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Production and Testing of the DNA Few-Group Coupled Neutron-Gamma Cross-Section Library

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Neutron Physics Division

PRODUCTION AND TESTING OF THE DNA FEW-GROUP COUPLED NEUTRON-GAMMA CROSS-SECTION LIBRARY

D. E. Bartine, J. R. Knight,* J. V. Pace, III,*
and R. Roussin

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*Computer Sciences Division

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ABSTRACT

A state-of-the-art cross-section library has been developed for the Defense Nuclear Agency in a 37-21 neutron-gamma energy group structure that can be used for radiation transport calculations on most available computer facilities. Based on data from the DNA Working Cross Section Library and the Evaluated Nuclear Data File, the library contains cross sections for 35 nuclides that will be updated and added to regularly. The documentation presented here includes descriptions of typical sources and responses in the 37-21 structure and results of comparative calculations performed for testing purposes. The library is available through the Radiation Shielding Information Center at Oak Ridge National Laboratory.

I. INTRODUCTION

Many contractors performing radiation transport calculations for the Defense Nuclear Agency do not have access to the large computer facilities required to use the detailed sets of coupled neutron and gamma-ray interaction cross sections developed by the several shielding research organizations. To aid their contractors, DNA requested that ORNL develop and test a coupled cross-section library having the minimum number of neutron and gamma-ray energy groups to obtain acceptable accuracy in the transport results. The resulting library, processed with the AMPX code,[1] contains 37 neutron groups and 21 gamma-ray groups and includes cross sections for 35 nuclides of specific interest to the defense community. The library is based on cross-section data from the DNA Working Cross Section Library (DNA WCSL)* and the Evaluated Nuclear Data File.[2] As new data become available from these two sources, the library will be subject to regular maintenance and revision and thereby will represent the state of the art.

This report presents the documentation of the library. Section II gives a listing of the contents of the library in terms of nuclides, with appropriate references. It also presents the energy group structure, along with details regarding the processing employed.

Section III contains a listing of the response functions included in the library and a discussion of their application, together with descriptions of frequently employed source distributions. Calculations performed to test the library by comparison with other libraries are described in

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*R. W. Roussin, "The Defense Nuclear Agency Working Cross Section Library: Description and Contents," ORNL-RSIC-34 (1972) Revised 1973. This document is periodically revised to reflect changes in the DNA WCSL, but a more timely status is given by means of the RSIC Monthly Newsletter.

Section IV. Complete problem descriptions are given, as well as the results obtained and conclusions drawn, particularly with regard to group structure and weighting functions.

Appendix A contains a listing of the partial reaction cross sections (for example, elastic, inelastic, etc.) by element, and describes a simple module for collapsing the 37-21 neutron-gamma group library to fewer energy groups, as in a 22-18 neutron-gamma structure.

Inquiries or requests for the library package may be mailed to:

Data Coordinator
Radiation Shielding Information Center (RSIC)
Oak Ridge National Laboratory
Post Office Box X
Oak Ridge, Tennessee 37830.

The library is designated DLC-31/(DPL-1/FEWG1) by RSIC.

II. LIBRARY CONTENTS

A list of the 35 nuclides included in this cross-section library is presented in Table 1, along with the names of the evaluators, the date of the evaluation, and the data set identification in the DNA Working Cross Section Library and/or Evaluated Nuclear Data File (ENDF/B).

As stated previously, the cross sections were processed into a coupled 37-21 neutron-gamma energy group structure, with gamma-ray production included for each element. The energy structure, shown in Table 2, is quite biased at high energies for both the neutron and the gamma-ray groups owing to the importance of high-energy particles for the calculation of tissue dose and silicon damage in electronics.[3] In addition, the neutron groups are tailored to allow for the major peaks and valleys in the total neutron cross sections of nitrogen, oxygen, silicon, and iron, and the gamma-ray groups are tailored to allow

Table 1. DATA DESCRIPTION FOR THE DEFENSE NUCLEAR AGENCY FEW-GROUP CROSS-SECTION LIBRARY

Material	Evaluators	Date	DNA MAT-MOD	ENDF/B-IV Equivalent
H	Stewart, LaBauve, Young - LASL	10/73	4148-2	1269
H-3	Stewart - LASL	10/73	4169-1	1169
Li-6	Battat, LaBauve - LASL	1974		1271
Li-7	Battat, LaBauve - LASL	1974		1272
Be-9	Howerton, Perkins - LLL	1973	4154-3	1289
B-10	LaBauve, Young, Hale - LASL	1972		1159*
B-11	LaBauve, Young, Hale - LASL	1973		1160*
C-12	Perey, Perey - ORNL	2/74	4274-0	1274
N	Young, Foster - LASL	7/73	4133-4	1275
O	Young, Foster - LASL	8/73	4134-2	1276
F	Fu, Larson, Perey - ORNL	9/74	4509-1	1277
Na	Paik, Pitterle, Perey - WARD, ORNL	2/72	4156-0	1156
Mg	Drake, Fricke - SAI	2/74	4512-1	1280
Al	Foster, Young - LASL	11/73	4135-3	1193
Si	Larson, Perey, Drake, Young - ORNL	2/74	4151-3	1194
Cl	Drake - GGA	1967		1149
K	Drake - GGA	1967		1150
Ca	Fu, Perey - ORNL	2/73	4152-3	1195
V	Penny, Owen - ORNL	9/72		1196
Cr	Prince - BNL	4/74		1191
Mn	Takahashi - BNL	2/74		1197
Fe	Perey, Fu, Penny, Kinney, Wright - ORNL	2/74	4180-2	1192
Ni	Bhat - BNL	12/73		1190
Cu	Drake, Fricke - SAI	2/74	4529-1	1295
Mo	Howerton - LLL	9/74		1287
Ta-181	Howerton, Perkins, MacGregor - LLL	10/73	4179-3	1285
W-182	Young - LASL	3/74	4582-2	1128
W-183	Young - LASL	3/74	4583-2	1129
W-184	Young - LASL	3/74	4584-2	1130
W-186	Young - LASL	3/74	4586-2	1131
Pb	Fu, Perey - ORNL	10/73	4136-5	1288
U-235	Howerton, MacGregor - LLL	3/73	4188-1	
U-238	Howerton, MacGregor - LLL	3/73	4187-1	
Pu-239	Stewart, Hunter - LASL	3/73	4539-0	
Pu-240	Stewart, Hunter - LASL	3/73	4540-0	

*Secondary gamma-ray production cross sections processed with POPOP4.

Table 2. NEUTRON AND GAMMA-RAY ENERGY BOUNDARIES FOR THE 37-21 COUPLED NEUTRON-GAMMA LIBRARY

Group No.	Neutron Group (eV) Energy	Neutron Group (eV) Lethargy	Gamma Group (eV) Energy	Gamma Group (eV) Eff. Avg.
1	1.96+7*	-0.675	1.40+7	1.20+7
2	1.69+7	-0.525	1.00+7	9.00+6
3	1.49+7	-0.400	8.00+6	7.50+6
4	1.42+7	-0.350	7.00+6	6.50+6
5	1.38+7	-0.325	6.00+6	5.50+6
6	1.28+7	-0.250	5.00+6	4.50+6
7	1.22+7	-0.200	4.00+6	3.50+6
8	1.11+7	-0.100	3.00+6	2.75+6
9	1.00+7	0.000	2.50+6	2.25+6
10	9.05+6	0.100	2.00+6	1.75+6
11	8.19+6	0.200	1.50+6	1.25+6
12	7.41+6	0.300	1.00+6	8.50+5
13	6.38+6	0.450	7.00+5	5.75+5
14	4.97+6	0.700	4.50+5	3.75+5
15	4.72+6	0.750	3.00+5	2.25+5
16	4.07+6	0.900	1.50+5	1.25+5
17	3.01+6	1.200	1.00+5	8.50+4
18	2.39+6	1.433	7.00+4	5.75+4
19	2.31+6	1.467	4.50+4	3.75+4
20	1.83+6	1.700	3.00+4	2.50+4
21	1.11+6	2.200	2.00+4	1.50+4
22	5.50+5	2.900	1.00+4	
23	1.58+5	4.150		
24	1.11+5	4.500		
25	5.25+4	5.250		
26	2.48+4	6.000		
27	2.19+4	6.125		
28	1.03+4	6.875		
29	3.35+3	8.000		
30	1.23+3	9.000		
31	5.83+2	9.750		
32	1.01+2	11.500		
33	2.90+1	12.750		
34	1.07+1	13.750		
35	3.06+0	15.000		
36	1.13+0	16.000		
37	4.14-1	17.000		
38	1.00-5	27.631		

*Read as 1.96×10^7.

accurate calculation of pair production, annihilation photon transport, hydrogen capture, and backscatter photon transport. There is also sufficient low photon energy structure to allow for rapidly changing cross sections and response functions. The cross-section data were processed with the AMPX[1] code, using a 1/E weighting spectrum for all neutron groups except the thermal group, for which a 300°K Maxwellian weighting spectrum was used. A P_3 Legendre expansion is given for each element in the ANISN[4] format, as follows:

For Energy Group g

Table Position		Cross Section
1	σ_a	absorption
2	$\nu\sigma_f$	fission
3	σ_T	total
4	σ_{gg}	scatter within group g
5	$\sigma_{g-1\rightarrow g}$	downscatter into group g
.	$\sigma_{g-2\rightarrow g}$	scatter from groups g-1, g-2, etc. to group g
.	.	.
.	.	.
.	.	.
.	$\sigma_{1\rightarrow g}$	downscatter from group 1 to g
.	.	
.	0	
.	.	
61	0	

The table length of the cross-section set is therefore 61 to allow for downscatter and production from all higher groups to group 58 (gamma-ray group 21), and the cross sections basically fill in the upper diagonal matrix below the first three positions.

III. SOURCES AND RESPONSES

This section presents the sources and response functions included with the library for use in defense-related calculations. The titles of the response functions are listed in Table 3, along with the applicable units. Responses 1 and 2, the neutron and gamma free-in-air tissue kerma response functions, were generated for an 11-element standard man[5] composition from the same data used for the cross-section library with the MACK[6] code. Free-in-air tissue kerma is also referred to as a single-collision or first-collision dose. Responses 3, 4, and 5 are essentially electronic damage functions. Responses 6 and 7 are neutron and gamma tissue dose responses, respectively. These tissue dose responses were obtained by transporting monoenergetic neutron and gamma broad-beam sources through tissue phantoms and scoring the maximum energy deposition (kerma) in the phantoms. Response 6, the Snyder-Auxier neutron tissue dose function,[7] considered a three-dimensional homogeneous cylindrical tissue phantom and includes the effects of secondary gammas produced in the phantom. Response 7, the Claiborne-Trubey gamma tissue dose function,[8] considered a one-dimensional homogeneous slab tissue phantom. Table 4 presents the free-in-air kerma functions (responses 1 and 2), the tissue dose (in-phantom) functions (responses 6 and 7), and includes the older Henderson neutron free-in-air kerma function for comparison. The entire set of response functions listed in Table 3 are presented in cross-section format as Appendix B. Responses 8 through 21 and 22 through 35 are neutron and gamma elemental kerma factors, respectively. Kerma is

Table 3. RESPONSES INCLUDED WITH THE 37-21 LIBRARY

Position	Response Function	Units
1	Neutron Free-in-Air Tissue Kerma	Rads/(Neutron/cm^2)
2	Gamma Free-in-Air Tissue Kerma	Rads/(Neutron/cm^2)
3	Neutron Displacement in Silicon	(Equiv. 1-MeV Neutrons/(cm^2·sec))/ Neutron/(cm^2·sec)
4	Neutron Ionization in Silicon	(Rads-Si)/(Neutron/cm^2)
5	Gamma Ionization in Silicon	(Rads-Si)/(Photon/cm^2)
6	Snyder-Auxier Neutron Tissue Dose	Rads/(Neutron/cm^2)
7	Claiborne-Trubey Gamma Tissue Dose	Rads/(Photon/cm^2)
8	H Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
9	C Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
10	N Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
11	O Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
12	Na Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
13	Mg Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
14	Al Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
15	Si Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
16	P Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
17	S Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
18	Cl Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
19	K Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
20	Ca Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
21	Fe Neutron Kerma	(Rads/Atom)/(Neutron/(cm^2·g))
22	H Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
23	C Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
24	N Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
25	O Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
26	Na Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
27	Mg Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
28	Al Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
29	Si Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
30	P Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
31	S Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
32	Cl Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
33	K Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
34	Ca Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
35	Fe Gamma Kerma	(Rads/Atom)/(Photon/(cm^2·g))
36	Snyder-Neufeld Neutron Tissue Dose	Rads/(Neutron/cm^2)
37	Henderson Neutron Free-in-Air Tissue Kerma	Rads/(Neutron/cm^2)
38	Henderson Gamma Free-in-Air Tissue Kerma	Rads/(Photon/cm^2)
39	Snyder-Auxier Neutron Tissue Dose	Rem/(Neutron/cm^2)

Table 4. SELECTED TISSUE RESPONSE FUNCTIONS

4.A. Neutron Responses in Rads/(Neutron/cm^2)

Group	Upper Energy Boundary (MeV)	Neutron Free-in-Air Tissue Kerma	Snyder-Auxier Neutron Tissue Dose	Henderson Free-in-Air Tissue Kerma
1	19.6	7.00-09	7.85-09	5.64-09
2	16.9	6.64-09	7.78-09	5.64-09
3	14.9	6.43-09	7.74-09	5.52-09
4	14.2	6.33-09	7.71-09	5.41-09
5	13.8	6.19-09	7.49-09	5.48-09
6	12.8	6.00-09	7.21-09	5.44-09
7	12.2	5.93-09	6.89-09	5.30-09
8	11.1	5.68-09	6.49-09	5.09-09
9	10.0	5.53-09	6.23-09	4.83-09
10	9.0	5.22-09	6.10-09	4.85-09
11	8.2	5.12-09	5.97-09	4.84-09
12	7.4	4.86-09	5.82-09	4.55-09
13	6.4	4.56-09	5.57-09	4.46-09
14	5.0	4.32-09	5.34-09	4.26-09
15	4.7	4.25-09	5.09-09	4.33-09
16	4.1	4.04-09	4.56-09	4.06-09
17	3.0	3.43-09	4.00-09	3.37-09
18	2.4	3.14-09	3.82-09	3.14-09
19	2.3	3.07-09	3.74-09	3.09-09
20	1.8	2.65-09	3.52-09	2.66-09
21	1.1	2.01-09	2.94-09	2.01-09
22	5.5-01	1.25-09	1.69-09	1.21-09
23	1.6-01	7.68-10	9.72-10	7.53-10
24	1.1-01	5.35-10	7.45-10	4.97-10
25	5.2-02	3.02-10	5.89-10	2.53-10
26	2.5-02	2.05-10	5.13-10	1.72-10
27	2.2-02	1.41-10	4.49-10	1.25-10
28	1.0-02	6.01-11	4.21-10	0.0
29	3.4-03	2.12-11	4.79-10	0.0
30	1.2-03	8.88-12	5.25-10	0.0
31	5.8-04	3.07-12	5.58-10	0.0
32	1.0-04	1.14-12	5.94-10	0.0
33	2.9-05	1.12-12	6.18-10	0.0
34	1.1-05	1.69-12	6.28-10	0.0
35	3.1-06	2.82-12	6.22-10	0.0
36	1.1-06	4.60-12	6.00-10	0.0
37	4.1-07	2.20-10	5.17-10	0.0
	1.0-11			

4.B. Gamma Responses in Rads/(Photon/cm^2)

Group	Upper Energy Boundary (MeV)	Gamma Free-in-Air Tissue Kerma	Claiborne-Trubey Gamma Tissue Dose
1	14.0	3.04-09	3.05-09
2	10.0	2.41-09	2.43-09
3	8.0	2.09-09	2.12-09
4	7.0	1.88-09	1.92-09
5	6.0	1.67-09	1.71-09
6	5.0	1.46-09	1.50-09
7	4.0	1.23-09	1.27-09
8	3.0	1.05-09	1.09-09
9	2.5	9.15-10	9.59-10
10	2.0	7.68-10	8.13-10
11	1.5	5.98-10	6.41-10
12	1.00	4.36-10	4.82-10
13	0.70	3.05-10	3.60-10
14	0.45	1.98-10	2.48-10
15	0.30	1.11-10	1.64-10
16	0.15	5.56-11	1.01-10
17	0.10	4.02-11	7.44-11
18	0.07	4.09-11	7.73-11
19	0.045	7.34-11	1.17-10
20	0.030	1.63-10	2.23-10
21	0.020	5.22-10	6.26-10
	0.010		

an acronym for Kinetic Energy Release in MAterials. The elemental kerma factors given here must be multiplied by the normal atomic number density (atoms/g/10^{24}) to give calculational units of rads/(neutron/cm^2), similar to those given in the tissue kerma responses 1 and 2. The elemental kerma data included here were used in the generation of responses 1 and 2. Response 36 is an older neutron tissue dose function,[9] while responses 37 and 38 are older free-in-air tissue kerma factors,[10] still frequently employed.

A word of caution should be expressed regarding the use of response 37, since the Henderson neutron tissue kerma has no values below group 27 (10 keV), while the newer kerma have values at all energies and have a fairly significant value at thermal energies. Response 39 is the Snyder-Auxier neutron tissue dose response in units of rem/(neutron/cm^2). The data in response 6, the Snyder-Auxier neutron tissue dose in rads/(neutron/cm^2), were multiplied by a quality factor which accounts for the difference in linear energy transfer (LET) for neutrons of different energies in order to obtain response 39. The LET quality factors are similar to the relative biological effectiveness (RBE) factors frequently used in radiobiological applications. Selected neutron and gamma sources are given in Table 5 in the 37-21 group structure. These sources are commonly used in defense-related calculations, and some of the neutron sources were utilized in the comparative calculations presented in Section IV.

Table 5. SELECTED SOURCE DISTRIBUTIONS

5.A. Neutron Sources

Group	Upper Energy Boundary (MeV)	Sources (Neutrons/Source Neutron) 14 MeV	Thermonuclear**	Fission***
1	19.6	0.0	0.0	0.0
2	16.9	1.89-02*	0.0	0.0
3	14.9	3.12-01	1.89-02	0.0
4	14.2	3.12-01	9.34-03	0.0
5	13.8	3.54-01	2.66-02	0.0
6	12.8	4.37-03	1.67-02	0.0
7	12.2	0.0	1.69-02	0.0
8	11.1	0.0	1.24-02	0.0
9	10.0	0.0	7.48-03	3.84-03
10	9.0	0.0	6.82-03	3.50-03
11	8.2	0.0	6.78-03	5.39-03
12	7.4	0.0	1.03-02	7.35-03
13	6.4	0.0	1.81-02	1.84-02
14	5.0	0.0	3.62-03	3.25-03
15	4.7	0.0	1.24-02	8.47-03
16	4.1	0.0	2.60-02	5.50-02
17	3.0	0.0	2.37-02	3.24-02
18	2.4	0.0	3.75-03	1.06-02
19	2.3	0.0	2.56-02	9.72-02
20	1.8	0.0	6.44-02	1.47-01
21	1.1	0.0	8.85-02	2.16-01
22	5.5-01	0.0	9.14-02	1.50-01
23	1.6-01	0.0	1.16-02	1.93-02
24	1.1-01	0.0	1.11-01	1.21-01
25	5.2-02	0.0	5.40-02	5.73-02
26	2.5-02	0.0	5.68-03	6.00-03
27	2.2-02	0.0	9.26-02	2.40-02
28	1.0-02	0.0	1.16-01	1.44-02
29	3.4-03	0.0	7.38-02	0.0
30	1.2-03	0.0	2.32-02	0.0
31	5.8-04	0.0	2.03-02	0.0
32	1.0-04	0.0	1.90-03	0.0
33	2.9-05	0.0	0.0	0.0
34	1.1-05	0.0	0.0	0.0
35	3.1-06	0.0	0.0	0.0
36	1.1-06	0.0	0.0	0.0
37	4.1-07	0.0	0.0	0.0
	1.0-11			
TOTAL		1.00	1.00	1.00

*Read 1.89-02 as 1.89×10^{-2}.

**From reference 11.

***From reference 12.

5.B. Prompt Gamma Fission Source*

Group	Upper Energy Boundary (MeV)	Gamma/Source Gamma
1	14.0	1.65-5**
2	10.0	1.34-4
3	8.0	3.02-4
4	7.0	9.08-4
5	6.0	2.73-3
6	5.0	8.19-3
7	4.0	2.46-2
8	3.0	2.70-2
9	2.5	4.69-2
10	2.0	8.12-2
11	1.5	1.41-1
12	1.00	1.30-1
13	0.70	1.47-1
14	0.45	1.09-1
15	0.30	1.29-1
16	0.15	4.79-2
17	0.10	3.01-2
18	0.070	2.58-2
19	0.045	1.58-2
20	0.030	1.07-2
21	0.020	1.08-2
	0.010	
TOTAL		0.98

*From reference 13.

**Read as 1.65×10^{-5}.

IV. TESTING

This section presents the results of efforts designed to determine the ability of the 37-21 library to solve problems of basic interest to the defense community. These efforts were specifically directed toward questions concerning the correctness of the basic data, the results of the processing (including effects of the weighting function utilized in collapsing from the basic point data to a few-group library), and the adequacy of the 37 neutron and 21 gamma energy group structures selected. Three basic problems were addressed in the course of this study, two air penetration calculations and a concrete penetration calculation. All three problems were run using the familiar sources and response functions given in Section III and Appendix B.

Table 6 presents the results of an air transport calculation in spherical geometry using an S_{16} angular quadrature. Neutron and gamma tissue doses, neutron displacement in silicon, and neutron and gamma ionization in silicon are given at 2000 m in air due to a thermonuclear source. The calculations were extended to 3000 m to allow for adequate reflection. The results are given in rads or equivalent 1-MeV displacements per incident neutron. This problem was calculated with six different cross-section sets. The 129-neutron 43-gamma cross-section set* with a (1/E) weighting was selected as a standard because energy-group boundaries for this structure were specifically chosen to fit in detail the peaks and valleys in the neutron cross sections and to bracket major gamma-production lines for elements involved in transport through air and concrete. The 129-43 case with $(1/E\Sigma_T)$ weighting indicates the adequacy of this group structure for this problem, since the results agree to within

*See Appendix D.

Table 6. AIR TRANSPORT PROBLEM (2000M, THERMO SOURCE, P_3S_{16}, SPHERICAL)

Cross Section	Snyder-Neufeld Neutron Tissue Dose (Rads)	Neutron Displacement (equiv. 1-MeV/neutrons/cm^2)	Neutron Ionization (Rads-Si)	Henderson Gamma Tissue Dose (Rads)	Gamma Ionization (Rads-Si)
129-43(1/E)	1.61-23	3.87-15	2.72-25	8.28-24	7.81-24
129-43(1/EΣ_T)	+4%*	+3%	+1%	+0%	+2%
129-42(1/E)	---	---	---	-15%	-15%
37-18(1/E)	+3%	+2%	+1%	+3%	+3%
37-18(1/EΣ_T)	+19%	+14%	+7%	+4%	+5%
37-21(1/E)	+3%	+2%	+1%	+0%	+18%

*Percent deviation from 129-43(1/E) results.

4%. The 129-42 set indicates the importance ($\sim$ 15%) of including the gammas with energies above 10 MeV, since the 42-group gamma structure cuts off at 10 MeV. The 37-18 (1/E) results agree quite well with the 129-43 set and indicate the adequacy of the 37-group neutron structure for this problem. The 37-18 ($1/E\Sigma_T$) results, on the other hand, show a fairly large discrepancy, exceeding the arbitrarily selected goal of agreement within 10%. This is believed to be due to an overemphasis on relative minima contained in relatively broad energy groups in the 1.8- to 0.1-MeV range, so that resulting downscatter is too low for the ($1/E\Sigma_T$)-weighted case. The 37-21 (1/E) results agree very well for the neutron responses and for the gamma tissue dose. The increase in the gamma silicon response is due to the importance of low-energy gammas ($E < 0.10$ MeV) for the silicon ionization response as compared with the Henderson gamma tissue dose response (see Appendix B). The 21-group gamma structure was designed to provide sufficient energy groups for low-energy gamma transport (5 groups below 0.1 MeV) and hence gives an enhanced silicon ionization compared to the 43-group structure.

Table 7 presents the results of a series of calculations for a thermonuclear source spectrum incident on a 40 in. concrete slab. The responses and cross-section sets utilized are very similar to those presented in Table 6, but an S_8 angular quadrature set was employed for the slab geometry. The results here are generally similar to those obtained for the air case. In general, the results were satisfactory (within 10% of the 129-43 (1/E) results) for all combinations of weighting functions and group structures employed. The final calculation was

Table 7. CONCRETE TRANSPORT PROBLEM (40" CONCRETE, THERMO SOURCE, P_3S_8, Slab)

Cross Section	Snyder-Neufeld Neutron Tissue Dose (Rads)	Neutron Displacement (equiv. 1-MeV/neutrons/cm^2)	Neutron Ionization (Rads-Si)	Henderson Gamma Tissue Dose (Rads)	Gamma Ionization (Rads-Si)
129-43(1/E)	2.26-14*	4.97-6	4.69-16	4.72-14	4.66-14
129-43(1/EΣ_T)	+7%	-1%	+3%	+1%	+1%
129-42(1/E)	---	---	---	0%	0%
37-18(1/E)	-7%	-7%	-3%	-5%	-4%
37-18(1/EΣ_T)	+2%	+1%	+1%	-3%	-1%
37-21(1/E)	-7%	-7%	-4%	-5%	+2%
37-21(1/E)**	+4%	+4%	+3%	-3%	+4%

*Percent deviation from 129-43(1/E) results.

**ENDF/B-IV Si (4151-3) and Fe (4180-2).

added to determine the effect of the new ENDF/B-IV evaluated data and does indicate a significant increase in calculated responses, especially due to the high-energy cross sections for silicon.

Table 8 presents the results of a study of very deep (9000 m) air penetration from 14-MeV and weapon fission sources. Results for the 14-MeV case indicate that both weightings meet the 10% criteria for about 4000 m, and that the 37-21 results are always within a 20% criteria for this problem. These results are quite gratifying, since the uncertainty in the dose due to uncertainties in the basic cross-section data is considerably larger than this discrepancy.[2] The weapon fission-weighted cross section set displays a definite superiority to the 1/E-weighted set for the weapon fission source within the first 3000 m. The weapon fission-weighted cross sections for nitrogen and oxygen were therefore included in this library for use in similar problems.

A related study to determine P_ℓ (degree of Legendre expansion) requirements for air transport determined that the P_3 expansion was adequate. For example, with a weapon fission source, the resulting Snyder-Auxier neutron dose from a P_3 calculation was within 7% of a similar P_5 calculation out to 9000 m, while the gamma dose was within 13%.

In summary, these results indicate that the 37-21 library is adequate to solve many problems of interest to the defense community. Additional testing of the library continues, and additions and updates will be performed as required.

Table 8. NEUTRON TISSUE DOSE[a] COMPARISONS
FOR 14 MeV AND WEAPON FISSION SOURCES IN 9000 m OF AIR

Cross Sections Weighting Range (m)	14 MeV Source			Weapon Fission Source		
	129-43 1/E	37-21 1/E	37-21 Weapon Fission ϕ Weighted	129-43 1/E	37-21 1/E	37-21 Weapon Fission ϕ Weighted
500	1.72-19[b]	+0%[c]	-0%	1.05-19	+5%	+4%
1000	1.25-20	+0%	-2%	3.93-21	+12%	+5%
1500	9.75-22	+1%	-2%	1.65-22	+19%	+8%
2000	8.03-23	+0%	-3%	8.58-24	+18%	+7%
2500	7.31-24	-0%	-4%	5.82-25	+12%	+2%
3000	6.64-25	-2%	-6%	4.41-26	+4%	-5%
3500	6.01-26	-5%	-8%	3.58-27	-4%	-10%
4000	5.50-27	-7%	-11%	3.07-28	-9%	-14%
4500	5.88-28	-9%	-12%	3.14-29	-12%	-15%
5000	5.54-29	-11%	-14%	2.86-30	-14%	-17%
5500	6.05-30	-12%	-16%	3.03-31	-14%	-17%
6000	5.78-31	-13%	-16%	2.82-32	-14%	-17%
6500	5.54-32	-14%	-17%	2.63-33	-12%	-15%
7000	5.31-33	-13%	-16%	2.46-34	-10%	-13%
7500	5.85-34	-13%	-16%	2.64-35	-6%	-10%
8000	5.61-35	-11%	-15%	2.47-36	-2%	-7%
8500	5.36-36	-9%	-13%	2.30-37	+4%	-2%
9000	3.17-37	-6%	-11%	1.32-38	+10%	+4%

a. Snyder-Neufeld neutron response function, see Appendix B, in Rads/Incident Neutron.
b. Read as 1.72×10^{-19}.
c. Percent difference from the value calculated with the 129-43 cross section set.

REFERENCES

1. N. M. Greene, et al, "AMPX: A Modular Code System for Generating Coupled Multigroup Neutron-Gamma Libraries from ENDF/B," ORNL-TM-3706 (March 1976).

2. D. Garber, C. Dunford, and S. Pearlstein, "Data Formats and Procedures for the Evaluated Nuclear Data File, ENDF," BNL-NCS-50496 (ENDF 102) Revised Oct. 1975.

3. D. E. Bartine, E. M. Oblow, F. R. Mynatt, "Radiation-Transport Cross-Section Sensitivity Analysis - A General Approach Illustrated for a Thermonuclear Source in Air," Nuc. Sci. Eng. 55, 147 (1974).

4. W. W. Engle, Jr., "A User's Manual for ANISN, A One-Dimensional Discrete Ordinates Transport Code with Anisotropic Scattering," K-1693, Computing Technology Center (1967).

5. J. J. Ritts, M. Solomito, P. N. Stevens, "The Calculation of Neutron-Induced Physical Doses in Human Tissues," ORNL-TM-2991 (1969).

6. M. A. Abdou, C. W. Maynard, R. Q. Wright, "MACK: A Computer Program to Calculate Neutron Energy Release Parameters (Fluence-to-Kerma Factors) and Multigroup Neutron Reaction Cross Sections From Nuclear Data in ENDF Format," ORNL-TM-3994 (July 1973).

7. "Protection Against Neutron Radiation," NCRP-38, National Council on Radiation Protection and Measurements, Washington, D. C. (1971).

8. H. C. Claiborne, D. K. Trubey, "Dose Rates in a Slab Phantom from Monoenergetic Gamma Rays," Nucl. Appl. Tech. 8, 450 (1970).

9. W. S. Snyder and C. Neufeld, Radiation Res., 6, 1, 67 (1957).

10. B. J. Henderson, "Conversion of Neutron or Gamma Ray Flux to Absorbed Dose Rate," XDC 59-8-179 (August 14, 1959).

11. E. A. Straker and M. L. Gritzner, "Neutron and Secondary Gamma-Ray Transport in Infinite Homogeneous Air," ORNL-TM-4464 (1969).

12. J. V. Pace, III, D. E. Bartine, F. R. Mynatt, "Neutron and Secondary-Gamma-Ray Transport Calculations for 14-MeV and Fission Neutron Sources in Air-Over-Ground and Air-Over-Seawater Geometries," ORNL-TM-4841 (August 1975).

13. P. G. Fisher, W. S. Knapp, "Aids for the Study of Electromagnetic Blackout," 70TMP-12, General Electric - TEMP, Santa Barbara, Cal., p. 2.7 (July 1970).

APPENDIX A

Listing of Partial Cross Sections

This appendix contains partial cross sections listed by nuclide for each cross-section set included in the library. Partials are included for both neutron and gamma cross sections in a one-dimensional array printed by the AMPX code at the completion of processing the point data into multigroup form. The total cross section for neutrons is the sum of the elastic, inelastic, (n,2n), and absorption cross sections. The constituent partials of the absorption cross section [such as (n,γ), (n,P), (n,D), (n,T), (n,α), etc.] are then listed separately. The inelastic cross section includes (n, n', xγ)-type reactions. The gamma partials listed are the pair-production and photoelectric cross sections and their sum, printed as the absorption cross section. The Compton scattering cross section is not given here, but may be obtained by subtracting the absorption cross section from the total nuclide cross section. The energy deposition values given here are gamma kerma values in units of (MeV-barn)/(photon-atom), and are consistent with the tissue kerma values in (rads/atom)/(photon/cm^2/gram) given in Appendix B. No gamma partials are listed for the weapon fission-weighted nitrogen and oxygen cross-section sets, since the gamma transport cross sections are unaffected by the weighting function and are therefore the same as those listed under the (1/E)-weighted nitrogen and oxygen. The partial cross sections listed can be used for analytical purposes or as response functions to determine reaction rates.

ORNL-DWG 76-10087R

REACTION CROSS SECTIONS FOR HYDROGEN DNA 4148/2 (1/E WT.)

GROUP	TOTAL	ELASTIC	ABSORPTION
1	5.32302E-01	5.32275E-01	2.68673E-05
2	6.12459E-01	6.12431E-01	2.83339E-05
3	6.67594E-01	6.67565E-01	2.93463E-05
4	6.92208E-01	6.92178E-01	2.97573E-05
5	7.25978E-01	7.25948E-01	3.00695E-05
6	7.69675E-01	7.69645E-01	3.06026E-05
7	8.24695E-01	8.24664E-01	3.13505E-05
8	9.02482E-01	9.02450E-01	3.21841E-05
9	9.84736E-01	9.84703E-01	3.29407E-05
10	1.07176E 00	1.07172E 00	3.35589E-05
11	1.16450E 00	1.16447E 00	3.42191E-05
12	1.28788E 00	1.28785E 00	3.52371E-05
13	1.50017E 00	1.50014E 00	3.59527E-05
14	1.67237E 00	1.67234E 00	3.63973E-05
15	1.79253E 00	1.79250E 00	3.63248E-05
16	2.08199E 00	2.08195E 00	3.59786E-05
17	2.45549E 00	2.45546E 00	3.52368E-05
18	2.65745E 00	2.65741E 00	3.47338E-05
19	2.87294E 00	2.87291E 00	3.43736E-05
20	3.53525E 00	3.53521E 00	3.43693E-05
21	4.88398E 00	4.88395E 00	3.53676E-05
22	8.12390E 00	8.12385E 00	5.13731E-05
23	1.15197E 01	1.15197E 01	8.71564E-05
24	1.38983E 01	1.38982E 01	1.32163E-04
25	1.65985E 01	1.65983E 01	2.21885E-04
26	1.77896E 01	1.77893E 01	2.93816E-04
27	1.86032E 01	1.86028E 01	3.89943E-04
28	1.96592E 01	1.96586E 01	6.82155E-04
29	2.01747E 01	2.01735E 01	1.18550E-03
30	2.03353E 01	2.03335E 01	1.81401E-03
31	2.04061E 01	2.04026E 01	3.48742E-03
32	2.04559E 01	2.04487E 01	7.28390E-03
33	2.04617E 01	2.04490E 01	1.27107E-02
34	2.04714E 01	2.04490E 01	2.24407E-02
35	2.04881E 01	2.04490E 01	3.91590E-02
36	2.05135E 01	2.04490E 01	6.45676E-02
37	4.50000E 01	4.47339E 01	2.66028E-01

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	3.80646E-03	3.75934E-11	3.80646E-03	4.13745E-01
2	2.91026E-03	5.10629E-11	2.91026E-03	3.57840E-01
3	2.32310E-03	6.27394E-11	2.32310E-03	3.26230E-01
4	1.95515E-03	7.39797E-11	1.95515E-03	3.03612E-01
5	1.60361E-03	8.96976E-11	1.60361E-03	2.79006E-01
6	1.20935E-03	1.14444E-10	1.20935E-03	2.51195E-01
7	7.62591E-04	1.57350E-10	7.62591E-04	2.18681E-01
8	4.36222E-04	2.14886E-10	4.36222E-04	1.90105E-01
9	2.50127E-04	2.86445E-10	2.50127E-04	1.67767E-01
10	9.89497E-05	4.32054E-10	9.89492E-05	1.41816E-01
11	1.18670E-05	7.92342E-10	1.18662E-05	1.10723E-01
12	1.97341E-09	1.97341E-09	0.0	8.08160E-02
13	6.76240E-09	6.76240E-09	0.0	5.64788E-02
14	2.53930E-08	2.53930E-08	0.0	3.65513E-02
15	1.56099E-07	1.56099E-07	0.0	2.03433E-02
16	8.97628E-07	8.97628E-07	0.0	9.40621E-03
17	3.17157E-06	3.17157E-06	0.0	5.33661E-03
18	1.23380E-05	1.23380E-05	0.0	2.88521E-03
19	5.18057E-05	5.18057E-05	0.0	1.41804E-03
20	2.07748E-04	2.07748E-04	0.0	7.47593E-04
21	1.46685E-03	1.46685E-03	0.0	4.99627E-04

ONE DIMENSION AVERAGES FOR H-3 MAT 1169 37N-21G P3 T=300K 10-9-75(3) IDENTIFIER 1169

XSEC GRP. ID	TOTAL	ELASTIC	(n,2n)	GROUP FLUX
1	7.43258E-01	7.04561E-01	3.86965E-02	1.49959E-01
2	8.56596E-01	8.11362E-01	4.52346E-02	1.25040E-01
3	9.34107E-01	8.85469E-01	4.86379E-02	4.99605E-02
4	9.72350E-01	9.22422E-01	4.99280E-02	2.50450E-02
5	1.01896E 00	9.67866E-01	5.10950E-02	7.49975E-03
6	1.07593E 00	1.02380E 00	5.21297E-02	4.99824E-02
7	1.16158E 00	1.10924E 00	5.23417E-02	9.99714E-02
8	1.27548E 00	1.22647E 00	4.90112E-02	1.00026E-01
9	1.39172E 00	1.35626E 00	3.54598E-02	9.99970E-02
10	1.52253E 00	1.51160E 00	1.09308E-02	1.00004E-01
11	1.65337E 00	1.65337E 00	0.0	9.99966E-02
12	1.83799E 00	1.83799E 00	0.0	1.49999E-01
13	2.10567E 00	2.10567E 00	0.0	2.49993E-01
14	2.27078E 00	2.27078E 00	0.0	5.00021E-02
15	2.35044E 00	2.35044E 00	0.0	1.50006E-01
16	2.42410E 00	2.42410E 00	0.0	3.00015E-01
17	2.33324E 00	2.33324E 00	0.0	2.33288E-01
18	2.24329E 00	2.24329E 00	0.0	3.33783E-02
19	2.13934E 00	2.13934E 00	0.0	2.33339E-01
20	1.87601E 00	1.87601E 00	0.0	5.00009E-01
21	1.60325E 00	1.60325E 00	0.0	6.99975E-01
22	1.36175E 00	1.36175E 00	0.0	1.25002E 00
23	1.30019E 00	1.30019E 00	0.0	3.49973E-01
24	1.30000E 00	1.30000E 00	0.0	7.50003E-01
25	1.30000E 00	1.30000E 00	0.0	7.49977E-01
26	1.30000E 00	1.30000E 00	0.0	1.25015E-01
27	1.30000E 00	1.30000E 00	0.0	7.50001E-01
28	1.30000E 00	1.30000E 00	0.0	1.12501E 00
29	1.30000E 00	1.30000E 00	0.0	9.99990E-01
30	1.30000E 00	1.30000E 00	0.0	7.49995E-01
31	1.30000E 00	1.30000E 00	0.0	1.75001E 00
32	1.30000E 00	1.30000E 00	0.0	1.25000E 00
33	1.30000E 00	1.30000E 00	0.0	9.99996E-01
34	1.30000E 00	1.30000E 00	0.0	1.25000E 00
35	1.30000E 00	1.30000E 00	0.0	9.99949E-01
36	1.30000E 00	1.30000E 00	0.0	1.00003E 00
37	1.29995E 00	1.29995E 00	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	3.80647E-03	3.75934E-11	3.80647E-03	4.13745E-01
2	8.00000E 00	1.00000E 01	2.91025E-03	5.10629E-11	2.91025E-03	3.57840E-01
3	7.00000E 00	8.00000E 00	2.32310E-03	6.27393E-11	2.32310E-03	3.26230E-01
4	6.00000E 00	7.00000E 00	1.95515E-03	7.39797E-11	1.95515E-03	3.03612E-01
5	5.00000E 00	6.00000E 00	1.60361E-03	8.96974E-11	1.60361E-03	2.79006E-01
6	4.00000E 00	5.00000E 00	1.20935E-03	1.14444E-10	1.20935E-03	2.51195E-01
7	3.00000E 00	4.00000E 00	7.62591E-04	1.57351E-10	7.62591E-04	2.18681E-01
8	2.50000E 00	3.00000E 00	4.36226E-04	2.14886E-10	4.36226E-04	1.90105E-01
9	2.00000E 00	2.50000E 00	2.50127E-04	2.86445E-10	2.50127E-04	1.67767E-01
10	1.50000E 00	2.00000E 00	9.89497E-05	4.32055E-10	9.89493E-05	1.41816E-01
11	1.00000E 00	1.50000E 00	1.18670E-05	7.92342E-10	1.18662E-05	1.10723E-01
12	7.00000E-01	1.00000E 00	1.97341E-09	1.97341E-09	0.0	8.08160E-02
13	4.50000E-01	7.00000E-01	6.76240E-09	6.76240E-09	0.0	5.64787E-02
14	3.00000E-01	4.50000E-01	2.53929E-08	2.53929E-08	0.0	3.65513E-02
15	1.50000E-01	3.00000E-01	1.56099E-07	1.56099E-07	0.0	2.03431E-02
16	9.99999E-02	1.50000E-01	8.97631E-07	8.97631E-07	0.0	9.40602E-03
17	6.99999E-02	9.99999E-02	3.17158E-06	3.17158E-06	0.0	5.33369E-03
18	4.50000E-02	6.99999E-02	1.23380E-05	1.23380E-05	0.0	2.88566E-03
19	3.00000E-02	4.50000E-02	5.18058E-05	5.18058E-05	0.0	1.42151E-03
20	2.00000E-02	3.00000E-02	2.07748E-04	2.07748E-04	0.0	7.50245E-04
21	9.99999E-03	2.00000E-02	1.46685E-03	1.46685E-03	0.0	5.06698E-04

ONE DIMENSION AVERAGES FOR LI-6 MAT 1271 37N-21G P3 T=300K 10-9-75(3) IDENTIFIER 1271

KSEC GRP.	ID	TOTAL	ELASTIC	(n,n') Gamma	(n,2n) ALPHA	ABSORPTION	CAPTURE	(n,GAMMA)	(n,P)	(n,ALPHA)	GROUP FLUX
1		1.22294E 00	7.47071E-01	3.66721E-01	8.63760E-02	2.27718E-02	2.27718E-02	1.00454E-05	4.62598E-03	1.81358E-02	1.49959E-01
2		1.31776E 00	8.17324E-01	3.93739E-01	7.81637E-02	2.85370E-02	2.85370E-02	1.01124E-05	5.96338E-03	2.25635E-02	1.25040E-01
3		1.38731E 00	8.61412E-01	4.22078E-01	7.20736E-02	3.17511E-02	3.17511E-02	1.01552E-05	5.84513E-03	2.48958E-02	4.99605E-02
4		1.41946E 00	8.80036E-01	4.37152E-01	6.90893E-02	3.31802E-02	3.31802E-02	1.01737E-05	7.19866E-03	2.55713E-02	2.50450E-02
5		1.45956E 00	9.05144E-01	4.54338E-01	6.53964E-02	3.50780E-02	3.50780E-02	1.01984E-05	7.73388E-03	2.73339E-02	7.49975E-02
6		1.51380E 00	9.34882E-01	4.81168E-01	6.01881E-02	3.75684E-02	3.75684E-02	1.02292E-05	8.47382E-03	2.90844E-02	4.99824E-02
7		1.57761E 00	9.89518E-01	5.14261E-01	5.21893E-02	4.16485E-02	4.16485E-02	1.02663E-05	9.31580E-03	3.23224E-02	9.99714E-02
8		1.65869E 00	1.01397E 00	5.58190E-01	4.01897E-02	4.63425E-02	4.63425E-02	1.03161E-05	1.04072E-02	3.59250E-02	1.00026E-01
9		1.73368E 00	1.05881E 00	5.95167E-01	2.79619E-02	5.17461E-02	5.17461E-02	1.03661E-05	1.15811E-02	4.01546E-02	9.99970E-02
10		1.80076E 00	1.10275E 00	6.24051E-01	1.57795E-02	5.81831E-02	5.81831E-02	1.04164E-05	1.28467E-02	4.53260E-02	1.00004E-01
11		1.85976E 00	1.14772E 00	6.39866E-01	6.97063E-03	6.52052E-02	6.52052E-02	1.04668E-05	1.46008E-02	5.05939E-02	9.99966E-02
12		1.93022E 00	1.19960E 00	6.53701E-01	9.95999E-04	7.59274E-02	7.59274E-02	1.05303E-05	1.76124E-02	5.83044E-02	1.49999E-01
13		2.02791E 00	1.27486E 00	6.55241E-01	0.0	9.78123E-02	9.78123E-02	1.06326E-05	2.44586E-02	7.33431E-02	2.49993E-01
14		2.09039E 00	1.32681E 00	6.49015E-01	0.0	1.14568E-01	1.14568E-01	1.07100E-05	2.84344E-02	8.61225E-02	5.00021E-02
15		2.11827E 00	1.35709E 00	6.32269E-01	0.0	1.28920E-01	1.28920E-01	1.07619E-05	3.24020E-02	9.65076E-02	1.50006E-01
16		2.06508E 00	1.42176E 00	5.05437E-01	0.0	1.37885E-01	1.37885E-01	1.08797E-05	1.34605E-02	1.24413E-01	3.00015E-01
17		1.72905E 00	1.36904E 00	1.90114E-01	0.0	1.69894E-01	1.69894E-01	1.10208E-05	0.0	1.69883E-01	2.33288E-01
18		1.56272E 00	1.26426E 00	9.44144E-02	0.0	2.04041E-01	2.04041E-01	1.10921E-05	0.0	2.04030E-01	3.33785E-02
19		1.43264E 00	1.15987E 00	3.79200E-02	0.0	2.34850E-01	2.34850E-01	1.11639E-05	0.0	2.34839E-01	2.33339E-01
20		1.23541E 00	9.82503E-01	4.82415E-04	0.0	2.52427E-01	2.52427E-01	1.13637E-05	0.0	2.52416E-01	5.00009E-01
21		1.42477E 00	1.14387E 00	0.0	0.0	2.80903E-01	2.80903E-01	1.16984E-05	0.0	2.80892E-01	6.99975E-01
22		4.94943E 00	3.43234E 00	0.0	0.0	1.51710E 00	1.51710E 00	1.27360E-05	0.0	1.51708E 00	1.25002E 00
23		1.89990E 00	1.06215E 00	0.0	0.0	8.37754E-01	8.37754E-01	1.68557E-05	0.0	8.37736E-01	3.49973E-01
24		1.45313E 00	7.56804E-01	0.0	0.0	6.96325E-01	6.96325E-01	2.22925E-05	0.0	6.96302E-01	7.50003E-01
25		1.55853E 00	7.08356E-01	0.0	0.0	8.50177E-01	8.50177E-01	3.24351E-05	0.0	8.50144E-01	7.49977E-01
26		1.72252E 00	7.06590E-01	0.0	0.0	1.01593E 00	1.01593E 00	4.01374E-05	0.0	1.01589E 00	1.25015E-01
27		1.55821E 00	7.08479E-01	0.0	0.0	1.24973E 00	1.24973E 00	5.02365E-05	0.0	1.24968E 00	7.50001E-01
28		2.69338E 00	7.12510E-01	0.0	0.0	1.98087E 00	1.98087E 00	8.08660E-05	0.0	1.98079E 00	1.12501E 00
29		4.06189E 00	7.16112E-01	0.0	0.0	3.34578E 00	3.34578E 00	1.37179E-04	0.0	3.34564E 00	9.99990E-01
30		5.87275E 00	7.18004E-01	0.0	0.0	5.15474E 00	5.15474E 00	2.11504E-04	0.0	5.15453E 00	7.49995E-01
31		1.06064E 01	7.19388E-01	0.0	0.0	9.88702E 00	9.88702E 00	4.05489E-04	0.0	9.88662E 00	1.75001E 00
32		2.13411E 01	7.20448E-01	0.0	0.0	2.06206E 01	2.06206E 01	8.45239E-04	0.0	2.06198E 01	1.25000E 00
33		3.67133E 01	7.20827E-01	0.0	0.0	3.59925E 01	3.59925E 01	1.47482E-03	0.0	3.59910E 01	9.99996E-01
34		6.42740E 01	7.21001E-01	0.0	0.0	6.35530E 01	6.35530E 01	2.60352E-03	0.0	6.35504E 01	1.25000E 00
35		1.11626E 02	7.21123E-01	0.0	0.0	1.10905E 02	1.10905E 02	4.54271E-03	0.0	1.10900E 02	9.99949E-01
36		1.83586E 02	7.21176E-01	0.0	0.0	1.82865E 02	1.82865E 02	7.48963E-03	0.0	1.82857E 02	1.00003E 00
37		7.53991E 02	7.21209E-01	0.0	0.0	7.53270E 02	7.53270E 02	3.08514E-02	0.0	7.53239E 02	6.85856E 00

LI-6 AND LI-7

PHOTON INTERACTION CROSS SECTIONS

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	2.57996E-02	1.50699E-08	2.57996E-02	1.40012E 00
2	8.00000E 00	1.00000E 01	2.03699E-02	2.04830E-08	2.03699E-02	1.16681E 00
3	7.00000E 00	8.00000E 00	1.67592E-02	2.51724E-08	1.67591E-02	1.04223E 00
4	6.00000E 00	7.00000E 00	1.44115E-02	2.96879E-08	1.44115E-02	9.57772E-01
5	5.00000E 00	6.00000E 00	1.21017E-02	3.60036E-08	1.21017E-02	8.69787E-01
6	4.00000E 00	5.00000E 00	9.43685E-03	4.60196E-08	9.43681E-03	7.73940E-01
7	3.00000E 00	4.00000E 00	6.27993E-03	6.35137E-08	6.27987E-03	6.66102E-01
8	2.50000E 00	3.00000E 00	3.77246E-03	8.69900E-08	3.77238E-03	5.74626E-01
9	2.00000E 00	2.50000E 00	2.22000E-03	1.16165E-07	2.21988E-03	5.05144E-01
10	1.50000E 00	2.00000E 00	8.91318E-04	1.75301E-07	8.91143E-04	4.25915E-01
11	1.00000E 00	1.50000E 00	7.12826E-05	3.21113E-07	7.09615E-05	3.32183E-01
12	7.00000E-01	1.00000E 00	7.20421E-07	7.20421E-07	0.0	2.42449E-01
13	4.50000E-01	7.00000E-01	2.06655E-06	2.06655E-06	0.0	1.69437E-01
14	3.00000E-01	4.50000E-01	6.85720E-06	6.85720E-06	0.0	1.09656E-01
15	1.50000E-01	3.00000E-01	3.86017E-05	3.86017E-05	0.0	6.10369E-02
16	9.99999E-02	1.50000E-01	2.18320E-04	2.18320E-04	0.0	2.82438E-02
17	6.99999E-02	9.99999E-02	7.82383E-04	7.82383E-04	0.0	1.60644E-02
18	4.50000E-02	6.99999E-02	3.15577E-03	3.15577E-03	0.0	8.82651E-03
19	3.00000E-02	4.50000E-02	1.39123E-02	1.39123E-02	0.0	4.75622E-03
20	2.00000E-02	3.00000E-02	5.87014E-02	5.87014E-02	0.0	3.63421E-03
21	9.99999E-03	2.00000E-02	4.42225E-01	4.42225E-01	0.0	7.24118E-03

ONE DIMENSION AVERAGES FOR LI-7 MAT 1272 37N-21G P3 T=300K 10-9-75(3) IDENTIFIER 1272

XSEC GRP.	TOTAL	ELASTIC	(n,n') Gamma	(n,2n)	(n,2n) ALPHA	ABSORPTION	CAPTURE	(n,GAMMA)	(n,D)	GROUP FLUX
1	1.27204E 00	8.47366E-01	3.54555E-01	2.09095E-02	3.90922E-02	1.09184E-02	1.09184E-02	9.09649E-06	1.09093E-02	1.49959E-01
2	1.36449E 00	9.08300E-01	3.80175E-01	2.24165E-02	4.18932E-02	1.17024E-02	1.17024E-02	9.74843E-06	1.16926E-02	1.25040E-01
3	1.42256E 00	9.49390E-01	4.00975E-01	2.26153E-02	3.84705E-02	1.11078E-02	1.11078E-02	1.00002E-05	1.10978E-02	4.99605E-02
4	1.45339E 00	9.73846E-01	4.14417E-01	2.20332E-02	3.30592E-02	1.00354E-02	1.00354E-02	1.00002E-05	1.00254E-02	2.50450E-02
5	1.49581E 00	1.00865E 00	4.31558E-01	2.13684E-02	2.55744E-02	8.66534E-03	8.66534E-03	1.00003E-05	8.65534E-03	7.49975E-02
6	1.54385E 00	1.04173E 00	4.57685E-01	2.00466E-02	1.76298E-02	6.76165E-03	6.76165E-03	1.00002E-05	6.75165E-03	4.99824E-02
7	1.58690E 00	1.06417E 00	4.91019E-01	1.79328E-02	9.69549E-03	4.09038E-03	4.09038E-03	1.00002E-05	4.08038E-03	9.99714E-02
8	1.64343E 00	1.09071E 00	5.34947E-01	1.35232E-02	2.24901E-03	2.00360E-03	2.00360E-03	1.00002E-05	1.99360E-03	1.00026E-01
9	1.71580E 00	1.14311E 00	5.67044E-01	5.12560E-03	0.0	5.26116E-04	5.26116E-04	1.00002E-05	5.16115E-04	9.99970E-02
10	1.77913E 00	1.18186E 00	5.96621E-01	6.39191E-04	0.0	1.12965E-05	1.12965E-05	1.00003E-05	1.29623E-06	1.00004E-01
11	1.84502E 00	1.21971E 00	6.25299E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	9.99966E-02
12	1.97315E 00	1.32655E 00	6.46593E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	1.49999E-01
13	2.16972E 00	1.57504E 00	5.94666E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	2.49993E-01
14	2.45753E 00	2.02659E 00	4.30934E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	5.00021E-02
15	2.50339E 00	2.15748E 00	3.47898E-01	0.0	0.0	1.00003E-05	1.00003E-05	1.00003E-05	0.0	1.50006E-01
16	2.16885E 00	1.89859E 00	2.70247E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	3.00015E-01
17	1.98045E 00	1.77970E 00	2.00740E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	2.33288E-01
18	1.88269E 00	1.68820E 00	1.94477E-01	0.0	0.0	1.00002E-05	1.00002E-05	1.00002E-05	0.0	3.33783E-02
19	1.78851E 00	1.58682E 00	1.94682E-01	0.0	0.0	1.00003E-05	1.00003E-05	1.00003E-05	0.0	2.33339E-01
20	1.72082E 00	1.52606E 00	1.94751E-01	0.0	0.0	1.00001E-05	1.00001E-05	1.00001E-05	0.0	5.00009E-01
21	1.26518E 00	1.18427E 00	8.99064E-02	0.0	0.0	1.00001E-05	1.00001E-05	1.00001E-05	0.0	6.99975E-01
22	2.62585E 00	2.62584E 00	1.60501E-08	0.0	0.0	1.00001E-05	1.00001E-05	1.00001E-05	0.0	1.25002E 00
23	9.90651E-01	9.90635E-01	0.0	0.0	0.0	1.63018E-05	1.63018E-05	1.63018E-05	0.0	3.49973E-01
24	9.60470E-01	9.60445E-01	0.0	0.0	0.0	2.45293E-05	2.45293E-05	2.45293E-05	0.0	7.50003E-01
25	1.01377E 00	1.01373E 00	0.0	0.0	0.0	4.12636E-05	4.12636E-05	4.12636E-05	0.0	7.49977E-01
26	1.03217E 00	1.03212E 00	0.0	0.0	0.0	5.54067E-05	5.54067E-05	5.54067E-05	0.0	1.25015E-01
27	1.04253E 00	1.04246E 00	0.0	0.0	0.0	7.60647E-05	7.60647E-05	7.60647E-05	0.0	7.50001E-01
28	1.04976E 00	1.04964E 00	0.0	0.0	0.0	1.17832E-04	1.17832E-04	1.17832E-04	0.0	1.12501E 00
29	1.04997E 00	1.04981E 00	0.0	0.0	0.0	1.62107E-04	1.62107E-04	1.62107E-04	0.0	9.99990E-01
30	1.04993E 00	1.04971E 00	0.0	0.0	0.0	2.18487E-04	2.18487E-04	2.18487E-04	0.0	7.49995E-01
31	1.04591E 00	1.04951E 00	0.0	0.0	0.0	4.04303E-04	4.04303E-04	4.04303E-04	0.0	1.75001E 00
32	1.05014E 00	1.04932E 00	0.0	0.0	0.0	8.15454E-04	8.15454E-04	8.15454E-04	0.0	1.25000E 00
33	1.05061E 00	1.04922E 00	0.0	0.0	0.0	1.38741E-03	1.38741E-03	1.38741E-03	0.0	9.99996E-01
34	1.05163E 00	1.04920E 00	0.0	0.0	0.0	2.43244E-03	2.43244E-03	2.43244E-03	0.0	1.25000E 00
35	1.05348E 00	1.04920E 00	0.0	0.0	0.0	4.28233E-03	4.28233E-03	4.28233E-03	0.0	9.99949E-01
36	1.05648E 00	1.04940E 00	0.0	0.0	0.0	7.08309E-03	7.08309E-03	7.08309E-03	0.0	1.00003E 00
37	1.07853E 00	1.04979E 00	0.0	0.0	0.0	2.87324E-02	2.87324E-02	2.87324E-02	0.0	6.85856E 00

REACTION CROSS SECTIONS FOR BE 4154/3 37N-21G 1/E 11-20-74 (5) IDENTIFICATION

GROUP	TOTAL	ELASTIC	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)	(N,D)	(N,T)	(N,ALPHA)	GROUP FLUX
1	9.09828E-01	8.59546E-01	5.02825E-02	5.02825E-02	1.00002E-04	1.55895E-03	5.47348E-03	3.65456E-02	6.60452E-03	1.49954E-01
2	9.31284E-01	8.54632E-01	7.66524E-02	7.66524E-02	1.33332E-04	8.68423E-04	1.32631E-04	6.68183E-02	8.73312E-03	1.25046E-01
3	9.47816E-01	9.04548E-01	4.32676E-02	4.32676E-02	1.00002E-04	1.66374E-04	0.0	3.29734E-02	1.00276E-02	4.99605E-02
4	9.68780E-01	9.37646E-01	3.11342E-02	3.11342E-02	1.00002E-04	0.0	0.0	2.00615E-02	1.09728E-02	2.50450E-02
5	9.99409E-01	9.65761E-01	3.36474E-02	3.36474E-02	1.00003E-04	0.0	0.0	2.12100E-02	1.23374E-02	7.49975E-02
6	1.02286E 00	9.99469E-01	2.33887E-02	2.33887E-02	1.00002E-04	0.0	0.0	9.34353E-03	1.39452E-02	4.99824E-02
7	1.02732E 00	1.01043E 00	1.68876E-02	1.68876E-02	1.00002E-04	0.0	0.0	9.05359E-04	1.58823E-02	9.99714E-02
8	1.06587E 00	1.04732E 00	1.85483E-02	1.85483E-02	1.00002E-04	0.0	0.0	0.0	1.84463E-02	1.00026E-01
9	1.12188E 00	1.10099E 00	2.08936E-02	2.08936E-02	1.00002E-04	0.0	0.0	0.0	2.07936E-02	9.99970E-02
10	1.16036E 00	1.13571E 00	2.46509E-02	2.46509E-02	1.00003E-04	0.0	0.0	0.0	2.45509E-02	1.00004E-01
11	1.17800E 00	1.14805E 00	2.99462E-02	2.99462E-02	1.00003E-04	0.0	0.0	0.0	2.98462E-02	9.99966E-02
12	1.20465E 00	1.16646E 00	3.75836E-02	3.75836E-02	1.00002E-04	0.0	0.0	0.0	3.74836E-02	1.49995E-01
13	1.26010E 00	1.20464E 00	5.54607E-02	5.54607E-02	1.00002E-04	0.0	0.0	0.0	5.53607E-02	2.49993E-01
14	1.33076E 00	1.26255E 00	6.82113E-02	6.82113E-02	1.00002E-04	0.0	0.0	0.0	6.81114E-02	5.00021E-02
15	1.37845E 00	1.30112E 00	7.73301E-02	7.73301E-02	1.00003E-04	0.0	0.0	0.0	7.72301E-02	1.50006E-01
16	2.03961E 00	1.94473E 00	9.48861E-02	9.48861E-02	1.00002E-04	0.0	0.0	0.0	9.47862E-02	3.00015E-01
17	3.06055E 00	2.96451E 00	9.64401E-02	9.64401E-02	1.00002E-04	0.0	0.0	0.0	9.63402E-02	2.33288E-01
18	2.10357E 00	2.03006E 00	7.39096E-02	7.39096E-02	1.00002E-04	0.0	0.0	0.0	7.38096E-02	3.33783E-02
19	1.80144E 00	1.75070E 00	5.07395E-02	5.07395E-02	1.00003E-04	0.0	0.0	0.0	5.06395E-02	2.33339E-01
20	2.34716E 00	2.33264E 00	1.51199E-02	1.51199E-02	1.00001E-04	0.0	0.0	0.0	1.50199E-02	5.00009E-01
21	3.91034E 00	3.90899E 00	1.34626E-03	1.34626E-03	1.00001E-04	0.0	0.0	0.0	1.24626E-03	6.99975E-01
22	4.20072E 00	4.20062E 00	1.00001E-04	1.00001E-04	1.00001E-04	0.0	0.0	0.0	0.0	1.25002E 00
23	5.16564E 00	5.16494E 00	1.00001E-04	1.00001E-04	1.00001E-04	0.0	0.0	0.0	0.0	3.49973E-01
24	5.57155E 00	5.57186E 00	1.00000E-04	1.00000E-04	1.00000E-04	0.0	0.0	0.0	0.0	7.50063E-01
25	5.86244E 00	5.86234E 00	9.99999E-05	9.99999E-05	9.99999E-05	0.0	0.0	0.0	0.0	7.49977E-01
26	5.93255E 00	5.93245E 00	1.00000E-04	1.00000E-04	1.00000E-04	0.0	0.0	0.0	0.0	1.25015E-01
27	5.96913E 00	5.96903E 00	1.00000E-04	1.00000E-04	1.00000E-04	0.0	0.0	0.0	0.0	7.50001E-01
28	5.99926E 00	5.99916E 00	1.00000E-04	1.00000E-04	1.00000E-04	0.0	0.0	0.0	0.0	1.12501E 00
29	6.00010E 00	6.00000E 00	1.00000E-04	1.00000E-04	1.00000E-04	0.0	0.0	0.0	0.0	9.99990E-01
30	6.00011E 00	6.00000E 00	1.03651E-04	1.03651E-04	1.03651E-04	0.0	0.0	0.0	0.0	7.49995E-01
31	6.00013E 00	6.00000E 00	1.29433E-04	1.29433E-04	1.29433E-04	0.0	0.0	0.0	0.0	1.75001E 00
32	6.00021E 00	6.00000E 00	2.08761E-04	2.08761E-04	2.08761E-04	0.0	0.0	0.0	0.0	1.25000E 00
33	6.00037E 00	6.00000E 00	3.64298E-04	3.64298E-04	3.64298E-04	0.0	0.0	0.0	0.0	9.99996E-01
34	6.00065E 00	6.00001E 00	6.43146E-04	6.43146E-04	6.43146E-04	0.0	0.0	0.0	0.0	1.25000E 00
35	6.00113E 00	6.00001E 00	1.12235E-03	1.12235E-03	1.12235E-03	0.0	0.0	0.0	0.0	9.99949E-01
36	6.00186E 00	6.00001E 00	1.84989E-03	1.84989E-03	1.84989E-03	0.0	0.0	0.0	0.0	1.00003E 00
37	6.00740E 00	5.99978E 00	7.61840E-03	7.61840E-03	7.61840E-03	0.0	0.0	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Be

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	4.39564E-02	7.44245E-08	4.39563E-02	1.97241E 00
2	8.00000E 00	1.00000E 01	3.48996E-02	1.01179E-07	3.48995E-02	1.61778E 00
3	7.00000E 00	8.00000E 00	2.88597E-02	1.24351E-07	2.88596E-02	1.43192E 00
4	6.00000E 00	7.00000E 00	2.49046E-02	1.46669E-07	2.49045E-02	1.30828E 00
5	5.00000E 00	6.00000E 00	2.09936E-02	1.77881E-07	2.09934E-02	1.18155E 00
6	4.00000E 00	5.00000E 00	1.64548E-02	2.27478E-07	1.64545E-02	1.04549E 00
7	3.00000E 00	4.00000E 00	1.18329E-02	3.14288E-07	1.10325E-02	8.94830E-01
8	2.50000E 00	3.00000E 00	6.67103E-03	4.30814E-07	6.67061E-03	7.69040E-01
9	2.00000E 00	2.50000E 00	3.93962E-03	5.75602E-07	3.93905E-03	6.74754E-01
10	1.50000E 00	2.00000E 00	1.58566E-03	8.68763E-07	1.58478E-03	5.68190E-01
11	1.00000E 00	1.50000E 00	1.17461E-04	1.59086E-06	1.15870E-04	4.42922E-01
12	7.00000E-01	1.00000E 00	3.59670E-06	3.59670E-06	0.0	3.23267E-01
13	4.50000E-01	7.00000E-01	1.04185E-05	1.04185E-05	0.0	2.25920E-01
14	3.00000E-01	4.50000E-01	3.45508E-05	3.45508E-05	0.0	1.46218E-01
15	1.50000E-01	3.00000E-01	1.91065E-04	1.91065E-04	0.0	8.14103E-02
16	9.99999E-02	1.50000E-01	1.05365E-03	1.05365E-03	0.0	3.77496E-02
17	6.99999E-02	9.99999E-02	3.68612E-03	3.68612E-03	0.0	2.16362E-02
18	4.50000E-02	6.99999E-02	1.44167E-02	1.44167E-02	0.0	1.23246E-02
19	3.00000E-02	4.50000E-02	6.14215E-02	6.14215E-02	0.0	7.87639E-03
20	2.00000E-02	3.00000E-02	2.50421E-01	2.50421E-01	0.0	8.95318E-03
21	9.99999E-03	2.00000E-02	1.79443E 00	1.79443E 00	0.0	2.54674E-02

REACTION CROSS SECTIONS FOR B-10 ENDF 560 (1/E WT.) IDENTIFICATION 560

GROUP	TOTAL	ELASTIC	INELASTIC	ABSORPTION	(N,P)	(N,D)	(N,ALPHA)	GROUP FLUX
1	1.36485E 00	9.92555E-01	2.81362E-01	9.09340E-02	1.86797E-02	2.20626E-02	5.01917E-02	1.49958E-01
2	1.36466E 00	9.78913E-01	2.75721E-01	1.10023E-01	2.64940E-02	2.64223E-02	5.71063E-02	1.25041E-01
3	1.36421E 00	9.63484E-01	2.80596E-01	1.20130E-01	3.09561E-02	2.89305E-02	6.02431E-02	4.99605E-02
4	1.36188E 00	9.53732E-01	2.85273E-01	1.22875E-01	3.27537E-02	2.99442E-02	6.01776E-02	2.50451E-02
5	1.36340E 00	9.46640E-01	2.91291E-01	1.25473E-01	3.50152E-02	3.12333E-02	5.92245E-02	7.49978E-02
6	1.36633E 00	9.42048E-01	2.95362E-01	1.28926E-01	3.77220E-02	3.27301E-02	5.84742E-02	4.99823E-02
7	1.37297E 00	9.46624E-01	2.93135E-01	1.33213E-01	4.07306E-02	3.42399E-02	5.82425E-02	9.99715E-02
8	1.35326E 00	9.36153E-01	2.77761E-01	1.39349E-01	4.43760E-02	3.58737E-02	5.90988E-02	1.00026E-01
9	1.33406E 00	9.33532E-01	2.54909E-01	1.45618E-01	4.71829E-02	3.71248E-02	6.13103E-02	9.99977E-02
10	1.35598E 00	9.61997E-01	2.40939E-01	1.53045E-01	4.79302E-02	3.77504E-02	6.73643E-02	1.00005E-01
11	1.40617E 00	1.02090E 00	2.26079E-01	1.59193E-01	4.06995E-02	3.74873E-02	8.10065E-02	9.99966E-02
12	1.41501E 00	1.05297E 00	1.82229E-01	1.79811E-01	2.92185E-02	3.33849E-02	1.17208E-01	1.49999E-01
13	1.29381E 00	9.61321E-01	1.32558E-01	1.99928E-01	2.84898E-02	1.30965E-02	1.58342E-01	2.49995E-01
14	1.45415E 00	1.09829E 00	1.21250E-01	2.34607E-01	2.67705E-02	1.76485E-04	2.07660E-01	5.00026E-02
15	1.66661E 00	1.29003E 00	1.03200E-01	2.73384E-01	2.20849E-02	0.0	2.51299E-01	1.50008E-01
16	1.69837E 00	1.38420E 00	6.24302E-02	2.51740E-01	1.43380E-02	0.0	2.37402E-01	3.00014E-01
17	2.20164E 00	1.84000E 00	4.11128E-02	3.20529E-01	1.21581E-02	0.0	3.08371E-01	2.33288E-01
18	1.90068E 00	1.55256E 00	3.66930E-02	3.11426E-01	1.08878E-02	0.0	3.00538E-01	3.33783E-02
19	2.02502E 00	1.52606E 00	5.55979E-02	4.43361E-01	9.66328E-03	0.0	4.33697E-01	2.33341E-01
20	2.13999E 00	1.84616E 00	6.04591E-03	2.87781E-01	4.94033E-03	0.0	2.82840E-01	5.00008E-01
21	3.21603E 00	2.87053E 00	8.91385E-05	3.45405E-01	5.25831E-04	0.0	3.44879E-01	6.99975E-01
22	4.70947E 00	3.61582E 00	0.0	1.09366E 00	3.51716E-05	0.0	1.09362E 00	1.25002E 00
23	4.77937E 00	3.06104E 00	0.0	1.71834E 00	4.32108E-06	0.0	1.71833E 00	3.49973E-01
24	4.85545E 00	2.62991E 00	0.0	2.22554E 00	2.03138E-06	0.0	2.22554E 00	7.50003E-01
25	5.45695E 00	2.30590E 00	0.0	3.15106E 00	1.46654E-06	0.0	3.15106E 00	7.49976E-01
26	6.07526E 00	2.20660E 00	0.0	3.86866E 00	1.59318E-06	0.0	3.86866E 00	1.25015E-01
27	6.98931E 00	2.15566E 00	0.0	4.83364E 00	1.73461E-06	0.0	4.83364E 00	7.50000E-01
28	9.91320E 00	2.10517E 00	0.0	7.80803E 00	2.07988E-06	0.0	7.80803E 00	1.12501E 00
29	1.54469E 01	2.09297E 00	0.0	1.33539E 01	2.55080E-06	0.0	1.33539E 01	9.99990E-01
30	2.28110E 01	2.09294E 00	0.0	2.07181E 01	3.21190E-06	0.0	2.07188E 01	7.49995E-01
31	4.20996E 01	2.09655E 00	0.0	4.00031E 01	6.07934E-06	0.0	4.00031E 01	1.75001E 00
32	8.59089E 01	2.10049E 00	0.0	8.38084E 01	1.26048E-05	0.0	8.38084E 01	1.25000E 00
33	1.48640E 02	2.10287E 00	0.0	1.46537E 02	2.19037E-05	0.0	1.46537E 02	9.99996E-01
34	2.61128E 02	2.10404E 00	0.0	2.59024E 02	3.85024E-05	0.0	2.59024E 02	1.25000E 00
35	4.54372E 02	2.10489E 00	0.0	4.52267E 02	6.69060E-05	0.0	4.52267E 02	9.99949E-01
36	7.48058E 02	2.10528E 00	0.0	7.45952E 02	1.10099E-04	0.0	7.45952E 02	1.00003E 00
37	3.07618E 03	2.10567E 00	0.0	3.07407E 03	4.53523E-04	0.0	3.07407E 03	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	6.68678E-02	2.59017E-07	6.68675E-02	2.59724E 00
2	5.32839E-02	3.52187E-07	5.32835E-02	2.09964E 00
3	4.42092E-02	4.32872E-07	4.42088E-02	1.84270E 00
4	3.82392E-02	5.10571E-07	3.82387E-02	1.67439E 00
5	3.23147E-02	6.19251E-07	3.23141E-02	1.50423E 00
6	2.54103E-02	7.92217E-07	2.54095E-02	1.32383E 00
7	1.71154E-02	1.09543E-06	1.71143E-02	1.12693E 00
8	1.03894E-02	1.50250E-06	1.03878E-02	9.64889E-01
9	6.14952E-03	2.30818E-06	6.14751E-03	8.44980E-01
10	2.48008E-03	3.03124E-06	2.47705E-03	7.10642E-01
11	1.75854E-04	5.54939E-06	1.70305E-04	5.53668E-01
12	1.25437E-05	1.25437E-05	0.0	4.04090E-01
13	3.62595E-05	3.62595E-05	0.0	2.82413E-01
14	1.19605E-04	1.19605E-04	0.0	1.82800E-01
15	6.53184E-04	6.53184E-04	0.0	1.01847E-01
16	3.55110E-03	3.55110E-03	0.0	4.74553E-02
17	1.22577E-02	1.22577E-02	0.0	2.76880E-02
18	4.71393E-02	4.71393E-02	0.0	1.69902E-02
19	1.96956E-01	1.96956E-01	0.0	1.41329E-02
20	7.85740E-01	7.85740E-01	0.0	2.24656E-02
21	5.42850E 00	5.42850E 00	0.0	7.37112E-02

ONE DIMENSION AVERAGES FOR B=11 MAT 1160 37N-21G P3 T=300K 10-9-75(3) IDENTIFIER 1160

XSEC GRP.	ID	TOTAL	ELASTIC	(n,n') GAMMA	(n,2n)	ABSORPTION	CAPTURE	(n,GAMMA)	(n,P)
1		1.25983E 00	5.87228E-01	6.13355E-01	2.00005E-02	3.92484E-02	3.92484E-02	1.38126E-07	3.82009E-03
2		1.30319E 00	5.94739E-01	6.41042E-01	2.00004E-02	4.74147E-02	4.74147E-02	1.85417E-07	3.81749E-03
3		1.32008E 00	5.99565E-01	6.50977E-01	2.00004E-02	4.95394E-02	4.95394E-02	2.09264E-07	3.18125E-03
4		1.31986E 00	6.04963E-01	6.47464E-01	1.95092E-02	4.79264E-02	4.79264E-02	2.14812E-07	2.43353E-03
5		1.31623E 00	6.56473E-01	6.05250E-01	1.11134E-02	4.33969E-02	4.33969E-02	2.21537E-07	9.44971E-04
6		1.30715E 00	7.16691E-01	5.54096E-01	1.21118E-03	3.51511E-02	3.51511E-02	2.29685E-07	0.0
7		1.28799E 00	7.63510E-01	4.97482E-01	0.0	2.69956E-02	2.69956E-02	2.38628E-07	0.0
8		1.29716E 00	8.51742E-01	4.25782E-01	0.0	1.96317E-02	1.96317E-02	2.59708E-07	0.0
9		1.31389E 00	9.54473E-01	3.53279E-01	0.0	6.14219E-03	6.14219E-03	4.69708E-07	0.0
10		1.33170E 00	1.03624E 00	2.95453E-01	0.0	2.84573E-07	2.84573E-07	2.84573E-07	0.0
11		1.47653E 00	1.23501E 00	2.41514E-01	0.0	6.38300E-07	6.38300E-07	6.38300E-07	0.0
12		1.45888E 00	1.28619E 00	1.72693E-01	0.0	4.46278E-07	4.46278E-07	4.46278E-07	0.0
13		1.62472E 00	1.51486E 00	1.09861E-01	0.0	1.02710E-06	1.02710E-06	1.02710E-06	0.0
14		1.68629E 00	1.63710E 00	4.91872E-02	0.0	1.16178E-06	1.16178E-06	1.16178E-06	0.0
15		1.40781E 00	1.37114E 00	3.66708E-02	0.0	1.56788E-06	1.56788E-06	1.56788E-06	0.0
16		1.47377E 00	1.45299E 00	2.07803E-02	0.0	7.66056E-07	7.66056E-07	7.66056E-07	0.0
17		1.71897E 00	1.71327E 00	5.70240E-03	0.0	2.57426E-06	2.57426E-06	2.57426E-06	0.0
18		1.43442E 00	1.43432E 00	1.07046E-04	0.0	1.62837E-06	1.62837E-06	1.62837E-06	0.0
19		1.76676E 00	1.76676E 00	0.0	0.0	1.12089E-06	1.12089E-06	1.12089E-06	0.0
20		2.57794E 00	2.57794E 00	0.0	0.0	2.32595E-06	2.32595E-06	2.32595E-06	0.0
21		2.74529E 00	2.74529E 00	0.0	0.0	1.93222E-06	1.93222E-06	1.93222E-06	0.0
22		4.09641E 00	4.09640E 00	0.0	0.0	5.21918E-06	5.21918E-06	5.21918E-06	0.0
23		4.23895E 00	4.23895E 00	0.0	0.0	2.32784E-06	2.32784E-06	2.32784E-06	0.0
24		4.52454E 00	4.52453E 00	0.0	0.0	2.98759E-06	2.98759E-06	2.98759E-06	0.0
25		4.86252E 00	4.86251E 00	0.0	0.0	5.83872E-06	5.83872E-06	5.83872E-06	0.0
26		5.04769E 00	5.04765E 00	0.0	0.0	3.97240E-05	3.97240E-05	3.97240E-05	0.0
27		5.34847E 00	5.34811E 00	0.0	0.0	3.59695E-04	3.59695E-04	3.59695E-04	0.0
28		5.01904E 00	5.01903E 00	0.0	0.0	1.06606E-05	1.06606E-05	1.06606E-05	0.0
29		5.02915E 00	5.02914E 00	0.0	0.0	1.78537E-05	1.78537E-05	1.78537E-05	0.0
30		5.03325E 00	5.03322E 00	0.0	0.0	2.74916E-05	2.74916E-05	2.74916E-05	0.0
31		5.03505E 00	5.03500E 00	0.0	0.0	5.26756E-05	5.26756E-05	5.26756E-05	0.0
32		5.03601E 00	5.03590E 00	0.0	0.0	1.09775E-04	1.09775E-04	1.09775E-04	0.0
33		5.03619E 00	5.03600E 00	0.0	0.0	1.91536E-04	1.91536E-04	1.91536E-04	0.0
34		5.03635E 00	5.03601E 00	0.0	0.0	3.38123E-04	3.38123E-04	3.38123E-04	0.0
35		5.03660E 00	5.03601E 00	0.0	0.0	5.89964E-04	5.89964E-04	5.89964E-04	0.0
36		5.03698E 00	5.03601E 00	0.0	0.0	9.72676E-04	9.72676E-04	9.72676E-04	0.0
37		5.03982E 00	5.03581E 00	0.0	0.0	4.00658E-03	4.00658E-03	4.00658E-03	0.0

XSEC GRP.	ID	(n,T)	(n,ALPHA)	GROUP FLUX
1		1.62504E-02	1.91778E-02	1.49959E-01
2		1.62487E-02	2.73483E-02	1.25040E-01
3		1.57998E-02	3.05581E-02	4.99605E-02
4		1.49590E-02	3.05337E-02	2.50450E-02
5		1.23748E-02	3.00769E-02	7.49975E-02
6		6.09668E-03	2.90542E-02	4.99824E-02
7		2.26253E-04	2.67691E-02	9.99714E-02
8		0.0	1.98315E-02	1.00026E-01
9		0.0	6.14172E-03	4.99970E-02
10		0.0	0.0	1.00004E-01
11		0.0	0.0	4.99966E-02
12		0.0	0.0	1.49999E-01
13		0.0	0.0	2.49993E-01
14		0.0	0.0	5.00021E-02
15		0.0	0.0	1.50006E-01
16		0.0	0.0	3.00015E-01
17		0.0	0.0	2.33288E-01
18		0.0	0.0	3.33783E-02
19		0.0	0.0	2.33339E-01
20		0.0	0.0	5.00009E-01
21		0.0	0.0	6.99975E-01
22		0.0	0.0	1.25002E 00
23		0.0	0.0	3.49973E-01
24		0.0	0.0	7.50003E-01
25		0.0	0.0	7.49977E-01
26		0.0	0.0	1.25015E-01
27		0.0	0.0	7.50001E-01
28		0.0	0.0	1.12501E 00
29		0.0	0.0	9.99990E-01
30		0.0	0.0	7.49995E-01
31		0.0	0.0	1.75001E 00
32		0.0	0.0	1.25000E 00
33		0.0	0.0	9.99996E-01
34		0.0	0.0	1.25000E 00
35		0.0	0.0	9.99949E-01
36		0.0	0.0	1.00003E 00
37		0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR B-11

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	6.68678E-02	2.59017E-07	6.68675E-02	2.59724E 00
2	8.00000E 00	1.00000E 01	5.32839E-02	3.52187E-07	5.32835E-02	2.09964E 00
3	7.00000E 00	8.00000E 00	4.42092E-02	4.32872E-07	4.42088E-02	1.84270E 00
4	6.00000E 00	7.00000E 00	3.82392E-02	5.10571E-07	3.82387E-02	1.67439E 00
5	5.00000E 00	6.00000E 00	3.23147E-02	6.19251E-07	3.23141E-02	1.50423E 00
6	4.00000E 00	5.00000E 00	2.54103E-02	7.92217E-07	2.54095E-02	1.32383E 00
7	3.00000E 00	4.00000E 00	1.71154E-02	1.09543E-06	1.71143E-02	1.12693E 00
8	2.50000E 00	3.00000E 00	1.03894E-02	1.50250E-06	1.03878E-02	9.64889E-01
9	2.00000E 00	2.50000E 00	6.14952E-03	2.00818E-06	6.14751E-03	8.44980E-01
10	1.50000E 00	2.00000E 00	2.48008E-03	3.03124E-06	2.47705E-03	7.10642E-01
11	1.00000E 00	1.50000E 00	1.75854E-04	5.54939E-06	1.70305E-04	5.53668E-01
12	7.00000E-01	1.00000E 00	1.25437E-05	1.25437E-05	0.0	4.04090E-01
13	4.50000E-01	7.00000E-01	3.62595E-05	3.62595E-05	0.0	2.82413E-01
14	3.00000E-01	4.50000E-01	1.19605E-04	1.19605E-04	0.0	1.82800E-01
15	1.50000E-01	3.00000E-01	6.53184E-04	6.53184E-04	0.0	1.01846E-01
16	9.99999E-02	1.50000E-01	3.55110E-03	3.55110E-03	0.0	4.74544E-02
17	6.99999E-02	9.99999E-02	1.22577E-02	1.22577E-02	0.0	2.76734E-02
18	4.50000E-02	6.99999E-02	4.71394E-02	4.71394E-02	0.0	1.69924E-02
19	3.00000E-02	4.50000E-02	1.96956E-01	1.96956E-01	0.0	1.41503E-02
20	2.00000E-02	3.00000E-02	7.85741E-01	7.85741E-01	0.0	2.24789E-02
21	9.99999E-03	2.00000E-02	5.42850E 00	5.42850E 00	0.0	7.37466E-02

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REACTION CROSS SECTIONS FOR C-12 DNA 4274/0 (1/E WT.) IDENTIFICATION 4274

GROUP	TOTAL	ELASTIC	INELASTIC	ABSORPTION	(N,GAMMA)	(N,ALPHA)	GROUP FLUX
1	1.37002E 00	8.41117E-01	4.48009E-01	8.08975E-02	0.0	8.08975E-02	1.49958E-01
2	1.36987E 00	8.40990E-01	4.47985E-01	8.08904E-02	0.0	8.08904E-02	1.25041E-01
3	1.30819E 00	7.83161E-01	4.44733E-01	8.02989E-02	0.0	8.02989E-02	4.99605E-02
4	1.27037E 00	7.38813E-01	4.50088E-01	8.14675E-02	0.0	8.14675E-02	2.50451E-02
5	1.34410E 00	7.95541E-01	4.61279E-01	8.72759E-02	0.0	8.72759E-02	7.49978E-02
6	1.33372E 00	7.67217E-01	4.66193E-01	1.00312E-01	0.0	1.00312E-01	4.99823E-02
7	1.38432E 00	8.41684E-01	4.62877E-01	7.97544E-02	0.0	7.97544E-02	9.99715E-02
8	1.22246E 00	6.73363E-01	4.24899E-01	1.24200E-01	0.0	1.24200E-01	1.00026E-01
9	1.24310E 00	6.64851E-01	3.34531E-01	2.43721E-01	0.0	2.43721E-01	9.99977E-02
10	1.13849E 00	7.72565E-01	2.69368E-01	9.65620E-02	0.0	9.65620E-02	1.00005E-01
11	1.90756E 00	1.42632E 00	3.70934E-01	1.10313E-01	0.0	1.10313E-01	9.99966E-02
12	9.40747E-01	7.32204E-01	2.06040E-01	2.50377E-03	0.0	2.50377E-03	1.49999E-01
13	1.21603E 00	1.05990E 00	1.56097E-01	2.91522E-05	0.0	2.91522E-05	2.49995E-01
14	1.31749E 00	1.30498E 00	1.25121E-02	0.0	0.0	0.0	5.00026E-02
15	1.80838E 00	1.80838E 00	0.0	0.0	0.0	0.0	1.50008E-01
16	2.17502E 00	2.17502E 00	0.0	0.0	0.0	0.0	3.00014E-01
17	1.88012E 00	1.88012E 00	0.0	0.0	0.0	0.0	2.33288E-01
18	1.58473E 00	1.58473E 00	0.0	0.0	0.0	0.0	3.33783E-02
19	1.78454E 00	1.78454E 00	0.0	0.0	0.0	0.0	2.33341E-01
20	2.10054E 00	2.10054E 00	0.0	0.0	0.0	0.0	5.00008E-01
21	2.86290E 00	2.86290E 00	0.0	0.0	0.0	0.0	6.99975E-01
22	3.80870E 00	3.80870E 00	0.0	0.0	0.0	0.0	1.25002E 00
23	4.28885E 00	4.28885E 00	0.0	0.0	0.0	0.0	3.49973E-01
24	4.46417E 00	4.46417E 00	0.0	0.0	0.0	0.0	7.50003E-01
25	4.60149E 00	4.60149E 00	0.0	0.0	0.0	0.0	7.49976E-01
26	4.64887E 00	4.64887E 00	0.0	0.0	0.0	0.0	1.25015E-01
27	4.67315E 00	4.67315E 00	0.0	0.0	0.0	0.0	7.50000E-01
28	4.70434E 00	4.70434E 00	0.0	2.96252E-07	2.96252E-07	0.0	1.12501E 00
29	4.71961E 00	4.71960E 00	0.0	1.07128E-05	1.07128E-05	0.0	9.99990E-01
30	4.72468E 00	4.72466E 00	0.0	1.87393E-05	1.87393E-05	0.0	7.49995E-01
31	4.72736E 00	4.72732E 00	0.0	3.58100E-05	3.58100E-05	0.0	1.75001E 00
32	4.72880E 00	4.72873E 00	0.0	7.46458E-05	7.46458E-05	0.0	1.25000E 00
33	4.72908E 00	4.72895E 00	0.0	1.30246E-04	1.30246E-04	0.0	9.99996E-01
34	4.72923E 00	4.72900E 00	0.0	2.29925E-04	2.29925E-04	0.0	1.25000E 00
35	4.72940E 00	4.72900E 00	0.0	4.01180E-04	4.01180E-04	0.0	9.99949E-01
36	4.72966E 00	4.72900E 00	0.0	6.61431E-04	6.61431E-04	0.0	1.00003E 00
37	4.73152E 00	4.72881E 00	0.0	2.70633E-03	2.70633E-03	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	9.45196E-02	6.66729E-07	9.45190E-02	3.27444E 00
2	7.55135E-02	9.06651E-07	7.55126E-02	2.61233E 00
3	6.28020E-02	1.11439E-06	6.28009E-02	2.27453E 00
4	5.44108E-02	1.31449E-06	5.44095E-02	2.05608E 00
5	4.60623E-02	1.59436E-06	4.60607E-02	1.83782E 00
6	3.62921E-02	2.04028E-06	3.62901E-02	1.60892E 00
7	2.45183E-02	2.82291E-06	2.45155E-02	1.36234E 00
8	1.49272E-02	3.87376E-06	1.49233E-02	1.16217E 00
9	8.85019E-03	5.17911E-06	8.84501E-03	1.01582E 00
10	3.57596E-03	7.81809E-06	3.56814E-03	8.53246E-01
11	2.48250E-04	1.43102E-05	2.33940E-04	6.64423E-01
12	3.26986E-05	3.26986E-05	0.0	4.84923E-01
13	9.62458E-05	9.62458E-05	0.0	3.38925E-01
14	3.20695E-04	3.20695E-04	0.0	2.19423E-01
15	1.75226E-03	1.75226E-03	0.0	1.22409E-01
16	9.44243E-03	9.44243E-03	0.0	5.75666E-02
17	3.22312E-02	3.22312E-02	0.0	3.46649E-02
18	1.21826E-01	1.21826E-01	0.0	2.39474E-02
19	4.98471E-01	4.98471E-01	0.0	2.63575E-02
20	1.94450E 00	1.94450E 00	0.0	5.08983E-02
21	1.29489E 01	1.29489E 01	0.0	1.73368E-01

REACTION CROSS SECTIONS FOR NITROGEN DNA 4133/4 (1/E WT.) IDENTIFICATION 4133

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,D)	(N,T)	(N,ALPHA)	(N,2ALPHA)
1	1.55921E 00	9.64215E-01	4.09666E-01	1.02876E-02	1.75038E-01	5.64542E-06	1.92161E-02	2.42210E-02	1.14658E-02	6.00931E-02	6.00364E-02
2	1.58235E 00	9.28376E-01	4.25768E-01	9.21114E-03	2.18999E-01	9.85700E-06	2.98771E-02	3.22446E-02	2.20149E-02	8.44039E-02	5.04485E-02
3	1.57772E 00	8.98205E-01	4.30159E-01	7.72132E-03	2.41635E-01	1.44358E-05	3.88592E-02	3.83062E-02	2.81117E-02	9.71925E-02	3.91512E-02
4	1.56922E 00	8.85978E-01	4.29331E-01	6.53875E-03	2.47379E-01	1.64485E-05	4.31349E-02	4.10435E-02	2.98992E-02	1.01552E-01	3.17326E-02
5	1.56777E 00	8.87953E-01	4.22584E-01	4.43195E-03	2.52800E-01	1.78944E-05	4.77637E-02	4.43397E-02	3.13775E-02	1.06945E-01	2.23570E-02
6	1.57016E 00	9.09433E-01	4.07602E-01	1.99007E-03	2.51132E-01	1.92481E-05	5.04572E-02	4.57907E-02	3.19137E-02	1.10664E-01	1.22878E-02
7	1.43523E 00	8.21604E-01	3.79022E-01	2.87304E-04	2.34315E-01	1.92756E-05	4.84022E-02	4.34946E-02	2.99105E-02	1.08876E-01	3.61256E-03
8	1.41141E 00	8.85531E-01	3.09741E-01	0.0	2.16140E-01	2.14245E-05	4.79793E-02	3.59774E-02	2.40419E-02	1.07972E-01	1.47799E-04
9	1.30177E 00	9.00899E-01	2.12242E-01	0.0	1.88634E-01	1.93212E-05	4.46068E-02	2.46947E-02	1.30741E-02	1.06218E-01	2.07357E-05
10	1.25896E 00	8.81593E-01	2.01939E-01	0.0	1.75433E-01	1.57391E-05	3.62513E-02	1.80177E-02	1.23760E-02	1.08772E-01	0.0
11	1.46317E 00	1.06716E 00	2.00148E-01	0.0	1.95864E-01	1.82645E-05	2.48290E-02	1.83896E-02	1.65498E-02	1.36077E-01	0.0
12	1.31923E 00	9.95072E-01	1.56925E-01	0.0	1.67231E-01	1.35276E-05	2.07694E-02	1.30920E-02	2.49346E-02	1.08421E-01	0.0
13	1.41001E 00	1.14478E 00	6.86111E-02	0.0	1.96618E-01	1.90495E-05	2.71341E-02	1.70236E-04	1.32059E-02	1.56088E-01	0.0
14	1.06553E 00	7.67463E-01	4.06681E-02	0.0	2.57402E-01	9.99927E-06	3.30152E-02	0.0	9.64413E-04	2.23412E-01	0.0
15	1.82321E 00	1.40989E 00	2.11110E-02	0.0	3.92218E-01	1.65829E-05	4.65678E-02	0.0	9.34052E-05	3.45540E-01	0.0
16	1.72472E 00	1.35418E 00	5.83269E-03	0.0	3.64713E-01	2.36451E-05	4.56914E-02	0.0	0.0	3.18998E-01	0.0
17	1.44695E 00	1.25677E 00	8.62770E-04	0.0	1.89318E-01	1.63457E-05	6.07300E-02	0.0	0.0	1.28572E-01	0.0
18	1.46017E 00	1.36049E 00	0.0	0.0	9.96724E-02	2.17116E-05	2.50460E-02	0.0	0.0	7.46047E-02	0.0
19	1.60538E 00	1.51172E 00	0.0	0.0	9.36531E-02	2.72215E-05	2.29723E-02	0.0	0.0	7.06536E-02	0.0
20	2.05576E 00	1.97876E 00	0.0	0.0	7.69975E-02	3.47170E-05	4.66741E-02	0.0	0.0	3.02886E-02	0.0
21	1.86517E 00	1.82715E 00	0.0	0.0	3.80213E-02	2.63212E-05	3.77237E-02	0.0	0.0	2.71315E-04	0.0
22	3.18098E 00	3.17330E 00	0.0	0.0	7.67975E-03	2.54360E-05	7.63567E-03	0.0	0.0	1.86483E-05	0.0
23	4.06250E 00	4.06097E 00	0.0	0.0	1.53302E-03	3.30046E-05	1.50002E-03	0.0	0.0	0.0	0.0
24	4.83550E 00	4.83393E 00	0.0	0.0	1.56344E-03	4.36210E-05	1.51982E-03	0.0	0.0	0.0	0.0
25	6.05923E 00	6.05747E 00	0.0	0.0	1.75951E-03	6.34113E-05	1.69610E-03	0.0	0.0	0.0	0.0
26	6.65659E 00	6.65456E 00	0.0	0.0	2.02641E-03	7.84311E-05	1.94798E-03	0.0	0.0	0.0	0.0
27	7.13024E 00	7.12776E 00	0.0	0.0	2.48038E-03	9.81120E-05	2.38227E-03	0.0	0.0	0.0	0.0
28	7.77016E 00	7.76619E 00	0.0	0.0	3.97840E-03	1.57750E-04	3.82065E-03	0.0	0.0	0.0	0.0
29	8.41997E 00	8.41322E 00	0.0	0.0	6.74655E-03	2.67271E-04	6.48127E-03	0.0	0.0	0.0	0.0
30	8.93982E 00	8.92941E 00	0.0	0.0	1.04046E-02	4.11771E-04	9.99286E-03	0.0	0.0	0.0	0.0
31	9.47175E 00	9.45181E 00	0.0	0.0	1.99471E-02	7.89082E-04	1.91580E-02	0.0	0.0	0.0	0.0
32	9.90277E 00	9.86120E 00	0.0	0.0	4.15791E-02	1.64421E-03	3.99348E-02	0.0	0.0	0.0	0.0
33	9.99672E 00	9.92417E 00	0.0	0.0	7.25483E-02	2.86806E-03	6.96803E-02	0.0	0.0	0.0	0.0
34	1.00816E 01	9.95353E 00	0.0	0.0	1.28069E-01	5.06149E-03	1.23008E-01	0.0	0.0	0.0	0.0
35	1.01799E 01	9.95640E 00	0.0	0.0	2.23457E-01	8.82888E-03	2.14628E-01	0.0	0.0	0.0	0.0
36	1.03254E 01	9.95695E 00	0.0	0.0	3.68419E-01	1.45590E-02	3.53860E-01	0.0	0.0	0.0	0.0
37	1.14743E 01	9.95664E 00	0.0	0.0	1.51771E 00	6.00779E-02	1.45763E 00	0.0	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.26828E-01	1.46452E-06	1.26826E-01	4.00308E 00
2	1.01547E-01	1.99261E-06	1.01545E-01	3.15550E 00
3	8.46162E-02	2.45077E-06	8.46137E-02	2.72727E 00
4	7.34077E-02	2.89228E-06	7.34048E-02	2.45328E 00
5	6.22343E-02	3.51021E-06	6.22308E-02	2.18230E 00
6	4.91180E-02	4.49402E-06	4.91135E-02	1.90083E 00
7	3.32694E-02	6.21966E-06	3.32632E-02	1.60115E 00
8	2.03072E-02	8.53959E-06	2.02986E-02	1.36093E 00
9	1.20598E-02	1.14269E-05	1.20484E-02	1.18731E 00
10	4.88345E-03	1.72630E-05	4.86619E-03	9.96021E-01
11	3.38607E-04	3.16221E-05	3.06985E-04	7.75193E-01
12	7.26848E-05	7.26848E-05	0.0	5.65773E-01
13	2.15800E-04	2.15800E-04	0.0	3.95470E-01
14	7.22419E-04	7.22419E-04	0.0	2.56119E-01
15	3.94572E-03	3.94572E-03	0.0	1.43190E-01
16	2.11477E-02	2.11477E-02	0.0	6.83741E-02
17	7.16504E-02	7.16504E-02	0.0	4.32399E-02
18	2.67895E-01	2.67895E-01	0.0	3.48002E-02
19	1.08120E 00	1.08120E 00	0.0	4.86716E-02
20	4.15182E 00	4.15182E 00	0.0	1.04414E-01
21	2.69104E 01	2.69104E 01	0.0	3.58281E-01

REACTION CROSS SECTIONS FOR OXYGEN DNA 4134/2 (1/E WT.) IDENTIFICATION 4134

GROUP	TOTAL	ELASTIC	INELASTIC	ABSORPTION	(N,GAMMA)	(N,P)	(N,D)	(N,ALPHA)
1	1.63504E 00	1.00704E 00	5.78455E-01	4.95468E-02	6.63359E-09	2.43524E-02	4.36244E-03	2.08320E-02
2	1.61386E 00	9.38069E-01	5.62716E-01	1.13073E-01	7.10507E-09	3.34320E-02	9.15658E-03	7.04848E-02
3	1.68237E 00	9.56340E-01	5.16233E-01	1.69802E-01	7.42177E-09	3.95443E-02	1.38965E-02	1.16561E-01
4	1.62521E 00	9.61276E-01	4.76219E-01	1.87712E-01	7.56204E-09	4.67732E-02	1.51715E-02	1.25767E-01
5	1.60158E 00	9.88670E-01	4.25581E-01	1.86929E-01	7.75404E-09	4.09571E-02	1.49219E-02	1.31050E-01
6	1.55634E 00	1.03515E 00	3.45506E-01	1.75687E-01	7.99991E-09	2.47957E-02	1.11512E-02	1.39741E-01
7	1.67934E 00	1.12923E 00	3.36554E-01	2.13556E-01	8.30614E-09	4.20531E-02	3.79430E-03	1.67709E-01
8	1.35599E 00	9.32725E-01	2.35835E-01	1.97435E-01	8.73204E-09	1.51370E-03	2.77858E-05	1.85893E-01
9	1.23322E 00	8.43464E-01	2.41390E-01	1.48365E-01	9.17975E-09	0.0	0.0	1.48365E-01
10	1.26714E 00	8.86034E-01	2.73106E-01	1.08000E-01	9.65047E-09	0.0	0.0	1.08000E-01
11	1.18895E 00	9.02938E-01	2.21299E-01	6.47474E-02	1.01453E-08	0.0	0.0	6.47474E-02
12	1.11102E 00	9.31439E-01	7.64141E-02	1.03170E-01	1.08011E-08	0.0	0.0	1.03170E-01
13	1.29477E 00	1.24083E 00	0.0	5.39451E-02	1.19418E-08	0.0	0.0	5.39451E-02
14	1.28074E 00	1.20610E 00	0.0	7.46468E-02	1.28639E-08	0.0	0.0	7.46468E-02
15	1.72046E 00	1.63763E 00	0.0	8.28372E-02	1.35265E-08	0.0	0.0	8.28372E-02
16	2.66188E 00	2.65252E 00	0.0	8.96311E-03	1.51477E-08	0.0	0.0	8.96010E-03
17	1.05751E 00	1.05751E 00	0.0	2.60314E-07	1.73015E-08	0.0	0.0	2.43013E-07
18	2.40891E-01	2.40891E-01	0.0	1.64861E-08	1.84841E-08	0.0	0.0	2.02825E-12
19	1.65294E 00	1.65294E 00	0.0	1.97697E-08	1.97697E-08	0.0	0.0	0.0
20	2.69714E 00	2.69714E 00	0.0	2.37961E-08	2.37961E-08	0.0	0.0	0.0
21	3.60900E 00	3.60900E 00	0.0	3.22014E-08	3.22014E-08	0.0	0.0	0.0
22	4.86092E 00	4.86092E 00	0.0	5.30187E-08	5.30187E-08	0.0	0.0	0.0
23	3.52875E 00	3.52875E 00	0.0	7.79212E-08	7.79212E-08	0.0	0.0	0.0
24	3.60780E 00	3.60780E 00	0.0	1.03056E-07	1.03056E-07	0.0	0.0	0.0
25	3.67811E 00	3.67811E 00	0.0	1.49944E-07	1.49944E-07	0.0	0.0	0.0
26	3.70394E 00	3.70394E 00	0.0	1.85552E-07	1.85552E-07	0.0	0.0	0.0
27	3.71730E 00	3.71730E 00	0.0	2.32241E-07	2.32241E-07	0.0	0.0	0.0
28	3.73474E 00	3.73474E 00	0.0	3.73841E-07	3.73841E-07	0.0	0.0	0.0
29	3.74358E 00	3.74358E 00	0.0	6.34181E-07	6.34181E-07	0.0	0.0	0.0
30	3.74629E 00	3.74629E 00	0.0	9.77789E-07	9.77789E-07	0.0	0.0	0.0
31	3.74742E 00	3.74742E 00	0.0	1.87461E-06	1.87461E-06	0.0	0.0	0.0
32	3.74798E 00	3.74798E 00	0.0	3.90765E-06	3.90765E-06	0.0	0.0	0.0
33	3.74808E 00	3.74808E 00	0.0	6.81832E-06	6.81832E-06	0.0	0.0	0.0
34	3.74811E 00	3.74810E 00	0.0	1.20366E-05	1.20366E-05	0.0	0.0	0.0
35	3.74812E 00	3.74810E 00	0.0	2.10019E-05	2.10019E-05	0.0	0.0	0.0
36	3.74813E 00	3.74810E 00	0.0	3.46265E-05	3.46265E-05	0.0	0.0	0.0
37	3.74810E 00	3.74796E 00	0.0	1.42635E-04	1.42635E-04	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.63813E-01	2.90548E-06	1.53810E-01	4.78338E 00
2	1.31391E-01	3.95505E-06	1.31387E-01	3.72920E 00
3	1.09652E-01	4.86732E-06	1.09648E-01	3.20092E 00
4	9.52302E-02	5.74655E-06	9.52244E-02	2.86601E 00
5	8.08305E-02	6.97869E-06	8.08235E-02	2.53767E 00
6	6.38719E-02	8.93822E-06	6.38630E-02	2.19949E 00
7	4.33468E-02	1.23736E-05	4.33364E-02	1.84332E 00
8	2.65201E-02	1.69976E-05	2.65031E-02	1.56115E 00
9	1.57734E-02	2.27619E-05	1.57506E-02	1.35943E 00
10	6.40287E-03	3.44117E-05	6.36846E-03	1.13897E 00
11	4.52115E-04	6.30798E-05	3.89035E-04	8.85985E-01
12	1.45418E-04	1.45418E-04	0.0	6.46649E-01
13	4.33223E-04	4.33223E-04	0.0	4.52068E-01
14	1.45123E-03	1.45123E-03	0.0	2.92933E-01
15	7.89172E-03	7.89172E-03	0.0	1.64321E-01
16	4.19781E-02	4.19781E-02	0.0	8.02748E-02
17	1.41098E-01	1.41098E-01	0.0	5.42836E-02
18	5.21433E-01	5.21433E-01	0.0	5.15241E-02
19	2.07501E 00	2.07501E 00	0.0	8.57493E-02
20	7.84057E 00	7.84057E 00	0.0	1.93413E-01
21	4.93857E 01	4.93857E 01	0.0	6.56410E-01

REACTION CROSS SECTIONS FOR N 1275 ARB 37N-21G 300K (0-4-74(3) IDENTIFICATION

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)
1	1.55849E 00	9.64955E-01	4.09279E-01	1.03079E-02	1.73951E-01	1.73951E-01	5.54450E-06	1.89599E-02
2	1.58194E 00	9.29043E-01	4.25517E-01	9.24378E-03	2.18134E-01	2.18134E-01	9.74150E-06	2.96330E-02
3	1.57782E 00	8.98334E-01	4.30165E-01	7.73379E-03	2.41538E-01	2.41538E-01	1.44061E-05	3.87971E-02
4	1.56926E 00	8.86034E-01	4.29334E-01	6.54374E-03	2.47349E-01	2.47349E-01	1.64346E-05	4.31042E-02
5	1.56761E 00	8.87671E-01	4.22732E-01	4.47171E-03	2.52732E-01	2.52732E-01	1.78878E-05	4.77063E-02
6	1.57040E 00	9.09423E-01	4.07766E-01	2.00550E-03	2.51208E-01	2.51208E-01	1.92189E-05	5.04671E-02
7	1.43862E 00	8.24080E-01	3.79569E-01	3.04266E-04	2.34568E-01	2.34668E-01	1.92940E-05	4.84286E-02
8	1.41063E 00	8.82589E-01	3.11567E-01	0.0	2.16472E-01	2.16472E-01	2.13691E-05	4.79804E-02
9	1.29860E 00	8.99686E-01	2.10959E-01	0.0	1.87955E-01	1.87955E-01	1.92098E-05	4.44085E-02
10	1.25824E 00	8.80844E-01	2.01895E-01	0.0	1.75504E-01	1.75504E-01	1.57172E-05	3.61851E-02
11	1.46030E 00	1.06417E 00	1.99984E-01	0.0	1.96145E-01	1.96145E-01	1.82484E-05	2.48824E-02
12	1.30917E 00	9.92682E-01	1.53455E-01	0.0	1.63039E-01	1.63039E-01	1.33372E-05	2.10962E-02
13	1.40602E 00	1.14039E 00	6.75016E-02	0.0	1.98132E-01	1.98132E-01	1.88832E-05	2.72755E-02
14	1.06635E 00	7.68050E-01	4.06024E-02	0.0	2.57695E-01	2.57695E-01	1.00208E-05	3.30288E-02
15	1.77765E 00	1.36855E 00	2.27247E-02	0.0	3.86370E-01	3.86370E-01	1.60619E-05	4.49625E-02
16	1.71141E 00	1.34718E 00	5.46824E-03	0.0	3.58762E-01	3.58762E-01	2.34835E-05	4.39290E-02
17	1.43917E 00	1.25519E 00	7.84385E-04	0.0	1.83188E-01	1.83188E-01	1.65294E-05	5.97810E-02
18	1.46235E 00	1.36213E 00	0.0	0.0	1.00221E-01	1.00221E-01	2.17758E-05	2.51987E-02
19	1.60481E 00	1.51318E 00	0.0	0.0	9.16305E-02	9.16305E-02	2.73480E-05	2.22779E-02
20	2.00029E 00	1.92914E 00	0.0	0.0	7.11518E-02	7.11518E-02	3.46710E-05	4.41249E-02
21	1.85219E 00	1.81157E 00	0.0	0.0	4.06228E-02	4.06228E-02	2.61765E-05	4.03892E-02
22	3.15904E 00	3.15088E 00	0.0	0.0	8.15971E-03	8.15971E-03	2.54221E-05	8.11525E-03
23	4.06119E 00	4.05966E 00	0.0	0.0	1.53299E-03	1.53299E-03	3.29867E-05	1.50000E-03
24	4.82937E 00	4.82781E 00	0.0	0.0	1.56352E-03	1.56352E-03	4.35382E-05	1.51998E-03
25	6.05077E 00	6.04901E 00	0.0	0.0	1.75668E-03	1.75668E-03	6.32479E-05	1.69344E-03
26	6.65512E 00	6.65309E 00	0.0	0.0	2.02590E-03	2.02590E-03	7.84100E-05	1.94749E-03
27	7.12633E 00	7.12386E 00	0.0	0.0	2.47675E-03	2.47675E-03	9.79648E-05	2.37879E-03
28	7.76827E 00	7.76430E 00	0.0	0.0	3.96574E-03	3.96574E-03	1.57250E-04	3.80850E-03
29	8.41518E 00	8.40846E 00	0.0	0.0	6.72679E-03	6.72679E-03	2.66411E-04	6.46038E-03
30	8.94020E 00	8.92981E 00	0.0	0.0	1.03951E-02	1.03951E-02	4.11378E-04	9.98376E-03
31	9.46563E 00	9.44582E 00	0.0	0.0	1.98115E-02	1.98115E-02	7.83721E-04	1.90278E-02
32	9.90473E 00	9.86323E 00	0.0	0.0	4.15001E-02	4.15001E-02	1.64109E-03	3.98590E-02
33	9.99626E 00	9.92389E 00	0.0	0.0	7.23684E-02	7.23684E-02	2.86096E-03	6.95075E-02
34	1.00803E 01	9.95309E 00	0.0	0.0	1.27240E-01	1.27240E-01	5.02873E-03	1.22211E-01
35	1.01783E 01	9.95636E 00	0.0	0.0	2.21932E-01	2.21932E-01	8.76867E-03	2.13163E-01
36	1.03215E 01	9.95697E 00	0.0	0.0	3.64522E-01	3.64522E-01	1.44044E-02	3.50118E-01
37	1.13584E 01	9.95680E 00	0.0	0.0	1.40158E 00	1.40158E 00	5.54777E-02	1.34610E 00

REACTION CROSS SECTIONS FOR N 1275 ARB 37N-21G 300K (0-4-74(3)

GROUP	(N,D)	(N,T)	(N,ALPHA)	(N,2ALPHA)	GROUP FLUX
1	2.40138E-02	1.12552E-02	5.94708E-02	6.02458E-02	1.42548E-01
2	3.20701E-02	2.17863E-02	8.39491E-02	5.06854E-02	9.17856E-02
3	3.82714E-02	2.80859E-02	9.71097E-02	3.92596E-02	3.10699E-02
4	4.10321E-02	2.98911E-02	1.01527E-01	3.17775E-02	1.45153E-02
5	4.42912E-02	3.13670E-02	1.06822E-01	2.25275E-02	3.95085E-02
6	4.57977E-02	3.19073E-02	1.10663E-01	1.23537E-02	2.34705E-02
7	4.35613E-02	2.99668E-02	1.08939E-01	3.75325E-03	4.08405E-02
8	3.61710E-02	2.41940E-02	1.07953E-01	1.51565E-04	3.38845E-02
9	2.44603E-02	1.28779E-02	1.06170E-01	1.86032E-05	3.57881E-02
10	1.79203E-02	1.24318E-02	1.08951E-01	0.0	4.38355E-02
11	1.84109E-02	1.65312E-02	1.36302E-01	0.0	6.25867E-02
12	1.17931E-02	2.51014E-02	1.05035E-01	0.0	1.22768E-01
13	1.58655E-04	1.28351E-02	1.57844E-01	0.0	3.15687E-01
14	0.0	9.51306E-04	2.23705E-01	0.0	9.11689E-02
15	0.0	1.14611E-04	3.41277E-01	0.0	1.93919E-01
16	0.0	0.0	3.14810E-01	0.0	6.29880E-01
17	0.0	0.0	1.23390E-01	0.0	8.27463E-01
18	0.0	0.0	7.50002E-02	0.0	1.98267E-01
19	0.0	0.0	6.93252E-02	0.0	1.55878E 00
20	0.0	0.0	2.69923E-02	0.0	4.13802E 00
21	0.0	0.0	2.07433E-04	0.0	8.81340E 00
22	0.0	0.0	1.90399E-05	0.0	1.27293E 01
23	0.0	0.0	0.0	0.0	3.35074E 00
24	0.0	0.0	0.0	0.0	7.08299E 00
25	0.0	0.0	0.0	0.0	6.47936E 00
26	0.0	0.0	0.0	0.0	1.02746E 00
27	0.0	0.0	0.0	0.0	5.93486E 00
28	0.0	0.0	0.0	0.0	8.42855E 00
29	0.0	0.0	0.0	0.0	6.96107E 00
30	0.0	0.0	0.0	0.0	4.90186E 00
31	0.0	0.0	0.0	0.0	1.07627E 01
32	0.0	0.0	0.0	0.0	7.18708E 00
33	0.0	0.0	0.0	0.0	5.46510E 00
34	0.0	0.0	0.0	0.0	6.26720E 00
35	0.0	0.0	0.0	0.0	4.34567E 00
36	0.0	0.0	0.0	0.0	3.53427E 00
37	0.0	0.0	0.0	0.0	7.81109E 00

REACTION CROSS SECTIONS FOR O 1276 ARB 37N-21G 300K 10-4-74(3) IDENTIFICATION

GROUP	TOTAL	ELASTIC	INELASTIC	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)	(N,D)	(N,ALPHA)	GROUP FLUX
1	1.63624E 00	1.00955E 00	5.77547E-01	4.91422E-02	4.91422E-02	6.62171E-09	2.42198E-02	4.29381E-03	2.06286E-02	1.42548E-01
2	1.61063E 00	9.35875E-01	5.63760E-01	1.10997E-01	1.10997E-01	7.09625E-09	3.32387E-02	9.02038E-03	6.87374E-02	9.17856E-02
3	1.68321E 00	9.97355E-01	5.16295E-01	1.69561E-01	1.69561E-01	7.42034E-09	3.94352E-02	1.36710E-02	1.16455E-01	3.10699E-02
4	1.62511E 00	9.61122E-01	4.76313E-01	1.87679E-01	1.87679E-01	7.56161E-09	4.67642E-02	1.51698E-02	1.25745E-01	1.45153E-02
5	1.60188E 00	9.87739E-01	4.27006E-01	1.87140E-01	1.87140E-01	7.75049E-09	4.12441E-02	1.49477E-02	1.30948E-01	3.96083E-02
6	1.55671E 00	1.03519E 00	3.45890E-01	1.75626E-01	1.75626E-01	7.99834E-09	2.48181E-02	1.11937E-02	1.39614E-01	2.34705E-02
7	1.67777E 00	1.12797E 00	3.35817E-01	2.13975E-01	2.13975E-01	8.29950E-09	4.28152E-02	3.93875E-03	1.67221E-01	4.08405E-02
8	1.35621E 00	9.33241E-01	2.36828E-01	1.86141E-01	1.86141E-01	8.72502E-09	1.61836E-03	2.96184E-05	1.84493E-01	3.38845E-02
9	1.22829E 00	8.40065E-01	2.40508E-01	1.47715E-01	1.47715E-01	9.19085E-09	0.0	0.0	1.47715E-01	3.57861E-02
10	1.26830E 00	8.90221E-01	2.72237E-01	1.05847E-01	1.05847E-01	9.66207E-09	0.0	0.0	1.05847E-01	4.38355E-02
11	1.18123E 00	8.96407E-01	2.20009E-01	6.48125E-02	6.48125E-02	1.01445E-08	0.0	0.0	6.48125E-02	6.26867E-02
12	1.08527E 00	9.13595E-01	6.87159E-02	1.02961E-01	1.02961E-01	1.08361E-08	0.0	0.0	1.02961E-01	1.22768E-01
13	1.29361E 00	1.23725E 00	0.0	5.63665E-02	5.63665E-02	1.19642E-08	0.0	0.0	5.63665E-02	3.15687E-01
14	1.27927E 00	1.20538E 00	0.0	7.38868E-02	7.38868E-02	1.28672E-08	0.0	0.0	7.38868E-02	9.11689E-02
15	1.67382E 00	1.59378E 00	0.0	8.00388E-02	8.00388E-02	1.34772E-08	0.0	0.0	8.00388E-02	1.90919E-01
16	2.61142E 00	2.60431E 00	0.0	7.11205E-03	7.11205E-03	1.52555E-08	0.0	0.0	7.11203E-03	6.29860E-01
17	1.04232E 00	1.04232E 00	0.0	2.11212E-07	2.11212E-07	1.73688E-08	0.0	0.0	1.93844E-07	8.27463E-01
18	2.44115E-01	2.44115E-01	0.0	1.84997E-08	1.84997E-08	1.84981E-08	0.0	0.0	1.57298E-12	1.98267E-01
19	1.67301E 00	1.67301E 00	0.0	1.97999E-08	1.97999E-08	1.97999E-08	0.0	0.0	0.0	1.55878E 00
20	2.74006E 00	2.74006E 00	0.0	2.40004E-08	2.40004E-08	2.40004E-08	0.0	0.0	0.0	4.13802E 00
21	3.41249E 00	3.41249E 00	0.0	3.26812E-08	3.26812E-08	3.26812E-08	0.0	0.0	0.0	8.81940E 00
22	4.73457E 00	4.73457E 00	0.0	5.28237E-08	5.28237E-08	5.28237E-08	0.0	0.0	0.0	1.27293E 01
23	3.52885E 00	3.52885E 00	0.0	7.78788E-08	7.78788E-08	7.78788E-08	0.0	0.0	0.0	3.35074E 00
24	3.60815E 00	3.60815E 00	0.0	1.02860E-07	1.02860E-07	1.02860E-07	0.0	0.0	0.0	7.08299E 00
25	3.67781E 00	3.67781E 00	0.0	1.49557E-07	1.49557E-07	1.49557E-07	0.0	0.0	0.0	6.47936E 00
26	3.70321E 00	3.70321E 00	0.0	1.85502E-07	1.85502E-07	1.85502E-07	0.0	0.0	0.0	1.02746E 00
27	3.71833E 00	3.71833E 00	0.0	2.31891E-07	2.31891E-07	2.31891E-07	0.0	0.0	0.0	5.93486E 00
28	3.73516E 00	3.73516E 00	0.0	3.72651E-07	3.72651E-07	3.72651E-07	0.0	0.0	0.0	8.42855E 00
29	3.74344E 00	3.74344E 00	0.0	6.32136E-07	6.32136E-07	6.32136E-07	0.0	0.0	0.0	6.96107E 00
30	3.74732E 00	3.74732E 00	0.0	9.76898E-07	9.76898E-07	9.76898E-07	0.0	0.0	0.0	4.90186E 00
31	3.74753E 00	3.74753E 00	0.0	1.86186E-06	1.86186E-06	1.86186E-06	0.0	0.0	0.0	1.07627E 01
32	3.74799E 00	3.74799E 00	0.0	3.90023E-06	3.90023E-06	3.90023E-06	0.0	0.0	0.0	7.18708E 00
33	3.74808E 00	3.74808E 00	0.0	6.80141E-06	6.80141E-06	6.80141E-06	0.0	0.0	0.0	5.46510E 00
34	3.74742E 00	3.74741E 00	0.0	1.19586E-05	1.19586E-05	1.19586E-05	0.0	0.0	0.0	6.26720E 00
35	3.74812E 00	3.74810E 00	0.0	2.08587E-05	2.08587E-05	2.08587E-05	0.0	0.0	0.0	4.34567E 00
36	3.74813E 00	3.74810E 00	0.0	3.42603E-05	3.42603E-05	3.42603E-05	0.0	0.0	0.0	3.53427E 00
37	3.74815E 00	3.74802E 00	0.0	1.31721E-04	1.31721E-04	1.31721E-04	0.0	0.0	0.0	7.81109E 00

REACTION CROSS SECTIONS FOR F-19(1277) 37N-21G 1/EST P-3 300K IDENTIFICATION 1277003

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)
1	1.75188E 00	9.14120E-01	6.70140E-01	1.14906E-01	5.27174E-02	5.27174E-02	7.69157E-06	1.13532E-02
2	1.75006E 00	8.54825E-01	7.57440E-01	8.01461E-02	5.76536E-02	5.76536E-02	8.82221E-06	1.44811E-02
3	1.74883E 00	8.33995E-01	7.95454E-01	5.88833E-02	6.04952E-02	6.04952E-02	9.62727E-06	1.62726E-02
4	1.74762E 00	8.27185E-01	8.09266E-01	4.91879E-02	6.19794E-02	6.19794E-02	9.99232E-06	1.70492E-02
5	1.74681E 00	8.20476E-01	8.21666E-01	3.47993E-02	6.98725E-02	6.98725E-02	1.05073E-05	1.91409E-02
6	1.74572E 00	8.20526E-01	8.28493E-01	1.68516E-02	7.98531E-02	7.98531E-02	1.11861E-05	2.17230E-02
7	1.73429E 00	8.03332E-01	8.35374E-01	4.27264E-03	9.13146E-02	9.13146E-02	1.20605E-05	2.58077E-02
8	1.71509E 00	7.65772E-01	8.44235E-01	9.86429E-06	1.05071E-01	1.05071E-01	1.33296E-05	3.26168E-02
9	1.70975E 00	7.42020E-01	8.52079E-01	0.0	1.15656E-01	1.15656E-01	1.47228E-05	3.87907E-02
10	1.66837E 00	6.90734E-01	8.39259E-01	0.0	1.38380E-01	1.38380E-01	1.62755E-05	4.06437E-02
11	1.66621E 00	6.91211E-01	8.09426E-01	0.0	1.45570E-01	1.45570E-01	1.79826E-05	3.75455E-02
12	1.56813E 00	6.40795E-01	7.55200E-01	0.0	1.72139E-01	1.72139E-01	2.04343E-05	3.21217E-02
13	1.77278E 00	8.96828E-01	7.00541E-01	0.0	1.75415E-01	1.75415E-01	2.49224E-05	1.30964E-02
14	1.76302E 00	9.62930E-01	6.60508E-01	0.0	1.39586E-01	1.39586E-01	2.89055E-05	8.26749E-04
15	1.99158E 00	1.23982E 00	6.57054E-01	0.0	9.47058E-02	9.47058E-02	3.19865E-05	2.28281E-04
16	1.98564E 00	1.25485E 00	7.08177E-01	0.0	2.26141E-02	2.26141E-02	3.99758E-05	0.0
17	2.56425E 00	1.79810E 00	7.65307E-01	0.0	8.44817E-04	8.44817E-04	5.20210E-05	0.0
18	2.31568E 00	1.50707E 00	8.08017E-01	0.0	5.90689E-04	5.90689E-04	5.96249E-05	0.0
19	2.67517E 00	1.81431E 00	8.60478E-01	0.0	3.86330E-04	3.86330E-04	5.81807E-05	0.0
20	3.07042E 00	1.94030E 00	1.13000E 00	0.0	1.16435E-04	1.16435E-04	9.40239E-05	0.0
21	3.85069E 00	2.26004E 00	1.59051E 00	0.0	1.41222E-04	1.41222E-04	1.41222E-04	0.0
22	5.85494E 00	3.63520E 00	2.21521E 00	0.0	5.34126E-04	5.34126E-04	5.34126E-04	0.0
23	5.10879E 00	4.68994E 00	4.18474E-01	0.0	3.78525E-04	3.78525E-04	3.78525E-04	0.0
24	4.92663E 00	4.92576E 00	0.0	0.0	8.73605E-04	8.73605E-04	8.73605E-04	0.0
25	4.77441E 00	4.71836E 00	0.0	0.0	6.05034E-03	6.05034E-03	6.05034E-03	0.0
26	3.51271E 00	3.51143E 00	0.0	0.0	1.27856E-03	1.27856E-03	1.27856E-03	0.0
27	3.48509E 00	3.48182E 00	0.0	0.0	3.26367E-03	3.26367E-03	3.26367E-03	0.0
28	3.47452E 00	3.47445E 00	0.0	0.0	6.20551E-05	6.20551E-05	6.20551E-05	0.0
29	3.46947E 00	3.46942E 00	0.0	0.0	5.08849E-05	5.08849E-05	5.08849E-05	0.0
30	3.48348E 00	3.48341E 00	0.0	0.0	6.37127E-05	6.37127E-05	6.37127E-05	0.0
31	3.81914E 00	3.81904E 00	0.0	0.0	1.03540E-04	1.03540E-04	1.03540E-04	0.0
32	3.99751E 00	3.99730E 00	0.0	0.0	2.14712E-04	2.14712E-04	2.14712E-04	0.0
33	3.99765E 00	3.99730E 00	0.0	0.0	3.54305E-04	3.54305E-04	3.54305E-04	0.0
34	3.99796E 00	3.99730E 00	0.0	0.0	6.58023E-04	6.58023E-04	6.58023E-04	0.0
35	3.99839E 00	3.99730E 00	0.0	0.0	1.08549E-03	1.08549E-03	1.08549E-03	0.0
36	3.99921E 00	3.99730E 00	0.0	0.0	1.91389E-03	1.91389E-03	1.91389E-03	0.0
37	4.00433E 00	3.99717E 00	0.0	0.0	7.16303E-03	7.16303E-03	7.16303E-03	0.0

GROUP	(N,D)	(N,T)	(N,ALPHA)	GROUP FLUX
1	1.20016E-02	7.88720E-03	2.14678E-02	2.73234E-01
2	1.20006E-02	7.73926E-03	2.34239E-02	2.27989E-01
3	1.20053E-02	7.65859E-03	2.45487E-02	9.11688E-02
4	1.19925E-02	7.62448E-03	2.53033E-02	4.57192E-02
5	1.18676E-02	7.58279E-03	3.12708E-02	1.36980E-01
6	1.17085E-02	7.53522E-03	3.88752E-02	9.13513E-02
7	1.11118E-02	7.00562E-03	4.73735E-02	1.83881E-01
8	5.85271E-03	4.81369E-03	5.77744E-02	1.86053E-01
9	8.13660E-03	1.57862E-03	6.71356E-02	1.86564E-01
10	5.14223E-03	3.13909E-04	9.22638E-02	1.91235E-01
11	2.18035E-03	1.58760E-05	1.05810E-01	1.93785E-01
12	4.72541E-04	0.0	1.39524E-01	3.05126E-01
13	1.70704E-05	0.0	1.62276E-01	4.49787E-01
14	0.0	0.0	1.38730E-01	9.04704E-02
15	0.0	0.0	9.44455E-02	2.40268E-01
16	0.0	0.0	2.25741E-02	4.82237E-01
17	0.0	0.0	7.92796E-04	2.90529E-01
18	0.0	0.0	5.31005E-04	4.59914E-02
19	0.0	0.0	3.28149E-04	2.78814E-01
20	0.0	0.0	2.24116E-05	5.19522E-01
21	0.0	0.0	0.0	5.80312E-01
22	0.0	0.0	0.0	6.81092E-01
23	0.0	0.0	0.0	2.18602E-01
24	0.0	0.0	0.0	4.87304E-01
25	0.0	0.0	0.0	5.09076E-01
26	0.0	0.0	0.0	1.13646E-01
27	0.0	0.0	0.0	6.87156E-01
28	0.0	0.0	0.0	1.03933E 00
29	0.0	0.0	0.0	9.73837E-01
30	0.0	0.0	0.0	7.60912E-01
31	0.0	0.0	0.0	2.53351E 00
32	0.0	0.0	0.0	2.58641E 00
33	0.0	0.0	0.0	1.31959E 00
34	0.0	0.0	0.0	2.52906E 00
35	0.0	0.0	0.0	1.37392E 00
36	0.0	0.0	0.0	1.93516E 00
37	0.0	0.0	0.0	7.57447E 00

GAMMA 1-D CROSS SECTIONS FOR F-15(1277) 37N-21G 1/EST P-3 300K ID = 1277003

XSEC GRP. ID	PHOTOELECTRIC	PAIR PRODUCTION	INCOHERENT SCATTERING	ABSORPTION	TOTAL	ENERGY ABSORPTION
1	2.05164E-04	8.73785E-01	8.51679E-01	2.05164E-04	1.72567E 00	1.67179E 01
2	2.80353E-04	7.07125E-01	1.04787E 00	2.80353E-04	1.75528E 00	1.20253E 01
3	3.46537E-04	5.95387E-01	1.19165E 00	3.46537E-04	1.78738E 00	9.77871E 00
4	4.10612E-04	5.20400E-01	1.31754E 00	4.10612E-04	1.83835E 00	8.42523E 00
5	5.00693E-04	4.44859E-01	1.47812E 00	5.00693E-04	1.92348E 00	7.16612E 00
6	6.44956E-04	3.53789E-01	1.69143E 00	6.44956E-04	2.04587E 00	5.93486E 00
7	8.99881E-04	2.42611E-01	1.99175E 00	8.99881E-04	2.23526E 00	4.73269E 00
8	1.24240E-03	1.50423E-01	2.30807E 00	1.24240E-03	2.45974E 00	3.86403E 00
9	1.66630E-03	9.02793E-02	2.60181E 00	1.66630E-03	2.69376E 00	3.29850E 00
10	2.53036E-03	3.70335E-02	3.00399E 00	2.53036E-03	3.04356E 00	2.72647E 00
11	4.67809E-03	1.89361E-03	3.60251E 00	4.67809E-03	3.60908E 00	2.11016E 00
12	1.04499E-02	0.0	4.35107E 00	1.04499E-02	4.36152E 00	1.54416E 00
13	2.91818E-02	0.0	5.19702E 00	2.91818E-02	5.22620E 00	1.08917E 00
14	9.29637E-02	0.0	6.18788E 00	9.29637E-02	6.28084E 00	7.28023E-01
15	4.78887E-01	0.0	7.47431E 00	4.78887E-01	7.95320E 00	4.82366E-01
16	2.44640E 00	0.0	8.86885E 00	2.44640E 00	1.13153E 01	4.71929E-01
17	7.96019E 00	0.0	9.70899E 00	7.96019E 00	1.76692E 01	7.56005E-01
18	2.81493E 01	0.0	1.04428E 01	2.81493E 01	3.85920E 01	1.59344E 00
19	1.05632E 02	0.0	1.10815E 01	1.05632E 02	1.16714E 02	3.82355E 00
20	3.69822E 02	0.0	1.15405E 01	3.69822E 02	3.81362E 02	8.88138E 00
21	1.98985E 03	0.0	1.17048E 01	1.98985E 03	2.00180E 03	2.66030E 01

REACTION CROSS SECTIONS FOR NA DNA 4156/1 (1/E WT.) IDENTIFICATION 4156

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,ALPHA)	ID CAPTURE
1	1.71177E 00	8.57734E-01	6.26258E-01	5.21882E-02	1.75592E-01	2.40065E-04	4.48818E-02	1.30470E-01	0.0
2	1.66013E 00	8.31903E-01	6.07372E-01	5.05461E-02	1.70308E-01	2.32765E-04	4.35277E-02	1.26547E-01	0.0
3	1.64872E 00	8.19036E-01	6.18441E-01	3.51635E-02	1.76078E-01	2.22034E-04	4.41718E-02	1.31684E-01	0.0
4	1.62839E 00	7.81860E-01	6.40423E-01	2.02686E-02	1.85838E-01	2.12545E-04	4.58509E-02	1.39775E-01	0.0
5	1.62720E 00	7.49938E-01	6.68517E-01	6.33841E-03	2.02403E-01	2.01306E-04	5.24414E-02	1.49761E-01	0.0
6	1.59829E 00	6.77498E-01	7.02368E-01	0.0	2.18419E-01	1.91479E-04	5.85359E-02	1.59692E-01	0.0
7	1.60253E 00	6.45917E-01	7.40030E-01	0.0	2.16587E-01	1.82178E-04	6.40946E-02	1.52310E-01	0.0
8	1.57699E 00	5.91756E-01	7.82932E-01	0.0	2.02304E-01	1.77478E-04	8.52655E-02	1.16861E-01	0.0
9	1.58939E 00	6.04256E-01	8.41950E-01	0.0	1.43188E-01	1.74703E-04	5.94929E-02	8.35201E-02	0.0
10	1.57142E 00	5.89198E-01	8.74340E-01	0.0	1.37885E-01	1.71974E-04	5.40756E-02	5.36370E-02	0.0
11	1.66206E 00	6.83147E-01	8.99525E-01	0.0	7.93895E-02	1.69626E-04	5.04652E-02	2.87546E-02	0.0
12	1.68957E 00	7.39451E-01	9.07204E-01	0.0	4.29169E-02	1.67306E-04	3.58306E-02	6.94291E-03	0.0
13	1.85999E 00	9.40102E-01	9.01836E-01	0.0	1.80539E-02	1.63819E-04	1.69547E-02	9.35359E-04	0.0
14	1.88158E 00	1.02006E 00	8.59420E-01	0.0	2.10130E-03	1.61247E-04	1.53006E-03	4.09996E-04	0.0
15	1.99741E 00	1.13843E 00	8.58207E-01	0.0	7.75689E-04	1.60133E-04	4.38835E-04	1.76721E-04	0.0
16	2.15629E 00	1.34868E 00	8.07432E-01	0.0	1.79075E-04	1.65766E-04	1.31710E-05	1.38376E-07	0.0
17	2.63393E 00	1.98010E 00	6.53652E-01	0.0	1.77712E-04	1.77712E-04	0.0	0.0	0.0
18	2.75262E 00	2.07815E 00	6.74278E-01	0.0	1.83994E-04	1.83994E-04	0.0	0.0	0.0
19	2.76892E 00	2.16854E 00	6.00187E-01	0.0	1.90562E-04	1.90562E-04	0.0	0.0	0.0
20	2.90351E 00	2.36026E 00	5.40042E-01	0.0	2.09875E-04	2.09875E-04	0.0	0.0	0.0
21	4.78817E 00	4.43248E 00	3.55397E-01	0.0	2.88827E-04	2.88827E-04	0.0	0.0	0.0
22	3.65484E 00	3.65231E 00	1.98533E-03	0.0	5.49937E-04	5.49937E-04	0.0	0.0	0.0
23	3.46648E 00	3.46555E 00	0.0	0.0	9.28597E-04	9.28597E-04	0.0	0.0	1.30181E-03
24	4.69237E 00	4.69082E 00	0.0	0.0	1.55022E-03	1.55022E-03	0.0	0.0	0.0
25	4.12856E 00	4.12619E 00	0.0	0.0	2.38017E-03	2.38017E-03	0.0	0.0	0.0
26	3.97050E 00	3.97028E 00	0.0	0.0	2.25910E-04	2.25910E-04	0.0	0.0	0.0
27	4.39701E 00	4.39674E 00	0.0	0.0	2.71073E-04	2.71073E-04	0.0	0.0	0.0
28	1.35700E 01	1.35695E 01	0.0	0.0	4.66863E-04	4.66863E-04	0.0	0.0	5.55632E-03
29	7.10519E 01	7.10519E 01	0.0	0.0	1.20008E-06	1.20008E-06	0.0	0.0	8.85572E-02
30	3.57947E 00	3.57129E 00	0.0	0.0	8.18335E-03	8.18335E-03	0.0	0.0	2.91871E-04
31	3.19596E 00	3.18754E 00	0.0	0.0	8.42422E-03	8.42422E-03	0.0	0.0	0.0
32	3.15128E 00	3.13508E 00	0.0	0.0	1.21963E-02	1.21963E-02	0.0	0.0	0.0
33	3.15401E 00	3.13351E 00	0.0	0.0	2.05047E-02	2.05047E-02	0.0	0.0	0.0
34	3.18168E 00	3.14557E 00	0.0	0.0	3.61164E-02	3.61164E-02	0.0	0.0	0.0
35	3.23687E 00	3.17387E 00	0.0	0.0	6.30090E-02	6.30090E-02	0.0	0.0	0.0
36	3.31682E 00	3.21295E 00	0.0	0.0	1.03874E-01	1.03874E-01	0.0	0.0	0.0
37	3.72682E 00	3.29893E 00	0.0	0.0	4.27895E-01	4.27895E-01	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	3.02585E-01	1.43816E-05	3.02571E-01	7.43155E 00
2	2.43642E-01	1.96007E-05	2.43623E-01	5.63739E 00
3	2.04317E-01	2.41589E-05	2.03993E-01	4.74685E 00
4	1.77613E-01	2.85602E-05	1.77585E-01	4.19709E 00
5	1.51159E-01	3.47322E-05	1.51124E-01	3.66916E 00
6	1.19751E-01	4.45335E-05	1.19706E-01	3.13622E 00
7	8.16195E-02	6.16915E-05	8.15578E-02	2.59006E 00
8	5.02025E-02	8.48497E-05	5.01176E-02	2.17067E 00
9	2.99837E-02	1.13841E-04	2.98699E-02	1.87969E 00
10	1.22834E-02	1.72417E-04	1.21109E-02	1.56893E 00
11	1.00480E-03	3.16628E-04	6.88176E-04	1.21858E 00
12	7.17367E-04	7.17367E-04	0.0	8.89570E-01
13	2.07036E-03	2.07036E-03	0.0	6.22435E-01
14	6.77450E-03	6.77450E-03	0.0	4.04507E-01
15	3.60940E-02	3.60940E-02	0.0	2.30985E-01
16	1.89906E-01	1.89906E-01	0.0	1.26210E-01
17	6.34248E-01	6.34248E-01	0.0	1.10820E-01
18	2.32643E 00	2.32643E 00	0.0	1.58694E-01
19	9.16095E 00	9.16095E 00	0.0	3.44266E-01
20	3.40911E 01	3.40911E 01	0.0	8.23763E-01
21	2.07232E 02	2.07232E 02	0.0	2.75091E 00

REACTION CROSS SECTIONS FOR MG 4512/1 37N-21G 1/E 11-20-74 (5)

IDENTIFICATION

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)	(N,ALPHA)	GROUP FLUX
1	1.81145E 00	9.44443E-01	5.70438E-01	7.45353E-02	2.22036E-01	2.22036E-01	3.00006E-04	9.65815E-02	1.25154E-01	1.49959E-01
2	1.80811E 00	9.61871E-01	5.73868E-01	5.09656E-02	2.81404E-01	2.81404E-01	3.00006E-04	1.29116E-01	1.51968E-01	1.25040E-01
3	1.80364E 00	8.40835E-01	5.89840E-01	4.10468E-02	3.32116E-01	3.32116E-01	3.00130E-04	1.61700E-01	1.70115E-01	4.99605E-02
4	1.77060E 00	7.87528E-01	6.00533E-01	3.56589E-02	3.46882E-01	3.46882E-01	3.00026E-04	1.70377E-01	1.76205E-01	2.50450E-02
5	1.68912E 00	6.95461E-01	6.14256E-01	2.80593E-02	3.51350E-01	3.51350E-01	3.00290E-04	1.69420E-01	1.81630E-01	7.49975E-02
6	1.68802E 00	6.83880E-01	6.35830E-01	1.86762E-02	3.49635E-01	3.49635E-01	3.00006E-04	1.65403E-01	1.83922E-01	4.99824E-02
7	1.69570E 00	7.02245E-01	6.63409E-01	1.23497E-02	3.17702E-01	3.17702E-01	3.00006E-04	1.39569E-01	1.77833E-01	9.99714E-02
8	1.67109E 00	6.75586E-01	7.01547E-01	9.13134E-03	2.84828E-01	2.84828E-01	3.00006E-04	1.32821E-01	1.51708E-01	1.00026E-01
9	1.65069E 00	7.13048E-01	7.13625E-01	5.85107E-03	2.18167E-01	2.18167E-01	3.00507E-04	1.08394E-01	1.09472E-01	9.99970E-02
10	1.76656E 00	8.90943E-01	7.01674E-01	2.62596E-03	1.71317E-01	1.71317E-01	3.00008E-04	1.01667E-01	6.93499E-02	1.00004E-01
11	1.68672E 00	8.58042E-01	7.10890E-01	4.42620E-04	1.17349E-01	1.17349E-01	3.00007E-04	7.07338E-02	4.63149E-02	9.99966E-02
12	1.75172E 00	8.80498E-01	8.08646E-01	0.0	6.25787E-02	6.25787E-02	3.00964E-04	3.22617E-02	3.00161E-02	1.49999E-01
13	1.76775E 00	8.18926E-01	9.27410E-01	0.0	2.14106E-02	2.14106E-02	3.00908E-04	1.29044E-03	1.98193E-02	2.49993E-01
14	2.10343E 00	1.19617E 00	8.91391E-01	0.0	1.58764E-02	1.58764E-02	3.07750E-04	1.01898E-06	1.55677E-02	5.00021E-02
15	2.09463E 00	1.33597E 00	7.46321E-01	0.0	1.23433E-02	1.23433E-02	3.14005E-04	0.0	1.20253E-02	1.50006E-01
16	1.87972E 00	1.20390E 00	6.70156E-01	0.0	5.67102E-03	5.67102E-03	3.40768E-04	0.0	5.33025E-03	3.00015E-01
17	2.40911E 00	1.80271E 00	6.05669E-01	0.0	1.33610E-03	1.33610E-03	3.92331E-04	0.0	9.43773E-04	2.33288E-01
18	1.99751E 00	1.51270E 00	4.84143E-01	0.0	6.61030E-04	6.61030E-04	4.40332E-04	0.0	2.20698E-04	3.33783E-02
19	2.42559E 00	2.03976E 00	3.85275E-01	0.0	5.47056E-04	5.47056E-04	5.07263E-04	0.0	3.97930E-05	2.33339E-01
20	2.99127E 00	2.78043E 00	1.20106E-01	0.0	7.35271E-04	7.35271E-04	7.35271E-04	0.0	0.0	5.00009E-01
21	3.74742E 00	3.74008E 00	5.98684E-03	0.0	1.34942E-03	1.34942E-03	1.34942E-03	0.0	0.0	6.99975E-01
22	6.44309E 00	6.44269E 00	0.0	0.0	3.92607E-04	3.92607E-04	3.92607E-04	0.0	0.0	1.25002E 00
23	4.30189E 00	4.30179E 00	0.0	0.0	9.90662E-05	9.90662E-05	9.90662E-05	0.0	0.0	3.49973E-01
24	1.20127E 01	1.20109E 01	0.0	0.0	1.79732E-03	1.79732E-03	1.79732E-03	0.0	0.0	7.50003E-01
25	3.25846E 00	3.25829E 00	0.0	0.0	1.68098E-04	1.68098E-04	1.68098E-04	0.0	0.0	7.49937E-01
26	4.78102E 00	4.77989E 00	0.0	0.0	1.12677E-03	1.12677E-03	1.12677E-03	0.0	0.0	1.25015E-01
27	4.18118E 00	4.18015E 00	0.0	0.0	1.03965E-03	1.03965E-03	1.03965E-03	0.0	0.0	7.50001E-01
28	3.34153E 00	3.34176E 00	0.0	0.0	1.66707E-04	1.66707E-04	1.66707E-04	0.0	0.0	1.12501E 00
29	3.37654E 00	3.37630E 00	0.0	0.0	2.40581E-04	2.40581E-04	2.40581E-04	0.0	0.0	9.99990E-01
30	3.39117E 00	3.39082E 00	0.0	0.0	3.54110E-04	3.54110E-04	3.54110E-04	0.0	0.0	7.49995E-01
31	3.39947E 00	3.39882E 00	0.0	0.0	6.56179E-04	6.56179E-04	6.56179E-04	0.0	0.0	1.75001E 00
32	3.39979E 00	3.39841E 00	0.0	0.0	1.37809E-03	1.37809E-03	1.37809E-03	0.0	0.0	1.25000E 00
33	3.39952E 00	3.39711E 00	0.0	0.0	2.41508E-03	2.41508E-03	2.41508E-03	0.0	0.0	9.99996E-01
34	3.39937E 00	3.39506E 00	0.0	0.0	4.31024E-03	4.31024E-03	4.31024E-03	0.0	0.0	1.25000E 00
35	3.39952E 00	3.39201E 00	0.0	0.0	7.51194E-03	7.51194E-03	7.51194E-03	0.0	0.0	9.99949E-01
36	3.39606E 00	3.38372E 00	0.0	0.0	1.23431E-02	1.23431E-02	1.23431E-02	0.0	0.0	1.00003E 00
37	3.39467E 00	3.34435E 00	0.0	0.0	5.05238E-02	5.05238E-02	5.05238E-02	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Mg

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	3.58034E-01	2.20065E-05	3.58012E-01	8.41581E 00
2	8.00000E 00	1.00000E 01	2.88592E-01	3.00035E-05	2.88562E-01	6.32716E 00
3	7.00000E 00	8.00000E 00	2.41879E-01	3.69969E-05	2.41842E-01	5.30375E 00
4	6.00000E 00	7.00000E 00	2.10707E-01	4.37526E-05	2.10663E-01	4.67173E 00
5	5.00000E 00	6.00000E 00	1.79452E-01	5.32295E-05	1.79399E-01	4.06813E 00
6	4.00000E 00	5.00000E 00	1.42263E-01	6.82718E-05	1.42195E-01	3.46209E 00
7	3.00000E 00	4.00000E 00	9.70684E-02	9.45954E-05	9.69738E-02	2.84577E 00
8	2.50000E 00	3.00000E 00	5.97916E-02	1.30154E-04	5.96614E-02	2.37683E 00
9	2.00000E 00	2.50000E 00	3.57613E-02	1.74721E-04	3.55866E-02	2.05445E 00
10	1.50000E 00	2.00000E 00	1.47059E-02	2.64754E-04	1.44411E-02	1.71266E 00
11	1.00000E 00	1.50000E 00	1.29173E-03	4.86433E-04	8.05301E-04	1.32955E 00
12	7.00000E-01	1.00000E 00	1.09689E-03	1.09689E-03	0.0	9.70701E-01
13	4.50000E-01	7.00000E-01	3.13694E-03	3.13694E-03	0.0	6.79471E-01
14	3.00000E-01	4.50000E-01	1.02062E-02	1.02062E-02	0.0	4.42296E-01
15	1.50000E-01	3.00000E-01	5.40929E-02	5.40929E-02	0.0	2.54924E-01
16	9.99999E-02	1.50000E-01	2.83889E-01	2.83889E-01	0.0	1.46870E-01
17	6.99999E-02	9.99999E-02	9.46884E-01	9.46884E-01	0.0	1.41816E-01
18	4.50000E-02	6.99999E-02	3.46496E 00	3.46496E 00	0.0	2.23737E-01
19	3.00000E-02	4.50000E-02	1.35947E 01	1.35947E 01	0.0	5.04880E-01
20	2.00000E-02	3.00000E-02	5.02978E 01	5.02978E 01	0.0	1.21252E 00
21	9.99999E-03	2.00000E-02	3.01638E 02	3.01638E 02	0.0	4.00634E 00

REACTION CROSS SECTIONS FOR ALUMINUM DNA 4135/3 (1/E WT.) IDENTIFICATION 4135

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,D)	(N,T)	(N,ALPHA)
1	1.78402E 00	7.75759E-01	5.56048E-01	3.06919E-01	1.45297E-01	6.41096E-04	4.59868E-02	2.71151E-02	1.05442E-02	6.08054E-02
2	1.76057E 00	6.71526E-01	6.98092E-01	1.94352E-01	1.98602E-01	6.30025E-04	6.34481E-02	3.09709E-02	3.08488E-03	9.84682E-02
3	1.74833E 00	6.47711E-01	8.01247E-01	7.76125E-02	2.21755E-01	5.27361E-04	7.35292E-02	2.88695E-02	2.86714E-04	1.18542E-01
4	1.74494E 00	6.50649E-01	8.39118E-01	2.63054E-02	2.28865E-01	5.00342E-04	7.76135E-02	2.63375E-02	2.14982E-05	1.24392E-01
5	1.73669E 00	6.37969E-01	8.63618E-01	2.00575E-03	2.33095E-01	4.65936E-04	8.26442E-02	2.21192E-02	7.02020E-06	1.27859E-01
6	1.73440E 00	6.32102E-01	8.71219E-01	0.0	2.31083E-01	4.25197E-04	8.81798E-02	1.65701E-02	4.23803E-06	1.25901E-01
7	1.74141E 00	6.41329E-01	8.77900E-01	0.0	2.22179E-01	3.79650E-04	9.51301E-02	1.04555E-02	1.23026E-06	1.16212E-01
8	1.70030E 00	6.36579E-01	8.57004E-01	0.0	2.06315E-01	3.23903E-04	1.02163E-01	4.09693E-03	0.0	9.97304E-02
9	1.71648E 00	6.99446E-01	8.31998E-01	0.0	1.85039E-01	2.73452E-04	1.02379E-01	6.15180E-04	0.0	8.17719E-02
10	1.74967E 00	7.60754E-01	8.35292E-01	0.0	1.53585E-01	2.27938E-04	9.39949E-02	7.71924E-05	0.0	5.52849E-02
11	1.82928E 00	8.66153E-01	8.45394E-01	0.0	1.17735E-01	1.86641E-04	8.20287E-02	5.01526E-05	0.0	3.54653E-02
12	1.94326E 00	1.04074E 00	8.23559E-01	0.0	7.89695E-02	1.40677E-04	6.50200E-02	2.00500E-05	0.0	1.37889E-02
13	2.09714E 00	1.26929E 00	7.88491E-01	0.0	3.93635E-02	7.83478E-05	3.83268E-02	1.13261E-07	0.0	9.58293E-04
14	2.17875E 00	1.41910E 00	7.41734E-01	0.0	1.79161E-02	4.94698E-05	1.78650E-02	0.0	0.0	1.72291E-06
15	2.23897E 00	1.48781E 00	7.37254E-01	0.0	1.39018E-02	3.94740E-05	1.38422E-02	0.0	0.0	5.08028E-08
16	2.47823E 00	1.82570E 00	6.46843E-01	0.0	5.69735E-03	2.35848E-05	5.61377E-03	0.0	0.0	1.60111E-13
17	2.89102E 00	2.48654E 00	4.03358E-01	0.0	4.76804E-04	1.15635E-04	3.61169E-04	0.0	0.0	0.0
18	2.72074E 00	2.40312E 00	3.17486E-01	0.0	1.35970E-04	1.32718E-04	3.25164E-06	0.0	0.0	0.0
19	3.04339E 00	2.74277E 00	3.00472E-01	0.0	1.44792E-04	1.44695E-04	9.66212E-08	0.0	0.0	0.0
20	3.19441E 00	2.97471E 00	2.19562E-01	0.0	1.38807E-04	1.38807E-04	0.0	0.0	0.0	0.0
21	3.63428E 00	3.62866E 00	5.35545E-03	0.0	2.61248E-04	2.61248E-04	0.0	0.0	0.0	0.0
22	4.14543E 00	4.14457E 00	0.0	0.0	8.54905E-04	8.54905E-04	0.0	0.0	0.0	0.0
23	5.83284E 00	5.83016E 00	0.0	0.0	2.68750E-03	2.68750E-03	0.0	0.0	0.0	0.0
24	5.35693E 00	5.35511E 00	0.0	0.0	1.81706E-03	1.81706E-03	0.0	0.0	0.0	0.0
25	7.29701E 00	7.28517E 00	0.0	0.0	7.84610E-03	7.84610E-03	0.0	0.0	0.0	0.0
26	6.47375E-01	6.44342E-01	0.0	0.0	3.03288E-03	3.03288E-03	0.0	0.0	0.0	0.0
27	1.05299E 00	1.04956E 00	0.0	0.0	3.02695E-03	3.02695E-03	0.0	0.0	0.0	0.0
28	1.62451E 00	1.61261E 00	0.0	0.0	1.18925E-02	1.18925E-02	0.0	0.0	0.0	0.0
29	1.34779E 00	1.34492E 00	0.0	0.0	2.87216E-03	2.87216E-03	0.0	0.0	0.0	0.0
30	1.34893E 00	1.34699E 00	0.0	0.0	1.94571E-03	1.94571E-03	0.0	0.0	0.0	0.0
31	1.35010E 00	1.34727E 00	0.0	0.0	2.83257E-03	2.83257E-03	0.0	0.0	0.0	0.0
32	1.35240E 00	1.34733E 00	0.0	0.0	5.09717E-03	5.09717E-03	0.0	0.0	0.0	0.0
33	1.35620E 00	1.34730E 00	0.0	0.0	8.90509E-03	8.90509E-03	0.0	0.0	0.0	0.0
34	1.36294E 00	1.34722E 00	0.0	0.0	1.57174E-02	1.57174E-02	0.0	0.0	0.0	0.0
35	1.37451E 00	1.34712E 00	0.0	0.0	2.73911E-02	2.73911E-02	0.0	0.0	0.0	0.0
36	1.39222E 00	1.34706E 00	0.0	0.0	4.51578E-02	4.51578E-02	0.0	0.0	0.0	0.0
37	1.53357E 00	1.34752E 00	0.0	0.0	1.86050E-01	1.86050E-01	0.0	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	4.18050E-01	3.13584E-05	4.18019E-01	9.45049E 00
2	3.37284E-01	4.27682E-05	3.37241E-01	7.05193E 00
3	2.82917E-01	5.27589E-05	2.82864E-01	5.88126E 00
4	2.46605E-01	6.24129E-05	2.46542E-01	5.16176E 00
5	2.10165E-01	7.59599E-05	2.10089E-01	4.47797E 00
6	1.66686E-01	9.74535E-05	1.66588E-01	3.79466E 00
7	1.13838E-01	1.35050E-04	1.13703E-01	3.10481E 00
8	7.02310E-02	1.85873E-04	7.00452E-02	2.58449E 00
9	4.20613E-02	2.49658E-04	4.18117E-02	2.22987E 00
10	1.73596E-02	3.78492E-04	1.59811E-02	1.85659E 00
11	1.62677E-03	6.95725E-04	9.31049E-04	1.44058E 00
12	1.60760E-03	1.60760E-03	0.0	1.05194E 00
13	4.78942E-03	4.78942E-03	0.0	7.36856E-01
14	1.59981E-02	1.59981E-02	0.0	4.80932E-01
15	8.59716E-02	8.59716E-02	0.0	2.81632E-01
16	4.49219E-01	4.49219E-01	0.0	1.76095E-01
17	1.48128E 00	1.48128E 00	0.0	1.91153E-01
18	5.31913E 00	5.31913E 00	0.0	3.28053E-01
19	2.03811E 01	2.03811E 01	0.0	7.50358E-01
20	7.35089E 01	7.35089E 01	0.0	1.77021E 00
21	4.24152E 02	4.24152E 02	0.0	5.64482E 00

REACTION CROSS SECTIONS FOR SI 1194 1/E 32-21G 300K 10-3-74(3) IDENTIFICATION 1194

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)
1	1.87014E 00	8.73091E-01	7.76015E-01	5.82529E-02	1.62785E-01	1.62785E-01	4.54752E-04	9.09036E-02
2	1.83789E 00	7.89756E-01	6.82366E-01	5.57505E-02	3.10015E-01	3.10015E-01	4.81156E-04	1.69430E-01
3	1.80166E 00	7.27120E-01	6.27728E-01	5.06836E-02	3.96129E-01	3.96129E-01	4.96024E-04	2.17481E-01
4	1.81321E 00	7.30364E-01	6.14170E-01	4.66373E-02	4.22042E-01	4.22042E-01	5.01744E-04	2.32316E-01
5	1.83432E 00	7.42352E-01	6.14981E-01	3.98689E-02	4.37124E-01	4.37124E-01	5.12682E-04	2.41871E-01
6	1.85018E 00	7.49083E-01	6.21859E-01	3.14492E-02	4.47791E-01	4.47791E-01	5.23031E-04	2.51056E-01
7	1.83011E 00	7.23304E-01	6.34111E-01	2.20356E-02	4.50664E-01	4.50664E-01	5.33585E-04	2.60316E-01
8	1.79341E 00	6.79214E-01	6.55325E-01	1.10632E-02	4.47812E-01	4.47812E-01	5.45834E-04	2.68433E-01
9	1.82255E 00	7.23945E-01	6.69776E-01	3.72387E-03	4.25105E-01	4.25105E-01	5.57991E-04	2.60294E-01
10	1.91473E 00	8.16826E-01	6.70453E-01	2.05716E-04	4.27246E-01	4.27246E-01	5.73692E-04	2.67894E-01
11	1.99010E 00	8.64091E-01	6.69070E-01	0.0	4.56937E-01	4.56937E-01	5.80015E-04	2.71199E-01
12	1.89957E 00	8.53178E-01	7.44684E-01	0.0	3.01705E-01	3.01705E-01	5.89279E-04	2.22696E-01
13	2.14624E 00	1.26339E 00	8.09893E-01	0.0	7.29621E-02	7.29621E-02	6.06147E-04	5.77814E-02
14	2.67942E 00	1.95590E 00	7.08593E-01	0.0	1.45264E-02	1.45264E-02	6.13212E-04	1.16262E-02
15	2.35251E 00	1.68812E 00	6.59692E-01	0.0	4.70238E-03	4.70238E-03	6.20016E-04	2.21166E-03
16	2.19325E 00	1.61357E 00	5.78355E-01	0.0	1.32715E-03	1.32715E-03	6.31644E-04	5.82929E-06
17	2.64718E 00	2.20302E 00	4.43491E-01	0.0	6.66257E-04	6.66257E-04	6.40011E-04	0.0
18	2.51437E 00	2.17105E 00	3.42683E-01	0.0	6.40014E-04	6.40014E-04	6.40014E-04	0.0
19	3.25668E 00	3.03355E 00	2.22484E-01	0.0	6.49130E-04	6.49130E-04	6.49130E-04	0.0
20	2.81528E 00	2.80722E 00	7.41047E-03	0.0	6.54689E-04	6.54689E-04	6.54689E-04	0.0
21	3.80362E 00	3.80256E 00	0.0	0.0	6.61229E-04	6.61229E-04	6.61229E-04	0.0
22	5.14844E 00	5.14777E 00	0.0	0.0	6.70007E-04	6.70007E-04	6.70007E-04	0.0
23	5.58608E-01	5.67937E-01	0.0	0.0	6.71570E-04	6.71570E-04	6.71570E-04	0.0
24	1.63000E 00	1.62842E 00	0.0	0.0	1.57563E-03	1.57563E-03	1.57563E-03	0.0
25	1.44465E 00	1.43725E 00	0.0	0.0	7.60876E-03	7.60876E-03	7.60876E-03	0.0
26	1.47652E 00	1.47316E 00	0.0	0.0	3.36118E-03	3.36118E-03	3.36118E-03	0.0
27	1.69446E 00	1.69414E 00	0.0	0.0	3.17791E-04	3.17791E-04	3.17791E-04	0.0
28	2.10920E 00	2.10886E 00	0.0	0.0	3.39902E-04	3.39902E-04	3.39902E-04	0.0
29	2.15057E 00	2.15000E 00	0.0	0.0	5.75962E-04	5.75962E-04	5.75962E-04	0.0
30	2.15069E 00	2.15000E 00	0.0	0.0	8.85793E-04	8.85793E-04	8.85793E-04	0.0
31	2.15169E 00	2.15000E 00	0.0	0.0	1.69090E-03	1.69090E-03	1.69090E-03	0.0
32	2.15353E 00	2.15000E 00	0.0	0.0	3.52994E-03	3.52994E-03	3.52994E-03	0.0
33	2.15617E 00	2.15000E 00	0.0	0.0	6.17560E-03	6.17560E-03	6.17560E-03	0.0
34	2.16084E 00	2.15000E 00	0.0	0.0	1.08403E-02	1.08403E-02	1.08403E-02	0.0
35	2.16856E 00	2.15000E 00	0.0	0.0	1.89579E-02	1.89579E-02	1.89579E-02	0.0
36	2.18129E 00	2.15000E 00	0.0	0.0	3.12920E-02	3.12920E-02	3.12920E-02	0.0
37	2.27855E 00	2.14952E 00	0.0	0.0	1.28629E-01	1.28629E-01	1.28629E-01	0.0

GROUP	(N,D)	(N,ALPHA)	GROUP FLUX
1	6.57451E-03	6.48515E-02	1.49959E-01
2	1.47987E-02	1.25306E-01	1.25040E-01
3	1.82051E-02	1.55543E-01	4.99605E-02
4	1.88537E-02	1.70370E-01	2.50450E-02
5	1.80800E-02	1.76660E-01	7.49975E-02
6	1.44738E-02	1.81738E-01	4.99824E-02
7	6.15871E-03	1.83656E-01	9.99714E-02
8	2.22448E-04	1.78611E-01	1.00026E-01
9	0.0	1.64253E-01	9.99970E-02
10	0.0	1.58779E-01	1.00004E-01
11	0.0	1.85158E-01	9.99966E-02
12	0.0	7.84194E-02	1.49999E-01
13	0.0	1.45745E-02	2.49993E-01
14	0.0	2.28692E-03	5.00021E-02
15	0.0	1.87070E-03	1.50006E-01
16	0.0	6.89674E-04	3.00015E-01
17	0.0	2.62460E-05	2.33288E-01
18	0.0	0.0	3.33783E-02
19	0.0	0.0	2.33339E-01
20	0.0	0.0	5.00009E-01
21	0.0	0.0	6.99975E-01
22	0.0	0.0	1.25002E 00
23	0.0	0.0	3.49973E-01
24	0.0	0.0	7.50003E-01
25	0.0	0.0	7.49977E-01
26	0.0	0.0	1.25015E-01
27	0.0	0.0	7.50001E-01
28	0.0	0.0	1.12501E 00
29	0.0	0.0	9.99990E-01
30	0.0	0.0	7.49995E-01
31	0.0	0.0	1.75001E 00
32	0.0	0.0	1.25000E 00
33	0.0	0.0	9.99996E-01
34	0.0	0.0	1.25000E 00
35	0.0	0.0	9.99949E-01
36	0.0	0.0	1.00003E 00
37	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Si

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	4.82716E-01	4.62972E-05	4.82670E-01	1.05366E 01
2	8.00000E 00	1.00000E 01	3.89708E-01	6.31640E-05	3.89645E-01	7.80659E 00
3	7.00000E 00	8.00000E 00	3.27136E-01	7.79455E-05	3.27058E-01	6.47943E 00
4	6.00000E 00	7.00000E 00	2.85304E-01	9.22339E-05	2.85212E-01	5.66720E 00
5	5.00000E 00	6.00000E 00	2.43298E-01	1.12291E-04	2.43185E-01	4.89870E 00
6	4.00000E 00	5.00000E 00	1.93133E-01	1.44168E-04	1.92989E-01	4.13434E 00
7	3.00000E 00	4.00000E 00	1.32055E-01	2.00036E-04	1.31855E-01	3.36752E 00
8	2.50000E 00	3.00000E 00	8.15788E-02	2.75477E-04	8.13034E-02	2.79377E 00
9	2.00000E 00	2.50000E 00	4.89482E-02	3.69904E-04	4.85783E-02	2.40607E 00
10	1.50000E 00	2.00000E 00	2.03239E-02	5.60950E-04	1.97629E-02	2.00083E 00
11	1.00000E 00	1.50000E 00	2.10030E-03	1.03218E-03	1.06812E-03	1.55177E 00
12	7.00000E-01	1.00000E 00	2.33180E-03	2.33180E-03	0.0	1.13338E 00
13	4.50000E-01	7.00000E-01	6.68258E-03	6.68258E-03	0.0	7.94380E-01
14	3.00000E-01	4.50000E-01	2.17348E-02	2.17348E-02	0.0	5.19557E-01
15	1.50000E-01	3.00000E-01	1.14731E-01	1.14731E-01	0.0	3.07732E-01
16	9.99999E-02	1.50000E-01	5.97580E-01	5.97580E-01	0.0	2.03270E-01
17	6.99999E-02	9.99999E-02	1.97606E 00	1.97606E 00	0.0	2.37104E-01
18	4.50000E-02	6.99999E-02	7.14241E 00	7.14241E 00	0.0	4.30434E-01
19	3.00000E-02	4.50000E-02	2.75832E 01	2.75832E 01	0.0	1.01023E 00
20	2.00000E-02	3.00000E-02	1.00135E 02	1.00135E 02	0.0	2.40821E 00
21	9.99999E-03	2.00000E-02	5.79331E 02	5.79331E 02	0.0	7.70913E 00

ONE DIMENSION AVERAGES FOR CL MAT 1149 37N-21G P3 T=300K 10-9-75(3) IDENTIFIER 1149

XSEC GRP. ID	TOTAL	ELASTIC	(n,n') GAMMA	(n,2n)	(n,n') ALPHA	(n,n') P	ABSORPTION	CAPTURE
1	2.03412E 00	9.88181E-01	8.04352E-01	3.87969E-02	3.97773E-02	1.28589E-02	1.50159E-01	1.50159E-01
2	2.06640E 00	1.01913E 00	7.97033E-01	3.41577E-02	3.45914E-02	1.01162E-02	1.71877E-01	1.71877E-01
3	2.08880E 00	1.03403E 00	8.03337E-01	2.93481E-02	3.04583E-02	8.41940E-03	1.83215E-01	1.83215E-01
4	2.09950E 00	1.03539E 00	8.18444E-01	2.20638E-02	2.84964E-02	7.71331E-03	1.87391E-01	1.87391E-01
5	2.10961E 00	1.05626E 00	8.23122E-01	5.73573E-03	2.50627E-02	6.82943E-03	1.92595E-01	1.92595E-01
6	2.12883E 00	1.07889E 00	8.24676E-01	0.0	2.05829E-02	5.93120E-03	1.98755E-01	1.98755E-01
7	2.13897E 00	1.08824E 00	8.24569E-01	0.0	1.52619E-02	5.00228E-03	2.05871E-01	2.05871E-01
8	2.15969E 00	1.11336E 00	8.20347E-01	0.0	9.31949E-03	3.66278E-03	2.13003E-01	2.13003E-01
9	2.23497E 00	1.19978E 00	8.09320E-01	0.0	5.36594E-03	2.15422E-03	2.18358E-01	2.18358E-01
10	2.35268E 00	1.33302E 00	7.95158E-01	0.0	2.58329E-03	1.08525E-03	2.20838E-01	2.20838E-01
11	2.45321E 00	1.45043E 00	7.80005E-01	0.0	5.28223E-04	5.41974E-04	2.21704E-01	2.21704E-01
12	2.55866E 00	1.58366E 00	7.59458E-01	0.0	1.63990E-11	1.30775E-04	2.15622E-01	2.15622E-01
13	2.67044E 00	1.74942E 00	7.31404E-01	0.0	0.0	0.0	1.89615E-01	1.89615E-01
14	2.76672E 00	1.89132E 00	7.12371E-01	0.0	0.0	0.0	1.63033E-01	1.63033E-01
15	2.85518E 00	2.02812E 00	6.84725E-01	0.0	0.0	0.0	1.42340E-01	1.42340E-01
16	3.08846E 00	2.34901E 00	6.51093E-01	0.0	0.0	0.0	8.83514E-02	8.83514E-02
17	3.10907E 00	2.55858E 00	5.00613E-01	0.0	0.0	0.0	4.98758E-02	4.98758E-02
18	3.05455E 00	2.57957E 00	4.36698E-01	0.0	0.0	0.0	3.82791E-02	3.82791E-02
19	2.97118E 00	2.60806E 00	3.35246E-01	0.0	0.0	0.0	2.78746E-02	2.78746E-02
20	2.62782E 00	2.55294E 00	6.24676E-02	0.0	0.0	0.0	1.24184E-02	1.24184E-02
21	2.23113E 00	2.22779E 00	0.0	0.0	0.0	0.0	3.34503E-03	3.34503E-03
22	2.13066E 00	2.12967E 00	0.0	0.0	0.0	0.0	9.93356E-04	9.93356E-04
23	2.05494E 00	2.05367E 00	0.0	0.0	0.0	0.0	1.27409E-03	1.27409E-03
24	2.30007E 00	2.29670E 00	0.0	0.0	0.0	0.0	3.37155E-03	3.37155E-03
25	3.39592E 00	3.38661E 00	0.0	0.0	0.0	0.0	9.31248E-03	9.31248E-03
26	4.23649E 00	4.22328E 00	0.0	0.0	0.0	0.0	1.32060E-02	1.32060E-02
27	2.74014E 00	2.72843E 00	0.0	0.0	0.0	0.0	1.17122E-02	1.17122E-02
28	2.40099E 00	2.38108E 00	0.0	0.0	0.0	0.0	1.99078E-02	1.99078E-02
29	1.74376E 00	1.72734E 00	0.0	0.0	0.0	0.0	1.64182E-02	1.64182E-02
30	2.32099E 00	2.26785E 00	0.0	0.0	0.0	0.0	5.31433E-02	5.31433E-02
31	4.75469E 00	4.47496E 00	0.0	0.0	0.0	0.0	2.79731E-01	2.79731E-01
32	9.96758E 00	9.49288E 00	0.0	0.0	0.0	0.0	4.74696E-01	4.74696E-01
33	1.43038E 01	1.32197E 01	0.0	0.0	0.0	0.0	1.08409E 00	1.08409E 00
34	1.76451E 01	1.55425E 01	0.0	0.0	0.0	0.0	2.10265E 00	2.10265E 00
35	1.98259E 01	1.68566E 01	0.0	0.0	0.0	0.0	3.96935E 00	3.96935E 00
36	2.24791E 01	1.57829E 01	0.0	0.0	0.0	0.0	6.69629E 00	6.69629E 00
37	4.33586E 01	1.64075E 01	0.0	0.0	0.0	0.0	2.69510E 01	2.69510E 01

XSEC GRP. ID	(n,GAMMA)	(n,P)	(n,ALPHA)	GROUP FLUX
1	1.00002E-05	9.42241E-02	5.59252E-02	1.49959E-01
2	1.00002E-05	9.65616E-02	7.53055E-02	1.25040E-01
3	1.00002E-05	9.77098E-02	8.54954E-02	4.99605E-02
4	1.00002E-05	9.80230E-02	8.93583E-02	2.50450E-02
5	1.00003E-05	9.86763E-02	9.39083E-02	7.49975E-02
6	1.00002E-05	9.99411E-02	9.88041E-02	4.99824E-02
7	1.00002E-05	1.01658E-01	1.04203E-01	9.99714E-02
8	1.00002E-05	1.03104E-01	1.09889E-01	1.00026E-01
9	1.00002E-05	1.04745E-01	1.13602E-01	9.99970E-02
10	1.00003E-05	1.05118E-01	1.15710E-01	1.00004E-01
11	1.00002E-05	1.05489E-01	1.16205E-01	9.99966E-02
12	1.00002E-05	1.01772E-01	1.13840E-01	1.49999E-01
13	1.00002E-05	9.19595E-02	9.76457E-02	2.49993E-01
14	1.00002E-05	8.29993E-02	8.00235E-02	5.00021E-02
15	1.00003E-05	7.74282E-02	6.49023E-02	1.50006E-01
16	1.00002E-05	6.02046E-02	2.81369E-02	3.00015E-01
17	1.00002E-05	4.13563E-02	8.50952E-03	2.33298E-01
18	1.00002E-05	3.33613E-02	4.90782E-03	3.33783E-02
19	1.00336E-05	2.53699E-02	2.49464E-03	2.33339E-01
20	1.08995E-05	1.21018E-02	3.05727E-04	5.00009E-01

PHOTON INTERACTION CROSS SECTIONS FOR C1

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	7.03951E-01	1.17293E-04	7.03834E-01	1.40959E 01
2	8.00000E 00	1.00000E 01	5.69253E-01	1.60180E-04	5.69093E-01	1.02491E 01
3	7.00000E 00	8.00000E 00	4.78814E-01	1.97869E-04	4.78616E-01	8.39743E 00
4	6.00000E 00	7.00000E 00	4.18211E-01	2.34337E-04	4.17977E-01	7.27586E 00
5	5.00000E 00	6.00000E 00	3.57247E-01	2.85576E-04	3.56961E-01	6.22635E 00
6	4.00000E 00	5.00000E 00	2.84048E-01	3.67393E-04	2.83681E-01	5.19402E 00
7	3.00000E 00	4.00000E 00	1.94785E-01	5.11515E-04	1.94274E-01	4.17609E 00
8	2.50000E 00	3.00000E 00	1.20901E-01	7.05522E-04	1.20195E-01	3.43100E 00
9	2.00000E 00	2.50000E 00	7.29600E-02	9.46668E-04	7.20134E-02	2.93910E 00
10	1.50000E 00	2.00000E 00	3.08810E-02	1.43681E-03	2.94441E-02	2.43515E 00
11	1.00000E 00	1.50000E 00	4.18671E-03	2.65155E-03	1.53516E-03	1.88610E 00
12	7.00000E-01	1.00000E 00	6.01103E-03	6.01103E-03	0.0	1.37885E 00
13	4.50000E-01	7.00000E-01	1.72750E-02	1.72750E-02	0.0	9.69646E-01
14	3.00000E-01	4.50000E-01	5.62461E-02	5.62461E-02	0.0	6.41658E-01
15	1.50000E-01	3.00000E-01	2.95796E-01	2.95796E-01	0.0	4.04969E-01
16	9.99999E-02	1.50000E-01	1.52837E 00	1.52837E 00	0.0	3.43043E-01
17	6.99999E-02	9.99999E-02	5.00195E 00	5.00195E 00	0.0	5.01984E-01
18	4.50000E-02	6.99999E-02	1.77899E 01	1.77899E 01	0.0	1.02121E 00
19	3.00000E-02	4.50000E-02	6.71740E 01	6.71740E 01	0.0	2.43791E 00
20	2.00000E-02	3.00000E-02	2.37013E 02	2.37013E 02	0.0	5.69397E 00
21	9.99999E-03	2.00000E-02	1.29783E 03	1.29783E 03	0.0	1.73302E 01

REACTION CROSS SECTIONS FOR K ENDF 1150 (1/E WT.) IDENTIFICATION 1150

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,ALPHA)
1	1.93642E 00	9.41191E-01	6.79560E-01	3.00541E-02	2.85612E-01	2.74668E-05	2.29913E-01	5.56719E-02
2	1.96102E 00	9.16296E-01	6.28926E-01	1.49638E-02	4.00835E-01	3.15062E-05	3.16905E-01	8.38987E-02
3	2.01635E 00	9.44628E-01	6.09292E-01	5.75728E-03	4.56676E-01	3.43687E-05	3.53299E-01	1.03343E-01
4	2.04537E 00	9.63751E-01	6.03906E-01	2.70385E-03	4.75007E-01	3.56789E-05	3.63499E-01	1.11472E-01
5	2.08988E 00	9.95540E-01	5.99480E-01	3.18275E-04	4.94540E-01	3.75177E-05	3.73662E-01	1.20840E-01
6	2.14659E 00	1.03225E 00	6.02567E-01	0.0	5.11770E-01	3.99314E-05	3.80544E-01	1.31186E-01
7	2.22065E 00	1.09543E 00	6.00888E-01	0.0	5.24337E-01	4.30553E-05	3.83261E-01	1.41033E-01
8	2.32073E 00	1.17504E 00	6.14919E-01	0.0	5.30768E-01	4.75816E-05	3.80051E-01	1.50669E-01
9	2.42434E 00	1.25906E 00	6.35347E-01	0.0	5.29940E-01	5.25860E-05	3.73489E-01	1.56399E-01
10	2.54843E 00	1.35732E 00	6.67703E-01	0.0	5.23406E-01	5.81167E-05	3.64364E-01	1.59283E-01
11	2.67603E 00	1.45772E 00	7.06468E-01	0.0	5.11844E-01	6.42320E-05	3.51941E-01	1.59839E-01
12	2.82502E 00	1.59383E 00	7.36562E-01	0.0	4.94629E-01	7.28190E-05	3.36640E-01	1.57916E-01
13	3.04346E 00	1.89641E 00	6.86169E-01	0.0	4.60883E-01	8.90886E-05	3.12919E-01	1.47875E-01
14	3.23738E 00	2.21834E 00	5.90454E-01	0.0	4.28583E-01	1.03249E-04	2.93788E-01	1.34692E-01
15	3.35593E 00	2.44460E 00	5.12818E-01	0.0	3.98519E-01	1.14202E-04	2.80003E-01	1.18402E-01
16	3.48587E 00	2.95903E 00	2.58857E-01	0.0	2.67986E-01	1.43423E-04	2.11616E-01	5.62271E-02
17	3.26502E 00	3.07238E 00	6.39263E-02	0.0	1.28713E-01	1.86973E-04	1.16374E-01	1.21519E-02
18	2.99321E 00	2.82823E 00	3.70835E-02	0.0	1.27893E-01	2.13167E-04	1.22927E-01	4.75361E-03
19	3.04259E 00	2.93770E 00	3.38133E-02	0.0	7.10761E-02	2.44119E-04	6.81109E-02	2.72112E-03
20	2.69377E 00	2.66013E 00	1.40116E-02	0.0	1.96287E-02	3.55121E-04	1.90293E-02	2.44307E-04
21	2.22912E 00	2.22741E 00	1.75950E-04	0.0	1.53603E-03	6.53525E-04	8.81348E-04	1.15232E-06
22	1.95984E 00	1.95798E 00	0.0	0.0	1.86342E-03	1.81045E-03	5.13907E-05	1.57460E-06
23	2.18213E 00	2.17830E 00	0.0	0.0	3.83029E-03	3.79768E-03	3.05175E-05	2.09072E-06
24	3.04702E 00	3.04028E 00	0.0	0.0	6.73571E-03	6.70331E-03	2.97419E-05	2.66579E-06
25	2.70235E 00	2.68811E 00	0.0	0.0	1.42375E-02	1.41907E-02	4.29662E-05	3.87538E-06
26	1.63596E 00	1.61442E 00	0.0	0.0	2.15441E-02	2.14861E-02	5.31691E-05	4.79565E-06
27	1.75979E 00	1.74685E 00	0.0	0.0	1.29391E-02	1.28666E-02	6.65469E-05	6.00227E-06
28	5.61289E 00	5.40191E 00	0.0	0.0	2.10982E-01	2.10865E-01	1.07121E-04	9.66190E-06
29	1.19471E 00	1.17952E 00	0.0	0.0	1.51881E-02	1.49900E-02	1.81720E-04	1.63904E-05
30	1.29710E 00	1.28527E 00	0.0	0.0	1.18360E-02	1.15305E-02	2.80177E-04	2.52709E-05
31	1.50710E 00	1.48440E 00	0.0	0.0	2.27035E-02	2.21179E-02	5.37141E-04	4.84480E-05
32	1.79762E 00	1.75030E 00	0.0	0.0	4.73253E-02	4.61046E-02	1.11967E-03	1.00989E-04
33	1.98165E 00	1.69908E 00	0.0	0.0	8.25756E-02	8.04458E-02	1.95368E-03	1.76211E-04
34	2.15940E 00	2.01363E 00	0.0	0.0	1.45772E-01	1.42012E-01	3.44885E-03	3.11067E-04
35	2.29953E 00	2.04518E 00	0.0	0.0	2.54347E-01	2.47787E-01	6.01760E-03	5.42760E-04
36	2.44234E 00	2.02300E 00	0.0	0.0	4.19346E-01	4.08530E-01	9.92121E-03	8.94861E-04
37	3.88595E 00	2.15865E 00	0.0	0.0	1.72730E 00	1.68275E 00	4.08663E-02	3.68603E-03

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	8.73955E-01	2.05164E-04	8.73785E-01	1.67179E 01
2	7.07405E-01	2.80353E-04	7.07125E-01	1.20253E 01
3	5.95733E-01	3.46537E-04	5.95387E-01	9.77871E 00
4	5.20810E-01	4.10612E-04	5.20400E-01	8.42523E 00
5	4.45359E-01	5.00693E-04	4.44859E-01	7.16612E 00
6	3.47776E-01	6.44956E-04	3.47131E-01	5.91272E 00
7	2.37887E-01	8.59881E-04	2.36987E-01	4.71772E 00
8	1.51665E-01	1.24240E-03	1.50423E-01	3.86403E 00
9	9.19455E-02	1.66630E-03	9.02793E-02	3.29850E 00
10	3.95639E-02	2.53036E-03	3.70335E-02	2.72647E 00
11	6.57170E-03	4.67809E-03	1.89361E-03	2.11316E 00
12	1.04499E-02	1.04499E-02	0.0	1.54416E 00
13	2.91818E-02	2.91818E-02	0.0	1.08917E 00
14	9.29636E-02	9.29636E-02	0.0	7.28023E-01
15	4.78886E-01	4.78886E-01	0.0	4.82371E-01
16	2.44640E 00	2.44640E 00	0.0	4.71932E-01
17	7.96017E 00	7.96017E 00	0.0	7.56059E-01
18	2.81493E 01	2.81493E 01	0.0	1.59343E 00
19	1.05632E 02	1.05632E 02	0.0	3.82348E 00
20	3.69822E 02	3.69822E 02	0.0	8.88132E 00
21	1.98985E 03	1.98985E 03	0.0	2.66029E 01

REACTION CROSS SECTIONS FOR CALCIUM DNA 4152/3 (1/E WT.) IDENTIFICATION 4152

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,D)	(N,T)	(N,HE3)	(N,ALPHA)	(N,2ALPHA)
1	2.31206E 00	8.60203E-01	1.33277E 00	2.36006E-02	9.54900E-02	1.08046E-05	3.13537E-02	1.71842E-02	1.33810E-02	7.46872E-03	2.05659E-02	5.52571E-03
2	2.06526E 00	8.53184E-01	1.02268E 00	3.43405E-03	1.85957E-01	1.20979E-05	9.25251E-02	1.76996E-02	3.76101E-03	7.56270E-03	6.39480E-02	4.48792E-04
3	2.11178E 00	8.63757E-01	9.40714E-01	1.78671E-03	3.05521E-01	1.29973E-05	1.67288E-01	1.79166E-02	7.42439E-06	7.46522E-03	1.12807E-01	2.37114E-05
4	2.14498E 00	8.81599E-01	8.82876E-01	1.70293E-03	3.78804E-01	1.34043E-05	2.14840E-01	1.79769E-02	4.34982E-06	7.28283E-03	1.38679E-01	7.81620E-06
5	2.22158E 00	9.24824E-01	8.02744E-01	1.56383E-03	4.92452E-01	1.39704E-05	3.02203E-01	1.77326E-02	9.55318E-07	6.60713E-03	1.65888E-01	6.47349E-06
6	2.28224E 00	9.56373E-01	7.05654E-01	1.30902E-03	6.14909E-01	1.47070E-05	4.00324E-01	1.74078E-02	0.0	4.92784E-03	1.92229E-01	5.83043E-06
7	2.39119E 00	1.06408E 00	6.03342E-01	4.75039E-04	7.23294E-01	1.56475E-05	4.90914E-01	1.66526E-02	0.0	1.23326E-03	2.14374E-01	5.11406E-06
8	2.51982E 00	1.17650E 00	5.22456E-01	0.0	8.20866E-01	1.69911E-05	5.71933E-01	1.46590E-02	0.0	3.06033E-05	2.34222E-01	4.24045E-06
9	2.68234E 00	1.30877E 00	4.99428E-01	0.0	8.74142E-01	1.80768E-05	6.17110E-01	9.80240E-03	0.0	7.26529E-06	2.47209E-01	3.44753E-06
10	2.76666E 00	1.39688E 00	4.75926E-01	0.0	8.93863E-01	1.87581E-05	6.40246E-01	2.16529E-04	0.0	4.46502E-06	2.53372E-01	2.73317E-06
11	2.88573E 00	1.52589E 00	4.61474E-01	0.0	8.98372E-01	1.93572E-05	6.45731E-01	6.02316E-06	0.0	1.93285E-06	2.52612E-01	2.08110E-06
12	3.01998E 00	1.70019E 00	4.35223E-01	0.0	8.84574E-01	2.13392E-05	6.38621E-01	2.43151E-06	0.0	8.24514E-08	2.45928E-01	1.35909E-06
13	3.23360E 00	2.04145E 00	3.90961E-01	0.0	7.95194E-01	3.10172E-05	5.67610E-01	1.62393E-08	0.0	0.0	2.27552E-01	3.91339E-07
14	3.39804E 00	2.33515E 00	3.62925E-01	0.0	6.99964E-01	3.92434E-05	4.89130E-01	0.0	0.0	0.0	2.10795E-01	0.0
15	3.58083E 00	2.63458E 00	3.07347E-01	0.0	6.38901E-01	4.85396E-05	4.40331E-01	0.0	0.0	0.0	1.98521E-01	0.0
16	3.55911E 00	3.05793E 00	4.66578E-02	0.0	4.54525E-01	7.24203E-05	3.26382E-01	0.0	0.0	0.0	1.28071E-01	0.0
17	3.61854E 00	3.42479E 00	8.11820E-03	0.0	1.85626E-01	1.01680E-04	1.34586E-01	0.0	0.0	0.0	5.09380E-02	0.0
18	2.88896E 00	2.75057E 00	8.65398E-03	0.0	8.93364E-02	1.15561E-04	6.34810E-02	0.0	0.0	0.0	2.57398E-02	0.0
19	3.21581E 00	3.16177E 00	9.04308E-03	0.0	4.49984E-02	1.31791E-04	3.16222E-02	0.0	0.0	0.0	1.32444E-02	0.0
20	2.54234E 00	2.52825E 00	5.84313E-03	0.0	8.24881E-03	1.87282E-04	4.23117E-03	0.0	0.0	0.0	3.83035E-03	0.0
21	2.20640E 00	2.20280E 00	0.0	0.0	3.60385E-03	2.99190E-04	5.37928E-04	0.0	0.0	0.0	2.76673E-03	0.0
22	2.43291E 00	2.42935E 00	0.0	0.0	3.55529E-03	9.49445E-04	2.27672E-07	0.0	0.0	0.0	2.60562E-03	0.0
23	2.73314E 00	2.72520E 00	0.0	0.0	7.93399E-03	5.38918E-03	0.0	0.0	0.0	0.0	2.54481E-03	0.0
24	1.45753E 00	1.45284E 00	0.0	0.0	4.68644E-03	2.15918E-03	0.0	0.0	0.0	0.0	2.52726E-03	0.0
25	1.69854E 00	1.69426E 00	0.0	0.0	4.27870E-03	1.76583E-03	0.0	0.0	0.0	0.0	2.51287E-03	0.0
26	2.30455E 00	2.22588E 00	0.0	0.0	7.86790E-02	7.61712E-02	0.0	0.0	0.0	0.0	2.50777E-03	0.0
27	2.18181E 00	2.16501E 00	0.0	0.0	1.68071E-02	1.43018E-02	0.0	0.0	0.0	0.0	2.50537E-03	0.0
28	2.41445E 00	2.41019E 00	0.0	0.0	4.26567E-03	1.76340E-03	0.0	0.0	0.0	0.0	2.50228E-03	0.0
29	2.56134E 00	2.55636E 00	0.0	0.0	4.98502E-03	2.48426E-03	0.0	0.0	0.0	0.0	2.50077E-03	0.0
30	2.57260E 00	2.56750E 00	0.0	0.0	5.10294E-03	2.60264E-03	0.0	0.0	0.0	0.0	2.50030E-03	0.0
31	2.57459E 00	2.56750E 00	0.0	0.0	7.09257E-03	4.59246E-03	0.0	0.0	0.0	0.0	2.50011E-03	0.0
32	2.57950E 00	2.56750E 00	0.0	0.0	1.20023E-02	9.50228E-03	0.0	0.0	0.0	0.0	2.50002E-03	0.0
33	2.58675E 00	2.56750E 00	0.0	0.0	1.92469E-02	1.67469E-02	0.0	0.0	0.0	0.0	2.50000E-03	0.0
34	2.66693E 00	2.62460E 00	0.0	0.0	3.23297E-02	2.98297E-02	0.0	0.0	0.0	0.0	2.50000E-03	0.0
35	2.80656E 00	2.75215E 00	0.0	0.0	5.34110E-02	5.09110E-02	0.0	0.0	0.0	0.0	2.50000E-03	0.0
36	2.93989E 00	2.85335E 00	0.0	0.0	8.65424E-02	8.40424E-02	0.0	0.0	0.0	0.0	2.50000E-03	0.0
37	3.32709E 00	2.98002E 00	0.0	0.0	3.47071E-01	3.44738E-01	0.0	0.0	0.0	0.0	2.28330E-03	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	9.65670E-01	2.46735E-04	9.69423E-01	1.81024E 01
2	7.81957E-01	3.37255E-04	7.81620E-01	1.29573E 01
3	6.58889E-01	4.16999E-04	6.58472E-01	1.04998E 01
4	5.76264E-01	4.94231E-04	5.75770E-01	9.02272E 00
5	4.93317E-01	6.02829E-34	4.92414E-01	7.65218E 00
6	3.92608E-01	7.76997E-04	3.91831E-01	6.31572E 00
7	2.69967E-01	1.08524E-03	2.68882E-01	5.01627E 00
8	1.68334E-01	1.49901E-03	1.66835E-01	4.08277E 00
9	1.02223E-01	2.01001E-03	1.00213E-01	3.47917E 00
10	4.42273E-02	3.05308E-03	4.11742E-02	2.87236E 00
11	7.73632E-03	5.64931E-03	2.08701E-03	2.22215E 00
12	1.30734E-02	1.30734E-02	0.0	1.62713E 00
13	3.86740E-02	3.86740E-02	0.0	1.15084E 00
14	1.27400E-01	1.27400E-01	0.0	7.76968E-01
15	6.63127E-01	6.63127E-01	0.0	5.39604E-01
16	3.34141E 00	3.34141E 00	0.0	5.88855E-01
17	1.06533E 01	1.06533E 01	0.0	9.83466E-01
18	3.66199E 01	3.66199E 01	0.0	2.06162E 00
19	1.33233E 02	1.33233E 02	0.0	4.82165E 00
20	4.53823E 02	4.53823E 02	0.0	1.09055E 01
21	2.37497E 03	2.37497E 03	0.0	3.17900E 01

REACTION CROSS SECTIONS FOR V 1156 L/E 37A-21G 300K 10-3-74(3) IDENTIFICATION 1196

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)
1	2.13367E 00	8.75039E-01	2.20709E-01	9.17230E-01	1.20688E-01	1.20688E-01	1.31841E-04	2.87270E-02
2	2.19545E 00	9.13323E-01	3.29842E-01	8.35967E-01	1.16321E-01	1.16321E-01	1.51231E-04	3.51168E-02
3	2.27505E 00	9.71430E-01	4.86077E-01	7.15616E-01	1.04532E-01	1.04532E-01	1.64970E-04	3.60589E-02
4	2.31866E 00	1.00417E 00	5.80551E-01	6.35645E-01	9.83028E-02	9.83028E-02	1.71261E-04	3.60848E-02
5	2.37550E 00	1.05134E 00	7.49699E-01	4.91806E-01	8.70547E-02	8.70547E-02	1.80087E-04	3.59132E-02
6	2.46335E 00	1.11820E 00	1.00405E 00	2.67689E-01	7.34089E-02	7.34089E-02	1.91671E-04	3.54880E-02
7	2.56957E 00	1.19766E 00	1.27405E 00	3.44584E-02	6.38089E-02	6.38089E-02	2.06666E-04	3.47473E-02
8	2.72628E 00	1.33295E 00	1.34095E 00	0.0	5.23835E-02	5.23835E-02	2.28392E-04	3.30542E-02
9	2.87739E 00	1.47076E 00	1.36518E 00	0.0	4.14455E-02	4.14455E-02	2.52415E-04	3.03605E-02
10	3.03811E 00	1.62048E 00	1.38795E 00	0.0	2.96789E-02	2.96789E-02	2.78964E-04	2.67404E-02
11	3.19637E 00	1.77156E 00	1.40124E 00	0.0	2.35666E-02	2.35666E-02	3.08316E-04	2.25661E-02
12	3.37321E 00	1.93824E 00	1.41739E 00	0.0	1.75783E-02	1.75783E-02	3.49532E-04	1.72099E-02
13	3.60659E 00	2.14171E 00	1.45392E 00	0.0	1.09591E-02	1.[illegible]591E-02	4.27629E-04	1.05315E-02
14	3.73367E 00	2.22801E 00	1.49947E 00	0.0	6.18909E-03	6.18909E-03	4.95597E-04	5.69350E-03
15	3.76966E 00	2.22314E 00	1.54435E 00	0.0	2.16186E-03	2.16186E-03	5.48177E-04	1.61368E-03
16	3.85735E 00	2.28637E 00	1.57018E 00	0.0	7.93391E-04	7.93391E-04	6.88430E-04	1.04961E-04
17	3.85315E 00	2.60139E 00	1.25087E 00	0.0	8.97477E-04	8.97477E-04	8.97471E-04	6.09263E-09
18	3.47659E 00	2.56164E 00	9.14325E-01	0.0	1.02321E-03	1.02321E-03	1.02321E-03	0.0
19	3.28760E 00	2.45129E 00	8.35197E-01	0.0	1.16043E-03	1.16043E-03	1.16043E-03	0.0
20	3.33969E 00	2.81224E 00	5.28053E-01	0.0	1.40278E-03	1.40278E-03	1.40278E-03	0.0
21	3.09856E 00	2.75991E 00	3.37017E-01	0.0	1.63122E-03	1.63122E-03	1.63122E-03	0.0
22	4.56231E 00	4.47234E 00	8.60583E-02	0.0	3.90806E-03	3.90806E-03	3.90806E-03	0.0
23	6.70702E 00	6.70107E 00	0.0	0.0	5.94873E-03	5.94873E-03	5.94873E-03	0.0
24	7.01365E 00	7.00697E 00	0.0	0.0	6.68443E-03	6.68443E-03	6.68443E-03	0.0
25	6.95882E 00	6.94751E 00	0.0	0.0	1.13133E-02	1.13133E-02	1.13133E-02	0.0
26	2.70303E 01	2.70064E 01	0.0	0.0	2.39181E-02	2.39181E-02	2.39181E-02	0.0
27	5.86105E 01	5.85813E 01	0.0	0.0	2.92490E-02	2.92490E-02	2.92490E-02	0.0
28	1.01594E 02	1.01482E 02	0.0	0.0	1.11788E-01	1.11788E-01	1.11788E-01	0.0
29	1.08370E 01	1.08028E 01	0.0	0.0	3.41855E-02	3.41855E-02	3.41855E-02	0.0
30	6.58669E 00	6.55527E 00	0.0	0.0	3.17270E-02	3.17270E-02	3.17270E-02	0.0
31	6.27131E 00	6.16443E 00	0.0	0.0	1.04876E-01	1.04876E-01	1.04876E-01	0.0
32	5.30446E 00	5.19151E 00	0.0	0.0	1.12953E-01	1.12953E-01	1.12953E-01	0.0
33	5.19443E 00	5.00000E 00	0.0	0.0	1.94431E-01	1.94431E-01	1.94431E-01	0.0
34	5.34224E 00	5.00001E 00	0.0	0.0	3.42233E-01	3.42233E-01	3.42233E-01	0.0
35	5.59703E 00	4.99999E 00	0.0	0.0	5.97040E-01	5.97040E-01	5.97040E-01	0.0
36	5.98434E 00	4.99999E 00	0.0	0.0	9.84346E-01	9.84346E-01	9.84346E-01	0.0
37	9.05435E 00	4.99976E 00	0.0	0.0	4.05460E 00	4.05460E 00	4.05460E 00	0.0

GROUP	(N,D)	(N,T)	(N,ALPHA)	GROUP FLUX
1	3.42525E-02	3.07429E-02	2.68339E-02	1.49959E-01
2	3.30947E-02	2.24813E-02	2.54766E-02	1.25040E-01
3	3.13666E-02	1.52983E-02	2.16437E-02	4.99605E-02
4	3.02036E-02	1.23961E-02	1.94471E-02	2.50450E-02
5	2.80945E-02	6.57920E-03	1.62838E-02	7.49975E-02
6	2.48795E-02	4.21655E-04	1.24281E-02	4.99824E-02
7	2.03319E-02	8.40907E-06	8.51460E-03	9.99714E-02
8	1.42371E-02	0.0	4.86387E-03	1.00026E-01
9	8.08728E-03	0.0	2.74557E-03	9.99970E-02
10	1.07915E-03	0.0	1.58042E-03	1.00004E-01
11	3.75525E-05	0.0	6.54642E-04	9.99966E-02
12	0.0	0.0	1.89392E-05	1.49999E-01
13	0.0	0.0	0.0	2.49993E-01
14	0.0	0.0	0.0	5.00021E-02
15	0.0	0.0	0.0	1.50006E-01
16	0.0	0.0	0.0	3.00015E-01
17	0.0	0.0	0.0	2.33288E-01
18	0.0	0.0	0.0	3.33783E-02
19	0.0	0.0	0.0	2.33339E-01
20	0.0	0.0	0.0	5.00009E-01
21	0.0	0.0	0.0	6.99975E-01
22	0.0	0.0	0.0	1.25002E 00
23	0.0	0.0	0.0	3.49973E-01
24	0.0	0.0	0.0	7.50003E-01
25	0.0	0.0	0.0	7.49977E-01
26	0.0	0.0	0.0	1.25015E-01
27	0.0	0.0	0.0	7.50001E-01
28	0.0	0.0	0.0	1.12501E 00
29	0.0	0.0	0.0	9.99990E-01
30	0.0	0.0	0.0	7.49995E-01
31	0.0	0.0	0.0	1.75001E 00
32	0.0	0.0	0.0	1.25000E 00
33	0.0	0.0	0.0	9.99996E-01
34	0.0	0.0	0.0	1.25000E 00
35	0.0	0.0	0.0	9.99949E-01
36	0.0	0.0	0.0	1.00003E 00
37	0.0	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR V

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.26874E 00	4.69913E-04	1.26828E 00	2.25655E 01
2	8.00000E 00	1.00000E 01	1.02830E 00	6.43116E-04	1.02765E 00	1.59354E 01
3	7.00000E 00	8.00000E 00	8.66452E-01	7.96626E-04	8.65656E-01	1.27808E 01
4	6.00000E 00	7.00000E 00	7.57788E-01	9.45541E-04	7.56842E-01	1.08987E 01
5	5.00000E 00	6.00000E 00	6.48313E-01	1.15530E-03	6.47158E-01	9.16605E 00
6	4.00000E 00	5.00000E 00	5.17788E-01	1.49202E-03	5.16296E-01	7.49572E 00
7	3.00000E 00	4.00000E 00	3.57955E-01	2.08887E-03	3.55866E-01	5.88908E 00
8	2.50000E 00	3.00000E 00	2.24429E-01	2.89204E-03	2.21537E-01	4.75026E 00
9	2.00000E 00	2.50000E 00	1.37511E-01	3.88649E-03	1.33625E-01	4.02758E 00
10	1.50000E 00	2.00000E 00	6.11563E-02	5.91844E-03	5.52378E-02	3.31355E 00
11	1.00000E 00	1.50000E 00	1.37237E-02	1.09870E-02	2.73668E-03	2.56109E 00
12	7.00000E-01	1.00000E 00	2.54038E-02	2.54038E-02	0.0	1.87977E 00
13	4.50000E-01	7.00000E-01	7.45823E-02	7.45823E-02	0.0	1.34004E 00
14	3.00000E-01	4.50000E-01	2.43162E-01	2.43162E-01	0.0	9.28400E-01
15	1.50000E-01	3.00000E-01	1.24223E 00	1.24223E 00	0.0	7.16872E-01
16	9.99999E-02	1.50000E-01	6.14453E 00	6.14453E 00	0.0	9.53636E-01
17	6.99999E-02	9.99999E-02	1.93015E 01	1.93015E 01	0.0	1.71179E 00
18	4.50000E-02	6.99999E-02	6.52349E 01	6.52349E 01	0.0	3.63852E 00
19	3.00000E-02	4.50000E-02	2.33246E 02	2.33246E 02	0.0	8.42871E 00
20	2.00000E-02	3.00000E-02	7.81460E 02	7.81460E 02	0.0	1.87805E 01
21	9.99999E-03	2.00000E-02	3.99421E 03	3.99421E 03	0.0	5.35380E 01

REACTION CROSS SECTIONS FOR CR 1191 1/E 37N-21G INF CIL 300K 10-3-74(3) IDENTIFICATION 1191

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)
1	2.09851E 00	8.28832E-01	4.69175E-01	6.52431E-01	1.48075E-01	1.48075E-01	9.85479E-04	7.58068E-02
2	2.25877E 00	9.67393E-01	5.89030E-01	5.51692E-01	1.50656E-01	1.50656E-01	1.23057E-03	8.20399E-02
3	2.37185E 00	1.06643E 00	7.41244E-01	4.19477E-01	1.44658E-01	1.44658E-01	9.81738E-04	8.25904E-02
4	2.42262E 00	1.11187E 00	8.30309E-01	3.41132E-01	1.39314E-01	1.39314E-01	8.80330E-04	8.22428E-02
5	2.49226E 00	1.17481E 00	9.74289E-01	2.13004E-01	1.30151E-01	1.30151E-01	7.47585E-04	8.13236E-02
6	2.57774E 00	1.25854E 00	1.09439E 00	1.06358E-01	1.18453E-01	1.18453E-01	6.05017E-04	7.94939E-02
7	2.67879E 00	1.34508E 00	1.14785E 00	8.35050E-02	1.02348E-01	1.02348E-01	4.80363E-04	7.59395E-02
8	2.80863E 00	1.46354E 00	1.19879E 00	6.21450E-02	8.41516E-02	8.41516E-02	3.83704E-04	6.87571E-02
9	2.96036E 00	1.60807E 00	1.24563E 00	3.78121E-02	6.88514E-02	6.88514E-02	3.34519E-04	5.91468E-02
10	3.15048E 00	1.78078E 00	1.30181E 00	1.33416E-02	5.45500E-02	5.45500E-02	3.26524E-04	4.83662E-02
11	3.33143E 00	1.92556E 00	1.36408E 00	1.46741E-04	4.21573E-02	4.21573E-02	3.33679E-04	3.81463E-02
12	3.48242E 00	2.04439E 00	1.40804E 00	0.0	2.93911E-02	2.93911E-02	4.32595E-04	2.75295E-02
13	3.64152E 00	2.17017E 00	1.45999E 00	0.0	1.13545E-02	1.13545E-02	7.24885E-04	1.01640E-02
14	3.81660E 00	2.36762E 00	1.44259E 00	0.0	6.38773E-03	6.38773E-03	1.05717E-03	5.11923E-03
15	3.77604E 00	2.46508E 00	1.30534E 00	0.0	5.61585E-03	5.61585E-03	1.38759E-03	4.10013E-03
16	3.75451E 00	2.62971E 00	1.12083E 00	0.0	4.36510E-03	4.36510E-03	1.46566E-03	2.37188E-03
17	3.71124E 00	2.76004E 00	9.47864E-01	0.0	3.33671E-03	3.33671E-03	2.91187E-03	4.24603E-04
18	3.25314E 00	2.39929E 00	8.50266E-01	0.0	3.57749E-03	3.57749E-03	3.41822E-03	1.59222E-04
19	3.34845E 00	2.58527E 00	7.59609E-01	0.0	3.57149E-03	3.57149E-03	3.50701E-03	6.44681E-05
20	3.25967E 00	2.95527E 00	2.97859E-01	0.0	6.54501E-03	6.54501E-03	6.53986E-03	5.15686E-06
21	3.17423E 00	3.14103E 00	2.70675E-02	0.0	6.12872E-03	6.12872E-03	6.12869E-03	2.83096E-08
22	3.83254E 00	3.82845E 00	0.0	0.0	4.04309E-03	4.04309E-03	4.04309E-03	4.56029E-10
23	6.49518E 00	6.48756E 00	0.0	0.0	7.62015E-03	7.62015E-03	7.62015E-03	0.0
24	5.39873E 00	5.38807E 00	0.0	0.0	1.06620E-02	1.06620E-02	1.06620E-02	0.0
25	5.19252E 00	5.16571E 00	0.0	0.0	2.72045E-02	2.72045E-02	2.72045E-02	0.0
26	3.04068E 00	2.98412E 00	0.0	0.0	5.65640E-02	5.65640E-02	5.65640E-02	0.0
27	4.11525E 00	4.08714E 00	0.0	0.0	2.81120E-02	2.81120E-02	2.81120E-02	0.0
28	2.35317E 01	2.34614E 01	0.0	0.0	7.03645E-02	7.03645E-02	7.03645E-02	0.0
29	7.53467E 00	7.50885E 00	0.0	0.0	1.26019E-01	1.26019E-01	1.26019E-01	0.0
30	4.86325E 00	4.84268E 00	0.0	0.0	2.05750E-02	2.05750E-02	2.05750E-02	0.0
31	4.49560E 00	4.46133E 00	0.0	0.0	3.42693E-02	3.42693E-02	3.42693E-02	0.0
32	4.43688E 00	4.36804E 00	0.0	0.0	6.88442E-02	6.88442E-02	6.88442E-02	0.0
33	4.47132E 00	4.35208E 00	0.0	0.0	1.19242E-01	1.19242E-01	1.19242E-01	0.0
34	4.56206E 00	4.35182E 00	0.0	0.0	2.10247E-01	2.10247E-01	2.10247E-01	0.0
35	4.71820E 00	4.35155E 00	0.0	0.0	3.66759E-01	3.66759E-01	3.66759E-01	0.0
36	4.95586E 00	4.35130E 00	0.0	0.0	6.04554E-01	6.04554E-01	6.04554E-01	0.0
37	6.87218E 00	4.38411E 00	0.0	0.0	2.48867E 00	2.48867E 00	2.48867E 00	0.0

GROUP	(N,D)	(N,T)	(N,HE3)	(N,ALFA)	GROUP FLUX
1	2.51956E-02	1.31989E-02	8.96461E-04	3.19917E-02	1.49959E-01
2	2.11087E-02	2.56945E-03	3.62719E-05	4.36707E-02	1.25040E-01
3	1.65855E-02	1.10456E-03	3.86332E-06	4.33926E-02	4.99605E-02
4	1.43446E-02	8.32806E-04	4.94092E-07	4.10127E-02	2.50450E-02
5	1.13921E-02	1.92146E-04	8.25928E-08	3.64952E-02	7.49975E-02
6	8.11571E-03	9.56952E-06	1.20471E-08	3.02251E-02	4.99824E-02
7	3.06124E-03	2.59509E-07	9.13797E-09	2.28666E-02	9.99714E-02
8	1.50830E-04	6.40274E-10	5.56322E-09	1.48601E-02	1.00026E-01
9	2.30302E-06	0.0	2.33030E-09	9.36748E-03	9.99970E-02
10	2.10223E-06	0.0	1.15718E-10	5.85679E-03	1.00004E-01
11	5.07860E-09	0.0	0.0	3.67733E-03	9.99966E-02
12	0.0	0.0	0.0	1.42865E-03	1.49999E-01
13	0.0	0.0	0.0	4.65770E-04	2.49993E-01
14	0.0	0.0	0.0	2.11335E-04	5.00021E-02
15	0.0	0.0	0.0	1.28135E-04	1.50006E-01
16	0.0	0.0	0.0	7.56487E-06	3.00015E-01
17	0.0	0.0	0.0	2.45331E-07	2.33288E-01
18	0.0	0.0	0.0	5.03420E-08	3.33783E-02
19	0.0	0.0	0.0	1.33425E-08	2.33339E-01
20	0.0	0.0	0.0	0.0	5.00009E-01
21	0.0	0.0	0.0	0.0	6.99975E-01
22	0.0	0.0	0.0	0.0	1.25002E 00
23	0.0	0.0	0.0	0.0	3.49573E-01
24	0.0	0.0	0.0	0.0	7.50003E-01
25	0.0	0.0	0.0	0.0	7.49977E-01
26	0.0	0.0	0.0	0.0	1.25015E-01
27	0.0	0.0	0.0	0.0	7.50001E-01
28	0.0	0.0	0.0	0.0	1.12501E 00
29	0.0	0.0	0.0	0.0	9.99990E-01
30	0.0	0.0	0.0	0.0	7.49995E-01
31	0.0	0.0	0.0	0.0	1.75001E 00
32	0.0	0.0	0.0	0.0	1.25000E 00
33	0.0	0.0	0.0	0.0	9.99996E-01
34	0.0	0.0	0.0	0.0	1.25000E 00
35	0.0	0.0	0.0	0.0	9.99949E-01
36	0.0	0.0	0.0	0.0	1.00003E 00
37	0.0	0.0	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Cr

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.37871E 00	5.64574E-04	1.37815E 00	2.41520E 01
2	8.00000E 00	1.00000E 01	1.11775E 00	7.72981E-04	1.11698E 00	1.69870E 01
3	7.00000E 00	8.00000E 00	9.41796E-01	9.58061E-04	9.40838E-01	1.35811E 01
4	6.00000E 00	7.00000E 00	8.23659E-01	1.13770E-03	8.22521E-01	1.15535E 01
5	5.00000E 00	6.00000E 00	7.04656E-01	1.39089E-03	7.03265E-01	9.69130E 00
6	4.00000E 00	5.00000E 00	5.63298E-01	1.79748E-03	5.61501E-01	7.90236E 00
7	3.00000E 00	4.00000E 00	3.90097E-01	2.51844E-03	3.87578E-01	6.18719E 00
8	2.50000E 00	3.00000E 00	2.45039E-01	3.48931E-03	2.41549E-01	4.97623E 00
9	2.00000E 00	2.50000E 00	1.50582E-01	4.69248E-03	1.45889E-01	4.21220E 00
10	1.50000E 00	2.00000E 00	6.75825E-02	7.15180E-03	6.04307E-02	3.46149E 00
11	1.00000E 00	1.50000E 00	1.62646E-02	1.32906E-02	2.97401E-03	2.67473E 00
12	7.00000E-01	1.00000E 00	3.08250E-02	3.08250E-02	0.0	1.96507E 00
13	4.50000E-01	7.00000E-01	9.08945E-02	9.08945E-02	0.0	1.40549E 00
14	3.00000E-01	4.50000E-01	2.97210E-01	2.97210E-01	0.0	9.84443E-01
15	1.50000E-01	3.00000E-01	1.51956E 00	1.51956E 00	0.0	7.92796E-01
16	9.99999E-02	1.50000E-01	7.50982E 00	7.50982E 00	0.0	1.12691E 00
17	6.99999E-02	9.99999E-02	2.35237E 01	2.35237E 01	0.0	2.06497E 00
18	4.50000E-02	6.99999E-02	7.91231E 01	7.91231E 01	0.0	4.40282E 00
19	3.00000E-02	4.50000E-02	2.80977E 02	2.80977E 02	0.0	1.01508E 01
20	2.00000E-02	3.00000E-02	9.33354E 02	9.33354E 02	0.0	2.24352E 01
21	9.99999E-03	2.00000E-02	4.69657E 03	4.69657E 03	0.0	6.30211E 01

REACTION CROSS SECTIONS FOR MN 1157 1/E 37N-21G INF DIL 300K 10-3-74(3) IDENTIFICATION 1197

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	CAPTURE	(N,GAMMA)
1	2.32927E 00	1.20060E 00	1.76136E-01	8.93163E-01	3.26707E-06	5.93719E-02	5.93719E-02	5.68889E-04
2	2.40828E 00	1.22217E 00	2.29256E-01	8.73231E-01	0.0	8.36195E-02	8.36195E-02	8.42596E-04
3	2.53102E 00	1.24074E 00	3.89918E-01	8.13624E-01	0.0	8.67363E-02	8.67363E-02	9.18017E-04
4	2.59019E 00	1.26454E 00	4.70861E-01	7.69525E-01	0.0	8.52709E-02	8.52709E-02	7.81326E-04
5	2.73115E 00	1.29632E 00	6.67686E-01	6.84362E-01	0.0	8.27844E-02	8.27844E-02	6.95528E-04
6	2.91465E 00	1.33492E 00	9.65914E-01	5.40501E-01	0.0	7.33176E-02	7.33176E-02	6.80889E-04
7	3.06314E 00	1.37716E 00	1.34600E 00	2.79312E-01	0.0	6.06782E-02	6.06782E-02	6.70118E-04
8	3.03358E 00	1.43811E 00	1.52640E 00	2.19420E-02	0.0	4.75300E-02	4.75300E-02	5.87877E-04
9	3.17578E 00	1.53975E 00	1.59486E 00	0.0	0.0	4.11709E-02	4.11709E-02	5.98814E-04
10	3.30204E 00	1.63942E 00	1.62630E 00	0.0	0.0	3.63215E-02	3.63215E-02	6.44623E-04
11	3.41232E 00	1.72743E 00	1.65298E 00	0.0	0.0	3.19133E-02	3.19133E-02	7.04596E-04
12	3.53515E 00	1.82812E 00	1.68062E 00	0.0	0.0	2.64182E-02	2.64182E-02	7.83081E-04
13	3.66305E 00	1.97078E 00	1.67728E 00	0.0	0.0	1.49871E-02	1.49871E-02	9.32385E-04
14	3.73242E 00	2.06670E 00	1.65904E 00	0.0	0.0	6.69043E-03	6.69043E-03	1.05480E-03
15	3.71708E 00	2.07922E 00	1.63426E 00	0.0	0.0	3.60037E-03	3.60037E-03	1.14927E-03
16	3.72349E 00	2.19546E 00	1.52643E 00	0.0	0.0	1.59763E-03	1.59763E-03	1.38978E-03
17	3.65523E 00	2.36888E 00	1.28865E 00	0.0	0.0	1.69642E-03	1.69642E-03	1.69140E-03
18	3.64930E 00	2.48168E 00	1.16584E 00	0.0	0.0	1.77250E-03	1.77250E-03	1.76929E-03
19	3.56772E 00	2.51276E 00	1.05309E 00	0.0	0.0	1.87951E-03	1.87951E-03	1.87823E-03
20	3.43660E 00	2.57828E 00	8.55974E-01	0.0	0.0	2.34576E-03	2.34576E-03	2.34540E-03
21	3.22418E 00	2.57709E 00	6.43841E-01	0.0	0.0	3.24444E-03	3.24444E-03	3.24436E-03
22	4.27159E 00	3.79742E 00	4.66741E-01	0.0	0.0	7.43333E-03	7.43333E-03	7.43333E-03
23	7.23102E 00	7.06947E 00	1.46333E-01	0.0	0.0	1.52182E-02	1.52182E-02	1.52182E-02
24	7.98001E 00	7.95918E 00	0.0	0.0	0.0	2.08248E-02	2.08248E-02	2.08248E-02
25	1.19370E 01	1.19028E 01	0.0	0.0	0.0	3.41742E-02	3.41742E-02	3.41742E-02
26	1.56535E 01	1.56063E 01	0.0	0.0	0.0	4.71312E-02	4.71312E-02	4.71312E-02
27	8.61982E 00	8.55223E 00	0.0	0.0	0.0	6.75878E-02	6.75878E-02	6.75878E-02
28	2.95253E 01	2.95186E 01	0.0	0.0	0.0	1.06924E-02	1.06924E-02	1.06924E-02
29	1.56325E 02	1.56319E 02	0.0	0.0	0.0	6.35136E-03	6.35136E-03	6.35136E-03
30	5.25472E 01	5.25335E 01	0.0	0.0	0.0	1.36993E-02	1.36993E-02	1.36993E-02
31	1.93042E 02	1.92928E 02	0.0	0.0	0.0	1.14711E-01	1.14711E-01	1.14711E-01
32	3.25431E 00	2.86272E 00	0.0	0.0	0.0	3.91591E-01	3.91591E-01	3.91591E-01
33	2.58625E 00	2.03184E 00	0.0	0.0	0.0	5.54405E-01	5.54405E-01	5.54405E-01
34	2.75873E 00	1.83510E 00	0.0	0.0	0.0	9.23622E-01	9.23622E-01	9.23622E-01
35	3.36341E 00	1.78079E 00	0.0	0.0	0.0	1.58262E 00	1.58262E 00	1.58262E 00
36	4.35832E 00	1.76316E 00	0.0	0.0	0.0	2.59516E 00	2.59516E 00	2.59516E 00
37	1.23732E 01	1.71340E 00	0.0	0.0	0.0	1.06598E 01	1.06598E 01	1.06598E 01

GROUP	(N,P)	(N,D)	(N,HE3)	(N,ALPHA)	ID CAPTURE	GROUP FLUX
1	2.70128E-02	5.18784E-03	4.20009E-04	2.61823E-02	0.0	1.49959E-01
2	4.30427E-02	4.95407E-03	4.20008E-04	3.43602E-02	0.0	1.25040E-01
3	4.66364E-02	4.62116E-03	4.20008E-04	3.41406E-02	0.0	4.99605E-02
4	4.69211E-02	4.39988E-03	3.89053E-04	3.27796E-02	0.0	2.50450E-02
5	4.53051E-02	4.01557E-03	4.71458E-05	3.27171E-02	0.0	7.49975E-02
6	4.05028E-02	3.45587E-03	0.0	2.86781E-02	0.0	4.99824E-02
7	3.48164E-02	2.71483E-03	0.0	2.24769E-02	0.0	9.99714E-02
8	2.98400E-02	1.79903E-03	0.0	1.53031E-02	0.0	1.00026E-01
9	2.79850E-02	9.17911E-04	0.0	1.18651E-02	0.0	9.99970E-02
10	2.68453E-02	7.51219E-05	0.0	8.75245E-03	0.0	1.00004E-01
11	2.60731E-02	2.35743E-06	0.0	5.13320E-03	0.0	9.99966E-02
12	2.36330E-02	4.82351E-09	0.0	2.00208E-03	0.0	1.49999E-01
13	1.37735E-02	3.05558E-16	0.0	2.81152E-04	0.0	2.49993E-01
14	5.61455E-03	0.0	0.0	2.10845E-05	0.0	5.00021E-02
15	2.44488E-03	0.0	0.0	6.22169E-06	0.0	1.50006E-01
16	2.06597E-04	0.0	0.0	1.29140E-06	0.0	3.00015E-01
17	4.10309E-06	0.0	0.0	9.14470E-07	0.0	2.33288E-01
18	2.44541E-06	0.0	0.0	7.63056E-07	0.0	3.33783E-02
19	1.04527E-06	0.0	0.0	6.34316E-07	0.0	2.33339E-01
20	0.0	0.0	0.0	3.58310E-07	0.0	5.00009E-01
21	0.0	0.0	0.0	7.67363E-08	0.0	6.99975E-01
22	0.0	0.0	0.0	0.0	0.0	1.25002E 00
23	0.0	0.0	0.0	0.0	0.0	3.49973E-01
24	0.0	0.0	0.0	0.0	3.05459E-03	7.50003E-01
25	0.0	0.0	0.0	0.0	9.22429E-03	7.49977E-01
26	0.0	0.0	0.0	0.0	1.39665E-02	1.25015E-01
27	0.0	0.0	0.0	0.0	1.22899E-02	7.50001E-01
28	0.0	0.0	0.0	0.0	3.30040E-02	1.12501E 00
29	0.0	0.0	0.0	0.0	2.23315E-01	9.99990E-01
30	0.0	0.0	0.0	0.0	1.39187E 00	7.49995E-01
31	0.0	0.0	0.0	0.0	4.47013E 00	1.75001E 00
32	0.0	0.0	0.0	0.0	0.0	1.25000E 00
33	0.0	0.0	0.0	0.0	0.0	9.99996E-01
34	0.0	0.0	0.0	0.0	0.0	1.25000E 00
35	0.0	0.0	0.0	0.0	0.0	9.99949E-01
36	0.0	0.0	0.0	0.0	0.0	1.00003E 00
37	0.0	0.0	0.0	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Mn

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.49317E 00	6.92375E-04	1.49248E 00	2.57881E 01
2	8.00000E 00	1.00000E 01	1.21086E 00	9.48371E-04	1.20991E 00	1.80679E 01
3	7.00000E 00	8.00000E 00	1.02022E 00	1.17616E-03	1.01905E 00	1.44015E 01
4	6.00000E 00	7.00000E 00	8.92240E-01	1.39736E-03	8.90843E-01	1.22233E 01
5	5.00000E 00	6.00000E 00	7.63324E-01	1.70926E-03	7.61615E-01	1.02271E 01
6	4.00000E 00	5.00000E 00	6.10731E-01	2.21028E-03	6.08521E-01	8.31583E 00
7	3.00000E 00	4.00000E 00	4.23732E-01	3.09919E-03	4.20633E-01	6.48918E 00
8	2.50000E 00	3.00000E 00	2.66764E-01	4.29719E-03	2.62467E-01	5.20435E 00
9	2.00000E 00	2.50000E 00	1.64520E-01	5.78306E-03	1.58737E-01	4.39818E 00
10	1.50000E 00	2.00000E 00	7.47007E-02	8.82135E-03	6.58794E-02	3.61038E 00
11	1.00000E 00	1.50000E 00	1.96319E-02	1.64101E-02	3.22182E-03	2.78936E 00
12	7.00000E-01	1.00000E 00	3.78653E-02	3.78653E-02	0.0	2.05171E 00
13	4.50000E-01	7.00000E-01	1.10425E-01	1.10425E-01	0.0	1.47273E 00
14	3.00000E-01	4.50000E-01	3.57497E-01	3.57497E-01	0.0	1.04278E 00
15	1.50000E-01	3.00000E-01	1.80716E 00	1.80716E 00	0.0	8.71027E-01
16	9.99999E-02	1.50000E-01	8.85626E 00	8.85626E 00	0.0	1.29812E 00
17	6.99999E-02	9.99999E-02	2.75978E 01	2.75978E 01	0.0	2.40606E 00
18	4.50000E-02	6.99999E-02	9.23297E 01	9.23297E 01	0.0	5.13010E 00
19	3.00000E-02	4.50000E-02	3.26320E 02	3.26320E 02	0.0	1.17865E 01
20	2.00000E-02	3.00000E-02	1.07917E 03	1.07917E 03	0.0	2.59420E 01
21	9.99999E-03	2.00000E-02	5.39370E 03	5.39370E 03	0.0	7.24045E 01

REACTION CROSS SECTIONS FOR FE 1192 I/E 37N-21G INF CIL 300K 10-3-74(3) IDENTIFICATION 1192

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)
1	2.27626E 00	9.40473E-01	5.70221E-01	6.29979E-01	1.35593E-01	1.35593E-01	1.73270E-04	6.32785E-02
2	2.39588E 00	1.02686E 00	5.89979E-01	6.18931E-01	1.60118E-01	1.60118E-01	1.51809E-04	9.41105E-02
3	2.52021E 00	1.12603E 00	7.02991E-01	5.13231E-01	1.77963E-01	1.77963E-01	2.04515E-04	1.15981E-01
4	2.57010E 00	1.17150E 00	7.81873E-01	4.33110E-01	1.83621E-01	1.83621E-01	2.10324E-04	1.24416E-01
5	2.63419E 00	1.22645E 00	9.29764E-01	2.95806E-01	1.82171E-01	1.82171E-01	2.18285E-04	1.28938E-01
6	2.72715E 00	1.30315E 00	1.14068E 00	1.08359E-01	1.74961E-01	1.74961E-01	2.28600E-04	1.28650E-01
7	2.85234E 00	1.38101E 00	1.29944E 00	1.18641E-02	1.60025E-01	1.60025E-01	2.41689E-04	1.20786E-01
8	3.02228E 00	1.53385E 00	1.34973E 00	0.0	1.38693E-01	1.38693E-01	2.80257E-04	1.08099E-01
9	3.192EOE 00	1.69368E 00	1.38103E 00	0.0	1.18087E-01	1.18087E-01	2.78EOOE-04	9.50699E-02
10	3.330C9E 00	1.81270E 00	1.41779E 00	0.0	9.96040E-02	9.96040E-02	3.05038E-04	8.23279E-02
11	3.472E7E 00	1.54253E 00	1.44717E 00	0.0	8.27796E-02	8.27796E-02	3.41543E-04	7.03495E-02
12	3.60E72E 00	2.06609E 00	1.47986E 00	0.0	6.27725E-02	6.27725E-02	3.86156E-04	5.56779E-02
13	3.66508E 00	2.09422E 00	1.53748E 00	0.0	3.79822E-02	3.79822E-02	4.85178E-04	3.58283E-02
14	3.71007E 00	2.12825E 00	1.55653E 00	0.0	2.52869E-02	2.52869E-02	5.48513E-04	2.43925E-02
15	3.69248E 00	2.21333E 00	1.45858E 00	0.0	2.05675E-02	2.05675E-02	5.56627E-04	1.98144E-02
16	3.48524E 00	2.15434E 00	1.27819E 00	0.0	1.27147E-02	1.27147E-02	7.53658E-04	1.19251E-02
17	3.43468E 00	2.47237E 00	9.56525E-01	0.0	5.99040E-03	5.99040E-03	9.75060E-04	5.01134E-03
18	3.06551E 00	2.20431E 00	8.61437E-01	0.0	3.76733E-03	3.76733E-03	1.10002E-03	2.66730E-03
19	3.10737E 00	2.22526E 00	8.79436E-01	0.0	2.67437E-03	2.67437E-03	1.26629E-03	1.38609E-03
20	2.85912E 00	2.26534E 00	5.91668E-01	0.0	2.10767E-03	2.10767E-03	1.55542E-03	1.52245E-04
21	2.78957E 00	2.67510E 00	1.10467E-01	0.0	4.39631E-03	4.39631E-03	4.35003E-03	6.28031E-06
22	3.67747E 00	3.67157E 00	0.0	0.0	5.49307E-03	5.49307E-03	5.49303E-03	3.78399E-08
23	4.13953E 00	4.13402E 00	0.0	0.0	5.50778E-03	5.50778E-03	5.50778E-03	0.0
24	5.13229E 00	5.12322E 00	0.0	0.0	9.07452E-03	9.07452E-03	9.07452E-03	0.0
25	1.48665E 01	1.48503E 01	0.0	0.0	1.62136E-02	1.62136E-02	1.62136E-02	0.0
26	6.65529E-01	6.51214E-01	0.0	0.0	1.47251E-02	1.47251E-02	1.47251E-02	0.0
27	2.65737E 00	2.65236E 00	0.0	0.0	5.01603E-03	5.01603E-03	5.01603E-03	0.0
28	8.94622E 00	8.52288E 00	0.0	0.0	1.73414E-02	1.73414E-02	1.73414E-02	0.0
29	7.73204E 00	7.72376E 00	0.0	0.0	8.28106E-03	8.28106E-03	8.28106E-03	0.0
30	9.88416E 00	9.57632E 00	0.0	0.0	3.07839E-01	3.07839E-01	3.07839E-01	0.0
31	1.10706E 01	1.10436E 01	0.0	0.0	2.69379E-02	2.69379E-02	2.69379E-02	0.0
32	1.14457E 01	1.13855E 01	0.0	0.0	5.62023E-02	5.62023E-02	5.62023E-02	0.0
33	1.14884E 01	1.13903E 01	0.0	0.0	9.80650E-02	9.80650E-02	9.80650E-02	0.0
34	1.15642E 01	1.13511E 01	0.0	0.0	1.73116E-01	1.73116E-01	1.73116E-01	0.0
35	1.16939E 01	1.13518E 01	0.0	0.0	3.02060E-01	3.02060E-01	3.02060E-01	0.0
36	1.18905E 01	1.13525E 01	0.0	0.0	4.98012E-01	4.98012E-01	4.98012E-01	0.0
37	1.34453E 01	1.13538E 01	0.0	0.0	2.05145E 00	2.05145E 00	2.05145E 00	0.0

GROUP	(N,D)	(N,T)	(N,HE3)	(N,ALFA)	GROUP FLUX
1	2.58653E-02	1.51635E-02	6.75566E-03	1.63369E-02	1.49959E-01
2	2.61426E-02	4.75142E-03	2.54402E-03	3.23717E-02	1.25040E-01
3	2.17472E-02	8.79740E-04	5.96025E-04	3.85550E-02	4.99605E-02
4	1.89335E-02	1.49565E-04	1.42690E-04	3.97697E-02	2.50450E-02
5	1.31768E-02	3.15701E-06	3.46846E-05	3.97978E-02	7.49975E-02
6	7.62876E-03	0.0	0.0	3.84542E-02	4.59824E-02
7	3.19327E-03	0.0	0.0	3.52050E-02	9.99714E-02
8	1.13152E-03	0.0	0.0	2.92019E-02	1.00026E-01
9	4.05277E-05	0.0	0.0	2.26979E-02	9.99970E-02
10	0.0	0.0	0.0	1.69711E-02	1.00004E-01
11	0.0	0.0	0.0	1.20887E-02	5.99966E-02
12	0.0	0.0	0.0	6.70841E-03	1.49999E-01
13	0.0	0.0	0.0	1.68464E-03	2.49993E-01
14	0.0	0.0	0.0	3.45854E-04	5.00021E-02
15	0.0	0.0	0.0	1.54490E-04	1.50006E-01
16	0.0	0.0	0.0	3.59832E-05	3.00015E-01
17	0.0	0.0	0.0	7.06099E-09	2.33288E-01
18	0.0	0.0	0.0	0.0	3.33783E-02
19	0.0	0.0	0.0	0.0	2.33339E-01
20	0.0	0.0	0.0	0.0	5.00009E-01
21	0.0	0.0	0.0	0.0	6.99975E-01
22	0.0	0.0	0.0	0.0	1.25002E 00
23	0.0	0.0	0.0	0.0	3.49973E-01
24	0.0	0.0	0.0	0.0	7.50003E-01
25	0.0	0.0	0.0	0.0	7.49977E-01
26	0.0	0.0	0.0	0.0	1.25015E-01
27	0.0	0.0	0.0	0.0	7.50001E-01
28	0.0	0.0	0.0	0.0	1.12501E 00
29	0.0	0.0	0.0	0.0	9.99990E-01
30	0.0	0.0	0.0	0.0	7.49995E-01
31	0.0	0.0	0.0	0.0	1.75001E 00
32	0.0	0.0	0.0	0.0	1.25000E 00
33	0.0	0.0	0.0	0.0	9.99996E-01
34	0.0	0.0	0.0	0.0	1.25000E 00
35	0.0	0.0	0.0	0.0	9.99949E-01
36	0.0	0.0	0.0	0.0	1.00003E 00
37	0.0	0.0	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Fe

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.61201E 00	8.21255E-04	1.61119E 00	2.74728E 01
2	8.00000E 00	1.00000E 01	1.30761E 00	1.12535E-03	1.30648E 00	1.91780E 01
3	7.00000E 00	8.00000E 00	1.10172E 00	1.39647E-03	1.10032E 00	1.52418E 01
4	6.00000E 00	7.00000E 00	9.63472E-01	1.65995E-03	9.61812E-01	1.29076E 01
5	5.00000E 00	6.00000E 00	8.24239E-01	2.03159E-03	8.22208E-01	1.07730E 01
6	4.00000E 00	5.00000E 00	6.60154E-01	2.62873E-03	6.57525E-01	8.73629E 00
7	3.00000E 00	4.00000E 00	4.58848E-01	3.68873E-03	4.55159E-01	6.79493E 00
8	2.50000E 00	3.00000E 00	2.89396E-01	5.11834E-03	2.84277E-01	5.43408E 00
9	2.00000E 00	2.50000E 00	1.79051E-01	6.89289E-03	1.72158E-01	4.58492E 00
10	1.50000E 00	2.00000E 00	8.21136E-02	1.05224E-02	7.15912E-02	3.75953E 00
11	1.00000E 00	1.50000E 00	2.30748E-02	1.95945E-02	3.48022E-03	2.90407E 00
12	7.00000E-01	1.00000E 00	4.43537E-02	4.43537E-02	0.0	2.13793E 00
13	4.50000E-01	7.00000E-01	1.25639E-01	1.25639E-01	0.0	1.53764E 00
14	3.00000E-01	4.50000E-01	4.02176E-01	4.02176E-01	0.0	1.09547E 00
15	1.50000E-01	3.00000E-01	2.04980E 00	2.04980E 00	0.0	9.39632E-01
16	9.99999E-02	1.50000E-01	1.02344E 01	1.02344E 01	0.0	1.47219E 00
17	6.99999E-02	9.99999E-02	3.24452E 01	3.24452E 01	0.0	2.80930E 00
18	4.50000E-02	6.99999E-02	1.10483E 02	1.10483E 02	0.0	6.12366E 00
19	3.00000E-02	4.50000E-02	3.95408E 02	3.95408E 02	0.0	1.42719E 01
20	2.00000E-02	3.00000E-02	1.31003E 03	1.31003E 03	0.0	3.14915E 01
21	9.99999E-03	2.00000E-02	6.40433E 03	6.40433E 03	0.0	8.61735E 01

REACTION CROSS SECTIONS FOR NI 1190 L/E 37N-21G INF EIL 300K 10-3-74(3) IDENTIFICATION

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	ABSORPTION	CAPTURE	(N,GAMMA)	(N,P)	(N,ALPHA)	GROUP FLUX
1	2.41568E 00	1.69681E 00	8.95067E-01	2.07236E-01	2.56573E-01	2.56573E-01	0.0	1.59691E-01	5.68822E-02	1.45555E-01
2	2.53882E 00	1.18098E 00	8.32656E-01	1.86857E-01	3.38330E-01	3.38330E-01	0.0	2.13374E-01	1.24955E-01	1.25040E-01
3	2.65013E 00	1.27728E 00	8.06009E-01	1.56341E-01	4.10500E-01	4.10500E-01	0.0	2.69306E-01	1.41154E-01	4.55605E-02
4	2.71173E 00	1.32712E 00	8.05013E-01	1.36202E-01	4.43399E-01	4.43399E-01	0.0	2.97170E-01	1.46229E-01	2.50450E-02
5	2.79155E 00	1.39807E 00	8.01332E-01	1.00515E-01	4.91630E-01	4.91630E-01	0.0	3.40466E-01	1.51164E-01	7.45575E-02
6	2.88856E 00	1.49071E 00	7.96369E-01	5.57351E-02	5.46147E-01	5.46147E-01	0.0	3.91657E-01	1.54450E-01	4.99824E-02
7	3.01595E 00	1.60306E 00	7.96790E-01	2.12677E-02	5.94818E-01	5.94818E-01	3.65719E-05	4.40572E-01	1.54206E-01	9.99714E-02
8	3.17915E 00	1.74157E 00	8.03682E-01	6.62889E-03	6.27271E-01	6.27271E-01	1.48331E-04	4.79382E-01	1.47741E-01	1.00026E-01
9	3.31514E 00	1.88080E 00	8.06844E-01	3.62257E-03	6.24083E-01	6.24083E-01	2.48497E-04	4.89376E-01	1.34458E-01	9.99970E-02
10	3.42399E 00	1.98921E 00	8.33991E-01	8.81356E-04	5.99913E-01	5.99913E-01	3.39061E-04	4.83446E-01	1.16128E-01	1.00004E-01
11	3.53535E 00	2.07806E 00	8.90381E-01	9.50882E-06	5.66963E-01	5.66963E-01	4.44118E-04	4.71441E-01	9.50781E-02	9.99986E-02
12	3.64506E 00	2.14980E 00	9.75312E-01	0.0	5.19883E-01	5.19883E-01	6.44039E-04	4.48956E-01	7.02832E-02	1.45999E-01
13	3.72682E 00	2.17675E 00	1.12519E 00	0.0	4.24875E-01	4.24875E-01	1.00737E-03	3.83121E-01	4.07462E-02	2.49993E-01
14	3.62677E 00	2.08711E 00	1.22017E 00	0.0	3.21497E-01	3.21497E-01	1.26217E-03	2.95773E-01	2.44618E-02	5.00021E-02
15	3.56647E 00	2.02794E 00	1.24624E 00	0.0	2.92291E-01	2.92291E-01	1.44513E-03	2.71879E-01	1.89668E-02	1.50006E-01
16	3.37169E 00	1.96918E 00	1.21131E 00	0.0	1.91202E-01	1.91202E-01	1.89517E-03	1.84854E-01	4.45256E-03	3.00019E-01
17	3.16103E 00	2.16525E 00	9.01469E-01	0.0	9.43100E-02	9.43100E-02	3.13120E-03	9.11787E-02	1.51307E-07	2.33286E-01
18	3.13317E 00	2.30134E 00	7.64497E-01	0.0	6.73296E-02	6.73296E-02	3.69240E-03	6.36373E-02	0.0	3.33783E-02
19	2.89480E 00	2.27103E 00	5.87132E-01	0.0	3.66378E-02	3.66378E-02	4.07239E-03	3.25654E-02	0.0	2.33335E-01
20	3.07119E 00	2.68504E 00	1.70861E-01	0.0	1.52844E-02	1.52844E-02	6.86657E-03	8.39785E-03	0.0	5.00009E-01
21	2.91150E 00	2.90366E 00	0.0	0.0	7.83609E-03	7.83609E-03	7.57314E-03	2.62954E-04	0.0	6.99979E-01
22	5.43463E 00	5.42565E 00	0.0	0.0	9.17917E-03	9.17917E-03	9.17917E-03	0.0	0.0	1.25002E 00
23	4.98160E 00	4.96673E 00	0.0	0.0	1.48784E-02	1.48784E-02	1.48784E-02	0.0	0.0	3.49973E-01
24	7.93116E 00	7.93311E 00	0.0	0.0	1.80508E-02	1.80508E-02	1.80508E-02	0.0	0.0	7.50003E-01
25	9.48653E 00	9.45048E 00	0.0	0.0	3.60572E-02	3.60572E-02	3.60572E-02	0.0	0.0	7.49977E-01
26	1.45148E 01	1.44803E 01	0.0	0.0	3.44758E-02	3.44758E-02	3.44758E-02	0.0	0.0	1.25015E-01
27	4.48359E 01	4.47380E 01	0.0	0.0	9.70864E-02	9.70864E-02	9.70864E-02	0.0	0.0	7.50001E-01
28	1.81010E 01	1.80708E 01	0.0	0.0	3.01810E-02	3.01810E-02	3.01810E-02	0.0	0.0	1.12501E 00
29	1.62441E 01	1.62084E 01	0.0	0.0	3.57050E-02	3.57050E-02	3.57050E-02	0.0	0.0	9.99990E-01
30	1.67113E 01	1.66847E 01	0.0	0.0	2.66073E-02	2.66073E-02	2.66073E-02	0.0	0.0	7.49995E-01
31	1.74912E 01	1.74483E 01	0.0	0.0	4.88604E-02	4.88604E-02	4.88604E-02	0.0	0.0	1.75001E 00
32	1.78632E 01	1.77625E 01	0.0	0.0	1.00697E-01	1.00697E-01	1.00697E-01	0.0	0.0	1.25000E 00
33	1.79812E 01	1.78057E 01	0.0	0.0	1.75522E-01	1.75522E-01	1.75522E-01	0.0	0.0	9.99996E-01
34	1.81361E 01	1.78263E 01	0.0	0.0	3.09784E-01	3.09784E-01	3.09784E-01	0.0	0.0	1.25000E 00
35	1.83874E 01	1.78470E 01	0.0	0.0	5.40408E-01	5.40408E-01	5.40408E-01	0.0	0.0	9.99949E-01
36	1.87562E 01	1.78654E 01	0.0	0.0	8.90809E-01	8.90809E-01	8.90809E-01	0.0	0.0	1.00003E 00
37	2.16864E 01	1.80191E 01	0.0	0.0	3.66729E 00	3.66729E 00	3.66729E 00	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Ni

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.86049E 00	1.18584E-03	1.85931E 00	3.09608E 01
2	8.00000E 00	1.00000E 01	1.51073E 00	1.62579E-03	1.50910E 00	2.14751E 01
3	7.00000E 00	8.00000E 00	1.27425E 00	2.01834E-03	1.27223E 00	1.69844E 01
4	6.00000E 00	7.00000E 00	1.11535E 00	2.39992E-03	1.11295E 00	1.43281E 01
5	5.00000E 00	6.00000E 00	9.55230E-01	2.93840E-03	9.52291E-01	1.19061E 01
6	4.00000E 00	5.00000E 00	7.66064E-01	3.80200E-03	7.62262E-01	9.60232E 00
7	3.00000E 00	4.00000E 00	5.33767E-01	5.33221E-03	5.28435E-01	7.41862E 00
8	2.50000E 00	3.00000E 00	3.38187E-01	7.40554E-03	3.30781E-01	5.90033E 00
9	2.00000E 00	2.50000E 00	2.10779E-01	9.99968E-03	2.00779E-01	4.96262E 00
10	1.50000E 00	2.00000E 00	9.91614E-02	1.52954E-02	8.38661E-02	4.06085E 00
11	1.00000E 00	1.50000E 00	3.25561E-02	2.85194E-02	4.03671E-03	3.13663E 00
12	7.00000E-01	1.00000E 00	6.36637E-02	6.36637E-02	0.0	2.31559E 00
13	4.50000E-01	7.00000E-01	1.75882E-01	1.75882E-01	0.0	1.67835E 00
14	3.00000E-01	4.50000E-01	5.53455E-01	5.53455E-01	0.0	1.22325E 00
15	1.50000E-01	3.00000E-01	2.78472E 00	2.78472E 00	0.0	1.12789E 00
16	9.99999E-02	1.50000E-01	1.38369E 01	1.38369E 01	0.0	1.92328E 00
17	6.99999E-02	9.99999E-02	4.37879E 01	4.37879E 01	0.0	3.75372E 00
18	4.50000E-02	6.99999E-02	1.48863E 02	1.48863E 02	0.0	8.23143E 00
19	3.00000E-02	4.50000E-02	5.30358E 02	5.30358E 02	0.0	1.91367E 01
20	2.00000E-02	3.00000E-02	1.74307E 03	1.74307E 03	0.0	4.19099E 01
21	9.99999E-03	2.00000E-02	8.32869E 03	8.32869E 03	0.0	1.12276E 02

REACTION CROSS SECTIONS FOR CO 4529/1 37N-21G 1/E INF DIL 300K 11-20-74(5) IDENTIFICATION 4529

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	CAPTURE	(N,GAMMA)
1	2.57837E 00	1.14821E 00	4.27053E-01	8.98371E-01	5.63354E-03	9.90962E-02	9.90962E-02	2.06745E-03
2	2.74341E 00	1.28316E 00	5.52611E-01	7.95678E-01	0.0	1.11961E-01	1.11961E-01	2.18814E-03
3	2.88772E 00	1.39898E 00	6.96161E-01	6.73152E-01	0.0	1.19427E-01	1.19427E-01	2.26671E-03
4	2.95450E 00	1.45173E 00	7.78865E-01	6.02529E-01	0.0	1.21778E-01	1.21778E-01	2.29990E-03
5	3.03776E 00	1.51493E 00	9.12611E-01	4.87737E-01	0.0	1.22482E-01	1.22482E-01	2.34609E-03
6	3.13786E 00	1.58849E 00	1.10374E 00	3.22906E-01	0.0	1.22725E-01	1.22725E-01	2.40316E-03
7	3.25738E 00	1.67051E 00	1.32534E 00	1.36030E-01	0.0	1.25501E-01	1.25501E-01	2.47255E-03
8	3.41083E 00	1.78284E 00	1.48863E 00	1.69777E-02	0.0	1.22391E-01	1.22391E-01	2.56508E-03
9	3.54046E 00	1.89403E 00	1.53216E 00	0.0	0.0	1.14209E-01	1.14209E-01	2.66675E-03
10	3.62921E 00	1.97943E 00	1.54676E 00	0.0	0.0	1.03025E-01	1.03025E-01	2.77562E-03
11	3.70285E 00	2.05178E 00	1.55795E 00	0.0	0.0	9.31202E-02	9.31202E-02	2.89208E-03
12	3.78623E 00	2.12885E 00	1.57038E 00	0.0	0.0	8.69541E-02	8.69541E-02	3.06211E-03
13	3.62844E 00	2.17276E 00	1.58274E 00	0.0	0.0	7.29430E-02	7.29430E-02	3.34416E-03
14	3.77429E 00	2.13986E 00	1.57047E 00	0.0	0.0	6.39716E-02	6.39716E-02	3.59942E-03
15	3.68848E 00	2.09196E 00	1.53751E 00	0.0	0.0	5.90222E-02	5.90222E-02	3.79869E-03
16	3.43853E 00	1.57810E 00	1.41344E 00	0.0	0.0	4.73906E-02	4.73906E-02	4.30858E-03
17	3.18092E 00	1.91593E 00	1.23299E 00	0.0	0.0	3.20038E-02	3.20038E-02	5.12526E-03
18	3.09523E 00	1.57092E 00	1.09924E 00	0.0	0.0	2.50742E-02	2.50742E-02	5.57372E-03
19	3.05310E 00	2.02605E 00	1.00760E 00	0.0	0.0	1.94419E-02	1.94419E-02	6.17791E-03
20	3.15532E 00	2.50978E 00	6.32806E-01	0.0	0.0	1.27373E-02	1.27373E-02	8.78173E-03
21	3.70651E 00	3.60692E 00	8.86274E-02	0.0	0.0	1.13625E-02	1.13625E-02	1.11045E-02
22	4.88752E 00	4.87201E 00	0.0	0.0	0.0	1.59094E-02	1.59094E-02	1.59094E-02
23	5.82520E 00	5.80146E 00	0.0	0.0	0.0	2.37502E-02	2.37502E-02	2.37502E-02
24	7.42543E 00	7.39261E 00	0.0	0.0	0.0	3.28226E-02	3.28226E-02	3.28226E-02
25	1.03714E 01	1.03171E 01	0.0	0.0	0.0	5.42842E-02	5.42842E-02	5.42842E-02
26	1.14017E 01	1.13333E 01	0.0	0.0	0.0	6.84791E-02	6.84791E-02	6.84791E-02
27	1.52645E 01	1.51485E 01	0.0	0.0	0.0	1.15957E-01	1.15957E-01	1.15957E-01
28	1.62115E 01	1.59809E 01	0.0	0.0	0.0	2.30671E-01	2.30671E-01	2.30671E-01
29	1.84475E 01	1.81089E 01	0.0	0.0	0.0	3.38571E-01	3.38571E-01	3.38571E-01
30	5.93750E 00	5.79958E 00	0.0	0.0	0.0	1.38329E-01	1.38329E-01	1.38329E-01
31	9.30912E 00	8.13359E 00	0.0	0.0	0.0	1.17554E 00	1.17554E 00	1.17554E 00
32	8.13077E 00	8.05497E 00	0.0	0.0	0.0	7.57976E-02	7.57976E-02	7.57976E-02
33	8.56067E 00	8.42161E 00	0.0	0.0	0.0	1.39262E-01	1.39262E-01	1.39262E-01
34	8.79513E 00	8.54615E 00	0.0	0.0	0.0	2.48984E-01	2.48984E-01	2.48984E-01
35	9.03136E 00	8.58971E 00	0.0	0.0	0.0	4.41657E-01	4.41657E-01	4.41657E-01
36	9.33817E 00	8.60370E 00	0.0	0.0	0.0	7.34677E-01	7.34677E-01	7.34677E-01
37	1.16461E 01	8.61073E 00	0.0	0.0	0.0	3.03533E 00	3.03533E 00	3.03533E 00

GROUP	(N,P)	(N,D)	(N,HE3)	(N,ALPHA)	GROUP FLUX
1	7.42316E-02	4.08883E-03	3.43442E-03	1.52740E-02	1.49959E-01
2	7.69243E-02	5.02484E-03	3.63809E-03	2.41861E-02	1.25040E-01
3	7.88262E-02	5.33149E-03	2.81381E-03	3.01873E-02	4.99605E-02
4	7.94130E-02	5.37082E-03	2.27950E-03	3.24149E-02	2.50450E-02
5	7.96764E-02	5.27973E-03	1.50798E-03	3.36777E-02	7.49975E-02
6	7.98258E-02	5.09717E-03	6.73605E-04	3.47213E-02	4.99824E-02
7	7.96626E-02	4.56573E-03	1.74853E-04	3.86214E-02	9.99714E-02
8	7.91240E-02	3.35615E-03	1.32152E-05	3.73323E-02	1.00026E-01
9	7.86469E-02	1.97474E-03	0.0	3.09189E-02	9.99970E-02
10	7.82332E-02	6.76191E-04	0.0	2.13402E-02	1.00004E-01
11	7.81936E-02	1.50304E-04	0.0	1.18843E-02	9.99966E-02
12	7.71446E-02	1.38511E-05	0.0	6.73363E-03	1.49959E-01
13	6.86864E-02	0.0	0.0	9.12548E-04	2.49993E-01
14	6.03722E-02	0.0	0.0	0.0	5.00021E-02
15	5.52235E-02	0.0	0.0	0.0	1.50306E-01
16	4.30820E-02	0.0	0.0	0.0	3.00015E-01
17	2.68726E-02	0.0	0.0	0.0	2.33288E-01
18	1.95065E-02	0.0	0.0	0.0	3.33783E-02
19	1.32640E-02	0.0	0.0	0.0	2.33339E-01
20	3.95561E-03	0.0	0.0	0.0	5.00009E-01
21	2.57964E-04	0.0	0.0	0.0	6.99975E-01
22	0.0	0.0	0.0	0.0	1.25302E 00
23	0.0	0.0	0.0	0.0	3.49973E-01
24	0.0	0.0	0.0	0.0	7.50003E-01
25	0.0	0.0	0.0	0.0	7.49977E-01
26	0.0	0.0	0.0	0.0	1.25015E-01
27	0.0	0.0	0.0	0.0	7.50001E-01
28	0.0	0.0	0.0	0.0	1.12501E 00
29	0.0	0.0	0.0	0.0	9.99990E-01
30	0.0	0.0	0.0	0.0	7.49925E-01
31	0.0	0.0	0.0	0.0	1.75001E 00
32	0.0	0.0	0.0	0.0	1.25000E 00
33	0.0	0.0	0.0	0.0	9.99996E-01
34	0.0	0.0	0.0	0.0	1.25000E 00
35	0.0	0.0	0.0	0.0	9.99949E-01
36	0.0	0.0	0.0	0.0	1.00003E 00
37	0.0	0.0	0.0	0.0	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS FOR Cu

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.99101E 00	1.34821E-03	1.98966E 00	3.27743E 01
2	8.00000E 00	1.00000E 01	1.61749E 00	1.84885E-03	1.61565E 00	2.26653E 01
3	7.00000E 00	8.00000E 00	1.36506E 00	2.29567E-03	1.36276E 00	1.78852E 01
4	6.00000E 00	7.00000E 00	1.19536E 00	2.73015E-03	1.19263E 00	1.50607E 01
5	5.00000E 00	6.00000E 00	1.02426E 00	3.34337E-03	1.02092E 00	1.24884E 01
6	4.00000E 00	5.00000E 00	8.21931E-01	4.32596E-03	8.17605E-01	1.00455E 01
7	3.00000E 00	4.00000E 00	5.73285E-01	6.06552E-03	5.67219E-01	7.73557E 00
8	2.50000E 00	3.00000E 00	3.63847E-01	8.42788E-03	3.55419E-01	6.13554E 00
9	2.00000E 00	2.50000E 00	2.27379E-01	1.13952E-02	2.15984E-01	5.15223E 00
10	1.50000E 00	2.00000E 00	1.07859E-01	1.74470E-02	9.04115E-02	4.21143E 00
11	1.00000E 00	1.50000E 00	3.68840E-02	3.25519E-02	4.33208E-03	3.25240E 00
12	7.00000E-01	1.00000E 00	7.39520E-02	7.39520E-02	0.0	2.40487E 00
13	4.50000E-01	7.00000E-01	2.09988E-01	2.09988E-01	0.0	1.75353E 00
14	3.00000E-01	4.50000E-01	6.70934E-01	6.70934E-01	0.0	1.30215E 00
15	1.50000E-01	3.00000E-01	3.38446E 00	3.38446E 00	0.0	1.26864E 00
16	9.99999E-02	1.50000E-01	1.66635E 01	1.66635E 01	0.0	2.27248E 00
17	6.99999E-02	9.99999E-02	5.21352E 01	5.21352E 01	0.0	4.44770E 00
18	4.50000E-02	6.99999E-02	1.74551E 02	1.74551E 02	0.0	9.64658E 00
19	3.00000E-02	4.50000E-02	6.12311E 02	6.12311E 02	0.0	2.20998E 01
20	2.00000E-02	3.00000E-02	1.98695E 03	1.98695E 03	0.0	4.77895E 01
21	9.99999E-03	2.00000E-02	9.39755E 03	9.39755E 03	0.0	1.26726E 02

REACTION CROSS SECTIONS FOR MO 1287 1/E 37N-21G INF CIL 300K 10-3-74(3) IDENTIFICATION

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	CAPTURE	(N,GAMMA)	GROUP FLUX
1	3.64452E 00	1.87294E 00	2.79272E-01	6.56719E-01	8.35338E-01	6.48265E-04	6.48265E-04	6.48265E-04	1.49555E-01
2	3.77355E 00	1.97011E 00	3.18625E-01	1.22948E 00	2.54801E-01	9.39529E-04	9.39529E-04	9.39529E-04	1.25040E-01
3	3.88857E 00	2.02690E 00	3.40862E-01	1.50003E 00	0.0	1.18653E-03	1.18653E-03	1.18653E-03	4.99605E-02
4	3.90660E 00	2.05434E 00	3.50987E-01	1.50003E 00	0.0	1.31284E-03	1.31284E-03	1.31284E-03	2.50450E-02
5	4.05061E 00	2.16649E 00	3.83235E-01	1.49938E 00	0.0	1.50604E-03	1.50604E-03	1.50604E-03	7.49975E-02
6	4.21022E 00	2.30842E 00	4.23689E-01	1.47633E 00	0.0	1.78268E-03	1.78268E-03	1.78268E-03	4.59824E-02
7	4.29840E 00	2.41618E 00	4.60634E-01	1.41150E 00	0.0	2.08463E-03	2.08463E-03	2.08463E-03	9.99714E-02
8	4.30943E 00	2.47306E 00	6.46149E-01	1.18724E 00	0.0	2.38405E-03	2.38405E-03	2.38405E-03	1.00026E-01
9	4.32564E 00	2.47619E 00	1.19064E 00	6.56091E-01	0.0	2.72098E-03	2.72098E-03	2.72098E-03	9.99970E-02
10	4.26772E 00	2.40170E 00	1.70650E 00	1.56412E-01	0.0	3.10560E-03	3.10560E-03	3.10560E-03	1.00004E-01
11	4.17559E 00	2.29943E 00	1.86870E 00	4.31649E-03	0.0	3.54448E-03	3.54448E-03	3.54448E-03	9.99966E-02
12	4.06265E 00	2.18032E 00	1.87834E 00	0.0	0.0	4.18513E-03	4.18513E-03	4.18513E-03	1.49959E-01
13	3.89023E 00	1.99740E 00	1.88750E 00	0.0	0.0	5.33405E-03	5.33405E-03	5.33405E-03	2.49953E-01
14	3.78440E 00	1.88450E 00	1.89371E 00	0.0	0.0	6.19497E-03	6.19497E-03	6.19497E-03	5.00021E-02
15	3.77222E 00	1.86829E 00	1.89709E 00	0.0	0.0	6.85220E-03	6.85220E-03	6.85220E-03	1.50006E-01
16	3.58004E 00	2.07164E 00	1.89979E 00	0.0	0.0	8.60537E-03	8.60537E-03	8.60537E-03	3.00015E-01
17	4.29659E 00	2.41625E 00	1.86912E 00	0.0	0.0	1.12185E-02	1.12185E-02	1.12185E-02	2.33288E-01
18	4.53250E 00	2.68507E 00	1.83464E 00	0.0	0.0	1.27902E-02	1.27902E-02	1.27902E-02	3.33783E-02
19	4.86784E 00	3.08417E 00	1.78902E 00	0.0	0.0	1.46471E-02	1.46471E-02	1.46471E-02	2.33339E-01
20	5.66148E 00	4.35714E 00	1.24323E 00	0.0	0.0	2.13076E-02	2.13076E-02	2.13076E-02	5.00009E-01
21	7.05751E 00	6.64448E 00	3.76225E-01	0.0	0.0	3.68055E-02	3.68055E-02	3.68055E-02	6.99979E-01
22	8.57439E 00	8.48563E 00	3.37072E-02	0.0	0.0	5.50520E-02	5.50520E-02	5.50520E-02	1.25002E 00
23	9.00042E 00	8.93128E 00	0.0	0.0	0.0	6.91351E-02	6.91351E-02	6.91351E-02	3.49973E-01
24	8.54235E 00	8.46031E 00	0.0	0.0	0.0	8.20468E-02	8.20468E-02	8.20468E-02	7.50003E-01
25	8.29411E 00	8.15116E 00	0.0	0.0	0.0	1.42951E-01	1.42951E-01	1.42951E-01	7.49977E-01
26	8.27805E 00	8.07116E 00	0.0	0.0	0.0	2.06887E-01	2.06887E-01	2.06887E-01	1.25015E-01
27	8.46775E 00	8.17927E 00	0.0	0.0	0.0	2.88481E-01	2.88481E-01	2.88481E-01	7.50001E-01
28	9.36627E 00	8.85046E 00	0.0	0.0	0.0	5.15918E-01	5.15918E-01	5.15918E-01	1.12501E 00
29	1.15257E 01	1.06739E 01	0.0	0.0	0.0	8.51824E-01	8.51824E-01	8.51824E-01	9.99950E-01
30	1.02764E 01	9.11418E 00	0.0	0.0	0.0	1.16218E 00	1.16218E 00	1.16218E 00	7.49995E-01
31	1.52228E 01	1.12673E 01	0.0	0.0	0.0	3.95554E 00	3.95554E 00	3.95554E 00	1.25001E 00
32	3.27787E 01	1.86961E 01	0.0	0.0	0.0	1.40827E 01	1.40827E 01	1.40827E 01	1.25000E 00
33	5.84686E 00	4.89243E 00	0.0	0.0	0.0	9.54427E-01	9.54427E-01	9.54427E-01	9.99956E-01
34	5.16888E 00	4.98299E 00	0.0	0.0	0.0	1.85886E-01	1.85886E-01	1.85886E-01	1.25000E 00
35	5.31269E 00	5.00001E 00	0.0	0.0	0.0	3.12679E-01	3.12679E-01	3.12679E-01	9.99949E-01
36	5.51553E 00	5.00001E 00	0.0	0.0	0.0	5.15519E-01	5.15519E-01	5.15519E-01	1.00003E 00
37	7.12329E 00	4.99981E 00	0.0	0.0	0.0	2.12347E 00	2.12347E 00	2.12347E 00	6.85856E 00

PHOTON INTERACTION CROSS SECTIONS

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	6.05118E 00	7.68392E-03	4.04350E 00	6.03668E 01
2	8.00000E 00	1.00000E 01	8.31295E 00	1.05824E-02	3.30227E 00	4.06054E 01
3	7.00000E 00	8.00000E 00	8.81880E 00	1.31997E-02	2.80560E 00	3.13756E 01
4	6.00000E 00	7.00000E 00	8.48468E 00	1.57553E-02	2.46892E 00	2.59604E 01
5	5.00000E 00	6.00000E 00	8.14634E 00	1.93770E-02	2.12696E 00	2.10790E 01
6	4.00000E 00	5.00000E 00	1.74005E 00	2.52164E-02	1.71484E 00	1.64919E 01
7	3.00000E 00	4.00000E 00	1.23925E 00	3.56341E-02	1.20362E 00	1.22576E 01
8	2.50000E 00	3.00000E 00	8.17948E-01	4.98773E-02	7.68071E-01	9.43159E 00
9	2.00000E 00	2.50000E 00	5.43702E-01	6.78877E-02	4.75814E-01	7.78057E 00
10	1.50000E 00	2.00000E 00	5.10659E-01	1.04557E-01	2.06102E-01	6.29480E 00
11	1.00000E 00	1.50000E 00	8.85647E-01	1.96137E-01	9.50966E-03	4.89346E 00
12	7.00000E-01	1.00000E 00	4.36577E-01	4.36577E-01	0.0	3.75607E 00
13	4.50000E-01	7.00000E-01	1.18798E 00	1.18798E 00	0.0	3.02736E 00
14	3.00000E-01	4.50000E-01	5.66106E 00	3.66106E 00	0.0	2.85704E 00
15	1.50000E-01	3.00000E-01	1.76217E 01	1.76217E 01	0.0	4.39887E 00
16	9.99999E-02	1.50000E-01	8.30359E 01	8.30359E 01	0.0	1.03726E 01
17	6.99999E-02	9.99999E-02	2.49564E 02	2.49564E 02	0.0	2.08062E 01
18	4.50000E-02	6.99999E-02	7.80516E 02	7.80516E 02	0.0	4.34808E 01
19	3.00000E-02	4.50000E-02	2.56809E 03	2.56809E 03	0.0	9.26286E 01
20	2.00000E-02	3.00000E-02	7.58018E 03	7.58018E 03	0.0	1.82899E 02
21	9.99999E-03	2.00000E-02	5.34454E 03	5.34454E 03	0.0	7.21695E 01

REACTION CROSS SECTIONS FOR TA-181 DNA 4179/3 (1/E WT.) IDENTIFICATION 4179

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	(N,GAMMA)	(N,P)
1	5.33542E 00	2.88452E 00	2.30005E-01	9.16894E-01	1.29306E 00	1.09378E-02	3.43938E-03	7.49840E-03
2	5.38819E 00	2.93095E 00	2.30003E-01	1.72239E 00	4.94430E-01	1.04143E-02	4.02758E-03	6.38674E-03
3	5.40646E 00	2.94014E 00	2.30003E-01	2.17828E 00	4.89829E-02	9.05433E-03	4.36270E-03	4.69162E-03
4	5.35037E 00	2.90054E 00	2.30002E-01	2.21160E 00	0.0	8.22208E-03	4.49656E-03	3.72552E-03
5	5.29575E 00	2.84321E 00	2.30003E-01	2.21536E 00	0.0	7.16743E-03	4.66781E-03	2.49961E-03
6	5.23016E 00	2.77456E 00	2.36691E-01	2.21288E 00	0.0	6.02612E-03	4.86980E-03	1.15632E-03
7	5.16844E 00	2.70815E 00	3.61347E-01	2.09272E 00	0.0	6.22999E-03	5.32376E-03	9.06226E-04
8	5.11832E 00	2.64652E 00	6.35179E-01	1.82961E 00	0.0	7.02285E-03	6.23461E-03	7.88242E-04
9	5.17051E 00	2.58658E 00	1.21622E 00	1.35996E 00	0.0	7.75000E-03	7.06854E-03	6.81468E-04
10	5.30116E 00	2.42891E 00	2.26647E 00	5.97376E-01	0.0	8.41064E-03	7.82578E-03	5.84869E-04
11	5.46656E 00	2.46832E 00	2.93757E 00	5.16673E-02	0.0	9.00811E-03	8.51064E-03	4.97469E-04
12	5.80045E 00	2.58876E 00	3.20202E 00	0.0	0.0	9.67060E-03	9.27029E-03	4.00317E-04
13	6.49380E 00	2.93954E 00	3.54302E 00	0.0	0.0	1.12377E-02	1.09693E-02	2.68381E-04
14	7.03195E 00	3.25527E 00	3.76359E 00	0.0	0.0	1.30852E-02	1.28917E-02	1.93470E-04
15	7.31235E 00	3.41373E 00	3.88441E 00	0.0	0.0	1.42113E-02	1.40370E-02	1.74336E-04
16	7.80648E 00	3.76794E 00	4.01852E 00	0.0	0.0	2.00216E-02	1.98839E-02	1.37747E-04
17	8.21270E 00	4.10714E 00	4.07106E 00	0.0	0.0	3.45093E-02	3.44061E-02	1.03235E-04
18	8.25654E 00	4.17080E 00	4.04103E 00	0.0	0.0	4.47107E-02	4.46217E-02	8.90390E-05
19	8.12869E 00	4.13201E 00	3.94197E 00	0.0	0.0	5.47218E-02	5.46449E-02	7.69449E-05
20	7.32670E 00	3.69525E 00	3.53578E 00	0.0	0.0	9.56729E-02	9.56219E-02	5.10458E-05
21	6.24602E 00	3.50206E 00	2.59076E 00	0.0	0.0	1.53196E-01	1.53172E-01	2.42713E-05
22	6.56566E 00	5.14014E 00	1.17577E 00	0.0	0.0	2.49750E-01	2.49746E-01	4.37805E-06
23	7.56915E 00	6.72452E 00	5.66968E-01	0.0	0.0	2.77664E-01	2.77664E-01	0.0
24	8.70862E 00	7.82859E 00	5.05173E-01	0.0	0.0	3.74861E-01	3.74861E-01	0.0
25	9.77179E 00	8.73328E 00	3.84499E-01	0.0	0.0	6.54010E-01	6.54010E-01	0.0
26	1.04600E 01	9.21203E 00	3.16601E-01	0.0	0.0	9.31386E-01	9.31386E-01	0.0
27	1.18297E 01	1.02236E 01	2.06091E-01	0.0	0.0	1.40002E 00	1.40002E 00	0.0
28	1.45066E 01	1.13988E 01	2.23796E-02	0.0	0.0	3.08550E 00	3.08550E 00	0.0
29	1.88596E 01	1.19183E 01	0.0	0.0	0.0	6.94141E 00	6.94141E 00	0.0
30	2.44283E 01	1.20792E 01	0.0	0.0	0.0	1.23491E 01	1.23491E 01	0.0
31	5.71994E 01	3.01349E 01	0.0	0.0	0.0	2.70645E 01	2.70645E 01	0.0
32	1.39793E 02	5.26173E 01	0.0	0.0	0.0	8.71759E 01	8.71759E 01	0.0
33	5.74142E 01	1.12370E 01	0.0	0.0	0.0	4.61771E 01	4.61771E 01	0.0
34	4.59884E 02	3.81976E 01	0.0	0.0	0.0	4.21686E 02	4.21686E 02	0.0
35	1.18889E 01	5.00245E 00	0.0	0.0	0.0	6.88649E 00	6.88649E 00	0.0
36	1.10556E 01	5.79734E 00	0.0	0.0	0.0	5.25827E 00	5.25827E 00	0.0
37	2.37517E 01	6.21010E 00	0.0	0.0	0.0	1.75416E 01	1.75416E 01	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.12757E 01	8.46162E-02	1.11911E 01	1.51738E 02
2	9.38635E 00	1.17426E-01	9.26893E 00	9.97060E 01
3	8.17623E 00	1.47974E-01	8.02825E 00	7.59150E 01
4	7.34978E 00	1.78091E-01	7.17169E 00	6.19075E 01
5	6.50848E 00	2.21162E-01	6.28732E 00	4.92953E 01
6	5.48288E 00	2.91819E-01	5.19106E 00	3.75045E 01
7	4.21052E 00	4.20527E-01	3.78999E 00	2.68044E 01
8	3.14270E 00	5.98577E-01	2.54412E 00	1.99033E 01
9	2.48402E 00	8.25541E-01	1.65848E 00	1.61420E 01
10	2.07073E 00	1.28875E 00	7.81987E-01	1.31806E 01
11	2.48966E 00	2.45450E 00	3.51612E-02	1.10891E 01
12	5.18338E 00	5.18338E 00	0.0	1.02090E 01
13	1.27109E 01	1.27109E 01	0.0	1.11583E 01
14	3.63514E 01	3.63514E 01	0.0	1.58296E 01
15	1.60859E 02	1.60859E 02	0.0	3.40173E 01
16	6.96063E 02	6.96063E 02	0.0	8.45468E 01
17	1.91477E 03	1.91477E 03	0.0	1.58722E 02
18	1.37883E 03	1.37883E 03	0.0	7.95518E 01
19	3.58657E 03	3.58657E 03	0.0	1.29692E 02
20	1.07195E 04	1.07195E 04	0.0	2.58427E 02
21	4.18723E 04	4.18723E 04	0.0	5.80834E 02

REACTION CROSS SECTIONS FOR W-182 DNA 4582/2 (1/E WT.) IDENTIFICATION 4582

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,ALPHA)	ID CAPTURE
1	5.40325E 00	2.83294E 00	3.10179E-01	8.55669E-01	1.37816E 00	2.63097E-02	4.21733E-03	1.28833E-02	9.20899E-03	0.0
2	5.39635E 00	2.82638E 00	3.19757E-01	2.13921E 00	9.51990E-02	1.58098E-02	3.82340E-03	7.39200E-03	4.59436E-03	0.0
3	5.36113E 00	2.77765E 00	3.45492E-01	2.22802E 00	1.89142E-04	9.77487E-03	3.66190E-03	4.36966E-03	1.74332E-03	0.0
4	5.34224E 00	2.74216E 00	3.67490E-01	2.22453E 00	0.0	8.06699E-03	3.60213E-03	3.34667E-03	1.11819E-03	0.0
5	5.31120E 00	2.68506E 00	4.06528E-01	2.21330E 00	0.0	6.31251E-03	3.50375E-03	2.20517E-03	6.03597E-04	0.0
6	5.27490E 00	2.60769E 00	4.72492E-01	2.19012E 00	0.0	4.60096E-03	3.31007E-03	1.06920E-03	2.21699E-04	0.0
7	5.23055E 00	2.50410E 00	6.01657E-01	2.12145E 00	0.0	3.33756E-03	2.96779E-03	3.16044E-04	5.37265E-05	0.0
8	5.17066E 00	2.37887E 00	8.99196E-01	1.89018E 00	0.0	2.41678E-03	2.39773E-03	1.89675E-05	7.52708E-08	0.0
9	5.09752E 00	2.23912E 00	1.52374E 00	1.33288E 00	0.0	1.77257E-03	1.77257E-03	0.0	0.0	0.0
10	5.04550E 00	2.29409E 00	2.33210E 00	4.17833E-01	0.0	1.48104E-03	1.48104E-03	0.0	0.0	0.0
11	5.08451E 00	2.29888E 00	2.78263E 00	1.38370E-03	0.0	1.61514E-03	1.61514E-03	0.0	0.0	0.0
12	5.22848E 00	2.39758E 00	2.82853E 00	0.0	0.0	2.36842E-03	2.36842E-03	0.0	0.0	0.0
13	5.60427E 00	2.74767E 00	2.85189E 00	0.0	0.0	4.71179E-03	4.71179E-03	0.0	0.0	0.0
14	5.97904E 00	3.10878E 00	2.86324E 00	0.0	0.0	7.01448E-03	7.01448E-03	0.0	0.0	0.0
15	6.24612E 00	3.36558E 00	2.87141E 00	0.0	0.0	9.12097E-03	9.12097E-03	0.0	0.0	0.0
16	6.71973E 00	3.81735E 00	2.88679E 00	0.0	0.0	1.55913E-02	1.55913E-02	0.0	0.0	0.0
17	7.04874E 00	4.15356E 00	2.86612E 00	0.0	0.0	2.90617E-02	2.90617E-02	0.0	0.0	0.0
18	7.12815E 00	4.27301E 00	2.81669E 00	0.0	0.0	3.84541E-02	3.84541E-02	0.0	0.0	0.0
19	7.15066E 00	4.38600E 00	2.71784E 00	0.0	0.0	4.68194E-02	4.68194E-02	0.0	0.0	0.0
20	7.04529E 00	4.56106E 00	2.41749E 00	0.0	0.0	6.67432E-02	6.67432E-02	0.0	0.0	0.0
21	6.65511E 00	4.64594E 00	1.94059E 00	0.0	0.0	6.85747E-02	6.85747E-02	0.0	0.0	0.0
22	7.10721E 00	6.17132E 00	8.57537E-01	0.0	0.0	7.83620E-02	7.83620E-02	0.0	0.0	0.0
23	8.21931E 00	7.97551E 00	1.24897E-01	0.0	0.0	1.18897E-01	1.18897E-01	0.0	0.0	0.0
24	8.31773E 00	8.20766E 00	1.96267E-03	0.0	0.0	1.08113E-01	1.08113E-01	0.0	0.0	0.0
25	8.89773E 00	8.77979E 00	0.0	0.0	0.0	1.17940E-01	1.17940E-01	0.0	0.0	0.0
26	9.24168E 00	9.11255E 00	0.0	0.0	0.0	1.29129E-01	1.29129E-01	0.0	0.0	0.0
27	9.42285E 00	9.28069E 00	0.0	0.0	0.0	1.42155E-01	1.42155E-01	0.0	0.0	0.0
28	1.49445E 01	1.47995E 01	0.0	0.0	0.0	1.45016E-01	1.45016E-01	0.0	0.0	2.25553E-01
29	2.28076E 01	2.27569E 01	0.0	0.0	0.0	5.06403E-02	5.06403E-02	0.0	0.0	1.48514E 00
30	3.35893E 01	3.35468E 01	0.0	0.0	0.0	4.25155E-02	4.25155E-02	0.0	0.0	2.75494E 00
31	9.46438E 01	9.45948E 01	0.0	0.0	0.0	4.89874E-02	4.89874E-02	0.0	0.0	1.34226E 01
32	1.03614E 01	1.01929E 01	0.0	0.0	0.0	1.68508E-01	1.68508E-01	0.0	0.0	1.24218E-01
33	1.43459E 02	1.43191E 02	0.0	0.0	0.0	2.67350E-01	2.67350E-01	0.0	0.0	2.17857E 02
34	2.02624E 01	1.92813E 01	0.0	0.0	0.0	9.81117E-01	9.81117E-01	0.0	0.0	2.69723E 02
35	1.31284E 01	1.04028E 01	0.0	0.0	0.0	2.72564E 00	2.72564E 00	0.0	0.0	2.90212E 00
36	1.62231E 01	1.14520E 01	0.0	0.0	0.0	4.77118E 00	4.77118E 00	0.0	0.0	0.0
37	2.83381E 01	1.17774E 01	0.0	0.0	0.0	1.65607E 01	1.65607E 01	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.15527E 01	8.63434E-02	1.14664E 01	1.55169E 02
2	9.62137E 00	1.19852E-01	9.50152E 00	1.01924E 02
3	8.38608E 00	1.51087E-01	8.23500E 00	7.75907E 01
4	7.54179E 00	1.81890E-01	7.35991E 00	6.32580E 01
5	6.68188E 00	2.25958E-01	6.45592E 00	5.03504E 01
6	5.63261E 00	2.98297E-01	5.33431E 00	3.82815E 01
7	4.32979E 00	4.30158E-01	3.89963E 00	2.73295E 01
8	3.23479E 00	6.12726E-01	2.62206E 00	2.02673E 01
9	2.55769E 00	8.45692E-01	1.71200E 00	1.64212E 01
10	2.13011E 00	1.32100E 00	8.09114E-01	1.33990E 01
11	2.55331E 00	2.51695E 00	3.63612E-02	1.12764E 01
12	5.35487E 00	5.35487E 00	0.0	1.04306E 01
13	1.33332E 01	1.33332E 01	0.0	1.15549E 01
14	3.86282E 01	3.86282E 01	0.0	1.66853E 01
15	1.72536E 02	1.72536E 02	0.0	3.63875E 01
16	7.45058E 02	7.45058E 02	0.0	9.04786E 01
17	2.02999E 03	2.02999E 03	0.0	1.68318E 02
18	1.24131E 03	1.24131E 03	0.0	6.93039E 01
19	3.83832E 03	3.83832E 03	0.0	1.38727E 02
20	1.15999E 04	1.15999E 04	0.0	2.79559E 02
21	4.34287E 04	4.34287E 04	0.0	6.08984E 02

REACTION CROSS SECTIONS FOR W-183 DNA 4583/2 (1/E WT.) IDENTIFICATION 4583

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,ALPHA)	ID CAPTUR(
1	5.40213E 00	2.82886E 00	2.82184E-01	6.62645E-01	1.60150E 00	2.69496E-02	4.27239E-03	1.34682E-02	9.20899E-03	0.0
2	5.39542E 00	2.82656E 00	2.87358E-01	2.01920E 00	2.45467E-01	1.68370E-02	3.93781E-03	8.30478E-03	4.59439E-03	0.0
3	5.35984E 00	2.77726E 00	3.09208E-01	2.25958E 00	3.14134E-03	1.06565E-02	3.78850E-03	5.12325E-03	1.74479E-03	0.0
4	5.34224E 00	2.74290E 00	3.27232E-01	2.26325E 00	0.0	8.86704E-03	3.71253E-03	4.03615E-03	1.11837E-03	0.0
5	5.31223E 00	2.68469E 00	3.58335E-01	2.26224E 00	0.0	6.95479E-03	3.53996E-03	2.81047E-03	6.04360E-04	0.0
6	5.27644E 00	2.60638E 00	4.04965E-01	2.26016E 00	0.0	4.93563E-03	3.16995E-03	1.54349E-03	2.22202E-04	0.0
7	5.22874E 00	2.50414E 00	4.69013E-01	2.25248E 00	0.0	3.10217E-03	2.48101E-03	5.67152E-04	5.40088E-05	0.0
8	5.17025E 00	2.37418E 00	5.65250E-01	2.22921E 00	0.0	1.61696E-03	1.55404E-03	6.28466E-05	7.62325E-08	0.0
9	5.09930E 00	2.25951E 00	6.78225E-01	2.16062E 00	0.0	9.51344E-04	9.51344E-04	0.0	0.0	0.0
10	5.05007E 00	2.22628E 00	8.38737E-01	1.98431E 00	0.0	7.42199E-04	7.42199E-04	0.0	0.0	0.0
11	5.08413E 00	2.28458E 00	1.21296E 00	1.58578E 00	0.0	8.13111E-04	8.13111E-04	0.0	0.0	0.0
12	5.22865E 00	2.58391E 00	1.98619E 00	6.57354E-01	0.0	1.20624E-03	1.20624E-03	0.0	0.0	0.0
13	5.60727E 00	2.95560E 00	2.64556E 00	3.69169E-03	0.0	2.40619E-03	2.40619E-03	0.0	0.0	0.0
14	5.97946E 00	3.26425E 00	2.71163E 00	0.0	0.0	3.58104E-03	3.58104E-03	0.0	0.0	0.0
15	6.24612E 00	3.51069E 00	2.73078E 00	0.0	0.0	4.65620E-03	4.65620E-03	0.0	0.0	0.0
16	6.74735E 00	3.94635E 00	2.79302E 00	0.0	0.0	7.97276E-03	7.97276E-03	0.0	0.0	0.0
17	7.08743E 00	4.18552E 00	2.88697E 00	0.0	0.0	1.49309E-02	1.49309E-02	0.0	0.0	0.0
18	7.14414E 00	4.20125E 00	2.92302E 00	0.0	0.0	1.98706E-02	1.98706E-02	0.0	0.0	0.0
19	7.13050E 00	4.16993E 00	2.93608E 00	0.0	0.0	2.44872E-02	2.44872E-02	0.0	0.0	0.0
20	6.96716E 00	3.95279E 00	2.98013E 00	0.0	0.0	3.42473E-02	3.42473E-02	0.0	0.0	0.0
21	6.66784E 00	3.87537E 00	2.74759E 00	0.0	0.0	4.48782E-02	4.48782E-02	0.0	0.0	0.0
22	7.18155E 00	5.58516E 00	1.50640E 00	0.0	0.0	8.99864E-02	8.99864E-02	0.0	0.0	0.0
23	8.45632E 00	7.63569E 00	6.25365E-01	0.0	0.0	1.95268E-01	1.95268E-01	0.0	0.0	0.0
24	9.84123E 00	9.32157E 00	2.45715E-01	0.0	0.0	2.73954E-01	2.73954E-01	0.0	0.0	0.0
25	9.87290E 00	9.57872E 00	3.64021E-03	0.0	0.0	2.90543E-01	2.90543E-01	0.0	0.0	0.0
26	9.93294E 00	9.64726E 00	0.0	0.0	0.0	2.85675E-01	2.85675E-01	0.0	0.0	0.0
27	1.01851E 01	9.86467E 00	0.0	0.0	0.0	3.20413E-01	3.20413E-01	0.0	0.0	0.0
28	1.06532E 01	1.02214E 01	0.0	0.0	0.0	4.31779E-01	4.31779E-01	0.0	0.0	0.0
29	1.10620E 01	1.04235E 01	0.0	0.0	0.0	6.38438E-01	6.38438E-01	0.0	0.0	0.0
30	3.48234E 01	3.42687E 01	0.0	0.0	0.0	5.54669E-01	5.54669E-01	0.0	0.0	4.37222E 00
31	3.72147E 01	3.71463E 01	0.0	0.0	0.0	6.84405E-02	6.84405E-02	0.0	0.0	1.89015E 01
32	1.61667E 02	1.61526E 02	0.0	0.0	0.0	1.40301E-01	1.40301E-01	0.0	0.0	7.98101E 01
33	6.33054E 01	6.29091E 01	0.0	0.0	0.0	3.96329E-01	3.96329E-01	0.0	0.0	1.13433E 02
34	5.32246E 00	4.68241E 00	0.0	0.0	0.0	6.40047E-01	6.40047E-01	0.0	0.0	7.20313E 01
35	4.55976E 00	3.21506E 00	0.0	0.0	0.0	1.34470E 00	1.34470E 00	0.0	0.0	0.0
36	5.28321E 00	3.34078E 00	0.0	0.0	0.0	1.94243E 00	1.94243E 00	0.0	0.0	0.0
37	1.14030E 01	3.39725E 00	0.0	0.0	0.0	8.00577E 00	8.00577E 00	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.15527E 01	8.63434E-02	1.14664E 01	1.55169E 02
2	9.62137E 00	1.19852E-01	9.50152E 00	1.01924E 02
3	8.38608E 00	1.51087E-01	8.23500E 00	7.75907E 01
4	7.54179E 00	1.81890E-01	7.35991E 00	6.32580E 01
5	6.68188E 00	2.25958E-01	6.45592E 00	5.03504E 01
6	5.63261E 00	2.98297E-01	5.33431E 00	3.82815E 01
7	4.32979E 00	4.30158E-01	3.89963E 00	2.73295E 01
8	3.23479E 00	6.12726E-01	2.62206E 00	2.02673E 01
9	2.55769E 00	8.45692E-01	1.71200E 00	1.64212E 01
10	2.13011E 00	1.32100E 00	8.09114E-01	1.33990E 01
11	2.55331E 00	2.51695E 00	3.63612E-02	1.12764E 01
12	5.35487E 00	5.35487E 00	0.0	1.04306E 01
13	1.33332E 01	1.33332E 01	0.0	1.15549E 01
14	3.86282E 01	3.86282E 01	0.0	1.66853E 01
15	1.72536E 02	1.72536E 02	0.0	3.63875E 01
16	7.45058E 02	7.45058E 02	0.0	9.04786E 01
17	2.02999E 03	2.02999E 03	0.0	1.68318E 02
18	1.24131E 03	1.24131E 03	0.0	6.93039E 01
19	3.83832E 03	3.83832E 03	0.0	1.38727E 02
20	1.15999E 04	1.15999E 04	0.0	2.79559E 02
21	4.34287E 04	4.34287E 04	0.0	6.08984E 02

REACTION CROSS SECTIONS FOR W-184 DNA 4584/2 (1/E WT.)

IDENTIFICATION 4584

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,ALPHA)	ID CAPTURE
1	5.40156E 00	2.83514E 00	2.48038E-01	4.56786E-01	1.83578E 00	2.58108E-02	4.40479E-03	1.21971E-02	9.20899E-03	0.0
2	5.39397E 00	2.83085E 00	2.57207E-01	1.70051E 00	5.90236E-01	1.51695E-02	4.03667E-03	6.53845E-03	4.59433E-03	0.0
3	5.36216E 00	2.78245E 00	2.81997E-01	2.27792E 00	1.04644E-02	9.32715E-03	3.90171E-03	3.68220E-03	1.74324E-03	0.0
4	5.34212E 00	2.74647E 00	3.02035E-01	2.28192E 00	4.00077E-03	7.69183E-03	3.85248E-03	2.72116E-03	1.11819E-03	0.0
5	5.31109E 00	2.69038E 00	3.37005E-01	2.27752E 00	1.47969E-04	6.03624E-03	3.76078E-03	1.67161E-03	6.03853E-04	0.0
6	5.27546E 00	2.61522E 00	3.92194E-01	2.26359E 00	0.0	4.46539E-03	3.55465E-03	6.89052E-04	2.21699E-04	0.0
7	5.22896E 00	2.51378E 00	4.90793E-01	2.22108E 00	0.0	3.31349E-03	3.09975E-03	1.60009E-04	5.37265E-05	0.0
8	5.16888E 00	2.38398E 00	6.96176E-01	2.08642E 00	0.0	2.30358E-03	2.29977E-03	3.72654E-06	7.52708E-08	0.0
9	5.10349E 00	2.26367E 00	1.08234E 00	1.75594E 00	0.0	1.54302E-03	1.54302E-03	0.0	0.0	0.0
10	5.06108E 00	2.24108E 00	1.72399E 00	1.09480E 00	0.0	1.20205E-03	1.20205E-03	0.0	0.0	0.0
11	5.10882E 00	2.29583E 00	2.56514E 00	2.46591E-01	0.0	1.27218E-03	1.27218E-03	0.0	0.0	0.0
12	5.28394E 00	2.44350E 00	2.83859E 00	0.0	0.0	1.85068E-03	1.85068E-03	0.0	0.0	0.0
13	5.73211E 00	2.86975E 00	2.85869E 00	0.0	0.0	3.67603E-03	3.67603E-03	0.0	0.0	0.0
14	6.12775E 00	3.25671E 00	2.86556E 00	0.0	0.0	5.47087E-03	5.47087E-03	0.0	0.0	0.0
15	6.35048E 00	3.46543E 00	2.87795E 00	0.0	0.0	7.11035E-03	7.11035E-03	0.0	0.0	0.0
16	6.74317E 00	3.83559E 00	2.89538E 00	0.0	0.0	1.22051E-02	1.22051E-02	0.0	0.0	0.0
17	7.06955E 00	4.13003E 00	2.91738E 00	0.0	0.0	2.21480E-02	2.21480E-02	0.0	0.0	0.0
18	7.17777E 00	4.21628E 00	2.93303E 00	0.0	0.0	2.84565E-02	2.84565E-02	0.0	0.0	0.0
19	7.23918E 00	4.30652E 00	2.89908E 00	0.0	0.0	3.35770E-02	3.35770E-02	0.0	0.0	0.0
20	7.24466E 00	4.57765E 00	2.61892E 00	0.0	0.0	4.80911E-02	4.80911E-02	0.0	0.0	0.0
21	6.86194E 00	4.91879E 00	1.88559E 00	0.0	0.0	5.75619E-02	5.75619E-02	0.0	0.0	0.0
22	7.09838E 00	6.18012E 00	8.49002E-01	0.0	0.0	6.92617E-02	6.92617E-02	0.0	0.0	0.0
23	8.35636E 00	8.11153E 00	1.22289E-01	0.0	0.0	1.22543E-01	1.22543E-01	0.0	0.0	0.0
24	8.46076E 00	8.35985E 00	0.0	0.0	0.0	1.00906E-01	1.00906E-01	0.0	0.0	0.0
25	9.13210E 00	9.04256E 00	0.0	0.0	0.0	8.95441E-02	8.95441E-02	0.0	0.0	0.0
26	9.52334E 00	9.43263E 00	0.0	0.0	0.0	9.07171E-02	9.07171E-02	0.0	0.0	0.0
27	9.75732E 00	9.66037E 00	0.0	0.0	0.0	9.69421E-02	9.69421E-02	0.0	0.0	0.0
28	1.01488E 01	1.00284E 01	0.0	0.0	0.0	1.20463E-01	1.20463E-01	0.0	0.0	0.0
29	3.21718E 01	3.21097E 01	0.0	0.0	0.0	6.21641E-02	6.21641E-02	0.0	0.0	1.41355E 00
30	5.12959E 01	5.12607E 01	0.0	0.0	0.0	3.51520E-02	3.51520E-02	0.0	0.0	3.17609E 00
31	7.80033E 01	7.79779E 01	0.0	0.0	0.0	2.54440E-02	2.54440E-02	0.0	0.0	5.92653E 00
32	3.40339E 00	3.38184E 00	0.0	0.0	0.0	4.15506E-02	4.15506E-02	0.0	0.0	1.44300E-02
33	4.05527E 00	4.01018E 00	0.0	0.0	0.0	4.50973E-02	4.50973E-02	0.0	0.0	0.0
34	4.26795E 00	4.17943E 00	0.0	0.0	0.0	8.85144E-02	8.85144E-02	0.0	0.0	0.0
35	4.42834E 00	4.24755E 00	0.0	0.0	0.0	1.80795E-01	1.80795E-01	0.0	0.0	0.0
36	4.59354E 00	4.27090E 00	0.0	0.0	0.0	3.22645E-01	3.22645E-01	0.0	0.0	0.0
37	5.67631E 00	4.27729E 00	0.0	0.0	0.0	1.39902E 00	1.39902E 00	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DE
1	1.15527E 01	8.63434E-02	1.14664E 01	1.55169E 02
2	9.62137E 00	1.19852E-01	9.50152E 00	1.01924E 02
3	8.38608E 00	1.51087E-01	8.23500E 00	7.75907E 01
4	7.54179E 00	1.81890E-01	7.35991E 00	6.32580E 01
5	6.68188E 00	2.25958E-01	6.45592E 00	5.03504E 01
6	5.63261E 00	2.98297E-01	5.33431E 00	3.82815E 01
7	4.32979E 00	4.30158E-01	3.89963E 00	2.73295E 01
8	3.23479E 00	6.12726E-01	2.62206E 00	2.02673E 01
9	2.55769E 00	8.45692E-01	1.71200E 00	1.64212E 01
10	2.13011E 00	1.32100E 00	8.09114E-01	1.33990E 01
11	2.55331E 00	2.51695E 00	3.63612E-02	1.12764E 01
12	5.35487E 00	5.35487E 00	0.0	1.04306E 01
13	1.33332E 01	1.33332E 01	0.0	1.15549E 01
14	3.86282E 01	3.86282E 01	0.0	1.66853E 01
15	1.72536E 02	1.72536E 02	0.0	3.63875E 01
16	7.45058E 02	7.45058E 02	0.0	9.04786E 01
17	2.02999E 03	2.02999E 03	0.0	1.68318E 02
18	1.24131E 03	1.24131E 03	0.0	6.93039E 01
19	3.83832E 03	3.83832E 03	0.0	1.38727E 02
20	1.15999E 04	1.15999E 04	0.0	2.79559E 02
21	4.34287E 04	4.34287E 04	0.0	6.08984E 02

REACTION CROSS SECTIONS FOR W-186 DNA 4586/2 (1/E WT.) IDENTIFICATION 4586

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION	(N,GAMMA)	(N,P)	(N,ALPHA)	ID CAPT
1	5.40209E 00	2.82798E 00	2.04071E-01	2.67296E-01	2.07869E 00	2.40472E-02	4.49881E-03	1.03394E-02	9.20899E-03	0.0
2	5.39472E 00	2.82548E 00	2.10316E-01	1.23138E 00	1.11406E 00	1.34900E-02	4.13286E-03	4.76277E-03	4.59433E-03	0.0
3	5.36051E 00	2.77788E 00	2.31256E-01	2.22157E 00	1.21779E-01	8.02489E-03	4.00453E-03	2.27711E-03	1.74324E-03	0.0
4	5.34154E 00	2.74328E 00	2.50386E-01	2.32310E 00	1.82195E-02	6.55064E-03	3.95826E-03	1.47419E-03	1.11819E-03	0.0
5	5.31055E 00	2.68689E 00	2.83645E-01	2.32885E 00	5.99266E-03	5.17922E-03	3.86919E-03	7.06420E-04	6.03609E-04	0.0
6	5.27562E 00	2.60945E 00	3.36065E-01	2.32605E 00	0.0	4.05451E-03	3.66336E-03	1.69447E-04	2.21704E-04	0.0
7	5.23103E 00	2.50494E 00	4.28376E-01	2.29446E 00	0.0	3.25380E-03	3.18239E-03	1.76770E-05	5.37265E-05	0.0
8	5.17047E 00	2.38874E 00	5.87164E-01	2.19224E 00	0.0	2.32376E-03	2.32368E-03	0.0	7.52708E-08	0.0
9	5.08995E 00	2.25458E 00	9.04677E-01	1.92917E 00	0.0	1.52723E-03	1.52723E-03	0.0	0.0	0.0
10	5.03834E 00	2.30029E 00	1.37688E 00	1.36001E 00	0.0	1.16580E-03	1.16580E-03	0.0	0.0	0.0
11	5.10398E 00	2.43657E 00	2.19051E 00	4.75678E-01	0.0	1.22624E-03	1.22624E-03	0.0	0.0	0.0
12	5.28285E 00	2.47229E 00	2.80376E 00	5.01514E-03	0.0	1.78108E-03	1.78108E-03	0.0	0.0	0.0
13	5.69210E 00	2.84778E 00	2.84079E 00	0.0	0.0	3.53815E-03	3.53815E-03	0.0	0.0	0.0
14	6.08919E 00	3.23659E 00	2.84734E 00	0.0	0.0	5.25925E-03	5.25925E-03	0.0	0.0	0.0
15	6.35298E 00	3.49638E 00	2.84978E 00	0.0	0.0	6.82768E-03	6.82768E-03	0.0	0.0	0.0
16	6.82258E 00	3.94988E 00	2.86087E 00	0.0	0.0	1.18315E-02	1.18315E-02	0.0	0.0	0.0
17	7.16604E 00	4.27183E 00	2.87377E 00	0.0	0.0	2.04411E-02	2.04411E-02	0.0	0.0	0.0
18	7.26286E 00	4.35996E 00	2.87740E 00	0.0	0.0	2.54989E-02	2.54989E-02	0.0	0.0	0.0
19	7.30226E 00	4.41836E 00	2.85371E 00	0.0	0.0	3.01849E-02	3.01849E-02	0.0	0.0	0.0
20	7.25676E 00	4.59651E 00	2.62000E 00	0.0	0.0	4.02481E-02	4.02481E-02	0.0	0.0	0.0
21	6.82933E 00	5.04401E 00	1.73493E 00	0.0	0.0	5.03862E-02	5.03862E-02	0.0	0.0	0.0
22	7.05420E 00	6.19647E 00	7.94658E-01	0.0	0.0	6.30735E-02	6.30735E-02	0.0	0.0	0.0
23	8.38737E 00	8.19246E 00	9.28411E-02	0.0	0.0	1.02067E-01	1.02067E-01	0.0	0.0	0.0
24	8.44267E 00	8.36645E 00	0.0	0.0	0.0	7.62203E-02	7.62203E-02	0.0	0.0	0.0
25	9.07354E 00	9.00680E 00	0.0	0.0	0.0	6.67449E-02	6.67449E-02	0.0	0.0	0.0
26	9.45980E 00	9.39264E 00	0.0	0.0	0.0	6.71598E-02	6.71598E-02	0.0	0.0	0.0
27	9.66647E 00	9.59614E 00	0.0	0.0	0.0	7.03353E-02	7.03353E-02	0.0	0.0	0.0
28	1.00342E 01	9.95037E 00	0.0	0.0	0.0	8.38495E-02	8.38495E-02	0.0	0.0	0.0
29	2.13827E 01	2.13365E 01	0.0	0.0	0.0	4.62420E-02	4.62420E-02	0.0	0.0	8.29620E
30	4.85301E 01	4.84886E 01	0.0	0.0	0.0	4.14693E-02	4.14693E-02	0.0	0.0	3.34992E
31	3.43307E 01	3.42870E 01	0.0	0.0	0.0	4.37441E-02	4.37441E-02	0.0	0.0	6.31052E
32	1.81157E 01	1.80864E 01	0.0	0.0	0.0	2.92605E-02	2.92605E-02	0.0	0.0	5.88689E
33	2.74566E 03	2.74564E 03	0.0	0.0	0.0	1.95211E-02	1.95211E-02	0.0	0.0	4.82404E
34	8.50162E 00	4.52796E 00	0.0	0.0	0.0	3.97366E 00	3.97366E 00	0.0	0.0	1.72516E
35	6.09844E 00	6.64991E-01	0.0	0.0	0.0	5.43345E 00	5.43345E 00	0.0	0.0	0.0
36	8.17745E 00	3.55006E-01	0.0	0.0	0.0	7.82244E 00	7.82244E 00	0.0	0.0	0.0
37	3.03415E 01	2.46185E-01	0.0	0.0	0.0	3.00953E 01	3.00953E 01	0.0	0.0	0.0

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.15527E 01	8.63434E-02	1.14664E 01	1.55169E 02
2	9.62137E 00	1.19852E-01	9.50152E 00	1.01924E 02
3	8.38608E 00	1.51087E-01	8.23500E 00	7.75907E 01
4	7.54179E 00	1.81890E-01	7.35991E 00	6.32580E 01
5	6.68188E 00	2.25958E-01	6.45592E 00	5.03504E 01
6	5.63261E 00	2.98297E-01	5.33431E 00	3.82815E 01
7	4.32979E 00	4.30158E-01	3.89963E 00	2.73295E 01
8	3.23479E 00	6.12726E-01	2.62206E 00	2.02673E 01
9	2.55769E 00	8.45692E-01	1.71200E 00	1.64212E 01
10	2.13011E 00	1.32100E 00	8.09114E-01	1.33990E 01
11	2.55331E 00	2.51695E 00	3.63612E-02	1.12764E 01
12	5.35487E 00	5.35487E 00	0.0	1.04306E 01
13	1.33332E 01	1.33332E 01	0.0	1.15549E 01
14	3.86282E 01	3.86282E 01	0.0	1.66853E 01
15	1.72536E 02	1.72536E 02	0.0	3.63875E 01
16	7.45058E 02	7.45058E 02	0.0	9.04786E 01
17	2.02999E 03	2.02999E 03	0.0	1.68318E 02
18	1.24131E 03	1.24131E 03	0.0	6.93039E 01
19	3.83832E 03	3.83832E 03	0.0	1.38727E 02
20	1.15999E 04	1.15999E 04	0.0	2.79559E 02
21	4.34287E 04	4.34287E 04	0.0	6.08984E 02

REACTION CROSS SECTIONS FOR LEAD DNA 4136/5 (1/E WT.) IDENTIFICATION 4136

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	ABSORPTION
1	5.87824E 00	3.37317E 00	3.09821E-01	3.16876E-01	1.87823E 00	1.43912E-04
2	5.64504E 00	3.16294E 00	3.26480E-01	1.16580E 00	9.89647E-01	1.66885E-04
3	5.42713E 00	2.93616E 00	3.37831E-01	2.03007E 00	1.22885E-01	1.83303E-04
4	5.34086E 00	2.84690E 00	3.43993E-01	2.14971E 00	7.19839E-05	1.90857E-04
5	5.30084E 00	2.80518E 00	3.53950E-01	2.14150E 00	0.0	2.01502E-04
6	5.22528E 00	2.73653E 00	3.74929E-01	2.11360E 00	0.0	2.15530E-04
7	5.17345E 00	2.69799E 00	4.25947E-01	2.04928E 00	0.0	2.33783E-04
8	5.14734E 00	2.67172E 00	6.18380E-01	1.85699E 00	0.0	2.60435E-04
9	5.15393E 00	2.68765E 00	1.03691E 00	1.42908E 00	0.0	2.90127E-04
10	5.28034E 00	2.79397E 00	1.74757E 00	7.38476E-01	0.0	3.23203E-04
11	5.52930E 00	3.04911E 00	2.24766E 00	2.32172E-01	0.0	3.60050E-04
12	5.95362E 00	3.46416E 00	2.45808E 00	3.09659E-02	0.0	4.12318E-04
13	6.87219E 00	4.40796E 00	2.46372E 00	0.0	0.0	5.12676E-04
14	7.56772E 00	5.09208E 00	2.47504E 00	0.0	0.0	6.01049E-04
15	7.67180E 00	5.41974E 00	2.25139E 00	0.0	0.0	6.70219E-04
16	7.80692E 00	6.23716E 00	1.56890E 00	0.0	0.0	8.57313E-04
17	7.34366E 00	6.45161E 00	8.90909E-01	0.0	0.0	1.14132E-03
18	7.02418E 00	6.33861E 00	6.84258E-01	0.0	0.0	1.31461E-03
19	6.09555E 00	5.49363E 00	6.00393E-01	0.0	0.0	1.52212E-03
20	5.31136E 00	4.93877E 00	3.70307E-01	0.0	0.0	2.28286E-03
21	5.29634E 00	5.19626E 00	9.62901E-02	0.0	0.0	3.78554E-03
22	7.11919E 00	7.11505E 00	0.0	0.0	0.0	4.13655E-03
23	9.78616E 00	9.78191E 00	0.0	0.0	0.0	4.25433E-03
24	1.11635E 01	1.11604E 01	0.0	0.0	0.0	3.07118E-03
25	1.11141E 01	1.11094E 01	0.0	0.0	0.0	4.68147E-03
26	1.00958E 01	1.00934E 01	0.0	0.0	0.0	2.35331E-03
27	1.09220E 01	1.09181E 01	0.0	0.0	0.0	3.94834E-03
28	1.12781E 01	1.12743E 01	0.0	0.0	0.0	3.81380E-03
29	1.13446E 01	1.13414E 01	0.0	0.0	0.0	3.20186E-03
30	1.12008E 01	1.11998E 01	0.0	0.0	0.0	9.75707E-04
31	1.11986E 01	1.11967E 01	0.0	0.0	0.0	1.87472E-03
32	1.11984E 01	1.11945E 01	0.0	0.0	0.0	3.90784E-03
33	1.12010E 01	1.11941E 01	0.0	0.0	0.0	6.81861E-03
34	1.12061E 01	1.11941E 01	0.0	0.0	0.0	1.20370E-02
35	1.12150E 01	1.11940E 01	0.0	0.0	0.0	2.10026E-02
36	1.12286E 01	1.11940E 01	0.0	0.0	0.0	3.46272E-02
37	1.13361E 01	1.11935E 01	0.0	0.0	0.0	1.42638E-01

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.38949E 01	1.38995E-01	1.37559E 01	1.84046E 02
2	1.16260E 01	1.93633E-01	1.14323E 01	1.20717E 02
3	1.01852E 01	2.43801E-01	9.94136E 00	9.18441E 01
4	9.20140E 00	2.93227E-01	8.90817E 00	7.48210E 01
5	8.20168E 00	3.63853E-01	7.83783E 00	5.94858E 01
6	7.01530E 00	4.81204E-01	6.53410E 00	4.52666E 01
7	5.54601E 00	6.97729E-01	4.84828E 00	3.23685E 01
8	4.30275E 00	1.00013E 00	3.30262E 00	2.40293E 01
9	3.57207E 00	1.39041E 00	2.18166E 00	1.95637E 01
10	3.22805E 00	2.17695E 00	1.05110E 00	1.61986E 01
11	4.18019E 00	4.13304E 00	4.71531E-02	1.41371E 01
12	8.75542E 00	8.75542E 00	0.0	1.39044E 01
13	2.14943E 01	2.14943E 01	0.0	1.65306E 01
14	6.06348E 01	6.06348E 01	0.0	2.49648E 01
15	2.57521E 02	2.57521E 02	0.0	5.39139E 01
16	1.06105E 03	1.06105E 03	0.0	1.28794E 02
17	1.25812E 03	1.25812E 03	0.0	1.11677E 02
18	1.80630E 03	1.80600E 03	0.0	9.95759E 01
19	5.70889E 03	5.70889E 03	0.0	2.06454E 02
20	1.69434E 04	1.69434E 04	0.0	4.08519E 02
21	3.84208E 04	3.84208E 04	0.0	5.78363E 02

ONE DIMENSION AVERAGES FOR U-235 MAT 4188,M1 37N-21G P3 T=300K INF DIL IDENTIFIER 4188

XSEC GRP.	ID	TOTAL	ELASTIC	(n,n') GAMMA	(n,2n)	(n,F)	(n,3n)	(n,4n)	ABSORPTION
1		6.01306E 00	3.33440E 00	1.72771E-01	2.32567E-01	2.10159E 00	1.33625E-01	3.55816E-02	2.10412E 00
2		5.90002E 00	3.12751E 00	5.03266E-01	2.76052E-01	2.17805E 00	1.11908E-01	0.0	2.18128E 00
3		5.82092E 00	3.00412E 00	5.33811E-01	3.13438E-01	2.17041E 00	9.55009E-02	0.0	2.17405E 00
4		5.87695E 00	2.99057E 00	5.93268E-01	3.73274E-01	2.14168E 00	7.43695E-02	0.0	2.14548E 00
5		5.82999E 00	2.98016E 00	5.78315E-01	4.58111E-01	1.96474E 00	4.46669E-02	0.0	1.96674E 00
6		5.80340E 00	2.97318E 00	4.71621E-01	5.43517E-01	1.79866E 00	1.21614E-02	0.0	1.80293E 00
7		5.76233E 00	2.96039E 00	5.13404E-01	5.88553E-01	1.69537E 00	3.00975E-06	0.0	1.69989E 00
8		5.80691E 00	2.97663E 00	5.32509E-01	6.04998E-01	1.68794E 00	0.0	0.0	1.69278E 00
9		5.92477E 00	3.02474E 00	5.37387E-01	5.85620E-01	1.77155E 00	0.0	0.0	1.77703E 00
10		6.14323E 00	3.19544E 00	6.22244E-01	5.26786E-01	1.79238E 00	0.0	0.0	1.79877E 00
11		6.51090E 00	3.49607E 00	8.72506E-01	4.34551E-01	1.70056E 00	0.0	0.0	1.70777E 00
12		6.95088E 00	3.83031E 00	1.36201E 00	2.93670E-01	1.45676E 00	0.0	0.0	1.46489E 00
13		7.29865E 00	4.27060E 00	1.89194E 00	1.83002E-02	1.10844E 00	0.0	0.0	1.11781E 00
14		7.60787E 00	4.53461E 00	1.96470E 00	0.0	1.09777E 00	0.0	0.0	1.10856E 00
15		7.76044E 00	4.64897E 00	1.97819E 00	0.0	1.12021E 00	0.0	0.0	1.13328E 00
16		7.84265E 00	4.65270E 00	1.99399E 00	0.0	1.17852E 00	0.0	0.0	1.19596E 00
17		7.64421E 00	4.39055E 00	1.97915E 00	0.0	1.24404E 00	0.0	0.0	1.27451E 00
18		7.41792E 00	4.17685E 00	1.93308E 00	0.0	1.26618E 00	0.0	0.0	1.30798E 00
19		7.13976E 00	3.95753E 00	1.86229E 00	0.0	1.26855E 00	0.0	0.0	1.31995E 00
20		6.70168E 00	3.73870E 00	1.65724E 00	0.0	1.22909E 00	0.0	0.0	1.30574E 00
21		6.88139E 00	4.28647E 00	1.32786E 00	0.0	1.14225E 00	0.0	0.0	1.26707E 00
22		9.12579E 00	6.72776E 00	8.44737E-01	0.0	1.29992E 00	0.0	0.0	1.55329E 00
23		1.16144E 01	9.18600E 00	5.01858E-01	0.0	1.52478E 00	0.0	0.0	1.92655E 00
24		1.25804E 01	1.00188E 01	3.38123E-01	0.0	1.65461E 00	0.0	0.0	2.22350E 00
25		1.32551E 01	1.04124E 01	1.40523E-01	0.0	1.91314E 00	0.0	0.0	2.70222E 00
26		1.37945E 01	1.06667E 01	2.74998E-02	0.0	2.18473E 00	0.0	0.0	3.10035E 00
27		1.42082E 01	1.08605E 01	9.19208E-04	0.0	2.32740E 00	0.0	0.0	3.34684E 00
28		1.61454E 01	1.09959E 01	0.0	0.0	3.89162E 00	0.0	0.0	5.14955E 00
29		1.95070E 01	1.10000E 01	0.0	0.0	6.10049E 00	0.0	0.0	8.50704E 00
30		2.59863E 01	1.10000E 01	0.0	0.0	9.17762E 00	0.0	0.0	1.49862E 01
31		3.93075E 01	1.13375E 01	0.0	0.0	1.61839E 01	0.0	0.0	2.79700E 01
32		7.10005E 01	1.26265E 01	0.0	0.0	3.85701E 01	0.0	0.0	5.83740E 01
33		1.01097E 02	1.23277E 01	0.0	0.0	4.92855E 01	0.0	0.0	8.87695E 01
34		7.53203E 01	1.12151E 01	0.0	0.0	3.74900E 01	0.0	0.0	6.41052E 01
35		4.37271E 01	1.20526E 01	0.0	0.0	2.20309E 01	0.0	0.0	3.06745E 01
36		9.98505E 01	1.35258E 01	0.0	0.0	7.48193E 01	0.0	0.0	8.43247E 01
37		5.58148E 02	1.49489E 01	0.0	0.0	4.62613E 02	0.0	0.0	5.43199E 02

XSEC GRP.	ID	CAPTURE	(n,GAMMA)	$\bar{\nu}$	GROUP FLUX	χ(E)
1		2.52813E-03	2.52813E-03	5.05212E 00	1.49959E-01	0.0
2		3.23160E-03	3.23160E-03	4.72465E 00	1.25040E-01	0.0
3		3.63431E-03	3.63431E-03	4.53315E 00	4.99605E-02	0.0
4		3.79568E-03	3.79568E-03	4.45134E 00	2.50450E-02	0.0
5		4.00003E-03	4.00003E-03	4.33932E 00	7.49975E-02	0.0
6		4.24318E-03	4.24318E-03	4.20507E 00	4.99824E-02	1.31763E-07
7		4.51460E-03	4.51460E-03	4.05535E 00	9.99714E-02	2.89453E-04
8		4.84731E-03	4.84731E-03	3.90192E 00	1.00026E-01	7.94293E-04
9		5.48157E-03	5.48157E-03	3.80146E 00	9.99970E-02	1.47322E-03
10		6.38846E-03	6.38846E-03	3.70870E 00	1.00004E-01	2.54385E-03
11		7.20791E-03	7.20791E-03	3.60650E 00	9.99966E-02	4.11372E-03
12		8.12517E-03	8.12517E-03	3.45257E 00	1.49999E-01	1.03819E-02
13		9.36436E-03	9.36436E-03	3.20449E 00	2.49993E-01	3.35737E-02
14		1.07831E-02	1.07831E-02	3.06263E 00	5.00021E-02	9.73139E-03
15		1.30626E-02	1.30626E-02	2.98548E 00	1.50006E-01	3.58529E-02
16		1.74335E-02	1.74335E-02	2.85057E 00	3.00015E-01	1.00601E-01
17		3.04693E-02	3.04693E-02	2.74373E 00	2.33288E-01	9.87920E-02
18		4.17989E-02	4.17989E-02	2.70147E 00	3.33783E-02	1.50640E-02
19		5.13954E-02	5.13954E-02	2.66712E 00	2.33339E-01	1.07502E-01
20		7.66562E-02	7.66562E-02	2.59302E 00	5.00009E-01	2.14474E-01
21		1.24816E-01	1.24816E-01	2.51559E 00	6.99975E-01	2.02721E-01
22		2.53363E-01	2.53363E-01	2.45656E 00	1.25002E 00	1.32565E-01
23		4.01768E-01	4.01768E-01	2.43591E 00	3.49973E-01	1.17423E-02
24		5.68896E-01	5.68896E-01	2.42926E 00	7.50003E-01	1.19464E-02
25		7.89082E-01	7.89082E-01	2.42436E 00	7.49977E-01	4.01461E-03
26		9.15612E-01	9.15612E-01	2.42279E 00	1.25015E-01	3.33026E-04
27		1.01945E 00	1.01945E 00	2.42182E 00	7.50001E-01	1.09198E-03
28		1.25793E 00	1.25793E 00	2.42071E 00	1.12501E 00	3.61063E-04
29		2.40655E 00	2.40655E 00	2.42024E 00	9.99990E-01	3.57288E-05
30		5.80862E 00	5.80862E 00	2.42011E 00	7.49995E-01	4.04249E-06
31		9.78617E 00	9.78617E 00	2.42015E 00	1.75001E 00	8.95456E-07
32		1.98039E 01	1.98039E 01	2.42006E 00	1.25000E 00	1.09503E-11
33		3.94840E 01	3.94840E 01	2.42003E 00	9.99996E-01	0.0
34		2.66152E 01	2.66152E 01	2.42001E 00	1.25000E 00	0.0
35		8.64359E 00	8.64359E 00	2.42001E 00	9.99949E-01	0.0
36		9.50547E 00	9.50547E 00	2.42000E 00	1.00003E 00	0.0
37		8.05869E 01	8.05869E 01	2.41998E 00	6.85856E 00	0.0

PHOTON INTERACTION CROSS SECTIONS FOR U-235

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.69618E 01	2.44171E-01	1.67176E 01	2.21710E 02
2	8.00000E 00	1.00000E 01	1.43188E 01	3.38776E-01	1.39801E 01	1.45739E 02
3	7.00000E 00	8.00000E 00	1.26919E 01	4.26725E-01	1.22652E 01	1.11396E 02
4	6.00000E 00	7.00000E 00	1.15804E 01	5.13416E-01	1.10670E 01	9.10218E 01
5	5.00000E 00	6.00000E 00	1.04537E 01	6.37337E-01	9.81639E 00	7.25822E 01
6	4.00000E 00	5.00000E 00	9.09660E 00	8.44786E-01	8.25182E 00	5.53674E 01
7	3.00000E 00	4.00000E 00	7.42790E 00	1.23053E 00	6.19737E 00	3.97611E 01
8	2.50000E 00	3.00000E 00	6.05246E 00	1.76095E 00	4.29151E 00	2.97298E 01
9	2.00000E 00	2.50000E 00	5.30622E 00	2.42591E 00	2.88031E 00	2.44240E 01
10	1.50000E 00	2.00000E 00	5.20748E 00	3.78935E 00	1.41813E 00	2.06840E 01
11	1.00000E 00	1.50000E 00	7.30074E 00	7.23740E 00	6.33391E-02	1.90331E 01
12	7.00000E-01	1.00000E 00	1.51450E 01	1.51450E 01	0.0	2.00349E 01
13	4.50000E-01	7.00000E-01	3.57999E 01	3.57999E 01	0.0	2.50465E 01
14	3.00000E-01	4.50000E-01	9.69290E 01	9.69290E 01	0.0	3.85241E 01
15	1.50000E-01	3.00000E-01	3.95265E 02	3.95265E 02	0.0	8.22191E 01
16	9.99999E-02	1.50000E-01	1.08859E 03	1.08859E 03	0.0	1.39336E 02
17	6.99999E-02	9.99999E-02	1.03455E 03	1.03455E 03	0.0	8.59487E 01
18	4.50000E-02	6.99999E-02	3.03236E 03	3.03236E 03	0.0	1.67301E 02
19	3.00000E-02	4.50000E-02	9.18505E 03	9.18505E 03	0.0	3.32613E 02
20	2.00000E-02	3.00000E-02	2.39695E 04	2.39695E 04	0.0	5.85825E 02
21	9.99999E-03	2.00000E-02	3.37333E 04	3.37333E 04	0.0	4.82875E 02

REACTION CROSS SECTIONS FOR U-238 DNA 4187/1 (1/E WT.) IDENTIFICATION 4187

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	SUM FISSION	ABSORPTION	CAPTURE	NU	CHI
1	5.92839E 00	3.12410E 00	3.00006E-01	2.38186E-01	8.97852E-01	1.36589E 00	1.36825E 00	2.35160E-03	4.97102E 00	0.0
2	5.96781E 00	3.08868E 00	3.00004E-01	4.25683E-01	8.30878E-01	1.31975E 00	1.32257E 00	2.82144E-03	4.66122E 00	0.0
3	5.96221E 00	3.06626E 00	3.00554E-01	7.51839E-01	6.10692E-01	1.22967E 00	1.23286E 00	3.19042E-03	4.48373E 00	0.0
4	5.91719E 00	3.05427E 00	3.02785E-01	8.93530E-01	5.08423E-01	1.15476E 00	1.15818E 00	3.42206E-03	4.41124E 00	0.0
5	5.87437E 00	3.03723E 00	3.05999E-01	1.07220E 00	3.78698E-01	1.07654E 00	1.08025E 00	3.71189E-03	4.32576E 00	0.0
6	5.84648E 00	3.01478E 00	3.14041E-01	1.27925E 00	2.23902E-01	1.01044E 00	1.01450E 00	4.06051E-03	4.21995E 00	5.85898E-07
7	5.82435E 00	3.00502E 00	3.60267E-01	1.44023E 00	4.15166E-02	9.72873E-01	9.77323E-01	4.44639E-03	4.08496E 00	5.43594E-04
8	5.82380E 00	2.91861E 00	3.70007E-01	1.57292E 00	0.0	9.57337E-01	9.62259E-01	4.92207E-03	3.90014E 00	1.27725E-03
9	5.94347E 00	3.03434E 00	3.64264E-01	1.57164E 00	0.0	9.67870E-01	9.73222E-01	5.35224E-03	3.74719E 00	2.21513E-03
10	6.21986E 00	3.35931E 00	4.65608E-01	1.42004E 00	0.0	9.69157E-01	9.74898E-01	5.74126E-03	3.63137E 00	3.60660E-03
11	6.53468E 00	3.67490E 00	7.55098E-01	1.14342E 00	0.0	9.54885E-01	9.61259E-01	6.37314E-03	3.52414E 00	5.50937E-03
12	6.90858E 00	4.02900E 00	1.59941E 00	4.18464E-01	0.0	8.53845E-01	8.61711E-01	7.86589E-03	3.40134E 00	1.30794E-02
13	7.40764E 00	4.44459E 00	2.39745E 00	4.08822E-08	0.0	5.55665E-01	5.65602E-01	9.93712E-03	3.19549E 00	3.91264E-02
14	7.73785E 00	4.72388E 00	2.48061E 00	0.0	0.0	5.21268E-01	5.33364E-01	1.20960E-02	3.05597E 00	1.08586E-02
15	7.92364E 00	4.88463E 00	2.50159E 00	0.0	0.0	5.22132E-01	5.37422E-01	1.52894E-02	2.98115E 00	3.89613E-02
16	8.13981E 00	5.00950E 00	2.58511E 00	0.0	0.0	5.23782E-01	5.45192E-01	2.14107E-02	2.83711E 00	1.04220E-01
17	7.99640E 00	4.76177E 00	2.66498E 00	0.0	0.0	5.35245E-01	5.69652E-01	3.44064E-02	2.70091E 00	9.83450E-02
18	7.82580E 00	4.55956E 00	2.67791E 00	0.0	0.0	5.43701E-01	5.88323E-01	4.46217E-02	2.64872E 00	1.47974E-02
19	7.64182E 00	4.39533E 00	2.65416E 00	0.0	0.0	5.38049E-01	5.92329E-01	5.42802E-02	2.60954E 00	1.04614E-01
20	6.85896E 00	4.37235E 00	2.13586E 00	0.0	0.0	2.38291E-01	3.50748E-01	1.12457E-01	2.54462E 00	2.05689E-01
21	7.71096E 00	5.84595E 00	1.71153E 00	0.0	0.0	8.04089E-03	1.53480E-01	1.45440E-01	2.45075E 00	1.96166E-01
22	9.90383E 00	8.69065E 00	1.06965E 00	0.0	0.0	6.67602E-05	1.43526E-01	1.43459E-01	2.39070E 00	1.32458E-01
23	1.10947E 01	1.05890E 01	3.11078E-01	0.0	0.0	0.0	1.94611E-01	1.94611E-01	0.0	1.16526E-02
24	1.21601E 01	1.18504E 01	7.72346E-02	0.0	0.0	0.0	2.32440E-01	2.32440E-01	0.0	1.15617E-02
25	1.33784E 01	1.29804E 01	1.97601E-04	0.0	0.0	0.0	3.97790E-01	3.97790E-01	0.0	3.71224E-03
26	1.37472E 01	1.32467E 01	0.0	0.0	0.0	0.0	5.00520E-01	5.00520E-01	0.0	2.99058E-04
27	1.40050E 01	1.33940E 01	0.0	0.0	0.0	0.0	6.11045E-01	6.11045E-01	0.0	9.62510E-04
28	1.45249E 01	1.36475E 01	0.0	0.0	0.0	0.0	8.77442E-01	8.77442E-01	0.0	3.12602E-04
29	2.04792E 01	1.88933E 01	0.0	0.0	0.0	0.0	1.58595E 00	1.58595E 00	0.0	3.18679E-05
30	2.55059E 01	2.25060E 01	0.0	0.0	0.0	0.0	2.99992E 00	2.99992E 00	0.0	3.87502E-06
31	5.16600E 01	4.01075E 01	0.0	0.0	0.0	0.0	1.15525E 01	1.15525E 01	0.0	1.07937E-06
32	1.04397E 02	5.99916E 01	0.0	0.0	0.0	0.0	4.44056E 01	4.44056E 01	0.0	3.08495E-08
33	8.93874E 01	2.82995E 01	0.0	0.0	0.0	0.0	6.10879E 01	6.10879E 01	0.0	2.38539E-09
34	1.18419E 02	1.44330E 01	0.0	0.0	0.0	0.0	1.03986E 02	1.03986E 02	0.0	3.42710E-10
35	8.28425E 00	7.73726E 00	0.0	0.0	0.0	0.0	5.46986E-01	5.46986E-01	0.0	2.64987E-11
36	8.51056E 00	7.87249E 00	0.0	0.0	0.0	0.0	6.38069E-01	6.38069E-01	0.0	3.58666E-12
37	1.01423E 01	7.88515E 00	0.0	0.0	0.0	0.0	2.25716E 00	2.25716E 00	0.0	5.61341E-13

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.69618E 01	2.44171E-01	1.67176E 01	2.21710E 02
2	1.43188E 01	3.38776E-01	1.39801E 01	1.45739E 02
3	1.26919E 01	4.26725E-01	1.22652E 01	1.11396E 02
4	1.15804E 01	5.13416E-01	1.10670E 01	9.10218E 01
5	1.04537E 01	6.37336E-01	9.81637E 00	7.25822E 01
6	9.09659E 00	8.44786E-01	8.25181E 00	5.53674E 01
7	7.42788E 00	1.23053E 00	6.19735E 00	3.97611E 01
8	6.05247E 00	1.76095E 00	4.29152E 00	2.97298E 01
9	5.30622E 00	2.42591E 00	2.88031E 00	2.44240E 01
10	5.20748E 00	3.78935E 00	1.41813E 00	2.06840E 01
11	7.30074E 00	7.23740E 00	6.33391E-02	1.90331E 01
12	1.51450E 01	1.51450E 01	0.0	2.00349E 01
13	3.57998E 01	3.57998E 01	0.0	2.50465E 01
14	9.69288E 01	9.69288E 01	0.0	3.85241E 01
15	3.95264E 02	3.95264E 02	0.0	8.22191E 01
16	1.08859E 03	1.08859E 03	0.0	1.39336E 02
17	1.03455E 03	1.03455E 03	0.0	8.59488E 01
18	3.03236E 03	3.03236E 03	0.0	1.67301E 02
19	9.18505E 03	9.18505E 03	0.0	3.32613E 02
20	2.39695E 04	2.39695E 04	0.0	5.85824E 02
21	3.37333E 04	3.37333E 04	0.0	4.82875E 02

REACTION CROSS SECTIONS FOR PU-239 DNA 4539/0 (1/E WT.) IDENTIFICATION 4539

GROUP	TOTAL	ELASTIC	INELASTIC	(N,2N)	(N,3N)	SUM FISSION	ABSORPTION	CAPTURE
1	6.25715E 00	3.13883E 00	2.12817E-01	2.19600E-02	9.54764E-02	2.67042E 00	2.78806E 00	1.17640E-01
2	6.12497E 00	3.07541E 00	2.18192E-01	1.03803E-01	7.77805E-02	2.59895E 00	2.64980E 00	5.08463E-02
3	6.03698E 00	3.01883E 00	2.22782E-01	1.76772E-01	3.76572E-02	2.55686E 00	2.58094E 00	2.40799E-02
4	5.99792E 00	2.99883E 00	2.24495E-01	2.03982E-01	2.28512E-02	2.52943E 00	2.54777E 00	1.83355E-02
5	5.93362E 00	2.96730E 00	2.17793E-01	2.27115E-01	1.09028E-02	2.49728E 00	2.51052E 00	1.32359E-02
6	5.84818E 00	2.94561E 00	2.02359E-01	2.37354E-01	2.36157E-04	2.45366E 00	2.46263E 00	8.96296E-03
7	5.84072E 00	3.01740E 00	1.85627E-01	2.35283E-01	0.0	2.39650E 00	2.40241E 00	5.91211E-03
8	5.89593E 00	3.12390E 00	1.75642E-01	2.26888E-01	0.0	2.36592E 00	2.36950E 00	3.57905E-03
9	6.02446E 00	3.26609E 00	1.84974E-01	2.12824E-01	0.0	2.35836E 00	2.36057E 00	2.21052E-03
10	6.21534E 00	3.46509E 00	2.33943E-01	1.92628E-01	0.0	2.32211E 00	2.32368E 00	1.57740E-03
11	6.40994E 00	3.65655E 00	3.53769E-01	1.66789E-01	0.0	2.23163E 00	2.23284E 00	1.21579E-03
12	6.79290E 00	3.85436E 00	7.79804E-01	1.15177E-01	0.0	2.04266E 00	2.04356E 00	9.04886E-04
13	7.42960E 00	4.11365E 00	1.54714E 00	1.08133E-02	0.0	1.75747E 00	1.75800E 00	5.23907E-04
14	7.79082E 00	4.39053E 00	1.66102E 00	0.0	0.0	1.73923E 00	1.73927E 00	3.80842E-05
15	7.93467E 00	4.52287E 00	1.66102E 00	0.0	0.0	1.75078E 00	1.75078E 00	0.0
16	7.99620E 00	4.52852E 00	1.65851E 00	0.0	0.0	1.80917E 00	1.80917E 00	0.0
17	7.76020E 00	4.23923E 00	1.63156E 00	0.0	0.0	1.88931E 00	1.88941E 00	1.06435E-04
18	7.60429E 00	4.07016E 00	1.58760E 00	0.0	0.0	1.94526E 00	1.94653E 00	1.26458E-03
19	7.47034E 00	3.99063E 00	1.52579E 00	0.0	0.0	1.94861E 00	1.95392E 00	5.31465E-03
20	7.25463E 00	4.08703E 00	1.32910E 00	0.0	0.0	1.81836E 00	1.83850E 00	2.01430E-02
21	7.77244E 00	5.09479E 00	9.45469E-01	0.0	0.0	1.66467E 00	1.73218E 00	6.75157E-02
22	9.74538E 00	7.53302E 00	5.21094E-01	0.0	0.0	1.52874E 00	1.69127E 00	1.62529E-01
23	1.13496E 01	9.21278E 00	3.52926E-01	0.0	0.0	1.55210E 00	1.78393E 00	2.31827E-01
24	1.23659E 01	1.01660E 01	2.67449E-01	0.0	0.0	1.65416E 00	1.93242E 00	2.78255E-01
25	1.33388E 01	1.09174E 01	2.31220E-01	0.0	0.0	1.71985E 00	2.19014E 00	4.70295E-01
26	1.20134E 01	9.93064E 00	2.11301E-01	0.0	0.0	1.48759E 00	1.87150E 00	3.83912E-01
27	1.21506E 01	1.00581E 01	1.61706E-01	0.0	0.0	1.49647E 00	1.93078E 00	4.34317E-01
28	1.29111E 01	1.05918E 01	1.31785E-02	0.0	0.0	1.68602E 00	2.30610E 00	6.20082E-01
29	1.38081E 01	1.06821E 01	0.0	0.0	0.0	2.30321E 00	3.12603E 00	8.22816E-01
30	1.47222E 01	1.06662E 01	0.0	0.0	0.0	3.01937E 00	4.05594E 00	1.03657E 00
31	2.01051E 01	1.58126E 01	0.0	0.0	0.0	3.55507E 00	4.29248E 00	7.37416E-01
32	2.16287E 01	2.02745E 01	0.0	0.0	0.0	1.19903E 00	1.35421E 00	1.55182E-01
33	1.98613E 01	1.43645E 01	0.0	0.0	0.0	4.30788E 00	5.49686E 00	1.18898E 00
34	1.50402E 01	9.32558E 00	0.0	0.0	0.0	4.15697E 00	5.71457E 00	1.55760E 00
35	3.38262E 01	1.06105E 01	0.0	0.0	0.0	1.87173E 01	2.32158E 01	4.49851E 00
36	1.94523E 02	1.23598E 01	0.0	0.0	0.0	1.23174E 02	1.82163E 02	5.89896E 01
37	1.18195E 03	8.79669E 00	0.0	0.0	0.0	8.00281E 02	1.17315E 03	3.72869E 02

PHOTON INTERACTION CROSS SECTIONS

GROUP	SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.76103E 01	2.67174E-01	1.73431E 01	2.29628E 02
2	1.48952E 01	3.71935E-01	1.45232E 01	1.51049E 02
3	1.32298E 01	4.68853E-01	1.27609E 01	1.15549E 02
4	1.20927E 01	5.64454E-01	1.15282E 01	9.44690E 01
5	1.09406E 01	7.01210E-01	1.02394E 01	7.53744E 01
6	9.54804E 00	9.27264E-01	8.62078E 00	5.75202E 01
7	7.83233E 00	1.34233E 00	6.49001E 00	4.13155E 01
8	6.42715E 00	1.91910E 00	4.50806E 00	3.09185E 01
9	5.69272E 00	2.65787E 00	3.03485E 00	2.54693E 01
10	5.65231E 00	4.15217E 00	1.50014E 00	2.16583E 01
11	7.94666E 00	7.87972E 00	6.69367E-02	2.00412E 01
12	1.65986E 01	1.65986E 01	0.0	2.13990E 01
13	3.94950E 01	3.94950E 01	0.0	2.72099E 01
14	1.05872E 02	1.05872E 02	0.0	4.18603E 01
15	4.22847E 02	4.22847E 02	0.0	8.79697E 01
16	9.72665E 02	9.72665E 02	0.0	1.26269E 02
17	1.09569E 03	1.09569E 03	0.0	9.09752E 01
18	3.25378E 03	3.25378E 03	0.0	1.79419E 02
19	9.95698E 03	9.95698E 03	0.0	3.60460E 02
20	2.43464E 04	2.43464E 04	0.0	5.99567E 02
21	3.58525E 04	3.58525E 04	0.0	5.04486E 02

REACTION CROSS SECTIONS FOR PU-239 DNA 4539/0 (1/E WT.) IDENTIFICATION 4539

GROUP	(N,GAMMA)	(N,P)	(N,D)	(N,T)	(N,ALPHA)	NU	ID CAPTURE	ID FISSION	CHI
1	0.0	3.10627E-02	1.53477E-02	3.32818E-02	3.79482E-02	5.38626E 00	0.0	0.0	1.82148E-05
2	0.0	9.60168E-03	4.81296E-03	1.01389E-02	2.62928E-02	5.10331E 00	0.0	0.0	6.30096E-05
3	0.0	3.69583E-03	1.57547E-03	3.88243E-03	1.49262E-02	4.94320E 00	0.0	0.0	5.47701E-05
4	0.0	2.55135E-03	1.29627E-03	2.66164E-03	1.18262E-02	4.87639E 00	0.0	0.0	3.79023E-05
5	0.0	1.65997E-03	8.56515E-04	1.75998E-03	8.95943E-03	4.79376E 00	0.0	0.0	1.74308E-04
6	0.0	9.57148E-04	5.15229E-04	1.04381E-03	6.44678E-03	4.69848E 00	0.0	0.0	1.87560E-04
7	0.0	5.49202E-04	2.28360E-04	5.70849E-04	4.56370E-03	4.58778E 00	0.0	0.0	6.49679E-04
8	0.0	2.03634E-04	2.80170E-05	3.03358E-04	3.04405E-03	4.42776E 00	0.0	0.0	1.23456E-03
9	0.0	2.54212E-05	0.0	5.08423E-05	2.13426E-03	4.27709E 00	0.0	0.0	2.17493E-03
10	0.0	0.0	0.0	0.0	1.57740E-03	4.14170E 00	0.0	0.0	3.58144E-03
11	0.0	0.0	0.0	0.0	1.21579E-03	4.01891E 00	0.0	0.0	5.54553E-03
12	0.0	0.0	0.0	0.0	9.04886E-04	3.88317E 00	0.0	0.0	1.33437E-02
13	0.0	0.0	0.0	0.0	5.23907E-04	3.69668E 00	0.0	0.0	4.03616E-02
14	0.0	0.0	0.0	0.0	3.80842E-05	3.57600E 00	0.0	0.0	1.12583E-02
15	0.0	0.0	0.0	0.0	0.0	3.50756E 00	0.0	0.0	4.04810E-02
16	0.0	0.0	0.0	0.0	0.0	3.37605E 00	0.0	0.0	1.08479E-01
17	1.06435E-04	0.0	0.0	0.0	0.0	3.25123E 00	0.0	0.0	1.02084E-01
18	1.26458E-03	0.0	0.0	0.0	0.0	3.20014E 00	0.0	0.0	1.52716E-02
19	5.31465E-03	0.0	0.0	0.0	0.0	3.15731E 00	0.0	0.0	1.07548E-01
20	2.01430E-02	0.0	0.0	0.0	0.0	3.06533E 00	0.0	0.0	2.08172E-01
21	6.75157E-02	0.0	0.0	0.0	0.0	2.96849E 00	0.0	0.0	1.90745E-01
22	1.62529E-01	0.0	0.0	0.0	0.0	2.89596E 00	0.0	0.0	1.21686E-01
23	2.31827E-01	0.0	0.0	0.0	0.0	2.86801E 00	0.0	0.0	1.06473E-02
24	2.78255E-01	0.0	0.0	0.0	0.0	2.85979E 00	0.0	0.0	1.08085E-02
25	4.70295E-01	0.0	0.0	0.0	0.0	2.85380E 00	0.0	0.0	3.62179E-03
26	3.83912E-01	0.0	0.0	0.0	0.0	2.85150E 00	0.0	0.0	3.01206E-04
27	4.34317E-01	0.0	0.0	0.0	0.0	2.85042E 00	0.0	0.0	9.91074E-04
28	6.20082E-01	0.0	0.0	0.0	0.0	2.84903E 00	0.0	0.0	3.90881E-04
29	8.22816E-01	0.0	0.0	0.0	0.0	2.84834E 00	0.0	0.0	6.91504E-05
30	1.03657E 00	0.0	0.0	0.0	0.0	2.84814E 00	0.0	0.0	1.34242E-05
31	7.37416E-01	0.0	0.0	0.0	0.0	2.84805E 00	1.02487E 01	9.42018E 00	5.98494E-06
32	1.55182E-01	0.0	0.0	0.0	0.0	2.84801E 00	3.55363E 01	3.65611E 01	3.95068E-07
33	1.18898E 00	0.0	0.0	0.0	0.0	2.84800E 00	6.31272E 01	8.73135E 01	5.46461E-08
34	1.55760E 00	0.0	0.0	0.0	0.0	2.84800E 00	1.75432E 01	2.17476E 01	1.28759E-08
35	4.49851E 00	0.0	0.0	0.0	0.0	2.84800E 00	0.0	0.0	1.57754E-09
36	5.89896E 01	0.0	0.0	0.0	0.0	2.84800E 00	0.0	0.0	2.62486E-10
37	3.72869E 02	0.0	0.0	0.0	0.0	2.85217E 00	0.0	0.0	0.0

ONE DIMENSION AVERAGES FOR PU-240 MAT 4540,MO 37N-21G P3 T=300K INF DIL IDENTIFIER 4540

XSEC GRP	ID	TOTAL	ELASTIC	(n,n') GAMMA	(n,2n)	(n,F)	(n,3n)	ABSORPTION	CAPTURE
1		6.17915E 00	3.60474E 00	1.72815E-01	2.19600E-02	2.25200E 00	1.27500E-01	2.25213E 00	1.39007E-04
2		6.16260E 00	3.50009E 00	1.78193E-01	1.03760E-01	2.24252E 00	1.36762E-01	2.24379E 00	1.26609E-03
3		6.13592E 00	3.44410E 00	1.82782E-01	1.70615E-01	2.23517E 00	1.01193E-01	2.23724E 00	2.06974E-03
4		6.11786E 00	3.43149E 00	1.84606E-01	1.91481E-01	2.22850E 00	7.93938E-02	2.23089E 00	2.39176E-03
5		6.08855E 00	3.46926E 00	1.80062E-01	1.15752E-01	2.17480E 00	4.58775E-02	2.17760E 00	2.80152E-03
6		6.05500E 00	3.26532E 00	1.68871E-01	2.34817E-01	2.07253E 00	1.01683E-02	2.07582E 00	3.29570E-03
7		6.01783E 00	3.26953E 00	1.58362E-01	2.36070E-01	2.05004E 00	0.0	2.05387E 00	3.82855E-03
8		6.00881E 00	3.25597E 00	1.75131E-01	2.25677E-01	2.04754E 00	0.0	2.05202E 00	4.48886E-03
9		6.07027E 00	3.57832E 00	2.46915E-01	2.03252E-01	2.03670E 00	0.0	2.04179E 00	5.08929E-03
10		6.18524E 00	3.61755E 00	4.36919E-01	1.59594E-01	1.96546E 00	0.0	1.97118E 00	5.72299E-03
11		6.33326E 00	3.82140E 00	8.80148E-01	8.23456E-02	1.74282E 00	0.0	1.74937E 00	6.55466E-03
12		6.56771E 00	3.56457E 00	1.41592E 00	1.55493E-02	1.56385E 00	0.0	1.57166E 00	7.80947E-03
13		7.04665E 00	3.86683E 00	1.62486E 00	0.0	1.54446E 00	0.0	1.55496E 00	1.04986E-02
14		7.39142E 00	4.16972E 00	1.65004E 00	0.0	1.55845E 00	0.0	1.57166E 00	1.32111E-02
15		7.57450E 00	4.33551E 00	1.65004E 00	0.0	1.57820E 00	0.0	1.59395E 00	1.57503E-02
16		7.66915E 00	4.36164E 00	1.65003E 00	0.0	1.63385E 00	0.0	1.65748E 00	2.36310E-02
17		7.47712E 00	4.17537E 00	1.65003E 00	0.0	1.61617E 00	0.0	1.65172E 00	3.55544E-02
18		7.35194E 00	4.03642E 00	1.65004E 00	0.0	1.62300E 00	0.0	1.66549E 00	4.24870E-02
19		7.21471E 00	3.83611E 00	1.65004E 00	0.0	1.67752E 00	0.0	1.72856E 00	5.10426E-02
20		9.95143E 00	3.59633E 00	1.63375E 00	0.0	1.64365E 00	0.0	1.72134E 00	7.76921E-02
21		7.32531E 00	4.07798E 00	1.53246E 00	0.0	1.08633E 00	0.0	1.21487E 00	1.28542E-01
22		9.43608E 00	7.76402E 00	1.32315E 00	0.0	1.74304E-01	0.0	3.50916E-01	1.76612E-01
23		1.10359E 01	9.83807E 00	6.96615E-01	0.0	7.39797E-02	0.0	3.05249E-01	2.31269E-01
24		1.20453E 01	1.12626E 01	3.99065E-01	0.0	7.74556E-02	0.0	3.83522E-01	3.06066E-01
25		1.32318E 01	1.26733E 01	6.68349E-03	0.0	9.55702E-02	0.0	5.51825E-01	4.56255E-01
26		1.36814E 01	1.30101E 01	0.0	0.0	9.81621E-02	0.0	6.71274E-01	5.73112E-01
27		1.44067E 01	1.36088E 01	0.0	0.0	9.54550E-02	0.0	7.97860E-01	7.02405E-01
28		1.62499E 01	1.51205E 01	0.0	0.0	1.08537E-01	0.0	1.12945E 00	1.02049E 00
29		1.86657E 01	1.80394E 01	0.0	0.0	6.33239E-02	0.0	6.26353E-01	5.63029E-01
30		2.12446E 01	2.08548E 01	0.0	0.0	4.31759E-02	0.0	3.89856E-01	3.46680E-01
31		2.68022E 01	2.66972E 01	0.0	0.0	9.35786E-03	0.0	1.05022E-01	9.56644E-02
32		8.01846E 01	8.09904E 01	0.0	0.0	7.81885E-04	0.0	9.46307E-02	9.34488E-02
33		9.72871E 00	9.58156E 00	0.0	0.0	8.16399E-04	0.0	1.47150E-01	1.46332E-01
34		1.14274E 01	1.11658E 01	0.0	0.0	6.83858E-04	0.0	2.61648E-01	2.60964E-01
35		7.76275E 01	7.66940E 01	0.0	0.0	1.14930E-03	0.0	9.33590E-01	9.32441E-01
36		9.46238E 02	9.07753E 02	0.0	0.0	8.68824E-03	0.0	3.84860E 01	3.84773E 01
37		2.50186E 02	3.37322E 00	0.0	0.0	4.90825E-02	0.0	2.46813E 02	2.46764E 02

XSEC GRP	ID	(n,GAMMA)	$\bar{\nu}$	RESOLVED RESONANCE CAPTURE	RESOLVED RESONANCE FISSION	GROUP FLUX	χ(E)
1		1.39007E-04	5.50585E 00	0.0	0.0	1.49959E-01	0.0
2		1.26609E-03	5.16951E 00	0.0	0.0	1.25040E-01	3.17460E-05
3		2.06974E-03	4.97351E 00	0.0	0.0	4.99605E-02	7.39941E-05
4		2.39176E-03	4.90069E 00	0.0	0.0	2.50450E-02	5.03498E-05
5		2.80152E-03	4.80382E 00	0.0	0.0	7.49975E-02	2.25847E-04
6		3.29570E-03	4.68761E 00	0.0	0.0	4.99824E-02	2.37004E-04
7		3.82855E-03	4.56001E 00	0.0	0.0	9.99714E-02	7.97720E-04
8		4.48886E-03	4.40015E 00	0.0	0.0	1.00026E-01	1.46883E-03
9		5.08929E-03	4.25733E 00	0.0	0.0	9.99970E-02	2.51935E-03
10		5.72299E-03	4.12936E 00	0.0	0.0	1.00004E-01	4.05509E-03
11		6.55466E-03	4.01298E 00	0.0	0.0	9.99966E-02	6.15757E-03
12		7.80947E-03	3.88172E 00	0.0	0.0	1.49999E-01	1.45094E-02
13		1.04986E-02	3.70471E 00	0.0	0.0	2.49993E-01	4.27483E-02
14		1.32111E-02	3.58961E 00	0.0	0.0	5.00021E-02	1.17569E-02
15		1.57503E-02	3.52524E 00	0.0	0.0	1.50006E-01	4.19134E-02
16		2.36310E-02	3.39944E 00	0.0	0.0	3.00015E-01	1.10612E-01
17		3.55544E-02	3.28177E 00	0.0	0.0	2.33288E-01	1.02753E-01
18		4.24870E-02	3.23229E 00	0.0	0.0	3.33783E-02	1.52929E-02
19		5.10426E-02	3.19118E 00	0.0	0.0	2.33339E-01	1.07243E-01
20		7.76921E-02	3.10257E 00	0.0	0.0	5.00009E-01	2.05816E-01
21		1.28542E-01	3.01746E 00	0.0	0.0	6.99975E-01	1.87027E-01
22		1.76612E-01	2.95193E 00	0.0	0.0	1.25002E 00	1.18625E-01
23		2.31269E-01	2.91611E 00	0.0	0.0	1.49973E-01	1.03508E-02
24		3.06066E-01	2.90707E 00	0.0	0.0	7.50003E-01	1.05011E-02
25		4.56255E-01	2.90252E 00	0.0	0.0	7.49977E-01	3.51665E-03
26		5.73112E-01	2.90038E 00	0.0	0.0	1.25015E-01	2.92415E-04
27		7.02405E-01	2.89930E 00	0.0	0.0	7.50001E-01	9.62116E-04
28		1.02049E 00	2.89798E 00	7.39359E-02	8.02326E-03	1.12501E 00	3.79448E-04
29		5.63029E-01	2.89733E 00	1.51957E 00	1.34601E-01	9.99990E-01	6.71303E-05
30		3.46680E-01	2.89713E 00	3.54212E 00	2.19624E-01	7.49995E-01	1.30349E-05
31		9.56644E-02	2.89705E 00	1.20984E 01	1.08490E-01	1.75001E 00	5.81457E-06
32		9.34488E-02	2.89701E 00	6.01988E 01	4.82355E-01	1.25000E 00	3.84536E-07
33		1.46332E-01	2.89700E 00	2.04880E 01	1.80792E-01	6.99996E-01	5.41124E-08
34		2.60964E-01	2.89700E 00	1.60001E 00	3.05427E-04	1.25000E 00	1.31588E-08
35		9.32441E-01	2.89700E 00	4.53106E 02	8.64937E-02	0.99949E-01	1.85161E-09
36		3.84773E 01	2.89700E 00	7.82174E 03	1.49310E 00	1.00003E 00	4.13194E-10
37		2.46764E 02	2.90483E 00	0.0	0.0	6.35856E 00	1.18670E-10

PHOTON INTERACTION CROSS SECTIONS FOR Pu-240

GROUP	GROUP LIMITS (MEV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E 01	1.40000E 01	1.76103E 01	2.67174E-01	1.73431E 01	2.29628E 02
2	8.00000E 00	1.00000E 01	1.48951E 01	3.71935E-01	1.45232E 01	1.51049E 02
3	7.00000E 00	8.00000E 00	1.32298E 01	4.68853E-01	1.27609E 01	1.15549E 02
4	6.00000E 00	7.00000E 00	1.20927E 01	5.64454E-01	1.15282E 01	9.44690E 01
5	5.00000E 00	6.00000E 00	1.09406E 01	7.01209E-01	1.02394E 01	7.53744E 01
6	4.00000E 00	5.00000E 00	9.54804E 00	9.27263E-01	8.62077E 00	5.75202E 01
7	3.00000E 00	4.00000E 00	7.83233E 00	1.34233E 00	6.49001E 00	4.13155E 01
8	2.50000E 00	3.00000E 00	6.42716E 00	1.91910E 00	4.50806E 00	3.09185E 01
9	2.00000E 00	2.50000E 00	5.69272E 00	2.65787E 00	3.03485E 00	2.54693E 01
10	1.50000E 00	2.00000E 00	5.65230E 00	4.15216E 00	1.50014E 00	2.16583E 01
11	1.00000E 00	1.50000E 00	7.94666E 00	7.87972E 00	6.69367E-02	2.00412E 01
12	7.00000E-01	1.00000E 00	1.65985E 01	1.65985E 01	0.0	2.13990E 01
13	4.50000E-01	7.00000E-01	3.94950E 01	3.94950E 01	0.0	2.72099E 01
14	3.00000E-01	4.50000E-01	1.05872E 02	1.05872E 02	0.0	4.18603E 01
15	1.50000E-01	3.00000E-01	4.22847E 02	4.22847E 02	0.0	8.79698E 01
16	9.99999E-02	1.50000E-01	9.72666E 02	9.72666E 02	0.0	1.26269E 02
17	6.99999E-02	9.99999E-02	1.09569E 03	1.09569E 03	0.0	9.09750E 01
18	4.50000E-02	6.99999E-02	3.25378E 03	3.25378E 03	0.0	1.79419E 02
19	3.00000E-02	4.50000E-02	9.95698E 03	9.95698E 03	0.0	3.60460E 02
20	2.00000E-02	3.00000E-02	2.43465E 04	2.43465E 04	0.0	5.99568E 02
21	9.99999E-03	2.00000E-02	3.58526E 04	3.58526E 04	0.0	5.04487E 02

APPENDIX B

Listing of Response Functions

This Appendix contains a listing of response functions included with this library as material 1. The responses are given as a function of group number (neutron groups 1 through 37; gamma groups 38 through 58) and as a function of position as follows:

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POS 1   N FREE-IN-AIR TIS KER                RADS/(N/CM**2)
POS 2   G FREE-IN-AIR TIS KER                RADS/(G/CM**2)
POS 3   N DISPLACEMENT IN SI                 (EQUIV 1MEV N/CM**2)/(N/CM**2)
POS 4   N ION IN SI                          (RADS-SI)/(N/CM**2)
POS 5   G ION IN SI                          (RADS-SI)/(G/CM**2)
POS 6   SNYDER-AUXIER N TIS DOSE             RADS/(N/CM**2)
POS 7   CLAIBORNE-TRUBEY G TIS DOSE          RADS/(G/CM**2)
POS 8   H NEUTRON KERMA                      (RADS/ATOM)/(N/CM**2*G)
POS 9   C NEUTRON KERMA                      (RADS/ATOM)/(N/CM**2*G)
POS 10  N NEUTRON KERMA                      (RADS/ATOM)/(N/CM**2*G)
POS 11  O NEUTRON KERMA                      (RADS/ATOM)/(N/CM**2*G)
POS 12  NA NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 13  MG NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 14  AL NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 15  SI NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 16   P NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 17   S NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 18  CL NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 19   K NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 20  CA NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 21  FE NEUTRON KERMA                     (RADS/ATOM)/(N/CM**2*G)
POS 22   H GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 23   C GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 24   N GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 25   O GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 26  NA GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 27  MG GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 28  AL GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*G)
POS 29  SI GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 30   P GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 31   S GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 32  CL GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 33   K GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 34  CA GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 35  FE GAMMA KERMA                       (RADS/ATOM)/(G/CM**2*GM)
POS 36  SNYDER-NEUFELD N TIS DOSE            RADS/(N/CM**2)
POS 37  HENDERSON N FREE-IN-AIR TIS KERMA    RADS/(N/CM**2)
POS 38  HENDERSON G FREE-IN-AIR TIS KERMA    RADS/(G/CM**2)
POS 39  SNYDER-AUXIER N TIS DOSE             REM/(N/CM**2)

   30* ARRAY   3538 ENTRIES READ

    0T
MATERIAL    1 READ FROM CARDS
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***** CROSS-SECTIONS TO BE PRINTED OR PUNCHED ARE LISTED BELOW ***** (02-18-76) *****
RESPONSES INCLUDED WITH THE 37N-21G LIBRARY AS MATERIAL 1.

POS.	GRP. 1	GRP. 2	GRP. 3	GRP. 4	GRP. 5	GRP. 6	GRP. 7	GRP. 8
1	6.99549E-09	6.63978E-09	6.43058E-09	6.32729E-09	6.18579E-09	6.00249E-09	5.93479E-09	5.68159E-09
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	2.50000E 00	2.50000E 00	2.50000E 00	2.49800E 00	2.46300E 00	2.41700E 00	2.36200E 00	2.29200E 00
4	9.19499E-10	9.19499E-10	9.19499E-10	9.19499E-10	9.19499E-10	1.01100E-09	1.07900E-09	1.14900E-09
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	7.85069E-09	7.78399E-09	7.73948E-09	7.71169E-09	7.49489E-09	7.21409E-09	6.89439E-09	6.48569E-09
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	7.86089E-08	7.87899E-08	7.86567E-08	7.85388E-08	7.83119E-08	7.79659E-08	7.74428E-08	7.66267E-08
9	4.42139E-08	3.75740E-08	3.27839E-08	3.08860E-08	3.06530E-08	2.94540E-08	2.55440E-08	2.37600E-08
10	7.98539E-08	6.91549E-08	6.19968E-08	5.86029E-08	5.47389E-08	5.00590E-08	4.25939E-08	3.66339E-08
11	6.97929E-08	5.77649E-08	5.18349E-08	4.87459E-08	4.33709E-08	3.70589E-08	3.80100E-08	3.04659E-08
12	5.61169E-08	4.61149E-08	4.24109E-08	4.21659E-08	4.23339E-08	4.14689E-08	3.78380E-08	3.18960E-08
13	7.88369E-08	7.95018E-08	8.22778E-08	8.17819E-08	7.81149E-08	7.28668E-08	6.28428E-08	5.14140E-08
14	1.08110E-07	1.30630E-07	1.47350E-07	1.51770E-07	1.50810E-07	1.46810E-07	1.39090E-07	1.26320E-07
15	8.91147E-08	8.29849E-08	7.84448E-08	7.57069E-08	7.06348E-08	6.46078E-08	5.76979E-08	4.91169E-08
16	6.10748E-08	6.09609E-08	6.06900E-08	6.02809E-08	5.80800E-08	5.52579E-08	5.17339E-08	4.69359E-08
17	9.33338E-08	9.23928E-08	9.08489E-08	9.12929E-08	9.21307E-08	9.25708E-08	9.20618E-08	8.63739E-08
18	6.48739E-08	6.17629E-08	5.92000E-08	5.79359E-08	5.59889E-08	5.36079E-08	5.08529E-08	4.70900E-08
19	1.16400E-07	1.35000E-07	1.36770E-07	1.35400E-07	1.31950E-07	1.25960E-07	1.17400E-07	1.05430E-07
20	1.36830E-07	1.28820E-07	1.30290E-07	1.34120E-07	1.41760E-07	1.47600E-07	1.48230E-07	1.44790E-07
21	6.57759E-08	5.46179E-08	5.06429E-08	4.88060E-08	4.59329E-08	4.21249E-08	3.68339E-08	3.01630E-08
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 23 THRU POS. 35 SAME AS ABOVE							
36	7.00558E-09	7.00558E-09	7.00558E-09	7.00558E-09	7.00558E-09	7.00558E-09	7.00558E-09	7.00558E-09
37	5.64339E-09	5.64339E-09	5.51549E-09	5.40990E-09	5.48209E-09	5.44049E-09	5.29870E-09	5.09289E-09
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	6.17719E-08	5.97138E-08	5.84630E-08	5.77959E-08	5.50719E-08	5.15969E-08	4.77879E-08	4.30900E-08
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 41 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 9	GRP. 10	GRP. 11	GRP. 12	GRP. 13	GRP. 14	GRP. 15	GRP. 16
1	5.52839E-09	5.22119E-09	5.12309E-09	4.86389E-09	4.55979E-09	4.32029E-09	4.25509E-09	4.04379E-09
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	2.22300E 00	2.15700E 00	2.04600E 00	1.82100E 00	1.70800E 00	2.05600E 00	1.67400E 00	1.33200E 00
4	1.15900E-09	1.12000E-09	1.03300E-09	7.68599E-10	3.02799E-10	1.02100E-10	8.51799E-11	6.04999E-11
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	6.22719E-09	6.09929E-09	5.97419E-09	5.81579E-09	5.57109E-09	5.34319E-09	5.09019E-09	4.55920E-09
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	7.56017E-08	7.43948E-08	7.31039E-08	7.12878E-08	6.79228E-08	6.51439E-08	6.31549E-08	5.84929E-08
9	2.93200E-08	1.67790E-08	2.34270E-08	9.52108E-09	1.19320E-08	1.03140E-08	1.26260E-08	1.74370E-08
10	3.05060E-08	2.60289E-08	2.81329E-08	2.30590E-08	2.54610E-08	2.26210E-08	3.65310E-08	3.00239E-08
11	2.41060E-08	2.09660E-08	1.67140E-08	1.81090E-08	1.26990E-08	1.08100E-08	1.12900E-08	1.23510E-08
12	2.35520E-08	1.82430E-08	1.46550E-08	1.12850E-08	9.08139E-09	7.54909E-09	7.27089E-09	6.20959E-09
13	3.72989E-08	2.78400E-08	1.97490E-08	1.38150E-08	9.54858E-09	9.67098E-09	8.61919E-09	6.02219E-09
14	1.06910E-07	9.11037E-08	7.77098E-08	6.10768E-08	4.37139E-08	3.43890E-08	3.18210E-08	2.49619E-08
15	4.09969E-08	3.71410E-08	3.64460E-08	2.19650E-08	9.97848E-09	8.52048E-09	6.62109E-09	4.93569E-09
16	4.20179E-08	3.58479E-08	2.95180E-08	2.36860E-08	1.69570E-08	1.35170E-08	1.23290E-08	9.67329E-09
17	7.66267E-08	6.81729E-08	6.05459E-08	5.19329E-08	3.85089E-08	3.10660E-08	3.06140E-08	2.70019E-08
18	4.36019E-08	4.01569E-08	3.68019E-08	3.24180E-08	2.47820E-08	1.95660E-08	1.67090E-08	1.09250E-08
19	9.40269E-08	8.37179E-08	7.44658E-08	6.46158E-08	5.08609E-08	4.17779E-08	3.63200E-08	2.20900E-08
20	1.38850E-07	1.29230E-07	1.17780E-07	1.02830E-07	7.76719E-08	6.03978E-08	5.11059E-08	3.14900E-08
21	2.44900E-08	1.98210E-08	1.60720E-08	1.23240E-08	8.33119E-09	6.48559E-09	5.64720E-09	4.41259E-09
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 23 THRU POS. 35 SAME AS ABOVE							
36	7.05279E-09	7.10289E-09	7.03619E-09	6.71089E-09	6.07429E-09	5.69619E-09	5.37649E-09	4.86219E-09
37	4.82880E-09	4.84829E-09	4.84269E-09	4.55359E-09	4.46189E-09	4.26169E-09	4.33399E-09	4.05880E-09
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	4.08939E-08	4.08939E-08	4.08939E-08	4.11160E-08	4.25339E-08	4.29789E-08	4.16169E-08	3.87250E-08
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 41 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 17	GRP. 18	GRP. 19	GRP. 20	GRP. 21	GRP. 22	GRP. 23	GRP. 24
1	3.42890E-09	3.13959E-09	3.07090E-09	2.64570E-09	2.00900E-09	1.24680E-09	7.68309E-10	5.35159E-10
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1.47600E 00	1.49800E 00	1.37700E 00	9.61200E-01	9.95100E-01	7.11400E-01	7.00900E-02	8.84700E-02
4	5.22699E-11	4.78099E-11	4.19499E-11	2.93699E-11	1.94600E-11	1.27700E-11	5.51799E-13	8.88599E-13
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	4.00320E-09	3.82249E-09	3.73909E-09	3.52230E-09	2.94120E-09	1.69410E-09	9.72438E-10	7.45038E-10
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	5.28339E-08	5.00179E-08	4.73019E-08	4.03019E-08	3.05200E-08	1.91980E-08	1.22160E-08	8.57369E-09
9	1.18950E-08	8.57249E-09	8.05969E-09	6.38509E-09	4.80139E-09	2.57020E-09	1.28520E-09	7.89199E-10
10	1.54660E-08	1.00540E-08	8.98889E-09	7.19039E-09	3.63760E-09	2.00740E-09	1.10580E-09	7.66129E-10
11	4.32289E-09	1.18050E-09	5.73519E-09	6.57119E-09	5.35789E-09	2.88379E-09	9.13368E-10	5.28929E-10
12	5.57359E-09	5.45859E-09	5.03299E-09	3.79069E-09	3.66400E-09	1.34960E-09	5.86719E-10	4.28879E-10
13	5.57359E-09	3.85040E-09	3.94719E-09	3.15660E-09	2.22210E-09	2.02910E-09	6.93739E-10	1.24990E-09
14	1.35390E-08	9.54058E-09	9.05629E-09	6.66559E-09	2.39250E-09	1.26570E-09	8.83869E-10	5.04639E-10
15	4.66699E-09	3.87100E-09	4.42060E-09	3.04700E-09	2.32210E-09	1.46990E-09	8.34779E-11	1.30700E-10
16	6.65418E-09	4.62109E-09	4.13939E-09	3.00399E-09	1.61810E-09	7.97629E-10	3.15090E-10	2.99489E-10
17	1.36680E-08	1.00880E-08	7.35599E-09	2.46130E-09	1.27910E-09	7.59279E-10	1.08140E-09	3.69360E-10
18	6.83529E-09	5.51649E-09	4.42509E-09	2.54699E-09	1.17320E-09	5.20459E-10	2.34850E-10	1.52010E-10
19	1.03680E-08	8.85919E-09	5.87839E-09	2.69760E-09	1.06950E-09	4.23789E-10	2.12770E-10	1.71360E-10
20	1.31610E-08	7.27208E-09	5.43789E-09	2.33700E-09	1.17450E-09	5.38259E-10	3.44610E-10	1.63390E-10
21	3.49730E-09	2.88510E-09	2.59470E-09	1.75440E-09	8.45599E-10	5.88289E-10	2.72700E-10	2.04560E-10
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 23 THRU POS. 35 SAME AS ABOVE							
36	4.47859E-09	4.34239E-09	4.22839E-09	3.97819E-09	3.34990E-09	1.84200E-09	1.23350E-09	9.51589E-10
37	3.37210E-09	3.14420E-09	3.08580E-09	2.65850E-09	2.00910E-09	1.21010E-09	7.53379E-10	4.96779E-10
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	3.56120E-08	3.48890E-08	3.51389E-08	3.58620E-08	3.22760E-08	1.68020E-08	7.80899E-09	4.96510E-09
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 41 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 25	GRP. 26	GRP. 27	GRP. 28	GRP. 29	GRP. 30	GRP. 31	GRP. 32
1	3.01580E-10	2.05190E-10	1.41020E-10	6.00730E-11	2.12250E-11	8.88380E-12	3.07440E-12	1.14100E-12
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	7.60300E-02	7.50000E-02	7.50000E-02	7.50000E-02	7.50000E-02	7.50000E-02	7.50000E-02	7.50000E-02
4	4.21900E-13	2.80000E-13	1.98000E-13	4.10300E-15	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	5.88800E-10	5.12910E-10	4.48970E-10	4.21450E-10	4.79270E-10	5.25140E-10	5.57670E-10	5.93810E-10
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.86240E-09	3.31570E-09	2.28100E-09	9.72050E-10	3.41950E-10	1.41250E-10	4.49760E-11	9.61730E-12
9	3.86640E-10	2.47200E-10	1.64260E-10	6.67260E-11	2.28990E-11	9.38750E-12	2.97840E-12	6.27040E-13
10	4.62090E-10	3.31520E-10	2.43260E-10	1.34600E-10	1.00760E-10	1.15830E-10	1.97300E-10	4.01540E-10
11	2.48240E-10	1.56390E-10	1.03190E-10	4.15450E-11	1.41950E-11	5.81100E-12	1.84210E-12	3.87010E-13
12	2.09470E-10	1.20230E-10	8.63890E-11	8.60930E-11	2.54100E-10	4.23660E-12	1.28600E-12	4.47730E-13
13	1.58740E-10	1.35780E-10	8.30250E-11	2.53600E-11	8.77130E-12	3.61150E-12	1.16020E-12	2.72100E-13
14	2.96830E-10	1.67660E-11	1.74480E-11	1.02060E-11	3.22580E-12	1.33700E-12	4.64910E-13	1.80880E-13
15	5.74990E-11	3.68860E-11	2.74860E-11	1.39010E-11	4.89650E-12	2.01980E-12	6.72650E-13	2.14060E-13
16	1.59260E-10	8.60730E-11	6.69490E-11	2.82720E-11	8.67470E-12	3.65230E-12	1.27420E-12	4.02300E-13
17	9.99280E-11	9.21200E-11	9.04460E-11	8.07790E-11	7.68430E-11	7.59810E-11	7.54060E-11	7.52380E-11
18	9.97610E-11	8.79870E-11	3.70210E-11	4.45970E-11	2.87040E-11	1.17570E-10	4.46720E-10	3.89730E-11
19	7.48640E-11	3.03660E-11	2.13580E-11	1.57020E-11	3.30990E-12	2.55360E-12	3.52900E-12	6.77690E-12
20	1.21000E-10	1.13700E-10	9.74080E-11	8.19250E-11	7.42850E-11	7.17550E-11	7.05840E-11	7.02160E-11
21	2.62340E-10	9.39280E-12	2.09840E-11	3.30000E-11	8.95630E-12	6.89250E-12	1.92160E-12	8.89920E-13
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 23 THRU POS. 35 SAME AS ABOVE							
36	5.92770E-10	5.90470E-10	5.52390E-10	5.57940E-10	6.00200E-10	6.16600E-10	6.72760E-10	5.34590E-10
37	2.53480E-10	1.72500E-10	1.25490E-10	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	2.74800E-09	1.92010E-09	1.38030E-09	1.00020E-09	1.02610E-09	1.05280E-09	1.11530E-09	1.18760E-09
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 41 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 33	GRP. 34	GRP. 35	GRP. 36	GRP. 37	GRP. 38	GRP. 39	GRP. 40
1	1.12430E-12	1.68590E-12	2.82180E-12	4.59920E-12	1.88280E-11	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	3.04260E-09	2.40740E-09	2.08550E-09
3	7.50000E-02	7.50000E-02	7.50000E-02	7.50000E-02	7.50000E-02	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	3.84800E-09	2.94400E-09	2.48500E-09
6	6.17990E-10	6.27720E-10	6.22440E-10	5.99650E-10	5.17080E-10	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	3.04970E-09	2.42940E-09	2.12060E-09
8	3.27330E-12	1.48180E-12	1.15470E-12	1.49220E-12	5.99350E-12	0.0	0.0	0.0
9	2.00700E-13	6.97900E-14	2.75810E-14	1.85860E-14	4.51010E-14	0.0	0.0	0.0
10	6.98940E-10	1.23330E-09	2.15170E-09	3.54750E-09	1.46420E-08	0.0	0.0	0.0
11	1.22840E-13	4.08940E-14	1.31290E-14	5.07070E-15	1.80280E-15	0.0	0.0	0.0
12	4.33050E-13	6.57050E-13	1.11050E-12	1.82030E-12	7.50150E-12	0.0	0.0	0.0
13	1.31460E-13	1.24140E-13	1.79700E-13	2.84750E-13	1.15600E-12	0.0	0.0	0.0
14	1.92000E-13	2.99620E-13	5.08780E-13	8.34890E-13	3.44250E-12	0.0	0.0	0.0
15	1.83660E-13	2.62530E-13	4.38540E-13	7.17820E-13	2.94810E-12	0.0	0.0	0.0
16	2.46780E-13	2.56130E-13	4.32190E-13	6.73290E-13	2.74640E-12	0.0	0.0	0.0
17	7.52530E-11	7.53170E-11	7.53850E-11	7.58160E-11	8.14200E-11	0.0	0.0	0.0
18	8.76770E-11	1.98000E-10	4.35860E-10	7.78210E-10	3.20900E-09	0.0	0.0	0.0
19	1.17120E-11	2.06370E-11	3.59920E-11	5.93370E-11	2.44900E-10	0.0	0.0	0.0
20	7.02430E-11	7.04140E-11	7.07170E-11	7.12050E-11	6.90150E-11	0.0	0.0	0.0
21	1.02700E-12	1.64610E-12	2.81520E-12	4.62530E-12	1.90710E-11	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	6.62000E-09	5.72540E-09	5.21970E-09
23	0.0	0.0	0.0	0.0	0.0	5.23900E-08	4.17970E-08	3.63920E-08
24	0.0	0.0	0.0	0.0	0.0	6.40479E-08	5.04880E-08	4.36350E-08
25	0.0	0.0	0.0	0.0	0.0	7.65330E-08	5.96669E-08	5.12140E-08
26	0.0	0.0	0.0	0.0	0.0	1.18910E-07	9.01179E-08	7.59489E-08
27	0.0	0.0	0.0	0.0	0.0	1.34650E-07	1.01230E-07	8.48589E-08
28	0.0	0.0	0.0	0.0	0.0	1.51210E-07	1.12830E-07	9.40989E-08
29	0.0	0.0	0.0	0.0	0.0	1.68580E-07	1.24910E-07	1.03670E-07
30	0.0	0.0	0.0	0.0	0.0	1.86770E-07	1.37460E-07	1.13570E-07
31	0.0	0.0	0.0	0.0	0.0	2.05740E-07	1.50480E-07	1.23800E-07
32	0.0	0.0	0.0	0.0	0.0	2.25540E-07	1.63980E-07	1.34360E-07
33	0.0	0.0	0.0	0.0	0.0	2.67490E-07	1.92400E-07	1.56460E-07
34	0.0	0.0	0.0	0.0	0.0	2.89650E-07	2.07310E-07	1.68000E-07
35	0.0	0.0	0.0	0.0	0.0	4.39550E-07	3.06850E-07	2.43870E-07
36	3.88370E-10	3.43050E-10	3.27480E-10	3.23040E-10	3.20530E-10	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	0.0	0.0	0.0	0.0	0.0	3.20810E-09	2.47220E-09	2.08470E-09
39	1.23650E-09	1.25600E-09	1.24490E-09	1.19930E-09	1.03440E-09	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 41 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 41	GRP. 42	GRP. 43	GRP. 44	GRP. 45	GRP. 46	GRP. 47	GRP. 48
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1.87880E-09	1.67380E-09	1.46010E-09	1.23170E-09	1.04810E-09	9.14869E-10	7.67738E-10	5.97649E-10
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	2.17500E-09	1.86200E-09	1.54500E-09	1.22200E-09	9.80299E-10	8.28399E-10	6.71799E-10	5.07399E-10
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	1.91630E-09	1.70970E-09	1.49670E-09	1.27180E-09	1.09030E-09	9.58819E-10	8.12868E-10	6.41069E-10
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 9 THRU POS. 21 SAME AS ABOVE							
22	4.85779E-09	4.46419E-09	4.01899E-09	3.49890E-09	3.04160E-09	2.68429E-09	2.26900E-09	1.77150E-09
23	3.28979E-08	2.94050E-08	2.57420E-08	2.17970E-08	1.85950E-08	1.62530E-08	1.36520E-08	1.06310E-08
24	3.92529E-08	3.49170E-08	3.04129E-08	2.56180E-08	2.17740E-08	1.89970E-08	1.59360E-08	1.24030E-08
25	4.58559E-08	4.06029E-08	3.51919E-08	2.94930E-08	2.49780E-08	2.17500E-08	1.82220E-08	1.41760E-08
26	6.71538E-08	5.87059E-08	5.01789E-08	4.14419E-08	3.47300E-08	3.00750E-08	2.51020E-08	1.98980E-08
27	7.47469E-08	6.50899E-08	5.53939E-08	4.55309E-08	3.80289E-08	3.28720E-08	2.74030E-08	2.12720E-08
28	8.25868E-08	7.16858E-08	6.07149E-08	4.96769E-08	4.13519E-08	3.56770E-08	2.97059E-08	2.30500E-08
29	9.06747E-08	7.83788E-08	6.61489E-08	5.38800E-08	4.47009E-08	3.84980E-08	3.20129E-08	2.48270E-08
30	9.90078E-08	8.52847E-08	7.16909E-08	5.81379E-08	4.80739E-08	4.13279E-08	3.43250E-08	2.66100E-08
31	1.07590E-07	9.23648E-08	7.73389E-08	6.24458E-08	5.14700E-08	4.41700E-08	3.66420E-08	2.83919E-08
32	1.16410E-07	9.96208E-08	8.31038E-08	6.68169E-08	5.48959E-08	4.70259E-08	3.89619E-08	3.01780E-08
33	1.34800E-07	1.14660E-07	9.49569E-08	7.57229E-08	6.18239E-08	5.27759E-08	4.36220E-08	3.37630E-08
34	1.44360E-07	1.22430E-07	1.01050E-07	8.02588E-08	6.53229E-08	5.56669E-08	4.59580E-08	3.55540E-08
35	2.06510E-07	1.72370E-07	1.39780E-07	1.08720E-07	8.69449E-08	7.33579E-08	6.01519E-08	4.64660E-08
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	1.86510E-09	1.66130E-09	1.44310E-09	1.19710E-09	1.01110E-09	8.70689E-10	7.25299E-10	5.64059E-10
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 40 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 49	GRP. 50	GRP. 51	GRP. 52	GRP. 53	GRP. 54	GRP. 55	GRP. 56
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	4.36239E-10	3.05019E-10	1.97770E-10	1.11330E-10	5.55969E-11	4.01989E-11	4.08849E-11	7.34239E-11
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	3.68099E-10	2.65699E-10	1.84100E-10	1.12060E-10	7.45398E-11	8.35899E-11	1.44700E-10	3.21099E-10
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	4.82329E-10	3.60290E-10	2.47810E-10	1.64210E-10	1.01180E-10	7.44479E-11	7.72839E-11	1.17180E-10
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 9 THRU POS. 21 SAME AS ABOVE							
22	1.29310E-09	9.03659E-10	5.84819E-10	3.25490E-10	1.50500E-10	8.91789E-11	4.95629E-11	2.27470E-11
23	7.75869E-09	5.42270E-09	3.51070E-09	1.95860E-09	9.21069E-10	5.74159E-10	3.95609E-10	4.22060E-10
24	9.05228E-09	6.32749E-09	4.09789E-09	2.29100E-09	1.09400E-09	7.11248E-10	5.63299E-10	7.79129E-10
25	1.03460E-08	7.23309E-09	4.68689E-09	2.62910E-09	1.28440E-09	8.84969E-10	8.18210E-10	1.37240E-09
26	1.42330E-08	9.95838E-09	6.47209E-09	3.69570E-09	2.01940E-09	1.75280E-09	2.42850E-09	5.50879E-09
27	1.55310E-08	1.08710E-08	7.07679E-09	4.07869E-09	2.34990E-09	2.22270E-09	3.40050E-09	8.07789E-09
28	1.68300E-08	1.17900E-08	7.69489E-09	4.50589E-09	2.81740E-09	2.96610E-09	4.96079E-09	1.20060E-08
29	1.81340E-08	1.27100E-08	8.31289E-09	4.92369E-09	3.25230E-09	3.65710E-09	6.48569E-09	1.61630E-08
30	1.94380E-08	1.36370E-08	8.94619E-09	5.38899E-09	3.83539E-09	4.64829E-09	8.67649E-09	2.19250E-08
31	2.07490E-08	1.45760E-08	9.60939E-09	5.94109E-09	4.65359E-09	6.06379E-09	1.16360E-08	2.90479E-08
32	2.20610E-08	1.55140E-08	1.02670E-08	6.47939E-09	5.48859E-09	7.62349E-09	1.52950E-08	3.90059E-08
33	2.47070E-08	1.74270E-08	1.16480E-08	7.71769E-09	7.55069E-09	1.14200E-08	2.38240E-08	6.11759E-08
34	2.60340E-08	1.84130E-08	1.24310E-08	8.63339E-09	9.42138E-09	1.48420E-08	3.08540E-08	7.71449E-08
35	3.42060E-08	2.46019E-08	1.75280E-08	1.50340E-08	2.35540E-08	4.21229E-08	9.14928E-08	2.28350E-07
36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38	4.10599E-10	2.93009E-10	1.92260E-10	1.10590E-10	5.48209E-11	3.71130E-11	3.67239E-11	6.32728E-11
39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POS. 40 THRU POS. 61 SAME AS ABOVE							

POS.	GRP. 57	GRP. 58
1	0.0	0.0
2	1.63280E-10	5.22169E-10
3	0.0	0.0
4	0.0	0.0
5	7.38799E-10	2.26000E-09
6	0.0	0.0
7	2.22650E-10	6.25779E-10
8	0.0	0.0
	POS. 9 THRU POS. 21 SAME AS ABOVE	
22	1.19610E-11	7.95969E-12
23	8.14369E-10	2.77340E-09
24	1.67060E-09	5.73199E-09
25	3.09459E-09	1.05020E-08
26	1.31800E-08	4.40109E-08
27	1.94000E-08	6.40958E-08
28	2.83230E-08	9.03117E-08
29	3.85310E-08	1.23330E-07
30	5.20589E-08	1.64270E-07
31	6.74718E-08	2.07120E-07
32	9.11019E-08	2.77260E-07
33	1.42100E-07	4.25630E-07
34	1.74480E-07	5.08610E-07
35	5.03860E-07	1.37870E-06
36	0.0	0.0
37	0.0	0.0
38	1.41590E-10	4.40629E-10
39	0.0	0.0
	POS. 40 THRU POS. 61 SAME AS ABOVE	

APPENDIX C

ARID - A Simple Collapsing Code

A simple collapsing code, ARID, has been developed from the COMAND module of the AMPX processing code to enable collapse of the 37-21 library to smaller group structures. The ARID code is included in the library package, and is tailored to receive the 37-21 energy group structure cross-section sets as input data sets. The user then specifies the final group structure and the collapsing spectrum. A (1/E) to thermal Maxwellian neutron spectrum and a flat gamma spectrum are built into the code, or the user can input an arbitrary weighting spectrum, such as that obtained for a specific calculation with the original 37-21 library. This gives the user the capacity to generate problem-dependent cross-section libraries as desired, or to create smaller problem-independent libraries. The following pages give details on procedures for running ARID and discuss output choices.

ARID

The collapser to go with the DNA Few Group Library is a simplified version of the AMPX COMAND module.

This module, ARID (ANISN Reduction If DNA Few Group Library is Your Base Cross Section Set), assumes the following:

1. An ANISN library in card image or binary format is mounted on logical unit 20. It has the ANISN P_ℓ decks stacked with control cards interspersed as if one were getting ready to run ALC1 to make an ANISN library.
2. A collapsed library will be written in ANISN binary format on logical unit 18. These can be punched onto cards in the ANISN free-form BCD format on logical 7.
3. ARID assumes:
   a. total number of groups on DNA library is 58 (37 neutron and 21 gamma),
   b. the total cross section is in position 3,
   c. the within group cross section is in position 4,
   d. the table length of the DNA library is 61.
4. One can selectively collapse the data over a built-in spectrum, or the user may override the built-in data by inputting his own. The built-in spectrum consists of a 1/E variation joined to a thermal Maxwellian (300k) for neutrons and has a flat variation for gamma groups.

The data required are as follows:

1$$ Collapsing Case Description

1. IGMF - total number of groups in broad structure.
2. IHTF - position of σ_T in broad structure.
3. IHSF - position of σ_{gg} in broad structure.
4. IHMF - table length in broad structure.
5. IEDIT - 0, almost no edit,
   1, edit collapsed data,
   2, edit fine group and collapsed data.
6. NSPEC - spectrum number to use in collapsing (input a zero).
7. NPNCH - 0, no punch,
   1, punch collapsed cross sections in ANISN free-form format.
8. NFM - -1, DNA Few Group Library is in ANISN binary format,
   0, DNA Few Group Library is in ANISN BCD free-form format,
   1, DNA Few Group Library is in ANISN BCD fixed form format.

T Terminate Block 1

3 ** Weighting Spectrum (This will override a selected spectrum.)

4 $$ Broad Group Numbers by Fine Group

This corresponds to the 28$ array in ANISN or 51$ array in XSDRN.

A zero entry will suppress a group.

T Terminate Case Data

Note that one can use ARID to convert ANISN library formats, either BCD to binary or binary to BCD.

APPENDIX D

Energy Group Structure for 129n-43γ Cross-Section Set

Group	Energy Range	Lethargy Range
1	1.4000E07 - 1.4500E07	-0.372 - -0.336
2	1.3250E07 - 1.4000E07	-0.336 - -0.281
3	1.2500E07 - 1.3250E07	-0.281 - -0.223
4	1.1750E07 - 1.2500E07	-0.223 - -0.161
5	1.1500E07 - 1.1750E07	-0.161 - -0.140
6	1.1250E07 - 1.1500E07	-0.140 - -0.118
7	1.1000E07 - 1.1250E07	-0.118 - -0.095
8	1.0800E07 - 1.1000E07	-0.095 - -0.077
9	1.0500E07 - 1.0800E07	-0.077 - -0.049
10	1.0000E07 - 1.0500E07	-0.049 - 0.0
11	9.7500E06 - 1.0000E07	0.0 - 0.025
12	9.5000E06 - 9.7500E06	0.025 - 0.051
13	8.9000E06 - 9.5000E06	0.051 - 0.117
14	8.6000E06 - 8.9000E06	0.117 - 0.151
15	8.4000E06 - 8.6000E06	0.151 - 0.174
16	8.2000E06 - 8.4000E06	0.174 - 0.198
17	8.1000E06 - 8.2000E06	0.198 - 0.211
18	8.0000E06 - 8.1000E06	0.211 - 0.223
19	7.9000E06 - 8.0000E06	0.223 - 0.236
20	7.7500E06 - 7.9000E06	0.236 - 0.255
21	7.5000E06 - 7.7500E06	0.255 - 0.288
22	7.2500E06 - 7.5000E06	0.288 - 0.322
23	7.1000E06 - 7.2500E06	0.322 - 0.342
24	7.0000E06 - 7.1000E06	0.342 - 0.357
25	6.8500E06 - 7.0000E06	0.357 - 0.378
26	6.7000E06 - 6.8500E06	0.378 - 0.400
27	6.5700E06 - 6.7000E06	0.400 - 0.420
28	6.4300E06 - 6.5700E06	0.420 - 0.442
29	6.2500E06 - 6.4300E06	0.442 - 0.470
30	5.7500E06 - 6.2500E06	0.470 - 0.553
31	5.5200E06 - 5.7500E06	0.553 - 0.594
32	5.2000E06 - 5.5200E06	0.594 - 0.654
33	5.0700E06 - 5.2000E06	0.654 - 0.679
34	5.0000E06 - 5.0700E06	0.679 - 0.693
35	4.9200E06 - 5.0000E06	0.693 - 0.709
36	4.8000E06 - 4.9200E06	0.709 - 0.734
37	4.7200E06 - 4.8000E06	0.734 - 0.751
38	4.6500E06 - 4.7200E06	0.751 - 0.766
39	4.4500E06 - 4.6500E06	0.766 - 0.810
40	4.3000E06 - 4.4500E06	0.810 - 0.844
41	4.1400E06 - 4.3000E06	0.844 - 0.882
42	4.0500E06 - 4.1400E06	0.882 - 0.904
43	3.9500E06 - 4.0500E06	0.904 - 0.929
44	3.8000E06 - 3.9500E06	0.929 - 0.968
45	3.6000E06 - 3.8000E06	0.968 - 1.022
46	3.4500E06 - 3.6000E06	1.022 - 1.064

Energy Group Structure (Cont'd.)

Group	Energy Range	Lethargy Range
47	3.3000E06 - 3.4500E06	1.064 - 1.109
48	3.1500E06 - 3.3000E06	1.109 - 1.155
49	3.0000E06 - 3.1500E06	1.155 - 1.204
50	2.9400E06 - 3.0000E06	1.204 - 1.224
51	2.8700E06 - 2.9400E06	1.224 - 1.248
52	2.7800E06 - 2.8700E06	1.248 - 1.280
53	2.7200E06 - 2.7800E06	1.280 - 1.302
54	2.4500E06 - 2.7200E06	1.302 - 1.406
55	2.4000E06 - 2.4500E06	1.406 - 1.427
56	2.3800E06 - 2.4000E06	1.427 - 1.435
57	2.3600E06 - 2.3800E06	1.435 - 1.444
58	2.3400E06 - 2.3600E06	1.444 - 1.452
59	2.3200E06 - 2.3400E06	1.452 - 1.461
60	2.3000E06 - 2.3200E06	1.461 - 1.470
61	2.2600E06 - 2.3000E06	1.470 - 1.487
62	2.1800E06 - 2.2600E06	1.487 - 1.523
63	1.9700E06 - 2.1800E06	1.523 - 1.625
64	1.8500E06 - 1.9700E06	1.625 - 1.687
65	1.8200E06 - 1.8500E06	1.687 - 1.704
66	1.7500E06 - 1.8200E06	1.704 - 1.743
67	1.6600E06 - 1.7500E06	1.743 - 1.796
68	1.6300E06 - 1.6600E06	1.796 - 1.814
69	1.5700E06 - 1.6300E06	1.814 - 1.852
70	1.4500E06 - 1.5700E06	1.852 - 1.931
71	1.3900E06 - 1.4500E06	1.931 - 1.973
72	1.3300E06 - 1.3900E06	1.973 - 2.017
73	1.2900E06 - 1.3300E06	2.017 - 2.048
74	1.2700E06 - 1.2900E06	2.048 - 2.064
75	1.2450E06 - 1.2700E06	2.064 - 2.083
76	1.2200E06 - 1.2450E06	2.083 - 2.104
77	1.2000E06 - 1.2200E06	2.104 - 2.120
78	1.1500E06 - 1.2000E06	2.120 - 2.163
79	1.1000E06 - 1.1500E06	2.163 - 2.207
80	1.0500E06 - 1.1000E06	2.207 - 2.254
81	9.8000E05 - 1.0500E06	2.254 - 2.323
82	9.3000E05 - 9.8000E05	2.323 - 2.375
83	8.3000E05 - 9.3000E05	2.375 - 2.489
84	7.3000E05 - 8.3000E05	2.489 - 2.617
85	6.3000E05 - 7.3000E05	2.617 - 2.765
86	5.8000E05 - 6.3000E05	2.765 - 2.847
87	5.0000E05 - 5.8000E05	2.847 - 2.996
88	4.0000E05 - 5.0000E05	2.996 - 3.219
89	2.5000E05 - 4.0000E05	3.219 - 3.689
90	1.5500E05 - 2.5000E05	3.689 - 4.167
91	1.3000E05 - 1.5500E05	4.167 - 4.343
92	1.1100E05 - 1.3000E05	4.343 - 4.501
93	8.2500E04 - 1.1100E05	4.501 - 4.798
94	8.1000E04 - 8.2500E04	4.798 - 4.816
95	7.2000E04 - 8.1000E04	4.816 - 4.934

Energy Group Structure (Cont'd.)

Group	Energy Range	Lethargy Range
96	6.8000E04 - 7.2000E04	4.934 - 4.991
97	4.0860E04 - 6.8000E04	4.991 - 5.500
98	3.5000E04 - 4.0860E04	5.500 - 5.655
99	3.0000E04 - 3.5000E04	5.655 - 5.809
100	2.7000E04 - 3.0000E04	5.809 - 5.915
101	2.5000E04 - 2.7000E04	5.915 - 5.991
102	2.3000E04 - 2.5000E04	5.991 - 6.075
103	1.9300E04 - 2.3000E04	6.075 - 6.250
104	1.5030E04 - 1.9300E04	6.250 - 6.500
105	9.1100E03 - 1.5030E04	6.500 - 7.001
106	5.5300E03 - 9.1100E03	7.001 - 7.500
107	3.3500E03 - 5.5300E03	7.500 - 8.001
108	2.0300E03 - 3.3500E03	8.001 - 8.502
109	1.2300E03 - 2.0300E03	8.502 - 9.003
110	9.6100E02 - 1.2300E03	9.003 - 9.250
111	7.4900E02 - 9.6100E02	9.250 - 9.499
112	5.8300E02 - 7.4900E02	9.499 - 9.750
113	3.5300E02 - 5.8300E02	9.750 - 10.252
114	2.7500E02 - 3.5300E02	10.252 - 10.501
115	1.6700E02 - 2.7500E02	10.501 - 11.000
116	1.0100E02 - 1.6700E02	11.000 - 11.503
117	7.8900E01 - 1.0100E02	11.503 - 11.750
118	4.7800E01 - 7.8900E01	11.750 - 12.251
119	2.9000E01 - 4.7800E01	12.251 - 12.751
120	1.7600E01 - 2.9000E01	12.751 - 13.250
121	1.0670E01 - 1.7600E01	13.250 - 13.751
122	6.4700E00 - 1.0670E01	13.751 - 14.251
123	3.9300E00 - 6.4700E00	14.251 - 14.749
124	2.3800E00 - 3.9300E00	14.749 - 15.251
125	1.4400E00 - 2.3800E00	15.251 - 15.753
126	8.7600E-01 - 1.4400E00	15.753 - 16.250
127	5.3100E-01 - 8.7600E-01	16.250 - 16.751
128	4.1400E-01 - 5.3100E-01	16.751 - 17.000
129	1.0000E-04 - 4.1400E-01	17.000 - 25.328

Photon Interaction Cross Sections

Group	Group Limits (MeV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
1	1.00000E01	1.40000E01	1.63813E-01	2.90548E-06	1.63810E-01	4.78338E00
2	9.00000E00	1.00000E01	1.38658E-01	3.70045E-06	1.38654E-01	3.91056E00
3	8.00000E00	9.00000E00	1.24124E-01	4.20963E-06	1.24119E-01	3.54783E00
4	7.76000E00	8.00000E00	1.15126E-01	4.58882E-06	1.15122E-01	3.33044E00
5	7.72000E00	7.76000E00	1.13111E-01	4.68452E-06	1.13106E-01	3.28231E00
6	7.50000E00	7.72000E00	1.11238E-01	4.77760E-06	1.11233E-01	3.23790E00
7	7.04000E00	7.50000E00	1.06339E-01	5.03862E-06	1.06334E-01	3.12268E00
8	7.02000E00	7.04000E00	1.02879E-01	5.23592E-06	1.02874E-01	3.04195E00
9	6.73000E00	7.02000E00	1.00643E-01	5.37369E-06	1.00638E-01	2.99020E00
10	6.71000E00	6.73000E00	9.84069E-02	5.51628E-06	9.84014E-02	2.93860E00
11	6.14000E00	6.71000E00	9.41482E-02	5.81501E-06	9.41424E-02	2.84104E00
12	6.12000E00	6.14000E00	8.98875E-02	6.13486E-06	8.98814E-02	2.74386E00
13	5.84000E00	6.12000E00	8.77247E-02	6.31462E-06	8.77185E-02	2.69467E00
14	5.82000E00	5.84000E00	8.55705E-02	6.50142E-06	8.55640E-02	2.64558E00
15	5.12000E00	5.82000E00	8.04006E-02	7.01075E-06	8.03937E-02	2.52788E00
16	5.09500E00	5.12000E00	7.51896E-02	7.57645E-06	7.51920E-02	2.40924E00
17	4.45000E00	5.09500E00	6.91069E-02	8.26098E-06	6.90987E-02	2.29427E00
18	4.43000E00	4.45000E00	6.26526E-02	9.03827E-06	6.26436E-02	2.17853E00
19	3.86000E00	4.43000E00	5.69965E-02	9.89113E-06	5.69866E-02	2.07562E00
20	3.84000E00	3.86000E00	5.08873E-02	1.08451E-05	5.08765E-02	1.97083E00
21	3.69000E00	3.84000E00	4.89665E-02	1.11613E-05	4.89553E-02	1.93997E00
22	3.67000E00	3.69000E00	4.70690E-02	1.14897E-05	4.70575E-02	1.90912E00
23	3.38000E00	3.67000E00	4.37132#-02	1.21495E-05	4.37011E-02	1.85277E00
24	3.36000E00	3.38000E00	4.04328E-02	1.28578E-05	4.04199E-02	1.79629E00
25	2.84000E00	3.36000E00	3.48301E-02	1.43772E-05	3.48158E-02	1.69617E00
26	2.82000E00	2.84000E00	2.84131E-02	1.62294E-05	2.83969E-02	1.59281E00
27	2.80000E00	2.82000E00	2.78930E-02	1.63963E-05	2.78766E-02	1.58494E00
28	2.78000E00	2.80000E00	2.73787E-02	1.65662E-05	2.73622E-02	1.57707E00
29	2.32000E00	2.78000E00	2.17837E-02	1.89530E-05	2.17647E-02	1.48170E00
30	2.30000E00	2.32000E00	1.67467E-02	2.17545E-05	1.67250E-02	1.38491E00
31	2.13000E00	2.30000E00	1.50287E-02	2.31335E-05	1.50056E-02	1.34548E00
32	2.11000E00	2.13000E00	1.33959E-02	2.46232E-05	1.33713E-02	1.30559E00
33	1.79000E00	2.11000E00	1.01178E-02	2.82235E-05	1.00896E-02	1.23102E00

Photon Interaction Cross Sections (Cont'd.)

Group	Group Limits (MeV)		SIG ABS	SIG PE	SIG PP	ENERGY DEP
34	1.77000E00	1.79000E00	6.53062E-03	3.28530E-05	6.49777E-03	1.15399E00
35	1.64000E00	1.77000E00	5.32255E-03	3.54684E-05	5.28709E-03	1.11890E00
36	1.62000E00	1.64000E00	4.26155E-03	3.83345E-05	4.22322E-03	1.08330E00
37	7.38000E-01	1.62000E00	7.67590E-04	8.15626E-05	6.86027E-04	8.40891E-01
38	7.18000E-01	7.38000E-01	2.08687E-04	2.08687E-04	0.0	5.64813E-01
39	5.20000E-01	7.18000E-01	3.39119E-04	3.39119E-04	0.0	4.85497E-01
40	5.00000E-01	5.20000E-01	5.54766E-04	5.54766E-04	0.0	4.02880E-01
41	3.00000E-01	5.00000E-01	1.25894E-03	1.25894E-03	0.0	3.13480E-01
42	1.00000E-01	3.00000E-01	1.64216E-02	1.64216E-02	0.0	1.43309E-01
43	1.00000E-04	1.00000E-01	6.08122E02	6.08122E02	0.0	1.71055E00

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