neutron-induced and photonic calculational constants.

The system must supply reliable up-to-date data, select specific types of data on request, provide output in a variety of forms — ultimately in the form of input to other computer codes — and function rapidly and efficiently. The system has now been developed to a point where these goals are being realized.

The ECRL-50400 series, An Integrated System for Production of Neutron-Induced and Photonic Calculational Constants, comprises the following volumes:

- Vol. 1, ECSIL, A System for Storage, Retrieval and Display of Experimental Neutron Data, March 1974.
- Vol. 2, A Bibliography of the Experimental Data of Neutron-Induced Interactions, March 1974.
- Vol. 3, An Index of the Experimental Data of Neutron-Induced Interactions, March 1974.
- Vol. 4, Evaluated Nuclear Cross-Section Library, April 1971.
- Vol. 5, CLYBER, A New High-Data-Processing Computer Program for Producing Calculational Constants, May 1971.
- Vol. 6, Photon Cross-Sections: 1 keV to 100 MeV, October 1968.
- Vol. 7, Graphical Experimental Data for Major Neutron-Induced Interactions, April 1974.
- Vol. 8, Graphical Experimental Data for Supplemental Neutron-Induced Interactions, October 1974.
- Vol. 9, Thresholds of Nuclear Reactions Induced by Neutrons, Photons, Deuterons, Tritons, and Alpha Particles, September 1970.
- Vol. 10, Tabulated Experimental Data for Neutron-Induced Interactions, May 1974.

- Vol. 11, Experimental Data, Indexes and Techniques of Obtaining a Selected Set of Neutron Resonance Parameters, May 1972.
- Vol. 12, An Atlas of Resolved Neutron Resonance Parameters, July 1972.
- Vol. 13, An Atlas of Unresolved Neutron Resonance Parameters, September 1972.
- Vol. 14, TARTNP: A Coupled Neutron-Photon Monte Carlo Transport Code, September 1975.
- Vol. 15, The LLL Evaluated Nuclear Data Library (ENDL): Evaluation Techniques, Reaction Index, and Descriptions of Individual Evaluations, September 1975.
- Vol. 16, Tabular and Graphical Presentation of 175 Neutron Group Constants Derived from the LLL Evaluated Neutron Data Library (ENDL), January 1975.

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THE LLL EVALUATED NUCLEAR DATA LIBRARY (ENDL): EVALUATION TECHNIQUES, REACTION INDEX, AND DESCRIPTIONS OF INDIVIDUAL EVALUATIONS

Abstract

A general description of evaluation methods, a reaction index to evaluated data, and detailed

descriptions of evaluated nuclear data for eight-four isotopes or elements are presented.

Introduction

In 1958, we started to develop the Evaluated Nuclear Data Library (ENDL). Initially, the first computerized version of the library was produced. Since that time, the library has undergone numerous changes in order to keep pace with requests for new or better evaluated data and for types of data not previously included in the library. Furthermore, as computer capacity has increased, more sophisticated library systems have been developed.

At present, 84 isotopes or elements are included in the library. Seventy-two of the evaluations are complete in the sense that, for neutron-induced reactions, all energetically possible reactions in the energy range of 10^{-10} Mev to 20 Mev have been considered, and cross sections, energy distributions, angular distributions, and other

relevant information is provided. Cross sections for charged-particle-induced reactions are provided for a limited number of elements, and are complete for some elements. For all elements, since the early days of the project, only one or two reactions have had complete evaluations, such as deuterium cross sections, angular distributions, and energy distributions for neutron production from neutron-induced processes. Photon interaction cross sections¹ are provided over the energy range from 1 keV to 100 Mev for elements from hydrogen through californium. For five of the light isotopes, cross sections for selected charged-particle-induced reactions are also provided.

The collection of evaluated data described above exists for applied physics and engineering purposes, and this report is directed primarily to

those who have need for such data. Because of the bulk of the material, this volume is being divided in two parts. Part A presents:

- A general description of the ENDL library, including its historical background. The types of evaluated data included:
 - The general methods used in producing the data

- Reaction index to the evaluated data
- Future parts will present:
 - Detailed description of the individual evaluations
 - The tests that are carried out on the evaluated data sets
 - A summary of the test results

General Characteristics of ENDL

The purpose of the ENDL evaluated library is to provide in as succinct and simple a form as possible the nuclear data required for general neutronics and photonics calculations (and, to a much more limited extent, for calculations involving reactions induced by charged particles). Note that ENDL is not purported to be an all-inclusive or definitive representation of nuclear reaction data. Indeed, it deviates from this concept in both directions in that it omits some data that have been measured, and it includes some "data" that have not been measured. ENDL omits some measured data because it includes only those isotopes or elements that

are required for neutronics and photonics of real physical configurations. ENDL also necessarily includes some evaluated data that are not based on measurement, since it is required to contain data for all appropriate reactions over eleven decades of energy, and our experimental knowledge of the various parameters of nuclear reactions does not begin to approach completeness over this whole energy range. Hence, the data tables must be fleshed out, with nuclear systematics being used in the absence of experimental data. Ultimately, the validity of these ENDL evaluations can only be determined by comparing

misleading users into believing that the evaluator had more knowledge at his disposal than was actually the case. We would like to emphasize, however, that at no time in the ENDL evaluations has real knowledge of the physics been sacrificed merely in order to obtain a compact or simple representation. The principle we have attempted to follow is to present all of the detail that is justified by experimental knowledge, and no detail that is not so justified.

The following list of general characteristics of the ENDL library is presented here in summary form for convenience. These characteristics are discussed in detail in the remainder of this section.

- The method of interpolation to be used with each type of data is the same for all data of that type.
- With one exception (Legendre coefficients for angular distributions), parametric representations are not used.
- New types of data, improved evaluations, and evaluations for materials not previously contained in the library are entered as the need arises — usually by user request.
- New editions of the library are produced as soon as the modified data have been entered into the library.
- The system used for entering data into the library⁵ has sufficient flexibility that data types not previously considered can be entered easily by a logical extension of the encoding system.
- With one exception (the representations of angular distributions directly and also in terms of Legendre coefficients), redundant quantities are not carried in the library.
- Whenever evaluations that have been done elsewhere are deemed to be superior in whole or in part to those already in ENDL, or are judged to be adequate if no such evaluations are already in ENDL, they are adopted for the ENDL library, usually with some modifications.
- Modification of the evaluated data is never done solely to obtain agreement with

integral measurements of systems such as critical assemblies or pulsed spheres.

used as a means of representing energy-angle correlations.

We now discuss these general characteristics of the ENDL library in more detail, following the order of the above list. With the exception of photon interaction cross sections, which are log-log interpolable, all quantities entered into the evaluations are presented in sufficient detail to permit linear-linear interpolation; that is, the linearly-interpolated intermediate values are consistent with experimental knowledge (where experiments exist) or with the knowledge of nuclear systematics or nuclear theory (where experimental data are not available). Parametric representations, such as nuclear temperatures or resonance parameters, are avoided in the current form of the library because usually they are only valid over a limited range of incident energy, and because they are not unique in their interpretation. There are two exceptions to this rule:

- Legendre coefficients are included in the library as redundant quantities for angular distributions
- For one isotope (^2_1H), Legendre coefficients are

From time to time, user needs dictate the inclusion of entirely new types of data in the ENDL library. Examples of these user-dictated library additions are energy deposits from neutron-induced reactions, entered in 1964, photon production cross sections and photon spectra from neutron-induced reactions, entered in 1970, and electron production cross sections and spectra, which are just now being entered into the library. In the near future, the needs of controlled thermonuclear reactor calculations will require the inclusion of charged-particle production cross sections and charged-particle spectra from neutron-induced reactions. In addition to new types of data, new and changing laboratory interests have also dictated the inclusion of particular isotopes or elements not previously contained in the library, and they have led to both an extension of the energy range considered and an extension of the detail with which some types of data are represented. As might be expected, another common reason for making changes in the library is simply to modify evaluations based on new

experimental data that have become available, especially for types of quantities not previously measured.

One general problem in maintaining the ENDL library is to make available to users the most recent version of the library, and at the same time to maintain continuity for such work as parameter studies by having available a relatively fixed version of the library. This two-fold library need is met by making updated versions of ENDL on an essentially continuous basis for the user who wants the latest version of the library, and, at the same time, maintaining a standard "floor-version" that keeps its identity for approximately 1 year. The main laboratory neutronics and photonics production codes use standard sets of calculational constants,⁶ which are derived from the "floor-version" of ENDL. For users who feel the need of the most recent data, special files of calculational constants are created to their specifications from the latest version of the library.

To enter new data into the ENDL library, or to modify already existing data, a system has been devised that is both simple and straightforward to use. The main features of this system were put into final form only after several iterations extending over the course of the last decade. Since this

system is described in detail in Vol. 4 of this series,⁵ only a general outline of the method will be presented here. The essence of the system is that the various nuclear reactions and the types of data associated with these reactions comprise a self-organizing data system, in the sense that a data entry is always defined by an incident particle, a target nucleus, a reaction that occurs, and some property of that reaction which is to be described. For well-defined nuclear reactions, the data classification includes three main categories of specification:

- The initial state constellation. This requires specifying the incident particle and the target.
- The intermediate states, if known. This requires specifying the excited states of the intermediate nuclei, and sometimes the excited state of the final nucleus.
- The final state constellation. This requires specifying all (or all but one) of the final state products, and also the difference in energy between the initial and final state constellations. This latter quantity is of course the mass difference Q -value.

Having defined the reaction with respect to these three categories, it still remains to list the reaction parameters that specify the reaction properties for a particular data entry. There are two practical subdivisions in the specification of reaction properties: the first has to do with the existence of the reaction and the probability that it will occur; the second is concerned with the properties of the reaction products. With respect to the first subdivision, the cross section represents the probability that a reaction will occur, and it quite obviously implies the existence of the reaction. In the second subdivision, the reaction properties include angular distributions, energy distributions, multiplicities, energy deposits, etc. In describing the properties of the reaction products, it is necessary to specify both the secondary particle and the particular property of that particle which is to be tabulated. For many reactions, there is more than one secondary particle; in these cases, each secondary particle can be independently specified with respect to the desired reaction properties.

Whenever it is possible to specify nuclear reactions in the manner just described, they are so specified. However, while some experimental data are available for photon and charged

particle production, other types of data are not identified with specific reactions. For information of this type, cruder representation is provided, so that photon production, electron production, hydrogen production, helium production, etc., can be described without specifying the particular reaction channel that produced the photons or charged particles. There are, of course, many instances where it is possible to associate the production information with a specific nuclear reaction; this is the case if the particle production has only one energetically possible reaction channel. For example, in many isotopes the (n,γ) reaction is the only photon-producing reaction at incident neutron energies below the threshold for the inelastic scattering process; thus, the observed photon production in this low energy range can be directly identified with the (n,γ) reaction. Evaluated (n,γ) reactions are specified by labeling the emergent particle as a photon, and then providing multiplicities and energy spectra to characterize this particle. The principle followed in creating evaluated data files is to identify, whenever possible, the specific reaction from which particles are emergent, but to use the cruder specification whenever such identification cannot be accomplished.

Redundant or derivable quantities are in general not carried in the ENDL library, but, as with most rules of a practical system, there are exceptions to the rule:

- Angular distributions are usually entered into the library as differential probabilities, but for certain uses it is convenient to have Legendre coefficients available; hence, these are included as redundant secondary information.
- For most reactions, total and local energy deposits are derivable largely (and for many reactions totally) from other information contained in the library. In this sense they are redundant quantities. But for some reactions, it is necessary to apply a recipe derived from nuclear systematics in order to obtain the energy-dependent energy deposits. Since some of the energy deposits are not derivable from other data contained in the library, it was decided to include all energy deposits as specific (and often

redundant) entries in the library.

Other redundant quantities such as total cross sections, nonelastic cross sections, total inelastic cross sections, average scattering angles, etc., which are derivable by simple procedures, are not carried in the stored form of the library, but are presented in the display listings and graphical representations that are produced by the computer code UTILITY.

Whenever it is found that an evaluation made at another laboratory is superior to a corresponding evaluation in ENDL, the outside evaluation is taken over and used in ENDL, usually with some modification. Because of the varied interests of different laboratories, evaluators associated with particular laboratories have differing proficiencies with respect to handling certain energy ranges, classes of isotopes, or classes of reactions. The objective of the ENDL system is to provide the best possible evaluations for the purposes of the Lawrence Livermore Laboratory, and these evaluations are gleaned from all available sources. Thus, many of the evaluations are hybrid in the sense that parts of the evaluation have been made at different laboratories. A detailed description of each evaluation is given in Chapter 4.

In cases where data have been adopted from evaluations made elsewhere, the rationale for and the description of these adopted data are given in Chapter 4.

Chapter 5 describes the testing and checking procedures carried out on the evaluated data sets. As was stated above, the validity of any set of evaluated data can only be determined through such a testing or checking process. One point to be made here is that evaluations in ENDF are never changed solely in order to obtain agreement with integral experiments (the so-called bulk measurements). The process of renormalizing evaluated microscopic data in order to obtain agreement with experimental integral measurements can lead to a false sense of security about the quality of the evaluated data. The difficulty is that the adjusted

data may do well in calculating parameters of bulk systems similar to those for which the data were adjusted, but the adjusted data often do very poorly in calculations for systems which are not similar to those used for the adjustment. As a practical matter, it is a legitimate activity to adjust the group constants used for neutronics calculations in order to obtain agreement with experimental parameters from bulk experiments. These group constants, however, are derived from the evaluated data, and they are not part of the evaluated data. In addition to an overall checking of an evaluated data set, the various testing procedures are often useful for diagnostic purposes, in that they can indicate potential troublesome areas in the evaluations, which should be examined for deficiencies.

Methods of Evaluation

The methods used in arriving at an evaluated data set vary widely, depending on factors such as the type of data under consideration, whether or not microscopic measurements exist in the pertinent energy range, and, if there are no measurements, whether or not adequate theoretical models can be used to provide the needed

evaluation data. If neither experiments nor adequate theoretical models are available, it is necessary to fall back on the catchall method of using observed nuclear systematics. For several classes of important quantities, relatively few experiments have been performed and reliable theoretical models do not exist. Fortunately, in

these cases it is often possible to combine the relatively few experiments with basic concepts such as conservation of energy and thereby arrive at useful recipes, which can be characterized as "formalized systematics." In the following discussion, use of these recipes is described in the sections dealing with the appropriate data types. Note that we are not claiming that our methods are the only ways to obtain evaluated data. In some cases it is expedient to discuss alternative techniques of evaluation, together with the reasons for selecting a specific alternative for use in the ENDL library. Other evaluators might well select different alternatives because they hold different opinions or because they have different uses in mind for their evaluations.

For data types (and over energy ranges) where measurements have been made, production of an evaluated data set is particularly easy if there is only one experiment; the evaluator usually follows the trend of the experimental data, keeping in mind the rule that a change in curvature is, in general, associated with a physical reason for that change. If this concept is used as a guideline, the resulting evaluated data will be as smooth as is consistent with experimental knowledge. However, for

many important data types, the measurements are sparse, and they often have large experimental uncertainties associated with them. When this is the case, it is necessary to make evaluation decisions that are based on more than just the experimental measurements; the evaluator must invoke his knowledge of systematics in order to select the specific values that will be entered into the evaluation. If the same quantity has been measured by more than one experimentalist, the ideal situation is, of course, one in which the experiments agree; the problem of selection of the evaluated data is then minimal. It is more usual, however, that multiple measurements of the same quantity do not agree to within the experimental uncertainties. In this more difficult situation, the evaluator must investigate the experimental techniques by reading the reports of the experiments, taking into account differences such as normalizations, and, if at all possible, obtaining the advice of the experimentalists who made the measurements. In the final analysis, it is the evaluator who must make a selection among conflicting experiments.

Note that in almost all cases the evaluator must make a considered selection, and he should not resort blindly to mechanical methods such as

least-squares fitting techniques in order to obtain his evaluated data. A simple example can illustrate this: If there are two measurements at a given energy, one with a value of 10 ± 1 barns and the other with a value of 20 ± 1 barns, it is likely that one of these is correct or more nearly correct than the other. In the absence of any other knowledge, a fitting technique would give a value of 15 barns for this quantity, and one would be virtually certain that the answer was wrong. In such cases the evaluator can often resolve experimental contradictions and arrive at a "best value" to use in the evaluated data set. In general, if we examined all of the isotopes, all of the energy ranges, and all of the data types in ENDF, we would find that most have never been measured. However, there are a few, such as the fission cross section of ^{235}U , which have received a great deal of attention by many experimenters. In the case of ^{235}U , it is probably legitimate, after a careful study has been made of the reports of the various experiments, to use a somewhat mechanistic fitting technique over certain limited energy ranges.

A severe problem area for the evaluator occurs when verified measurements show considerable detail in the structure of the cross section.

Usually these are total cross-section measurements, and there are no corresponding measurements of the partial cross sections that, when summed, add up to the total cross section. In such a case, if the fine resolution structure of the total cross section is to be maintained in the evaluated data set, this resultant structure in the total cross section must be attributed to one or more of the constituent reactions, so that it is necessary to introduce unmeasured structure into some of the partial cross sections. For different isotopes and in different energy ranges, the division of the reactions into (1) smooth evaluated distributions, and (2) artificially-constructed distributions that contain the measured total cross section structure, depends largely upon nuclear systematics. For example, in the lighter isotopes, any measured structure in the total cross section in the low MeV region is, in the absence of contrary experimental information, attributed to the elastic scattering cross section. On the other hand, for the heavy nonfissionable isotopes or elements, similar structure in the total cross section at eV and keV energies is largely reflected in the capture cross section. For thermally fissionable isotopes, structure in the total cross section at low energies is distributed between

fission and capture processes. These general rules are somewhat oversimplified, but they serve to illustrate the fact that the extremely detailed knowledge associated with fine resolution, total cross-section measurements does not necessarily lead to a significant improvement in our knowledge of the partial cross sections that make up the total. It is these partial cross sections that are most important for reaction neutronics or photonics calculations.

To aid in the production of evaluations for neutron-induced reactions, the Physical Data Group of LLL maintains a reasonably complete and up-to-date file of the measured data for neutron-induced interactions. This file is called ECSIL⁷⁻¹¹ (Experimental Cross Section Information Library), and it currently contains approximately one million experimental measurements of cross sections, angular distributions, energy distributions, etc., taken from over three thousand references. Of the million or so data points in ECSIL, 65% are measurements of total cross sections, and 21% are measurements of fission cross sections. An additional 7% are measurements of cross sections for (n,γ) reactions, which leaves only 7%, or approximately seventy thousand measured values, for all other types of data, including cross sections, angular distributions,

energy distributions, etc., for the several hundred isotopes and elements on which experiments have been performed. Volume 3 of this series⁸ is an index of the experimental data on neutron-induced interactions. Investigation of the volume demonstrates the relative paucity of experimental data that are available to serve as a guide in producing evaluations. In this breakdown, we do not mean to denigrate the usefulness of the 650,000 measurements of total cross sections for producing evaluated data, since these measurements serve the extremely important function of providing bounds for the various partial cross sections that make up the total.

The remainder of this section is devoted to a description of the methods that are used to obtain specific types of evaluated data. The general methods used to obtain evaluations in cases where experimental data are available have already been discussed; hence, the following discussion describes the techniques that are used to obtain evaluated data in cases where experimental data are not available.

ELASTIC SCATTERING

Elastic scattering includes both the total elastic cross section and the differential cross sections. The

total elastic cross section can be obtained experimentally either directly (by carrying out an integration over the differential elastic scattering cross section) or indirectly (by subtracting the nonelastic cross section from the total cross section).

There are relatively few measurements in which the total elastic cross section was obtained directly,^{8,9,11} as an integration over the differential elastic scattering cross section. Since most measurements of differential elastic scattering do not include the important small angle region, it is necessary to extrapolate to zero degrees when carrying out an integration over the differential cross section. The quantity known as Wick's Limit $(k_T/4\pi)^2$ provides a useful fiducial point in determining the zero degree elastic scattering cross section. Wick's Limit is a theoretical construct derived from the optical theorem, and while it purports to be just the lower limit for zero degree elastic scattering, it is usually close to the actual value for that quantity. Many elastic scattering measurements are made at relatively few angles, and in general only at the smaller (forward scattering) angles where the cross section is the largest.

Thus, in addition to the extrapolation to zero degrees, integration over the differential elastic scattering cross section usually also involves an extrapolation to large (backward) scattering angles. There is no quantity analogous to Wick's Limit that can be used as a guide in the back angle extrapolation; however, for most energies and for almost all materials, backward scattering in the center-of-mass system either is very much smaller than forward angle scattering, or, in cases where it is not, can be deduced from the trend of differential cross-section measurements at neighboring energies or for neighboring materials.

Using the extrapolation methods just described, we can represent the differential elastic scattering cross section as a continuous function of the cosine of the scattering angle, evaluated at any energy where differential elastic scattering cross sections have been measured. The integral over this function is the total elastic cross section. This value for the total elastic cross section can be checked against the difference of a measured total cross section and a measured nonelastic cross section, if such measurements are available. When this check is carried out, it is often found that there is some discrepancy between

the elastic cross section, which is obtained by integrating over the differential elastic cross section, and the elastic cross section, which is obtained by differencing the total and nonelastic cross sections. In most cases, the experimental uncertainties are so large for each of these determinations that they overlap. However, if the errors in the two determinations do not overlap, the value selected for the evaluation is usually the one that is obtained as the difference between the measured total and nonelastic cross sections, since each of these quantities can be measured with considerably greater precision than is obtained by integrating over the differential elastic scattering cross section. Fortunately, for most energies at which this technique is used, the elastic scattering cross section is at least half of the total cross section, so that we do not encounter the problem of differencing comparable quantities. The methods just described for obtaining elastic scattering cross sections are primarily appropriate to the MeV region, where, in fact, most of the measurements of the differential elastic cross section have been made.

In the case of the very light isotopes, the determination of the elastic scattering cross section presents a special problem for each

material. The techniques used for these light materials are discussed in the next section, where the evaluations for each isotope or element are described in detail. In the case of the heavier isotopes, a useful tool for obtaining elastic scattering cross sections is the optical model, which can be used with any one of several sets of so-called "global parameters" to obtain calculated total, shape elastic, and compound-nucleus-formation cross sections, as well as angular distributions (differential elastic scattering cross sections). For incident energies greater than about 4 MeV, and for nonmagic nuclei, the calculated cross section for compound nucleus formation (often called the "reaction cross section" in optical model terms) is a good approximation to the nonelastic cross section, and the calculated shape elastic cross section is a similarly accurate approximation to the elastic scattering cross section. Hence, for neutron energies greater than about 4 MeV and for nuclear masses greater than about $A = 30$, optical model calculations are useful aids in producing evaluated data. Since total cross sections in the MeV region have been measured for most materials, the technique used in obtaining an evaluated elastic cross section from

optical model calculations is to first calculate the ratio of the elastic cross section to the total cross section, then to renormalize the calculated total cross section to match the measured value, and finally to adjust the calculated elastic cross section according to the renormalization factor obtained for the total cross section.

At very low energies (on the order of eV's or fractions of an eV) and continuing to higher energies (on the order of tens or hundreds of kilovolts, depending upon the isotope or element), the elastic scattering process is isotropic in the center-of-mass system. As a practical consequence of this fact, elastic scattering measurements usually extend down to energies just low enough to define the highest energy at which the process is isotropic.

In ENDL, all cross sections are assumed to be nuclear in nature; hence, effects such as bound-atom, and atomic or molecular scattering are not accounted for (bound-atom effects are important, for example, in moderator calculations for thermal reactors). Thus in ENDL, the free-atom cross section is used to represent elastic scattering throughout the low energy region (extending from a few eV down to the least energy for which the cross section is tabulated (10^{-10} MeV)), most of the very large fluctuations in

and, of course, at the higher energies also.

In the absence of any information, the elastic scattering cross section, starting at the lowest energies, is held constant at its low energy (thermal) value up through increasing energies until finally an energy is reached at which nuclear systematics or total cross section measurements indicate the onset of the broad gradual changes in the elastic cross section which are characteristic of the higher energies. However, if total cross section measurements are available in this epithermal region, then different techniques are used to obtain the elastic scattering cross section. Of the approximately 650,000 individual measurements of total cross sections, by far the bulk of them are for neutron energies below 1 keV. This is the energy range for heavy isotopes, in which detailed resonance structure can be resolved. For lighter isotopes and elements (with Z less than about 30), the levels are more widely spaced, and modern experimental techniques allow for resolution of resonance structure at incident neutron energies up to about 4 or 5 MeV. In the case of the light isotopes, most of the resonance structure is reflected in the elastic scattering cross section. For the heavy nonfissionable materials, and, of course, at the higher energies also.

the total cross section are reflected in the (n, γ) cross section, but a significant amount of change is also seen in the elastic scattering cross section. In some cases, the experiments are complete enough to permit the total cross sections to be broken down into elastic and inelastic (capture) components, but in general this division must be estimated on the basis of systematics.

For convenience and compactness of presentation, especially for the heavy materials, the very-fine-resolution measurements of the total cross section are fitted by the experimentalist to a resonance parameter formalism,¹²⁻¹⁴ usually using a Breit-Wigner representation. Since most experiments of this type include only the total cross section, the resonance parameter fit determines only the product of the statistical weight times the neutron width plus the angular momentum for the resonances. The evaluator must determine the breakdown into spin, elastic, and nonelastic components. In a relatively few cases, both the total and capture cross sections are included, and the resonance parameters given by the experimentalist contain both total widths and partial widths for capture. For the fissionable isotopes, some measurements are of both the fission and capture cross

sections, and the resonance parameters contain partial widths for capture and for fission. Once a complete set of resonance parameters has been obtained, partly by experiment and partly by assumption, it can be used in an expansion formula to obtain energy-dependent cross sections. Care must be used in the application of the Breit-Wigner¹⁵ formalism to ensure that the expanded elastic cross sections agree with the experimental data, especially in the valleys between resonances. This is usually accomplished by combining the calculated cross sections with a correction factor (commonly known as the background cross section). Because of the gross uncertainties that are inherent in the assumed widths used in the expansion formula, any distortions due to the particular devices used to ensure agreement with experimental cross sections are probably of little consequence.

For the lighter materials, where the resonance structure in the total cross section generally represents fluctuations in the elastic scattering, the elastic scattering cross section is usually obtained by subtracting the measured or estimated nonelastic reaction cross section from the total cross section. For the heavy elements, on the other hand, and especially for the thermally

fissionable isotopes, the nonelastic cross section is comparable to the total cross section, and the elastic scattering cross section must be estimated on some other basis than the subtraction procedure described above.

The above description of evaluation techniques used to obtain elastic scattering cross sections includes several general methods, which are applicable over specific energy ranges and for certain classes of materials. The particular areas in which one or another of these techniques has been used for specific evaluations will be described more explicitly in the next section, with the individual isotopes and materials discussed in detail. We close the present section by describing the methods used to obtain evaluated angular distributions for elastic scattering. Throughout the ENDL library, all angular and energy distributions are presented in normalized differential probability form (with the area under the distribution set equal to unity); the normalizing factors needed to convert these differential probabilities into differential cross sections are obtained from the corresponding integrated cross sections. For display purposes, the graphical representations of the differential

probabilities that are generated by the LITLITV code have been renormalized into the form of differential cross sections; this permits direct comparison of the evaluated data with experimental data. One reason for storing angular distributions as normalized probabilities in ENDL is that it is often possible, when new (integral) information becomes available, to correct the elastic scattering cross section without having to insert new values for the angular distributions. In such cases, it is convenient to be able to upgrade the library without having to renormalize the differential probabilities.

As mentioned above, the elastic scattering process at low energies is isotropic in the center-of-mass system. The lowest energy at which anisotropy first appears is different for different elements, being on the order of a MeV for very light isotopes, and in the keV range for heavy elements. In the ENDL library, the first energy entered for the elastic scattering probability distribution is the highest energy at which the elastic scattering is still isotropic. For higher energies, entries into the evaluation are made at incident neutron energy intervals such that linear interpolation with energy at each value of the cosine of the scattering angle yields an angular probability

distribution that is consistent with the experimental and theoretical knowledge of the particular isotope in question.

If there is resonance structure in the elastic scattering cross section, the associated angular distribution changes, in principle, across the resonance. This effect has been measured for a few resonances; however, for the great majority of the resonances observed, especially with the light materials, corresponding angular distribution measurements have not been made, or, if they have been made, the differential measurements were not done with the same fine resolution as the total cross section measurements from which the elastic cross section was derived. If the statistics of the levels that are characterized by the resonance structure in the elastic cross section are well known, the R-matrix formalism can be used to calculate a series of changing differential cross sections over the resonance region. For two reasons, we have chosen not to use this formalism for the evaluated angular distributions of elastic scattering in the ENDL library. First, the bulk of evaluated data that results from application of this formalism is so great that, if real multizone multimaterial problems are to be calculated, even the most sophisticated

neutronics codes on the world's largest computer cannot make use of the data;^{3,4} also, the less sophisticated and most-commonly-used neutronics methods predigest the elastic scattering data into the form of transfer matrix elements or elastic scattering correction factors, so that there apparently is little use for such detail even if the calculated scattering probabilities were absolutely true to nature. Our second and perhaps more compelling reason for not using the R-matrix formalism is that the statistics of the nuclear levels required as input into the R-matrix calculation must be estimated for many or most of the levels involved, so that it is not at all clear that these detailed theoretical calculations are in fact adding to our knowledge of the experimental situation. For the isotopes where the R-matrix formalism can be applied, experimental differential cross section measurements, of the broad resolution type, already exist which supply data adequate for ENDL purposes. This discussion should not be interpreted as a cavalier dismissal of the R-matrix method. But we do feel that no evaluated data set should be so detailed that its use is precluded in any practical situation.

For energy regimes and for materials where elastic angular distribution measurements have not

been made, the shapes of the angular distributions over an energy range extending from the onset of anisotropy to a few MeV are deduced from the known angular distributions of neighboring elements or isotopes, with the optical model sometimes serving as a guide. For higher neutron energies (up to 20 MeV), optical model calculations are used directly to obtain the shapes of the differential probabilities.

INELASTIC SCATTERING

Inelastic scattering includes all processes in which the initial and final states each include a single neutron and the target nucleus, with the final-state neutron having a lesser energy than the initial-state neutron because of a transfer of (excitation) energy to the target nucleus. At low bombarding energies, inelastic scattering can often be identified with a specific excited state. However, at higher bombarding energies (in the MeV range), so many excited states of the target nucleus or compound system are possible that the process can only be treated statistically, as an average over the many available excited states. In the ENDL evaluations, cross sections for inelastic scattering at low energies are usually represented as level excitation functions. This

usually includes the first few levels from threshold up to an energy at which they are no longer defined by experiment. For higher energies, the various inelastic scattering processes are lumped into a continuum representation, which includes unresolved level excitation functions, equilibrium processes, pre-equilibrium processes, and unresolved direct interaction processes. In the current ENDL, the inelastic continuum neutrons are assigned a single angular distribution for each incident neutron energy. However, since the pre-equilibrium and unresolved direct-interaction neutrons are in fact peaked much more sharply in the forward direction than are the other continuum neutrons, we are going to modify the ENDL evaluations so as to handle the angular distribution for the pre-equilibrium and unresolved direct-interaction neutrons separately. Inelastic scattering processes in light nuclei (A less than 19) are usually special cases; these are dealt with in the following section, where each individual evaluation is discussed in some detail. For nonfissionable material the inelastic scattering cross section comprises most of the nonelastic cross section at energies below the $n,2n$ threshold (and above the main neutron capture region). Since

particle emission is usually favored over photon emission in cases where particle emission is energetically possible, the inelastic cross section drops sharply above the $n,2n$ threshold as a result of competition with the $n,2n$ reaction. Well above the $n,2n$ threshold, the inelastic scattering cross section reaches an equilibrium value that is approximately 10 to 30% of the nonelastic cross section, depending upon the isotope. The cross section continues at this ratio up to the upper limit of evaluated neutron energies in ENDL (20 MeV).

In cases where inelastic scattering excitation functions for individual levels have been well-determined by experiment,^{8,10,11} we include them explicitly in the evaluation; but if an excitation function for a level has not been well-determined experimentally, our choice is to include it in the continuum representation rather than to depend on theoretical calculations of the excitation function. This choice has certain programmatic implications in terms of the number of levels that can be used explicitly in neutronics calculations (see Ref. 3). However, in addition to these implications, we have chosen this approach for another reason. The Hauser-Feshbach technique is the standard method used to calculate

excitation functions for inelastic scattering to specific levels, but this calculational procedure has a fairly high degree of uncertainty. The main difficulty in applying the Hauser-Feshbach method is that it requires a knowledge of the nuclear statistics of the levels (in order to apply the important width fluctuation correction), and in most cases the statistics are not known. Hence the resulting calculated level excitation functions (except for a few well-known low-lying levels) contain large uncertainties. An argument might be made that rather than to present simply a sum over the unknown excitation functions, as we do, it would be a better evaluation to include poorly defined excitation functions for many levels, and thereby at least indicate the existence of these excitation functions. However, we feel that a more compelling counter-argument, aside from the practical reasons described above, is that a false inference on the part of the user would be drawn concerning the accuracy of the estimated or calculated excitation functions. Throughout the ENDL evaluation, we have attempted to present the information with a minimum of complexity, especially when additional complexity would imply

knowledge that we do not, in fact, have.

In the few cases where anisotropic center-of-mass angular distributions for inelastic scattering from specific levels have been measured, we have included these anisotropic representations in ENDL, but these represent only a very small fraction of the levels contained in the library. Thus, most of the discrete level excitation functions that are included in ENDL are implicitly assumed to be isotropic in the center-of-mass system. However, the continuum representations of inelastic scattering, in contrast to the discrete excitation function representation, are assumed to be isotropic in the laboratory system, since, in the absence of a specific Q-value, no center-of-mass system can be defined. As described above, the pre-equilibrium and unresolved direct-interaction neutron components of the continuum representations will in the future be assigned anisotropic (forward-peaked) angular distributions, in contrast to the isotropic angular distributions, which apply to the main body of the continuum inelastic neutrons.

In the case of inelastic neutrons that arise from excitations of specific levels, energy distributions do not have to be included in the evaluations, since these are completely

defined kinematically by the angular distributions of the secondary neutrons. However, energy distributions for continuum inelastic neutrons must be given. For incident neutron energies less than about 5 MeV, the energy distributions for the continuum inelastic neutrons are presented in tabular form in the ENDL evaluations, with the tables being derived, in the absence of experiment, from temperature models. (The specific nuclear temperatures that have been assumed for the materials contained in ENDL are listed in the next chapter.) For incident neutron energies greater than 5 MeV, the secondary neutron distributions are characterized by a two-component model — a "temperature" component plus a "pre-equilibrium and unresolved direct-interaction" component. The latter component gives a negligible contribution at neutron energies below 5 MeV, but it increases until it comprises about 10% of the total nonelastic neutron emission cross section at 15 MeV, where it flattens out and continues at that same fraction up to 20 MeV. At these higher energies, the inelastic scattering cross section is usually only one-quarter of the nonelastic cross section, and the other inelastic reactions ($n,2n$ and $n,3n$) have multiplicities greater than

unity. Thus, the inelastic scattering cross section makes only a small contribution to the total nonelastic-neutron-emission cross section. Hence, although inelastic scattering contributes little to the total neutron emission cross section, it nevertheless supplies high-energy neutrons representing 10% of the total emitted neutrons. This implies that at energies of 15 MeV and above, more than 50% of the inelastically scattered neutrons must, in fact, belong to the pre-equilibrium and unresolved direct-interaction component of the secondary neutron distribution.

The recipe used in ENDL to represent the neutrons from inelastic scattering at incident energies above 5 MeV is obtained by "marrying" a low neutron energy temperature model to a straight line representation for the high-energy neutrons. The dividing line for this marriage is obtained by using the temperature model up to the secondary-neutron energy at which the ratio of the integrals under the "temperature" and "high-energy tail" distributions correspond to the assumed branching ratio for these processes, as determined by the evaluator. The shape used in ENDL for the high-energy tail is obtained by linearly interpolating between the value of

the differential probability at the cutoff point for the temperature model and an assumed end-point value, which is one-half of this value, at the highest allowable energy. A computer code, PREP, constructs the appropriate secondary energy distributions once the evaluator has provided three quantities: the branching ratio between the two processes, the energy which is to be subtracted from the incident neutron energy in order to provide an upper limit for the secondary neutrons, and the incident neutron energy.

In the current version of ENDL, the secondary neutrons from inelastic scattering are assumed to be isotropic in the laboratory system. As was stated above, this is an incorrect representation of the high-energy neutrons, which are in fact highly peaked forward. This deficiency in the ENDL library, which will be corrected, is probably of little practical consequence for most applications. However, one important application of this effect is in the case of albedo calculations when a high-energy neutron current impinges upon a wall of material that has a very small curvature (i.e., an approximately infinite half-plane). The albedo of secondary neutrons from such a wall is affected by the two-component nature of the inelastic angular distribution.

This situation is an approximation to some of the controlled thermonuclear reactor (CTR) concepts that are currently being investigated at Livermore and elsewhere.

$n,2n$ REACTION

With certain notable exceptions, excitation functions for $n,2n$ reactions have not been measured^{8,10,11} for most of the isotopes and elements of interest to the user of evaluated data. The majority of the $n,2n$ measurements that have been made are activation measurements, which in many cases represent only part of the $n,2n$ reaction (because the measured activation is associated with only one of the two or more isomeric states in the residual nucleus). As a further limitation, many of these measurements have been made at only one energy, 14 MeV, and therefore do not define the energy-dependent excitation function for the reaction. Also, in the cases where excitation functions for the total $n,2n$ reaction have been measured, the error bars are relatively large. Faced with these difficulties, the evaluator is rescued by the circumstance that in most isotopes the $n,2n$ reaction rises from threshold in a sigmoid shape and reaches a plateau value about 2 MeV above threshold. Once this plateau

value has been reached, the $n,2n$ cross section remains relatively constant until the onset of the next competing reaction (usually $n,3n$). The total nonelastic cross section remains almost constant with increasing neutron energy from the onset of the $n,2n$ plateau up to 20 MeV, so that competing nonelastic reactions can be accurately summed by the evaluator. (The nonelastic cross section does, in fact, fall slightly throughout this energy range, but it can be approximated fairly well by a straight line with a slight negative slope.) The introduction of the competing $n,3n$ reaction causes a drop in the $n,2n$ cross section. Below the threshold for the $n,3n$ reaction, the $n,2n$ reaction constitutes about three-fourths of the total nonelastic cross section. The remainder of the nonelastic cross section in this energy range is comprised of the n,n' cross section, with a negligible contribution also coming from the n,γ process. In the case of fissionable materials, the systematics just described apply to the difference between the nonelastic and the fission cross section, with the $n,2n$ reaction constituting about 75% of that difference. Except for some of the very light isotopes, the angular distribution of the secondary neutrons from the $n,2n$ reaction is assumed to

be isotropic in the laboratory frame of reference.

A few measurements have been made of the energy spectra for nonelastic neutron emission at incident neutron energies where the $n,2n$ reaction is dominant. Quite obviously there is no experimental method by which the secondary neutrons from the $n,2n$ reaction can be separated from the secondary neutrons arising from other reactions, particularly the n,n' and $n,3n$ reactions. And there is no experimental method that can distinguish the first neutron from the second neutron in an $n,2n$ reaction. But there are sound physical reasons for arguing that the energy spectrum of first neutrons from the $n,2n$ reaction is considerably harder than the energy spectrum of second neutrons from the same reaction, since the available excitation energy, U , is much larger, on the average, for the first neutron than it is for the second. The existing measurements of $n,2n$ energy spectra (more exactly, the portions of the spectra that are ascribed to the primary and secondary $n,2n$ neutrons) can be interpreted in terms of a two-nuclear-temperature model. Guided by these few existing measurements, and in the general absence of measurement, we derive two nuclear temperatures T for the $n,2n$ reaction by iterating on the relation

$T = \sqrt{U/a}$, where U is the residual excitation energy after the neutron in question has boiled off, and a is the Fermi level density. More explicitly, $U = E_n - \bar{E}_1$ for the first neutron and $U = E_n + Q - \bar{E}_1 - E_2$ for the second neutron. An iteration procedure is needed to maintain energy conservation.

$n,3n$ REACTION

For atomic numbers (Z) less than 40, there are very few isotopes that have $n,3n$ mass difference thresholds that are below 20 MeV. Two notable exceptions are ^3H , with a threshold of 11.3 MeV, and ^7Li , with a threshold of 14.8 MeV. Both materials are, of course, very light isotopes, and hence constitute special cases, as described in detail in the following chapter. For atomic numbers (Z) greater than 40 and atomic masses (A) greater than about 90, the $n,3n$ threshold is well below the 23-MeV upper limit of the ENDL evaluations. Thus, $n,3n$ processes must be included in these evaluations. Since there have been almost no measurements of $n,3n$ cross sections,^{8,10,11} it is necessary to use nuclear systematics to obtain these quantities. As the third channel for neutron emission ($n,3n$) opens, it is assumed in the evaluations that the $n,3n$ cross

section follows the sigmoid shape that is typical of threshold reactions, reaching a plateau at an energy about 1-1/2 to 2 MeV above the threshold value. As in the case of the $n,2n$ cross section, the plateau cross-section value, once reached, remains a relatively constant fraction of the total nonelastic cross section for incident neutron energies less than the threshold of the next (usually $n,4n$) reaction. In the plateau region, the ratio of the $n,3n$ cross section to the $n,2n$ cross section is usually assumed to be two or three to one.

The angular distributions of the secondary neutrons from the $n,3n$ reaction are assumed to be isotropic in the laboratory system. The energy distributions of the secondary neutrons are derived in the same way as the $n,2n$ energy distributions. That is, we derive three nuclear temperatures (T) by iterating on the relation $T = \sqrt{U/a}$, where U is the residual excitation energy after the neutron in question has boiled off, and a is a level density parameter.

$n,4n$ REACTION

It is not until the charge of the nucleus (Z) reaches a value of about 90 that the threshold for the $n,4n$ reaction occurs below 20 MeV. The

only cross-section measurement for this reaction was made on ^{238}U at 17.8 and 18.8 MeV.^{8,10} As a result, the evaluated data for the $n,4n$ cross section are obtained almost completely from systematics; consequently, they have a high order of uncertainty associated with them. The secondary neutrons from this reaction are assumed to be isotropic in the laboratory system, and the evaluated energy distribution is obtained in a manner completely analogous to that described for the $n,2n$ and $n,3n$ reactions.

n,p REACTION

The n,p reaction becomes significant when incident neutron energies are in excess of a few MeV, except in the cases of the very lightest nuclei, in particular ^3He , ^7Be , and ^{14}N . The reason for this is that although the n,p mass difference threshold is negative or very low for many isotopes, the emission of a proton is inhibited by the Coulomb barrier and is in competition with the emission of one or more neutrons. The practical n,p threshold for materials other than the very lightest is on the order of a few MeV, and for most materials the cross section remains small until incident neutron energies of about

10 MeV are reached. Since the Coulomb barrier is enhanced as the nuclear charge Z increases, the n,p cross section for the heavier elements is usually small even at 14 MeV, which is where most of the measurements have been made. However, this small n,p cross section at 14 MeV can be important when evaluating structural materials for controlled thermonuclear reactors.

When carrying out n,p evaluations for ENDL, we are guided as much as possible by experiment.^{8,10,11} If only a single point has been measured at 14 MeV, the shape of the evaluated cross section is determined by systematics, and it is then normalized to the 14-MeV value. For certain applications the energy and angular distributions of the emergent protons can be important considerations. This is especially true for controlled thermonuclear reactor calculations in which gas formation in the first wall must be considered. At the time of this writing only the overall cross section and the local and nonlocal energy deposits are being entered in the ENDL library for the n,p reaction. There is an implicit assumption of isotropy for the emergent protons, and the energy distribution of the secondary protons is represented only by the pre-processing necessary to obtain the local energy deposits.

Although a few measurements of the angular and energy distributions of secondary protons from the n,p reaction have been made, the need for explicit representation of these quantities in evaluated data sets is only now developing. As more experimental data become available, and as the need for these data in evaluated form becomes more pressing, they will be entered into the evaluated ENDL files.

n,d REACTION

The cross section for this reaction is, in general, very small; consequently, it is usually ignored in evaluations. Only a few measurements of the n,d reaction cross section^{8,10,11} have been made and most of them have been at 14 MeV. Since activation methods at energies above the threshold of the $n,n'p$ reaction have been used to make most of these measurements, the two reactions (n,d and $n,n'p$) cannot be differentiated on the basis of the measurements. The $n,n'p$ reaction is discussed below.

n,t REACTION

The n,t reaction is important for very light nuclei (especially ${}^6\text{Li}$, and to a lesser extent ${}^{10}\text{B}$), but for heavier nuclei the cross section is

so small that the reaction can be ignored without materially affecting any use of the evaluated library. Only a few measurements have been made of the n,α reaction^{8,10,11} for heavy nuclei, mostly at 14 MeV.

$n, {}^3\text{He}$ REACTION

The only measurements for this reaction have been made in the neighborhood of 14 MeV, and they are all single point measurements.^{8,10,11} The magnitude of the $n, {}^3\text{He}$ cross section is so small that the reaction is usually ignored in evaluations.

n,α REACTION

There have been a large number of experimental determinations of the n,α cross section, especially for the light and intermediate nuclei.^{8,10,11} The mass difference threshold for this reaction is often either very small or negative, but the Coulomb barrier in all but the very lightest nuclei causes the effective threshold to be of the order of several MeV. In carrying out evaluations for the n,α reaction, whenever there is an experimentally determined n,α excitation function, the evaluation is guided by the experiment. In those cases where there is a single point or only a few points, the evaluated cross-section

shape is determined from systematics, with the normalization obtained from the experimental data. There have been very few measurements of energy or angular distributions for the secondary alpha particles from the n,α reaction. Since few applications have been made of the microscopic energy or angular alpha distributions, they are not usually entered into the ENDF library explicitly. However, with the advent of more sophisticated CTR calculations, these data will probably be needed for "first-wall-damage" calculations. At the present time, only the total n,α cross section, the local energy deposit, and the total energy deposit are carried in the library. To derive the local energy deposit, it is necessary to make assumptions about the mean value of the energy of the secondary alpha particles. It is only in this indirect manner that the energy distribution of the alphas enters into the present evaluations.

$n,n'p$ REACTION

Most experiments of the $n,n'p$ reaction are for single points in the neighborhood of 14 MeV.^{8,10,11} In a few cases the magnitude of the cross section from these measurements is large enough for evaluated data to be entered for this reaction. However, in the case of those isotopes which

have not been measured but which probably have large cross sections (because of the low mass-difference threshold), there does not seem to be an adequate method for estimating the magnitude of the cross section. For those cases, the $n,n'p$ reaction cross section has been subsumed into the n,n' cross section in the evaluations. This approximation probably does not materially affect neutron transport calculations, since the proper number of secondary neutrons is conserved. On the other hand, to the extent that the cross section is nonnegligible, an error will be introduced into the calculations that determine isotope production from neutron-induced reactions. If the $n,n'p$ cross section has been measured at one or more energies and its magnitude is shown to be nonnegligible, the excitation function for this reaction is evaluated from systematics, and the normalization is deduced from the experimental data. Neutrons from the $n,n'p$ reaction are assumed to be isotropic in the laboratory system. The energy distributions for these neutrons are obtained by assuming the same spectra as for the first neutrons from $n,2n$ reactions with the same thresholds. This method of obtaining secondary energy distribution is crude, and it does not, for example, take into account a differentiation between the

$n,n'p$ and $n,n'pn'$ reactions, but the latter is a sophistication that is not warranted by present experimental knowledge.

$n,n'd$ REACTION

Although this reaction is energetically possible for a number of light and intermediate nuclei, only ^6Li and ^{10}B have been measured.^{8,10,11} In the case of ^{10}B , the reaction leads to a final state containing two alpha particles. The ^6Li ($n,n'd$) reaction is extremely important for many applications, and, in addition to the cross sections, both the energy and angular distributions of the secondary neutrons and deuterons have been measured. This reaction will be discussed in the section dealing with the evaluation for ^6Li . For nuclei other than ^6Li and ^{10}B , the reaction is ignored in the evaluations, because there have been no measurements and there is no reliable method for estimating the magnitude of the cross section.

$n,n't$ REACTION

In the case of the $n,n't$ reaction for ^7Li , the cross sections, energy distributions, and angular distributions of the neutrons and the tritons from this reaction have all been measured.

However, none of the other isotopes have been measured, although the reaction is energetically possible for a number of light and intermediate isotopes. Hence, the only ENDF isotope for which the n,n' reaction is included is ^7Li , and the evaluated data followed the experimental determination. The details of this evaluation are discussed in the section dealing with the individual evaluations for ^7Li .

n,n' REACTION

No measurements have been made for this reaction,⁸ and it is not included in the evaluations, although the reaction is energetically possible for many isotopes. The effect of ignoring this reaction is probably not severe, since it is estimated that the reaction has a very low cross section.

n,n' REACTION

A few measurements of the cross section for the n,n' reaction^{8,10,11} have been included in the evaluation for a few nuclei. In cases where the excitation function has been determined by experiment, the experimental result is used in the evaluation. In cases where only one point has been measured, the shape of the excitation function is obtained from systematics, and the

magnitude of the excitation function is obtained by normalizing to the experiment at that one point. The secondary neutrons from the n,n' reaction are assumed to be isotropic in the laboratory system, and the energy distribution of the secondary neutrons is obtained by deducing a nuclear temperature from elementary considerations of energy conservation. The energy and angular distributions of the alpha particles are not included in the evaluation; however, the energy distribution is implicitly included in a crude estimate of the average energy of the secondary alphas, which is used to calculate local energy deposits.

n,γ REACTION

For most isotopes of interest, the n,γ reaction has been measured over at least part of the energy range of interest.^{8,9,11} For the very light isotopes this reaction generally has a very small magnitude, which in most cases has been measured only at thermal neutron energies. As the mass of the isotope increases, the capture reaction cross section increases. In the medium and heavy nuclei the cross section is of sizable magnitude for all but the closed-shell nuclei. For nuclei with mass numbers less than about 50, there is little structure in the n,γ reaction below one eV of

incident neutron energy. Because resonance structure is not seen at these lower energies, there have been very few low-energy measurements for such isotopes except at thermal energies. In the neutron energy region above thermal energies, it is usually assumed that the cross section follows a $1/v$ fall-off in magnitude as neutron energy increases until the resolved resonance region is reached^{12,13} (v is the neutron velocity). As the isotopic mass number increases beyond 50, the lower bound of the resolved resonance region decreases gradually, so that in the neighborhood of mass number 100 the first resolved resonance is in the low eV range. With even greater nuclear mass numbers, the location of the first resonance continues to decrease and is usually at some fraction of an electron volt, with exceptions as noted above for the closed-shell nuclei. The overall behavior of the capture cross section can be characterized as decreasing gradually on an approximately $1/v$ basis from thermal energies to the onset of the resonance region, and then continuing on through the resolved resonances on this same $1/v$ basis but with the values at the resonances superposed on the $1/v$ background.

Above the resolved resonance region is the unresolved region,¹⁷ where the n,γ reaction cross section

can be obtained indirectly by extrapolating from the resolved to the unresolved energy region, or directly by using such broad-resolution instruments as lead slowing-down spectrometers. Generally, the capture cross section above the unresolved region (in the neighborhood of 1 keV for heavy materials) decreases in a smooth fashion until the onset of p-wave capture is reached. In the neighborhood of a few hundred keV, where the cross section rises slightly over the next two hundred or so keV and then falls off rapidly with increasing energy. At 15 MeV the capture cross section, for most isotopes heavier than the very lightest, is about 1 barn and is still decreasing, so that at 20 MeV the capture cross section is some fraction of 1 barn.

For most moderately heavy and heavy isotopes, resonance parameters have been obtained over a limited range of neutron energies. Where these resonance parameters exist, they can be used to obtain the capture cross sections. However, for many isotopes, only total cross-section measurements have been made in the resonance region; thus, assumptions must be made with respect to the gamma-ray widths (Γ_γ) in order to obtain capture cross sections by expansion of the resonance parameters.

As with all other reactions, the

problem of obtaining evaluated neutron cross sections for the n, γ reaction is simplified in cases where measurements have been made, especially if only one set of measurements exists over the range. Where there are no measurements, systematics must be resorted to, of the general type described above.

4.1. FISSION

In terms of the total number of measurements that have been carried out,^{8,9,11} the fission process has received more attention than any other nuclear reaction. For the more important fissioning isotopes, there have been as many as ten different series of measurements in certain energy ranges, using techniques that are quite different from one another. Most measurements of the fission cross section that have been made are relative measurements, and they must be normalized to a "known" value that is a result of an absolute fission cross-section measurement. Even the so-called "absolute" fission measurements are, in fact, measurements that are relative to the hydrogen scattering cross section, the $^6\text{Li}(n, t)$ cross section, or the $^{10}\text{B}(n, t)$ cross section. The number of these absolute measurements is a relatively small fraction of the total number of

determinations of the fission cross section. In several important energy ranges, the absolute fission measurements still do not agree to better than a few percent. Some of the relative fission measurements determine only the shape of the cross section as a function of energy, and must be normalized to an assumed fiducial point. Others are relative to a "standard" fission cross section, usually ^{235}U . The net result is that the shapes of the fission cross sections for various isotopes are well determined over much of the energy range of interest, but their absolute values have uncertainties of 5% or more.

For isotopes that fission at thermal energies (and below), the general characteristics of the fission cross sections are similar to one another. The most important fiducial mark for normalizing these fission cross sections is the thermal neutron fission cross section, which is well-determined for most of these isotopes. At neutron energies below thermal, the cross section is obtained by extrapolating from the thermal value, using a $1/v$ cross-section scaling law. At neutron energies above thermal, the cross section also scales roughly in proportion to $1/v$; it then falls off with increasing neutron energy until the point at which the first resonance

is encountered, in the neighborhood of 1 eV for these heavy isotopes. Above the first resonance is a series of resonances, the so-called "resolved resonance region," in which the resonances have been delineated experimentally^{12,13} so that pointwise data can be obtained from the resonance parameters. Above this resolved resonance region, there is a very important "unresolved resonance region." Two (of several) techniques for obtaining the fission cross section throughout that region are (1) estimation of "resonance parameters" using statistical methods based on the lower-lying resolved resonance region;¹⁴ (2) matching to the results obtained by "poor-resolution" measurements, in which the structure is washed out but the average magnitude of the cross section is obtained. Above the unresolved resonance region, usually in the neighborhood of about 1 keV, the fission cross section falls off with increasing energy, gradually flattening out at about 800 keV, where it begins to rise to a plateau value at 1 to 2 MeV, followed by a gradual falling again. At the onset of the n, n' fission process (usually around 5 to 6 MeV), the cross section rises sharply to a second plateau, and then once again falls off gradually until the onset of the $n, 2n$ fission process, where it rises again to a new plateau

value, and then falls off again. This general characteristic is repeated with the $n, 3n$ process, and continues until the 20-MeV limit of the evaluations is reached.

The isotopes that are fissionable in the MeV region, and not at thermal energies, have effective fission thresholds at neutron energies ranging from a few hundred keV to about 1.5 MeV. These isotopes exhibit a characteristic threshold fission process, in which the cross section rises in the usual sigmoid shape for threshold processes until the first plateau is reached, in the low MeV region, and then follows the same characteristics as for thermally fissile isotopes. Note that in sub-threshold fission, a small fission cross section still exists below the effective fission threshold. That cross section is, in general, characterized by a slowly varying background cross section of low magnitude, with some very narrow resonance peaks imposed on this background. Because of the narrowness of these resonance peaks and the very low average background cross-section values, the mean value of the fission cross section for the sub-threshold fission process is usually quite small and can often be neglected in practical applications for systems that depend upon the fission process.

There are some isotopes that are

not initially present in a material. Instead, they are created in appreciable quantities by multiple neutron capture or other processes. Since these isotopes, in general, have rather short half-lives, fission cross sections and other related fission properties have not been measured for them. To obtain the cross sections for these materials, it is necessary to resort almost completely to the use of systematics. Fortunately, thermal cross sections for the fission process have been measured for several of these exotic materials. The uncertainties in these thermal fission cross-section measurements are relatively high, but at least something is available that can be extrapolated in energy in both directions from room thermal neutron energy. If another data point is available at a neutron energy far removed from thermal, the fission cross section can be estimated throughout the energy range of interest by using the systematics described above. A completely empirical observation was made by H. H. Barschall in 1955, to the effect that the fission cross section in the 2- to 3-MeV plateau region shows a relatively linear dependence upon $Z^{4/3}/A$ for all fissionable isotopes. There are now more measurements of fission cross sections

for various isotopes in the 2- to 3-MeV region than there were in 1955 when Barschall made his observation. The isotopes of each element seem to follow a definite but nonlinear relationship as a function of $Z^{4/3}/A$. This empirical observation has no basis in theory, and its practical virtue is that it seems to predict reasonable values for the plateau region cross sections. If the value obtained from this empiricism for a particular isotope is combined with a measured thermal value, the fission cross section over the entire range can be crudely estimated.

For applications that depend upon the fission process, the figure-of-merit for a fissionable isotope is not simply the fission cross section, but rather the product of the fission cross section and the average number of neutrons per fission ($\bar{\nu}$), with each factor of this product being a function of the incident neutron energy. The quantity $\bar{\nu}$ has received considerable experimental attention, especially during the past few years.^{8,9,11} As with other measurements, several different techniques are used to determine $\bar{\nu}$. In particular, these include ratio measurements, in which the value for $\bar{\nu}$ for a specific isotope is obtained from the ratio of the number of neutrons measured at a particular

neutron energy for that isotope to the number of neutrons measured for that or another isotope at that or another energy in a region where $\bar{\nu}$ has an assumed known value. Since most measurements of $\bar{\nu}$ are, in fact, made relative to another value for $\bar{\nu}$, a major consideration is the normalization of the so-called "absolute" values of $\bar{\nu}$ which are used as standards. The standard most often used for $\bar{\nu}$ measurements is the spontaneous fission $\bar{\nu}$ of ^{252}Cf . This quantity has been measured using both liquid scintillator techniques and boron-pile detectors to determine the average number of neutrons. The two techniques give values that differ by 1 or 2%. The experimental values for the spontaneous fission $\bar{\nu}$ of ^{252}Cf appeared for some time to fall into two distinct groups, corresponding to these two techniques, with the extreme values differing by as much as 2.4%. However, the two most recent determinations of this quantity (carried out in 1972) agree with each other and, perhaps fortuitously, they agree with the weighted mean value of the previous measurements.

All other measurements of $\bar{\nu}$ for various isotopes now relate ultimately to the ^{252}Cf spontaneous fission $\bar{\nu}$, which is the reason that this quantity is of such great importance. Many measurements of $\bar{\nu}$ are made relative to

the ^{235}U thermal $\bar{\nu}$ value, but the value adopted for that quantity is one that has been normalized to the ^{252}Cf value. A value of 3.73 ± 0.01 for the ^{252}Cf spontaneous $\bar{\nu}$ is consistent with both the 1972 measurements and the weighted mean of the earlier measurements. Using this value, one obtains a thermal $\bar{\nu}$ value of 2.384 for ^{235}U , which differs from the commonly accepted value of 2.407 by 1%. Note that the thermal $\bar{\nu}$ value for ^{235}U has been a monotonically decreasing function of time, with the accepted value being 2.47 in 1958, 2.41 in 1965, 2.407 in 1970. If the recent $\bar{\nu}$ value for ^{252}Cf is adopted, this value becomes 2.384 in 1974.

In 1961 Schuster and Howerton¹⁶ developed a formalism, based on qualitative physical arguments, for predicting $\bar{\nu}$ of the uranium isotopes. The formalism accounts for the observed structure in the energy dependence of $\bar{\nu}$. In 1971 Howerton¹⁷ extended this formalism to include a predictive method for determining the energy dependence of $\bar{\nu}$ in the isotopes of thorium and plutonium, as well as uranium. In addition to extending the range of this predictive method, the latter paper also compared some predictions made in 1963 with the post-1963 experimental data. Excellent agreement was obtained.

Although measurements of $\bar{\sigma}$ for the transplutonium isotopes are very scarce, the Howerton predictive empiricism appears to agree to within 5 or 10% with the few existing measurements. The Howerton method requires as input the charge (Z) and mass (A) of the nucleus, and the threshold for neutron-induced fission. For neutron energies above the onset of the n, n' fission threshold, estimates must also be provided for the fractional branching ratios of the various fission modes and for the n, n' fission threshold.

Adequate testing of the Howerton formalism for predicting the incident-neutron energy dependence of $\bar{\sigma}$ as a function of the charge and mass of the isotope will have to wait until sufficiently accurate experimental values are obtained. In the meantime, it is the only method currently available for estimating values of $\bar{\sigma}$ as a function of incident neutron energy for isotopes that have not been measured. As mentioned above, knowledge of the fission threshold energy is required in the application of this method, and for this purpose the threshold for those isotopes having positive fission thresholds is taken to be the energy at which the cross section for fission reaches one-half of its plateau value. The same threshold definition can be

applied to isotopes that have negative fission thresholds (i.e., they are fissionable at thermal energies), and that are observed in (d,pf) reactions such as those reported by Northrop, Stokes, and Boyer.¹⁸ If no measurements have been made from which a fission threshold can be inferred, the method of Vandenbosch and Seaborg¹⁹ can be used to calculate the fission threshold energy. When calculated fission threshold values are compared with available experimental data, it is usually found that they are somewhat lower in energy than the experimental values, with the deviations ranging from 0.1 to 1.25 MeV. Fortunately, the Howerton method for calculating the energy dependence of $\bar{\sigma}$ is not very sensitive to threshold values. In the extreme case of ^{236}U , where the calculated fission threshold and the experimental fission threshold differ by approximately 1.25 MeV, the error in $\bar{\sigma}$ resulting from this error in the fission threshold is just over 6% in the worst case, which occurs right at the threshold energy. The error decreases with increasing energy above threshold. Since the "figure of merit" for most isotopes that contribute to the fission process is the product of $\bar{\sigma}$ and the fission cross section, and since the fission cross section as a function of energy is usually not as well

known as the value of $\bar{\nu}$, it is the fission cross section that is probably the greatest source of uncertainty in neutronics calculations.

Another important quantity in the fission reaction is the energy distribution of the fission neutrons. Experimental determinations of the energy spectra from neutron-induced fission have been made for many isotopes, but only at relatively few incident neutron energies. The experimental energy spectra are well represented by Maxwellian distributions, with the peak of the distribution (and hence the average energy of the fission neutrons) a function of both the isotope and the incident neutron energy. In 1959 Terrell²⁰ proposed a relationship between the mean energy of the fission spectrum and the average number of neutrons ($\bar{\nu}$) resulting from fission. In 1971 Howerton and Doyas²¹ using the Terrell relationship together with a suggestion by Batchelor, Gilboy and Towle,²² evaluated the two constants of Terrell's relationship by fitting to 39 experimental measurements. Their comparison of experimental and calculated values showed a standard deviation of the calculated values from the central point of the measurements of 4.02%; the first moment of the calculated values about the central point of the measurements was

0.74%, with 66.7% of the values lying within the stated experimental error, 30.8% within twice the experimental error, and 2.5% (one measurement) within three times the experimental error. Howerton and Doyas also noted that a simple linear fit of the $\bar{\nu}$ values appropriate to the isotopes and incident neutron energies yielded a fit that was as good as the Terrell representation, with the appropriate constants being essentially unity and one-eighth. The Terrell representation has the advantage of a physics plausibility argument; the linear representation has no such advantage, but it is easy to remember.

PHOTON PRODUCTION CROSS SECTIONS AND SPECTRA

For the light isotopes ($Z < 10$), photon production from neutron-induced reactions is composed entirely of identifiable lines. Many of these lines can be identified with specific reactions. There are many other photons, however, that cannot be unambiguously identified with specific reactions, and these are carried in the ENDF library as $(n, X\gamma)$ production cross sections. In subsequent sections we will describe the evaluations for the light isotopes and discuss photon production for these materials.

In the present section, we describe the various classes of photon production and outline the techniques that are used to obtain cross sections and spectra in the absence of measurement.

One general type of photon production occurs only in hydrogen and a few other very light nuclei. This is the process in which the capture reaction is characterized by the absence of excited states in the compound nucleus, and capture leads to the emission of a single photon. In the case of hydrogen at the very lowest energies, a single 2.23-MeV photon is emitted following neutron capture. As the incident neutron energy increases, the energy of the single photon in the capture process changes in accordance with the equation $E_\gamma = 2.23 \text{ MeV} + \frac{A}{A+1} \times E_n$, where $A=1$ is the atomic number of the hydrogen nucleus, E_n is the incident neutron energy in MeV, and 2.23 MeV is the Q-value for this particular reaction. Thus, although the reaction is characterized by a single monoenergetic photon being emitted, the energy of the photon is, in fact, a linear function of the incident neutron energy.

As the mass of the target nucleus increases, the neutron capture process is still associated with the excitation of specific levels in the excited

$A+1$ nucleus, but there are now underlying levels in the compound nucleus. The deexcitation of these levels usually involves a cascade process. As a result, neutron capture in the heavier nuclei results in a distribution of final-state photon energies. This photon distribution is handled in the evaluated library by

- Taking an experimentally determined photon energy distribution
- Renormalizing this experimentally determined shape so that the integral over the energy distribution is equal to unity
- Associating a "photon multiplicity" with this normalized spectrum such that the product of the photon multiplicity times the mean energy of the normalized spectrum will yield the available energy for photon production.

At low energies, the available energy is essentially just the Q-value of the reaction, and at higher energies it is the sum of the Q-value and the kinetic energy of the incident neutron in the center of mass system. This

method of handling photon production is adequate for neutron energies that are so low that neutron capture is the only photon-producing reaction. However, for neutron energies that are greater than the threshold of the first level for inelastic scattering, photons resulting from $n,n'\gamma$ reactions must also be accounted for. In cases where the $n,n'\gamma$ levels are readily identifiable and where separate excitation functions for inelastic scattering from those levels have been entered into the library, it is sometimes possible to identify specific photons as coming from particular level excitations, and these $n,n'\gamma$ photons are entered separately in the evaluations. It is often true, however, that in certain energy regions and for certain elements, no experimental data exist that permit this separation, and then the capture and $n,n'\gamma$ photons are grouped together into one overall photon production cross section. Thus, in general, there may or may not be a neutron energy range for each element such that the gamma production cross sections and spectra can be separated into the appropriate capture and $n,n'\gamma$ components.

For many nuclei, it is necessary to make a change in the representation of photon production once the threshold for inelastic scattering is reached.

In those cases, the representation for photon production from the capture reaction is terminated at the threshold for inelastic scattering, and total photon production cross sections and spectra are used at higher energies without identifying the reactions that contribute to the total cross sections and spectra. For about 20% of the isotopes and elements in the ENDL collection, there are measured data that can be used to obtain the total photon cross sections and spectra, but for the remaining 80% it is necessary to rely upon a formalized empiricism first developed by Howerton and Plechaty in 1968.²³ This formalism has been improved by Perkins, Haight, and Howerton²⁴ as new experimental data have become available. The formalism is usually denoted as the R-parameter technique. It is based on the empirical observation that the experimental spectra of continuum gammas with energies greater than 1 MeV follow a simple evaporation form. From measured gamma-ray spectra, the R-parameter (which is similar to the inverse of a nuclear temperature in the usual evaporation model) can be determined as a function of incident neutron energy. The photon multiplicity is uniquely defined in terms of the R-parameter, so that the $(n,x\gamma)$ cross section can be obtained

once the R-parameter is known.

The general mathematical form used to describe photon spectra in the R-parameter technique is $N(E_\gamma) \approx (E_\gamma)^a \times \exp(-R_a \times E_\gamma)$, where a ranges from 0 to 5, depending on the reaction being considered, and where R_a is the corresponding empirically determined R-parameter. The simple evaluation spectrum has the value $a = 1$. Other values of a , with suitable choices for R_a , would also give reasonable representations of photon spectra for energies $E_\gamma > 1$ MeV. Certain specific photon-producing reactions dictate specific a values. For example, for the first transition from a highly excited state, $a = 3$ for dipole transitions and $a = 5$ for quadrupole transitions. Since the total neutron-induced photon spectrum is, in general, made up of the gamma-ray cascades from highly excited states, we might expect the range of "best" a values to lie between 3 and 5. However, as it turns out, the value for R_a varies with the excitation energy of the nucleus. Hence the choice for a depends somewhat on the energy dependence assumed for R_a ; the total gamma-ray spectrum, therefore, is not necessarily reproduced most accurately by a values that lie in the range $a = 3$ to 5. In fact, in the early development of the formalism, various values of a were investigated,

and it was found that $a = 1$ gave the best total representation for the available experimental data.

At the time that the original R-parameter formalism was developed, experimental photon data were available only at 4 and 14 MeV. In view of this lack of information, a linear dependence of R on the incident neutron energy was assumed. However, in late 1971, when all of the (n, X_γ) spectra in the LLL experimental neutron cross section library (ECSIL) were systematically analyzed on the basis of R-parameters, it became apparent that the behavior of the R-parameter was not linear over the entire range of neutron energies. In the medium energy region, where the $(n, n'\gamma)$ reaction predominates, the behavior is essentially linear. However, at higher energies (e.g., at 14 MeV), the experimental R values lie above this linear behavior, and at lower energies [i.e., below the $(n, n'\gamma)$ threshold], they lie below this linear behavior. An analysis of these results indicated that it is a more reasonable assumption to take the R-parameter as an explicit function of the excitation energy in the residual nucleus, U , rather than as a function of the incident neutron energy, E_n .

In 1972, Morgan²⁵ and coworkers

at ORNL performed an (n, X_γ) experiment on ^{181}Ta , one of the most comprehensive measurements carried out to date. In this experiment, gamma-ray spectra (b/ster MeV) for photons above 1 MeV in energy were measured at two angles and at a series of incident neutron energies between 0.007 and 20 MeV. Discrete gamma lines were, for the most part, washed out by the experimental resolution, which varied between 5 and 10%. When we analyzed these spectra for R-parameters over the entire range of incident neutron energies, we obtained the following conclusions:

- The evaporation form given above adequately describes the measured spectra over the entire neutron energy range, even when the only photon component present is from the (n, γ) reaction.
- When values of $\underline{a} \approx 3$ are inserted in the basic spectral equation, nearly all of the spectra thus obtained have maxima above 1.5 MeV. Since this large $\underline{a}$ value for the gamma ray spectral maximum is not observed experimentally, the basic spectral form with $\underline{a} = 1$ was assumed for

the purpose of the formalism; this gives the spectral maximum at about the observed position.

- When both the (n, γ) and the $(n, n' \gamma)$ reactions are present in comparable amounts ($1 \leq E_n \leq 4$ MeV), each component appears to have its own evaporation spectrum, yielding two distinct R-parameters at each neutron energy. Thus, in this energy region the R-parameter is reaction-dependent.

These conclusions enabled us for the first time to obtain R as a function of the excitation energy U . Using two separate reactions $l(n, \gamma)$ and $l(n, n' \gamma)$ between the excitation energies $1 \leq U \leq 10$ MeV, and using the basic spectral equation with $\underline{a} = 1$, it was found that when the excitation energy U for these two reactions is the same, the $R(U)$ values thus obtained are approximately equal, indicating essentially no dependence on the specific residual nucleus. Furthermore, at high excitation energies, $R(U)$ appears to approach a constant value. From this new information, the Howerton-Plechaty formalism was extended as follows: The photons from each individual

reaction are assumed to follow the form given above, with the R-parameter now being taken from the excitation function dependence $R(U)$. Hence, (n, X_γ) cross sections and spectra can be calculated for each reaction, using the $R(U)$ curve, and then summed to obtain the total continuum (n, X_γ) cross section.

Except for the results noted above for tantalum, there are few measurements on heavy nuclei that are complete enough to permit a determination of the R-parameter as a function of excitation energy. Gamma-ray production spectra for natural iron and for niobium have been reported in the literature. When discrete line contributions to the gamma-ray spectra of these two elements are subtracted, the resulting spectra contain (n, X_γ) contributions that come mainly from the (n, n') continuum process. These spectra have been analyzed for R-parameters, yielding results that are in surprisingly good agreement with the results obtained for tantalum.

In the evaluations, gamma-ray production cross sections and spectra are calculated for each individual reaction from the R-parameter formalism, and they could be entered in the ENDL evaluated library in this detail. However, the only data against which these calculations can be checked in most cases are total

gamma production cross sections and total gamma-ray spectral shapes. Thus, it seems more appropriate for the ENDL purposes to sum over the calculations for the individual gamma-producing reactions and present just the total gamma-ray cross sections and spectra. These total cross sections and spectra represent an economical representation of the known data, and they can be readily checked against the data. Also, any large errors that are associated with the individual reactions tend to be canceled out to some extent by using these combined forms.

ELECTRON PRODUCTION CROSS SECTIONS AND SPECTRA

A phenomenon that is of some interest for specific applications is the production of conversion electrons and their associated x rays from atomic bombardment of heavy nuclei by low-energy photons. For specific low-energy photon lines, conversion coefficients can be applied to obtain electron cross sections and the associated x rays. However, for low-energy continuum photons, it is necessary to extend the R-parameter formalism in order to obtain electron cross sections.²³ This extension was carried out by Perkins, Haight and Howerton.²⁴ To simplify the

calculations, they employed the following assumptions for calculating conversion electrons:

- A single set of conversion coefficients is used regardless of the reaction
- An average multipolarity mixture is assumed
- Only the K, L, and M atomic shells are considered
- The differences in the electron binding energies between the various atomic subshells are neglected.

This method yields a unique definition of the total normalized probability distribution for the emission of electrons, and also the total integrated electron production cross section relative to the gamma-ray production cross section (which is equivalent to the corresponding multiplicity ratio). The final step in this sequence of radiative processes is to calculate the production of x rays associated with the conversion electrons. These x rays are produced when a vacancy is created in one of the atomic shells following internal conversion. This vacancy is filled by a higher orbit electron, with an associated emission of electromagnetic radiation, which

is usually in the x-ray range. The basic assumptions used in calculating these associated x rays are:

- A K-shell vacancy is filled by an electron from the L-shell (thereby creating an L-shell vacancy), with the emission of a K_{α} x ray
- An L-shell vacancy is filled by an electron from the M-shell (thereby creating an M-shell vacancy), with the emission of an L_{α} x ray
- An M-shell vacancy is filled by an unbound electron, with the emission of an M_{α} x ray.

For each x ray produced by a given shell vacancy, the multiplicity is set equal to the corresponding electron multiplicity. The total multiplicity for a given x ray is obtained by summing over all shell vacancies that could create the x ray.

In the Perkins-Haight-Howerton treatment, the competing Auger process is neglected because the heavy nuclei are ten times more likely to emit x rays than Auger electrons.

CHARGED-PARTICLE CROSS SECTIONS

There are 26 reactions induced by the bombardment of charged particles

onto light nuclei ($A \leq 11$) whose cross sections are required for applications which involve highly energetic charged particles. The cross sections for these reactions are carried in ENDL, over energies that range from their effective thresholds up to 20 MeV. Although provision is made in ENDL for the energy and angular distributions of reaction products from these charged-particle-induced reactions, evaluations of these quantities have not yet been requested, and consequently are not included with the other evaluated data. All evaluated cross sections for charged-particle-induced reactions are based to some degree on experimental data. As with the neutron-induced reactions, many of these cross sections have not been measured over a major portion of the energy range, so interpolations and extrapolations based on nuclear systematics are used to supplement the measured values.

AVERAGE ENERGY DEPOSITS FROM NEUTRON-INDUCED REACTIONS

For many applications that involve neutron-induced reactions, it is desirable to have a measure of the reaction energy that is deposited both locally and nonlocally. For the present purposes, the total energy

deposit is defined as all of the available energy from the reaction with the exception of any energy that is carried off by neutrons. The local energy deposit is defined as the total energy deposit minus the energy that appears as photon energy. The total energy deposit ($E.D._{total}$) can be written as:

$$E.D._{total} = E_n + Q - M_n \times \bar{E}'_n,$$

where E_n is the incident neutron energy, Q is the energy release in the reaction, M_n is the neutron multiplicity of the final state in the reaction, and $\bar{E}'_n$ is the average neutron energy in the final state. Similarly, the local energy deposit ($E.D._{local}$) is the sum of the energy of the center-of-mass plus the recoil energy of the nucleus plus the average energy of any light secondary particles other than neutrons or photons. The average energy of the final state neutrons can be obtained either from the kinematics of a two-body reaction with a defined Q -value, or from tabular representations. In the latter case, either the reactions are not two-body, or, in the case of inelastic scattering to the continuum, do not have a defined Q . For local energy deposits arising from reactions in which charged particles are emitted, it is necessary to

estimate the average energy of the final-state charged particles. For those few reactions in which the energy of the charged particles has been determined experimentally, an average value can be estimated from the results of the experiment. In the majority of the reactions, no determination of the charged particle spectrum has been made experimentally. Consequently, a gross estimate is made of the average charged-particle energy by assuming that (for $Z = 29$) the average energy of the charged particles is equal to half of the square root of the energy which is available after the average neutron energy has been removed. For

$Z = 29$, the average energy of the charged particles is 0.25 times the available energy; for $Z = 74$ it is assumed that all the available energy is carried by the charged particles. Since the difference between the total energy deposit and the local deposit represents the energy carried away by gamma rays, there is clearly a close relationship between the nonlocal energy deposit and the photon production data. To ensure calculational consistency between these quantities, energy deposits are used as input data for calculating the photon production cross sections and spectra described in a previous section.

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Appendix

Reaction Index to ENDL Data

In the index that follows, an entry is made for each type of nuclear data for each reaction contained in ENDL, together with the number of incident particle energies for which entries are made and the range in energy of the incident particle. The data associated with each index entry represents the time of the most recent modification of the data appropriate to that entry. Those who need the specific values may obtain the data in either the ENDL format (upon request to the authors) or in the ENDF/B format (upon request to the Radiation Shielding Information Center at Oak Ridge National Laboratory, the National Neutron Cross Section Center at Brookhaven National Laboratory, or the Nuclear Data Section of the International Atomic Energy Agency, Vienna, Austria).

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INSTALLATION ORIGINATING THIS LIBRARY   - LLL
YEAR ORIGINATED                         - 75
LIBRARY EDITION NO                      - 2
LIBRARY VERSION NO.                     - 49
DATE OF LAST DATA CHANGE               - 20076
UTILITY VERSION OF                       - 021276

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02/12/76

0-NU-1
ATOMIC MASS = 1.00874 0

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	8	2/09/73	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	7	2/09/73	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	

02/12/78

-1-

		REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,EL/STIC		CROSS SECTION	99	7/27/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N	ANGULAR DIST.	13	7/27/72	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,ELASTIC	N	TOTAL ENERGY DEP.	4	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N	LOCAL ENERGY DEP.	4	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,G		CROSS SECTION	219	2/24/71	2.2247+ 0	1.0000-10	2.0000+ 1	
N,G	G	ANGULAR DIST.	4	11/01/72	2.2247+ 0	1.0000-10	2.0000+ 1	
N,G	G	ENERGY-ANGLE DIST.	2	11/01/72	2.2247+ 0	1.0000-10	2.0000+ 1	
N,G	G	MULTIPLICITY	2	11/01/72	2.2247+ 0	1.0000-10	2.0000+ 1	
N,G		TOTAL ENERGY DEP.	2	11/12/74	2.2247+ 0	1.0000-10	2.0000+ 1	
N,G		LOCAL ENERGY DEP.	2	11/12/74	2.2247+ 0	1.0000-10	2.0000+ 1	

 I-H -1
 ATOMIC MASS = 1.007825

-2-

I-H -1

02/12/76

I-H -2
ATOMIC MASS = 2.0141+ 0

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	40	1/03/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	14	1/03/72	0.0000+ 0	5.0000-2	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	24	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	24	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,2N	CROSS SECTION	12	7/09/72	-2.2300+ 0	3.3500+ 0	2.0000+ 1	LEVEL = 2.2300+ 0 MEV
N,2N	N ANGULAR DIST.	2	7/09/72	-2.2300+ 0	3.3500+ 0	2.0000+ 1	LEVEL = 2.2300+ 0 MEV
N,2N	N ENERGY-ANGLE DIST.	10	10/25/72	-2.2300+ 0	3.3500+ 0	2.0000+ 1	LEVEL = 2.2300+ 0 MEV
N,2N	N TOTAL ENERGY DEP.	2	10/25/72	-2.2300+ 0	3.3500+ 0	2.0000+ 1	LEVEL = 2.2300+ 0 MEV
N,2N	N LOCAL ENERGY DEP.	2	10/25/72	-2.2300+ 0	3.3500+ 0	2.0000+ 1	LEVEL = 2.2300+ 0 MEV
N,G	CROSS SECTION	72	1/03/72	6.2500+ 0	1.0000-10	2.0000+ 1	
N,G	G ENERGY-ANGLE DIST.	2	11/01/72	6.2500+ 0	1.0000-10	2.0000+ 1	
N,G	G MULTIPLICITY	2	11/01/72	6.2500+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	6.2500+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	6.2500+ 0	1.0000-10	2.0000+ 1	

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 1-M -3
 ATOMIC MASS = 3.0170* 0

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	36	7/07/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	12	1/03/72	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	25	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	25	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,2N	CROSS SECTION	11	7/07/72	-6.2600+ 0	8.3600+ 0	2.0000+ 1	
N,2N	ANGULAR DIST.	5	7/07/72	-6.2600+ 0	8.3600+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	7	7/07/72	-6.2600+ 0	8.3600+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	4	11/12/74	-6.2600+ 0	8.3600+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	4	11/12/74	-6.2600+ 0	8.3600+ 0	2.0000+ 1	

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2-HE-3
ATOMIC MASS = 3.016049

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	55	1/03/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	10	1/03/72	0.0000+ 0	5.0000- 1	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	20	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	20	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,P	CROSS SECTION	140	7/10/72	7.6000- 1	1.0000-10	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	7.6000- 1	1.0000-10	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	7.6000- 1	1.0000-10	2.0000+ 1	
N,D	CROSS SECTION	23	7/10/72	-3.2700+ 0	4.3500+ 0	2.0000+ 1	
N,D	TOTAL ENERGY DEP.	2	11/12/74	-3.2700+ 0	4.3500+ 0	2.0000+ 1	
N,D	LOCAL ENERGY DEP.	2	11/12/74	-3.2700+ 0	4.3500+ 0	2.0000+ 1	
N,G	CROSS SECTION	2	11/01/72	2.0578+ 1	1.0000-10	2.0000+ 1	
N,G	G ENERGY-ANGLE DIST.	2	11/01/72	2.0578+ 1	1.0000-10	2.0000+ 1	
N,G	G MULTIPLICITY	2	11/01/72	2.0578+ 1	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	2.0578+ 1	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	2.0578+ 1	1.0000-10	2.0000+ 1	

02/12/76

2-HE-4
ATOMIC MASS = 4.00260

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	31	7/08/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	30	1/03/72	0.0000+ 0	2.0000- 2	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	

02/12/76

3-LI-6
ATOMIC MASS = 6.015120

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	55	4/01/71	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	15	10/15/70	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	29	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	29	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,2N	CROSS SECTION	5	10/15/70	-5.6600+0	6.6100+0	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	5	10/15/70	-5.6600+0	6.6100+0	2.0000+1	
N,2N	TOTAL ENERGY DEP.	16	11/12/74	-5.6600+0	6.6100+0	2.0000+1	
N,2N	LOCAL ENERGY DEP.	14	11/12/74	-5.6600+0	6.6100+0	2.0000+1	
N,N'D	CROSS SECTION	26	12/15/71	-1.4600+0	1.7040+0	2.0000+1	
N,N'D	ANGULAR DIST.	12	1/05/74	-1.4600+0	1.7040+0	2.0000+1	
N,N'D	ENERGY-ANGLE DIST.	12	3/13/73	-1.4600+0	1.7040+0	2.0000+1	
N,N'D	TOTAL ENERGY DEP.	6	11/12/74	-1.4600+0	1.7040+0	2.0000+1	
N,N'D	LOCAL ENERGY DEP.	6	11/12/74	-1.4600+0	1.7040+0	2.0000+1	
N,N'D	CROSS SECTION	22	4/01/71	-1.4600+0	2.6000+0	2.0000+1	LEVEL = 2.1800+0 MEV
N,N'D	ANGULAR DIST.	6	4/19/71	-1.4600+0	2.6000+0	2.0000+1	LEVEL = 2.1800+0 MEV
N,N'D	TOTAL ENERGY DEP.	8	2/07/73	-1.4600+0	2.6000+0	2.0000+1	LEVEL = 2.1800+0 MEV
N,N'D	LOCAL ENERGY DEP.	8	2/07/73	-1.4600+0	2.6000+0	2.0000+1	LEVEL = 2.1800+0 MEV
N,P	CROSS SECTION	14	4/01/71	-2.7300+0	3.1800+0	2.0000+1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-2.7300+0	3.1800+0	2.0000+1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-2.7300+0	3.1800+0	2.0000+1	
N,T	CROSS SECTION	304	4/01/71	4.7900+0	1.0000-10	2.0000+1	
N,T	TOTAL ENERGY DEP.	2	11/12/74	4.7900+0	1.0000-10	2.0000+1	
N,T	LOCAL ENERGY DEP.	2	11/12/74	4.7900+0	1.0000-10	2.0000+1	
N,G	CROSS SECTION	271	9/08/70	7.2600+0	1.0000-10	2.0000+1	
N,G	ENERGY-ANGLE DIST.	2	11/01/72	7.2600+0	1.0000-10	2.0000+1	
N,G	MULTIPLICITY	2	11/01/72	7.2600+0	1.0000-10	2.0000+1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	7.2600+0	1.0000-10	2.0000+1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	7.2600+0	1.0000-10	2.0000+1	

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3-L1-7
ATOMIC MASS = 7 0160+ 0

	REACTION	POINTS	DATE	G-VALUE	E MIN	E MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	53	7/09/72	0 0000+ 0	1 0000-10	4 0000+ 1	
N,ELASTIC	ANGULAR DIST.	16	1/03/72	0 0000+ 0	5 0000- 2	2 0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	31	11/12/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	31	11/12/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N,N'	CROSS SECTION	11	7/09/72	0 0000+ 0	5 4700- 1	2 0000+ 1	LEVEL = 4 7740- 1 MEV
N,N'	ANGULAR DIST.	3	7/09/72	0 0000+ 0	5 4700- 1	2 0000+ 1	LEVEL = 4 7740- 1 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0 0000+ 0	5 4700- 1	2 0000+ 1	LEVEL = 4 7740- 1 MEV
N,N'	MULTIPLICITY	2	11/01/72	0 0000+ 0	5 4700- 1	2 0000+ 1	LEVEL = 4 7740- 1 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0 0000+ 0	5 4700- 1	2 0000+ 1	LEVEL = 4 7740- 1 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0 0000+ 0	5 4700- 1	2 0000+ 1	LEVEL = 4 7740- 1 MEV
N,2N	CROSS SECTION	5	7/09/72	-7 2600+ 0	8 3100+ 0	2 0000+ 1	
N,2N	ENERGY-ANGLE DIST.	6	7/09/72	-7 2600+ 0	8 3100+ 0	2 0000+ 1	
N,2N	TOTAL ENERGY DEP.	12	11/12/74	-7 2600+ 0	8 3100+ 0	2 0000+ 1	
N,2N	LOCAL ENERGY DEP.	11	11/12/74	-7 2600+ 0	8 3100+ 0	2 0000+ 1	
N,N'T	CROSS SECTION	14	7/09/72	-2 4700+ 0	2 8260+ 0	2 0000+ 1	
N,N'T	ANGULAR DIST.	6	7/27/72	-2 4700+ 0	2 8260+ 0	2 0000+ 1	
N,N'T	ENERGY-ANGLE DIST.	6	7/09/72	-2 4700+ 0	2 8260+ 0	2 0000+ 1	
N,N'T	TOTAL ENERGY DEP.	9	11/12/74	-2 4700+ 0	2 8260+ 0	2 0000+ 1	
N,N'T	LOCAL ENERGY DEP.	9	11/12/74	-2 4700+ 0	2 8260+ 0	2 0000+ 1	
N,0	CROSS SECTION	78	1/03/75	2 0300+ 0	1 0000-10	2 0000+ 1	
N,0	ENERGY-ANGLE DIST.	2	11/01/72	2 0300+ 0	1 0000-10	2 0000+ 1	
N,0	MULTIPLICITY	2	11/01/72	2 0300+ 0	1 0000-10	2 0000+ 1	
N,0	TOTAL ENERGY DEP.	2	11/12/74	2 0300+ 0	1 0000-10	2 0000+ 1	
N,0	LOCAL ENERGY DEP.	2	11/12/74	2 0300+ 0	1 0000-10	2 0000+ 1	

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4-BE-7
 ATOMIC MASS = 7.0100 + 0
 QUALIFIER

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX
N,ELASTIC	CROSS SECTION	10	9/15/74	0.0000 + 0	1.0000 - 10	2.0000 + 1
N,ELASTIC	N ANGULAR DIST.	16	9/15/74	0.0000 + 0	5.0000 - 1	2.0000 + 1
N,ELASTIC	N TOTAL ENERGY DEP.	31	11/12/74	0.0000 + 0	1.0000 - 10	2.0000 + 1
N,ELASTIC	N LOCAL ENERGY DEP.	31	11/12/74	0.0000 + 0	1.0000 - 10	2.0000 + 1
N,P	CROSS SECTION	113	2/16/70	1.6500 + 0	1.0000 - 10	2.0000 + 1
N,P	TOTAL ENERGY DEP.	2	11/12/74	1.6500 + 0	1.0000 - 10	2.0000 + 1
N,P	LOCAL ENERGY DEP.	2	11/12/74	1.6500 + 0	1.0000 - 10	2.0000 + 1
N,A	CROSS SECTION	9	9/15/74	1.8992 + 1	1.0000 - 10	2.0000 + 1
N,A	TOTAL ENERGY DEP.	2	11/12/74	1.8992 + 1	1.0000 - 10	2.0000 + 1
N,A	LOCAL ENERGY DEP.	2	11/12/74	1.8992 + 1	1.0000 - 10	2.0000 + 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	53	8/01/71	0.0000 0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	21	12/14/71	0.0000 0	2.3000-1	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	32	11/12/74	0.0000 0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	32	11/12/74	0.0000 0	1.0000-10	2.0000+1	
N,N	CROSS SECTION	14	3/22/72	-1.6650 0	1.8660 0	2.0000+1	LEVEL = 1.6800 0 MEV
N,N	ANGULAR DIST.	2	3/22/72	-1.6650 0	1.8660 0	2.0000+1	LEVEL = 1.6800 0 MEV
N,N	TOTAL ENERGY DEP.	2	6/07/72	-1.6650 0	1.8660 0	2.0000+1	LEVEL = 1.6800 0 MEV
N,N	LOCAL ENERGY DEP.	2	6/07/72	-1.6650 0	1.8660 0	2.0000+1	LEVEL = 1.6800 0 MEV
N,N	ANGULAR DIST.	9	12/01/73	-1.6650 0	1.8660 0	2.0000+1	LEVEL = 1.6800 0 MEV
N,N	ENERGY-ANGLE DIST.	9	12/01/73	-1.6650 0	1.8660 0	2.0000+1	LEVEL = 1.6800 0 MEV
N,N	CROSS SECTION	19	3/22/72	-1.6650 0	2.6996 0	2.0000+1	LEVEL = 2.4300 0 MEV
N,N	ANGULAR DIST.	7	9/01/73	-1.6650 0	2.6996 0	2.0000+1	LEVEL = 2.4300 0 MEV
N,N	TOTAL ENERGY DEP.	2	6/07/72	-1.6650 0	2.6996 0	2.0000+1	LEVEL = 2.4300 0 MEV
N,N	LOCAL ENERGY DEP.	2	6/07/72	-1.6650 0	2.6996 0	2.0000+1	LEVEL = 2.4300 0 MEV
N,N	ANGULAR DIST.	7	12/01/73	-1.6650 0	2.6996 0	2.0000+1	LEVEL = 2.4300 0 MEV
N,N	ENERGY-ANGLE DIST.	7	12/01/73	-1.6650 0	2.6996 0	2.0000+1	LEVEL = 2.4300 0 MEV
N,N	CROSS SECTION	10	3/22/72	-1.6650 0	7.5100 0	2.0000+1	LEVEL = 6.7600 0 MEV
N,N	ANGULAR DIST.	2	3/22/72	-1.6650 0	7.5100 0	2.0000+1	LEVEL = 6.7600 0 MEV
N,N	TOTAL ENERGY DEP.	2	6/07/72	-1.6650 0	7.5100 0	2.0000+1	LEVEL = 6.7600 0 MEV
N,N	LOCAL ENERGY DEP.	2	6/07/72	-1.6650 0	7.5100 0	2.0000+1	LEVEL = 6.7600 0 MEV
N,N	ANGULAR DIST.	6	9/01/73	-1.6650 0	7.5100 0	2.0000+1	LEVEL = 6.7600 0 MEV
N,N	ENERGY-ANGLE DIST.	6	9/01/73	-1.6650 0	7.5100 0	2.0000+1	LEVEL = 6.7600 0 MEV
N,N	CROSS SECTION	4	9/01/73	-1.6650 0	1.2530 1	2.0000+1	LEVEL = 1.1280 1 MEV
N,N	ANGULAR DIST.	2	9/01/73	-1.6650 0	1.2530 1	2.0000+1	LEVEL = 1.1280 1 MEV
N,N	TOTAL ENERGY DEP.	2	9/01/73	-1.6650 0	1.2530 1	2.0000+1	LEVEL = 1.1280 1 MEV
N,N	LOCAL ENERGY DEP.	2	9/01/73	-1.6650 0	1.2530 1	2.0000+1	LEVEL = 1.1280 1 MEV
N,N	ANGULAR DIST.	5	9/01/73	-1.6650 0	1.2530 1	2.0000+1	LEVEL = 1.1280 1 MEV
N,N	ENERGY-ANGLE DIST.	5	9/01/73	-1.6650 0	1.2530 1	2.0000+1	LEVEL = 1.1280 1 MEV
N,P	CROSS SECTION	4	8/01/71	-1.2830 1	1.4260 1	2.0000+1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-1.2830 1	1.4260 1	2.0000+1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-1.2830 1	1.4260 1	2.0000+1	
N,D	CROSS SECTION	9	8/01/71	-1.4660 1	1.6290 1	2.0000+1	
N,D	TOTAL ENERGY DEP.	2	11/12/74	-1.4660 1	1.6290 1	2.0000+1	
N,D	LOCAL ENERGY DEP.	2	11/12/74	-1.4660 1	1.6290 1	2.0000+1	
N,T	CROSS SECTION	4	9/01/73	-1.0440 1	1.1600 1	2.0000+1	LEVEL = 0.0000 0 MEV
N,T	TOTAL ENERGY DEP.	2	11/12/74	-1.0440 1	1.1600 1	2.0000+1	LEVEL = 0.0000 0 MEV
N,T	LOCAL ENERGY DEP.	2	11/12/74	-1.0440 1	1.1600 1	2.0000+1	LEVEL = 0.0000 0 MEV
N,T	CROSS SECTION	7	9/01/73	-1.0440 1	1.2130 1	2.0000+1	LEVEL = 4.7800 1 MEV
N,T	ENERGY-ANGLE DIST.	2	10/25/72	-1.0440 1	1.2130 1	2.0000+1	LEVEL = 4.7800 1 MEV
N,T	TOTAL ENERGY DEP.	2	11/12/74	-1.0440 1	1.2130 1	2.0000+1	LEVEL = 4.7800 1 MEV
N,T	LOCAL ENERGY DEP.	2	11/12/74	-1.0440 1	1.2130 1	2.0000+1	LEVEL = 4.7800 1 MEV
N,A	CROSS SECTION	15	7/28/71	-6.0000 1	6.7000 1	2.0000+1	LEVEL = 4.7800 1 MEV
N,A	TOTAL ENERGY DEP.	2	11/12/74	-6.0000 1	6.7000 1	2.0000+1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	-6.0000 1	6.7000 1	2.0000+1	
N,O	CROSS SECTION	151	12/14/71	6.8200 0	1.0000-10	2.0000+1	
N,O	ENERGY-ANGLE DIST.	2	10/25/72	6.8200 0	1.0000-10	2.0000+1	
N,O	MULTIPLICITY	2	10/25/72	6.8200 0	1.0000-10	2.0000+1	
N,O	TOTAL ENERGY DEP.	2	11/12/74	6.8200 0	1.0000-10	2.0000+1	
N,O	LOCAL ENERGY DEP.	2	11/12/74	6.8200 0	1.0000-10	2.0000+1	

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5-B-10
ATOMIC MASS = 1.0013

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	44	9/08/70	0.0000-0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	15	9/08/70	0.0000-0	3.1700-1	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	29	11/12/74	0.0000-0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	29	11/12/74	0.0000-0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	9	9/08/70	0.0000-0	5.0000+0	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	5	9/08/70	0.0000-0	5.0000+0	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000-0	5.0000+0	2.0000+1	
N,N'	MULTIPLICITY	2	11/01/72	0.0000-0	5.0000+0	2.0000+1	
N,N'	TOTAL ENERGY DEP.	6	11/12/74	0.0000-0	5.0000+0	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000-0	5.0000+0	2.0000+1	
N,N'	CROSS SECTION	10	9/08/70	0.0000-0	1.0500+0	2.0000+1	
N,N'	ANGULAR DIST.	2	9/08/70	0.0000-0	1.0500+0	2.0000+1	LEVEL = 7.1700-1 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000-0	1.0500+0	2.0000+1	LEVEL = 7.1700-1 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000-0	1.0500+0	2.0000+1	LEVEL = 7.1700-1 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000-0	1.0500+0	2.0000+1	LEVEL = 7.1700-1 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000-0	1.0500+0	2.0000+1	LEVEL = 7.1700-1 MEV
N,N'	CROSS SECTION	6	9/08/70	0.0000-0	2.2500+0	2.0000+1	LEVEL = 1.7400+0 MEV
N,N'	ANGULAR DIST.	2	9/08/70	0.0000-0	2.2500+0	2.0000+1	LEVEL = 1.7400+0 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000-0	2.2500+0	2.0000+1	LEVEL = 1.7400+0 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000-0	2.2500+0	2.0000+1	LEVEL = 1.7400+0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000-0	2.2500+0	2.0000+1	LEVEL = 1.7400+0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000-0	2.2500+0	2.0000+1	LEVEL = 1.7400+0 MEV
N,N'	CROSS SECTION	8	9/08/70	0.0000-0	2.5000+0	2.0000+1	LEVEL = 2.1500+0 MEV
N,N'	ANGULAR DIST.	2	9/08/70	0.0000-0	2.5000+0	2.0000+1	LEVEL = 2.1500+0 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000-0	2.5000+0	2.0000+1	LEVEL = 2.1500+0 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000-0	2.5000+0	2.0000+1	LEVEL = 2.1500+0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000-0	2.5000+0	2.0000+1	LEVEL = 2.1500+0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000-0	2.5000+0	2.0000+1	LEVEL = 2.1500+0 MEV
N,N'	CROSS SECTION	5	9/08/70	0.0000-0	4.0000+0	2.0000+1	LEVEL = 3.5900+0 MEV
N,N'	ANGULAR DIST.	2	9/08/70	0.0000-0	4.0000+0	2.0000+1	LEVEL = 3.5900+0 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000-0	4.0000+0	2.0000+1	LEVEL = 3.5900+0 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000-0	4.0000+0	2.0000+1	LEVEL = 3.5900+0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000-0	4.0000+0	2.0000+1	LEVEL = 3.5900+0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000-0	4.0000+0	2.0000+1	LEVEL = 3.5900+0 MEV
N,2N	CROSS SECTION	4	9/08/70	-0.4000-0	9.3000+0	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	4	9/08/70	-0.4000-0	9.3000+0	2.0000+1	
N,2N	TOTAL ENERGY DEP.	8	11/12/74	-0.4000-0	9.3000+0	2.0000+1	
N,2N	LOCAL ENERGY DEP.	7	11/12/74	-0.4000-0	9.3000+0	2.0000+1	
N,N'D2A	CROSS SECTION	5	9/08/70	-0.0200-0	6.7000+0	2.0000+1	
N,N'D2A	ENERGY-ANGLE DIST.	5	9/08/70	-0.0200-0	6.7000+0	2.0000+1	
N,N'D2A	TOTAL ENERGY DEP.	10	11/12/74	-0.0200-0	6.7000+0	2.0000+1	
N,N'D2A	LOCAL ENERGY DEP.	10	11/12/74	-0.0200-0	6.7000+0	2.0000+1	
N,12A	CROSS SECTION	11	9/08/70	3.3000-1	1.5000+0	2.0000+1	
N,12A	TOTAL ENERGY DEP.	2	11/12/74	3.3000-1	1.5000+0	2.0000+1	
N,12A	LOCAL ENERGY DEP.	2	11/12/74	3.3000-1	1.5000+0	2.0000+1	
N,A	CROSS SECTION	322	9/08/70	2.8000-0	1.0000-10	2.0000+1	
N,A	ENERGY-ANGLE DIST.	2	11/01/72	2.8000-0	1.0000-10	2.0000+1	
N,A	MULTIPLICITY	10	11/01/72	2.8000-0	1.0000-10	2.0000+1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	2.8000-0	1.0000-10	2.0000+1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	2.8000-0	1.0000-10	2.0000+1	
N,G	CROSS SECTION	56	9/08/70	1.1450-1	1.0000-10	2.0000+1	
N,G	ENERGY-ANGLE DIST.	2	11/01/72	1.1450-1	1.0000-10	2.0000+1	
N,G	MULTIPLICITY	2	11/01/72	1.1450-1	1.0000-10	2.0000+1	

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5-B -10
ATOMIC MASS = 1.0013* 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.G	TOTAL ENERGY DEP.	2	11/12/74	1.1450* 1	1.0000-10	2.0000* 1	
N.G	LOCAL ENERGY DEP.	2	11/12/74	1.1450* 1	1.0000-10	3.0000* 1	

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5-B-11
ATOMIC MASS = 1.0093

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	55	8/10/72	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	15	4/29/72	0.0000+0	3.3000-1	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	20	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	20	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	9	4/29/72	0.0000+0	7.5000+0	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	5	4/29/72	0.0000+0	7.5000+0	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000+0	7.5000+0	2.0000+1	
N,N'	MULTIPLICITY	3	11/01/72	0.0000+0	7.5000+0	2.0000+1	
N,N'	TOTAL ENERGY DEP.	5	11/12/74	0.0000+0	7.5000+0	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+0	7.5000+0	2.0000+1	
N,N'	CROSS SECTION	11	4/29/72	0.0000+0	2.3370+0	2.0000+1	
N,N'	ANGULAR DIST.	4	4/29/72	0.0000+0	2.3370+0	2.0000+1	LEVEL = 2.1400+0 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000+0	2.3370+0	2.0000+1	LEVEL = 2.1400+0 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000+0	2.3370+0	2.0000+1	LEVEL = 2.1400+0 MEV
N,N'	TOTAL ENERGY DEP.	6	11/12/74	0.0000+0	2.3370+0	2.0000+1	LEVEL = 2.1400+0 MEV
N,N'	LOCAL ENERGY DEP.	6	11/12/74	0.0000+0	2.3370+0	2.0000+1	LEVEL = 2.1400+0 MEV
N,N'	CROSS SECTION	8	4/29/72	0.0000+0	4.8690+0	2.0000+1	LEVEL = 4.4600+0 MEV
N,N'	ANGULAR DIST.	2	4/29/72	0.0000+0	4.8690+0	2.0000+1	LEVEL = 4.4600+0 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000+0	4.8690+0	2.0000+1	LEVEL = 4.4600+0 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000+0	4.8690+0	2.0000+1	LEVEL = 4.4600+0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+0	4.8690+0	2.0000+1	LEVEL = 4.4600+0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+0	4.8690+0	2.0000+1	LEVEL = 4.4600+0 MEV
N,N'	CROSS SECTION	5	4/29/72	0.0000+0	5.4910+0	2.0000+1	LEVEL = 5.0300+0 MEV
N,N'	ANGULAR DIST.	2	4/29/72	0.0000+0	5.4910+0	2.0000+1	LEVEL = 5.0300+0 MEV
N,N'	ENERGY-ANGLE DIST.	2	11/01/72	0.0000+0	5.4910+0	2.0000+1	LEVEL = 5.0300+0 MEV
N,N'	MULTIPLICITY	2	11/01/72	0.0000+0	5.4910+0	2.0000+1	LEVEL = 5.0300+0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+0	5.4910+0	2.0000+1	LEVEL = 5.0300+0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+0	5.4910+0	2.0000+1	LEVEL = 5.0300+0 MEV
N,2N	CROSS SECTION	3	4/29/72	-1.1460+1	1.2510+1	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	4	4/29/72	-1.1460+1	1.2510+1	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	2	11/01/72	-1.1460+1	1.2510+1	2.0000+1	
N,2N	MULTIPLICITY	4	11/01/72	-1.1460+1	1.2510+1	2.0000+1	
N,2N	TOTAL ENERGY DEP.	4	11/12/74	-1.1460+1	1.2510+1	2.0000+1	
N,2N	LOCAL ENERGY DEP.	4	11/12/74	-1.1460+1	1.2510+1	2.0000+1	
N,P	CROSS SECTION	3	4/29/72	-1.0720+1	1.1700+1	2.0000+1	
N,P	ENERGY-ANGLE DIST.	2	11/01/72	-1.0720+1	1.1700+1	2.0000+1	
N,P	MULTIPLICITY	3	11/01/72	-1.0720+1	1.1700+1	2.0000+1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-1.0720+1	1.1700+1	2.0000+1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-1.0720+1	1.1700+1	2.0000+1	
N,T	CROSS SECTION	3	4/29/72	-0.9500+0	1.0430+1	2.0000+1	
N,T	TOTAL ENERGY DEP.	2	11/12/74	-0.9500+0	1.0430+1	2.0000+1	
N,T	LOCAL ENERGY DEP.	2	11/12/74	-0.9500+0	1.0430+1	2.0000+1	
N,A	CROSS SECTION	5	4/29/72	-6.6400+0	7.2400+0	2.0000+1	
N,A	ENERGY-ANGLE DIST.	2	11/01/72	-6.6400+0	7.2400+0	2.0000+1	
N,A	MULTIPLICITY	3	11/01/72	-6.6400+0	7.2400+0	2.0000+1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	-6.6400+0	7.2400+0	2.0000+1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	-6.6400+0	7.2400+0	2.0000+1	
N,G	CROSS SECTION	35	4/29/72	3.3700+0	1.0000-10	2.0000+1	
N,G	ENERGY-ANGLE DIST.	2	11/01/72	3.3700+0	1.0000-10	2.0000+1	
N,G	MULTIPLICITY	2	11/01/72	3.3700+0	1.0000-10	2.0000+1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	3.3700+0	1.0000-10	2.0000+1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	3.3700+0	1.0000-10	2.0000+1	

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ATOMIC MASS = 1.40031

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	409	6/29/70	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	37	1/03/72	0.0000+ 0	5.0000- 1	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	36	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	36	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	27	6/29/70	0.0000+ 0	2.4796+ 0	2.0000+ 1	LEVEL = 2.3130+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	2.4796+ 0	2.0000+ 1	LEVEL = 2.3130+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	2.4796+ 0	2.0000+ 1	LEVEL = 2.3130+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	2.4796+ 0	2.0000+ 1	LEVEL = 2.3130+ 0 MEV
N,N'	CROSS SECTION	24	6/29/70	0.0000+ 0	4.2292+ 0	2.0000+ 1	LEVEL = 3.9450+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	4.2292+ 0	2.0000+ 1	LEVEL = 3.9450+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	4.2292+ 0	2.0000+ 1	LEVEL = 3.9450+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	4.2292+ 0	2.0000+ 1	LEVEL = 3.9450+ 0 MEV
N,N'	CROSS SECTION	22	6/29/70	0.0000+ 0	5.2669+ 0	2.0000+ 1	LEVEL = 4.9130+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	5.2669+ 0	2.0000+ 1	LEVEL = 4.9130+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	5.2669+ 0	2.0000+ 1	LEVEL = 4.9130+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	5.2669+ 0	2.0000+ 1	LEVEL = 4.9130+ 0 MEV
N,N'	CROSS SECTION	21	6/29/70	0.0000+ 0	5.4738+ 0	2.0000+ 1	LEVEL = 5.1060+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	5.4738+ 0	2.0000+ 1	LEVEL = 5.1060+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	5.4738+ 0	2.0000+ 1	LEVEL = 5.1060+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	5.4738+ 0	2.0000+ 1	LEVEL = 5.1060+ 0 MEV
N,N'	CROSS SECTION	20	6/29/70	0.0000+ 0	6.1009+ 0	2.0000+ 1	LEVEL = 5.6910+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	6.1009+ 0	2.0000+ 1	LEVEL = 5.6910+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.1009+ 0	2.0000+ 1	LEVEL = 5.6910+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.1009+ 0	2.0000+ 1	LEVEL = 5.6910+ 0 MEV
N,N'	CROSS SECTION	19	6/29/70	0.0000+ 0	6.2542+ 0	2.0000+ 1	LEVEL = 5.8340+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	6.2542+ 0	2.0000+ 1	LEVEL = 5.8340+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.2542+ 0	2.0000+ 1	LEVEL = 5.8340+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.2542+ 0	2.0000+ 1	LEVEL = 5.8340+ 0 MEV
N,N'	CROSS SECTION	19	6/29/70	0.0000+ 0	6.6445+ 0	2.0000+ 1	LEVEL = 6.1980+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	6.6445+ 0	2.0000+ 1	LEVEL = 6.1980+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.6445+ 0	2.0000+ 1	LEVEL = 6.1980+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.6445+ 0	2.0000+ 1	LEVEL = 6.1980+ 0 MEV
N,N'	CROSS SECTION	19	6/29/70	0.0000+ 0	6.9082+ 0	2.0000+ 1	LEVEL = 6.4440+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	6.9082+ 0	2.0000+ 1	LEVEL = 6.4440+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.9082+ 0	2.0000+ 1	LEVEL = 6.4440+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	6.9082+ 0	2.0000+ 1	LEVEL = 6.4440+ 0 MEV
N,N'	CROSS SECTION	17	6/29/70	0.0000+ 0	7.5342+ 0	2.0000+ 1	LEVEL = 7.0280+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	7.5342+ 0	2.0000+ 1	LEVEL = 7.0280+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	7.5342+ 0	2.0000+ 1	LEVEL = 7.0280+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	7.5342+ 0	2.0000+ 1	LEVEL = 7.0280+ 0 MEV
N,N'	CROSS SECTION	15	6/29/70	0.0000+ 0	8.5398+ 0	2.0000+ 1	LEVEL = 7.9880+ 0 MEV
N,N'	N ANGULAR DIST.	2	6/29/70	0.0000+ 0	8.5398+ 0	2.0000+ 1	LEVEL = 7.9880+ 0 MEV
N,N'	N TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	8.5398+ 0	2.0000+ 1	LEVEL = 7.9880+ 0 MEV
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	8.5398+ 0	2.0000+ 1	LEVEL = 7.9880+ 0 MEV
N,2N	CROSS SECTION	10	6/29/70	-1.0550+ 1	1.1310+ 1	2.0000+ 1	
N,2N	N ENERGY-ANGLE DIST.	4	9/19/72	-1.0550+ 1	1.1310+ 1	2.0000+ 1	
N,2N	N TOTAL ENERGY DEP.	5	11/12/74	-1.0550+ 1	1.1310+ 1	2.0000+ 1	
N,2N	N LOCAL ENERGY DEP.	4	11/12/74	-1.0550+ 1	1.1310+ 1	2.0000+ 1	
N,N,P	CROSS SECTION	11	6/29/70	-7.5500+ 0	8.0940+ 0	2.0000+ 1	
N,N,P	N ENERGY-ANGLE DIST.	5	9/19/72	-7.5500+ 0	8.0940+ 0	2.0000+ 1	
N,N,P	N TOTAL ENERGY DEP.	7	11/12/74	-7.5500+ 0	8.0940+ 0	2.0000+ 1	
N,N,P	N LOCAL ENERGY DEP.	7	11/12/74	-7.5500+ 0	8.0940+ 0	2.0000+ 1	
N,P	CROSS SECTION	340	6/29/70	-2600- 1	1.0000-10	2.0000+ 1	

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ATOMIC MASS = 1.4003* 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,P	TOTAL ENERGY DEP.	2	11/12/74	6.2600- 1	1.0000-10	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	6.2600- 1	1.0000-10	2.0000+ 1	
N,D	CROSS SECTION	10	6/29/70	-5.3200+ 0	5.7000+ 0	2.0000+ 1	
N,D	TOTAL ENERGY DEP.	2	11/12/74	-5.3200+ 0	5.7000+ 0	2.0000+ 1	
N,D	LOCAL ENERGY DEP.	2	11/12/74	-5.3200+ 0	5.7000+ 0	2.0000+ 1	
N,T	CROSS SECTION	24	6/29/70	-4.0000+ 0	4.2900+ 0	2.0000+ 1	
N,T	TOTAL ENERGY DEP.	2	11/12/74	-4.0000+ 0	4.2900+ 0	2.0000+ 1	
N,T	LOCAL ENERGY DEP.	2	11/12/74	-4.0000+ 0	4.2900+ 0	2.0000+ 1	
N,A	CROSS SECTION	229	12/15/71	-1.5000- 1	1.6065- 1	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	-1.5000- 1	1.6065- 1	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	-1.5000- 1	1.6065- 1	2.0000+ 1	
N,G	CROSS SECTION	50	6/29/70	1.0830+ 1	1.0000-10	2.0000+ 1	
N,G	G ENERGY-ANGLE DIST.	4	6/01/73	1.0830+ 1	1.0000-10	2.0000+ 1	
N,G	G MULTIPLICITY	4	6/01/73	1.0830+ 1	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	1.0830+ 1	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	1.0830+ 1	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	17	11/21/74	0.0000+ 0	9.9000+ 0	2.0000+ 1	PHOTON = 1.0890- 1 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	9.9000+ 0	2.0000+ 1	PHOTON = 1.0890- 1 MEV
N,XG	CROSS SECTION	32	11/21/74	0.0000+ 0	7.1946+ 0	2.0000+ 1	PHOTON = 6.0890- 1 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	7.1946+ 0	2.0000+ 1	PHOTON = 6.0890- 1 MEV
N,XG	CROSS SECTION	37	11/21/74	0.0000+ 0	6.5410+ 0	2.0000+ 1	PHOTON = 6.3360- 1 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	6.5410+ 0	2.0000+ 1	PHOTON = 6.3360- 1 MEV
N,XG	CROSS SECTION	20	11/21/74	0.0300+ 0	9.6580+ 0	2.0000+ 1	PHOTON = 6.8000- 1 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	9.6580+ 0	2.0000+ 1	PHOTON = 6.8000- 1 MEV
N,XG	CROSS SECTION	71	11/21/74	0.0000+ 0	5.2670+ 0	2.0000+ 1	PHOTON = 7.2810- 1 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	5.2670+ 0	2.0000+ 1	PHOTON = 7.2810- 1 MEV
N,XG	CROSS SECTION	33	11/21/74	0.0000+ 0	7.0000+ 0	2.0000+ 1	PHOTON = 1.2425+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	7.0000+ 0	2.0000+ 1	PHOTON = 1.2425+ 0 MEV
N,XG	CROSS SECTION	68	11/21/74	0.0000+ 0	5.4740+ 0	2.0000+ 1	PHOTON = 1.2500+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	5.4740+ 0	2.0000+ 1	PHOTON = 1.2500+ 0 MEV
N,XG	CROSS SECTION	76	11/21/74	0.0000+ 0	4.2400+ 0	2.0000+ 1	PHOTON = 1.6319+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	4.2400+ 0	2.0000+ 1	PHOTON = 1.6319+ 0 MEV
N,XG	CROSS SECTION	157	11/21/74	0.0000+ 0	2.4460+ 0	2.0000+ 1	PHOTON = 2.1244+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	2.4460+ 0	2.0000+ 1	PHOTON = 2.1244+ 0 MEV
N,XG	CROSS SECTION	62	11/21/74	0.0000+ 0	7.3970+ 0	2.0000+ 1	PHOTON = 2.3000+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	7.3970+ 0	2.0000+ 1	PHOTON = 2.3000+ 0 MEV
N,XG	CROSS SECTION	83	11/21/74	0.0000+ 0	2.4790+ 0	2.0000+ 1	PHOTON = 2.3128+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	2.4790+ 0	2.0000+ 1	PHOTON = 2.3128+ 0 MEV
N,XG	CROSS SECTION	47	11/21/74	0.0000+ 0	6.9080+ 0	2.0000+ 1	PHOTON = 2.4989+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	6.9080+ 0	2.0000+ 1	PHOTON = 2.4989+ 0 MEV
N,XG	CROSS SECTION	68	11/21/74	0.0000+ 0	5.4740+ 0	2.0000+ 1	PHOTON = 2.7931+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	5.4740+ 0	2.0000+ 1	PHOTON = 2.7931+ 0 MEV
N,XG	CROSS SECTION	45	11/21/74	0.0000+ 0	7.9800+ 0	2.0000+ 1	PHOTON = 2.8516+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	7.9800+ 0	2.0000+ 1	PHOTON = 2.8516+ 0 MEV
N,XG	CROSS SECTION	113	11/21/74	0.0000+ 0	5.5480+ 0	2.0000+ 1	PHOTON = 2.8945+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	5.5480+ 0	2.0000+ 1	PHOTON = 2.8945+ 0 MEV
N,XG	CROSS SECTION	26	11/21/74	0.0000+ 0	9.0170+ 0	2.0000+ 1	PHOTON = 3.0860+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	9.0170+ 0	2.0000+ 1	PHOTON = 3.0860+ 0 MEV
N,XG	CROSS SECTION	60	11/21/74	0.0000+ 0	6.1010+ 0	2.0000+ 1	PHOTON = 3.3800+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	6.1010+ 0	2.0000+ 1	PHOTON = 3.3800+ 0 MEV
N,XG	CROSS SECTION	20	11/21/74	0.0000+ 0	9.6580+ 0	2.0000+ 1	PHOTON = 3.6841+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	9.6580+ 0	2.0000+ 1	PHOTON = 3.6841+ 0 MEV
N,XG	CROSS SECTION	28	11/21/74	0.0000+ 0	9.3520+ 0	2.0000+ 1	PHOTON = 3.8000+ 0 MEV
N,XG	G ANGULAR DIST.	2	11/21/74	0.0000+ 0	9.3520+ 0	2.0000+ 1	PHOTON = 3.8000+ 0 MEV

REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,XG CROSS SECTION	17	11/21/74	0.0000+ 0	9.9000+ 0	2.0000+ 1	PHOTON = 3.8540+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	9.9000+ 0	2.0000+ 1	PHOTON = 3.8540+ 0 MEV
N,XG CROSS SECTION	51	11/21/74	0.0000+ 0	6.6440+ 0	2.0000+ 1	PHOTON = 3.8540+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	6.6440+ 0	2.0000+ 1	PHOTON = 3.8540+ 0 MEV
N,XG CROSS SECTION	76	11/21/74	0.0000+ 0	4.2400+ 0	2.0000+ 1	PHOTON = 3.8540+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	4.2400+ 0	2.0000+ 1	PHOTON = 3.8540+ 0 MEV
N,XG CROSS SECTION	18	11/21/74	0.0000+ 0	9.0630+ 0	2.0000+ 1	PHOTON = 4.4444+ 0 MEV
N,XG ANGULAR DIST.	12	11/21/74	0.0000+ 0	9.0630+ 0	2.0000+ 1	PHOTON = 4.4444+ 0 MEV
N,XG CROSS SECTION	60	11/21/74	0.0000+ 0	7.9330+ 0	2.0000+ 1	PHOTON = 4.4444+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	7.9330+ 0	2.0000+ 1	PHOTON = 4.4444+ 0 MEV
N,XG CROSS SECTION	71	11/21/74	0.0000+ 0	5.2670+ 0	2.0000+ 1	PHOTON = 4.6500+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	5.2670+ 0	2.0000+ 1	PHOTON = 4.6500+ 0 MEV
N,XG CROSS SECTION	113	11/21/74	0.0000+ 0	5.5490+ 0	2.0000+ 1	PHOTON = 5.1184+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	5.5490+ 0	2.0000+ 1	PHOTON = 5.1184+ 0 MEV
N,XG CROSS SECTION	68	11/21/74	0.0000+ 0	5.4740+ 0	2.0000+ 1	PHOTON = 5.1059+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	5.4740+ 0	2.0000+ 1	PHOTON = 5.1059+ 0 MEV
N,XG CROSS SECTION	60	11/21/74	0.0000+ 0	6.1010+ 0	2.0000+ 1	PHOTON = 5.6310+ 0 MEV
N,XG ANGULAR DIST.	52	11/21/74	0.0000+ 0	6.1010+ 0	2.0000+ 1	PHOTON = 5.6310+ 0 MEV
N,XG CROSS SECTION	33	11/21/74	0.0000+ 0	8.7410+ 0	2.0000+ 1	PHOTON = 5.8340+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	8.7410+ 0	2.0000+ 1	PHOTON = 5.8340+ 0 MEV
N,XG CROSS SECTION	42	11/21/74	0.0000+ 0	5.8620+ 0	2.0000+ 1	PHOTON = 6.0545+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	5.8620+ 0	2.0000+ 1	PHOTON = 6.0545+ 0 MEV
N,XG CROSS SECTION	51	11/21/74	0.0000+ 0	6.5440+ 0	2.0000+ 1	PHOTON = 6.1376+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	6.5440+ 0	2.0000+ 1	PHOTON = 6.1376+ 0 MEV
N,XG CROSS SECTION	29	11/21/74	0.0000+ 0	6.3420+ 0	2.0000+ 1	PHOTON = 6.4416+ 0 MEV
N,XG ANGULAR DIST.	42	11/21/74	0.0000+ 0	6.3420+ 0	2.0000+ 1	PHOTON = 6.4416+ 0 MEV
N,XG CROSS SECTION	37	11/21/74	0.0000+ 0	6.9080+ 0	2.0000+ 1	PHOTON = 6.4436+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	6.9080+ 0	2.0000+ 1	PHOTON = 6.4436+ 0 MEV
N,XG CROSS SECTION	62	11/21/74	0.0000+ 0	6.5410+ 0	2.0000+ 1	PHOTON = 6.7281+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	6.5410+ 0	2.0000+ 1	PHOTON = 6.7281+ 0 MEV
N,XG CROSS SECTION	33	11/21/74	0.0000+ 0	7.3970+ 0	2.0000+ 1	PHOTON = 6.7080+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	7.3970+ 0	2.0000+ 1	PHOTON = 6.7080+ 0 MEV
N,XG CROSS SECTION	41	11/21/74	0.0000+ 0	7.0000+ 0	2.0000+ 1	PHOTON = 7.0117+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	7.0000+ 0	2.0000+ 1	PHOTON = 7.0117+ 0 MEV
N,XG CROSS SECTION	45	11/21/74	0.0000+ 0	7.5340+ 0	2.0000+ 1	PHOTON = 7.0280+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	7.5340+ 0	2.0000+ 1	PHOTON = 7.0280+ 0 MEV
N,XG CROSS SECTION	35	11/21/74	0.0000+ 0	7.9800+ 0	2.0000+ 1	PHOTON = 7.2863+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	7.9800+ 0	2.0000+ 1	PHOTON = 7.2863+ 0 MEV
N,XG CROSS SECTION	33	11/21/74	0.0000+ 0	8.5400+ 0	2.0000+ 1	PHOTON = 7.3370+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	8.5400+ 0	2.0000+ 1	PHOTON = 7.3370+ 0 MEV
N,XG CROSS SECTION	33	11/21/74	0.0000+ 0	8.7410+ 0	2.0000+ 1	PHOTON = 7.9580+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	8.7410+ 0	2.0000+ 1	PHOTON = 7.9580+ 0 MEV
N,XG CROSS SECTION	28	11/21/74	0.0000+ 0	9.3420+ 0	2.0000+ 1	PHOTON = 8.5650+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	9.3420+ 0	2.0000+ 1	PHOTON = 8.5650+ 0 MEV
N,XG CROSS SECTION	25	11/21/74	0.0000+ 0	9.7350+ 0	2.0000+ 1	PHOTON = 8.9520+ 0 MEV
N,XG ANGULAR DIST.		11/21/74	0.0000+ 0	9.7350+ 0	2.0000+ 1	PHOTON = 8.9520+ 0 MEV

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ATOMIC MASS = 1.5995 + 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,XG	CROSS SECTION	5	11/01/72	0.0000+ 0	9.4500+ 0	2.0000+ 1	PHOTON = 1.8000+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	9.4500+ 0	2.0000+ 1	PHOTON = 1.8000+ 0 MEV
N,XG	CROSS SECTION	7	11/01/72	0.0000+ 1	9.4300+ 0	2.0000+ 1	PHOTON = 2.7000+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	9.4300+ 0	2.0000+ 1	PHOTON = 2.7000+ 0 MEV
N,XG	CROSS SECTION	21	11/01/72	0.0000+ 0	5.6300+ 0	2.0000+ 1	PHOTON = 3.0900+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	5.6300+ 0	2.0000+ 1	PHOTON = 3.0900+ 0 MEV
N,XG	CROSS SECTION	19	11/01/72	0.0000+ 0	6.2500+ 0	2.0000+ 1	PHOTON = 3.7300+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	6.2500+ 0	2.0000+ 1	PHOTON = 3.7300+ 0 MEV
N,XG	CROSS SECTION	5	11/01/72	0.0000+ 0	1.2300+ 1	2.0000+ 1	PHOTON = 4.4000+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.2300+ 1	2.0000+ 1	PHOTON = 4.4000+ 0 MEV
N,XG	CROSS SECTION	35	11/01/72	0.0000+ 0	6.5200+ 0	2.0000+ 1	PHOTON = 6.1300+ 0 MEV
N,XG	G ANGULAR DIST.	4	11/01/72	0.0000+ 0	6.5200+ 0	2.0000+ 1	PHOTON = 6.1300+ 0 MEV
N,XG	CROSS SECTION	25	11/01/72	0.0000+ 0	7.3600+ 0	2.0000+ 1	PHOTON = 6.9200+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	7.3600+ 0	2.0000+ 1	PHOTON = 6.9200+ 0 MEV
N,XG	CROSS SECTION	16	11/01/72	0.0000+ 0	7.5700+ 0	2.0000+ 1	PHOTON = 7.1200+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	7.5700+ 0	2.0000+ 1	PHOTON = 7.1200+ 0 MEV
N,XG	CROSS SECTION	6	11/01/72	0.0000+ 0	9.4300+ 0	2.0000+ 1	PHOTON = 8.8700+ 0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	9.4300+ 0	2.0000+ 1	PHOTON = 8.8700+ 0 MEV

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	258	11/30/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	20	11/30/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	32	11/30/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	32	11/30/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	39	11/30/74	0.0000+ 0	6.2585+ 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	10	11/30/74	0.0000+ 0	6.2585+ 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	9	11/30/74	0.0000+ 0	6.2585+ 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	6.2585+ 0	2.0000+ 1	
N,N	CROSS SECTION	111	11/30/74	0.0000+ 0	1.1584- 1	2.0000+ 1	LEVEL = 1.1000- 1 MEV
N,N'	ANGULAR DIST.	14	11/30/74	0.0000+ 0	1.1584- 1	2.0000+ 1	LEVEL = 1.1000- 1 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	1.1584- 1	2.0000+ 1	LEVEL = 1.1000- 1 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	1.1584- 1	2.0000+ 1	LEVEL = 1.1000- 1 MEV
N,N'	CROSS SECTION	77	11/30/74	0.0000+ 0	2.0746- 1	2.0000+ 1	LEVEL = 1.9700- 1 MEV
N,N'	ANGULAR DIST.	14	11/30/74	0.0000+ 0	2.0746- 1	2.0000+ 1	LEVEL = 1.9700- 1 MEV
N,N'	TOTAL ENERGY DEP.	9	11/30/74	0.0000+ 0	2.0746- 1	2.0000+ 1	LEVEL = 1.9700- 1 MEV
N,N'	LOCAL ENERGY DEP.	9	11/30/74	0.0000+ 0	2.0746- 1	2.0000+ 1	LEVEL = 1.9700- 1 MEV
N,N'	CROSS SECTION	25	11/30/74	0.0000+ 0	1.4927+ 0	2.0000+ 1	LEVEL = 1.4170+ 0 MEV
N,N'	ANGULAR DIST.	14	11/30/74	0.0000+ 0	1.4927+ 0	2.0000+ 1	LEVEL = 1.4170+ 0 MEV
N,N'	TOTAL ENERGY DEP.	7	11/30/74	0.0000+ 0	1.4927+ 0	2.0000+ 1	LEVEL = 1.4170+ 0 MEV
N,N'	LOCAL ENERGY DEP.	7	11/30/74	0.0000+ 0	1.4927+ 0	2.0000+ 1	LEVEL = 1.4170+ 0 MEV
N,N'	CROSS SECTION	28	11/30/74	0.0000+ 0	1.5354+ 0	2.0000+ 1	LEVEL = 1.4580+ 0 MEV
N,N'	ANGULAR DIST.	13	11/30/74	0.0000+ 0	1.5354+ 0	2.0000+ 1	LEVEL = 1.4580+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	1.5354+ 0	2.0000+ 1	LEVEL = 1.4580+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	1.5354+ 0	2.0000+ 1	LEVEL = 1.4580+ 0 MEV
N,N'	CROSS SECTION	18	11/30/74	0.0000+ 0	1.6365+ 0	2.0000+ 1	LEVEL = 1.5540+ 0 MEV
N,N'	ANGULAR DIST.	14	11/30/74	0.0000+ 0	1.6365+ 0	2.0000+ 1	LEVEL = 1.5540+ 0 MEV
N,N'	TOTAL ENERGY DEP.	7	11/30/74	0.0000+ 0	1.6365+ 0	2.0000+ 1	LEVEL = 1.5540+ 0 MEV
N,N'	LOCAL ENERGY DEP.	7	11/30/74	0.0000+ 0	1.6365+ 0	2.0000+ 1	LEVEL = 1.5540+ 0 MEV
N,N'	CROSS SECTION	32	11/30/74	0.0000+ 0	2.9276+ 0	2.0000+ 1	LEVEL = 2.7800+ 0 MEV
N,N'	ANGULAR DIST.	13	11/30/74	0.0000+ 0	2.9276+ 0	2.0000+ 1	LEVEL = 2.7800+ 0 MEV
N,N'	TOTAL ENERGY DEP.	5	11/30/74	0.0000+ 0	2.9276+ 0	2.0000+ 1	LEVEL = 2.7800+ 0 MEV
N,N'	LOCAL ENERGY DEP.	5	11/30/74	0.0000+ 0	2.9276+ 0	2.0000+ 1	LEVEL = 2.7800+ 0 MEV
N,N'	CROSS SECTION	33	11/30/74	0.0000+ 0	4.1144+ 0	2.0000+ 1	LEVEL = 3.9070+ 0 MEV
N,N'	ANGULAR DIST.	11	11/30/74	0.0000+ 0	4.1144+ 0	2.0000+ 1	LEVEL = 3.9070+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.1144+ 0	2.0000+ 1	LEVEL = 3.9070+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.1144+ 0	2.0000+ 1	LEVEL = 3.9070+ 0 MEV
N,N'	CROSS SECTION	27	11/30/74	0.0000+ 0	4.2103+ 0	2.0000+ 1	LEVEL = 3.9980+ 0 MEV
N,N'	ANGULAR DIST.	11	11/30/74	0.0000+ 0	4.2103+ 0	2.0000+ 1	LEVEL = 3.9980+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.2103+ 0	2.0000+ 1	LEVEL = 3.9980+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.2103+ 0	2.0000+ 1	LEVEL = 3.9980+ 0 MEV
N,N'	CROSS SECTION	29	11/30/74	0.0000+ 0	4.2461+ 0	2.0000+ 1	LEVEL = 4.0320+ 0 MEV
N,N'	ANGULAR DIST.	11	11/30/74	0.0000+ 0	4.2461+ 0	2.0000+ 1	LEVEL = 4.0320+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.2461+ 0	2.0000+ 1	LEVEL = 4.0320+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.2461+ 0	2.0000+ 1	LEVEL = 4.0320+ 0 MEV
N,N'	CROSS SECTION	29	11/30/74	0.0000+ 0	4.6104+ 0	2.0000+ 1	LEVEL = 4.3780+ 0 MEV
N,N'	ANGULAR DIST.	11	11/30/74	0.0000+ 0	4.6104+ 0	2.0000+ 1	LEVEL = 4.3780+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.6104+ 0	2.0000+ 1	LEVEL = 4.3780+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.6104+ 0	2.0000+ 1	LEVEL = 4.3780+ 0 MEV
N,N'	CROSS SECTION	19	11/30/74	0.0000+ 0	4.7968+ 0	2.0000+ 1	LEVEL = 4.5550+ 0 MEV
N,N'	ANGULAR DIST.	11	11/30/74	0.0000+ 0	4.7968+ 0	2.0000+ 1	LEVEL = 4.5550+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.7968+ 0	2.0000+ 1	LEVEL = 4.5550+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/30/74	0.0000+ 0	4.7968+ 0	2.0000+ 1	LEVEL = 4.5550+ 0 MEV
N,N'	CROSS SECTION	40	11/30/74	0.0000+ 0	4.7988+ 0	2.0000+ 1	LEVEL = 4.5570+ 0 MEV

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ATOMIC MASS = 1.899841

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,N'	N	ANGULAR DIST.	11	11/30/74	0.0000 0	4.7989 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	4.7989 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	4.7989 0	2.0000 1
N,N'	N	CROSS SECTION	23	11/30/74	0.0000 0	4.8949 0	2.0000 1
N,N'	N	ANGULAR DIST.	11	11/30/74	0.0000 0	4.8949 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	4.8949 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	4.8949 0	2.0000 1
N,N'	N	CROSS SECTION	40	11/30/74	0.0000 0	4.9316 0	2.0000 1
N,N'	N	ANGULAR DIST.	11	11/30/74	0.0000 0	4.9316 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	4.9316 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	4.9316 0	2.0000 1
N,N'	N	CROSS SECTION	32	11/30/74	0.0000 0	5.3771 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.3771 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	5.3771 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	5.3771 0	2.0000 1
N,N'	N	CROSS SECTION	31	11/30/74	0.0000 0	5.6235 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.6235 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	5.6235 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	5.6235 0	2.0000 1
N,N'	N	CROSS SECTION	20	11/30/74	0.0000 0	5.7162 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.7162 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	4	11/30/74	0.0000 0	5.7162 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	4	11/30/74	0.0000 0	5.7162 0	2.0000 1
N,N'	N	CROSS SECTION	17	11/30/74	0.0000 0	5.7541 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.7541 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	5.7541 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	5.7541 0	2.0000 1
N,N'	N	CROSS SECTION	24	11/30/74	0.0000 0	5.7910 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.7910 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	5.7910 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	5.7910 0	2.0000 1
N,N'	N	CROSS SECTION	19	11/30/74	0.0000 0	5.8341 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.8341 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	0.0000 0	5.8341 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	0.0000 0	5.8341 0	2.0000 1
N,N'	N	CROSS SECTION	22	11/30/74	0.0000 0	5.9289 0	2.0000 1
N,N'	N	ANGULAR DIST.	10	11/30/74	0.0000 0	5.9289 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	4	11/30/74	0.0000 0	5.9289 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	4	11/30/74	0.0000 0	5.9289 0	2.0000 1
N,N'	N	CROSS SECTION	9	11/30/74	-1.0431 1	1.0985 1	2.0000 1
N,N'	N	ENERGY-ANGLE DIST.	6	11/30/74	-1.0431 1	1.0985 1	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	3	11/30/74	-1.0431 1	1.0985 1	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	3	11/30/74	-1.0431 1	1.0985 1	2.0000 1
N,N'	N	CROSS SECTION	23	11/30/74	-7.9930 0	8.4200 0	2.0000 1
N,N'	N	ENERGY-ANGLE DIST.	8	11/30/74	-7.9930 0	8.4200 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	0	11/30/74	-7.9930 0	8.4174 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	7	11/30/74	-7.9930 0	8.4174 0	2.0000 1
N,N'	N	CROSS SECTION	34	11/30/74	-4.8780 0	5.1500 0	2.0000 1
N,N'	N	ENERGY-ANGLE DIST.	10	11/30/74	-4.8780 0	5.1500 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	16	11/25/74	-4.8780 0	5.1500 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	14	11/25/74	-4.8780 0	5.1500 0	2.0000 1
N,N'	N	CROSS SECTION	34	11/30/74	-4.0360 0	4.2503 0	2.0000 1
N,N'	N	TOTAL ENERGY DEP.	2	11/30/74	-4.0360 0	4.2503 0	2.0000 1
N,N'	N	LOCAL ENERGY DEP.	2	11/30/74	-4.0360 0	4.2503 0	2.0000 1

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9-F -19

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9-F -19
ATOMIC MASS = 1.89984 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,D	CROSS SECTION	15	11/30/74	-5.7689+ 0	6.0742+ 0	2.0000+ 1	
N,D	TOTAL ENERGY DEP.	2	11/30/74	-5.7689+ 0	6.0742+ 0	2.0000+ 1	
N,D	LOCAL ENERGY DEP.	2	11/30/74	-5.7689+ 0	6.0742+ 0	2.0000+ 1	
N,T	CROSS SECTION	9	11/30/74	-7.5570+ 0	7.9582+ 0	2.0000+ 1	
N,T	TOTAL ENERGY DEP.	2	11/30/74	-7.5570+ 0	7.9582+ 0	2.0000+ 1	
N,T	LOCAL ENERGY DEP.	2	11/30/74	-7.5570+ 0	7.9582+ 0	2.0000+ 1	
N,A	CROSS SECTION	17	11/30/74	-1.5230+ 0	1.6039+ 0	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/30/74	-1.5230+ 0	1.6039+ 0	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/30/74	-1.5230+ 0	1.6039+ 0	2.0000+ 1	
N,G	CROSS SECTION	870	11/30/74	6.6000+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	11/01/72	6.6000+ 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	2	11/01/72	6.6000+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/30/74	6.6000+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/30/74	6.6000+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	6	1/04/73	0.0000+ 0	4.0000+ 0	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	8	1/04/73	0.0000+ 0	4.0000+ 0	2.0000+ 1	
N,XG	CROSS SECTION	11	1/04/73	0.0000+ 0	1.1600- 1	2.0000+ 1	PHOTON = 1.1000- 1 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.1600- 1	2.0000+ 1	PHOTON = 1.1000- 1 MEV
N,XG	CROSS SECTION	8	1/04/73	0.0000+ 0	2.5000- 1	2.0000+ 1	PHOTON = 1.9700- 1 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	2.5000- 1	2.0000+ 1	PHOTON = 1.9700- 1 MEV
N,XG	CROSS SECTION	9	1/04/73	0.0000+ 0	1.4310+ 0	2.0000+ 1	PHOTON = 1.2400+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.4310+ 0	2.0000+ 1	PHOTON = 1.2400+ 0 MEV
N,XG	CROSS SECTION	7	1/4/73	0.0000+ 0	1.5350+ 0	2.0000+ 1	PHOTON = 1.3500+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.5350+ 0	2.0000+ 1	PHOTON = 1.3500+ 0 MEV
N,XG	CROSS SECTION	4	1/04/73	0.0000+ 0	1.5350+ 0	2.0000+ 1	PHOTON = 1.4500+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.5350+ 0	2.0000+ 1	PHOTON = 1.4500+ 0 MEV
N,XG	CROSS SECTION	4	1/04/73	0.0000+ 0	2.9300+ 0	2.0000+ 1	PHOTON = 2.5800+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	2.9300+ 0	2.0000+ 1	PHOTON = 2.5800+ 0 MEV

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11-NA-23
ATOMIC MASS = 2.259041

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	355	12/13/71	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N ANGULAR DIST.	10	10/15/70	0.0000+0	4.0000-2	2.0000+1	
N,ELASTIC	N TOTAL ENERGY DEP.	24	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N LOCAL ENERGY DEP.	24	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	27	8/18/72	0.0000+0	2.1710+0	2.0000+1	
N,N'	N ENERGY-ANGLE DIST.	15	8/18/72	0.0000+0	2.1710+0	2.0000+1	
N,N'	N TOTAL ENERGY DEP.	15	11/12/74	0.0000+0	2.1710+0	2.0000+1	
N,N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+0	2.1710+0	2.0000+1	
N,N'	N CROSS SECTION	77	8/18/72	0.0000+0	4.5850-1	2.0000+1	LEVEL = 4.3920-1 MEV
N,N'	N ANGULAR DIST.	21	8/18/72	0.0000+0	4.5850-1	2.0000+1	LEVEL = 4.3920-1 MEV
N,N'	N TOTAL ENERGY DEP.	8	11/12/74	0.0000+0	4.5850-1	2.0000+1	LEVEL = 4.3920-1 MEV
N,N'	N LOCAL ENERGY DEP.	8	11/12/74	0.0000+0	4.5850-1	2.0000+1	LEVEL = 4.3920-1 MEV
N,2N	CROSS SECTION	14	8/19/70	-1.2434+1	1.2980+1	2.0000+1	
N,2N	N ENERGY-ANGLE DIST.	4	8/19/70	-1.2434+1	1.2980+1	2.0000+1	
N,2N	N TOTAL ENERGY DEP.	4	11/12/74	-1.2434+1	1.2980+1	2.0000+1	
N,2N	N LOCAL ENERGY DEP.	3	11/12/74	-1.2434+1	1.2980+1	2.0000+1	
N,N'P	CROSS SECTION	33	8/19/70	-8.7940+0	9.1800+0	2.0000+1	
N,N'P	N ENERGY-ANGLE DIST.	5	8/19/70	-8.7940+0	9.1800+0	2.0000+1	
N,N'P	N TOTAL ENERGY DEP.	7	11/12/74	-8.7940+0	9.1800+0	2.0000+1	
N,N'P	N LOCAL ENERGY DEP.	6	11/12/74	-8.7940+0	9.1800+0	2.0000+1	
N,N'A	CROSS SECTION	15	8/19/70	-1.0498+1	1.0959+1	2.0000+1	
N,N'A	N ENERGY-ANGLE DIST.	5	8/19/70	-1.0498+1	1.0959+1	2.0000+1	
N,N'A	N TOTAL ENERGY DEP.	5	11/12/74	-1.0498+1	1.0959+1	2.0000+1	
N,N'A	N LOCAL ENERGY DEP.	4	11/12/74	-1.0498+1	1.0959+1	2.0000+1	
N,P	CROSS SECTION	118	8/19/70	-3.5970+0	3.7600+0	2.0000+1	
N,P	N TOTAL ENERGY DEP.	2	11/12/74	-3.5970+0	3.7600+0	2.0000+1	
N,P	N LOCAL ENERGY DEP.	2	11/12/74	-3.5970+0	3.7600+0	2.0000+1	
N,A	CROSS SECTION	75	12/15/71	-3.8000+0	4.0460+0	2.0000+1	
N,A	N TOTAL ENERGY DEP.	2	11/12/74	-3.8000+0	4.0460+0	2.0000+1	
N,A	N LOCAL ENERGY DEP.	2	11/12/74	-3.8000+0	4.0460+0	2.0000+1	
N,G	CROSS SECTION	102	12/13/71	6.9700+0	1.0000-10	2.0000+1	
N,G	G ENERGY DIST.	2	1/01/72	6.9700+0	1.0010-10	2.0000+1	
N,G	G MULTIPLICITY	2	11/01/72	6.9700+0	1.0010-10	2.0000+1	
N,G	N TOTAL ENERGY DEP.	2	11/12/74	6.9700+0	1.0000-10	2.0000+1	
N,G	N LOCAL ENERGY DEP.	2	11/12/74	6.9700+0	1.0000-10	2.0000+1	
N,XG	CROSS SECTION	6	2/21/73	0.0000+0	4.0000+0	2.0000+1	
N,XG	G ENERGY-ANGLE DIST.	5	1/04/73	0.0000+0	4.0000+0	2.0000+1	
N,XG	N CROSS SECTION	47	1/04/73	0.0000+0	4.5850-1	2.0000+1	PHOTON = 4.3900-1 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	4.5850-1	2.0000+1	PHOTON = 4.3900-1 MEV
N,XG	N CROSS SECTION	7	1/04/73	0.0000+0	2.1680+0	2.0000+1	PHOTON = 1.6400+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	2.1680+0	2.0000+1	PHOTON = 1.6400+0 MEV
N,XG	N CROSS SECTION	7	1/04/73	0.0000+0	2.1680+0	2.0000+1	PHOTON = 2.3000+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	2.1680+0	2.0000+1	PHOTON = 2.3000+0 MEV
N,XG	N CROSS SECTION	4	1/04/73	0.0000+0	2.3000+0	2.0000+1	PHOTON = 2.3000+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	2.3000+0	2.0000+1	PHOTON = 2.3000+0 MEV
N,XG	N CROSS SECTION	4	1/04/73	0.0000+0	2.6000+0	2.0000+1	PHOTON = 2.6000+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	2.6000+0	2.0000+1	PHOTON = 2.6000+0 MEV
N,XG	N CROSS SECTION	4	1/04/73	0.0000+0	3.0000+0	2.0000+1	PHOTON = 3.0000+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	3.0000+0	2.0000+1	PHOTON = 3.0000+0 MEV

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	481	12/13/71	0.0000+ 0	1.0000-10	2.7000+ 1	
N,ELASTIC	ANGULAR DIST.	18	12/08/70	0.0000+ 0	1.0000- 3	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	35	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	35	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	11	10/18/72	0.0000+ 0	3.0000+ 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	10	10/18/72	0.0000+ 0	3.0000+ 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	12	11/12/74	0.0000+ 0	3.0000+ 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	3.0000+ 0	2.0000+ 1	
N,N'	CROSS SECTION	17	10/18/72	0.0000+ 0	1.4300+ 0	2.0000+ 1	LEVEL = 1.3700+ 0 MEV
N,N'	ANGULAR DIST.	2	12/08/70	0.0000+ 0	1.4300+ 0	2.0000+ 1	LEVEL = 1.3700+ 0 MEV
N,N'	TOTAL ENERGY DEP.	3	11/12/74	0.0000+ 0	1.4300+ 0	2.0000+ 1	LEVEL = 1.3700+ 0 MEV
N,N'	LOCAL ENERGY DEP.	3	11/12/74	0.0000+ 0	1.4300+ 0	2.0000+ 1	LEVEL = 1.3700+ 0 MEV
N,N'	CROSS SECTION	5	12/08/70	0.0000+ 0	1.6768+ 0	6.0000+ 0	LEVEL = 1.6100+ 0 MEV
N,N'	ANGULAR DIST.	2	12/08/70	0.0000+ 0	1.6768+ 0	6.0000+ 0	LEVEL = 1.6100+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.6768+ 0	6.0000+ 0	LEVEL = 1.6100+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.6768+ 0	6.0000+ 0	LEVEL = 1.6100+ 0 MEV
N,N'	CROSS SECTION	4	12/08/70	0.0000+ 0	1.9059+ 0	6.5000+ 0	LEVEL = 1.8300+ 0 MEV
N,N'	ANGULAR DIST.	2	12/08/70	0.0000+ 0	1.9059+ 0	6.5000+ 0	LEVEL = 1.8300+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.9059+ 0	6.5000+ 0	LEVEL = 1.8300+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.9059+ 0	6.5000+ 0	LEVEL = 1.8300+ 0 MEV
N,2N	CROSS SECTION	5	1/05/71	-7.3240+ 0	7.6279+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	7	12/02/70	-7.3240+ 0	7.6279+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	15	11/12/74	-7.3240+ 0	7.6279+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	8	11/12/74	-7.3240+ 0	7.6279+ 0	2.0000+ 1	
N,P	CROSS SECTION	9	12/08/70	-3.0200+ 0	3.1500+ 0	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-3.0200+ 0	3.1500+ 0	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-3.0200+ 0	3.1500+ 0	2.0000+ 1	
N,G	CROSS SECTION	2	12/13/71	9.0920+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	11/01/72	9.0920+ 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	2	11/01/72	9.0920+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	9.0920+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	9.0920+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	5	2/21/73	0.0000+ 0	3.5000+ 0	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	5	1/08/73	0.0000+ 0	3.5000+ 0	2.0000+ 1	
N,XG	CROSS SECTION	11	1/05/73	0.0000+ 0	1.4300+ 0	2.0000+ 1	PHOTON = 1.3690+ 0 MEV
N,XG	ANGULAR DIST.	2	1/08/73	0.0000+ 0	1.4300+ 0	2.0000+ 1	PHOTON = 1.3690+ 0 MEV
N,XG	CROSS SECTION	5	1/05/73	0.0000+ 0	1.6700+ 0	2.0000+ 1	PHOTON = 1.6100+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.6700+ 0	2.0000+ 1	PHOTON = 1.6100+ 0 MEV
N,XG	CROSS SECTION	2	1/05/73	0.0000+ 0	1.9000+ 0	2.0000+ 1	PHOTON = 1.8300+ 0 MEV
N,XG	ANGULAR DIST.	4	1/08/73	0.0000+ 0	1.9000+ 0	2.0000+ 1	PHOTON = 1.8300+ 0 MEV
N,XG	CROSS SECTION	3	1/05/73	0.0000+ 0	4.4100+ 0	2.0000+ 1	PHOTON = 2.8000+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	4.4100+ 0	2.0000+ 1	PHOTON = 2.8000+ 0 MEV
N,XG	CROSS SECTION	3	1/05/73	0.0000+ 0	5.4400+ 0	2.0000+ 1	PHOTON = 3.8600+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	5.4400+ 0	2.0000+ 1	PHOTON = 3.8600+ 0 MEV
N,XG	CROSS SECTION	3	1/05/73	0.0000+ 0	4.4100+ 0	2.0000+ 1	PHOTON = 4.2300+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	4.4100+ 0	2.0000+ 1	PHOTON = 4.2300+ 0 MEV
N,XG	CROSS SECTION	3	1/05/73	0.0000+ 0	6.2900+ 0	2.0000+ 1	PHOTON = 4.6300+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	6.2900+ 0	2.0000+ 1	PHOTON = 4.6300+ 0 MEV

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 12-MG-24
 ATOMIC MASS = 2.3985* 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,P	CROSS SECTION	16	9/22/74	-4.7300* 0	4.9300* 0	2.0000* 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-4.7300* 0	4.9300* 0	2.0000* 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-4.7300* 0	4.9300* 0	2.0000* 1	

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13-AL-27
ATOMIC MASS = 2.6983

	REACTION	POINTS	DATE	D-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	1713	10/18/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	34	10/18/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	29	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	29	11/12/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	17	10/18/74	0.0000+0	5.2500+0	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	9	10/20/74	0.0000+0	5.2500+0	2.0000+1	
N,N'	TOTAL ENERGY DEP.	8	11/12/74	0.0000+0	5.2500+0	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+0	5.2500+0	2.0000+1	
N,N'	CROSS SECTION	53	10/18/74	0.0000+0	8.7500+0	2.0000+1	LEVEL = 8.4300+1 MEV
N,N'	ANGULAR DIST.	18	10/18/74	0.0000+0	8.7500+0	2.0000+1	LEVEL = 8.4300+1 MEV
N,N'	TOTAL ENERGY DEP.	18	11/12/74	0.0000+0	8.7500+0	2.0000+1	LEVEL = 8.4300+1 MEV
N,N'	LOCAL ENERGY DEP.	16	11/12/74	0.0000+0	8.7500+0	2.0000+1	LEVEL = 8.4300+1 MEV
N,N'	CROSS SECTION	50	10/18/74	0.0000+0	1.0510+0	2.0000+1	LEVEL = 1.0130+0 MEV
N,N'	ANGULAR DIST.	18	10/18/74	0.0000+0	1.0510+0	2.0000+1	LEVEL = 1.0130+0 MEV
N,N'	TOTAL ENERGY DEP.	16	11/12/74	0.0000+0	1.0510+0	2.0000+1	LEVEL = 1.0130+0 MEV
N,N'	LOCAL ENERGY DEP.	16	11/12/74	0.0000+0	1.0510+0	2.0000+1	LEVEL = 1.0130+0 MEV
N,N'	CROSS SECTION	36	10/18/74	0.0000+0	2.2930+0	2.0000+1	LEVEL = 2.2100+0 MEV
N,N'	ANGULAR DIST.	18	10/18/74	0.0000+0	2.2930+0	2.0000+1	LEVEL = 2.2100+0 MEV
N,N'	TOTAL ENERGY DEP.	11	11/12/74	0.0000+0	2.2930+0	2.0000+1	LEVEL = 2.2100+0 MEV
N,N'	LOCAL ENERGY DEP.	11	11/12/74	0.0000+0	2.2930+0	2.0000+1	LEVEL = 2.2100+0 MEV
N,N'	CROSS SECTION	51	10/18/74	0.0000+0	2.8340+0	2.0000+1	LEVEL = 2.7320+0 MEV
N,N'	ANGULAR DIST.	8	10/18/74	0.0000+0	2.8340+0	2.0000+1	LEVEL = 2.7320+0 MEV
N,N'	TOTAL ENERGY DEP.	4	11/12/74	0.0000+0	2.8340+0	2.0000+1	LEVEL = 2.7320+0 MEV
N,N'	LOCAL ENERGY DEP.	4	11/12/74	0.0000+0	2.8340+0	2.0000+1	LEVEL = 2.7320+0 MEV
N,N'	CROSS SECTION	51	10/18/74	0.0000+0	3.0910+0	2.0000+1	LEVEL = 2.9800+0 MEV
N,N'	ANGULAR DIST.	11	10/18/74	0.0000+0	3.0910+0	2.0000+1	LEVEL = 2.9800+0 MEV
N,N'	TOTAL ENERGY DEP.	10	11/12/74	0.0000+0	3.0910+0	2.0000+1	LEVEL = 2.9800+0 MEV
N,N'	LOCAL ENERGY DEP.	10	11/12/74	0.0000+0	3.0910+0	2.0000+1	LEVEL = 2.9800+0 MEV
N,N'	CROSS SECTION	38	10/18/74	0.0000+0	3.1130+0	2.0000+1	LEVEL = 3.0010+0 MEV
N,N'	ANGULAR DIST.	11	10/18/74	0.0000+0	3.1130+0	2.0000+1	LEVEL = 3.0010+0 MEV
N,N'	TOTAL ENERGY DEP.	10	11/12/74	0.0000+0	3.1130+0	2.0000+1	LEVEL = 3.0010+0 MEV
N,N'	LOCAL ENERGY DEP.	10	11/12/74	0.0000+0	3.1130+0	2.0000+1	LEVEL = 3.0010+0 MEV
N,N'	CROSS SECTION	27	10/18/74	0.0000+0	3.8150+0	2.0000+1	LEVEL = 3.6780+0 MEV
N,N'	ANGULAR DIST.	2	10/18/74	0.0000+0	3.8150+0	2.0000+1	LEVEL = 3.6780+0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+0	3.8150+0	2.0000+1	LEVEL = 3.6780+0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+0	3.8150+0	2.0000+1	LEVEL = 3.6780+0 MEV
N,N'	CROSS SECTION	34	10/18/74	0.0000+0	4.1040+0	2.0000+1	LEVEL = 3.9560+0 MEV
N,N'	ANGULAR DIST.	9	10/18/74	0.0000+0	4.1040+0	2.0000+1	LEVEL = 3.9560+0 MEV
N,N'	TOTAL ENERGY DEP.	5	11/12/74	0.0000+0	4.1040+0	2.0000+1	LEVEL = 3.9560+0 MEV
N,N'	LOCAL ENERGY DEP.	5	11/12/74	0.0000+0	4.1040+0	2.0000+1	LEVEL = 3.9560+0 MEV
N,N'	CROSS SECTION	53	10/18/74	0.0000+0	4.2070+0	2.0000+1	LEVEL = 4.0550+0 MEV
N,N'	ANGULAR DIST.	9	10/18/74	0.0000+0	4.2070+0	2.0000+1	LEVEL = 4.0550+0 MEV
N,N'	TOTAL ENERGY DEP.	5	11/12/74	0.0000+0	4.2070+0	2.0000+1	LEVEL = 4.0550+0 MEV
N,N'	LOCAL ENERGY DEP.	5	11/12/74	0.0000+0	4.2070+0	2.0000+1	LEVEL = 4.0550+0 MEV
N,N'	CROSS SECTION	46	10/18/74	0.0000+0	4.5740+0	2.0000+1	LEVEL = 4.4090+0 MEV
N,N'	ANGULAR DIST.	8	10/18/74	0.0000+0	4.5740+0	2.0000+1	LEVEL = 4.4090+0 MEV
N,N'	TOTAL ENERGY DEP.	5	11/12/74	0.0000+0	4.5740+0	2.0000+1	LEVEL = 4.4090+0 MEV
N,N'	LOCAL ENERGY DEP.	5	11/12/74	0.0000+0	4.5740+0	2.0000+1	LEVEL = 4.4090+0 MEV
N,N'	CROSS SECTION	35	10/18/74	0.0000+0	4.6770+0	2.0000+1	LEVEL = 4.5080+0 MEV
N,N'	ANGULAR DIST.	8	10/18/74	0.0000+0	4.6770+0	2.0000+1	LEVEL = 4.5080+0 MEV
N,N'	TOTAL ENERGY DEP.	5	11/12/74	0.0000+0	4.6770+0	2.0000+1	LEVEL = 4.5080+0 MEV
N,N'	LOCAL ENERGY DEP.	5	11/12/74	0.0000+0	4.6770+0	2.0000+1	LEVEL = 4.5080+0 MEV
N,N'	CROSS SECTION	32	10/18/74	0.0000+0	4.7510+0	2.0000+1	LEVEL = 4.5800+0 MEV

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13-AL-27
ATOMIC MASS = 2.6983* 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,Y'	N ANGULAR DIST.	8	10/18/74	0.0000+0	4.7510+0	2.0000+1	LEVEL = 4.5800+0 MEV
N,N'	N TOTAL ENERGY DEP.	5	11/12/74	0.0000+0	4.7510+0	2.0000+1	LEVEL = 4.5800+0 MEV
N,N'	N LOCAL ENERGY DEP.	5	11/12/74	0.0000+0	4.7510+0	2.0000+1	LEVEL = 4.5800+0 MEV
N,N'	N CROSS SECTION	30	10/18/74	0.0000+0	4.9910+0	2.0000+1	LEVEL = 4.8110+0 MEV
N,N'	N ANGULAR DIST.	6	10/18/74	0.0000+0	4.9910+0	2.0000+1	LEVEL = 4.8110+0 MEV
N,N'	N TOTAL ENERGY DEP.	6	11/12/74	0.0000+0	4.9910+0	2.0000+1	LEVEL = 4.8110+0 MEV
N,N'	N LOCAL ENERGY DEP.	6	11/12/74	0.0000+0	4.9910+0	2.0000+1	LEVEL = 4.8110+0 MEV
N,2N	N CROSS SECTION	14	10/18/74	-1.3057+1	1.3545+1	2.0000+1	
N,2N	N ENERGY-ANGLE DIST.	8	10/18/74	-1.3057+1	1.3545+1	2.0000+1	
N,2N	N TOTAL ENERGY DEP.	4	11/12/74	-1.3057+1	1.3545+1	2.0000+1	
N,2N	N LOCAL ENERGY DEP.	3	11/12/74	-1.3057+1	1.3545+1	2.0000+1	
N,P	N CROSS SECTION	147	10/18/74	-1.8278+0	1.8961+0	2.0000+1	
N,P	N TOTAL ENERGY DEP.	2	11/12/74	-1.8278+0	1.8961+0	2.0000+1	
N,P	N LOCAL ENERGY DEP.	2	11/12/74	-1.8278+0	1.8961+0	2.0000+1	
N,D	N CROSS SECTION	24	10/18/74	-6.0460+0	6.2720+0	2.0000+1	
N,D	N TOTAL ENERGY DEP.	2	11/12/74	-6.0460+0	6.2720+0	2.0000+1	
N,D	N LOCAL ENERGY DEP.	2	11/12/74	-6.0460+0	6.2720+0	2.0000+1	
N,T	N CROSS SECTION	14	10/18/74	-1.0884+1	1.1291+1	2.0000+1	
N,T	N TOTAL ENERGY DEP.	2	11/12/74	-1.0884+1	1.1291+1	2.0000+1	
N,T	N LOCAL ENERGY DEP.	2	11/12/74	-1.0884+1	1.1291+1	2.0000+1	
N,A	N CROSS SECTION	32	10/18/74	-3.1316+0	3.2487+0	2.0000+1	
N,A	N TOTAL ENERGY DEP.	2	11/12/74	-3.1316+0	3.2487+0	2.0000+1	
N,A	N LOCAL ENERGY DEP.	2	11/12/74	-3.1316+0	3.2487+0	2.0000+1	
N,G	N CROSS SECTION	168	10/18/74	7.7300+0	1.0000-10	2.0000+1	
N,G	G ENERGY DIST.	2	11/01/72	7.7300+0	1.0000-10	2.0000+1	
N,G	G MULTIPLICITY	2	11/01/72	7.7300+0	1.0000-10	2.0000+1	
N,G	N TOTAL ENERGY DEP.	2	11/12/74	7.7300+0	1.0000-10	2.0000+1	
N,G	N LOCAL ENERGY DEP.	2	11/12/74	7.7300+0	1.0000-10	2.0000+1	
N,XG	N CROSS SECTION	9	1/05/73	0.0000+0	3.0600+0	2.0000+1	
N,XG	G ENERGY DIST.	5	1/05/73	0.0000+0	3.0600+0	2.0000+1	
N,XG	N CROSS SECTION	12	1/05/73	0.0000+0	0.7400-1	2.0000+1	PHOTON = 0.4000+1 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	0.7400-1	2.0000+1	PHOTON = 0.4000+1 MEV
N,XG	N CROSS SECTION	9	1/05/73	0.0000+0	1.0560+0	2.0000+1	PHOTON = 1.0130+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	1.0560+0	2.0000+1	PHOTON = 1.0130+0 MEV
N,XG	N CROSS SECTION	8	1/05/73	0.0000+0	2.8300+0	2.0000+1	PHOTON = 1.7200+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	2.8300+0	2.0000+1	PHOTON = 1.7200+0 MEV
N,XG	N CROSS SECTION	8	1/05/73	0.0000+0	2.8920+0	2.0000+1	PHOTON = 2.8100+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	2.8920+0	2.0000+1	PHOTON = 2.8100+0 MEV
N,XG	N CROSS SECTION	8	1/05/73	0.0000+0	3.0000+0	2.0000+1	PHOTON = 3.0000+0 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+0	3.0000+0	2.0000+1	PHOTON = 3.0000+0 MEV

02/12/76

14-SI-NAT
ATOMIC MASS = 2.8066* 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	871	8/19/70	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	24	5/25/71	0.0000+ 0	6.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	35	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	35	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	17	3/04/72	0.0000+ 0	2.1030+ 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	8	3/04/72	0.0000+ 0	2.1030+ 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	8	11/12/74	0.0000+ 0	2.1030+ 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	2.1030+ 0	2.0000+ 1	
N,N'	CROSS SECTION	13	1/09/73	0.0000+ 0	1.3187+ 0	4.0200+ 0	LEVEL = 1.2730+ 0 MEV
N,N'	ANGULAR DIST.	2	8/19/70	0.0000+ 0	1.3187+ 0	4.0200+ 0	LEVEL = 1.2730+ 0 MEV
N,N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.3187+ 0	4.0200+ 0	LEVEL = 1.2730+ 0 MEV
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.3187+ 0	4.0200+ 0	LEVEL = 1.2730+ 0 MEV
N,N'	CROSS SECTION	190	8/19/70	0.0000+ 0	1.8430+ 0	2.0000+ 1	LEVEL = 1.7787+ 0 MEV
N,N'	ANGULAR DIST.	2	5/25/71	0.0000+ 0	1.8430+ 0	2.0000+ 1	LEVEL = 1.7787+ 0 MEV
N,N'	TOTAL ENERGY DEP.	3	11/12/74	0.0000+ 0	1.8430+ 0	2.0000+ 1	LEVEL = 1.7787+ 0 MEV
N,N'	LOCAL ENERGY DEP.	3	11/12/74	0.0000+ 0	1.8430+ 0	2.0000+ 1	LEVEL = 1.7787+ 0 MEV
N,2N	CROSS SECTION	6	11/15/72	-8.4840+ 0	8.7887+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	5	3/04/72	-8.4840+ 0	8.7887+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	10	11/12/74	-8.4840+ 0	8.7887+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	4	11/12/74	-8.4840+ 0	8.7887+ 0	2.0000+ 1	
N,N'P	CROSS SECTION	50	8/19/70	-1.1573+ 1	1.2000+ 1	2.0000+ 1	
N,N'P	ENERGY-ANGLE DIST.	5	10/15/70	-1.1573+ 1	1.2000+ 1	2.0000+ 1	
N,N'P	TOTAL ENERGY DEP.	3	11/12/74	-1.1573+ 1	1.2000+ 1	2.0000+ 1	
N,N'P	LOCAL ENERGY DEP.	3	11/12/74	-1.1573+ 1	1.2000+ 1	2.0000+ 1	
N,P	CROSS SECTION	369	8/19/70	-2.8932+ 0	3.0600+ 0	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-2.8932+ 0	3.0600+ 0	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-2.8932+ 0	3.0600+ 0	2.0000+ 1	
N,D	CROSS SECTION	81	12/15/71	-9.3583+ 0	9.6970+ 0	2.0000+ 1	
N,D	TOTAL ENERGY DEP.	2	11/12/74	-9.3583+ 0	9.6970+ 0	2.0000+ 1	
N,D	LOCAL ENERGY DEP.	2	11/12/74	-9.3583+ 0	9.6970+ 0	2.0000+ 1	
N,A	CROSS SECTION	373	2/12/72	-3.2700- 2	3.3900- 2	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	-3.2700- 2	3.3900- 2	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	-3.2700- 2	3.3900- 2	2.0000+ 1	
N,G	CROSS SECTION	46	8/13/70	6.7680+ 0	1.0000-10	2.0000+ 1	
N,G	ENERG DIST.	2	11/01/72	6.7680+ 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	2	11/01/72	6.7680+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	6.7680+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	6.7680+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	6	2/21/73	0.0000+ 0	4.0000+ 0	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	6	1/09/73	0.0000+ 0	4.0000+ 0	2.0000+ 1	
N,XG	CROSS SECTION	13	1/09/73	0.0000+ 0	1.3170+ 0	2.0000+ 1	PHOTON = 1.2730+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.3170+ 0	2.0000+ 1	PHOTON = 1.2730+ 0 MEV
N,XG	CROSS SECTION	140	1/09/73	0.0000+ 0	1.8430+ 0	2.0000+ 1	PHOTON = 1.7787+ 0 MEV
N,XG	ANGULAR DIST.	9	1/09/73	0.0000+ 0	1.8430+ 0	2.0000+ 1	PHOTON = 1.7787+ 0 MEV
N,XG	CROSS SECTION	7	1/09/73	0.0000+ 0	4.7740+ 0	2.0000+ 1	PHOTON = 2.8300+ 0 MEV
N,XG	ANGULAR DIST.	6	1/09/73	0.0000+ 0	4.7740+ 0	2.0000+ 1	PHOTON = 2.8300+ 0 MEV
N,XG	CROSS SECTION	8	1/09/73	0.0000+ 0	5.1470+ 0	2.0000+ 1	PHOTON = 3.1900+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	5.1470+ 0	2.0000+ 1	PHOTON = 3.1900+ 0 MEV
N,XG	CROSS SECTION	3	1/09/73	0.0000+ 0	6.4900+ 0	2.0000+ 1	PHOTON = 4.4900+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	6.4900+ 0	2.0000+ 1	PHOTON = 4.4900+ 0 MEV
N,XG	CROSS SECTION	4	1/09/73	0.0000+ 0	7.1200+ 0	2.0000+ 1	PHOTON = 5.1000+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	7.1200+ 0	2.0000+ 1	PHOTON = 5.1000+ 0 MEV
N,XG	CROSS SECTION	4	1/09/73	0.0000+ 0	7.1200+ 0	2.0000+ 1	PHOTON = 6.8800+ 0 MEV

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14-SI-NAT

02/12/76

14-SI-NAT
 ATOMIC MASS = 2.8086 ± 1
 QUALIFIER
 REACTION
 G ANGULAR DIST.
 N.XG
 POINTS
 DATE
 2 5/31/73
 O-VALUE
 0 0000 ± 0
 E-MIN
 7 120 ± 0
 E-MAX
 2 0000 ± 1
 PHOTON = 6.8800 ± 0 MEV

02/12/76

15-P -31
ATOMIC MASS = 3.0974 + 1

	REACTION	POINTS	DATE	Q VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	123	8/19/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	20	1/03/72	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	10	8/19/72	0.0000+ 0	1.3100+ 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	10	8/19/72	0.0000+ 0	1.3100+ 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	13	11/12/74	0.0000+ 0	1.3100+ 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.3100+ 0	2.0000+ 1	
N,2N	CROSS SECTION	8	8/19/72	-1.2310+ 1	1.2711+ 1	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	4	8/19/72	-1.2310+ 1	1.2711+ 1	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	4	11/12/74	-1.2310+ 1	1.2711+ 1	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	3	11/12/74	-1.2310+ 1	1.2711+ 1	2.0000+ 1	
N,N'P	CROSS SECTION	4	8/19/72	-7.3000+ 0	7.5377+ 0	2.0000+ 1	
N,N'P	ENERGY-ANGLE DIST.	5	8/19/72	-7.3000+ 0	7.5377+ 0	2.0000+ 1	
N,N'P	TOTAL ENERGY DEP.	10	11/12/74	-7.3000+ 0	7.5377+ 0	2.0000+ 1	
N,N'P	LOCAL ENERGY DEP.	8	11/12/74	-7.3000+ 0	7.5377+ 0	2.0000+ 1	
N,P	CROSS SECTION	13	8/19/72	-7.1000+ 1	1.5000+ 0	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-7.1000+ 1	1.5000+ 0	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-7.1000+ 1	1.5000+ 0	2.0000+ 1	
N,A	CROSS SECTION	8	8/19/72	-1.9400+ 0	3.0000+ 0	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	-1.9400+ 0	3.0000+ 0	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	-1.9400+ 0	3.0000+ 0	2.0000+ 1	
N,G	CROSS SECTION	67	8/19/72	7.9300+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	11/01/72	7.9300+ 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	2	11/01/72	7.9300+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	7.9300+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	7.9300+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	5	2/21/73	0.0000+ 0	3.3000+ 0	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	5	1/11/73	0.0000+ 0	3.3000+ 0	2.0000+ 1	
N,XG	CROSS SECTION	9	1/11/73	0.0000+ 0	1.3100+ 0	2.0000+ 1	PHOTON = 1.2650+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.3100+ 0	2.0000+ 1	PHOTON = 1.2650+ 0 MEV
N,XG	CROSS SECTION	5	1/11/73	0.0000+ 0	2.3060+ 0	2.0000+ 1	PHOTON = 2.2340+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	2.3060+ 0	2.0000+ 1	PHOTON = 2.2340+ 0 MEV

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16-S -32
ATOMIC MASS = 3.1972+ 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	201	8/23/72	5.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	16	1/03/72	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	13	8/23/72	0.0000+ 0	2.3100+ 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	9	8/23/72	0.0000+ 0	2.3100+ 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	10	11/12/74	0.0000+ 0	2.3100+ 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	2.3100+ 0	2.0000+ 1	
N,2N	CROSS SECTION	7	1/09/73	-1.5088+ 1	1.5560+ 1	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	2	1/09/73	-1.5088+ 1	1.5560+ 1	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	3	11/12/74	-1.5088+ 1	1.5560+ 1	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	3	11/12/74	-1.5088+ 1	1.5560+ 1	2.0000+ 1	
N,N'P	CROSS SECTION	3	8/23/72	-8.8600+ 0	9.1400+ 0	2.0000+ 1	
N,N'P	ENERGY-ANGLE DIST.	5	0/23/72	-8.8600+ 0	9.1400+ 0	2.0000+ 1	
N,N'P	TOTAL ENERGY DEP.	8	11/12/74	-8.8600+ 0	9.1400+ 0	2.0000+ 1	
N,N'P	LOCAL ENERGY DEP.	7	11/12/74	-8.8600+ 0	9.1400+ 0	2.0000+ 1	
N,P	CROSS SECTION	36	8/23/72	-9.2000- 1	1.6000+ 0	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-9.2000- 1	1.6000+ 0	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-9.2000- 1	1.6000+ 0	2.0000+ 1	
N,T	CROSS SECTION	3	8/23/72	-1.2670+ 1	1.3100+ 1	2.0000+ 1	
N,T	TOTAL ENERGY DEP.	2	11/12/74	-1.2670+ 1	1.3100+ 1	2.0000+ 1	
N,T	LOCAL ENERGY DEP.	2	11/12/74	-1.2670+ 1	1.3100+ 1	2.0000+ 1	
N,A	CROSS SECTION	45	8/23/72	1.5300+ 0	1.0000-10	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	1.5300+ 0	1.0000-10	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	1.5300+ 0	1.0000-10	2.0000+ 1	
N,G	CROSS SECTION	130	8/23/72	6.6400+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	11/01/72	6.6400+ 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	2	11/01/72	6.6400+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	6.6400+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	3	11/12/74	6.6400+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	6	2/21/73	0.0000+ 0	5.0000- 1	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	7	1/11/73	0.0000+ 0	5.0000- 1	2.0000+ 1	
N,XG	CROSS SECTION	4	1/09/73	0.0000+ 0	3.9000+ 0	2.0000+ 1	PHOTON = 1.5400+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	3.9000+ 0	2.0000+ 1	PHOTON = 1.5400+ 0 MEV
N,XG	CROSS SECTION	11	1/09/73	0.0000+ 0	2.3100+ 0	2.0000+ 1	PHOTON = 2.2370+ 0 MEV
N,XG	ANGULAR DIST.	2	1/09/73	0.0000+ 0	2.3100+ 0	2.0000+ 1	PHOTON = 2.2370+ 0 MEV
N,XG	CROSS SECTION	4	1/09/73	0.0000+ 0	5.1660+ 0	2.0000+ 1	PHOTON = 2.7700+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	5.1660+ 0	2.0000+ 1	PHOTON = 2.7700+ 0 MEV
N,XG	CROSS SECTION	3	1/11/73	0.0000+ 0	5.0000+ 0	2.0000+ 1	PHOTON = 3.7800+ 0 MEV
N,XG	ANGULAR DIST.	2	1/09/73	0.0000+ 0	5.0000+ 0	2.0000+ 1	PHOTON = 3.7800+ 0 MEV
N,XG	CROSS SECTION	5	1/09/73	0.0000+ 0	4.4200+ 0	2.0000+ 1	PHOTON = 4.2900+ 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	4.4200+ 0	2.0000+ 1	PHOTON = 4.2900+ 0 MEV

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ATOMIC MASS = 3.5453+ 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	825	2/15/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N.ELASTIC	N ANGULAR DIST.	9	8/19/70	0.0000+ 0	2.0000- 1	2.0000+ 1	
N.ELASTIC	N TOTAL ENERGY DEP.	28	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N.ELASTIC	N LOCAL ENERGY DEP.	28	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N.N'	N CROSS SECTION	27	1/12/73	0.0000+ 0	8.6000- 1	2.0000+ 1	
N.N'	N ENERGY-ANGLE DIST.	9	8/23/72	0.0000+ 0	8.6000- 1	2.0000+ 1	
N.N'	N TOTAL ENERGY DEP.	13	11/12/74	0.0000+ 0	8.6000- 1	2.0000+ 1	
N.N'	N LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	8.6000- 1	2.0000+ 1	
N.2N	N CROSS SECTION	14	8/19/70	-1.2650+ 1	1.3010+ 1	2.0000+ 1	
N.2N	N ENERGY-ANGLE DIST.	4	8/19/70	-1.2650+ 1	1.3010+ 1	2.0000+ 1	
N.2N	N TOTAL ENERGY DEP.	4	11/12/74	-1.2650+ 1	1.3010+ 1	2.0000+ 1	
N.2N	N LOCAL ENERGY DEP.	3	11/12/74	-1.2650+ 1	1.3010+ 1	2.0000+ 1	
N.N'P	N CROSS SECTION	20	8/19/70	-6.3700+ 0	6.5512+ 0	2.0000+ 1	
N.N'P	N ENERGY-ANGLE DIST.	5	8/19/70	-6.3700+ 0	6.5512+ 0	2.0000+ 1	
N.N'P	N TOTAL ENERGY DEP.	14	11/12/74	-6.3700+ 0	6.5512+ 0	2.0000+ 1	
N.N'P	N LOCAL ENERGY DEP.	11	11/12/74	-6.3700+ 0	6.5512+ 0	2.0000+ 1	
N.N'A	N CROSS SECTION	22	8/19/70	-6.9900+ 0	7.1900+ 0	2.0000+ 1	
N.N'A	N ENERGY-ANGLE DIST.	5	8/23/72	-6.9900+ 0	7.1900+ 0	2.0000+ 1	
N.N'A	N TOTAL ENERGY DEP.	9	11/12/74	-6.9900+ 0	7.1900+ 0	2.0000+ 1	
N.N'A	N LOCAL ENERGY DEP.	8	11/12/74	-6.9900+ 0	7.1900+ 0	2.0000+ 1	
N.P	N CROSS SECTION	456	12/13/71	6.1000- 1	1.0000-10	2.0000+ 1	
N.P	N TOTAL ENERGY DEP.	2	11/12/74	6.1000- 1	1.0000-10	2.0000+ 1	
N.P	N LOCAL ENERGY DEP.	2	11/12/74	6.1000- 1	1.0000-10	2.0000+ 1	
N.A	N CROSS SECTION	48	8/19/70	9.3000- 1	1.0000+ 0	2.0000+ 1	
N.A	N TOTAL ENERGY DEP.	2	11/12/74	9.3000- 1	1.0000+ 0	2.0000+ 1	
N.A	N LOCAL ENERGY DEP.	2	11/12/74	9.3000- 1	1.0000+ 0	2.0000+ 1	
N.G	N CROSS SECTION	245	12/13/71	8.5800+ 0	1.0000-10	2.0000+ 1	
N.G	N ENERGY DIST.	2	11/01/72	8.5800+ 0	1.0000-10	2.0000+ 1	
N.G	N MULTIPLICITY	2	11/01/72	8.5800+ 0	1.0000-10	2.0000+ 1	
N.G	N TOTAL ENERGY DEP.	2	11/12/74	8.5800+ 0	1.0000-10	2.0000+ 1	
N.G	N LOCAL ENERGY DEP.	2	11/12/74	8.5800+ 0	1.0000-10	2.0000+ 1	
N.XG	N CROSS SECTION	5	2/21/73	0.0000+ 0	2.7000+ 0	2.0000+ 1	
N.XG	N ENERGY-ANGLE DIST.	7	1/12/73	0.0000+ 0	1.2540+ 0	2.0000+ 1	
N.XG	N CROSS SECTION	5	1/12/73	0.0000+ 0	1.2540+ 0	2.0000+ 1	
N.XG	N ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.7750+ 0	2.0000+ 1	PHOTON = 1.2200+ 0 MEV
N.XG	N CROSS SECTION	5	1/12/73	0.0000+ 0	1.7500+ 0	2.0000+ 1	PHOTON = 1.2200+ 0 MEV
N.XG	N ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.7500+ 0	2.0000+ 1	PHOTON = 1.7500+ 0 MEV
N.XG	N CROSS SECTION	3	1/12/73	0.0000+ 0	6.4000+ 0	2.0000+ 1	PHOTON = 1.7500+ 0 MEV
N.XG	N ANGULAR DIST.	2	5/31/73	0.0000+ 0	6.4000+ 0	2.0000+ 1	PHOTON = 2.1270+ 0 MEV

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ATOMIC MASS = 3.9948 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	83	8/23/72	0.0000 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	15	1/03/72	0.0000 0	1.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	35	11/12/74	0.0000 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	35	11/12/74	0.0000 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	14	8/23/72	0.0000 0	1.5000 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	8	8/23/72	0.0000 0	1.5000 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	11	11/12/74	0.0000 0	1.5000 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000 0	1.5000 0	2.0000+ 1	
N,2N	CROSS SECTION	8	8/23/72	-9.8700 0	1.0500 1	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	5	8/23/72	-9.8700 0	1.0500 1	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	5	11/12/74	-9.8700 0	1.0500 1	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	11/12/74	-9.8700 0	1.0500 1	2.0000+ 1	
N,P	CROSS SECTION	5	8/23/72	-6.7200 0	0.0000 0	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/12/74	-6.7200 0	0.0000 0	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	-6.7200 0	0.0000 0	2.0000+ 1	
N,A	CROSS SECTION	6	8/23/72	-2.4900 0	2.5000 0	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/12/74	-2.4900 0	2.5000 0	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/12/74	-2.4900 0	2.5000 0	2.0000+ 1	
N,G	CROSS SECTION	72	8/23/72	6.1000 0	1.0000-10	2.0000+ 1	
N,G	ENERGY-ANGLE DIST.	2	1/16/73	6.1000 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	2	1/16/73	6.1000 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	6.1000 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	6.1000 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	5	2/21/73	0.0000 0	3.5000 0	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	5	1/12/73	0.0000 0	3.5000 0	2.0000+ 1	
N,XG	CROSS SECTION	5	1/12/73	0.0000 0	2.17 0	2.0000+ 1	PHOTON = 6.6500- 1 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000 0	2.17 0	2.0000+ 1	PHOTON = 6.6500- 1 MEV
N,XG	CROSS SECTION	3	1/12/73	0.0000 0	2.590 0	2.0000+ 1	PHOTON = 1.0690 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000 0	2.590 0	2.0000+ 1	PHOTON = 1.0690 0 MEV
N,XG	CROSS SECTION	8	1/12/73	0.0000 0	1.5000 0	2.0000+ 1	PHOTON = 1.4600 0 MEV
N,XG	ANGULAR DIST.	2	1/12/73	0.0000 0	1.5000 0	2.0000+ 1	PHOTON = 1.4600 0 MEV
N,XG	CROSS SECTION	5	1/12/73	0.0000 0	3.3000 0	2.0000+ 1	PHOTON = 1.7700 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000 0	3.3000 0	2.0000+ 1	PHOTON = 1.7700 0 MEV
N,XG	CROSS SECTION	3	1/12/73	0.0000 0	2.5900 0	2.0000+ 1	PHOTON = 2.5200 0 MEV
N,XG	ANGULAR DIST.	2	5/31/73	0.0000 0	2.5900 0	2.0000+ 1	PHOTON = 2.5200 0 MEV

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	389	8/25/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N.ELASTIC	ANGULAR DIST.	16	3/10/70	0.0000+ 0	3.0000- 2	2.0000+ 1	
N.ELASTIC	TOTAL ENERGY DEP.	29	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N.ELASTIC	LOCAL ENERGY DEP.	29	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N.N'	CROSS SECTION	47	8/25/72	0.0000+ 0	1.0100+ 0	2.0000+ 1	
N.N'	ENERGY-ANGLE DIST.	9	8/25/72	0.0000+ 0	1.0100+ 0	2.0000+ 1	
N.N'	TOTAL ENERGY DEP.	13	11/12/74	0.0000+ 0	1.0100+ 0	2.0000+ 1	
N.N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.0100+ 0	2.0000+ 1	
N.2N	CROSS SECTION	15	8/19/70	-1.3071+ 1	1.3410+ 1	2.0000+ 1	
N.2N	ENERGY-ANGLE DIST.	4	8/19/70	-1.3071+ 1	1.3410+ 1	2.0000+ 1	
N.2N	TOTAL ENERGY DEP.	4	11/12/74	-1.3071+ 1	1.3410+ 1	2.0000+ 1	
N.2N	LOCAL ENERGY DEP.	3	11/12/74	-1.3071+ 1	1.3410+ 1	2.0000+ 1	
N.N'P	CROSS SECTION	26	8/19/70	-6.4240+ 0	6.6000+ 0	2.0000+ 1	
N.N'P	ENERGY-ANGLE DIST.	5	8/19/70	-6.4240+ 0	6.6000+ 0	2.0000+ 1	
N.N'P	TOTAL ENERGY DEP.	11	11/12/74	-6.4240+ 0	6.6000+ 0	2.0000+ 1	
N.N'P	LOCAL ENERGY DEP.	7	11/12/74	-6.4240+ 0	6.6000+ 0	2.0000+ 1	
N.N'A	CROSS SECTION	26	8/19/70	-7.3650+ 0	7.6000+ 0	2.0000+ 1	
N.N'A	ENERGY-ANGLE DIST.	5	8/19/70	-7.3650+ 0	7.6000+ 0	2.0000+ 1	
N.N'A	TOTAL ENERGY DEP.	8	11/12/74	-7.3650+ 0	7.6000+ 0	2.0000+ 1	
N.N'A	LOCAL ENERGY DEP.	7	11/12/74	-7.3650+ 0	7.6000+ 0	2.0000+ 1	
N.P	CROSS SECTION	177	8/19/70	2.2000- 1	7.6000- 1	2.0000+ 1	
N.P	TOTAL ENERGY DEP.	2	11/12/74	2.2000- 1	7.6000- 1	2.0000+ 1	
N.P	LOCAL ENERGY DEP.	2	11/12/74	2.2000- 1	7.6000- 1	2.0000+ 1	
N.A	CROSS SECTION	98	8/19/70	1.3700+ 0	1.5000+ 0	2.0000+ 1	
N.A	TOTAL ENERGY DEP.	2	11/12/74	1.3700+ 0	1.5000+ 0	2.0000+ 1	
N.A	LOCAL ENERGY DEP.	2	11/12/74	1.3700+ 0	1.5000+ 0	2.0000+ 1	
N.G	CROSS SECTION	242	8/25/72	7.8000+ 0	1.0000-10	2.0000+ 1	
N.G	ENERGY DIST.	2	11/01/72	7.8000+ 0	1.0070-10	2.0000+ 1	
N.G	MULTIPLICITY	2	11/01/72	7.8000+ 0	1.0000-10	2.0000+ 1	
N.G	TOTAL ENERGY DEP.	2	11/12/74	7.8000+ 0	1.0000-10	2.0000+ 1	
N.G	LOCAL ENERGY DEP.	2	11/12/74	7.8000+ 0	1.0000-10	2.0000+ 1	
N.XG	CROSS SECTION	5	2/21/73	0.0000+ 0	2.0000+ 0	2.0000+ 1	
N.XG	ENERGY-ANGLE DIST.	6	1/16/73	0.0000+ 0	2.0000+ 0	2.0000+ 1	
N.XG	CROSS SECTION	9	1/12/73	0.0000+ 0	1.0030+ 0	2.0000+ 1	PHOTON = 9.8000- 1 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.0030+ 0	2.0000+ 1	PHOTON = 9.8000- 1 MEV
N.XG	CROSS SECTION	5	1/12/73	0.0000+ 0	1.5430+ 0	2.0000+ 1	PHOTON = 1.2660+ 0 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.5770+ 0	2.0000+ 1	PHOTON = 1.2660+ 0 MEV
N.XG	CROSS SECTION	4	1/12/73	0.0000+ 0	1.7770+ 0	2.0000+ 1	PHOTON = 1.2940+ 0 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.7250+ 0	2.0000+ 1	PHOTON = 1.2940+ 0 MEV
N.XG	CROSS SECTION	7	1/12/73	0.0000+ 0	1.6300+ 0	2.0000+ 1	PHOTON = 1.6300+ 0 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.5090+ 0	2.0000+ 1	PHOTON = 1.6300+ 0 MEV
N.XG	CROSS SECTION	6	1/12/73	0.0000+ 0	2.5940+ 0	2.0000+ 1	PHOTON = 2.5300+ 0 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	2.5940+ 0	2.0000+ 1	PHOTON = 2.5300+ 0 MEV
N.XG	CROSS SECTION	4	1/12/73	0.0000+ 0	2.4920+ 0	2.0000+ 1	PHOTON = 2.8200+ 0 MEV
N.XG	ANGULAR DIST.	2	1/16/73	0.0000+ 0	2.8920+ 0	2.0000+ 1	PHOTON = 2.8200+ 0 MEV
N.XG	CROSS SECTION	4	1/12/73	0.0000+ 0	3.0970+ 0	2.0000+ 1	PHOTON = 3.0200+ 0 MEV
N.XG	ANGULAR DIST.	2	1/16/73	0.0000+ 0	3.0070+ 0	2.0000+ 1	PHOTON = 3.0200+ 0 MEV
N.XG	CROSS SECTION	4	1/12/73	0.0000+ 0	3.7510+ 0	2.0000+ 1	PHOTON = 3.6000+ 0 MEV
N.XG	ANGULAR DIST.	2	5/26/75	0.0000+ 0	3.6920+ 0	2.0000+ 1	PHOTON = 3.6000+ 0 MEV

		REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC		CROSS SECTION	798	12/13/71	0.0000-0	1.0000-10	2.0000+1	
N,ELASTIC	N	ANGULAR DIST.	15	8/19/70	0.0000-0	1.0000-1	2.0000+1	
N,ELASTIC	N	TOTAL ENERGY DEP.	33	11/12/74	0.0000-0	1.0000-10	2.0000+1	
N,ELASTIC	N	LOCAL ENERGY DEP.	33	11/12/74	0.0000-0	1.0000-10	2.0000+1	
N,N'		CROSS SECTION	22	7/14/73	0.0000-0	1.1900-0	2.0000+1	
N,N'	N	ENERGY-ANGLE DIST.	10	8/29/72	0.0000-0	1.1900-0	2.0000+1	
N,N'	N	TOTAL ENERGY DEP.	9	11/12/74	0.0000-0	1.1900-0	2.0000+1	
N,N'	N	LOCAL ENERGY DEP.	2	11/12/74	0.0000-0	1.1900-0	2.0000+1	
N,2N		CROSS SECTION	17	8/19/70	-1.0030-1	1.0262-1	2.0000+1	
N,2N	N	ENERGY-ANGLE DIST.	5	8/29/72	-1.0030-1	1.0262-1	2.0000+1	
N,2N	N	TOTAL ENERGY DEP.	5	11/12/74	-1.0030-1	1.0262-1	2.0000+1	
N,2N	N	LOCAL ENERGY DEP.	3	11/12/74	-1.0030-1	1.0262-1	2.0000+1	
N,N'P		CROSS SECTION	22	8/19/70	-8.3400-0	8.5500-0	2.0000+1	
N,N'P	N	ENERGY-ANGLE DIST.	5	8/29/72	-8.3400-0	8.5500-0	2.0000+1	
N,N'P	N	TOTAL ENERGY DEP.	9	11/12/74	-8.3400-0	8.5500-0	2.0000+1	
N,N'P	N	LOCAL ENERGY DEP.	8	11/12/74	-8.3400-0	8.5500-0	2.0000+1	
N,N'A		CROSS SECTION	22	8/19/70	-7.0400-0	7.2200-0	2.0000+1	
N,N'A	N	ENERGY-ANGLE DIST.	6	8/29/72	-7.0400-0	7.2200-0	2.0000+1	
N,N'A	N	TOTAL ENERGY DEP.	10	11/12/74	-7.0400-0	7.2200-0	2.0000+1	
N,N'A	N	LOCAL ENERGY DEP.	9	11/12/74	-7.0400-0	7.2200-0	2.0000+1	
N,P		CROSS SECTION	130	8/29/72	-5.5000-1	9.7000-1	2.0000+1	
N,P		TOTAL ENERGY DEP.	2	11/12/74	-5.5000-1	9.7000-1	2.0000+1	
N,P		LOCAL ENERGY DEP.	2	11/12/74	-5.5000-1	9.7000-1	2.0000+1	
N,A		CROSS SECTION	69	7/14/73	1.8000-0	6.0000-1	2.0000+1	
N,A		TOTAL ENERGY DEP.	2	11/12/74	1.8000-0	6.0000-1	2.0000+1	
N,A		LOCAL ENERGY DEP.	2	11/12/74	1.8000-0	6.0000-1	2.0000+1	
N,G		CROSS SECTION	336	12/13/71	8.3600-0	1.0000-10	2.0000+1	
N,G	G	ENERGY DIST.	2	11/01/72	8.3600-0	1.0000-10	2.0000+1	
N,G	G	MULTIPLICITY	2	11/01/72	8.3600-0	1.0000-10	2.0000+1	
N,G		TOTAL ENERGY DEP.	2	11/12/74	8.3600-0	1.0000-10	2.0000+1	
N,G		LOCAL ENERGY DEP.	2	11/12/74	8.3600-0	1.0000-10	2.0000+1	
N,XG		CROSS SECTION	7	1/22/73	0.0000-0	3.4580-0	2.0000+1	
N,XG	G	ENERGY-ANGLE DIST.	5	1/22/73	0.0000-0	3.4580-0	2.0000+1	
N,XG		CROSS SECTION	7	1/22/73	0.0000-0	3.4360-0	2.0000+1	PHOTON = 5.1100-1 MEV
N,XG	G	ANGULAR DIST.	2	5/31/73	0.0000-0	3.4360-0	2.0000+1	PHOTON = 5.1100-1 MEV
N,XG		CROSS SECTION	9	1/22/73	0.0000-0	1.3650-0	2.0000+1	PHOTON = 7.7000-1 MEV
N,XG	G	ANGULAR DIST.	2	5/31/73	0.0000-0	1.3650-0	2.0000+1	PHOTON = 7.7000-1 MEV
N,XG		CROSS SECTION	9	1/22/73	0.0000-0	1.1840-0	2.0000+1	PHOTON = 1.1880-0 MEV
N,XG	G	ANGULAR DIST.	2	5/31/73	0.0000-0	1.1840-0	2.0000+1	PHOTON = 1.1880-0 MEV
N,XG		CROSS SECTION	5	1/22/73	0.0000-0	3.8270-0	9.0000+0	PHOTON = 3.7340-0 MEV
N,XG	G	ANGULAR DIST.	5	1/22/73	0.0000-0	3.8270-0	9.0000+0	PHOTON = 3.7340-0 MEV
N,XG		CROSS SECTION	5	1/22/73	0.0000-0	4.0010-0	9.0000+0	PHOTON = 3.9030-0 MEV
N,XG	G	ANGULAR DIST.	5	1/22/73	0.0000-0	4.0010-0	9.0000+0	PHOTON = 3.9030-0 MEV

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 21-SC-45
 ATOMIC MASS = 4.4956 ± 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,G	CROSS SECTION	307	3/08/71	8.7700 ± 0	1.0000-10	2.0000 ± 1	
N,G	TOTAL ENERGY DEP.	2	11/12/74	8.7700 ± 0	1.0000-10	2.0000 ± 1	
N,G	LOCAL ENERGY DEP.	2	11/12/74	8.7700 ± 0	1.0000-10	2.0000 ± 1	

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22-TI-NAT
ATOMIC MASS = 4.740000

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	913	8/29/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N.ELASTIC	ANGULAR DIST.	12	1/03/72	0.0000+ 0	2.5000- 1	2.0000+ 1	
N.ELASTIC	TOTAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N.ELASTIC	LOCAL ENERGY DEP.	30	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N.N'	CROSS SECTION	17	8/29/72	0.0000+ 0	2.5000- 1	2.0000+ 1	
N.N'	ENERGY-ANGLE DIST.	11	10/18/72	0.0000+ 0	2.5000- 1	2.0000+ 1	
N.N'	TOTAL ENERGY DEP.	15	11/12/74	0.0000+ 0	2.5000- 1	2.0000+ 1	
N.N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	2.5000- 1	2.0000+ 1	
N.N'	CROSS SECTION	39	8/29/72	0.0000+ 0	1.0100+ 0	2.0000+ 1	LEVEL = 9.8700- 1 MEV
N.N'	ANGULAR DIST.	2	8/29/72	0.0000+ 0	1.0100+ 0	2.0000+ 1	LEVEL = 9.8700- 1 MEV
N.N'	TOTAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.0100+ 0	2.0000+ 1	LEVEL = 9.8700- 1 MEV
N.N'	LOCAL ENERGY DEP.	2	11/12/74	0.0000+ 0	1.0100+ 0	2.0000+ 1	LEVEL = 9.8700- 1 MEV
N.2N	CROSS SECTION	6	8/29/72	-1.1630+ 1	1.2000+ 1	2.0000+ 1	
N.2N	ENERGY-ANGLE DIST.	6	10/18/72	-1.1630+ 1	1.2000+ 1	2.0000+ 1	
N.2N	TOTAL ENERGY DEP.	5	11/12/74	-1.1630+ 1	1.2000+ 1	2.0000+ 1	
N.2N	LOCAL ENERGY DEP.	5	11/12/74	-1.1630+ 1	1.2000+ 1	2.0000+ 1	
N.P	CROSS SECTION	8	8/29/72	-3.2100+ 0	6.0000+ 0	2.0000+ 1	
N.P	TOTAL ENERGY DEP.	2	11/12/74	-3.2100+ 0	6.0000+ 0	2.0000+ 1	
N.P	LOCAL ENERGY DEP.	2	11/12/74	-3.2100+ 0	6.0000+ 0	2.0000+ 1	
N.A	CROSS SECTION	6	8/29/72	-2.0300+ 0	6.0000+ 0	2.0000+ 1	
N.A	TOTAL ENERGY DEP.	2	11/12/74	-2.0300+ 0	6.0000+ 0	2.0000+ 1	
N.A	LOCAL ENERGY DEP.	2	11/12/74	-2.0300+ 0	6.0000+ 0	2.0000+ 1	
N.G	CROSS SECTION	363	8/29/72	8.2400+ 0	1.0000-10	2.0000+ 1	
N.G	ENERGY DIST.	2	12/01/75	8.2400+ 0	1.0000-10	2.0000+ 1	
N.G	MULTIPLICITY	2	12/01/75	8.2400+ 0	1.0000-10	2.0000+ 1	
N.G	TOTAL ENERGY DEP.	2	11/12/74	8.2400+ 0	1.0000-10	2.0000+ 1	
N.G	LOCAL ENERGY DEP.	2	11/12/74	8.2400+ 0	1.0000-10	2.0000+ 1	
N.XG	CROSS SECTION	8	1/23/73	0.0000+ 0	3.0000+ 0	2.0000+ 1	
N.XG	ENERGY-ANGLE DIST.	8	1/23/73	0.0000+ 0	3.0000+ 0	2.0000+ 1	
N.XG	CROSS SECTION	9	1/23/73	0.0000+ 0	1.0000+ 0	5.0000+ 0	PHOTON = 9.8000- 1 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.0000+ 0	5.0000+ 0	PHOTON = 9.8000- 1 MEV
N.XG	CROSS SECTION	8	1/23/73	0.0000+ 0	1.4000+ 0	5.0000+ 0	PHOTON = 1.3800+ 0 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.4000+ 0	5.0000+ 0	PHOTON = 1.3800+ 0 MEV
N.XG	CROSS SECTION	6	1/23/73	0.0000+ 0	1.6000+ 0	5.0000+ 0	PHOTON = 1.5600+ 0 MEV
N.XG	ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.6000+ 0	5.0000+ 0	PHOTON = 1.5600+ 0 MEV

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24-CR-NAT
ATOMIC MASS = 5.19980 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	231	9/04/73	0.0000 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST	39	3/01/74	0.0000 0	4.0000 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP	50	11/12/74	0.0000 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP	50	11/12/74	0.0000 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	17	9/04/73	0.0000 0	3.2000 0	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST	8	9/04/73	0.0000 0	3.2000 0	2.0000+ 1	
N,N'	TOTAL ENERGY DEP	7	11/12/74	0.0000 0	1.2000 0	2.0000+ 1	
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	3.2000 0	2.0000+ 1	
N,N'	CROSS SECTION	63	9/04/73	0.0000 0	5.7000 1	3.2000+ 0	LEVEL = 5.6000 1 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	5.7000 1	3.2000+ 0	LEVEL = 5.6000 1 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	5.7000 1	3.2000+ 0	LEVEL = 5.6000 1 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	5.7000 1	3.2000+ 0	LEVEL = 5.6000 1 MEV
N,N'	CROSS SECTION	47	9/04/73	0.0000 0	0.0000 0	3.2000+ 0	LEVEL = 7.9000 1 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	0.0000 0	3.2000+ 0	LEVEL = 7.9000 1 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	0.0000 0	3.2000+ 0	LEVEL = 7.9000 1 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	0.0000 0	3.2000+ 0	LEVEL = 7.9000 1 MEV
N,N'	CROSS SECTION	38	9/04/73	0.0000 0	1.0000 0	3.2000+ 0	LEVEL = 9.9000 1 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	1.0000 0	3.2000+ 0	LEVEL = 9.9000 1 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	1.0000 0	3.2000+ 0	LEVEL = 9.9000 1 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	1.0000 0	3.2000+ 0	LEVEL = 9.9000 1 MEV
N,N'	CROSS SECTION	20	9/04/73	0.0000 0	1.4000 0	3.2000+ 0	LEVEL = 1.4000 0 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	1.4000 0	3.2000+ 0	LEVEL = 1.4000 0 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	1.4000 0	3.2000+ 0	LEVEL = 1.4000 0 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	1.4000 0	3.2000+ 0	LEVEL = 1.4000 0 MEV
N,N'	CROSS SECTION	16	9/04/73	0.0000 0	2.0000 0	3.2000+ 0	LEVEL = 1.0000 0 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	2.0000 0	3.2000+ 0	LEVEL = 1.0000 0 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	2.0000 0	3.2000+ 0	LEVEL = 1.0000 0 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	2.0000 0	3.2000+ 0	LEVEL = 1.0000 0 MEV
N,N'	CROSS SECTION	10	9/04/73	0.0000 0	2.4000 0	3.2000+ 0	LEVEL = 2.3500 0 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	2.4000 0	3.2000+ 0	LEVEL = 2.3500 0 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	2.4000 0	3.2000+ 0	LEVEL = 2.3500 0 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	2.4000 0	3.2000+ 0	LEVEL = 2.3500 0 MEV
N,N'	CROSS SECTION	6	9/04/73	0.0000 0	2.8000 0	3.2000+ 0	LEVEL = 2.6000 0 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	2.8000 0	3.2000+ 0	LEVEL = 2.6000 0 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	2.8000 0	3.2000+ 0	LEVEL = 2.6000 0 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	2.8000 0	3.2000+ 0	LEVEL = 2.6000 0 MEV
N,N'	CROSS SECTION	4	9/04/73	0.0000 0	3.0000 0	3.2000+ 0	LEVEL = 2.9000 0 MEV
N,N'	ANGULAR DIST	2	9/04/73	0.0000 0	3.0000 0	3.2000+ 0	LEVEL = 2.9000 0 MEV
N,N'	TOTAL ENERGY DEP	2	11/12/74	0.0000 0	3.0000 0	3.2000+ 0	LEVEL = 2.9000 0 MEV
N,N'	LOCAL ENERGY DEP	2	11/12/74	0.0000 0	3.0000 0	3.2000+ 0	LEVEL = 2.9000 0 MEV
N,2N	CROSS SECTION	9	9/04/73	-7.9405 0	0.5000 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST	7	9/04/73	-7.9405 0	0.5000 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP	10	11/12/74	-7.9405 0	0.5000 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP	2	11/12/74	-7.9405 0	0.5000 0	2.0000+ 1	
N,P	CROSS SECTION	24	9/04/73	-2.5660 1	4.0000 0	2.0000+ 1	
N,P	TOTAL ENERGY DEP	2	11/12/74	-2.5660 1	4.0000 0	2.0000+ 1	
N,P	LOCAL ENERGY DEP	2	11/12/74	-2.5660 1	4.0000 0	2.0000+ 1	
N,G	CROSS SECTION	191	9/04/73	9.2500 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST	2	3/28/74	9.2500 0	1.0000-10	3.5000- 2	
N,G	MULTIPLICITY	3	3/28/74	9.2500 0	1.0000-10	3.5000- 2	
N,G	TOTAL ENERGY DEP	2	11/12/74	9.2500 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP	2	11/12/74	9.2500 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	25	3/12/74	0.0000 0	3.5000- 2	2.0000+ 1	

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24-CR-NAT
ATOMIC MASS = 5.1998+ 1

REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
0 ENERGY-ANGLE DIST.	21	3/12/74	0.0000+ 0	3.5000- 2	2.0000+ 1	

N. JO

02/12/78

26-FF-NAS
ATOMIC NAS = 5000.0

REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N-ELASTIC	2609	6/08/78	0.0000	1.0000	1.0000	
ANGULAR DIST	17	5/27/72	0.0000	1.0000	1.0000	
TOTAL ENERGY DEP	33	11/12/78	0.0000	1.0000	1.0000	
LOCAL ENERGY DEP	33	11/12/78	0.0000	1.0000	1.0000	
CROSS SECTION	37	10/04/73	0.0000	1.0000	1.0000	
ANGULAR DIST	10	5/27/72	0.0000	1.0000	1.0000	
TOTAL ENERGY DEP	12	11/12/78	0.0000	1.0000	1.0000	
LOCAL ENERGY DEP	12	11/12/78	0.0000	1.0000	1.0000	
CROSS SECTION	49	5/27/72	0.0000	1.0000	1.0000	
ANGULAR DIST	6	5/27/72	0.0000	1.0000	1.0000	
TOTAL ENERGY DEP	6	11/12/78	0.0000	1.0000	1.0000	
LOCAL ENERGY DEP	6	11/12/78	0.0000	1.0000	1.0000	
CROSS SECTION	11	5/27/72	1.1400	1.0000	1.0000	
ENERGY-ANGLE DIST	3	5/27/72	1.1400	1.0000	1.0000	
LOCAL ENERGY DEP	3	11/12/78	1.1400	1.0000	1.0000	
CROSS SECTION	37	11/12/78	1.1400	1.0000	1.0000	
LOCAL ENERGY DEP	37	11/12/78	1.1400	1.0000	1.0000	
CROSS SECTION	27	5/27/72	3.2000	1.0000	1.0000	
LOCAL ENERGY DEP	27	5/27/72	3.2000	1.0000	1.0000	
TOTAL ENERGY DEP	27	11/12/78	3.2000	1.0000	1.0000	
CROSS SECTION	123	8/22/72	7.8000	1.0000	1.0000	
LOCAL ENERGY DEP	123	11/01/72	7.8000	1.0000	1.0000	
CROSS SECTION	2	11/01/72	7.8000	1.0000	1.0000	
LOCAL ENERGY DEP	2	11/01/72	7.8000	1.0000	1.0000	
CROSS SECTION	13	2/08/73	0.0000	1.0000	1.0000	
ENERGY-ANGLE DIST	302	2/07/73	0.0000	1.0000	1.0000	
LOCAL ENERGY DEP	302	2/07/73	0.0000	1.0000	1.0000	
CROSS SECTION	7	2/08/73	0.0000	1.0000	1.0000	
ANGULAR DIST	3	2/08/73	0.0000	1.0000	1.0000	
CROSS SECTION	8	5/31/73	0.0000	1.0000	1.0000	
ANGULAR DIST	8	5/31/73	0.0000	1.0000	1.0000	

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26-FF-NAS

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28-Fe-54
ATOMIC MASS = 53.94001

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,P	CROSS SECTION	15	9/22/74	9.0000-2	0.0000-1	2.0000+1	
N,P	TOTAL ENERGY DEP	2	11/12/74	9.0000-2	0.0000-1	2.0000+1	
N,P	LOCAL ENERGY DEP	2	11/12/74	9.0000-2	0.0000-1	2.0000+1	
N,G	CROSS SECTION	19	5/27/70	9.2930-0	1.0000-3	2.0000+1	
N,G	TOTAL ENERGY DEP	2	11/12/74	9.2950-0	1.0000-3	2.0000+1	
N,G	LOCAL ENERGY DEP	2	11/12/74	9.2990-0	1.0000-3	2.0000+1	

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								26-Fe-58	
								ATOMIC MASS = 5.79330 1	
REACTION		POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER		
N.G	CROSS SECTION	20	5/27/70	6.5800+ 0	1.0000- 3	2.0000+ 1			
N.G	TOTAL ENERGY DEP.	2	11/12/74	6.5800+ 0	1.0000- 3	2.0000+ 1			
N.G	LOCAL ENERGY DEP.	2	11/12/74	6.5800+ 0	1.0000- 3	2.0000+ 1			

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27-CO-59
ATOMIC MASS = 5.8935* 1

	REACTION	POINTS	DATE	Q-VALUE	E MIN	E MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	2800	3/01/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST	57	3/01/74	0.0000+ 0	1.0000- 3	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP	45	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP	45	11/12/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	27	3/01/74	0.0000+ 0	2.4400+ 0	2.0000+ 1	
N,N'	N ENERGY ANGLE DIST	14	3/01/74	0.0000+ 0	2.4400+ 0	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP	13	11/12/74	0.0000+ 0	2.4400+ 0	2.0000+ 1	
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.4400+ 0	2.0000+ 1	
N,N'	CROSS SECTION	15	3/01/74	0.0000+ 0	1.1100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	1.1100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.1100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.1100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	CROSS SECTION	14	3/01/74	0.0000+ 0	2.0000+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	1.2100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.2100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.2100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	CROSS SECTION	13	3/01/74	0.0000+ 0	3.1100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	3.1100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.3100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.3100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	CROSS SECTION	13	3/01/74	0.0000+ 0	1.4000+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	1.4000+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.4000+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.4000+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	CROSS SECTION	10	3/01/74	0.0000+ 0	1.7100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	1.7100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.7100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	1.7100+ 0	0.0000+ 0	LEVEL = 1.0000+ 0 MEV
N,N'	CROSS SECTION	10	3/01/74	0.0000+ 0	2.1000+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	2.1000+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.1000+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.1000+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	CROSS SECTION	11	3/01/74	0.0000+ 0	2.1900+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	2.1900+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.1900+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.1900+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	CROSS SECTION	12	3/01/74	0.0000+ 0	2.3600+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	2.3600+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.3600+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.3600+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	CROSS SECTION	10	3/01/74	0.0000+ 0	2.5400+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N ANGULAR DIST	2	3/01/74	0.0000+ 0	2.5400+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N TOTAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.5400+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	N LOCAL ENERGY DEP	2	11/12/74	0.0000+ 0	2.5400+ 0	0.0000+ 0	LEVEL = 2.0000+ 0 MEV
N,N'	CROSS SECTION	13	3/01/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	N ENERGY ANGLE DIST	7	3/01/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP	5	11/12/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	N LOCAL ENERGY DEP	3	11/12/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	CROSS SECTION	10	3/01/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP	7	11/12/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	N LOCAL ENERGY DEP	2	11/12/74	1.0600+ 1	1.0600+ 1	2.0000+ 1	
N,N'	CROSS SECTION	4	3/01/74	5.2320+ 0	5.2320+ 0	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP	2	11/12/74	5.2320+ 0	5.2320+ 0	2.0000+ 1	

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ATOMIC MASS • 5 0935 • 1

QUALIFIER

N.D.	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX
N.D.	CROSS SECTION	2	11/12/74	-5.14500	5.32000	2.00000
N.T	LOCAL ENERGY DEP.	2	3/01/74	9.90000	9.08000	2.00000
N.T	TOTAL ENERGY DEP.	2	11/12/74	9.90000	9.08000	2.00000
N.T	CROSS SECTION	30	3/01/74	-8.91000	9.08000	2.00000
N.A	TOTAL ENERGY DEP.	3	2/08/74	3.20000	3.90000	2.00000
N.A	LOCAL ENERGY DEP.	2	11/12/74	3.20000	3.90000	2.00000
N.A	CROSS SECTION	1978	2/01/74	7.90000	1.00000	2.00000
N.G	ENERGY DIST.	2	3/21/74	7.90000	1.00000	2.00000
N.G	MULTIPLICITY	3	3/21/74	7.90000	1.00000	2.00000
N.O	TOTAL ENERGY DEP.	2	11/12/74	7.90000	1.00000	2.00000
N.O	CROSS SECTION	48	3/21/74	0.00000	3.50000	2.00000
N.O	ENERGY-ANGLE DISY.	37	3/21/74	0.00000	3.50000	2.00000

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ATOMIC MASSES = 5.8680, 1

REACTION		POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,N'	CROSS SECTION	11	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	ANGULAR DIST	2	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	TOTAL ENERGY DEP	2	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	LOCAL ENERGY DEP	2	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	CROSS SECTION	12	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	ANGULAR DIST	2	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	ENERGY-ANGLE DIST	0	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	TOTAL ENERGY DEP	14	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N'	LOCAL ENERGY DEP	0	6-05-75	0.0000-0	1.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,P	CROSS SECTION	0	6-05-75	0.0000-0	0.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,P	ANGULAR DIST	2	6-05-75	0.0000-0	0.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,P	ENERGY-ANGLE DIST	4	6-05-75	0.0000-0	0.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,P	TOTAL ENERGY DEP	12	6-05-75	0.0000-0	0.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,P	LOCAL ENERGY DEP	0	6-05-75	0.0000-0	0.1000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,A	CROSS SECTION	0	6-05-75	0.0000-0	0.0010-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,A	ANGULAR DIST	2	6-05-75	0.0000-0	0.0010-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,A	ENERGY-ANGLE DIST	4	6-05-75	0.0000-0	0.0010-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,A	TOTAL ENERGY DEP	16	6-05-75	0.0000-0	0.0010-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,N,A	LOCAL ENERGY DEP	13	6-05-75	0.0000-0	0.0010-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,P	CROSS SECTION	76	6-05-75	3.9470-1	1.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,P	TOTAL ENERGY DEP	2	6-05-75	3.9470-1	1.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,P	LOCAL ENERGY DEP	2	6-05-75	3.9470-1	1.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,D	CROSS SECTION	9	6-05-75	5.3570-0	6.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,D	TOTAL ENERGY DEP	2	6-05-75	5.3570-0	6.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,D	LOCAL ENERGY DEP	2	6-05-75	5.3570-0	6.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,A	CROSS SECTION	23	6-05-75	2.0000-0	1.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,A	TOTAL ENERGY DEP	2	6-05-75	2.0000-0	1.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,A	LOCAL ENERGY DEP	2	6-05-75	2.0000-0	1.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,G	CROSS SECTION	582	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,G	ENERGY DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,G	MULTIPLICITY	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,G	TOTAL ENERGY DEP	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,G	LOCAL ENERGY DEP	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	6	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ENERGY DIST	6	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	6	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	9	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	0	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	9	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	1	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	6	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	0	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	0	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	ANGULAR DIST	2	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV
N,XG	CROSS SECTION	21	6-05-75	0.0000-0	0.0000-0	2.0000-1	LEVEL = 1 6200-0 MEV

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[illegible]

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28-NI-58
ATOMIC MASS = 5.7935+ 1

	REACTION	POINTS	DATE	G VALU	E MIN	E MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	2530	1/15/75	0 0000+ 0	1 0000-10	2 0000+ 1	
N.ELASTIC	N ANGULAR DIST	16	1/03/72	0 0000+ 0	5 0000- 2	2 0000+ 1	
N.ELASTIC	N TOTAL ENERGY DEP	30	11/12/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N.ELASTIC	N LOCAL ENERGY DEP	30	11/12/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N.N'	CROSS SECTION	25	10/20/73	0 0000+ 0	1 0000+ 0	2 0000+ 1	
N.N'	N ENERGY-ANGLE DIST.	9	12/24/74	0 0000+ 0	1 0000+ 0	2 0000+ 1	
N.N'	N TOTAL ENERGY DEP	11	11/12/74	0 0000+ 0	1 0000+ 0	2 0000+ 1	
N.N'	N LOCAL ENERGY DEP	2	11/12/74	0 0000+ 0	1 0000+ 0	2 0000+ 1	
N.2N	CROSS SECTION	5	10/20/73	-1 2400+ 1	1 2400+ 1	2 0000+ 1	
N.2N	N ENERGY-ANGLE DIST.	5	11/25/74	-1 2400+ 1	1 2400+ 1	2 0000+ 1	
N.2N	N TOTAL ENERGY DEP	5	11/12/74	-1 2400+ 1	1 2400+ 1	2 0000+ 1	
N.2N	N LOCAL ENERGY DEP	2	11/12/74	-1 2400+ 1	1 2400+ 1	2 0000+ 1	
N.N.D	CROSS SECTION	9	10/20/73	-6 1800+ 0	0 3500+ 0	2 0000+ 1	
N.N.P	N ENERGY-ANGLE DIST.	5	10/20/73	-6 1800+ 0	0 3500+ 0	2 0000+ 1	
N.N.P	N TOTAL ENERGY DEP	11	11/12/74	-6 1800+ 0	0 3500+ 0	2 0000+ 1	
N.N.P	N LOCAL ENERGY DEP	9	11/12/74	-6 1800+ 0	0 3500+ 0	2 0000+ 1	
N.P	CROSS SECTION	68	10/20/73	4 0000+ 1	4 0700+ 1	2 0000+ 1	
N.P	N TOTAL ENERGY DEP	2	11/12/74	4 0000+ 1	4 0700+ 1	2 0000+ 1	
N.P	N LOCAL ENERGY DEP	2	11/12/74	4 0000+ 1	4 0700+ 1	2 0000+ 1	
N.D	CROSS SECTION	9	01/31/72	-5 9500+ 0	7 0000+ 0	2 0000+ 1	
N.D	N TOTAL ENERGY DEP	2	11/12/74	-5 9500+ 0	7 0000+ 0	2 0000+ 1	
N.D	N LOCAL ENERGY DEP	2	11/12/74	-5 9500+ 0	7 0000+ 0	2 0000+ 1	
N.A	CROSS SECTION	12	01/31/72	2 0900+ 0	1 0000-10	2 0000+ 1	
N.A	N TOTAL ENERGY DEP	2	11/12/74	2 0900+ 0	1 0000-10	2 0000+ 1	
N.A	N LOCAL ENERGY DEP	2	11/12/74	2 0900+ 0	1 0000-10	2 0000+ 1	
N.G	CROSS SECTION	3805	1/15/75	0 5200+ 0	1 0000-10	2 0000+ 1	
N.G	N ENERGY DIST.	2	11/01/72	0 5200+ 0	1 0000-10	2 0000+ 1	
N.G	G MULTIPLICITY	2	11/01/72	0 5200+ 0	1 0000-10	2 0000+ 1	
N.G	N TOTAL ENERGY DEP	2	11/12/74	0 5200+ 0	1 0000-10	2 0000+ 1	
N.G	N LOCAL ENERGY DEP	2	11/12/74	0 5200+ 0	1 0000-10	2 0000+ 1	
N.XG	CROSS SECTION	12	1/17/73	0 0300+ 0	1 5000+ 0	2 0000+ 1	
N.XG	G ENERGY DIST.	7	1/17/73	0 0000+ 0	1 5000+ 0	2 0000+ 1	

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ATOMIC MASS = 63.546(4)

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	96	07/31/72	0.00000	0	1.0000-10	2.0000+1
N,ELASTIC	ANGULAR DIST	21	11/20/72	0.00000	0	5.0000-12	2.0000+1
N,ELASTIC	TOTAL ENERGY DEP	35	11/12/74	0.00000	0	1.0000-10	2.0000+1
N,ELASTIC	LOCAL ENERGY DEP	35	11/12/74	0.00000	0	1.0000-10	2.0000+1
N,N	CROSS SECTION	19	07/31/72	0.00000	0	6.0000-11	2.0000+1
N,N	ENERGY-ANGLE DIST	11	11/20/72	0.00000	0	6.0000-11	2.0000+1
N,N	TOTAL ENERGY DEP	16	11/12/74	0.00000	0	6.0000-11	2.0000+1
N,N	LOCAL ENERGY DEP	2	11/12/74	0.00000	0	6.0000-11	2.0000+1
N,2N	CROSS SECTION	9	07/31/72	0.00000	0	1.0000-10	2.0000+1
N,2N	ENERGY-ANGLE DIST	5	07/31/72	0.00000	0	1.0000-10	2.0000+1
N,2N	TOTAL ENERGY DEP	5	11/12/74	0.00000	0	1.0000-10	2.0000+1
N,2N	LOCAL ENERGY DEP	3	11/12/74	0.00000	0	1.0000-10	2.0000+1
N,N,P	CROSS SECTION	0	07/31/72	-6.12000	0	6.2000+0	2.0000+1
N,N,P	ENERGY-ANGLE DIST	6	07/31/72	-6.12000	0	6.2000+0	2.0000+1
N,N,P	TOTAL ENERGY DEP	11	11/12/74	-6.12000	0	6.2000+0	2.0000+1
N,N,P	LOCAL ENERGY DEP	11	11/12/74	-6.12000	0	6.2000+0	2.0000+1
N,P	CROSS SECTION	7	07/31/72	7.20000	0	1.0000+0	2.0000+1
N,P	TOTAL ENERGY DEP	2	11/12/74	7.20000	0	1.0000+0	2.0000+1
N,P	LOCAL ENERGY DEP	2	11/12/74	7.20000	0	1.0000+0	2.0000+1
N,A	CROSS SECTION	9	07/31/72	1.72000	0	1.0000+0	2.0000+1
N,A	TOTAL ENERGY DEP	2	11/12/74	1.72000	0	1.0000+0	2.0000+1
N,A	LOCAL ENERGY DEP	2	11/12/74	1.72000	0	1.0000+0	2.0000+1
N,G	CROSS SECTION	114	07/31/72	7.75000	0	1.0000-10	2.0000+1
N,G	ENERGY DIST	2	11/20/72	7.75000	0	1.0000-10	2.0000+2
N,G	MULTIPLICITY	3	11/20/72	7.75000	0	1.0000-10	1.0000+2
N,G	TOTAL ENERGY DEP	2	11/12/74	7.75000	0	1.0000-10	2.0000+1
N,G	LOCAL ENERGY DEP	2	11/12/74	7.75000	0	1.0000-10	2.0000+1
N,XG	CROSS SECTION	54	11/20/72	0.00000	0	9.9000-11	2.0000+1
N,XG	ENERGY-ANGLE DIST	12	7/07/73	0.00000	0	9.9000-11	2.0000+1

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								29-CU-63	
								ATOMIC MASS = 6 2930. 1	
REACTION		POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER		
N.G	CROSS SECTION	58	9/22/74	7 9200+ 0	1 0000-10	2 0000+ 1			
N.G	TOTAL ENERGY DEP.	2	11/12/74	7 9200+ 0	1 0000-10	2 0000+ 1			
N.G	LOCAL ENERGY DEP.	2	11/12/74	7 9200+ 0	1 0000-10	2 0000+ 1			

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30-ZN-64
ATOMIC MASS = 6.9294

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,P	CROSS SECTION	18	9/22/74	2 1000- 1	9 0000- 1	2 0000+ 1	
H,P	TOTAL ENERGY DEP.	2	11/12/74	2 1000- 1	9 0000- 1	2 0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/12/74	2 1000- 1	9 0000- 1	2 0000+ 1	

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ATOMIC MASS = 9.1224 + 1

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	916	9/04/73	0.0000+0	1.0000+10	2.0000+1	
N,ELASTIC	ANGULAR DIST	20	9/04/73	0.0000+0	1.0000+10	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP	16	11/12/74	0.0000+0	1.0000+10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP	16	11/12/74	0.0000+0	1.0000+10	2.0000+1	
N,N	CROSS SECTION	14	9/04/73	0.0000+0	2.0000+0	2.0000+1	
N,N	ENERGY ANGLE DIST	9	9/04/73	0.0000+0	2.0000+0	2.0000+1	
N,N	TOTAL ENERGY DEP	9	11/12/74	0.0000+0	2.0000+0	2.0000+1	
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	2.0000+0	2.0000+1	
N,N	CROSS SECTION	20	9/04/73	0.0000+0	9.1000+1	2.0001+0	LEVEL = 9.1990+1 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	9.1000+1	2.0001+0	LEVEL = 9.1990+1 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	9.1000+1	2.0001+0	LEVEL = 9.1990+1 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	9.1000+1	2.0001+0	LEVEL = 9.1990+1 MEV
N,N	CROSS SECTION	10	9/04/73	0.0000+0	1.2100+0	2.0001+0	LEVEL = 1.2100+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.2100+0	2.0001+0	LEVEL = 1.2100+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.2100+0	2.0001+0	LEVEL = 1.2100+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.2100+0	2.0001+0	LEVEL = 1.2100+0 MEV
N,N	CROSS SECTION	12	9/04/73	0.0000+0	1.3200+0	2.0001+0	LEVEL = 1.3000+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.3200+0	2.0001+0	LEVEL = 1.3000+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.3200+0	2.0001+0	LEVEL = 1.3000+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.3200+0	2.0001+0	LEVEL = 1.3000+0 MEV
N,N	CROSS SECTION	12	9/04/73	0.0000+0	1.4000+0	2.0001+0	LEVEL = 1.3800+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.4000+0	2.0001+0	LEVEL = 1.3800+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.4000+0	2.0001+0	LEVEL = 1.3800+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.4000+0	2.0001+0	LEVEL = 1.3800+0 MEV
N,N	CROSS SECTION	10	9/04/73	0.0000+0	1.5000+0	2.0001+0	LEVEL = 1.4800+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.5000+0	2.0001+0	LEVEL = 1.4800+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.5000+0	2.0001+0	LEVEL = 1.4800+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.5000+0	2.0001+0	LEVEL = 1.4800+0 MEV
N,N	CROSS SECTION	7	9/04/73	0.0000+0	1.6000+0	2.0001+0	LEVEL = 1.5500+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.6000+0	2.0001+0	LEVEL = 1.5500+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.6000+0	2.0001+0	LEVEL = 1.5500+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.6000+0	2.0001+0	LEVEL = 1.5500+0 MEV
N,N	CROSS SECTION	6	9/04/73	0.0000+0	1.7000+0	2.0001+0	LEVEL = 1.7500+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.7000+0	2.0001+0	LEVEL = 1.7500+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.7000+0	2.0001+0	LEVEL = 1.7500+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.7000+0	2.0001+0	LEVEL = 1.7500+0 MEV
N,N	CROSS SECTION	4	9/04/73	0.0000+0	1.8000+0	2.0001+0	LEVEL = 1.8500+0 MEV
N,N	ANGULAR DIST	2	9/04/73	0.0000+0	1.8000+0	2.0001+0	LEVEL = 1.8500+0 MEV
N,N	TOTAL ENERGY DEP	2	11/12/74	0.0000+0	1.8000+0	2.0001+0	LEVEL = 1.8500+0 MEV
N,N	LOCAL ENERGY DEP	2	11/12/74	0.0000+0	1.8000+0	2.0001+0	LEVEL = 1.8500+0 MEV
N,2N	CROSS SECTION	11	9/04/73	-7.2000-0	7.2700+0	2.0000+1	
N,2N	ENERGY ANGLE DIST	6	9/04/73	-7.2000-0	7.2700+0	2.0000+1	
N,2N	TOTAL ENERGY DEP	16	11/12/74	-7.2000-0	7.2700+0	2.0000+1	
N,2N	LOCAL ENERGY DEP	4	11/12/74	-7.2000-0	7.2700+0	2.0000+1	
N,3N	CROSS SECTION	3	9/04/73	-1.4950-1	1.1100+1	2.0000+1	
N,3N	ENERGY ANGLE DIST	3	9/04/73	-1.4950-1	1.1100+1	2.0000+1	
N,3N	TOTAL ENERGY DEP	3	11/12/74	-1.4950-1	1.1115+1	2.0000+1	
N,3N	LOCAL ENERGY DEP	3	11/12/74	-1.4950-1	1.1115+1	2.0000+1	
N,P	CROSS SECTION	12	9/04/73	-7.6300-1	1.7000+0	2.0000+1	
N,P	TOTAL ENERGY DEP	2	11/12/74	-7.6300-1	1.7000+0	2.0000+1	
N,P	LOCAL ENERGY DEP	2	11/12/74	-7.6300-1	1.7000+0	2.0000+1	
N,G	CROSS SECTION	1117	9/04/73	0.0000+0	1.0000+10	2.0000+1	
N,G	ENERGY DIST	2	3/21/76	0.0000+0	1.0000+10	3.5000-2	

02/12/76

 40-ZR-NAT
 ATOMIC MASS = 91.224 + 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.G	0	MULTIPLICITY	3	3/21/74	B 6800+ 0	1 0000-10	3 5000- 2
N.G		TOTAL ENERGY DEP.	2	11/12/74	B 6800+ 0	1 0000-10	2 0000+ 1
N.G		LOCAL ENERGY DEP.	2	11/12/74	B 6800+ 0	1 0000-10	2 0000+ 1
N.G		CROSS SECTION	25	3/12/74	0 0000+ 0	3 5000- 2	2 0000+ 1
N.XG	G	ENERGY-ANGLE DIST	24	3/12/74	0 0000+ 0	3 5000- 2	2 0000+ 1

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40-ZR-90
ATOMIC MASS = 89.9000 ± 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,Zn	CROSS SECTION	11	9/22/74	-1.1990 ± 1	1.2120 ± 1	2.0000 ± 1	

	REACTION	POINTS	DATE	Q-VALUE	E MIN	E MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	1761	5/25/74	0.0000 ± 0	1.0000-10	2.0000-1	
N,ELASTIC	ANGULAR DIST	32	5/25/74	0.0000 ± 0	1.0000-2	2.0000-1	
N,ELASTIC	TOTAL ENERGY DEP	33	5/25/74	0.0000 ± 0	1.0000-10	2.0000-1	
N,ELASTIC	LOCAL ENERGY DEP	33	5/25/74	0.0000 ± 0	1.0000-10	2.0000-1	
N,N'	CROSS SECTION	19	5/25/74	0.0000 ± 0	2.5495-0	2.0000-1	
N,N'	ENERGY-ANGLE DIST	14	5/25/74	0.0000 ± 0	2.5495-0	2.0000-1	
N,N'	TOTAL ENERGY DEP	9	5/25/74	0.0000 ± 0	2.5495-0	2.0000-1	
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.5495-0	2.0000-1	
N,N'	CROSS SECTION	21	5/25/74	0.0000 ± 0	2.9410-2	6.0000-0	LEVEL = 2.9000-2 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	2.9410-2	6.0000-0	LEVEL = 2.9000-2 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.9410-2	6.0000-0	LEVEL = 2.9000-2 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.9410-2	6.0000-0	LEVEL = 2.9000-2 MEV
N,N'	CROSS SECTION	22	5/25/74	0.0000 ± 0	7.4792-1	6.0000-0	LEVEL = 7.4000-1 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	7.4792-1	6.0000-0	LEVEL = 7.4000-1 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	7.4792-1	6.0000-0	LEVEL = 7.4000-1 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	7.4792-1	6.0000-0	LEVEL = 7.4000-1 MEV
N,N'	CROSS SECTION	22	5/25/74	0.0000 ± 0	8.1867-1	6.0000-0	LEVEL = 8.1000-1 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	8.1867-1	6.0000-0	LEVEL = 8.1000-1 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	8.1867-1	6.0000-0	LEVEL = 8.1000-1 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	8.1867-1	6.0000-0	LEVEL = 8.1000-1 MEV
N,N'	CROSS SECTION	20	5/25/74	0.0000 ± 0	9.6926-1	6.0000-0	LEVEL = 9.5900-1 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	9.6926-1	6.0000-0	LEVEL = 9.5900-1 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	9.6926-1	6.0000-0	LEVEL = 9.5900-1 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	9.6926-1	6.0000-0	LEVEL = 9.5900-1 MEV
N,N'	CROSS SECTION	21	5/25/74	0.0000 ± 0	1.0815-0	6.0000-0	LEVEL = 1.0700-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	1.0815-0	6.0000-0	LEVEL = 1.0700-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.0815-0	6.0000-0	LEVEL = 1.0700-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.0815-0	6.0000-0	LEVEL = 1.0700-0 MEV
N,N'	CROSS SECTION	17	5/25/74	0.0000 ± 0	1.3292-0	6.0000-0	LEVEL = 1.3150-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	1.3292-0	6.0000-0	LEVEL = 1.3150-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.3292-0	6.0000-0	LEVEL = 1.3150-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.3292-0	6.0000-0	LEVEL = 1.3150-0 MEV
N,N'	CROSS SECTION	15	5/25/74	0.0000 ± 0	1.5039-0	6.0000-0	LEVEL = 1.4880-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	1.5039-0	6.0000-0	LEVEL = 1.4880-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.5039-0	6.0000-0	LEVEL = 1.4880-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.5039-0	6.0000-0	LEVEL = 1.4880-0 MEV
N,N'	CROSS SECTION	16	5/25/74	0.0000 ± 0	1.6919-0	6.0000-0	LEVEL = 1.6740-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	1.6919-0	6.0000-0	LEVEL = 1.6740-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.6919-0	6.0000-0	LEVEL = 1.6740-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.6919-0	6.0000-0	LEVEL = 1.6740-0 MEV
N,N'	CROSS SECTION	16	5/25/74	0.0000 ± 0	1.9678-0	6.0000-0	LEVEL = 1.9470-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	1.9678-0	6.0000-0	LEVEL = 1.9470-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.9678-0	6.0000-0	LEVEL = 1.9470-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	1.9678-0	6.0000-0	LEVEL = 1.9470-0 MEV
N,N'	CROSS SECTION	15	5/25/74	0.0000 ± 0	2.1821-0	6.0000-0	LEVEL = 2.1590-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	2.1821-0	6.0000-0	LEVEL = 2.1590-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.1821-0	6.0000-0	LEVEL = 2.1590-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.1821-0	6.0000-0	LEVEL = 2.1590-0 MEV
N,N'	CROSS SECTION	12	5/25/74	0.0000 ± 0	2.3599-0	6.0000-0	LEVEL = 2.3350-0 MEV
N,N'	ANGULAR DIST	2	5/25/74	0.0000 ± 0	2.3599-0	6.0000-0	LEVEL = 2.3350-0 MEV
N,N'	TOTAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.3599-0	6.0000-0	LEVEL = 2.3350-0 MEV
N,N'	LOCAL ENERGY DEP	2	5/25/74	0.0000 ± 0	2.3599-0	6.0000-0	LEVEL = 2.3350-0 MEV
N,N'	CROSS SECTION	9	5/25/74	0.0000 ± 0	2.5495-0	6.0000-0	LEVEL = 2.5190-0 MEV

ATOMIC MASS = 9.2808+1

REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,N'	2	5/25/74	0.0000+0	2.540E+0	6.0000+0	LEVEL = 2.5190+0 MEV
N,N'	2	5/25/74	0.0000+0	2.540E+0	6.0000+0	LEVEL = 2.5190+0 MEV
N,N'	2	5/25/74	0.0000+0	2.540E+0	6.0000+0	LEVEL = 2.5190+0 MEV
N,N'	16	5/25/74	-8.87E+0	8.94E+0	2.540E+0	
N,N'	7	5/25/74	-8.87E+0	8.94E+0	2.540E+0	
N,N'	10	5/25/74	-8.87E+0	8.94E+0	2.540E+0	
N,N'	5	5/25/74	-8.87E+0	8.94E+0	2.540E+0	
N,N'	3	5/25/74	-1.67E+1	1.64E+1	2.540E+0	
N,N'	3	5/25/74	-1.67E+1	1.64E+1	2.540E+0	
N,N'	2	5/25/74	-1.67E+1	1.64E+1	2.540E+0	
N,N'	2	5/25/74	-1.67E+1	1.64E+1	2.540E+0	
N,N'	6	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	15	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	12	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	11	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	8	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	2	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	10	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	2	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	2	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	5174	5/25/74	-1.94E+0	1.96E+0	2.540E+0	
N,N'	3	11/20/72	-7.23E+0	7.23E+0	2.540E+0	
N,N'	3	11/20/72	-7.23E+0	7.23E+0	2.540E+0	
N,N'	2	5/25/74	-7.23E+0	7.23E+0	2.540E+0	
N,N'	2	5/25/74	-7.23E+0	7.23E+0	2.540E+0	
N,N'	54	11/20/72	0.0000+0	9.900E+0	2.540E+0	
N,N'	12	7/07/73	0.0000+0	9.900E+0	2.540E+0	

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42-MQ-NAT
ATOMIC MASS = 9.5940+ 1

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	119	9/05/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST	12	11/03/72	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	30	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	30	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	19	9/22/72	0.0000+ 0	2.5000- 1	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	12	9/22/72	0.0000+ 0	2.5000- 1	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	16	11/14/74	0.0000+ 0	2.5000- 1	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000+ 0	2.5000- 1	2.0000+ 1	
N,2N	CROSS SECTION	16	9/22/72	-7.0000+ 0	0.0000+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	7	9/22/72	-7.0000+ 0	0.0000+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	13	11/14/74	-7.0000+ 0	0.0000+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-7.0000+ 0	0.0000+ 0	2.0000+ 1	
N,3N	CROSS SECTION	7	9/22/72	-1.4800+ 1	1.5000+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	4	9/22/72	-1.4800+ 1	1.5000+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	3	11/14/74	-1.4800+ 1	1.5000+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	3	11/14/74	-1.4800+ 1	1.5000+ 1	2.0000+ 1	
N,O	CROSS SECTION	400	9/05/72	0.7500+ 0	1.0000-10	2.0000+ 1	
N,O	ENERGY DIST.	2	11/20/72	0.7500+ 0	1.0000-10	1.0000+ 2	
N,O	MULTIPLICITY	3	11/20/72	0.7500+ 0	1.0000-10	1.0000+ 2	
N,O	TOTAL ENERGY DEP.	2	11/14/74	0.7500+ 0	1.0000-10	2.0000+ 1	
N,O	LOCAL ENERGY DEP.	2	11/14/74	0.7500+ 0	1.0000-10	2.0000+ 1	
N,XO	CROSS SECTION	54	11/20/72	0.0000+ 0	9.9000- 3	2.0000+ 1	
N,XO	ENERGY-ANGLE DIST.	12	7/07/73	0.0000+ 0	9.9000- 3	2.0000+ 1	

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ATOMIC MASS = 47.40-107
1 0691+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.G	G ENERGY DIST.	2	3/21/74	7 2690+ 0	1 0000-10	3 5000- 2	
N.G	G MULTIPLICITY	3	3/21/74	7 2690+ 0	1 0000-10	3 5000- 2	
N.G	TOTAL ENERGY DEP	2	11/14/74	7 2690+ 0	1 0000-10	2 0000+ 1	
N.G	LOCAL ENERGY DEP	2	11/14/74	7 2690+ 0	1 0000-10	2 0000+ 1	
N.XG	CROSS SECTION	25	3/12/74	0 0000+ 0	3 5000- 2	2 0000+ 1	
N.XG	G ENERGY-ANGLE DIST	25	3/12/74	0 0000+ 0	3 5000- 2	2 0000+ 1	

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48-CD-NAT
ATOMIC MASS = 1.1240 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	37	9/25/72	0.0000 0	1.0000-10	2.0000 1	
N,ELASTIC	N ANGULAR DIST.	14	1/03/72	0.0000 0	5.0000- 2	2.0000 1	
N,ELASTIC	N TOTAL ENERGY DEP.	32	11/14/74	0.0000 0	1.0000-10	2.0000 1	
N,ELASTIC	N LOCAL ENERGY DEP.	32	11/14/74	0.0000 0	1.0000-10	2.0000 1	
N,N'	CROSS SECTION	15	9/25/72	0.0000 0	2.5000- 1	2.0000 1	
N,N'	N ENERGY-ANGLE DIST.	10	9/25/72	0.0000 0	2.5000- 1	2.0000 1	
N,N'	N TOTAL ENERGY DEP.	20	11/14/74	0.0000 0	2.5000- 1	2.0000 1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000 0	2.5000- 1	2.0000 1	
N,2N	CROSS SECTION	15	9/25/72	0.0000 0	2.5000- 1	2.0000 1	
N,2N	N ENERGY-ANGLE DIST.	6	9/25/72	-0.6200 0	8.7500 0	2.0000 1	
N,2N	N TOTAL ENERGY DEP.	9	11/14/74	-0.6200 0	8.7500 0	2.0000 1	
N,2N	N LOCAL ENERGY DEP.	2	11/14/74	-0.6200 0	8.7500 0	2.0000 1	
N,3N	CROSS SECTION	7	9/25/72	-1.6150 1	1.6350 1	2.0000 1	
N,3N	N ENERGY-ANGLE DIST.	3	9/25/72	-1.6150 1	1.6350 1	2.0000 1	
N,3N	N TOTAL ENERGY DEP.	3	11/14/74	-1.6150 1	1.6350 1	2.0000 1	
N,3N	N LOCAL ENERGY DEP.	2	11/14/74	-1.6150 1	1.6350 1	2.0000 1	
N,G	CROSS SECTION	1030	9/25/72	0.0400 0	1.0000-10	2.0000 1	
N,G	G ENERGY DIST.	2	11/20/72	0.0400 0	1.0000-10	1.0000 2	
N,G	G MULTIPLICITY	3	11/20/72	0.0400 0	1.0000-10	1.0000 2	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	0.0400 0	1.0000-10	2.0000 1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	0.0400 0	1.0000-10	2.0000 1	
N,XG	CROSS SECTION	54	11/20/72	0.3000 0	9.2000 3	2.0000 1	
N,XG	G ENERGY-ANGLE DIST.	12	7/07/73	0.0000 0	9.9000 3	2.0000 1	

02/12/76

				ATOMIC MASS = ⁴⁸ CO-114 1.1390* 2		
REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.G	CROSS SECTION	187	3/09/73	6.1500* 0	1 0000-10	2 0000* 1
N.G	TOTAL ENERGY DEP.	2	11/14/74	6.1500* 0	1 0000-10	2 0000* 1
N.G	LOCAL ENERGY DEP.	2	11/14/74	6.1500* 0	1 0000-10	2 0000* 1

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N.G	REACTION	POINTS	DATE	O-VALUE	C-MIN	C-MAX	ATOMIC MASS = 1.1430* 2	49-IN-115
N.XG	CROSS SECTION	49	9/22/74	6.8300* 0	1 0000-10	2 0.00* 1	QUALIFIER	
	CROSS SECTION	21	9/22/74	0 0000* 0	3 3803- 1	2 0000* 1	ACTIVATED 49-IN-116	
							PHOTON = 3.3500- 1 MEV	

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50-SN-NAT
ATOMIC MASS = 1.1869* 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	84	2/15/75	0.0000* 0	1.0000-10	2.0000* 1	
N,ELASTIC	N ANGULAR DIST.	16	1/03/72	0.0000* 0	0.0000- 2	2.0000* 1	
N,ELASTIC	N TOTAL ENERGY DEP.	36	11/14/74	0.0000* 0	1.0000-10	2.0000* 1	
N,ELASTIC	N LOCAL ENERGY DEP.	36	11/14/74	0.0000* 0	1.0000-10	2.0000* 1	
N,N'	CROSS SECTION	16	10/02/72	0.0000* 0	2.0000* 1	2.0000* 1	
N,N'	N ENERGY-ANGLE DIST.	10	10/03/72	0.0000* 0	2.0000* 1	2.0000* 1	
N,N'	N TOTAL ENERGY DEP.	13	11/14/74	0.0000* 0	2.0000* 1	2.0000* 1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000* 0	2.0000* 1	2.0000* 1	
N,2N	CROSS SECTION	14	10/03/72	-9.3000* 0	9.5000* 0	2.0000* 1	
N,2N	N ENERGY-ANGLE DIST.	6	10/03/72	-9.3000* 0	9.5000* 0	2.0000* 1	
N,2N	N TOTAL ENERGY DEP.	7	11/14/74	-9.3000* 0	9.5000* 0	2.0000* 1	
N,2N	N LOCAL ENERGY DEP.	2	11/14/74	-9.3000* 0	9.5000* 0	2.0000* 1	
N,3N	CROSS SECTION	7	10/03/72	-1.5000* 1	1.5127* 1	2.0000* 1	
N,3N	N ENERGY-ANGLE DIST.	5	10/03/72	-1.5000* 1	1.5127* 1	2.0000* 1	
N,3N	N TOTAL ENERGY DEP.	3	11/14/74	-1.5000* 1	1.5127* 1	2.0000* 1	
N,3N	N LOCAL ENERGY DEP.	3	11/14/74	-1.5000* 1	1.5127* 1	2.0000* 1	
N,G	CROSS SECTION	70	10/02/72	9.3500* 0	1.0000-10	2.0000* 1	
N,G	G ENERGY DIST.	2	11/20/72	9.3500* 0	1.0000-10	1.0000* 2	
N,G	G MULTIPLICITY	3	11/20/72	9.3500* 0	1.0000-10	1.0000* 2	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	9.3500* 0	1.0000-10	2.0000* 1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	9.3500* 0	1.0000-10	2.0000* 1	
N,XG	CROSS SECTION	54	11/20/72	0.0000* 0	9.9000- 3	2.0000* 1	
N,XG	G ENERGY-ANGLE DIST.	12	7/08/73	0.0000* 0	9.9000- 3	2.0000* 1	

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56-BA-138
ATOMIC MASS = 1.3790 ± 2

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	120	11/03/72	0.0000 ± 0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	15	11/03/72	0.0000 ± 0	1.0000-1	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	35	11/14/74	0.0000 ± 0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	35	11/14/74	0.0000 ± 0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	20	10/03/72	0.0000 ± 0	1.0000-10	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	11	10/03/72	0.0000 ± 0	1.0000-10	2.0000+1	
N,N'	TOTAL ENERGY DEP.	14	11/14/74	0.0000 ± 0	1.0000-10	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000 ± 0	1.0000-10	2.0000+1	
N,2N	CROSS SECTION	13	10/03/72	-0.5700 ± 0	0.6500-0	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	7	10/03/72	-0.5700 ± 0	0.6500-0	2.0000+1	
N,2N	TOTAL ENERGY DEP.	11	11/14/74	-0.5700 ± 0	0.6500-0	2.0000+1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-0.5700 ± 0	0.6500-0	2.0000+1	
N,3N	CROSS SECTION	6	10/03/72	-1.5600 ± 1	1.5600-1	2.0000+1	
N,3N	ENERGY-ANGLE DIST.	4	10/03/72	-1.5600 ± 1	1.5600-1	2.0000+1	
N,3N	TOTAL ENERGY DEP.	3	11/14/74	-1.5600 ± 1	1.5600-1	2.0000+1	
N,3N	LOCAL ENERGY DEP.	2	11/14/74	-1.5600 ± 1	1.5600-1	2.0000+1	
N,P	CROSS SECTION	4	10/03/72	-4.0400 ± 0	0.0000-0	2.0000+1	
N,P	TOTAL ENERGY DEP.	2	11/14/74	-4.0400 ± 0	0.0000-0	2.0000+1	
N,P	LOCAL ENERGY DEP.	2	11/14/74	-4.0400 ± 0	0.0000-0	2.0000+1	
H,A	CROSS SECTION	5	10/03/72	3.0700 ± 0	2.2500-0	2.0000+1	
H,A	TOTAL ENERGY DEP.	2	11/14/74	3.0700 ± 0	2.2500-0	2.0000+1	
H,A	LOCAL ENERGY DEP.	3	11/14/74	3.0700 ± 0	2.2500-0	2.0000+1	
N,G	CROSS SECTION	116	10/03/72	4.7100 ± 0	1.0000-10	2.0000+1	
N,G	ENERGY DIST.	2	11/20/72	4.7100 ± 0	1.0000-10	1.0000-2	
N,G	MULTIPLICITY	3	11/20/72	4.7100 ± 0	1.0000-10	1.0000-2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	4.7100 ± 0	1.0000-10	2.0000+1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	4.7100 ± 0	1.0000-10	2.0000+1	
N,XO	CROSS SECTION	94	11/20/72	0.0000 ± 0	9.9000-3	2.0000+1	
N,XO	ENERGY-ANGLE DIST.	12	7/08/73	0.0000 ± 0	9.9000-3	2.0000+1	

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63-EU-NAT
ATOML NA C = 1.5196E-2

	REACTION	POINTS	DATE	Q (A) E	Q (M) E	E (M) E
N,ELASTIC	CROSS SECTION	10	10/03/72	0.000E+0	0.000E+0	2.000E+1
N,ELASTIC	ANGLE-ANGLE DIST	0	10/03/72	0.000E+0	0.000E+0	2.000E+1
N,ELASTIC	TOTAL ENERGY DEP	26	11/14/74	0.000E+0	0.000E+0	2.000E+1
N,ELASTIC	LOCAL ENERGY DEP	26	11/14/74	0.000E+0	0.000E+0	2.000E+1
N,N	CROSS SECTION	49	10/03/72	0.000E+0	0.000E+0	2.000E+1
N,N	ENERGY-ANGLE DIST	12	10/03/72	0.000E+0	0.000E+0	2.000E+1
N,N	TOTAL ENERGY DEP	22	11/14/74	0.000E+0	0.000E+0	2.000E+1
N,N	LOCAL ENERGY DEP	22	11/14/74	0.000E+0	0.000E+0	2.000E+1
N,2N	CROSS SECTION	15	10/03/72	-0.2700E+0	0.47E+0	2.000E+1
N,2N	ENERGY-ANGLE DIST	7	10/03/72	-0.2700E+0	0.47E+0	2.000E+1
N,2N	TOTAL ENERGY DEP	11	11/14/74	-0.2700E+0	0.47E+0	2.000E+1
N,2N	LOCAL ENERGY DEP	2	11/14/74	-0.2700E+0	0.47E+0	2.000E+1
N,3N	CROSS SECTION	7	10/03/72	-1.4900E+1	1.5000E+1	2.000E+1
N,3N	ENERGY-ANGLE DIST	5	10/03/72	-1.4900E+1	1.5000E+1	2.000E+1
N,3N	TOTAL ENERGY DEP	3	11/14/74	-1.4900E+1	1.5000E+1	2.000E+1
N,3N	LOCAL ENERGY DEP	3	11/14/74	-1.4900E+1	1.5000E+1	2.000E+1
N,G	CROSS SECTION	262	10/03/72	0.2600E+0	1.000E+10	2.000E+1
N,G	ENERGY DIST	2	11/20/72	0.2600E+0	1.000E+10	1.000E+2
N,G	MULTIPLICITY	3	11/20/72	0.2600E+0	1.000E+10	1.000E+2
N,G	TOTAL ENERGY DEP	2	11/14/74	0.2600E+0	1.000E+10	2.000E+1
N,G	LOCAL ENERGY DEP	2	11/14/74	0.2600E+0	1.000E+10	2.000E+1
N,X0	CROSS SECTION	54	11/20/72	0.0000E+0	9.9000E+3	2.000E+1
N,X0	ENERGY-ANGLE DIST	12	7/08/73	0.0000E+0	9.9000E+3	2.000E+1

G.A. FIER

02/12/76

64-GO-NAT
ATOMIC MASS = 1.5729* 2

REACTION		POINTS	DATE	Q-VALUE	E MIN	E MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	178	2/15/75	0.0000* 0	1.0000* 10	2.0000* 1	
N,ELASTIC	ANGULAR DIST.	8	10/03/72	0.0000* 0	5.0000* 1	2.0000* 1	
N,ELASTIC	TOTAL ENERGY DEP.	26	11/14/74	0.0000* 0	1.0000* 10	2.0000* 1	
N,ELASTIC	LOCAL ENERGY DEP.	26	11/14/74	0.0000* 0	1.0000* 10	2.0000* 1	
N,N'	CROSS SECTION	21	10/03/72	0.0000* 0	1.0000* 2	2.0000* 1	
N,N'	ENERGY-ANGLE DIST.	13	10/03/72	2.0000* 0	3.0000* 2	2.0000* 1	
N,N'	TOTAL ENERGY DEP.	19	11/14/74	0.0000* 0	3.0000* 2	2.0000* 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000* 0	3.0000* 2	2.0000* 1	
N,2N	CROSS SECTION	13	10/03/72	-6.3700* 0	6.4109* 0	2.0000* 1	
N,2N	ENERGY-ANGLE DIST.	8	10/03/72	-6.3700* 0	6.4109* 0	2.0000* 1	
N,2N	TOTAL ENERGY DEP.	15	11/14/74	-6.3700* 0	6.4109* 0	2.0000* 1	
N,2N	LOCAL ENERGY DEP.	4	11/14/74	-6.3700* 0	6.4109* 0	2.0000* 1	
N,3N	CROSS SECTION	7	10/03/72	-1.3400* 1	1.3500* 1	2.0000* 1	
N,3N	ENERGY-ANGLE DIST.	4	10/03/72	-1.3400* 1	1.3500* 1	2.0000* 1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.3400* 1	1.3500* 1	2.0000* 1	
N,3N	LOCAL ENERGY DEP.	2	11/14/74	-1.3400* 1	1.3500* 1	2.0000* 1	
N,O	CROSS SECTION	283	10/03/72	0.0400* 0	1.0000* 10	2.0000* 1	
N,O	ENERGY DIST.	2	11/21/72	0.0400* 0	1.0000* 10	1.0000* 2	
N,O	MULTIPLICITY	3	11/21/72	0.0400* 0	1.0000* 10	1.0000* 2	
N,O	TOTAL ENERGY DEP.	2	11/14/74	0.0400* 0	1.0000* 10	2.0000* 1	
N,O	LOCAL ENERGY DEP.	2	11/14/74	0.0400* 0	1.0000* 10	2.0000* 1	
N,XG	CROSS SECTION	54	11/21/72	0.0000* 0	9.9000* 1	2.0000* 1	
N,XG	ENERGY-ANGLE DIST.	12	7/08/73	0.0000* 0	9.9000* 1	2.0000* 1	

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67-MO-165
ATOMIC MASS = 1.6493 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N, ELASTIC	CROSS SECTION	154	10/03/72	0.0000 + 0	1.0000 - 10	2.0000 + 1	
N, ELASTIC	N ANGULAR DIST.	13	11/03/72	0.0000 + 0	2.0000 - 1	2.0000 + 1	
N, ELASTIC	N TOTAL ENERGY DEP.	28	11/14/74	0.0000 + 0	1.0000 - 10	2.0000 + 1	
N, ELASTIC	N LOCAL ENERGY DEP.	28	11/14/74	0.0000 + 0	1.0000 - 10	2.0000 + 1	
N, N'	CROSS SECTION	20	10/03/72	0.0000 + 0	9.5000 - 2	2.0000 + 1	
N, N'	N ENERGY-ANGLE DIST.	14	10/03/72	0.0000 + 0	9.5000 - 2	2.0000 + 1	
N, N'	N TOTAL ENERGY DEP.	19	11/14/74	0.0000 + 0	9.5000 - 2	2.0000 + 1	
N, N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000 + 0	9.5000 - 2	2.0000 + 1	
N, 2N	CROSS SECTION	16	10/03/72	-7.9900 + 0	0.0000 + 0	2.0000 + 1	
N, 2N	N ENERGY-ANGLE DIST.	9	10/03/72	-7.9900 + 0	0.0000 + 0	2.0000 + 1	
N, 2N	N TOTAL ENERGY DEP.	13	11/14/74	-7.9900 + 0	0.0000 + 0	2.0000 + 1	
N, 2N	N LOCAL ENERGY DEP.	3	11/14/74	-7.9900 + 0	0.0000 + 0	2.0000 + 1	
N, 3N	CROSS SECTION	7	10/03/72	-1.4670 + 1	1.4800 + 1	2.0000 + 1	
N, 3N	N ENERGY-ANGLE DIST.	5	10/03/72	-1.4670 + 1	1.4800 + 1	2.0000 + 1	
N, 3N	N TOTAL ENERGY DEP.	4	11/14/74	-1.4670 + 1	1.4800 + 1	2.0000 + 1	
N, 3N	N LOCAL ENERGY DEP.	4	11/14/74	-1.4670 + 1	1.4800 + 1	2.0000 + 1	
N, 0	CROSS SECTION	231	10/03/72	6.2000 + 0	1.0000 - 10	2.0000 + 1	
N, 0	D ENERGY DIST.	2	11/21/72	6.2000 + 0	1.0000 - 10	1.0000 - 2	
N, 0	O MULTIPLICITY	1	11/21/72	6.2000 + 0	1.0000 - 10	1.0000 - 2	
N, 0	O TOTAL ENERGY DEP.	3	11/14/74	6.2000 + 0	1.0000 - 10	2.0000 + 1	
N, 0	O LOCAL ENERGY DEP.	2	11/14/74	6.2000 + 0	1.0000 - 10	2.0000 + 1	
N, X0	CROSS SECTION	54	11/21/72	0.0000 + 0	9.9000 - 3	2.0000 + 1	
N, X0	O ENERGY-ANGLE DIST.	14	7/08/73	0.0000 + 0	9.9000 - 3	2.0000 + 1	

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S-1A-101
8095-2

REACTION	POINTS	DATE	Q (K.E.)	E (K.E.)	E (MAX)	
N,P	CROSS SECTION	6	17/01/72	-2 3900	1	2 3900
N,P	TOTAL ENERGY DEP.	2	11/14/74	-2 3400	1	2 3400
N,P	LOCAL ENERGY DEP.	2	11/14/74	-2 3300	1	2 3300
N,G	CROSS SECTION	1834	4/01/70	6 0000	0	1 0000
N,G	ENERGY-ANGLE DIST.	2	10/11/75	6 0000	0	1 0000
N,G	ENERGY DIST.	3	6/25/73	6 0000	0	1 0000
N,G	MULTIPLICITY	4	6/25/73	6 0000	0	1 0000
N,G	MULTIPLICITY	3	6/25/73	6 0000	0	1 0000
N,G	TOTAL ENERGY DEP.	2	11/14/74	6 0000	0	1 0000
N,G	LOCAL ENERGY DEP.	2	11/14/74	6 0000	0	1 0000
N,XG	CROSS SECTION	47	10/13/75	0 0000	0	3 4000
N,XG	ENERGY-ANGLE DIST.	23	10/13/75	0 0000	0	3 4000
N,XG	CROSS SECTION	31	7/22/74	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000
N,XG	CROSS SECTION	30	7/22/74	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000
N,XG	CROSS SECTION	25	7/22/74	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000
N,XG	CROSS SECTION	12	7/22/74	0 0000	0	6 2100
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	6 2100
N,XG	CROSS SECTION	12	7/22/74	0 0000	0	1 5950
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 5950
N,XG	CROSS SECTION	14	7/22/74	0 0000	0	3 0320
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	3 0320
N,XG	CROSS SECTION	9	7/22/74	0 0000	0	3 3940
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	3 3940
N,XG	CROSS SECTION	13	7/22/74	0 0000	0	4 9800
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	4 9800
N,XG	CROSS SECTION	8	7/22/74	0 0000	0	7 2400
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	7 2400
N,XG	CROSS SECTION	14	7/22/74	0 0000	0	3 0320
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	3 0320
N,XG	CROSS SECTION	7	7/22/74	0 0000	0	9 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	9 3000
N,XG	CROSS SECTION	9	7/22/74	0 0000	0	3 3940
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	3 3940
N,XG	CROSS SECTION	16	7/22/74	0 0000	0	4 9800
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	4 9800
N,XG	CROSS SECTION	13	7/22/74	0 0000	0	4 9800
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	4 9800
N,XG	CROSS SECTION	10	7/22/74	0 0000	0	4 9800
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	4 9800
N,XG	CROSS SECTION	7	7/22/74	0 0000	0	1 2000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 2000
N,XG	CROSS SECTION	5	11/26/73	0 0000	0	1 2000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 2000
N,XG	CROSS SECTION	5	11/26/73	0 0000	0	1 2000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 2000
N,XG	CROSS SECTION	6	11/26/73	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000
N,XG	CROSS SECTION	6	11/26/73	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000
N,XG	CROSS SECTION	5	11/26/73	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000
N,XG	CROSS SECTION	5	11/26/73	0 0000	0	1 3000
N,XG	ANGULAR DIST.	2	7/22/74	0 0000	0	1 3000

-73-

73-10-101

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 13-14-101
 ATOMIC MASS = 1.00950 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,XG	CROSS SECTION	6	11/26/73	0.0000+0	1.5000+0	2.0000+1	PHOTON = 1.3000+0 MEV
N,XG	G ANGULAR DIST	2	7/22/74	0.0000+0	1.5000+0	2.0000+1	PHOTON = 1.3000+0 MEV
N,XG	CROSS SECTION	6	11/26/73	0.0000+0	1.4000+0	2.0000+1	PHOTON = 1.1000+0 MEV
N,XG	G ANGULAR DIST	2	7/22/74	0.0000+0	1.4000+0	2.0000+1	PHOTON = 1.1000+0 MEV
N,XG	CROSS SECTION	5	11/26/73	0.0000+0	1.4500+0	2.0000+1	PHOTON = 1.2000+0 MEV
N,XG	G ANGULAR DIST	2	7/22/74	0.0000+0	1.4500+0	2.0000+1	PHOTON = 1.2000+0 MEV
N,XB	CROSS SECTION	47	10/13/75	0.0000+0	3.4500+2	2.0000+1	
N,XB	R CHARGE-ANGLE DIST.	20	10/13/75	0.0000+0	3.4500+2	2.0000+1	
N,XB	CROSS SECTION	18	7/22/74	0.0000+0	6.2100-1	2.0000+1	PHOTON = 3.1000-1 MEV
N,XB	CROSS SECTION	11	7/22/74	0.0000+0	1.5950-1	2.0000+1	PHOTON = 1.4200-1 MEV
N,XB	CROSS SECTION	25	7/22/74	0.0000+0	1.3600-1	2.0000+1	PHOTON = 6.0700-2 MEV
N,XB	CROSS SECTION	12	7/22/74	0.0000+0	6.2100-1	2.0000+1	PHOTON = 7.0400-2 MEV
N,XB	CROSS SECTION	12	7/22/74	0.0000+0	1.5950-1	2.0000+1	PHOTON = 8.5000-2 MEV
N,XB	CROSS SECTION	14	7/22/74	0.0000+0	3.0320-1	2.0000+1	PHOTON = 0.8000-2 MEV
N,XB	CROSS SECTION	9	7/22/74	0.0000+0	3.3900-1	2.0000+1	PHOTON = 1.1150-1 MEV
N,XB	CROSS SECTION	26	7/22/74	0.0000+0	1.3600-1	2.0000+1	PHOTON = 1.2810-1 MEV
N,XB	CROSS SECTION	12	7/22/74	0.0000+0	6.2100-1	2.0000+1	PHOTON = 1.2780-1 MEV
N,XB	CROSS SECTION	14	7/22/74	0.0000+0	3.0320-1	2.0000+1	PHOTON = 1.5500-1 MEV
N,XB	CROSS SECTION	9	7/22/74	0.0000+0	7.2000-1	2.0000+1	PHOTON = 1.5000-1 MEV
N,XB	CROSS SECTION	9	7/22/74	0.0000+0	3.3900-1	2.0000+1	PHOTON = 1.6890-1 MEV
N,XB	CROSS SECTION	13	7/22/74	0.0000+0	4.0000-1	2.0000+1	PHOTON = 1.6550-1 MEV
N,XB	CROSS SECTION	8	7/22/74	0.0000+0	7.2000-1	2.0000+1	PHOTON = 2.1500-1 MEV
N,XB	CROSS SECTION	13	7/22/74	0.0000+0	4.0000-1	2.0000+1	PHOTON = 2.0150-1 MEV
N,XB	CROSS SECTION	6	7/22/74	0.0000+0	4.0500-1	2.0000+1	PHOTON = 4.1480-1 MEV

02/12/76

76-W-1447
ATOMIC MASS = 1.8385+2

REACTION		POINTS	DATE	1 MIN	5 MIN	1 MIN	QUALIFIER
N,ELASTIC		CROSS SECTION	1249	11/26/74	0.0000+0	1.0000+1	2.0000+1
N,ELASTIC	N	ANGULAR DIST.	11	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,ELASTIC	N	TOTAL ENERGY DEP.	29	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,ELASTIC	N	LOCAL ENERGY DEP.	29	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,N'		CROSS SECTION	14	3/13/70	0.0000+0	1.0000+1	2.0000+1
N,N'	N	ENERGY-ANGLE DIST.	13	10/03/72	0.0000+0	1.0000+1	2.0000+1
N,N'	N	TOTAL ENERGY DEP.	20	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,N'	N	LOCAL ENERGY DEP.	2	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,2N		CROSS SECTION	9	3/13/70	0.0000+0	1.0000+1	2.0000+1
N,2N	N	ENERGY-ANGLE DIST.	7	10/03/72	0.0000+0	1.0000+1	2.0000+1
N,2N	N	TOTAL ENERGY DEP.	14	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,2N	N	LOCAL ENERGY DEP.	3	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,3N		CROSS SECTION	6	10/03/72	0.0000+0	1.0000+1	2.0000+1
N,3N	N	ENERGY-ANGLE DIST.	6	10/03/72	0.0000+0	1.0000+1	2.0000+1
N,3N	N	TOTAL ENERGY DEP.	4	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,3N	N	LOCAL ENERGY DEP.	2	11/24/74	0.0000+0	1.0000+1	2.0000+1
N,G		CROSS SECTION	1921	11/26/74	0.0000+0	1.0000+10	2.0000+1
N,G	G	ENERGY DIST.	2	11/21/72	0.0000+0	1.0000+10	1.0000+2
N,G	G	MULTIPLICITY	3	11/21/72	0.0000+0	1.0000+10	1.0000+2
N,G		TOTAL ENERGY DEP.	2	11/24/74	0.0000+0	1.0000+10	2.0000+1
N,G		LOCAL ENERGY DEP.	2	11/24/74	0.0000+0	1.0000+10	2.0000+1
N,X0		CROSS SECTION	94	11/26/72	0.0000+0	9.9000+1	2.0000+1
N,X0	G	ENERGY-ANGLE DIST.	12	7/09/73	0.0000+0	9.9000+1	2.0000+1

02/12/78

REACTION		POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,G	CROSS SECTION	349	3/09/73	5 4700+ 0	1 0000-10	2 0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/14/74	5 4700+ 0	1 0000-10	2 0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	5 4700+ 0	1 0000-10	2 0000+ 1	

74-M-106
ATOMIC MASS = 1.0505+ 2

02/12/76

75-RE-185
ATOMIC MASS = 18.9984

		REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC		CROSS SECTION	600	6/03/74	0.0000+0	1.0000+1	2.0000+1	
N,ELASTIC	N	ANGLE-ANG DIST	30	6/03/74	0.0000+0	1.0000+1	2.0000+1	
N,ELASTIC	N	TOTAL ENERGY DEP	30	11/19/74	0.0000+0	1.0000+1	2.0000+1	
N,ELASTIC	N	LOCAL ENERGY DEP	30	11/19/74	0.0000+0	1.0000+10	2.0000+1	
N,N'		CROSS SECTION	31	6/03/74	0.0000+0	1.0000+1	2.0000+1	
N,N'	N	ENERGY-ANGLE DIST	15	6/03/74	0.0000+0	1.0000+1	2.0000+1	
N,N'	N	TOTAL ENERGY DEP	15	11/19/74	0.0000+0	1.0000+1	2.0000+1	
N,N'	N	LOCAL ENERGY DEP	2	11/19/74	0.0000+0	1.0000+1	2.0000+1	
N,2N		CROSS SECTION	16	6/03/74	0.0000+0	1.0000+0	2.0000+1	
N,2N	N	ENERGY-ANGLE DIST	9	6/03/74	0.0000+0	1.0000+0	2.0000+1	
N,2N	N	TOTAL ENERGY DEP	14	11/19/74	0.0000+0	1.0000+0	2.0000+1	
N,2N	N	LOCAL ENERGY DEP	4	11/19/74	0.0000+0	1.0000+0	2.0000+1	
N,3N		CROSS SECTION	4	6/03/74	0.0000+1	1.0000+1	2.0000+1	
N,3N	N	ENERGY-ANGLE DIST	5	6/03/74	0.0000+1	1.0000+1	2.0000+1	
N,3N	N	TOTAL ENERGY DEP	4	11/19/74	0.0000+1	1.0000+1	2.0000+1	
N,3N	N	LOCAL ENERGY DEP	1	11/19/74	0.0000+1	1.0000+1	2.0000+1	
N,G		CROSS SECTION	1063	3/09/73	6.1780+0	1.0000+10	2.0000+1	
N,G	G	ENERGY DIST	2	6/03/74	6.1780+0	1.0000+13	2.0000+1	
N,G	G	MULTIPLICITY	1	6/03/74	6.1780+0	1.0000+10	2.0000+1	
N,G		TOTAL ENERGY DEP	2	11/19/74	6.1780+0	1.0000+10	2.0000+1	
N,G		LOCAL ENERGY DEP	2	11/19/74	6.1780+0	1.0000+10	2.0000+1	
N,XG		CROSS SECTION	15	6/06/74	0.0000+0	2.5000+1	2.0000+1	
N,XG	G	ENERGY-ANGLE DIST	15	6/06/74	0.0000+0	2.5000+1	2.0000+1	

02/12/76

75-RE-187
ATOMIC MASS = 1.8696 * 2

	REACTION	POINTS	DATE	Q-VALUE	E MIN	E MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	507	6/03/74	0.0000 * 0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	38	6/03/74	0.0000 * 0	1.0000-10	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	39	11/14/74	0.0000 * 0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	39	11/14/74	0.0000 * 0	1.0000-10	2.0000+1	
N,N	CROSS SECTION	26	6/03/74	0.0000 * 0	1.0000-10	2.0000+1	
N,N	ENERGY-ANGLE DIST.	14	6/03/74	0.0000 * 0	1.0000-10	2.0000+1	
N,N	TOTAL ENERGY DEP.	17	11/14/74	0.0000 * 0	1.0000-10	2.0000+1	
N,N	LOCAL ENERGY DEP.	2	11/14/74	0.0000 * 0	1.0000-10	2.0000+1	
N,N	CROSS SECTION	15	6/03/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	10	6/03/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,2N	TOTAL ENERGY DEP.	15	11/14/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,2N	LOCAL ENERGY DEP.	4	11/14/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,3N	CROSS SECTION	5	6/03/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,3N	ENERGY-ANGLE DIST.	5	6/03/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,3N	LOCAL ENERGY DEP.	2	11/14/74	-1.3560 * 1	1.0000-10	2.0000+1	
N,G	CROSS SECTION	896	3/09/73	5.0730 * 0	1.0000-10	2.0000+1	
N,G	ENERGY DIST.	2	6/03/74	5.0730 * 0	1.0000-10	2.0000+1	
N,G	MULTIPLICITY	3	6/03/74	5.0730 * 0	1.0000-10	2.0000+1	
N,G	TOTAL ENERGY DEP.	2	11/14/74	5.0730 * 0	1.0000-10	2.0000+1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	5.0730 * 0	1.0000-10	2.0000+1	
N,XG	CROSS SECTION	15	6/06/74	0.0000 * 0	2.5000-1	2.0000+1	
N,XG	ENERGY-ANGLE DIST.	15	6/06/74	0.0000 * 0	2.5000-1	2.0000+1	

02/12/76

77-1R-191
ATOMIC MASS = 1.9096+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,G	CROSS SECTION	295	3/09/73	6 2000+ 0	1 0000-10	2 0000+ 1	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6 2000+ 0	1 0000-10	2 0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6 2000+ 0	1 0000-10	2 0000+ 1	

02/12/76

REACTION		POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.G	CROSS SECTION	253	3/09/73	6 0700* 0	1 0000-10	2 0000* 1	
N.G	TOTAL ENERGY DEP	2	11/14/74	6 0700* 0	1 0000-10	2 0000* 1	
N.G	LOCAL ENERGY DEP	2	11/14/74	6 0700* 0	1 0000-10	2 0000* 1	

77-1R-193
 ATOMIC MASS = 1.3296* 2

02/12/76

78-P1-NAT
ATOMIC MASS = 1.9509* 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	93	7/05/72	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	ANGLE-AR DIST.	14	7/05/72	0.0000+0	1.0000-1	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	30	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	30	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	19	7/05/72	0.0000+0	1.5000-1	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	12	7/05/72	0.0000+0	1.5000-1	2.0000+1	
N,N'	TOTAL ENERGY DEP.	15	11/14/74	0.0000+0	1.5000-1	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000+0	1.5000-1	2.0000+1	
N,2N	CROSS SECTION	13	7/05/72	-6.0700+0	6.1014+0	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	7	7/05/72	-6.0700+0	6.1014+0	2.0000+1	
N,2N	TOTAL ENERGY DEP.	14	11/14/74	-6.0700+0	6.1014+0	2.0000+1	
N,2N	LOCAL ENERGY DEP.	3	11/14/74	-6.0700+0	6.1014+0	2.0000+1	
N,3N	CROSS SECTION	6	7/05/72	-1.3900+1	1.4000+1	2.0000+1	
N,3N	ENERGY-ANGLE DIST.	4	7/05/72	-1.3900+1	1.4000+1	2.0000+1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.3900+1	1.4000+1	2.0000+1	
N,3N	LOCAL ENERGY DEP.	4	11/14/74	-1.3900+1	1.4000+1	2.0000+1	
N,G	CROSS SECTION	1416	7/05/72	7.7200+0	1.0000-10	2.0000+1	
N,G	ENERGY DIST.	2	12/05/72	7.7200+0	1.0000-10	1.0000-2	
N,G	MULTIPLICITY	3	12/05/72	7.7200+0	1.0000-10	1.0000-2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	7.7200+0	1.0000-10	2.0000+1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	7.7200+0	1.0000-10	2.0000+1	
N,XO	CROSS SECTION	54	12/05/72	0.0000+0	9.9000-3	2.0000+1	
N,XO	ENERGY-ANGLE DIST.	12	7/09/73	0.0000+0	9.9000-3	2.0000+1	

02/12/76

79-AU-197
ATOMIC MASS = 1.9697* 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	117	6/20/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	23	1/01/72	0.0000+ 0	1.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	40	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	40	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	19	6/20/72	0.0000+ 0	0.0000- 2	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	20	6/29/72	0.0000+ 0	0.0000- 2	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	24	11/14/74	0.0000+ 0	0.0000- 2	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000+ 0	0.0000- 2	2.0000+ 1	
N,2N	CROSS SECTION	12	6/20/72	-0.0000+ 0	0.0000+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	7	6/20/72	-0.0000+ 0	0.0000+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	13	11/14/74	-0.0000+ 0	0.0000+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-0.0000+ 0	0.0000+ 0	2.0000+ 1	
N,3N	CROSS SECTION	6	6/20/72	-1.4750+ 1	1.4026+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	4	7/29/72	-1.4750+ 1	1.4026+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.4750+ 1	1.4026+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	4	11/14/74	-1.4750+ 1	1.4026+ 1	2.0000+ 1	
N,P	CROSS SECTION	12	6/20/72	4.0000- 2	1.0000+ 1	2.0000+ 1	
N,P	TOTAL ENERGY DEP.	2	11/14/74	0000- 2	1.0000+ 1	2.0000+ 1	
N,P	LOCAL ENERGY DEP.	2	11/14/74	4.0000- 2	1.0000+ 1	2.0000+ 1	
N,A	CROSS SECTION	6	6/20/72	7.0300+ 0	7.0000+ 0	2.0000+ 1	
N,A	TOTAL ENERGY DEP.	2	11/14/74	7.0300+ 0	7.0000+ 0	2.0000+ 1	
N,A	LOCAL ENERGY DEP.	2	11/14/74	7.0300+ 0	7.0000+ 0	2.0000+ 1	
N,G	CROSS SECTION	3544	11/04/74	6.5100+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	11/26/77	6.5100+ 0	1.0000-10	1.0000- 2	
N,G	MULTIPLICITY	3	11/26/72	6.5100+ 0	1.0000-10	1.0000- 2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6.5100+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6.5100+ 0	1.0000-10	2.0000+ 1	
N,XO	CROSS SECTION	54	11/21/72	0.0000+ 0	9.9000- 3	2.0000+ 1	
N,XO	ENERGY-ANGLE DIST.	12	7/09/73	0.0000+ 0	9.9000- 3	2.0000+ 1	

02/12/76

82-PB-NA1
ATOMIC MASS = 2.0719 ± 2

	REACTION	POINTS	DATE	G-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	80	3/14/72	0.0010 ± 0	1.0000 ± 10	2.0000 ± 1	
N,ELASTIC	ANGULAR DIST.	19	11/18/74	0.0010 ± 0	1.0000 ± 2	2.0000 ± 1	
N,ELASTIC	TOTAL ENERGY DEP.	37	11/14/74	0.0000 ± 0	5.0000 ± 1	2.0000 ± 1	
N,ELASTIC	LOCAL ENERGY DEP.	37	11/14/74	0.0000 ± 0	5.0000 ± 1	2.0000 ± 1	
N,N'	CROSS SECTION	10	3/23/72	0.0000 ± 0	5.0000 ± 1	2.0000 ± 1	
N,N'	ENERGY-ANGLE DIST.	12	3/23/72	0.0000 ± 0	5.0000 ± 1	2.0000 ± 1	
N,N'	TOTAL ENERGY DEP.	16	11/14/74	0.0000 ± 0	5.0000 ± 1	2.0000 ± 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000 ± 0	5.0000 ± 1	2.0000 ± 1	
N,2N	CROSS SECTION	9	3/23/72	-6.5000 ± 0	6.0000 ± 0	2.0000 ± 1	
N,2N	ENERGY-ANGLE DIST.	7	3/23/72	-6.5000 ± 0	6.0000 ± 0	2.0000 ± 1	
N,2N	TOTAL ENERGY DEP.	17	11/14/74	-6.5000 ± 0	6.0000 ± 0	2.0000 ± 1	
N,2N	LOCAL ENERGY DEP.	4	11/14/74	-6.5000 ± 0	6.0000 ± 0	2.0000 ± 1	
N,3N	CROSS SECTION	6	3/23/72	-1.4000 ± 1	1.4000 ± 1	2.0000 ± 1	
N,3N	ENERGY-ANGLE DIST.	3	3/24/72	-1.4000 ± 1	1.4000 ± 1	2.0000 ± 1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.4000 ± 1	1.4000 ± 1	2.0000 ± 1	
N,3N	LOCAL ENERGY DEP.	3	11/14/74	-1.4000 ± 1	1.4000 ± 1	2.0000 ± 1	
N,G	CROSS SECTION	83	12/21/72	7.3500 ± 0	1.0000 ± 10	1.0000 ± 2	
N,G	ENERGY-ANGLE DIST.	2	11/21/72	7.3500 ± 0	1.0000 ± 10	1.0000 ± 2	
N,G	MULTIPLICITY	3	11/21/72	7.3500 ± 0	1.0000 ± 10	1.0000 ± 2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	7.3500 ± 0	1.0000 ± 10	1.0000 ± 0	
N,G	LOCAL ENERGY DEP.	2	11/14/74	7.3500 ± 0	1.0000 ± 10	1.0000 ± 0	
N,XG	CROSS SECTION	94	11/21/72	0.0000 ± 0	9.9000 ± 3	2.0000 ± 1	
N,XG	ENERGY-ANGLE DIST.	12	7/09/73	0.0000 ± 0	9.9000 ± 3	2.0000 ± 1	

02/12/76

 90-TM-232
 ATOMIC MASS = 2.3204+ 2
 QUALIFIER

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	
N,ELASTIC	CROSS SECTION	2983	0/02/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N,ELASTIC	ANGULAR DIST.	13	1/01/72	0 0000+ 0	4 0000- 1	2 0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	29	11/14/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	29	11/14/74	0 0000+ 0	1 0000-10	2 0000+ 1	
N,N'	CROSS SECTION	62	10/20/72	0 0000+ 0	5 0000- 2	2 0000+ 1	
N,N'	ENERGY-ANGLE DIST.	13	10/20/72	0 0000+ 0	5 0000- 2	2 0000+ 1	
N,N'	TOTAL ENERGY DEP.	20	11/14/74	0 0000+ 0	5 0000- 2	2 0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0 0000+ 0	5 0000- 2	2 0000+ 1	
N,2N	CROSS SECTION	17	10/20/72	-6 3400- 0	6 5000+ 0	2 0000+ 1	
N,2N	ENERGY-ANGLE DIST.	9	10/20/72	-6 3400- 0	6 5000+ 0	2 0000+ 1	
N,2N	TOTAL ENERGY DEP.	17	11/14/74	-6 3400- 0	6 5000+ 0	2 0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-6 3400- 0	6 5000+ 0	2 0000+ 1	
N,3N	CROSS SECTION	8	10/20/72	-1 1560- 1	1 1610+ 1	2 0000+ 1	
N,3N	ENERGY-ANGLE DIST.	5	10/20/72	-1 1560- 1	1 1610+ 1	2 0000+ 1	
N,3N	TOTAL ENERGY DEP.	5	11/14/74	-1 1560- 1	1 1610+ 1	2 0000+ 1	
N,3N	LOCAL ENERGY DEP.	4	11/14/74	-1 1560- 1	1 1610+ 1	2 0000+ 1	
N,4N	CROSS SECTION	2	10/20/72	-1 8350- 1	1 8500+ 1	2 0000+ 1	
N,4N	ENERGY-ANGLE DIST.	3	10/20/72	-1 8350- 1	1 8500+ 1	2 0000+ 1	
N,4N	TOTAL ENERGY DEP.	2	11/14/74	-1 8350- 1	1 8500+ 1	2 0000+ 1	
N,4N	LOCAL ENERGY DEP.	2	11/14/74	-1 8350- 1	1 8500+ 1	2 0000+ 1	
N,F	CROSS SECTION	36	10/20/72	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,F	TOTAL ENERGY DEP.	2	11/14/74	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,F	LOCAL ENERGY DEP.	2	11/14/74	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,F	ENERGY-ANGLE DIST.	7	10/20/72	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,F	NEUTRONS/FISSION	6	10/20/72	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,F	ENERGY DIST.	2	12/14/72	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,F	MULTIPLICITY	2	12/14/72	1 7000- 2	1 0000+ 0	2 0000+ 1	
N,G	CROSS SECTION	5535	0/02/74	4 7900+ 0	1 0000-10	2 0000+ 1	
N,G	ENERGY DIST.	2	12/14/72	4 7900+ 0	1 0000-10	1 0000- 2	
N,G	MULTIPLICITY	3	12/14/72	4 7900+ 0	1 0000-10	1 0000- 2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	4 7900+ 0	1 0000-10	2 0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	4 7900+ 0	1 0000-10	2 0000+ 1	
N,NG	CROSS SECTION	54	12/14/72	0 0000+ 0	9 9000- 3	2 0000+ 1	
N,NG	ENERGY-ANGLE DIST.	12	12/14/72	0 0000+ 0	9 9000- 3	2 0000+ 1	

02/12/76

92-U -233
ATOMIC MASS = 2.3304 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	343	6/15/73	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	ANGULAR DIST.	20	11/03/72	0.0000 + 0	4.0000-2	2.0000 + 1	
N,ELASTIC	TOTAL ENERGY DEP.	33	11/14/74	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	LOCAL ENERGY DEP.	33	11/14/74	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	CROSS SECTION	32	3/13/70	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	ENERGY-ANGLE DIST.	11	11/03/72	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	TOTAL ENERGY DEP.	17	11/14/74	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000 + 0	1.0000-10	2.0000 + 1	
N,2N	CROSS SECTION	12	12/24/74	-5.0000 + 0	6.0000-0	2.0000 + 1	
N,2N	ENERGY-ANGLE DIST.	8	11/03/72	-5.0000 + 0	6.0000-0	2.0000 + 1	
N,2N	TOTAL ENERGY DEP.	14	11/14/74	-5.0000 + 0	6.0000-0	2.0000 + 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-5.0000 + 0	6.0000-0	2.0000 + 1	
N,3N	CROSS SECTION	6	12/28/74	-1.3100 + 1	1.3500 + 1	2.0000 + 1	
N,3N	ENERGY-ANGLE DIST.	5	11/03/72	-1.3100 + 1	1.3500 + 1	2.0000 + 1	
N,3N	TOTAL ENERGY DEP.	3	11/14/74	-1.3100 + 1	1.3500 + 1	2.0000 + 1	
N,3N	LOCAL ENERGY DEP.	2	11/14/74	-1.3100 + 1	1.3500 + 1	2.0000 + 1	
N,F	CROSS SECTION	1614	11/22/75	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	TOTAL ENERGY DEP.	2	11/14/74	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	LOCAL ENERGY DEP.	2	11/14/74	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	5	11/03/72	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	NEUTRONS/FISSION	13	12/24/74	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY DIST.	2	12/14/72	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	MULTIPLICITY	2	12/14/72	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	NEUTRONS/FISSION	5	3/26/71	1.0000 + 2	1.0000-10	2.0000 + 1	DELAYED
N,G	CROSS SECTION	1954	6/15/73	6.8400 + 0	1.0000-10	2.0000 + 1	
N,G	ENERGY DIST.	2	12/14/72	6.8400 + 0	1.0000-10	1.0000-2	
N,G	MULTIPLICITY	3	12/14/72	6.8400 + 0	1.0000-10	1.0000-2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6.8400 + 0	1.0000-10	2.0000 + 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6.8400 + 0	1.0000-10	2.0000 + 1	
N,XG	CROSS SECTION	54	12/14/72	0.0000 + 0	9.9000-3	2.0000 + 1	
N,XG	ENERGY-ANGLE DIST.	12	12/14/72	0.0000 + 0	9.9000-3	2.0000 + 1	

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92-U -234
ATOMIC MASS = 234.04092

	REACTION	POINTS	DATE	G-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	37	11/03/72	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	28	11/03/72	0.0000+0	4.0000-2	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	31	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	31	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	19	11/15/72	0.0000+0	4.0000-2	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	13	11/15/72	0.0000+0	4.0000-2	2.0000+1	
N,N'	TOTAL ENERGY DEP.	23	11/14/74	0.0000+0	4.0000-2	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000+0	4.0000-2	2.0000+1	
N,2N	CROSS SECTION	13	11/15/72	6.0000+0	6.0000+0	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	7	11/15/72	6.0000+0	6.0000+0	2.0000+1	
N,2N	TOTAL ENERGY DEP.	16	11/14/74	6.0000+0	6.0000+0	2.0000+1	
N,2N	LOCAL ENERGY DEP.	8	11/14/74	6.0000+0	6.0000+0	2.0000+1	
N,3N	CROSS SECTION	7	11/15/72	-1.2500+1	1.2500+1	2.0000+1	
N,3N	ENERGY-ANGLE DIST.	4	11/15/72	-1.2500+1	1.2500+1	2.0000+1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.2500+1	1.2500+1	2.0000+1	
N,3N	LOCAL ENERGY DEP.	4	11/14/74	-1.2500+1	1.2500+1	2.0000+1	
N,f	CROSS SECTION	40	11/22/75	1.0000+2	1.0000-1	2.0000+1	
N,f	TOTAL ENERGY DEP.	2	11/14/74	1.0000+2	1.0000-1	2.0000+1	
N,f	LOCAL ENERGY DEP.	2	11/14/74	1.0000+2	1.0000-1	2.0000+1	
N,f	ENERGY-ANGLE DIST.	6	11/15/72	1.0000+2	1.0000-1	2.0000+1	
N,f	NEUTRONS/FISSION	7	11/15/72	1.0000+2	1.0000-1	2.0000+1	
N,f	ENERGY DIST.	2	12/14/72	1.0000+2	1.0000-1	2.0000+1	
N,f	MULTIPLICITY	2	12/14/72	1.0000+2	1.0000-1	2.0000+1	
N,g	CROSS SECTION	77	11/07/72	5.3100+0	1.0000-10	2.0000+1	
N,g	ENERGY DIST.	2	12/14/72	5.3100+0	1.0000-10	1.0000-2	
N,g	MULTIPLICITY	3	12/14/72	5.3100+0	1.0000-10	1.0000-2	
N,g	TOTAL ENERGY DEP.	2	11/14/74	5.3100+0	1.0000-10	2.0000+1	
N,g	LOCAL ENERGY DEP.	2	11/14/74	5.3100+0	1.0000-10	2.0000+1	
N,XG	CROSS SECTION	54	12/14/72	0.0000+0	9.9000-3	2.0000+1	
N,XG	ENERGY-ANGLE DIST.	12	12/14/72	5.0000+0	9.9000-3	2.0000+1	

02/12/76

92-U -235
ATOMIC MASS = 2.3504 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	235	1/27/76	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	ANGULAR DIST.	28	1/03/72	0.0000 + 0	4.0000-2	2.0000 + 1	
N,ELASTIC	TOTAL ENERGY DEP.	31	11/14/74	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	LOCAL ENERGY DEP.	21	11/14/74	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N	CROSS SECTION	25	1/25/76	0.0000 + 0	2.0000-2	2.0000 + 1	
N,N'	ENERGY-ANGLE DIST.	17	3/04/72	0.0000 + 0	2.0000-2	2.0000 + 1	
N,N'	TOTAL ENERGY DEP.	35	11/14/74	0.0000 + 0	2.0000-2	2.0000 + 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000 + 0	2.0000-2	2.0000 + 1	
N,2N	CROSS SECTION	17	12/28/74	-5.2300 + 0	5.2524 + 0	2.0000 + 1	
N,2N	ENERGY-ANGLE DIST.	7	12/15/71	-5.2300 + 0	5.2524 + 0	2.0000 + 1	
N,2N	TOTAL ENERGY DEP.	19	11/14/74	-5.2300 + 0	5.2524 + 0	2.0000 + 1	
N,2N	LOCAL ENERGY DEP.	7	11/14/74	-5.2300 + 0	5.2524 + 0	2.0000 + 1	
N,3N	CROSS SECTION	7	1/27/76	-1.2000 + 1	1.2500 + 1	2.0000 + 1	
N,3N	ENERGY-ANGLE DIST.	4	9/22/71	-1.2000 + 1	1.2500 + 1	2.0000 + 1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.2000 + 1	1.2500 + 1	2.0000 + 1	
N,3N	LOCAL ENERGY DEP.	2	11/14/74	-1.2000 + 1	1.2500 + 1	2.0000 + 1	
N,4N	CROSS SECTION	3	5/04/71	-1.7890 + 1	1.7970 + 1	2.0000 + 1	
N,4N	ENERGY-ANGLE DIST.	2	5/04/71	-1.7870 + 1	1.7970 + 1	2.0000 + 1	
N,4N	TOTAL ENERGY DEP.	2	11/14/74	-1.7890 + 1	1.7970 + 1	2.0000 + 1	
N,4N	LOCAL ENERGY DEP.	2	11/14/74	-1.7890 + 1	1.7970 + 1	2.0000 + 1	
N,F	CROSS SECTION	1511	1/26/76	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	TOTAL ENERGY DEP.	3	11/14/74	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	LOCAL ENERGY DEP.	3	11/14/74	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	6	1/13/73	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	NEUTRONS/FISSION	11	1/25/76	1.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY DIST.	2	1/30/73	1.0000 + 2	1.0000-10	1.0900 + 0	
N,F	MULTIPLICITY	3	1/30/73	1.0000 + 2	1.0000-10	1.0900 + 0	
N,F	NEUTRONS/FISSION	5	3/26/71	1.0000 + 2	1.0000-10	2.0000 + 1	
N,G	CROSS SECTION	767	1/10/72	6.5500 + 0	1.0000-10	2.0000 + 1	DELAYED
N,G	ENERGY-ANGLE DIST.	2	1/30/73	6.5500 + 0	1.0000-10	1.0900 + 0	
N,G	MULTIPLICITY	3	1/30/73	6.5500 + 0	1.0000-10	1.0900 + 0	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6.5500 + 0	1.0000-10	2.0000 + 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6.5500 + 0	1.0000-10	2.0000 + 1	
N,X0	CROSS SECTION	18	1/30/73	0.0000 + 0	2.0000-2	2.0000 + 1	
N,X0	ENERGY DIST.	18	1/30/73	0.0000 + 0	2.0000-2	2.0000 + 1	

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92-U -236
ATOMIC MASS = 2.3605+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	35	11/15/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	20	1/03/72	0.0000+ 0	4.0000- 2	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	31	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	31	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	21	11/15/72	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,N'	N ENERGY-ANGLE DIST.	13	11/15/72	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP.	32	11/14/74	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000+ 0	5.0000- 2	2.0000+ 1	
N,2N	CROSS SECTION	14	11/15/72	-6.5500+ 0	5.5000+ 0	2.0000+ 1	
N,2N	N ENERGY-ANGLE DIST.	7	11/15/72	-6.5500+ 0	6.5000+ 0	2.0000+ 1	
N,2N	N TOTAL ENERGY DEP.	19	11/14/74	-6.5500+ 0	6.5000+ 0	2.0000+ 1	
N,2N	N LOCAL ENERGY DEP.	3	11/14/74	-6.5500+ 0	6.5000+ 0	2.0000+ 1	
N,3N	CROSS SECTION	8	12/28/74	-1.1850+ 1	1.1910+ 1	2.0000+ 1	
N,3N	N ENERGY-ANGLE DIST.	5	11/15/72	-1.1850+ 1	1.1910+ 1	2.0000+ 1	
N,3N	N TOTAL ENERGY DEP.	5	11/14/74	-1.1850+ 1	1.1910+ 1	2.0000+ 1	
N,3N	N LOCAL ENERGY DEP.	4	11/14/74	-1.1850+ 1	1.1910+ 1	2.0000+ 1	
N,F	CROSS SECTION	40	2/02/76	1.0000+ 2	1.0000-10	2.0000+ 1	
N,F	N TOTAL ENERGY DEP.	2	11/14/74	1.0000+ 2	1.0000-10	2.0000+ 1	
N,F	N LOCAL ENERGY DEP.	2	11/14/74	1.0000+ 2	1.0000-10	2.0000+ 1	
N,F	N ENERGY-ANGLE DIST.	6	11/15/72	1.0000+ 2	1.0000-10	2.0000+ 1	
N,F	N NEUTRONS/FISSION	6	11/15/72	1.0000+ 2	1.0000-10	2.0000+ 1	
N,F	G ENERGY DIST.	2	12/14/72	1.0000+ 2	1.0000-10	2.0000+ 1	
N,F	G MULTIPLICITY	2	12/14/72	1.0000+ 2	1.0000-10	2.0000+ 1	
N,G	CROSS SECTION	127	10/27/75	5.1200+ 0	1.0000-10	2.0000+ 1	
N,G	G ENERGY DIST.	2	12/14/72	5.1200+ 0	1.0000-10	1.0000- 2	
N,G	G MULTIPLICITY	3	12/14/72	5.1200+ 0	1.0000-10	1.0000- 2	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	5.1200+ 0	1.0000-10	2.0000+ 1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	5.1200+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	54	12/14/72	0.0000+ 0	9.9000- 3	2.0000+ 1	
N,XG	G ENERGY-ANGLE DIST.	12	12/14/72	0.0000+ 0	9.9000- 3	2.0000+ 1	

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92-U -237
ATOMIC MASS = 2.3712+ 2

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	48	9/27/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	20	1/03/72	0.0000+ 0	4.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	35	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	35	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	22	11/15/72	0.0000+ 0	2.0000- 2	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	11	11/15/72	0.0000+ 0	2.0000- 2	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	26	11/14/74	0.0000+ 0	2.0000- 2	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000+ 0	2.0000- 2	2.0000+ 1	
N,2N	CROSS SECTION	11	11/15/72	-5.1200+ 0	5.1500+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	7	11/15/72	-5.1200+ 0	5.1500+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	15	11/14/74	-5.1200+ 0	5.1500+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-5.1200+ 0	5.1500+ 0	2.0000+ 1	
N,3N	CROSS SECTION	7	11/15/72	-1.1670+ 1	1.1720+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	5	11/15/72	-1.1670+ 1	1.1720+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	5	11/14/74	-1.1670+ 1	1.1720+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	3	11/14/74	-1.1670+ 1	1.1720+ 1	2.0000+ 1	
N,F	CROSS SECTION	81	9/27/75	1.8000+ 2	1.0000-10	2.0000+ 1	
N,F	TOTAL ENERGY DEP.	3	11/14/74	1.8000+ 2	1.0000-10	2.0000+ 1	
N,F	LOCAL ENERGY DEP.	3	11/14/74	1.8000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	5	11/15/72	1.8000+ 2	1.0000-10	2.0000+ 1	
N,F	NEUTRONS/FISSION	18	11/15/72	1.8000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY DIST.	2	12/14/72	1.8000+ 2	1.0000-10	1.0000- 2	
N,F	MULTIPLICITY	3	12/14/72	1.8000+ 2	1.0000-10	1.0000- 2	
N,G	CROSS SECTION	174	9/27/75	6.1400+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	12/14/72	6.1400+ 0	1.0000-10	1.0000- 2	
N,G	MULTIPLICITY	3	12/14/72	6.1400+ 0	1.0000-10	1.0000- 2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6.1400+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6.1400+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	15	9/30/75	0.0000+ 0	9.9000- 3	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	15	9/30/75	0.0000+ 0	9.9000- 3	2.0000+ 1	

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ATOMIC MASS • 230.04390

[illegible]

02/12/75

92-U -230
ATOMIC MASS = 2.3805+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,4N	N LOCAL ENERGY DEP.	2	11/14/74	-1.7820+ 1	1.8000+ 1	2.0000+ 1	
N,F	N CROSS SECTION	41	2/02/76	1.8000+ 2	4.5000+ 1	2.0000+ 1	
N,F	N TOTAL ENERGY DEP.	2	11/14/74	1.8000+ 2	4.5000+ 1	2.0000+ 1	
N,F	N LOCAL ENERGY DEP.	2	11/14/74	1.8000+ 2	4.5000+ 1	2.0000+ 1	
N,F	N ENERGY-ANGLE DIST.	8	1/17/70	1.8000+ 2	4.5000+ 1	2.0000+ 1	
N,F	N NEUTRONS/FISSION	5	12/24/74	1.8000+ 2	4.5000+ 1	2.0000+ 1	
N,F	G ENERGY DIST.	2	1/29/73	1.8000+ 2	4.5000+ 1	1.0900+ 0	
N,F	G MULTIPLICITY	3	1/29/73	1.8000+ 2	4.5000+ 1	1.0900+ 0	
N,F	N NEUTRONS/FISSION	4	3/26/71	1.8000+ 2	4.5000+ 1	2.0000+ 1	DELAYED
N,G	N CROSS SECTION	1468	1/09/76	4.8000+ 0	1.0000+ 10	2.0000+ 1	
N,G	G ENERGY-ANGLE DIST.	2	1/29/73	4.8000+ 0	1.0000+ 10	1.0900+ 0	
N,G	G MULTIPLICITY	3	1/29/73	4.8000+ 0	1.0000+ 10	1.0900+ 0	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	4.8000+ 0	1.0000+ 10	2.0000+ 1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	4.8000+ 0	1.0000+ 10	2.0000+ 1	
N,XG	N CROSS SECTION	9	1/29/73	0.0000+ 0	5.3000+ 1	2.0000+ 1	
N,XG	G ENERGY DIST.	9	1/29/73	0.0000+ 0	5.3000+ 1	2.0000+ 1	
N,XG	N CROSS SECTION	10	1/29/73	0.0000+ 0	5.3000+ 2	1.0900+ 1	
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	5.0000+ 2	2.0000+ 1	PHOTON = 5.0000- 2 MEV
N,XG	N CROSS SECTION	9	1/29/73	0.0000+ 0	1.5000+ 1	1.0900+ 0	PHOTON = 1.0000- 1 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.5000+ 1	2.0000+ 1	PHOTON = 1.0000- 1 MEV
N,XG	N CROSS SECTION	9	1/29/73	0.0000+ 0	1.5000+ 1	1.0900+ 0	PHOTON = 1.5000- 1 MEV
N,XG	G ANGULAR DIST.	2	5/31/73	0.0000+ 0	1.5000+ 1	2.0000+ 1	PHOTON = 1.5000- 1 MEV

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92-U -239
ATOMIC MASS = 2.3913 + 2

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	33	10/30/75	0.0000 + 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	20	11/03/72	0.0000 + 0	4.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	36	11/14/74	0.0000 + 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	36	11/14/74	0.0000 + 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	19	11/15/72	0.0000 + 0	5.0000- 2	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	12	11/15/72	0.0000 + 0	5.0000- 2	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	28	11/14/74	0.0000 + 0	5.0000- 2	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000 + 0	5.0000- 2	2.0000+ 1	
N,2N	CROSS SECTION	14	11/15/72	-4.0000 + 0	4.0000- 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	7	11/15/72	-4.0000 + 0	4.0000- 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	17	11/14/74	-4.0000 + 0	4.0000- 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-4.0000 + 0	4.0000- 0	2.0000+ 1	
N,3N	CROSS SECTION	12	11/15/72	-1.0950 + 1	1.1000+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	5	11/15/72	-1.0950 + 1	1.1000+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	5	11/14/74	-1.0950 + 1	1.1000+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	3	11/14/74	-1.0950 + 1	1.1000+ 1	2.0000+ 1	
N,4N	CROSS SECTION	5	11/15/72	-1.6070 + 1	1.6150+ 1	2.0000+ 1	
N,4N	ENERGY-ANGLE DIST.	4	11/15/72	-1.6070 + 1	1.6150+ 1	2.0000+ 1	
N,4N	TOTAL ENERGY DEP.	3	11/14/74	-1.6070 + 1	1.6150+ 1	2.0000+ 1	
N,4N	LOCAL ENERGY DEP.	3	11/14/74	-1.6070 + 1	1.6150+ 1	2.0000+ 1	
N,F	CROSS SECTION	163	10/30/75	1.0000 + 2	1.0000-10	2.0000+ 1	
N,F	TOTAL ENERGY DEP.	2	11/14/74	1.0000 + 2	1.0000-10	2.0000+ 1	
N,F	LOCAL ENERGY DEP.	2	11/14/74	1.0000 + 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	4	11/15/72	1.0000 + 2	1.0000-10	2.0000+ 1	
N,F	NEUTRONS/ISSION	2	11/15/72	1.0000 + 2	1.0000-10	2.0000+ 1	
N,F	ENERGY DIST.	2	12/14/72	1.0000 + 2	1.0000-10	2.0000+ 1	
N,F	MULTIPLICITY	2	12/14/72	1.0000 + 2	1.0000-10	2.0000+ 1	
N,G	CROSS SECTION	211	10/30/75	5.9300 + 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	12/14/72	5.9300 + 0	1.0000-10	1.0000- 2	
N,G	MULTIPLICITY	3	12/14/72	5.9300 + 0	1.0000-10	1.0000- 2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	5.9300 + 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	5.9300 + 0	1.0000-10	2.0000+ 1	
N,XO	CROSS SECTION	54	12/14/72	0.0000 + 0	9.9000- 3	2.0000+ 1	
N,XO	ENERGY-ANGLE DIST.	12	12/14/72	0.0000 + 0	9.9000- 3	2.0000+ 1	

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92-U -240
ATOMIC MASS = 2.4013+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	33	11/15/72	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	28	11/03/72	0.0000+ 0	4.0000+ 2	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	31	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	31	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	18	11/15/72	0.0000+ 0	1.0000+ 2	2.0000+ 1	
N,N'	N ENERGY-ANGLE DIST.	11	11/15/72	0.0000+ 0	1.0000+ 2	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP.	20	11/14/74	0.0000+ 0	1.0000+ 2	2.0000+ 1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000+ 0	1.0000+ 2	2.0000+ 1	
N,2N	CROSS SECTION	13	11/15/72	-5.9300+ 0	5.9600+ 0	2.0000+ 1	
N,2N	N ENERGY-ANGLE DIST.	5	11/15/72	-5.9300+ 0	5.9600+ 0	2.0000+ 1	
N,2N	N TOTAL ENERGY DEP.	20	11/14/74	-5.9300+ 0	5.9600+ 0	2.0000+ 1	
N,2N	N LOCAL ENERGY DEP.	2	11/14/74	-5.9300+ 0	5.9600+ 0	2.0000+ 1	
N,3N	CROSS SECTION	10	11/15/72	-1.0740+ 1	1.0800+ 1	2.0000+ 1	
N,3N	N ENERGY-ANGLE DIST.	5	11/15/72	-1.0740+ 1	1.0800+ 1	2.0000+ 1	
N,3N	N TOTAL ENERGY DEP.	5	11/14/74	-1.0740+ 1	1.0800+ 1	2.0000+ 1	
N,3N	N LOCAL ENERGY DEP.	2	11/14/74	-1.0740+ 1	1.0800+ 1	2.0000+ 1	
N,4N	CROSS SECTION	5	11/15/72	-1.6880+ 1	1.7000+ 1	2.0000+ 1	
N,4N	N ENERGY-ANGLE DIST.	3	11/15/72	-1.6880+ 1	1.7000+ 1	2.0000+ 1	
N,4N	N TOTAL ENERGY DEP.	3	11/14/74	-1.6880+ 1	1.7000+ 1	2.0000+ 1	
N,4N	N LOCAL ENERGY DEP.	3	11/14/74	-1.6880+ 1	1.7000+ 1	2.0000+ 1	
N,F	CROSS SECTION	17	11/15/72	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,F	N TOTAL ENERGY DEP.	2	11/14/74	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,F	N LOCAL ENERGY DEP.	2	11/14/74	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,F	N ENERGY-ANGLE DIST.	6	11/15/72	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,F	N NEUTRONS/FISSION	6	11/15/72	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,F	G ENERGY DIST.	2	12/14/72	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,F	G MULTIPLICITY	2	12/14/72	1.0000+ 2	1.0000+ 0	2.0000+ 1	
N,G	CROSS SECTION	79	12/13/71	6.0800+ 0	1.0000-10	2.0000+ 1	
N,G	L ENERGY DIST.	2	12/14/72	6.0800+ 0	1.0000-10	1.0000+ 2	
N,G	G MULTIPLICITY	3	12/14/72	6.0800+ 0	1.0000-10	1.0000+ 2	
N,O	N TOTAL ENERGY DEP.	2	11/14/74	6.0800+ 0	1.0000-10	2.0000+ 1	
N,O	N LOCAL ENERGY DEP.	2	11/14/74	6.0800+ 0	1.0000-10	2.0000+ 1	
N,XO	CROSS SECTION	34	12/14/72	0.0000+ 0	9.9000+ 3	2.0000+ 1	
N,XO	G ENERGY-ANGLE DIST.	12	12/14/72	0.0000+ 0	9.9000+ 3	2.0000+ 1	

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93-NP-237
ATOMIC MASS = 2.3700-2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	423	4/20/73	0.0000-0	1.0000-10	2.0000-1	
N.ELASTIC	N ANGULAR DIST	20	5/10/73	0.0000-0	4.0000-2	2.0000-1	
N.ELASTIC	N TOTAL ENERGY DEP	36	11/14/74	0.0000-0	1.0000-10	2.0000-1	
N.ELASTIC	N LOCAL ENERGY DEP	36	11/14/74	0.0000-0	1.0000-10	2.0000-1	
N.N'	CROSS SECTION	15	5/10/73	0.0000-0	3.5000-2	2.0000-1	
N.N'	N ENERGY-ANGLE DIST.	12	4/20/73	0.0000-0	3.5000-2	2.0000-1	
N.N'	N TOTAL ENERGY DEP.	19	11/14/74	0.0000-0	3.5000-2	2.0000-1	
N.N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000-0	3.5000-2	2.0000-1	
N.2N	CROSS SECTION	19	3/09/73	0.0000-0	3.5000-2	2.0000-1	
N.2N	N ENERGY-ANGLE DIST.	0	4/20/73	-6.5100-0	6.5100-0	2.0000-1	
N.2N	N TOTAL ENERGY DEP.	19	11/14/74	-6.5100-0	6.5100-0	2.0000-1	
N.2N	N LOCAL ENERGY DEP.	2	11/14/74	-6.5100-0	6.5100-0	2.0000-1	
N.3N	CROSS SECTION	8	5/10/73	-1.2310-1	1.2400-1	2.0000-1	
N.3N	N ENERGY-ANGLE DIST.	5	5/20/73	-1.2310-1	1.2400-1	2.0000-1	
N.3N	N TOTAL ENERGY DEP.	5	11/14/74	-1.2310-1	1.2400-1	2.0000-1	
N.3N	N LOCAL ENERGY DEP.	4	11/14/74	-1.2310-1	1.2400-1	2.0000-1	
N.F	CROSS SECTION	151	4/20/73	1.0000-2	1.0000-10	2.0000-1	
N.F	N TOTAL ENERGY DEP.	3	11/14/74	1.0000-2	1.0000-10	2.0000-1	
N.F	N LOCAL ENERGY DEP.	3	11/14/74	1.0000-2	1.0000-10	2.0000-1	
N.F	N ENERGY-ANGLE DIST.	5	4/20/73	1.0000-2	1.0000-10	2.0000-1	
N.F	N NEUTRONS/FISSION	5	4/20/73	1.0000-2	1.0000-10	2.0000-1	
N.F	O ENERGY DIST.	2	6/14/73	1.0000-2	1.0000-10	2.0000-1	
N.F	O MULTIPLICITY	2	6/14/73	1.0000-2	1.0000-10	2.0000-1	
N.G	CROSS SECTION	1269	4/20/73	5.4800-0	1.0000-10	2.0000-1	
N.G	O ENERGY DIST.	2	6/14/73	5.4800-0	1.0000-10	1.0000-2	
N.G	G MULTIPLICITY	3	6/14/73	5.4800-0	1.0000-10	1.0000-2	
N.G	N TOTAL ENERGY DEP.	2	11/14/74	5.4800-0	1.0000-10	2.0000-1	
N.G	N LOCAL ENERGY DEP.	2	11/14/74	5.4800-0	1.0000-10	2.0000-1	
N.XO	CROSS SECTION	54	6/14/73	0.0000-0	9.0000-3	2.0000-1	
N.XO	O ENERGY-ANGLE DIST	12	6/14/73	0.0000-0	9.0000-3	2.0000-1	

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94-PU-238
ATOMIC MASS = 238.02891

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	395	1/03/75	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	ANGULAR DIST.	20	1/03/72	0.0000+0	5.0000-2	2.0000+1	
N,ELASTIC	TOTAL ENERGY DEP.	33	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	LOCAL ENERGY DEP.	33	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	13	11/15/72	0.0000+0	5.0000-2	2.0000+1	
N,N'	ENERGY-ANGLE DIST.	12	11/15/72	0.0000+0	5.0000-2	2.0000+1	
N,N'	TOTAL ENERGY DEP.	31	11/14/74	0.0000+0	5.0000-2	2.0000+1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000+0	5.0000-2	2.0000+1	
N,2N	CROSS SECTION	10	11/15/72	-7.0000+0	7.0000+0	2.0000+1	
N,2N	ENERGY-ANGLE DIST.	5	11/15/72	-7.0000+0	7.0000+0	2.0000+1	
N,2N	TOTAL ENERGY DEP.	17	11/14/74	1.0000+0	7.0000+0	2.0000+1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-7.0000+0	7.0000+0	2.0000+1	
N,3N	CROSS SECTION	5	11/15/72	-1.2000+1	1.2000+1	2.0000+1	
N,3N	ENERGY-ANGLE DIST.	4	11/15/72	-1.2000+1	1.2000+1	2.0000+1	
N,3N	TOTAL ENERGY DEP.	4	11/14/74	-1.2000+1	1.2000+1	2.0000+1	
N,3N	LOCAL ENERGY DEP.	4	11/14/74	-1.2000+1	1.2000+1	2.0000+1	
N,F	CROSS SECTION	574	1/03/75	1.0000+0	1.0000-10	2.0000+1	
N,F	TOTAL ENERGY DEP.	2	11/14/74	1.0000+0	1.0000-10	2.0000+1	
N,F	LOCAL ENERGY DEP.	2	11/14/74	1.0000+0	1.0000-10	2.0000+1	
N,F	ENERGY-ANGLE DIST.	4	11/15/72	1.0000+0	1.0000-10	2.0000+1	
N,F	NEUTRONS/FISSION	17	11/15/72	1.0000+0	1.0000-10	2.0000+1	
N,F	ENERGY DIST.	2	12/14/72	1.0000+0	1.0000-10	2.0000+1	
N,F	MULTIPLICITY	2	12/14/72	1.0000+0	1.0000-10	2.0000+1	
N,O	CROSS SECTION	629	1/03/75	5.6600+0	1.0000-10	2.0000+1	
N,O	ENERGY DIST.	2	12/14/72	5.6600+0	1.0000-10	1.0000-2	
N,O	MULTIPLICITY	3	12/14/72	5.6600+0	1.0000-10	1.0000-2	
N,O	TOTAL ENERGY DEP.	2	11/14/74	5.6600+0	1.0000-10	2.0000+1	
N,O	LOCAL ENERGY DEP.	2	11/14/74	5.6600+0	1.0000-10	2.0000+1	
N,XO	CROSS SECTION	54	12/14/72	0.0000+0	9.9000+3	2.0000+1	
N,XO	ENERGY-ANGLE DIST.	12	12/14/72	0.0000+0	9.9000+3	2.0000+1	

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 94-PU-239
 ATOMIC MASS = 239.05219

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,G	CROSS SECTION	1480	4/25/73	6.5300+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	11/30/72	6.5300+ 0	1.0000-10	3.0200- 1	
N,G	MULTIPLICITY	3	11/30/72	6.5300+ 0	1.0000-10	3.0200- 1	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6.5300+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6.5300+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	11	11/30/72	0.0000+ 0	3.0000- 1	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	10	11/30/72	0.0000+ 0	3.0000- 1	2.0000+ 1	
N,XG	CROSS SECTION	9	11/30/72	0.0000+ 0	6.0000- 2	3.0200- 1	PHOTON = 6.0000- 2 MEV
N,XG	ANGULAR DIST.	2	5/13/73	0.0000+ 0	6.0000- 2	3.0200- 1	PHOTON = 6.0000- 2 MEV
N,XG	CROSS SECTION	4	11/30/72	0.0000+ 0	8.0000- 2	3.0200- 1	PHOTON = 8.0000- 2 MEV
N,XG	ANGULAR DIST.	2	5/13/73	0.0000+ 0	8.0000- 2	3.0200- 1	PHOTON = 8.0000- 2 MEV
N,XG	CROSS SECTION	4	11/30/72	0.0000+ 0	1.0000- 1	3.0200- 1	PHOTON = 1.0000- 1 MEV
N,XG	ANGULAR DIST.	2	5/13/73	0.0000+ 0	1.0000- 1	3.0200- 1	PHOTON = 1.0000- 1 MEV

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 94-PJ-240
 ATOMIC MASS = 2.4005 2

	REACTION	POINTS	DATE	-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	1597	1/31/72	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N ANGULAR DIST.	28	1/03/72	0.0000+0	4.0000-2	2.0000+1	
N,ELASTIC	N TOTAL ENERGY DEP.	31	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N LOCAL ENERGY DEP.	31	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	13	11/15/72	0.0000+0	5.0000-2	2.0000+1	
N,N'	N ENERGY-ANGLE DIST.	12	11/15/72	0.0000+0	5.0000-2	2.0000+1	
N,N'	N TOTAL ENERGY DEP.	29	11/14/74	0.0000+0	5.0000-2	2.0000+1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000+0	5.0000-2	2.0000+1	
N,2N	CROSS SECTION	10	11/15/72	-6.5300+0	6.0000+0	2.0000+1	
N,2N	N ENERGY-ANGLE DIST.	6	11/15/72	-6.5300+0	6.0000+0	2.0000+1	
N,2N	N TOTAL ENERGY DEP.	17	11/14/74	-6.5300+0	6.0000+0	2.0000+1	
N,2N	N LOCAL ENERGY DEP.	2	11/14/74	-6.5300+0	6.0000+0	2.0000+1	
N,3N	CROSS SECTION	5	11/15/72	-1.2190+1	1.2250+1	2.0000+1	
N,3N	N ENERGY-ANGLE DIST.	4	11/15/72	-1.2190+1	1.2250+1	2.0000+1	
N,3N	N TOTAL ENERGY DEP.	5	11/14/74	-1.2190+1	1.2250+1	2.0000+1	
N,3N	N LOCAL ENERGY DEP.	4	11/14/74	-1.2190+1	1.2250+1	2.0000+1	
N,F	CROSS SECTION	2075	1/31/73	1.0000+2	1.0000-10	2.0000+1	
N,F	N TOTAL ENERGY DEP.	2	11/14/74	1.0000+2	1.0000-10	2.0000+1	
N,F	N LOCAL ENERGY DEP.	2	11/14/74	1.0000+2	1.0000-10	2.0000+1	
N,F	N ENERGY-ANGLE DIST.	4	11/15/72	1.0000+2	1.0000-10	2.0000+1	
N,F	N NEUTRONS/FISSION	7	11/15/72	1.0000+2	1.0000-10	2.0000+1	
N,F	O ENERGY DIST.	2	12/14/72	1.0000+2	1.0000-10	2.0000+1	
N,F	G MULTIPLICITY	2	12/14/72	1.0000+2	1.0000-10	2.0000+1	
N,G	CROSS SECTION	3003	1/1/0	5.2400+0	1.0000-10	2.0000+1	
N,G	G ENERGY DIST.	2	12/14/72	5.2400+0	1.0000-10	1.0000-2	
N,G	G MULTIPLICITY	3	12/14/72	5.2400+0	1.0000-10	1.0000-2	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	5.2400+0	1.0000-10	2.0000+1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	5.2400+0	1.0000-10	2.0000+1	
N,XG	CROSS SECTION	94	12/14/72	0.0000+0	9.9000-3	2.0000+1	
N,XG	G ENERGY-ANGLE DIST.	12	12/14/72	0.0000+0	9.9000-3	2.0000+1	

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94-PU-241
ATOMIC MASS = 2.4113-2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	38	11/15/72	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N ANGULAR DIST.	29	11/03/72	0.0000+0	4.0000-2	2.0000+1	
N,ELASTIC	N TOTAL ENERGY DEP.	31	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N LOCAL ENERGY DEP.	31	11/14/74	0.0000+0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	17	11/15/72	0.0000+0	5.0000-2	2.0000+1	
N,N'	N ENERGY-ANGLE DIST.	11	11/15/72	0.0000+0	5.0000-2	2.0000+1	
N,N'	N TOTAL ENERGY DEP.	20	11/14/74	0.0000+0	5.0000-2	2.0000+1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000+0	5.0000-2	2.0000+1	
N,2N	CROSS SECTION	13	11/15/72	-5.2400+0	5.3000+0	2.0000+1	
N,2N	N ENERGY-ANGLE DIST.	6	11/15/72	-5.2400+0	5.3000+0	2.0000+1	
N,2N	N TOTAL ENERGY DEP.	17	11/14/74	-5.2400+0	5.3000+0	2.0000+1	
N,2N	N LOCAL ENERGY DEP.	2	11/14/74	-5.2400+0	5.3000+0	2.0000+1	
N,3N	CROSS SECTION	8	11/15/72	-1.1780+1	1.1850+1	2.0000+1	
N,3N	N ENERGY-ANGLE DIST.	5	11/15/72	-1.1780+1	1.1850+1	2.0000+1	
N,3N	N TOTAL ENERGY DEP.	5	11/14/74	-1.1780+1	1.1850+1	2.0000+1	
N,3N	N LOCAL ENERGY DEP.	4	11/14/74	-1.1780+1	1.1850+1	2.0000+1	
N,4N	CROSS SECTION	4	11/15/72	-1.7430+1	1.7600+1	2.0000+1	
N,4N	N ENERGY-ANGLE DIST.	3	11/15/72	-1.7430+1	1.7600+1	2.0000+1	
N,4N	N TOTAL ENERGY DEP.	2	11/14/74	-1.7430+1	1.7500+1	2.0000+1	
N,4N	N LOCAL ENERGY DEP.	2	11/14/74	-1.7430+1	1.7600+1	2.0000+1	
N,F	CROSS SECTION	121	11/15/72	1.8600+2	1.0000-10	2.0000+1	
N,F	N TOTAL ENERGY DEP.	2	11/14/74	1.8600+2	1.0000-10	2.0000+1	
N,F	N LOCAL ENERGY DEP.	2	11/14/74	1.8600+2	1.0000-10	2.0000+1	
N,F	N ENERGY-ANGLE DIST.	4	11/15/72	1.8600+2	1.0000-10	2.0000+1	
N,F	N NEUTRONS/FISSION	5	11/15/72	1.8600+2	1.0000-10	2.0000+1	
N,F	G ENERGY DIST.	2	12/14/72	1.8600+2	1.0000-10	2.0000+1	
N,F	G MULTIPLICITY	2	12/14/72	1.8600+2	1.0000-10	2.0000+1	
N,G	CROSS SECTION	120	11/15/72	6.3000+0	1.0000-10	2.0000+1	
N,G	G ENERGY DIST.	2	12/14/72	6.3000+0	1.0000-10	1.0000-2	
N,G	G MULTIPLICITY	3	12/14/72	6.3000+0	1.0000-10	1.0000-2	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	6.3000+0	1.0000-10	2.0000+1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	6.3000+0	1.0000-10	2.0000+1	
N,XO	CROSS SECTION	54	12/14/72	0.0000+0	9.9000-3	2.0000+1	
N,XO	O ENERGY-ANGLE DIST.	12	12/14/72	0.0000+0	9.9000-3	2.0000+1	

		REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC		CROSS SECTION	758	12/01/75	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N	ANGULAR DIST.	19	12/01/75	0.0000+0	1.0000-2	2.0000+1	
N,ELASTIC	N	TOTAL ENERGY DEP.	30	12/01/75	0.0000+0	1.0000-10	2.0000+1	
N,ELASTIC	N	LOCAL ENERGY DEP.	38	12/01/75	0.0000+0	1.0000-10	2.0000+1	
N,N'		CROSS SECTION	22	12/01/75	0.0000+0	4.0000-2	2.0000+1	
N,N'	N	ENERGY-ANGLE DIST.	17	12/01/75	0.0000+0	4.0000-2	2.0000+1	
N,N'	N	TOTAL ENERGY DEP.	24	12/01/75	0.0000+0	4.0000-2	2.0000+1	
N,N'	N	LOCAL ENERGY DEP.	2	12/01/75	0.0000+0	4.0000-2	2.0000+1	
N,2N		CROSS SECTION	17	12/01/75	-6.3000+0	6.3000+0	2.0000+1	
N,2N	N	ENERGY-ANGLE DIST.	10	12/01/75	-6.3000+0	6.3000+0	2.0000+1	
N,2N	N	TOTAL ENERGY DEP.	15	12/01/75	-6.3000+0	6.3000+0	2.0000+1	
N,2N	N	LOCAL ENERGY DEP.	3	12/01/75	-6.3000+0	6.3000+0	2.0000+1	
N,3N		CROSS SECTION	17	12/01/75	-1.1500+1	1.1500+1	2.0000+1	
N,3N	N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1500+1	1.1500+1	2.0000+1	
N,3N	N	TOTAL ENERGY DEP.	5	12/01/75	-1.1500+1	1.1500+1	2.0000+1	
N,3N	N	LOCAL ENERGY DEP.	3	12/01/75	-1.1500+1	1.1500+1	2.0000+1	
N,4N		CROSS SECTION	2	12/01/75	-1.8070+1	1.8150+1	2.0000+1	
N,4N	N	ENERGY-ANGLE DIST.	3	12/01/75	-1.8070+1	1.8150+1	2.0000+1	
N,4N	N	TOTAL ENERGY DEP.	2	12/01/75	-1.8070+1	1.8150+1	2.0000+1	
N,4N	N	LOCAL ENERGY DEP.	2	12/01/75	-1.8070+1	1.8150+1	2.0000+1	
N,F		CROSS SECTION	434	12/01/75	2.0000+2	1.0000-10	2.0000+1	
N,F	N	TOTAL ENERGY DEP.	2	12/01/75	2.0000+2	1.0000-10	2.0000+1	
N,F	N	LOCAL ENERGY DEP.	2	12/01/75	2.0000+2	1.0000-10	2.0000+1	
N,F	N	ENERGY-ANGLE DIST.	4	12/01/75	2.0000+2	1.0000-10	2.0000+1	
N,F	G	ENERGY-ANGLE DIST.	2	12/01/75	2.0000+2	1.0000-10	3.0000+1	
N,F	N	NEUTRONS/FISSION	4	12/01/75	2.0000+2	1.0000-10	2.0000+1	
N,F	G	MULTIPLICITY	3	12/01/75	2.0000+2	1.0000-10	3.0000+1	
N,G		CROSS SECTION	1271	12/01/75	5.0400+0	1.0000-10	2.0000+1	
N,G	G	ENERGY DIST.	2	12/01/75	5.0400+0	1.0000-10	3.0000+1	
N,G	G	MULTIPLICITY	3	12/01/75	5.0400+0	1.0000-10	3.0000+1	
N,G	N	TOTAL ENERGY DEP.	2	12/01/75	5.0400+0	1.0000-10	2.0000+1	
N,G	N	LOCAL ENERGY DEP.	2	12/01/75	5.0400+0	1.0000-10	2.0000+1	
N,XG		CROSS SECTION	16	12/01/75	0.0000+0	2.9999-1	2.0000+1	
N,XG	G	ENERGY-ANGLE DIST.	15	12/01/75	0.0000+0	2.9999-1	2.0000+1	

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94-PU-243
ATOMIC MASS = 2.4301 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	143	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	ANGULAR DIST.	19	12/01/75	0.0000 + 0	1.0000 - 2	2.0000 + 1	
N,ELASTIC	TOTAL ENERGY DEP.	38	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	LOCAL ENERGY DEP.	38	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	CROSS SECTION	25	12/01/75	0.0000 + 0	6.0000 - 2	2.0000 + 1	
N,N'	ENERGY-ANGLE DIST.	17	12/01/75	0.0000 + 0	6.0000 - 2	2.0000 + 1	
N,N'	TOTAL ENERGY DEP.	22	12/01/75	0.0000 + 0	6.0000 - 2	2.0000 + 1	
N,N'	LOCAL ENERGY DEP.	2	12/01/75	0.0000 + 0	6.0000 - 2	2.0000 + 1	
N,2N	CROSS SECTION	20	12/01/75	-5.0392 + 0	5.0000 + 0	2.0000 + 1	
N,2N	ENERGY-ANGLE DIST.	10	12/01/75	-5.0392 + 0	5.0000 + 0	2.0000 + 1	
N,2N	TOTAL ENERGY DEP.	19	12/01/75	-5.0392 + 0	5.0000 + 0	2.0000 + 1	
N,2N	LOCAL ENERGY DEP.	3	12/01/75	-5.0392 + 0	5.0000 + 0	2.0000 + 1	
N,3N	CROSS SECTION	14	12/01/75	-1.1333 + 1	1.1380 + 1	2.0000 + 1	
N,3N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1333 + 1	1.1380 + 1	2.0000 + 1	
N,3N	TOTAL ENERGY DEP.	9	12/01/75	-1.1333 + 1	1.1380 + 1	2.0000 + 1	
N,3N	LOCAL ENERGY DEP.	3	12/01/75	-1.1333 + 1	1.1380 + 1	2.0000 + 1	
N,4N	CROSS SECTION	7	12/01/75	-1.6581 + 1	1.6650 + 1	2.0000 + 1	
N,4N	ENERGY-ANGLE DIST.	4	12/01/75	-1.6581 + 1	1.6650 + 1	2.0000 + 1	
N,4N	TOTAL ENERGY DEP.	3	12/01/75	-1.6581 + 1	1.6650 + 1	2.0000 + 1	
N,4N	LOCAL ENERGY DEP.	3	12/01/75	-1.6581 + 1	1.6650 + 1	2.0000 + 1	
N,F	CROSS SECTION	359	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	TOTAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	LOCAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	2	12/01/75	2.0000 + 2	1.0000-10	3.0000 + 1	
N,F	NEUTRONS/FISSION	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	MULTIPLICITY	3	12/01/75	2.0000 + 2	1.0000-10	3.0000 + 1	
N,G	CROSS SECTION	327	12/01/75	6.0200 + 0	1.0000-10	2.0000 + 1	
N,G	ENERGY DIST.	2	12/01/75	6.0200 + 0	1.0000-10	3.0000 + 1	
N,G	MULTIPLICITY	3	12/01/75	6.0200 + 0	1.0000-10	3.0000 + 1	
N,G	TOTAL ENERGY DEP.	2	12/01/75	6.0200 + 0	1.0000-10	2.0000 + 1	
N,G	LOCAL ENERGY DEP.	2	12/01/75	6.0200 + 0	1.0000-10	2.0000 + 1	
N,XO	CROSS SECTION	16	12/01/75	0.0000 + 0	2.9999 - 1	2.0000 + 1	
N,XO	ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	2.9999 - 1	2.0000 + 1	

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95-AM-242
ATOMIC MASS = 2.4200 + 2

	REACTION	POINTS	DATE	Q VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	25	11/15/72	0.0000 + 0	1.0070 + 10	2.0000 + 1	
N,ELASTIC	ANGULAR DIST.	21	11/15/72	0.0000 + 0	1.0000 + 2	2.0000 + 1	
N,ELASTIC	TOTAL ENERGY DEP.	35	11/14/74	0.0000 + 0	1.0000 + 10	2.0000 + 1	
N,ELASTIC	LOCAL ENERGY DEP.	35	11/14/74	0.0000 + 0	1.0000 + 10	2.0000 + 1	
N,N'	CROSS SECTION	13	11/15/72	0.0000 + 0	1.0000 + 1	2.0000 + 1	
N,N'	ENERGY-ANGLE DIST.	10	11/15/72	0.0000 + 0	1.0000 + 1	2.0000 + 1	
N,N'	TOTAL ENERGY DEP.	21	11/14/74	0.0000 + 0	1.0000 + 1	2.0000 + 1	
N,N'	LOCAL ENERGY DEP.	2	11/14/74	0.0000 + 0	1.0000 + 1	2.0000 + 1	
N,2N	CROSS SECTION	10	11/15/72	-5.5300 + 0	5.6000 + 0	2.0000 + 1	
N,2N	ENERGY-ANGLE DIST.	6	11/15/72	-5.5300 + 0	5.6000 + 0	2.0000 + 1	
N,2N	TOTAL ENERGY DEP.	17	11/14/74	-5.5300 + 0	5.6000 + 0	2.0000 + 1	
N,2N	LOCAL ENERGY DEP.	2	11/14/74	-5.5300 + 0	5.6000 + 0	2.0000 + 1	
N,3N	CROSS SECTION	0	11/15/72	-1.1250 + 1	1.1300 + 1	2.0000 + 1	
N,3N	ENERGY-ANGLE DIST.	5	11/15/72	-1.1250 + 1	1.1300 + 1	2.0000 + 1	
N,3N	TOTAL ENERGY DEP.	5	11/14/74	-1.1250 + 1	1.1300 + 1	2.0000 + 1	
N,3N	LOCAL ENERGY DEP.	4	11/14/74	-1.1250 + 1	1.1300 + 1	2.0000 + 1	
N,4N	CROSS SECTION	4	11/15/72	-1.0130 + 1	1.0250 + 1	2.0000 + 1	
N,4N	ENERGY-ANGLE DIST.	3	11/15/72	-1.0130 + 1	1.0250 + 1	2.0000 + 1	
N,4N	TOTAL ENERGY DEP.	2	11/14/74	-1.0130 + 1	1.0250 + 1	2.0000 + 1	
N,4N	LOCAL ENERGY DEP.	2	11/14/74	-1.0130 + 1	1.0250 + 1	2.0000 + 1	
N,F	CROSS SECTION	491	11/15/72	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,F	TOTAL ENERGY DEP.	2	11/14/74	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,F	LOCAL ENERGY DEP.	2	11/14/74	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	4	11/15/72	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,F	NEUTRONS/FISSION	4	11/15/72	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,F	ENERGY DIST.	2	12/14/72	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,F	MULTIPLICITY	2	12/14/72	1.9200 + 2	1.0000 + 10	2.0000 + 1	
N,G	CROSS SECTION	490	11/15/72	6.3800 + 0	1.0000 + 10	2.0000 + 1	
N,G	ENERGY DIST.	2	12/14/72	6.3800 + 0	1.0000 + 10	1.0000 + 2	
N,G	MULTIPLICITY	3	12/14/72	6.3800 + 0	1.0000 + 10	1.0000 + 2	
N,G	TOTAL ENERGY DEP.	2	11/14/74	6.3800 + 0	1.0000 + 10	2.0000 + 1	
N,G	LOCAL ENERGY DEP.	2	11/14/74	6.3800 + 0	1.0000 + 10	2.0000 + 1	
N,XG	CROSS SECTION	54	12/14/72	0.0000 + 0	9.9000 + 3	2.0000 + 1	
N,XG	ENERGY-ANGLE DIST.	12	12/14/72	0.0000 + 0	9.9000 + 3	2.0000 + 1	

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35-AM-243
ATOMIC MASS - 2.4307+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	1064	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	19	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	39	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	39	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	26	12/01/75	0.0000+ 0	8.0000- 2	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	14	12/01/75	0.0000+ 0	8.0000- 2	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	24	12/01/75	0.0000+ 0	8.0000- 2	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	12/01/75	0.0000+ 0	8.0000- 2	2.0000+ 1	
N,2N	CROSS SECTION	18	12/01/75	-6.3730+ 0	6.4100+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	9	12/01/75	-6.3730+ 0	6.4100+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	16	12/01/75	-6.3730+ 0	6.4100+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	12/01/75	-6.3730+ 0	6.4100+ 0	2.0000+ 1	
N,3N	CROSS SECTION	10	12/01/75	-1.1901+ 1	1.1950+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1901+ 1	1.1950+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	5	12/01/75	-1.1901+ 1	1.1950+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	4	12/01/75	-1.1901+ 1	1.1950+ 1	2.0000+ 1	
N,4N	CROSS SECTION	3	12/01/75	-1.8424+ 1	1.8500+ 1	2.0000+ 1	
N,4N	ENERGY-ANGLE DIST.	3	12/01/75	-1.8424+ 1	1.8500+ 1	2.0000+ 1	
N,4N	TOTAL ENERGY DEP.	2	12/01/75	-1.8424+ 1	1.8500+ 1	2.0000+ 1	
N,4N	LOCAL ENERGY DEP.	2	12/01/75	-1.8424+ 1	1.8500+ 1	2.0000+ 1	
N,F	CROSS SECTION	72	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	TOTAL ENERGY DEP.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	LOCAL ENERGY DEP.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	5	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	NEUTRONS/FISSION	5	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	MULTIPLICITY	3	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,G	CROSS SECTION	3346	12/01/75	5.3600+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	12/01/75	5.3600+ 0	1.0000-10	2.0000+ 1	
N,G	MULTIPLICITY	3	12/01/75	5.3600+ 0	1.0000-10	2.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	12/01/75	5.3600+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	12/01/75	5.3600+ 0	1.0000-10	2.0000+ 1	
N,X0	CROSS SECTION	16	12/01/75	0.0000+ 0	2.9999- 1	2.0000+ 1	
N,X0	ENERGY-ANGLE DIST.	15	12/01/75	0.0000+ 0	2.9999- 1	2.0000+ 1	

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96-CM-242
ATOMIC MASS = 2.4201 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	827	2/02/76	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	21	2/02/76	0.0000+ 0	4.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	35	2/02/76	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	35	2/02/76	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	27	2/02/76	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	16	2/02/76	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	18	2/02/76	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	2/02/76	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,2N	CROSS SECTION	14	2/02/76	-6.9700+ 0	7.0000- 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	9	2/02/76	-6.9700+ 0	7.0000- 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	14	2/02/76	-6.9700+ 0	7.0000- 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	4	2/02/76	-6.9700+ 0	7.0000- 0	2.0000+ 1	
N,3N	CROSS SECTION	7	2/02/76	-1.3030+ 1	1.3030+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	5	2/02/76	-1.3030+ 1	1.3030+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	4	2/02/76	-1.3030+ 1	1.3030+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	3	2/02/76	-1.3030+ 1	1.3030+ 1	2.0000+ 1	
N,F	CROSS SECTION	893	2/02/76	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	TOTAL ENERGY DEP.	2	2/02/76	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	LOCAL ENERGY DEP.	2	2/02/76	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	5	2/02/76	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	2	2/02/76	2.0000+ 2	1.0000-10	3.0000- 1	
N,F	NEUTRONS/FISSION	5	2/02/76	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	MULTIPLICITY	3	2/02/76	2.0000+ 2	1.0000-10	3.0000- 1	
N,G	CROSS SECTION	483	2/02/76	5.7000+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	2/02/76	5.7000+ 0	1.0000-10	3.0000- 1	
N,G	MULTIPLICITY	3	2/02/76	5.7000+ 0	1.0000-10	3.0000- 1	
N,G	TOTAL ENERGY DEP.	2	2/02/76	5.7000+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	2/02/76	5.7000+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	15	2/02/76	0.0000+ 0	2.9999- 1	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	15	2/02/76	0.0000+ 0	2.9999- 1	2.0000+ 1	

02/12/76

96-CM-243
ATOMIC MASS = 2.4305- 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	143	2/02/76	0.0000-0	1.0000-10	2.0000-1	
N,ELASTIC	ANGULAR DIST.	19	2/02/76	0.0000-0	1.0000-10	2.0000-1	
N,ELASTIC	TOTAL ENERGY DEP.	30	2/02/76	0.0000-0	1.0000-10	2.0000-1	
N,ELASTIC	LOCAL ENERGY DEP.	30	2/02/76	0.0000-0	1.0000-10	2.0000-1	
N,N'	CROSS SECTION	25	2/02/76	0.0000-0	6.0000-1	2.0000-1	
N,N'	ENERGY-ANGLE DIST.	14	2/02/76	0.0000-0	6.0000-2	2.0000-1	
N,N'	TOTAL ENERGY DEP.	23	2/02/76	0.0000-0	6.0000-2	2.0000-1	
N,N'	LOCAL ENERGY DEP.	2	2/02/76	0.0000-0	6.0000-2	2.0000-1	
N,2N	CROSS SECTION	10	2/02/76	-5.6900-0	5.7200-0	2.0000-1	
N,2N	ENERGY-ANGLE DIST.	7	2/02/76	-5.6900-0	5.7200-0	2.0000-1	
N,2N	TOTAL ENERGY DEP.	19	2/02/76	-5.6900-0	5.7200-0	2.0000-1	
N,2N	LOCAL ENERGY DEP.	2	2/02/76	-5.6900-0	5.7200-0	2.0000-1	
N,3N	CROSS SECTION	6	2/02/76	-1.2660-1	1.2720-1	2.0000-1	
N,3N	ENERGY-ANGLE DIST.	5	2/02/76	-1.2660-1	1.2720-1	2.0000-1	
N,3N	TOTAL ENERGY DEP.	4	2/02/76	-1.2660-1	1.2720-1	2.0000-1	
N,3N	LOCAL ENERGY DEP.	2	2/02/76	-1.2660-1	1.2720-1	2.0000-1	
N,4N	CROSS SECTION	2	2/02/76	-1.8740-1	1.8820-1	2.0000-1	
N,4N	ENERGY-ANGLE DIST.	2	2/02/76	-1.8740-1	1.8820-1	2.0000-1	
N,4N	TOTAL ENERGY DEP.	2	2/02/76	-1.8740-1	1.8820-1	2.0000-1	
N,4N	LOCAL ENERGY DEP.	2	2/02/76	-1.8740-1	1.8820-1	2.0000-1	
N,F	CROSS SECTION	1585	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,F	TOTAL ENERGY DEP.	2	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,F	LOCAL ENERGY DEP.	2	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,F	ENERGY-ANGLE DIST.	6	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,F	G	2	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,F	N	5	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,F	G	3	2/02/76	2.0000-2	1.0000-10	2.0000-1	
N,G	CROSS SECTION	219	2/02/76	6.8000-0	1.0000-10	2.0000-1	
N,G	ENERGY DIST.	2	2/02/76	6.8000-0	1.0000-10	2.0000-1	
N,G	O	3	2/02/76	6.8000-0	1.0000-10	2.0000-1	
N,G	TOTAL ENERGY DEP.	2	2/02/76	6.8000-0	1.0000-10	2.0000-1	
N,G	LOCAL ENERGY DEP.	2	2/02/76	6.8000-0	1.0000-10	2.0000-1	
N,XO	CROSS SECTION	16	2/02/76	0.0000-0	2.9999-1	2.0000-1	
I,XO	G	15	2/02/76	0.0000-0	2.9999-1	2.0000-1	

02/12/76

95-CM-244
ATOMIC MASS = 2.4408 ± 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	827	12/01/75	0.0000 ± 0	1.0000-10	2.0000+1	
N.ELASTIC	N ANGULAR DIST.	19	12/01/75	0.0000 ± 0	1.0000-2	2.0000+1	
N.ELASTIC	N TOTAL ENERGY DEP.	39	12/01/75	0.0000 ± 0	1.0000-10	2.0000+1	
N.ELASTIC	N LOCAL ENERGY DEP.	39	12/01/75	0.0000 ± 0	1.0000-10	2.0000+1	
N,N'	CROSS SECTION	27	12/01/75	0.0000 ± 0	4.5000-2	2.0000+1	
N,N'	N ENERGY-ANGLE DIST.	16	12/01/75	0.0000 ± 0	4.5000-2	2.0000+1	
N,N'	N TOTAL ENERGY DEP.	18	12/01/75	0.0000 ± 0	4.5000-2	2.0000+1	
N,N'	N LOCAL ENERGY DEP.	2	12/01/75	0.0000 ± 0	4.5000-2	2.0000+1	
N,2N	CROSS SECTION	15	12/01/75	-6.8000 ± 0	6.0300-0	2.0000+1	
N,2N	N ENERGY-ANGLE DIST.	9	12/01/75	-6.8000 ± 0	6.0300-0	2.0000+1	
N,2N	N TOTAL ENERGY DEP.	15	12/01/75	-6.8000 ± 0	6.0300-0	2.0000+1	
N,2N	N LOCAL ENERGY DEP.	4	12/01/75	-6.8000 ± 0	6.0300-0	2.0000+1	
N,3N	CROSS SECTION	10	12/01/75	-1.2490 ± 1	1.2550-1	2.0000+1	
N,3N	N ENERGY-ANGLE DIST.	6	12/01/75	-1.2490 ± 1	1.2550-1	2.0000+1	
N,3N	N TOTAL ENERGY DEP.	4	12/01/75	-1.2490 ± 1	1.2550-1	2.0000+1	
N,3N	N LOCAL ENERGY DEP.	2	12/01/75	-1.2490 ± 1	1.2550-1	2.0000+1	
N,4N	CROSS SECTION	2	12/01/75	-1.9470 ± 1	1.9550-1	2.0000+1	
N,4N	N ENERGY-ANGLE DIST.	2	12/01/75	-1.9470 ± 1	1.9550-1	2.0000+1	
N,4N	N TOTAL ENERGY DEP.	2	12/01/75	-1.9470 ± 1	1.9550-1	2.0000+1	
N,4N	N LOCAL ENERGY DEP.	2	12/01/75	-1.9470 ± 1	1.9550-1	2.0000+1	
N,F	CROSS SECTION	895	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,F	N TOTAL ENERGY DEP.	2	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,F	N LOCAL ENERGY DEP.	2	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,F	N ENERGY-ANGLE DIST.	5	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,F	N ENERGY-ANGLE DIST.	2	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,F	N NEUTRON MULTIPLICITY	5	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,F	N NEUTRON MULTIPLICITY	3	12/01/75	2.0000 ± 2	1.0000-10	2.0000+1	
N,G	CROSS SECTION	1144	12/01/75	5.5200 ± 0	1.0000-10	2.0000+1	
N,G	N ENERGY-ANGLE DIST.	2	12/01/75	5.5200 ± 0	1.0000-10	2.0000+1	
N,G	N MULTIPLICITY	3	12/01/75	5.5200 ± 0	1.0000-10	2.0000+1	
N,G	N TOTAL ENERGY DEP.	2	12/01/75	5.5200 ± 0	1.0000-10	2.0000+1	
N,G	N LOCAL ENERGY DEP.	2	12/01/75	5.5200 ± 0	1.0000-10	2.0000+1	
N,XG	CROSS SECTION	16	12/01/75	0.0000 ± 0	2.9999-1	2.0000+1	
N,XG	N ENERGY-ANGLE DIST.	15	12/01/75	0.0000 ± 0	2.9999-1	2.0000+1	

02/12/76

96-CM-245
ATOMIC MASS = 2.4501 * 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	86	3/15/75	0.0000 * 0	1.0000-10	2.0000 * 1	
N.ELASTIC	ANGULAR DIST.	10	3/15/75	0.0000 * 0	4.0000-2	2.0000 * 1	
N.ELASTIC	TOTAL ENERGY DEP.	36	3/15/75	0.0000 * 0	1.0000-10	2.0000 * 1	
N.ELASTIC	LOCAL ENERGY DEP.	36	3/15/75	0.0000 * 0	1.0000-10	2.0000 * 1	
N,N'	CROSS SECTION	26	3/15/75	0.0000 * 0	6.0000-2	2.0000 * 1	
N,N'	ENERGY-ANGLE DIST.	14	3/15/75	0.0000 * 0	6.0000-2	2.0000 * 1	
N,N'	TOTAL ENERGY DEP.	24	3/15/75	0.0000 * 0	6.0000-2	2.0000 * 1	
N,N'	LOCAL ENERGY DEP.	2	3/15/75	0.0000 * 0	6.0000-2	2.0000 * 1	
N,2N	CROSS SECTION	10	3/15/75	-5.5200 * 0	5.6000 * 0	2.0000 * 1	
N,2N	ENERGY-ANGLE DIST.	7	3/15/75	-5.5200 * 0	5.6000 * 0	2.0000 * 1	
N,2N	TOTAL ENERGY DEP.	19	3/15/75	-5.5200 * 0	5.6000 * 0	2.0000 * 1	
N,2N	LOCAL ENERGY DEP.	2	3/15/75	-5.5200 * 0	5.6000 * 0	2.0000 * 1	
N,3N	CROSS SECTION	6	3/15/75	-1.2320 * 1	1.2400 * 1	2.0000 * 1	
N,3N	ENERGY-ANGLE DIST.	6	3/15/75	-1.2320 * 1	1.2400 * 1	2.0000 * 1	
N,3N	TOTAL ENERGY DEP.	5	3/15/75	-1.2320 * 1	1.2400 * 1	2.0000 * 1	
N,3N	LOCAL ENERGY DEP.	4	3/15/75	-1.2320 * 1	1.2400 * 1	2.0000 * 1	
N,4N	CROSS SECTION	2	3/15/75	-1.8020 * 1	1.8200 * 1	2.0000 * 1	
N,4N	ENERGY-ANGLE DIST.	3	3/15/75	-1.8020 * 1	1.8200 * 1	2.0000 * 1	
N,4N	TOTAL ENERGY DEP.	2	3/15/75	-1.8020 * 1	1.8200 * 1	2.0000 * 1	
N,4N	LOCAL ENERGY DEP.	2	3/15/75	-1.8020 * 1	1.8200 * 1	2.0000 * 1	
N,F	CROSS SECTION	4336	3/15/75	2.0000 * 2	1.0000-10	2.0000 * 1	
N,F	TOTAL ENERGY DEP.	2	3/15/75	2.0000 * 2	1.0000-10	2.0000 * 1	
N,F	LOCAL ENERGY DEP.	2	3/15/75	2.0000 * 2	1.0000-10	2.0000 * 1	
N,F	ENERGY-ANGLE DIST.	6	3/15/75	2.0000 * 2	1.0000-10	2.0000 * 1	
N,F	ENERGY-ANGLE DIST.	2	3/15/75	2.0000 * 2	1.0000-10	3.0200 * 1	
N,F	NEUTRONS/FISSION	6	3/15/75	2.0000 * 2	1.0000-10	2.0000 * 1	
N,F	MULTIPLICITY	3	3/15/75	2.0000 * 2	1.0000-10	3.0200 * 1	
N,G	CROSS SECTION	219	3/15/75	6.4500 * 0	1.0000-10	2.0000 * 1	
N,G	ENERGY DIST.	2	3/15/75	6.4500 * 0	1.0000-10	3.0200 * 1	
N,G	MULTIPLICITY	3	3/15/75	6.4500 * 0	1.0000-10	3.0200 * 1	
N,G	TOTAL ENERGY DEP.	2	3/15/75	6.4500 * 0	1.0000-10	2.0000 * 1	
N,G	LOCAL ENERGY DEP.	2	3/15/75	6.4500 * 0	1.0000-10	2.0000 * 1	
N,XG	CROSS SECTION	12	3/15/75	0.0000 * 0	3.0000-1	2.0000 * 1	
N,XG	ENERGY-ANGLE DIST.	11	3/15/75	0.0000 * 0	3.0000-1	2.0000 * 1	

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96-CM-246
ATOMIC MASS = 2.4507 2

REACTION		POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC		CROSS SECTION	276	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1
N,ELASTIC	N	ANGULAR DIST.	19	12/01/75	0.5000+ 0	1.0000- 2	2.0000+ 1
N,ELASTIC	N	TOTAL ENERGY DEP.	38	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1
N,ELASTIC	N	LOCAL ENERGY DEP.	38	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1
N,N'		CROSS SECTION	20	12/01/75	0.0000+ 0	4.3000- 2	2.0000+ 1
N,N'	N	ENERGY-ANGLE DIST.	15	12/01/75	0.0000+ 0	4.3000- 2	2.0000+ 1
N,N'	N	TOTAL ENERGY DEP.	17	12/01/75	0.0000+ 0	4.3000- 2	2.0000+ 1
N,N'	N	LOCAL ENERGY DEP.	2	12/01/75	0.0000+ 0	4.3000- 2	2.0000+ 1
N,2N		CROSS SECTION	17	12/01/75	-6.4500+ 0	6.4800+ 0	2.0000+ 1
N,2N	N	ENERGY-ANGLE DIST.	9	12/01/75	-6.4500+ 0	6.4800+ 0	2.0000+ 1
N,2N	N	TOTAL ENERGY DEP.	13	12/01/75	-6.4500+ 0	6.4800+ 0	2.0000+ 1
N,2N	N	LOCAL ENERGY DEP.	4	12/01/75	-6.4500+ 0	6.4800+ 0	2.0000+ 1
N,3N		CROSS SECTION	11	12/01/75	-1.1970+ 1	1.2020+ 1	2.0000+ 1
N,3N	N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1970+ 1	1.2020+ 1	2.0000+ 1
N,3N	N	TOTAL ENERGY DEP.	5	12/01/75	-1.1970+ 1	1.2020+ 1	2.0000+ 1
N,3N	N	LOCAL ENERGY DEP.	4	12/01/75	-1.1970+ 1	1.2020+ 1	2.0000+ 1
N,4N		CROSS SECTION	3	12/01/75	-1.0760+ 1	1.0840+ 1	2.0000+ 1
N,4N	N	ENERGY-ANGLE DIST.	3	12/01/75	-1.0760+ 1	1.0840+ 1	2.0000+ 1
N,4N	N	TOTAL ENERGY DEP.	2	12/01/75	-1.0760+ 1	1.0840+ 1	2.0000+ 1
N,4N	N	LOCAL ENERGY DEP.	2	12/01/75	-1.0760+ 1	1.0840+ 1	2.0000+ 1
N,F		CROSS SECTION	305	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1
N,F	N	TOTAL ENERGY DEP.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1
N,F	N	LOCAL ENERGY DEP.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1
N,F	N	ENERGY-ANGLE DIST.	5	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1
N,F	G	ENERGY-ANGLE DIST.	2	12/01/75	2.0000+ 2	1.0000-10	3.0000+ 1
N,F	N	NEUTRONS/FISSIION	5	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1
N,F	G	MULTIPLICITY	3	12/01/75	2.0000+ 2	1.0000-10	3.0000+ 1
N,G		CROSS SECTION	433	12/01/75	5.1600+ 0	1.0000-10	2.0000+ 1
N,G	G	ENERGY DIST.	2	12/01/75	5.1600+ 0	1.0000-10	3.0000+ 1
N,G	G	MULTIPLICITY	3	12/01/75	5.1600+ 0	1.0000-10	3.0000+ 1
N,G		TOTAL ENERGY DEP.	2	12/01/75	5.1600+ 0	1.0000-10	2.0000+ 1
N,G		LOCAL ENERGY DEP.	2	12/01/75	5.1600+ 0	1.0000-10	2.0000+ 1
N,X0		CROSS SECTION	16	12/01/75	0.0000+ 0	2.9999- 1	2.0000+ 1
N,X0	G	ENERGY-ANGLE DIST.	15	12/01/75	0.0000+ 0	2.9999- 1	2.0000+ 1

02/12/76

96-CM-247
ATOMIC MASS = 2.4701 ± 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	217	12/01/75	0.0000 ± 0	1.0000-10	2.0000 ± 1	
N,ELASTIC	ANGULAR DIST.	28	12/01/75	0.0000 ± 0	1.0000-2	2.0000 ± 1	
N,ELASTIC	TOTAL ENERGY DEP.	39	12/01/75	0.0000 ± 0	1.0000-10	2.0000 ± 1	
N,ELASTIC	LOCAL ENERGY DEP.	39	12/01/75	0.0000 ± 0	1.0000-10	2.0000 ± 1	
N,N'	CROSS SECTION	19	12/01/75	0.0000 ± 0	5.0000-2	2.0000 ± 1	
N,N'	ENERGY-ANGLE DIST.	15	12/01/75	0.0000 ± 0	5.0000-2	2.0000 ± 1	
N,N'	TOTAL ENERGY DEP.	17	12/01/75	0.0000 ± 0	5.0000-2	2.0000 ± 1	
N,N'	LOCAL ENERGY DEP.	2	12/01/75	0.0000 ± 0	5.0000-2	2.0000 ± 1	
N,2N	CROSS SECTION	17	12/01/75	-5.1500 ± 0	5.1800 ± 0	2.0000 ± 1	
N,2N	ENERGY-ANGLE DIST.	10	12/01/75	-5.1500 ± 0	5.1800 ± 0	2.0000 ± 1	
N,2N	TOTAL ENERGY DEP.	20	12/01/75	-5.1500 ± 0	5.1800 ± 0	2.0000 ± 1	
N,2N	LOCAL ENERGY DEP.	2	12/01/75	-5.1500 ± 0	5.1800 ± 0	2.0000 ± 1	
N,3N	CROSS SECTION	10	12/01/75	-1.1600 ± 1	1.1650 ± 1	2.0000 ± 1	
N,3N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1600 ± 1	1.1650 ± 1	2.0000 ± 1	
N,3N	TOTAL ENERGY DEP.	5	12/01/75	-1.1600 ± 1	1.1650 ± 1	2.0000 ± 1	
N,3N	LOCAL ENERGY DEP.	3	12/01/75	-1.1600 ± 1	1.1650 ± 1	2.0000 ± 1	
N,4N	CROSS SECTION	4	12/01/75	-1.7100 ± 1	1.7200 ± 1	2.0000 ± 1	
N,4N	ENERGY-ANGLE DIST.	3	12/01/75	-1.7100 ± 1	1.7200 ± 1	2.0000 ± 1	
N,4N	TOTAL ENERGY DEP.	3	12/01/75	-1.7100 ± 1	1.7200 ± 1	2.0000 ± 1	
N,4N	LOCAL ENERGY DEP.	3	12/01/75	-1.7100 ± 1	1.7200 ± 1	2.0000 ± 1	
N,F	CROSS SECTION	1170	12/01/75	2.0000 ± 2	1.0000-10	2.0000 ± 1	
N,F	TOTAL ENERGY DEP.	2	12/01/75	2.0000 ± 2	1.0000-10	2.0000 ± 1	
N,F	LOCAL ENERGY DEP.	2	12/01/75	2.0000 ± 2	1.0000-10	2.0000 ± 1	
N,F	ENERGY-ANGLE DIST.	5	12/01/75	2.0000 ± 2	1.0000-10	2.0000 ± 1	
N,F	NEUTRON FISSIION	2	12/01/75	2.0000 ± 2	1.0000-10	3.0000 ± 1	
N,F	G MULTIPLICITY	5	12/01/75	2.0000 ± 2	1.0000-10	2.0000 ± 1	
N,G	CROSS SECTION	1268	12/01/75	2.0000 ± 2	1.0000-10	3.0000 ± 1	
N,G	ENERGY DIST.	2	12/01/75	6.2100 ± 0	1.0000-10	2.0000 ± 1	
N,G	G MULTIPLICITY	3	12/01/75	6.2100 ± 0	1.0000-10	3.0000 ± 1	
N,G	TOTAL ENERGY DEP.	2	12/01/75	6.2100 ± 0	1.0000-10	2.0000 ± 1	
N,G	LOCAL ENERGY DEP.	2	12/01/75	6.2100 ± 0	1.0000-10	2.0000 ± 1	
N,XG	CROSS SECTION	16	12/01/75	0.0000 ± 0	2.9999-1	2.0000 ± 1	
N,XG	ENERGY-ANGLE DIST.	15	12/01/75	0.0000 ± 0	2.9999-1	2.0000 ± 1	

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96-CM-248
ATOMIC MASS = 2.48014 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	699	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	ANGULAR DIST.	19	12/01/75	0.0000+ 0	1.0000- 2	2.0000+ 1	
N,ELASTIC	TOTAL ENERGY DEP.	39	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	LOCAL ENERGY DEP.	38	12/01/75	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	19	12/01/75	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,N'	ENERGY-ANGLE DIST.	15	12/01/75	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,N'	TOTAL ENERGY DEP.	17	12/01/75	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,N'	LOCAL ENERGY DEP.	2	12/01/75	0.0000+ 0	4.5000- 2	2.0000+ 1	
N,2N	CROSS SECTION	15	12/01/75	-6.2000+ 0	6.2300+ 0	2.0000+ 1	
N,2N	ENERGY-ANGLE DIST.	9	12/01/75	-6.2000+ 0	6.2300+ 0	2.0000+ 1	
N,2N	TOTAL ENERGY DEP.	10	12/01/75	-6.2000+ 0	6.2300+ 0	2.0000+ 1	
N,2N	LOCAL ENERGY DEP.	2	12/01/75	-6.2000+ 0	6.2300+ 0	2.0000+ 1	
N,3N	CROSS SECTION	13	12/01/75	-1.1360+ 1	1.1410+ 1	2.0000+ 1	
N,3N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1360+ 1	1.1410+ 1	2.0000+ 1	
N,3N	TOTAL ENERGY DEP.	5	12/01/75	-1.1360+ 1	1.1410+ 1	2.0000+ 1	
N,3N	LOCAL ENERGY DEP.	3	12/01/75	-1.1360+ 1	1.1410+ 1	2.0000+ 1	
N,4N	CROSS SECTION	5	12/01/75	-1.7810+ 1	1.7890+ 1	2.0000+ 1	
N,4N	ENERGY-ANGLE DIST.	3	12/01/75	-1.7810+ 1	1.7890+ 1	2.0000+ 1	
N,4N	TOTAL ENERGY DEP.	2	12/01/75	-1.7810+ 1	1.7890+ 1	2.0000+ 1	
N,4N	LOCAL ENERGY DEP.	2	12/01/75	-1.7810+ 1	1.7890+ 1	2.0000+ 1	
N,F	CROSS SECTION	600	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	TOTAL ENERGY DEP.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	LOCAL ENERGY DEP.	2	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	5	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	ENERGY-ANGLE DIST.	2	12/01/75	2.0000+ 2	1.0000-10	3.0000+ 1	
N,F	NEUTRONS/FISSION	5	12/01/75	2.0000+ 2	1.0000-10	2.0000+ 1	
N,F	MULTIPLICITY	3	12/01/75	2.0000+ 2	1.0000-10	3.0000+ 1	
N,G	CROSS SECTION	965	12/01/75	4.7100+ 0	1.0000-10	2.0000+ 1	
N,G	ENERGY DIST.	2	12/01/75	4.7100+ 0	1.0000-10	3.0000+ 1	
N,G	MULTIPLICITY	3	12/01/75	4.7100+ 0	1.0000-10	3.0000+ 1	
N,G	TOTAL ENERGY DEP.	2	12/01/75	4.7100+ 0	1.0000-10	2.0000+ 1	
N,G	LOCAL ENERGY DEP.	2	12/01/75	4.7100+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	16	12/01/75	0.0000+ 0	2.9999- 1	2.0000+ 1	
N,XG	ENERGY-ANGLE DIST.	15	12/01/75	0.0000+ 0	2.9999- 1	2.0000+ 1	

02/12/76

97-BK-249
ATOMIC MASS = 2.4801 + 2

	REACTION	POINTS	DATE	O-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	209	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	N ANGULAR DIST.	19	12/01/75	0.0000 + 0	1.0000- 2	2.0000 + 1	
N,ELASTIC	N TOTAL ENERGY DEP.	38	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	N LOCAL ENERGY DEP.	38	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	CROSS SECTION	23	12/01/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,N'	N ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,N'	N TOTAL ENERGY DEP.	17	12/01/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,N'	N LOCAL ENERGY DEP.	2	12/01/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,2N	CROSS SECTION	18	12/01/75	-6.2000 + 0	6.2300 + 0	2.0000 + 1	
N,2N	N ENERGY-ANGLE DIST.	8	12/01/75	-6.2000 + 0	6.2300 + 0	2.0000 + 1	
N,2N	N TOTAL ENERGY DEP.	12	12/01/75	-6.2000 + 0	6.2300 + 0	2.0000 + 1	
N,2N	N LOCAL ENERGY DEP.	2	12/01/75	-6.2000 + 0	6.2300 + 0	2.0000 + 1	
N,3N	CROSS SECTION	12	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,3N	N ENERGY-ANGLE DIST.	5	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,3N	N TOTAL ENERGY DEP.	5	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,3N	N LOCAL ENERGY DEP.	3	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,4N	CROSS SECTION	5	12/01/75	-1.7900 + 1	1.7900 + 1	2.0000 + 1	
N,4N	N ENERGY-ANGLE DIST.	3	12/01/75	-1.7900 + 1	1.7900 + 1	2.0000 + 1	
N,4N	N TOTAL ENERGY DEP.	2	12/01/75	-1.7900 + 1	1.7900 + 1	2.0000 + 1	
N,4N	N LOCAL ENERGY DEP.	2	12/01/75	-1.7900 + 1	1.7900 + 1	2.0000 + 1	
N,F	CROSS SECTION	125	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N TOTAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N LOCAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N ENERGY-ANGLE DIST.	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	G ENERGY-ANGLE DIST.	2	12/01/75	2.0000 + 2	1.0000-10	3.0000 - 1	
N,F	N NEUTRONS/FISSION	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	G MULTIPLICITY	3	12/01/75	2.0000 + 2	1.0000-10	3.0000 - 1	
N,G	G CROSS SECTION	369	12/01/75	4.9700 + 0	1.0000-10	2.0000 + 1	
N,G	G ENERGY DIST.	2	12/01/75	4.9700 + 0	1.0000-10	3.0000 - 1	
N,G	G MULTIPLICITY	3	12/01/75	4.9700 + 0	1.0000-10	3.0000 - 1	
N,G	N TOTAL ENERGY DEP.	2	12/01/75	4.9700 + 0	1.0000-10	2.0000 + 1	
N,G	N LOCAL ENERGY DEP.	2	12/01/75	4.9700 + 0	1.0000-10	2.0000 + 1	
N,XG	CROSS SECTION	16	12/01/75	0.0000 + 0	2.9999 - 1	2.0000 + 1	
N,XG	G ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	2.9999 - 1	2.0000 + 1	

02/12/76

98-CF-249
ATOMIC MASS = 2.4908 + 2

	REACTION	POINTS	DATE	C-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	312	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	ANGULAR DIST.	19	12/01/75	0.0000 + 0	1.0000 - 2	2.0000 + 1	
N,ELASTIC	TOTAL ENERGY DEP.	38	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	LOCAL ENERGY DEP.	38	12/01/75	0.0000 + 0	1.0000 - 10	2.0000 + 1	
N,N'	CROSS SECTION	19	12/01/75	0.0000 + 0	4.5000 - 2	2.0000 + 1	
N,N'	ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	4.5000 - 2	2.0000 + 1	
N,N'	TOTAL ENERGY DEP.	17	12/01/75	0.0000 + 0	4.5000 - 2	2.0000 + 1	
N,N'	LOCAL ENERGY DEP.	2	12/01/75	0.0000 + 0	4.5000 - 2	2.0000 + 1	
N,2N	CROSS SECTION	16	12/01/75	-5.5900 + 0	5.6200 + 0	2.0000 + 1	
N,2N	ENERGY-ANGLE DIST.	9	12/01/75	-5.5900 + 0	5.6200 + 0	2.0000 + 1	
N,2N	TOTAL ENERGY DEP.	18	12/01/75	-5.5900 + 0	5.6200 + 0	2.0000 + 1	
N,2N	LOCAL ENERGY DEP.	2	12/01/75	-5.5900 + 0	5.6200 + 0	2.0000 + 1	
N,3N	CROSS SECTION	11	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,3N	ENERGY-ANGLE DIST.	6	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,3N	TOTAL ENERGY DEP.	5	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,3N	LOCAL ENERGY DEP.	3	12/01/75	-1.1780 + 1	1.1830 + 1	2.0000 + 1	
N,4N	CROSS SECTION	4	12/01/75	-1.8670 + 1	1.8670 + 1	2.0000 + 1	
N,4N	ENERGY-ANGLE DIST.	3	12/01/75	-1.8670 + 1	1.8670 + 1	2.0000 + 1	
N,4N	TOTAL ENERGY DEP.	2	12/01/75	-1.8670 + 1	1.8670 + 1	2.0000 + 1	
N,4N	LOCAL ENERGY DEP.	2	12/01/75	-1.8670 + 1	1.8670 + 1	2.0000 + 1	
N,F	CROSS SECTION	2027	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	TOTAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	LOCAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	2	12/01/75	2.0000 + 2	1.0000-10	3.0000 + 1	
N,F	NEUTRONS/FISSION	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	MULTIPLICITY	3	12/01/75	2.0000 + 2	1.0000-10	3.0000 + 1	
N,G	CROSS SECTION	1939	12/01/75	6.6200 + 0	1.0000-10	2.0000 + 1	
N,G	ENERGY DIST.	2	12/01/75	6.6200 + 0	1.0000-10	3.0000 + 1	
N,G	MULTIPLICITY	3	12/01/75	6.6200 + 0	1.0000-10	3.0000 + 1	
N,G	TOTAL ENERGY DEP.	2	12/01/75	6.6200 + 0	1.0000-10	2.0000 + 1	
N,G	LOCAL ENERGY DEP.	2	12/01/75	6.6200 + 0	1.0000-10	2.0000 + 1	
N,XG	CROSS SECTION	16	12/01/75	0.0000 + 0	2.9999 - 1	2.0000 + 1	
N,XG	ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	2.9999 - 1	2.0000 + 1	

02/12/75

98-CF-250
ATOMIC MASS = 2.5001 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	185	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	N ANGULAR DIST.	19	12/01/75	0.0000 + 0	1.0000- 2	2.0000 + 1	
N,ELASTIC	N TOTAL ENERGY DEP.	40	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	N LOCAL ENERGY DEP.	40	12/01/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	CROSS SECTION	20	12/01/75	0.0000 + 0	4.5000- 2	2.0000 + 1	
N,N'	N ENERGY-ANGLE DIST.	14	12/01/75	0.0000 + 0	4.5000- 2	2.0000 + 1	
N,N'	N TOTAL ENERGY DEP.	15	12/01/75	0.0000 + 0	4.5000- 2	2.0000 + 1	
N,N'	N LOCAL ENERGY DEP.	2	12/01/75	0.0000 + 0	4.5000- 2	2.0000 + 1	
N,2N	CROSS SECTION	18	12/01/75	-6.6100 + 0	6.6400 + 0	2.0000 + 1	
N,2N	N ENERGY-ANGLE DIST.	9	12/01/75	-6.6100 + 0	6.6400 + 0	2.0000 + 1	
N,2N	N TOTAL ENERGY DEP.	18	12/01/75	-6.6100 + 0	6.6400 + 0	2.0000 + 1	
N,2N	N LOCAL ENERGY DEP.	3	12/01/75	-6.6100 + 0	6.6400 + 0	2.0000 + 1	
N,3N	CROSS SECTION	11	12/01/75	-1.2210 + 1	1.2260 + 1	2.0000 + 1	
N,3N	N ENERGY-ANGLE DIST.	6	12/01/75	-1.2210 + 1	1.2260 + 1	2.0000 + 1	
N,3N	N TOTAL ENERGY DEP.	5	12/01/75	-1.2210 + 1	1.2260 + 1	2.0000 + 1	
N,3N	N LOCAL ENERGY DEP.	4	12/01/75	-1.2210 + 1	1.2260 + 1	2.0000 + 1	
N,4N	CROSS SECTION	4	12/01/75	-1.8590 + 1	1.8670 + 1	2.0000 + 1	
N,4N	N ENERGY-ANGLE DIST.	3	12/01/75	-1.8590 + 1	1.8670 + 1	2.0000 + 1	
N,4N	N TOTAL ENERGY DEP.	2	12/01/75	-1.8590 + 1	1.8670 + 1	2.0000 + 1	
N,4N	N LOCAL ENERGY DEP.	2	12/01/75	-1.8590 + 1	1.8670 + 1	2.0000 + 1	
N,F	CROSS SECTION	22	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N TOTAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N LOCAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N ENERGY-ANGLE DIST.	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	G ENERGY-ANGLE DIST.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	N NEUTRONS/FISSION	5	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	G MULTIPLICITY	3	12/01/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,G	CROSS SECTION	260	12/01/75	5.1100 + 0	1.0000-10	3.0000 + 1	
N,G	O ENERGY DIST.	2	12/01/75	5.1100 + 0	1.0000-10	3.0000 + 1	
N,G	G MULTIPLICITY	3	12/01/75	5.1100 + 0	1.0000-10	3.0000 + 1	
N,G	N TOTAL ENERGY DEP.	2	12/01/75	5.1100 + 0	1.0000-10	2.0000 + 1	
N,G	N LOCAL ENERGY DEP.	2	12/01/75	5.1100 + 0	1.0000-10	2.0000 + 1	
N,XG	CROSS SECTION	15	12/01/75	0.0000 + 0	2.9999- 1	2.0000 + 1	
N,XG	O ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	2.9999- 1	2.0000 + 1	

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99-CF-251
ATOMIC MASS = 2.5101 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N.ELASTIC	CROSS SECTION	159	12/01/75	0.0000 + 0	1.0000-10	2.0000+ 1	
N.ELASTIC	N ANGULAR DIST.	19	12/01/75	0.0000 + 0	1.0000- 2	2.0000+ 1	
N.ELASTIC	N TOTAL ENERGY DEP.	40	12/01/75	0.0000 + 0	1.0000-10	2.0000+ 1	
N.ELASTIC	N LOCAL ENERGY DEP.	40	12/01/75	0.0000 + 0	1.0000-10	2.0000+ 1	
N.N'	CROSS SECTION	19	12/01/75	0.0000 + 0	2.5000- 2	2.0000+ 1	
N.N'	N ENERGY-ANGLE DIST.	14	12/01/75	0.0000 + 0	2.5000- 2	2.0000+ 1	
N.N'	N TOTAL ENERGY DEP.	17	12/01/75	0.0000 + 0	2.5000- 2	2.0000+ 1	
N.N'	N LOCAL ENERGY DEP.	2	12/01/75	0.0000 + 0	2.5000- 2	2.0000+ 1	
N.2N	CROSS SECTION	15	12/01/75	-5.1000 + 0	5.1300 + 0	2.0000+ 1	
N.2N	N ENERGY-ANGLE DIST.	10	12/01/75	-5.1000 + 0	5.1300 + 0	2.0000+ 1	
N.2N	N TOTAL ENERGY DEP.	22	12/01/75	-5.1000 + 0	5.1300 + 0	2.0000+ 1	
N.2N	N LOCAL ENERGY DEP.	2	12/01/75	-5.1000 + 0	5.1300 + 0	2.0000+ 1	
N.3N	CROSS SECTION	8	12/01/75	-1.1730 + 1	1.1780 + 1	2.0000+ 1	
N.3N	N ENERGY-ANGLE DIST.	6	12/01/75	-1.1730 + 1	1.1780 + 1	2.0000+ 1	
N.3N	N TOTAL ENERGY DEP.	5	12/01/75	-1.1730 + 1	1.1780 + 1	2.0000+ 1	
N.3N	N LOCAL ENERGY DEP.	3	12/01/75	-1.1730 + 1	1.1780 + 1	2.0000+ 1	
N.4N	CROSS SECTION	5	12/01/75	-1.7320 + 1	1.7390 + 1	2.0000+ 1	
N.4N	N ENERGY-ANGLE DIST.	3	12/01/75	-1.7320 + 1	1.7390 + 1	2.0000+ 1	
N.4N	N TOTAL ENERGY DEP.	3	12/01/75	-1.7320 + 1	1.7390 + 1	2.0000+ 1	
N.4N	N LOCAL ENERGY DEP.	3	12/01/75	-1.7320 + 1	1.7390 + 1	2.0000+ 1	
N.F	CROSS SECTION	203	12/01/75	2.0000 + 2	1.0000-10	2.0000+ 1	
N.F	N TOTAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000+ 1	
N.F	N LOCAL ENERGY DEP.	2	12/01/75	2.0000 + 2	1.0000-10	2.0000+ 1	
N.F	N ENERGY-ANGLE DIST.	5	12/01/75	2.0000 + 2	1.0000-10	2.0000+ 1	
N.F	G ENERGY-ANGLE DIST.	2	12/01/75	2.0000 + 2	1.0000-10	3.0000- 1	
N.F	N NEUTRONS/FISSION	5	12/01/75	2.0000 + 2	1.0000-10	2.0000+ 1	
N.G	G MULTIPLICITY	3	12/01/75	2.0000 + 2	1.0000-10	3.0000- 1	
N.G	CROSS SECTION	206	12/01/75	6.1700 + 0	1.0000-10	2.0000+ 1	
N.G	G ENERGY DIST.	2	12/01/75	6.1700 + 0	1.0000-10	3.0000- 1	
N.G	G MULTIPLICITY	3	12/01/75	6.1700 + 0	1.0000-10	3.0000- 1	
N.G	N TOTAL ENERGY DEP.	2	12/01/75	6.1700 + 0	1.0000-10	2.0000+ 1	
N.G	N LOCAL ENERGY DEP.	2	12/01/75	6.1700 + 0	1.0000-10	2.0000+ 1	
N.XG	CROSS SECTION	16	12/01/75	0.0000 + 0	2.9999- 1	2.0000+ 1	
N.XG	G ENERGY-ANGLE DIST.	15	12/01/75	0.0000 + 0	2.9999- 1	2.0000+ 1	

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98-CF-252
ATOMIC MASS = 2.5201 + 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	518	3/15/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	ANGULAR DIST.	13	3/29/75	0.0000 + 0	4.0000- 2	2.0000 + 1	
N,ELASTIC	TOTAL ENERGY DEP.	39	3/29/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,ELASTIC	LOCAL ENERGY DEP.	39	3/29/75	0.0000 + 0	1.0000-10	2.0000 + 1	
N,N'	CROSS SECTION	27	3/15/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,N'	ENERGY-ANGLE DIST.	14	3/15/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,N'	TOTAL ENERGY DEP.	23	3/29/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,N'	LOCAL ENERGY DEP.	2	3/29/75	0.0000 + 0	5.0000- 2	2.0000 + 1	
N,2N	CROSS SECTION	9	3/15/75	-6.1700 + 1	6.2500 + 0	2.0000 + 1	
N,2N	ENERGY-ANGLE DIST.	7	3/15/75	-6.1700 + 0	6.2500 + 0	2.0000 + 1	
N,2N	TOTAL ENERGY DEP.	14	3/29/75	-6.1700 + 0	6.2500 + 0	2.0000 + 1	
N,2N	LOCAL ENERGY DEP.	2	3/29/75	-6.1700 + 0	6.2500 + 0	2.0000 + 1	
N,3N	CROSS SECTION	8	3/15/75	-1.1280 + 1	1.1400 + 1	2.0000 + 1	
N,3N	ENERGY-ANGLE DIST.	5	3/15/75	-1.1280 + 1	1.1400 + 1	2.0000 + 1	
N,3N	TOTAL ENERGY DEP.	5	3/29/75	-1.1280 + 1	1.1400 + 1	2.0000 + 1	
N,3N	LOCAL ENERGY DEP.	2	3/29/75	-1.1280 + 1	1.1400 + 1	2.0000 + 1	
N,4N	CROSS SECTION	2	3/15/75	-1.7900 + 1	1.8000 + 1	2.0000 + 1	
N,4N	ENERGY-ANGLE DIST.	3	3/15/75	-1.7900 + 1	1.8000 + 1	2.0000 + 1	
N,4N	TOTAL ENERGY DEP.	2	3/29/75	-1.7900 + 1	1.8000 + 1	2.0000 + 1	
N,4N	LOCAL ENERGY DEP.	2	3/29/75	-1.7900 + 1	1.8000 + 1	2.0000 + 1	
N,F	CROSS SECTION	1287	3/15/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	TOTAL ENERGY DEP.	2	3/29/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	LOCAL ENERGY DEP.	2	3/29/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	6	3/15/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	ENERGY-ANGLE DIST.	2	3/15/75	2.0000 + 2	1.0000-10	3.0200 + 1	
N,F	NEUTRONS/FISSION	6	3/15/75	2.0000 + 2	1.0000-10	2.0000 + 1	
N,F	MULTIPLICITY	3	3/15/75	2.0000 + 2	1.0000-10	3.0200 + 1	
N,G	CROSS SECTION	1257	3/15/75	4.7900 + 0	1.0000-10	2.0000 + 1	
N,G	ENERGY DIST.	2	3/15/75	4.7900 + 0	1.0000-10	3.0200 + 1	
N,G	MULTIPLICITY	3	3/15/75	4.7900 + 0	1.0000-10	3.0200 + 1	
N,G	TOTAL ENERGY DEP.	2	3/29/75	4.7900 + 0	1.0000-10	2.0000 + 1	
N,G	LOCAL ENERGY DEP.	2	3/29/75	4.7900 + 0	1.0000-10	2.0000 + 1	
N,XO	CROSS SECTION	12	3/15/75	0.0000 + 0	3.0000- 1	2.0000 + 1	
N,XO	ENERGY-ANGLE DIST.	12	3/15/75	0.0000 + 0	3.0000- 1	2.0000 + 1	

02/12/76

FISSION PRODUCTS
ATOMIC MASS = 1.1700+ 2

	REACTION	POINTS	DATE	Q-VALUE	E-MIN	E-MAX	QUALIFIER
N,ELASTIC	CROSS SECTION	26	11/15/72	0.0000+ 0	1.0500-10	2.0000+ 1	
N,ELASTIC	N ANGULAR DIST.	10	11/03/72	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,ELASTIC	N TOTAL ENERGY DEP.	32	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,ELASTIC	N LOCAL ENERGY DEP.	32	11/14/74	0.0000+ 0	1.0000-10	2.0000+ 1	
N,N'	CROSS SECTION	14	11/15/72	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,N'	N ENERGY-ANGLE DIST.	9	11/15/72	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,N'	N TOTAL ENERGY DEP.	20	11/14/74	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,N'	N LOCAL ENERGY DEP.	2	11/14/74	0.0000+ 0	1.0000- 1	2.0000+ 1	
N,2N	CROSS SECTION	9	11/15/72	-8.0000+ 0	8.2000+ 0	2.0000+ 1	
N,2N	N ENERGY-ANGLE DIST.	5	11/15/72	-8.0000+ 0	8.2000+ 0	2.0000+ 1	
N,2N	N TOTAL ENERGY DEP.	12	11/14/74	-8.0000+ 0	8.2000+ 0	2.0000+ 1	
N,2N	N LOCAL ENERGY DEP.	2	11/14/74	-8.0000+ 0	8.2000+ 0	2.0000+ 1	
N,3N	CROSS SECTION	5	11/15/72	-1.5350+ 1	1.5500+ 1	2.0000+ 1	
N,3N	N ENERGY-ANGLE DIST.	3	11/15/72	-1.5350+ 1	1.5500+ 1	2.0000+ 1	
N,3N	N TOTAL ENERGY DEP.	3	11/14/74	-1.5350+ 1	1.5500+ 1	2.0000+ 1	
N,3N	N LOCAL ENERGY DEP.	2	11/14/74	-1.5350+ 1	1.5500+ 1	2.0000+ 1	
N,G	CROSS SECTION	74	11/15/72	8.0000+ 0	1.0000-10	2.0000+ 1	
N,G	O ENERGY DIST.	2	11/20/72	8.0000+ 0	1.0000-10	1.0000- 2	
N,G	G MULTIPLICITY	3	11/20/72	8.0000+ 0	1.0000-10	1.0000- 2	
N,G	N TOTAL ENERGY DEP.	2	11/14/74	8.0000+ 0	1.0000-10	2.0000+ 1	
N,G	N LOCAL ENERGY DEP.	2	11/14/74	8.0000+ 0	1.0000-10	2.0000+ 1	
N,XG	CROSS SECTION	16	12/01/75	0.0000+ 0	9.9900- 3	2.0000+ 1	
N,XG	G ENERGY-ANGLE DIST.	15	12/01/75	0.0000+ 0	9.9900- 3	2.0000+ 1	