AD
UNC-5139

NEUTRON CROSS SECTIONS OF NITROGEN, OXYGEN, ALUMINUM, SILICON, IRON, DEUTERIUM, AND BERYLLIUM

J. H. Ray
G. Grochowski
E. S. Troubetzkoy

Project Scientist: E. S. Troubetzkoy

November 15, 1965

This research was sponsored by the Defense Atomic Support Agency under Subtasks 06.044 and 11.022

Contract No.: DA-18-035-AMC-125(A)
(UNC Project 2322)
for US Army Nuclear Defense Laboratory
Edgewood Arsenal, Maryland

UNITED NUCLEAR
CORPORATION
RESEARCH AND ENGINEERING CENTER

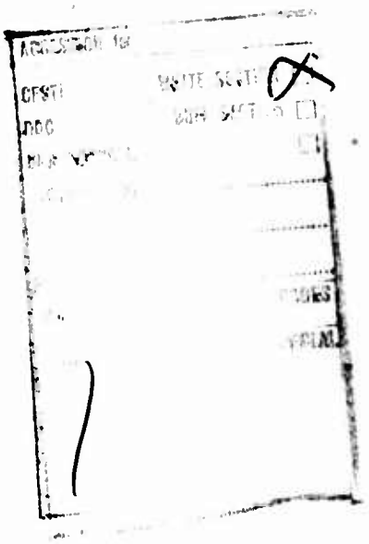
Disclaimer

Findings in this report are those of the Contractor. The US Army Nuclear Defense Laboratory does not necessarily concur with them.

Also, these findings are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

Disposition

Destroy this report when no longer needed. Do not return to the originator.



AD
UNC-5139

NEUTRON CROSS SECTIONS OF NITROGEN, OXYGEN, ALUMINUM, SILICON, IRON, DEUTERIUM, AND BERYLLIUM

J. H. Ray
G. Grochowski
E. S. Troubetzkoy

Project Scientist: E. S. Troubetzkoy

November 15, 1965

This research was sponsored by the Defense Atomic Support Agency under Subtasks 06.044 and 11.022

Contract No.: DA-18-035-AMC-125(A)
(UNC Project 2322)
for US Army Nuclear Defense Laboratory
Edgewood Arsenal, Maryland

UNITED NUCLEAR CORPORATION
Research and Engineering Center
Elmsford, New York

ABSTRACT

Neutron cross-section sets have been prepared for N, O, Al, Si, Fe, D, and Be for neutron energies from 0.037 eV to 18 MeV. The cross sections tabulated include the total, elastic, inelastic, (n,2n), and cross sections for charged particle emission. Information is also given on the angular distribution of elastically scattered neutrons and on the energy distribution of neutrons and γ-rays following nonelastic reactions.

INTRODUCTION

Complete sets of neutron cross-section data are presented for N, O, Al, Si, Fe, D, and Be in the energy range from 0.037 eV to 18 MeV. The cross sections of N, O, Al, Si, and Fe have been recompiled and present major revisions of our earlier reports on these elements. The cross sections of D and Be are essentially those which we reported earlier.

Data are given on the total cross section, σ_{nT}, on the elastic cross section, $\sigma_{n,n}$, on the capture cross section, $\sigma_{n,\gamma}$, and on cross sections for charged particle emission. The inelastic cross section is broken into two parts. The part that corresponds to discrete level excitation is labeled $\sigma_{n,n'}$ levels. The remaining part corresponds to the emission of a continuous neutron spectrum; this part is added to the cross section for all other neutron-producing reactions, giving a cross section which is labeled $\sigma_{n,n'}$ continuum. Values of $\sigma_{n,2n}$ are also given.

Level excitation cross sections are presented in a normalized form: the excitation of level ν is

$$\sigma_{n,n'\nu}(E) = \sigma_{n,n'}(\text{levels})(E)a_{\nu}(E)$$

with

$$\sum_{\nu=1}^{\nu_{max}} a_{\nu}(E) = 1.$$

Tables of a_ν are given.

The continuous part of the inelastic spectrum is described, when applicable, by a statistical model (B. Eisenman and F. R. Nakache, UNC-5093, p. 14ff).

The angular distribution of elastically scattered neutrons is presented in the form of an expansion in Legendre polynomials (center-of-mass system):

$$\sigma_{n,n}(E,\theta) = \frac{\sigma_{n,n}(E)}{4\pi} \sum_{\ell=0}^{L} (2\ell+1)\, f_\ell(E)\, P_\ell(\cos\,\theta),$$

where $f_0 = 1$, and L is large enough (≤ 14). Tables of f_ℓ are given.

Information is also given on γ-ray spectra following absorption and following inelastic reactions. The neutron energy range is broken into groups. The energy E_n given in the tables is the upper energy of the group; the spectrum quoted is considered as constant in that group. The γ-ray energy range is also broken into groups. The spectra have been integrated over these groups. The groups are labeled by a single energy, E_γ, which is either the energy of a predominant line in that group or the mean energy of that group.

TABLE OF CONTENTS

TABLES

FIGURES

1. NITROGEN

1.1 NEUTRON CROSS SECTIONS

1.1.1 The Total Cross Section

Over the entire range of incident neutron energies from 0.037 eV to 18 MeV the total cross section is the same as that given in our previous compilation, UNC-5002[1] (see Table 1 and Fig. 1).

Mention should be made here of very detailed measurements made at Hanford even though they are too recent to have been included in this compilation.[2] From 2 to 8 MeV these measurements are considered to be the best available at present; above 8 MeV they are suspected of being too high, and below 2 MeV the shape, but not the normalization of the data, was fixed at the time of communication (late August 1965).

1.1.2 The Elastic-Scattering Cross Section

Throughout the entire range the elastic-scattering cross section is the difference between the total cross section and the sum of the cross sections for all other reactions (see Table 1).

1.1.3 The Radiative-Capture Cross Section

The cross section for the radiative capture (n,γ) reaction is the same as in UNC-5002[1] (see Table 1). It is taken to follow the 1/v law from 0.18 barn at 0.0253 eV

to 0.08 millibarn at 0.0253 MeV. At higher energies the cross section is taken to be zero.

1.1.4 The (n,α) Cross Section

For energies below about 8 MeV the measurements of Gabbard, Bichsel, and Bonner[3] were used. At higher energies, the only measurement is the old one of Randolph.[4] We used our usual French curve art work to bring the curve through Randolph's point to 18 MeV (see Table 1).

1.1.5 The (n,d) Cross Section

Differential cross sections for the angular distribution of the deuterons from the (n,d) reaction in nitrogen are given by Chase et al.[5] The Legendre analysis code was used to integrate these to give total (n,d) cross sections at the appropriate energies. As in the case of the (n,α) reaction, the only cross section measurement is that of Randolph.[4] French curves were again used to extend the cross-section curve through Randolph's point and on to 18 MeV (see Table 1).

1.1.6 The (n,2α) Cross Section

Randolph[4] quotes a value of 15 mb for the (n, 2α) reaction in nitrogen at an incident neutron energy of 14 MeV. A curve was drawn through this point passing through zero at 11.5 MeV (see Table 1).

1.1.7 The (n,p) Cross Section

For incident neutron energies below about 1.25 MeV the values from UNC-5002 were used.[1] Between 1.25 and about 8 MeV we took the measurements of Gabbard, Bichsel, and Bonner.[3] There are no measurements of this cross section at higher energies. After some agonizing, we finally made the assumption that the (n,p) cross section should roughly parallel the (n,α) cross section and extrapolated accordingly (see Table 1).

1.1.8 The (n,t) Cross Section

Gabbard, Bichsel, and Bonner[3] have measured the cross section for neutron-initiated triton emission for neutron energies below about 8 MeV. There are no measurements at higher energies. Here we assumed that the cross section should rise similarly to the (n,d) cross section but should maintain a slowly varying sum when added to the (n,p) cross section, since competition with that reaction might be expected (see Table 1).

1.1.9 The Absorption Cross Section

The absorption cross section is equal to $\sigma_{n,\gamma} + \sigma_{n,\alpha} + \sigma_{n,d} + \sigma_{n,2\alpha} + \sigma_{n,p} + \sigma_{n,t}$. A curve is given in Fig. 2.

1.1.10 The (n,2n) Cross Section

Ashby and Catron[6] give -10.55 MeV as the Q value for the (n,2n) reaction in N^{14} and -10.84 MeV as the value in N^{15}. The latest supplement to BNL-325[7] has a graph showing measurements by nine authors of the (n,2n) cross section in N^{14} but gives no data on the reaction in N^{15}. Because of the low relative abundance of N^{15} and because of the similarity of the Q values in the two isotopes, we have used the N^{14} data to describe the (n,2n) cross section in the natural element (see Table 1).

1.1.11 The Nonelastic Cross Section

At six energies from 5 MeV to 11.6 MeV Chase et al.[5] have calculated the nonelastic cross section as the difference between their measured values of the total cross section and integrated values of their differential elastic-scattering cross section measurements. Bauer et al.[8] have similarly found a value at 14 MeV. Flerov and Talyzin[9] and Phillips, Davis, and Graves[10] have obtained nonelastic cross sections by sphere transmission measurements at neutron energies between 14 and 15 MeV. For neutron energies below about 5.5 MeV we have taken the nonelastic cross section to be the sum of the cross sections for all reactions except

elastic scattering. For higher energies we have drawn a curve guided by the measurements given above.

1.1.12 The Inelastic-Scattering Cross Section

For energies below about 5.5 MeV we have used values from UNC-5002.[1] For higher energies we have used the difference between the nonelastic cross section and the sum of all other nonelastic reactions. The sum of inelastic and (n,2n) cross sections is given in Fig. 3.

1.2 ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

For neutron energies above about 3 MeV the situation is, as usual, quite complicated. Bostrom et al.[11] have measured differential cross sections at 10 energies between 3 and 16 MeV, but with a large gap from 7 to 15 MeV. Chase et al.[5] have made measurements at seven energies between 5 and 11.6 MeV. Legendre coefficients have been derived from both sets of measurements, and the agreement between the two sets of coefficients is, to say the least, poor. Phillips[12] has measured the angular distribution at 7 MeV, and, on analysis, his data yield the same Legendre coefficients as those of Chase at the same energy. Analysis of the measurements of Bauer[8] and those of Strizlak et al.[13] gives coefficients which agree well for low values of ℓ, but the agreement deteriorates as the order of the expansion increases.

In drawing curves of f_ℓ vs energy we have used the results of Fowler and Johnson[14] for energies below 2.5 MeV, and, for higher energies, we have favored the results of Chase and of Bauer. We have also, at high energies particularly, had to avoid the Scylla and Charybdis[15] of finding, on resynthesis, either negative differential cross sections (resulting from excessively high coefficients) or violation of the Wick limit (which often results from excessively low coefficients). The Legendre coefficients are listed in Table 2.

1.3 ENERGY DISTRIBUTION OF INELASTICALLY SCATTERED NEUTRONS

Nitrogen-14 has isolated energy levels at 2.31 MeV, 3.95 MeV, and a multitude of closely spaced levels above 4.9 MeV. R. B. Day[16] investigated the neutron energy range from 2.56 to 4.2 MeV for the presence of a 2.3-MeV gamma ray and succeeded in detecting one only above 3.95 MeV. He quotes a cross section of 6 mb, a value which does not disagree with the low energy data of Hall and Bonner[17] who measured the cross section for production of the 2.31-MeV gamma ray by neutrons with energy between 4.73 and 8 MeV. The observation of no gamma rays produced by neutrons with energy below 3.95 MeV disagrees with the data of Bostrom et al.[18]; the disagreement became even worse after Bostrom corrected his data.[19] In fact, Bostrom's data also disagree with the low energy data of Hall and Bonner. Therefore, we have decided to follow Day in assuming that inelastic scattering is negligible for neutrons below 3.95 MeV, and, furthermore, to assume that excitation of the 2.31-MeV level is negligible for incident neutrons of any energy. An experimental check of this assumption is available only for 14-MeV neutrons for which Bauer[8] estimated that the cross section for exciting the 2.31-MeV level is of the order of 4 mb; this datum is, however, in disagreement with an estimate of about 15 mb given earlier by Bobyr et al.[20]

For incident neutron energies less than 4.91 MeV, the inelastic scattering cross section was assumed to be equal to the excitation of the 3.91-MeV level. For higher energies, the inelastic scattering cross section is for the excitation of a continuum of levels. The energy distribution of emergent neutrons is here governed by statistical theory with parameters:

$E_t = 10.8$ MeV
$a^{(1)} = 0.63$ MeV^{-1}
$a^{(2)} = 0.63$ MeV^{-1}
$E_0^{(1)} = 8.5$ MeV

$E_0^{(2)} = 16.$ MeV
$E_1^{(1)} = 4.02$ MeV
$E_1^{(2)} = 0.01$ MeV

1.4 ENERGY DISTRIBUTION OF GAMMA RAYS FOLLOWING NONELASTIC REACTIONS

1.4.1 Gamma Rays Following Absorption

Motz et al.[21] give the relative intensities of the gamma rays following thermal neutron capture. We assume that the capture spectrum does not change as a function of energy. We also assume that the (n,p) reaction causes no secondary gamma emission. Therefore, we obtain the number of γ-rays per absorption by multiplying the radiative capture spectrum by the factor:

$$\frac{\sigma_{n,\gamma}}{(\sigma_{n,\gamma}+\sigma_{n,p})}$$

Luckily both the (n,p) and (n,γ) cross sections follow the 1/v relation over the entire range of energies for which the (n,γ) reaction is of interest so that the intensity factor is constant. At 0.0253 eV we have used 1.80 barn for $\sigma_{n,p}$ and 0.08 barn for $\sigma_{n,\gamma}$. The absorption spectrum is given in Table 3.

1.4.2 Gamma Rays Following Inelastic Scattering

The spectrum of gamma rays following inelastic scattering of neutrons by nitrogen was calculated by statistical theory for neutron energies above 5.7 MeV. In considering the spectrum of inelastically scattered neutrons we assumed that the excitation of the 2.31-MeV level could be safely neglected. In considering gamma-ray emission we cannot make that assumption; several higher energy levels decay by cascades which include the 2.31-MeV level. This level was included in the gamma-ray spectrum calculations as one for which excitation by decay of higher levels was allowed, but for which excitation by incident neutrons was not allowed.

For neutron energies below 5.7 MeV the gamma-ray spectrum was governed by the decay scheme shown above. Excitation functions for the various levels were based on the work of Hall and Bonner.[17] The γ-ray spectra are given in Table 4.

1.5 REFERENCES

1. Tralli, N. et al.: UNC-5002 (Jan. 31, 1962).
2. Unpublished communication by W. Biggers, Aug. 22, 1965.
3. Gabbard, F., Bichsel, H., and Bonner, T. W.: Nuclear Phys., 14:277 (1959/60), and F. Gabbard, private communication (1963), quoted in BNL-325, 2nd Ed., Supplement 2 (May 1964).
4. Randolph, M. L.: Radiation Research, 7:47 (1957).
5. Chase, L. F., Jr., et al.: AFSWC-TR-61-15 (Feb. 1961).
6. Ashby, V. J. and Catron, H. C.: UCRL-5419 (Feb. 10, 1959).
7. Stehn, John R. et al.: BNL-325, 2nd Ed., Supplement 2 (May 1964).
8. Bauer, R. W., Anderson, J. D., and Christensen, L. J.: Nuclear Phys., 47:241 (1963).
9. Flerov, N. N. and Talyzin, V. M.: Atomnaya Energiya, 1:155 (1956).
10. Phillips, D. D., Davis, R. W., and Graves, E. R.: Phys. Rev., 88:600 (1952).
11. Bostrom, N. A. et al.: WADC-TR-57-446 (1957).
12. Phillips, D. D.: Data from BNL-400, 2nd Ed. (Oct. 1962).
13. Strizhak, V. I., Bobyr, V. V., and Grona, L. Ya.: Soviet Phys. JETP, 14:225 (1962) translated from ZETF, 41:313 (1961).
14. Fowler, J. L. and Johnson, C. H.: Phys. Rev., 98:728 (1955).
15. Homer, "The Odyssey," Book XII.
16. Day, R. B.: Phys. Rev., 102:767 (1956).
17. Hall, H. E. and Bonner, T. W.: Nuclear Phys., 14:295 (1959/60).
18. Bostrom, N. A. et al.: WADC-TR-58-88 (1958).
19. Bostrom, N. A. et al.: WADC-TR-59-31 (1959).
20. Bobyr, V. V. et al.: Zhurnal Exp. Teoret. Fyz, USSR, 41:24 (1961).
21. Motz, H. T., Carter, R. E., and Barfield, W. D. in: "Pile Neutron Research in Physics," p. 225, IAEA, Vienna, 1962.

TABLE 1 — N – NEUTRON CROSS SECTIO

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels*	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$	
1,8017E 01	1,5501E 00	9,8699E-01	0	1,9956E-01	1,0899E-02	1
1,7139E 01	1,5691E 00	9,8283E-01	0	2,2055E-01	1,0602E-02	1
1,6303E 01	1,5884E 00	9,7458E-01	0	2,4635E-01	1,0146E-02	1
1,5508E 01	1,5987E 00	9,6543E-01	0	2,6584E-01	9,2353E-03	1
1,4751E 01	1,6000E 00	9,5102E-01	0	2,8291E-01	7,7689E-03	1
1,4032E 01	1,5951E 00	9,3226E-01	0	2,9926E-01	6,0925E-03	1
1,3348E 01	1,5534E 00	9,0120E-01	0	2,8853E-01	4,4835E-03	1
1,2697E 01	1,5017E 00	8,8194E-01	0	2,5745E-01	2,3948E-03	1
1,2077E 01	1,4604E 00	8,8267E-01	0	2,1604E-01	1,1434E-03	7
1,1488E 01	1,4298E 00	8,6800E-01	0	1,9429E-01	3,3235E-04	9
1,0928E 01	1,4002E 00	8,4249E-01	0	1,9319E-01	4,3455E-05	
1,0395E 01	1,3615E 00	8,1142E-01	0	1,9745E-01	0	
9,8882E 00	1,3301E 00	7,9009E-01	0	2,0556E-01	0	
9,4059E 00	1,3025E 00	7,7655E-01	0	2,1861E-01	0	
8,9472E 00	1,2925E 00	7,8007E-01	0	2,3576E-01	0	
8,5108E 00	1,3198E 00	8,1121E-01	0	2,5477E-01	0	
8,0957E 00	1,4627E 00	9,2484E-01	0	2,7890E-01	0	
7,7009E 00	1,5112E 00	1,0192E 00	0	2,7230E-01	0	
7,3253E 00	1,4347E 00	9,3573E-01	0	2,5000E-01	0	
6,9681E 00	1,3750E 00	9,1884E-01	0	2,6600E-01	0	
6,6282E 00	1,3585E 00	9,0967E-01	0	2,7059E-01	0	
6,3050E 00	1,4023E 00	9,5753E-01	0	2,2707E-01	0	
5,9975E 00	1,4780E 00	1,0980E 00	0	1,5835E-01	0	
5,7050E 00	1,5518E 00	1,2917E 00	0	4,7963E-02	0	
5,4267E 00	1,6432E 00	1,4184E 00	0	3,4538E-02	0	
5,1621E 00	1,6337E 00	1,3216E 00	0	2,1254E-02	0	
4,9103E 00	1,3675E 00	1,0510E 00	0	8,5711E-03	0	
4,6708E 00	1,8566E 00	1,4585E 00	8,5830E-03	0	0	
4,4430E 00	1,7768E 00	1,3546E 00	7,7304E-03	0	0	
4,2263E 00	1,7087E 00	1,2294E 00	6,7626E-03	0	0	
4,0202E 00	1,7115E 00	1,2409E 00	1,7514E-03	0	0	
3,8242E 00	1,6881E 00	1,3255E 00	0	0	0	
3,6376E 00	1,7508E 00	1,3676E 00	0	0	0	
3,4602E 00	1,7299E 00	1,3367E 00	0	0	0	
3,2915E 00	1,7342E 00	1,3596E 00	0	0	0	
3,1310E 00	1,6687E 00	1,3641E 00	0	0	0	
2,9783E 00	1,6635E 00	1,3879E 00	0	0	0	
2,8330E 00	1,4677E 00	1,2354E 00	0	0	0	
2,6948E 00	1,4881E 00	1,2452E 00	0	0	0	
2,5634E 00	1,5000E 00	1,3547E 00	0	0	0	
2,4384E 00	1,5062E 00	1,4048E 00	0	0	0	
2,3195E 00	1,5621E 00	1,4445E 00	0	0	0	
2,2063E 00	1,6615E 00	1,4562E 00	0	0	0	
2,0987E 00	1,5805E 00	1,5096E 00	0	0	0	
1,9964E 00	1,6517E 00	1,5912E 00	0	0	0	
1,8990E 00	1,8477E 00	1,7747E 00	0	0	0	
1,8064E 00	2,4604E 00	2,2994E 00	0	0	0	
1,7183E 00	2,0529E 00	1,9975E 00	0	0	0	
1,6345E 00	2,3957E 00	2,3502E 00	0	0	0	
1,5548E 00	2,3688E 00	2,3156E 00	0	0	0	

*Excitation of 3.91 MeV level only.

IONS (ALL CROSS SECTIONS IN BARNS)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
1,8999E-02	8,6004E-02	2,0001E+02	1,9000E-01	4,8500E-02	0
1,8692E-02	8,7536E-02	2,0212E+02	1,9085E-01	4,8446E-02	0
1,8185E-02	8,9947E-02	2,0592E+02	1,9076E-01	4,8009E-02	0
1,7451E-02	9,2509E-02	2,1004E+02	1,8892E-01	4,7508E-02	0
1,6303E-02	9,5610E-02	2,1502E+02	1,8570E-01	4,6951E-02	0
1,4987E-02	1,0008E-01	2,2047E+02	1,8039E-01	4,6050E-02	0
1,3119E-02	1,0750E-01	2,2945E+02	1,7505E-01	4,5020E-02	0
1,0854E-02	1,1735E-01	2,4073E+02	1,6654E-01	4,3513E-02	0
7,2074E-03	1,3237E-01	2,5994E+02	1,5425E-01	4,1964E-02	0
9,2850E-04	1,5783E-01	2,9103E+02	1,3919E-01	4,0428E-02	0
0	1,7187E-01	3,1341E+02	1,2067E-01	3,8582E-02	0
0	1,8017E-01	3,1504E+02	1,0020E-01	3,6447E-02	0
0	1,8287E-01	3,1687E+02	8,0678E-02	3,3999E-02	0
0	1,8375E-01	3,1710E+02	5,5231E-02	3,1228E-02	0
0	1,8268E-01	3,1692E+02	3,0002E-02	2,7057E-02	0
0	1,7859E-01	3,1606E+02	1,6212E-02	2,2907E-02	0
0	1,8893E-01	3,1719E+02	1,5442E-02	1,7429E-02	0
0	1,4817E-01	3,1479E+02	1,7765E-02	1,8926E-02	0
0	1,6855E-01	3,1304E+02	2,5149E-02	2,2198E-02	0
0	1,1181E-01	3,1558E+02	1,4367E-02	2,8410E-02	0
0	1,0939E-01	4,1003E+02	3,6895E-04	2,8444E-02	0
0	1,6035E-01	4,1150E+02	0	1,5480E-02	0
0	1,6556E-01	4,1348E+02	0	1,2562E-02	0
0	1,5959E-01	4,1520E+02	0	7,2730E-03	0
0	1,4223E-01	4,1704E+02	0	3,1949E-04	0
0	2,4025E-01	5,1064E+02	0	0	0
0	2,5322E-01	5,1466E+02	0	0	0
0	3,3007E-01	5,1935E+02	0	0	0
0	3,4924E-01	6,1524E+02	0	0	0
0	3,0029E-01	7,1229E+02	0	0	0
0	3,9010E-01	7,1870E+02	0	0	0
0	3,1202E-01	5,1052E+02	0	0	0
0	3,3822E-01	4,1495E+02	0	0	0
0	3,5261E-01	4,1057E+02	0	0	0
0	3,3899E-01	5,1554E+02	0	0	0
0	2,6840E-01	5,1610E+02	0	0	0
0	2,3135E-01	4,1429E+02	0	0	0
0	1,5077E-01	6,1487E+02	0	0	0
0	1,2166E-01	1,1216E+01	0	0	0
0	1,1266E-01	5,1259E+02	0	0	0
0	7,7934E-02	2,1347E+02	0	0	0
0	8,7292E-02	5,1036E+02	0	0	0
0	1,4775E-01	5,1755E+02	0	0	0
0	5,3962E-02	1,1693E+02	0	0	0
0	5,0002E-02	1,1051E+02	0	0	0
0	6,0767E-02	1,1222E+02	0	0	0
0	1,4279E-01	1,1821E+02	0	0	0
0	3,6082E-02	1,1931E+02	0	0	0
0	2,0242E-02	2,1528E+02	0	0	0
0	1,8786E-02	3,1440E+02	0	0	0

TABLE 1 — N (CONT

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$	σ
1.4790E 00	2.0748E 00	1.9547E 00	0	0	0	
1.4068E 00	2.5151E 00	2.2767E 00	0	0	0	
1.3382E 00	2.8260E 00	2.7279E 00	0	0	0	
1.2730E 00	1.8608E 00	1.8389E 00	0	0	0	
1.2109E 00	1.6098E 00	1.5958E 00	0	0	0	
1.1518E 00	1.7262E 00	1.7161E 00	0	0	0	
1.0956E 00	2.4849E 00	2.4791E 00	0	0	0	
1.0422E 00	2.2083E 00	2.2049E 00	0	0	0	
9.9137E-01	1.5527E 00	1.5381E 00	0	0	0	
9.4302E-01	1.2602E 00	1.2511E 00	0	0	0	
8.9703E-01	1.3960E 00	1.3886E 00	0	0	0	
8.5328E-01	1.5957E 00	1.5863E 00	0	0	0	
8.1167E-01	1.7859E 00	1.7732E 00	0	0	0	
7.7208E-01	1.9043E 00	1.8860E 00	0	0	0	
7.3443E-01	2.0579E 00	2.0292E 00	0	0	0	
6.9861E-01	2.2929E 00	2.2328E 00	0	0	0	
6.6454E-01	2.3820E 00	2.2090E 00	0	0	0	
6.3213E-01	1.9135E 00	1.7573E 00	0	0	0	
6.0130E-01	1.7968E 00	1.7383E 00	0	0	0	
5.7197E-01	2.0328E 00	2.0205E 00	0	0	0	
5.4408E-01	2.2293E 00	2.2205E 00	0	0	0	
5.1754E-01	2.3184E 00	2.2888E 00	0	0	0	
4.9230E-01	2.4753E 00	2.3938E 00	0	0	0	
4.6829E-01	2.5896E 00	2.5772E 00	0	0	0	
4.4545E-01	3.3526E 00	3.3502E 00	0	0	0	
4.2373E-01	5.0142E 00	5.0123E 00	0	0	0	
4.0306E-01	3.2912E 00	3.2894E 00	0	0	0	
3.8341E-01	2.9194E 00	2.9177E 00	0	0	0	
3.6471E-01	2.9562E 00	2.9545E 00	0	0	0	
3.4692E-01	3.0434E 00	3.0417E 00	0	0	0	
3.3000E-01	3.1031E 00	3.1015E 00	0	0	0	
3.1391E-01	3.1760E 00	3.1744E 00	0	0	0	
2.9860E-01	3.2331E 00	3.2315E 00	0	0	0	
2.8403E-01	3.3004E 00	3.2988E 00	0	0	0	
2.7018E-01	3.3772E 00	3.3756E 00	0	0	0	
2.5700E-01	3.4465E 00	3.4449E 00	0	0	0	
2.4447E-01	3.4983E 00	3.4967E 00	0	0	0	
2.3255E-01	3.5532E 00	3.5517E 00	0	0	0	
2.2121E-01	3.6183E 00	3.6168E 00	0	0	0	
2.1042E-01	3.6838E 00	3.6822E 00	0	0	0	
2.0016E-01	3.7320E 00	3.7305E 00	0	0	0	
1.9039E-01	3.7979E 00	3.7964E 00	0	0	0	
1.8111E-01	3.8766E 00	3.8751E 00	0	0	0	
1.7228E-01	3.9448E 00	3.9433E 00	0	0	0	
1.6387E-01	3.9962E 00	3.9948E 00	0	0	0	
1.5588E-01	4.0603E 00	4.0588E 00	0	0	0	
1.4828E-01	4.1172E 00	4.1157E 00	0	0	0	
1.4105E-01	4.1688E 00	4.1674E 00	0	0	0	
1.3417E-01	4.2210E 00	4.2195E 00	0	0	0	
1.2762E-01	4.2902E 00	4.2887E 00	0	0	0	

(CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	2.8574E-02	9.1501E+02	0	0	0
0	3.9216E-02	1.9920E+01	0	0	0
0	1.8830E-02	7.9271E+02	0	0	0
0	4.8197E-03	1.7144E+02	0	0	0
0	0	1.3991E+02	0	0	0
0	0	1.0194E+02	0	0	0
0	0	5.8393E+03	0	0	0
0	0	5.3870E+03	0	0	0
0	0	1.4604E+02	0	0	0
0	0	9.0994E+03	0	0	0
0	0	7.4009E+03	0	0	0
0	0	9.4703E+03	0	0	0
0	0	1.2707E+02	0	0	0
0	0	1.8274E+02	0	0	0
0	0	2.8716E+02	0	0	0
0	0	9.0049E+02	0	0	0
0	0	1.7305E+01	0	0	0
0	0	1.5625E+01	0	0	0
0	0	5.8596E+02	0	0	0
0	0	1.2240E+02	0	0	0
0	0	8.7503E+03	0	0	0
0	0	2.9537E+02	0	0	0
0	0	8.1555E+02	0	0	0
0	0	1.2410E+02	0	0	0
0	0	4.3806E+03	0	0	0
0	0	1.8501E+01	0	0	0
0	0	1.8003E+03	0	0	0
0	0	1.7511E+01	0	0	0
0	0	1.7004E+03	0	0	0
0	0	1.6713E+03	0	0	0
0	0	1.6501E+01	0	0	0
0	0	1.6287E+03	0	0	0
0	0	1.6022E+03	0	0	0
0	0	1.5901E+03	0	0	0
0	0	1.5802E+03	0	0	0
0	0	1.5702E+03	0	0	0
0	0	1.5603E+03	0	0	0
0	0	1.5499E+03	0	0	0
0	0	1.5402E+03	0	0	0
0	0	1.5304E+03	0	0	0
0	0	1.5203E+03	0	0	0
0	0	1.5104E+03	0	0	0
0	0	1.5003E+03	0	0	0
0	0	1.4914E+03	0	0	0
0	0	1.4900E+03	0	0	0
0	0	1.4802E+03	0	0	0
0	0	1.4701E+03	0	0	0
0	0	1.4600E+03	0	0	0
0	0	1.4717E+03	0	0	0

TABLE 1 — N (CON

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$
1.2140E-01	4.3458E 00	4.3444E 00	0	0	0
1.1548E-01	4.3957E 00	4.3942E 00	0	0	0
1.0985E-01	4.4469E 00	4.4454E 00	0	0	0
1.0449E-01	4.5015E 00	4.5000E 00	0	0	0
9.9394E-02	4.5744E 00	4.5729E 00	0	0	0
9.4547E-02	4.5187E 00	4.5172E 00	0	0	0
8.9935E-02	4.5319E 00	4.5304E 00	0	0	0
8.5549E-02	4.5982E 00	4.5967E 00	0	0	0
8.1377E-02	4.6942E 00	4.6928E 00	0	0	0
7.7408E-02	4.8029E 00	4.8014E 00	0	0	0
7.3633E-02	4.9948E 00	4.9933E 00	0	0	0
7.0042E-02	5.2941E 00	5.2926E 00	0	0	0
6.6626E-02	5.6213E 00	5.6198E 00	0	0	0
6.3376E-02	5.5208E 00	5.5193E 00	0	0	0
6.0286E-02	5.4346E 00	5.4331E 00	0	0	0
5.7345E-02	5.5871E 00	5.5856E 00	0	0	0
5.4549E-02	5.7873E 00	5.7858E 00	0	0	0
5.1888E-02	5.9747E 00	5.9731E 00	0	0	0
4.9358E-02	6.0374E 00	6.0359E 00	0	0	0
4.6950E-02	5.9991E 00	5.9976E 00	0	0	0
4.4661E-02	5.9257E 00	5.9242E 00	0	0	0
4.2483E-02	5.9944E 00	5.9928E 00	0	0	0
4.0411E-02	6.0889E 00	6.0874E 00	0	0	0
3.8440E-02	6.1462E 00	6.1446E 00	0	0	0
3.6565E-02	6.1871E 00	6.1855E 00	0	0	0
3.4782E-02	6.1527E 00	6.1511E 00	0	0	0
3.3085E-02	6.1078E 00	6.1055E 00	0	0	0
3.1472E-02	6.1200E 00	6.1090E 00	0	0	0
2.9937E-02	6.2916E 00	6.2887E 00	0	0	0
2.8477E-02	6.4783E 00	6.4766E 00	0	0	0
2.7088E-02	6.5928E 00	6.5910E 00	0	0	0
2.5767E-02	6.6932E 00	6.6914E 00	0	0	0
2.4510E-02	6.7651E 00	6.7632E 00	0	0	0
2.3315E-02	6.6294E 00	6.6274E 00	0	0	0
2.2178E-02	6.6086E 00	6.6066E 00	0	0	0
2.1096E-02	6.6985E 00	6.6964E 00	0	0	0
2.0067E-02	6.8831E 00	6.8810E 00	0	0	0
1.9089E-02	7.0806E 00	7.0784E 00	0	0	0
1.8158E-02	7.2749E 00	7.2727E 00	0	0	0
1.7272E-02	7.3904E 00	7.3881E 00	0	0	0
1.6430E-02	7.4847E 00	7.4823E 00	0	0	0
1.5628E-02	7.5774E 00	7.5750E 00	0	0	0
1.4866E-02	7.5832E 00	7.5808E 00	0	0	0
1.4141E-02	7.4146E 00	7.4121E 00	0	0	0
1.3452E-02	7.2335E 00	7.2309E 00	0	0	0
1.2795E-02	7.2000E 00	7.1974E 00	0	0	0
1.2171E-02	7.2034E 00	7.2007E 00	0	0	0
1.1578E-02	7.2431E 00	7.2403E 00	0	0	0
1.1013E-02	7.3057E 00	7.3028E 00	0	0	0
1.0476E-02	7.4839E 00	7.4810E 00	0	0	0

(CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	0	1.4700E+03	0	0	0
0	0	1.4700E+03	0	0	0
0	0	1.4700E+03	0	0	0
0	0	1.4700E+03	0	0	0
0	0	1.4709E+03	0	0	0
0	0	1.4704E+03	0	0	0
0	0	1.4800E+03	0	0	0
0	0	1.4800E+03	0	0	0
0	0	1.4810E+03	0	0	0
0	0	1.4804E+03	0	0	0
0	0	1.4900E+03	0	0	0
0	0	1.4910E+03	0	0	0
0	0	1.4905E+03	0	0	0
0	0	1.5000E+03	0	0	0
0	0	1.5009E+03	0	0	0
0	0	1.5004E+03	0	0	0
0	0	1.5104E+03	0	0	0
0	0	1.5205E+03	0	0	0
0	0	1.5304E+03	0	0	0
0	0	1.5404E+03	0	0	0
0	0	1.5502E+03	0	0	0
0	0	1.5604E+03	0	0	0
0	0	1.5803E+03	0	0	0
0	0	1.5905E+03	0	0	0
0	0	1.6109E+03	0	0	0
0	0	1.6309E+03	0	0	0
0	0	2.3078E+03	0	0	0
0	0	1.0996E+02	0	0	0
0	0	2.8281E+03	0	0	0
0	0	1.7285E+03	0	0	0
0	0	1.7583E+03	0	0	0
0	0	1.7887E+03	0	0	0
0	0	1.8200E+03	0	0	0
0	0	1.8749E+03	0	0	0
0	0	1.9224E+03	0	0	0
0	0	1.9710E+03	0	0	0
0	0	2.0209E+03	0	0	0
0	0	2.0721E+03	0	0	0
0	0	2.1246E+03	0	0	0
0	0	2.1783E+03	0	0	0
0	0	2.2335E+03	0	0	0
0	0	2.2900E+03	0	0	0
0	0	2.3480E+03	0	0	0
0	0	2.4074E+03	0	0	0
0	0	2.4684E+03	0	0	0
0	0	2.5309E+03	0	0	0
0	0	2.5949E+03	0	0	0
0	0	2.6606E+03	0	0	0
0	0	2.7280E+03	0	0	0
0	0	2.7970E+03	0	0	0
0	0	0	0	1.3136E-05	0
0	0	0	0	8.1272E-05	0
0	0	0	0	8.3330E-05	0
0	0	0	0	8.5439E-05	0
0	0	0	0	8.7602E-05	0
0	0	0	0	8.9820E-05	0
0	0	0	0	9.2094E-05	0
0	0	0	0	9.4425E-05	0
0	0	0	0	9.6815E-05	0
0	0	0	0	9.9266E-05	0
0	0	0	0	1.0178E-04	0
0	0	0	0	1.0436E-04	0
0	0	0	0	1.0700E-04	0
0	0	0	0	1.0971E-04	0
0	0	0	0	1.1248E-04	0
0	0	0	0	1.1533E-04	0
0	0	0	0	1.1825E-04	0
0	0	0	0	1.2124E-04	0
0	0	0	0	1.2431E-04	0

TABLE 1 — N (CON

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$
9,9651E-03	7,7493E 00	7,7463E 00	0	0	0
9,4791E-03	7,8885E 00	7,8854E 00	0	0	0
9,0168E-03	7,9826E 00	7,9795E 00	0	0	0
8,5771E-03	8,0177E 00	8,0144E 00	0	0	0
8,1588E-03	8,0371E 00	8,0338E 00	0	0	0
7,7609E-03	8,0503E 00	8,0469E 00	0	0	0
7,3824E-03	8,0756E 00	8,0722E 00	0	0	0
7,0223E-03	8,0979E 00	8,0944E 00	0	0	0
6,6798E-03	8,1184E 00	8,1148E 00	0	0	0
6,3541E-03	8,1378E 00	8,1341E 00	0	0	0
6,0442E-03	8,1576E 00	8,1537E 00	0	0	0
5,7494E-03	8,1777E 00	8,1738E 00	0	0	0
5,4690E-03	8,1985E 00	8,1944E 00	0	0	0
5,2023E-03	8,2270E 00	8,2228E 00	0	0	0
4,9485E-03	8,2571E 00	8,2529E 00	0	0	0
4,7072E-03	8,2943E 00	8,2899E 00	0	0	0
4,4776E-03	8,3261E 00	8,3217E 00	0	0	0
4,2592E-03	8,3576E 00	8,3530E 00	0	0	0
4,0515E-03	8,3947E 00	8,3900E 00	0	0	0
3,8539E-03	8,4255E 00	8,4207E 00	0	0	0
3,6660E-03	8,4487E 00	8,4438E 00	0	0	0
3,4872E-03	8,4760E 00	8,4710E 00	0	0	0
3,3171E-03	8,4978E 00	8,4926E 00	0	0	0
3,1553E-03	8,5179E 00	8,5126E 00	0	0	0
3,0014E-03	8,5382E 00	8,5327E 00	0	0	0
2,8551E-03	8,5578E 00	8,5522E 00	0	0	0
2,7158E-03	8,5775E 00	8,5718E 00	0	0	0
2,5834E-03	8,5984E 00	8,5925E 00	0	0	0
2,4574E-03	8,6249E 00	8,6189E 00	0	0	0
2,3375E-03	8,6447E 00	8,6385E 00	0	0	0
2,2235E-03	8,6738E 00	8,6675E 00	0	0	0
2,1151E-03	8,6971E 00	8,6906E 00	0	0	0
2,0119E-03	8,7173E 00	8,7106E 00	0	0	0
1,9138E-03	8,7371E 00	8,7302E 00	0	0	0
1,8205E-03	8,7574E 00	8,7504E 00	0	0	0
1,7317E-03	8,7771E 00	8,7699E 00	0	0	0
1,6472E-03	8,7960E 00	8,7886E 00	0	0	0
1,5669E-03	8,8156E 00	8,8080E 00	0	0	0
1,4905E-03	8,8367E 00	8,8289E 00	0	0	0
1,4178E-03	8,8575E 00	8,8495E 00	0	0	0
1,3486E-03	8,8772E 00	8,8691E 00	0	0	0
1,2829E-03	8,8962E 00	8,8878E 00	0	0	0
1,2203E-03	8,9163E 00	8,9077E 00	0	0	0
1,1608E-03	8,9362E 00	8,9274E 00	0	0	0
1,1042E-03	8,9567E 00	8,9477E 00	0	0	0
1,0503E-03	8,9767E 00	8,9675E 00	0	0	0
9,9909E-04	8,9964E 00	8,9870E 00	0	0	0
9,5037E-04	9,0140E 00	9,0043E 00	0	0	0
9,0402E-04	9,0284E 00	9,0184E 00	0	0	0
8,5993E-04	9,0466E 00	9,0364E 00	0	0	0

N (CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	0	2.8679E-03	0	0	1.2766E-04
0	0	2.9405E-03	0	0	1.3069E-04
0	0	3.0149E-03	0	0	1.3400E-04
0	0	3.0912E-03	0	0	1.3739E-04
0	0	3.1695E-03	0	0	1.4087E-04
0	0	3.2497E-03	0	0	1.4443E-04
0	0	3.3320E-03	0	0	1.4809E-04
0	0	3.4163E-03	0	0	1.5184E-04
0	0	3.5028E-03	0	0	1.5568E-04
0	0	3.5915E-03	0	0	1.5962E-04
0	0	3.6824E-03	0	0	1.6366E-04
0	0	3.7756E-03	0	0	1.6781E-04
0	0	3.8712E-03	0	0	1.7205E-04
0	0	3.9692E-03	0	0	1.7641E-04
0	0	4.0697E-03	0	0	1.8087E-04
0	0	4.1727E-03	0	0	1.8545E-04
0	0	4.2783E-03	0	0	1.9015E-04
0	0	4.3866E-03	0	0	1.9496E-04
0	0	4.4977E-03	0	0	1.9990E-04
0	0	4.6116E-03	0	0	2.0496E-04
0	0	4.7283E-03	0	0	2.1015E-04
0	0	4.8480E-03	0	0	2.1547E-04
0	0	4.9707E-03	0	0	2.2092E-04
0	0	5.0966E-03	0	0	2.2651E-04
0	0	5.2257E-03	0	0	2.3225E-04
0	0	5.3579E-03	0	0	2.3813E-04
0	0	5.4935E-03	0	0	2.4416E-04
0	0	5.6325E-03	0	0	2.5034E-04
0	0	5.7749E-03	0	0	2.5667E-04
0	0	5.9208E-03	0	0	2.6317E-04
0	0	6.0703E-03	0	0	2.6983E-04
0	0	6.2235E-03	0	0	2.7666E-04
0	0	6.3805E-03	0	0	2.8367E-04
0	0	6.5413E-03	0	0	2.9085E-04
0	0	6.7060E-03	0	0	2.9821E-04
0	0	6.8747E-03	0	0	3.0576E-04
0	0	7.0475E-03	0	0	3.1350E-04
0	0	7.2244E-03	0	0	3.2144E-04
0	0	7.4055E-03	0	0	3.2958E-04
0	0	7.5909E-03	0	0	3.3792E-04
0	0	7.7806E-03	0	0	3.4647E-04
0	0	7.9748E-03	0	0	3.5524E-04
0	0	8.1735E-03	0	0	3.6424E-04
0	0	8.3768E-03	0	0	3.7346E-04
0	0	8.5848E-03	0	0	3.8291E-04
0	0	8.7976E-03	0	0	3.9261E-04
0	0	9.0153E-03	0	0	4.0254E-04
0	0	9.2380E-03	0	0	4.1273E-04
0	0	9.4658E-03	0	0	4.2318E-04
0	0	9.6987E-03	0	0	4.3390E-04

TABLE 1 — N (CO

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$
8,1799E-04	9,0662E 00	9,0558E 00	0	0	0
7,7809E-04	9,0789E 00	9,0682E 00	0	0	0
7,4015E-04	9,0965E 00	9,0856E 00	0	0	0
7,0405E-04	9,1163E 00	9,1050E 00	0	0	0
6,6971E-04	9,1294E 00	9,1178E 00	0	0	0
6,3705E-04	9,1468E 00	9,1350E 00	0	0	0
6,0598E-04	9,1660E 00	9,1539E 00	0	0	0
5,7643E-04	9,1789E 00	9,1665E 00	0	0	0
5,4831E-04	9,1967E 00	9,1839E 00	0	0	0
5,2157E-04	9,2163E 00	9,2032E 00	0	0	0
4,9613E-04	9,2288E 00	9,2154E 00	0	0	0
4,7194E-04	9,2465E 00	9,2327E 00	0	0	0
4,4892E-04	9,2659E 00	9,2518E 00	0	0	0
4,2703E-04	9,2790E 00	9,2645E 00	0	0	0
4,0620E-04	9,2967E 00	9,2819E 00	0	0	0
3,8639E-04	9,3159E 00	9,3007E 00	0	0	0
3,6755E-04	9,3290E 00	9,3134E 00	0	0	0
3,4962E-04	9,3469E 00	9,3309E 00	0	0	0
3,3257E-04	9,3662E 00	9,3498E 00	0	0	0
3,1635E-04	9,3790E 00	9,3622E 00	0	0	0
3,0092E-04	9,3978E 00	9,3805E 00	0	0	0
2,8624E-04	9,4252E 00	9,4075E 00	0	0	0
2,7228E-04	9,4548E 00	9,4366E 00	0	0	0
2,5901E-04	9,4844E 00	9,4658E 00	0	0	0
2,4637E-04	9,5062E 00	9,4872E 00	0	0	0
2,3436E-04	9,5271E 00	9,5076E 00	0	0	0
2,2293E-04	9,5466E 00	9,5266E 00	0	0	0
2,1206E-04	9,5660E 00	9,5455E 00	0	0	0
2,0171E-04	9,5858E 00	9,5647E 00	0	0	0
1,9188E-04	9,5980E 00	9,5764E 00	0	0	0
1,8252E-04	9,6082E 00	9,5860E 00	0	0	0
1,7362E-04	9,6181E 00	9,5954E 00	0	0	0
1,6515E-04	9,6278E 00	9,6045E 00	0	0	0
1,5709E-04	9,6445E 00	9,6207E 00	0	0	0
1,4943E-04	9,6656E 00	9,6411E 00	0	0	0
1,4215E-04	9,6864E 00	9,6613E 00	0	0	0
1,3521E-04	9,7062E 00	9,6805E 00	0	0	0
1,2862E-04	9,7252E 00	9,6988E 00	0	0	0
1,2235E-04	9,7449E 00	9,7178E 00	0	0	0
1,1638E-04	9,7576E 00	9,7299E 00	0	0	0
1,1070E-04	9,7678E 00	9,7394E 00	0	0	0
1,0530E-04	9,7782E 00	9,7491E 00	0	0	0
1,0017E-04	9,7956E 00	9,7657E 00	0	0	0
9,5283E-05	9,8152E 00	9,7846E 00	0	0	0
9,0636E-05	9,8282E 00	9,7968E 00	0	0	0
8,6215E-05	9,8456E 00	9,8134E 00	0	0	0
8,2011E-05	9,8653E 00	9,8323E 00	0	0	0
7,8011E-05	9,8778E 00	9,8440E 00	0	0	0
7,4206E-05	9,8878E 00	9,8531E 00	0	0	0
7,0587E-05	9,8984E 00	9,8628E 00	0	0	0

– N (CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	0	0	1.00108E-02	0	0	4.44865E-04
0	0	0	1.02533E-02	0	0	4.56148E-04
0	0	0	1.05033E-02	0	0	4.67696E-04
0	0	0	1.07598E-02	0	0	4.79532E-04
0	0	0	1.10263E-02	0	0	4.91678E-04
0	0	0	1.13043E-02	0	0	5.04118E-04
0	0	0	1.15908E-02	0	0	5.16888E-04
0	0	0	1.18842E-02	0	0	5.29968E-04
0	0	0	1.22206E-02	0	0	5.43388E-04
0	0	0	1.25558E-02	0	0	5.57138E-04
0	0	0	1.28953E-02	0	0	5.71248E-04
0	0	0	1.31798E-02	0	0	5.85708E-04
0	0	0	1.35156E-02	0	0	6.00536E-04
0	0	0	1.38954E-02	0	0	6.15736E-04
0	0	0	1.42055E-02	0	0	6.31316E-04
0	0	0	1.45804E-02	0	0	6.47308E-04
0	0	0	1.49535E-02	0	0	6.63688E-04
0	0	0	1.53116E-02	0	0	6.80488E-04
0	0	0	1.56906E-02	0	0	6.97716E-04
0	0	0	1.60995E-02	0	0	7.15378E-04
0	0	0	1.65035E-02	0	0	7.33488E-04
0	0	0	1.69021E-02	0	0	7.52058E-04
0	0	0	1.73906E-02	0	0	7.71098E-04
0	0	0	1.77995E-02	0	0	7.90618E-04
0	0	0	1.82395E-02	0	0	8.10628E-04
0	0	0	1.87015E-02	0	0	8.31158E-04
0	0	0	1.91774E-02	0	0	8.52198E-04
0	0	0	1.96605E-02	0	0	8.73768E-04
0	0	0	2.01897E-02	0	0	8.95886E-04
0	0	0	2.07008E-02	0	0	9.18568E-04
0	0	0	2.11991E-02	0	0	9.41818E-04
0	0	0	2.17277E-02	0	0	9.65658E-04
0	0	0	2.22777E-02	0	0	9.90108E-04
0	0	0	2.28041E-02	0	0	1.01588E-03
0	0	0	2.33195E-02	0	0	1.04228E-03
0	0	0	2.40166E-02	0	0	1.06928E-03
0	0	0	2.46206E-02	0	0	1.09698E-03
0	0	0	2.52435E-02	0	0	1.12548E-03
0	0	0	2.58844E-02	0	0	1.15478E-03
0	0	0	2.65305E-02	0	0	1.18498E-03
0	0	0	2.72099E-02	0	0	1.21618E-03
0	0	0	2.78986E-02	0	0	1.24838E-03
0	0	0	2.86056E-02	0	0	1.28168E-03
0	0	0	2.93296E-02	0	0	1.31618E-03
0	0	0	3.00716E-02	0	0	1.35188E-03
0	0	0	3.08326E-02	0	0	1.38898E-03
0	0	0	3.16136E-02	0	0	1.42758E-03
0	0	0	3.24156E-02	0	0	1.46768E-03
0	0	0	3.32346E-02	0	0	1.50948E-03
0	0	0	3.40796E-02	0	0	1.55298E-03
0	0	0	3.49476E-02	0	0	1.59838E-03
0	0	0	3.58406E-02	0	0	1.64568E-03
0	0	0	3.67586E-02	0	0	1.69508E-03
0	0	0	3.77036E-02	0	0	1.74658E-03
0	0	0	3.86756E-02	0	0	1.80038E-03
0	0	0	3.96766E-02	0	0	1.85648E-03
0	0	0	4.07076E-02	0	0	1.91508E-03
0	0	0	4.17706E-02	0	0	1.97628E-03
0	0	0	4.28656E-02	0	0	2.04018E-03
0	0	0	4.39946E-02	0	0	2.10698E-03
0	0	0	4.51596E-02	0	0	2.17678E-03
0	0	0	4.63616E-02	0	0	2.24978E-03
0	0	0	4.76026E-02	0	0	2.32618E-03
0	0	0	4.88846E-02	0	0	2.40608E-03
0	0	0	5.02096E-02	0	0	2.48968E-03
0	0	0	5.15786E-02	0	0	2.57718E-03
0	0	0	5.29946E-02	0	0	2.66868E-03
0	0	0	5.44586E-02	0	0	2.76438E-03
0	0	0	5.59726E-02	0	0	2.86448E-03
0	0	0	5.75396E-02	0	0	2.96908E-03
0	0	0	5.91606E-02	0	0	3.07848E-03
0	0	0	6.08376E-02	0	0	3.19278E-03
0	0	0	6.25726E-02	0	0	3.31218E-03
0	0	0	6.43676E-02	0	0	3.43688E-03
0	0	0	6.62246E-02	0	0	3.56708E-03
0	0	0	6.81456E-02	0	0	3.70288E-03
0	0	0	7.01326E-02	0	0	3.84458E-03
0	0	0	7.21876E-02	0	0	3.99228E-03
0	0	0	7.43126E-02	0	0	4.14618E-03
0	0	0	7.65106E-02	0	0	4.30648E-03
0	0	0	7.87826E-02	0	0	4.47338E-03
0	0	0	8.11316E-02	0	0	4.64708E-03
0	0	0	8.35606E-02	0	0	4.82778E-03
0	0	0	8.60716E-02	0	0	5.01568E-03
0	0	0	8.86676E-02	0	0	5.21098E-03
0	0	0	9.13506E-02	0	0	5.41388E-03
0	0	0	9.41236E-02	0	0	5.62458E-03
0	0	0	9.69886E-02	0	0	5.84328E-03
0	0	0	9.99496E-02	0	0	6.07028E-03
0	0	0	1.03008E-01	0	0	6.30568E-03
0	0	0	1.06168E-01	0	0	6.54978E-03
0	0	0	1.09433E-01	0	0	6.80278E-03
0	0	0	1.12806E-01	0	0	7.06488E-03
0	0	0	1.16290E-01	0	0	7.33638E-03
0	0	0	1.19890E-01	0	0	7.61748E-03
0	0	0	1.23608E-01	0	0	7.90848E-03
0	0	0	1.27448E-01	0	0	8.20958E-03
0	0	0	1.31414E-01	0	0	8.52108E-03
0	0	0	1.35510E-01	0	0	8.84318E-03
0	0	0	1.39740E-01	0	0	9.17618E-03

TABLE 1 — N (CC

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$
6,7145E-05	9,9158E 00	9,8794E 00	0	0	0
6,3870E-05	9,9283E 00	9,8909E 00	0	0	0
6,0755E-05	9,9473E 00	9,9089E 00	0	0	0
5,7792E-05	9,9728E 00	9,9335E 00	0	0	0
5,4973E-05	9,9789E 00	9,9386E 00	0	0	0
5,2292E-05	9,9880E 00	9,9466E 00	0	0	0
4,9742E-05	9,9974E 00	9,9550E 00	0	0	0
4,7316E-05	1,0000E 01	9,9565E 00	0	0	0
4,5008E-05	1,0000E 01	9,9554E 00	0	0	0
4,2813E-05	1,0000E 01	9,9543E 00	0	0	0
4,0725E-05	1,0000E 01	9,9531E 00	0	0	0
3,8739E-05	1,0000E 01	9,9520E 00	0	0	0
3,6850E-05	1,0000E 01	9,9507E 00	0	0	0
3,5053E-05	1,0000E 01	9,9495E 00	0	0	0
3,3343E-05	1,0000E 01	9,9482E 00	0	0	0
3,1717E-05	1,0000E 01	9,9469E 00	0	0	0
3,0170E-05	1,0000E 01	9,9456E 00	0	0	0
2,8699E-05	1,0000E 01	9,9442E 00	0	0	0
2,7299E-05	1,0000E 01	9,9428E 00	0	0	0
2,5968E-05	1,0000E 01	9,9413E 00	0	0	0
2,4701E-05	1,0000E 01	9,9398E 00	0	0	0
2,3490E-05	1,0000E 01	9,9383E 00	0	0	0
2,2350E-05	1,0000E 01	9,9368E 00	0	0	0
2,1260E-05	1,0000E 01	9,9352E 00	0	0	0
2,0224E-05	1,0000E 01	9,9339E 00	0	0	0
1,9237E-05	1,0008E 01	9,9393E 00	0	0	0
1,8299E-05	1,0018E 01	9,9477E 00	0	0	0
1,7407E-05	1,0028E 01	9,9559E 00	0	0	0
1,6558E-05	1,0037E 01	9,9635E 00	0	0	0
1,5750E-05	1,0047E 01	9,9714E 00	0	0	0
1,4982E-05	1,0057E 01	9,9800E 00	0	0	0
1,4251E-05	1,0068E 01	9,9885E 00	0	0	0
1,3556E-05	1,0078E 01	9,9964E 00	0	0	0
1,2895E-05	1,0087E 01	1,0004E 01	0	0	0
1,2266E-05	1,0097E 01	1,0011E 01	0	0	0
1,1668E-05	1,0100E 01	1,0013E 01	0	0	0
1,1099E-05	1,0107E 01	1,0018E 01	0	0	0
1,0558E-05	1,0117E 01	1,0028E 01	0	0	0
1,0043E-05	1,0127E 01	1,0033E 01	0	0	0
9,5529E-06	1,0137E 01	1,0041E 01	0	0	0
9,0870E-06	1,0147E 01	1,0048E 01	0	0	0
8,6438E-06	1,0150E 01	1,0049E 01	0	0	0
8,2223E-06	1,0157E 01	1,0053E 01	0	0	0
7,8213E-06	1,0167E 01	1,0060E 01	0	0	0
7,4398E-06	1,0177E 01	1,0068E 01	0	0	0
7,0770E-06	1,0187E 01	1,0075E 01	0	0	0
6,7318E-06	1,0197E 01	1,0082E 01	0	0	0
6,4035E-06	1,0200E 01	1,0082E 01	0	0	0
6,0912E-06	1,0207E 01	1,0086E 01	0	0	0
5,7941E-06	1,0217E 01	1,0093E 01	0	0	0

N (CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	0	0	0	0	1,5588E-03
0	0	0	0	0	1,6816E-03
0	0	0	0	0	1,8384E-03
0	0	0	0	0	1,9737E-03
0	0	0	0	0	2,1161E-03
0	0	0	0	0	2,2595E-03
0	0	0	0	0	2,4041E-03
0	0	0	0	0	2,5497E-03
0	0	0	0	0	2,6966E-03
0	0	0	0	0	2,8446E-03
0	0	0	0	0	2,9938E-03
0	0	0	0	0	3,0443E-03
0	0	0	0	0	3,0960E-03
0	0	0	0	0	3,1491E-03
0	0	0	0	0	3,2035E-03
0	0	0	0	0	3,2593E-03
0	0	0	0	0	3,3165E-03
0	0	0	0	0	3,3751E-03
0	0	0	0	0	3,4352E-03
0	0	0	0	0	3,4969E-03
0	0	0	0	0	3,5601E-03
0	0	0	0	0	3,6249E-03
0	0	0	0	0	3,6914E-03
0	0	0	0	0	3,7595E-03
0	0	0	0	0	3,8294E-03
0	0	0	0	0	3,9010E-03
0	0	0	0	0	3,9744E-03
0	0	0	0	0	4,0497E-03
0	0	0	0	0	4,1269E-03
0	0	0	0	0	4,2061E-03
0	0	0	0	0	4,2872E-03
0	0	0	0	0	4,3705E-03
0	0	0	0	0	4,4558E-03
0	0	0	0	0	4,5433E-03
0	0	0	0	0	4,6330E-03
0	0	0	0	0	4,7249E-03
0	0	0	0	0	4,8192E-03
0	0	0	0	0	4,9159E-03
0	0	0	0	0	5,0150E-03
0	0	0	0	0	5,1167E-03
0	0	0	0	0	5,2209E-03
0	0	0	0	0	5,3278E-03
0	0	0	0	0	5,4373E-03
0	0	0	0	0	5,5496E-03
0	0	0	0	0	5,6648E-03
0	0	0	0	0	5,7829E-03
0	0	0	0	0	5,9040E-03
0	0	0	0	0	6,0281E-03
0	0	0	0	0	6,1554E-03
0	0	0	0	0	6,2859E-03

TABLE 1 — N (CO

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$
5,5116E-06	1,0227E 01	1,0100E 01	0	0	0
5,2428E-06	1,0237E 01	1,0107E 01	0	0	0
4,9871E-06	1,0247E 01	1,0113E 01	0	0	0
4,7438E-06	1,0250E 01	1,0113E 01	0	0	0
4,5125E-06	1,0257E 01	1,0116E 01	0	0	0
4,2924E-06	1,0267E 01	1,0123E 01	0	0	0
4,0831E-06	1,0277E 01	1,0129E 01	0	0	0
3,8839E-06	1,0287E 01	1,0135E 01	0	0	0
3,6945E-06	1,0297E 01	1,0142E 01	0	0	0
3,5143E-06	1,0300E 01	1,0141E 01	0	0	0
3,3429E-06	1,0307E 01	1,0144E 01	0	0	0
3,1799E-06	1,0317E 01	1,0150E 01	0	0	0
3,0248E-06	1,0328E 01	1,0156E 01	0	0	0
2,8773E-06	1,0337E 01	1,0161E 01	0	0	0
2,7370E-06	1,0347E 01	1,0166E 01	0	0	0
2,6035E-06	1,0350E 01	1,0165E 01	0	0	0
2,4765E-06	1,0357E 01	1,0167E 01	0	0	0
2,3557E-06	1,0367E 01	1,0173E 01	0	0	0
2,2408E-06	1,0377E 01	1,0178E 01	0	0	0
2,1315E-06	1,0387E 01	1,0183E 01	0	0	0
2,0276E-06	1,0397E 01	1,0187E 01	0	0	0
1,9287E-06	1,0400E 01	1,0185E 01	0	0	0
1,8346E-06	1,0407E 01	1,0186E 01	0	0	0
1,7452E-06	1,0417E 01	1,0191E 01	0	0	0
1,6601E-06	1,0427E 01	1,0194E 01	0	0	0
1,5791E-06	1,0436E 01	1,0198E 01	0	0	0
1,5021E-06	1,0446E 01	1,0203E 01	0	0	0
1,4288E-06	1,0450E 01	1,0200E 01	0	0	0
1,3591E-06	1,0457E 01	1,0201E 01	0	0	0
1,2928E-06	1,0467E 01	1,0204E 01	0	0	0
1,2298E-06	1,0477E 01	1,0207E 01	0	0	0
1,1698E-06	1,0487E 01	1,0210E 01	0	0	0
1,1128E-06	1,0497E 01	1,0213E 01	0	0	0
1,0585E-06	1,0500E 01	1,0209E 01	0	0	0
1,0069E-06	1,0500E 01	1,0202E 01	0	0	0
9,5777E-07	1,0500E 01	1,0195E 01	0	0	0
9,1109E-07	1,0507E 01	1,0194E 01	0	0	0
8,6662E-07	1,0517E 01	1,0196E 01	0	0	0
8,2436E-07	1,0527E 01	1,0198E 01	0	0	0
7,8415E-07	1,0537E 01	1,0199E 01	0	0	0
7,4591E-07	1,0547E 01	1,0201E 01	0	0	0
7,0953E-07	1,0557E 01	1,0202E 01	0	0	0
6,7493E-07	1,0567E 01	1,0203E 01	0	0	0
6,4201E-07	1,0577E 01	1,0204E 01	0	0	0
6,1070E-07	1,0587E 01	1,0204E 01	0	0	0
5,8091E-07	1,0597E 01	1,0204E 01	0	0	0
5,5258E-07	1,0607E 01	1,0205E 01	0	0	0
5,2563E-07	1,0617E 01	1,0205E 01	0	0	0
5,0000E-07	1,0627E 01	1,0204E 01	0	0	0
4,7561E-07	1,0637E 01	1,0203E 01	0	0	0

— N (CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	0	1.2194E+01	0	0	5.4197E-03
0	0	1.2503E+01	0	0	5.5569E-03
0	0	1.2802E+01	0	0	5.6976E-03
0	0	1.3104E+01	0	0	5.8419E-03
0	0	1.3377E+01	0	0	5.9897E-03
0	0	1.3818E+01	0	0	6.1414E-03
0	0	1.4108E+01	0	0	6.2968E-03
0	0	1.4627E+01	0	0	6.4563E-03
0	0	1.4694E+01	0	0	6.6197E-03
0	0	1.5271E+01	0	0	6.7873E-03
0	0	1.5606E+01	0	0	6.9591E-03
0	0	1.6094E+01	0	0	7.1353E-03
0	0	1.6401E+01	0	0	7.3159E-03
0	0	1.6877E+01	0	0	7.5011E-03
0	0	1.7305E+01	0	0	7.6910E-03
0	0	1.7743E+01	0	0	7.8857E-03
0	0	1.8192E+01	0	0	8.0853E-03
0	0	1.8652E+01	0	0	8.2900E-03
0	0	1.9125E+01	0	0	8.4999E-03
0	0	1.9609E+01	0	0	8.7150E-03
0	0	2.0105E+01	0	0	8.9357E-03
0	0	2.0614E+01	0	0	9.1619E-03
0	0	2.1136E+01	0	0	9.3938E-03
0	0	2.1671E+01	0	0	9.6316E-03
0	0	2.2220E+01	0	0	9.8754E-03
0	0	2.2782E+01	0	0	1.0125E-02
0	0	2.3359E+01	0	0	1.0382E-02
0	0	2.3950E+01	0	0	1.0645E-02
0	0	2.4557E+01	0	0	1.0914E-02
0	0	2.5178E+01	0	0	1.1190E-02
0	0	2.5816E+01	0	0	1.1474E-02
0	0	2.6469E+01	0	0	1.1764E-02
0	0	2.7139E+01	0	0	1.2062E-02
0	0	2.7826E+01	0	0	1.2367E-02
0	0	2.8531E+01	0	0	1.2680E-02
0	0	2.9253E+01	0	0	1.3001E-02
0	0	2.9993E+01	0	0	1.3330E-02
0	0	3.0753E+01	0	0	1.3668E-02
0	0	3.1531E+01	0	0	1.4014E-02
0	0	3.2329E+01	0	0	1.4369E-02
0	0	3.3148E+01	0	0	1.4732E-02
0	0	3.3987E+01	0	0	1.5105E-02
0	0	3.4847E+01	0	0	1.5488E-02
0	0	3.5730E+01	0	0	1.5880E-02
0	0	3.6634E+01	0	0	1.6282E-02
0	0	3.7561E+01	0	0	1.6694E-02
0	0	3.8511E+01	0	0	1.7117E-02
0	0	3.9487E+01	0	0	1.7550E-02
0	0	4.0487E+01	0	0	1.7994E-02
0	0	4.1514E+01	0	0	1.8450E-02

TABLE 1 — N (C

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$
4.5242E-07	1.0647E 01	1.0202E 01	0	0	0
4.3035E-07	1.0657E 01	1.0201E 01	0	0	0
4.0936E-07	1.0667E 01	1.0199E 01	0	0	0
3.8940E-07	1.0677E 01	1.0198E 01	0	0	0
3.7041E-07	1.0687E 01	1.0196E 01	0	0	0
3.5234E-07	1.0697E 01	1.0193E 01	0	0	0
3.3516E-07	1.0714E 01	1.0197E 01	0	0	0
3.1881E-07	1.0734E 01	1.0204E 01	0	0	0
3.0326E-07	1.0754E 01	1.0211E 01	0	0	0
2.8847E-07	1.0774E 01	1.0217E 01	0	0	0
2.7440E-07	1.0793E 01	1.0223E 01	0	0	0
2.6102E-07	1.0814E 01	1.0228E 01	0	0	0
2.4829E-07	1.0833E 01	1.0233E 01	0	0	0
2.3618E-07	1.0854E 01	1.0239E 01	0	0	0
2.2466E-07	1.0874E 01	1.0243E 01	0	0	0
2.1371E-07	1.0893E 01	1.0246E 01	0	0	0
2.0328E-07	1.0913E 01	1.0250E 01	0	0	0
1.9337E-07	1.0933E 01	1.0253E 01	0	0	0
1.8394E-07	1.0953E 01	1.0256E 01	0	0	0
1.7497E-07	1.0973E 01	1.0258E 01	0	0	0
1.6643E-07	1.0992E 01	1.0259E 01	0	0	0
1.5832E-07	1.1011E 01	1.0260E 01	0	0	0
1.5060E-07	1.1032E 01	1.0262E 01	0	0	0
1.4329E-07	1.1053E 01	1.0263E 01	0	0	0
1.3627E-07	1.1073E 01	1.0263E 01	0	0	0
1.2962E-07	1.1092E 01	1.0262E 01	0	0	0
1.2330E-07	1.1112E 01	1.0261E 01	0	0	0
1.1728E-07	1.1132E 01	1.0259E 01	0	0	0
1.1156E-07	1.1152E 01	1.0257E 01	0	0	0
1.0612E-07	1.1173E 01	1.0255E 01	0	0	0
1.0095E-07	1.1192E 01	1.0251E 01	0	0	0
9.6024E-08	1.1213E 01	1.0248E 01	0	0	0
9.1341E-08	1.1233E 01	1.0243E 01	0	0	0
8.6887E-08	1.1253E 01	1.0238E 01	0	0	0
8.2649E-08	1.1273E 01	1.0233E 01	0	0	0
7.8618E-08	1.1293E 01	1.0226E 01	0	0	0
7.4784E-08	1.1312E 01	1.0219E 01	0	0	0
7.1137E-08	1.1333E 01	1.0212E 01	0	0	0
6.7667E-08	1.1353E 01	1.0204E 01	0	0	0
6.4367E-08	1.1373E 01	1.0194E 01	0	0	0
6.1228E-08	1.1393E 01	1.0184E 01	0	0	0
5.8242E-08	1.1419E 01	1.0180E 01	0	0	0
5.5401E-08	1.1449E 01	1.0179E 01	0	0	0
5.2699E-08	1.1486E 01	1.0183E 01	0	0	0
5.0129E-08	1.1531E 01	1.0196E 01	0	0	0
4.7684E-08	1.1581E 01	1.0212E 01	0	0	0
4.5359E-08	1.1631E 01	1.0227E 01	0	0	0
4.3147E-08	1.1682E 01	1.0242E 01	0	0	0
4.1042E-08	1.1732E 01	1.0256E 01	0	0	0
3.9041E-08	1.1781E 01	1.0268E 01	0	0	0
3.7137E-08	1.1832E 01	1.0280E 01	0	0	0

— N (CONTINUED)

$\sigma_{n,2\alpha}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
0	0	0	0	0	1.8917E-02
0	0	0	0	0	1.9396E-02
0	0	0	0	0	1.9887E-02
0	0	0	0	0	2.0390E-02
0	0	0	0	0	2.0906E-02
0	0	0	0	0	2.1436E-02
0	0	0	0	0	2.1978E-02
0	0	0	0	0	2.2535E-02
0	0	0	0	0	2.3105E-02
0	0	0	0	0	2.3690E-02
0	0	0	0	0	2.4290E-02
0	0	0	0	0	2.4905E-02
0	0	0	0	0	2.5535E-02
0	0	0	0	0	2.6181E-02
0	0	0	0	0	2.6844E-02
0	0	0	0	0	2.7524E-02
0	0	0	0	0	2.8221E-02
0	0	0	0	0	2.8935E-02
0	0	0	0	0	2.9667E-02
0	0	0	0	0	3.0418E-02
0	0	0	0	0	3.1188E-02
0	0	0	0	0	3.1978E-02
0	0	0	0	0	3.2788E-02
0	0	0	0	0	3.3618E-02
0	0	0	0	0	3.4469E-02
0	0	0	0	0	3.5341E-02
0	0	0	0	0	3.6236E-02
0	0	0	0	0	3.7153E-02
0	0	0	0	0	3.8094E-02
0	0	0	0	0	3.9058E-02
0	0	0	0	0	4.0047E-02
0	0	0	0	0	4.1061E-02
0	0	0	0	0	4.2100E-02
0	0	0	0	0	4.3166E-02
0	0	0	0	0	4.4259E-02
0	0	0	0	0	4.5379E-02
0	0	0	0	0	4.6528E-02
0	0	0	0	0	4.7706E-02
0	0	0	0	0	4.8913E-02
0	0	0	0	0	5.0152E-02
0	0	0	0	0	5.1421E-02
0	0	0	0	0	5.2723E-02
0	0	0	0	0	5.4058E-02
0	0	0	0	0	5.5426E-02
0	0	0	0	0	5.6829E-02
0	0	0	0	0	5.8268E-02
0	0	0	0	0	5.9743E-02
0	0	0	0	0	6.1255E-02
0	0	0	0	0	6.2806E-02
0	0	0	0	0	6.4396E-02
0	0	0	0	0	6.6031E-02

TABLE 2 — N – LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7
1.8017E 01	6.9319E-01	5.3021E-01	4.0004E-01	2.8863E-01	1.7069E-01	8.6538E-02	3.7996E-02
1.7139E 01	6.9259E-01	5.2281E-01	3.9286E-01	2.8153E-01	1.6481E-01	8.3019E-02	3.6768E-02
1.6303E 01	6.8310E-01	5.1190E-01	3.8419E-01	2.7656E-01	1.6191E-01	8.1705E-02	3.6308E-02
1.5508E 01	6.7369E-01	5.0014E-01	3.7340E-01	2.6846E-01	1.5566E-01	7.7578E-02	3.4737E-02
1.4751E 01	6.6293E-01	4.8712E-01	3.6189E-01	2.5862E-01	1.4753E-01	7.2219E-02	3.2663E-02
1.4032E 01	6.4191E-01	4.6966E-01	3.4837E-01	2.5071E-01	1.4190E-01	7.0059E-02	3.2219E-02
1.3348E 01	5.9069E-01	4.4025E-01	3.2445E-01	2.3764E-01	1.2705E-01	6.4931E-02	3.0694E-02
1.2697E 01	5.2917E-01	4.0551E-01	2.9023E-01	2.2385E-01	1.0328E-01	5.7681E-02	2.7619E-02
1.2077E 01	4.7799E-01	3.7549E-01	2.5867E-01	2.1392E-01	7.8615E-02	5.0905E-02	2.3887E-02
1.1488E 01	4.4401E-01	3.5299E-01	2.4366E-01	2.0583E-01	5.8931E-02	4.4303E-02	2.1725E-02
1.0928E 01	4.2248E-01	3.3380E-01	2.3006E-01	1.9945E-01	4.9952E-02	3.8670E-02	1.9529E-02
1.0395E 01	4.1242E-01	3.2032E-01	2.2008E-01	1.9390E-01	4.5795E-02	2.2976E-02	1.9468E-02
9.8882E 00	4.0713E-01	3.1001E-01	2.1012E-01	1.8788E-01	4.3028E-02	1.2866E-02	0
9.4059E 00	4.0312E-01	2.9986E-01	2.0900E-01	1.8099E-01	4.0471E-02	5.0643E-03	0
8.9472E 00	4.0000E-01	2.8876E-01	2.0975E-01	1.7363E-01	3.7802E-02	-1.3224E-03	0
8.5108E 00	3.9630E-01	2.7638E-01	2.0824E-01	1.6420E-01	3.5101E-02	-4.0174E-03	0
8.0957E 00	3.8722E-01	2.6517E-01	2.0132E-01	1.5464E-01	3.2081E-02	-7.5395E-03	0
7.7009E 00	3.5420E-01	2.4741E-01	1.8896E-01	1.3456E-01	2.3119E-02	-3.0741E-03	0
7.3253E 00	2.9189E-01	2.3491E-01	1.8305E-01	1.1323E-01	1.8440E-03	5.1080E-03	0
6.9681E 00	2.4041E-01	2.3161E-01	1.6095E-01	1.0036E-01	-2.1981E-02	1.1217E-02	0
6.6282E 00	2.8714E-01	2.3500E-01	1.6572E-01	9.2977E-02	-2.9124E-02	1.0668E-02	0
6.3050E 00	2.8269E-01	2.4278E-01	1.7485E-01	7.7104E-02	-9.4260E-03	2.1411E-03	0
5.9975E 00	2.2910E-01	2.3798E-01	1.6728E-01	4.9225E-02	3.1391E-02	-1.3912E-02	0
5.7050E 00	1.7390E-01	2.1841E-01	1.0739E-01	2.5497E-02	2.7819E-02	-1.7714E-02	0
5.4267E 00	1.4127E-01	1.9753E-01	8.5481E-02	3.9691E-02	3.1249E-02	-9.1679E-03	0
5.1621E 00	1.2468E-01	1.8604E-01	7.9845E-02	6.4418E-02	3.5408E-02	5.0499E-03	0
4.9103E 00	1.3576E-01	2.2117E-01	7.1621E-02	7.2888E-02	3.0290E-02	1.4180E-02	0
4.6708E 00	1.8014E-01	2.7777E-01	5.9927E-02	6.2657E-02	1.4454E-02	1.3138E-02	0
4.4430E 00	2.1422E-01	3.2231E-01	4.7282E-02	4.9922E-02	1.8725E-03	2.0062E-03	0
4.2263E 00	2.2846E-01	3.5172E-01	3.5999E-02	4.2244E-02	0	0	0
4.0202E 00	2.0684E-01	3.6797E-01	2.5986E-02	4.4294E-02	0	0	0
3.8242E 00	1.4305E-01	3.7052E-01	1.8173E-02	5.5609E-02	0	0	0
3.6376E 00	8.3518E-02	3.6673E-01	1.2139E-02	6.6739E-02	0	0	0
3.4602E 00	5.0138E-02	3.5424E-01	8.6423E-03	6.7581E-02	0	0	0
3.2915E 00	3.3518E-02	3.3492E-01	6.4703E-03	5.2250E-02	0	0	0
3.1310E 00	2.8906E-02	3.1140E-01	6.0830E-03	3.2513E-02	0	0	0
2.9783E 00	3.8534E-02	2.8083E-01	6.7726E-03	9.1050E-03	0	0	0
2.8330E 00	6.0460E-02	2.4136E-01	9.9907E-03	0	0	0	0
2.6948E 00	9.1606E-02	2.0103E-01	1.4642E-02	0	0	0	0
2.5634E 00	1.2348E-01	1.5668E-01	2.2287E-02	0	0	0	0

TABLE 2 — N (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7
2,4384E 00	1.5595E-01	1,1404E-01	3,4851E-02	0	0	0	0
2,3192E 00	1.9756E-01	7,9989E-02	3,6054E-02	0	0	0	0
2,2065E 00	1.9532E-01	5,4212E-02	1,6637E-02	0	0	0	0
2,0987E 00	1.1501E-01	3,6593E-02	9,8073E-03	0	0	0	0
1,9964E 00	9.1191E-02	5,8214E-02	8,7301E-03	0	0	0	0
1,8990E 00	8.7813E-02	9,2562E-02	1,0117E-02	0	0	0	0
1,8064E 00	5.1512E-02	1,2259E-01	1,5447E-03	0	0	0	0
1,7185E 00	6.4106E-02	9,1010E-02	4,9625E-03	0	0	0	0
1,6345E 00	2,0277E-01	7,0474E-02	1,0221E-02	0	0	0	0
1,5540E 00	1.5511E-01	4,8026E-02	1,9538E-02	0	0	0	0
1,4790E 00	1,1361E-01	1,6142E-02	1,9585E-02	0	0	0	0
1,4066E 00	1.4721E-01	1,9615E-02	1,7951E-02	0	0	0	0
1,3386E 00	6,4610E-02	6,8172E-02	1,1111E-02	0	0	0	0
1,2735E 00	6,0861E-02	3,6237E-02	2,3355E-02	0	0	0	0
1,2109E 00	1,0344E-01	4,8614E-02	2,0884E-02	0	0	0	0
1,1510E 00	1.7290E-01	7,2512E-02	1,8617E-02	0	0	0	0
1,0956E 00	6,8479E-02	4,2085E-02	1,5949E-02	0	0	0	0
1,0422E 00	1.5719E-02	0	0	0	0	0	0
9,9137E-01	5,3613E-02	0	0	0	0	0	0
9,4302E-01	6,6390E-02	0	0	0	0	0	0
8,9703E-01	5,9921E-02	0	0	0	0	0	0
8,5328E-01	5,3766E-02	0	0	0	0	0	0
8,1167E-01	4,7979E-02	0	0	0	0	0	0
7,7200E-01	4,4510E-02	0	0	0	0	0	0
7,3443E-01	4,2446E-02	0	0	0	0	0	0
6,9861E-01	4,0370E-02	0	0	0	0	0	0
6,6454E-01	3,8401E-02	0	0	0	0	0	0
6,3213E-01	3,6526E-02	0	0	0	0	0	0
6,0130E-01	3,4747E-02	0	0	0	0	0	0
5,7197E-01	3,3052E-02	0	0	0	0	0	0
5,4408E-01	3,1440E-02	0	0	0	0	0	0
5,1754E-01	2,9907E-02	0	0	0	0	0	0
4,9230E-01	2,8448E-02	0	0	0	0	0	0
4,6827E-01	2,7062E-02	0	0	0	0	0	0
4,4545E-01	2,5741E-02	0	0	0	0	0	0
4,2373E-01	2,4486E-02	0	0	0	0	0	0
4,0305E-01	2,3291E-02	0	0	0	0	0	0
3,8341E-01	2,2155E-02	0	0	0	0	0	0
3,6471E-01	2,1075E-02	0	0	0	0	0	0
3,4692E-01	2,0047E-02	0	0	0	0	0	0

TABLE 2 — N (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
3.3000E-01	1.9069E-02	4.2483E-02	2.4549E-03	5.7494E-03	3.3223E-04
3.1391E-01	1.8139E-02	4.0411E-02	2.3352E-03	5.4690E-03	3.1603E-04
2.9850E-01	1.7255E-02	3.8440E-02	2.2213E-03	5.2023E-03	3.0062E-04
2.8403E-01	1.6415E-02	3.6565E-02	2.1130E-03	4.9485E-03	2.8596E-04
2.7018E-01	1.5613E-02	3.4782E-02	2.0099E-03	4.7072E-03	2.7201E-04
2.5700E-01	1.4851E-02	3.3085E-02	1.9119E-03	4.4776E-03	2.5874E-04
2.4447E-01	1.4127E-02	3.1472E-02	1.8186E-03	4.2592E-03	2.4613E-04
2.3255E-01	1.3438E-02	2.9937E-02	1.7299E-03	4.0515E-03	2.3412E-04
2.2121E-01	1.2785E-02	2.8477E-02	1.6456E-03	3.8539E-03	2.2270E-04
2.1042E-01	1.2159E-02	2.7088E-02	1.5653E-03	3.6660E-03	2.1184E-04
2.0016E-01	1.1566E-02	2.5767E-02	1.4890E-03	3.4872E-03	2.0151E-04
1.9039E-01	1.1002E-02	2.4510E-02	1.4164E-03	3.3171E-03	1.9168E-04
1.8111E-01	1.0466E-02	2.3315E-02	1.3473E-03	3.1553E-03	1.8233E-04
1.7228E-01	9.9551E-03	2.2176E-02	1.2816E-03	3.0014E-03	1.7344E-04
1.6387E-01	9.4696E-03	2.1090E-02	1.2191E-03	2.8551E-03	1.6498E-04
1.5586E-01	9.0078E-03	2.0057E-02	1.1596E-03	2.7159E-03	1.5694E-04
1.4828E-01	8.5684E-03	1.9089E-02	1.1031E-03	2.5834E-03	1.4928E-04
1.4105E-01	8.1506E-03	1.8158E-02	1.0493E-03	2.4574E-03	1.4200E-04
1.3417E-01	7.7530E-03	1.7272E-02	9.9809E-04	2.3375E-03	1.3508E-04
1.2762E-01	7.3749E-03	1.6430E-02	9.4941E-04	2.2235E-03	1.2849E-04
1.2139E-01	7.0152E-03	1.5628E-02	9.0311E-04	2.1151E-03	1.2222E-04
1.1548E-01	6.6731E-03	1.4866E-02	8.5906E-04	2.0119E-03	1.1626E-04
1.0985E-01	6.3477E-03	1.4141E-02	8.1716E-04	1.9138E-03	1.1059E-04
1.0449E-01	6.0381E-03	1.3452E-02	7.7731E-04	1.8205E-03	1.0520E-04
9.9394E-02	5.7436E-03	1.2799E-02	7.3944E-04	1.7317E-03	1.0007E-04
9.4547E-02	5.4635E-03	1.2171E-02	7.0334E-04	1.6472E-03	9.5187E-05
8.9935E-02	5.1970E-03	1.1576E-02	6.6904E-04	1.5669E-03	9.0544E-05
8.5549E-02	4.9436E-03	1.1013E-02	6.3641E-04	1.4905E-03	8.6129E-05
8.1377E-02	4.7025E-03	1.0476E-02	6.0537E-04	1.4178E-03	8.1928E-05
7.7408E-02	4.4731E-03	9.9651E-03	5.7585E-04	1.3486E-03	7.7932E-05
7.3633E-02	4.2550E-03	9.4791E-03	5.4776E-04	1.2829E-03	7.4132E-05
7.0042E-02	4.0474E-03	9.0168E-03	5.2105E-04	1.2203E-03	7.0516E-05
6.6626E-02	3.8500E-03	8.5771E-03	4.9564E-04	1.1608E-03	6.7077E-05
6.3376E-02	3.6623E-03	8.1588E-03	4.7146E-04	1.1042E-03	6.3806E-05
6.0280E-02	3.4837E-03	7.7609E-03	4.4847E-04	1.0503E-03	6.0694E-05
5.7345E-02	3.3138E-03	7.3824E-03	4.2660E-04	9.9909E-04	5.7734E-05
5.4549E-02	3.1522E-03	7.0223E-03	4.0579E-04	9.5037E-04	5.4918E-05
5.1888E-02	2.9984E-03	6.6798E-03	3.8600E-04	9.0402E-04	5.2240E-05
4.9356E-02	2.8522E-03	6.3541E-03	3.6718E-04	8.5993E-04	4.9692E-05
4.6950E-02	2.7131E-03	6.0442E-03	3.4927E-04	8.1799E-04	4.7268E-05
4.4661E-02	2.5808E-03				

TABLE 2 — N (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
7.7809E+04	4.4963E+05	1.0530E+04	6.0851E+06	1.4251E+05	8.2352E+07
7.4015E+04	4.2770E+05	1.0017E+04	5.7883E+06	1.3550E+05	7.8336E+07
7.0405E+04	4.0684E+05	9.5283E+05	5.5060E+06	1.2895E+05	7.4515E+07
6.6971E+04	3.8700E+05	9.0630E+05	5.2375E+06	1.2266E+05	7.0881E+07
6.3705E+04	3.6813E+05	8.6215E+05	4.9820E+06	1.1668E+05	6.7424E+07
6.0590E+04	3.5017E+05	8.2011E+05	4.7391E+06	1.1099E+05	6.4136E+07
5.7643E+04	3.3309E+05	7.8011E+05	4.5079E+06	1.0559E+05	6.1008E+07
5.4831E+04	3.1685E+05	7.4206E+05	4.2881E+06	1.0047E+05	5.8032E+07
5.2157E+04	3.0140E+05	7.0587E+05	4.0789E+06	9.5529E+06	5.5202E+07
4.9613E+04	2.8670E+05	6.7145E+05	3.8800E+06	9.0870E+06	5.2510E+07
4.7194E+04	2.7271E+05	6.3870E+05	3.6908E+06	8.6438E+06	4.9949E+07
4.4892E+04	2.5941E+05	6.0755E+05	3.5108E+06	8.2223E+06	4.7513E+07
4.2703E+04	2.4676E+05	5.7792E+05	3.3396E+06	7.8213E+06	4.5196E+07
4.0620E+04	2.3473E+05	5.4971E+05	3.1767E+06	7.4398E+06	4.2991E+07
3.8639E+04	2.2328E+05	5.2292E+05	3.0218E+06	7.0770E+06	4.0895E+07
3.6755E+04	2.1239E+05	4.9742E+05	2.8744E+06	6.7318E+06	3.8900E+07
3.4962E+04	2.0203E+05	4.7316E+05	2.7342E+06	6.4035E+06	3.7003E+07
3.3257E+04	1.9218E+05	4.5008E+05	2.6009E+06	6.0912E+06	3.5198E+07
3.1635E+04	1.8281E+05	4.2813E+05	2.4741E+06	5.7941E+06	3.3482E+07
3.0098E+04	1.7389E+05	4.0725E+05	2.3533E+06	5.5110E+06	3.1849E+07
2.8624E+04	1.6541E+05	3.8739E+05	2.2386E+06	5.2420E+06	3.0295E+07
2.7229E+04	1.5734E+05	3.6850E+05	2.1294E+06	4.9871E+06	2.8818E+07
2.5901E+04	1.4967E+05	3.5053E+05	2.0255E+06	4.7438E+06	2.7412E+07
2.4637E+04	1.4237E+05	3.3343E+05	1.9268E+06	4.5125E+06	2.6075E+07
2.3436E+04	1.3543E+05	3.1717E+05	1.8328E+06	4.2924E+06	2.4804E+07
2.2293E+04	1.2882E+05	3.0170E+05	1.7434E+06	4.0831E+06	2.3594E+07
2.1206E+04	1.2254E+05	2.8699E+05	1.6584E+06	3.8839E+06	2.2443E+07
2.0171E+04	1.1656E+05	2.7299E+05	1.5775E+06	3.6945E+06	2.1349E+07
1.9188E+04	1.1088E+05	2.5968E+05	1.5006E+06	3.5143E+06	2.0307E+07
1.8252E+04	1.0547E+05	2.4701E+05	1.4274E+06	3.3429E+06	1.9317E+07
1.7362E+04	1.0033E+05	2.3496E+05	1.3578E+06	3.1798E+06	1.8375E+07
1.6515E+04	9.5433E+06	2.2350E+05	1.2915E+06	3.0248E+06	1.7479E+07
1.5709E+04	9.0779E+06	2.1260E+05	1.2286E+06	2.8773E+06	1.6626E+07
1.4943E+04	8.6351E+06	2.0224E+05	1.1686E+06	2.7370E+06	1.5815E+07
1.4215E+04	8.2140E+06	1.9237E+05	1.1116E+06	2.6035E+06	1.5044E+07
1.3521E+04	7.8134E+06	1.8299E+05	1.0574E+06	2.4765E+06	1.4310E+07
1.2862E+04	7.4323E+06	1.7407E+05	1.0059E+06	2.3557E+06	1.3612E+07
1.2235E+04	7.0699E+06	1.6559E+05	9.5680E+07	2.2408E+06	1.2948E+07
1.1638E+04	6.7251E+06	1.5750E+05	9.1013E+07	2.1315E+06	1.2317E+07
1.1070E+04	6.3971E+06	1.4982E+05	8.6574E+07	2.0276E+06	1.1716E+07

TABLE 2 — N (CONTINUED)

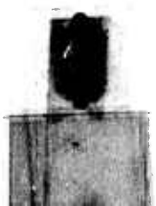
E, MeV	f_1	E, MeV	f_1
1.9287E+06	1.1145E+07	8.6188E+07	1.5078E+08
1.8346E+06	1.0601E+07	2.4829E+07	1.4342E+08
1.7452E+06	1.0084E+07	2.3618E+07	1.3642E+08
1.6601E+06	9.5922E+08	2.2466E+07	1.2977E+08
1.5791E+06	9.1244E+08	2.1371E+07	1.2343E+08
1.5021E+06	8.6793E+08	2.0328E+07	1.1741E+08
1.4288E+06	8.2560E+08	1.9337E+07	1.1168E+08
1.3591E+06	7.8533E+08	1.8394E+07	1.0623E+08
1.2928E+06	7.4703E+08	1.7497E+07	1.0105E+08
1.2298E+06	7.1059E+08	1.6643E+07	9.6118E+09
1.1698E+06	6.7593E+08	1.5832E+07	9.1428E+09
1.1128E+06	6.4297E+08	1.5060E+07	8.6966E+09
1.0585E+06	6.1161E+08	1.4329E+07	8.2722E+09
1.0069E+06	5.8177E+08	1.3627E+07	7.8685E+09
9.5777E+07	5.5340E+08	1.2962E+07	7.4844E+09
9.1105E+07	5.2641E+08	1.2330E+07	7.1191E+09
8.6662E+07	5.0073E+08	1.1728E+07	6.7716E+09
8.2436E+07	4.7631E+08	1.1156E+07	6.4411E+09
7.8415E+07	4.5307E+08	1.0612E+07	6.1267E+09
7.4591E+07	4.3097E+08	1.0095E+07	5.8276E+09
7.0953E+07	4.0995E+08	9.6024E+08	5.5431E+09
6.7493E+07	3.8996E+08	9.1341E+08	5.2725E+09
6.4201E+07	3.7093E+08	8.6887E+08	5.0151E+09
6.1070E+07	3.5284E+08	8.2649E+08	4.7702E+09
5.8091E+07	3.3563E+08	7.8618E+08	4.5373E+09
5.5253E+07	3.1926E+08	7.4784E+08	4.3157E+09
5.2563E+07	3.0369E+08	7.1137E+08	4.1049E+09
5.0000E+07	2.8887E+08	6.7667E+08	3.9045E+09
4.7561E+07	2.7478E+08	6.4367E+08	3.7138E+09
4.5242E+07	2.6138E+08	6.1229E+08	3.5323E+09
4.3035E+07	2.4863E+08	5.8248E+08	3.3590E+09
4.0936E+07	2.3650E+08	5.5401E+08	3.1937E+09
3.8940E+07	2.2496E+08	5.2690E+08	3.0365E+09
3.7041E+07	2.1399E+08	5.0120E+08	2.8910E+09
3.5234E+07	2.0355E+08	4.7684E+08	2.7497E+09
3.3516E+07	1.9362E+08	4.5355E+08	2.6153E+09
3.1881E+07	1.8417E+08	4.3147E+08	2.4875E+09
3.0326E+07	1.7519E+08	4.1048E+08	2.3659E+09
2.8847E+07	1.6664E+08	3.9041E+08	2.2502E+09
2.7440E+07	1.5851E+08	3.7137E+08	2.1398E+09

TABLE 3 — N – NUMBER OF γ-RAYS EMITTED PER ABSORPTION

E_γ, MeV	
1.667	.0051
1.884	.0089
1.997	.0017
2.520	.0025
2.827	.0006
3.531	.0038
3.678	.0098
3.854	.0003
4.508	.0068
5.269	.0136
5.298	.0089
5.532	.0089
5.561	.0047
6.321	.0077
7.298	.0038
8.316	.0017
9.046	.0002
9.149	.0006
10.824	.0060

TABLE 4 — N – NUMBER OF γ-RAYS EMITTED

E, MeV	0.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4
1.80200E 01	.0007	.0025	.1220	.3504	.0342	.0207	.0423	.0363	.1
1.71000E 01	.0008	.0026	.1233	.3352	.0346	.0208	.0427	.0365	.1
1.63000E 01	.0008	.0026	.1248	.3466	.0350	.0209	.0431	.0366	.1
1.55000E 01	.0008	.0026	.1267	.3445	.0356	.0210	.0435	.0368	.1
1.47500E 01	.0008	.0027	.1289	.3425	.0362	.0211	.0440	.0370	.1
1.40000E 01	.0008	.0027	.1318	.3404	.0370	.0212	.0446	.0370	.1
1.33000E 01	.0008	.0027	.1352	.3386	.0378	.0212	.0451	.0369	.1
1.27000E 01	.0008	.0028	.1389	.3372	.0387	.0211	.0455	.0366	.1
1.21000E 01	.0008	.0028	.1434	.3361	.0396	.0209	.0459	.0361	.1
1.15000E 01	.0009	.0028	.1491	.3355	.0407	.0205	.0460	.0351	.1
1.09000E 01	.0009	.0029	.1561	.3356	.0418	.0198	.0461	.0339	.1
1.04000E 01	.0009	.0029	.1634	.3365	.0428	.0190	.0460	.0327	.1
9.89000E 00	.0009	.0028	.1726	.3385	.0439	.0179	.0459	.0314	.1
9.41000E 00	.0009	.0027	.1832	.3418	.0450	.0167	.0459	.0296	.1
8.95000E 00	.0009	.0026	.1958	.3467	.0462	.0156	.0457	.0281	.1
8.51000E 00	.0008	.0025	.2111	.3536	.0475	.0140	.0458	.0264	.1
8.10000E 00	.0008	.0023	.2293	.3630	.0489	.0125	.0461	.0243	.1
7.70000E 00	.0007	.0020	.2522	.3759	.0503	.0113	.0459	.0224	.2
7.33000E 00	.0007	.0017	.2796	.3923	.0523	.0095	.0465	.0190	.2
6.97000E 00	.0006	.0014	.3136	.4148	.0540	.0084	.0463	.0129	.2
6.63000E 00	.0005	.0009	.3551	.4437	.0553	.0078	.0440	.0046	.2
6.30000E 00	.0003	.0003	.4063	.4803	.0568	.0064	.0376	0	.2
6.00000E 00	.0001	.0000	.4622	.5233	.0559	.0038	.0318	0	.2
5.70000E 00	0	0	.5238	.5735	.0497	0	.0334	0	.2
5.65000E 00	0	0	.5845	.6289	.0445	0	.0373	0	.2
5.60000E 00	0	0	.5796	.6235	.0439	0	.0370	0	.2
5.50000E 00	0	0	.5796	.6235	.0439	0	.0370	0	.2
5.40000E 00	0	0	.6033	.6421	.0388	0	.0385	0	.2
5.25000E 00	0	0	.6833	.7011	.0177	0	.0436	0	.2
5.10000E 00	0	0	.9334	.9334	0	0	.0596	0	.2
5.05000E 00	0	0	.9400	.9400	0	0	.0600	0	.0
4.00000E 00	0	0	.9400	.9400	0	0	.0600	0	
3.99000E 00	0	0	0	0	0	0	0	0	
1.00000E-16	0	0	0	0	0	0	0	0	



ED PER NEUTRON-PRODUCING REACTION

E_γ, MeV

4.75	5.25	5.75	6.5	7.5	9.0	11.0	13.0	15.0	17.0
.1220	.0962	.0849	.1858	.1460	.2182	.1507	.0900	.0465	.0150
.1231	.0968	.0854	.1860	.1451	.2102	.1381	.0797	.0362	.0055
.1244	.0976	.0858	.1868	.1439	.2012	.1273	.0701	.0259	.0005
.1260	.0984	.0864	.1876	.1419	.1911	.1169	.0589	.0136	0
.1280	.0994	.0869	.1881	.1399	.1811	.1075	.0466	.0041	0
.1303	.1005	.0873	.1884	.1363	.1716	.0953	.0319	0	0
.1329	.1015	.0875	.1885	.1338	.1628	.0822	.0162	0	0
.1354	.1024	.0877	.1889	.1314	.1551	.0687	.0055	0	0
.1384	.1034	.0879	.1900	.1296	.1442	.0522	.0001	0	0
.1419	.1048	.0886	.1914	.1280	.1316	.0318	0	0	0
.1463	.1069	.0892	.1939	.1258	.1155	.0138	0	0	0
.1510	.1087	.0905	.1962	.1216	.0986	.0032	0	0	0
.1564	.1118	.0919	.1985	.1144	.0753	0	0	0	0
.1631	.1153	.0936	.1983	.1075	.0504	0	0	0	0
.1708	.1194	.0952	.1951	.0994	.0277	0	0	0	0
.1797	.1244	.0953	.1917	.0852	.0101	0	0	0	0
.1899	.1286	.0939	.1875	.0629	.0004	0	0	0	0
.2006	.1318	.0951	.1764	.0327	0	0	0	0	0
.2104	.1383	.0958	.1542	.0098	0	0	0	0	0
.2219	.1478	.0932	.1136	0	0	0	0	0	0
.2379	.1564	.0845	.0634	0	0	0	0	0	0
.2532	.1616	.0650	.0190	0	0	0	0	0	0
.2606	.1592	.0300	0	0	0	0	0	0	0
.2515	.1414	0	0	0	0	0	0	0	0
.2072	.1265	0	0	0	0	0	0	0	0
.2145	.1250	0	0	0	0	0	0	0	0
.2145	.1250	0	0	0	0	0	0	0	0
.2090	.1105	0	0	0	0	0	0	0	0
.2048	.0505	0	0	0	0	0	0	0	0
.0070	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

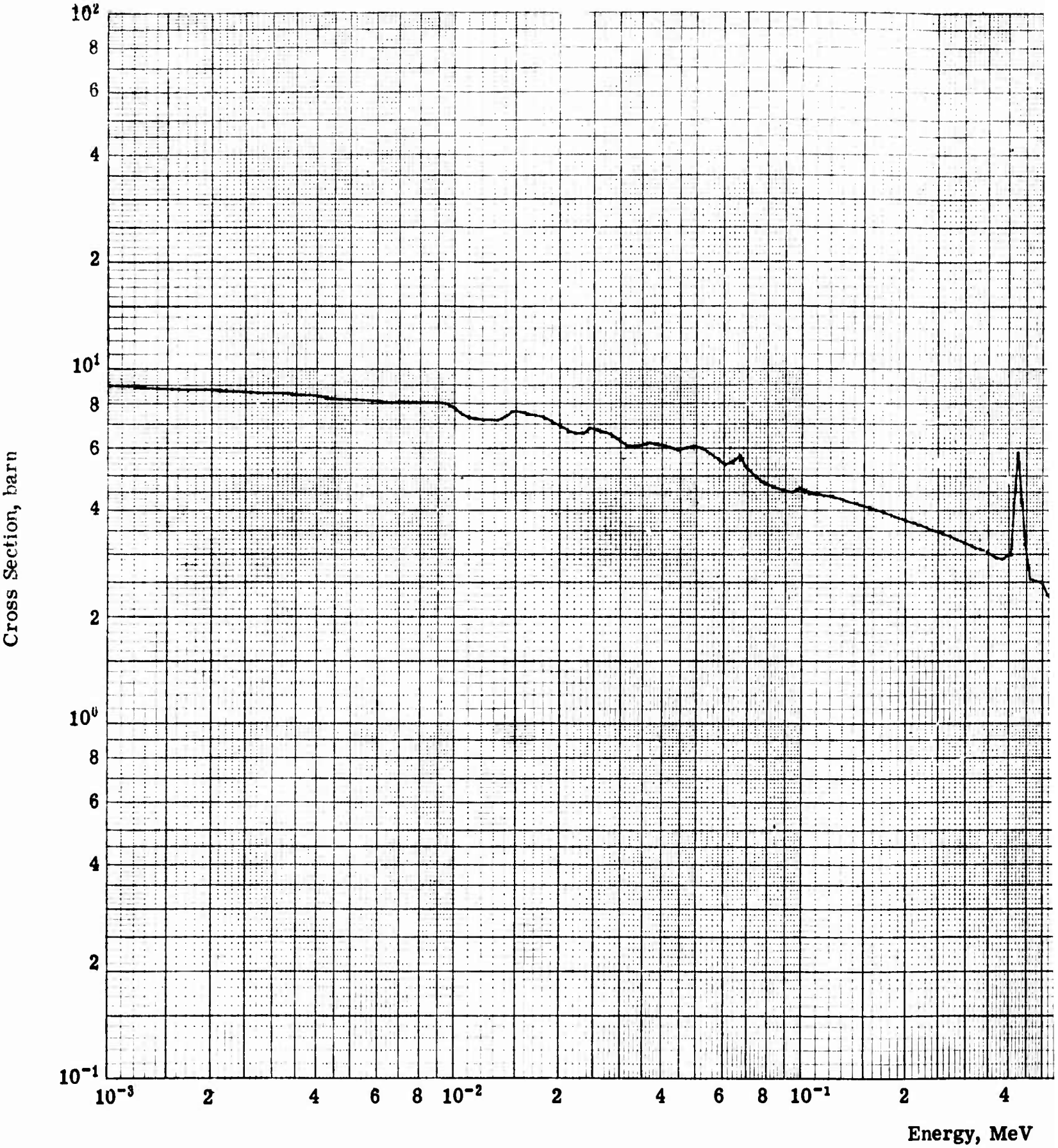
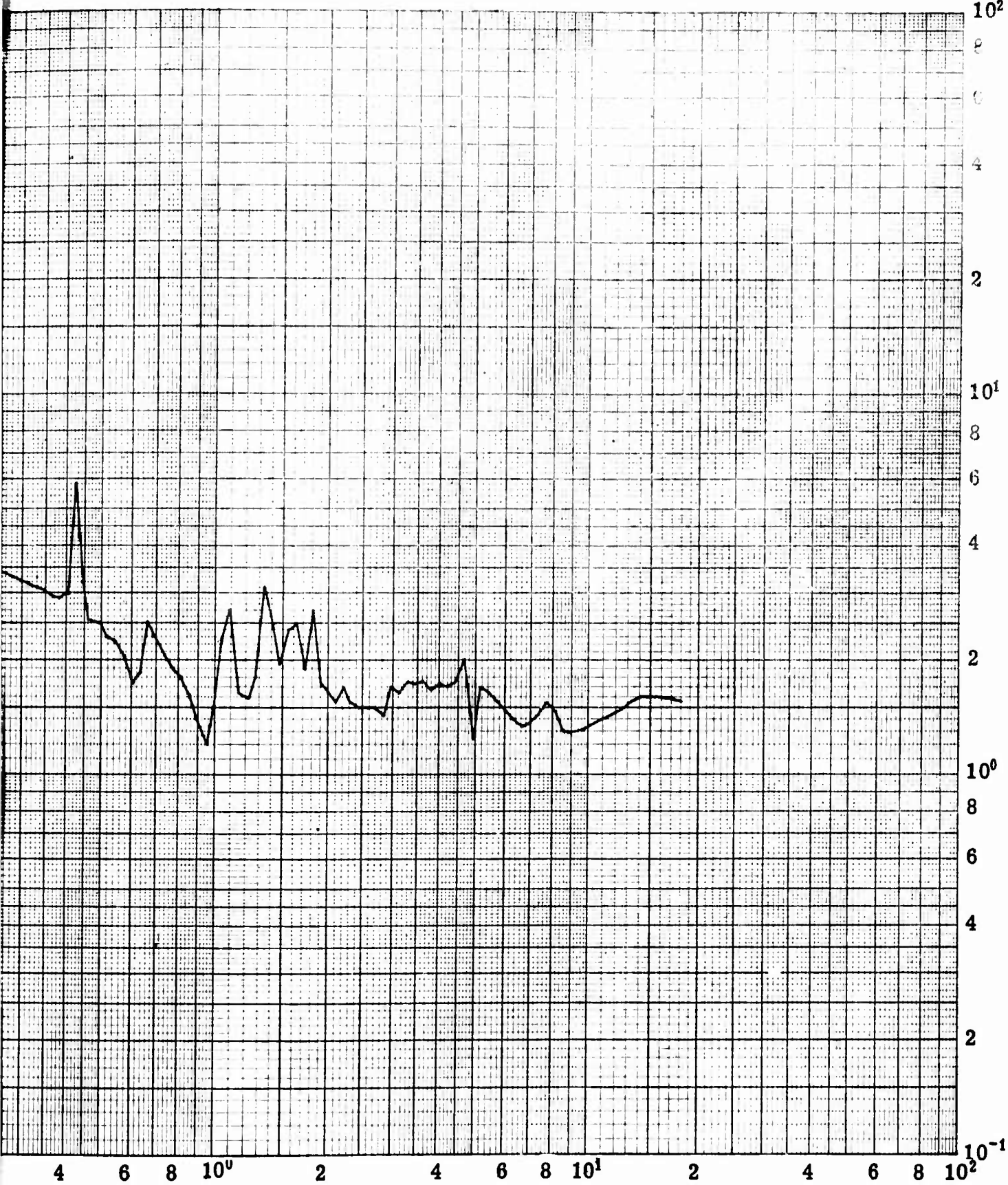


Fig. 1(a) — N – Total Cross Section –



Section – High Energy Part

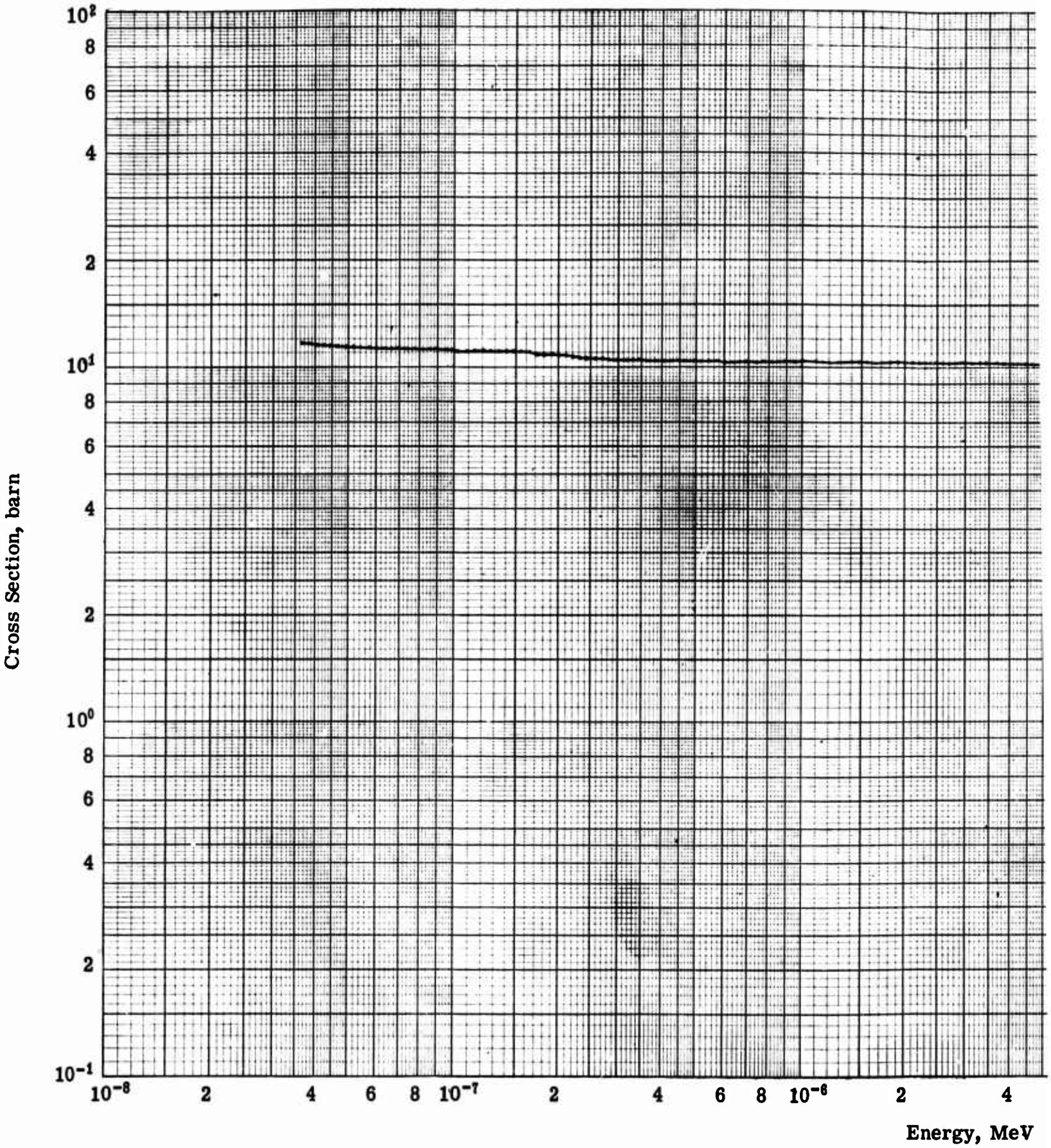
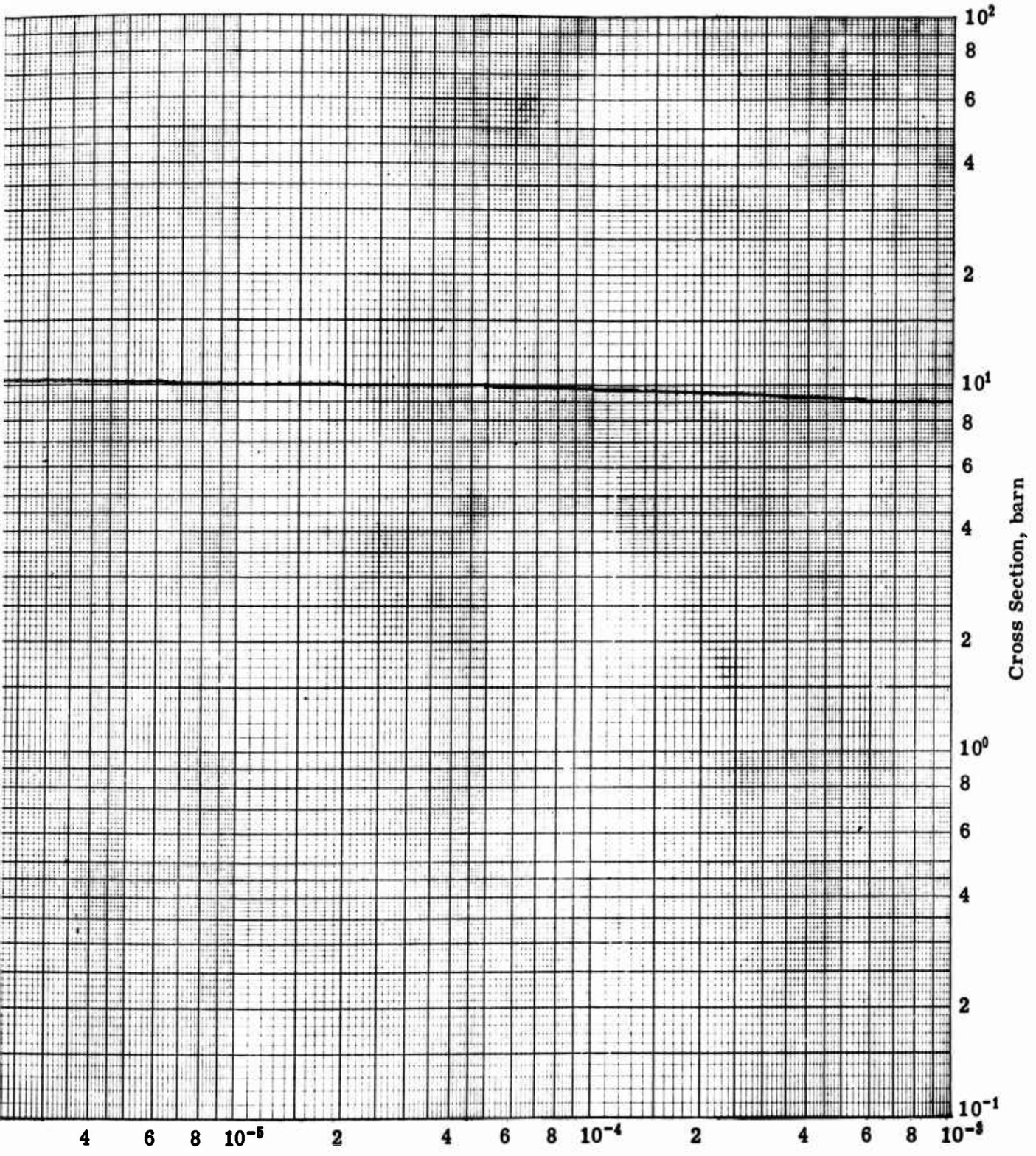


Fig. 1(b) — N – Total Cross Section



nergy, MeV

ross Section – Low Energy Part

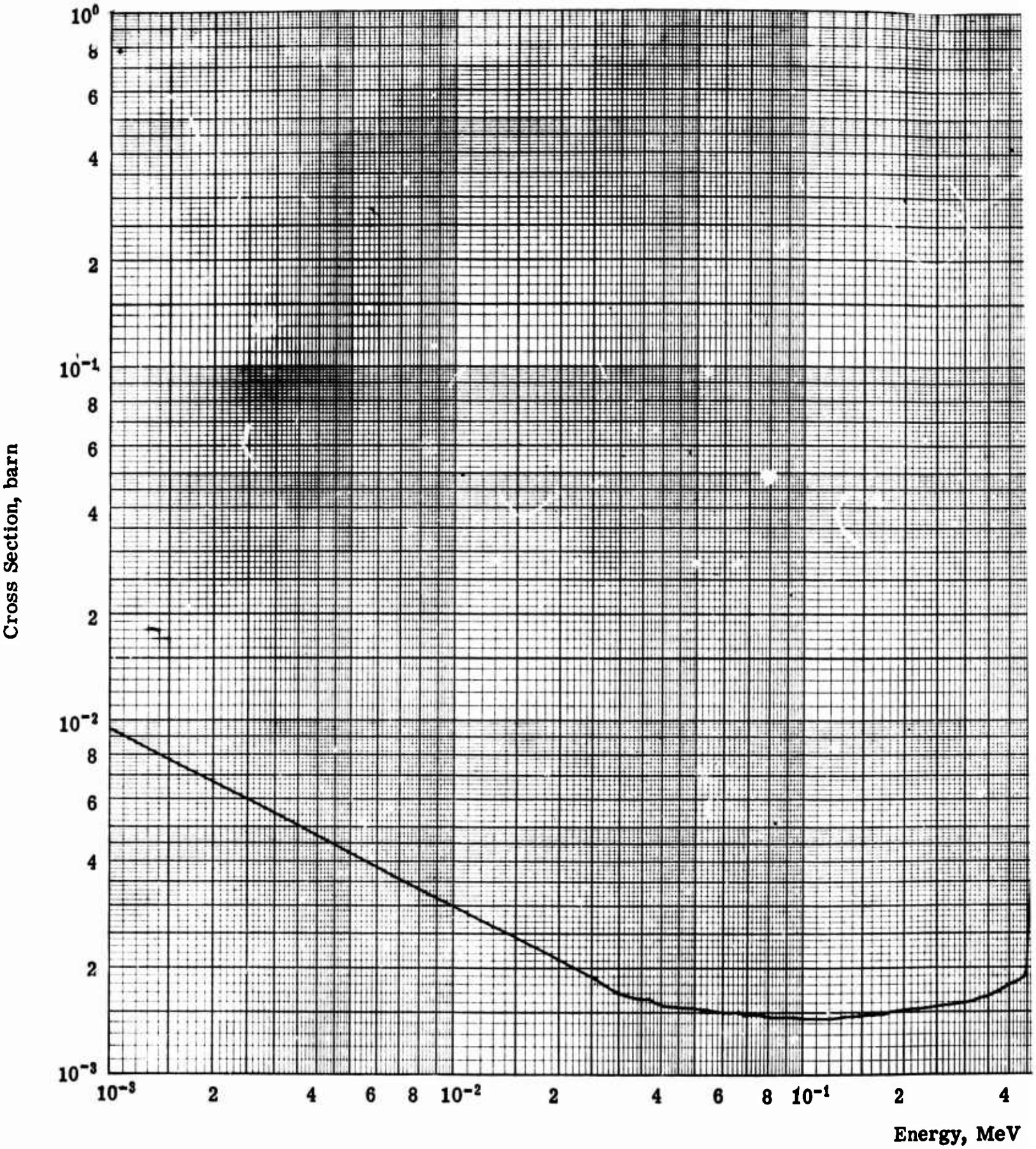
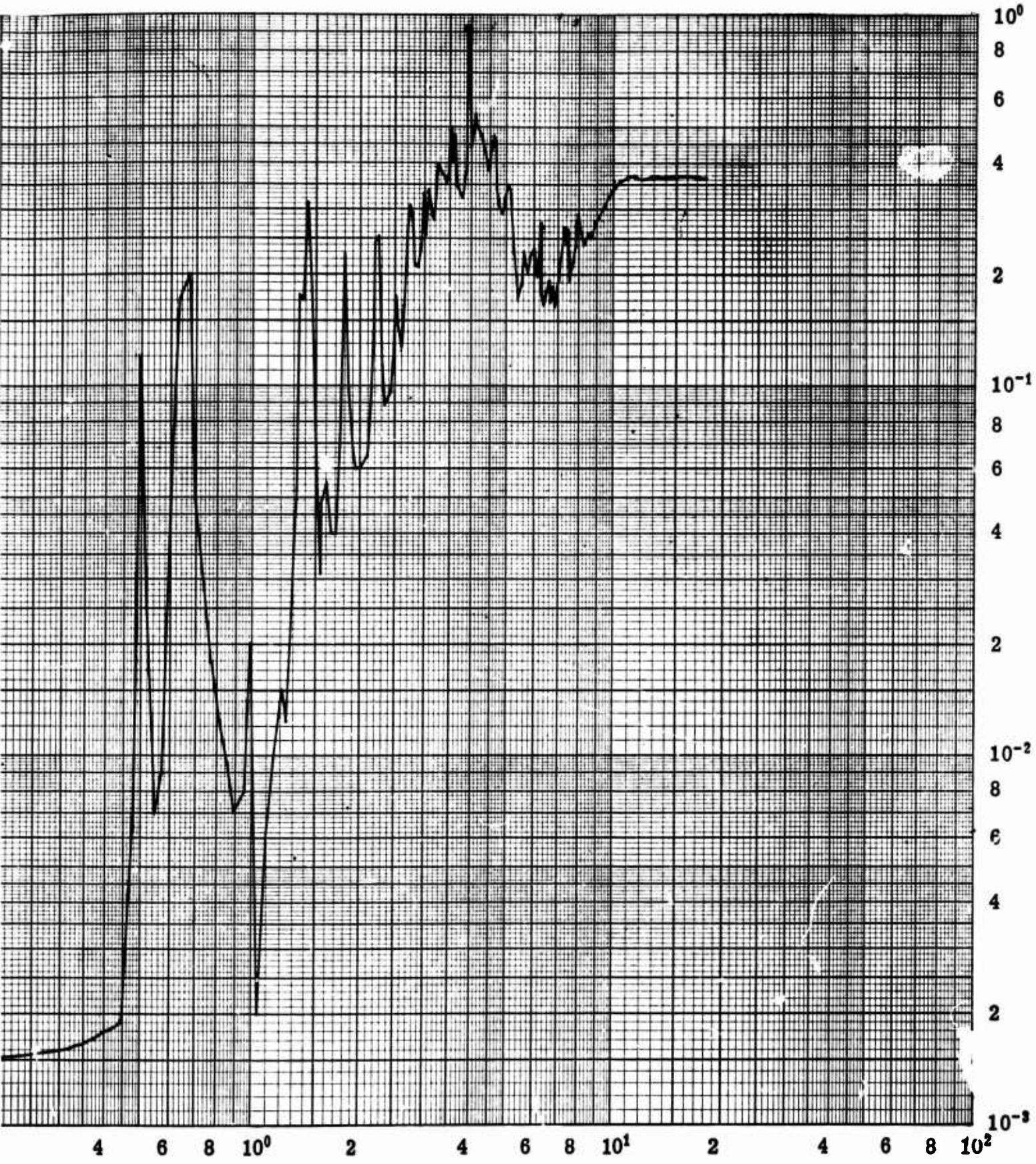


Fig. 2(a) — N – Absorption Cross Sec



n Cross Section – High Energy Part

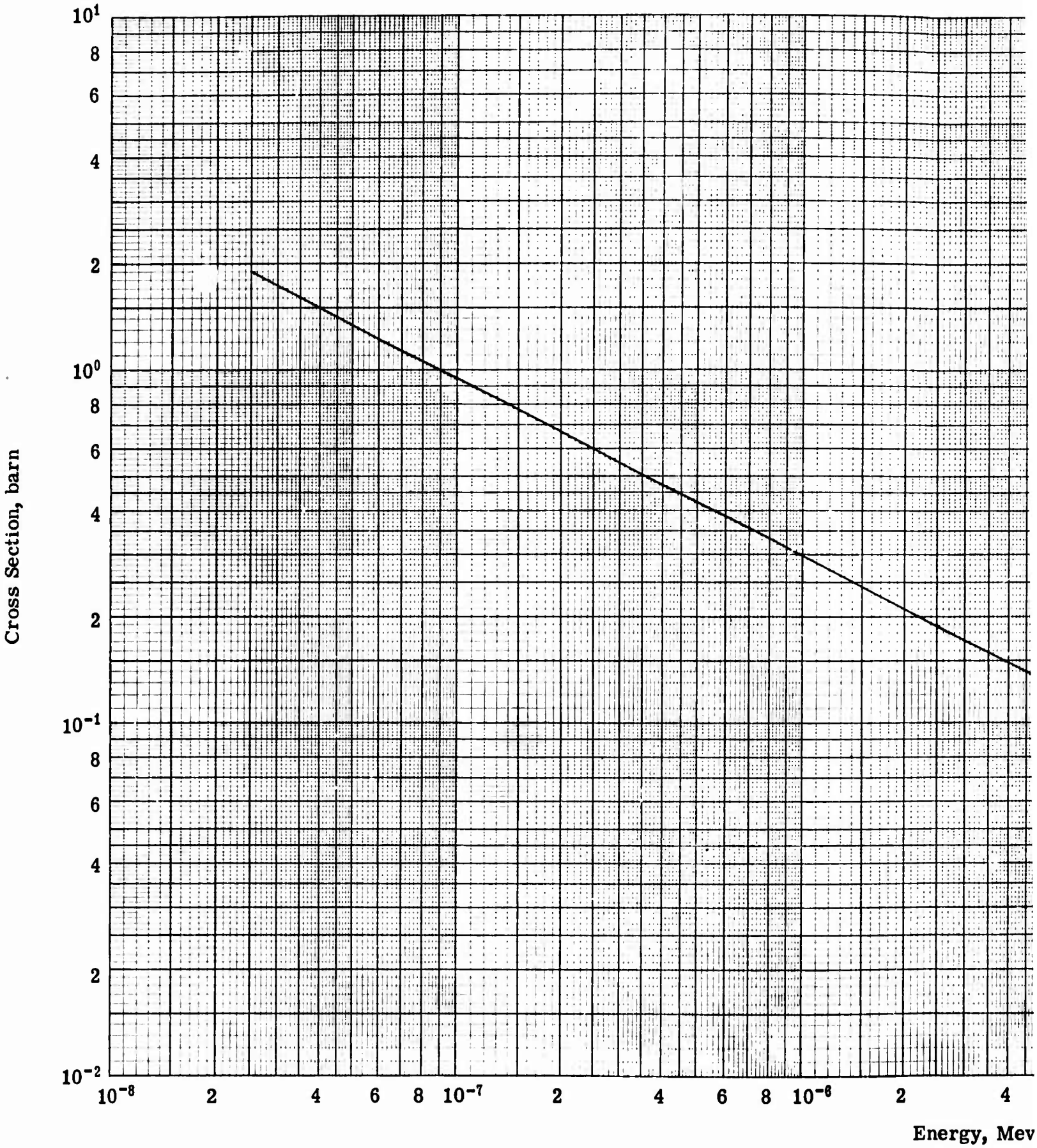
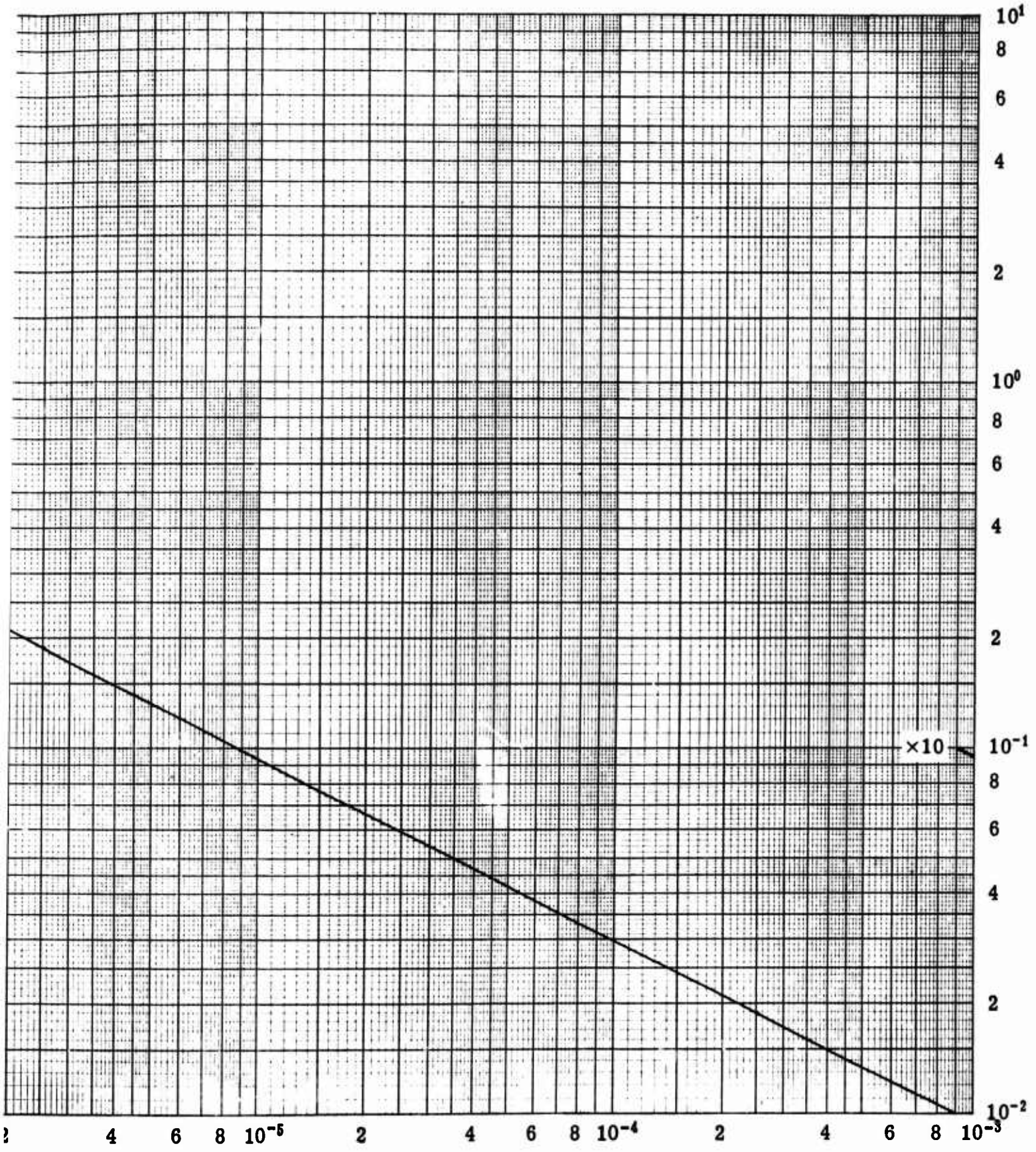


Fig. 2(b) — N – Absorption Cross Se



ion Cross Section – Low Energy Part

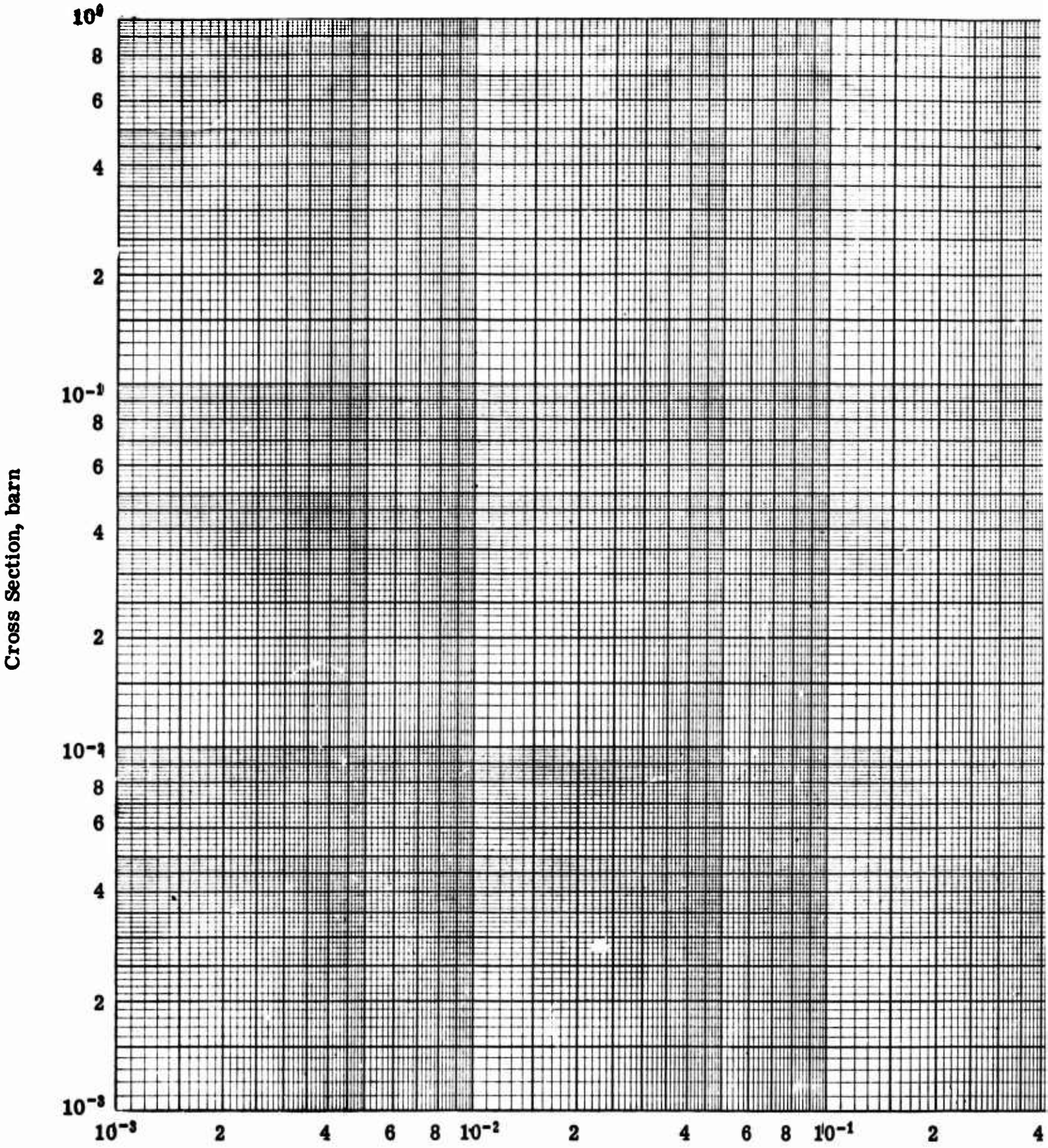
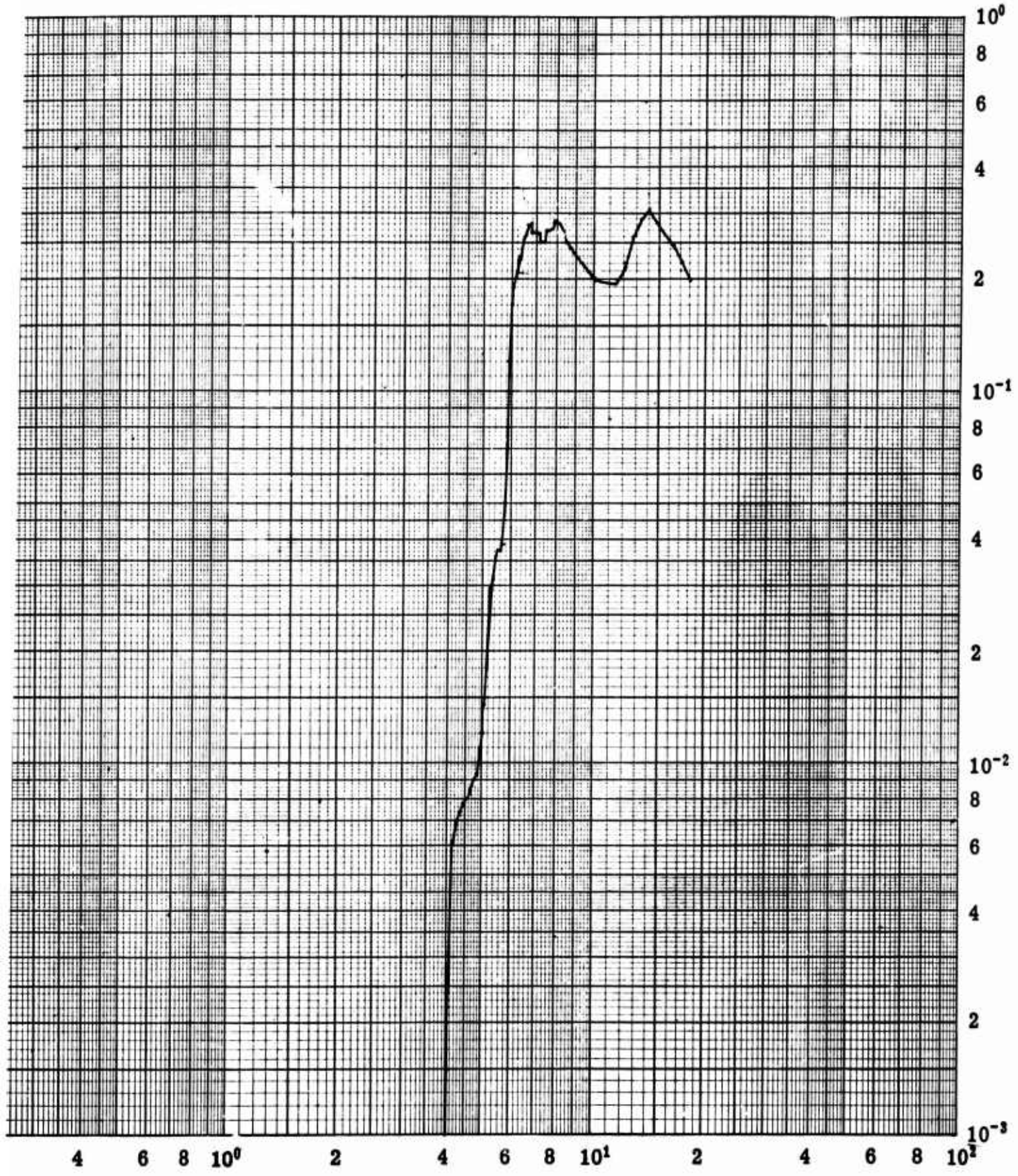


Fig. 3 — N – Inelastic-Scatterir



rgy, MeV

cattering Cross Section

2. OXYGEN

2.1 NEUTRON CROSS SECTIONS

2.1.1 The Total Cross Section

For incident neutron energies below about 3.5 MeV the data of UNC-5038[1] have withstood the onslaught of the years. For higher energies we have used the data of Fossan et al.[2] quoted in the latest supplement to BNL-325[3] (see Table 5 and Fig. 4).

2.1.2 The Elastic-Scattering Cross Section

For energies above about 3.5 MeV the elastic-scattering cross section was calculated from

$$\sigma_{n,n} = \sigma_{nT} - \sigma_{nX}$$

For lower energies the total and elastic-scattering cross sections were assumed to be identical.

2.1.3 The Nonelastic Cross Section

In the energy range below 10 MeV the cross section for nonelastic reactions is given by

$$\sigma_{nX} = \sigma_{n,n'} + \sigma_{n,\alpha}$$

Above 10 MeV a smooth curve was drawn, guided by the data of Flerov and Talyzin[4] and of Bauer et al.[5] Confirmation was given by the data of Chase et al.[6]

2.1.4 The (n,α) Cross Section

The cross section for the (n,α) reaction in oxygen has been measured by E.A. Davis et al.[7] at a great many incident neutron energies between 5 and 8.8 MeV. For energies below 5 MeV the values in UNC-5038 were retained.

Until recently, the only measurement of the (n,α) cross section in oxygen at higher energies was that of Randolph[8] at 14 MeV. In 1963, however, Bormann and coworkers[9] published a set of values for neutron energies between 12 and 20 MeV. We have used these and have bridged the gap between these and Davis's data by a smooth curve.

2.1.5 The (n,d) Cross Section

The (n,d) cross section has been measured at 14 MeV by Randolph.[8] The angular distribution of neutrons from the (d,n) reaction in N^{15} has been measured by Weil and Jones[10] for several deuteron energies. We have analyzed and integrated these distributions, and, from the resulting cross sections for the inverse reaction, cross sections for the direct reaction have been calculated.

2.1.6 The (n,p) Cross Section

The data of DeJuren, Stooksberry, and Wallis were used.[11]

2.1.7 The Absorption Cross Section

The absorption cross section is equal to $\sigma_{n,\alpha} + \sigma_{n,p} + \sigma_{n,d}$. A curve is given in Fig. 5.

2.1.8 The Inelastic-Scattering Cross Section

For energies below about 10 MeV we have still used the data for excitation of individual levels measured by the Rice group and quoted in BNL-325,[12] but otherwise unpublished except in compilations.[1,13-16] At higher energies the only measurement found in the literature is the cloud chamber work of J. P. Conner[17] in 1953. Consequently we have taken

$$\sigma_{n,n'} = \sigma_{nX} - \sigma_{n,\alpha} - \sigma_{n,p} - \sigma_{n,d}$$

to describe the inelastic-scattering cross section for neutron energies above 10 MeV (see Table 5 and Fig. 6).

2.2 ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

Detailed measurements of the angular distribution of neutrons elastically scattered from oxygen have recently been made by Lane[18] in the energy range below about 1.7 MeV and by Sayres[19] between about 3 and 4.75 MeV. Otherwise one cannot say that the situation is much better than it was two years ago. The old gaps and conflicting experimental results still exist. Above 5 MeV the only new measurement is that of Bauer[5] at 14 MeV.

The work of Fowler and Cohn[20] confirms Lane's data, and that of Phillips[21] and of Johnson and Fowler[22] confirms Sayres' data. We have generally ignored the data of Hunzinger and Huber[23] since their data conflict with those of other workers perhaps because of their lack of measurements at small scattering angles. In the range just below 3 MeV we have been guided by the calculated Legendre coefficients of Lustig,[13] since his work predicted the main features of Lane's experimental results.

We have analyzed angular distributions from many sources, plotted the resulting Legendre coefficients, and drawn curves through the data. Where there are serious gaps or conflicts in the data it is obvious that more than one curve will be

possible. In such cases, the judgments cannot alw e rational; a species of aesthetics is also necessary. Point values are then read from the curves at the energies used in the tables. Where the values change rapidly with energy, average values are prepared corresponding to these tabular energies. These point values are then used to resynthesize angular distributions to make sure that no negative cross sections are being generated.

It is also necessary to examine the forward peak of the resynthesized angular distribution at each energy. G. C. Wick[24] has shown that the differential cross section at 0° ($\cos\theta = 1.0$) is limited by

$$\sigma_{n,n}(E,0) \geq \left(\frac{k\sigma_{nT}(E)}{4\pi}\right)^2$$

where $k = 1/\lambda$, the reciprocal of the reduced neutron wavelength. It is patently impossible to make measurements at zero deflection in the undeflected neutron beam, as that experimental verification of the Wick limit is not available; further, the measurements at other angles (e.g., $\cos\theta = 0.7$ to 0.95) may be such that a least-squares routine, like our LEGEND code, will predict $\sigma_{n,n}(E,0)$ values below the Wick limit. In such cases, the Wick limit may be entered as a data point at $\theta = 0$, or the normalization may be raised by increasing $\sigma_{n,n}$ relative to σ_{nT}, or the limit may be lowered by decreasing σ_{nT}. One must be careful, however, since these measures to insure strict observance of the Wick limit generate some distortion of either the angular distribution or the cross sections themselves. The Legendre coefficients are listed in Table 6.

2.3 ENERGY DISTRIBUTION OF INELASTICALLY SCATTERED NEUTRONS

As shown in the Nuclear Data Sheets,[25] the first excited level in oxygen at 6.06 MeV has the same spin and parity as the ground state, and pair emission is given as the probable mode of decay. Lustig, Goldstein, and Kalos[13] cite

T. W. Bonner as having concluded, after a search for these pairs, that excitation of this level by inelastic scattering is rare compared with that of other levels. We have followed their example and ignored the contribution of the 6.06-MeV level to inelastic scattering.

Because of the relatively large gap (1.76 MeV) between the fourth and fifth levels, we have decided to treat the fifth and higher levels as forming a continuum and to treat the lower levels as individually excited.

At 18 MeV it seems most likely that the spectrum of secondary neutrons will be given adequately by statistical theory since the influence of the very large number of high energy levels will probably overwhelm that of the lowest levels. We have used French curves to bridge the gap between 10 and 18 MeV, bringing the level excitation curves to zero at 18 MeV.

The discrete part of the neutron spectrum is given in Table 7. The continuous part has been calculated using the parameters:

$$a_1 = 18\ \text{MeV}^{-1}$$

$$E_{01} = 17\ \text{MeV}$$

$$E_{11} = 9\ \text{MeV}.$$

2.4 ENERGY DISTRIBUTION OF GAMMA RAYS FOLLOWING NONELASTIC REACTIONS

2.4.1 Gamma Rays Following Absorption

We have taken the radiative-capture cross section to be zero. The only source of absorption γ-rays which we take into account is that due from the reaction $O^{16}(n,\alpha)C^{13*}$. The data given in Table 8 are based on the work of Davis et al.[7]

2.4.2 Gamma Rays Following Inelastic Scattering

The spectrum of gamma rays following inelastic neutron scattering, shown in Table 9, was calculated from the excitation curves for the three discrete levels along with the continuum theory parameters. The level density was assumed to be 4 per MeV up to 17 MeV.

2.5 REFERENCES

1. Kalos, M. H., Goldstein, H., and Ray, J. H.: UNC-5038 (Aug. 31, 1962).
2. Fossan, D. B. et al.: Phys. Rev., 123:209 (1961).
3. Stehn, J. R. et al.: BNL-325, 2nd Ed., Supplement 2 (May 1964).
4. Flerov, N. N. and Talyzin, V. M.: Atomnaya Energiya, 1:155 (1956).
5. Bauer, R. W. et al.: Nuclear Phys., 47:241 (1963).
6. Chase, L. F., Jr., et al.: AFSWC-TR-61-15 (1961).
7. Davis, E. A. et al.: Nuclear Phys., 48:169 (1963).
8. Randolph, M. L.: Radiation Research, 7:47 (1957).
9. Bormann, M. et al.: Zeitschrift für Physik, 174:1 (1963).
10. Weil, J. L. and Jones, K. W.: Phys. Rev., 112:1975 (1958).
11. DeJuren, J. A., Stooksberry, R. W., and Wallis, M.: Phys. Rev., 127:1229 (1962).
12. Hughes, D. J. and Schwartz, R. B.: BNL-325, 2nd Ed. (July 1958).
13. Lustig, H., Goldstein, H., and Kalos, M. H.: NDA 086-2 (Jan. 31, 1958).
14. Troubetzkoy, E. S.: NDA 2111-3, Vol. C (Nov. 1, 1959).
15. King, D. C.: AEEW-M-445 (July 1964).
16. Schmidt, J. J.: KFK 120 (EANDC-E-35U) (Dec. 1962).
17. Conner, J. P.: Phys. Rev., 89:712 (1953).
18. Lane, R. O. et al.: Ann. of Phys., 12:135 (1961) and private communication.
19. Sayres, A. R., private communication.
20. Fowler, J. L. and Cohn, H. O.: Phys. Rev. 109:89 (1958).
21. Phillips, D. D., private communication.

22. Johnson, C. H. and Fowler, J. L.: Bull. Am. Phys. Soc., 9:348 (1964).

23. Hunzinger, W. and Huber, P.: Helv. Phys. Acta, 35:351 (1962).

24. Wick, G. C.: Atti Reale Acad. Italia, Mem. classe sci. fis., mat., e nat., 13:1203 (1943). See also Coon, J. H. et al.: Phys. Rev., 111:250 (1958).

25. Ajzenberg-Selove, F. and Lauritsen, T.: Nuclear Data Sheets, National Academy of Sciences-National Research Council, Washington, D. C.

TABLE 5 — O – NEUTRON CROSS SECTIONS (ALL CROSS SECTIONS IN BARNS)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,d}$
1.8017E 01	1.6407E 00	8.9142E-01	9.5038E-06	4.1794E-01	2.8012E-01	3.1199E-02	1.9999E-02
1.7139E 01	1.5927E 00	8.1601E-01	3.1451E-03	3.9789E-01	3.2500E-01	3.0977E-02	1.9700E-02
1.6303E 01	1.5343E 00	7.5900E-01	7.1305E-03	3.8224E-01	3.3500E-01	3.0800E-02	2.0104E-02
1.5508E 01	1.4778E 00	6.8961E-01	1.7097E-02	3.7895E-01	3.3799E-01	3.2778E-02	2.1389E-02
1.4751E 01	1.5038E 00	7.3547E-01	2.8356E-02	3.7013E-01	3.1201E-01	3.6181E-02	1.9687E-02
1.4032E 01	1.4870E 00	7.2823E-01	4.9743E-02	3.5290E-01	2.9000E-01	4.8690E-02	1.7300E-02
1.3348E 01	1.4651E 00	7.6000E-01	7.4331E-02	3.2545E-01	2.3997E-01	4.5884E-02	1.9439E-02
1.2697E 01	1.4998E 00	8.6653E-01	9.9196E-02	2.9606E-01	1.8997E-01	2.9722E-02	1.8306E-02
1.2077E 01	1.5000E 00	9.1497E-01	1.2591E-01	2.6260E-01	1.4003E-01	3.9383E-02	1.7099E-02
1.1488E 01	1.6189E 00	1.0832E 00	1.5894E-01	2.1991E-01	1.1502E-01	3.0710E-02	1.1130E-02
1.0928E 01	1.3412E 00	8.6368E-01	1.9364E-01	1.7563E-01	1.0000E-01	6.4861E-03	1.7382E-03
1.0395E 01	1.2388E 00	7.9120E-01	2.3408E-01	1.2295E-01	9.0002E-02	5.9232E-04	0
9.8882E 00	1.2510E 00	8.0597E-01	2.8830E-01	5.2683E-02	8.3999E-02	0	0
9.4059E 00	1.0999E 00	6.9741E-01	3.1226E-01	1.4236E-02	7.6000E-02	0	0
8.9472E 00	1.1648E 00	7.7154E-01	3.2617E-01	6.5444E-05	6.7000E-02	0	0
8.5106E 00	1.1738E 00	7.9572E-01	3.1749E-01	0	6.0600E-02	0	0
8.0957E 00	1.0935E 00	8.0696E-01	2.2326E-01	0	6.1300E-02	0	0
7.7009E 00	1.2411E 00	9.6244E-01	2.2871E-01	0	5.0000E-02	0	0
7.3253E 00	1.3065E 00	1.0491E 00	1.5541E-01	0	1.0200E-01	0	0
6.9681E 00	1.0160E 00	8.7249E-01	6.9953E-02	0	7.3602E-02	0	0
6.6282E 00	9.5448E-01	8.4068E-01	1.2500E-02	0	1.0130E-01	0	0
6.3050E 00	9.0856E-01	9.0081E-01	5.5002E-04	0	6.7195E-02	0	0
5.9975E 00	1.1868E 00	1.1500E 00	0	0	3.6804E-02	0	0
5.7050E 00	1.4178E 00	1.3069E 00	0	0	1.1097E-01	0	0
5.4267E 00	1.0337E 00	1.0268E 00	0	0	6.9024E-03	0	0
5.1621E 00	1.6048E 00	1.5445E 00	0	0	6.0304E-02	0	0
4.9103E 00	1.1291E 00	1.0251E 00	0	0	1.0400E-01	0	0
4.6708E 00	1.1091E 00	1.0611E 00	0	0	4.8005E-02	0	0
4.4430E 00	1.8765E 00	1.8385E 00	0	0	3.8001E-02	0	0
4.2263E 00	1.8182E 00	1.7172E 00	0	0	1.0098E-01	0	0
4.0202E 00	1.6957E 00	1.6257E 00	0	0	7.0003E-02	0	0
3.8242E 00	2.8939E 00	2.8869E 00	0	0	6.9983E-03	0	0
3.6376E 00	2.9780E 00	2.9780E 00	0	0	1.8120E-06	0	0
3.4602E 00	3.0164E 00	3.0164E 00	0	0	0	0	0
3.2915E 00	2.8559E 00	2.8559E 00	0	0	0	0	0
3.1310E 00	1.8043E 00	1.8043E 00	0	0	0	0	0
2.9783E 00	1.3564E 00	1.3564E 00	0	0	0	0	0
2.8330E 00	1.2841E 00	1.2841E 00	0	0	0	0	0
2.6948E 00	1.2230E 00	1.2230E 00	0	0	0	0	0

TABLE 5 — O (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$
2.5634E 00	1.2315E 00	1.2315E 00
2.4384E 00	9.1926E-01	9.1926E-01
2.3195E 00	7.7852E-01	7.7852E-01
2.2063E 00	1.1595E 00	1.1595E 00
2.0987E 00	1.3999E 00	1.3999E 00
1.9964E 00	1.737 0E 00	1.737 0E 00
1.899 0E 00	2.7209E 00	2.7209E 00
1.8064E 00	2.5426E 00	2.5426E 00
1.7183E 00	3.0163E 00	3.0163E 00
1.6345E 00	3.4743E 00	3.4743E 00
1.5548E 00	2.2793E 00	2.2793E 00
1.479 0E 00	2.2783E 00	2.2783E 00
1.4068E 00	2.6093E 00	2.6093E 00
1.3382E 00	3.8044E 00	3.8044E 00
1.273 0E 00	4.5507E 00	4.5507E 00
1.2109E 00	3.0120E 00	3.0120E 00
1.1518E 00	3.0332E 00	3.0332E 00
1.0956E 00	3.8646E 00	3.8646E 00
1.0422E 00	5.7346E 00	5.7346E 00
9.9137E-01	7.4696E 00	7.4696E 00
9.4302E-01	5.0599E 00	5.0599E 00
8.9703E-01	3.5612E 00	3.5612E 00
8.5328E-01	3.0333E 00	3.0333E 00
8.1167E-01	2.8226E 00	2.8226E 00
7.7208E-01	2.7849E 00	2.7849E 00
7.3443E-01	2.8031E 00	2.8031E 00
6.9861E-01	2.8499E 00	2.8499E 00
6.6454E-01	2.9087E 00	2.9087E 00
6.3213E-01	3.0252E 00	3.0252E 00
6.0130E-01	3.1985E 00	3.1985E 00
5.7197E-01	3.3972E 00	3.3972E 00
5.4408E-01	3.6436E 00	3.6436E 00
5.1754E-01	4.2751E 00	4.2751E 00
4.9230E-01	5.7075E 00	5.7075E 00
4.6829E-01	9.4956E 00	9.4956E 00
4.4545E-01	1.4473E 01	1.4473E 01
4.2373E-01	1.1219E 01	1.1219E 01
4.0306E-01	6.0429E 00	6.0429E 00
3.8341E-01	4.2595E 00	4.2595E 00

E, MeV	σ_{nT}	$\sigma_{n,n}$
3.6471E-01	4.032 0E 00	4.032 0E 00
3.4692E-01	3.9478E 00	3.9478E 00
3.3000E-01	3.8491E 00	3.8491E 00
3.1391E-01	3.76 00E 00	3.76 00E 00
2.986 0E-01	3.73 00E 00	3.73 00E 00
2.8403E-01	3.7114E 00	3.7114E 00
2.7018E-01	3.7014E 00	3.7014E 00
2.570 0E-01	3.7000E 00	3.7000E 00
2.4447E-01	3.7000E 00	3.7000E 00
2.3255E-01	3.7000E 00	3.7000E 00
2.2121E-01	3.7000E 00	3.7000E 00
2.1042E-01	3.7000E 00	3.7000E 00
2.0016E-01	3.7000E 00	3.7000E 00
1.9039E-01	3.7000E 00	3.7000E 00
1.8111E-01	3.7000E 00	3.7000E 00
1.7228E-01	3.7000E 00	3.7000E 00
1.6387E-01	3.7000E 00	3.7000E 00
1.5588E-01	3.7000E 00	3.7000E 00
1.4828E-01	3.7000E 00	3.7000E 00
1.4105E-01	3.7000E 00	3.7000E 00
1.3417E-01	3.7000E 00	3.7000E 00
1.2762E-01	3.7000E 00	3.7000E 00
1.214 0E-01	3.7000E 00	3.7000E 00
1.1546E-01	3.7000E 00	3.7000E 00
1.0985E-01	3.7000E 00	3.7000E 00
1.0449E-01	3.7000E 00	3.7000E 00
9.9394E-02	3.7000E 00	3.7000E 00
9.4547E-02	3.7000E 00	3.7000E 00
8.9935E-02	3.7000E 00	3.7000E 00
8.5549E-02	3.7000E 00	3.7000E 00
8.1377E-02	3.7000E 00	3.7000E 00
7.7408E-02	3.7000E 00	3.7000E 00
7.3633E-02	3.7000E 00	3.7000E 00
7.0042E-02	3.7000E 00	3.7000E 00
6.6626E-02	3.7000E 00	3.7000E 00
6.3379E-02	3.7000E 00	3.7000E 00
6.0286E-02	3.7000E 00	3.7000E 00
5.7345E-02	3.7000E 00	3.7000E 00
5.4549E-02	3.7000E 00	3.7000E 00

TABLE 5 — O (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	E, MeV	σ_{nT}	$\sigma_{n,n}$
5.1888E-02	3.7000E 00	3.7000E 00	7.3824E-03	3.7000E 00	3.7000E 00
4.9358E-02	3.7000E 00	3.7000E 00	7.0223E-03	3.7000E 00	3.7000E 00
4.6950E-02	3.7000E 00	3.7000E 00	6.6798E-03	3.7000E 00	3.7000E 00
4.4661E-02	3.7000E 00	3.7000E 00	6.3541E-03	3.7000E 00	3.7000E 00
4.2483E-02	3.7000E 00	3.7000E 00	6.0442E-03	3.7000E 00	3.7000E 00
4.0411E-02	3.7000E 00	3.7000E 00	5.7494E-03	3.7000E 00	3.7000E 00
3.8440E-02	3.7000E 00	3.7000E 00	5.4690E-03	3.7000E 00	3.7000E 00
3.6565E-02	3.7000E 00	3.7000E 00	5.2023E-03	3.7000E 00	3.7000E 00
3.4782E-02	3.7000E 00	3.7000E 00	4.9485E-03	3.7000E 00	3.7000E 00
3.3085E-02	3.7000E 00	3.7000E 00	4.7072E-03	3.7000E 00	3.7000E 00
3.1472E-02	3.7000E 00	3.7000E 00	4.4776E-03	3.7000E 00	3.7000E 00
2.9937E-02	3.7000E 00	3.7000E 00	4.2592E-03	3.7000E 00	3.7000E 00
2.8477E-02	3.7000E 00	3.7000E 00	4.0515E-03	3.7000E 00	3.7000E 00
2.7088E-02	3.7000E 00	3.7000E 00	3.8539E-03	3.7000E 00	3.7000E 00
2.5767E-02	3.7000E 00	3.7000E 00	3.6660E-03	3.7000E 00	3.7000E 00
2.4510E-02	3.7000E 00	3.7000E 00	3.4872E-03	3.7000E 00	3.7000E 00
2.3315E-02	3.7000E 00	3.7000E 00	3.3171E-03	3.7000E 00	3.7000E 00
2.2178E-02	3.7000E 00	3.7000E 00	3.1553E-03	3.7000E 00	3.7000E 00
2.1096E-02	3.7000E 00	3.7000E 00	3.0014E-03	3.7000E 00	3.7000E 00
2.0067E-02	3.7000E 00	3.7000E 00	2.8551E-03	3.7000E 00	3.7000E 00
1.9089E-02	3.7000E 00	3.7000E 00	2.7158E-03	3.7000E 00	3.7000E 00
1.8158E-02	3.7000E 00	3.7000E 00	2.5834E-03	3.7000E 00	3.7000E 00
1.7272E-02	3.7000E 00	3.7000E 00	2.4574E-03	3.7000E 00	3.7000E 00
1.6430E-02	3.7000E 00	3.7000E 00	2.3375E-03	3.7000E 00	3.7000E 00
1.5628E-02	3.7000E 00	3.7000E 00	2.2235E-03	3.7000E 00	3.7000E 00
1.4866E-02	3.7000E 00	3.7000E 00	2.1151E-03	3.7000E 00	3.7000E 00
1.4141E-02	3.7000E 00	3.7000E 00	2.0119E-03	3.7000E 00	3.7000E 00
1.3452E-02	3.7000E 00	3.7000E 00	1.9138E-03	3.7000E 00	3.7000E 00
1.2795E-02	3.7000E 00	3.7000E 00	1.8205E-03	3.7000E 00	3.7000E 00
1.2171E-02	3.7000E 00	3.7000E 00	1.7317E-03	3.7000E 00	3.7000E 00
1.1578E-02	3.7000E 00	3.7000E 00	1.6472E-03	3.7000E 00	3.7000E 00
1.1013E-02	3.7000E 00	3.7000E 00	1.5669E-03	3.7000E 00	3.7000E 00
1.0476E-02	3.7000E 00	3.7000E 00	1.4905E-03	3.7000E 00	3.7000E 00
9.9651E-03	3.7000E 00	3.7000E 00	1.4178E-03	3.7000E 00	3.7000E 00
9.4791E-03	3.7000E 00	3.7000E 00	1.3486E-03	3.7000E 00	3.7000E 00
9.0168E-03	3.7000E 00	3.7000E 00	1.2829E-03	3.7000E 00	3.7000E 00
8.5771E-03	3.7000E 00	3.7000E 00	1.2203E-03	3.7000E 00	3.7000E 00
8.1588E-03	3.7000E 00	3.7000E 00	1.1608E-03	3.7000E 00	3.7000E 00
7.7609E-03	3.7000E 00	3.7000E 00	1.1042E-03	3.7000E 00	3.7000E 00

TABLE 5 — O (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$
1.0503E-03	3.7000E 00	3.7000E 00
9.9909E-04	3.7000E 00	3.7000E 00
9.5037E-04	3.7000E 00	3.7000E 00
9.0402E-04	3.7000E 00	3.7000E 00
8.5993E-04	3.7000E 00	3.7000E 00
8.1799E-04	3.7000E 00	3.7000E 00
7.7809E-04	3.7000E 00	3.7000E 00
7.4015E-04	3.7000E 00	3.7000E 00
7.0405E-04	3.7000E 00	3.7000E 00
6.6971E-04	3.7000E 00	3.7000E 00
6.3705E-04	3.7000E 00	3.7000E 00
6.0598E-04	3.7000E 00	3.7000E 00
5.7643E-04	3.7000E 00	3.7000E 00
5.4831E-04	3.7000E 00	3.7000E 00
5.2157E-04	3.7000E 00	3.7000E 00
4.9613E-04	3.7000E 00	3.7000E 00
4.7194E-04	3.7000E 00	3.7000E 00
4.4892E-04	3.7000E 00	3.7000E 00
4.2703E-04	3.7000E 00	3.7000E 00
4.0620E-04	3.7000E 00	3.7000E 00
3.8639E-04	3.7000E 00	3.7000E 00
3.6755E-04	3.7000E 00	3.7000E 00
3.4962E-04	3.7000E 00	3.7000E 00
3.3257E-04	3.7000E 00	3.7000E 00
3.1635E-04	3.7000E 00	3.7000E 00
3.0092E-04	3.7000E 00	3.7000E 00
2.8624E-04	3.7000E 00	3.7000E 00
2.7228E-04	3.7000E 00	3.7000E 00
2.5901E-04	3.7000E 00	3.7000E 00
2.4637E-04	3.7000E 00	3.7000E 00
2.3436E-04	3.7000E 00	3.7000E 00
2.2293E-04	3.7000E 00	3.7000E 00
2.1206E-04	3.7000E 00	3.7000E 00
2.0171E-04	3.7000E 00	3.7000E 00
1.9188E-04	3.7000E 00	3.7000E 00
1.8252E-04	3.7000E 00	3.7000E 00
1.7362E-04	3.7000E 00	3.7000E 00
1.6515E-04	3.7000E 00	3.7000E 00
1.5709E-04	3.7000E 00	3.7000E 00

E, MeV	σ_{nT}	$\sigma_{n,n}$
1.4943E-04	3.7000E 00	3.7000E 00
1.4215E-04	3.7000E 00	3.7000E 00
1.3521E-04	3.7000E 00	3.7000E 00
1.2862E-04	3.7000E 00	3.7000E 00
1.2235E-04	3.7000E 00	3.7000E 00
1.1638E-04	3.7000E 00	3.7000E 00
1.1070E-04	3.7000E 00	3.7000E 00
1.0530E-04	3.7000E 00	3.7000E 00
1.0017E-04	3.7000E 00	3.7000E 00
9.5283E-05	3.7000E 00	3.7000E 00
9.0636E-05	3.7000E 00	3.7000E 00
8.6215E-05	3.7000E 00	3.7000E 00
8.2011E-05	3.7000E 00	3.7000E 00
7.8011E-05	3.7000E 00	3.7000E 00
7.4206E-05	3.7000E 00	3.7000E 00
7.0587E-05	3.7000E 00	3.7000E 00
6.7145E-05	3.7000E 00	3.7000E 00
6.3870E-05	3.7000E 00	3.7000E 00
6.0755E-05	3.7000E 00	3.7000E 00
5.7792E-05	3.7000E 00	3.7000E 00
5.4973E-05	3.7000E 00	3.7000E 00
5.2292E-05	3.7000E 00	3.7000E 00
4.9742E-05	3.7000E 00	3.7000E 00
4.7316E-05	3.7000E 00	3.7000E 00
4.5008E-05	3.7000E 00	3.7000E 00
4.2813E-05	3.7000E 00	3.7000E 00
4.0725E-05	3.7000E 00	3.7000E 00
3.8739E-05	3.7000E 00	3.7000E 00
3.6850E-05	3.7000E 00	3.7000E 00
3.5053E-05	3.7000E 00	3.7000E 00
3.3343E-05	3.7000E 00	3.7000E 00
3.1717E-05	3.7000E 00	3.7000E 00
3.0170E-05	3.7000E 00	3.7000E 00
2.8699E-05	3.7000E 00	3.7000E 00
2.7299E-05	3.7000E 00	3.7000E 00
2.5968E-05	3.7000E 00	3.7000E 00
2.4701E-05	3.7000E 00	3.7000E 00
2.3496E-05	3.7000E 00	3.7000E 00
2.2350E-05	3.7000E 00	3.7000E 00

TABLE 5 — O (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$
2.1260E-05	3.7000E 00	3.7000E 00
2.0224E-05	3.7000E 00	3.7000E 00
1.9237E-05	3.7000E 00	3.7000E 00
1.8299E-05	3.7000E 00	3.7000E 00
1.7407E-05	3.7000E 00	3.7000E 00
1.6558E-05	3.7000E 00	3.7000E 00
1.5750E-05	3.7000E 00	3.7000E 00
1.4982E-05	3.7000E 00	3.7000E 00
1.4251E-05	3.7000E 00	3.7000E 00
1.3556E-05	3.7000E 00	3.7000E 00
1.2895E-05	3.7000E 00	3.7000E 00
1.2266E-05	3.7000E 00	3.7000E 00
1.1668E-05	3.7000E 00	3.7000E 00
1.1099E-05	3.7000E 00	3.7000E 00
1.0558E-05	3.7000E 00	3.7000E 00
1.0043E-05	3.7000E 00	3.7000E 00
9.5529E-06	3.7000E 00	3.7000E 00
9.0870E-06	3.7000E 00	3.7000E 00
8.6438E-06	3.7000E 00	3.7000E 00
8.2223E-06	3.7000E 00	3.7000E 00
7.8213E-06	3.7000E 00	3.7000E 00
7.4398E-06	3.7000E 00	3.7000E 00
7.0770E-06	3.7000E 00	3.7000E 00
6.7318E-06	3.7000E 00	3.7000E 00
6.4035E-06	3.7000E 00	3.7000E 00
6.0912E-06	3.7000E 00	3.7000E 00
5.7941E-06	3.7000E 00	3.7000E 00
5.5116E-06	3.7000E 00	3.7000E 00
5.2428E-06	3.7000E 00	3.7000E 00
4.9871E-06	3.7000E 00	3.7000E 00
4.7438E-06	3.7000E 00	3.7000E 00
4.5125E-06	3.7000E 00	3.7000E 00
4.2924E-06	3.7000E 00	3.7000E 00
4.0831E-06	3.7000E 00	3.7000E 00
3.8839E-06	3.7000E 00	3.7000E 00
3.6945E-06	3.7000E 00	3.7000E 00
3.5143E-06	3.7000E 00	3.7000E 00
3.3429E-06	3.7000E 00	3.7000E 00
3.1799E-06	3.7000E 00	3.7000E 00

E, MeV	σ_{nT}	$\sigma_{n,n}$
3.0248E-06	3.7000E 00	3.7000E 00
2.8773E-06	3.7000E 00	3.7000E 00
2.7370E-06	3.7000E 00	3.7000E 00
2.6035E-06	3.7000E 00	3.7000E 00
2.4765E-06	3.7000E 00	3.7000E 00
2.3557E-06	3.7000E 00	3.7000E 00
2.2408E-06	3.7000E 00	3.7000E 00
2.1315E-06	3.7000E 00	3.7000E 00
2.0276E-06	3.7000E 00	3.7000E 00
1.9287E-06	3.7000E 00	3.7000E 00
1.8346E-06	3.7000E 00	3.7000E 00
1.7452E-06	3.7000E 00	3.7000E 00
1.6601E-06	3.7000E 00	3.7000E 00
1.5791E-06	3.7000E 00	3.7000E 00
1.5021E-06	3.7000E 00	3.7000E 00
1.4288E-06	3.7000E 00	3.7000E 00
1.3591E-06	3.7000E 00	3.7000E 00
1.2928E-06	3.7000E 00	3.7000E 00
1.2298E-06	3.7000E 00	3.7000E 00
1.1698E-06	3.7000E 00	3.7000E 00
1.1128E-06	3.7000E 00	3.7000E 00
1.0585E-06	3.7000E 00	3.7000E 00
1.0069E-06	3.7000E 00	3.7000E 00
9.5777E-07	3.7000E 00	3.7000E 00
9.1105E-07	3.7000E 00	3.7000E 00
8.6662E-07	3.7000E 00	3.7000E 00
8.2436E-07	3.7000E 00	3.7000E 00
7.8415E-07	3.7000E 00	3.7000E 00
7.4591E-07	3.7000E 00	3.7000E 00
7.0953E-07	3.7000E 00	3.7000E 00
6.7493E-07	3.7000E 00	3.7000E 00
6.4201E-07	3.7000E 00	3.7000E 00
6.1070E-07	3.7000E 00	3.7000E 00
5.8091E-07	3.7000E 00	3.7000E 00
5.5258E-07	3.7000E 00	3.7000E 00
5.2563E-07	3.7000E 00	3.7000E 00
5.0000E-07	3.7000E 00	3.7000E 00
4.7561E-07	3.7000E 00	3.7000E 00
4.5242E-07	3.7000E 00	3.7000E 00

TABLE 5 — O (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$
4.3035E-07	3.7000E 00	3.7000E 00
4.0930E-07	3.7000E 00	3.7000E 00
3.8940E-07	3.7000E 00	3.7000E 00
3.7041E-07	3.7000E 00	3.7000E 00
3.5234E-07	3.7000E 00	3.7000E 00
3.3516E-07	3.7000E 00	3.7000E 00
3.1881E-07	3.7000E 00	3.7000E 00
3.0326E-07	3.7000E 00	3.7000E 00
2.8847E-07	3.7000E 00	3.7000E 00
2.7440E-07	3.7000E 00	3.7000E 00
2.6102E-07	3.7000E 00	3.7000E 00
2.4829E-07	3.7000E 00	3.7000E 00
2.3618E-07	3.7000E 00	3.7000E 00
2.2466E-07	3.7000E 00	3.7000E 00
2.1371E-07	3.7000E 00	3.7000E 00
2.0328E-07	3.7000E 00	3.7000E 00
1.9337E-07	3.7000E 00	3.7000E 00
1.8394E-07	3.7000E 00	3.7000E 00
1.7497E-07	3.7000E 00	3.7000E 00
1.6643E-07	3.7000E 00	3.7000E 00
1.5832E-07	3.7000E 00	3.7000E 00
1.5060E-07	3.7000E 00	3.7000E 00
1.4325E-07	3.7000E 00	3.7000E 00
1.3627E-07	3.7000E 00	3.7000E 00
1.2962E-07	3.7000E 00	3.7000E 00
1.2330E-07	3.7000E 00	3.7000E 00
1.1726E-07	3.7000E 00	3.7000E 00
1.1150E-07	3.7000E 00	3.7000E 00
1.0612E-07	3.7000E 00	3.7000E 00
1.0095E-07	3.7000E 00	3.7000E 00
9.6024E-08	3.7000E 00	3.7000E 00
9.1341E-08	3.7000E 00	3.7000E 00
8.6887E-08	3.7000E 00	3.7000E 00
8.2649E-08	3.7000E 00	3.7000E 00
7.8616E-08	3.7000E 00	3.7000E 00
7.4784E-08	3.7000E 00	3.7000E 00
7.1137E-08	3.7000E 00	3.7000E 00
6.7667E-08	3.7000E 00	3.7000E 00
6.4367E-08	3.7000E 00	3.7000E 00
6.1228E-08	3.7000E 00	3.7000E 00
5.8242E-08	3.7000E 00	3.7000E 00
5.5401E-08	3.7000E 00	3.7000E 00
5.2699E-08	3.7000E 00	3.7000E 00
5.0129E-08	3.7000E 00	3.7000E 00
4.7684E-08	3.7000E 00	3.7000E 00
4.5359E-08	3.7000E 00	3.7000E 00
4.3147E-08	3.7000E 00	3.7000E 00
4.1042E-08	3.7000E 00	3.7000E 00
3.9041E-08	3.7000E 00	3.7000E 00
3.7137E-08	3.7000E 00	3.7000E 00

TABLE 6 — O – LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8
1.8017E 01	7.9999E-01	6.4198E-01	4.9697E-01	3.6898E-01	2.4197E-01	1.2298E-01	4.3697E-02	9.0041E-03
1.7139E 01	7.9331E-01	6.3226E-01	4.8630E-01	3.6018E-01	2.3211E-01	1.1607E-01	4.2436E-02	8.2220E-03
1.6303E 01	7.7118E-01	6.0836E-01	4.6683E-01	3.4607E-01	2.1827E-01	1.0606E-01	3.8995E-02	6.4637E-03
1.5508E 01	7.3924E-01	5.7985E-01	4.4706E-01	3.3294E-01	2.0618E-01	9.8096E-02	3.6441E-02	7.3298E-03
1.4751E 01	7.0276E-01	5.5371E-01	4.3074E-01	3.2373E-01	1.9734E-01	9.3532E-02	3.6139E-02	9.0180E-03
1.4032E 01	6.5277E-01	5.1601E-01	4.0395E-01	3.0779E-01	1.8261E-01	8.4765E-02	3.2723E-02	9.4524E-03
1.3348E 01	5.7603E-01	4.5570E-01	3.5734E-01	2.7919E-01	1.5703E-01	6.7902E-02	2.4034E-02	7.9332E-03
1.2697E 01	5.1402E-01	4.1141E-01	3.2507E-01	2.6154E-01	1.3996E-01	5.9047E-02	2.0230E-02	6.1810E-03
1.2077E 01	4.5604E-01	3.7396E-01	2.9732E-01	2.4708E-01	1.2658E-01	5.2672E-02	1.7945E-02	5.8150E-03
1.1488E 01	3.9756E-01	3.3773E-01	2.7068E-01	2.3283E-01	1.1276E-01	4.6780E-02	1.5808E-02	5.3797E-03
1.0928E 01	3.4129E-01	3.0324E-01	2.4477E-01	2.1882E-01	9.8650E-02	4.1372E-02	1.3934E-02	4.7732E-03
1.0395E 01	2.8655E-01	2.7105E-01	2.2113E-01	2.0495E-01	8.4774E-02	3.6526E-02	1.2309E-02	4.0086E-03
9.8882E 00	2.3618E-01	2.4029E-01	1.9903E-01	1.9114E-01	7.0991E-02	3.2068E-02	1.0827E-02	3.0207E-03
9.4059E 00	1.8755E-01	2.1159E-01	1.7722E-01	1.7792E-01	5.6878E-02	2.8044E-02	9.5232E-03	1.0379E-02
8.9472E 00	1.4997E-01	1.9270E-01	1.6233E-01	1.6840E-01	4.5781E-02	2.6833E-02	1.0224E-02	1.1410E-02
8.5108E 00	1.4245E-01	1.9857E-01	1.6988E-01	1.7480E-01	4.9156E-02	3.5634E-02	1.8410E-02	1.6872E-02
8.0957E 00	7.4127E-02	1.5448E-01	1.2895E-01	1.4353E-01	1.7725E-02	2.1151E-02	8.9799E-03	1.1192E-02
7.7009E 00	5.7627E-02	1.4628E-01	1.2638E-01	1.3750E-01	1.1071E-02	2.2939E-02	1.0930E-02	1.0097E-02
7.3253E 00	8.6768E-02	1.7219E-01	1.5503E-01	1.5641E-01	2.7883E-02	3.9614E-02	2.4081E-02	4.3388E-03
6.9681E 00	2.7283E-02	1.2596E-01	1.1158E-01	1.1284E-01	-1.0416E-02	1.5530E-02	7.4229E-03	8.3308E-03
6.6282E 00	4.6393E-02	1.1997E-01	1.1939E-01	9.8149E-02	-4.3300E-03	8.2617E-03	3.0800E-03	9.2817E-03
6.3050E 00	1.0864E-01	1.2919E-01	1.5031E-01	9.1267E-02	7.6693E-03	5.1497E-03	1.6119E-03	3.3093E-03
5.9975E 00	1.3971E-01	1.4256E-01	1.6982E-01	8.4634E-02	1.5756E-02	4.2960E-03	-3.5615E-04	1.2442E-03
5.7050E 00	1.3168E-01	1.5958E-01	1.7868E-01	7.4341E-02	1.7134E-02	6.9833E-03	-4.4256E-03	9.3482E-04
5.4267E 00	1.0889E-01	1.7737E-01	1.7812E-01	6.3628E-02	1.3726E-02	1.2174E-02	-9.2237E-03	-7.2430E-04
5.1621E 00	9.0935E-02	1.9650E-01	1.6959E-01	5.1235E-02	7.9215E-03	1.9410E-02	-1.5322E-02	-1.0090E-03
4.9103E 00	9.2465E-02	1.2555E-01	1.2900E-01	3.7799E-02	-1.3087E-03	1.1541E-02	-1.1321E-02	-7.5743E-04
4.6708E 00	1.9663E-01	5.5290E-02	1.2211E-01	4.1587E-02	-1.6637E-02	-1.0751E-02	-3.9259E-04	-3.0535E-03
4.4430E 00	4.3149E-01	2.8368E-01	1.6945E-01	4.1695E-02	-1.0632E-02	-1.0003E-02	0	0
4.2263E 00	2.2128E-01	2.1431E-01	6.5588E-02	1.1704E-02	1.5134E-03	-6.6628E-03	0	0
4.0202E 00	3.0716E-01	1.4965E-01	7.5913E-02	-1.9612E-03	-5.6063E-03	-3.2528E-03	0	0
3.8242E 00	3.0025E-01	2.0160E-01	1.1449E-01	1.2829E-02	-3.3262E-03	-3.7029E-03	0	0
3.6376E 00	3.5534E-01	2.3541E-01	1.1271E-01	4.1781E-02	1.1379E-02	1.0700E-02	0	0
3.4602E 00	2.5765E-01	2.6604E-01	6.1080E-02	1.8440E-02	-3.1502E-04	-1.9800E-03	0	0
3.2915E 00	1.5761E-01	3.0668E-01	8.6680E-02	-1.3670E-02	-4.7800E-03	4.3600E-03	0	0
3.1310E 00	2.1161E-01	2.2297E-01	8.8802E-02	-1.8831E-02	-1.9559E-03	5.1416E-03	0	0
2.9783E 00	1.0178E-01	5.5128E-02	2.0217E-02	-1.8055E-02	-8.7209E-03	-8.6388E-03	0	0
2.8330E 00	4.9708E-02	2.8965E-02	7.1729E-03	-3.9229E-03	-2.5350E-03	-2.4530E-03	0	0
2.6948E 00	1.7790E-02	8.0811E-03	-4.7721E-05	6.3000E-04	-9.9889E-04	-3.3194E-04	0	0
2.5634E 00	3.1227E-03	-2.0143E-03	6.0079E-03	3.9649E-03	4.5199E-03	3.4779E-03	0	0
2.4384E 00	-1.1888E-02	-1.1285E-02	2.2396E-03	9.3435E-04	6.8372E-04	4.5674E-04	0	0
2.3195E 00	7.0476E-02	3.7860E-02	2.0928E-04	3.3946E-03	1.0358E-03	0	0	0
2.2063E 00	7.2084E-02	1.1776E-01	-2.1144E-04	8.0699E-03	9.9176E-04	0	0	0
2.0987E 00	9.7910E-02	1.2069E-01	-3.0676E-04	1.4594E-02	-1.9049E-03	0	0	0

TABLE 6 — O (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8
1.9964E 00	9.8415E-02	1.1159E-01	2.9272E-03	1.9343E-02	-4.7372E-04	0	0	0
1.8990E 00	6.6587E-02	9.1913E-02	1.7564E-02	2.6707E-02	9.8983E-03	0	0	0
1.8064E 00	1.2088E-02	6.3561E-02	2.9714E-02	2.7892E-02	2.2280E-02	0	0	0
1.7183E 00	-4.5877E-02	3.8611E-02	4.5874E-02	3.0164E-02	3.1756E-02	0	0	0
1.6345E 00	1.4792E-02	9.6452E-02	8.7909E-02	8.5487E-02	5.7147E-02	0	0	0
1.5548E 00	3.1690E-02	4.5592E-02	4.6460E-02	5.7050E-02	4.1596E-02	0	0	0
1.4790E 00	4.0542E-02	4.4048E-02	6.0309E-02	1.6236E-02	1.4913E-02	0	0	0
1.4068E 00	1.5393E-01	1.0384E-01	5.4353E-02	1.0152E-02	-4.8872E-03	0	0	0
1.3382E 00	3.2563E-01	1.6267E-01	4.5480E-02	6.5144E-03	-7.9159E-03	0	0	0
1.2730E 00	-1.6049E-02	1.6069E-01	-3.3899E-02	2.4988E-02	1.0306E-02	0	0	0
1.2109E 00	-9.6323E-02	1.8495E-01	-2.3688E-02	1.6789E-02	-1.0079E-03	0	0	0
1.1518E 00	-6.7821E-02	2.5513E-01	-3.8190E-02	1.1679E-02	-1.1081E-02	0	0	0
1.0956E 00	-1.2640E-02	3.0194E-01	-1.9084E-02	8.7609E-04	-1.1637E-02	0	0	0
1.0422E 00	-1.2143E-03	3.3056E-01	-2.0748E-02	5.1269E-03	-1.3303E-02	0	0	0
9.9137E-01	5.6992E-02	2.5407E-01	2.7760E-02	6.6491E-03	1.8431E-02	0	0	0
9.4302E-01	3.3334E-02	6.5112E-02	2.7844E-02	1.3052E-02	4.5268E-02	0	0	0
8.9703E-01	3.8979E-02	-1.8214E-02	4.9270E-03	9.7597E-03	2.4852E-02	0	0	0
8.5328E-01	5.0641E-02	-3.2139E-02	-8.2983E-03	4.2973E-03	1.3769E-03	0	0	0
8.1167E-01	8.4690E-02	-4.4163E-02	1.7730E-03	-1.9572E-03	2.1569E-03	0	0	0
7.7208E-01	1.1210E-01	-3.3859E-02	3.9058E-03	6.7326E-04	8.3152E-03	0	0	0
7.3443E-01	1.3166E-01	-2.1876E-02	-1.6387E-03	1.3886E-03	5.3399E-03	0	0	0
6.9861E-01	1.4378E-01	-1.8847E-02	-1.9813E-03	-1.4488E-03	5.2314E-03	0	0	0
6.6454E-01	1.5347E-01	-1.2152E-02	-6.1690E-03	6.3554E-04	6.8288E-04	0	0	0
6.3213E-01	1.7548E-01	-4.4909E-03	-6.9549E-03	5.5893E-03	-3.7220E-03	0	0	0
6.0130E-01	2.0251E-01	-1.2310E-03	-7.8600E-04	6.0477E-03	-1.9614E-03	0	0	0
5.7197E-01	2.4841E-01	-2.1859E-03	1.0109E-02	6.2397E-03	4.1704E-03	0	0	0
5.4408E-01	3.0433E-01	1.3499E-02	2.8928E-03	-2.2262E-03	3.7261E-03	0	0	0
5.1754E-01	3.5785E-01	4.4088E-02	-1.1774E-03	-8.4373E-03	-4.4662E-03	0	0	0
4.9230E-01	3.9496E-01	8.3865E-02	-4.6087E-04	-3.5902E-03	-5.8427E-03	0	0	0
4.6829E-01	3.8321E-01	1.2144E-01	1.6373E-02	6.7241E-03	6.3923E-03	0	0	0
4.4545E-01	2.2606E-01	1.4622E-01	-3.3834E-03	3.4843E-03	-4.1025E-03	0	0	0
4.2373E-01	1.2482E-02	1.3195E-01	2.7097E-02	8.3817E-03	1.5180E-02	0	0	0
4.0306E-01	-1.7222E-01	8.6443E-02	2.4545E-02	5.7651E-03	1.1175E-02	0	0	0
3.8341E-01	-2.3308E-01	3.6216E-02	2.0163E-02	-5.0344E-03	1.7783E-02	0	0	0
3.6471E-01	-2.3968E-01	5.5458E-03	3.3817E-02	-9.7672E-03	1.8237E-02	0	0	0
3.4692E-01	-2.2524E-01	-4.2833E-02	3.7706E-02	-2.2435E-03	2.6524E-02	0	0	0
3.3000E-01	-2.1106E-01	-2.0263E-02	1.0490E-02	3.8479E-03	1.5750E-02	0	0	0
3.1391E-01	-1.9285E-01	-1.7150E-02	-1.6219E-03	3.7640E-03	1.2189E-02	0	0	0
2.9860E-01	-1.7385E-01	-2.9945E-02	-3.4201E-03	1.9058E-03	1.3743E-02	0	0	0
2.8403E-01	-1.6070E-01	-2.9515E-02	-4.6836E-03	4.1119E-03	1.0742E-02	0	0	0
2.7018E-01	-1.4945E-01	-2.5890E-02	-5.7714E-03	7.2247E-03	6.7490E-03	0	0	0
2.5700E-01	-1.3875E-01	-2.2442E-02	-6.8062E-03	1.0186E-02	2.9428E-03	0	0	0
2.4447E-01	-1.2856E-01	-1.9162E-02	-7.7905E-03	1.3002E-02	-6.7398E-04	0	0	0
2.3255E-01	-1.1888E-01	-1.6042E-02	-8.7267E-03	1.5681E-02	-4.1143E-03	0	0	0

TABLE 6 — O (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8
2.2121E-01	-1.0967E-01	-1.3074E-02	-9.6174E-03	1.8230E-02	-7.3869E-03	0	0	0
2.1042E-01	-1.0090E-01	-1.0251E-02	-1.0465E-02	2.0654E-02	-1.0500E-02	0	0	0
2.0016E-01	-8.9148E-02	-1.1866E-02	-7.6657E-03	1.9925E-02	-9.9310E-03	0	0	0
1.9039E-01	-7.4149E-02	-1.8198E-02	-9.8161E-04	1.5845E-02	-4.2247E-03	0	0	0
1.8111E-01	-5.9878E-02	-2.4226E-02	5.3794E-03	1.1962E-02	8.2599E-04	0	0	0
1.7228E-01	-4.6303E-02	-2.9959E-02	1.1430E-02	8.2677E-03	5.6304E-03	0	0	0
1.6387E-01	-3.6680E-02	-3.2238E-02	1.4345E-02	5.7497E-03	8.2713E-03	0	0	0
1.5588E-01	-3.5523E-02	-2.6684E-02	1.0213E-02	5.7754E-03	6.0935E-03	0	0	0
1.4828E-01	-3.4781E-02	-2.1055E-02	5.9720E-03	5.9085E-03	3.8114E-03	0	0	0
1.4105E-01	-3.4076E-02	-1.5700E-02	1.9378E-03	6.0351E-03	1.6405E-03	0	0	0
1.3417E-01	-3.3405E-02	-1.0606E-02	-1.8996E-03	6.1556E-03	-4.2444E-04	0	0	0
1.2762E-01	-3.2766E-02	-5.8505E-03	-5.3969E-03	6.2125E-03	-2.3118E-03	0	0	0
1.2140E-01	-3.2148E-02	-3.4821E-03	-5.0297E-03	4.8750E-03	-2.2440E-03	0	0	0
1.1548E-01	-3.1555E-02	-2.1491E-03	-3.1043E-03	3.0088E-03	-1.3850E-03	0	0	0
1.0985E-01	-3.0992E-02	-8.8113E-04	-1.2727E-03	1.2336E-03	-5.6784E-04	0	0	0
1.0449E-01	-3.0463E-02	-2.9404E-05	-4.2472E-05	4.1166E-05	-1.8949E-05	0	0	0
9.9394E-02	-2.9978E-02	0	0	0	0	0	0	0
9.4547E-02	-2.9518E-02	0	0	0	0	0	0	0
8.9935E-02	-2.9079E-02	0	0	0	0	0	0	0
8.5549E-02	-2.8660E-02	0	0	0	0	0	0	0
8.1377E-02	-2.8254E-02	0	0	0	0	0	0	0
7.7408E-02	-2.7867E-02	0	0	0	0	0	0	0
7.3633E-02	-2.7499E-02	0	0	0	0	0	0	0
7.0042E-02	-2.7148E-02	0	0	0	0	0	0	0
6.6626E-02	-2.6815E-02	0	0	0	0	0	0	0
6.3376E-02	-2.6498E-02	0	0	0	0	0	0	0
6.0286E-02	-2.6197E-02	0	0	0	0	0	0	0
5.7345E-02	-2.5910E-02	0	0	0	0	0	0	0
5.4549E-02	-2.5637E-02	0	0	0	0	0	0	0
5.1888E-02	-2.5377E-02	0	0	0	0	0	0	0
4.9358E-02	-2.5130E-02	0	0	0	0	0	0	0
4.6950E-02	-2.4896E-02	0	0	0	0	0	0	0
4.4661E-02	-2.4672E-02	0	0	0	0	0	0	0
4.2483E-02	-2.4460E-02	0	0	0	0	0	0	0
4.0411E-02	-2.4257E-02	0	0	0	0	0	0	0
3.8440E-02	-2.4065E-02	0	0	0	0	0	0	0
3.6565E-02	-2.3882E-02	0	0	0	0	0	0	0
3.4782E-02	-2.3708E-02	0	0	0	0	0	0	0
3.3085E-02	-2.3543E-02	0	0	0	0	0	0	0
3.1472E-02	-2.3385E-02	0	0	0	0	0	0	0
2.9937E-02	-2.3236E-02	0	0	0	0	0	0	0
2.8477E-02	-2.3093E-02	0	0	0	0	0	0	0
2.7088E-02	-2.2958E-02	0	0	0	0	0	0	0
2.5767E-02	-2.2829E-02	0	0	0	0	0	0	0
2.4511E-02	-2.2706E-02	0	0	0	0	0	0	0

TABLE 6 — O (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
2.3315E-02	-2.2590E-02	2.4574E-03	-8.5652E-03	2.5901E-04	-9.0276E-04
2.2178E-02	-2.2479E-02	2.3375E-03	-8.1475E-03	2.4637E-04	-8.5874E-04
2.1096E-02	-2.2373E-02	2.2235E-03	-7.7501E-03	2.3436E-04	-8.1686E-04
2.0067E-02	-2.2273E-02	2.1151E-03	-7.3721E-03	2.2293E-04	-7.7702E-04
1.9089E-02	-2.2177E-02	2.0119E-03	-7.0126E-03	2.1206E-04	-7.3912E-04
1.8158E-02	-2.2086E-02	1.9138E-03	-6.6706E-03	2.0171E-04	-7.0307E-04
1.7272E-02	-2.2000E-02	1.8205E-03	-6.3453E-03	1.9188E-04	-6.6878E-04
1.6430E-02	-2.1918E-02	1.7317E-03	-6.0358E-03	1.8252E-04	-6.3617E-04
1.5628E-02	-2.1840E-02	1.6472E-03	-5.7414E-03	1.7362E-04	-6.0514E-04
1.4866E-02	-2.1765E-02	1.5669E-03	-5.4614E-03	1.6515E-04	-5.7563E-04
1.4141E-02	-2.1695E-02	1.4905E-03	-5.1951E-03	1.5709E-04	-5.4755E-04
1.3452E-02	-2.1627E-02	1.4178E-03	-4.9417E-03	1.4943E-04	-5.2085E-04
1.2795E-02	-2.1563E-02	1.3486E-03	-4.7007E-03	1.4215E-04	-4.9545E-04
1.2171E-02	-2.1502E-02	1.2829E-03	-4.4714E-03	1.3521E-04	-4.7128E-04
1.1578E-02	-2.1445E-02	1.2203E-03	-4.2534E-03	1.2862E-04	-4.4830E-04
1.1013E-02	-2.1389E-02	1.1608E-03	-4.0459E-03	1.2235E-04	-4.2644E-04
1.0476E-02	-2.1337E-02	1.1042E-03	-3.8486E-03	1.1638E-04	-4.0564E-04
9.9651E-03	-2.1287E-02	1.0503E-03	-3.6609E-03	1.1070E-04	-3.8586E-04
9.4791E-03	-2.1240E-02	9.9909E-04	-3.4823E-03	1.0530E-04	-3.6704E-04
9.0168E-03	-2.1195E-02	9.5037E-04	-3.3125E-03	1.0017E-04	-3.4914E-04
8.5771E-03	-2.1152E-02	9.0402E-04	-3.1510E-03	9.5283E-05	-3.3211E-04
8.1588E-03	-2.1111E-02	8.5993E-04	-2.9973E-03	9.0636E-05	-3.1591E-04
7.7609E-03	-2.1072E-02	8.1799E-04	-2.8511E-03	8.6215E-05	-3.0050E-04
7.3824E-03	-2.1035E-02	7.7809E-04	-2.7121E-03	8.2011E-05	-2.8585E-04
7.0223E-03	-2.1000E-02	7.4015E-04	-2.5798E-03	7.8011E-05	-2.7191E-04
6.6798E-03	-2.0967E-02	7.0405E-04	-2.4540E-03	7.4206E-05	-2.5865E-04
6.3541E-03	-2.0935E-02	6.6971E-04	-2.3343E-03	7.0587E-05	-2.4603E-04
6.0442E-03	-2.0845E-02	6.3705E-04	-2.2204E-03	6.7145E-05	-2.3403E-04
5.7494E-03	-2.0040E-02	6.0598E-04	-2.1122E-03	6.3870E-05	-2.2262E-04
5.4690E-03	-1.9062E-02	5.7643E-04	-2.0091E-03	6.0755E-05	-2.1176E-04
5.2023E-03	-1.8133E-02	5.4831E-04	-1.9112E-03	5.7792E-05	-2.0143E-04
4.9485E-03	-1.7248E-02	5.2157E-04	-1.8179E-03	5.4973E-05	-1.9161E-04
4.7072E-03	-1.6407E-02	4.9613E-04	-1.7293E-03	5.2292E-05	-1.8226E-04
4.4776E-03	-1.5607E-02	4.7194E-04	-1.6449E-03	4.9742E-05	-1.7338E-04
4.2592E-03	-1.4846E-02	4.4892E-04	-1.5647E-03	4.7316E-05	-1.6492E-04
4.0515E-03	-1.4122E-02	4.2703E-04	-1.4884E-03	4.5008E-05	-1.5688E-04
3.8539E-03	-1.3433E-02	4.0620E-04	-1.4158E-03	4.2813E-05	-1.4923E-04
3.6660E-03	-1.2778E-02	3.8639E-04	-1.3468E-03	4.0725E-05	-1.4195E-04
3.4872E-03	-1.2155E-02	3.6755E-04	-1.2811E-03	3.8739E-05	-1.3503E-04
3.3171E-03	-1.1562E-02	3.4962E-04	-1.2186E-03	3.6850E-05	-1.2844E-04
3.1553E-03	-1.0998E-02	3.3257E-04	-1.1592E-03	3.5053E-05	-1.2218E-04
3.0014E-03	-1.0462E-02	3.1635E-04	-1.1026E-03	3.3343E-05	-1.1622E-04
2.8551E-03	-9.9513E-03	3.0092E-04	-1.0489E-03	3.1717E-05	-1.1055E-04
2.7158E-03	-9.4660E-03	2.8624E-04	-9.9771E-04	3.0170E-05	-1.0516E-04
2.5834E-03	-9.0043E-03	2.7228E-04	-9.4905E-04	2.8699E-05	-1.0003E-04
				2.7299E-05	-9.5150E-05

TABLE 6 — O (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
2.5968E-05	-9.0510E-05	2.8773E-06	-1.0028E-05	3.1881E-07	-1.1109E-06
2.4701E-05	-8.6096E-05	2.7370E-06	-9.5394E-06	3.0326E-07	-1.0567E-06
2.3496E-05	-8.1897E-05	2.6035E-06	-9.0741E-06	2.8847E-07	-1.0051E-06
2.2350E-05	-7.7903E-05	2.4765E-06	-8.6315E-06	2.7440E-07	-9.5609E-07
2.1260E-05	-7.4103E-05	2.3557E-06	-8.2106E-06	2.6102E-07	-9.0945E-07
2.0224E-05	-7.0489E-05	2.2408E-06	-7.8101E-06	2.4829E-07	-8.6507E-07
1.9237E-05	-6.7051E-05	2.1315E-06	-7.4292E-06	2.3618E-07	-8.2287E-07
1.8299E-05	-6.3781E-05	2.0276E-06	-7.0668E-06	2.2466E-07	-7.8272E-07
1.7407E-05	-6.0670E-05	1.9287E-06	-6.7222E-06	2.1371E-07	-7.4453E-07
1.6558E-05	-5.7712E-05	1.8346E-06	-6.3943E-06	2.0328E-07	-7.0820E-07
1.5750E-05	-5.4897E-05	1.7452E-06	-6.0824E-06	1.9337E-07	-6.7364E-07
1.4982E-05	-5.2219E-05	1.6601E-06	-5.7858E-06	1.8394E-07	-6.4077E-07
1.4251E-05	-4.9673E-05	1.5791E-06	-5.5036E-06	1.7497E-07	-6.0950E-07
1.3556E-05	-4.7250E-05	1.5021E-06	-5.2352E-06	1.6643E-07	-5.7976E-07
1.2895E-05	-4.4946E-05	1.4288E-06	-4.9798E-06	1.5832E-07	-5.5147E-07
1.2266E-05	-4.2754E-05	1.3591E-06	-4.7369E-06	1.5060E-07	-5.2456E-07
1.1668E-05	-4.0669E-05	1.2928E-06	-4.5059E-06	1.4325E-07	-4.9896E-07
1.1099E-05	-3.8685E-05	1.2298E-06	-4.2861E-06	1.3627E-07	-4.7461E-07
1.0558E-05	-3.6798E-05	1.1696E-06	-4.0771E-06	1.2962E-07	-4.5144E-07
1.0043E-05	-3.5004E-05	1.1128E-06	-3.8782E-06	1.2330E-07	-4.2941E-07
9.5529E-06	-3.3296E-05	1.0585E-06	-3.6890E-06	1.1728E-07	-4.0845E-07
9.0870E-06	-3.1673E-05	1.0069E-06	-3.5091E-06	1.1156E-07	-3.8851E-07
8.6438E-06	-3.0128E-05	9.5777E-07	-3.3380E-06	1.0612E-07	-3.6955E-07
8.2223E-06	-2.8659E-05	9.1105E-07	-3.1751E-06	1.0095E-07	-3.5151E-07
7.8213E-06	-2.7261E-05	8.6662E-07	-3.0203E-06	9.6024E-08	-3.3435E-07
7.4398E-06	-2.5931E-05	8.2436E-07	-2.8730E-06	9.1341E-08	-3.1802E-07
7.0770E-06	-2.4667E-05	7.8415E-07	-2.7328E-06	8.6887E-08	-3.0250E-07
6.7318E-06	-2.3464E-05	7.4591E-07	-2.5995E-06	8.2649E-08	-2.8773E-07
6.4035E-06	-2.2319E-05	7.0953E-07	-2.4727E-06	7.8618E-08	-2.7368E-07
6.0912E-06	-2.1231E-05	6.7493E-07	-2.3521E-06	7.4784E-08	-2.6031E-07
5.7941E-06	-2.0195E-05	6.4201E-07	-2.2374E-06	7.1137E-08	-2.4760E-07
5.5116E-06	-1.9210E-05	6.1070E-07	-2.1282E-06	6.7667E-08	-2.3551E-07
5.2428E-06	-1.8273E-05	5.8091E-07	-2.0244E-06	6.4367E-08	-2.2400E-07
4.9871E-06	-1.7382E-05	5.5258E-07	-1.9257E-06	6.1228E-08	-2.1306E-07
4.7438E-06	-1.6534E-05	5.2563E-07	-1.8318E-06	5.8242E-08	-2.0265E-07
4.5125E-06	-1.5728E-05	5.0000E-07	-1.7424E-06	5.5401E-08	-1.9275E-07
4.2924E-06	-1.4961E-05	4.7561E-07	-1.6574E-06	5.2699E-08	-1.8334E-07
4.0831E-06	-1.4231E-05	4.5242E-07	-1.5766E-06	5.0129E-08	-1.7438E-07
3.8839E-06	-1.3537E-05	4.3035E-07	-1.4996E-06	4.7684E-08	-1.6586E-07
3.6945E-06	-1.2877E-05	4.0936E-07	-1.4265E-06	4.5359E-08	-1.5775E-07
3.5143E-06	-1.2249E-05	3.8940E-07	-1.3569E-06	4.3147E-08	-1.5004E-07
3.3429E-06	-1.1651E-05	3.7041E-07	-1.2907E-06	4.1042E-08	-1.4271E-07
3.1799E-06	-1.1083E-05	3.5234E-07	-1.2277E-06	3.9041E-08	-1.3573E-07
3.0248E-06	-1.0543E-05	3.3516E-07	-1.1678E-06	3.7137E-08	-1.2901E-07

TABLE 7 — O – FRACTION OF DISCRETE LEVEL EXCITATION CORRESPONDING TO LEVEL OF ENERGY E_ν

	E_ν, MeV		
E, MeV	6.14	6.92	7.12
1.8017E 01	3.5143E-01	3.2571E-01	3.2286E-01
1.7139E 01	3.5165E-01	3.2593E-01	3.2242E-01
1.6303E 01	3.5367E-01	3.2703E-01	3.1989E-01
1.5508E 01	3.5990E-01	3.2810E-01	3.1200E-01
1.4751E 01	3.7301E-01	3.3399E-01	2.9300E-01
1.4032E 01	3.8351E-01	3.4359E-01	2.7290E-01
1.3348E 01	3.9520E-01	3.5226E-01	2.5254E-01
1.2697E 01	4.1102E-01	3.5981E-01	2.2917E-01
1.2077E 01	4.3486E-01	3.5899E-01	2.0615E-01
1.1488E 01	4.7429E-01	3.5162E-01	1.7409E-01
1.0928E 01	5.2670E-01	3.3532E-01	1.3798E-01
1.0395E 01	6.4024E-01	2.6705E-01	9.2711E-02
9.8882E 00	7.8230E-01	1.6940E-01	4.8294E-02
9.4059E 00	8.0981E-01	1.4780E-01	4.2393E-02
8.9472E 00	8.3570E-01	1.1184E-01	3.2454E-02
8.5108E 00	8.5670E-01	1.1095E-01	3.2348E-02
8.0957E 00	8.6700E-01	1.0171E-01	3.1294E-02
7.7009E 00	9.1093E-01	6.8604E-02	2.0463E-02
7.3253E 00	9.8831E-01	9.5123E-03	2.1770E-03
6.9681E 00	1.0000E 00	0	0
6.6282E 00	1.0000E 00	0	0
6.3050E 00	1.0000E 00	0	0
5.9975E 00	0	0	0

TABLE 8 — O – NUMBER OF γ-RAYS EMITTED PER ABSORPTION

E, MeV	E_γ, MeV / 3.5
2,00000E 01	.423$_0$
1,71000E 01	.433$_0$
1,63000E 01	.434$_0$
1,55000E 01	.431$_0$
1,47500E 01	.422$_0$
1,40000E 01	.407$_0$
1,33000E 01	.393$_0$
1,27000E 01	.399$_0$
1,21000E 01	.356$_0$
1,15000E 01	.367$_0$
1,09000E 01	.462$_0$
1,04000E 01	.497$_0$
9,89000E 00	.5000
9,41000E 00	.5000
8,95000E 00	.5000
8,51000E 00	.4500
8,10000E 00	.4000
7,70000E 00	.1000
7,33000E 00	0
1,00000E-10	0

TABLE 9 — O – NUMBER OF γ-RAYS EMITTED

E, MeV	.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4.75	5
1.81000E 01	.0099	.0010	.0023	.0060	.0093	.0143	.0164	.0178	.0185	.0
1.71000E 01	.0101	.0010	.0023	.0060	.0099	.0143	.0161	.0173	.0176	.0
1.63000E 01	.0104	.0010	.0023	.0059	.0091	.0141	.0158	.0166	.0165	.0
1.55000E 01	.0106	.0010	.0022	.0058	.0089	.0138	.0152	.0156	.0153	.0
1.47500E 01	.0107	.0009	.0020	.0057	.0086	.0135	.0145	.0146	.0139	.0
1.40000E 01	.0112	.0009	.0019	.0055	.0083	.0130	.0136	.0134	.0126	.0
1.33000E 01	.0116	.0008	.0016	.0052	.0078	.0124	.0128	.0125	.0115	.0
1.27000E 01	.0120	.0006	.0014	.0049	.0073	.0120	.0123	.0116	.0098	.0
1.21000E 01	.0122	.0005	.0010	.0045	.0069	.0117	.0116	.0099	.0068	.0
1.15000E 01	.0118	.0003	.0007	.0042	.0067	.0112	.0098	.0065	.0032	.0
1.09000E 01	.0113	.0001	.0005	.0041	.0061	.0094	.0062	.0031	.0007	
1.04000E 01	.0109	.0000	.0004	.0037	.0048	.0064	.0033	.0008	0	
9.89000E 00	.0083	0	.0003	.0027	.0023	.0034	.0008	0	0	
9.41000E 00	.0093	0	.0002	.0008	.0006	.0006	0	0	0	
9.34000E 00	.0077	0	0	0	0	0	0	0	0	
9.20000E 00	.0062	0	0	0	0	0	0	0	0	
9.10000E 00	.0074	0	0	0	0	0	0	0	0	
8.95000E 00	.0064	0	0	0	0	0	0	0	0	
8.84000E 00	.0067	0	0	0	0	0	0	0	0	
8.70000E 00	.0065	0	0	0	0	0	0	0	0	
8.51000E 00	.0073	0	0	0	0	0	0	0	0	
8.35000E 00	.0060	0	0	0	0	0	0	0	0	
8.10000E 00	.0070	0	0	0	0	0	0	0	0	
7.87000E 00	.0046	0	0	0	0	0	0	0	0	
7.70000E 00	.0049	0	0	0	0	0	0	0	0	
7.40000E 00	.0006	0	0	0	0	0	0	0	0	
7.33000E 00	0	0	0	0	0	0	0	0	0	
6.30000E 00	0	0	0	0	0	0	0	0	0	
6.00000E 00	0	0	0	0	0	0	0	0	0	
1.00000E-10	0	0	0	0	0	0	0	0	0	

TTED PER NEUTRON-PRODUCING REACTION

E_γ, Mev

5.25	5.75	6.25	6.75	7.25	7.75	9.0	11.0	13.0	15.0	17.0
.0184	.0177	.1548	.1112	.1029	.0112	.2225	.2640	.1429	.0660	.0191
.0172	.0161	.1559	.1115	.1031	.0089	.2227	.2672	.1411	.0561	.0065
.0158	.0145	.1577	.1127	.1044	.0074	.2233	.2732	.1361	.0422	.0006
.0142	.0127	.1585	.1131	.1035	.0052	.2264	.2797	.1260	.0230	0
.0127	.0112	.1645	.1163	.0997	.0023	.2344	.2841	.1089	.0073	0
.0114	.0095	.1724	.1227	.0968	.0004	.2469	.2841	.0794	0	0
.0096	.0067	.1803	.1299	.0941	0	.2608	.2756	.0436	0	0
.0068	.0034	.1927	.1401	.0917	0	.2729	.2555	.0162	0	0
.0033	.0012	.2045	.1480	.0889	0	.2829	.2135	.0004	0	0
.0007	0	.2487	.1630	.0844	0	.3042	.1550	0	0	0
0	0	.3120	.1824	.0766	0	.3142	.0834	0	0	0
0	0	.4356	.1864	.0669	0	.2687	.0220	0	0	0
0	0	.6976	.1306	.0380	0	.1414	0	0	0	0
0	0	.7738	.1462	.0421	0	.0424	0	0	0	0
0	0	.8421	.1242	.0361	0	0	0	0	0	0
0	0	.8705	.0986	.0279	0	0	0	0	0	0
0	0	.8490	.1166	.0345	0	0	0	0	0	0
0	0	.8697	.1019	.0284	0	0	0	0	0	0
0	0	.8638	.1051	.0310	0	0	0	0	0	0
0	0	.8670	.1039	.0290	0	0	0	0	0	0
0	0	.8523	.1145	.0332	0	0	0	0	0	0
0	0	.8788	.0932	.0280	0	0	0	0	0	0
0	0	.8573	.1087	.0340	0	0	0	0	0	0
0	0	.9058	.0737	.0205	0	0	0	0	0	0
0	0	.9001	.0774	.0225	0	0	0	0	0	0
0	0	.9870	.0130	0	0	0	0	0	0	0
0	0	1.0000	0	0	0	0	0	0	0	0
0	0	1.0000	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

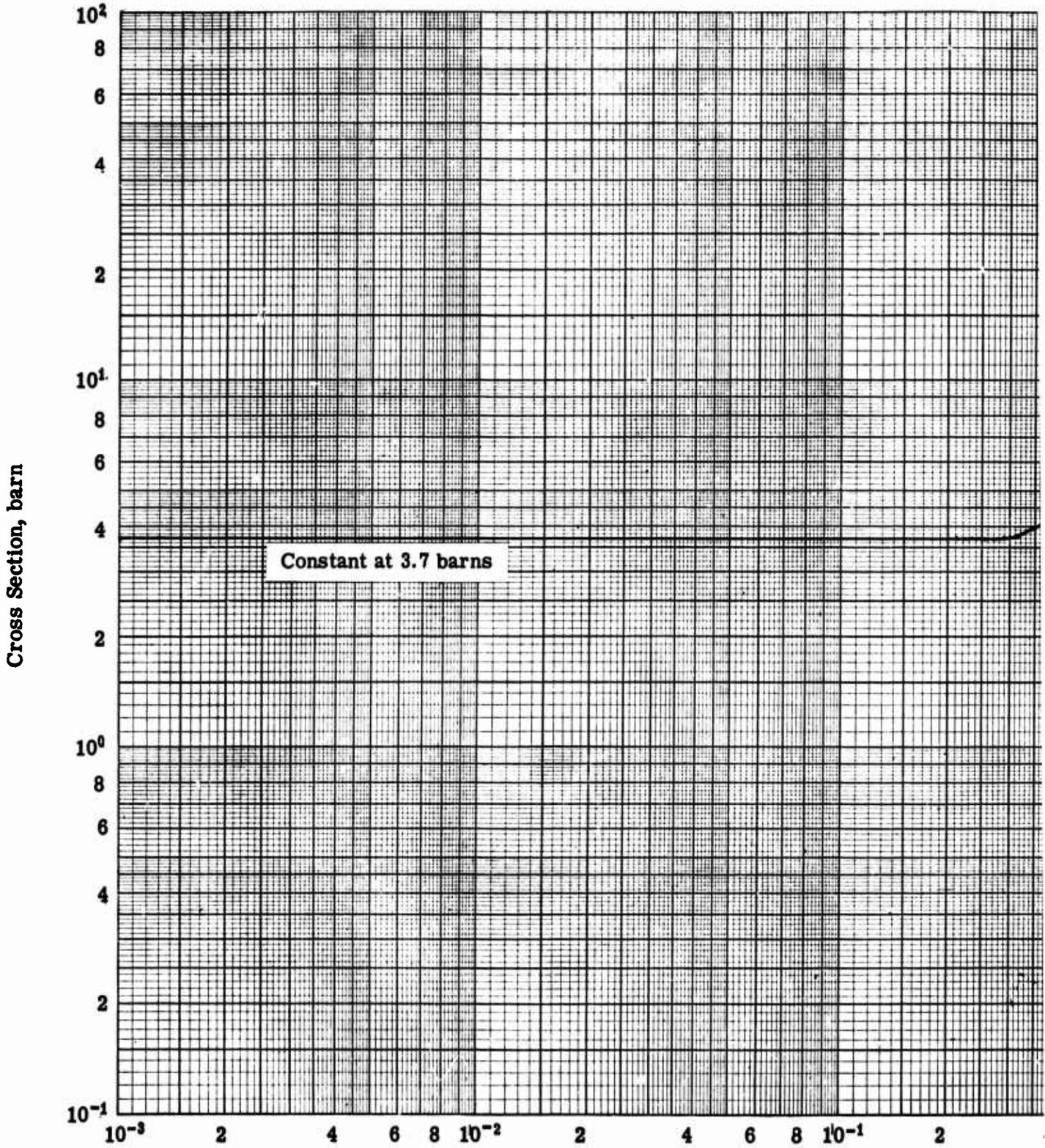
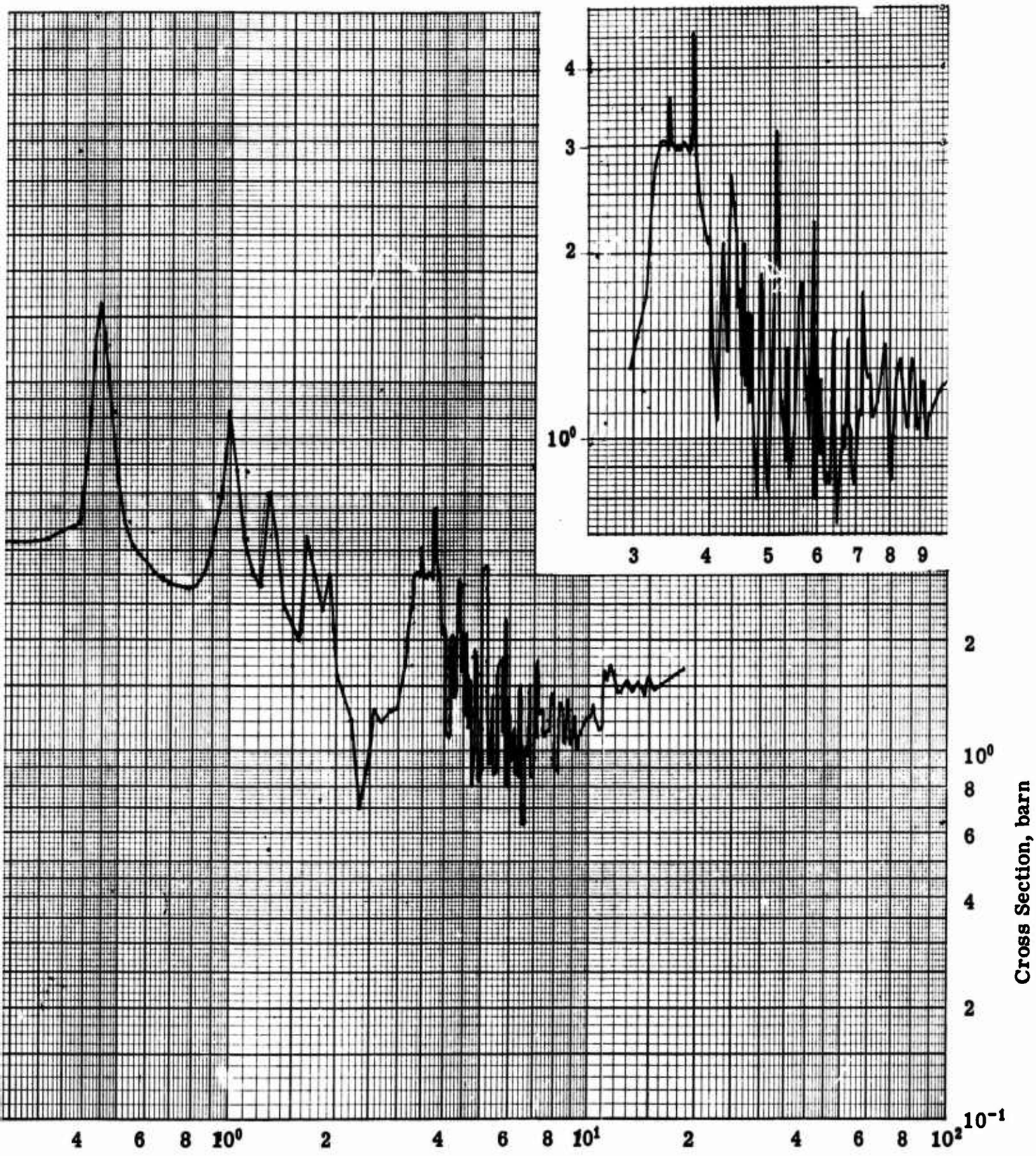


Fig. 4 — O – Total Cr



ergy, MeV

otal Cross Section

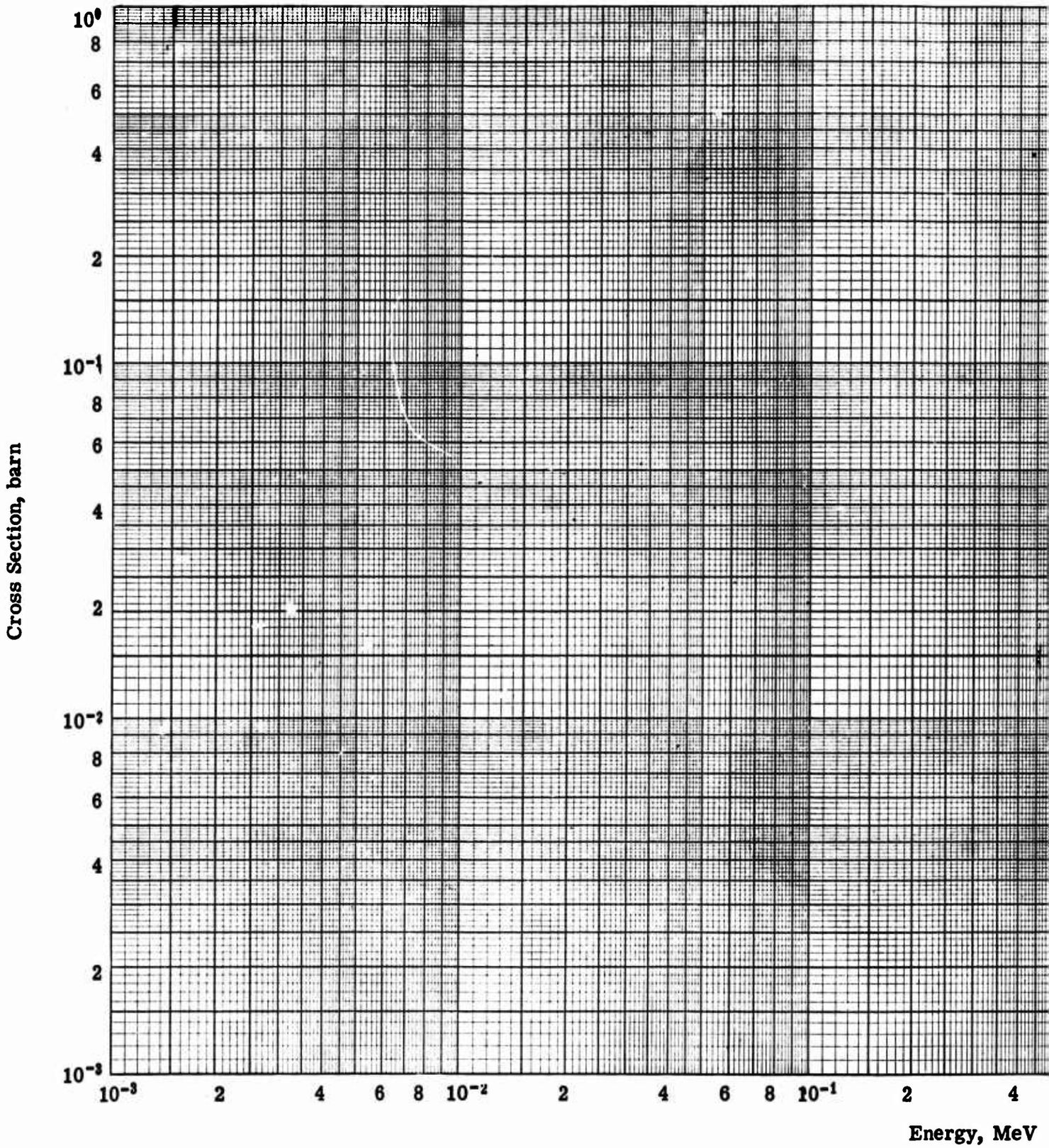
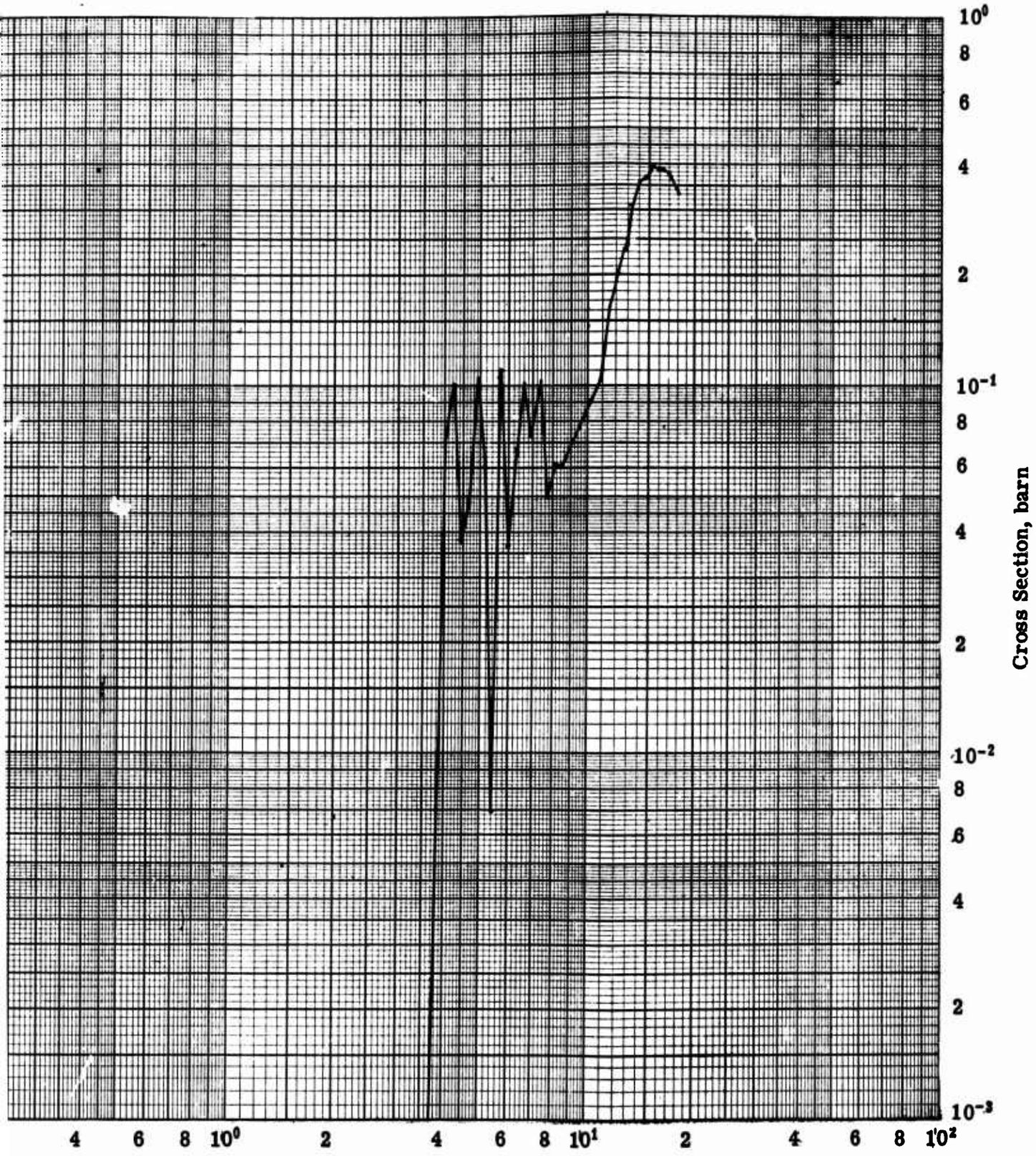


Fig. 5 — O – Absorption Cr



rgy, MeV

ırption Cross Section

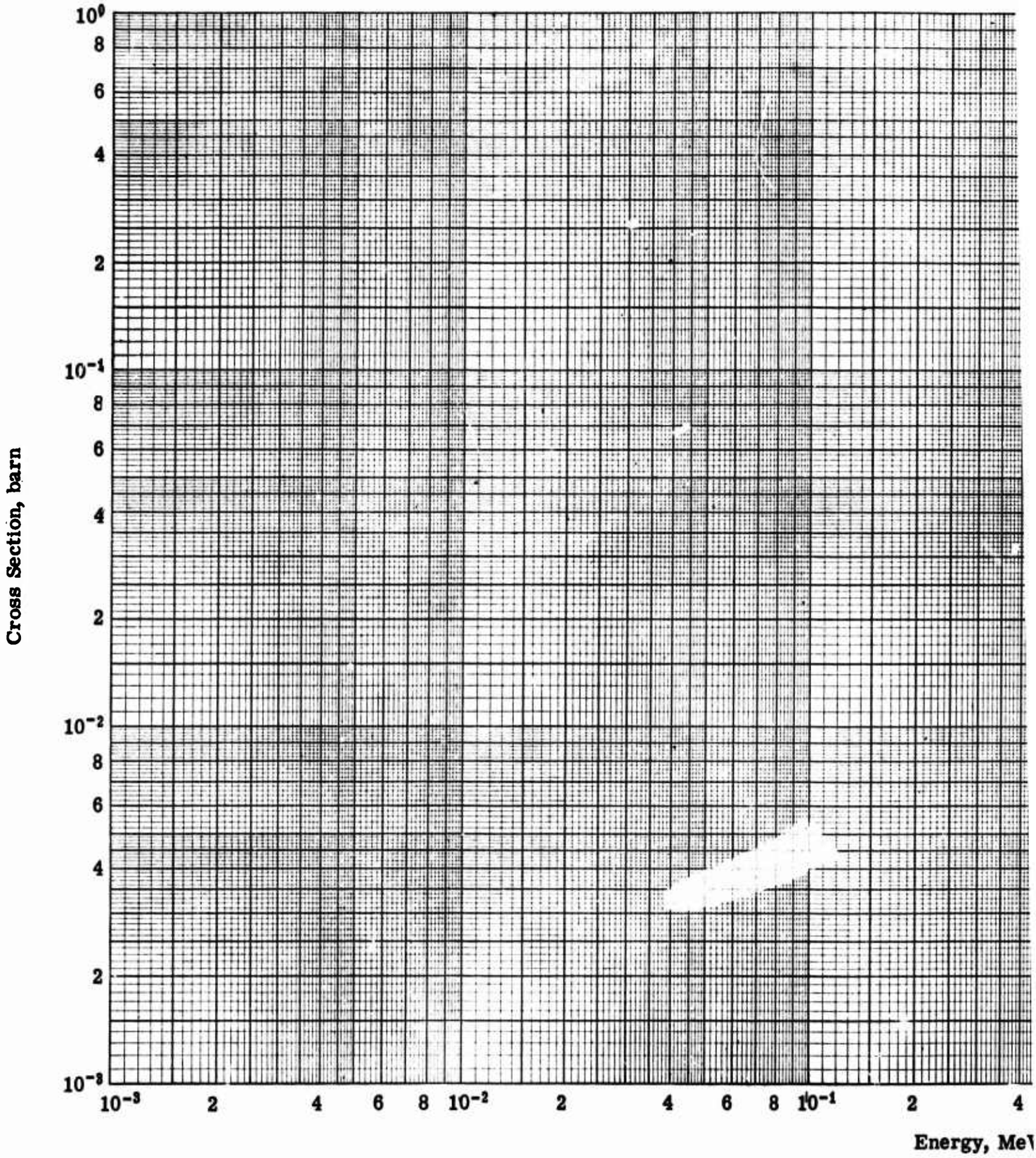
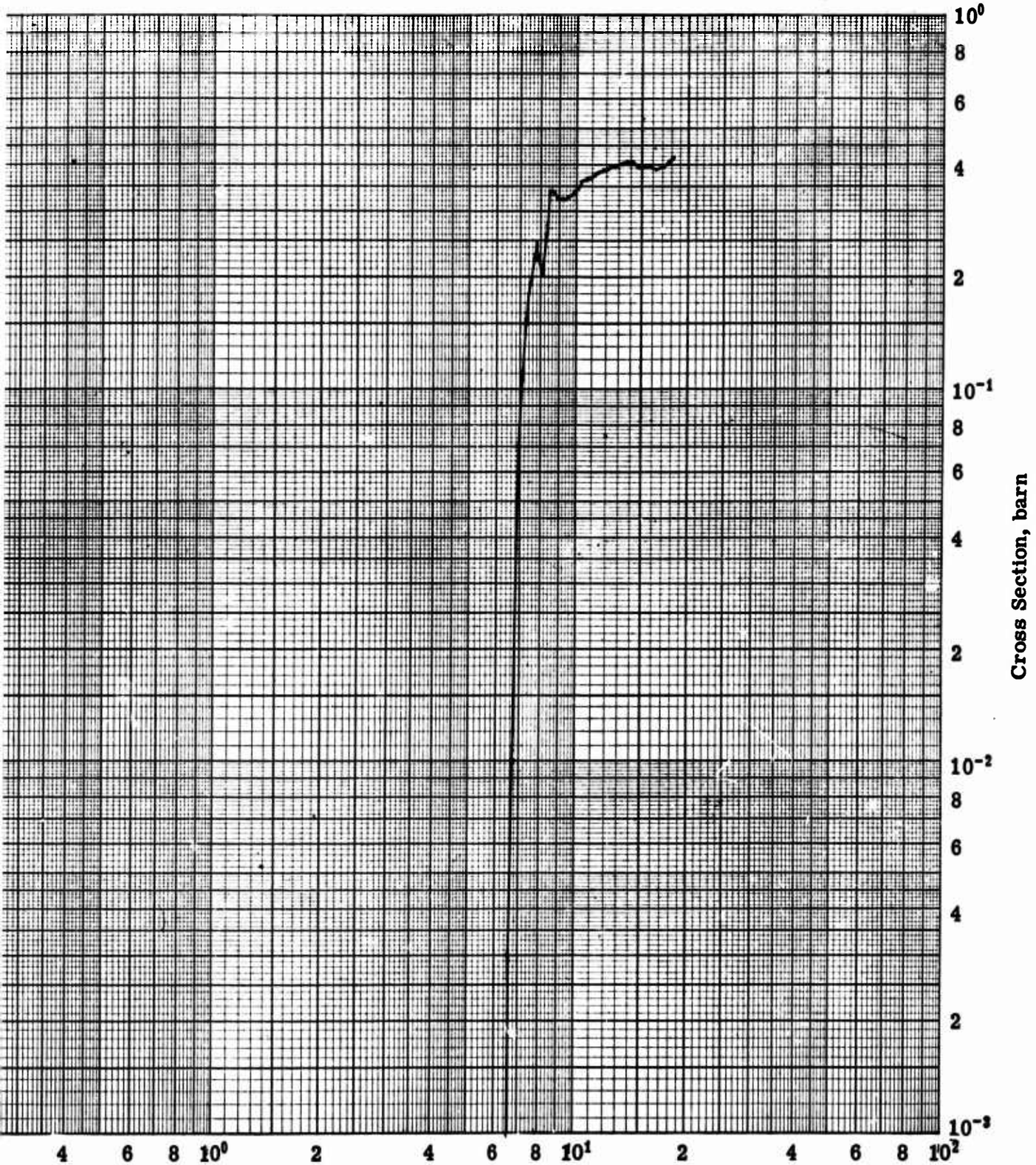


Fig. 6 — O – Inelastic-Scatte



gy, MeV

-Scattering Cross Section

3. ALUMINUM

3.1 NEUTRON CROSS SECTIONS

3.1.1 The Total Cross Section

For incident neutron energies above 2.4 MeV we have used the composite curve from the second supplement to BNL-325[1] to represent the total cross section, and from 0.4 to 2.4 MeV the composite curve from the second edition of BNL-325.[2] From about 5.5 to 400 keV we have used the results of Garg, Rainwater, and Havens[3] as reported in the BNL-325 Supplement.[1] Since the Columbia results[3] tend to indicate distinctly lower values of the total cross section at low energies, and since they reported no measurements below 4 keV, we have used the results of Hibdon[4] below the 5.9-keV resonance which lead into the composite curve in the second edition of BNL-325.[2] We used this curve, which rises very slowly with decreasing energy, for all energies below 4 keV (see Table 10 and Fig. 7).

3.1.2 The Elastic-Scattering Cross Section

Over the entire energy range we took the elastic-scattering cross section to be the difference between the total and nonelastic cross sections.

3.1.3 The Radiative Capture Cross Section

From about 20 keV to 5 MeV we used the results of many experimentalists[5-11] quoted in the BNL-325 supplement. The most detailed and extensive measure-

ments were those of Henkel and Barschall,[5] Henkel,[6] and of Calvi et al.[7] Where a choice between two measurements was necessary we used the more recent measurement. In ranges where measured points were sparse (from about 45 to 120 keV and from about 20 to about 30 keV) we used the "eye guide" curve from the BNL-325 supplement. The lower portion of this eye guide curve was brought smoothly into the 1/v line drawn through the BNL-325 "recommended" value of 0.235 barn at 0.0253 eV. The 5.9-keV resonance was assumed to make no appreciable contribution to the (n,γ) cross section. It is, after all, a p-wave resonance and consequently very narrow. Above 5 MeV the (n,γ) cross-section curve was brought upward through the 14-MeV data points of Csikai[12] and Perkin.[13] We attribute the rather sharp rise in the cross section to the onset of a direct interaction type of capture reaction.

3.1.4 The (n,α) Cross Section

For the (n,α) cross section we have used the measurements of Butler and Santry[14] and Ferguson.[15] The measurements of Ferguson cover only the range from about 12.7 to about 14.3 MeV and are given in "arbitrary units." We normalized them to the data of Butler and Santry.

3.1.5 The (n,p) Cross Section

The BNL-325 Supplement[1] shows composite curves of the (n,p) cross section covering the energy ranges from about 12 to about 21 MeV and from 2.7 to 5.1 MeV. The contributors in the upper energy range were Gabbard and Kern,[16] Mani, McCallum, and Ferguson,[17] and Hudson and Morgan.[18] For the lower range, the measurements of Calvi et al.[7] were normalized to those of Henkel.[19] BNL-325[2] gives a curve running from about 2.6 to about 8 MeV attributed to "Los Alamos, unpublished;" presumably these are the work of Henkel.[19] We have followed the composite curve of the BNL-325 supplement up to 5.1 MeV, the curve from BNL-325 from 5.1 to 8 MeV, and the BNL-325 supplement's composite from

12 to 18 MeV. We bridged the gap from 8 to 12 MeV with a smooth curve rising to a peak at about 10 MeV and then descending.

3.1.6 The Absorption Cross Section

We have taken the absorption cross section as equal to $\sigma_{n,\gamma} + \sigma_{n,\alpha} + \sigma_{n,p}$. A curve is given in Fig. 8. The Q-values given by Ashby and Catron[20] show three additional neutron-absorbing reactions to be energetically possible. These are the (n,t), (n,He^3), and (n,d) reactions. The values shown for the (n,t) and (n,He^3) cross sections in the BNL-325 Supplement[1] for 14 to 15-MeV neutrons are upper bounds only, and, even so, are very small compared with the (n,p) and (n,α) cross sections. We have ignored them.

Several measurements are quoted in the BNL-325 Supplement[1] for the (n,np) reaction at incident neutron energies between 14 and 15 MeV. Since the (n,np) reaction comes about because of the break-up of the deuteron from the (n,d) reaction, and since the (n,np) reaction produces a secondary neutron, we have taken the (n,d) cross section to be negligible and counted the (n,np) reaction as part of the (n,n′) reaction.

3.1.7 The (n,2n) Cross Section

Mani et al.[17] have measured the cross section for the (n,2n) reaction leading to the 229-keV isomeric state, 6.5 sec Al^{26m}. There are no other measurements of this reaction save those of Csikai et al.,[12] which are an upper bound. We have assumed that half of the (n,2n) events will lead to the ground state of Al^{26} and have drawn one curve through a set of points resulting from doubling Mani's measured values.

3.1.8 The Nonelastic Cross Section

The BNL-325 Supplement[1] shows a curve of the nonelastic cross section for neutron energies from somewhat below 2 to well over 100 MeV. The lower energy

portion of this curve was drawn through the data points of Beyster, Walt, and Salmi.[21] We have drawn a similarly shaped smooth curve through the inelastic scattering cross-section measurements of Towle and Gilboy[22] at 2, 3, and 4 MeV. Our curve lies somewhat higher than the BNL-325 eye-guide, although it is within the experimental error of the Beyster measurements at 2.5, 3.25, and 4 MeV. Cross sections derived from the inelastic gamma-ray measurements of Kiehn and Goodman[23] fall about a factor of two above our curves. In the energy range from 1 to 4 MeV, the cross sections for the (n,γ), (n,p), and (n,α) reactions are entirely negligible, and the nonelastic cross section can be regarded as the inelastic-scattering cross section.

Above 4 MeV we drew our curve smoothly through the usual cluster of points at 14 MeV[1] and between the two points of Degtyarev and Nadtochii[24] at about 16 MeV. Our curve crosses the BNL-325 eye-guide between 9 and 10 MeV where it passes through one of the data points of Ball, MacGregor, and Booth[25] at 9.5 MeV.

3.1.9 The Inelastic-Scattering Cross Section

We have calculated the inelastic-scattering cross section from the formula

$$\sigma_{n,n'} = \sigma_{nX} - \sigma_{n,\gamma} - \sigma_{n,p} - \sigma_{n,\alpha} - \sigma_{n,2n}$$

At 7 MeV our calculated value is within the experimental error of a measurement of this cross section by Thomson.[26] Values of $\sigma_{n,n'}$ are given in Table 10 and Fig. 9.

3.2 ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

Aluminum is no exception to the rule which has held for most elements for which we have compiled angular distribution data. In some energy ranges there are detailed measurements: those of Langsdorf, Lane, and Monahan[27] and of Ji-Peng Chien[28] below 1.5 MeV as well as isolated measurements by Lovchikova[29] and

Bostrom and Morgan.[30] At one energy, 14 MeV, there is a superabundance of data.[31-33] There is a range in which conflicting measurements abound: between 2 and 5 MeV there are 18 different measurements by eight different workers.[21,22,34-38] Finally, there is a large range in which there are no measurements at all. In this case it runs from 7 to 14 MeV. There are rarely any trustworthy measurements above 14 MeV, and for aluminum there are none. We are fortunate in having a set of optical model calculations, by Bühler and Emendörfer[40] which span the unmeasured energies and agree well with experiments at both ends.

In preparing our Legendre coefficients we have analyzed the 14-MeV data[31-33] as a composite angular distribution with 45 points. For each of the 14 coefficients we drew our curve midway between the point resulting from the analysis of the 14-MeV composite and the point given by Bühler and Emendörfer's calculations[40] at that energy. Between 6 and 12 MeV we used the Bühler and Emendörfer results. Between 1.55 and 5 MeV we were guided by the trend of the data, although our curve did not often pass through points resulting from analysis of the measured distributions. From 0.3 to 1.5 MeV we used Chien's data,[28] and below 0.3 MeV we used Langsdorf's data.[27] For the extrapolation to 18 MeV we followed the trend of the data below 14 MeV consistent with the necessity of avoiding Wick limit violations on the one hand and avoiding generation of negative cross sections on the other. The Legendre coefficients for aluminum are shown in Table 11.

3.3 ENERGY DISTRIBUTION OF INELASTICALLY SCATTERED NEUTRONS

For incident neutron energies below 4.02 MeV we have assumed the excitation of five discrete levels (0.842, 1.013, 2.206, 2.73, and 2.977 MeV). The level at 2.206 MeV is that given in the Landolt-Börnstein tables[41] with the excitation energy of 2.21 MeV lowered slightly to bring it below the lowest of our mesh points for which there will be a cross section for excitation of this level. Similarly,

our 2.977-MeV level is a combination of those given in the Landolt-Börnstein tables at 2.98 and 3.0 MeV with excitation energy slightly lowered as for the 2.21-MeV level (see Table 12).

For energies above 4.02 MeV we have calculated the distribution of scattered neutrons according to statistical theory using the following parameters:

E_t = 14. MeV $a^{(1)} = a^{(2)}$ = 3. MeV^{-1} $E_l^{(1)}$ = 0.842 MeV

$E_0^{(1)} = E_0^{(2)}$ = 6.5 MeV $E_l^{(2)}$ = 0.01 MeV

3.4 ENERGY DISTRIBUTION OF GAMMA RAYS FOLLOWING NONELASTIC REACTIONS

3.4.1 Gamma Rays Following Neutron Capture

Troubetzkoy and Goldstein[42] and Draper and Bostrom[43] have given the spectrum of gamma rays following thermal neutron capture. We have assumed that the spectrum is the same for all neutron energies of interest (see Table 13).

3.4.2 Gamma Rays Following Inelastic Scattering

For neutron energies below 4.02 MeV the spectrum of gamma rays emitted in inelastic neutron scattering was derived from the level excitation information described above. Between 4.02 and 8. MeV there are the experimental data of Perkin,[44] and at 14 MeV those of several experimenters.[45-48] Statistical model calculations, as given by Troubetzkoy,[49] were performed to interpolate between the two sets of data (see Table 14).

3.5 REFERENCES

1. Stehn, J. R. et al.: BNL-325, 2nd Ed., Supplement 2 (May 1964).
2. Hughes, D. J. and Schwartz, R. B.: BNL-325, 2nd Ed. (July 1, 1958).
3. Garg, J. B., Rainwater, J., and Havens, W. W., Jr.: CR-1860 (1964).
4. Hibdon, C. T.: Phys. Rev., 114:179 (1959).

5. Henkel, R. L. and Barschall, H. H.: Phys. Rev., 80:145 (1950).

6. Henkel, R. L.: Unpublished (1953).

7. Calvi, G. et al.: Nuclear Phys., 39:621 (1962).

8. Kononov, V. N., Staviskii, Iu. Ia., and Tolstikov, V. A.: Atomnaya Energiya, 5:564 (1958).

9. Macklin, R. L., Lazar, N. H., and Lyon, W. S.: Phys. Rev., 107:504 (1957).

10. Vervier, J. F.: Nuclear Phys., 9:569 (1958/59).

11. Gibbons, J. H. et al.: Phys. Rev., 122:182 (1961).

12. Csikai, J., Gyarmati, B., and Hunyadi, I.: Nuclear Phys., 46:141 (1963).

13. Perkin, J. L., O'Connor, L. P., and Coleman, R. F.: Proc. Phys. Soc. (London), 72:505 (1958).

14. Butler, J. P. and Santry, D. C.: Can. J. Phys., 41:372 (1963).

15. Ferguson, J. M.: USNRDL-TR-846 (May 1965).

16. Gabbard, F. and Kern, B. D.: Phys. Rev., 128:1276 (1962).

17. Mani, G. S., McCallum, G. J., and Ferguson, A. T. G.: Nuclear Phys., 19:535 (1960).

18. Hudson, O. M., Jr. and Morgan, I. L.: Bull. Am. Phys. Soc., 4:97 (1959). See also WADC-TN-59-107 (1959).

19. Henkel, R. L. (Unpublished) (1954).

20. Ashby, V. J. and Catron, H. C.: UCRL 5419 (Feb. 10, 1959).

21. Beyster, J. R., Walt, M., and Salmi, E. W.: Phys. Rev., 104:1319 (1956).

22. Towle, J. H. and Gilboy, W. B.: Nuclear Phys., 39:300 (1962).

23. Kiehn, R. M. and Goodman, C.: Phys. Rev., 95:989 (1954).

24. Degtyarev, Yu. G. and Nadtochii, V. G.: Atomnaya Energiya, 11:397 (1961).

25. Ball, W. P., MacGregor, M., and Booth, R.: Phys. Rev., 110:1392 (1958).

26. Thomson, D. B.: Phys. Rev., 129:1649 (1963).

27. Langsdorf, A. S., Jr., Lane, R. O., and Monahan, J. E.: ANL-5567 (1961).

28. Chien, Ji-Peng: Doctoral Thesis, University of Michigan, 1965. Reported by: Chien, J. P. and Smith, A. B.: Bull. Am. Phys. Soc. II (10): 576 (1965), and Smith, A. B. and Guenther, P. T.: EANDC-US-62-L (1965).

29. Lovchikova, G. N.: Atomnaya Energiya, 2:174 (1957).

30. Bostrom, N. A. and Morgan, I. L. (1956), quoted in Goldberg, M. D., May, V. M., and Stehn, J. R.: BNL-400, 2nd Ed., Vol. 1 (Oct. 1962).

31. St. Pierre, C., Machwe, M. K., and Lorrain, P.: Phys. Rev., 115:999 (1959).

32. Yuasa, K.: J. Phys. Soc. Japan, 13:1248 (1948).

33. Coon, J. H. et al.: Phys. Rev., 111:250 (1958).

34. Hill, R. W.: Phys. Rev., 109:2105 (1958).

35. Tsukada, K. et al.: "Physics of Fast and Intermediate Reactors," Vol. I, p. 75, Vienna, 1962.

36. Tanaka, S.: J. Phys. Soc. Japan, 19:2249 (1964).

37. Walt, M. and Beyster, J. R.: Phys. Rev., 98:677 (1955).

38. Whitehead, W. D. and Snowdon, S. C.: Phys. Rev., 92:114 (1953).

39. Little, R. N. et al.: Phys. Rev., 98:634 (1955).

40. Bühler, F. and Emendörfer, D.: Atomkernenergie, 9:321 (1964).

41. Landolt-Börnstein Tables, New Series, Vol. I, "Energy Levels of Nuclei," Springer-Verlag, Berlin, 1961.

42. Troubetzkoy, E. S. and Goldstein, H.: ORNL-2904 (May 1960).

43. Draper, J. E. and Bostrom, C. O.: Nuclear Phys., 47:108 (1963).

44. Perkin, J. L.: Nuclear Phys., 60:561 (1964).

45. Thompson, W. E. and Engesser, F. C.: USNRDL-TR-861 (June 1965).

46. Nefedov, V. V., Popov, V. I., and Yazvitskii, Yu. S., Soviet Progress in Neutron Phys., p. 241 (1961).

47. Caldwell, R. L., Mills, W. R., and Hickman, J. B., Nuclear Sci. and Eng., 8:173 (1960).

48. Scherrer, V. E., Theus, R. B., and Faust, W. R., Phys. Rev., 91:1475 (1953).

49. Troubetzkoy, E. S., Phys. Rev., 122:212 (1961).

TABLE 10 — Al – NEUTRON CROSS SECTIONS (ALL CROSS SECTIONS IN BARNS)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,\gamma}$
1.8017E 01	1.7925E 00	9.1495E-01	0	7.7597E-01	1.5975E-01	6.1194E-02	3.9659E-02	6.8040E-04
1.7139E 01	1.7747E 00	8.6172E-01	0	7.9382E-01	9.2583E-02	7.3480E-02	4.5076E-02	6.4569E-04
1.6303E 01	1.7399E 00	8.0000E-01	0	8.0416E-01	4.0811E-02	8.4932E-02	5.0179E-02	6.1227E-04
1.5508E 01	1.7500E 00	7.9126E-01	0	8.0476E-01	1.0646E-02	9.7728E-02	5.5650E-02	5.8057E-04
1.4751E 01	1.7264E 00	7.5708E-01	0	7.9554E-01	4.5908E-04	1.1185E-01	6.1357E-02	5.5041E-04
1.4032E 01	1.7367E 00	7.6176E-01	0	7.8694E-01	2.4771E-05	1.2051E-01	6.6981E-02	5.2091E-04
1.3348E 01	1.7596E 00	7.8003E-01	0	7.8428E-01	0	1.2178E-01	7.3043E-02	4.8772E-04
1.2697E 01	1.7505E 00	7.6838E-01	0	7.8298E-01	0	1.1909E-01	7.9580E-02	4.5208E-04
1.2077E 01	1.7159E 00	7.3095E-01	0	7.8363E-01	0	1.1442E-01	8.6508E-02	4.1812E-04
1.1488E 01	1.7590E 00	7.7115E-01	0	7.8051E-01	0	1.1408E-01	9.2880E-02	3.8199E-04
1.0928E 01	1.7675E 00	7.7780E-01	0	7.8658E-01	0	1.0666E-01	9.6142E-02	3.5123E-04
1.0395E 01	1.6445E 00	6.5451E-01	0	7.9408E-01	0	9.7665E-02	9.7935E-02	3.2174E-04
9.8882E 00	1.6967E 00	7.0669E-01	0	8.0253E-01	0	8.8821E-02	9.8359E-02	2.9253E-04
9.4059E 00	1.7055E 00	7.1635E-01	0	8.1057E-01	0	8.1614E-02	9.6707E-02	2.6094E-04
8.9472E 00	1.7135E 00	7.3000E-01	0	8.1757E-01	0	7.1606E-02	9.4132E-02	2.3236E-04
8.5108E 00	1.7441E 00	7.6429E-01	0	8.3090E-01	0	5.8513E-02	9.0161E-02	2.0755E-04
8.0957E 00	1.7358E 00	7.6080E-01	0	8.4464E-01	0	4.5211E-02	8.5012E-02	1.8515E-04
7.7009E 00	1.9067E 00	9.3652E-01	0	8.5623E-01	0	3.4666E-02	7.9095E-02	1.6873E-04
7.3253E 00	1.8631E 00	8.9929E-01	0	3.7194E-01	0	2.2318E-02	6.9428E-02	1.4190E-04
6.9681E 00	2.0091E 00	1.0643E 00	0	8.7034E-01	0	1.5291E-02	5.9930E-02	1.2389E-04
6.6282E 00	2.0943E 00	1.1684E 00	0	8.6552E-01	0	8.5885E-03	5.1743E-02	1.0711E-04
6.3050E 00	2.1081E 00	1.1940E 00	0	8.5559E-01	0	3.9764E-03	5.4420E-02	9.2674E-05
5.9975E 00	2.1614E 00	1.2650E 00	0	8.5322E-01	0	1.6099E-03	4.1449E-02	8.0091E-05
5.7050E 00	2.0710E 00	1.1842E 00	0	8.4011E-01	0	5.7558E-04	4.6024E-02	6.8911E-05
5.4267E 00	2.1178E 00	1.2501E 00	0	8.3387E-01	0	1.6561E-04	3.3647E-02	5.9806E-05
5.1621E 00	2.2335E 00	1.3839E 00	0	8.2283E-01	0	9.0427E-05	2.6676E-02	5.0871E-05
4.9103E 00	2.3057E 00	1.4766E 00	0	8.1013E-01	0	5.3707E-05	1.8934E-02	4.2761E-05
4.6708E 00	2.2472E 00	1.4399E 00	0	7.8758E-01	0	2.2862E-05	1.9602E-02	4.5949E-05
4.4430E 00	2.2210E 00	1.4411E 00	0	7.6466E-01	0	9.5953E-07	1.5240E-02	[illegible]
4.2263E 00	2.2746E 00	1.5230E 00	0	7.4135E-01	0	0	9.3962E-03	[illegible]
4.0202E 00	2.4050E 00	1.6806E 00	0	7.1694E-01	0	0	7.3042E-03	[illegible]
3.8242E 00	2.4332E 00	1.7389E 00	6.8679E-01	0	0	0	7.4470E-03	[illegible]
3.6376E 00	2.6012E 00	[illegible]	6.6151E-01	0	0	0	7.4236E-03	[illegible]
3.4602E 00	2.5212E 00	[illegible]	6.3008E-01	0	0	0	7.3255E-03	[illegible]
3.2915E 00	2.5166E 00	[illegible]	6.0096E-01	0	0	0	3.2422E-03	[illegible]
3.1310E 00	2.4339E 00	[illegible]	5.7018E-01	0	0	0	8.0990E-03	[illegible]
2.9783E 00	2.6233E 00	2.0830E 00	5.3876E-01	0	0	0	1.4839E-03	[illegible]
2.8330E 00	2.6514E 00	2.1518E 00	4.9825E-01	0	0	0	1.2103E-03	[illegible]
2.6948E 00	2.8177E 00	2.3472E 00	4.6961E-01	0	0	0	[illegible]	[illegible]
2.5634E 00	3.4062E 00	2.9660E 00	4.4015E-01	0	0	0	[illegible]	[illegible]
2.4384E 00	2.6562E 00	2.2461E 00	4.1002E-01	0	0	0	0	[illegible]
2.3195E 00	2.8738E 00	2.4943E 00	3.7939E-01	0	0	0	0	[illegible]
2.2063E 00	3.1752E 00	2.8294E 00	3.4563E-01	0	0	0	0	[illegible]
2.0987E 00	3.2358E 00	[illegible]	[illegible]	0	0	0	0	[illegible]

TABLE 10 — A1 (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,\gamma}$
1.9964E 00	3.2064E 00	2.9219E 00	2.8484E-01		0	0	0	3.0810E-04
1.8990E 00	2.6558E 00	2.4053E 00	2.5033E-01		0	0	0	2.0337E-04
1.8064E 00	2.7968E 00	2.5776E 00	2.1911E-01		0	0	0	1.6064E-04
1.7183E 00	2.8256E 00	2.6357E 00	1.8966E-01		0	0	0	1.0000E-04
1.6345E 00	2.9594E 00	2.7995E 00	1.5977E-01		0	0	0	1.1553E-04
1.5548E 00	3.2291E 00	3.0986E 00	1.3043E-01		0	0	0	9.1401E-05
1.4790E 00	3.1001E 00	2.9950E 00	1.0501E-01		0	0	0	1.2000E-04
1.4068E 00	2.8878E 00	2.8053E 00	8.2358E-02		0	0	0	1.4153E-04
1.3382E 00	2.9297E 00	2.8658E 00	6.3862E-02		0	0	0	1.2497E-04
1.2730E 00	3.2353E 00	3.1878E 00	4.7383E-02		0	0	0	1.0317E-04
1.2109E 00	3.9343E 00	3.8996E 00	3.4571E-02		0	0	0	1.2436E-04
1.1518E 00	3.8833E 00	3.8615E 00	2.1605E-02		0	0	0	1.5998E-04
1.0956E 00	2.9178E 00	2.9089E 00	9.1894E-03		0	0	0	1.4806E-04
1.0422E 00	2.9355E 00	2.9349E 00	9.2661E-04		0	0	0	1.2128E-04
9.9137E-01	2.7420E 00	2.7419E 00	2.4491E-10		0	0	0	1.1000E-04
9.4302E-01	2.8646E 00	2.8644E 00	0		0	0	0	1.2027E-04
8.9703E-01	3.4578E 00	3.4577E 00	0		0	0	0	1.1812E-04
8.5328E-01	4.0881E 00	4.0878E 00	0		0	0	0	2.2385E-04
8.1167E-01	4.9483E 00	4.9480E 00	0		0	0	0	2.5793E-04
7.7208E-01	4.4637E 00	4.4635E 00	0		0	0	0	2.5147E-04
7.3443E-01	3.1619E 00	3.1617E 00	0		0	0	0	2.3336E-04
6.9861E-01	3.1712E 00	3.1710E 00	0		0	0	0	2.4052E-04
6.6454E-01	3.7561E 00	3.7558E 00	0		0	0	0	2.9999E-04
6.3213E-01	3.9231E 00	3.9227E 00	0		0	0	0	3.6383E-04
6.0130E-01	3.0326E 00	3.0322E 00	0		0	0	0	4.2485E-04
5.7197E-01	3.8101E 00	3.8097E 00	0		0	0	0	4.5714E-04
5.4408E-01	3.8138E 00	3.8134E 00	0		0	0	0	3.1950E-04
5.1754E-01	4.0124E 00	4.0121E 00	0		0	0	0	2.8379E-04
4.9230E-01	3.5412E 00	3.5408E 00	0		0	0	0	4.6077E-04
4.6829E-01	3.9689E 00	3.9686E 00	0		0	0	0	2.8304E-04
4.4545E-01	4.6569E 00	4.6565E 00	0		0	0	0	3.6820E-04
4.2373E-01	4.8922E 00	4.8912E 00	0		0	0	0	9.7235E-04
4.0306E-01	3.8952E 00	3.8947E 00	0		0	0	0	5.2701E-04
3.8341E-01	3.2779E 00	3.2769E 00	0		0	0	0	1.1044E-03
3.6471E-01	4.6499E 00	4.6481E 00	0		0	0	0	1.8136E-03
3.4692E-01	2.9602E 00	2.9596E 00	0		0	0	0	6.0383E-04
3.3000E-01	3.3191E 00	3.3187E 00	0		0	0	0	4.3078E-04
3.1391E-01	4.4960E 00	4.4955E 00	0		0	0	0	5.2208E-04
2.9860E-01	4.7702E 00	4.7698E 00	0		0	0	0	4.0399E-04
2.8403E-01	5.6242E 00	5.6233E 00	0		0	0	0	9.1499E-04
2.7018E-01	2.4319E 00	2.4304E 00	0		0	0	0	1.4659E-03
2.5700E-01	2.6780E 00	2.6774E 00	0		0	0	0	6.6007E-04
2.4447E-01	2.8821E 00	2.8816E 00	0		0	0	0	4.6109E-04
2.3255E-01	3.5433E 00	3.5425E 00	0		0	0	0	6.2774E-04

TABLE 10 — Al (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.2121E-01	3.4273E 00	3.4264E 00	9.4391E-03
2.1042E-01	4.8500E 00	4.8492E 00	7.4399E-03
2.0016E-01	4.9820E 00	4.9816E 00	3.7916E-03
1.9039E-01	3.0177E 00	3.0172E 00	5.3609E-03
1.8111E-01	3.2710E 00	3.2703E 00	6.7515E-03
1.7228E-01	4.2860E 00	4.2846E 00	1.3404E-02
1.6387E-01	6.6753E 00	6.6732E 00	2.1112E-02
1.5588E-01	1.0257E 01	1.0254E 01	2.4293E-02
1.4828E-01	9.9159E 00	9.9131E 00	2.7410E-02
1.4105E-01	8.4397E 00	8.4372E 00	2.5327E-02
1.3417E-01	2.8076E 00	2.8047E 00	2.9721E-02
1.2762E-01	1.4411E 00	1.4376E 00	3.4810E-03
1.2140E-01	6.4310E 00	6.4273E 00	3.6881E-02
1.1548E-01	2.7972E 00	2.7936E 00	3.5898E-02
1.0985E-01	2.4573E 00	2.4540E 00	3.2706E-02
1.0449E-01	3.2332E 00	3.2303E 00	2.9389E-02
9.9394E-02	5.0490E 00	5.0464E 00	2.5961E-02
9.4547E-02	8.9076E 00	8.9055E 00	2.1840E-02
8.9935E-02	1.5774E 01	1.5772E 01	1.9399E-02
8.5549E-02	1.5541E 01	1.5539E 01	1.4985E-02
8.1377E-02	6.8270E 00	6.8256E 00	1.3230E-02
7.7408E-02	3.1743E 00	3.1730E 00	1.3297E-02
7.3633E-02	1.9832E 00	1.9818E 00	1.4017E-02
7.0042E-02	1.5402E 00	1.5387E 00	1.4929E-02
6.6626E-02	1.4213E 00	1.4198E 00	1.5981E-02
6.3370E-02	1.4201E 00	1.4184E 00	1.7372E-02
6.0266E-02	1.4948E 00	1.4929E 00	1.9069E-02
5.7345E-02	1.6039E 00	1.6018E 00	2.1091E-02
5.4549E-02	1.7693E 00	1.7670E 00	2.3808E-02
5.1888E-02	2.0079E 00	2.0052E 00	2.7084E-02
4.9350E-02	2.2762E 00	2.2730E 00	3.2291E-02
4.6950E-02	2.6695E 00	2.6650E 00	4.4394E-02
4.4661E-02	3.2784E 00	3.2716E 00	6.8382E-02
4.2483E-02	4.3626E 00	4.3521E 00	1.0489E-01
4.0411E-02	6.1895E 00	6.1746E 00	1.4869E-01
3.8440E-02	1.0224E 01	1.0209E 01	1.5091E-01
3.6569E-02	1.9557E 01	1.9544E 01	1.3227E-01
3.4782E-02	3.0731E 01	3.0720E 01	1.0901E-01
3.3085E-02	1.4680E 01	1.4672E 01	7.6475E-02
3.1472E-02	4.1574E 00	4.1528E 00	4.6747E-02
2.9937E-02	1.5432E 00	1.5396E 00	3.6370E-02
2.8477E-02	8.5298E-01	8.4994E-01	3.0481E-02
2.7088E-02	6.2072E-01	6.1818E-01	2.5441E-02
2.5767E-02	4.9815E-01	4.9602E-01	2.1276E-02
2.4510E-02	4.7908E-01	4.7324E-01	1.8408E-02

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.3318E-02	4.9389E-01	4.9220E-01	1.6898E-03
2.2178E-02	5.3320E-01	5.3169E-01	1.5521E-03
2.1096E-02	5.9136E-01	5.8993E-01	1.4295E-03
2.0067E-02	6.3903E-01	6.3772E-01	1.3136E-03
1.9089E-02	7.0301E-01	7.0176E-01	1.2405E-03
1.8158E-02	7.7411E-01	7.7292E-01	1.1910E-03
1.7272E-02	8.1884E-01	8.1770E-01	1.1379E-03
1.6430E-02	8.6882E-01	8.6773E-01	1.0874E-03
1.5628E-02	9.1781E-01	9.1677E-01	1.0387E-03
1.4866E-02	9.5588E-01	9.5488E-01	9.9597E-04
1.4141E-02	9.9161E-01	9.9064E-01	9.6410E-04
1.3452E-02	1.0160E 00	1.0151E 00	9.3486E-04
1.2795E-02	1.0397E 00	1.0388E 00	9.0584E-04
1.2171E-02	1.0702E 00	1.0693E 00	8.7822E-04
1.1578E-02	1.0841E 00	1.0832E 00	8.5174E-04
1.1013E-02	1.0897E 00	1.0889E 00	8.2639E-04
1.0476E-02	1.0951E 00	1.0943E 00	8.0214E-04
9.9651E-03	1.1031E 00	1.1023E 00	7.7894E-04
9.4791E-03	1.1047E 00	1.1039E 00	7.5679E-04
9.0160E-03	1.1090E 00	1.1082E 00	7.3563E-04
8.5771E-03	1.1309E 00	1.1302E 00	7.1541E-04
8.1589E-03	1.1601E 00	1.1593E 00	6.9611E-04
7.7609E-03	1.1817E 00	1.1809E 00	6.7768E-04
7.3824E-03	1.1953E 00	1.1946E 00	6.6008E-04
7.0223E-03	1.2043E 00	1.2036E 00	6.4328E-04
6.6790E-03	1.2268E 00	1.2261E 00	6.2725E-04
6.3541E-03	1.2807E 00	1.2800E 00	6.1195E-04
6.0442E-03	1.2455E 01	1.2454E 01	5.9736E-04
5.7494E-03	5.9043E 00	5.9036E 00	5.8345E-04
5.4690E-03	1.3690E 00	1.3683E 00	5.7020E-04
5.2023E-03	1.3979E 00	1.3972E 00	5.5757E-04
4.9485E-03	1.4094E 00	1.4087E 00	5.4554E-04
4.7072E-03	1.4100E 00	1.4093E 00	5.3408E-04
4.4776E-03	1.4100E 00	1.4093E 00	5.2316E-04
4.2592E-03	1.4100E 00	1.4093E 00	5.1276E-04
4.0515E-03	1.4100E 00	1.4093E 00	5.0286E-04
3.8539E-03	1.4100E 00	1.4093E 00	4.9343E-04
3.6660E-03	1.4100E 00	1.4093E 00	4.8446E-04
3.4872E-03	1.4100E 00	1.4093E 00	4.7592E-04
3.3171E-03	1.4100E 00	1.4093E 00	4.6779E-04
3.1553E-03	1.4100E 00	1.4093E 00	4.6006E-04
3.0014E-03	1.4100E 00	1.4093E 00	4.5270E-04
2.8551E-03	1.4100E 00	1.4093E 00	4.4570E-04
2.7159E-03	1.4100E 00	1.4092E 00	4.3904E-04
2.5834E-03	1.4100E 00	1.4098E 00	4.3271E-04

TABLE 10 — Al (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.4574E-03	1.4100E 00	1.4092E 00	7.8094E-04
2.3379E-03	1.4100E 00	1.4092E 00	8.0900E-04
2.2235E-03	1.4100E 00	1.4092E 00	8.3334E-04
2.1151E-03	1.4100E 00	1.4091E 00	8.5581E-04
2.0119E-03	1.4100E 00	1.4091E 00	8.7641E-04
1.9138E-03	1.4100E 00	1.4091E 00	8.9750E-04
1.8205E-03	1.4100E 00	1.4091E 00	9.1910E-04
1.7317E-03	1.4100E 00	1.4091E 00	9.4122E-04
1.6472E-03	1.4100E 00	1.4090E 00	9.6388E-04
1.5669E-03	1.4100E 00	1.4090E 00	9.8708E-04
1.4905E-03	1.4100E 00	1.4090E 00	1.0108E-03
1.4178E-03	1.4100E 00	1.4090E 00	1.0352E-03
1.3486E-03	1.4100E 00	1.4089E 00	1.0601E-03
1.2829E-03	1.4100E 00	1.4089E 00	1.0856E-03
1.2203E-03	1.4100E 00	1.4089E 00	1.1117E-03
1.1608E-03	1.4100E 00	1.4089E 00	1.1385E-03
1.1042E-03	1.4100E 00	1.4088E 00	1.1659E-03
1.0503E-03	1.4100E 00	1.4088E 00	1.1939E-03
9.9909E-04	1.4100E 00	1.4088E 00	1.2227E-03
9.5037E-04	1.4100E 00	1.4087E 00	1.2521E-03
9.0402E-04	1.4100E 00	1.4087E 00	1.2822E-03
8.5993E-04	1.4100E 00	1.4087E 00	1.3131E-03
8.1799E-04	1.4100E 00	1.4087E 00	1.3447E-03
7.7809E-04	1.4100E 00	1.4086E 00	1.3771E-03
7.4015E-04	1.4100E 00	1.4086E 00	1.4102E-03
7.0405E-04	1.4100E 00	1.4086E 00	1.4441E-03
6.6971E-04	1.4100E 00	1.4085E 00	1.4789E-03
6.3705E-04	1.4100E 00	1.4085E 00	1.5145E-03
6.0598E-04	1.4100E 00	1.4084E 00	1.5510E-03
5.7643E-04	1.4100E 00	1.4084E 00	1.5883E-03
5.4831E-04	1.4100E 00	1.4084E 00	1.6265E-03
5.2157E-04	1.4100E 00	1.4083E 00	1.6657E-03
4.9613E-04	1.4100E 00	1.4083E 00	1.7057E-03
4.7194E-04	1.4100E 00	1.4083E 00	1.7468E-03
4.4892E-04	1.4100E 00	1.4082E 00	1.7888E-03
4.2703E-04	1.4100E 00	1.4082E 00	1.8319E-03
4.0620E-04	1.4100E 00	1.4081E 00	1.8760E-03
3.8639E-04	1.4100E 00	1.4081E 00	1.9211E-03
3.6755E-04	1.4100E 00	1.4080E 00	1.9674E-03
3.4962E-04	1.4100E 00	1.4080E 00	2.0147E-03
3.3257E-04	1.4100E 00	1.4079E 00	2.0632E-03
3.1635E-04	1.4100E 00	1.4079E 00	2.1129E-03
3.0092E-04	1.4100E 00	1.4078E 00	2.1637E-03
2.8624E-04	1.4100E 00	1.4078E 00	2.2158E-03
2.7228E-04	1.4100E 00	1.4077E 00	2.2691E-03

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.5901E-04	1.4100E 00	1.4077E 00	2.3237E-03
2.4637E-04	1.4100E 00	1.4076E 00	2.3814E-03
2.3436E-04	1.4100E 00	1.4076E 00	2.4419E-03
2.2293E-04	1.4100E 00	1.4075E 00	2.5033E-03
2.1206E-04	1.4100E 00	1.4074E 00	2.5667E-03
2.0171E-04	1.4100E 00	1.4074E 00	2.6316E-03
1.9188E-04	1.4100E 00	1.4073E 00	2.6983E-03
1.8252E-04	1.4100E 00	1.4072E 00	2.7666E-03
1.7362E-04	1.4100E 00	1.4072E 00	2.8366E-03
1.6515E-04	1.4100E 00	1.4071E 00	2.9084E-03
1.5709E-04	1.4100E 00	1.4070E 00	2.9820E-03
1.4943E-04	1.4100E 00	1.4069E 00	3.0575E-03
1.4215E-04	1.4100E 00	1.4069E 00	3.1349E-03
1.3521E-04	1.4100E 00	1.4068E 00	3.2143E-03
1.2862E-04	1.4100E 00	1.4067E 00	3.2957E-03
1.2235E-04	1.4100E 00	1.4066E 00	3.3791E-03
1.1638E-04	1.4100E 00	1.4065E 00	3.4646E-03
1.1070E-04	1.4100E 00	1.4064E 00	3.5523E-03
1.0530E-04	1.4100E 00	1.4064E 00	3.6423E-03
1.0017E-04	1.4100E 00	1.4063E 00	3.7345E-03
9.5283E-05	1.4100E 00	1.4062E 00	3.8290E-03
9.0636E-05	1.4100E 00	1.4061E 00	3.9259E-03
8.6215E-05	1.4100E 00	1.4060E 00	4.0253E-03
8.2011E-05	1.4100E 00	1.4059E 00	4.1272E-03
7.8011E-05	1.4100E 00	1.4058E 00	4.2317E-03
7.4206E-05	1.4100E 00	1.4057E 00	4.3388E-03
7.0587E-05	1.4100E 00	1.4056E 00	4.4487E-03
6.7145E-05	1.4100E 00	1.4054E 00	4.5613E-03
6.3870E-05	1.4100E 00	1.4053E 00	4.6768E-03
6.0755E-05	1.4100E 00	1.4052E 00	4.7952E-03
5.7792E-05	1.4100E 00	1.4051E 00	4.9166E-03
5.4973E-05	1.4100E 00	1.4050E 00	5.0410E-03
5.2292E-05	1.4100E 00	1.4048E 00	5.1686E-03
4.9742E-05	1.4100E 00	1.4047E 00	5.2995E-03
4.7316E-05	1.4100E 00	1.4046E 00	5.4336E-03
4.5008E-05	1.4100E 00	1.4044E 00	5.5712E-03
4.2813E-05	1.4100E 00	1.4043E 00	5.7122E-03
4.0725E-05	1.4100E 00	1.4041E 00	5.8568E-03
3.8739E-05	1.4100E 00	1.4040E 00	6.0051E-03
3.6850E-05	1.4100E 00	1.4038E 00	6.1571E-03
3.5053E-05	1.4100E 00	1.4037E 00	6.3130E-03
3.3343E-05	1.4100E 00	1.4035E 00	6.4728E-03
3.1717E-05	1.4100E 00	1.4034E 00	6.6367E-03
3.0170E-05	1.4100E 00	1.4032E 00	6.8047E-03
2.8699E-05	1.4100E 00	1.4030E 00	6.9769E-03

TABLE 10 — Al (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.7299E-05	1.41006 00	1.4028E 00	7.1535E-03
2.5968E-05	1.41006 00	1.4027E 00	7.3346E-03
2.4701E-05	1.41006 00	1.4025E 00	7.5203E-03
2.3496E-05	1.41006 00	1.4023E 00	7.7107E-03
2.2350E-05	1.41006 00	1.4021E 00	7.9059E-03
2.1260E-05	1.41006 00	1.4019E 00	8.1060E-03
2.0224E-05	1.41006 00	1.4017E 00	8.3112E-03
1.9237E-05	1.41006 00	1.4015E 00	8.5216E-03
1.8299E-05	1.41006 00	1.4013E 00	8.7374E-03
1.7407E-05	1.41006 00	1.4010E 00	8.9585E-03
1.6558E-05	1.41006 00	1.4008E 00	9.1853E-03
1.5750E-05	1.41006 00	1.4006E 00	9.4179E-03
1.4982E-05	1.41006 00	1.4003E 00	9.6563E-03
1.4251E-05	1.41006 00	1.4001E 00	9.9007E-03
1.3556E-05	1.41006 00	1.3998E 00	1.0151E-02
1.2895E-05	1.41006 00	1.3996E 00	1.0408E-02
1.2266E-05	1.41006 00	1.3993E 00	1.0672E-02
1.1668E-05	1.41006 00	1.3991E 00	1.0942E-02
1.1099E-05	1.41006 00	1.3988E 00	1.1219E-02
1.0558E-05	1.41006 00	1.3985E 00	1.1503E-02
1.0043E-05	1.41016 00	1.3983E 00	1.1794E-02
9.5529E-06	1.41076 00	1.3987E 00	1.2093E-02
9.0870E-06	1.41166 00	1.3992E 00	1.2399E-02
8.6438E-06	1.41246 00	1.3997E 00	1.2713E-02
8.2223E-06	1.41326 00	1.4002E 00	1.3035E-02
7.8213E-06	1.41416 00	1.4007E 00	1.3365E-02
7.4398E-06	1.41496 00	1.4012E 00	1.3703E-02
7.0770E-06	1.41576 00	1.4017E 00	1.4050E-02
6.7318E-06	1.41656 00	1.4021E 00	1.4406E-02
6.4035E-06	1.41746 00	1.4026E 00	1.4770E-02
6.0912E-06	1.41826 00	1.4031E 00	1.5144E-02
5.7941E-06	1.41906 00	1.4035E 00	1.5527E-02
5.5116E-06	1.41996 00	1.4039E 00	1.5921E-02
5.2428E-06	1.42076 00	1.4044E 00	1.6324E-02
4.9871E-06	1.42156 00	1.4048E 00	1.6737E-02
4.7438E-06	1.42236 00	1.4052E 00	1.7160E-02
4.5125E-06	1.42326 00	1.4056E 00	1.7595E-02
4.2924E-06	1.42406 00	1.4060E 00	1.8040E-02
4.0831E-06	1.42486 00	1.4064E 00	1.8497E-02
3.8839E-06	1.42576 00	1.4067E 00	1.8969E-02
3.6945E-06	1.42656 00	1.4071E 00	1.9448E-02
3.5143E-06	1.42746 00	1.4074E 00	1.9938E-02
3.3429E-06	1.42826 00	1.4077E 00	2.0442E-02
3.1799E-06	1.42906 00	1.4081E 00	2.0960E-02
3.0248E-06	1.42996 00	1.4084E 00	2.1491E-02

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.8773E-06	1.4319E 00	1.4099E 00	2.1203E-02
2.7370E-06	1.4343E 00	1.4117E 00	2.1259E-02
2.6039E-06	1.4367E 00	1.4135E 00	2.1316E-02
2.4765E-06	1.4390E 00	1.4153E 00	2.1375E-02
2.3557E-06	1.4414E 00	1.4170E 00	2.1439E-02
2.2408E-06	1.4438E 00	1.4188E 00	2.1490E-02
2.1315E-06	1.4461E 00	1.4205E 00	2.1560E-02
2.0276E-06	1.4485E 00	1.4223E 00	2.1624E-02
1.9287E-06	1.4509E 00	1.4240E 00	2.1691E-02
1.8346E-06	1.4533E 00	1.4257E 00	2.1759E-02
1.7452E-06	1.4557E 00	1.4274E 00	2.1829E-02
1.6601E-06	1.4580E 00	1.4290E 00	2.1900E-02
1.5791E-06	1.4604E 00	1.4307E 00	2.1974E-02
1.5021E-06	1.4628E 00	1.4323E 00	3.1049E-02
1.4288E-06	1.4652E 00	1.4340E 00	3.1120E-02
1.3591E-06	1.4677E 00	1.4356E 00	3.1200E-02
1.2928E-06	1.4701E 00	1.4372E 00	3.1287E-02
1.2298E-06	1.4725E 00	1.4388E 00	3.1370E-02
1.1698E-06	1.4749E 00	1.4403E 00	3.1459E-02
1.1128E-06	1.4773E 00	1.4419E 00	3.1543E-02
1.0585E-06	1.4798E 00	1.4434E 00	3.1632E-02
1.0069E-06	1.4822E 00	1.4449E 00	3.1724E-02
9.5777E-07	1.4846E 00	1.4464E 00	3.1819E-02
9.1105E-07	1.4871E 00	1.4479E 00	3.1918E-02
8.6662E-07	1.4895E 00	1.4494E 00	4.1014E-02
8.2436E-07	1.4920E 00	1.4508E 00	4.1106E-02
7.8415E-07	1.4944E 00	1.4522E 00	4.1220E-02
7.4591E-07	1.4969E 00	1.4536E 00	4.1327E-02
7.0953E-07	1.4993E 00	1.4549E 00	4.1437E-02
6.7493E-07	1.5009E 00	1.4554E 00	4.1549E-02
6.4201E-07	1.5022E 00	1.4555E 00	4.1664E-02
6.1070E-07	1.5034E 00	1.4556E 00	4.1782E-02
5.8091E-07	1.5047E 00	1.4557E 00	4.1903E-02
5.5253E-07	1.5060E 00	1.4557E 00	5.1028E-02
5.2553E-07	1.5073E 00	1.4557E 00	5.1155E-02
5.0000E-07	1.5085E 00	1.4557E 00	5.1288E-02
4.7581E-07	1.5098E 00	1.4556E 00	5.1419E-02
4.5288E-07	1.5111E 00	1.4555E 00	5.1556E-02
4.3039E-07	1.5123E 00	1.4554E 00	5.1697E-02
4.0936E-07	1.5136E 00	1.4552E 00	5.1841E-02
3.8940E-07	1.5149E 00	1.4550E 00	5.1990E-02
3.7041E-07	1.5162E 00	1.4548E 00	6.1141E-02
3.5234E-07	1.5174E 00	1.4546E 00	6.1290E-02
3.3510E-07	1.5187E 00	1.4544E 00	6.1450E-02
3.1861E-07	1.5200E 00	1.4542E 00	6.1610E-02

TABLE 10 — Al (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
3.0326E+07	1.5213E 00	1.4534E 00	6.7871E-02
2.8847E+07	1.5226E 00	1.4530E 00	6.9889E-02
2.7440E+07	1.5239E 00	1.4525E 00	7.1351E-02
2.6102E+07	1.5251E 00	1.4520E 00	7.3197E-02
2.4829E+07	1.5264E 00	1.4514E 00	7.5009E-02
2.3618E+07	1.5277E 00	1.4508E 00	7.6908E-02
2.2466E+07	1.5290E 00	1.4501E 00	7.8895E-02
2.1371E+07	1.5303E 00	1.4494E 00	8.0851E-02
2.0328E+07	1.5316E 00	1.4487E 00	8.2898E-02
1.9337E+07	1.5329E 00	1.4479E 00	8.4996E-02
1.8394E+07	1.5342E 00	1.4470E 00	8.7148E-02
1.7497E+07	1.5354E 00	1.4461E 00	8.9394E-02
1.6643E+07	1.5367E 00	1.4451E 00	9.1610E-02
1.5832E+07	1.5380E 00	1.4441E 00	9.3938E-02
1.5060E+07	1.5393E 00	1.4430E 00	9.6313E-02
1.4325E+07	1.5406E 00	1.4419E 00	9.8794E-02
1.3627E+07	1.5419E 00	1.4407E 00	1.0129E-01
1.2962E+07	1.5432E 00	1.4394E 00	1.0381E-01
1.2330E+07	1.5445E 00	1.4381E 00	1.0644E-01
1.1728E+07	1.5458E 00	1.4367E 00	1.0914E-01
1.1156E+07	1.5471E 00	1.4352E 00	1.1190E-01
1.0612E+07	1.5484E 00	1.4337E 00	1.1473E-01
1.0095E+07	1.5499E 00	1.4322E 00	1.1764E-01
9.6024E+08	1.5532E 00	1.4326E 00	1.2064E-01
9.1341E+08	1.5573E 00	1.4336E 00	1.2367E-01
8.6887E+08	1.5613E 00	1.4345E 00	1.2680E-01
8.2649E+08	1.5654E 00	1.4354E 00	1.3001E-01
7.8618E+08	1.5695E 00	1.4362E 00	1.3330E-01
7.4784E+08	1.5735E 00	1.4369E 00	1.3668E-01
7.1137E+08	1.5776E 00	1.4375E 00	1.4014E-01
6.7667E+08	1.5817E 00	1.4380E 00	1.4368E-01
6.4367E+08	1.5858E 00	1.4385E 00	1.4731E-01
6.1228E+08	1.5900E 00	1.4389E 00	1.5103E-01
5.8242E+08	1.5941E 00	1.4392E 00	1.5487E-01
5.5401E+08	1.5982E 00	1.4395E 00	1.5879E-01
5.2699E+08	1.6024E 00	1.4396E 00	1.6281E-01
5.0129E+08	1.6066E 00	1.4396E 00	1.6694E-01
4.7684E+08	1.6107E 00	1.4396E 00	1.7116E-01
4.5359E+08	1.6149E 00	1.4394E 00	1.7549E-01
4.3147E+08	1.6191E 00	1.4392E 00	1.7994E-01
4.1042E+08	1.6233E 00	1.4388E 00	1.8449E-01
3.9041E+08	1.6276E 00	1.4384E 00	1.8916E-01
3.7137E+08	1.6318E 00	1.4378E 00	1.9397E-01

TABLE 11 — Al – LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7
1.8017E 01	7.1999E-01	5.2899E-01	4.3499E-01	3.6200E-01	3.1249E-01	2.7999E-01	1.4248E-01
1.7139E 01	7.1712E-01	5.2716E-01	4.3309E-01	3.6150E-01	3.0015E-01	2.7660E-01	1.3710E-01
1.6303E 01	7.1393E-01	5.2602E-01	4.3091E-01	3.6082E-01	2.9803E-01	2.7097E-01	1.3099E-01
1.5506E 01	7.0994E-01	5.2490E-01	4.2793E-01	3.6014E-01	2.9597E-01	2.2300E-01	1.2370E-01
1.4751E 01	7.0449E-01	5.2266E-01	4.2348E-01	3.5863E-01	2.9319E-01	2.1374E-01	1.1600E-01
1.4032E 01	6.9352E-01	5.1746E-01	4.1484E-01	3.5467E-01	2.8807E-01	2.0269E-01	1.0737E-01
1.3348E 01	6.6747E-01	5.0625E-01	4.0109E-01	3.4988E-01	2.8100E-01	1.8554E-01	9.4667E-02
1.2697E 01	6.4155E-01	4.8976E-01	3.8735E-01	3.4535E-01	2.7280E-01	1.6957E-01	8.2259E-02
1.2077E 01	6.2563E-01	4.4172E-01	3.8176E-01	3.4286E-01	2.6319E-01	1.5464E-01	7.1830E-02
1.1488E 01	6.1877E-01	4.4790E-01	3.8030E-01	3.4004E-01	2.5339E-01	1.4168E-01	6.4831E-02
1.0928E 01	6.1386E-01	4.6981E-01	3.7962E-01	3.3715E-01	2.4396E-01	1.2970E-01	5.8930E-02
1.0395E 01	6.0919E-01	4.9065E-01	3.7898E-01	3.3440E-01	2.3499E-01	1.1831E-01	5.3316E-02
9.8882E 00	6.0304E-01	5.0753E-01	3.7587E-01	3.2887E-01	2.2353E-01	1.0671E-01	4.7857E-02
9.4059E 00	5.9255E-01	5.1562E-01	3.6616E-01	3.1570E-01	2.0466E-01	9.3619E-02	4.2340E-02
8.9472E 00	5.8231E-01	5.2285E-01	3.5653E-01	3.0273E-01	1.8626E-01	8.1047E-02	3.7074E-02
8.5108E 00	5.7257E-01	5.2974E-01	3.4738E-01	2.9039E-01	1.6876E-01	6.9088E-02	3.2065E-02
8.0957E 00	5.6296E-01	5.3541E-01	3.3816E-01	2.7810E-01	1.5197E-01	5.7731E-02	2.7295E-02
7.7009E 00	5.4653E-01	5.2215E-01	3.1856E-01	2.5494E-01	1.3308E-01	4.7316E-02	2.2673E-02
7.3253E 00	5.2796E-01	5.0207E-01	2.9556E-01	2.2829E-01	1.1394E-01	3.7564E-02	1.8241E-02
6.9681E 00	5.1372E-01	4.8500E-01	2.7470E-01	2.0378E-01	9.6764E-02	2.9862E-02	1.4319E-02
6.6282E 00	5.1499E-01	4.7757E-01	2.5924E-01	1.8410E-01	8.4923E-02	2.3078E-02	1.1800E-02
6.3050E 00	5.1790E-01	4.7153E-01	2.4503E-01	1.6580E-01	7.4180E-02	1.7865E-02	9.6681E-03
5.9975E 00	5.2371E-01	4.6405E-01	2.3298E-01	1.4884E-01	6.4931E-02	1.4022E-02	8.2732E-03
5.7050E 00	5.4730E-01	4.4659E-01	2.3017E-01	1.3540E-01	6.1904E-02	1.7000E-02	1.1051E-02
5.4267E 00	5.7273E-01	4.2629E-01	2.2892E-01	1.2306E-01	5.9977E-02	2.0930E-02	1.4371E-02
5.1621E 00	5.9691E-01	4.1087E-01	2.2774E-01	1.1133E-01	5.8144E-02	2.4667E-02	1.7529E-02
4.9103E 00	5.9744E-01	3.7787E-01	2.0825E-01	1.0055E-01	5.4561E-02	2.9636E-02	2.0360E-02
4.6708E 00	5.4481E-01	3.3017E-01	1.5481E-01	9.0187E-02	4.6388E-02	3.2836E-02	2.1821E-02
4.4430E 00	5.0297E-01	3.0346E-01	1.2259E-01	7.9776E-02	3.6080E-02	2.9907E-02	2.1329E-02
4.2263E 00	4.7990E-01	2.8556E-01	1.0820E-01	7.0018E-02	2.8349E-02	2.5683E-02	1.9401E-02
4.0202E 00	4.6134E-01	2.7321E-01	9.8312E-02	6.1185E-02	2.3616E-02	2.2419E-02	1.6808E-02
3.8242E 00	4.4992E-01	2.6235E-01	9.0400E-02	5.3343E-02	1.9907E-02	1.8254E-02	1.4117E-02
3.6376E 00	4.3749E-01	2.5200E-01	8.3871E-02	4.6497E-02	1.7024E-02	1.4831E-02	1.1699E-02
3.4602E 00	4.2574E-01	2.4207E-01	7.7167E-02	4.0164E-02	1.4577E-02	1.2017E-02	9.4514E-03
3.2915E 00	4.1810E-01	2.3214E-01	7.1083E-02	3.4635E-02	1.2528E-02	9.8292E-03	7.4749E-03
3.1310E 00	4.1124E-01	2.2230E-01	6.5109E-02	2.9591E-02	1.0593E-02	7.8063E-03	5.6404E-03
2.9783E 00	4.0521E-01	2.1356E-01	5.9504E-02	2.4903E-02	9.0762E-03	6.2702E-03	4.4358E-03
2.8330E 00	3.9857E-01	2.0538E-01	5.5026E-02	2.1119E-02	7.5512E-03	4.7842E-03	3.4307E-03
2.6948E 00	3.9405E-01	1.9817E-01	5.0195E-02	1.7689E-02	6.1114E-03	3.5786E-03	2.5457E-03
2.5634E 00	3.8915E-01	1.9047E-01	4.5149E-02	1.4703E-02	5.0298E-03	2.6405E-03	1.7692E-03

Note: Values of f_8 through f_{14} are given on page 72.

TABLE 11 — A1 (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7
2.4384E 00	3.8412E-01	1.8374E-01	3.6996E-02	1.2435E-02	3.6993E-03	1.5[illegible]E-03	1.2997E-03
2.3195E 00	3.7999E-01	1.7623E-01	3.5240E-02	1.0120E-02	3.0225E-03	1.1[illegible]E-03	[illegible]E-04
2.2053E 00	3.7592E-01	1.6988E-01	3.1802E-02	8.4010E-03	2.1835E-03	7.7761E-04	5.1[illegible]E-04
2.0987E 00	3.7195E-01	1.6393E-01	2.7823E-02	6.5426E-03	1.4170E-03	3.[illegible]19E-04	2.3822E-04
1.9964E 00	3.6777E-01	1.5756E-01	2.3019E-02	5.0329E-03	7.5840E-04	4.3149E-05	2.0904E-05
1.8990E 00	3.6294E-01	1.4991E-01	1.8956E-02	3.9590E-03	9.5817E-05	0	0
1.8064E 00	3.5786E-01	1.4192E-01	1.4890E-02	2.9726E-03	0	0	0
1.7183E 00	3.5297E-01	1.3458E-01	1.0972E-02	2.0545E-03	0	0	0
1.6345E 00	3.4816E-01	1.2503E-01	7.2030E-03	1.5254E-03	0	0	0
1.5548E 00	3.3622E-01	1.0481E-01	3.3347E-03	1.8643E-03	0	0	0
1.4790E 00	3.2171E-01	8.4903E-02	5.8644E-03	9.0649E-03	0	0	0
1.4068E 00	3.1509E-01	9.7120E-02	-1.0959E-03	8.9107E-03	0	0	0
1.3382E 00	2.9097E-01	9.1854E-02	6.7956E-03	-7.6982E-03	0	0	0
1.2730E 00	3.1725E-01	9.7850E-02	6.6967E-03	-4.1482E-03	0	0	0
1.2109E 00	3.4731E-01	8.7608E-02	5.0286E-04	9.9086E-03	0	0	0
1.1518E 00	3.2187E-01	1.1928E-01	1.5171E-02	1.9271E-02	0	0	0
1.0956E 00	2.5227E-01	7.7855E-02	1.7835E-02	6.3886E-04	0	0	0
1.0422E 00	2.7312E-01	7.5264E-02	8.3648E-03	-2.6114E-04	0	0	0
9.9137E-01	2.8623E-01	5.1831E-02	4.6183E-04	-2.7032E-03	0	0	0
9.4302E-01	2.9410E-01	7.3563E-02	8.3111E-03	2.7940E-03	0	0	0
8.9703E-01	3.0678E-01	8.2069E-02	1.6172E-02	1.3704E-02	0	0	0
8.5328E-01	2.7549E-01	6.6035E-02	-6.0505E-03	6.2138E-03	0	0	0
8.1167E-01	2.7999E-01	5.2885E-02	-6.9388E-03	2.9265E-03	0	0	0
7.7208E-01	1.4725E-01	5.7557E-02	-7.3144E-03	6.9472E-03	0	0	0
7.3443E-01	1.7531E-01	5.3233E-02	-1.4175E-02	7.9221E-03	0	0	0
6.9861E-01	2.0454E-01	5.0458E-02	-5.0631E-03	6.7084E-03	0	0	0
6.6454E-01	2.3238E-01	4.7834E-02	3.7021E-03	5.5460E-03	0	0	0
6.3213E-01	2.3594E-01	4.4641E-02	7.3117E-03	6.5016E-03	0	0	0
6.0130E-01	2.2061E-01	4.1033E-02	6.8681E-03	9.1009E-03	0	0	0
5.7197E-01	2.0602E-01	3.7602E-02	6.4461E-03	1.1573E-02	0	0	0
5.4408E-01	1.9655E-01	2.8704E-02	5.2574E-03	9.1960E-03	0	0	0
5.1754E-01	1.8866E-01	1.2489E-02	2.6990E-03	-3.1440E-04	0	0	0
4.9230E-01	1.5716E-01	1.3828E-02	1.8980E-03	3.0761E-03	0	0	0
4.6829E-01	1.2630E-01	1.5740E-02	1.1004E-03	6.7782E-03	0	0	0
4.4545E-01	1.0938E-01	1.7165E-02	1.5166E-03	8.5405E-03	0	0	0
4.2373E-01	1.2970E-01	1.7368E-02	5.2197E-03	5.0627E-03	0	0	0
4.0306E-01	1.4831E-01	1.7183E-02	8.5712E-03	1.6739E-03	0	0	0
3.8341E-01	1.2779E-01	1.3224E-02	7.0734E-03	1.5913E-03	0	0	0
3.6471E-01	9.6833E-02	8.3244E-03	4.2448E-03	2.4531E-03	0	0	0
3.4692E-01	7.5765E-02	4.9477E-03	2.9741E-03	2.4420E-03	0	0	0

TABLE 11 — Al (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7
3.3000E-01	8.2594E-02	5.3360E-03	6.3194E-03	-2.3343E-04	0	0	0
3.1391E-01	9.1113E-02	6.0861E-03	9.8444E-03	-2.9789E-03	0	0	0
2.9860E-01	9.7317E-02	6.5303E-03	1.2187E-02	-4.9445E-03	0	0	0
2.8403E-01	9.5054E-02	5.7943E-03	1.0067E-02	-4.0353E-03	0	0	0
2.7016E-01	9.1969E-02	4.9615E-03	7.5529E-03	-2.8522E-03	0	0	0
2.5700E-01	8.9028E-02	4.1692E-03	5.1613E-03	-1.7267E-03	0	0	0
2.4447E-01	8.6233E-02	3.4156E-03	2.8864E-03	-6.5616E-04	0	0	0
2.3255E-01	8.3388E-02	2.7283E-03	7.6371E-04	3.3120E-04	0	0	0
2.2121E-01	7.7195E-02	2.6252E-03	-7.0148E-05	6.9150E-04	0	0	0
2.1042E-01	6.9987E-02	2.7352E-03	-4.4945E-04	8.1559E-04	0	0	0
2.0016E-01	6.3130E-02	2.8396E-03	-8.1026E-04	9.3362E-04	0	0	0
1.9036E-01	5.6608E-02	2.9394E-03	-1.1535E-03	1.0459E-03	0	0	0
1.8111E-01	5.0404E-02	3.0340E-03	-1.4799E-03	1.1527E-03	0	0	0
1.7228E-01	4.4502E-02	3.1241E-03	-1.7905E-03	1.2543E-03	0	0	0
1.6387E-01	3.8888E-02	3.2098E-03	-2.0859E-03	1.3509E-03	0	0	0
1.5588E-01	3.3548E-02	3.2912E-03	-2.3669E-03	1.4429E-03	0	0	0
1.4826E-01	2.8466E-02	3.3685E-03	-2.6342E-03	1.5303E-03	0	0	0
1.4105E-01	2.3637E-02	3.4425E-03	-2.8884E-03	1.6135E-03	0	0	0
1.3417E-01	1.9339E-02	3.4792E-03	-3.0340E-03	1.6498E-03	0	0	0
1.2762E-01	1.6403E-02	3.3844E-03	-2.8004E-03	1.5190E-03	0	0	0
1.2140E-01	1.3725E-02	3.2822E-03	-2.5412E-03	1.3782E-03	0	0	0
1.1546E-01	1.1177E-02	3.1847E-03	-2.2947E-03	1.2442E-03	0	0	0
1.0985E-01	8.7539E-03	3.0916E-03	-2.0602E-03	1.1167E-03	0	0	0
1.0449E-01	6.4486E-03	3.0035E-03	-1.8371E-03	9.9552E-04	0	0	0
9.9394E-02	4.2562E-03	2.9195E-03	-1.6249E-03	8.8020E-04	0	0	0
9.4547E-02	2.1704E-03	2.8396E-03	-1.4236E-03	7.7051E-04	0	0	0
8.9935E-02	1.8644E-04	2.7636E-03	-1.2310E-03	6.6617E-04	0	0	0
8.5549E-02	-1.7008E-03	2.6914E-03	-1.0484E-03	5.6692E-04	0	0	0
8.1377E-02	-3.4960E-03	2.6226E-03	-8.7463E-04	4.7250E-04	0	0	0
7.7406E-02	-5.2037E-03	2.5572E-03	-7.0937E-04	3.8270E-04	0	0	0
7.3633E-02	-6.8286E-03	2.4950E-03	-5.5217E-04	2.9727E-04	0	0	0
7.0042E-02	-8.3732E-03	2.4356E-03	-4.0263E-04	2.1601E-04	0	0	0
6.6626E-02	-9.8430E-03	2.3795E-03	-2.6039E-04	1.3871E-04	0	0	0
6.3376E-02	-1.1043E-02	2.3006E-03	-1.2388E-04	4.9028E-05	0	0	0
6.0280E-02	-1.1985E-02	2.2002E-03	7.1773E-06	-5.2456E-05	0	0	0
5.7345E-02	-1.2881E-02	2.1046E-03	1.3134E-04	-1.4899E-04	0	0	0
5.4549E-02	-1.3734E-02	2.0138E-03	2.5043E-04	-2.4082E-04	0	0	0
5.1888E-02	-1.4545E-02	1.9273E-03	3.6324E-04	-3.2816E-04	0	0	0
4.9358E-02	-1.5316E-02	1.8451E-03	4.7054E-04	-4.1125E-04	0	0	0
4.6950E-02	-1.6050E-02	1.7669E-03	5.7261E-04	-4.9029E-04	0	0	0

TABLE 11 — Al (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7
4.4661E-02	-1.6748E-02	1.6925E-03	6.6976E-04	-5.6547E-04	0	0	0
4.2483E-02	-1.7412E-02	1.6217E-03	7.6205E-04	-6.3698E-04	0	0	0
4.0411E-02	-1.8044E-02	1.5544E-03	8.4996E-04	-7.0501E-04	0	0	0
3.8440E-02	-1.8644E-02	1.4904E-03	9.3347E-04	-7.6972E-04	0	0	0
3.6565E-02	-1.9216E-02	1.4295E-03	1.0130E-03	-8.3127E-04	0	0	0
3.4782E-02	-1.9760E-02	1.3716E-03	1.0886E-03	-8.8982E-04	0	0	0
3.3085E-02	-2.0132E-02	1.2527E-03	1.0928E-03	-8.9063E-04	0	0	0
3.1472E-02	-1.9381E-02	6.5278E-04	5.7920E-04	-4.7181E-04	0	0	0
2.9937E-02	-1.8435E-02	7.2504E-05	6.4332E-05	-5.2404E-05	0	0	0
2.8477E-02	-1.7536E-02	0	0	0	0	0	0
2.7088E-02	-1.6681E-02	0	0	0	0	0	0
2.5767E-02	-1.5868E-02	0	0	0	0	0	0
2.4510E-02	-1.5094E-02	0	0	0	0	0	0
2.3315E-02	-1.4358E-02	0	0	0	0	0	0
2.2178E-02	-1.3657E-02	0	0	0	0	0	0
2.1096E-02	-1.2991E-02	0	0	0	0	0	0
2.0067E-02	-1.2358E-02	0	0	0	0	0	0
1.9089E-02	-1.1755E-02	0	0	0	0	0	0
1.8158E-02	-1.1182E-02	0	0	0	0	0	0
1.7272E-02	-1.0636E-02	0	0	0	0	0	0
1.6430E-02	-1.0118E-02	0	0	0	0	0	0
1.5628E-02	-9.6241E-03	0	0	0	0	0	0
1.4866E-02	-9.1548E-03	0	0	0	0	0	0
1.4141E-02	-8.7083E-03	0	0	0	0	0	0
1.3452E-02	-8.2836E-03	0	0	0	0	0	0
1.2795E-02	-7.8796E-03	0	0	0	0	0	0
1.2171E-02	-7.4953E-03	0	0	0	0	0	0
1.1576E-02	-7.1297E-03	0	0	0	0	0	0
1.1013E-02	-6.7820E-03	0	0	0	0	0	0
1.0476E-02	-6.4513E-03	0	0	0	0	0	0
9.9651E-03	-6.1366E-03	0	0	0	0	0	0
9.4791E-03	-5.8373E-03	0	0	0	0	0	0
9.0168E-03	-5.5526E-03	0	0	0	0	0	0
8.5771E-03	-5.2818E-03	0	0	0	0	0	0
8.1588E-03	-5.0242E-03	0	0	0	0	0	0
7.7609E-03	-4.7792E-03	0	0	0	0	0	0
7.3824E-03	-4.5461E-03	0	0	0	0	0	0
7.0223E-03	-4.3244E-03	0	0	0	0	0	0
6.6798E-03	-4.1135E-03	0	0	0	0	0	0
6.3541E-03	-3.9129E-03	0	0	0	0	0	0

TABLE 11 — Al (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
6.0442E-03	-3.7220E-03	8.1799E-04	-5.0372E-04	1.0530E-04	-6.4847E-05
5.7494E-03	-3.5405E-03	7.7809E-04	-4.7916E-04	1.0017E-04	-6.1684E-05
5.4690E-03	-3.3676E-03	7.4015E-04	-4.5579E-04	9.5283E-05	-5.8676E-05
5.2023E-03	-3.2036E-03	7.0405E-04	-4.3356E-04	9.0636E-05	-5.5814E-05
4.9485E-03	-3.0474E-03	6.6971E-04	-4.1241E-04	8.6215E-05	-5.3092E-05
4.7072E-03	-2.8987E-03	6.3705E-04	-3.9230E-04	8.2011E-05	-5.0503E-05
4.4776E-03	-2.7574E-03	6.0596E-04	-3.7317E-04	7.8011E-05	-4.8040E-05
4.2592E-03	-2.6229E-03	5.7643E-04	-3.5497E-04	7.4206E-05	-4.5697E-05
4.0515E-03	-2.4950E-03	5.4831E-04	-3.3766E-04	7.0587E-05	-4.3468E-05
3.8539E-03	-2.3733E-03	5.2157E-04	-3.2119E-04	6.7145E-05	-4.1348E-05
3.6660E-03	-2.2575E-03	4.9613E-04	-3.0552E-04	6.3870E-05	-3.9332E-05
3.4872E-03	-2.1474E-03	4.7194E-04	-2.9062E-04	6.0755E-05	-3.7413E-05
3.3171E-03	-2.0427E-03	4.4892E-04	-2.7645E-04	5.7792E-05	-3.5589E-05
3.1553E-03	-1.9431E-03	4.2703E-04	-2.6297E-04	5.4973E-05	-3.3853E-05
3.0014E-03	-1.8483E-03	4.0620E-04	-2.5014E-04	5.2292E-05	-3.2202E-05
2.8551E-03	-1.7582E-03	3.8639E-04	-2.3794E-04	4.9742E-05	-3.0632E-05
2.7158E-03	-1.6724E-03	3.6755E-04	-2.2634E-04	4.7316E-05	-2.9138E-05
2.5834E-03	-1.5909E-03	3.4962E-04	-2.1530E-04	4.5008E-05	-2.7717E-05
2.4574E-03	-1.5133E-03	3.3257E-04	-2.0480E-04	4.2813E-05	-2.6365E-05
2.3375E-03	-1.4395E-03	3.1635E-04	-1.9481E-04	4.0725E-05	-2.5079E-05
2.2235E-03	-1.3693E-03	3.0092E-04	-1.8531E-04	3.8739E-05	-2.3856E-05
2.1151E-03	-1.3025E-03	2.8624E-04	-1.7627E-04	3.6850E-05	-2.2692E-05
2.0119E-03	-1.2390E-03	2.7226E-04	-1.6768E-04	3.5053E-05	-2.1586E-05
1.9136E-03	-1.1785E-03	2.5901E-04	-1.5950E-04	3.3343E-05	-2.0533E-05
1.8205E-03	-1.1211E-03	2.4637E-04	-1.5172E-04	3.1717E-05	-1.9532E-05
1.7317E-03	-1.0664E-03	2.3436E-04	-1.4432E-04	3.0170E-05	-1.8579E-05
1.6472E-03	-1.0144E-03	2.2293E-04	-1.3728E-04	2.8699E-05	-1.7673E-05
1.5669E-03	-9.6490E-04	2.1206E-04	-1.3059E-04	2.7299E-05	-1.6811E-05
1.4905E-03	-9.1785E-04	2.0171E-04	-1.2422E-04	2.5968E-05	-1.5991E-05
1.4178E-03	-8.7306E-04	1.9186E-04	-1.1816E-04	2.4701E-05	-1.5211E-05
1.3486E-03	-8.3050E-04	1.8252E-04	-1.1240E-04	2.3496E-05	-1.4469E-05
1.2829E-03	-7.9000E-04	1.7362E-04	-1.0691E-04	2.2350E-05	-1.3764E-05
1.2203E-03	-7.5147E-04	1.6515E-04	-1.0170E-04	2.1260E-05	-1.3092E-05
1.1606E-03	-7.1482E-04	1.5709E-04	-9.6740E-05	2.0224E-05	-1.2454E-05
1.1042E-03	-6.7996E-04	1.4943E-04	-9.2022E-05	1.9237E-05	-1.1846E-05
1.0503E-03	-6.4680E-04	1.4215E-04	-8.7534E-05	1.8299E-05	-1.1269E-05
9.9909E-04	-6.1525E-04	1.3521E-04	-8.3265E-05	1.7407E-05	-1.0719E-05
9.5037E-04	-5.8524E-04	1.2862E-04	-7.9204E-05	1.6558E-05	-1.0196E-05
9.0402E-04	-5.5670E-04	1.2235E-04	-7.5341E-05	1.5750E-05	-9.6991E-06
8.5993E-04	-5.2955E-04	1.1638E-04	-7.1667E-05	1.4982E-05	-9.2260E-06
		1.1070E-04	-6.8172E-05		

TABLE 11 — Al (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
1.4251E-05	-8.7761E-06	1.9287E-06	-1.1877E-06	2.4[illegible]2E-07	-1.[illegible]74E-07
1.3556E-05	-8.3481E-06	1.8346E-06	-1.1298E-06	2.4[illegible]29E-07	-1.[illegible]29E-07
1.2895E-05	-7.9409E-06	1.7452E-06	-1.0747E-06	2.3618E-07	-1.[illegible]44E-07
1.2266E-05	-7.5536E-06	1.6601E-06	-1.0223E-06	2.2[illegible]6E-07	-1.[illegible]35E-07
1.1668E-05	-7.1852E-06	1.5791E-06	-9.7242E-07	2.1371E-07	-1.[illegible]15E-07
1.1099E-05	-6.8348E-06	1.5021E-06	-9.2499E-07	2.0328E-07	-1.[illegible]51E-07
1.0558E-05	-6.5015E-06	1.4298E-06	-8.7988E-07	1.9337E-07	-1.[illegible]08E-07
1.0043E-05	-6.1844E-06	1.3591E-06	-8.3697E-07	1.8394E-07	-1.[illegible]27E-07
9.5529E-06	-5.8828E-06	1.2928E-06	-7.9615E-07	1.7497E-07	-1.[illegible]75E-07
9.0870E-06	-5.5959E-06	1.2296E-06	-7.5732E-07	1.6643E-07	-1.[illegible]49E-07
8.6438E-06	-5.3230E-06	1.1698E-06	-7.2038E-07	1.5832E-07	-9.7493E-08
8.2223E-06	-5.0634E-06	1.1128E-06	-6.8525E-07	1.5060E-07	-9.2734E-08
7.8213E-06	-4.8164E-06	1.0585E-06	-6.5183E-07	1.4325E-07	-8.8218E-08
7.4398E-06	-4.5815E-06	1.0069E-06	-6.2004E-07	1.3627E-07	-8.3913E-08
7.0770E-06	-4.3581E-06	9.5777E-07	-5.8980E-07	1.2962E-07	-7.9[illegible]1E-08
6.7318E-06	-4.1455E-06	9.1105E-07	-5.6104E-07	1.2330E-07	-7.5928E-08
6.4035E-06	-3.9433E-06	8.6662E-07	-5.3367E-07	1.1728E-07	-7.2225E-08
6.0912E-06	-3.7510E-06	8.2436E-07	-5.0765E-07	1.1156E-07	-6.8702E-08
5.7941E-06	-3.5681E-06	7.8415E-07	-4.8289E-07	1.0612E-07	-6.5352E-08
5.5116E-06	-3.3941E-06	7.4591E-07	-4.5934E-07	1.0092E-07	-6.2165E-08
5.2428E-06	-3.2285E-06	7.0953E-07	-4.3694E-07	9.6024E-08	-5.9133E-08
4.9871E-06	-3.0711E-06	6.7493E-07	-4.1563E-07	9.1341E-08	-5.6249E-08
4.7438E-06	-2.9213E-06	6.4201E-07	-3.9536E-07	8.6867E-08	-5.3506E-08
4.5125E-06	-2.7788E-06	6.1070E-07	-3.7607E-07	8.2644E-08	-5.0899E-08
4.2924E-06	-2.6433E-06	5.8091E-07	-3.5773E-07	7.8618E-08	-4.8414E-08
4.0831E-06	-2.5144E-06	5.5255E-07	-3.4029E-07	7.4784E-08	-4.6053E-08
3.8839E-06	-2.3918E-06	5.2553E-07	-3.2369E-07	7.1137E-08	-4.3807E-08
3.6945E-06	-2.2751E-06	5.0000E-07	-3.0790E-07	6.7667E-08	-4.1671E-08
3.5143E-06	-2.1642E-06	4.7561E-07	-2.9289E-07	6.4367E-08	-3.9638E-08
3.3429E-06	-2.0586E-06	4.5242E-07	-2.7860E-07	6.1226E-08	-3.7705E-08
3.1799E-06	-1.9582E-06	4.3035E-07	-2.6501E-07	5.8242E-08	-3.5866E-08
3.0248E-06	-1.8627E-06	4.0936E-07	-2.5209E-07	5.5401E-08	-3.4117E-08
2.8773E-06	-1.7719E-06	3.8940E-07	-2.3980E-07	5.2699E-08	-3.2453E-08
2.7370E-06	-1.6854E-06	3.7041E-07	-2.2810E-07	5.0129E-08	-3.0870E-08
2.6035E-06	-1.6032E-06	3.5234E-07	-2.1698E-07	4.7684E-08	-2.9364E-08
2.4765E-06	-1.5251E-06	3.3516E-07	-2.0639E-07	4.5359E-08	-2.7932E-08
2.3557E-06	-1.4507E-06	3.1881E-07	-1.9633E-07	4.3147E-08	-2.6570E-08
2.2408E-06	-1.3799E-06	3.0326E-07	-1.8675E-07	4.1042E-08	-2.5274E-08
2.1315E-06	-1.3126E-06	2.8847E-07	-1.7764E-07	3.9041E-08	-2.4042E-08
2.0276E-06	-1.2486E-06	2.7440E-07	-1.6898E-07	3.7137E-08	-2.2855E-08

TABLE 11 — Al (CONTINUED)

E, MeV	f_8	f_9	f_{10}	f_{11}	f_{12}	f_{13}	f_{14}
1.8017E 01	6.6491E-02	2.3199E-02	8.9997E-03	4.4999E-03	6.1997E-04	-2.4698E-03	-2.8698E-03
1.7139E 01	6.3493E-02	2.2701E-02	8.9040E-03	4.4520E-03	6.1040E-04	-2.3997E-03	-2.8028E-03
1.6303E 01	5.9924E-02	2.1990E-02	8.7957E-03	4.3948E-03	6.0016E-04	-2.2897E-03	-2.7299E-03
1.5508E 01	5.5482E-02	2.0970E-02	8.6286E-03	4.2896E-03	5.8779E-04	-2.0911E-03	-2.6429E-03
1.4751E 01	5.0101E-02	1.9481E-02	8.2295E-03	4.0825E-03	5.5694E-04	-1.7822E-03	-2.4789E-03
1.4032E 01	4.2699E-02	1.6928E-02	7.2107E-03	3.6352E-03	4.9111E-04	-1.3119E-03	-2.0982E-03
1.3348E 01	3.2187E-02	1.2801E-02	5.1166E-03	2.3886E-03	3.3769E-04	-6.7975E-04	-1.2080E-03
1.2697E 01	2.3611E-02	8.9365E-03	3.1814E-03	1.2547E-03	2.0378E-04	-2.5372E-04	-4.8904E-04
1.2077E 01	1.8057E-02	6.0999E-03	1.8578E-03	5.3556E-04	1.0498E-04	-3.1035E-05	-8.0501E-05
1.1488E 01	1.5239E-02	4.8326E-03	1.3638E-03	3.3040E-04	7.0363E-05	9.7301E-06	-7.4779E-07
1.0928E 01	1.3220E-02	3.9908E-03	1.0857E-03	2.5415E-04	5.2983E-05	7.2072E-06	-4.6747E-07
1.0395E 01	1.1299E-02	3.1900E-03	8.2121E-04	1.8162E-04	3.6450E-05	4.8073E-06	-2.0081E-07
9.8882E 00	9.5527E-03	2.5062E-03	6.0265E-04	1.2321E-04	2.3243E-05	2.9023E-06	-1.0140E-08
9.4059E 00	8.1129E-03	2.0676E-03	4.8465E-04	9.6413E-05	1.7530E-05	2.1177E-06	0
8.9472E 00	6.7558E-03	1.6623E-03	3.7747E-04	7.2544E-05	1.2480E-05	1.4291E-06	0
8.5108E 00	5.4649E-03	1.2767E-03	2.7552E-04	4.9839E-05	7.6775E-06	7.7420E-07	0
8.0957E 00	4.2499E-03	9.1512E-04	1.8020E-04	2.8688E-05	3.2236E-06	1.7034E-07	0
7.7009E 00	3.3663E-03	6.7915E-04	1.2469E-04	1.7997E-05	1.4114E-06	0	0
7.3253E 00	2.6350E-03	4.9801E-04	8.5980E-05	1.1608E-05	6.5981E-07	0	0
6.9681E 00	1.9949E-03	3.4225E-04	5.3134E-05	6.2910E-06	2.1739E-08	0	0
6.6282E 00	1.6272E-03	2.6564E-04	3.9133E-05	4.5295E-06	0	0	0
6.3050E 00	1.3054E-03	2.0147E-04	2.7812E-05	3.2356E-06	0	0	0
5.9975E 00	1.5341E-03	3.8592E-04	1.7707E-05	2.0787E-06	0	0	0
5.7050E 00	4.9334E-03	2.0229E-03	1.2045E-05	1.4171E-06	0	0	0
5.4267E 00	8.6924E-03	3.8214E-03	7.3121E-06	8.6025E-07	0	0	0
5.1621E 00	1.2206E-02	5.5322E-03	2.8100E-06	3.3059E-07	0	0	0
4.9103E 00	1.5133E-02	7.6534E-03	4.5325E-08	5.3324E-09	0	0	0
4.6708E 00	1.6309E-02	9.8975E-03	0	0	0	0	0
4.4430E 00	1.5636E-02	1.1092E-02	0	0	0	0	0
4.2263E 00	1.2717E-02	3.9141E-03	0	0	0	0	0
4.0202E 00	7.9179E-03	-1.4461E-03	0	0	0	0	0
3.8242E 00	2.5191E-03	1.6126E-03	0	0	0	0	0
3.6376E 00	-3.7329E-04	4.0112E-03	0	0	0	0	0
3.4602E 00	-1.2503E-03	4.7692E-03	0	0	0	0	0
3.2915E 00	-1.0173E-03	3.3250E-03	0	0	0	0	0
3.1310E 00	-7.0540E-04	1.5668E-03	0	0	0	0	0
2.9783E 00	-4.1524E-04	2.2522E-04	0	0	0	0	0
2.8330E 00	-1.3224E-04	0	0	0	0	0	0
2.6948E 00	-1.4477E-05	0	0	0	0	0	0
2.5634E 00	0	0	0	0	0	0	0

Note: Values of f_1 through f_7 are given on pages 66 through 71.

TABLE 12 — Al – FRACTION OF DISCRETE LEVEL EXCITATION CORRESPONDING TO LEVEL OF ENERGY E_ν

E, MeV	E_ν, MeV 0.842	1.013	2.206	2.730	2.977
3.9242E 00	7.7550E-02	2.2950E-01	2.6542E-01	1.6211E-01	2.6542E-01
3.6376E 00	8.9124E-02	2.6580E-01	2.9456E-01	1.5559E-01	1.9466E-01
3.4602E 00	9.8413E-02	3.0000E-01	3.1746E-01	1.5238E-01	1.3175E-01
3.2915E 00	1.1000E-01	3.3667E-01	3.4167E-01	1.4500E-01	6.6667E-02
3.1310E 00	1.2105E-01	3.7368E-01	3.5439E-01	1.3333E-01	1.7544E-02
2.9783E 00	1.3325E-01	4.0924E-01	3.5189E-01	1.0560E-01	0
2.8330E 00	1.4914E-01	4.8796E-01	3.6291E-01	2.7147E-07	0
2.6940E 00	1.6383E-01	5.5745E-01	2.7872E-01	0	0
2.5634E 00	1.8140E-01	6.2791E-01	1.9070E-01	0	0
2.4384E 00	1.9268E-01	6.7805E-01	1.2927E-01	0	0
2.3195E 00	2.0520E-01	7.3150E-01	6.3158E-02	0	0
2.2063E 00	2.2029E-01	7.7971E-01	1.3749E-07	0	0
2.0987E 00	2.2857E-01	7.7143E-01	0	0	0
1.9964E 00	2.3158E-01	7.6842E-01	0	0	0
1.8990E 00	2.3600E-01	7.6400E-01	0	0	0
1.8064E 00	2.3744E-01	7.6256E-01	0	0	0
1.7183E 00	2.4211E-01	7.5789E-01	0	0	0
1.6345E 00	2.4375E-01	7.5625E-01	0	0	0
1.5546E 00	2.6154E-01	7.3846E-01	0	0	0
1.4790E 00	2.6667E-01	7.3333E-01	0	0	0
1.4068E 00	2.6829E-01	7.3171E-01	0	0	0
1.3382E 00	2.6563E-01	7.3437E-01	0	0	0
1.2730E 00	2.7660E-01	7.2340E-01	0	0	0
1.2109E 00	2.8571E-01	7.1429E-01	0	0	0
1.1518E 00	3.1818E-01	6.8182E-01	0	0	0
1.0956E 00	3.0000E-01	7.0000E-01	0	0	0
1.0422E 00	3.2258E-01	6.7742E-01	0	0	0
9.9137E-01	3.2309E-01	6.7691E-01	0	0	0
9.4302E-01	0	0	0	0	0

TABLE 13 — Al – NUMBER OF γ-RAYS EMITTED PER ABSORPTION

E_γ, MeV	
.20	2.5000
1.5	.9500
1.78	1.0000
2.5	.7000
4.0	.8000
6.0	.2000
7.73	.2500

TABLE 14 — Al – NUMBER OF γ-RAYS EMITTED PER NEUTRON-I

	E_γ, Mev								
E, Mev	.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4.75
1.80200E 01	.1000	.2100	.3100	.3000	.2100	.1700	.1600	.0900	.0700
1.40000E 01	.1200	.2200	.3200	.3000	.2000	.1600	.1500	.0900	.0700
1.09000E 01	.1300	.2500	.3100	.3100	.1800	.1400	.1000	.0900	.0800
8.51000E 00	.1600	.2800	.3000	.2000	.1300	.1200	.0700	.0900	.0800
6.63000E 00	.2000	.3100	.2800	.2700	.1400	.1100	.0400	.0600	.0500
5.16000E 00	.2100	.3500	.2400	.3700	.1300	.0500	.0100	.0100	0
4.02000E 00	.2200	.4000	.1800	.3800	.0700	.0100	0	0	0
3.13000E 00	.1700	.4700	.0400	.3300	0	0	0	0	0
2.44000E 00	.2900	.7100	0	0	0	0	0	0	0
1.90000E 00	.3100	.6900	0	0	0	0	0	0	0
1.48000E 00	.3600	.6400	0	0	0	0	0	0	0
1.15000E 00	1.0000	0	0	0	0	0	0	0	0
8.97000E-01	0	0	0	0	0	0	0	0	0
1.00000E-03	0	0	0	0	0	0	0	0	0

YS EMITTED PER NEUTRON-PRODUCING REACTION

Eγ, Mev								
3.75	4.25	4.75	5.25	5.75	6.25	6.75	7.5	8.5
.1600	.0900	.0700	.0550	.0450	.0400	.0400	.0600	.0400
.1500	.0900	.0700	.0550	.0450	.0400	.0350	.0500	.0300
.1000	.0900	.0800	.0550	.0450	.0400	.0200	.0300	.0100
.0700	.0900	.0800	.0600	.0400	.0300	.0100	0	0
.0400	.0600	.0500	.0200	.0050	0	0	0	0
.0100	.0100	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

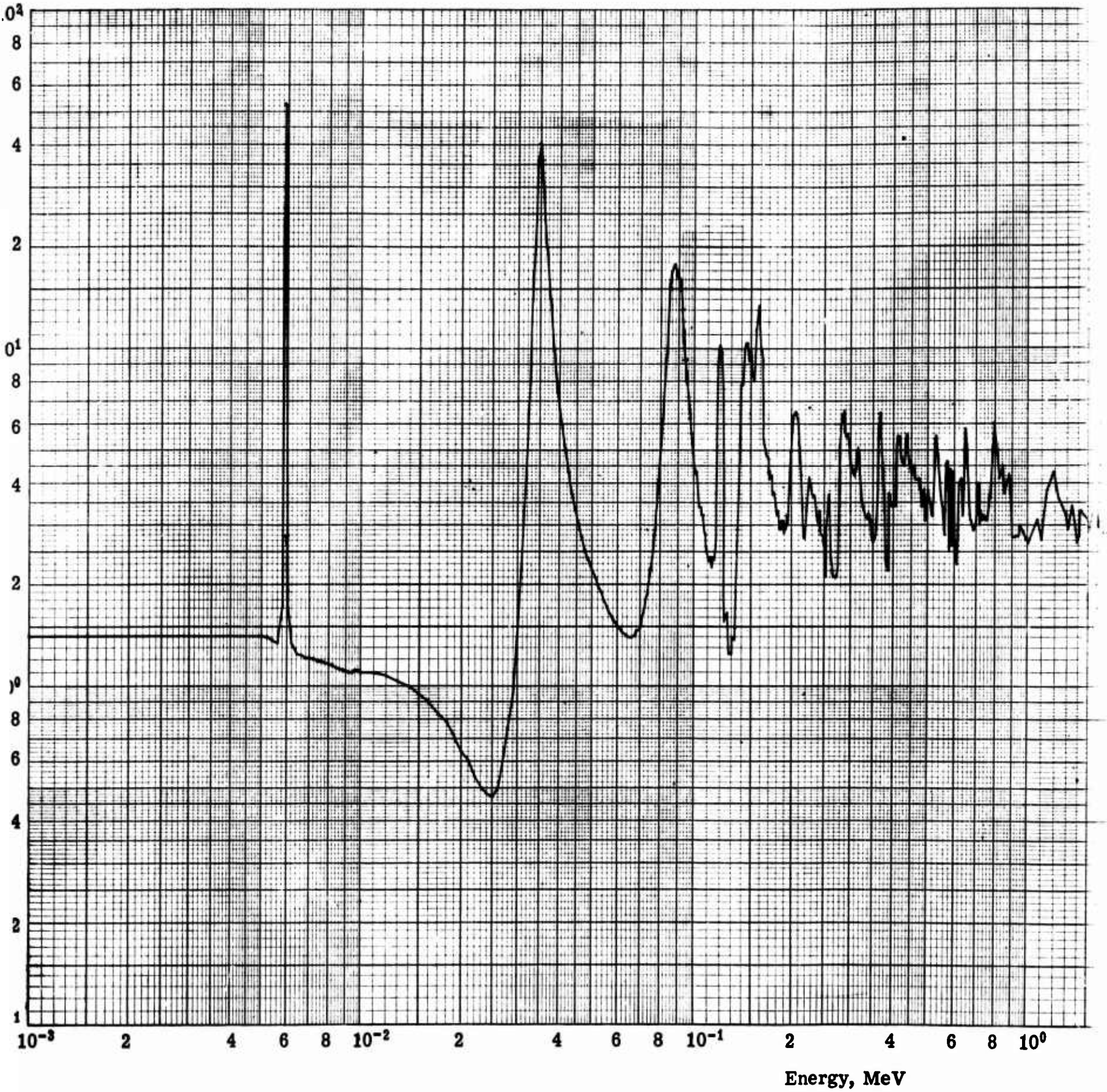
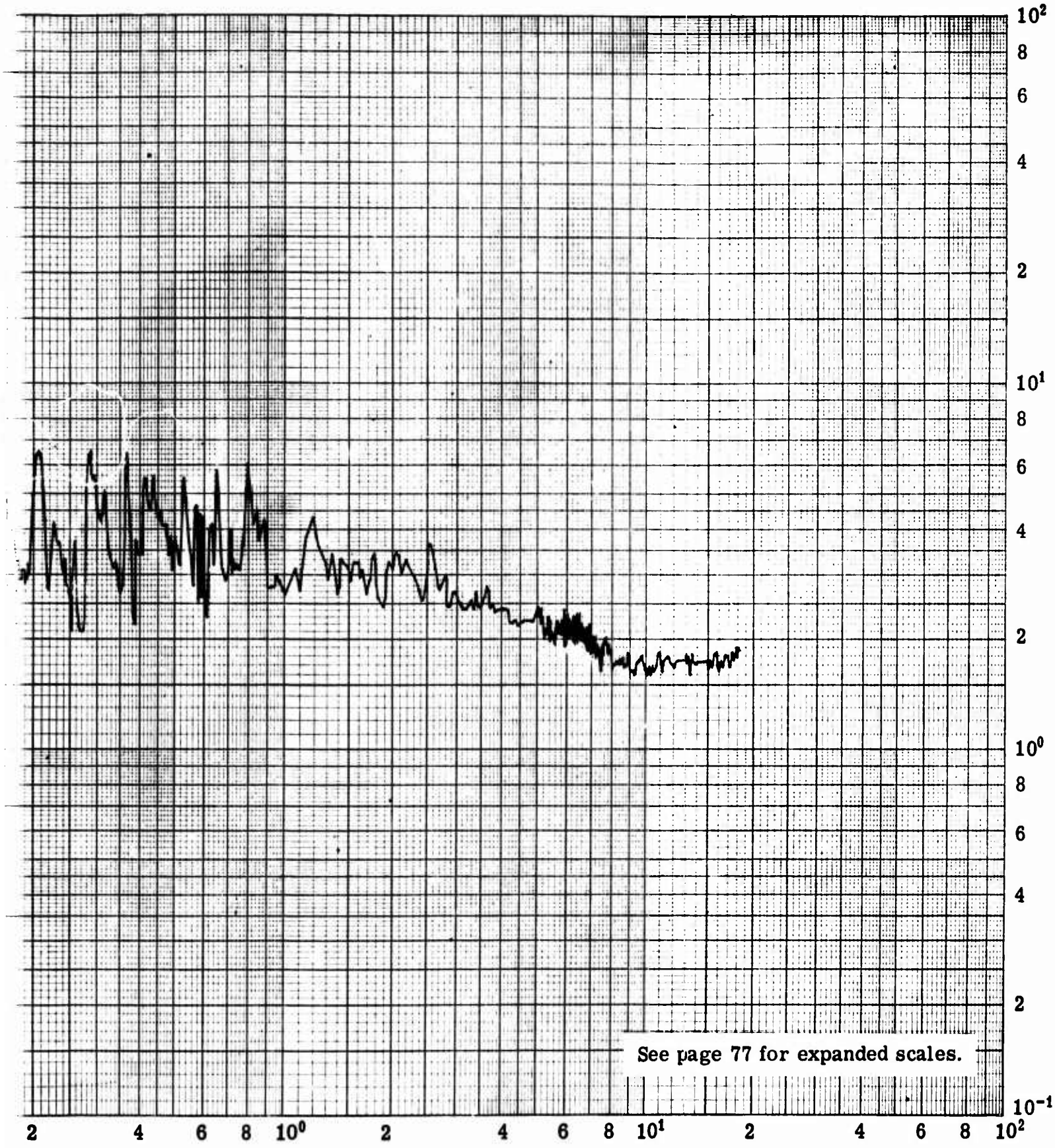
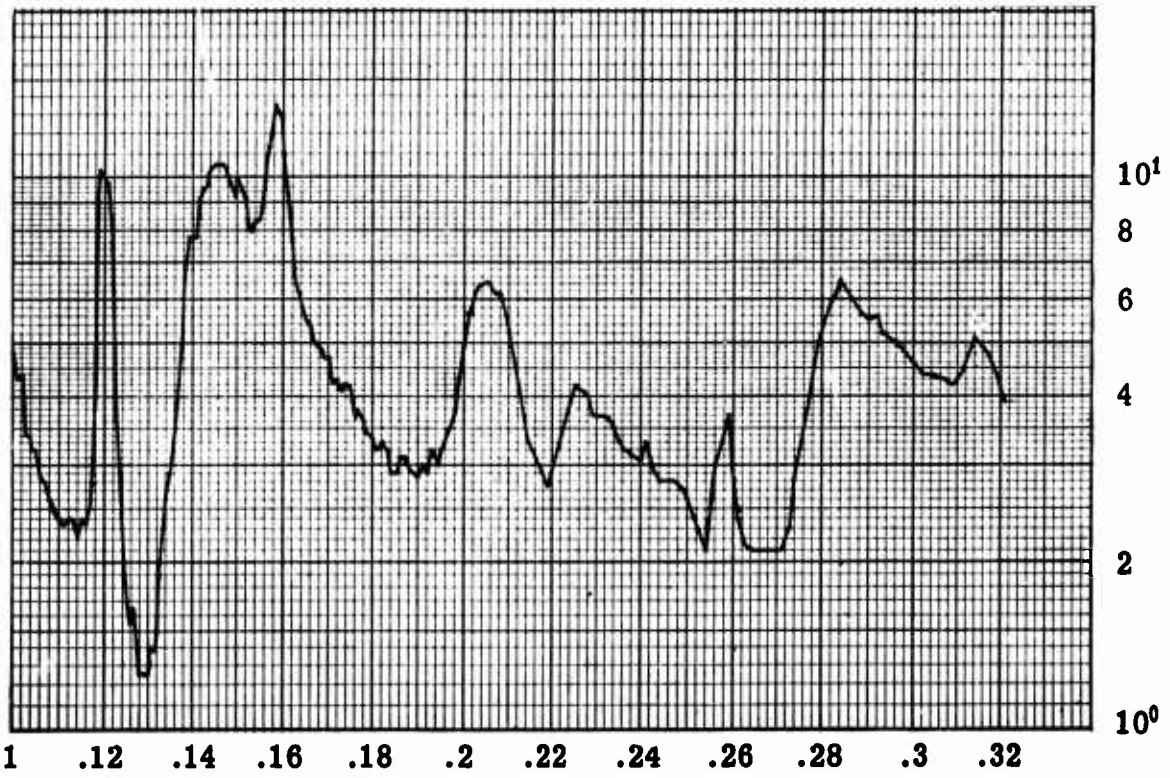


Fig. 7(a) — Al – Total Cross Section – High Energy



See page 77 for expanded scales.

al Cross Section – High Energy Part



4.

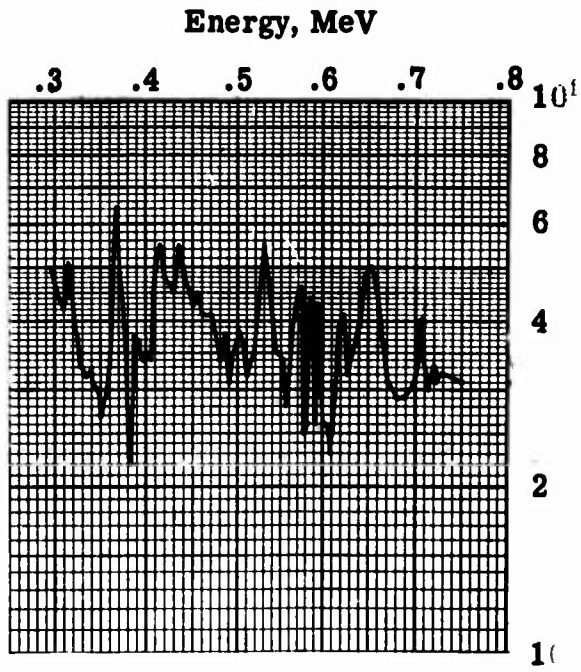
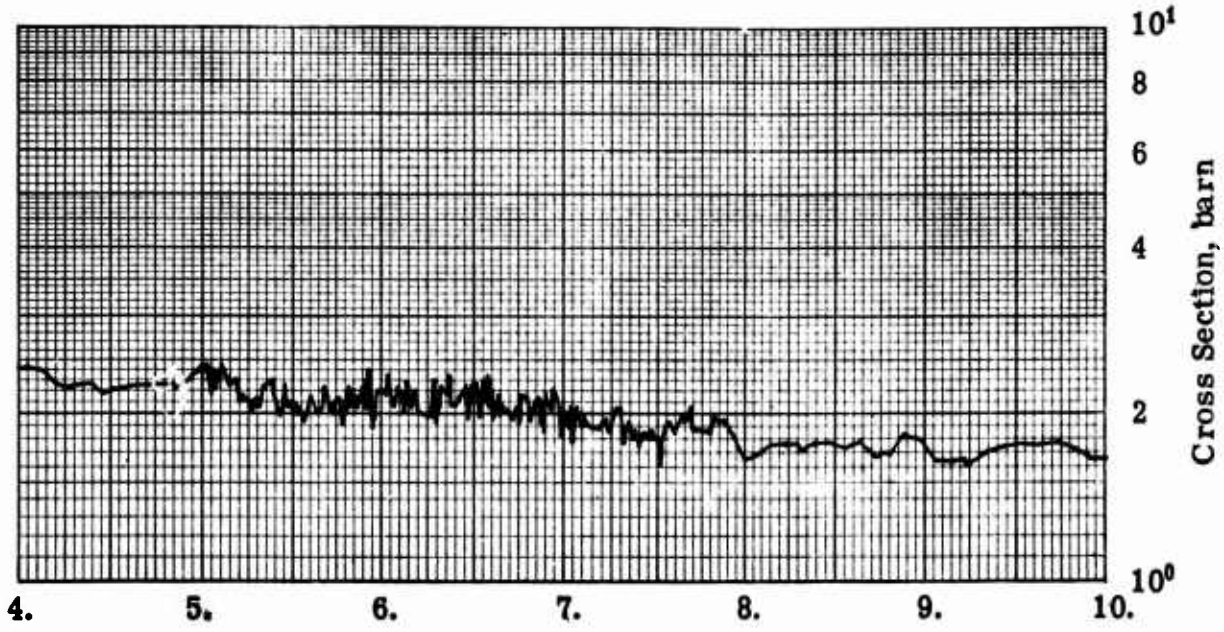
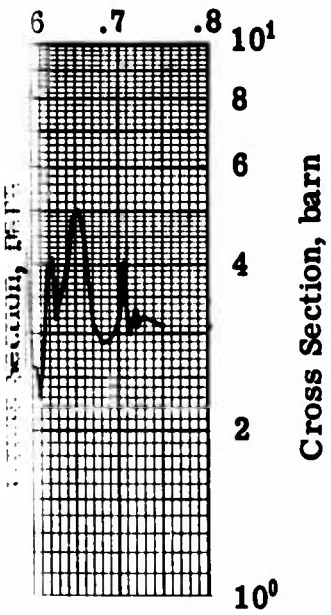


Fig. 7(a) — (Continued)



MeV



Continued)

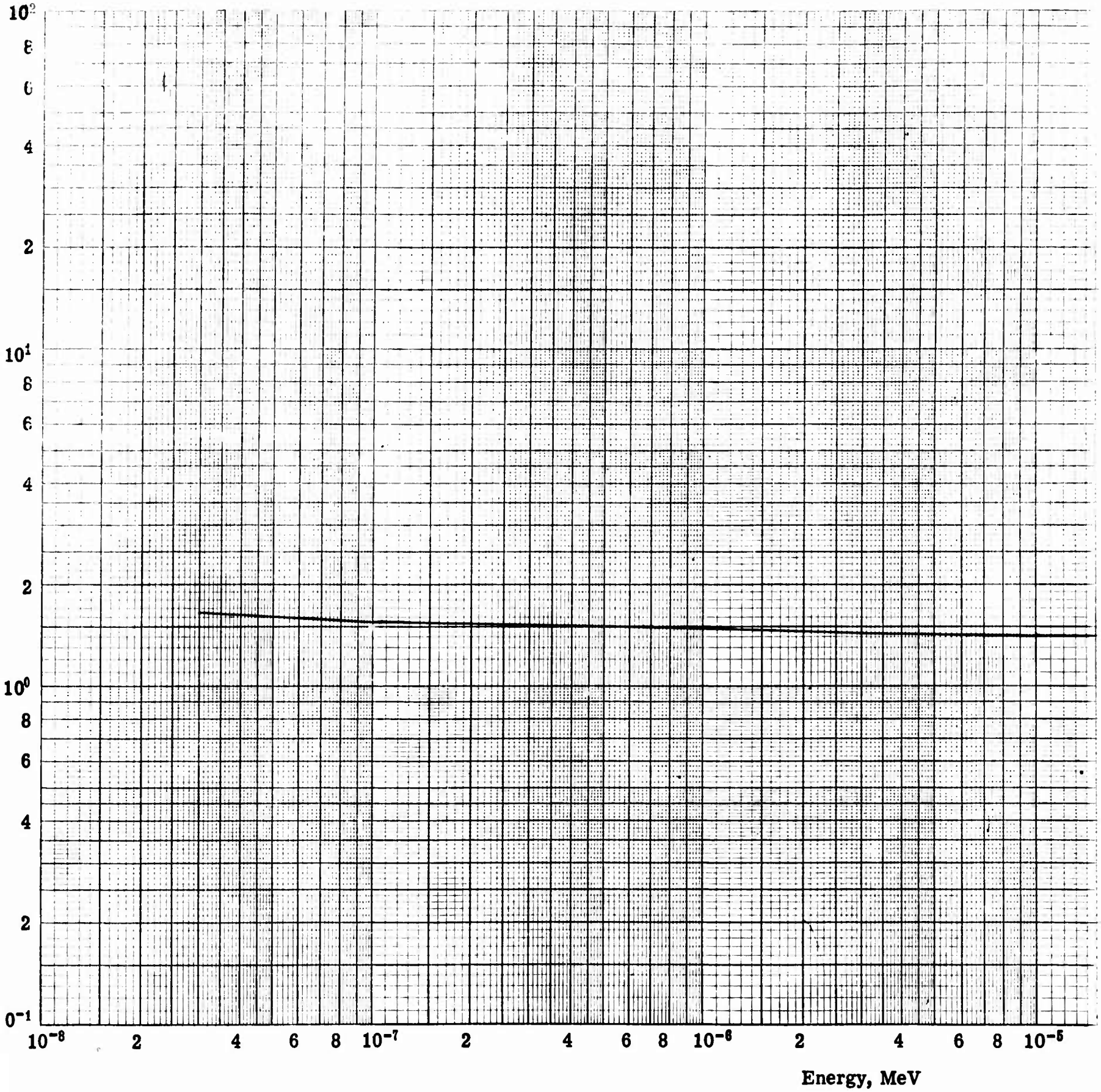
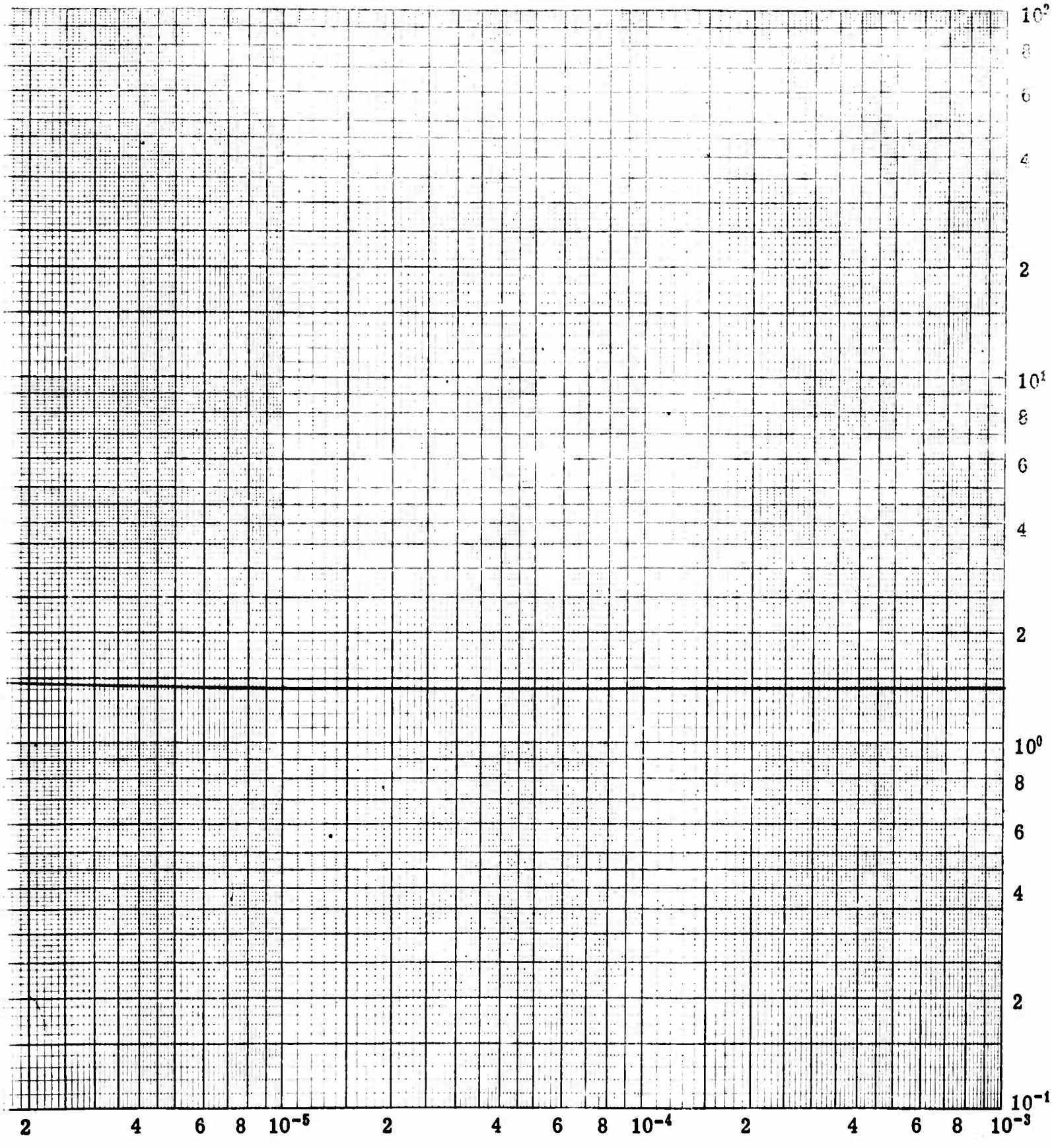


Fig. 7(b) — Al – Total Cross Section – Low Energy



al Cross Section – Low Energy Part

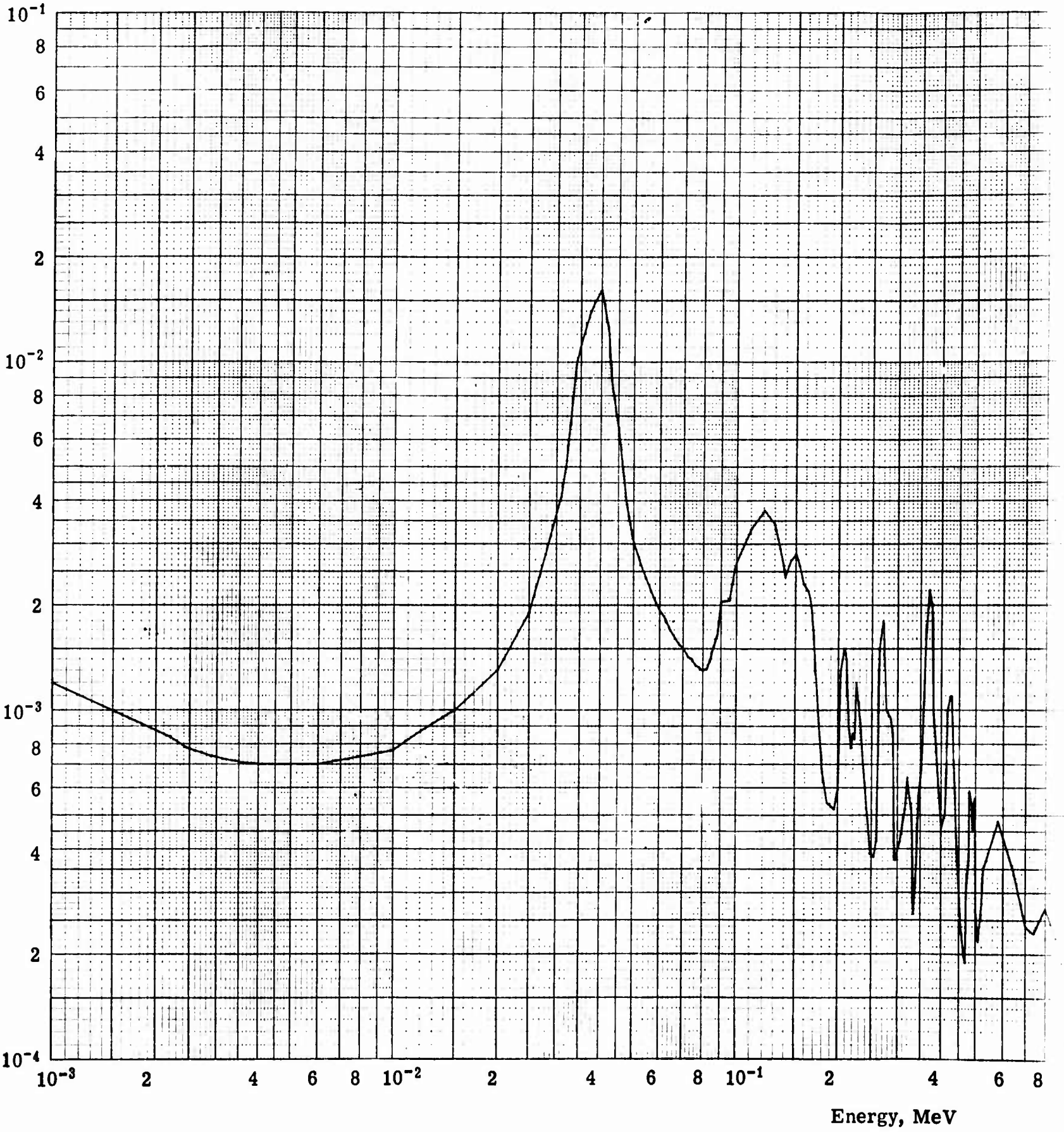
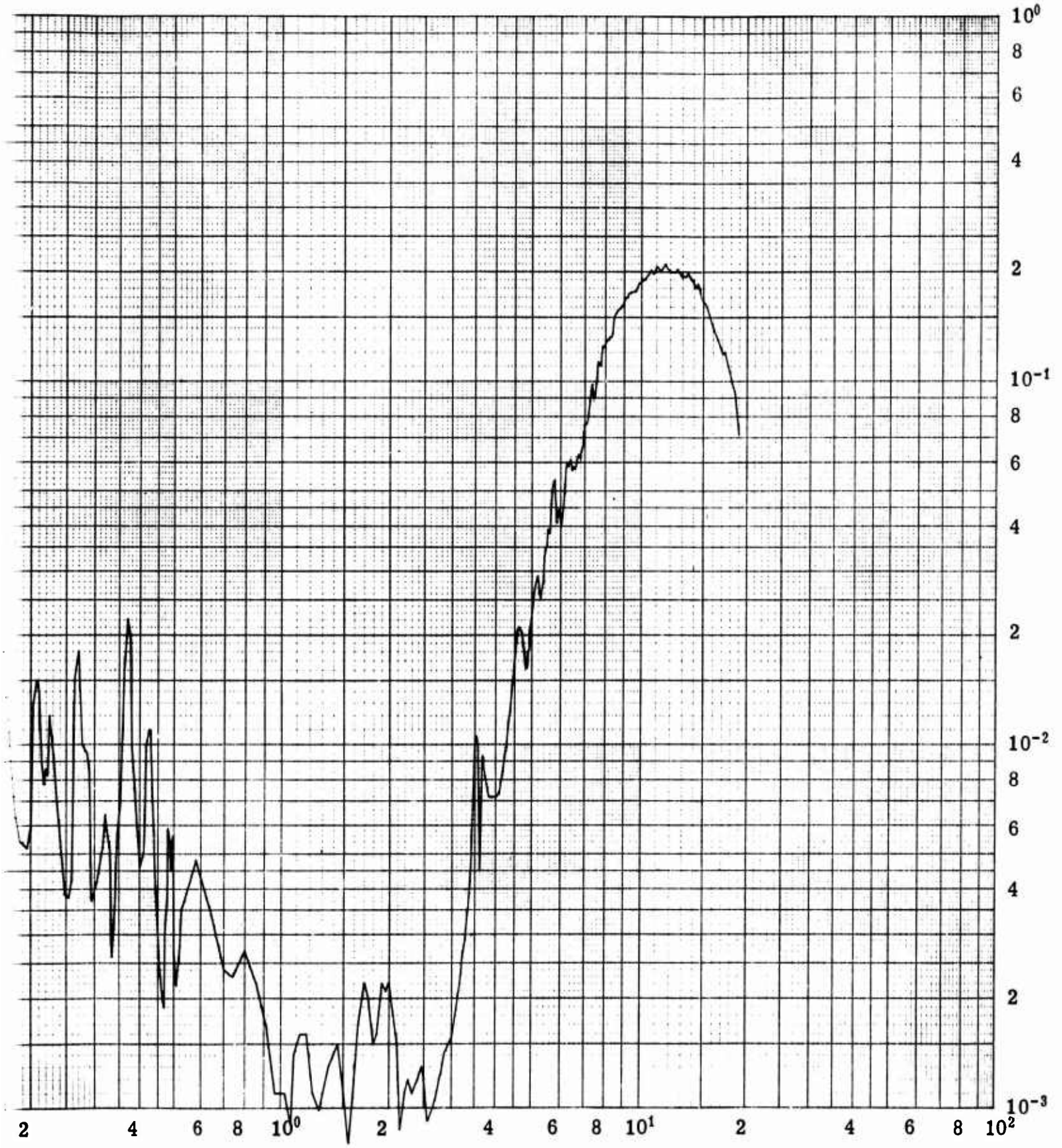


Fig. 8(a) — Al – Absorption Cross Section –



rption Cross Section – High Energy Part

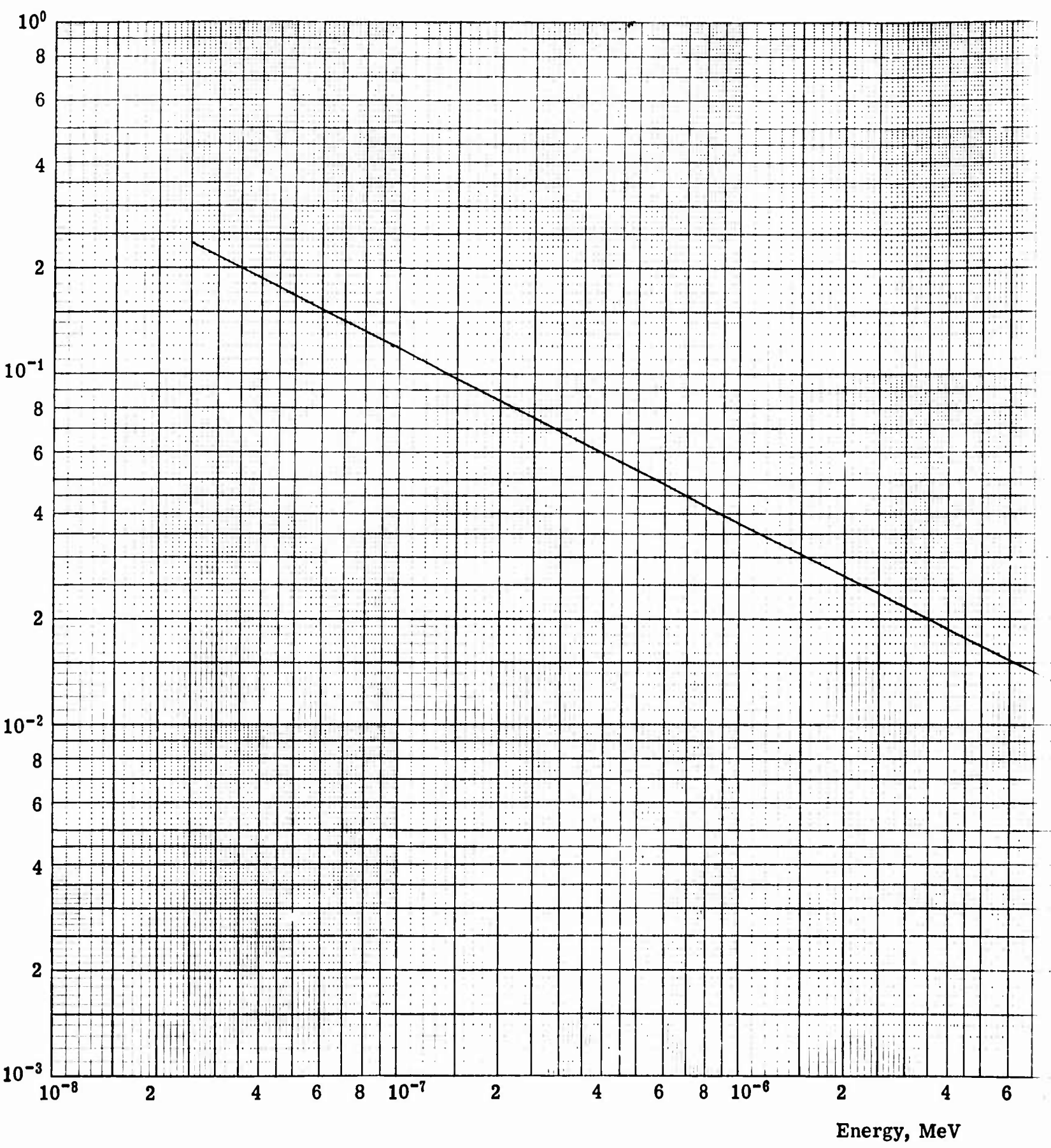
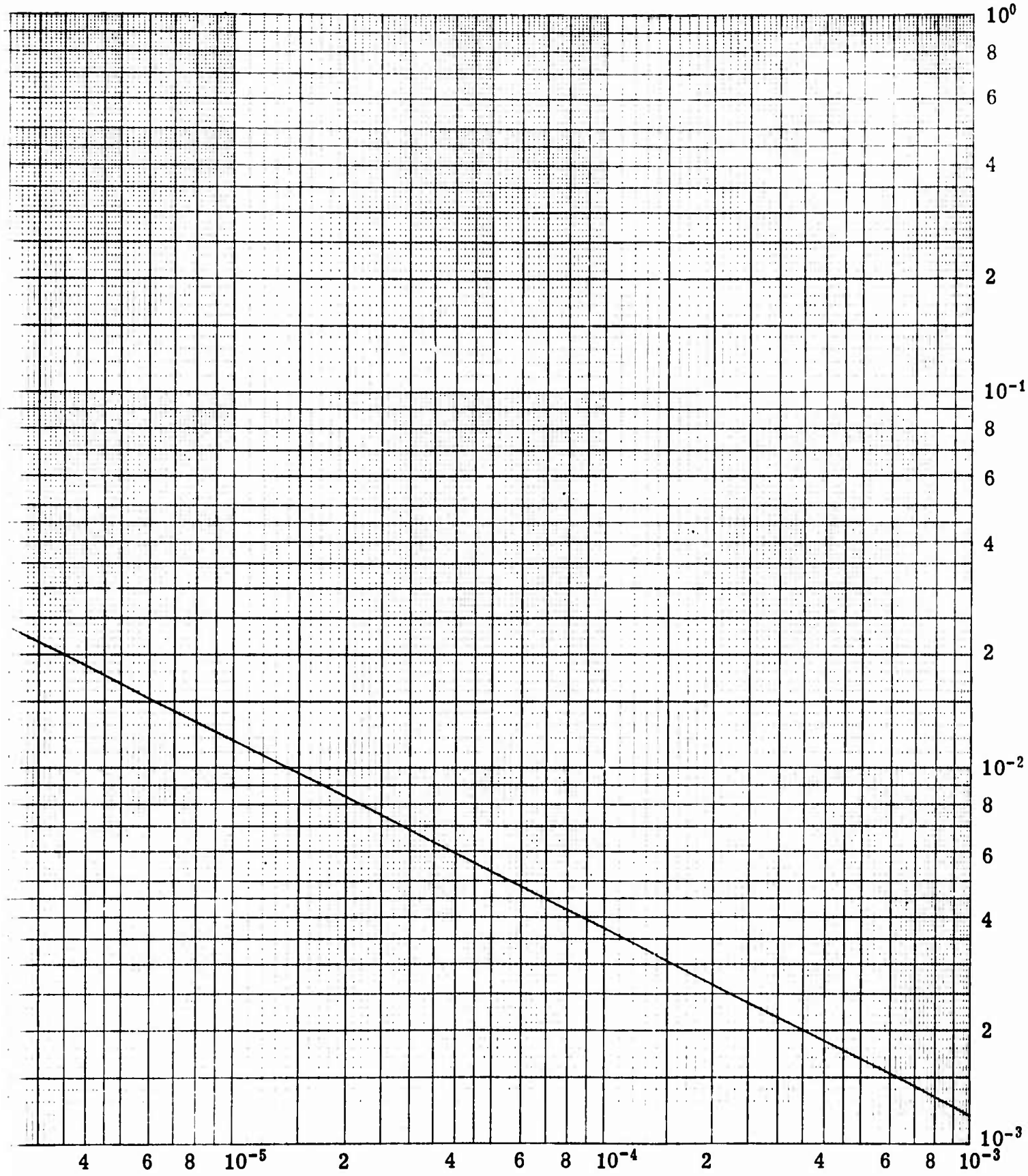


Fig. 8(b) — Al – Absorption Cross Section –



Cross Section – Low Energy Part

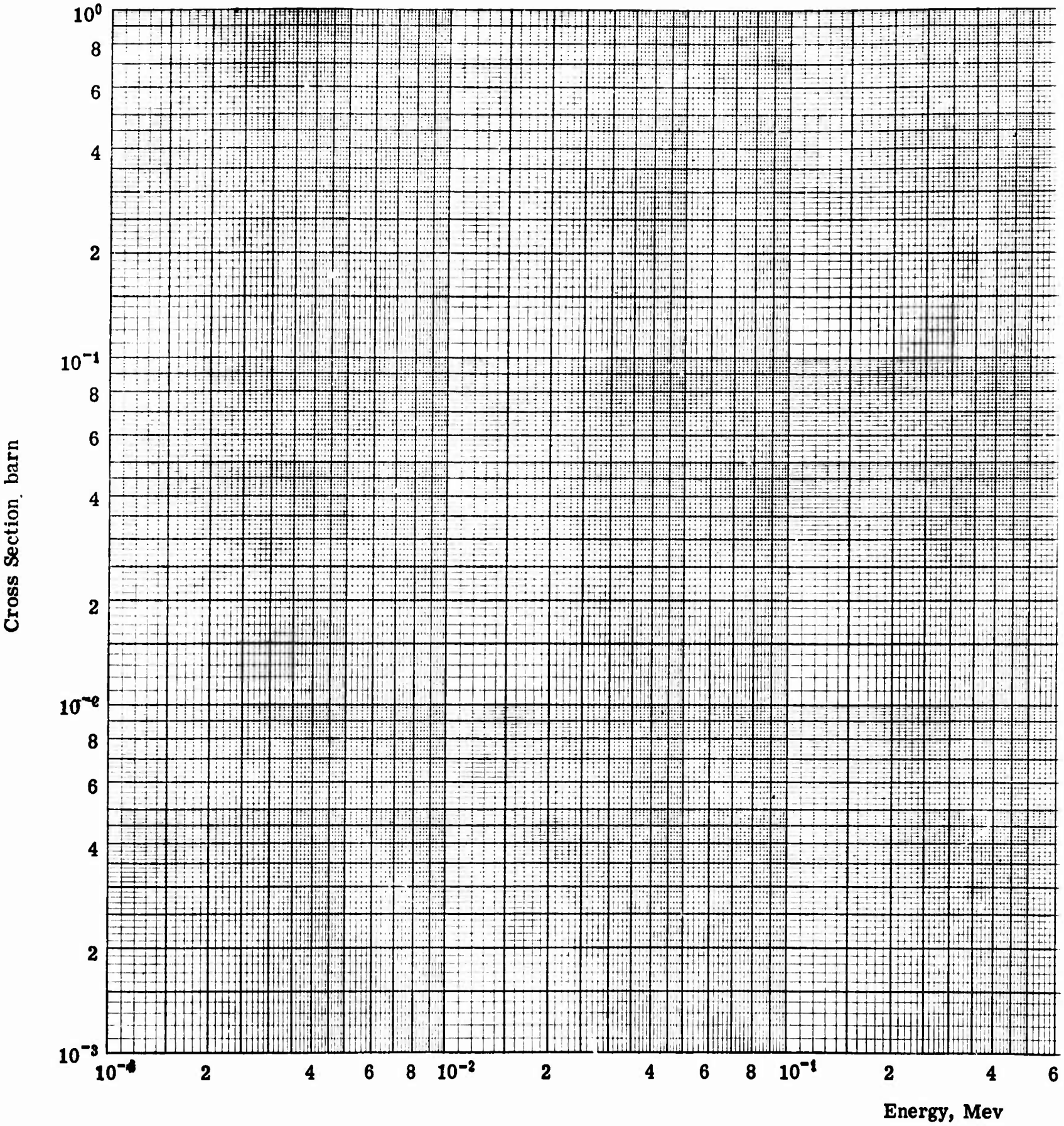
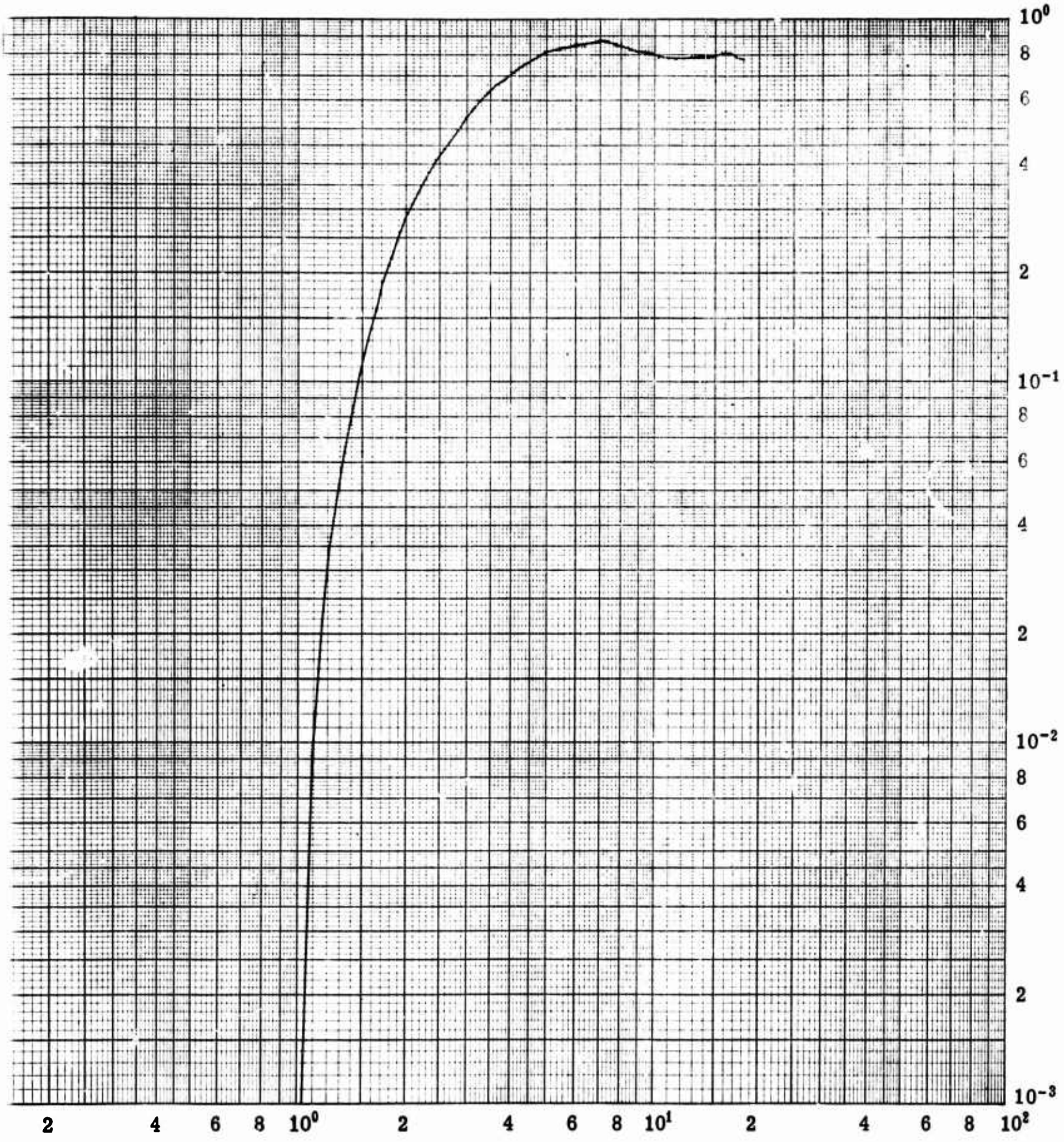


Fig. 9 — Al – Inelastic-Scattering plus



stic-Scattering plus (n,2n) Cross Section

4. SILICON

4.1 NEUTRON CROSS SECTIONS

4.1.1 The Total Cross Section

For neutron energies above 0.5 MeV the data presented in the latest supplement of BNL-325[1] have been used. Between 2.6 MeV and 5.4 MeV the data of Calvi et al.[2] have been used exclusively since it is the most recent and complete set of measurements in this energy interval. Below 0.5 MeV the data were obtained from BNL-325, 2nd Ed.[3] Measurements performed since then, such as Rayburn and Wollan[4] and the earlier tabulation of Howerton,[5] are consistent with these data (see Table 15 and Fig. 10).

4.1.2 The Elastic-Scattering Cross Section

For the entire energy range of interest the elastic-scattering cross section was calculated by

$$\sigma_{n,n} = \sigma_{nT} - \sigma_{nX}$$

4.1.3 The Nonelastic Cross Section

In the energy range below 4.5 MeV the cross section for nonelastic reaction is given by

$$\sigma_{nX} = \sigma_{n,n'} + \sigma_{n,p} + \sigma_{n,\alpha} + \sigma_{n,\gamma}$$

Above 4.5 MeV, the only measurement available is at 14.0 MeV, BNL-325.[1] This point was used along with the data presented for aluminum to give a reasonable representation of the cross section above 4.5 MeV.

4.1.4 The (n,α) Cross Section

Below 8.5 MeV the cross sections for the (n,α) reaction were taken from measurements of Mainsbridge et al.[6] These data are also shown in BNL-325.[1] Above 8.5 MeV the data reported by Colli et al.[7] have been used.

4.1.5 The (n,p) Cross Section

The cross sections for the (n,p) reactions have been obtained from measurements reported in the latest supplement of BNL-325. As for the (n,α) compilation, the data below 8.5 MeV were obtained from Mainsbridge et al. Above 8.5 MeV a smooth curve similar to the one shown in BNL-325 has been used to represent the abundant data available.

4.1.6 The (n,γ) Cross Section

Since the last revision of silicon cross sections reported in UNC-5002,[8] some additional data of Macklin et al.,[9] at 65 keV, have become available. These are consistent with the last compilation which also makes use of some of Macklin's earlier work.

4.1.7 The Absorption Cross Section

The absorption cross section is here taken to be

$$\sigma_{n,\gamma} + \sigma_{n,\alpha} + \sigma_{n,p}$$

A curve is given in Fig. 11.

4.1.8 The Inelastic-Scattering Cross Section

Below 4.5 MeV the cross section for the inelastic-scattering reaction has been obtained from the discrete level excitation data of Lind and Day,[10] and the Rice group.[11] There were also data available from Engesser et al.[12] at 14 MeV. At other energies the data obtained for aluminum were used as guides to draw a reasonable curve for silicon (see Fig. 12).

4.2 ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

Between 0.9 and 4.8 MeV, the data for angular distribution were obtained from BNL-400.[13] Below 0.9 MeV, the data of Lane et al.[14] were used. There was also the work of Martin et al.[15] at 14 MeV. These data compared well with the angular distribution of 14-MeV neutrons from aluminum shown in BNL-400. On this basis the Legendre polynomials calculated for aluminum were also used for silicon above 4.8 MeV. The Legendre coefficients are shown in Table 16.

4.3 SPECTRUM OF INELASTICALLY SCATTERED NEUTRONS

The neutron distribution of inelastically scattered neutrons with incident energies less than 4.5 MeV was governed by the excitation of five levels (1.28, 1.78, 2.02, 2.20, and 2.41 MeV). Cross-section data for these levels were obtained from the work of Lind and Day[10] and the Rice group[11] (see Table 17). For energies greater than 4.5 MeV a continuum of levels was assumed, with parameters:

$a = 2.8\ \text{MeV}^{-1}$

$E_1 = 2\ \text{MeV}$

$E_0 = 10\ \text{MeV}.$

4.4 ENERGY DISTRIBUTION OF GAMMA RAYS FOLLOWING NONELASTIC REACTIONS

4.4.1 Gamma Rays Following Neutron Capture

The spectrum of gamma rays following thermal neutron capture was obtained from a compilation by Troubetzkoy and Goldstein.[16] We assume the same spectrum holds for all incident neutron energies (see Table 18).

4.4.2 Gamma Rays Following Inelastic Scattering

The data for the spectrum of gamma rays following inelastic scattering were obtained from Perkin[17] at energies from 3.5 to 8.5 MeV. Below 3.5 MeV it was calculated from data on discrete levels.[10,11] Above 8.5 MeV the data of Engesser et al. at 14 MeV were used and enabled an extrapolation of the data at lower energies to be made (see Table 19).

4.5 REFERENCES

1. Stehn, J. R. et al.: BNL-325, 2nd Ed., Supplement 2 (1964).
2. Calvi, G. et al.: Nuclear Phys., 48:408 (1963).
3. Hughes, D. J. and Schwartz, R. B.: BNL-325, 2nd Ed. (1958).
4. Rayburn, L. A. and Wollan, E. O.: Nuclear Phys., 61:381 (1965).
5. Howerton, R. J.: UCRL-5226, Part I, Vol. I (1958).
6. Mainsbridge, B. et al.: Nuclear Phys., 48:83 (1963).
7. Colli, L. et al.: Nuclear Phys., 43:529 (1963).
8. Tralli, N. et al.: UNC-5002 (1962).
9. Macklin, R. L. et al.: Phys. Rev., 129:2695 (1963).
10. Lind, D. A. and Day, R. B.: Ann. Physik, 12(3):485 (1961).
11. Hall, H. and Bonner, T. W.: WASH 1028 (1960).
12. Engesser, F. C. et al.: USNRDL-TR-791 (1964).
13. Goldberg, M. D. et al.: BNL-400, 2nd Ed., Vol. I (1962).

14. Lane, R. O. et al.: Ann. Physik, 12:135 (1961), and private communication.

15. Martin, P. W. et al.: Nuclear Phys., 61:524 (1965).

16. Troubetzkoy, E. and Goldstein, H.: ORNL-2904 (May 1960).

17. Perkin, J. L.: Nuclear Phys., 60:561 (1964).

TABLE 15 — Si – NEUTRON CROSS SECTIONS (ALL CROSS SECTIONS IN BARNS)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,\gamma}$
1.8017E 01	1.9500E 00	1.0999E 00		5.5299E-01	1.6707E-01	1.2905E-01	3.5300E-04
1.7139E 01	1.9458E 00	1.0541E 00		5.4832E-01	1.6249E-01	1.2035E-01	3.6184E-04
1.6303E 01	1.9417E 00	1.0144E 00		5.3095E-01	2.2156E-01	1.7426E-01	4.1200E-04
1.5500E 01	1.9448E 00	9.9647E-01		4.9312E-01	2.5340E-01	1.9629E-01	4.4630E-04
1.4751E 01	1.9524E 00	9.7183E-01		4.7452E-01	2.6803E-01	2.1923E-01	4.8226E-04
1.4032E 01	1.9615E 00	9.8871E-01		5.1383E-01	3.1155E-01	2.4692E-01	5.2123E-04
1.3348E 01	1.9855E 00	9.9526E-01		4.9584E-01	3.2800E-01	2.6505E-01	5.6314E-04
1.2697E 01	2.0555E 00	1.0260E 00		4.8522E-01	3.3654E-01	2.8632E-01	6.0043E-04
1.2077E 01	2.2500E 00	1.2359E 00		3.6150E-01	3.4122E-01	3.1002E-01	6.5735E-04
1.1488E 01	2.2500E 00	1.1918E 00		3.9441E-01	3.4577E-01	3.2727E-01	7.1021E-04
1.0928E 01	2.2500E 00	1.2106E 00		3.4921E-01	3.4006E-01	3.4142E-01	7.6732E-04
1.0395E 01	2.2500E 00	1.2293E 00		3.2119E-01	3.4404E-01	3.5460E-01	8.2906E-04
9.8882E 00	2.2500E 00	1.2488E 00		2.9646E-01	3.3652E-01	3.6530E-01	8.9120E-04
9.4059E 00	2.2500E 00	1.2603E 00		2.8985E-01	3.2987E-01	3.8904E-01	9.4790E-04
8.9472E 00	2.2500E 00	1.2805E 00		2.7840E-01	3.1651E-01	3.7159E-01	1.0101E-03
8.5100E 00	2.2501E 00	1.2894E 00		2.9212E-01	2.9631E-01	3.7106E-01	1.0907E-03
8.0957E 00	2.2500E 00	1.3036E 00		3.1535E-01	2.8006E-01	3.6966E-01	1.1701E-03
7.7009E 00	2.2501E 00	1.3247E 00		3.5400E-01	2.1324E-01	3.5677E-01	1.2795E-03
7.3253E 00	2.2500E 00	1.3472E 00		3.9366E-01	1.6703E-01	3.3966E-01	1.3908E-03
6.9681E 00	2.2500E 00	1.3686E 00		4.3401E-01	1.2671E-01	3.1975E-01	1.5092E-03
6.6282E 00	2.2500E 00	1.3863E 00		4.9335E-01	8.5021E-02	2.8365E-01	1.6313E-03
6.3050E 00	2.2500E 00	1.4121E 00		5.8184E-01	5.4182E-02	2.0013E-01	1.7014E-03
5.9975E 00	2.2408E 00	1.4322E 00		6.6879E-01	2.6657E-02	1.1125E-01	1.8975E-03
5.7050E 00	2.1893E 00	1.4169E 00		7.0496E-01	5.3935E-03	2.9990E-02	2.0270E-03
5.4267E 00	2.1771E 00	1.4448E 00		6.9913E-01	2.5259E-04	3.0810E-02	2.1612E-03
5.1621E 00	2.5988E 00	**1.8916E 00**	**0**	**6.8794E-01**	0	1.7121E-02	2.3041E-03
4.9103E 00	2.0573E 00	**1.9693E 00**	**0**	**6.7983E-01**	0	8.1556E-03	2.4845E-03
4.6708E 00	2.7567E 00	**2.0797E 00**	**0**	**6.7423E-01**	0	2.7427E-03	2.6520E-03
4.4430E 00	2.4312E 00	1.7581E 00	6.6976E-01	0	0	5.2356E-04	2.8499E-03
4.2263E 00	2.4386E 00	1.7939E 00	6.4191E-01	0	0	0	3.0500E-03
4.0200E 00	2.3297E 00	1.7344E 00	5.9202E-01	0	0	0	3.2739E-03
3.8242E 00	2.1571E 00	1.5171E 00	6.3649E-01	0	0	0	3.4913E-03
3.6376E 00	1.9057E 00	1.4245E 00	4.7750E-01	0	0	0	3.7100E-03
3.4602E 00	2.4374E 00	1.8106E 00	6.2259E-01	0	0	0	3.9745E-03
3.2915E 00	2.3623E 00	1.5516E 00	7.6615E-01	0	0	0	4.3072E-03
3.1310E 00	2.5605E 00	1.8970E 00	6.5888E-01	0	0	0	4.6087E-03
2.9783E 00	2.3426E 00	1.8360E 00	5.0155E-01	0	0	0	5.0299E-03
2.8330E 00	2.8748E 00	2.2618E 00	6.0767E-01	0	0	0	5.3225E-03
2.6946E 00	2.7462E 00	2.4362E 00	3.0436E-01	0	0	0	5.6200E-03

TABLE 15 — Si (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}$ Continuum	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,\gamma}$
2.5634E 00	3.1116E 00	2.7927E 00	3.1294E-01	0	0	0	5.9358E-03
2.4384E 00	3.0979E 00	2.6421E 00	4.4950E-01	0	0	0	6.2971E-03
2.3195E 00	3.0729E 00	2.7331E 00	3.3316E-01	0	0	0	6.7103E-03
2.2063E 00	3.0482E 00	2.8373E 00	2.0377E-01	0	0	0	7.1506E-03
2.0987E 00	3.0236E 00	2.8455E 00	1.7052E-01	0	0	0	7.6197E-03
1.9964E 00	3.0011E 00	2.9017E 00	9.1260E-02	0	0	0	8.1039E-03
1.8990E 00	2.9879E 00	2.8999E 00	7.9406E-02	0	0	0	8.5591E-03
1.8064E 00	2.9761E 00	2.9505E 00	1.6600E-02	0	0	0	9.0207E-03
1.7183E 00	2.9645E 00	2.9477E 00	7.2172E-03	0	0	0	9.5198E-03
1.6345E 00	2.9526E 00	2.9368E 00	6.0000E-03	0	0	0	1.0040E-02
1.5548E 00	2.9412E 00	2.9247E 00	5.9336E-03	0	0	0	1.0588E-02
1.4790E 00	2.9297E 00	2.9149E 00	3.6411E-03	0	0	0	1.1089E-02
1.4068E 00	2.9182E 00	2.9067E 00	1.4863E-03	0	0	0	1.1427E-02
1.3382E 00	2.9067E 00	2.8949E 00	0	0	0	0	1.1774E-02
1.2730E 00	2.4701E 00	2.4580E 00	0	0	0	0	1.2127E-02
1.2109E 00	3.0852E 00	3.0727E 00	0	0	0	0	1.2493E-02
1.1518E 00	2.2631E 00	2.2502E 00	0	0	0	0	1.2870E-02
1.0956E 00	2.7931E 00	2.7798E 00	0	0	0	0	1.3259E-02
1.0422E 00	3.5310E 00	3.5173E 00	0	0	0	0	1.3659E-02
9.9137E-01	4.7169E 00	4.7029E 00	0	0	0	0	1.4049E-02
9.4302E-01	4.7938E 00	4.7795E 00	0	0	0	0	1.4384E-02
8.9703E-01	3.8832E 00	3.8686E 00	0	0	0	0	1.4686E-02
8.5326E-01	3.5258E 00	3.5110E 00	0	0	0	0	1.4834E-02
8.1167E-01	5.5699E 00	5.5549E 00	0	0	0	0	1.4967E-02
7.7208E-01	3.1744E 00	3.1592E 00	0	0	0	0	1.5259E-02
7.3443E-01	2.6153E 00	2.5997E 00	0	0	0	0	1.5632E-02
6.9861E-01	2.6078E 00	2.5919E 00	0	0	0	0	1.5967E-02
6.6454E-01	2.8070E 00	2.7910E 00	0	0	0	0	1.6067E-02
6.3213E-01	2.9853E 00	2.9692E 00	0	0	0	0	1.6132E-02
6.0130E-01	3.7003E 00	3.6841E 00	0	0	0	0	1.6212E-02
5.7197E-01	6.1827E 00	6.1663E 00	0	0	0	0	1.6405E-02
5.4408E-01	3.4722E 00	3.4556E 00	0	0	0	0	1.6623E-02
5.1754E-01	2.9959E 00	2.9790E 00	0	0	0	0	1.6845E-02
4.9230E-01	3.1909E 00	3.1738E 00	0	0	0	0	1.7071E-02
4.6829E-01	3.2000E 00	3.1827E 00	0	0	0	0	1.7308E-02
4.4545E-01	3.2200E 00	3.2025E 00	0	0	0	0	1.7539E-02
4.2373E-01	3.3004E 00	3.2826E 00	0	0	0	0	1.7753E-02
4.0306E-01	3.3892E 00	3.3712E 00	0	0	0	0	1.7957E-02
3.8341E-01	3.5220E 00	3.5039E 00	0	0	0	0	1.8063E-02

TABLE 15 — Si (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$	E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
3.6471E-01	3.6718E 00	3.6536E 00	1.8138E-02	4.9328E-02	1.4456E 00	1.4315E 00	1.4057E-02
3.4692E-01	3.8387E 00	3.8204E 00	1.8217E-02	4.6950E-02	1.4201E 00	1.4063E 00	1.3798E-02
3.3006E-01	4.0535E 00	4.0352E 00	1.8313E-02	4.4661E-02	1.4015E 00	1.3880E 00	1.3545E-02
3.1391E-01	4.2826E 00	4.2636E 00	1.8411E-02	4.2483E-02	1.4000E 00	1.3867E 00	1.3296E-02
2.9860E-01	4.5410E 00	4.5225E 00	1.8501E-02	4.0411E-02	1.4000E 00	1.3870E 00	1.3047E-02
2.8403E-01	4.9070E 00	4.8884E 00	1.8559E-02	3.8440E-02	1.4000E 00	1.3873E 00	1.2718E-02
2.7018E-01	5.3098E 00	5.2912E 00	1.8614E-02	3.6565E-02	1.4000E 00	1.3876E 00	1.2388E-02
2.5700E-01	5.7457E 00	5.7270E 00	1.8669E-02	3.4782E-02	1.4024E 00	1.3904E 00	1.2047E-02
2.4447E-01	6.3394E 00	6.3207E 00	1.8729E-02	3.3085E-02	1.4144E 00	1.4027E 00	1.1696E-02
2.3255E-01	7.2130E 00	7.1942E 00	1.8796E-02	3.1472E-02	1.4274E 00	1.4160E 00	1.1374E-02
2.2121E-01	8.0782E 00	8.0594E 00	1.8864E-02	2.9937E-02	1.4401E 00	1.4290E 00	1.1061E-02
2.1042E-01	9.1181E 00	9.0991E 00	1.8931E-02	2.8477E-02	1.4513E 00	1.4405E 00	1.0757E-02
2.0016E-01	1.0128E 01	1.0109E 01	1.8981E-02	2.7088E-02	1.4622E 00	1.4517E 00	1.0461E-02
1.9039E-01	1.0253E 01	1.0235E 01	1.8914E-02	2.5767E-02	1.4732E 00	1.4631E 00	1.0173E-02
1.8111E-01	9.7254E 00	9.7066E 00	1.8827E-02	2.4510E-02	1.4869E 00	1.4770E 00	9.8750E-03
1.7228E-01	5.6750E 00	5.6563E 00	1.8740E-02	2.3315E-02	1.5045E 00	1.4949E 00	9.5582E-03
1.6387E-01	2.6800E 00	2.6613E 00	1.8653E-02	2.2178E-02	1.5223E 00	1.5131E 00	9.1923E-03
1.5588E-01	1.2920E 00	1.2734E 00	1.8567E-02	2.1096E-02	1.5404E 00	1.5323E 00	8.8083E-03
1.4828E-01	7.4100E-01	7.2251E-01	1.8487E-02	2.0067E-02	1.5586E 00	1.5517E 00	8.4200E-03
1.4105E-01	4.7556E-01	4.5713E-01	1.8424E-02	1.9089E-02	1.5772E 00	1.5713E 00	8.0434E-03
1.3417E-01	5.3747E-01	5.1911E-01	1.8361E-02	1.8156E-02	1.5960E 00	1.5909E 00	7.6885E-03
1.2762E-01	6.4314E-01	6.2464E-01	1.8300E-02	1.7272E-02	1.6150E 00	1.6107E 00	7.3566E-03
1.2140E-01	7.6514E-01	7.4690E-01	1.8238E-02	1.6430E-02	1.6343E 00	1.6306E 00	7.0299E-03
1.1548E-01	8.4735E-01	8.2917E-01	1.8176E-02	1.5628E-02	1.6538E 00	1.6506E 00	6.7134E-03
1.0985E-01	9.1296E-01	8.9484E-01	1.8115E-02	1.4866E-02	1.6761E 00	1.6734E 00	6.4104E-03
1.0449E-01	9.8364E-01	9.6559E-01	1.8054E-02	1.4141E-02	1.7079E 00	1.7057E 00	6.2426E-03
9.9394E-02	1.0545E 00	1.0365E 00	1.7932E-02	1.3452E-02	1.7409E 00	1.7391E 00	1.8486E-03
9.4547E-02	1.1123E 00	1.0947E 00	1.7573E-02	1.2795E-02	1.7745E 00	1.7730E 00	1.5238E-03
8.9935E-02	1.1841E 00	1.1668E 00	1.7245E-02	1.2171E-02	1.8087E 00	1.8075E 00	1.2501E-03
8.5549E-02	1.3486E 00	1.3309E 00	1.7114E-02	1.1578E-02	1.8436E 00	1.8426E 00	1.0354E-03
8.1377E-02	1.5455E 00	1.5285E 00	1.7020E-02	1.1013E-02	1.8792E 00	1.8784E 00	8.5349E-04
7.7408E-02	1.7176E 00	1.7008E 00	1.6751E-02	1.0476E-02	1.9155E 00	1.9148E 00	7.0366E-04
7.3633E-02	1.8758E 00	1.8595E 00	1.6375E-02	9.9651E-03	1.9467E 00	1.9462E 00	5.9574E-04
7.0042E-02	2.0359E 00	2.0198E 00	1.6016E-02	9.4791E-03	1.9523E 00	1.9517E 00	5.2310E-04
6.6626E-02	2.0574E 00	2.0417E 00	1.5712E-02	9.0166E-03	1.9544E 00	1.9539E 00	4.6309E-04
6.3376E-02	1.9567E 00	1.9413E 00	1.5423E-02	8.5771E-03	1.9565E 00	1.9561E 00	4.1114E-04
6.0286E-02	1.8555E 00	1.8403E 00	1.5190E-02	8.1586E-03	1.9586E 00	1.9582E 00	3.8443E-04
5.7345E-02	1.7178E 00	1.7030E 00	1.4801E-02	7.7609E-03	1.9608E 00	1.9604E 00	3.6599E-04
5.4549E-02	1.5906E 00	1.5760E 00	1.4588E-02	7.3824E-03	1.9629E 00	1.9625E 00	3.4842E-04
5.1888E-02	1.5076E 00	1.4933E 00	1.4320E-02	7.0223E-03	1.9650E 00	1.9647E 00	3.3324E-04

TABLE 15 — Si (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$	E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
6.6796E-03	1.9672E 00	1.9666E 00	3.3296E-04	9.0402E-04	2.0584E 00	2.0575E 00	8.4133E-04
6.3541E-03	1.9693E 00	1.9690E 00	3.3620E-04	8.5993E-04	2.0625E 00	2.0617E 00	8.6203E-04
6.0442E-03	1.9714E 00	1.9711E 00	3.3984E-04	8.1799E-04	2.0667E 00	2.0658E 00	8.8447E-04
5.7494E-03	1.9736E 00	1.9732E 00	3.4604E-04	7.7809E-04	2.0709E 00	2.0700E 00	9.0686E-04
5.4690E-03	1.9757E 00	1.9754E 00	3.5302E-04	7.4015E-04	2.0751E 00	2.0741E 00	9.2982E-04
5.2023E-03	1.9779E 00	1.9775E 00	3.6014E-04	7.0405E-04	2.0793E 00	2.0783E 00	9.5335E-04
4.9485E-03	1.9800E 00	1.9796E 00	3.6740E-04	6.6971E-04	2.0835E 00	2.0825E 00	9.7749E-04
4.7072E-03	1.9822E 00	1.9818E 00	3.7480E-04	6.3705E-04	2.0877E 00	2.0867E 00	1.0021E-03
4.4776E-03	1.9843E 00	1.9839E 00	3.8236E-04	6.0598E-04	2.0919E 00	2.0909E 00	1.0276E-03
4.2592E-03	1.9865E 00	1.9861E 00	3.9007E-04	5.7643E-04	2.0961E 00	2.0951E 00	1.0530E-03
4.0515E-03	1.9886E 00	1.9882E 00	3.9796E-04	5.4831E-04	2.1004E 00	2.0993E 00	1.0803E-03
3.8539E-03	1.9908E 00	1.9904E 00	4.0748E-04	5.2157E-04	2.1046E 00	2.1035E 00	1.1076E-03
3.6660E-03	1.9930E 00	1.9925E 00	4.1779E-04	4.9613E-04	2.1089E 00	2.1078E 00	1.1357E-03
3.4872E-03	1.9951E 00	1.9947E 00	4.2837E-04	4.7194E-04	2.1132E 00	2.1120E 00	1.1644E-03
3.3171E-03	1.9973E 00	1.9966E 00	4.3921E-04	4.4892E-04	2.1174E 00	2.1162E 00	1.1939E-03
3.1553E-03	1.9995E 00	1.9990E 00	4.5033E-04	4.2703E-04	2.1217E 00	2.1205E 00	1.2241E-03
3.0014E-03	2.0016E 00	2.0012E 00	4.6173E-04	4.0620E-04	2.1260E 00	2.1248E 00	1.2551E-03
2.8551E-03	2.0036E 00	2.0033E 00	4.7342E-04	3.8639E-04	2.1303E 00	2.1290E 00	1.2869E-03
2.7158E-03	2.0060E 00	2.0055E 00	4.8541E-04	3.6755E-04	2.1346E 00	2.1333E 00	1.3195E-03
2.5834E-03	2.0082E 00	2.0077E 00	4.9769E-04	3.4962E-04	2.1389E 00	2.1376E 00	1.3529E-03
2.4574E-03	2.0103E 00	2.0098E 00	5.1029E-04	3.3257E-04	2.1433E 00	2.1419E 00	1.3871E-0
2.3375E-03	2.0125E 00	2.0120E 00	5.2321E-04	3.1635E-04	2.1476E 00	2.1462E 00	1.4222E-0
2.2235E-03	2.0147E 00	2.0142E 00	5.3646E-04	3.0092E-04	2.1520E 00	2.1505E 00	1.4582E-0
2.1151E-03	2.0169E 00	2.0164E 00	5.5004E-04	2.8624E-04	2.1563E 00	2.1548E 00	1.4952E-03
2.0119E-03	2.0191E 00	2.0185E 00	5.6396E-04	2.7228E-04	2.1607E 00	2.1591E 00	1.5330E-03
1.9138E-03	2.0213E 00	2.0207E 00	5.7824E-04	2.5901E-04	2.1650E 00	2.1635E 00	1.5718E-03
1.8205E-03	2.0235E 00	2.0229E 00	5.9288E-04	2.4637E-04	2.1694E 00	2.1678E 00	1.6116E-03
1.7317E-03	2.0257E 00	2.0251E 00	6.0789E-04	2.3436E-04	2.1738E 00	2.1722E 00	1.6524E-03
1.6472E-03	2.0279E 00	2.0273E 00	6.2327E-04	2.2293E-04	2.1782E 00	2.1765E 00	1.6942E-03
1.5669E-03	2.0301E 00	2.0294E 00	6.3905E-04	2.1206E-04	2.1826E 00	2.1809E 00	1.7371E-03
1.4905E-03	2.0323E 00	2.0316E 00	6.5523E-04	2.0171E-04	2.1870E 00	2.1853E 00	1.7811E-03
1.4178E-03	2.0345E 00	2.0338E 00	6.7182E-04	1.9188E-04	2.1915E 00	2.1896E 00	1.8262E-03
1.3486E-03	2.0367E 00	2.0360E 00	6.8883E-04	1.8252E-04	2.1959E 00	2.1940E 00	1.8724E-03
1.2829E-03	2.0389E 00	2.0382E 00	7.0626E-04	1.7362E-04	2.2003E 00	2.1984E 00	1.9198E-03
1.2203E-03	2.0411E 00	2.0404E 00	7.2414E-04	1.6515E-04	2.2048E 00	2.2028E 00	1.9684E-03
1.1608E-03	2.0434E 00	2.0426E 00	7.4247E-04	1.5709E-04	2.2093E 00	2.2072E 00	2.0182E-03
1.1042E-03	2.0456E 00	2.0448E 00	7.6127E-04	1.4943E-04	2.2137E 00	2.2117E 00	2.0697E-03
1.0503E-03	2.0478E 00	2.0470E 00	7.8054E-04	1.4215E-04	2.2182E 00	2.2161E 00	2.1224E-03
9.9909E-04	2.0503E 00	2.0495E 00	8.0021E-04	1.3521E-04	2.2227E 00	2.2205E 00	2.1765E-03
9.5037E-04	2.0542E 00	2.0534E 00	8.2096E-04	1.2862E-04	2.2272E 00	2.2250E 00	2.2319E-03
				1.2235E-04	2.2317E 00	2.2294E 00	2.2887E-03

TABLE 15 — Si (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$	E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
1.1638E-04	2.2362E 00	2.2339E 00	2.3470E-03	1.4982E-05	2.2500E 00	2.2434E 00	6.5689E-03
1.1070E-04	2.2407E 00	2.2383E 00	2.4068E-03	1.4251E-05	2.2500E 00	2.2433E 00	6.7331E-03
1.0530E-04	2.2453E 00	2.2428E 00	2.4680E-03	1.3556E-05	2.2500E 00	2.2431E 00	6.9015E-03
1.0017E-04	2.2493E 00	2.2468E 00	2.5309E-03	1.2895E-05	2.2500E 00	2.2429E 00	7.0741E-03
9.5283E-05	2.2500E 00	2.2474E 00	2.5993E-03	1.2266E-05	2.2500E 00	2.2427E 00	7.2510E-03
9.0636E-05	2.2500E 00	2.2473E 00	2.6614E-03	1.1668E-05	2.2500E 00	2.2426E 00	7.4323E-03
8.6215E-05	2.2500E 00	2.2473E 00	2.7291E-03	1.1099E-05	2.2500E 00	2.2424E 00	7.6182E-03
8.2011E-05	2.2500E 00	2.2472E 00	2.7986E-03	1.0558E-05	2.2500E 00	2.2422E 00	7.8087E-03
7.8011E-05	2.2500E 00	2.2471E 00	2.8699E-03	1.0043E-05	2.2500E 00	2.2420E 00	8.0040E-03
7.4206E-05	2.2500E 00	2.2471E 00	2.9430E-03	9.5529E-06	2.2500E 00	2.2418E 00	8.2041E-03
7.0587E-05	2.2500E 00	2.2470E 00	3.0179E-03	9.0870E-06	2.2500E 00	2.2416E 00	8.4093E-03
6.7145E-05	2.2500E 00	2.2469E 00	3.0947E-03	8.6438E-06	2.2500E 00	2.2414E 00	8.6196E-03
6.3870E-05	2.2500E 00	2.2468E 00	3.1735E-03	8.2223E-06	2.2500E 00	2.2412E 00	8.8351E-03
6.0755E-05	2.2500E 00	2.2467E 00	3.2543E-03	7.8213E-06	2.2500E 00	2.2409E 00	9.0561E-03
5.7792E-05	2.2500E 00	2.2467E 00	3.3372E-03	7.4398E-06	2.2500E 00	2.2407E 00	9.2826E-03
5.4973E-05	2.2500E 00	2.2466E 00	3.4222E-03	7.0770E-06	2.2500E 00	2.2405E 00	9.5147E-03
5.2292E-05	2.2500E 00	2.2465E 00	3.5093E-03	6.7318E-06	2.2500E 00	2.2402E 00	9.7526E-03
4.9742E-05	2.2500E 00	2.2464E 00	3.5986E-03	6.4035E-06	2.2500E 00	2.2400E 00	9.9955E-03
4.7316E-05	2.2500E 00	2.2463E 00	3.6903E-03	6.0912E-06	2.2500E 00	2.2398E 00	1.0248E-02
4.5008E-05	2.2500E 00	2.2462E 00	3.7842E-03	5.7941E-06	2.2500E 00	2.2395E 00	1.0505E-02
4.2813E-05	2.2500E 00	2.2461E 00	3.8806E-03	5.5116E-06	2.2500E 00	2.2392E 00	1.0769E-02
4.0725E-05	2.2500E 00	2.2460E 00	3.9794E-03	5.2428E-06	2.2500E 00	2.2390E 00	1.1040E-02
3.8739E-05	2.2500E 00	2.2459E 00	4.0807E-03	4.9871E-06	2.2500E 00	2.2387E 00	1.1317E-02
3.6850E-05	2.2500E 00	2.2458E 00	4.1846E-03	4.7438E-06	2.2500E 00	2.2384E 00	1.1602E-02
3.5053E-05	2.2500E 00	2.2457E 00	4.2911E-03	4.5125E-06	2.2500E 00	2.2381E 00	1.1893E-02
3.3343E-05	2.2500E 00	2.2456E 00	4.4004E-03	4.2924E-06	2.2500E 00	2.2378E 00	1.2192E-02
3.1717E-05	2.2500E 00	2.2455E 00	4.5124E-03	4.0831E-06	2.2500E 00	2.2375E 00	1.2499E-02
3.0170E-05	2.2500E 00	2.2454E 00	4.6273E-03	3.8839E-06	2.2500E 00	2.2372E 00	1.2813E-02
2.8699E-05	2.2500E 00	2.2453E 00	4.7451E-03	3.6945E-06	2.2500E 00	2.2369E 00	1.3135E-02
2.7299E-05	2.2500E 00	2.2451E 00	4.8659E-03	3.5143E-06	2.2500E 00	2.2365E 00	1.3465E-02
2.5968E-05	2.2500E 00	2.2450E 00	4.9898E-03	3.3429E-06	2.2500E 00	2.2362E 00	1.3803E-02
2.4701E-05	2.2500E 00	2.2449E 00	5.1169E-03	3.1799E-06	2.2500E 00	2.2359E 00	1.4150E-02
2.3496E-05	2.2500E 00	2.2448E 00	5.2472E-03	3.0248E-06	2.2500E 00	2.2355E 00	1.4506E-02
2.2350E-05	2.2500E 00	2.2446E 00	5.3808E-03	2.8773E-06	2.2500E 00	2.2351E 00	1.4871E-02
2.1260E-05	2.2500E 00	2.2445E 00	5.5177E-03	2.7370E-06	2.2500E 00	2.2348E 00	1.5244E-02
2.0224E-05	2.2500E 00	2.2443E 00	5.6582E-03	2.6035E-06	2.2500E 00	2.2344E 00	1.5627E-02
1.9237E-05	2.2500E 00	2.2442E 00	5.8023E-03	2.4765E-06	2.2500E 00	2.2340E 00	1.6020E-02
1.8299E-05	2.2500E 00	2.2441E 00	5.9496E-03	2.3557E-06	2.2500E 00	2.2336E 00	1.6423E-02
1.7407E-05	2.2500E 00	2.2439E 00	6.0997E-03	2.2408E-06	2.2500E 00	2.2332E 00	1.6836E-02
1.6558E-05	2.2500E 00	2.2437E 00	6.2523E-03	2.1315E-06	2.2500E 00	2.2327E 00	1.7259E-02
1.5750E-05	2.2500E 00	2.2436E 00	6.4080E-03	2.0276E-06	2.2500E 00	2.2323E 00	1.7693E-02

TABLE 15 — Si (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$	E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
1.9287E-06	2.2500E 00	2.2319E 00	1.8157E-02	2.6102E-07	2.2500E 00	2.2006E 00	4.9409E-02
1.8346E-06	2.2500E 00	2.2314E 00	1.8593E-02	2.4829E-07	2.2500E 00	2.1993E 00	5.0675E-02
1.7452E-06	2.2500E 00	2.2309E 00	1.9060E-02	2.3618E-07	2.2500E 00	2.1980E 00	5.1973E-02
1.6601E-06	2.2500E 00	2.2305E 00	1.9539E-02	2.2466E-07	2.2500E 00	2.1967E 00	5.3304E-02
1.5791E-06	2.2500E 00	2.2300E 00	2.0030E-02	2.1371E-07	2.2500E 00	2.1953E 00	5.4670E-02
1.5021E-06	2.2500E 00	2.2295E 00	2.0534E-02	2.0328E-07	2.2500E 00	2.1939E 00	5.6070E-02
1.4288E-06	2.2500E 00	2.2289E 00	2.1050E-02	1.9337E-07	2.2500E 00	2.1925E 00	5.7507E-02
1.3591E-06	2.2500E 00	2.2284E 00	2.1579E-02	1.8394E-07	2.2500E 00	2.1910E 00	5.8980E-02
1.2929E-06	2.2500E 00	2.2279E 00	2.2121E-02	1.7497E-07	2.2500E 00	2.1895E 00	6.0490E-02
1.2298E-06	2.2500E 00	2.2273E 00	2.2677E-02	1.6643E-07	2.2500E 00	2.1880E 00	6.2040E-02
1.1698E-06	2.2500E 00	2.2268E 00	2.3247E-02	1.5832E-07	2.2500E 00	2.1864E 00	6.3629E-02
1.1129E-06	2.2500E 00	2.2262E 00	2.3831E-02	1.5060E-07	2.2500E 00	2.1847E 00	6.5259E-02
1.0588E-06	2.2500E 00	2.2256E 00	2.4430E-02	1.4325E-07	2.2500E 00	2.1831E 00	6.6931E-02
1.0069E-06	2.2500E 00	2.2250E 00	2.5044E-02	1.3627E-07	2.2500E 00	2.1814E 00	6.8645E-02
9.5777E-07	2.2500E 00	2.2243E 00	2.5674E-02	1.2962E-07	2.2500E 00	2.1795E 00	7.0404E-02
9.1105E-07	2.2500E 00	2.2237E 00	2.6319E-02	1.2330E-07	2.2500E 00	2.1773E 00	7.2207E-02
8.6662E-07	2.2500E 00	2.2230E 00	2.6981E-02	1.1728E-07	2.2500E 00	2.1750E 00	7.4057E-02
8.2436E-07	2.2500E 00	2.2223E 00	2.7659E-02	1.1156E-07	2.2500E 00	2.1726E 00	7.5954E-02
7.8415E-07	2.2500E 00	2.2216E 00	2.8354E-02	1.0612E-07	2.2500E 00	2.1701E 00	7.7899E-02
7.4591E-07	2.2500E 00	2.2209E 00	2.9066E-02	1.0095E-07	2.2500E 00	2.1701E 00	7.9903E-02
7.0953E-07	2.2500E 00	2.2202E 00	2.9795E-02	9.6024E-08	2.2500E 00	2.1671E 00	8.2920E-02
6.7493E-07	2.2500E 00	2.2194E 00	3.0556E-02	9.1341E-08	2.2500E 00	2.1585E 00	8.1435E-02
6.4201E-07	2.2500E 00	2.2187E 00	3.1339E-02	8.6887E-08	2.2500E 00	2.1491E 00	1.0093E-01
6.1070E-07	2.2500E 00	2.2179E 00	3.2142E-02	8.2649E-08	2.2500E 00	2.1392E 00	1.1085E-01
5.8091E-07	2.2500E 00	2.2170E 00	3.2965E-02	7.8618E-08	2.2500E 00	2.1293E 00	1.2074E-01
5.5259E-07	2.2500E 00	2.2162E 00	3.3810E-02	7.4794E-08	2.2500E 00	2.1200E 00	1.2999E-01
5.2563E-07	2.2500E 00	2.2153E 00	3.4676E-02	7.1137E-08	2.2500E 00	2.1103E 00	1.3975E-01
5.0000E-07	2.2500E 00	2.2144E 00	3.5564E-02	6.7667E-08	2.2500E 00	2.1011E 00	1.4868E-01
4.7561E-07	2.2500E 00	2.2135E 00	3.6475E-02	6.4357E-08	2.2500E 00	2.0924E 00	1.5705E-01
4.5242E-07	2.2500E 00	2.2126E 00	3.7409E-02	6.1228E-08	2.2500E 00	2.0852E 00	1.6480E-01
4.3035E-07	2.2500E 00	2.2116E 00	3.8367E-02	5.8242E-08	2.2500E 00	2.0791E 00	1.7093E-01
4.0930E-07	2.2500E 00	2.2106E 00	3.9350E-02	5.5401E-08	2.2500E 00	2.0730E 00	1.7705E-01
3.8940E-07	2.2500E 00	2.2095E 00	4.0358E-02	5.2699E-08	2.2500E 00	2.0662E 00	1.8386E-01
3.7041E-07	2.2500E 00	2.2086E 00	4.1392E-02	5.0129E-08	2.2500E 00	2.0601E 00	1.8993E-01
3.5234E-07	2.2500E 00	2.2075E 00	4.2452E-02	4.7684E-08	2.2500E 00	2.0541E 00	1.9593E-01
3.3519E-07	2.2500E 00	2.2065E 00	4.3540E-02	4.5359E-08	2.2500E 00	2.0481E 00	2.0193E-01
3.1881E-07	2.2500E 00	2.2053E 00	4.4655E-02	4.3147E-08	2.2500E 00	2.0419E 00	2.0805E-01
3.0326E-07	2.2500E 00	2.2042E 00	4.5799E-02	4.1042E-08	2.2500E 00	2.0352E 00	2.1480E-01
2.8847E-07	2.2500E 00	2.2030E 00	4.6972E-02	3.9041E-08	2.2500E 00	2.0291E 00	2.2093E-01
2.7440E-07	2.2500E 00	2.2018E 00	4.8175E-02	3.7137E-08	2.2500E 00	2.0230E 00	2.2700E-01

TABLE 16 — Si – LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8
1.8017E 01	7.1000E-01	5.2000E-01	4.2499E-01	3.6000E-01	8.9999E-01	8.3996E-01	1.4039E-01	0.0000E+00
1.7130E 01	7.1000E-01	5.2000E-01	4.2289E-01	3.6000E-01	2.9741E-01	2.3394E-01	1.3600E-01	0.0000E+00
1.6303E 01	7.0996E-01	5.2000E-01	4.2077E-01	3.5999E-01	2.9493E-01	2.2732E-01	1.3070E-01	0.0000E+00
1.5508E 01	7.0638E-01	5.2000E-01	4.1879E-01	3.5903E-01	2.9286E-01	2.2114E-01	1.2181E-01	0.0000E+00
1.4751E 01	7.0070E-01	5.2000E-01	4.1690E-01	3.5752E-01	2.8954E-01	2.1433E-01	1.1108E-01	0.0000E+00
1.4032E 01	6.9342E-01	5.1986E-01	4.1493E-01	3.5594E-01	2.8695E-01	2.0552E-01	1.0239E-01	0.0000E+00
1.3348E 01	6.7246E-01	5.1871E-01	4.1178E-01	3.5342E-01	2.8339E-01	1.9028E-01	9.2339E-02	0.0000E+00
1.2697E 01	6.4277E-01	5.1711E-01	4.0704E-01	3.5082E-01	2.7927E-01	1.7426E-01	8.2864E-02	0.0000E+00
1.2077E 01	6.2611E-01	5.1518E-01	4.0065E-01	3.4814E-01	2.6824E-01	1.5908E-01	7.4229E-02	0.0000E+00
1.1488E 01	6.2332E-01	5.1248E-01	3.9243E-01	3.4346E-01	2.5442E-01	1.4464E-01	6.6442E-02	0.0000E+00
1.0928E 01	6.2145E-01	5.0967E-01	3.8402E-01	3.3841E-01	2.4376E-01	1.3091E-01	5.9154E-02	0.0000E+00
1.0395E 01	6.1761E-01	5.0701E-01	3.7602E-01	3.3361E-01	2.3363E-01	1.1784E-01	5.2221E-02	0.0000E+00
9.8882E 00	6.0726E-01	5.0447E-01	3.6779E-01	3.2729E-01	2.2160E-01	1.0516E-01	4.5815E-02	0.0000E+00
9.4059E 00	5.9529E-01	5.0206E-01	3.5824E-01	3.1647E-01	2.0369E-01	9.2412E-02	4.0235E-02	0.0000E+00
8.9472E 00	5.8503E-01	4.9935E-01	3.4865E-01	3.0591E-01	1.8621E-01	8.0248E-02	3.4957E-02	0.0000E+00
8.5108E 00	5.7925E-01	4.9516E-01	3.3790E-01	2.9587E-01	1.6961E-01	6.8678E-02	2.9936E-02	0.0000E+00
8.0957E 00	5.6764E-01	4.9107E-01	3.2733E-01	2.8628E-01	1.5373E-01	5.7669E-02	2.5178E-02	0.0000E+00
7.7009E 00	5.4734E-01	4.8853E-01	3.1323E-01	2.7635E-01	1.3646E-01	4.7054E-02	2.1057E-02	0.0000E+00
7.3253E 00	5.2990E-01	4.8669E-01	2.9820E-01	2.6658E-01	1.1918E-01	3.6907E-02	1.7299E-02	0.0000E+00
6.9681E 00	5.1859E-01	4.8399E-01	2.8302E-01	2.5676E-01	1.0378E-01	2.7957E-02	1.3929E-02	0.0000E+00
6.6282E 00	5.0533E-01	4.7765E-01	2.6478E-01	2.4513E-01	9.3703E-02	2.2486E-02	1.1610E-02	0.0000E+00
6.3050E 00	4.9618E-01	4.7118E-01	2.4699E-01	2.3381E-01	8.4267E-02	1.7634E-02	9.5079E-03	0.0000E+00
5.9975E 00	4.9025E-01	4.6447E-01	2.3007E-01	2.2253E-01	7.5258E-02	1.3695E-02	7.5633E-03	0.0000E+00
5.7050E 00	4.8592E-01	4.5480E-01	2.1397E-01	2.0872E-01	6.8005E-02	1.3972E-02	6.0427E-03	0.0000E+00
5.4267E 00	4.8222E-01	4.4509E-01	1.9866E-01	1.9508E-01	6.1634E-02	1.4900E-02	5.2624E-03	0.0000E+00
5.1621E 00	4.7917E-01	4.3579E-01	1.8409E-01	1.8210E-01	5.6306E-02	1.9782E-02	4.9563E-03	0.0000E+00
4.9103E 00	4.7634E-01	4.3239E-01	1.7964E-01	1.6627E-01	5.1280E-02	1.6629E-02	6.6734E-03	0.0000E+00
4.6708E 00	5.0446E-01	4.8339E-01	2.0815E-01	1.4529E-01	4.4892E-02	2.2471E-02	5.5271E-03	0.0000E+00
4.4430E 00	5.3305E-01	5.0622E-01	2.2227E-01	1.2511E-01	3.8356E-02	2.3536E-02	2.8678E-03	0.0000E+00
4.2263E 00	4.9902E-01	3.7304E-01	1.6657E-01	1.0603E-01	4.3472E-02	4.2906E-03	5.0057E-04	0.0000E+00
4.0202E 00	4.5750E-01	2.7977E-01	1.0122E-01	9.2364E-02	2.2150E-02	0	0	0
3.8242E 00	4.4338E-01	2.4815E-01	8.2939E-02	8.0593E-02	1.8162E-03	0	0	0
3.6376E 00	4.9685E-01	3.0498E-01	1.3302E-01	6.9395E-02	0	0	0	0
3.4602E 00	5.8502E-01	3.8362E-01	1.6402E-01	5.9545E-02	0	0	0	0
3.2915E 00	5.5458E-01	3.8500E-01	1.3392E-01	5.2329E-02	0	0	0	0
3.1310E 00	5.1924E-01	3.8500E-01	9.6898E-02	4.5582E-02	0	0	0	0
2.9783E 00	4.8533E-01	3.8410E-01	6.5010E-02	3.9524E-02	0	0	0	0
2.8330E 00	4.5200E-01	3.8004E-01	5.1782E-02	3.5043E-02	0	0	0	0
2.6948E 00	4.2020E-01	3.7590E-01	4.3974E-02	3.0896E-02	0	0	0	0
2.5634E 00	3.8995E-01	3.7195E-01	4.1300E-02	2.6950E-02	0	0	0	0
2.4384E 00	3.6298E-01	3.6639E-01	4.0000E-02	2.3197E-02	0	0	0	0
2.3195E 00	3.3918E-01	3.5926E-01	4.0000E-02	1.9628E-02	0	0	0	0
2.2063E 00	3.1654E-01	3.5246E-01	4.0000E-02	1.6232E-02	0	0	0	0
2.0987E 00	2.9501E-01	3.4600E-01	4.0000E-02	1.3002E-02	0	0	0	0

Note: Values of f_9 through f_{12} are given on page 98.

TABLE 16 — Si (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6	f_7	f_8
1.9964E 00	2.7507E-01	3.3841E-01	4.0000E-02	1.0066E-03	0	0	0	0
1.8990E 00	2.5903E-01	3.2346E-01	4.0000E-02	8.0041E-03	0	0	0	0
1.8064E 00	2.4421E-01	3.0811E-01	4.0000E-02	6.1506E-03	0	0	0	0
1.7183E 00	2.3435E-01	2.9350E-01	4.0000E-02	4.3876E-03	0	0	0	0
1.6345E 00	2.3214E-01	2.4640E-01	3.9585E-02	2.7105E-03	0	0	0	0
1.5548E 00	2.3173E-01	1.3456E-01	-2.0172E-02	1.1191E-03	0	0	0	0
1.4790E 00	2.5064E-01	9.5708E-02	-2.4487E-02	3.8476E-05	0	0	0	0
1.4068E 00	2.6854E-01	6.7871E-02	-2.3127E-02	0	0	0	0	0
1.3382E 00	2.5143E-01	7.3213E-02	-1.7539E-02	0	0	0	0	0
1.2730E 00	2.2572E-01	8.9427E-02	-8.9931E-03	0	0	0	0	0
1.2109E 00	2.2929E-01	8.1746E-02	-8.1175E-03	0	0	0	0	0
1.1518E 00	3.1578E-01	7.7098E-02	-8.0609E-03	0	0	0	0	0
1.0956E 00	3.9404E-01	1.0249E-01	-6.1960E-04	0	0	0	0	0
1.0422E 00	3.5682E-01	1.0582E-01	-2.6519E-03	0	0	0	0	0
9.9137E-01	3.3269E-01	8.9373E-02	-3.3699E-03	0	0	0	0	0
9.4302E-01	2.7378E-01	4.2363E-02	1.8077E-03	0	0	0	0	0
8.9703E-01	2.6310E-01	2.1066E-02	6.8182E-03	0	0	0	0	0
8.5328E-01	2.7013E-01	1.1148E-02	1.1016E-02	0	0	0	0	0
8.1167E-01	2.4332E-01	4.0388E-03	1.0137E-02	0	0	0	0	0
7.7208E-01	2.1101E-01	8.9931E-04	8.1864E-03	0	0	0	0	0
7.3443E-01	1.8693E-01	2.9794E-03	6.3307E-03	0	0	0	0	0
6.9861E-01	1.6638E-01	5.4098E-03	4.6568E-03	0	0	0	0	0
6.6454E-01	1.8057E-01	1.4473E-02	4.1684E-03	0	0	0	0	0
6.3213E-01	2.2938E-01	2.9044E-02	8.4386E-04	0	0	0	0	0
6.0130E-01	3.1584E-01	6.6763E-02	7.3791E-03	0	0	0	0	0
5.7197E-01	2.2867E-01	1.0589E-01	4.9586E-03	0	0	0	0	0
5.4408E-01	-8.8983E-02	4.7937E-02	5.5392E-03	0	0	0	0	0
5.1754E-01	4.1688E-02	-2.4964E-02	8.5686E-03	0	0	0	0	0
4.9230E-01	7.1318E-02	-1.7518E-02	-4.5419E-04	0	0	0	0	0
4.6829E-01	8.0514E-02	-1.2546E-02	-2.6306E-03	0	0	0	0	0
4.4545E-01	8.3978E-02	-5.1314E-03	4.0583E-04	0	0	0	0	0
4.2373E-01	8.5943E-02	-4.4412E-03	-1.7973E-04	0	0	0	0	0
4.0306E-01	8.7727E-02	-4.1956E-03	-9.6111E-04	0	0	0	0	0
3.8341E-01	8.9423E-02	-3.9020E-03	-1.7044E-03	0	0	0	0	0
3.6471E-01	8.7693E-02	-3.9291E-03	-2.4038E-03	0	0	0	0	0
3.4692E-01	7.8711E-02	-2.6551E-03	-3.0548E-03	0	0	0	0	0
3.3000E-01	6.9907E-02	-1.8073E-03	-3.0729E-03	0	0	0	0	0
3.1391E-01	6.1533E-02	-1.0009E-03	-2.8603E-03	0	0	0	0	0
2.9860E-01	5.3567E-02	-2.3381E-04	-2.8194E-03	0	0	0	0	0
2.8403E-01	4.6897E-02	-4.8409E-04	-2.4929E-03	0	0	0	0	0
2.7018E-01	4.1028E-02	-2.1019E-03	-2.0736E-03	0	0	0	0	0
2.5700E-01	3.7015E-02	-3.6[illegible]E-03	-1.[illegible]E-03	0	0	0	0	0
2.4447E-01	3.2437E-02	-5.1835E-03	-1.[illegible]E-04	0	0	0	0	0
2.[illegible]	2.8003E-02	-6.[illegible]	[illegible]	0	0	0	0	0

TABLE 16 — Si (CONTINUED)

E, MeV	f_1	f_2	f_3
2.2121E+01	2.3941E-02	-7.8577E-03	2.4293E-03
2.1042E+01	2.0041E-02	-9.1482E-03	3.4615E-03
2.0016E+01	1.6629E-02	-1.0540E-02	3.2966E-03
1.9039E+01	1.3442E-02	-1.1896E-02	2.9112E-03
1.8111E+01	1.0411E-02	-1.3187E-02	2.5447E-03
1.7228E+01	7.5274E-03	-1.4414E-02	2.1960E-03
1.6387E+01	4.7845E-03	-1.5582E-02	1.8643E-03
1.5588E+01	2.1755E-03	-1.6692E-02	1.5488E-03
1.4828E+01	-3.0638E-04	-1.7749E-02	1.2487E-03
1.4105E+01	-2.6672E-03	-1.8754E-02	9.6328E-04
1.3417E+01	-4.9128E-03	-1.9710E-02	6.9174E-04
1.2762E+01	-6.2058E-03	-2.0341E-02	5.2471E-04
1.2140E+01	-6.0336E-03	-2.0481E-02	5.1701E-04
1.1548E+01	-5.8485E-03	-2.0607E-02	5.1316E-04
1.0985E+01	-5.6724E-03	-2.0727E-02	5.0894E-04
1.0449E+01	-5.5049E-03	-2.0841E-02	5.0492E-04
9.9394E+02	-5.3455E-03	-2.0949E-02	5.0109E-04
9.4547E+02	-5.1939E-03	-2.1052E-02	4.9745E-04
8.9935E+02	-5.0497E-03	-2.1150E-02	4.9399E-04
8.5549E+02	-4.9126E-03	-2.1243E-02	4.9070E-04
8.1377E+02	-4.7821E-03	-2.1332E-02	4.8757E-04
7.7408E+02	-4.6580E-03	-2.1417E-02	4.8459E-04
7.3633E+02	-4.5400E-03	-2.1497E-02	4.8176E-04
7.0042E+02	-4.4277E-03	-2.1573E-02	4.7906E-04
6.6626E+02	-4.3209E-03	-2.1646E-02	4.7650E-04
6.3376E+02	-4.2193E-03	-2.1715E-02	4.7406E-04
6.0286E+02	-4.1226E-03	-2.1781E-02	4.7174E-04
5.7345E+02	-4.0307E-03	-2.1843E-02	4.6954E-04
5.4549E+02	-3.9432E-03	-2.1903E-02	4.6744E-04
5.1888E+02	-3.8600E-03	-2.1959E-02	4.6544E-04
4.9358E+02	-3.7908E-03	-2.2274E-02	1.2141E-03
4.6950E+02	-4.4493E-03	-2.3208E-02	3.7464E-03
4.4661E+02	-4.9420E-03	-2.4129E-02	6.2365E-03
4.2483E+02	-5.4105E-03	-2.4996E-02	8.6051E-03
4.0411E+02	-5.8563E-03	-2.5826E-02	1.0858E-02
3.8441E+02	-6.2803E-03	-2.6614E-02	1.3002E-02
3.6565E+02	-6.6836E-03	-2.7365E-02	1.5040E-02
3.4782E+02	-7.0673E-03	-2.8079E-02	1.6980E-02
3.3085E+02	-7.4322E-03	-2.8758E-02	1.8824E-02
3.1472E+02	-7.7793E-03	-2.9403E-02	2.0579E-02
2.9937E+02	-8.0077E-03	-2.9634E-02	2.1892E-02
2.8477E+02	-7.6936E-03	-2.7850E-02	2.1282E-02
2.7088E+02	-7.3183E-03	-2.5864E-02	2.0434E-02
2.5767E+02	-6.9614E-03	-2.3976E-02	1.9628E-02

E, MeV	f_1	f_2	f_3
2.4511E+02	-6.6210E-03	-2.2179E-02	1.8861E-02
2.3319E+02	-6.2998E-03	-2.0471E-02	1.8131E-02
2.2178E+02	-5.9918E-03	-1.8848E-02	1.7437E-02
2.1090E+02	-5.6965E-03	-1.7299E-02	1.6777E-02
2.0047E+02	-5.4216E-03	-1.5828E-02	1.6149E-02
1.9089E+02	-5.1572E-03	-1.4420E-02	1.5551E-02
1.8158E+02	-4.9056E-03	-1.3090E-02	1.4983E-02
1.7272E+02	-4.6664E-03	-1.1833E-02	1.4443E-02
1.6430E+02	-4.4388E-03	-1.0629E-02	1.3928E-02
1.5628E+02	-4.2223E-03	-9.4832E-03	1.3439E-02
1.4866E+02	-4.0164E-03	-8.3936E-03	1.2974E-02
1.4141E+02	-3.8205E-03	-7.3572E-03	1.2532E-02
1.3452E+02	-3.6342E-03	-6.3715E-03	1.2111E-02
1.2795E+02	-3.4569E-03	-5.4336E-03	1.1710E-02
1.2171E+02	-3.2883E-03	-4.5415E-03	1.1329E-02
1.1578E+02	-3.1280E-03	-3.6930E-03	1.0967E-02
1.1013E+02	-2.9754E-03	-2.8858E-03	1.0622E-02
1.0476E+02	-2.8303E-03	-2.1180E-03	1.0294E-02
9.9651E+03	-2.6923E-03	-1.3877E-03	9.2593E-03
9.4791E+03	-2.5610E-03	-6.9294E-04	4.8506E-03
9.0160E+03	-2.4361E-03	-9.7387E-05	6.8171E-04
8.5771E+03	-2.3173E-03	0	0
8.1588E+03	-2.2042E-03	0	0
7.7609E+03	-2.0967E-03	0	0
7.3824E+03	-1.9949E-03	0	0
7.0223E+03	-1.8972E-03	0	0
6.6798E+03	-1.8047E-03	0	0
6.3541E+03	-1.7167E-03	0	0
6.0442E+03	-1.6329E-03	0	0
5.7494E+03	-1.5533E-03	0	0
5.4690E+03	-1.4775E-03	0	0
5.2023E+03	-1.4055E-03	0	0
4.9485E+03	-1.3369E-03	0	0
4.7072E+03	-1.2717E-03	0	0
4.4776E+03	-1.2097E-03	0	0
4.2592E+03	-1.1507E-03	0	0
4.0515E+03	-1.0946E-03	0	0
3.8539E+03	-1.0412E-03	0	0
3.6660E+03	-9.9043E-04	0	0
3.4872E+03	-9.4213E-04	0	0
3.3171E+03	-8.9618E-04	0	0
3.1553E+03	-8.5247E-04	0	0
3.0014E+03	-8.1090E-04	0	0
2.8551E+03	-7.7135E-04	0	0

TABLE 16 — Si (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 16 — Si (CONTINUED)

E, MeV	f_1	E, MeV	f_1
3.1799E+06	-8.5911E-07	3.3516E+07	-0.0549E-08
3.0240E+06	-8.1721E-07	3.1881E+07	-8.6133E-08
2.8773E+06	-7.7735E-07	3.0326E+07	-8.1932E-08
2.7370E+06	-7.3944E-07	2.8847E+07	-7.7937E-08
2.6035E+06	-7.0338E-07	2.7440E+07	-7.4136E-08
2.4765E+06	-6.6907E-07	2.6102E+07	-7.0520E-08
2.3557E+06	-6.3644E-07	2.4829E+07	-6.7081E-08
2.2408E+06	-6.0540E-07	2.3610E+07	-6.3809E-08
2.1315E+06	-5.7588E-07	2.2466E+07	-6.0697E-08
2.0276E+06	-5.4779E-07	2.1371E+07	-5.7737E-08
1.9287E+06	-5.2108E-07	2.0328E+07	-5.4921E-08
1.8346E+06	-4.9566E-07	1.9337E+07	-5.2242E-08
1.7452E+06	-4.7149E-07	1.8394E+07	-4.9695E-08
1.6601E+06	-4.4849E-07	1.7497E+07	-4.7271E-08
1.5791E+06	-4.2662E-07	1.6643E+07	-4.4965E-08
1.5021E+06	-4.0581E-07	1.5832E+07	-4.2772E-08
1.4288E+06	-3.8602E-07	1.5060E+07	-4.0686E-08
1.3591E+06	-3.6720E-07	1.4325E+07	-3.8702E-08
1.2928E+06	-3.4929E-07	1.3627E+07	-3.6815E-08
1.2298E+06	-3.3225E-07	1.2962E+07	-3.5019E-08
1.1698E+06	-3.1605E-07	1.2330E+07	-3.3311E-08
1.1128E+06	-3.0063E-07	1.1728E+07	-3.1687E-08
1.0585E+06	-2.8597E-07	1.1156E+07	-3.0141E-08
1.0069E+06	-2.7203E-07	1.0612E+07	-2.8671E-08
9.5777E+07	-2.5876E-07	1.0095E+07	-2.7273E-08
9.1105E+07	-2.4614E-07	9.6024E+08	-2.5943E-08
8.6662E+07	-2.3413E-07	9.1341E+08	-2.4678E-08
8.2436E+07	-2.2272E-07	8.6887E+08	-2.3474E-08
7.8415E+07	-2.1185E-07	8.2649E+08	-2.2329E-08
7.4591E+07	-2.0152E-07	7.8618E+08	-2.1240E-08
7.0953E+07	-1.9169E-07	7.4784E+08	-2.0204E-08
6.7493E+07	-1.8234E-07	7.1137E+08	-1.9219E-08
6.4201E+07	-1.7345E-07	6.7667E+08	-1.8282E-08
6.1070E+07	-1.6499E-07	6.4367E+08	-1.7390E-08
5.8091E+07	-1.5694E-07	6.1228E+08	-1.6542E-08
5.5258E+07	-1.4929E-07	5.8242E+08	-1.5735E-08
5.2563E+07	-1.4201E-07	5.5401E+08	-1.4968E-08
5.0000E+07	-1.3508E-07	5.2699E+08	-1.4238E-08
4.7561E+07	-1.2850E-07	5.0129E+08	-1.3543E-08
4.5242E+07	-1.2223E-07	4.7684E+08	-1.2883E-08
4.3035E+07	-1.1627E-07	4.5359E+08	-1.2255E-08
4.0936E+07	-1.1060E-07	4.3147E+08	-1.1657E-08
3.8940E+07	-1.0520E-07	4.1042E+08	-1.1088E-08
3.7041E+07	-1.0007E-07	3.9041E+08	-1.0546E-08

3.7041E-07	-1.0007E-07	3.9041E-08	-1.0548E-08
3.9234E-07	-9.5192E-08	3.7137E-08	-1.0027E-08

TABLE 16 — Si (CONTINUED)

E, MeV	f_9	f_{10}	f_{11}	f_{12}
1.8017E 01	2.2195E-02	6.5977E-03	2.9987E-03	7.4962E-04
1.7139E 01	2.0635E-02	5.8242E-03	2.5690E-03	6.2411E-04
1.6303E 01	1.8745E-02	5.0800E-03	2.1549E-03	5.3116E-04
1.5508E 01	1.6311E-02	4.4622E-03	1.7587E-03	4.3968E-04
1.4751E 01	1.3662E-02	3.9324E-03	1.3803E-03	3.4508E-04
1.4032E 01	1.1177E-02	3.4285E-03	1.0341E-03	2.5852E-04
1.3348E 01	9.0679E-03	2.9492E-03	8.0679E-04	2.0170E-04
1.2697E 01	7.2616E-03	2.4932E-03	6.1137E-04	1.5284E-04
1.2077E 01	5.7514E-03	2.0634E-03	4.2939E-04	1.0735E-04
1.1488E 01	4.7434E-03	1.6973E-03	2.9912E-04	7.4779E-05
1.0928E 01	3.9024E-03	1.3610E-03	1.8699E-04	4.6747E-05
1.0395E 01	3.1024E-03	1.0410E-03	8.0326E-05	2.0081E-05
9.8882E 00	2.4045E-03	7.6179E-04	4.0562E-06	1.0140E-06
9.4059E 00	1.9118E-03	5.6471E-04	0	0
8.9472E 00	1.4619E-03	3.8111E-04	0	0
8.5108E 00	1.0645E-03	2.0645E-04	0	0
8.0957E 00	6.9199E-04	4.5425E-05	0	0
7.7009E 00	3.6457E-04	0	0	0
7.3253E 00	7.5573E-05	0	0	0
6.9681E 00	0	0	0	0

Note: Values of f_1 through f_8 are given on pages 93 through 97.

TABLE 17 — Si – FRACTION OF DISCRETE LEVEL EXCITATION CORRESPONDING TO LEVEL OF ENERGY E_ν

	E_γ, MeV				
E, MeV	1.28	1.78	2.02	2.20	2.41
4.4430E 00	0	1.0000E 00	0	0	0
4.2263E 00	0	1.0000E 00	0	0	0
4.0202E 00	0	1.0000E 00	0	0	0
3.8242E 00	0	1.0000E 00	0	0	0
3.6376E 00	0	1.0000E 00	0	0	0
3.4602E 00	0	9.9362E-01	6.3826E-03	0	0
3.2915E 00	0	9.7673E-01	2.2108E-02	0	1.1929E-03
3.1310E 00	0	9.5249E-01	3.9478E-02	2.8973E-04	7.7856E-03
2.9783E 00	0	9.1730E-01	5.9052E-02	5.6099E-03	1.7982E-02
2.8330E 00	0	9.5144E-01	3.3950E-02	4.2307E-03	1.0383E-02
2.6948E 00	0	9.2282E-01	5.2406E-02	1.2551E-02	1.2218E-02
2.5634E 00	0	9.1876E-01	4.5972E-02	2.5915E-02	9.3505E-03
2.4384E 00	0	9.6639E-01	1.9177E-02	1.1859E-02	2.5758E-03
2.3195E 00	0	9.7319E-01	2.2076E-02	4.7361E-03	0
2.2063E 00	0	9.9485E-01	1.5198E-02	0	0
2.0987E 00	0	1.0000E 00	0	0	0
1.9964E 00	1.5811E-02	9.8419E-01	0	0	0
1.8990E 00	2.3817E-02	9.7618E-01	0	0	0
1.8064E 00	4.5653E-01	5.4347E-01	0	0	0
1.7183E 00	1.0000E 00	0	0	0	0
1.6345E 00	1.0000E 00	0	0	0	0
1.5546E 00	1.0000E 00	0	0	0	0
1.4790E 00	1.0000E 00	0	0	0	0
1.4068E 00	1.0000E 00	0	0	0	0
1.3382E 00	0	0	0	0	0

TABLE 18 — Si – NUMBER OF γ-RAYS EMITTED PER ABSORPTION

Eγ, MeV	
1.28	.16
2.10	.13
2.65	.11
3.54	.60
4.2	.10
4.93	.75
5.11	.08
6.11	.025
6.40	.11
7.18	.08
8.47	.02
10.60	.002

TABLE 19 — Si – NUMBER OF γ-RAYS EMITTED PER NEUTR

	E_γ, MeV								
E, MeV	.75	1.25	1.75	2.25	2.75	3.25	3.75	4.25	4.'
1,80200E 01	,0300	,0300	,6000	,0210	,0600	0	,0300	,0400	,0
1,40000E 01	,0500	,0300	,6530	,0280	,0700	0	,0260	,0300	,0
1,09000E 01	,0500	,0350	,6700	,0400	,0820	,0080	,0120	,0240	,0
8,51000E 00	,0400	,0280	,6900	,0480	,0660	,0180	0	,0110	,0
6,63000E 00	,0230	,0180	,8000	,0520	,0700	,0420	0	,0070	,0
5,16000E 00	,0120	,0070	,8600	,0970	,0320	,0310	0	,0020	,0
4,02000E 00	,0050	,0010	,8700	,1100	,0100	,0090	0	0	
3,13000E 00	0	0	,8700	,1300	0	0	0	0	
2,44000E 00	0	0	,9700	,0300	0	0	0	0	
1,70000E 00	0	,0030	,9970	0	0	0	0	0	
1,48000E 00	0	1,0000	0	0	0	0	0	0	
1,15000E 00	0	0	0	0	0	0	0	0	
8,97000E-01	0	0	0	0	0	0	0	0	
1,00000E-03	0	0	0	0	0	0	0	0	

TED PER NEUTRON-PRODUCING REACTION

	E$_\gamma$, MeV							
5	4.25	4.75	5.25	5.75	6.25	6.75	7.25	7.75
0	.0400	.0050	.0620	0	0	.1000	.0500	.0060
0	.0300	.0150	.0520	0	0	.0790	.0350	.0120
0	.0240	.0390	.0440	.0020	0	.0400	.0260	0
0	.0110	.0340	.0280	.0070	.0190	.0190	.0190	0
0	.0070	.0120	.0150	.0020	.0050	0	0	0
0	.0020	.0010	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

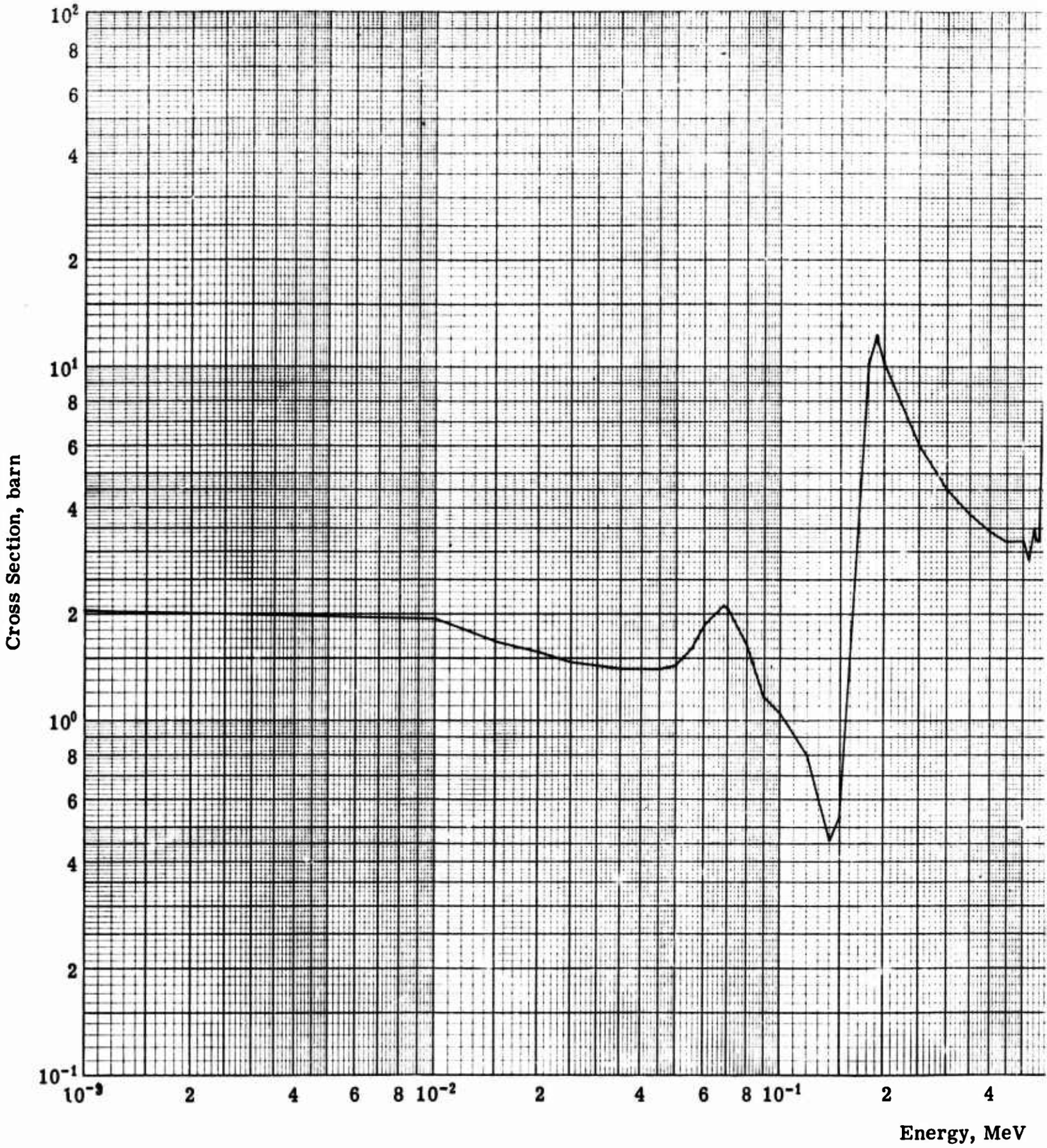
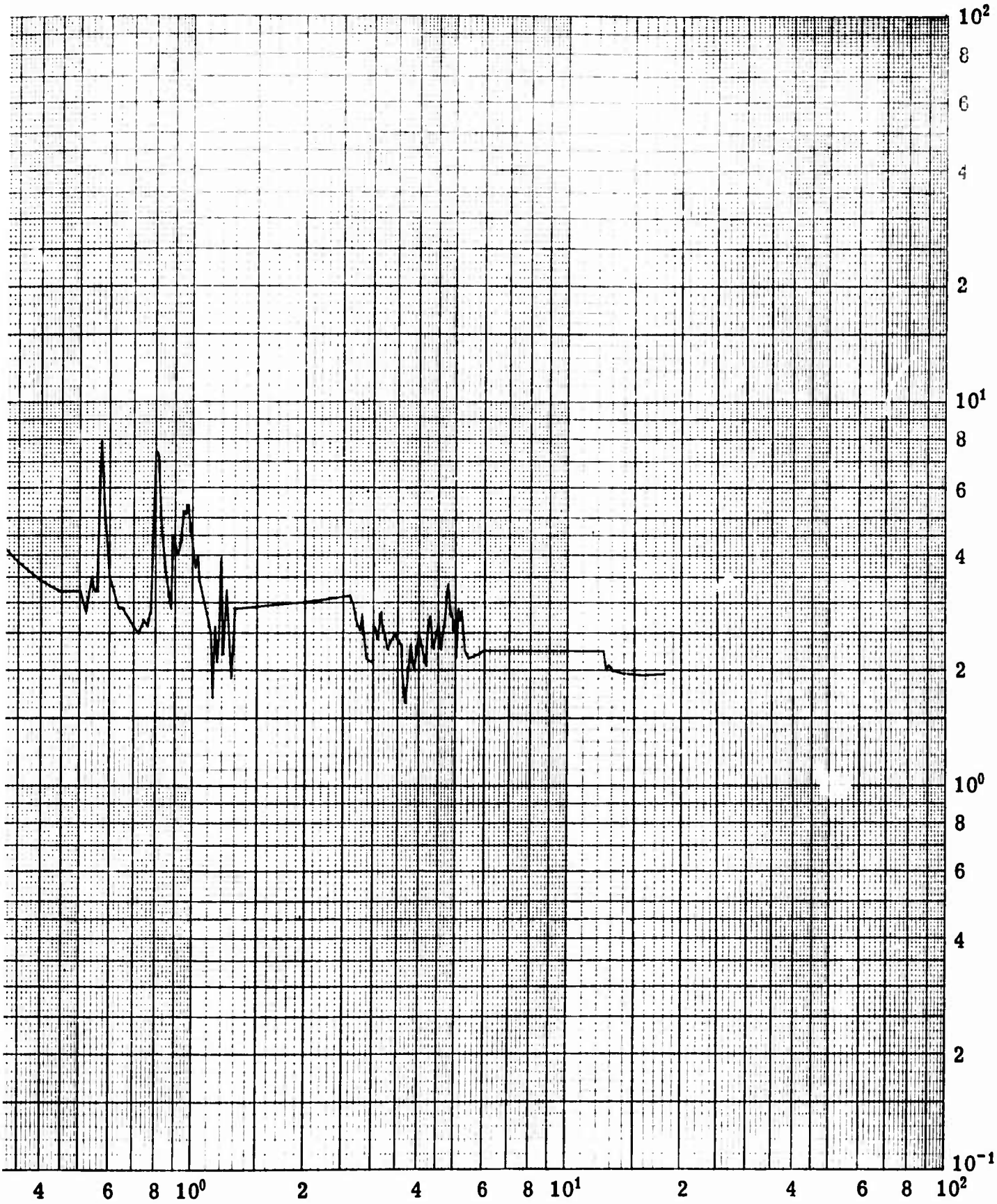


Fig. 10(a) — Si – Total Cross Section



y, MeV

s Section – High Energy Part

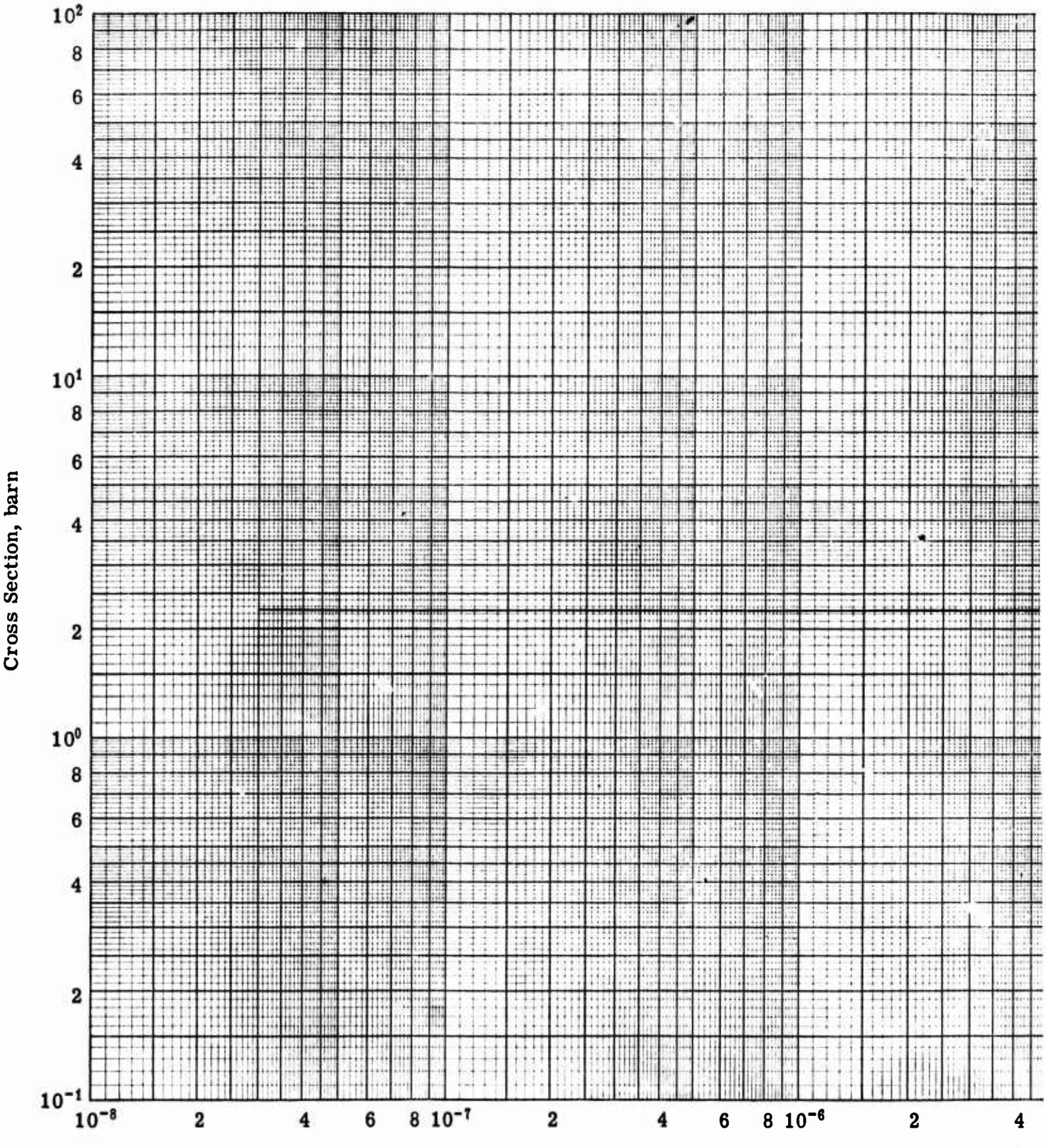
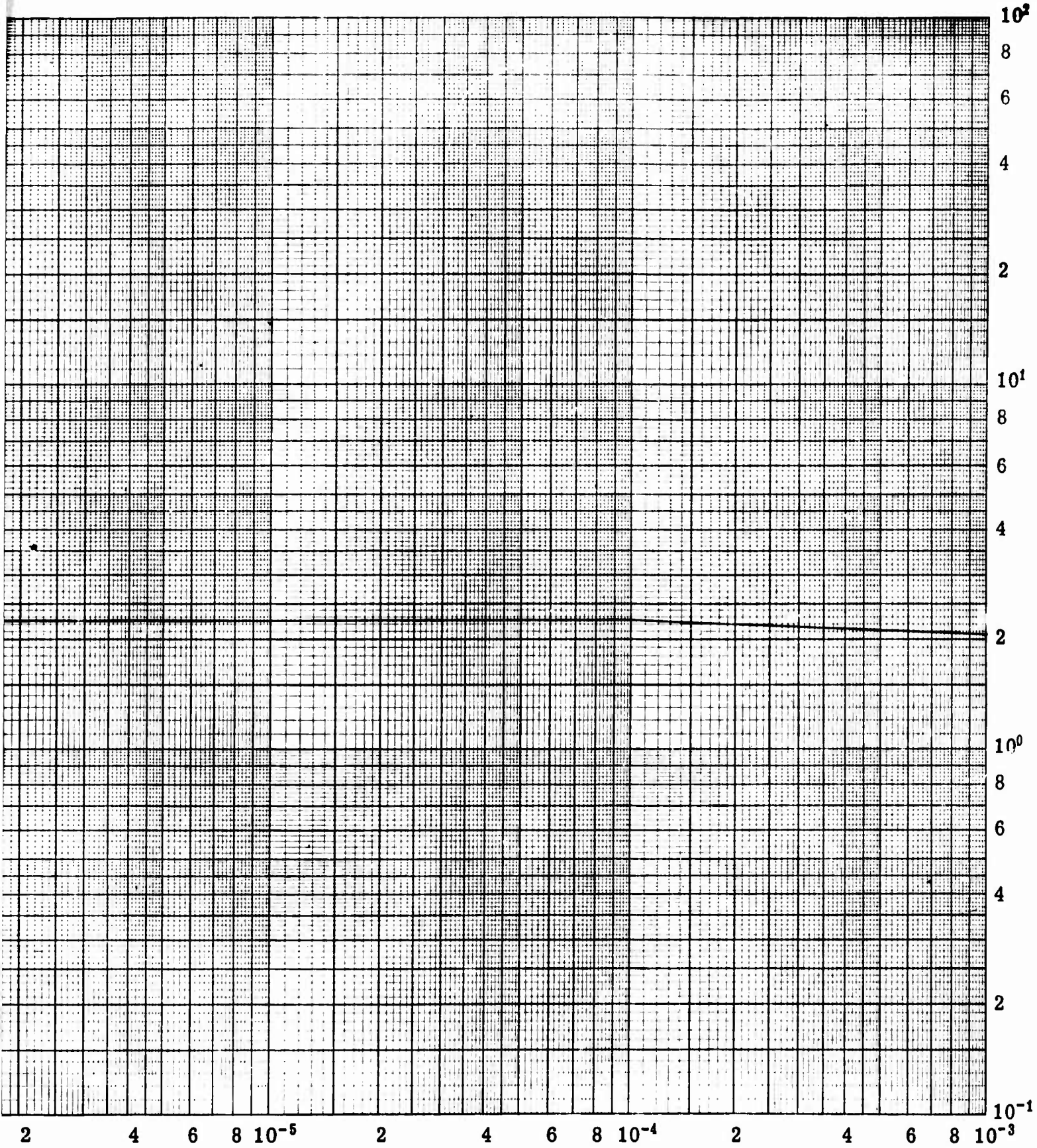


Fig. 10(b) — Si – Total Cross Sect



otal Cross Section – Low Energy Part

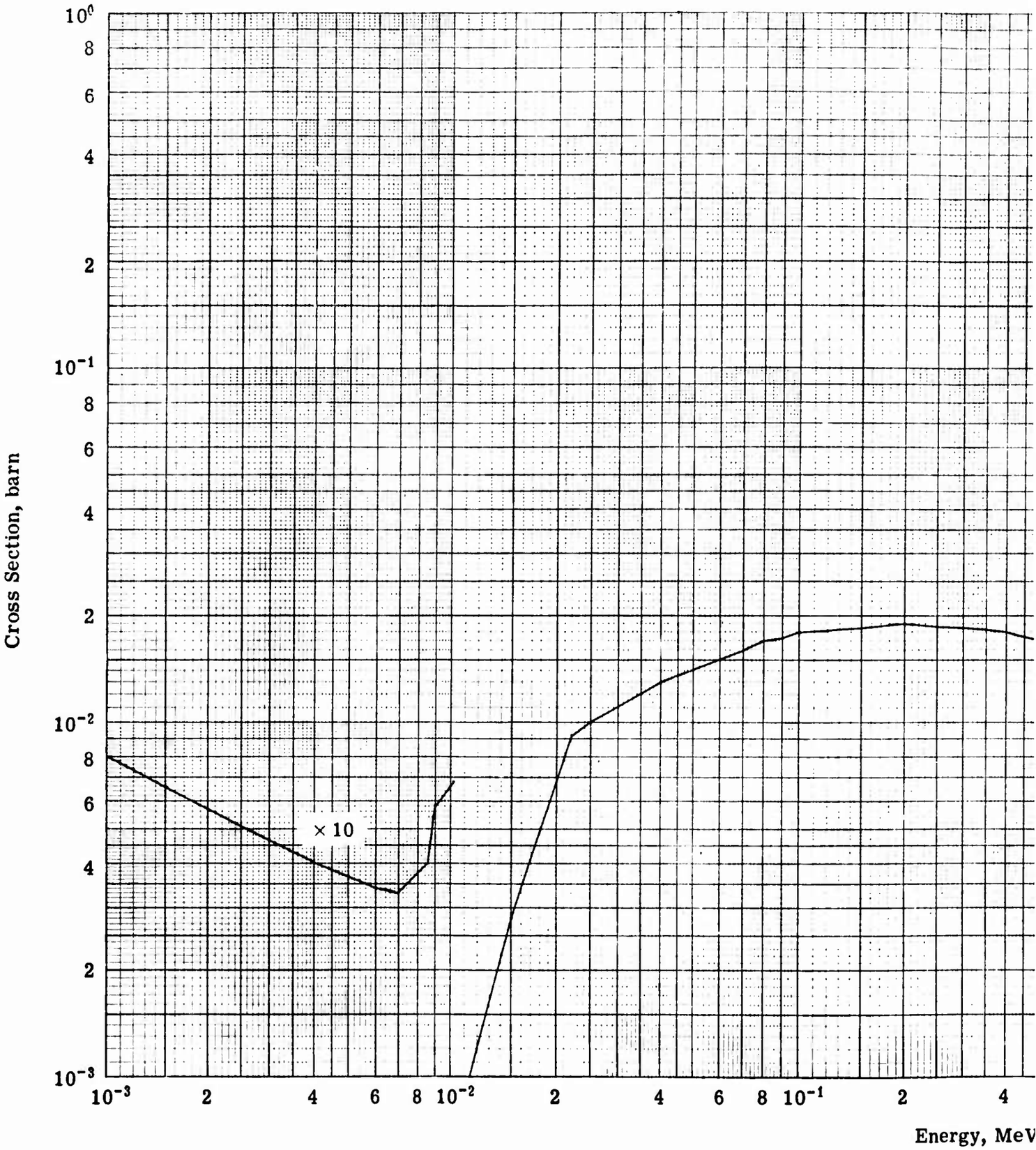
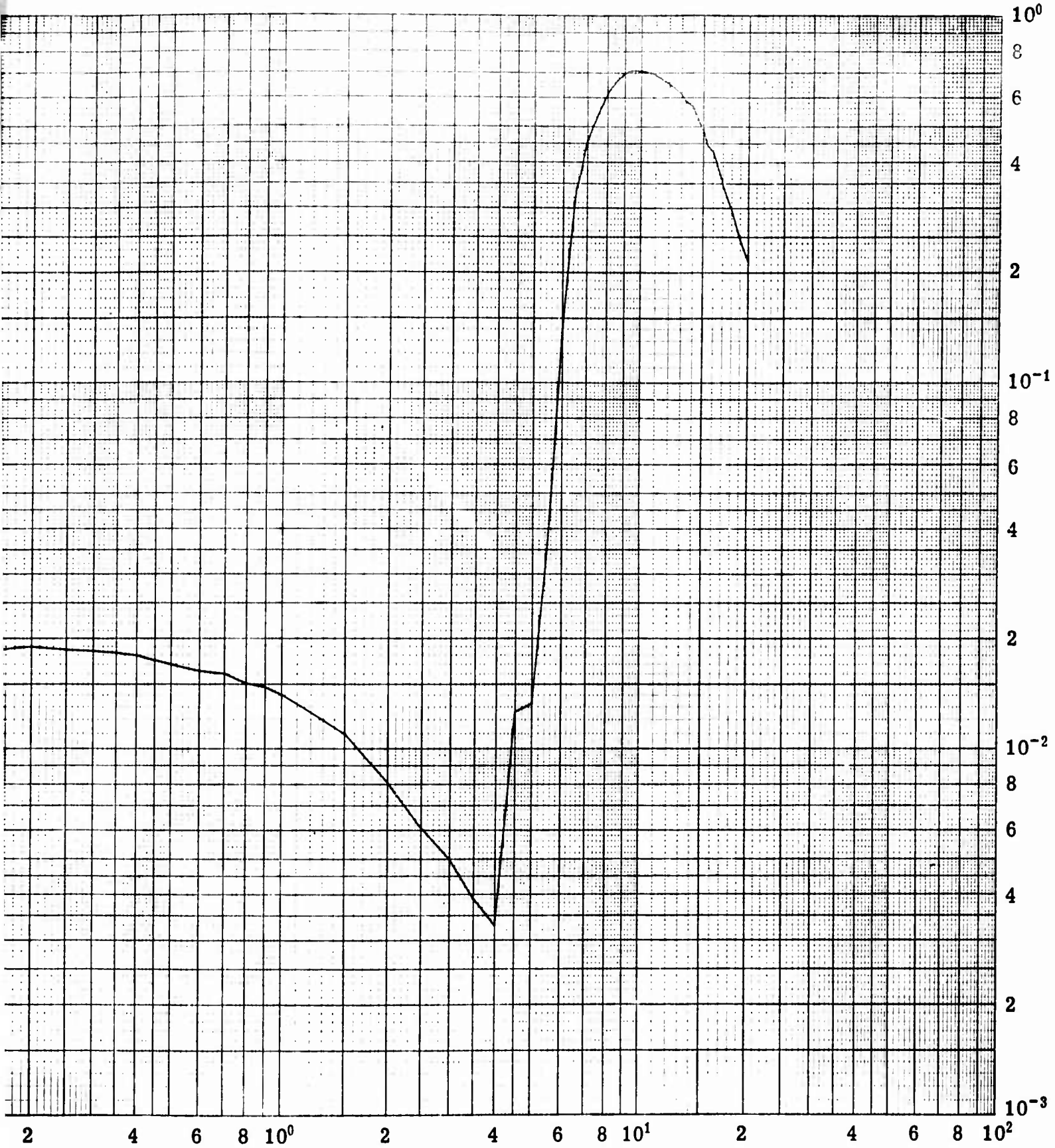


Fig. 11(a) — Si – Absorption Cross Se



rption Cross Section – High Energy Part

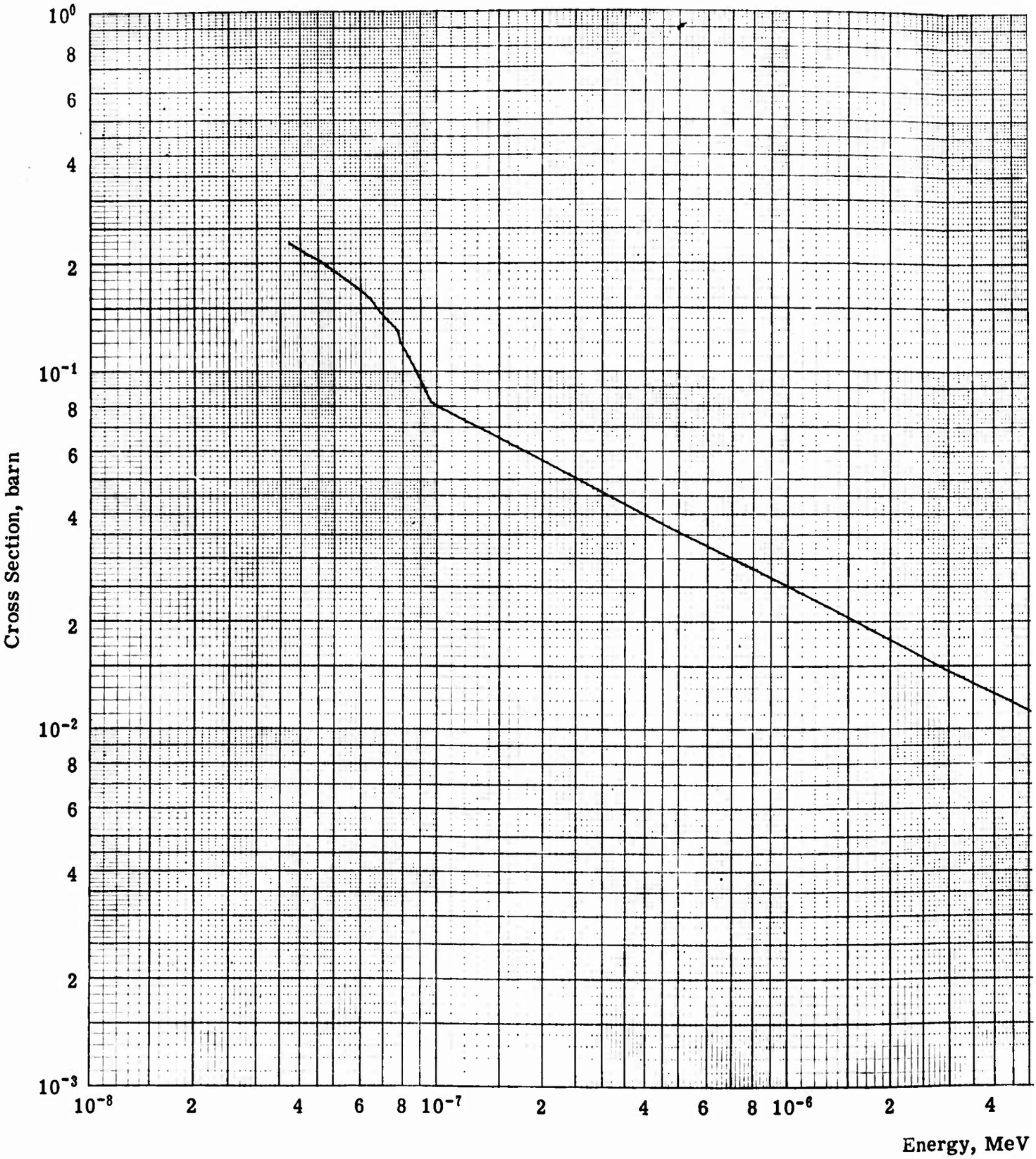
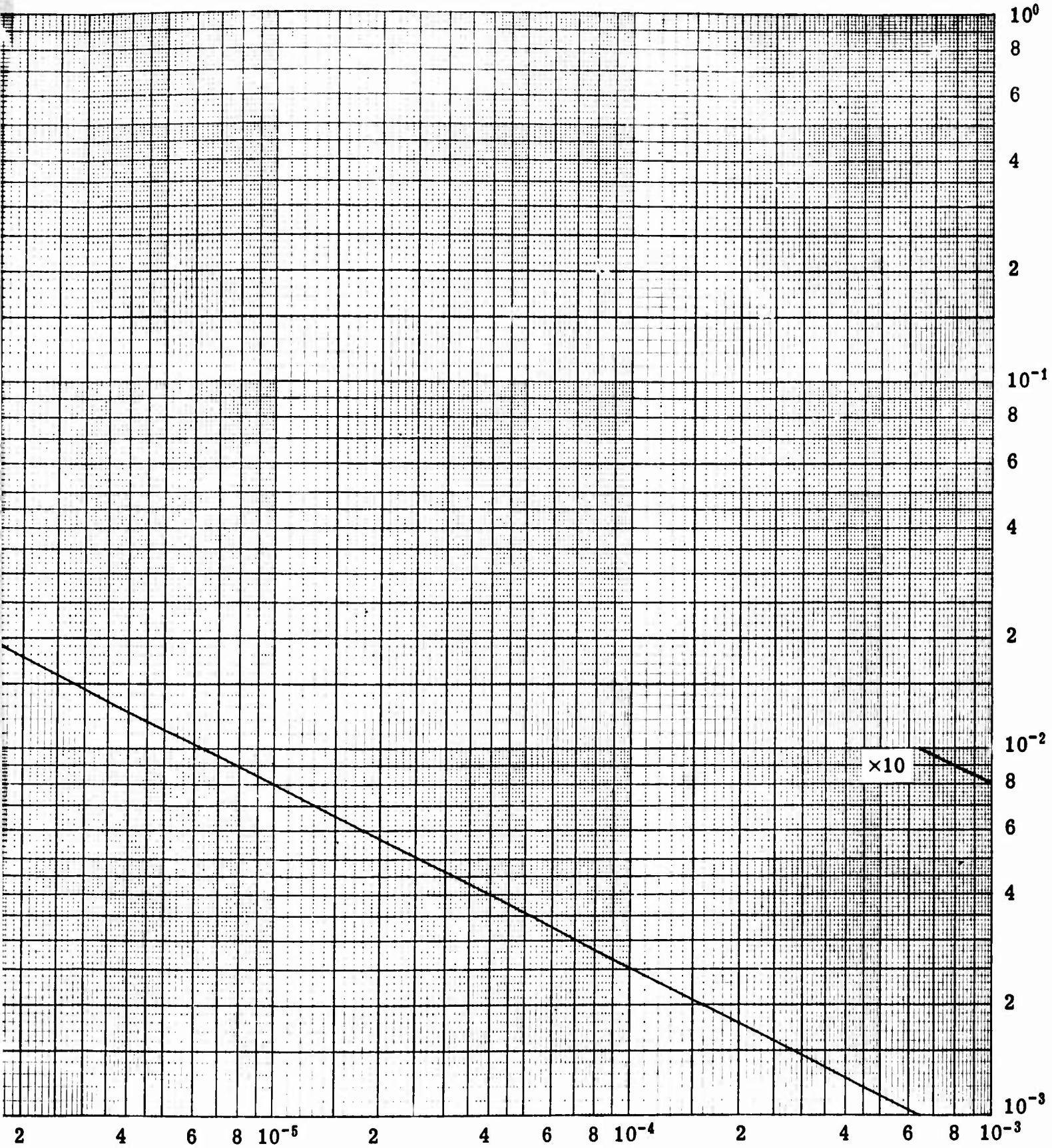


Fig. 11(b) — Si – Absorption Cross Se



rption Cross Section – Low Energy Part

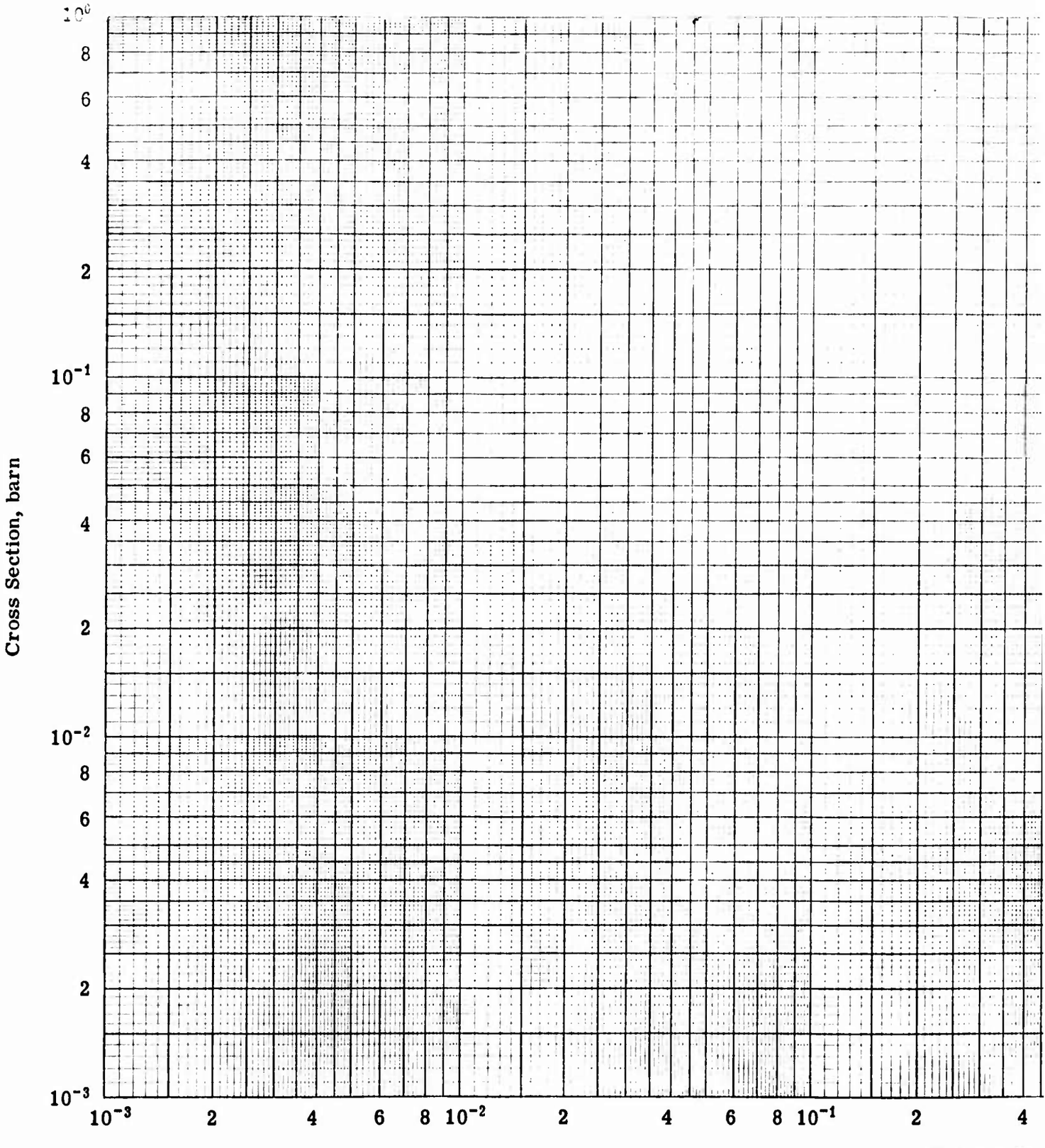
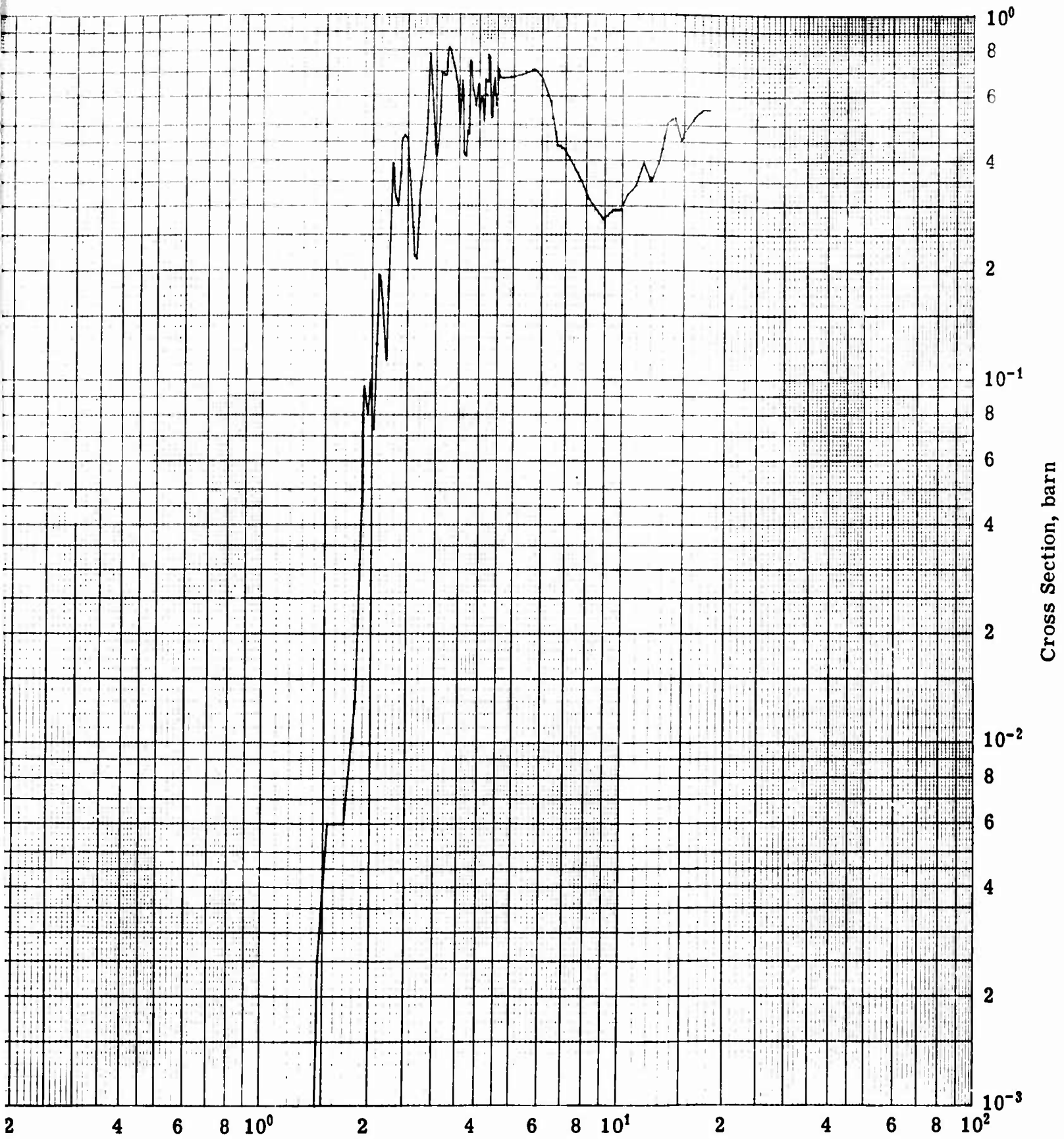


Fig. 12 — Si – Inelastic-Scatt



elastic-Scattering Cross Section

5. IRON

5.1 NEUTRON CROSS SECTIONS

5.1.1 The Total Cross Section

For incident neutron energies above about 0.23 MeV we have used the supplement to the second edition of BNL-325.[1] The measurements of Nereson and Darden,[2] and those of Mazari and Alba[3] which lie below the "eye-guide" curve in the range from about 4 to about 15 MeV are balanced by those of Weil and Jones,[4] which lie above it from 4 to 8 MeV, and those of Bratenahl, Peterson, and Stoering,[5] and of Armitage et al.[6] which lie above the "eye-guide" from 9 to 14 MeV.

From 4 keV to 0.23 MeV we used the data of Garg, Rainwater, and Havens[7] and followed the curve of the second edition of BNL-325[8] for lower energies. An exception to this was the range from 1.1 to 1.2 keV where we summed the BNL-325 values and the capture cross-section measurements from Harwell[9] to delineate the 1150 eV resonance (see Table 20 and Fig. 13).

5.1.2 The Elastic-Scattering Cross Section

Over the whole energy range we calculated the elastic-scattering cross section as the difference between the total and nonelastic cross sections. That is:

$$\sigma_{n,n} = \sigma_{nT} - \sigma_{nX}$$

5.1.3 The Radiative-Capture Cross Section

In the low energy part of the resonance region, from 1 to about 30 keV, we are fortunate in having the detailed measurements made by Moxon at Harwell and reported by Rae et al. at Geneva.[9] The measurements of Mitzel and Plendl[10] in this range were not used since they show the 1150 keV resonance as much lower and broader then do those of Moxon. Those of Macklin et al.[11] were not used since, in the range around 20 keV, they show resonance peaks as lower and broader than Moxon's work. From about 35 keV to about 2 MeV we have drawn a composite curve through the measurements of many workers,[12-15] and have continued the curve to 18 MeV mitigating the steep descent slightly at the higher energies. Below the Harwell data, from 10 to 1000 eV, we have taken the data of Isakov[16] and joined a 1/v curve which passes through the value measured by Isakov[17] (2.57 barns at 0.0253 eV).

5.1.4 The (n,p) Cross Section

The cross section for the (n,p) reaction in Fe^{56} has been measured in great detail by Santry and Butler,[18] and their results agree well with those of Bormann et al.[19] and of Terrell and Holm.[20] Since Fe^{56} accounts for about 92% of the naturally occurring isotopic mixture, we have taken this cross section to represent that of the natural element.

5.1.5 The (n,α) Cross Section

No measurements of the cross section for the (n,α) reaction in either natural iron or Fe^{56} are available. The calculations of Bullock and Moore,[21] however, indicate that the (n,α) cross section should be roughly the same size as the (n,p) cross section but should reach its peak at about 16 MeV instead of between 13 and 14 MeV. Calculations and measurements in other iron isotopes[22-24] lead one to expect the (n,α) cross section to be somewhat smaller than the (n,p) cross section. Accordingly, we have used our (n,p) curve for the (n,α) cross section, dis-

placing it so that the peak value is about 10% higher in energy and about 10% lower in magnitude.

5.1.6 The Absorption Cross Section

The work of Heinrich and Tanner[25] gives the (n,t) cross section in iron as very small and with a threshold above 15 MeV. We have therefore ignored this reaction and counted the absorption cross section as $\sigma_{n,\gamma} + \sigma_{n,p} + \sigma_{n,\alpha}$ (see Fig. 14).

5.1.7 The Nonelastic Cross Section

Data on the nonelastic cross section from seven workers are given in the supplement to BNL-325.[1] We have used these along with several more recent measurements[26-29] to draw a composite curve of σ_{nX} above about 3.5 MeV. For lower energies the inelastic-scattering cross section and the radiative-capture cross section are the only contributors to σ_{nX}, and the values of the inelastic-scattering cross section are in good agreement with the nonelastic cross section between about 0.85 to 3.5 MeV. For most of this range the capture cross section is, of course, negligible compared with the other cross sections.

5.1.8 The Inelastic-Scattering Cross Section

Measurements of the inelastic-scattering cross section are available from Gilboy and Towle,[29] Sukhanov and Rukavishnikov,[30] and Thomson.[31] We have derived the lower energy portion of this cross section, below about 3.5 MeV, from the inelastic gamma-ray production cross-section measurements of Montague and Paul.[32] At higher energies we have taken the inelastic-scattering cross section (including $\sigma_{n,2n}$) as the difference between the nonelastic and the absorption cross sections, i.e.,

$$\sigma_{n,n'} + \sigma_{n,2n} = \sigma_{nX} - \sigma_{n,p} - \sigma_{n,\alpha} - \sigma_{n,\gamma}$$

Our calculated values agree well with the measured values (see Fig. 15).

5.1.9 The (n,2n) Cross Section

Ashby and Catron[33] give -11.2 MeV as the Q value for the (n,2n) reaction in Fe^{56}, -13.3 MeV in Fe^{54}, -7.63 MeV in Fe^{57}, and -10.0 MeV in Fe^{58}. We have taken the threshold to be 10.9 MeV and drawn our curve rising from there and passing through the 14-MeV measurement of Ashby et al.[34] Lebedev et al.[35] state that the difference between the (n,2n) and capture cross sections is 0.26 ± 0.1 barn at 14 MeV. A value of the (n,2n) cross section derived from our values of $\sigma_{n,p}$ and $\sigma_{n,\alpha}$ with this formula is in good agreement with Ashby's measurement. This agreement may also be taken as confirmation of our choice of $\sigma_{n,\alpha}$.

5.2 ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

At 14 MeV we analyzed the composite distribution, given in the second edition of BNL-400,[36] which is made up from the work of Elliot,[37] Yuasa,[38] Coon et al.,[27] and Anderson et al.[39] We did not, however, use the work of Khaletskii[40] since his values do not agree well with those of the other workers. Between 14 and 7 MeV no angular distribution measurements were found. Between about 1.5 and 7 MeV there are 20 measurements by 15 groups of workers.[29,41-54] The calculated coefficients of Bühler and Emendörfer,[55] which were so helpful in bridging the 7- to 14-MeV gap in the aluminum angular distributions, were not used. The authors mentioned that their results could be compared with experiments at 7 and 14 MeV but make no statement about how good the agreement is. They do say that their curves agree "essentially" with the calculated results of Bjorklund and Fernbach.[56]

Below 1.5 MeV we have used the recent measurements of Smith[57] which supersede the earlier detailed work of Langsdorf, Lane, and Monahan.[58] Isolated measurements by several workers[53,59-64] are in good agreement with Smith's data.

The Legendre coefficients are given in Table 21.

5.3 ENERGY DISTRIBUTION OF INELASTICALLY SCATTERED NEUTRONS

For incident neutron energies we have taken the energy distribution of inelastically scattered neutrons to be governed by the excitation of six levels with energies of 0.845, 1.41, 2.1, 2.658, 3.0, and 3.4 MeV (see Table 22). The level excitation cross sections were derived from the work of Montague and Paul.[32] For higher energies we have assumed a continuum of levels with secondary neutron distribution parameters:

$$E_t = 11.0 \text{ MeV}$$
$$a^{(1)} = 5.7 \text{ MeV}^{-1}$$
$$a^{(2)} = 5.7 \text{ MeV}^{-1}$$
$$E_0^{(1)} = 3.73 \text{ MeV}$$
$$E_0^{(2)} = 3.73 \text{ MeV}$$
$$E_1^{(1)} = 0.845 \text{ MeV}$$
$$E_1^{(2)} = 0.01 \text{ MeV}.$$

5.4 ENERGY DISTRIBUTION OF GAMMA RAYS FOLLOWING NONELASTIC REACTIONS

5.4.1 Gamma Rays Following Neutron Capture

We have assumed that the spectrum of gamma rays given by Troubetzkoy and Goldstein[65] is valid for incident neutron energies below about 4.5 MeV. Above this energy the radiative capture cross section is negligible compared with the (n,p) and (n,α) cross sections. The charged particle reactions are assumed to produce no gamma rays (see Table 23).

5.4.2 Gamma Rays Following Inelastic Scattering

For neutron energies below about 3.5 MeV we have used the gamma-ray production cross sections of Montague and Paul,[32] from 3.5 to 8.5 MeV we have used the data of Perkin,[66] and at 14 MeV we have used the data of Caldwell et al.[67] We have used graphical methods to bridge the gap between 8.5 and 14 MeV and extrapolate the data to 18 MeV (see Table 24).

5.5 REFERENCES

1. Hughes, D. J., Magurno, B. A., and Brussel, M. K.: BNL-325, 2nd Ed., Supplement 1 (Jan. 1, 1960).
2. Nereson, N. and Darden, S. E.: Phys. Rev., 89:775 (1953).
3. Mazari, M. and Alba, F.: Vol. 15, p. 28, Proceedings of the Second International Conference on Peaceful Uses of Atomic Energy, Geneva, 1958.
4. Weil, J. L. and Jones, K. W.: Phys. Rev., 110:466 (1958).
5. Bratenahl, A., Peterson, J. M., and Stoering, J. P.: Phys. Rev., 110:927 (1958).
6. Armitage, B. H. et al.: AERE-PR/NP 3 (Harwell, Sept. 1962).
7. Garg, J. B., Rainwater, J., and Havens, W. W., Jr.: CR-1860 (1964).
8. Hughes, D. J. and Schwartz, R. B.: BNL-325, 2nd Ed. (July 1958).
9. Rae, E. R. et al.: Paper No. 167, International Conference (Geneva, 1964); see also AERE-PR/NP 5 (Harwell, Nov. 1963).
10. Mitzel, F. and Plendl, H. S.: Nukleonik, 6:371 (1964).
11. Macklin, R. L., Pasma, P. J., and Gibbons, J. H.: Phys. Rev., 136B:695 (1964).
12. Malishev, A. V., Staviskii, Yu. Ya., and Shapar, A. V.: Atomnaya Energiya, 17:508 (1964).
13. Diven, B. C., Terrell, J., and Hemmendinger, A.: Phys. Rev., 120:564 (1960).
14. Staviskii, Yu. Ya. and Shapar, A. V.: Atomnaya Energiya, 10:264 (1961).
15. Macklin, R. L., Gibbons, J. H., and Inada, T.: Phys. Rev., 129:2695 (1963).
16. Isakov, A. I., Popov, Yu. P., and Shapiro, F. L.: Soviet Physics JETP, 11:712 (1960).
17. Isakov, A. I.: Soviet Physics JETP, 14:739 (1962).
18. Santry, D. C. and Butler, J. P.: Can. J. Phys., 42:1030 (1964).
19. Bormann, M. et al.: Z. Physik, 166:477 (1962).
20. Terrell, J. and Holm, D. M.: Phys. Rev., 109:2031 (1958).
21. Bullock, R. E. and Moore, R. G., Jr.: Phys. Rev., 119:721 (1960).
22. Gardner, D. G. and Yu-Wen Yu: Nuclear Phys., 60:49 (1964).
23. Salisbury, S. R. and Chalmers, R. A.: WASH-1056 (Mar. 1965).

24. Chittenden, D. M., II, Gardner, D. G., and Fink, R. W.: Phys. Rev., 122:860 (1961).

25. Heinrich, F. and Tanner, F.: Helv. Phys. Acta, 36:298 (1963).

26. Beghian, L. E. et al.: Nuclear Sci. and Eng., 17:82 (1963).

27. Coon, J. H. et al.: Phys. Rev., 111:250 (1958).

28. Degtyarev, Yu. G. and Nadtochii, V. G.: Atomnaya Energiya, 11:397 (1961).

29. Gilboy, W. B. and Towle, J. H.: Nuclear Phys., 64:130 (1965).

30. Sukhanov, B. I. and Rukavishnikov, B. G.: Atomnaya Energiya, 11:398 (1961).

31. Thomson, D. B.: Phys. Rev., 129:1649 (1963).

32. Montague, J. H. and Paul, E. B.: Nuclear Phys., 30:93 (1962).

33. Ashby, V. J. and Catron, H. C.: UCRL-5419 (Feb. 1959).

34. Ashby, V. J. et al.: Phys. Rev., 111:616 (1958).

35. Lebedev, P. P. et al.: Atomnaya Energiya, 5:522 (1958).

36. Goldberg, M. D., May, V. M., Stehn, J. R.: BNL-400, 2nd Ed., Vol. II (Oct. 1962).

37. Elliot, J. O.: Phys. Rev., 101:684 (1956).

38. Yuasa, K.: J. Phys. Soc. Japan, 13:1248 (1958).

39. Anderson, J. D. et al.: Phys. Rev., 110:160 (1958).

40. Khaletskii, M. M.: Soviet Physics-Doklady, 2:152 (1957).

41. Beyster, J. R., Walt, M., and Salmi, E. W.: Phys. Rev., 104:1319 (1956).

42. Wilenzick, R. M. et al.: Bull. Am. Phys. Soc., 6:252 (1961).

43. Wilenzick, R. M. et al.: Nuclear Phys., 62:511 (1965).

44. Bostrom, N. A. et al.: WADC-TR-59-31 (1959).

45. Hill, R. W.: Phys. Rev., 109:2105 (1958).

46. Walt, M. and Beyster, J. R.: Phys. Rev., 98:677 (1955).

47. Machwe, M. K., Kent, D. W., and Snowdon, S. C.: Phys. Rev., 92:114 (1953).

48. Popov, V. I.: Atomnaya Energiya, 3:498 (1957).

49. Pasechnik, M. V. et al.: Vol. 14, p. 18, Second Geneva Conference, 1958.

50. Sal'nikov, O. A.: Atomnaya Energiya, 3:106 (1957).

51. Cranberg, L. and Levin, J. S.: Phys. Rev., 103:343 (1956).

52. Landon, H. H. et al.: Phys. Rev., 112:1192 (1958).

53. Muehlhause, C. O. et al.: Phys. Rev., 103:720 (1956).

54. Bredin, D. J.: Phys. Rev., 135:B412 (1964).

55. Bühler, F. and Emendörfer, D.: Atomkernenergie, 9:321 (1964).

56. Bjorklund, F. and Fernbach, S.: Phys. Rev., 109:1295 (1958).

57. Smith, A. B. and Guenther, P. T.: EANDC-US-62L (1965).

58. Langsdorf, A. S., Jr., Lane, R. O., and Monahan, J. E.: ANL-5567 rev. (Oct. 1961).

59. Darden, S. E., Haeberli, W., and Walton, R. B.: Phys. Rev., 96:836A (1954).

60. Walt, M. and Barschall, H. H.: Phys. Rev., 93:1062 (1954).

61. Lovchikova, G. N.: Atomnaya Energiya, 2:174 (1957).

62. Lovchikova, G. N.: Soviet Physics JETP, 11:1036 (1960).

63. Gilboy, W. B. and Towle, J. H.: Nuclear Phys., 42:86 (1963).

64. Pasechnik, V. et al.: Atomnaya Energiya, 16:207 (1964).

65. Troubetzkoy, E. and Goldstein, H.: ORNL-2904 (May 1960).

66. Perkin, J. L.: Nuclear Phys., 60:561 (1964).

67. Caldwell, R. L., Mills, W. R., Jr., and Hickman, J. B., Jr.: Nuclear Sci. and Eng., 8:173 (1960).

TABLE 20 — Fe – NEUTRON CROSS SECTIONS (ALL CROSS SECTIONS IN BARNS)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}+\sigma_{n,2n}$ Continuum	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,\gamma}$
1.8017E 01	2.3400E 00	1.2862E 00	0	9.0025E-01	9.0000E-01	9.2031E-02	6.1389E-02	1.9540E-04
1.7139E 01	2.3537E 00	1.1932E 00	0	9.8635E-01	9.0000E-01	1.0315E-01	7.0778E-02	2.0322E-04
1.6303E 01	2.3966E 00	1.1567E 00	0	1.0492E 00	8.8278E-01	1.1062E-01	7.9854E-02	2.1136E-04
1.5508E 01	2.4236E 00	1.1211E 00	0	1.1016E 00	7.5953E-01	1.0835E-01	9.2402E-02	2.1984E-04
1.4751E 01	2.4228E 00	1.1031E 00	0	1.1129E 00	6.1545E-01	1.0058E-01	1.0606E-01	2.2865E-04
1.4032E 01	2.4971E 00	1.1742E 00	0	1.1132E 00	4.7902E-01	9.5139E-02	1.1437E-01	2.3782E-04
1.3348E 01	2.6002E 00	1.2594E 00	0	1.1345E 00	2.1988E-01	8.9390E-02	1.1665E-01	2.4735E-04
1.2697E 01	2.6951E 00	1.3421E 00	0	1.1580E 00	5.8526E-02	8.3168E-02	1.1156E-01	2.5727E-04
1.2077E 01	2.7612E 00	1.3988E 00	0	1.1815E 00	1.4842E-02	7.7442E-02	1.0325E-01	2.6758E-04
1.1488E 01	2.8262E 00	1.4544E 00	0	1.2045E 00	1.5283E-03	7.0039E-02	9.6927E-02	2.7831E-04
1.0928E 01	2.9209E 00	1.5419E 00	0	1.2269E 00	1.4485E-04	6.3477E-02	8.8246E-02	2.8946E-04
1.0395E 01	3.0030E 00	1.6365E 00	0	1.2264E 00	0	5.7886E-02	8.1858E-02	3.0107E-04
9.8882E 00	3.0957E 00	1.7739E 00	0	1.1961E 00	0	5.1982E-02	7.3432E-02	3.1314E-04
9.4059E 00	3.1710E 00	1.9114E 00	0	1.1466E 00	0	4.5826E-02	6.6890E-02	3.2569E-04
8.9472E 00	3.2484E 00	1.9979E 00	0	1.1484E 00	0	3.9214E-02	6.2513E-02	3.3875E-04
8.5108E 00	3.3193E 00	2.0536E 00	0	1.1766E 00	0	3.4127E-02	5.4632E-02	3.5233E-04
8.0957E 00	3.3873E 00	2.1195E 00	0	1.1887E 00	0	2.9772E-02	4.8953E-02	3.6645E-04
7.7009E 00	3.4419E 00	2.1852E 00	0	1.1874E 00	0	2.4426E-02	4.4527E-02	3.8114E-04
7.3253E 00	3.5087E 00	2.2868E 00	0	1.1673E 00	0	1.8744E-02	3.5474E-02	3.9642E-04
6.9681E 00	3.5673E 00	2.3839E 00	0	1.1379E 00	0	1.3866E-02	3.1212E-02	4.1231E-04
6.6282E 00	3.6097E 00	2.4486E 00	0	1.1243E 00	0	8.7452E-03	2.7605E-02	4.2884E-04
6.3050E 00	3.6480E 00	2.5062E 00	0	1.1171E 00	0	3.7933E-03	2.0427E-02	4.4604E-04
5.9975E 00	3.6767E 00	2.5351E 00	0	1.1262E 00	0	1.5199E-03	1.3512E-02	4.6392E-04
5.7050E 00	3.6849E 00	2.5184E 00	0	1.1575E 00	0	2.0033E-04	8.3411E-03	4.8251E-04
5.4267E 00	3.6894E 00	2.4901E 00	0	1.1943E 00	0	0	4.4157E-03	5.0186E-04
5.1621E 00	3.6894E 00	2.4592E 00	0	1.2275E 00	0	0	2.1738E-03	5.2198E-04
4.9103E 00	3.6851E 00	2.4224E 00	0	1.2613E 00	0	0	8.6641E-04	5.4290E-04
4.6708E 00	3.6783E 00	2.3801E 00	0	1.2972E 00	0	0	4.5073E-04	5.6467E-04
4.4430E 00	3.6592E 00	2.3436E 00	0	1.3149E 00	0	0	3.3337E-05	5.8730E-04
4.2263E 00	3.6299E 00	2.3281E 00	0	1.3012E 00	0	0	0	6.1085E-04
4.0202E 00	3.5991E 00	2.3084E 00	0	1.2901E 00	0	0	0	6.3533E-04
3.8242E 00	3.5587E 00	2.4242E 00	0	1.1338E 00	0	0	0	6.6080E-04
3.6376E 00	3.5014E 00	2.0716E 00	1.2676E 00	1.6146E-01	0	0	0	6.8729E-04
3.4602E 00	3.4456E 00	2.3349E 00	1.1101E 00	0	0	0	0	7.1485E-04
3.2915E 00	3.3637E 00	2.3083E 00	1.0547E 00	0	0	0	0	7.4351E-04
3.1310E 00	3.2880E 00	2.3040E 00	9.8322E-01	0	0	0	0	7.7331E-04
2.9783E 00	3.1962E 00	2.2948E 00	9.0061E-01	0	0	0	0	8.0431E-04
2.8330E 00	3.1130E 00	2.1779E 00	9.3431E-01	0	0	0	0	8.3656E-04
2.6948E 00	3.1691E 00	2.1962E 00	9.7202E-01	0	0	0	0	8.7009E-04
2.5634E 00	3.5554E 00	2.5809E 00	9.7358E-01	0	0	0	0	9.0497E-04
2.4384E 00	3.2803E 00	2.3290E 00	9.5036E-01	0	0	0	0	9.4125E-04
2.3195E 00	2.9773E 00	2.0628E 00	9.1349E-01	0	0	0	0	9.7899E-04
2.2063E 00	2.9958E 00	2.1289E 00	8.6585E-01	0	0	0	0	1.0182E-03

TABLE 20 — Fe (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$ Levels	$\sigma_{n,n'}+\sigma_{n,2n}$ Continuum	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,p}$	$\sigma_{n,\gamma}$
2.0987E 00	3.2107E 00	2.3903E 00	8.1940E-01	0	0	0	0	1.0591E-03
1.9964E 00	3.1039E 00	2.3191E 00	7.8376E-01	0	0	0	0	1.1068E-03
1.8990E 00	3.0637E 00	2.3116E 00	7.5090E-01	0	0	0	0	1.1882E-03
1.8064E 00	2.4594E 00	1.9559E 00	7.0224E-01	0	0	0	0	1.2796E-03
1.7183E 00	2.6829E 00	2.0236E 00	6.5788E-01	0	0	0	0	1.3784E-03
1.6345E 00	2.9707E 00	2.3473E 00	6.2193E-01	0	0	0	0	1.4847E-03
1.5548E 00	3.0996E 00	2.5182E 00	5.7978E-01	0	0	0	0	1.5991E-03
1.4790E 00	2.7505E 00	2.2063E 00	5.4255E-01	0	0	0	0	1.7223E-03
1.4068E 00	2.5446E 00	2.0350E 00	5.0781E-01	0	0	0	0	1.8550E-03
1.3382E 00	2.5819E 00	2.1105E 00	4.6938E-01	0	0	0	0	1.9980E-03
1.2730E 00	3.0249E 00	2.5902E 00	4.3251E-01	0	0	0	0	2.1520E-03
1.2109E 00	2.4057E 00	2.0032E 00	4.0018E-01	0	0	0	0	2.3178E-03
1.1518E 00	2.2181E 00	1.8497E 00	3.6599E-01	0	0	0	0	2.4964E-03
1.0956E 00	2.4049E 00	2.0728E 00	3.2943E-01	0	0	0	0	2.6886E-03
1.0422E 00	2.8371E 00	2.5440E 00	2.9015E-01	0	0	0	0	2.8960E-03
9.9137E-01	2.3366E 00	2.0846E 00	2.4892E-01	0	0	0	0	3.1197E-03
9.4302E-01	1.7670E 00	1.5772E 00	1.8651E-01	0	0	0	0	3.3596E-03
8.9703E-01	2.4077E 00	2.3431E 00	6.1027E-02	0	0	0	0	3.6228E-03
8.5328E-01	2.6416E 00	2.6376E 00	0	0	0	0	0	3.9432E-03
8.1167E-01	3.2999E 00	3.2956E 00	0	0	0	0	0	4.2934E-03
7.7208E-01	4.1384E 00	4.1337E 00	0	0	0	0	0	4.6701E-03
7.3443E-01	3.4343E 00	3.4293E 00	0	0	0	0	0	4.9525E-03
6.9861E-01	2.5315E 00	2.5265E 00	0	0	0	0	0	5.0294E-03
6.6454E-01	2.2466E 00	2.2416E 00	0	0	0	0	0	5.0413E-03
6.3213E-01	2.2711E 00	2.2661E 00	0	0	0	0	0	5.0122E-03
6.0130E-01	2.4296E 00	2.4246E 00	0	0	0	0	0	4.9276E-03
5.7197E-01	2.6092E 00	2.6044E 00	0	0	0	0	0	4.8104E-03
5.4408E-01	2.7814E 00	2.7767E 00	0	0	0	0	0	4.7321E-03
5.1754E-01	2.9610E 00	2.9563E 00	0	0	0	0	0	4.6836E-03
4.9230E-01	3.2355E 00	3.2308E 00	0	0	0	0	0	4.6606E-03
4.6829E-01	3.7137E 00	3.7090E 00	0	0	0	0	0	4.7218E-03
4.4545E-01	3.9719E 00	3.9671E 00	0	0	0	0	0	4.7775E-03
4.2373E-01	4.2135E 00	4.2087E 00	0	0	0	0	0	4.8339E-03
4.0306E-01	4.6345E 00	4.6296E 00	0	0	0	0	0	4.8921E-03
3.8341E-01	4.3164E 00	4.3114E 00	0	0	0	0	0	4.9684E-03
3.6471E-01	3.1460E 00	3.1410E 00	0	0	0	0	0	5.1058E-03
3.4692E-01	1.8655E 00	1.8603E 00	0	0	0	0	0	5.1428E-03
3.3000E-01	3.5293E 00	3.5240E 00	0	0	0	0	0	5.2054E-03
3.1391E-01	2.8829E 00	2.8775E 00	0	0	0	0	0	5.3981E-03
2.9860E-01	1.5819E 00	1.5764E 00	0	0	0	0	0	5.5282E-03
2.8403E-01	3.2460E 00	3.2403E 00	0	0	0	0	0	5.6144E-03
2.7018E-01	3.0382E 00	3.0325E 00	0	0	0	0	0	5.6914E-03
2.5700E-01	2.4901E 00	2.4844E 00	0	0	0	0	0	5.6879E-03

TABLE 20 — Fe (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.4449E-01	3.1687E 00	3.1080E 00	9.7287E-02
2.3255E-01	3.0059E 00	3.0002E 00	5.7018E-02
2.2121E-01	3.9015E 00	3.8957E 00	5.7998E-02
2.1042E-01	2.8770E 00	2.8711E 00	5.8367E-02
2.0016E-01	4.1539E 00	4.1480E 00	5.8746E-02
1.9039E-01	7.5337E 00	7.5278E 00	5.9129E-02
1.8111E-01	1.9718E 00	1.9659E 00	5.9509E-02
1.7228E-01	3.8018E 00	3.7958E 00	5.9887E-02
1.6387E-01	1.8640E 00	1.8580E 00	6.0095E-02
1.5588E-01	2.8956E 00	2.8896E 00	6.0225E-02
1.4828E-01	4.7982E 00	4.7922E 00	6.0395E-02
1.4105E-01	7.8976E 00	7.8916E 00	6.0486E-02
1.3417E-01	1.9577E 00	1.9516E 00	6.0616E-02
1.2762E-01	2.8494E 00	2.8434E 00	6.0748E-02
1.2140E-01	2.2237E 00	2.2176E 00	6.0879E-02
1.1548E-01	2.4243E 00	2.4182E 00	6.1011E-02
1.0985E-01	2.9217E 00	2.9156E 00	6.1143E-02
1.0449E-01	3.4434E 00	3.4373E 00	6.1275E-02
9.9394E-02	3.8974E 00	3.8913E 00	6.1408E-02
9.4547E-02	4.4195E 00	4.4133E 00	6.1541E-02
8.9935E-02	5.8926E 00	5.8865E 00	6.1674E-02
8.5549E-02	1.4582E 01	1.4576E 01	6.1807E-02
8.1377E-02	3.6613E 00	3.6551E 00	6.1941E-02
7.7408E-02	3.9162E 00	3.9100E 00	6.2075E-02
7.3633E-02	9.0513E 00	9.0450E 00	6.2209E-02
7.0042E-02	2.4196E 00	2.4134E 00	6.2344E-02
6.6626E-02	2.3344E 00	2.3282E 00	6.2479E-02
6.3376E-02	3.1432E 00	3.1369E 00	6.2614E-02
6.0286E-02	3.6221E 00	3.6158E 00	6.2750E-02
5.7345E-02	3.7987E 00	3.7924E 00	6.2886E-02
5.4549E-02	4.7502E 00	4.7439E 00	6.3079E-02
5.1888E-02	6.2747E 00	6.2683E 00	6.3469E-02
4.9358E-02	4.1081E 00	4.1017E 00	6.3877E-02
4.6950E-02	4.5753E 00	4.5689E 00	6.4287E-02
4.4661E-02	4.9330E 00	4.9266E 00	6.4699E-02
4.2483E-02	5.4511E 00	5.4446E 00	6.5119E-02
4.0411E-02	5.6508E 00	5.6442E 00	6.5533E-02
3.8440E-02	6.0601E 00	6.0535E 00	6.5953E-02
3.6565E-02	6.8815E 00	6.8748E 00	6.6377E-02
3.4782E-02	8.0013E 00	7.9946E 00	6.6849E-02
3.3085E-02	9.9315E 00	9.9194E 00	1.2054E-02
3.1472E-02	1.3882E 01	1.3856E 01	2.6688E-02
2.9937E-02	2.2719E 01	2.2672E 01	4.7506E-02
2.8477E-02	5.7738E 01	5.7672E 01	6.6297E-02
2.7088E-02	3.5469E 01	3.5390E 01	0.9900E-02

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.5707E-02	4.5083E 00	4.5435E 00	9.1478E-02
2.4510E-02	9.7161E-01	9.4530E-01	2.6830E-02
2.3319E-02	9.3402E-01	9.0144E-01	3.2584E-02
2.2178E-02	1.2026E 00	1.1746E 00	2.8035E-02
2.1096E-02	1.5466E 00	1.5288E 00	1.7736E-02
2.0067E-02	1.9347E 00	1.9193E 00	1.5394E-02
1.9089E-02	2.1175E 00	2.1025E 00	1.5040E-02
1.8158E-02	2.7374E 00	2.7188E 00	1.8580E-02
1.7272E-02	2.8567E 00	2.8451E 00	1.1973E-02
1.6430E-02	3.0082E 00	2.9979E 00	1.0289E-02
1.5628E-02	3.2436E 00	3.2313E 00	1.2339E-02
1.4866E-02	3.5686E 00	3.5353E 00	3.3497E-02
1.4141E-02	3.9561E 00	3.9332E 00	2.2911E-02
1.3452E-02	4.6490E 00	4.6375E 00	1.1486E-02
1.2795E-02	4.3938E 00	4.3819E 00	1.1861E-02
1.2171E-02	4.6258E 00	4.6113E 00	1.4472E-02
1.1578E-02	4.9000E 00	4.8882E 00	3.1787E-02
1.1013E-02	5.6626E 00	5.6363E 00	2.6282E-02
1.0476E-02	6.6803E 00	6.6623E 00	1.7998E-02
9.9651E-03	6.4570E 00	6.4326E 00	2.4370E-02
9.4791E-03	7.7296E 00	7.6793E 00	5.1033E-02
9.0168E-03	9.5830E 00	9.5520E 00	3.0994E-02
8.5771E-03	1.3296E 01	1.3254E 01	4.1719E-02
8.1588E-03	1.8551E 01	1.8480E 01	7.0778E-02
7.7609E-03	2.3094E 01	2.3003E 01	9.0865E-02
7.3824E-03	1.6061E 01	1.5970E 01	9.0589E-02
7.0223E-03	9.4151E 00	9.3461E 00	6.9016E-02
6.6798E-03	1.0332E 01	1.0270E 01	5.6201E-02
6.3541E-03	1.1070E 01	1.1007E 01	6.2898E-02
6.0442E-03	6.6912E 00	6.6076E 00	8.3668E-02
5.7494E-03	5.5857E 00	5.5450E 00	4.0698E-02
5.4690E-03	5.3412E 00	5.3119E 00	2.9697E-02
5.2023E-03	5.1075E 00	5.0824E 00	2.5012E-02
4.9485E-03	4.8839E 00	4.8621E 00	2.1882E-02
4.7072E-03	4.9169E 00	4.8970E 00	1.9921E-02
4.4776E-03	5.3556E 00	5.3380E 00	1.7519E-02
4.2592E-03	5.8366E 00	5.8202E 00	1.6470E-02
4.0515E-03	6.3472E 00	6.3269E 00	2.0725E-02
3.8539E-03	6.6215E 00	6.6009E 00	2.0545E-02
3.6660E-03	6.1625E 00	6.1459E 00	1.6579E-02
3.4872E-03	5.5253E 00	5.5140E 00	1.1271E-02
3.3171E-03	5.2422E 00	5.2326E 00	9.1574E-03
3.1553E-03	5.0497E 00	5.0403E 00	9.4230E-03
3.0014E-03	5.1516E 00	5.1431E 00	8.4989E-03
2.8551E-03	5.3434E 00	5.3372E 00	6.2528E-03

TABLE 20 — Fe (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.7158E-03	5.5464E 00	5.5425E 00	3.9223E-03
2.5834E-03	5.7571E 00	5.7541E 00	2.9479E-03
2.4574E-03	5.9565E 00	5.9541E 00	2.4098E-03
2.3375E-03	6.1298E 00	6.1278E 00	2.0806E-03
2.2235E-03	6.3070E 00	6.3047E 00	2.3012E-03
2.1151E-03	6.4893E 00	6.4867E 00	2.6095E-03
2.0119E-03	6.6734E 00	6.6704E 00	2.9081E-03
1.9138E-03	6.8369E 00	6.8334E 00	3.5405E-03
1.8205E-03	6.9963E 00	6.9914E 00	4.9391E-03
1.7317E-03	7.1594E 00	7.1503E 00	9.1342E-03
1.6472E-03	7.3263E 00	7.3170E 00	9.3595E-03
1.5669E-03	7.4971E 00	7.4918E 00	5.2929E-03
1.4905E-03	7.6689E 00	7.6675E 00	1.4133E-03
1.4179E-03	7.8376E 00	7.8349E 00	2.6825E-03
1.3486E-03	8.0325E 00	8.0252E 00	7.3141E-03
1.2829E-03	8.3811E 00	8.3272E 00	3.3826E-02
1.2203E-03	8.7454E 00	8.4626E 00	2.8283E-01
1.1608E-03	1.0875E 01	8.5659E 00	2.3096E 00
1.1042E-03	8.9290E 00	8.7475E 00	1.8154E-01
1.0503E-03	8.9011E 00	8.8881E 00	1.3139E-02
9.9909E-04	9.0317E 00	9.0184E 00	1.3292E-02
9.5037E-04	9.1826E 00	9.1691E 00	1.3447E-02
9.0402E-04	9.3313E 00	9.3177E 00	1.3604E-02
8.5993E-04	9.4802E 00	9.4654E 00	1.3752E-02
8.1799E-04	9.6298E 00	9.5858E 00	1.3935E-02
7.7809E-04	9.8791E 00	9.7665E 00	1.4114E-02
7.4015E-04	9.8066E 00	9.7917E 00	1.4292E-02
7.0405E-04	9.9305E 00	9.9160E 00	1.4494E-02
6.6971E-04	1.0021E 01	1.0006E 01	1.4674E-02
6.3705E-04	1.0102E 01	1.0086E 01	1.5310E-02
6.0596E-04	1.0183E 01	1.0167E 01	1.5759E-02
5.7643E-04	1.0265E 01	1.0249E 01	1.6158E-02
5.4831E-04	1.0347E 01	1.0331E 01	1.6411E-02
5.2157E-04	1.0429E 01	1.0413E 01	1.6059E-02
4.9613E-04	1.0506E 01	1.0489E 01	1.7491E-02
4.7194E-04	1.0564E 01	1.0545E 01	1.9035E-02
4.4892E-04	1.0620E 01	1.0599E 01	2.0676E-02
4.2703E-04	1.0676E 01	1.0653E 01	2.2376E-02
4.0620E-04	1.0732E 01	1.0708E 01	2.4377E-02
3.8639E-04	1.0791E 01	1.0763E 01	2.8154E-02
3.6755E-04	1.0851E 01	1.0822E 01	2.9439E-02
3.4962E-04	1.0912E 01	1.0882E 01	3.0292E-02
3.3257E-04	1.0973E 01	1.0943E 01	2.9945E-02
3.1635E-04	1.1034E 01	1.1005E 01	2.9227E-02
3.0092E-04	1.1093E 01	1.1065E 01	2.8480E-02

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
2.8624E-04	1.1134E 01	1.1107E 01	2.7348E-02
2.7228E-04	1.1171E 01	1.1145E 01	2.6028E-02
2.5901E-04	1.1208E 01	1.1183E 01	2.5057E-02
2.4637E-04	1.1244E 01	1.1220E 01	2.4890E-02
2.3436E-04	1.1282E 01	1.1258E 01	2.3308E-02
2.2293E-04	1.1319E 01	1.1293E 01	2.5432E-02
2.1206E-04	1.1356E 01	1.1329E 01	2.7149E-02
2.0171E-04	1.1392E 01	1.1365E 01	2.6225E-02
1.9188E-04	1.1403E 01	1.1376E 01	2.6780E-02
1.8252E-04	1.1407E 01	1.1379E 01	2.7170E-02
1.7362E-04	1.1410E 01	1.1383E 01	2.7153E-02
1.6515E-04	1.1414E 01	1.1382E 01	3.2093E-02
1.5709E-04	1.1417E 01	1.1383E 01	3.4534E-02
1.4943E-04	1.1421E 01	1.1385E 01	3.5773E-02
1.4215E-04	1.1425E 01	1.1386E 01	3.7009E-02
1.3521E-04	1.1428E 01	1.1390E 01	3.8458E-02
1.2862E-04	1.1432E 01	1.1393E 01	3.9173E-02
1.2235E-04	1.1435E 01	1.1397E 01	3.8738E-02
1.1638E-04	1.1439E 01	1.1401E 01	3.8385E-02
1.1070E-04	1.1443E 01	1.1404E 01	3.8177E-02
1.0530E-04	1.1446E 01	1.1408E 01	3.7972E-02
1.0017E-04	1.1449E 01	1.1412E 01	3.7810E-02
9.5283E-05	1.1450E 01	1.1412E 01	3.7947E-02
9.0636E-05	1.1450E 01	1.1410E 01	3.9872E-02
8.6215E-05	1.1450E 01	1.1406E 01	4.3940E-02
8.2011E-05	1.1450E 01	1.1404E 01	4.5573E-02
7.8011E-05	1.1446E 01	1.1399E 01	4.7474E-02
7.4200E-05	1.1439E 01	1.1389E 01	4.9294E-02
7.0587E-05	1.1431E 01	1.1382E 01	4.9164E-02
6.7145E-05	1.1422E 01	1.1373E 01	4.9003E-02
6.3870E-05	1.1412E 01	1.1362E 01	5.0121E-02
6.0755E-05	1.1403E 01	1.1347E 01	5.0646E-02
5.7792E-05	1.1400E 01	1.1340E 01	5.9600E-02
5.4973E-05	1.1400E 01	1.1338E 01	6.2403E-02
5.2292E-05	1.1400E 01	1.1334E 01	6.6041E-02
4.9742E-05	1.1402E 01	1.1334E 01	6.7001E-02
4.7310E-05	1.1412E 01	1.1345E 01	6.6009E-02
4.5008E-05	1.1423E 01	1.1358E 01	6.5799E-02
4.2813E-05	1.1435E 01	1.1370E 01	6.4858E-02
4.0725E-05	1.1446E 01	1.1380E 01	6.5435E-02
3.8739E-05	1.1444E 01	1.1377E 01	6.7089E-02
3.6850E-05	1.1436E 01	1.1366E 01	6.9001E-02
3.5053E-05	1.1427E 01	1.1357E 01	7.0393E-02
3.3343E-05	1.1418E 01	1.1348E 01	7.0675E-02
3.1717E-05	1.1410E 01	1.1339E 01	7.0790E-02

TABLE 20 — Fe (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
3.0170E-05	1.1402E 01	1.1331E 01	7.0790E-02
2.8699E-05	1.1400E 01	1.1329E 01	7.1525E-02
2.7299E-05	1.1400E 01	1.1326E 01	7.4467E-02
2.5968E-05	1.1400E 01	1.1322E 01	7.8049E-02
2.4701E-05	1.1400E 01	1.1319E 01	8.0015E-02
2.3496E-05	1.1400E 01	1.1317E 01	8.2525E-02
2.2350E-05	1.1400E 01	1.1316E 01	8.4440E-02
2.1260E-05	1.1400E 01	1.1315E 01	8.5110E-02
2.0224E-05	1.1400E 01	1.1315E 01	8.5110E-02
1.9237E-05	1.1397E 01	1.1311E 01	8.6007E-02
1.8299E-05	1.1394E 01	1.1306E 01	8.7936E-02
1.7407E-05	1.1390E 01	1.1300E 01	8.9913E-02
1.6558E-05	1.1386E 01	1.1294E 01	9.1932E-02
1.5750E-05	1.1383E 01	1.1289E 01	9.3997E-02
1.4982E-05	1.1379E 01	1.1283E 01	9.6490E-02
1.4251E-05	1.1376E 01	1.1276E 01	9.9723E-02
1.3556E-05	1.1372E 01	1.1269E 01	1.0314E-01
1.2895E-05	1.1368E 01	1.1262E 01	1.0658E-01
1.2266E-05	1.1365E 01	1.1255E 01	1.0933E-01
1.1668E-05	1.1361E 01	1.1249E 01	1.1189E-01
1.1099E-05	1.1358E 01	1.1243E 01	1.1432E-01
1.0558E-05	1.1354E 01	1.1237E 01	1.1720E-01
1.0043E-05	1.1351E 01	1.1231E 01	1.1990E-01
9.5529E-06	1.1350E 01	1.1227E 01	1.2303E-01
9.0870E-06	1.1350E 01	1.1224E 01	1.2022E-01
8.6438E-06	1.1350E 01	1.1221E 01	1.2949E-01
8.2223E-06	1.1350E 01	1.1217E 01	1.3284E-01
7.8213E-06	1.1350E 01	1.1214E 01	1.3628E-01
7.4396E-06	1.1350E 01	1.1210E 01	1.3980E-01
7.0770E-06	1.1351E 01	1.1207E 01	1.4342E-01
6.7318E-06	1.1363E 01	1.1215E 01	1.4714E-01
6.4035E-06	1.1379E 01	1.1228E 01	1.5094E-01
6.0912E-06	1.1395E 01	1.1240E 01	1.5485E-01
5.7941E-06	1.1409E 01	1.1251E 01	1.5886E-01
5.5116E-06	1.1423E 01	1.1260E 01	1.6297E-01
5.2428E-06	1.1437E 01	1.1270E 01	1.6719E-01
4.9871E-06	1.1450E 01	1.1279E 01	1.7152E-01
4.7438E-06	1.1462E 01	1.1286E 01	1.7590E-01
4.5125E-06	1.1473E 01	1.1292E 01	1.8032E-01
4.2924E-06	1.1484E 01	1.1299E 01	1.8519E-01
4.0831E-06	1.1495E 01	1.1305E 01	1.8998E-01
3.8839E-06	1.1500E 01	1.1305E 01	1.9490E-01
3.6945E-06	1.1500E 01	1.1300E 01	1.9995E-01
3.5143E-06	1.1500E 01	1.1295E 01	2.0512E-01
3.3429E-06	1.1500E 01	1.1290E 01	2.1043E-01

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
3.1799E-06	1.1500E 01	1.1284E 01	2.1586E-01
3.0248E-06	1.1500E 01	1.1279E 01	2.2147E-01
2.8773E-06	1.1500E 01	1.1273E 01	2.2720E-01
2.7370E-06	1.1500E 01	1.1267E 01	2.3306E-01
2.6035E-06	1.1500E 01	1.1261E 01	2.3912E-01
2.4765E-06	1.1500E 01	1.1255E 01	2.4530E-01
2.3557E-06	1.1500E 01	1.1248E 01	2.5166E-01
2.2408E-06	1.1500E 01	1.1242E 01	2.5817E-01
2.1315E-06	1.1500E 01	1.1235E 01	2.6485E-01
2.0270E-06	1.1500E 01	1.1228E 01	2.7171E-01
1.9287E-06	1.1500E 01	1.1221E 01	2.7874E-01
1.8346E-06	1.1500E 01	1.1214E 01	2.8590E-01
1.7452E-06	1.1500E 01	1.1207E 01	2.9330E-01
1.6601E-06	1.1500E 01	1.1199E 01	3.0095E-01
1.5791E-06	1.1500E 01	1.1191E 01	3.0875E-01
1.5021E-06	1.1500E 01	1.1183E 01	3.1674E-01
1.4288E-06	1.1500E 01	1.1175E 01	3.2494E-01
1.3591E-06	1.1500E 01	1.1167E 01	3.3335E-01
1.2928E-06	1.1500E 01	1.1158E 01	3.4198E-01
1.2298E-06	1.1500E 01	1.1149E 01	3.5083E-01
1.1698E-06	1.1500E 01	1.1140E 01	3.5991E-01
1.1128E-06	1.1500E 01	1.1131E 01	3.6923E-01
1.0585E-06	1.1500E 01	1.1121E 01	3.7879E-01
1.0069E-06	1.1500E 01	1.1111E 01	3.8859E-01
9.5777E-07	1.1500E 01	1.1101E 01	3.9865E-01
9.1105E-07	1.1500E 01	1.1091E 01	4.0897E-01
8.6662E-07	1.1500E 01	1.1080E 01	4.1956E-01
8.2436E-07	1.1500E 01	1.1070E 01	4.3042E-01
7.8415E-07	1.1500E 01	1.1058E 01	4.4156E-01
7.4591E-07	1.1500E 01	1.1047E 01	4.5299E-01
7.0953E-07	1.1500E 01	1.1035E 01	4.6472E-01
6.7493E-07	1.1500E 01	1.1023E 01	4.7675E-01
6.4201E-07	1.1500E 01	1.1011E 01	4.8909E-01
6.1070E-07	1.1500E 01	1.0998E 01	5.0175E-01
5.8091E-07	1.1505E 01	1.0991E 01	5.1474E-01
5.5258E-07	1.1513E 01	1.0985E 01	5.2806E-01
5.2563E-07	1.1522E 01	1.0980E 01	5.4173E-01
5.0000E-07	1.1530E 01	1.0974E 01	5.5576E-01
4.7561E-07	1.1539E 01	1.0969E 01	5.7015E-01
4.5242E-07	1.1548E 01	1.0963E 01	5.8490E-01
4.3035E-07	1.1557E 01	1.0957E 01	6.0005E-01
4.0936E-07	1.1566E 01	1.0950E 01	6.1558E-01
3.8940E-07	1.1573E 01	1.0941E 01	6.3151E-01
3.7041E-07	1.1578E 01	1.0930E 01	6.4780E-01
3.5234E-07	1.1583E 01	1.0919E 01	6.6463E-01

TABLE 20 — Fe (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,\gamma}$
3.3516E-07	1.1588E 01	1.0907E 01	9.8184E-01
3.1881E-07	1.1594E 01	1.0894E 01	6.9949E-01
3.0326E-07	1.1600E 01	1.0882E 01	7.1760E-01
2.8847E-07	1.1619E 01	1.0883E 01	7.3617E-01
2.7440E-07	1.1644E 01	1.0888E 01	7.5523E-01
2.6102E-07	1.1668E 01	1.0893E 01	7.7478E-01
2.4829E-07	1.1693E 01	1.0898E 01	7.9484E-01
2.3618E-07	1.1717E 01	1.0902E 01	8.1541E-01
2.2466E-07	1.1742E 01	1.0906E 01	8.3652E-01
2.1371E-07	1.1767E 01	1.0909E 01	8.5817E-01
2.0328E-07	1.1792E 01	1.0911E 01	8.8039E-01
1.9337E-07	1.1810E 01	1.0906E 01	9.0318E-01
1.8394E-07	1.1824E 01	1.0897E 01	9.2656E-01
1.7497E-07	1.1838E 01	1.0888E 01	9.5054E-01
1.6643E-07	1.1853E 01	1.0877E 01	9.7515E-01
1.5832E-07	1.1867E 01	1.0867E 01	1.0004E 00
1.5060E-07	1.1881E 01	1.0859E 01	1.0263E 00
1.4329E-07	1.1896E 01	1.0843E 01	1.0530E 00
1.3627E-07	1.1910E 01	1.0830E 01	1.0806E 00
1.2962E-07	1.1925E 01	1.0817E 01	1.1091E 00
1.2330E-07	1.1939E 01	1.0802E 01	1.1386E 00
1.1728E-07	1.1954E 01	1.0787E 01	1.1690E 00
1.1156E-07	1.1968E 01	1.0772E 01	1.2004E 00
1.0612E-07	1.1983E 01	1.0755E 01	1.2327E 00
1.0095E-07	1.1998E 01	1.0738E 01	1.2661E 00
9.6024E-08	1.2019E 01	1.0727E 01	1.3017E 00
9.1341E-08	1.2043E 01	1.0710E 01	1.3384E 00
8.6887E-08	1.2065E 01	1.0705E 01	1.3765E 00
8.2649E-08	1.2086E 01	1.0691E 01	1.4160E 00
7.8610E-08	1.2113E 01	1.0682E 01	1.4570E 00
7.4784E-08	1.2150E 01	1.0682E 01	1.4997E 00
7.1137E-08	1.2188E 01	1.0688E 01	1.5440E 00
6.7667E-08	1.2222E 01	1.0677E 01	1.5904E 00
6.4367E-08	1.2284E 01	1.0669E 01	1.6387E 00
6.1228E-08	1.2287E 01	1.0661E 01	1.6888E 00
5.8242E-08	1.2324E 01	1.0650E 01	1.7407E 00
5.5401E-08	1.2365E 01	1.0654E 01	1.7948E 00
5.2699E-08	1.2406E 01	1.0651E 01	1.8508E 00
5.0129E-08	1.2448E 01	1.0647E 01	1.9090E 00
4.7684E-08	1.2492E 01	1.0648E 01	1.9695E 00
4.5359E-08	1.2537E 01	1.0641E 01	2.0323E 00
4.3147E-08	1.2582E 01	1.0637E 01	2.0977E 00
4.1042E-08	1.2627E 01	1.0638E 01	2.1656E 00
3.9041E-08	1.2679E 01	1.0638E 01	2.2362E 00
3.7137E-08	1.2730E 01	1.0648E 01	2.3094E 00

TABLE 21 — Fe – LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
1.8017E 01	7.6911E-01	6.2367E-01	5.2786E-01	4.3715E-01	3.4163E-01	2.4424E-01
1.7139E 01	7.7433E-01	6.4712E-01	5.4663E-01	4.5361E-01	3.5152E-01	2.5627E-01
1.6303E 01	7.7938E-01	6.7431E-01	5.6218E-01	4.6675E-01	3.5755E-01	2.7556E-01
1.5502E 01	7.8479E-01	6.8572E-01	5.7691E-01	4.7945E-01	3.6626E-01	2.7944E-01
1.4751E 01	7.8519E-01	6.9231E-01	5.8218E-01	4.7973E-01	3.7770E-01	2.7388E-01
1.4036E 01	7.8521E-01	6.9801E-01	5.8449E-01	4.7946E-01	3.8569E-01	2.8511E-01
1.3354E 01	7.8912E-01	7.0149E-01	5.7987E-01	4.6333E-01	3.4865E-01	2.4883E-01
1.2697E 01	7.8227E-01	7.0433E-01	5.7405E-01	4.6879E-01	3.2979E-01	2.3164E-01
1.2077E 01	7.8497E-01	7.0570E-01	5.8749E-01	4.3437E-01	3.2124E-01	2.3364E-01
1.1488E 01	7.8595E-01	6.9985E-01	5.5484E-01	4.1647E-01	2.8904E-01	1.9075E-01
1.0928E 01	7.8619E-01	6.8910E-01	5.3725E-01	3.9299E-01	2.8161E-01	1.7277E-01
1.0399E 01	7.8244E-01	6.7116E-01	5.1542E-01	3.6957E-01	2.3507E-01	1.6967E-01
9.8862E 00	7.8502E-01	6.6434E-01	5.0502E-01	3.5709E-01	2.1628E-01	1.3996E-01
9.4059E 00	7.8195E-01	6.4774E-01	4.8557E-01	3.3307E-01	1.9425E-01	1.1992E-01
8.9472E 00	7.8199E-01	6.4473E-01	4.7842E-01	3.1969E-01	1.7503E-01	9.4601E-02
8.5110E 00	7.8135E-01	6.2990E-01	4.6683E-01	3.1809E-01	1.8457E-01	9.3328E-02
8.0957E 00	7.8517E-01	6.2341E-01	4.5707E-01	2.9746E-01	1.5266E-01	8.2283E-02
7.7009E 00	7.8779E-01	6.1067E-01	4.3471E-01	2.8435E-01	1.4123E-01	7.2502E-02
7.3253E 00	7.8283E-01	5.9794E-01	4.3071E-01	2.4734E-01	1.2105E-01	5.7057E-02
6.9681E 00	7.7175E-01	5.8420E-01	4.2512E-01	2.5122E-01	1.0437E-01	4.6247E-02
6.6284E 00	7.8116E-01	5.7292E-01	4.1324E-01	2.3403E-01	9.4915E-02	3.7252E-02
6.3055E 00	7.6910E-01	5.6113E-01	4.0234E-01	2.2243E-01	8.0547E-02	2.9472E-02
5.9975E 00	7.3791E-01	5.4992E-01	3.9107E-01	2.1129E-01	7.3791E-02	2.4124E-02
5.7005E 00	7.6522E-01	5.3832E-01	3.7945E-01	2.0155E-01	6.3805E-02	2.1265E-02
5.4247E 00	7.1211E-01	5.2573E-01	3.6756E-01	1.8913E-01	5.7877E-02	1.7511E-02
5.1624E 00	6.9691E-01	5.1414E-01	3.5613E-01	1.7899E-01	5.2165E-02	1.5[illegible]E-02
4.9126E 00	6.8413E-01	5.0111E-01	3.4435E-01	1.6834E-01	4.8173E-02	1.3[illegible]E-02
4.6747E 00	6.8596E-01	4.8814E-01	3.3396E-01	1.5911E-01	4.2153E-02	1.2[illegible]E-02
4.4483E 00	6.8225E-01	4.7531E-01	3.2319E-01	1.5125E-01	3.8493E-02	9.[illegible]E-03
4.2326E 00	6.3403E-01	4.6251E-01	3.1182E-01	1.4209E-01	3.1981E-02	7.4922E-03
4.0272E 00	6.1495E-01	4.4974E-01	3.0109E-01	1.3493E-01	2.8129E-02	6.[illegible]E-03
3.8316E 00	6.2053E-01	4.3441E-01	2.9025E-01	1.2717E-01	2.4185E-02	5.[illegible]E-03
3.6376E 00	6.0499E-01	4.2199E-01	2.7999E-01	1.1912E-01	2.[illegible]E-02	3.[illegible]E-03
3.4[illegible]E 00	5.4153E-01	4.[illegible]E-01	2.6[illegible]E-01	1.1217E-01	1.7493E-02	3.[illegible]E-03
3.2915E 00	5.1755E-01	3.9617E-01	2.5315E-01	1.[illegible]E-01	1.5139E-02	2.[illegible]E-03

Note: Values of f_7 through f_{12} are given on page 127.

TABLE 21 — Fe (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
3.1310E 00	4.9293E-01	3.8622E-01	2.4186E-01	9.9996E-02	1.2923E-02	1.0182E-03
2.9783E 00	4.7082E-01	3.7491E-01	2.2881E-01	9.3455E-02	1.0301E-02	1.5015E-04
2.8330E 00	4.4585E-01	3.6520E-01	2.1555E-01	8.7205E-02	8.2512E-03	
2.6940E 00	4.2098E-01	3.5560E-01	2.0336E-01	8.1234E-02	7.0565E-03	
2.5634E 00	3.9597E-01	3.4724E-01	1.9050E-01	7.5292E-02	5.8447E-03	
2.4384E 00	3.7135E-01	3.3912E-01	1.7812E-01	6.9996E-02	3.9352E-03	
2.3195E 00	3.4379E-01	3.3211E-01	1.6709E-01	6.4985E-02	2.1217E-03	
2.2063E 00	3.1366E-01	3.2601E-01	1.5679E-01	5.9897E-02	9.7931E-04	
2.0987E 00	2.8149E-01	3.2094E-01	1.4689E-01	5.4943E-02	5.4153E-05	
1.9954E 00	2.5185E-01	3.1588E-01	1.3698E-01	4.9745E-02	-5.1184E-04	
1.8990E 00	2.4865E-01	3.1094E-01	1.2790E-01	4.4065E-02	-1.0055E-03	
1.8064E 00	2.5539E-01	3.0600E-01	1.1875E-01	3.8863E-02	-1.5137E-03	
1.7183E 00	2.6992E-01	3.0197E-01	1.0981E-01	3.3843E-02	-1.9420E-03	
1.6345E 00	2.7056E-01	2.9811E-01	1.0070E-01	2.8697E-02	-2.0000E-03	
1.5546E 00	2.4986E-01	2.9338E-01	9.2731E-02	2.7506E-02	-1.9647E-03	
1.4790E 00	2.0878E-01	2.7157E-01	7.8856E-02	4.1279E-02	-2.1045E-03	
1.4068E 00	2.5723E-01	2.8021E-01	6.9986E-02	5.2252E-02	-2.4861E-03	
1.3382E 00	2.7918E-01	2.5085E-01	5.2464E-02	3.1377E-02	-1.3744E-03	
1.2730E 00	1.4864E-01	2.5400E-01	5.5183E-02	3.0514E-02	-1.5434E-03	
1.2109E 00	2.0805E-01	2.3624E-01	4.2885E-02	1.8147E-02	-9.4459E-04	
1.1518E 00	2.2059E-01	2.3285E-01	3.6378E-02	2.3950E-02	-1.2139E-03	
1.0956E 00	1.8485E-01	1.8341E-01	4.2712E-02	3.8676E-03	-2.2330E-04	
1.0422E 00	1.9390E-01	1.8009E-01	2.8176E-02	3.9267E-03	-2.1652E-04	
9.9137E-01	2.0194E-01	2.0679E-01	3.3359E-02	9.6370E-03	-2.1053E-04	
9.4302E-01	2.9578E-01	2.2056E-01	4.5434E-02	1.8796E-02	-6.3087E-04	
8.9703E-01	2.5708E-01	2.0557E-01	3.4981E-02	3.2471E-02	-1.9181E-03	
8.5326E-01	2.9227E-01	1.6900E-01	3.9101E-02	1.0391E-02	-5.3993E-04	
8.1167E-01	1.7165E-01	1.2702E-01	2.4879E-02	7.3001E-03	-3.7540E-04	
7.7208E-01	1.3892E-01	1.0455E-01	1.7044E-02	-1.5737E-03	6.3810E-05	
7.3443E-01	2.0566E-01	1.1619E-01	1.8020E-02	-1.6111E-03	6.4627E-05	
6.9851E-01	2.8959E-01	1.5426E-01	1.8958E-02	1.7487E-02	-8.7031E-04	
6.6454E-01	1.5582E-01	1.5580E-01	-4.7686E-03	3.5588E-02	-1.7374E-03	
6.3213E-01	1.6535E-01	1.3871E-01	-1.0643E-02	2.9028E-02	-1.4115E-03	
6.0130E-01	2.9037E-01	1.0942E-01	-6.3282E-04	6.4702E-03	-3.1239E-04	
5.7197E-01	2.4899E-01	8.6625E-02	1.2767E-03	8.3237E-03	-4.0543E-04	
5.4406E-01	1.9794E-01	7.5414E-02	5.4120E-03	1.1873E-02	-5.8427E-04	

TABLE 21 — Fe (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
5.1754E-01	1.6022E-01	7.7477E-02	1.2402E-02	7.9609E-03	-3.9863E-04	0
4.9230E-01	1.2999E-01	5.9653E-02	3.7290E-03	6.0975E-03	-2.9650E-04	0
4.6829E-01	1.2675E-01	6.0534E-02	-2.8472E-03	5.1751E-03	-2.4717E-04	0
4.4545E-01	1.0945E-01	5.7001E-02	-6.3707E-03	5.7195E-03	-2.7179E-04	0
4.2373E-01	4.7172E-02	3.9810E-02	-1.9141E-03	1.0337E-02	-5.0128E-04	0
4.0306E-01	-9.6216E-03	2.3788E-02	2.8918E-03	1.4523E-02	-7.0994E-04	0
3.8341E-01	3.7036E-03	2.3791E-02	8.2381E-03	1.2642E-02	-6.2280E-04	0
3.6471E-01	3.6546E-02	2.8356E-02	1.3556E-02	9.0986E-03	-4.5441E-04	0
3.4692E-01	6.0563E-02	3.3489E-02	1.6425E-02	7.1958E-03	-3.5407E-04	0
3.3000E-01	9.1233E-02	4.0907E-02	1.2135E-02	1.0094E-02	-5.0210E-04	0
3.1391E-01	1.1441E-01	4.8154E-02	7.9229E-03	1.3206E-02	-6.5026E-04	0
2.9860E-01	1.3240E-01	5.3081E-02	3.7542E-03	1.5174E-02	-7.4335E-04	0
2.8403E-01	1.3209E-01	4.9309E-02	2.8012E-03	1.2786E-02	-6.2606E-04	0
2.7018E-01	1.2951E-01	4.4753E-02	2.1965E-03	1.0026E-02	-4.9091E-04	0
2.5700E-01	1.2753E-01	4.0413E-02	1.6213E-03	7.4005E-03	-3.6236E-04	0
2.4447E-01	1.2556E-01	3.6295E-02	1.0742E-03	4.9030E-03	-2.4007E-04	0
2.3255E-01	1.2359E-01	3.2373E-02	5.5371E-04	2.5274E-03	-1.2375E-04	0
2.2121E-01	1.1961E-01	2.8022E-02	9.3212E-05	4.2547E-04	-2.0833E-05	0
2.1042E-01	9.4800E-02	1.7709E-02	0	0	0	0
2.0016E-01	6.8441E-02	7.4910E-03	0	0	0	0
1.9039E-01	6.0731E-02	5.5050E-03	0	0	0	0
1.8111E-01	5.6549E-02	5.0235E-03	0	0	0	0
1.7226E-01	5.2572E-02	4.5639E-03	0	0	0	0
1.6397E-01	4.8789E-02	4.1267E-03	0	0	0	0
1.5588E-01	4.5190E-02	3.7109E-03	0	0	0	0
1.4828E-01	4.2087E-02	3.3422E-03	0	0	0	0
1.4105E-01	3.9988E-02	3.0631E-03	0	0	0	0
1.3417E-01	3.8037E-02	2.8010E-03	0	0	0	0
1.2752E-01	3.6181E-02	2.5228E-03	0	0	0	0
1.2140E-01	3.4416E-02	2.3101E-03	0	0	0	0
1.1548E-01	3.2737E-02	2.0910E-03	0	0	0	0
1.0985E-01	3.1140E-02	1.8768E-03	0	0	0	0
1.0449E-01	2.9621E-02	1.6731E-03	0	0	0	0
9.9394E-02	2.8176E-02	1.4941E-03	0	0	0	0
9.4547E-02	2.6801E-02	1.3613E-03	0	0	0	0
8.9935E-02	2.5494E-02	1.2798E-03	0	0	0	0

TABLE 21 — Fe (CONTINUED)

E, MeV	f_1	f_2
8.5549E-02	2.4250E-02	1.1833E-03
8.1377E-02	2.3067E-02	1.0914E-03
7.7408E-02	2.1941E-02	1.0040E-03
7.3633E-02	2.0871E-02	9.2094E-04
7.0042E-02	1.9852E-02	8.4188E-04
6.6626E-02	1.8884E-02	7.6669E-04
6.3375E-02	1.7952E-02	6.9515E-04
6.0286E-02	1.7086E-02	6.2711E-04
5.7345E-02	1.6252E-02	5.6239E-04
5.4549E-02	1.5459E-02	5.0082E-04
5.1898E-02	1.4704E-02	4.4226E-04
4.9358E-02	1.3987E-02	3.9069E-04
4.6950E-02	1.3305E-02	3.5168E-04
4.4651E-02	1.2656E-02	3.1502E-04
4.2483E-02	1.2039E-02	2.8015E-04
4.0411E-02	1.1451E-02	2.4697E-04
3.8440E-02	1.0893E-02	2.1542E-04
3.6565E-02	1.0352E-02	1.8541E-04
3.4782E-02	9.8563E-03	1.5686E-04
3.3085E-02	9.3756E-03	1.2970E-04
3.1472E-02	8.9134E-03	1.0386E-04
2.9937E-02	8.4834E-03	7.9290E-05
2.8477E-02	8.0697E-03	5.5915E-05
2.7088E-02	7.6761E-03	3.3680E-05
2.5767E-02	7.3018E-03	1.2529E-05
2.4510E-02	6.9457E-03	1.2538E-07
2.3315E-02	6.6069E-03	0
2.2178E-02	6.2847E-03	0
2.1096E-02	5.9792E-03	0
2.0067E-02	5.6866E-03	0
1.9089E-02	5.4093E-03	0
1.8158E-02	5.1455E-03	0
1.7272E-02	4.8945E-03	0
1.6430E-02	4.6558E-03	0
1.5629E-02	4.4287E-03	0
1.4866E-02	4.2128E-03	0

E, MeV	f_1
1.4141E-02	4.0073E-03
1.3452E-02	3.8119E-03
1.2795E-02	3.6259E-03
1.2171E-02	3.4491E-03
1.1578E-02	3.2809E-03
1.1013E-02	3.1209E-03
1.0476E-02	2.9687E-03
9.9651E-03	2.8239E-03
9.4791E-03	2.6862E-03
9.0166E-03	2.5552E-03
8.5771E-03	2.4305E-03
8.1588E-03	2.3120E-03
7.7609E-03	2.1992E-03
7.3824E-03	2.0920E-03
7.0223E-03	1.9900E-03
6.6798E-03	1.8929E-03
6.3541E-03	1.8006E-03
6.0442E-03	1.7128E-03
5.7494E-03	1.6292E-03
5.4690E-03	1.5498E-03
5.2023E-03	1.4742E-03
4.9485E-03	1.4023E-03
4.7072E-03	1.3339E-03
4.4776E-03	1.2689E-03
4.2592E-03	1.2070E-03
4.0515E-03	1.1481E-03
3.8539E-03	1.0921E-03
3.6660E-03	1.0389E-03
3.4872E-03	9.8819E-04
3.3171E-03	9.3999E-04
3.1553E-03	8.9415E-04
3.0014E-03	8.5054E-04
2.8551E-03	8.0906E-04
2.7158E-03	7.6960E-04
2.5834E-03	7.3207E-04
2.4574E-03	6.9636E-04

TABLE 21 — Fe (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
2.3375E-03	6.6240E-04	3.8639E-04	1.0949E-04	6.3870E-05	1.8099E-05
2.2235E-03	6.3010E-04	3.6755E-04	1.0415E-04	6.0755E-05	1.7217E-05
2.1151E-03	5.9937E-04	3.4962E-04	9.9074E-05	5.7792E-05	1.6377E-05
2.0119E-03	5.7013E-04	3.3257E-04	9.4242E-05	5.4973E-05	1.5578E-05
1.9138E-03	5.4233E-04	3.1635E-04	8.9646E-05	5.2292E-05	1.4818E-05
1.8205E-03	5.1588E-04	3.0092E-04	8.5274E-05	4.9742E-05	1.4096E-05
1.7317E-03	4.9072E-04	2.8624E-04	8.1115E-05	4.7316E-05	1.3408E-05
1.6472E-03	4.6679E-04	2.7228E-04	7.7159E-05	4.5008E-05	1.2754E-05
1.5669E-03	4.4402E-04	2.5901E-04	7.3396E-05	4.2813E-05	1.2132E-05
1.4905E-03	4.2237E-04	2.4637E-04	6.9817E-05	4.0725E-05	1.1541E-05
1.4178E-03	4.0177E-04	2.3430E-04	6.6412E-05	3.8739E-05	1.0978E-05
1.3486E-03	3.8217E-04	2.2293E-04	6.3173E-05	3.6850E-05	1.0442E-05
1.2829E-03	3.6353E-04	2.1206E-04	6.0092E-05	3.5053E-05	9.9331E-06
1.2203E-03	3.4580E-04	2.0171E-04	5.7161E-05	3.3343E-05	9.4436E-06
1.1608E-03	3.2894E-04	1.9188E-04	5.4373E-05	3.1717E-05	8.9878E-06
1.1042E-03	3.1290E-04	1.8252E-04	5.1721E-05	3.0170E-05	8.5495E-06
1.0503E-03	2.9764E-04	1.7362E-04	4.9199E-05	2.8699E-05	8.1325E-06
9.9909E-04	2.8312E-04	1.6515E-04	4.6799E-05	2.7299E-05	7.7359E-06
9.5037E-04	2.6931E-04	1.5709E-04	4.4517E-05	2.5968E-05	7.3586E-06
9.0402E-04	2.5618E-04	1.4943E-04	4.2346E-05	2.4701E-05	6.9997E-06
8.5993E-04	2.4368E-04	1.4215E-04	4.0281E-05	2.3496E-05	6.6583E-06
8.1799E-04	2.3180E-04	1.3521E-04	3.8316E-05	2.2350E-05	6.3336E-06
7.7809E-04	2.2049E-04	1.2862E-04	3.6447E-05	2.1260E-05	6.0247E-06
7.4015E-04	2.0974E-04	1.2235E-04	3.4670E-05	2.0224E-05	5.7309E-06
7.0405E-04	1.9951E-04	1.1638E-04	3.2979E-05	1.9237E-05	5.4514E-06
6.6971E-04	1.8978E-04	1.1070E-04	3.1371E-05	1.8299E-05	5.1855E-06
6.3705E-04	1.8053E-04	1.0530E-04	2.9841E-05	1.7407E-05	4.9326E-06
6.0598E-04	1.7172E-04	1.0017E-04	2.8385E-05	1.6558E-05	4.6921E-06
5.7643E-04	1.6335E-04	9.5283E-05	2.7001E-05	1.5750E-05	4.4632E-06
5.4831E-04	1.5538E-04	9.0636E-05	2.5684E-05	1.4982E-05	4.2455E-06
5.2157E-04	1.4780E-04	8.6215E-05	2.4431E-05	1.4251E-05	4.0385E-06
4.9613E-04	1.4059E-04	8.2011E-05	2.3240E-05	1.3556E-05	3.8415E-06
4.7194E-04	1.3374E-04	7.8011E-05	2.2106E-05	1.2895E-05	3.6542E-06
4.4892E-04	1.2721E-04	7.4205E-05	2.1028E-05	1.2266E-05	3.4760E-06
4.2703E-04	1.2101E-04	7.0587E-05	2.0003E-05	1.1668E-05	3.3064E-06
4.0620E-04	1.1511E-04	6.7145E-05	1.9027E-05	1.1099E-05	3.1452E-06

TABLE 21 — Fe (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
1.0558E-05	2.9918E-06	1.5791E-06	4.4748E-07	2.3618E-07	6.6929E-08
1.0043E-05	2.8459E-06	1.5021E-06	4.2565E-07	2.2460E-07	6.3664E-08
9.5529E-06	2.7071E-06	1.4298E-06	4.0489E-07	2.1371E-07	6.0559E-08
9.0870E-06	2.5751E-06	1.3591E-06	3.8515E-07	2.0328E-07	5.7606E-08
8.6438E-06	2.4495E-06	1.2928E-06	3.6636E-07	1.9337E-07	5.4796E-08
8.2223E-06	2.3300E-06	1.2298E-06	3.4850E-07	1.8394E-07	5.2124E-08
7.8213E-06	2.2164E-06	1.1698E-06	3.3150E-07	1.7497E-07	4.9582E-08
7.4396E-06	2.1083E-06	1.1128E-06	3.1533E-07	1.6643E-07	4.7164E-08
7.0770E-06	2.0055E-06	1.0585E-06	2.9995E-07	1.5832E-07	4.4864E-08
6.7314E-06	1.9076E-06	1.0069E-06	2.8532E-07	1.5060E-07	4.2676E-08
6.4035E-06	1.8146E-06	9.5777E-07	2.7141E-07	1.4325E-07	4.0594E-08
6.0912E-06	1.7261E-06	9.1105E-07	2.5817E-07	1.3627E-07	3.8614E-08
5.7941E-06	1.6419E-06	8.6662E-07	2.4558E-07	1.2962E-07	3.6731E-08
5.5110E-06	1.5618E-06	8.2430E-07	2.3360E-07	1.2330E-07	3.4940E-08
5.2428E-06	1.4857E-06	7.8415E-07	2.2221E-07	1.1728E-07	3.3236E-08
4.9871E-06	1.4132E-06	7.4591E-07	2.1137E-07	1.1156E-07	3.1615E-08
4.7438E-06	1.3443E-06	7.0953E-07	2.0106E-07	1.0612E-07	3.0073E-08
4.5125E-06	1.2787E-06	6.7496E-07	1.9126E-07	1.0095E-07	2.8606E-08
4.2924E-06	1.2164E-06	6.4201E-07	1.8193E-07	9.6024E-08	2.7211E-08
4.0831E-06	1.1570E-06	6.1070E-07	1.7306E-07	9.1341E-08	2.5884E-08
3.8839E-06	1.1006E-06	5.8091E-07	1.6462E-07	8.6887E-08	2.4622E-08
3.6945E-06	1.0469E-06	5.5258E-07	1.5659E-07	8.2649E-08	2.3421E-08
3.5143E-06	9.9588E-07	5.2563E-07	1.4895E-07	7.8618E-08	2.2279E-08
3.3429E-06	9.4731E-07	5.0000E-07	1.4169E-07	7.4784E-08	2.1192E-08
3.1799E-06	9.0111E-07	4.7561E-07	1.3478E-07	7.1137E-08	2.0159E-08
3.0248E-06	8.5716E-07	4.5242E-07	1.2820E-07	6.7667E-08	1.9175E-08
2.8773E-06	8.1536E-07	4.3035E-07	1.2195E-07	6.4367E-08	1.8240E-08
2.7370E-06	7.7559E-07	4.0936E-07	1.1600E-07	6.1228E-08	1.7351E-08
2.6035E-06	7.3777E-07	3.8940E-07	1.1035E-07	5.8242E-08	1.6504E-08
2.4765E-06	7.0178E-07	3.7041E-07	1.0496E-07	5.5401E-08	1.5699E-08
2.3557E-06	6.6756E-07	3.5234E-07	9.9846E-08	5.2699E-08	1.4934E-08
2.2408E-06	6.3500E-07	3.3516E-07	9.4976E-08	5.0129E-08	1.4205E-08
2.1315E-06	6.0403E-07	3.1881E-07	9.0344E-08	4.7684E-08	1.3513E-08
2.0276E-06	5.7457E-07	3.0326E-07	8.5938E-08	4.5359E-08	1.2854E-08
1.9287E-06	5.4655E-07	2.8847E-07	8.1747E-08	4.3147E-08	1.2227E-08
1.8346E-06	5.1989E-07	2.7440E-07	7.7760E-08	4.1042E-08	1.1630E-08
1.7452E-06	4.9454E-07	2.6102E-07	7.3968E-08	3.9041E-08	1.1063E-08
1.6601E-06	4.7042E-07	2.4829E-07	7.0360E-08	3.7137E-08	1.0517E-08

TABLE 21 — Fe (CONTINUED)

E, MeV	f_7	f_8	f_9	f_{10}	f_{11}	f_{12}
1.8017E 01	1.8730E-01	1.3781E+01	7.9200E-02	2.6013E-02	2.0398E-05	3.2058E-06
1.7139E 01	1.8656E-01	1.4078E+01	7.8926E-02	3.0250E-02	6.1253E-03	8.5095E-04
1.6303E 01	1.8851E-01	1.4130E+01	7.7580E-02	3.2709E-02	7.1384E-03	3.6076E-04
1.5508E 01	1.9279E-01	1.4078E+01	7.6918E-02	3.3221E-02	7.8880E-03	1.3035E-03
1.4751E 01	1.9227E-01	1.3327E+01	7.2227E-02	2.9955E-02	7.3906E-03	1.1704E-03
1.4032E 01	1.8957E-01	1.2466E+01	6.6757E-02	2.6307E-02	6.7238E-03	8.4728E-04
1.3348E 01	1.7724E-01	1.1484E+01	5.9778E-02	2.3549E-02	6.4842E-03	8.8508E-04
1.2697E 01	1.6353E-01	1.0517E+01	5.2778E-02	2.1071E-02	6.3368E-03	9.9136E-04
1.2077E 01	1.5032E-01	9.5783E+02	4.6124E-02	1.8662E-02	5.9755E-03	9.2769E-04
1.1488E 01	1.3582E-01	8.5034E+02	3.9310E-02	1.6047E-02	4.6708E-03	1.2651E-04
1.0928E 01	1.1602E-01	7.0330E+02	2.9815E-02	1.2885E-02	4.1633E-03	0
1.0395E 01	9.9022E-02	5.8218E+02	2.0739E-02	8.1655E-03	2.0858E-03	0
9.8882E 00	8.7685E-02	5.2207E+02	1.8714E-02	7.1268E-03	2.3887E-03	0
9.4059E 00	8.4842E-02	5.3081E+02	1.2958E-02	6.4501E-04	3.6445E-04	0
8.9472E 00	5.6474E-02	2.6909E+02	2.6306E-03	1.0406E-03	0	0
8.5108E 00	5.5565E-02	2.6807E+02	2.1396E-03	1.2058E-03	0	0
8.0957E 00	4.7677E-02	2.0449E+02	-3.6039E-04	1.7296E-04	0	0
7.7009E 00	4.1402E-02	1.7293E+02	-1.2252E-04	0	0	0
7.3253E 00	3.2214E-02	1.1948E+02	0	0	0	0
6.9681E 00	2.3998E-02	5.2480E+03	0	0	0	0
6.6282E 00	1.0271E-02	2.2570E+03	0	0	0	0
6.3050E 00	1.0098E-02	2.0667E+04	0	0	0	0
5.9975E 00	4.5163E-03	0	0	0	0	0
5.7050E 00	2.0335E-03	0	0	0	0	0
5.4267E 00	2.5181E-04	0	0	0	0	0
5.1621E 00	0	0	0	0	0	0
4.9103E 00	0	0	0	0	0	0
4.6706E 00	0	0	0	0	0	0
4.4430E 00	0	0	0	0	0	0
4.2263E 00	0	0	0	0	0	0
4.0202E 00	0	0	0	0	0	0
3.8242E 00	0	0	0	0	0	0
3.6376E 00	0	0	0	0	0	0
3.4602E 00	0	0	0	0	0	0
3.2915E 00	0	0	0	0	0	0

Note: Values of f_1 through f_6 are given on pages 121 through 126.

TABLE 22 — Fe – FRACTION OF DISCRETE LEVEL EXCITATION CORRESPONDING TO LEVEL OF ENERGY E_ν

E, MeV	E_ν, MeV					
	0.845	1.41	2.10	2.60	2.95	3.25
3.6376E 00	2.8479E-01	5.9239E-02	1.0263E-01	1.0301E-01	2.8785E-01	1.6249E-01
3.4602E 00	3.6042E-01	6.5876E-02	1.0981E-01	1.4371E-01	2.8289E-01	3.7299E-02
3.2915E 00	4.3672E-01	6.5972E-02	1.0486E-01	1.6036E-01	2.3208E-01	0
3.1310E 00	5.4440E-01	6.9106E-02	1.0191E-01	1.6740E-01	1.1719E-01	0
2.9783E 00	6.8180E-01	7.1928E-02	9.8406E-02	1.4787E-01	0	0
2.8330E 00	7.6542E-01	6.4580E-02	8.0116E-02	8.9887E-02	0	0
2.6948E 00	8.4822E-01	5.9265E-02	6.6504E-02	2.6014E-02	0	0
2.5634E 00	8.9020E-01	5.5672E-02	5.4126E-02	0	0	0
2.4384E 00	9.0379E-01	5.2611E-02	4.3602E-02	0	0	0
2.3195E 00	9.1850E-01	5.0354E-02	3.1149E-02	0	0	0
2.2063E 00	9.3835E-01	4.8582E-02	1.3066E-02	0	0	0
2.0987E 00	9.5360E-01	4.6404E-02	0	0	0	0
1.9964E 00	9.5695E-01	4.3054E-02	0	0	0	0
1.8990E 00	9.6169E-01	3.8307E-02	0	0	0	0
1.8064E 00	9.6760E-01	3.2404E-02	0	0	0	0
1.7183E 00	9.7440E-01	2.5601E-02	0	0	0	0
1.6345E 00	9.8192E-01	1.8084E-02	0	0	0	0
1.5548E 00	9.8918E-01	1.0822E-02	0	0	0	0
1.4790E 00	9.9608E-01	3.9164E-03	0	0	0	0
1.4068E 00	1.0000E 00	0	0	0	0	0
1.3382E 00	1.0000E 00	0	0	0	0	0
1.2730E 00	1.0000E 00	0	0	0	0	0
1.2109E 00	1.0000E 00	0	0	0	0	0
1.1518E 00	1.0000E 00	0	0	0	0	0
1.0956E 00	1.0000E 00	0	0	0	0	0
1.0422E 00	1.0000E 00	0	0	0	0	0
9.9137E-01	1.0000E 00	0	0	0	0	0
9.4302E-01	1.0000E 00	0	0	0	0	0
8.9703E-01	1.0000E 00	0	0	0	0	0
8.5328E-01	0	0	0	0	0	0

TABLE 23 — Fe – NUMBER OF γ-RAYS EMITTED PER ABSORPTION

E_γ, MeV	
.38	.7500
1.6	.6000
2.6	.2700
3.7	.2300
6.0	.2500
7.63	.3800
9.3	.0210

TABLE 24 — Fe – NUMBER OF γ-RAYS EMITTED PER NEUTRON-PRODUCING REACTION

E, MeV	E_γ, MeV									
	.85	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
1.81000E 01	.5000	1.1150	.3200	.1360	.0970	.0250	.0030	0	0	0
1.71000E 01	.6400	1.1100	.3300	.1500	.1040	.0400	.0100	.0060	.0020	0
1.63000E 01	.7500	1.1050	.3450	.1670	.1120	.0550	.0270	.0150	.0070	.0010
1.55000E 01	.8800	1.1000	.3600	.1850	.1180	.0700	.0550	.0300	.0140	.0030
1.47500E 01	1.0000	1.0900	.3800	.2000	.1240	.0820	.0740	.0500	.0200	.0050
1.40000E 01	1.1000	1.0800	.3950	.2190	.1300	.0930	.0790	.0530	.0260	.0070
1.33000E 01	1.1800	1.0600	.4050	.2350	.1330	.1100	.0790	.0540	.0270	.0090
1.27000E 01	1.2500	1.0400	.4200	.2500	.1350	.1220	.0790	.0550	.0280	.0096
1.21000E 01	1.3000	1.0200	.4350	.2650	.1380	.1270	.0780	.0550	.0280	.0098
1.15000E 01	1.3500	1.0100	.4500	.2800	.1400	.1320	.0750	.0540	.0280	.0098
1.09000E 01	1.3900	1.0000	.4700	.2950	.1410	.1360	.0730	.0510	.0270	.0097
1.04000E 01	1.4100	.9900	.4800	.3020	.1420	.1380	.0700	.0470	.0250	.0093
9.89000E 00	1.4200	.9700	.4950	.3100	.1410	.1400	.0660	.0430	.0230	.0080
9.41000E 00	1.4300	.9500	.5050	.3180	.1400	.1400	.0610	.0390	.0200	0
8.95000E 00	1.4400	.9300	.5200	.3250	.1380	.1380	.0540	.0320	.0160	0
8.51000E 00	1.4400	.9050	.5300	.3280	.1330	.1350	.0480	.0260	0	0
8.10000E 00	1.4300	.8800	.5400	.3310	.1260	.1200	.0410	.0190	0	0
7.70000E 00	1.4200	.8550	.5500	.3300	.1170	.1050	.0320	.0060	0	0
7.33000E 00	1.4100	.8300	.5600	.3280	.1060	.0900	.0210	0	0	0
6.97000E 00	1.4000	.8050	.5700	.3230	.0950	.0750	.0100	0	0	0
6.63000E 00	1.3700	.7800	.5700	.3170	.0850	.0600	.0030	0	0	0
6.30000E 00	1.3300	.7500	.5700	.3080	.0730	.0450	0	0	0	0
6.00000E 00	1.3000	.7200	.5650	.2970	.0640	.0300	0	0	0	0
5.70000E 00	1.2700	.6900	.5600	.2830	.0540	.0180	0	0	0	0
5.43000E 00	1.2400	.6650	.5500	.2700	.0450	.0070	0	0	0	0
5.16000E 00	1.1900	.6400	.5350	.2530	.0350	0	0	0	0	0
4.91000E 00	1.1500	.6100	.5150	.2380	.0250	0	0	0	0	0

TABLE 24 — Fe (CONTINUED)

	E_γ, MeV									
E, MeV	.85	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
4.67000E 00	1.1100	.5800	.4950	.2200	.0150	0	0	0	0	0
4.44000E 00	1.0600	.5500	.4700	.2000	.0050	0	0	0	0	0
4.23000E 00	1.0300	.5200	.4400	.1800	0	0	0	0	0	0
4.02000E 00	1.0100	.4900	.4000	.1550	0	0	0	0	0	0
3.82000E 00	.9800	.4600	.3600	.1250	0	0	0	0	0	0
3.64000E 00	.9600	.4300	.3200	.1000	0	0	0	0	0	0
3.46000E 00	.9400	.3900	.2600	.0560	0	0	0	0	0	0
3.29000E 00	.9200	.3400	.2000	0	0	0	0	0	0	0
3.13000E 00	.9250	.3000	.1000	0	0	0	0	0	0	0
2.97000E 00	.9250	.2600	.0300	0	0	0	0	0	0	0
2.83000E 00	.9300	.2200	0	0	0	0	0	0	0	0
2.69000E 00	.9400	.1700	0	0	0	0	0	0	0	0
2.56000E 00	.9000	.1000	0	0	0	0	0	0	0	0
2.44000E 00	.9140	.0860	0	0	0	0	0	0	0	0
2.32000E 00	.9240	.0760	0	0	0	0	0	0	0	0
2.21000E 00	.9290	.0710	0	0	0	0	0	0	0	0
2.10000E 00	.9380	.0620	0	0	0	0	0	0	0	0
2.00000E 00	.9460	.0540	0	0	0	0	0	0	0	0
1.90000E 00	.9550	.0450	0	0	0	0	0	0	0	0
1.81000E 00	.9640	.0360	0	0	0	0	0	0	0	0
1.72000E 00	.9730	.0270	0	0	0	0	0	0	0	0
1.63000E 00	.9800	.0200	0	0	0	0	0	0	0	0
1.55000E 00	.9900	.0100	0	0	0	0	0	0	0	0
1.41000E 00	1.0000	0	0	0	0	0	0	0	0	0
8.50000E-01	1.0000	0	0	0	0	0	0	0	0	0
8.40000E-01	0	0	0	0	0	0	0	0	0	0
1.00000E-10	0	0	0	0	0	0	0	0	0	0

Cross Section, barn

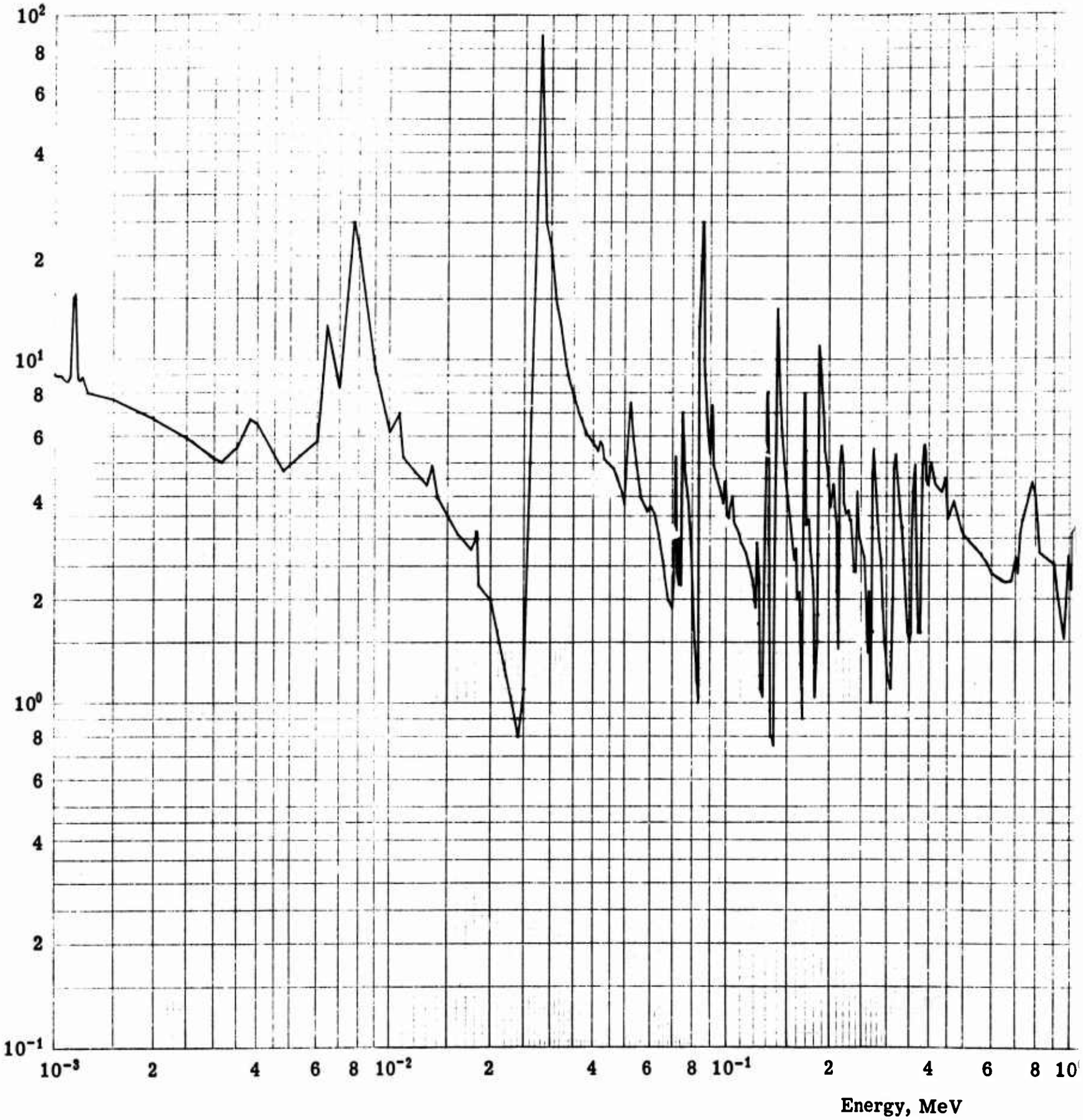
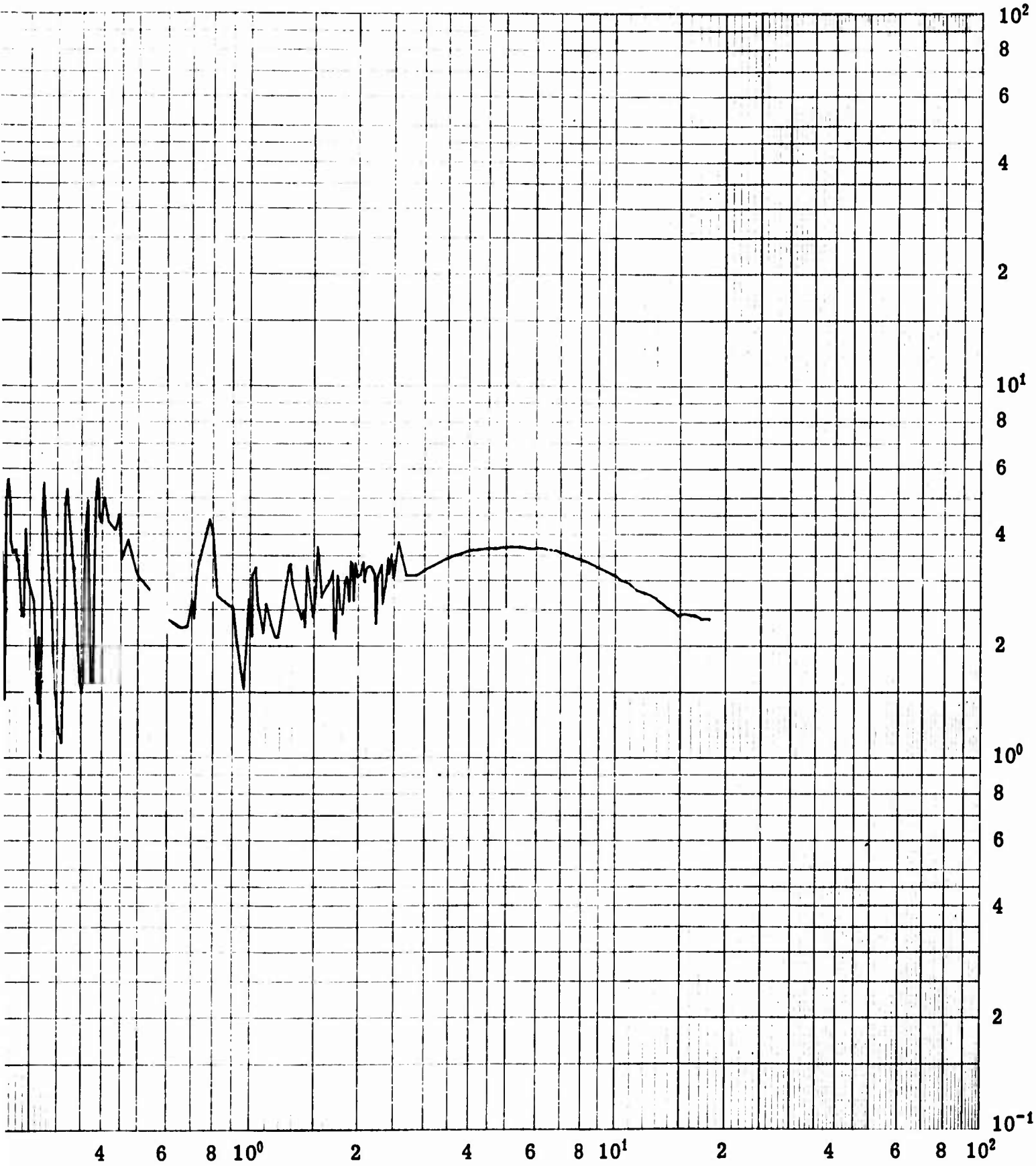


Fig. 13(a) — Fe – Total Cross Section – High



l Cross Section – High Energy Part

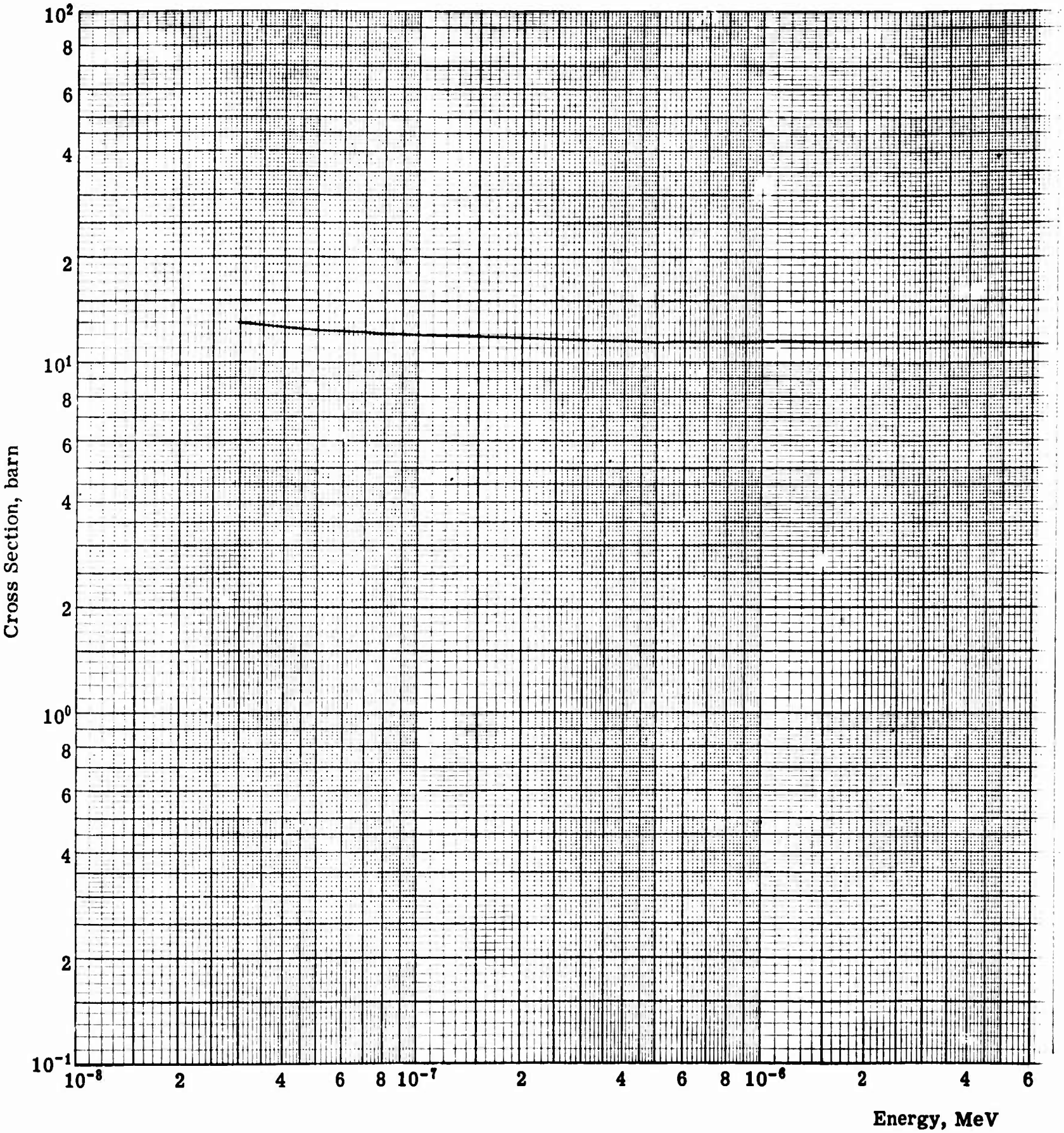
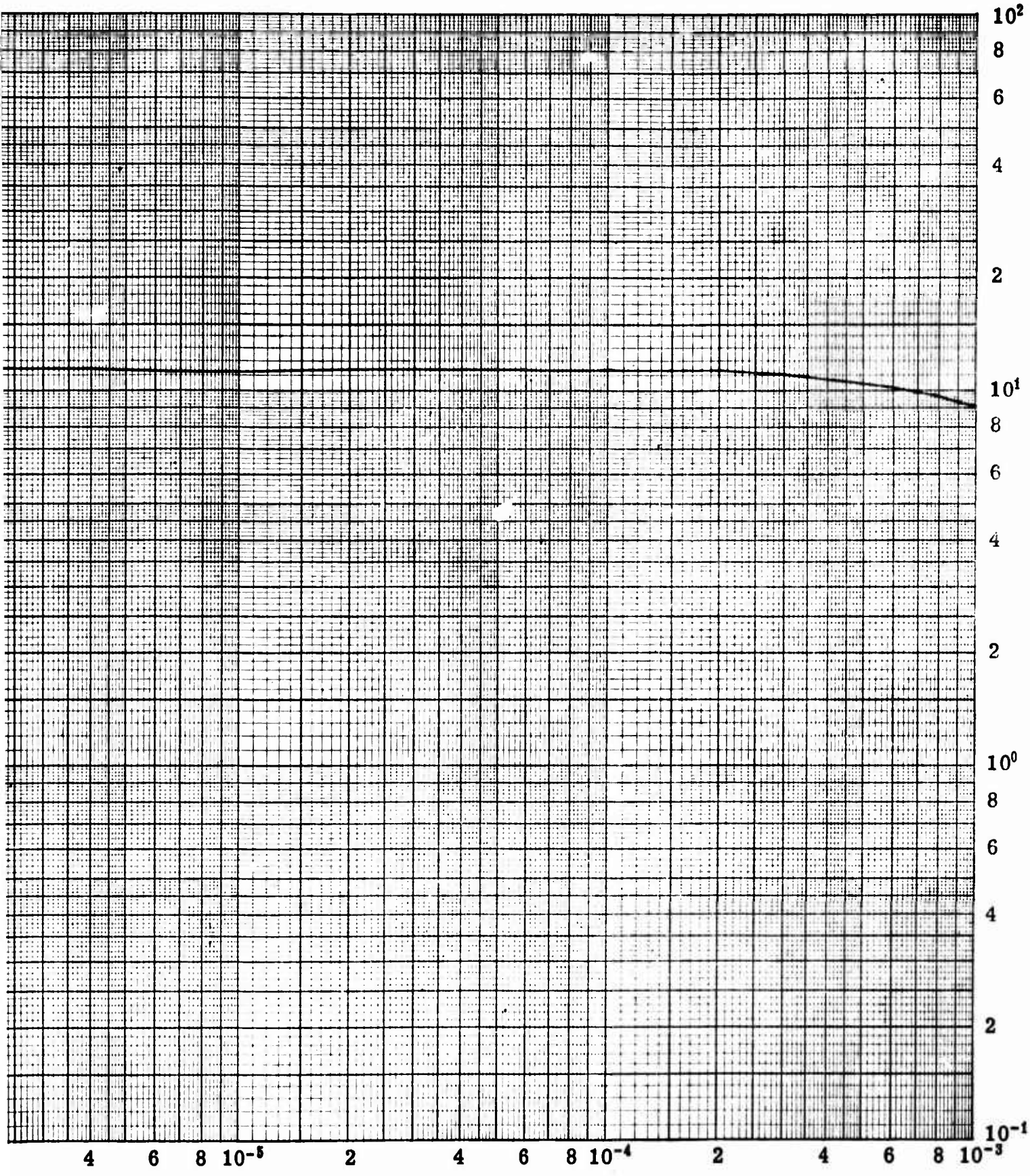


Fig. 13(b) — Fe – Total Cross Section



Cross Section – Low Energy Part

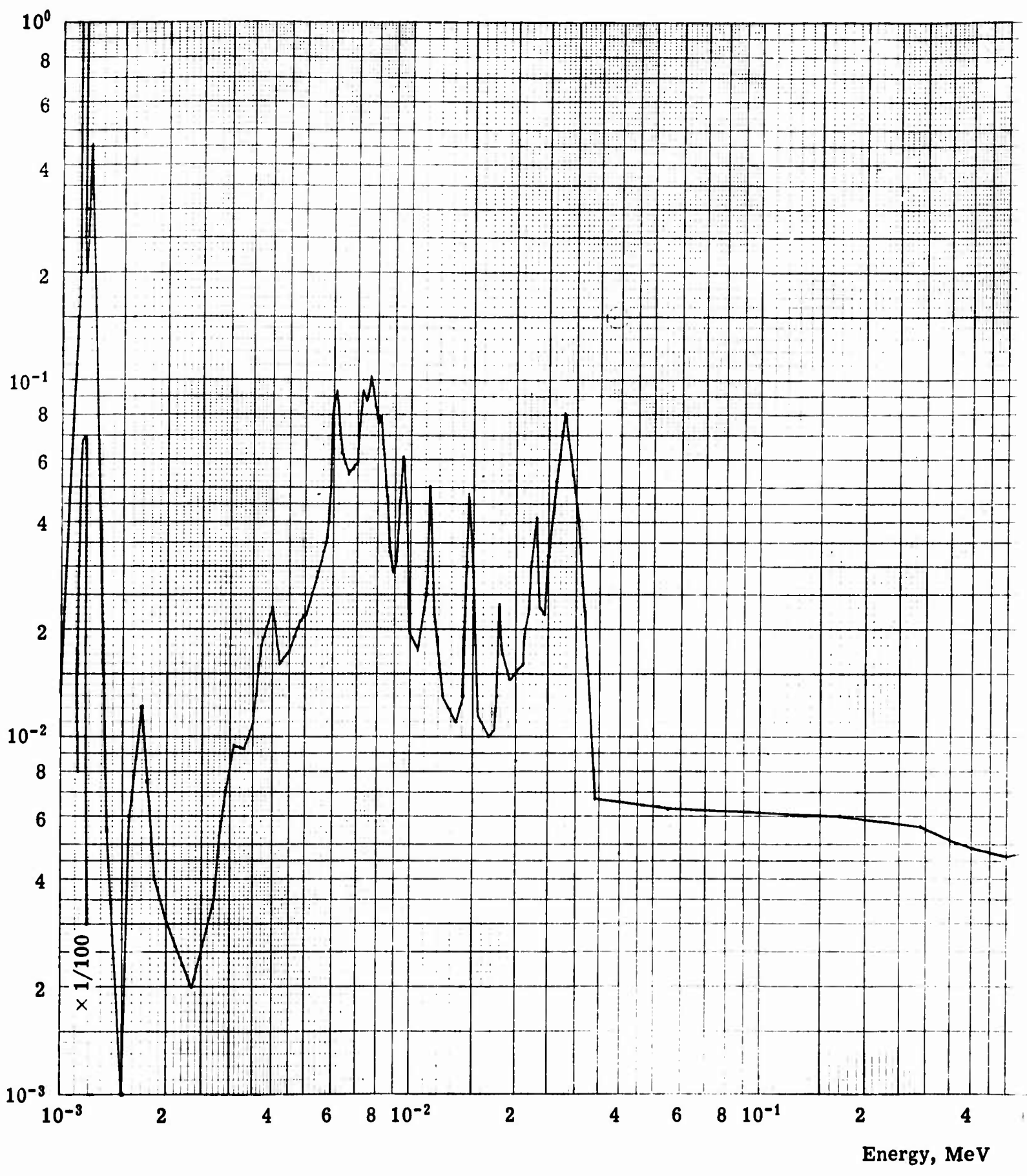
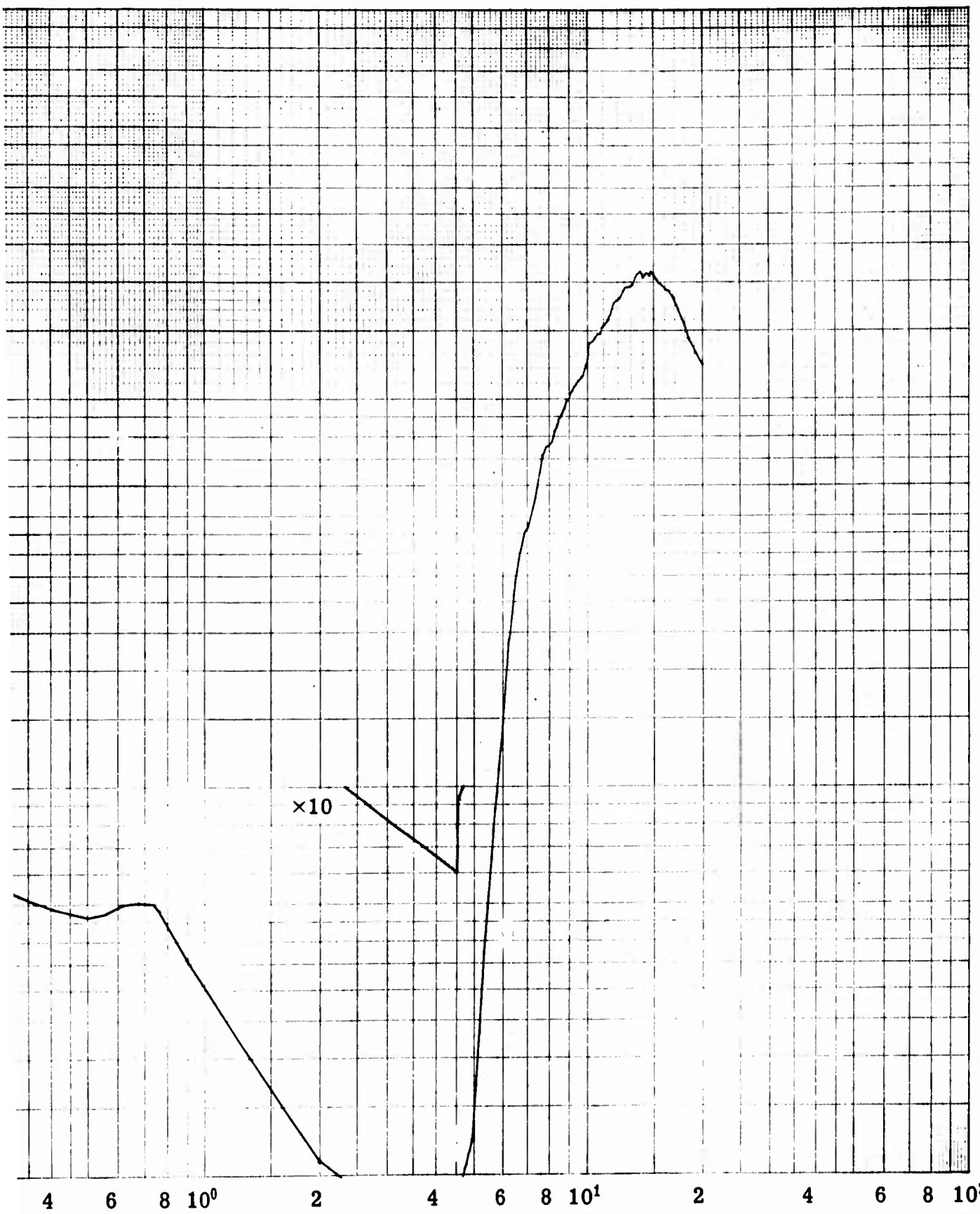


Fig. 14(a) — Fe – Absorption Cross Sec



Cross Section, barn

Cross Section – High Energy Part

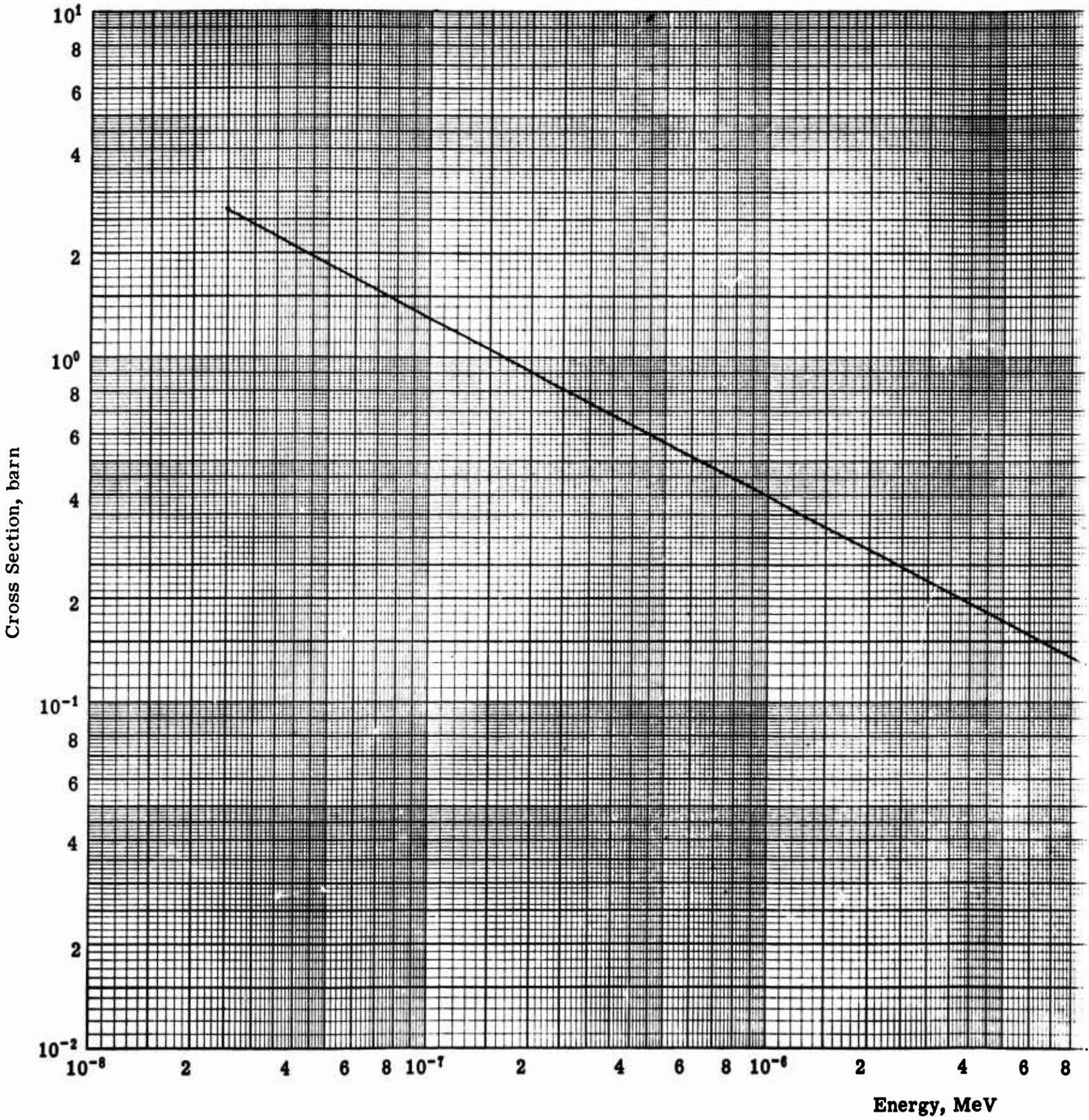
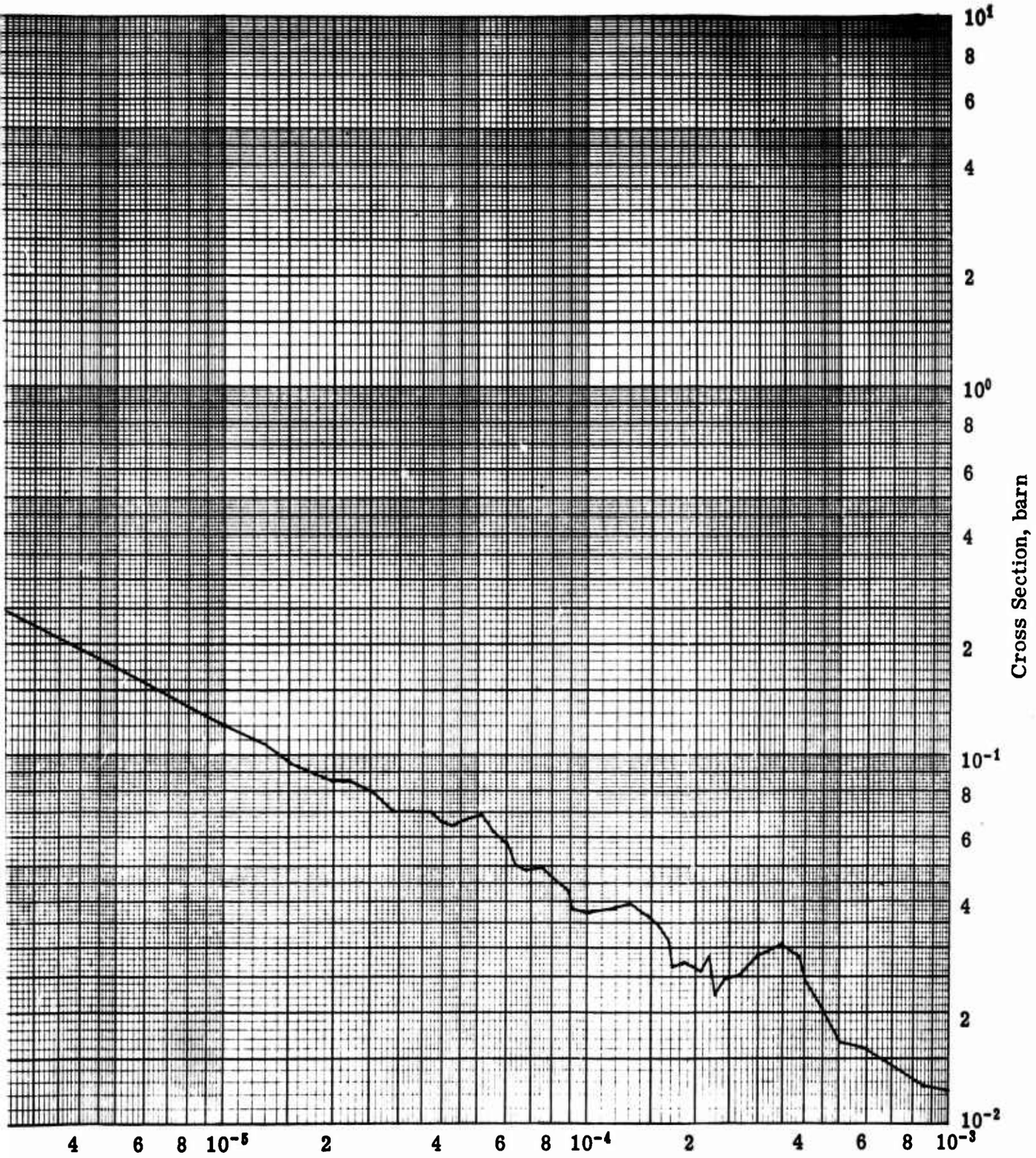


Fig. 14(b) — Fe – Absorption Cross Section –



ergy, MeV

n Cross Section – Low Energy Part

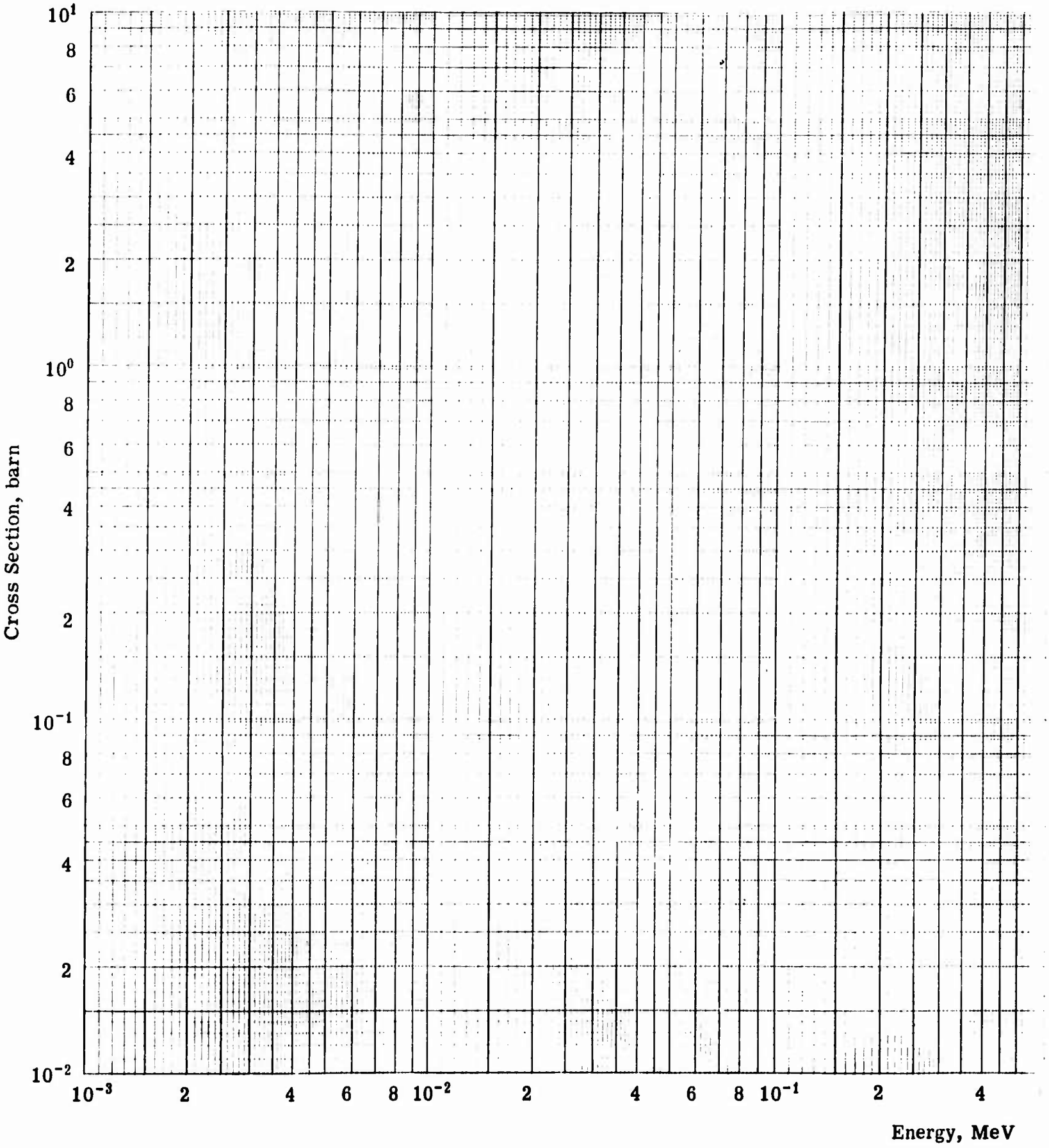
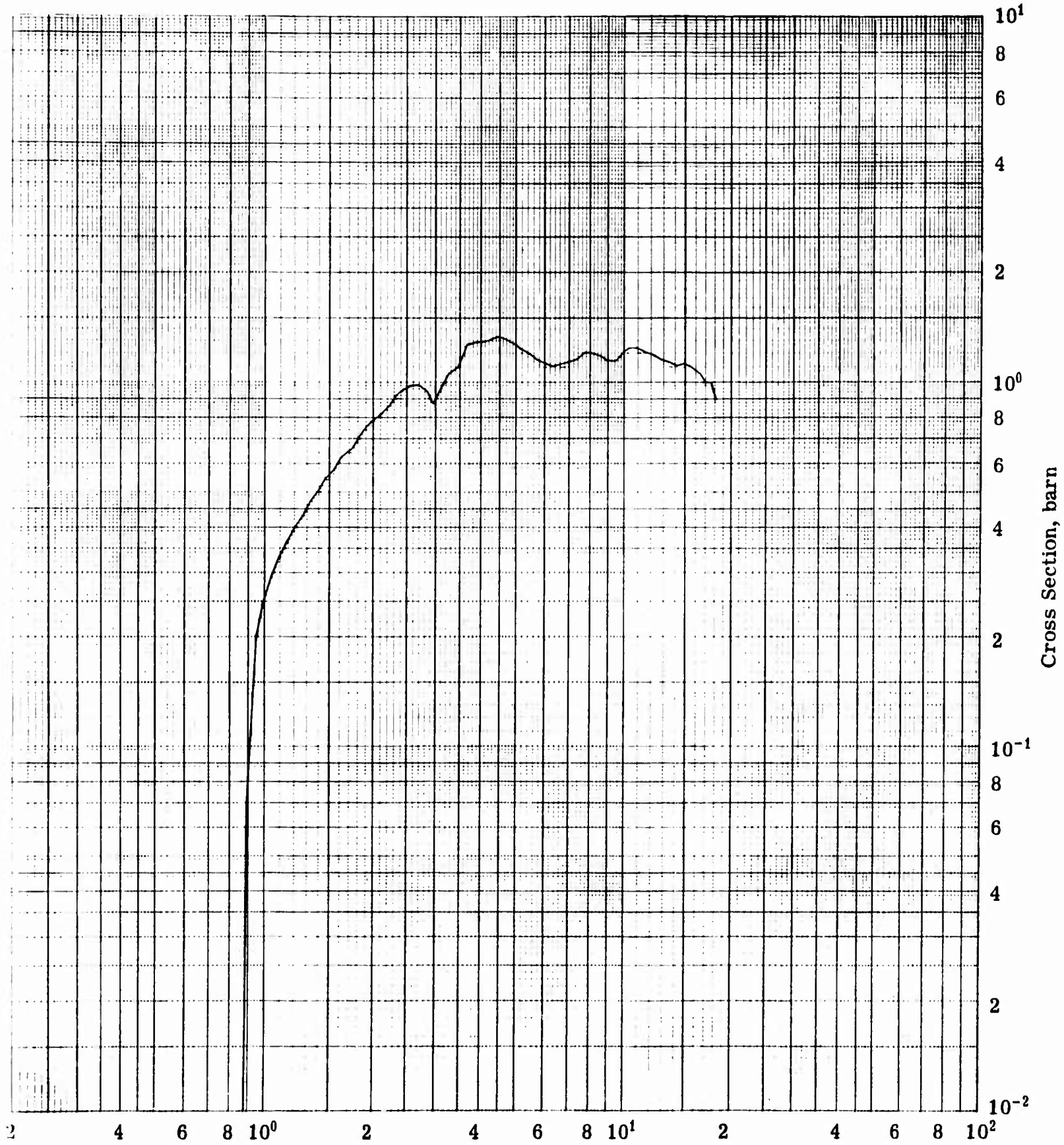


Fig. 15 — Fe – Inelastic-Scattering plu



-Scattering plus (n,2n) Cross Section

6. DEUTERIUM AND BERYLLIUM

The cross sections of deuterium were taken from the report UNC-5038,[1] those of beryllium, from UNC-5014, Vol. B.[2] They are listed in Tables 25 through 30 with out any essential modifications.

REFERENCES

1. Kalos, M. H., Goldstein, H., and Ray, J. H.: UNC-5038 (Aug. 31, 1962).
2. Krumbein, A. D.: UNC-5014, Vol. B (May 31, 1962).

TABLE 25 — D – NEUTRON CROSS SECTIONS
(ALL CROSS SECTIONS IN BARNS)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,n'}$
1.8017E 01	6.7009E-01	4.4011E-01	2.2997E-01
1.7139E 01	6.9874E-01	4.7832E-01	2.2042E-01
1.6303E 01	7.2989E-01	5.1986E-01	2.1004E-01
1.5508E 01	7.5971E-01	5.5961E-01	2.0010E-01
1.4751E 01	7.9093E-01	5.9993E-01	2.0000E-01
1.4032E 01	8.2872E-01	6.3830E-01	1.9043E-01
1.3348E 01	8.5796E-01	6.7728E-01	1.8068E-01
1.2697E 01	8.9022E-01	7.2028E-01	1.6994E-01
1.2077E 01	9.3113E-01	7.7151E-01	1.5962E-01
1.1488E 01	9.6077E-01	8.1077E-01	1.5000E-01
1.0928E 01	9.9813E-01	8.4813E-01	1.5000E-01
1.0395E 01	1.0304E 00	8.9048E-01	1.3990E-01
9.8862E 00	1.0702E 00	9.4019E-01	1.2996E-01
9.4059E 00	1.1104E 00	9.9036E-01	1.2000E-01
8.9472E 00	1.1503E 00	1.0303E 00	1.1994E-01
8.5108E 00	1.1899E 00	1.0799E 00	1.1002E-01
8.0957E 00	1.2304E 00	1.1305E 00	9.9893E-02
7.7009E 00	1.2499E 00	1.1799E 00	9.0023E-02
7.3253E 00	1.3206E 00	1.2308E 00	8.9870E-02
6.9681E 00	1.3703E 00	1.2903E 00	8.0000E-02
6.6282E 00	1.4202E 00	1.3403E 00	7.9946E-02
6.3052E 00	1.4594E 00	1.3892E 00	7.0130E-02
5.9975E 00	1.5104E 00	1.4504E 00	6.0000E-02
5.7040E 00	1.5592E 00	1.4992E 00	6.0000E-02
5.4267E 00	1.6007E 00	1.5507E 00	5.0000E-02
5.1621E 00	1.6595E 00	1.6095E 00	5.0000E-02
4.9103E 00	1.7099E 00	1.6699E 00	4.0012E-02
4.6708E 00	1.7598E 00	1.7198E 00	4.0000E-02
4.4430E 00	1.8192E 00	1.7891E 00	3.0132E-02
4.2263E 00	1.8707E 00	1.8409E 00	2.9826E-02
4.0202E 00	1.9100E 00	1.8899E 00	2.0011E-02
3.8242E 00	1.9590E 00	1.9390E 00	2.0000E-02
3.6376E 00	2.0108E 00	2.0008E 00	9.9347E-03
3.4602E 00	2.0599E 00	2.0649E 00	5.0066E-03
3.2915E 00	2.1196E 00	2.1195E 00	4.3538E-05
3.1310E 00	2.1697E 00	2.1697E 00	0
2.9783E 00	2.2174E 00	2.2174E 00	0
2.8330E 00	2.2689E 00	2.2689E 00	0
2.6948E 00	2.3183E 00	2.3183E 00	0
2.5634E 00	2.3687E 00	2.3687E 00	0
2.4384E 00	2.4205E 00	2.4205E 00	0
2.3195E 00	2.4602E 00	2.4602E 00	0
2.2063E 00	2.5013E 00	2.5013E 00	0
2.0987E 00	2.5405E 00	2.5405E 00	0
1.9964E 00	2.5811E 00	2.5811E 00	0
1.8990E 00	2.6104E 00	2.6104E 00	0
1.8064E 00	2.6512E 00	2.6512E 00	0
1.7183E 00	2.6808E 00	2.6808E 00	0

TABLE 25 — D (CONTINUED)

E, MeV	$\sigma_{nT} = \sigma_{n,n}$	E, MeV	$\sigma_{nT} = \sigma_{n,n}$
1.6345E 00	2.7180E 00	1.2702E-01	3.3791E 00
1.5548E 00	2.7482E 00	1.2140E-01	3.3800E 00
1.4790E 00	2.7803E 00	1.1548E-01	3.3892E 00
1.4068E 00	2.8009E 00	1.0985E-01	3.3900E 00
1.3382E 00	2.8208E 00	1.0449E-01	3.3995E 00
1.2730E 00	2.8487E 00	9.9394E-02	3.4000E 00
1.2109E 00	2.8697E 00	9.4547E-02	3.4000E 00
1.1518E 00	2.8894E 00	8.9935E-02	3.4000E 00
1.0956E 00	2.9201E 00	8.5549E-02	3.4000E 00
1.0422E 00	2.9399E 00	8.1377E-02	3.4000E 00
9.9137E-01	2.9599E 00	7.7408E-02	3.4000E 00
9.4302E-01	2.9899E 00	7.3633E-02	3.4000E 00
8.9703E-01	3.0000E 00	7.0042E-02	3.4000E 00
8.5328E-01	3.0199E 00	6.6626E-02	3.4000E 00
8.1167E-01	3.0402E 00	6.3376E-02	3.4000E 00
7.7208E-01	3.0600E 00	6.0286E-02	3.4000E 00
7.3443E-01	3.0798E 00	5.7345E-02	3.4000E 00
6.9861E-01	3.1002E 00	5.4549E-02	3.4000E 00
6.6454E-01	3.1204E 00	5.1888E-02	3.4000E 00
6.3213E-01	3.1400E 00	4.9358E-02	3.4000E 00
6.0130E-01	3.1499E 00	4.6951E-02	3.4000E 00
5.7197E-01	3.1400E 00	4.4661E-02	3.4000E 00
5.4408E-01	3.1700E 00	4.2483E-02	3.4000E 00
5.1754E-01	3.1902E 00	4.0411E-02	3.4000E 00
4.9230E-01	3.1999E 00	3.8440E-02	3.4000E 00
4.6829E-01	3.1999E 00	3.6565E-02	3.4000E 00
4.4545E-01	3.2000E 00	3.4782E-02	3.4000E 00
4.2373E-01	3.2001E 00	3.3085E-02	3.4000E 00
4.0306E-01	3.2200E 00	3.1472E-02	3.4000E 00
3.8341E-01	3.2299E 00	2.9937E-02	3.4000E 00
3.6471E-01	3.2402E 00	2.8477E-02	3.4000E 00
3.4692E-01	3.2600E 00	2.7088E-02	3.4000E 00
3.3006E-01	3.2700E 00	2.5767E-02	3.4000E 00
3.1391E-01	3.2801E 00	2.4510E-02	3.4000E 00
2.9860E-01	3.2900E 00	2.3315E-02	3.4000E 00
2.8403E-01	3.2700E 00	2.2178E-02	3.4000E 00
2.7018E-01	3.2999E 00	2.1096E-02	3.4000E 00
2.5700E-01	3.2900E 00	2.0067E-02	3.4000E 00
2.4447E-01	3.2996E 00	1.9089E-02	3.4000E 00
2.3255E-01	3.3000E 00	1.8158E-02	3.4000E 00
2.2121E-01	3.3100E 00	1.7272E-02	3.4000E 00
2.1042E-01	3.3196E 00	1.6430E-02	3.4000E 00
2.0016E-01	3.3100E 00	1.5628E-02	3.4000E 00
1.9039E-01	3.3195E 00	1.4866E-02	3.4000E 00
1.8111E-01	3.3299E 00	1.4141E-02	3.4000E 00
1.7226E-01	3.3300E 00	1.3452E-02	3.4000E 00
1.6387E-01	3.3399E 00	1.2795E-02	3.4000E 00
1.5588E-01	3.3489E 00	1.2171E-02	3.4000E 00
1.4828E-01	3.3596E 00	1.1578E-02	3.4000E 00
1.4105E-01	3.3699E 00	1.1013E-02	3.4000E 00
1.3417E-01	3.3700E 00	1.0476E-02	3.4000E 00

TABLE 25 — D (CONTINUED)

E, MeV	$\sigma_{nT} = \sigma_{n,n}$	E, MeV	$\sigma_{nT} = \sigma_{n,n}$
9.9651E-03	3.4000E 00	7.7809E-04	3.4000E 00
9.4791E-03	3.4000E 00	7.4015E-04	3.4000E 00
9.0168E-03	3.4000E 00	7.0405E-04	3.4000E 00
8.5771E-03	3.4000E 00	6.6971E-04	3.4000E 00
8.1588E-03	3.4000E 00	6.3705E-04	3.4000E 00
7.7609E-03	3.4000E 00	6.0598E-04	3.4000E 00
7.3824E-03	3.4000E 00	5.7643E-04	3.4000E 00
7.0223E-03	3.4000E 00	5.4831E-04	3.4000E 00
6.6798E-03	3.4000E 00	5.2157E-04	3.4000E 00
6.3541E-03	3.4000E 00	4.9613E-04	3.4000E 00
6.0442E-03	3.4000E 00	4.7194E-04	3.4000E 00
5.7494E-03	3.4000E 00	4.4892E-04	3.4000E 00
5.4690E-03	3.4000E 00	4.2703E-04	3.4000E 00
5.2023E-03	3.4000E 00	4.0620E-04	3.4000E 00
4.9485E-03	3.4000E 00	3.8639E-04	3.4000E 00
4.7072E-03	3.4000E 00	3.6755E-04	3.4000E 00
4.4776E-03	3.4000E 00	3.4962E-04	3.4000E 00
4.2592E-03	3.4000E 00	3.3257E-04	3.4000E 00
4.0515E-03	3.4000E 00	3.1635E-04	3.4000E 00
3.8539E-03	3.4000E 00	3.0092E-04	3.4000E 00
3.6660E-03	3.4000E 00	2.8624E-04	3.4000E 00
3.4872E-03	3.4000E 00	2.7228E-04	3.4000E 00
3.3171E-03	3.4000E 00	2.5901E-04	3.4000E 00
3.1553E-03	3.4000E 00	2.4637E-04	3.4000E 00
3.0014E-03	3.4000E 00	2.3436E-04	3.4000E 00
2.8551E-03	3.4000E 00	2.2293E-04	3.4000E 00
2.7158E-03	3.4000E 00	2.1206E-04	3.4000E 00
2.5834E-03	3.4000E 00	2.0171E-04	3.4000E 00
2.4574E-03	3.4000E 00	1.9188E-04	3.4000E 00
2.3375E-03	3.4000E 00	1.8252E-04	3.4000E 00
2.2235E-03	3.4000E 00	1.7362E-04	3.4000E 00
2.1151E-03	3.4000E 00	1.6515E-04	3.4000E 00
2.0119E-03	3.4000E 00	1.5709E-04	3.4000E 00
1.9138E-03	3.4000E 00	1.4943E-04	3.4000E 00
1.8205E-03	3.4000E 00	1.4215E-04	3.4000E 00
1.7317E-03	3.4000E 00	1.3521E-04	3.4000E 00
1.6472E-03	3.4000E 00	1.2862E-04	3.4000E 00
1.5669E-03	3.4000E 00	1.2235E-04	3.4000E 00
1.4905E-03	3.4000E 00	1.1638E-04	3.4000E 00
1.4178E-03	3.4000E 00	1.1070E-04	3.4000E 00
1.3486E-03	3.4000E 00	1.0530E-04	3.4000E 00
1.2829E-03	3.4000E 00	1.0017E-04	3.4000E 00
1.2203E-03	3.4000E 00	9.5283E-05	3.4000E 00
1.1608E-03	3.4000E 00	9.0636E-05	3.4000E 00
1.1042E-03	3.4000E 00	8.6215E-05	3.4000E 00
1.0503E-03	3.4000E 00	8.2011E-05	3.4000E 00
9.9909E-04	3.4000E 00	7.8011E-05	3.4000E 00
9.5037E-04	3.4000E 00	7.4206E-05	3.4000E 00
9.0402E-04	3.4000E 00	7.0587E-05	3.4000E 00
8.5993E-04	3.4000E 00	6.7145E-05	3.4000E 00
8.1799E-04	3.4000E 00	6.3870E-05	3.4000E 00

TABLE 25 — D (CONTINUED)

E, MeV	$\sigma_{nT} = \sigma_{n,n}$	E, MeV	$\sigma_{nT} = \sigma_{n,n}$
6.0755E+05	3.4000E 00	4.7438E+06	3.4000E 00
5.7792E+05	3.4000E 00	4.5125E+06	3.4000E 00
5.4973E+05	3.4000E 00	4.2924E+06	3.4000E 00
5.2292E+05	3.4000E 00	4.0831E+06	3.4000E 00
4.9742E+05	3.4000E 00	3.8839E+06	3.4000E 00
4.7316E+05	3.4000E 00	3.6945E+06	3.4000E 00
4.5008E+05	3.4000E 00	3.5143E+06	3.4000E 00
4.2813E+05	3.4000E 00	3.3429E+06	3.4000E 00
4.0725E+05	3.4000E 00	3.1799E+06	3.4000E 00
3.8739E+05	3.4000E 00	3.0248E+06	3.4000E 00
3.6850E+05	3.4000E 00	2.8773E+06	3.4000E 00
3.5053E+05	3.4000E 00	2.7370E+06	3.4000E 00
3.3343E+05	3.4000E 00	2.6035E+06	3.4000E 00
3.1717E+05	3.4000E 00	2.4765E+06	3.4000E 00
3.0170E+05	3.4000E 00	2.3557E+06	3.4000E 00
2.8699E+05	3.4000E 00	2.2408E+06	3.4000E 00
2.7299E+05	3.4000E 00	2.1315E+06	3.4000E 00
2.5968E+05	3.4000E 00	2.0276E+06	3.4000E 00
2.4701E+05	3.4000E 00	1.9287E+06	3.4000E 00
2.3496E+05	3.4000E 00	1.8346E+06	3.4000E 00
2.2350E+05	3.4000E 00	1.7452E+06	3.4000E 00
2.1260E+05	3.4000E 00	1.6601E+06	3.4000E 00
2.0224E+05	3.4000E 00	1.5791E+06	3.4000E 00
1.9237E+05	3.4000E 00	1.5021E+06	3.4000E 00
1.8299E+05	3.4000E 00	1.4288E+06	3.4000E 00
1.7407E+05	3.4000E 00	1.3591E+06	3.4000E 00
1.6558E+05	3.4000E 00	1.2928E+06	3.4000E 00
1.5750E+05	3.4000E 00	1.2298E+06	3.4000E 00
1.4982E+05	3.4000E 00	1.1698E+06	3.4000E 00
1.4251E+05	3.4000E 00	1.1128E+06	3.4000E 00
1.3556E+05	3.4000E 00	1.0585E+06	3.4000E 00
1.2895E+05	3.4000E 00	1.0069E+06	3.4000E 00
1.2266E+05	3.4000E 00	9.5777E+07	3.4000E 00
1.1668E+05	3.4000E 00	9.1105E+07	3.4000E 00
1.1099E+05	3.4000E 00	8.6662E+07	3.4000E 00
1.0558E+05	3.4000E 00	8.2436E+07	3.4000E 00
1.0043E+05	3.4000E 00	7.8415E+07	3.4000E 00
9.5529E+06	3.4000E 00	7.4591E+07	3.4000E 00
9.0870E+06	3.4000E 00	7.0953E+07	3.4000E 00
8.6438E+06	3.4000E 00	6.7493E+07	3.4000E 00
8.2223E+06	3.4000E 00	6.4201E+07	3.4000E 00
7.8213E+06	3.4000E 00	6.1070E+07	3.4000E 00
7.4398E+06	3.4000E 00	5.8091E+07	3.4000E 00
7.0770E+06	3.4000E 00	5.5258E+07	3.4000E 00
6.7318E+06	3.4000E 00	5.2563E+07	3.4000E 00
6.4035E+06	3.4000E 00	5.0000E+07	3.4000E 00
6.0912E+06	3.4000E 00	4.7561E+07	3.4000E 00
5.7941E+06	3.4000E 00	4.5242E+07	3.4000E 00
5.5116E+06	3.4000E 00	4.3035E+07	3.4000E 00
5.2428E+06	3.4000E 00	4.0936E+07	3.4000E 00
4.9871E+06	3.4000E 00	3.8940E+07	3.4000E 00

TABLE 25 — D (CONTINUED)

E, MeV	$\sigma_{nT} = \sigma_{n,n}$
3.7041E-07	3.4000E 00
3.5234E-07	3.4000E 00
3.3516E-07	3.4000E 00
3.1881E-07	3.4000E 00
3.0326E-07	3.4000E 00
2.8847E-07	3.4000E 00
2.7440E-07	3.4000E 00
2.6102E-07	3.4000E 00
2.4829E-07	3.4000E 00
2.3618E-07	3.4000E 00
2.2466E-07	3.4000E 00
2.1371E-07	3.4000E 00
2.0328E-07	3.4000E 00
1.9337E-07	3.4000E 00
1.8394E-07	3.4000E 00
1.7497E-07	3.4000E 00
1.6643E-07	3.4000E 00
1.5832E-07	3.4000E 00
1.5060E-07	3.4000E 00
1.4325E-07	3.4000E 00
1.3627E-07	3.4000E 00
1.2962E-07	3.4000E 00
1.2330E-07	3.4000E 00
1.1728E-07	3.4000E 00
1.1156E-07	3.4000E 00
1.0612E-07	3.4000E 00
1.0095E-07	3.4000E 00
9.6024E-08	3.4000E 00
9.1341E-08	3.4000E 00
8.6887E-08	3.4000E 00
8.2649E-08	3.4000E 00
7.8618E-08	3.4000E 00
7.4784E-08	3.4000E 00
7.1137E-08	3.4000E 00
6.7667E-08	3.4000E 00
6.4367E-08	3.4000E 00
6.1228E-08	3.4000E 00
5.8242E-08	3.4000E 00
5.5401E-08	3.4000E 00
5.2699E-08	3.4000E 00
5.0129E-08	3.4000E 00
4.7684E-08	3.4000E 00
4.5359E-08	3.4000E 00
4.3147E-08	3.4000E 00
4.1042E-08	3.4000E 00
3.9041E-08	3.4000E 00
3.7137E-08	3.4000E 00

TABLE 26 — D – LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
1.8017E 01	3.4900E-01	2.6500E-01	-2.3999E-02	4.2999E-02	-3.1999E-02	3.1997E-03
1.7139E 01	3.4804E-01	2.6500E-01	-2.3713E-02	4.2521E-02	-3.1713E-02	3.1042E-03
1.6303E 01	3.4700E-01	2.6500E-01	-2.3301E-02	4.2002E-02	-3.1401E-02	3.0004E-03
1.5508E 01	3.4601E-01	2.6500E-01	-2.3003E-02	4.1505E-02	-3.1004E-02	4.9010E-03
1.4751E 01	3.4500E-01	2.6500E-01	-2.2701E-02	4.0801E-02	-3.0401E-02	4.8002E-03
1.4032E 01	3.4500E-01	2.6500E-01	-2.2317E-02	4.0034E-02	-2.9730E-02	4.7043E-03
1.3348E 01	3.4407E-01	2.6500E-01	-2.2020E-02	3.9254E-02	-2.9048E-02	4.6068E-03
1.2697E 01	3.4299E-01	2.6500E-01	-2.1497E-02	3.8497E-02	-2.8497E-02	4.4994E-03
1.2077E 01	3.4192E-01	2.6500E-01	-2.0981E-02	3.7962E-02	-2.7974E-02	4.3962E-03
1.1488E 01	3.3996E-01	2.6500E-01	-2.0490E-02	3.6981E-02	-2.7285E-02	4.2981E-03
1.0928E 01	3.3809E-01	2.6500E-01	-2.0023E-02	3.6047E-02	-2.6537E-02	4.2047E-03
1.0395E 01	3.3598E-01	2.6500E-01	-2.1005E-02	3.5193E-02	-2.5592E-02	4.0990E-03
9.8882E 00	3.3399E-01	2.6500E-01	-2.1502E-02	3.4497E-02	-2.4797E-02	3.9996E-03
9.4059E 00	3.3096E-01	2.6500E-01	-2.2004E-02	3.3793E-02	-2.3093E-02	3.8991E-03
8.9472E 00	3.2698E-01	2.6499E-01	-2.2503E-02	3.2995E-02	-2.3194E-02	3.7994E-03
8.5108E 00	3.2401E-01	2.6400E-01	-2.2999E-02	3.2201E-02	-2.2302E-02	3.7002E-03
8.0957E 00	3.2096E-01	2.6298E-01	-2.4011E-02	3.1291E-02	-2.1490E-02	3.5979E-03
7.7009E 00	3.1701E-01	2.6100E-01	-2.4998E-02	3.0502E-02	-2.0602E-02	3.4005E-03
7.3253E 00	3.1191E-01	2.5897E-01	-2.6013E-02	2.9887E-02	-1.9484E-02	3.2974E-03
6.9681E 00	3.0495E-01	2.5699E-01	-2.7006E-02	2.8894E-02	-1.8294E-02	3.0989E-03
6.6282E 00	2.9695E-01	2.5499E-01	-2.8005E-02	2.7895E-02	-1.7295E-02	2.8989E-03
6.3050E 00	2.8715E-01	2.5303E-01	-2.8985E-02	2.6915E-02	-1.6315E-02	2.7030E-03
5.9975E 00	2.7488E-01	2.5097E-01	-3.0008E-02	2.5992E-02	-1.5392E-02	2.4983E-03
5.7050E 00	2.6123E-01	2.4805E-01	-3.0983E-02	2.5017E-02	-1.4515E-02	2.3033E-03
5.4269E 00	2.4681E-01	2.4496E-01	-3.2012E-02	2.3988E-02	-1.3589E-02	2.0988E-03
5.1621E 00	2.3112E-01	2.4202E-01	-3.2992E-02	2.3008E-02	-1.2707E-02	2.0008E-03
4.9103E 00	2.1302E-01	2.3900E-01	-3.3999E-02	2.2001E-02	-1.1801E-02	1.8002E-03
4.6708E 00	1.9506E-01	2.3601E-01	-3.5495E-02	2.1003E-02	-1.1003E-02	1.7003E-03
4.4431E 00	1.7822E-01	2.3205E-01	-3.6487E-02	2.0013E-02	-1.0211E-02	1.6013E-03
4.2263E 00	1.5765E-01	2.2795E-01	-3.7517E-02	1.9084E-02	-9.4878E-03	1.3983E-03
4.0202E 00	1.3802E-01	2.2500E-01	-3.8499E-02	1.8201E-02	-8.8007E-03	1.3001E-03
3.8242E 00	1.2037E-01	2.2108E-01	-3.9479E-02	1.7319E-02	-8.2125E-03	1.2021E-03
3.6376E 00	9.4817E-02	2.1796E-01	-4.0000E-02	1.6490E-02	-7.5922E-03	1.0987E-03
3.4602E 00	8.1019E-02	2.1500E-01	-4.0000E-02	1.5701E-02	-7.0008E-03	1.0001E-03
3.2915E 00	6.0183E-02	2.1103E-01	-4.0006E-02	1.4907E-02	-6.5044E-03	9.0087E-04

TABLE 26 — D (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
3.131E 00	-4.019E-02	2.082E-01	-3.953E-02	1.429E-02	-3.003E-03	8.006E-04
2.978E 00	-2.292E-02	2.042E-01	-3.902E-02	1.344E-02	-3.525E-03	7.051E-04
2.833E 00	-5.347E-03	2.000E-01	-3.851E-02	1.271E-02	-5.108E-03	7.000E-04
2.694E 00	-1.430E-02	1.961E-01	-3.801E-02	1.202E-02	-4.713E-03	6.034E-04
2.563E 00	-2.960E-02	1.930E-01	-3.702E-02	1.122E-02	-4.310E-03	6.000E-04
2.438E 00	-4.429E-02	1.899E-01	-3.598E-02	1.038E-02	-3.996E-03	5.000E-04
2.319E 00	-6.607E-02	1.859E-01	-3.499E-02	9.597E-03	-3.698E-03	4.995E-04
2.206E 00	-8.136E-02	1.828E-01	-3.396E-02	8.980E-03	-3.390E-03	4.000E-04
2.098E 00	-9.837E-02	1.789E-01	-3.298E-02	8.392E-03	-3.097E-03	3.987E-04
1.996E 00	-1.125E-01	1.758E-01	-3.196E-02	7.774E-03	-2.892E-03	3.000E-04
1.899E 00	-1.271E-01	1.729E-01	-3.098E-02	7.094E-03	-2.697E-03	3.000E-04
1.806E 00	-1.415E-01	1.698E-01	-2.994E-02	6.576E-03	-2.492E-03	2.960E-04
1.718E 00	-1.552E-01	1.659E-01	-2.848E-02	5.996E-03	-2.296E-03	2.000E-04
1.634E 00	-1.683E-01	1.622E-01	-2.755E-02	5.525E-03	-2.110E-03	2.000E-04
1.554E 00	-1.802E-01	1.591E-01	-2.656E-02	5.029E-03	-1.912E-03	2.000E-04
1.479E 00	-1.921E-01	1.559E-01	-2.548E-02	4.494E-03	-1.697E-03	1.985E-04
1.406E 00	-2.024E-01	1.528E-01	-2.443E-02	4.081E-03	-1.495E-03	1.000E-04
1.338E 00	-2.125E-01	1.499E-01	-2.296E-02	3.692E-03	-1.397E-03	1.000E-04
1.273E 00	-2.215E-01	1.471E-01	-2.185E-02	3.412E-03	-1.304E-03	1.000E-04
1.210E 00	-2.307E-01	1.436E-01	-2.081E-02	3.104E-03	-1.201E-03	1.000E-04
1.151E 00	-2.376E-01	1.400E-01	-1.983E-02	2.809E-03	-1.103E-03	1.000E-04
1.095E 00	-2.460E-01	1.369E-01	-1.899E-02	2.498E-03	-9.993E-04	1.000E-04
1.042E 00	-2.519E-01	1.340E-01	-1.800E-02	2.201E-03	-9.003E-04	1.000E-04
9.913E-01	-2.579E-01	1.300E-01	-1.700E-02	2.001E-03	-8.007E-04	7.349E-07
9.430E-01	-2.640E-01	1.270E-01	-1.600E-02	1.800E-03	-7.000E-04	0
8.970E-01	-2.690E-01	1.240E-01	-1.500E-02	1.600E-03	-6.000E-04	0
8.532E-01	-2.739E-01	1.200E-01	-1.400E-02	1.401E-03	-6.000E-04	0
8.116E-01	-2.790E-01	1.159E-01	-1.299E-02	1.199E-03	-5.000E-04	0
7.720E-01	-2.829E-01	1.130E-01	-1.200E-02	1.100E-03	-5.000E-04	0
7.344E-01	-2.869E-01	1.090E-01	-1.150E-02	1.001E-03	-4.011E-04	0
6.986E-01	-2.900E-01	1.059E-01	-1.079E-02	7.986E-04	-3.986E-04	0
6.645E-01	-2.931E-01	1.028E-01	-9.969E-03	6.957E-04	-3.000E-04	0
6.321E-01	-2.959E-01	1.000E-01	-9.302E-03	6.003E-04	-3.000E-04	0
6.013E-01	-2.979E-01	9.702E-02	-8.577E-03	5.009E-04	-2.009E-04	0
5.719E-01	-2.990E-01	9.299E-02	-7.799E-03	3.999E-04	-1.999E-04	0

TABLE 26 — D (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
5.4408E-01	-3.0000E-01	8.8014E-02	-7.2017E-03	3.0028E-04	-1.0028E-04	0
5.1754E-01	-3.0102E-01	8.3912E-02	-6.4912E-03	1.9824E-04	-9.8242E-05	0
4.9230E-01	-3.0199E-01	7.9058E-02	-6.0058E-03	1.0116E-04	-1.1622E-06	0
4.6829E-01	-3.0200E-01	7.4061E-02	-5.5061E-03	1.2179E-06	0	0
4.4545E-01	-3.0102E-01	6.8118E-02	-5.0099E-03	0	0	0
4.2373E-01	-2.9997E-01	6.1909E-02	-4.4935E-03	0	0	0
4.0306E-01	-2.9801E-01	5.5021E-02	-4.0015E-03	0	0	0
3.8341E-01	-2.9212E-01	4.7162E-02	-3.6081E-03	0	0	0
3.6471E-01	-2.8487E-01	3.9918E-02	-3.1935E-03	0	0	0
3.4692E-01	-2.7696E-01	3.4976E-02	-2.7986E-03	0	0	0
3.3000E-01	-2.6800E-01	3.0000E-02	-2.5000E-03	0	0	0
3.1391E-01	-2.5692E-01	2.5975E-02	-2.1981E-03	0	0	0
2.9860E-01	-2.4468E-01	2.1892E-02	-1.8919E-03	0	0	0
2.8403E-01	-2.3303E-01	1.8009E-02	-1.6007E-03	0	0	0
2.7018E-01	-2.2617E-01	1.6026E-02	-1.3039E-03	0	0	0
2.5700E-01	-2.0500E-01	1.4001E-02	-1.1001E-03	0	0	0
2.4447E-01	-1.8572E-01	1.2072E-02	-9.0723E-04	0	0	0
2.3255E-01	-1.6443E-01	9.9245E-03	-6.8868E-04	0	0	0
2.2121E-01	-1.5026E-01	8.0343E-03	-4.0514E-04	0	0	0
2.1042E-01	-1.4038E-01	6.0759E-03	-2.0759E-04	0	0	0
2.0016E-01	-1.3212E-01	5.0155E-03	-3.1025E-06	0	0	0
1.9039E-01	-1.2431E-01	4.0393E-03	0	0	0	0
1.8111E-01	-1.1610E-01	3.0120E-03	0	0	0	0
1.7228E-01	-1.0824E-01	2.0306E-03	0	0	0	0
1.6387E-01	-1.0078E-01	1.0970E-03	0	0	0	0
1.5588E-01	-9.3971E-02	1.1012E-04	0	0	0	0
1.4828E-01	-8.6279E-02	0	0	0	0	0
1.4105E-01	-8.0040E-02	0	0	0	0	0
1.3417E-01	-7.5120E-02	0	0	0	0	0
1.2762E-01	-7.0446E-02	0	0	0	0	0
1.2140E-01	-6.6827E-02	0	0	0	0	0
1.1548E-01	-6.3288E-02	0	0	0	0	0
1.0985E-01	-6.0137E-02	0	0	0	0	0
1.0449E-01	-5.7161E-02	0	0	0	0	0
9.9394E-02	-5.4173E-02	0	0	0	0	0

TABLE 26 — D (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
9.4547E-02	-5.2008E-02	1.9866E-02	-8.1909E-03	2.3375E-03	-1.2709E-03
8.9935E-02	-4.9148E-02	1.4141E-02	-7.7248E-03	2.2235E-03	-1.2146E-03
8.5549E-02	-4.6733E-02	1.3452E-02	-7.3481E-03	2.1151E-03	-1.1554E-03
8.1377E-02	-4.4453E-02	1.2795E-02	-6.9897E-03	2.0119E-03	-1.0990E-03
7.7408E-02	-4.2285E-02	1.2171E-02	-6.6488E-03	1.9138E-03	-1.0454E-03
7.3633E-02	-4.0223E-02	1.1578E-02	-6.3246E-03	1.8205E-03	-9.9446E-04
7.0042E-02	-3.8261E-02	1.1013E-02	-6.0161E-03	1.7317E-03	-9.4596E-04
6.6626E-02	-3.6395E-02	1.0476E-02	-5.7227E-03	1.6472E-03	-8.9982E-04
6.3376E-02	-3.4620E-02	9.9651E-03	-5.4436E-03	1.5669E-03	-8.5594E-04
6.0286E-02	-3.2932E-02	9.4791E-03	-5.1781E-03	1.4905E-03	-8.1419E-04
5.7345E-02	-3.1326E-02	9.0168E-03	-4.9256E-03	1.4178E-03	-7.7448E-04
5.4549E-02	-2.9798E-02	8.5771E-03	-4.6854E-03	1.3486E-03	-7.3671E-04
5.1888E-02	-2.8345E-02	8.1588E-03	-4.4568E-03	1.2829E-03	-7.0078E-04
4.9358E-02	-2.6962E-02	7.7609E-03	-4.2395E-03	1.2203E-03	-6.6660E-04
4.6950E-02	-2.5647E-02	7.3824E-03	-4.0327E-03	1.1608E-03	-6.3409E-04
4.4661E-02	-2.4397E-02	7.0223E-03	-3.8356E-03	1.1042E-03	-6.0317E-04
4.2483E-02	-2.3207E-02	6.6798E-03	-3.6490E-03	1.0503E-03	-5.7375E-04
4.0411E-02	-2.2075E-02	6.3541E-03	-3.4710E-03	9.9909E-04	-5.4577E-04
3.8440E-02	-2.0998E-02	6.0442E-03	-3.3017E-03	9.5037E-04	-5.1915E-04
3.6565E-02	-1.9974E-02	5.7494E-03	-3.1407E-03	9.0402E-04	-4.9383E-04
3.4782E-02	-1.9000E-02	5.4690E-03	-2.9875E-03	8.5993E-04	-4.6975E-04
3.3085E-02	-1.8073E-02	5.2023E-03	-2.8418E-03	8.1799E-04	-4.4684E-04
3.1472E-02	-1.7192E-02	4.9485E-03	-2.7032E-03	7.7809E-04	-4.2505E-04
2.9937E-02	-1.6354E-02	4.7072E-03	-2.5714E-03	7.4015E-04	-4.0432E-04
2.8477E-02	-1.5556E-02	4.4776E-03	-2.4460E-03	7.0405E-04	-3.8460E-04
2.7088E-02	-1.4797E-02	4.2592E-03	-2.3267E-03	6.6971E-04	-3.6584E-04
2.5767E-02	-1.4076E-02	4.0515E-03	-2.2132E-03	6.3705E-04	-3.4800E-04
2.4510E-02	-1.3389E-02	3.8539E-03	-2.1053E-03	6.0598E-04	-3.3103E-04
2.3315E-02	-1.2736E-02	3.6660E-03	-2.0026E-03	5.7643E-04	-3.1488E-04
2.2178E-02	-1.2115E-02	3.4872E-03	-1.9049E-03	5.4831E-04	-2.9952E-04
2.1096E-02	-1.1524E-02	3.3171E-03	-1.8120E-03	5.2157E-04	-2.8492E-04
2.0067E-02	-1.0962E-02	3.1553E-03	-1.7236E-03	4.9613E-04	-2.7102E-04
1.9089E-02	-1.0427E-02	3.0014E-03	-1.6396E-03	4.7194E-04	-2.5780E-04
1.8158E-02	-9.9189E-03	2.8551E-03	-1.5596E-03	4.4892E-04	-2.4523E-04
1.7272E-02	-9.4352E-03	2.7158E-03	-1.4836E-03	4.2703E-04	-2.3327E-04
1.6430E-02	-8.9750E-03	2.5834E-03	-1.4112E-03	4.0620E-04	-2.2189E-04
1.5628E-02	-8.5373E-03	2.4574E-03	-1.3424E-03	3.8639E-04	-2.1107E-04

TABLE 26 — D (CONTINUED)

E, MeV	f_1	E, MeV	f_1	E, MeV	f_1
3.6755E-04	2.0078E-04	5.7792E-05	3.1970E-05	9.0870E-06	4.9639E-06
3.4962E-04	1.9099E-04	5.4973E-05	3.0030E-05	8.6438E-06	4.7218E-06
3.3257E-04	1.8167E-04	5.2292E-05	2.8565E-05	8.2223E-06	4.4915E-06
3.1635E-04	1.7281E-04	4.9742E-05	2.7172E-05	7.8213E-06	4.2724E-06
3.0092E-04	1.6438E-04	4.7316E-05	2.5847E-05	7.4398E-06	4.0641E-06
2.8624E-04	1.5637E-04	4.5008E-05	2.4586E-05	7.0770E-06	3.8659E-06
2.7228E-04	1.4874E-04	4.2813E-05	2.3387E-05	6.7318E-06	3.6773E-06
2.5901E-04	1.4149E-04	4.0725E-05	2.2247E-05	6.4035E-06	3.4980E-06
2.4637E-04	1.3459E-04	3.8739E-05	2.1162E-05	6.0912E-06	3.3274E-06
2.3436E-04	1.2802E-04	3.6850E-05	2.0130E-05	5.7941E-06	3.1651E-06
2.2293E-04	1.2178E-04	3.5053E-05	1.9148E-05	5.5116E-06	3.0107E-06
2.1206E-04	1.1584E-04	3.3343E-05	1.8214E-05	5.2428E-06	2.8639E-06
2.0171E-04	1.1019E-04	3.1717E-05	1.7326E-05	4.9871E-06	2.7242E-06
1.9188E-04	1.0482E-04	3.0170E-05	1.6481E-05	4.7438E-06	2.5913E-06
1.8252E-04	9.9703E-05	2.8699E-05	1.5677E-05	4.5125E-06	2.4650E-06
1.7362E-04	9.4841E-05	2.7299E-05	1.4912E-05	4.2924E-06	2.3447E-06
1.6515E-04	9.0215E-05	2.5968E-05	1.4185E-05	4.0831E-06	2.2304E-06
1.5709E-04	8.5815E-05	2.4701E-05	1.3493E-05	3.8839E-06	2.1216E-06
1.4943E-04	8.1630E-05	2.3496E-05	1.2835E-05	3.6945E-06	2.0181E-06
1.4215E-04	7.7649E-05	2.2350E-05	1.2209E-05	3.5143E-06	1.9197E-06
1.3521E-04	7.3862E-05	2.1260E-05	1.1614E-05	3.3429E-06	1.8261E-06
1.2862E-04	7.0260E-05	2.0224E-05	1.1047E-05	3.1799E-06	1.7370E-06
1.2235E-04	6.6833E-05	1.9237E-05	1.0509E-05	3.0248E-06	1.6523E-06
1.1638E-04	6.3573E-05	1.8299E-05	9.9961E-06	2.8773E-06	1.5717E-06
1.1070E-04	6.0473E-05	1.7407E-05	9.5086E-06	2.7370E-06	1.4951E-06
1.0530E-04	5.7524E-05	1.6558E-05	9.0448E-06	2.6035E-06	1.4221E-06
1.0017E-04	5.4718E-05	1.5750E-05	8.6037E-06	2.4765E-06	1.3528E-06
9.5283E-05	5.2050E-05	1.4982E-05	8.1841E-06	2.3557E-06	1.2868E-06
9.0636E-05	4.9511E-05	1.4251E-05	7.7849E-06	2.2408E-06	1.2240E-06
8.6215E-05	4.7096E-05	1.3556E-05	7.4053E-06	2.1315E-06	1.1643E-06
8.2011E-05	4.4799E-05	1.2895E-05	7.0441E-06	2.0276E-06	1.1075E-06
7.8011E-05	4.2615E-05	1.2266E-05	6.7005E-06	1.9287E-06	1.0535E-06
7.4206E-05	4.0536E-05	1.1668E-05	6.3738E-06	1.8346E-06	1.0021E-06
7.0587E-05	3.8559E-05	1.1099E-05	6.0629E-06	1.7452E-06	9.5327E-07
6.7145E-05	3.6679E-05	1.0558E-05	5.7672E-06	1.6601E-06	9.0677E-07
6.3870E-05	3.4890E-05	1.0043E-05	5.4859E-06	1.5791E-06	8.6255E-07
6.0755E-05	3.3188E-05	9.5529E-06	5.2184E-06	1.5021E-06	8.2048E-07

TABLE 26 — D (CONTINUED)

E, MeV	f_1	E, MeV	f_1
1.4288E-06	-7.8046E-07	2.2466E-07	-1.2207E-07
1.3591E-06	-7.4239E-07	2.1371E-07	-1.1469E-07
1.2928E-06	-7.0418E-07	2.0328E-07	-1.1099E-07
1.2298E-06	-6.7174E-07	1.9337E-07	-1.0558E-07
1.1698E-06	-6.3498E-07	1.8394E-07	-1.0042E-07
1.1128E-06	-6.0781E-07	1.7497E-07	-9.5524E-08
1.0585E-06	-5.7816E-07	1.6643E-07	-9.0863E-08
1.0069E-06	-5.4996E-07	1.5832E-07	-8.6429E-08
9.5777E-07	-5.2314E-07	1.5060E-07	-8.2211E-08
9.1105E-07	-4.9762E-07	1.4325E-07	-7.8199E-08
8.6662E-07	-4.7335E-07	1.3627E-07	-7.4382E-08
8.2436E-07	-4.5026E-07	1.2962E-07	-7.0752E-08
7.8415E-07	-4.2830E-07	1.2330E-07	-6.7299E-08
7.4591E-07	-4.0741E-07	1.1728E-07	-6.4014E-08
7.0953E-07	-3.8754E-07	1.1156E-07	-6.0889E-08
6.7493E-07	-3.6863E-07	1.0612E-07	-5.7917E-08
6.4201E-07	-3.5065E-07	1.0095E-07	-5.5090E-08
6.1070E-07	-3.3355E-07	9.6024E-08	-5.2400E-08
5.8091E-07	-3.1728E-07	9.1341E-08	-4.9842E-08
5.5258E-07	-3.0180E-07	8.6887E-08	-4.7408E-08
5.2563E-07	-2.8708E-07	8.2649E-08	-4.5094E-08
5.0000E-07	-2.7308E-07	7.8618E-08	-4.2892E-08
4.7561E-07	-2.5976E-07	7.4784E-08	-4.0797E-08
4.5242E-07	-2.4708E-07	7.1137E-08	-3.8805E-08
4.3035E-07	-2.3503E-07	6.7667E-08	-3.6910E-08
4.0936E-07	-2.2357E-07	6.4367E-08	-3.5107E-08
3.8940E-07	-2.1266E-07	6.1228E-08	-3.3392E-08
3.7041E-07	-2.0229E-07	5.8242E-08	-3.1761E-08
3.5234E-07	-1.9242E-07	5.5401E-08	-3.0209E-08
3.3516E-07	-1.8303E-07	5.2699E-08	-2.8733E-08
3.1881E-07	-1.7410E-07	5.0129E-08	-2.7329E-08
3.0326E-07	-1.6561E-07	4.7684E-08	-2.5994E-08
2.8847E-07	-1.5753E-07	4.5359E-08	-2.4723E-08
2.7440E-07	-1.4984E-07	4.3147E-08	-2.3515E-08
2.6102E-07	-1.4253E-07	4.1042E-08	-2.2365E-08
2.4829E-07	-1.3558E-07	3.9041E-08	-2.1272E-08
2.3618E-07	-1.2896E-07	3.7137E-08	-2.0232E-08

TABLE 27 — Be – NEUTRON CROSS SECTIONS (ALL CROSS SECTIONS IN BARNS)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
1.8017E 01	1.3502E 00	9.2019E-01	4.0204E-01	1.0000E-02	1.8000E-02	0
1.7139E 01	1.3058E 00	9.5208E-01	4.1572E-01	1.0000E-02	1.8000E-02	0
1.6303E 01	1.4298E 00	9.7183E-01	4.2995E-01	1.0000E-02	1.8000E-02	0
1.5508E 01	1.4790E 00	1.0098E 00	4.4116E-01	1.0000E-02	1.8000E-02	0
1.4751E 01	1.5000E 00	1.0200E 00	4.5198E-01	1.0000E-02	1.8000E-02	0
1.4032E 01	1.5366E 00	1.0449E 00	4.6277E-01	1.0954E-02	1.8000E-02	0
1.3348E 01	1.5572E 00	1.0522E 00	4.7324E-01	1.3767E-02	1.8000E-02	0
1.2697E 01	1.5802E 00	1.0830E 00	4.8224E-01	1.5010E-02	0	0
1.2077E 01	1.6015E 00	1.0941E 00	4.9037E-01	1.7070E-02	0	0
1.1488E 01	1.6204E 00	1.1009E 00	5.0043E-01	1.9018E-02	0	0
1.0928E 01	1.6291E 00	1.0996E 00	5.0953E-01	1.9951E-02	0	0
1.0395E 01	1.6402E 00	1.0994E 00	5.1879E-01	2.2018E-02	0	0
9.8882E 00	1.6506E 00	1.0996E 00	5.2702E-01	2.4004E-02	0	0
9.4059E 00	1.7312E 00	1.1750E 00	5.3113E-01	2.5009E-02	0	0
8.9472E 00	1.8000E 00	1.2390E 00	5.3503E-01	2.6012E-02	0	
8.5108E 00	1.8000E 00	1.2319E 00	5.4011E-01	2.7996E-02	0	
8.0957E 00	1.8810E 00	1.3060E 00	5.4503E-01	3.0020E-02	0	
7.7009E 00	1.9298E 00	1.3502E 00	5.4755E-01	3.1995E-02	0	
7.3253E 00	1.9198E 00	1.3357E 00	5.5003E-01	3.4048E-02	0	
6.9681E 00	1.9098E 00	1.3198E 00	5.5206E-01	3.8011E-02	0	
6.6282E 00	1.9004E 00	1.3064E 00	5.5400E-01	4.0015E-02	0	
6.3050E 00	1.9388E 00	1.3413E 00	5.5450E-01	4.2952E-02	0	
5.9975E 00	1.8804E 00	1.2803E 00	5.5500E-01	4.5024E-02	0	
5.7050E 00	1.8994E 00	1.2959E 00	5.5550E-01	4.7947E-02	0	
5.4267E 00	1.9800E 00	1.3719E 00	5.5600E-01	5.2045E-02	0	
5.1621E 00	1.9800E 00	1.3680E 00	5.5600E-01	5.5967E-02	0	
4.9103E 00	1.9102E 00	1.2952E 00	5.5600E-01	5.8996E-02	0	
4.6708E 00	1.9894E 00	1.3725E 00	5.5293E-01	6.3981E-02	0	
4.4430E 00	2.0386E 00	1.4206E 00	5.5004E-01	6.7944E-02	0	
4.2263E 00	1.9223E 00	1.3031E 00	5.4219E-01	7.7114E-02	0	
4.0202E 00	1.9898E 00	1.3708E 00	5.3501E-01	8.3992E-02	0	
3.8242E 00	2.1145E 00	1.4976E 00	5.2797E-01	8.8890E-02	0	
3.6376E 00	2.3225E 00	1.7076E 00	5.2085E-01	9.4038E-02	0	
3.4602E 00	2.4198E 00	1.8130E 00	5.0975E-01	9.6996E-02	0	
3.2915E 00	2.5182E 00	1.9181E 00	4.9909E-01	1.0096E-01	0	
3.1310E 00	2.7767E 00	2.2509E 00	4.2189E-01	1.0398E-01	0	

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
2.9783E 00	3.2003E 00	2.8363E 00	2.3911E-01	1.0492E-01	0	0
2.8330E 00	3.7939E 00	3.4963E 00	1.9359E-01	1.0402E-01	0	0
2.6948E 00	3.8940E 00	3.6396E 00	1.5716E-01	9.7240E-02	0	0
2.5634E 00	2.7385E 00	2.5311E 00	1.1923E-01	8.8230E-02	0	0
2.4384E 00	2.2423E 00	2.0817E 00	8.1799E-02	7.8875E-02	0	0
2.3195E 00	1.9485E 00	1.8547E 00	4.3845E-02	6.9954E-02	0	0
2.2063E 00	1.8134E 00	1.7233E 00	2.9239E-02	6.0900E-02	0	0
2.0987E 00	1.7175E 00	1.6441E 00	1.5485E-02	5.7865E-02	0	0
1.9964E 00	1.6228E 00	1.5714E 00	3.7156E-03	4.7692E-02	0	0
1.8990E 00	1.6618E 00	1.6218E 00	0	3.9931E-02	0	0
1.8064E 00	1.7500E 00	1.7162E 00	0	3.3743E-02	0	0
1.7183E 00	1.8746E 00	1.8467E 00	0	2.7899E-02	0	0
1.6345E 00	1.9871E 00	1.9639E 00	0	2.3233E-02	0	0
1.5548E 00	2.1079E 00	2.0896E 00	0	1.8272E-02	0	0
1.4790E 00	2.2341E 00	2.2202E 00	0	1.3969E-02	0	0
1.4068E 00	2.3823E 00	2.3704E 00	0	1.1848E-02	0	0
1.3382E 00	2.5191E 00	2.5102E 00	0	8.9098E-03	0	0
1.2730E 00	2.6841E 00	2.6780E 00	0	6.1061E-03	0	0
1.2109E 00	2.8940E 00	2.8889E 00	0	5.0135E-03	0	0
1.1518E 00	3.0126E 00	3.0106E 00	0	2.0576E-03	0	0
1.0956E 00	3.2012E 00	3.2002E 00	0	9.9331E-04	0	0
1.0422E 00	3.2894E 00	3.2893E 00	0	3.7720E-06	0	0
9.9137E-01	3.3688E 00	3.3688E 00	0	0	0	0
9.4302E-01	3.4100E 00	3.4100E 00	0	0	0	0
8.9703E-01	3.4000E 00	3.4000E 00	0	0	0	0
8.5328E-01	3.4000E 00	3.4000E 00	0	0	0	0
8.1167E-01	4.3899E 00	4.3899E 00	0	0	0	0
7.7208E-01	3.8025E 00	3.8025E 00	0	0	0	0
7.3443E-01	3.3599E 00	3.3599E 00	0	0	0	0
6.9861E-01	3.3550E 00	3.3550E 00	0	0	0	0
6.6454E-01	3.6779E 00	3.6779E 00	0	0	0	0
6.3213E-01	6.8696E 00	6.8696E 00	0	0	0	0
6.0130E-01	5.0341E 00	5.0341E 00	0	0	0	0
5.7197E-01	3.4998E 00	3.4998E 00	0	0	0	0
5.4408E-01	3.3508E 00	3.3508E 00	0	0	0	0
5.1754E-01	3.4550E 00	3.4550E 00	0	0	0	0

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	E, MeV	σ_{nT}	$\sigma_{n,n}$
4.9230E-01	3.5965E 00	3.5965E 00	8.1377E-02	5.8401E 00	5.8401E 00
4.6829E-01	3.6975E 00	3.6975E 00	7.7408E-02	5.8490E 00	5.8490E 00
4.4545E-01	3.7960E 00	3.7960E 00	7.3633E-02	5.8509E 00	5.8509E 00
4.2373E-01	3.8818E 00	3.8818E 00	7.0042E-02	5.8598E 00	5.8598E 00
4.0306E-01	3.9496E 00	3.9496E 00	6.6626E-02	5.8600E 00	5.8600E 00
3.8341E-01	4.0363E 00	4.0363E 00	6.3376E-02	5.8601E 00	5.8601E 00
3.6471E-01	4.1029E 00	4.1029E 00	6.0286E-02	5.8690E 00	5.8690E 00
3.4692E-01	4.1906E 00	4.1906E 00	5.7345E-02	5.8700E 00	5.8700E 00
3.3000E-01	4.2500E 00	4.2500E 00	5.4549E-02	5.8700E 00	5.8700E 00
3.1391E-01	4.3006E 00	4.3006E 00	5.1888E-02	5.8704E 00	5.8704E 00
2.9860E-01	4.3526E 00	4.3526E 00	4.9358E-02	5.8788E 00	5.8788E 00
2.8403E-01	4.3998E 00	4.3998E 00	4.6950E-02	5.8800E 00	5.8800E 00
2.7018E-01	4.4682E 00	4.4682E 00	4.4661E-02	5.8800E 00	5.8800E 00
2.5700E-01	4.5000E 00	4.5000E 00	4.2483E-02	5.8800E 00	5.8800E 00
2.4447E-01	4.5464E 00	4.5464E 00	4.0411E-02	5.8800E 00	5.8800E 00
2.3255E-01	4.6058E 00	4.6058E 00	3.8440E-02	5.8878E 00	5.8878E 00
2.2121E-01	4.6773E 00	4.6773E 00	3.6565E-02	5.8900E 00	5.8900E 00
2.1042E-01	4.6984E 00	4.6984E 00	3.4782E-02	5.8900E 00	5.8900E 00
2.0016E-01	4.7484E 00	4.7484E 00	3.3085E-02	5.8900E 00	5.8900E 00
1.9039E-01	4.8144E 00	4.8144E 00	3.1472E-02	5.8902E 00	5.8902E 00
1.8111E-01	4.8883E 00	4.8883E 00	2.9937E-02	5.9000E 00	5.9000E 00
1.7228E-01	4.9463E 00	4.9463E 00	2.8477E-02	5.9000E 00	5.9000E 00
1.6387E-01	5.0019E 00	5.0019E 00	2.7088E-02	5.9000E 00	5.9000E 00
1.5588E-01	5.0623E 00	5.0623E 00	2.5767E-02	5.9067E 00	5.9067E 00
1.4828E-01	5.1345E 00	5.1345E 00	2.4510E-02	5.9119E 00	5.9119E 00
1.4105E-01	5.2189E 00	5.2189E 00	2.3315E-02	5.9149E 00	5.9149E 00
1.3417E-01	5.3056E 00	5.3056E 00	2.2178E-02	5.9195E 00	5.9195E 00
1.2762E-01	5.4100E 00	5.4100E 00	2.1096E-02	5.9245E 00	5.9244E 00
1.2140E-01	5.4890E 00	5.4890E 00	2.0067E-02	5.9289E 00	5.9289E 00
1.1548E-01	5.5839E 00	5.5839E 00	1.9089E-02	5.9328E 00	5.9328E 00
1.0985E-01	5.6833E 00	5.6833E 00	1.8158E-02	5.9365E 00	5.9365E 00
1.0449E-01	5.7390E 00	5.7390E 00	1.7272E-02	5.9398E 00	5.9398E 00
9.9394E-02	5.7863E 00	5.7863E 00	1.6430E-02	5.9428E 00	5.9428E 00
9.4547E-02	5.8206E 00	5.8206E 00	1.5628E-02	5.9474E 00	5.9474E 00
8.9935E-02	5.8301E 00	5.8301E 00	1.4866E-02	5.9512E 00	5.9512E 00
8.5549E-02	5.8399E 00	5.8399E 00	1.4141E-02	5.9534E 00	5.9533E 00

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	E, MeV	σ_{nT}	$\sigma_{n,n}$
1.3452E-02	5.9553E 00	5.9553E 00	2.2235E-03	6.0000E 00	6.0000E 00
1.2795E-02	5.9585E 00	5.9585E 00	2.1151E-03	6.0000E 00	6.0000E 00
1.2171E-02	5.9613E 00	5.9613E 00	2.0119E-03	6.0000E 00	6.0000E 00
1.1578E-02	5.9640E 00	5.9640E 00	1.9138E-03	6.0000E 00	6.0000E 00
1.1013E-02	5.9667E 00	5.9667E 00	1.8205E-03	6.0000E 00	6.0000E 00
1.0476E-02	5.9679E 00	5.9679E 00	1.7317E-03	6.0000E 00	6.0000E 00
9.9651E-03	5.9697E 00	5.9697E 00	1.6472E-03	6.0000E 00	6.0000E 00
9.4791E-03	5.9732E 00	5.9732E 00	1.5669E-03	6.0000E 00	6.0000E 00
9.0168E-03	5.9749E 00	5.9749E 00	1.4905E-03	6.0000E 00	6.0000E 00
8.5771E-03	5.9766E 00	5.9766E 00	1.4178E-03	6.0000E 00	6.0000E 00
8.1588E-03	5.9788E 00	5.9787E 00	1.3486E-03	6.0000E 00	6.0000E 00
7.7609E-03	5.9804E 00	5.9803E 00	1.2829E-03	6.0000E 00	6.0000E 00
7.3824E-03	5.9819E 00	5.9818E 00	1.2203E-03	6.0000E 00	5.9999E 00
7.0223E-03	5.9832E 00	5.9832E 00	1.1608E-03	6.0000E 00	6.0000E 00
6.6798E-03	5.9848E 00	5.9848E 00	1.1042E-03	6.0000E 00	6.0000E 00
6.3541E-03	5.9862E 00	5.9862E 00	1.0503E-03	6.0000E 00	6.0000E 00
6.0442E-03	5.9873E 00	5.9872E 00	9.9909E-04	6.0000E 00	6.0000E 00
5.7494E-03	5.9884E 00	5.9884E 00	9.5037E-04	6.0000E 00	6.0000E 00
5.4690E-03	5.9899E 00	5.9899E 00	9.0402E-04	6.0000E 00	6.0000E 00
5.2023E-03	5.9909E 00	5.9909E 00	8.5993E-04	6.0000E 00	6.0000E 00
4.9485E-03	5.9917E 00	5.9917E 00	8.1799E-04	6.0000E 00	5.9999E 00
4.7072E-03	5.9929E 00	5.9928E 00	7.7809E-04	6.0000E 00	5.9999E 00
4.4776E-03	5.9940E 00	5.9940E 00	7.4015E-04	6.0000E 00	5.9999E 00
4.2592E-03	5.9950E 00	5.9949E 00	7.0405E-04	6.0000E 00	5.9999E 00
4.0515E-03	5.9958E 00	5.9958E 00	6.6971E-04	6.0000E 00	5.9999E 00
3.8539E-03	5.9967E 00	5.9966E 00	6.3705E-04	6.0000E 00	5.9999E 00
3.6660E-03	5.9973E 00	5.9973E 00	6.0598E-04	6.0000E 00	5.9999E 00
3.4872E-03	5.9980E 00	5.9980E 00	5.7643E-04	6.0000E 00	5.9999E 00
3.3171E-03	5.9986E 00	5.9986E 00	5.4831E-04	6.0000E 00	5.9999E 00
3.1553E-03	5.9995E 00	5.9995E 00	5.2157E-04	6.0000E 00	5.9999E 00
3.0014E-03	6.0000E 00	6.0000E 00	4.9613E-04	6.0000E 00	5.9999E 00
2.8551E-03	6.0000E 00	6.0000E 00	4.7194E-04	6.0000E 00	5.9999E 00
2.7158E-03	6.0000E 00	6.0000E 00	4.4892E-04	6.0000E 00	5.9999E 00
2.5834E-03	6.0000E 00	6.0000E 00	4.2703E-04	6.0000E 00	5.9999E 00
2.4574E-03	6.0000E 00	6.0000E 00	4.0620E-04	6.0000E 00	5.9999E 00
2.3375E-03	6.0000E 00	6.0000E 00	3.8639E-04	6.0000E 00	5.9999E 00

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
3.6759E-04	6.0000E 00	5.9999E 00	0	0	0	0
3.4962E-04	6.0000E 00	5.9999E 00	0	0	0	0
3.3257E-04	6.0000E 00	5.9999E 00	0	0	0	0
3.1635E-04	6.0000E 00	5.9999E 00	0	0	0	0
3.0092E-04	6.0000E 00	5.9999E 00	0	0	0	0
2.8624E-04	6.0000E 00	5.9999E 00	0	0	0	0
2.7228E-04	6.0000E 00	5.9999E 00	0	0	0	0
2.5901E-04	6.0000E 00	5.9999E 00	0	0	0	0
2.4637E-04	6.0000E 00	5.9999E 00	0	0	0	1.0073E-04
2.3436E-04	6.0000E 00	5.9999E 00	0	0	0	1.0328E-04
2.2293E-04	6.0000E 00	5.9999E 00	0	0	0	1.0590E-04
2.1206E-04	6.0000E 00	5.9999E 00	0	0	0	1.0858E-04
2.0171E-04	6.0000E 00	5.9999E 00	0	0	0	1.1133E-04
1.9188E-04	6.0000E 00	5.9999E 00	0	0	0	1.1415E-04
1.8252E-04	6.0000E 00	5.9999E 00	0	0	0	1.1704E-04
1.7362E-04	6.0000E 00	5.9999E 00	0	0	0	1.2000E-04
1.6515E-04	6.0000E 00	5.9999E 00	0	0	0	1.2304E-04
1.5709E-04	6.0000E 00	5.9999E 00	0	0	0	1.2615E-04
1.4943E-04	6.0000E 00	5.9999E 00	0	0	0	1.2934E-04
1.4215E-04	6.0000E 00	5.9999E 00	0	0	0	1.3262E-04
1.3521E-04	6.0000E 00	5.9999E 00	0	0	0	1.3598E-04
1.2862E-04	6.0000E 00	5.9999E 00	0	0	0	1.3942E-04
1.2235E-04	6.0000E 00	5.9999E 00	0	0	0	1.4295E-04
1.1638E-04	6.0000E 00	5.9999E 00	0	0	0	1.4657E-04
1.1070E-04	6.0000E 00	5.9999E 00	0	0	0	1.5028E-04
1.0530E-04	6.0000E 00	5.9999E 00	0	0	0	1.5408E-04
1.0017E-04	6.0000E 00	5.9998E 00	0	0	0	1.5798E-04
9.5283E-05	6.0000E 00	5.9998E 00	0	0	0	1.6198E-04
9.0636E-05	6.0000E 00	5.9998E 00	0	0	0	1.6608E-04
8.6215E-05	6.0000E 00	5.9998E 00	0	0	0	1.7029E-04
8.2011E-05	6.0000E 00	5.9998E 00	0	0	0	1.7460E-04
7.8011E-05	6.0000E 00	5.9998E 00	0	0	0	1.7902E-04
7.4206E-05	6.0000E 00	5.9998E 00	0	0	0	1.8355E-04
7.0587E-05	6.0000E 00	5.9998E 00	0	0	0	1.8819E-04
6.7145E-05	6.0000E 00	5.9998E 00	0	0	0	1.9296E-04
6.3870E-05	6.0000E 00	5.9998E 00	0	0	0	1.9784E-04

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
6.0755E-05	6.0000E 00	5.9998E 00	0	0	0	2.0285E-04
5.7792E-05	6.0000E 00	5.9998E 00	0	0	0	2.0799E-04
5.4973E-05	6.0000E 00	5.9998E 00	0	0	0	2.1325E-04
5.2292E-05	6.0000E 00	5.9998E 00	0	0	0	2.1865E-04
4.9742E-05	6.0000E 00	5.9998E 00	0	0	0	2.2419E-04
4.7316E-05	6.0000E 00	5.9998E 00	0	0	0	2.2986E-04
4.5008E-05	6.0000E 00	5.9998E 00	0	0	0	2.3568E-04
4.2813E-05	6.0000E 00	5.9998E 00	0	0	0	2.4165E-04
4.0725E-05	6.0000E 00	5.9997E 00	0	0	0	2.4776E-04
3.8739E-05	6.0000E 00	5.9997E 00	0	0	0	2.5404E-04
3.6850E-05	6.0000E 00	5.9997E 00	0	0	0	2.6047E-04
3.5053E-05	6.0000E 00	5.9997E 00	0	0	0	2.6706E-04
3.3343E-05	6.0000E 00	5.9997E 00	0	0	0	2.7382E-04
3.1717E-05	6.0000E 00	5.9997E 00	0	0	0	2.8075E-04
3.0170E-05	6.0000E 00	5.9997E 00	0	0	0	2.8786E-04
2.8699E-05	6.0000E 00	5.9997E 00	0	0	0	2.9515E-04
2.7299E-05	6.0000E 00	5.9997E 00	0	0	0	3.0262E-04
2.5968E-05	6.0000E 00	5.9997E 00	0	0	0	3.1028E-04
2.4701E-05	6.0000E 00	5.9997E 00	0	0	0	3.1814E-04
2.3496E-05	6.0000E 00	5.9997E 00	0	0	0	3.2619E-04
2.2350E-05	6.0000E 00	5.9997E 00	0	0	0	3.3445E-04
2.1260E-05	6.0000E 00	5.9997E 00	0	0	0	3.4291E-04
2.0224E-05	6.0000E 00	5.9997E 00	0	0	0	3.5159E-04
1.9237E-05	6.0000E 00	5.9996E 00	0	0	0	3.6049E-04
1.8299E-05	6.0000E 00	5.9996E 00	0	0	0	3.6962E-04
1.7407E-05	6.0000E 00	5.9996E 00	0	0	0	3.7898E-04
1.6558E-05	6.0000E 00	5.9996E 00	0	0	0	3.8857E-04
1.5750E-05	6.0000E 00	5.9996E 00	0	0	0	3.9841E-04
1.4982E-05	6.0000E 00	5.9996E 00	0	0	0	4.0849E-04
1.4251E-05	6.0000E 00	5.9996E 00	0	0	0	4.1883E-04
1.3556E-05	6.0000E 00	5.9996E 00	0	0	0	4.2944E-04
1.2895E-05	6.0000E 00	5.9996E 00	0	0	0	4.4031E-04
1.2266E-05	6.0000E 00	5.9996E 00	0	0	0	4.5146E-04
1.1668E-05	6.0000E 00	5.9995E 00	0	0	0	4.6288E-04
1.1099E-05	6.0000E 00	5.9995E 00	0	0	0	4.7460E-04
1.0558E-05	6.0000E 00	5.9995E 00	0	0	0	4.8662E-04

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
1.0043E-05	0.0000E 00	5.9995E 00	0	0	0	4.9894E-04
9.3529E-06	6.0000E 00	5.9995E 00	0	0	0	5.1157E-04
9.0870E-06	6.0000E 00	5.9995E 00	0	0	0	5.2452E-04
8.6438E-06	6.0000E 00	5.9995E 00	0	0	0	5.3779E-04
8.2223E-06	6.0000E 00	5.9995E 00	0	0	0	5.5141E-04
7.8213E-06	6.0000E 00	5.9994E 00	0	0	0	5.6537E-04
7.4398E-06	6.0000E 00	5.9994E 00	0	0	0	5.7968E-04
7.0770E-06	6.0000E 00	5.9994E 00	0	0	0	5.9435E-04
6.7318E-06	6.0000E 00	5.9994E 00	0	0	0	6.0940E-04
6.4035E-06	6.0000E 00	5.9994E 00	0	0	0	6.2483E-04
6.0912E-06	6.0000E 00	5.9994E 00	0	0	0	6.4065E-04
5.7941E-06	6.0000E 00	5.9993E 00	0	0	0	6.5686E-04
5.5116E-06	6.0000E 00	5.9993E 00	0	0	0	6.7349E-04
5.2428E-06	6.0000E 00	5.9993E 00	0	0	0	6.9054E-04
4.9871E-06	6.0000E 00	5.9993E 00	0	0	0	7.0802E-04
4.7438E-06	6.0000E 00	5.9993E 00	0	0	0	7.2595E-04
4.5125E-06	6.0000E 00	5.9993E 00	0	0	0	7.4432E-04
4.2924E-06	6.0000E 00	5.9992E 00	0	0	0	7.6317E-04
4.0831E-06	6.0000E 00	5.9992E 00	0	0	0	7.8249E-04
3.8839E-06	6.0000E 00	5.9992E 00	0	0	0	8.0230E-04
3.6945E-06	6.0000E 00	5.9992E 00	0	0	0	8.2261E-04
3.5143E-06	6.0000E 00	5.9992E 00	0	0	0	8.4343E-04
3.3429E-06	6.0000E 00	5.9991E 00	0	0	0	8.6478E-04
3.1799E-06	6.0000E 00	5.9991E 00	0	0	0	8.8667E-04
3.0248E-06	6.0000E 00	5.9991E 00	0	0	0	9.0912E-04
2.8773E-06	6.0000E 00	5.9991E 00	0	0	0	9.3213E-04
2.7370E-06	6.0000E 00	5.9990E 00	0	0	0	9.5573E-04
2.6035E-06	6.0000E 00	5.9990E 00	0	0	0	9.7993E-04
2.4765E-06	6.0000E 00	5.9990E 00	0	0	0	1.0047E-03
2.3557E-06	6.0000E 00	5.9990E 00	0	0	0	1.0302E-03
2.2408E-06	6.0000E 00	5.9989E 00	0	0	0	1.0562E-03
2.1315E-06	6.0000E 00	5.9989E 00	0	0	0	1.0830E-03
2.0276E-06	6.0000E 00	5.9989E 00	0	0	0	1.1104E-03
1.9287E-06	6.0000E 00	5.9989E 00	0	0	0	1.1385E-03
1.8346E-06	6.0000E 00	5.9988E 00	0	0	0	1.1673E-03
1.7452E-06	6.0000E 00	5.9988E 00	0	0	0	1.1969E-03
1.6601E-06	6.0000E 00	5.9988E 00	0	0	0	1.2272E-03

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\nu_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
1.3791E-06	6.0000E 00	5.9987E 00	0	0	0	1.2582E-03
1.5021E-06	6.0000E 00	5.9987E 00	0	0	0	1.2901E-03
1.4288E-06	6.0000E 00	5.9987E 00	0	0	0	1.3226E-03
1.3591E-06	6.0000E 00	5.9986E 00	0	0	0	1.3562E-03
1.2928E-06	6.0000E 00	5.9986E 00	0	0	0	1.3906E-03
1.2298E-06	6.0000E 00	5.9986E 00	0	0	0	1.4258E-03
1.1698E-06	6.0000E 00	5.9985E 00	0	0	0	1.4619E-03
1.1128E-06	6.0000E 00	5.9985E 00	0	0	0	1.4989E-03
1.0585E-06	6.0000E 00	5.9985E 00	0	0	0	1.5368E-03
1.0069E-06	6.0000E 00	5.9984E 00	0	0	0	1.5757E-03
9.5777E-07	6.0000E 00	5.9984E 00	0	0	0	1.6156E-03
9.1105E-07	6.0000E 00	5.9983E 00	0	0	0	1.6565E-03
8.6662E-07	6.0000E 00	5.9983E 00	0	0	0	1.6985E-03
8.2436E-07	6.0000E 00	5.9983E 00	0	0	0	1.7415E-03
7.8415E-07	6.0000E 00	5.9982E 00	0	0	0	1.7855E-03
7.4591E-07	6.0000E 00	5.9982E 00	0	0	0	1.8307E-03
7.0953E-07	6.0000E 00	5.9981E 00	0	0	0	1.8771E-03
6.7493E-07	6.0000E 00	5.9981E 00	0	0	0	1.9246E-03
6.4201E-07	6.0000E 00	5.9980E 00	0	0	0	1.9733E-03
6.1070E-07	6.0000E 00	5.9980E 00	0	0	0	2.0233E-03
5.8091E-07	6.0000E 00	5.9979E 00	0	0	0	2.0745E-03
5.5258E-07	6.0000E 00	5.9979E 00	0	0	0	2.1270E-03
5.2563E-07	6.0000E 00	5.9978E 00	0	0	0	2.1809E-03
5.0000E-07	6.0000E 00	5.9978E 00	0	0	0	2.2361E-03
4.7561E-07	6.0000E 00	5.9977E 00	0	0	0	2.2927E-03
4.5242E-07	6.0000E 00	5.9977E 00	0	0	0	2.3507E-03
4.3035E-07	6.0000E 00	5.9976E 00	0	0	0	2.4102E-03
4.0936E-07	6.0000E 00	5.9975E 00	0	0	0	2.4712E-03
3.8940E-07	6.0000E 00	5.9975E 00	0	0	0	2.5338E-03
3.7041E-07	6.0000E 00	5.9974E 00	0	0	0	2.5979E-03
3.5234E-07	6.0000E 00	5.9973E 00	0	0	0	2.6637E-03
3.3516E-07	6.0000E 00	5.9973E 00	0	0	0	2.7311E-03
3.1881E-07	6.0000E 00	5.9972E 00	0	0	0	2.8003E-03
3.0326E-07	6.0000E 00	5.9971E 00	0	0	0	2.8712E-03
2.8847E-07	6.0000E 00	5.9971E 00	0	0	0	2.9439E-03
2.7440E-07	6.0000E 00	5.9970E 00	0	0	0	3.0184E-03
2.6102E-07	6.0000E 00	5.9969E 00	0	0	0	3.0948E-03

TABLE 27 — Be (CONTINUED)

E, MeV	σ_{nT}	$\sigma_{n,n}$	$\sigma_{n,2n}$	$\sigma_{n,\alpha}$	$\sigma_{n,t}$	$\sigma_{n,\gamma}$
2.4829E-07	6.0000E 00	5.9968E 00	0	0	0	3.1731E-03
2.3618E-07	6.0000E 00	5.9968E 00	0	0	0	3.2535E-03
2.2466E-07	6.0000E 00	5.9967E 00	0	0	0	3.3358E-03
2.1371E-07	6.0000E 00	5.9966E 00	0	0	0	3.4203E-03
2.0328E-07	6.0000E 00	5.9965E 00	0	0	0	3.5069E-03
1.9337E-07	6.0000E 00	5.9964E 00	0	0	0	3.5956E-03
1.8394E-07	6.0000E 00	5.9963E 00	0	0	0	3.6867E-03
1.7497E-07	6.0000E 00	5.9962E 00	0	0	0	3.7800E-03
1.6643E-07	6.0000E 00	5.9961E 00	0	0	0	3.8757E-03
1.5832E-07	6.0000E 00	5.9960E 00	0	0	0	3.9738E-03
1.5060E-07	6.0000E 00	5.9959E 00	0	0	0	4.0744E-03
1.4325E-07	6.0000E 00	5.9958E 00	0	0	0	4.1779E-03
1.3627E-07	6.0000E 00	5.9957E 00	0	0	0	4.2833E-03
1.2962E-07	6.0000E 00	5.9956E 00	0	0	0	4.3917E-03
1.2330E-07	6.0000E 00	5.9955E 00	0	0	0	4.5029E-03
1.1728E-07	6.0000E 00	5.9954E 00	0	0	0	4.6169E-03
1.1156E-07	6.0000E 00	5.9953E 00	0	0	0	4.7338E-03
1.0612E-07	6.0000E 00	5.9951E 00	0	0	0	4.8536E-03
1.0095E-07	6.0000E 00	5.9950E 00	0	0	0	4.9765E-03
9.6024E-08	6.0000E 00	5.9949E 00	0	0	0	5.1025E-03
9.1341E-08	6.0000E 00	5.9948E 00	0	0	0	5.2316E-03
8.6887E-08	6.0000E 00	5.9946E 00	0	0	0	5.3641E-03
8.2649E-08	6.0000E 00	5.9945E 00	0	0	0	5.4999E-03
7.8618E-08	6.0000E 00	5.9944E 00	0	0	0	5.6391E-03
7.4784E-08	6.0000E 00	5.9942E 00	0	0	0	5.7818E-03
7.1137E-08	6.0000E 00	5.9941E 00	0	0	0	5.9282E-03
6.7667E-08	6.0000E 00	5.9939E 00	0	0	0	6.0783E-03
6.4367E-08	6.0000E 00	5.9938E 00	0	0	0	6.2322E-03
6.1228E-08	6.0000E 00	5.9936E 00	0	0	0	6.3899E-03
5.8242E-08	6.0000E 00	5.9934E 00	0	0	0	6.5517E-03
5.5401E-08	6.0000E 00	5.9933E 00	0	0	0	6.7175E-03
5.2699E-08	6.0000E 00	5.9931E 00	0	0	0	6.8876E-03
5.0129E-08	6.0000E 00	5.9929E 00	0	0	0	7.0620E-03
4.7684E-08	6.0000E 00	5.9928E 00	0	0	0	7.2407E-03
4.5359E-08	6.0000E 00	5.9926E 00	0	0	0	7.4240E-03
4.3147E-08	6.0000E 00	5.9924E 00	0	0	0	7.6120E-03
4.1042E-08	6.0000E 00	5.9922E 00	0	0	0	7.8047E-03
3.9041E-08	6.0000E 00	5.9920E 00	0	0	0	8.0022E-03
3.7137E-08	6.0000E 00	5.9918E 00	0	0	0	8.2048E-03

TABLE 28 — Be –LEGENDRE EXPANSION COEFFICIENTS FOR ANGULAR DISTRIBUTION OF ELASTICALLY SCATTERED NEUTRONS

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
1.8017E 01	6.9900E-01	5.0198E-01	3.5997E-01	1.9398E-01	8.0179E-02	3.7995E-02
1.7139E 01	6.9996E-01	5.0016E-01	3.5042E-01	1.8941E-01	7.8805E-02	3.6172E-02
1.6303E 01	7.0000E-01	4.9900E-01	3.4701E-01	1.8404E-01	7.3025E-02	3.3518E-02
1.5508E 01	7.0000E-01	4.9704E-01	3.4304E-01	1.7812E-01	6.9077E-02	3.1538E-02
1.4751E 01	7.0000E-01	4.9500E-01	3.3501E-01	1.7102E-01	6.5513E-02	2.9208E-02
1.4032E 01	6.9043E-01	4.9225E-01	3.2862E-01	1.6387E-01	6.2109E-02	2.7642E-02
1.3348E 01	6.8534E-01	4.8940E-01	3.1847E-01	1.5607E-01	5.8510E-02	2.5507E-02
1.2697E 01	6.7997E-01	4.8492E-01	3.0989E-01	1.3706E-01	5.4471E-02	2.3478E-02
1.2077E 01	6.7452E-01	4.7781E-01	3.0076E-01	1.4140E-01	5.1665E-02	2.1373E-02
1.1488E 01	6.6490E-01	4.7481E-01	2.8948E-01	1.3366E-01	4.7369E-02	1.9732E-02
1.0928E 01	6.6023E-01	4.7045E-01	2.7727E-01	1.2539E-01	4.4317E-02	1.8163E-02
1.0395E 01	6.5490E-01	4.6588E-01	2.6978E-01	1.1784E-01	3.9924E-02	1.6462E-02
9.8882E 00	6.4498E-01	4.5994E-01	2.5794E-01	1.0994E-01	3.5973E-02	1.4488E-02
9.4059E 00	6.3991E-01	4.5188E-01	2.4882E-01	1.0184E-01	3.2446E-02	1.2970E-02
8.9472E 00	6.2994E-01	4.4488E-01	2.3884E-01	9.3398E-02	2.9462E-02	1.1284E-02
8.5108E 00	6.2002E-01	4.3604E-01	2.2704E-01	8.5530E-02	2.6511E-02	1.0004E-02
8.0957E 00	6.0997E-01	4.2874E-01	2.1576E-01	7.8851E-02	2.3424E-02	8.7723E-03
7.7009E 00	6.0701E-01	4.1706E-01	2.0504E-01	7.2032E-02	1.9916E-02	7.5049E-03
7.3253E 00	5.9474E-01	4.0769E-01	1.9372E-01	6.3819E-02	1.6922E-02	6.3764E-03
6.9681E 00	5.8482E-01	3.9584E-01	1.8286E-01	5.6943E-02	1.3978E-02	5.4883E-03
6.6282E 00	5.6880E-01	3.8184E-01	1.6990E-01	5.1915E-02	1.1962E-02	4.4886E-03
6.3050E 00	5.5004E-01	3.6801E-01	1.5995E-01	4.4238E-02	8.5022E-03	3.5048E-03
5.9975E 00	5.3483E-01	3.5574E-01	1.4773E-01	3.6375E-02	5.4865E-03	2.8791E-03
5.7050E 00	5.2471E-01	3.4101E-01	1.3198E-01	2.9245E-02	3.5653E-03	1.7384E-03
5.4267E 00	4.9964E-01	3.2769E-01	1.1574E-01	2.2832E-02	1.2447E-03	6.8270E-04
5.1621E 00	4.8522E-01	3.1520E-01	1.0516E-01	1.6107E-02	-9.0473E-04	1.0258E-05
4.9103E 00	4.7004E-01	3.0502E-01	9.6022E-02	1.0067E-02	-2.8946E-03	-8.9687E-04
4.6708E 00	4.4518E-01	2.9506E-01	9.0042E-02	7.0236E-03	-5.1840E-03	-1.5946E-03
4.4430E 00	4.2552E-01	2.8721E-01	8.9026E-02	1.8329E-04	-7.2446E-03	-2.0865E-03
4.2263E 00	4.0431E-01	2.7982E-01	8.5000E-02	-1.6549E-03	-8.9000E-03	-2.3000E-03
4.0202E 00	3.8504E-01	2.7502E-01	8.5000E-02	-5.9903E-03	-8.9000E-03	-2.3000E-03
3.8242E 00	3.5911E-01	2.7212E-01	8.5959E-02	-7.9172E-03	-7.3656E-03	-2.0121E-03
3.6376E 00	3.2809E-01	2.7208E-01	9.0181E-02	-7.8437E-03	-3.8179E-03	-1.4685E-03
3.4602E 00	2.9410E-01	2.7500E-01	9.6982E-02	-2.0158E-03	2.9809E-03	-3.0256E-04
3.2919E 00	2.6099E-01	2.8090E-01	1.0880E-01	4.8785E-03	9.8785E-03	8.7864E-04

TABLE 28 — Be (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
3.1310E 00	2.3478E-01	2.8792E-01	1.1790E-01	1.7846E-02	1.2174E-02	2.4805E-03
2.9783E 00	2.4479E-01	3.0329E-01	1.1936E-01	2.1958E-02	1.2328E-02	5.3718E-03
2.8330E 00	3.4276E-01	3.1358E-01	1.1441E-01	1.9894E-02	1.1199E-02	7.6058E-03
2.6948E 00	3.3853E-01	3.0933E-01	9.3045E-02	1.5980E-02	7.2823E-03	8.6300E-03
2.5634E 00	4.8789E-02	2.8625E-01	4.8375E-02	1.0394E-02	2.6412E-03	7.3708E-03
2.4384E 00	1.7524E-02	2.5318E-01	2.4929E-02	3.2176E-03	7.7838E-04	2.6073E-03
2.3195E 00	3.7001E-02	2.2319E-01	1.5456E-02	-3.4482E-03	-4.2145E-06	-7.5611E-04
2.2063E 00	8.9603E-02	1.8997E-01	1.0802E-02	-8.4250E-03	-4.6867E-04	-1.3900E-03
2.0987E 00	1.1263E-01	1.5295E-01	7.8977E-03	-8.7476E-03	-7.5064E-04	-1.2382E-03
1.9964E 00	1.1782E-01	1.0994E-01	5.7498E-03	-6.5644E-03	-8.0277E-04	-7.6342E-04
1.8990E 00	1.2211E-01	6.9301E-02	4.3401E-04	-3.4643E-03	-8.5000E-04	-2.9001E-04
1.8064E 00	1.2885E-01	3.7024E-02	-2.6173E-03	-1.8132E-03	-8.5000E-04	1.7683E-04
1.7183E 00	1.5801E-01	2.5682E-02	-4.0356E-03	-7.7373E-04	-8.5000E-04	5.1777E-04
1.6345E 00	2.0569E-01	3.0017E-02	-4.9034E-03	-1.6756E-04	-8.5000E-04	9.5075E-04
1.5548E 00	2.2012E-01	3.7114E-02	-4.1123E-03	-1.2776E-05	-8.5000E-04	1.2636E-03
1.4790E 00	2.2191E-01	4.4148E-02	-2.9842E-03	0	-7.9820E-04	1.5542E-03
1.4068E 00	2.1942E-01	4.9088E-02	-2.4487E-03	0	-7.4060E-04	1.7041E-03
1.3382E 00	2.1204E-01	4.9975E-02	-2.0000E-03	0	-6.4683E-04	1.7468E-03
1.2730E 00	2.0347E-01	4.9541E-02	-2.0000E-03	0	-6.0394E-04	1.7039E-03
1.2109E 00	1.9524E-01	4.7558E-02	-2.0000E-03	0	-5.5075E-04	1.6025E-03
1.1518E 00	1.9866E-01	4.4209E-02	-2.0000E-03	0	-5.0248E-04	1.4119E-03
1.0956E 00	1.7536E-01	3.8096E-02	-1.9960E-03	-1.2458E-04	-4.0000E-04	1.1836E-03
1.0422E 00	1.6545E-01	2.7961E-02	-1.7021E-03	-1.9849E-03	-4.0000E-04	1.0073E-03
9.9137E-01	1.5220E-01	2.4053E-02	-1.6935E-03	-3.0774E-04	-3.0073E-04	9.0076E-04
9.4302E-01	1.3402E-01	1.9006E-02	-1.5001E-03	-3.4895E-04	-3.0000E-04	7.0010E-04
8.9703E-01	1.1852E-01	1.4008E-02	-1.3001E-03	-4.4893E-04	-2.1539E-07	7.0000E-04
8.5328E-01	1.1206E-01	2.2884E-02	-1.3000E-03	-5.4835E-04	0	6.0065E-04
8.1167E-01	7.7375E-02	3.3957E-02	-1.0000E-03	-6.5041E-04	0	5.4859E-04
7.7208E-01	4.0158E-02	1.6372E-03	-1.0000E-03	-6.9890E-04	0	5.0010E-04
7.3443E-01	4.0979E-02	2.4474E-02	-1.0000E-03	-7.4844E-04	0	4.5056E-04
6.9861E-01	4.2952E-02	6.5886E-02	-1.0000E-03	-7.5057E-04	0	3.9997E-04
6.6454E-01	4.0064E-02	1.0538E-01	-1.0000E-03	-8.0000E-04	0	3.9634E-04
6.3213E-01	1.5192E-02	1.6155E-01	-1.0000E-03	-8.0000E-04	0	3.5018E-04
6.0130E-01	2.9242E-02	-2.8273E-02	-1.0000E-03	-8.4853E-04	0	3.0048E-04
5.7197E-01	4.0010E-02	-4.0004E-02	-4.9853E-04	-9.0000E-04	0	3.0000E-04

TABLE 28 — Be (CONTINUED)

E, MeV	f_1	f_2	f_3	f_4	f_5	f_6
5.4408E-01	4.5470E-02	-4.1988E-02	-2.3879E-06	9.0000E-04	0	3.0000E-04
5.1754E-01	4.7000E-02	-3.1379E-02	-2.0112E-08	8.4814E-04	0	2.9814E-04
4.9230E-01	4.7000E-02	-2.8080E-02	0	8.0057E-04	0	2.5057E-04
4.6829E-01	4.6512E-02	-2.4586E-02	0	8.0000E-04	0	2.5000E-04
4.4545E-01	4.5539E-02	-2.2098E-02	0	8.0000E-04	0	2.5000E-04
4.2373E-01	4.3962E-02	-1.9923E-02	0	7.9837E-04	0	2.5000E-04
4.0306E-01	4.2509E-02	-1.7018E-02	0	7.5015E-04	0	2.5000E-04
3.8341E-01	4.1000E-02	-1.5560E-02	0	7.5000E-04	0	2.5000E-04
3.6471E-01	3.9452E-02	-1.3968E-02	0	6.9998E-04	0	2.5000E-04
3.4692E-01	3.7982E-02	-1.2982E-02	0	6.9877E-04	0	2.5000E-04
3.3000E-01	3.6000E-02	-1.1000E-02	0	6.5000E-04	0	2.5000E-04
3.1391E-01	3.4488E-02	-9.9815E-03	0	6.2160E-04	0	2.0000E-04
2.9860E-01	3.3421E-02	-8.4469E-03	0	6.1849E-04	0	2.0000E-04
2.8403E-01	3.2006E-02	-7.5042E-03	0	6.0004E-04	0	2.0000E-04
2.7018E-01	3.0052E-02	-6.5258E-03	0	6.0000E-04	0	2.0000E-04
2.5700E-01	2.9000E-02	-6.0002E-03	0	5.5002E-04	0	2.0000E-04
2.4447E-01	2.8071E-02	-5.0709E-03	0	5.5000E-04	0	2.0000E-04
2.3255E-01	2.6926E-02	-4.0000E-03	0	5.0000E-04	0	2.0000E-04
2.2121E-01	2.6033E-02	-4.0000E-03	0	5.0000E-04	0	2.0000E-04
2.1042E-01	2.5075E-02	-3.5372E-03	0	5.0000E-04	0	2.0000E-04
2.0016E-01	2.4032E-02	-3.0149E-03	0	4.5078E-04	0	2.0000E-04
1.9039E-01	2.3077E-02	-2.8149E-03	0	2.1848E-04	0	1.0682E-04
1.8111E-01	2.2024E-02	-2.6045E-03	0	4.4804E-06	0	2.2222E-06
1.7228E-01	2.1248E-02	-2.3180E-03	0	6.1136E-08	0	3.0568E-08
1.6387E-01	2.0168E-02	-2.0928E-03	0	0	0	0
1.5588E-01	1.9174E-02	-1.8942E-03	0	0	0	0
1.4828E-01	1.8361E-02	-1.7136E-03	0	0	0	0
1.4105E-01	1.7410E-02	-1.6007E-03	0	0	0	0
1.3417E-01	1.6838E-02	-1.4087E-03	0	0	0	0
1.2762E-01	1.6029E-02	-1.2892E-03	0	0	0	0
1.2140E-01	1.5476E-02	-1.2101E-03	0	0	0	0
1.1548E-01	1.4895E-02	-1.1158E-03	0	0	0	0
1.0985E-01	1.3988E-02	-9.9801E-04	0	0	0	0
1.0449E-01	1.3264E-02	-9.0779E-04	0	0	0	0
9.9394E-02	1.2698E-02	-8.0000E-04	0	0	0	0

TABLE 28 — Be (CONTINUED)

E, MeV	f_1	f_2
9.4547E-02	1.2006E-02	-7.9093E-04
8.9935E-02	1.1598E-02	-7.0000E-04
8.5549E-02	1.1158E-02	-6.9020E-04
8.1377E-02	1.0735E-02	-6.0000E-04
7.7408E-02	1.0162E-02	-6.0000E-04
7.3633E-02	9.5569E-03	-5.0091E-04
7.0042E-02	9.2042E-03	-5.0001E-04
6.6626E-02	8.7532E-03	-4.9990E-04
6.3376E-02	8.3471E-03	-4.9831E-04
6.0286E-02	8.0286E-03	-4.0831E-04
5.7345E-02	7.7345E-03	-4.0000E-04
5.4549E-02	7.2914E-03	-3.8495E-04
5.1888E-02	6.7888E-03	-3.0000E-04
4.9358E-02	6.5358E-03	-3.0000E-04
4.6950E-02	6.1950E-03	-2.9995E-04
4.4661E-02	5.9461E-03	-2.8691E-04
4.2483E-02	5.7483E-03	-2.1576E-04
4.0411E-02	5.5411E-03	-2.0000E-04
3.8440E-02	5.3440E-03	-2.0000E-04
3.6565E-02	4.9565E-03	-1.9978E-04
3.4782E-02	4.7782E-03	-1.8820E-04
3.3085E-02	4.6085E-03	-1.0423E-04
3.1472E-02	4.4472E-03	-1.0000E-04
2.9937E-02	4.1937E-03	-1.0000E-04
2.8477E-02	4.0477E-03	-1.0000E-04
2.7088E-02	3.8176E-03	-9.9088E-05
2.5767E-02	3.5534E-03	-9.2835E-05
2.4510E-02	3.3755E-03	-8.7776E-05
2.3315E-02	3.2157E-03	-8.4787E-05
2.2178E-02	3.1356E-03	-8.0711E-05
2.1096E-02	3.0096E-03	-7.5481E-05
2.0067E-02	2.8135E-03	-7.0337E-05
1.9089E-02	2.7089E-03	-6.7266E-05
1.8158E-02	2.5815E-03	-6.3631E-05
1.7272E-02	2.4272E-03	-5.8936E-05
1.6430E-02	2.3430E-03	-5.6992E-05
1.5628E-02	2.1428E-03	-5.0885E-05

E, MeV	f_1	f_2
1.4866E-02	2.0866E-03	-4.8599E-05
1.4141E-02	2.0141E-03	-4.6424E-05
1.3452E-02	1.9086E-03	-4.4355E-05
1.2795E-02	1.7994E-03	-4.1637E-05
1.2171E-02	1.7214E-03	-3.8735E-05
1.1578E-02	1.5963E-03	-3.6311E-05
1.1013E-02	1.5022E-03	-3.3079E-05
1.0476E-02	1.4843E-03	-3.1952E-05
9.9651E-03	1.4090E-03	-2.9257E-05
9.4791E-03	1.2983E-03	-2.6917E-05
9.0168E-03	1.2413E-03	-2.5067E-05
8.5771E-03	1.2010E-03	-2.2885E-05
8.1588E-03	1.0979E-03	-2.0897E-05
7.7609E-03	1.0722E-03	-1.9804E-05
7.3824E-03	9.9912E-04	-1.7956E-05
7.0223E-03	9.8112E-04	-1.7056E-05
6.6798E-03	9.4119E-04	-1.4933E-05
6.3541E-03	8.9063E-04	-1.3885E-05
6.0442E-03	8.5155E-04	-1.3110E-05
5.7494E-03	8.0757E-04	-1.1329E-05
5.4690E-03	7.6586E-04	-9.8966E-06
5.2023E-03	7.3030E-04	-9.0075E-06
4.9485E-03	6.9647E-04	-8.1618E-06
4.7072E-03	6.5960E-04	-7.0360E-06
4.4776E-03	6.2720E-04	-5.9254E-06
4.2592E-03	5.9988E-04	-5.1975E-06
4.0515E-03	5.6724E-04	-4.0000E-06
3.8539E-03	5.4053E-04	-3.7696E-06
3.6660E-03	5.0953E-04	-2.8298E-06
3.4872E-03	4.8983E-04	-1.9359E-06
3.3171E-03	4.6628E-04	-1.0855E-06
3.1553E-03	4.3942E-04	-9.5616E-07
3.0014E-03	4.2018E-04	-9.0953E-07
2.8551E-03	3.9841E-04	-8.6517E-07
2.7158E-03	3.8188E-04	-8.2297E-07
2.5834E-03	3.6056E-04	-7.8284E-07
2.4574E-03	3.3984E-04	-7.4466E-07

TABLE 28 — Be (CONTINUED)

E, MeV	f_1	f_2	E, MeV	f_1	f_2
2.3375E-03	3.3235E-04	-7.0834E-07	3.6755E-04	4.9425E-05	-1.1138E-07
2.2235E-03	3.1470E-04	-6.7379E-07	3.4962E-04	4.7015E-05	-1.0595E-07
2.1151E-03	2.9811E-04	-6.4093E-07	3.3257E-04	4.4722E-05	-1.0078E-07
2.0119E-03	2.8191E-04	-6.0967E-07	3.1635E-04	4.2541E-05	-9.5863E-08
1.9138E-03	2.6879E-04	-5.7994E-07	3.0092E-04	4.0466E-05	-9.1188E-08
1.8205E-03	2.5348E-04	-5.5166E-07	2.8624E-04	3.8493E-05	-8.6741E-08
1.7317E-03	2.4317E-04	-5.2475E-07	2.7228E-04	3.6615E-05	-8.2510E-08
1.6472E-03	2.3472E-04	-4.9916E-07	2.5901E-04	3.4830E-05	-7.8486E-08
1.5669E-03	2.1865E-04	-4.7482E-07	2.4637E-04	3.3131E-05	-7.4659E-08
1.4905E-03	2.1005E-04	-4.5166E-07	2.3436E-04	3.1515E-05	-7.1017E-08
1.4178E-03	2.0117E-04	-4.2963E-07	2.2293E-04	2.9978E-05	-6.7554E-08
1.3486E-03	1.9386E-04	-4.0868E-07	2.1206E-04	2.8516E-05	-6.4259E-08
1.2829E-03	1.8043E-04	-3.8875E-07	2.0171E-04	2.7125E-05	-6.1125E-08
1.2203E-03	1.7228E-04	-3.6979E-07	1.9188E-04	2.5802E-05	-5.8144E-08
1.1608E-03	1.6602E-04	-3.5175E-07	1.8252E-04	2.4544E-05	-5.5308E-08
1.1042E-03	1.5069E-04	-3.3460E-07	1.7362E-04	2.3347E-05	-5.2611E-08
1.0503E-03	1.4702E-04	-3.1828E-07	1.6515E-04	2.2208E-05	-5.0045E-08
9.9909E-04	1.3901E-04	-3.0276E-07	1.5709E-04	2.1125E-05	-4.7604E-08
9.5037E-04	1.3007E-04	-2.8799E-07	1.4943E-04	2.0095E-05	-4.5283E-08
9.0402E-04	1.2724E-04	-2.7394E-07	1.4215E-04	1.9115E-05	-4.3074E-08
8.5993E-04	1.2016E-04	-2.6058E-07	1.3521E-04	1.8183E-05	-4.0973E-08
8.1799E-04	1.1000E-04	-2.4788E-07	1.2862E-04	1.7296E-05	-3.8975E-08
7.7809E-04	1.0463E-04	-2.3579E-07	1.2235E-04	1.6452E-05	-3.7074E-08
7.4015E-04	9.9531E-05	-2.2429E-07	1.1638E-04	1.5645E-05	-3.5266E-08
7.0405E-04	9.4677E-05	-2.1335E-07	1.1070E-04	1.4887E-05	-3.3546E-08
6.6971E-04	9.0059E-05	-2.0294E-07	1.0530E-04	1.4161E-05	-3.1910E-08
6.3705E-04	8.5667E-05	-1.9305E-07	1.0017E-04	1.3471E-05	-3.0354E-08
6.0598E-04	8.1489E-05	-1.8363E-07	9.5283E-05	1.2813E-05	-2.8874E-08
5.7643E-04	7.7513E-05	-1.7467E-07	9.0636E-05	1.2188E-05	-2.7465E-08
5.4831E-04	7.3734E-05	-1.6616E-07	8.6215E-05	1.1594E-05	-2.6126E-08
5.2153E-04	7.0138E-05	-1.5805E-07	8.2011E-05	1.1028E-05	-2.4852E-08
4.9613E-04	6.6717E-05	-1.5034E-07	7.8011E-05	1.0490E-05	-2.3640E-08
4.7194E-04	6.3464E-05	-1.4301E-07	7.4206E-05	9.9788E-06	-2.2487E-08
4.4892E-04	6.0368E-05	-1.3604E-07	7.0587E-05	9.4921E-06	-2.1390E-08
4.2703E-04	5.7424E-05	-1.2940E-07	6.7145E-05	9.0292E-06	-2.0347E-08
4.0620E-04	5.4624E-05	-1.2309E-07	6.3870E-05	8.5888E-06	-1.9354E-08
3.8639E-04	5.1960E-05	-1.1709E-07	6.0753E-05	8.1700E-06	-1.8411E-08

TABLE 28 — Be (CONTINUED)

E, MeV	f_1	f_2
5.7792E-05	7.7715E-06	-1.7513E-08
5.4973E-05	7.3925E-06	-1.6659E-08
5.2292E-05	7.0320E-06	-1.5846E-08
4.9742E-05	6.6890E-06	-1.5073E-08
4.7316E-05	6.3628E-06	-1.4338E-08
4.5008E-05	6.0525E-06	-1.3639E-08
4.2813E-05	5.7573E-06	-1.2974E-08
4.0725E-05	5.4765E-06	-1.2341E-08
3.8739E-05	5.2094E-06	-1.1739E-08
3.6850E-05	4.9553E-06	-1.1167E-08
3.5053E-05	4.7137E-06	-1.0622E-08
3.3343E-05	4.4838E-06	-1.0104E-08
3.1717E-05	4.2651E-06	-9.6111E-09
3.0170E-05	4.0571E-06	-9.1424E-09
2.8699E-05	3.8592E-06	-8.6965E-09
2.7299E-05	3.6710E-06	-8.2724E-09
2.5968E-05	3.4920E-06	-7.8689E-09
2.4701E-05	3.3217E-06	-7.4852E-09
2.3496E-05	3.1597E-06	-7.1201E-09
2.2350E-05	3.0056E-06	-6.7728E-09
2.1260E-05	2.8590E-06	-6.4425E-09
2.0224E-05	2.7195E-06	-6.1283E-09
1.9237E-05	2.5869E-06	-5.8294E-09
1.8299E-05	2.4607E-06	-5.5451E-09
1.7407E-05	2.3407E-06	-5.2747E-09
1.6558E-05	2.2266E-06	-5.0174E-09
1.5750E-05	2.1180E-06	-4.7727E-09
1.4982E-05	2.0147E-06	-4.5400E-09
1.4251E-05	1.9164E-06	-4.3185E-09
1.3556E-05	1.8230E-06	-4.1079E-09
1.2895E-05	1.7340E-06	-3.9076E-09
1.2266E-05	1.6495E-06	-3.7170E-09
1.1668E-05	1.5690E-06	-3.5357E-09
1.1099E-05	1.4925E-06	-3.3633E-09
1.0558E-05	1.4197E-06	-3.1992E-09
1.0043E-05	1.3505E-06	-3.0432E-09
9.5529E-06	1.2846E-06	-2.8948E-09

E, MeV	f_1	f_2
9.0870E-06	1.2220E-06	-2.7536E-09
8.6438E-06	1.1624E-06	-2.6193E-09
8.2223E-06	1.1057E-06	-2.4916E-09
7.8213E-06	1.0517E-06	-2.3701E-09
7.4398E-06	1.0005E-06	-2.2545E-09
7.0770E-06	9.5166E-07	-2.1445E-09
6.7318E-06	9.0525E-07	-2.0399E-09
6.4035E-06	8.6110E-07	-1.9404E-09
6.0912E-06	8.1910E-07	-1.8458E-09
5.7941E-06	7.7915E-07	-1.7558E-09
5.5116E-06	7.4115E-07	-1.6701E-09
5.2428E-06	7.0500E-07	-1.5887E-09
4.9871E-06	6.7062E-07	-1.5112E-09
4.7438E-06	6.3791E-07	-1.4375E-09
4.5125E-06	6.0680E-07	-1.3674E-09
4.2924E-06	5.7721E-07	-1.3007E-09
4.0831E-06	5.4905E-07	-1.2373E-09
3.8839E-06	5.2228E-07	-1.1769E-09
3.6945E-06	4.9680E-07	-1.1195E-09
3.5143E-06	4.7257E-07	-1.0649E-09
3.3429E-06	4.4952E-07	-1.0130E-09
3.1799E-06	4.2760E-07	-9.6357E-10
3.0248E-06	4.0675E-07	-9.1658E-10
2.8773E-06	3.8691E-07	-8.7187E-10
2.7370E-06	3.6804E-07	-8.2935E-10
2.6035E-06	3.5009E-07	-7.8890E-10
2.4765E-06	3.3301E-07	-7.5043E-10
2.3557E-06	3.1677E-07	-7.1383E-10
2.2408E-06	3.0132E-07	-6.7901E-10
2.1315E-06	2.8662E-07	-6.4589E-10
2.0276E-06	2.7265E-07	-6.1439E-10
1.9287E-06	2.5935E-07	-5.8443E-10
1.8346E-06	2.4667E-07	-5.5592E-10
1.7452E-06	2.3467E-07	-5.2881E-10
1.6601E-06	2.2322E-07	-5.0302E-10
1.5791E-06	2.1233E-07	-4.7848E-10
1.5021E-06	2.0198E-07	-4.5514E-10

TABLE 28 — Be (CONTINUED)

E, MeV	f_1	f_2
1.4288E-06	1.9213E-07	-4.3295E-10
1.3591E-06	1.8276E-07	-4.1183E-10
1.2928E-06	1.7384E-07	-3.9174E-10
1.2298E-06	1.6536E-07	-3.7264E-10
1.1698E-06	1.5730E-07	-3.5446E-10
1.1128E-06	1.4962E-07	-3.3717E-10
1.0585E-06	1.4233E-07	-3.2073E-10
1.0069E-06	1.3538E-07	-3.0508E-10
9.5777E-07	1.2878E-07	-2.9020E-10
9.1105E-07	1.2250E-07	-2.7605E-10
8.6662E-07	1.1653E-07	-2.6258E-10
8.2436E-07	1.1084E-07	-2.4977E-10
7.8415E-07	1.0543E-07	-2.3759E-10
7.4591E-07	1.0029E-07	-2.2600E-10
7.0953E-07	9.5400E-08	-2.1498E-10
6.7493E-07	9.0747E-08	-2.0449E-10
6.4201E-07	8.6320E-08	-1.9452E-10
6.1070E-07	8.2110E-08	-1.8503E-10
5.8091E-07	7.8105E-08	-1.7600E-10
5.5258E-07	7.4295E-08	-1.6742E-10
5.2563E-07	7.0471E-08	-1.5925E-10
5.0000E-07	6.7223E-08	-1.5148E-10
4.7561E-07	6.3944E-08	-1.4409E-10
4.5242E-07	6.0825E-08	-1.3707E-10
4.3035E-07	5.7858E-08	-1.3038E-10
4.0936E-07	5.5035E-08	-1.2402E-10
3.8940E-07	5.2351E-08	-1.1797E-10
3.7041E-07	4.9797E-08	-1.1221E-10
3.5234E-07	4.7368E-08	-1.0674E-10
3.3516E-07	4.5057E-08	-1.0153E-10
3.1881E-07	4.2859E-08	-9.6580E-11
3.0326E-07	4.0768E-08	-9.1868E-11
2.8847E-07	3.8779E-08	-8.7386E-11
2.7440E-07	3.6887E-08	-8.3123E-11
2.6102E-07	3.5087E-08	-7.9067E-11
2.4829E-07	3.3375E-08	-7.5210E-11
2.3618E-07	3.1747E-08	-7.1540E-11

E, MeV	f_1	f_2
2.2466E-07	3.0198E-08	-6.8050E-11
2.1371E-07	2.8725E-08	-6.4729E-11
2.0328E-07	2.7323E-08	-6.1571E-11
1.9337E-07	2.5990E-08	-5.8567E-11
1.8394E-07	2.4722E-08	-5.5709E-11
1.7497E-07	2.3515E-08	-5.2990E-11
1.6643E-07	2.2368E-08	-5.0404E-11
1.5832E-07	2.1276E-08	-4.7945E-11
1.5060E-07	2.0238E-08	-4.5605E-11
1.4325E-07	1.9250E-08	-4.3379E-11
1.3627E-07	1.8311E-08	-4.1262E-11
1.2962E-07	1.7417E-08	-3.9248E-11
1.2330E-07	1.6567E-08	-3.7333E-11
1.1728E-07	1.5758E-08	-3.5510E-11
1.1156E-07	1.4989E-08	-3.3777E-11
1.0612E-07	1.4257E-08	-3.2128E-11
1.0095E-07	1.3561E-08	-3.0560E-11
9.6024E-08	1.2899E-08	-2.9068E-11
9.1341E-08	1.2270E-08	-2.7649E-11
8.6887E-08	1.1671E-08	-2.6299E-11
8.2649E-08	1.1101E-08	-2.5015E-11
7.8618E-08	1.0559E-08	-2.3793E-11
7.4784E-08	1.0043E-08	-2.2631E-11
7.1137E-08	9.5526E-09	-2.1526E-11
6.7667E-08	9.0861E-09	-2.0475E-11
6.4367E-08	8.6423E-09	-1.9475E-11
6.1228E-08	8.2201E-09	-1.8524E-11
5.8242E-08	7.8186E-09	-1.7619E-11
5.5401E-08	7.4366E-09	-1.6758E-11
5.2699E-08	7.0733E-09	-1.5939E-11
5.0129E-08	6.7276E-09	-1.5160E-11
4.7684E-08	6.3989E-09	-1.4420E-11
4.5359E-08	6.0861E-09	-1.3715E-11
4.3147E-08	5.7887E-09	-1.3044E-11
4.1042E-08	5.5057E-09	-1.2407E-11
3.9041E-08	5.2365E-09	-1.1800E-11
3.7137E-08	4.9805E-09	-1.1223E-11

TABLE 29 — Be – NUMBER OF γ-RAYS EMITTED PER RADIATIVE CAPTURE

E_γ, MeV	
3.41	.5000
6.797	.7500

TABLE 30 — Be – NUMBER OF γ-RAYS EMITTED PER NEUTRON-PRODUCING REACTION

E, MeV	E_γ, MeV 2.43
1.80200E 01	.2610
1.63028E 01	.2900
1.47514E 01	.3200
1.33476E 01	.3600
1.20774E 01	.4000
1.09281E 01	.4450
9.88815E 00	.5100
8.94717E 00	.5700
8.09573E 00	.6450
7.32532E 00	.7100
6.62823E 00	.7750
5.99747E 00	.8140
5.42673E 00	.8370
4.91031E 00	.8380
4.44303E 00	.8200
4.02022E 00	.7600
3.63765E 00	.4300
3.29148E 00	.3000
2.97825E 00	.1200
2.69484E 00	0
1.00000E-10	0

DISTRIBUTION

	No. of Copies
Commanding Officer US Army Nuclear Defense Laboratory ATTN: Arnold T. Futterer Edgewood Arsenal, Maryland 21010	100*

*Plus one reproducible.

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1 ORIGINATING ACTIVITY *(Corporate author)*

US ARMY NUCLEAR DEFENSE LABORATORY
Edgewood Arsenal, Maryland 21010

2a REPORT SECURITY CLASSIFICATION

UNCLASSIFIED

2b GROUP

3 REPORT TITLE

NEUTRON CROSS SECTIONS OF NITROGEN, OXYGEN, ALUMINUM, SILICON, IRON, DEUTERIUM, AND BERYLLIUM

4 DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

5 AUTHOR(S) *(Last name, first name, initial)*

United Nuclear Corporation
J. H. Ray
G. Grochowski
E. S. Troubetzkoy, Project Scientist

6 REPORT DATE	7a TOTAL NO OF PAGES	7b NO OF REFS
November 15, 1965	169	21

8a CONTRACT OR GRANT NO.	9a ORIGINATOR'S REPORT NUMBER(S)
DA-18-035-AMC-125(A)	UNC-5139
b PROJECT NO	
c	9b OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
d	

10 AVAILABILITY/LIMITATION NOTICES

Distribution of this document is unlimited.

11 SUPPLEMENTARY NOTES	12 SPONSORING MILITARY ACTIVITY
	Department of the Army

13 ABSTRACT

Neutron cross-section sets have been prepared for N, O, Al, Si, Fe, D, and Be for neutron energies from 0.037 eV to 18 MeV. The cross sections tabulated include the total, elastic, inelastic, (n,2n), and cross sections for charged particle emission. Information is also given on the angular distribution of elastically scattered neutrons and on the energy distribution of neutrons and γ—rays following nonelastic reactions.

DD FORM 1 JAN 64 1473

UNCLASSIFIED

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Neutron cross sections Cross sections, neutron of Nitrogen of Oxygen of Aluminum of Silicon of Iron of Deuterium of Beryllium Energy distribution of neutrons of gamma rays						

INSTRUCTIONS

1. **ORIGINATING ACTIVITY:** Enter the name and address of the contractor, subcontractor, grantee, Department of Defense activity or other organization *(corporate author)* issuing the report.

2a. **REPORT SECURITY CLASSIFICATION:** Enter the overall security classification of the report. Indicate whether "Restricted Data" is included. Marking is to be in accordance with appropriate security regulations.

2b. **GROUP:** Automatic downgrading is specified in DoD Directive 5200.10 and Armed Forces Industrial Manual. Enter the group number. Also, when applicable, show that optional markings have been used for Group 3 and Group 4 as authorized.

3. **REPORT TITLE:** Enter the complete report title in all capital letters. Titles in all cases should be unclassified. If a meaningful title cannot be selected without classification, show title classification in all capitals in parenthesis immediately following the title.

4. **DESCRIPTIVE NOTES:** If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.

5. **AUTHOR(S):** Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.

6. **REPORT DATE:** Enter the date of the report as day, month, year; or month, year. If more than one date appears on the report, use date of publication.

7a. **TOTAL NUMBER OF PAGES:** The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.

7b. **NUMBER OF REFERENCES:** Enter the total number of references cited in the report.

8a. **CONTRACT OR GRANT NUMBER:** If appropriate, enter the applicable number of the contract or grant under which the report was written.

8b, 8c, & 8d. **PROJECT NUMBER:** Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.

9a. **ORIGINATOR'S REPORT NUMBER(S):** Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.

9b. **OTHER REPORT NUMBER(S):** If the report has been assigned any other report numbers *(either by the originator or by the sponsor)*, also enter this number(s).

10. **AVAILABILITY/LIMITATION NOTICES:** Enter any limitations on further dissemination of the report, other than those imposed by security classification, using standard statements such as:

(1) "Qualified requesters may obtain copies of this report from DDC."

(2) "Foreign announcement and dissemination of this report by DDC is not authorized."

(3) "U. S. Government agencies may obtain copies of this report directly from DDC. Other qualified DDC users shall request through _____."

(4) "U. S. military agencies may obtain copies of this report directly from DDC. Other qualified users shall request through _____."

(5) "All distribution of this report is controlled. Qualified DDC users shall request through _____."

If the report has been furnished to the Office of Technical Services, Department of Commerce, for sale to the public, indicate this fact and enter the price, if known.

11. **SUPPLEMENTARY NOTES:** Use for additional explanatory notes.

12. **SPONSORING MILITARY ACTIVITY:** Enter the name of the departmental project office or laboratory sponsoring *(paying for)* the research and development. Include address.

13. **ABSTRACT:** Enter an abstract giving a brief and factual summary of the document indicative of the report, even though it may also appear elsewhere in the body of the technical report. If additional space is required, a continuation sheet shall be attached.

It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as *(TS), (S), (C), or (U)*.

There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. **KEY WORDS:** Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Idenfiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, rules, and weights is optional.