International Atomic Energy Agency

INDC(CCP)-149/LV

INDC INTERNATIONAL NUCLEAR DATA COMMITTEE

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(Excerpt translation from USSR report Nuclear Constants, 3 (34) page 34,
also distributed as INDC(CCP)-140/G)

Translated by the IAEA
June 1980

IAEA NUCLEAR DATA SECTION, WAGRAMERSTRASSE 5, A-1400 VIENNA

Reproduced by the IAEA in Austria
June 1980
80-3375

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UDC 539.172.4

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ABSTRACT

A comparison is made between evaluations of radiative-capture and fission cross-sections for the isotopes ^{236}U, ^{237}Np, ^{238}Pu, ^{241}Am, ^{243}Am, ^{242}Cm and ^{244}Cm, and group cross-sections for use in fast-reactor calculations are recommended. Group cross-sections obtained from the HEDL graphical data (evaluation for ENDF/B-V) are shown for ^{234}U, ^{236}Pu, ^{237}Pu, ^{242}Pu, ^{244}Pu, ^{242m}Am, ^{241}Cm, ^{243}Cm and ^{248}Cm. Group cross-sections for 32 isotopes from the ENDL-76 library files are also given. In choosing recommended cross-sections, account was taken of the extent of agreement with experimental data where these are available, the extent to which the cross-sections are documented and the extent to which they have been calculated from a theoretical model. The reliability of evaluations is discussed. An attempt is made to evaluate the error in single-group cross-sections averaged over a typical fast-reactor spectrum. Conclusions are drawn from a study of the literature on the current status of experimental and theoretical research on transactinide cross-sections, and from the spread of the different evaluation data. Finally, the situation with respect to the integral experiments which can be used for correcting transactinide cross-sections is discussed.

By the mid-1970s, systems of nuclear constants with which the basic physical parameters of large fast-breeder reactors could be predicted with reasonable accuracy (±2% for the multiplication factor and ±6% for the breeding ratio with requirements of ±1% and ±2-3% respectively [1]) had practically been completed in various countries.

In recent years attention has increasingly been paid to the problem of obtaining data for transactinides. The reason for this is associated with methods used for handling irradiated fuel, the quantity of which is steadily increasing. However, the situation with respect to transactinide nuclear data (TND) will probably remain unsatisfactory for some time. Table 1 shows the radiative-capture cross-sections used in different laboratories for various isotopes averaged over the core spectrum of an industrial fast reactor. It will be seen that there are discrepancies by factors of up to 2-4.

In the face of practical problems with transactinides, the need for group transactinide constants in line with the current status of evaluation increases.

Sources of information

The purpose of the present paper is to compare the nuclear data on the basic transactinides, to recommend group fission and radiative-capture cross-sections for the region 10 eV-10 MeV, and to evaluate the errors in them. Evaluations for ^{236}U, ^{237}Np, ^{238}Pu, ^{241}Am, ^{243}Am, ^{242}Cm, and ^{244}Cm are compared (Table 2).

The main sources of information are the evaluations of the Obninsk Physics and Energy Institute (FEI) (L.P. Abagyan, S.M. Zakharova et al.), the Israeli group (M. Caner, S. Yiftah et al.), the Hanford Engineering Development Laboratory (HEDL) (F. Mann and R. Schenter), and the Japanese group (S. Igarasi and T. Nakagawa), together with the evaluated cross-section libraries of the Lawrence Livermore Laboratory (ENDL 76) (R. Howerton et al.).

The criteria used by the authors of the present paper for recommending a given evaluation were the extent to which information on basic data and theoretical models was available, the year in which the evaluation was performed and the extent to which it agreed with known experimental results. In the case of experimental findings, only the authors and year of publication are indicated, as in the CINDA-76/77 (Supplement 2) and CINDA-78 (Supplement 4) bibliographical indexes published by the IAEA in Vienna and in the bibliography in the review paper of Ref. [4] on the status of the most recent experimental work.

The constants chosen for ^{234}U, ^{236}Pu, ^{237}Pu, ^{242}Pu, ^{244}Pu, ^{242m}Am, ^{241}Cm, ^{243}Cm and ^{248}Cm (see Table 3) are taken mainly from the graphical data of HEDL [5]. The following important points should, however, be borne in mind:

(1) The constants for ^{234}U and ^{242}Pu used by FEI match the older evaluations of Ref. [6], which it is useful to compare with later evaluations; and

(2) The experimental data for the isotopes of plutonium and curium shown are very meagre and, apart from the HEDL data, there are no known evaluations for ^{237}Pu, ^{244}Pu and ^{241}Cm.

An advantage of the HEDL evaluation is the uniformity of the approach followed, whereby the Hauser-Feshbach theoretical model is applied for interpolation and extrapolation of data and rejection of inconsistent experimental results. Optical parameters, the structure of nuclear levels and threshold fission energies were obtained from systematics and by adjustment of theoretical values to experimental data. For the region of energies below 10 keV the evaluations are based on analysis of resolved and average resonance parameters. For certain isotopes the authors of Ref. [5] used the results of Refs [7, 8] without any changes. The HEDL evaluation was performed for the ENDF/B-V library.

The authors also considered it appropriate to show 28-group constants (σ_t, $\sigma_{n\gamma}$, σ_f, $\sigma_{n,2n}$, $\sigma_{n,3n}$) for isotopes of thorium (228-233), uranium (233-240), neptunium (237), plutonium (238-243), americium (241-243), curium (242-248), berkelium (249) and californium (249-252) taken from the ENDL-76 library (see Table 4). The ENDL evaluation methods are described in Refs [9, 10]. Ref. [11] contains a description of the basic data and a discussion of the special features of evaluation for the isotopes mentioned. It should, however, be mentioned that for the ENDL-76 evaluation the experimental data available by 1975-76 were used. Owing to lack of information, the authors of ENDL made extensive use of the patterns emerging from cross-section systematics. The procedure used for evaluating radiative capture was of a somewhat intuitive character, and many experimental and theoretical findings on cross-sections of isotopes of importance for the ^{233}U-^{232}Th cycle are not reflected in the ENDL evaluations.

The present paper does not contain an analysis of the reliability of ENDL-76 library cross-sections for the low-energy region (up to 10 eV). It is worth mentioning, though, that there is a considerable amount of information available on the evaluation of resonance integrals and on cross-sections at thermal energies and for the first-resonance region [12, 13]. A large quantity of information has also been accumulated from the analysis of irradiated fuel and small samples in thermal reactors.

The group constants in Table 4 were found using the SPURT group of programs [14]. These programs are designed for obtaining a full set of constants from nuclear data libraries (the number of energy groups is arbitrary) for neutron and photon calculations.

For calculation of the group constants in Table 4, the spectrum used for averaging and the division of energy groups in the range 0.215 eV–10 MeV are in accordance with the scheme of I.I. Bondarenko [6]. In the 26th group the cross-sections are averaged in the range 0.215 eV–0.00215 eV for the Maxwell spectrum. In addition, two groups in the high-energy region (14–10.5 MeV and 14.1–14.0 MeV) were introduced. For reasons of space, data obtained from ENDL-76 on resonance self-shielding coefficients in the resolved resonance region, inelastic scattering, anisotropy, the average number of neutrons per fission event and so on are not given. In the absence of better results, when used together with the available up-to-date evaluations of fission and radiative-capture cross-sections for transactinides, these data can be used in practice for interpreting data on the irradiation of samples and fuel clusters of different compositions in fast power reactors and for solving irradiated-fuel storage and reprocessing problems.

Comparison of evaluations of fission and radiative-capture cross-sections for the basic transactinides

Uranium-236. Radiative capture. In the BNAB system of constants [6] the cross-section was evaluated in accordance with systematics of density and of nuclear level widths. In the region 350 keV–4 MeV use was made of the activation data of J. Barry et al. (1961) and the measurements of D. Stupegia et al. (1961) for the cross-section of ^{235}U. For the ENDF/B-IV and ENDL evaluations the time-of-flight measurements ($E_n < 20$ keV) of A. Carlson et al. (1968) and new data on resonance parameters were used. The HEDL evaluations agree with the ENDF/B-IV data. Table 2 shows the extent (approximately 10%) to which the HEDL and ENDL-76 (apart from the 16th and 20th groups) evaluations agree. The BNAB data are systematically higher in the range 1–1000 keV. The HEDL evaluation is recommended.

Fission. In the BNAB evaluation use was made of the measurements of R. Lamphere et al. (1956) in the range 700 keV–4 MeV for the fission cross-section of ^{235}U. Since 1964 new experimental data from various independent studies have been published and the sub-threshold fission values have been brought up to date. Table 2 shows that the various evaluations with $E_n > E_{th}$ agree to within ±10%. The HEDL evaluation is recommended.

Neptunium-237. Radiative capture. Various evaluations are compared in Table 1 and Fig. 1. There are experimental data available by D. Stupegia et al. (1967) and M. Lindner et al. (1973) (activation at $E_n > 100$ keV). The results of the second, later paper give a cross-section value lower by a factor of 1.5-2. This is in fact the result given preference in papers after 1973. In the HEDL evaluation the ENDL/B-IV results (1973) are chosen. The data of Ref. [15] are those of the ENDL/B-IV evaluation at $E_n > 100$ keV. For the energy region below 100 keV they are data from a calculation differing somewhat from the HEDL evaluation. The evaluation of Ref. [16] is based on the experimental results of D. Stupegia et al. and differs from the other data.

Since the evaluation of Ref. [15] is documented in detail (by a whole file in the KEDAK-3 input format) and supplemented by evaluations of resonance parameters and different types of neutron cross-section in the context of a uniform theoretical model, the data given in this paper are recommended for use in practice.

Fission. The experimental findings available are comparatively extensive, as a result of which the various data differ only slightly from each other in the region of interest for fast reactors. The evaluation of Ref. [15] is recommended.

Plutonium-238. Radiative capture. The only experimental results available are those of M. Silbert et al. (1973), obtained from a nuclear explosion. The error in the results is given as of the order of 40%. For the region 0.5-100 keV these results were used as the basis for the evaluation in Ref. [17]. In the data of other authors theoretical values predominate. The curve in Ref. [18] for $E \simeq 2$-100 keV lies outside the lower margin of error for the experiment. At 5-50 keV the HEDL evaluation is lower than the experimental points by approximately 30%, whereas in the region $E_n > 50$ keV it is substantially higher. Table 2 and Fig. 2 show the evaluations of various authors. It will be seen that the ENDL-76 and ENDF/B-IV data for the region 5-200 keV differ considerably (by a factor of 1.5-2) from the HEDL data and Ref. [17]. The evaluation in Ref. [17] is recommended.

Fission. All evaluations are based on experimental results which show some inconsistency. This is the reason for the difference in the cross-sections shown in Table 2. The evaluation of Ref. [17] is recommended.

Americium-241. Radiative capture. Figure 3 and Table 2 give an idea of the spread in evaluations. The FEI evaluation is based on the theoretical radiative-capture cross-section of Ref. [19] for the region 20 eV–0.7 MeV as calculated by statistical theory without taking fission competition into account. For calculating penetrabilities, use was made of optical parameters taken from neutron data systematics. In the high energy region the cross-section was extrapolated from results of ^{241}Am irradiation experiments in the hard spectrum of the BR-5 reactor. Abnormally high radiative capture in the region above 0.8 MeV is also found in the evaluation of Ref. [20]. The ENDF/B-IV (1966) and ENDL-76 (1977) cross-sections in the region of interest for fast reactors (20–400 keV) are lower by a factor of 2–3 than the cross-sections in the evaluations of HEDL (1977) and Ref. [21]. In the latter two papers the absorption cross-sections correlate with the changes in time of flight performed by L. Weston et al. (1975). The measurements of D. Gayther et al. (1977) ($\sigma_a = \sigma_{n\gamma} + \sigma_f$ was measured in the region 0.1–500 keV) confirm the data of L. Weston et al. entirely, although in the region 10–100 keV the difference attains 20%. The divergence in the data of HEDL and Ref. [21] in the region 5–50 keV is caused by the difference in the fission cross-section (as is shown below). For calculation purposes the HEDL evaluation is recommended.

Fission. Evaluations are based on the numerous microscopic experimental data. As can be seen from Table 2, in the region E_n < 200 keV the various evaluations agree with each other satisfactorily. However, in the lower energy region considerable divergences are observed. The latest experimental data and analysis of integral measurements on critical assemblies indicate that nuclear-explosion measurements and the ENDF/B-IV, ENDL and Ref. [21] evaluations based on them are far too high. The HEDL data are recommended.

Americium-243. Radiative-capture. There are no experimental data available. Fig. 4 and Table 2 show the theoretical evaluations of ENDF/B-IV, ENDL-76, HEDL and Refs [17, 22]. It will be seen that they differ considerably. The evaluation of Ref. [17], which was performed in the best-known conditions, is recommended.

Fission. The experimental data agree well in the region above 0.2 MeV. In the region below 0.2 MeV, the evaluations of Ref. [17] and HEDL, unlike the evaluations of ENDL-76 and Ref. [22], were not based on nuclear-explosion data. The evaluation of Ref. [17] is recommended.

Curium-242. The experimental data are extremely meagre. There are measurements of its resonance absorption integral and of the fission cross-section at 14 MeV and on the fission spectrum. The data of ENDL-76 and HEDL contain theoretical cross-section evaluations. In the region below 1 keV, for the ENDL-76 files use was made of the data of Ref. [7], while for the HEDL evaluations the data of Ref. [8] were used. There is no information available on the constants used in the FEI calculations. Table 2 shows that both the radiative-capture and the fission cross-section differ considerably over the whole energy range. This confirms the importance of experimental findings as a primary source of information. The HEDL evaluation is recommended.

Curium 244. *Radiative capture*. Various data are shown in Table 2 and Fig. 5. For the lower energy region nuclear-explosion measurements were performed by M. Moore [1971]. However, these data are inaccessible in a pure form and thus for the evaluations of Ref. [17] the energy dependence of the cross-section was determined by calculation. Above 10 keV the Ref. [17] and HEDL evaluations agree with each other fairly well. The ENDF/B-IV and ENDL cross-sections lie considerably lower. Between these two groups of evaluations there are the results of Ref. [23] and of the Japanese group. For the region below 1 keV the cross-sections of Ref. [17], ENDL-76 and HEDL differ by no more than 30%. However, in the range of interest (10-1 keV), the data of Ref. [17] and HEDL differ by a factor of two. The evaluation of Ref. [17] is recommended.

Fission. There are various experimental findings available, including some for which the time-of-flight method was used with a nuclear explosion. This explains the considerable difference in the ENDF/B-IV (1967) cross-sections from later evaluations based on combined experimental material. From a practical point of view the agreement of the results in Ref. [17] and HEDL can be considered satisfactory. The evaluation of Ref. [17] is recommended.

Group-averaged constants for ^{234}U, ^{236}Pu, ^{237}Pu, ^{242}Pu, ^{242m}Am, ^{244}Pu, ^{241}Cm, ^{243}Cm and ^{244}Cm

Table 3 shows group radiative-capture and fission cross-sections as evaluated by HEDL for isotopes not shown in Table 2. There are very few experimental data for these isotopes and also very few theoretical data (except for ^{242}Pu). In practice, for purposes of calculation it would be best to use the HEDL evaluations since their treatment of the isotopes concerned shows that the way in which adjustment of calculations to experimental data is performed is satisfactory. Let us briefly discuss the data in Table 3.

Uranium-234. There are no experimental data on the radiative-capture cross-section of ^{234}U in the fast-neutron region. The radiative-capture cross-section evaluation given in Ref. [6] is based on the assumption of an analogous fission cross-section dependence of ^{234}U and ^{238}U. The ratio of level densities was found from statistical theory. For evaluation of the fission cross-section, use was made of those experimental and theoretical data based on the theory of sub-barrier fission which were accessible by 1964. The HEDL cross-sections, apart from the fission cross-sections in the region above 10 keV where new experimental data were used, agree with the cross-sections of ENDF/B-IV. The differences in the radiative-capture cross-section evaluations given in Ref. [6], HEDL and ENDL-76 in the region 1 keV to 1 MeV do not exceed 20%. The evaluations of the fission cross-section for $E_n > 0.5$ MeV also agree to within 5%.

Plutonium-236. There are no experimental data on the radiative-capture and fission cross-sections of ^{236}Pu in the fast-neutron region. For the region below 10 keV the HEDL data correspond to the evaluation of Ref. [7], while for the region above 10 keV theoretical results were used. The HEDL data differ by a factor of approximately two from the older evaluation of Ref. [20] in the region 1 keV to 1 MeV.

Plutonium-237. There are unreliable data for the fission cross-section in the thermal region. No evaluations other than HEDL are known.

Plutonium-242. In Ref [6] the same considerations were used as for evaluating ^{234}U. The HEDL data on the radiative-capture cross-section in the region 6-90 keV agree with the experimental findings of R. Hockenbury (1975), and in the region 10-250 keV with the most recent experimental results of Kaeppeler et al. (1978). At energies below 10 keV the data of Ref. [8] are used in the HEDL evaluation. The data of Ref. [6] on radiative-capture cross-sections in the region 1-100 keV are 10-20% lower than those of HEDL data. A difference by almost an order of magnitude is observed in the region 10-50 eV. The evaluated cross-section in the region 1 keV-1 MeV of ENDF/B-IV data differs from that of the HEDL data by a factor of 1.5-2. The radiative-capture cross-section in the region 5-500 keV according to the ENDL-76 evaluations is 20% lower than the HEDL results.

The fission cross-section in the evaluation of Ref. [6] is approximately 15% lower than that of HEDL and ENDL-76 data.

Americium-242m. There are no experimental data on the radiative-capture cross-section of ^{242m}Am. In the region below 10 keV the evaluation of Ref. [7] is used, while in the region above 10 keV theoretical results are used. In the ENDL-76 data it is assumed that at $E_n < 2$ keV, $\sigma_{n\gamma} = 0.1\ \sigma_f$; for the region of 10 keV evaluations were taken from cross-section systematics. The difference in HEDL and ENDL-76 data reaches a factor of 1.5 in the regions above 0.5 MeV and below 5 keV. The data for the fission cross-section at $E_n < 100$ keV are found to be unreliable. The results of HEDL and ENDL-76 differ by a factor of approximately two (where $E_n < 10$ keV).

Plutonium-244, curium-241, curium-243 and curium-244. There are no experimental data on radiative capture for these isotopes in the fast-neutron region. HEDL data (statistical calculation) and ENDL-76 data (evaluation from systematics) for this cross-section differ in certain important energy regions by factors of 1.5-2. The data on the fission cross-sections of these isotopes are scanty and inconsistent.

Evaluation reliability

Evaluations of fission cross-sections are based mainly on experimental material. For this reason, an assessment of their reliability can be made from the spread in the results of different authors. As a rule, calculations play the most important part in evaluations of the radiative-capture cross-section. The reliability of calculations is much harder to estimate, hence the notion of error in the evaluations recommended by the authors of the present paper will of necessity be somewhat subjective.

The status of transactinide experiments has been described in detail for each isotope in various papers (e.g. [4, 24]). These papers have been used as a starting point for determining the errors in evaluations based on experimental results. Many papers (e.g. [25]) have been written on the status of theoretical values. Results obtained from systematics of neutron reactions on actinides are given in Ref. [26], the author of which believes that the theoretical calculations are in principle accurate for the main reaction cross-sections for transactinides to within approximately 25%. However, in practice it is difficult to agree with this because the accuracy with which cross-sections can be predicted is determined by the criterion used for adjustment of theoretical values to experimental values. Where radiative-capture cross-sections are concerned, the isotopes ^{235}U, ^{238}U and ^{239}Pu can be regarded as standard nuclei. However, despite considerable efforts on the part of experimenters, the error in the radiative-capture cross-sections of these and other isotopes is still considerable (no better than 10-20%). The methods used for adjustment of parameters affecting these cross-sections to experimental values are therefore by no means uniform. Further causes of the lack of uniformity are the model approximations, on which the number of calculation parameters used and their interpretation depend. For example, force-function systematics depend on the type of optical potential involved and on whether the asphericity is taken into account. It is possible that the radiative-capture cross-sections of nuclei below the fission threshold will be predicted with a "good theoretical idea" to approximately the accuracy mentioned in Ref. [26] (around 25%). However, for fissionable nuclei the accuracy of prediction must be lower: if fission competition is taken into account an additional uncertainty of considerable importance is introduced since the theoretical idea of the fission process is less good and there is great uncertainty in the model parameters. An approximate appraisal of level fluctuations and other approximations in a model introduce errors, the evaluation of which requires special theoretical calculations. Normally, many authors are not in a position to perform such calculations. In the different laboratories cross-sections are calculated using all kinds of approximation and different basic information. This explains why the cross-sections calculated by different authors may differ by several factors. In any case, the similarity between results does not necessarily mean that they are reliable, since in this case there may be considerable correlated errors.

These circumstances necessitate the assignment of larger errors to evaluations of mean cross-sections than are usually cited. For example, in Ref. [27] a typical error of $\pm 25\%$ is assumed for the radiative-capture and fission cross-sections of transactinides (within a wide correlation range), which seems to us excessively optimistic. This conclusion is confirmed by the spread actually found in evaluations, as seen in Table 2.

It is interesting to compare different evaluations of cross-sections at the single-group level. For this purpose the cross-sections were averaged over different spectra (fission, core and shield of a breeder reactor). Let us consider these data for the isotopes shown in the last three lines of Table 2. It will be seen that the average radiative-capture cross-sections over the fission spectrum vary by factors 2-5. At the same time, the spread in average fission cross-sections is only 10-15% (except for ^{242}Cm, where it is large). When the radiative-capture cross-sections are averaged over the core and shield spectra of an industrial reactor, the difference is reduced to a factor of 1.5-2. The spread is greatest with cross-sections of isotopes for which there are no measured radiative-capture cross-sections (^{243}Am and ^{242}Cm). It is worth noting that in the core spectrum of a reactor with oxide fuel approximately half the radiative-capture events occur at $E_n < 10$ keV. In this region theoretical evaluations are more reliable (extrapolation on the basis of resonance parameters) than for the higher energy region. Thus, the situation becomes less favourable with a change to harder spectra (a fast reactor with metallic fuel and a thermonuclear blanket). In the case of average fission cross-sections, on the other hand, the spread increases (see Table 2) with a change from hard to softer spectra (10-15% for the fission spectrum and 20-40% for core and shield spectra). Clearly, this is because the isotopes shown in Table 2 are characterized by threshold fission (except for ^{238}Pu), while measured sub-threshold fission cross-sections are less reliable than for the region above the threshold.

Table 5 shows the errors (standard deviations) evaluated for the present paper in the radiative-capture and fission cross-sections of various isotopes (see Table 2). The cross-sections are assumed to be correlated over the whole energy range, so that these errors can be related to cross-sections averaged over the core or shield spectrum. No conclusions are drawn in relation to the correlations between the cross-sections of different types and of different isotopes.

For the isotopes ^{245}Cm, ^{246}Cm, ^{247}Cm, ^{249}Bk, ^{249}Cf, ^{250}Cf, ^{251}Cf and ^{252}Cf there are only the ENDL-76 theoretical evaluations. They should probably not be considered very reliable in the light of comparisons between the evaluations of cross-sections for other isotopes. It would therefore be wise to consider the cross-sections for this group of isotopes as being uncertain by a factor of three.

Thus, the cross-sections of certain isotopes are assigned very high uncertainty factors when direct experimental data are unavailable or are very inconsistent. This uncertainty can be reduced if experience has been acquired in the performance of theoretical calculations on the basis of nuclear data systematics. Unfortunately, studies containing a theoretical evaluation of cross-sections usually either fail to justify the accuracy claimed for the calculations or justify it extremely sketchily considering the complexity of this problem.

Table 6 shows single-group radiative-capture and fission cross-sections for 37 isotopes averaged over the fission, core and shield spectra of a fast reactor. The basic data used for averaging were those recommended in Tables 2 and 3, while the ENDL-76 library was used for isotopes not shown there. Table 7 shows the spectra used for averaging. The data given can be used for transactinide build-up and burn-up calculations. An idea of the accuracy of such calculations can be gained by using the error evaluations of Table 5.

It would seem that the fastest way of increasing the accuracy of the cross-sections of isotopes which are difficult to measure in differential experiments is to perform and analyse integral experiments, in particular, by means of sample irradiation experiments in power reactors and isotopic analysis of irradiated fuel. The volume of such information available is at present not large, and the main data published are given in Table 8. As can be seen from original work, it is not easy to interpret these experimental findings properly, but where microscopic data are highly uncertain, it may be possible to improve them considerably even when the accuracy of integral data is not very high.

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Table 1

Radiative-capture cross-sections for different isotopes averaged over the core spectrum of an industrial fast reactor, b

Isotope	USSR, FEI (present paper)	Japan [2]	USA, ORNL [3]
^{238}U	0,29	0,30	0,30
^{239}Pu	0,49	0,47	0,50
^{237}Np	2,4	I,7	0,76
^{238}Pu	I,I	0,5	0,22
^{241}Am	2,8	I,4	0,99
^{243}Am	I,5	0,9I	0,55
^{242}Cm	0,98	0,68	0,38
^{244}Cm	0,8I	0,53	0,37

Comparison of different evaluations of radiative-capture and fission cross-sections for the main transactinides

Table 2

	Group No.	Energy range	^{236}U $\sigma_{n\gamma}$ L.P. Abagyan et al. 1964 [6]	^{236}U $\sigma_{n\gamma}$ ENDL-76, 1975 [11]	^{236}U $\sigma_{n\gamma}$ HEDL, 1977 [5]	^{236}U σ_f L.P. Abagyan 1964 [6]	^{236}U σ_f ENDL-76, 1976 [11]	^{236}U σ_f HEDL, 1977 [5]	^{237}Np $\sigma_{n\gamma}$ S.M. Zakharova 1968 [17]	^{237}Np $\sigma_{n\gamma}$ ENDL-76, 1973 [II]	^{237}Np $\sigma_{n\gamma}$ M.Caner e.a., 1977 [I5]	^{237}Np $\sigma_{n\gamma}$ HEDL, 1977 [5]	^{237}Np σ_f V.I. Golubev et al. 1964[33]	^{237}Np σ_f ENDL-76, 1977 [II]	^{237}Np σ_f M.Caner e.a., 1977 [I5]	^{237}Np σ_f HEDL, 1977 [5]
MeV	I	I0,5-6,5 МэВ	0,0I	0,0I	0,02	I,50	I,50	I,60	0,07	0,007	0,008	0,008	2,40	2,I4	2,15	2,00
	2	6,5-4,0 "	0,02	0,03	0,03	0,92	0,88	I,I	0,I0	0,0I	0,02	0,02	I,53	I,49	I,49	I,50
	3	4,0-2,5 "	0,05	0,05	0,05	0,90	0,88	0,90	0,I5	0,02	0,03	0,03	I,48	I,6I	I,60	I,65
	4	2,5-I,4 "	0,09	0,I2	0,II	0,77	0,76	0,80	0,25	0,06	0,06	0,06	I,44	I,64	I,6I	I,65
	5	I,4-0,8 "	0,33	0,3I	0,3I	0,42	0,44	0,50	0,36	0,I4	0,I3	0,I3	I,28	I,40	I,4I	I,45
	6	0,8-0,4 "	0,30	0,26	0,28	0,03	0,03	0,03	0,55	0,3I	0,3I	0,3I	0,62	0,75	0,65	0,75
	7	0,4-0,2 "	0,33	0,26	0,27	0	0,003	<0,002	0,8I	0,63	0,63	0,63	0,07	0,09	0,08	0,08
	8	0,2-0,I "	0,40	0,32	0,32	0	0,002	<0,002	I,3	I,0	0,93	0,93	0,03	0,04	0,04	0,04
keV	9	I00-46,5 кэВ	0,60	0,47	0,43	0	0,003	<0,002	2,0	I,6	I,4	I,3	0,02	0,02	0,02	0,02
	I0	46,5-2I,5 "	0,80	0,66	0,60	0	0,024	<0,002	3,I	2,3	2,0	I,8	0,02	0,02	0,0I	0,008
	II	2I,5-I0 "	I,I	0,90	0,87	0	0,025	<0,002	4,4	3,3	2,7	2,6	0,02	0,0I	0,0I	0,006
	I2	I0-4,65 "	I,6	I,3	I,3	0	0,027	<0,002	7	4,5	3,8	4,2	0	0,02	0,0I	0,0I
	I3	4,65-2,I5 "	2,5	I,8	I,9	0	0,029	<0,002	I0	6,2	5,9	6,2	0	0,04	0,0I	0,0I
	I4	2,I5-I "	4	2,8	3,I	0	0,0I	<0,02	I6	8	9,2	II	0	0,I0	0,0I	0,02
eV	I5	I000-465 эВ	6	5,3	5,2	0	0,0I	-	25	I3	I5	I7	0	0,09	0,02	0,03
	I6	465-2I5 "	I0	I6	9	0	0,02	-	38	20	23	25	0	0,I7	0,04	0,04
	I7	2I5-I00 "	I4,5	I9	I6	0	0,04	-	52	3I	-	3I	0	0,28	-	0,07
	I8	I00-46,5 "	30	25	32	0	0,2	-	58	48	-	6I	0	0,30	-	0,06
	I9	46,5-2I,5 "	45	32	27	0	0,5	-	80	95	-	82	0	0,74	-	0,09
	20	2I,5-I0 "	0,I	0,5	0,I	0	0,5	-	92	92	-	93	0	0,02	-	0,00I
Averaged over spectrum:																
		fission	0,I80	0,I72	0,I72	0,578	0,572	0,62I	0,362	0,I76	0,I72	0,I70	I,20	I,3I	I,29	I,32
		core	0,8II	0,699	0,66I	0,I00	0,I03	0,II0	2,93	I,89	I,8I	I,88	0,294	0,339	0,3I8	0,329
		shield	I,36	I,27	I,I5	0,049	0,054	0,055	4,98	3,I3	3,I0	3,27	0,I65	0,203	0,I80	0,I86

Table 2 (continued)

	Group No.	Energy range	²³⁸Pu $\sigma_{n\gamma}$ ENDF/B-IV, I967 [5]	M.Caner e.a., I974 [I8]	ENDL-76, I975 [II]	L.P. Abagyan et al. 1975 [17]	HEDL, I977 [5]	²³⁸Pu σ_f ENDF/B-IV, I967	M.Caner e.a., I974 [I8]	ENDL-76, I975 [II]	L.P. Abagyan et. al. 1976 [17]	HEDL, I977 [5]	²⁴¹Am $\sigma_{n\gamma}$ A.G. Dovbenko et al. 1965 [19]	ENDF/B-IV, I966	L.Weston e.a., I975	ENDL-76, I977	S.Igarasi, I977 [22]	HEDL, I977 [5]
MeV	I	I0,5-6,5 МэВ	0,007	0,0I	0,02	0,004	0,02	2,5	2,5	2,4	2,5	2,6	0,I3	0,002	-	0,002	0	0,02
	2	6,5-4 "	0,0I	0,02	0,04	0,008	0,02	2,6	2,I	2,2	2,2	2,3	0,I9	0,005	-	0,003	0	0,02
	3	4-2,5 "	0,02	0,05	0,06	0,0I	0,04	2,5	2,2	2,3	2,2	2,3	0,3I	0,0I	-	0,006	0,02	0,05
	4	2,5-I,4 "	0,02	0,II	0,09	0,03	0,I0	2,2	2,2	2,3	2,2	2,2	0,53	0,026	-	0,02	0,I0	0,II
	5	I,4-0,8 "	0,04	0,I5	0,I5	0,05	0,I6	2,I	2,I	2,I	2,I	2,I	0,94	0,065	-	0,04	0,28	0,26
	6	0,8-0,4 "	0,07	0,I8	0,I7	0,I0	0,26	I,7	I,5	I,7	I,6	I,6	I,2	0,I4	-	0,I	0,54	0,58
	7	0,4-0,2 "	0,I2	0,23	0,I8	0,I9	0,36	0,85	0,9	I,I	0,98	0,95	0,9	0,I8	0,8	0,2	0,78	0,86
	8	0,2-0,I "	0,I7	0,32	0,20	0,34	0,50	0,55	0,6	0,87	0,70	0,75	I,2	0,43	I,3	0,42	I,I	I,2
keV	9	I00-46,5кэВ	0,28	0,56	0,28	0,60	0,66	0,5	0,55	0,90	0,66	0,6	I,6	0,8	I,6	0,76	I,4	I,6
	I0	46,5-2I,5 "	0,46	0,85	0,44	I,0	0,83	0,7	0,6	0,96	0,73	0,7	2,0	I,2	2,I	I,3	I,8	2,I
	II	2I,5-I0 "	0,62	I,2	0,66	I,7	I,3	I,I	0,7	0,99	0,8I	0,6	3,0	I,5	2,9	2,I	2,I	3,0
	I2	I0-4,65 "	2,0	I,6	0,96	2,3	2,0	0,7	0,85	I,3	0,97	0,7	4,2	3,2	3,4	3,5	3,4	3,5
	I3	4,65-2,I5 "	3,I	2,4	I,8	3,6	3,I	I,0	I,I	I,6	I,2	I,0	6,5	5,2	6,0	5,7	5,I	5
	I4	2,I5-I "	3,8	3,9	3,3	4,0	3,8	I,5	I,6	I,9	I,6	I,5	I0	8,5	9,4	9,I	8,I	8
eV	I5	I000-465 эВ	6,8	6,6	6,3	7,0	6,8	2,I	2,I	2,7	2,5	2,I	I6	I4	I5	I4,I	-	I4
	I6	465-2I5 "	I2,5	-	II,9	I4,4	I2,5	3,I	-	3,3	4,6	3,I	24	23	23	22	-	22
	I7	2I5-I00 "	29	-	27	30	29	4,I	-	6,9	5,0	4,I	40	35	38	34	-	37
	I8	I00-46,5 "	I0	-	I5,5	II	I0	I,6	-	2,0	4,6	I,6	47	55	47	50	-	46
	I9	46,5-2I,5 "	I,2	-	0,I	0,5	I,2	0,I	-	0,0I	0,I	0,I	60	82	56	76	-	65
	20	2I,5-I0 "	50	-	56	52	50	3,0	-	3,0	2,5	3,0	90	I08	85	97	-	75
Averaged over spectrum:		fission	0,043	0,I25	0,II2	0,064	0,I47	2,07	I,95	2,05	I,98	2,0I	0,676	0,074	-	0,063	0,252	0,274
		core	0,63I	0,797	0,578	0,902	0,899	I,I0	I,06	I,32	I,I6	I,I0	2,20	I,30	-	I,39	I,75	I,92
		shield	I,25	I,42	I,I2	I,62	I,53	I,05	I,00	I,32	I,I4	I,03	3,49	2,53	-	2,63	2,93	3,I3

Table 2 (continued)

	Group No.	Energy range	^{241}Am σ_f ENDF/B-IV, 1967	^{241}Am σ_f A.P.Abagyan et al. 1970	^{241}Am σ_f ENDL-76 1977	^{241}Am σ_f S.Igarasi, 1977 [22]	^{241}Am σ_f HEDL, 1977 [5]	^{243}Am $\sigma_{n\gamma}$ ENDF/B-IV, 1967 [5]	^{243}Am $\sigma_{n\gamma}$ ENDL-76, 1975 [11]	^{243}Am $\sigma_{n\gamma}$ A.P.Abagyan et al. 1975 [17]	^{243}Am $\sigma_{n\gamma}$ HEDL, 1977 [5]	^{243}Am σ_f ENDF/B-IV, 1967 [5]	^{243}Am σ_f A.P.Abagyan et al. 1975 [17]	^{243}Am σ_f ENDL-76, 1975 [11]	^{243}Am σ_f HEDL, 1977 [5]
MeV	1	10,5-6,5 МэВ	2,40	2,5	2,22	2,41	2,40	0,001	0,003	0,01	0,005	1,40	2,00	1,77	2,50
	2	6,5-4 "	1,90	2,0	1,96	2,06	1,95	0,003	0,004	0,03	0,007	1,40	1,40	1,41	1,70
	3	4-2,5 "	1,75	1,8	2,0	1,92	2,0	0,006	0,006	0,06	0,01	1,40	1,40	1,52	1,55
	4	2,5-1,4 "	1,65	1,6	1,80	1,87	1,95	0,015	0,016	0,17	0,03	1,40	1,50	1,53	1,55
	5	1,4-0,8 "	1,20	1,10	1,23	1,34	1,4	0,05	0,04	0,38	0,06	1,10	0,98	1,12	1,20
	6	0,8-0,4 "	0,20	0,20	0,21	0,21	0,25	0,11	0,08	0,59	0,13	0,06	0,09	0,15	0,12
	7	0,4-0,2 "	0,04	0,04	0,005	0,03	0,05	0,30	0,16	0,70	0,25	0,01	0,01	0,02	0,02
	8	0,2-0,1 "	0,02	0,03	0,02	0,04	0,02	0,42	0,21	0,96	0,50	0,002	0	0,01	0,01
keV	9	100-46,5 кэВ	0,02	0,02	0,02	0,03	0,02	0,6	0,25	1,4	0,92	0	0	0,02	0,01
	10	46,5-21,5 "	0,22	0,02	0,21	0,18	0,02	0,9	0,47	2,0	1,50	0	0	0,04	0,02
	11	21,5-10 "	0,83	0	0,81	0,82	0,02	1,3	0,79	2,7	1,80	0	0	0,06	0,02
	12	10-4,65 "	0,61	0	0,59	0,60	0,04	-	1,6	3,9	3,50	0	0	0,09	0,02
	13	4,65-2,15 "	1,0	0	1,03	0,91	0,06	-	1,9	6,0	5,5	0	0	0,10	0,004
	14	2,15-1 "	1,3	0	1,33	1,23	0,08	-	2,2	9,2	8	0	0	0,14	<0,001
eV	15	1000-465 эВ	1,5	0	1,51	-	0,12	-	3,0	13	12	0	0	0,12	<0,001
	16	465-215 "	1,4	0	1,4	-	0,18	-	10,9	20	21	0	0	0,15	<0,001
	17	215-100 "	0,75	0	0,72	-	0,22	-	33	32	36	0	0	0,25	0
	18	100-46,5 "	0,73	0	0,72	-	0,25	-	36	45	45	0	0	0,41	0
	19	46,5-21,5 "	0,78	0	0,79	-	0,31	-	63	63	63	0	0	0,52	0
	20	21,5-10 "	0,52	0	0,47	-	0,42	-	119	100	98	0	0	0,55	0
	Averaged over spectrum: fission		1,27	1,26	1,36	1,40	1,44	0,065	0,043	0,301	0,081	1,02	1,04	1,11	1,17
	core		0,453	0,250	0,462	0,473	0,305	-	0,524	1,84	1,36	0,193	0,197	0,242	0,231
	shield		0,461	0,133	0,462	0,464	0,174	-	1,14	3,01	2,52	0,097	0,097	0,150	0,121

Table 2 (concluded)

Group No.	Energy range	^{242}Cm						^{244}Cm								
		$\sigma_{n\gamma}$			σ_f			$\sigma_{n\gamma}$					σ_f			
		A.P. Abagyan 1972	ENDL-76, 1975 [11]	HEDL, 1977 [5]	A.P. Abagyan 1972	ENDL-76, 1975 [11]	HEDL, 1977 [5]	ENDF/B-IV, 1967	A.P. Abagyan et al. 1975 [17]	ENDL-76, 1975 [11]	HEDL, 1977 [5]	Gianotti 1978 [23]	ENDF/B-IV, 1967	A.P. Abagyan et al. 1975 [17]	ENDL-76, 1975 [11]	HEDL, 1977 [5]
I	I0,5-6,5 МэВ (MeV)	0,I0	0,028	$<2\cdot I0^{-3}$	3,0	I,90	2,3	0,008	0,003	0,003	0,003	-	2,5	2,2	I,9	2,5
2	6,5-4 "	0,20	0,0I	$<2\cdot I0^{-3}$	2,50	I,60	I,8	0,0I4	0,007	0,004	0,007	-	2,5	2,0	I,6	2,0
3	4-2,5 "	0,30	0,04	0,005	2,0	I,70	I,6	0,04	0,0I5	0,006	0,0I5	-	2,4	2,0	I,7	2,0
4	2,5-I,4 "	0,40	0,07	0,0I	2,0	I,80	I,3	0,04	0,04	0,0I6	0,05	-	2,0	I,9	I,7	I,9
5	I,4-0,8 "	0,50	0,I5	0,03	2,0	I,60	0,5I	0,06	0,09	0,04	0,I4	0,I8	I,6	2,0	I,6	I,9
6	0,8-0,4 "	0,50	0,I5	0,04	0,95	0,77	0,07	0,I2	0,23	0,08	0,24	0,I8	0,8	0,8	0,8	0,6
7	0,4-0,2 "	0,40	0,I8	0,07	0,I3	0,I3	$<I\cdot I0^{-3}$	0,I6	0,35	0,I6	0,39	0,20	0,28	0,08	0,I3	0,I2
8	0,2-0,I "	0,52	0,23	0,II	0,05	0,08	$<I\cdot I0^{-3}$	0,I9	0,45	0,2I	0,57	0,30	0,30	0,04	0,08	0,05
9	I00-46,5 кэВ (keV)	0,75	0,4I	0,I8	0,06	0,08	$<I\cdot I0^{3}$	0,3I	0,70	0,26	0,80	0,55	0,I5	0,04	0,08	0,06
I0	46,5-2I,5 "	I,20	0,72	0,36	0,08	0,09	$<I\cdot I0^{3}$	0,49	I,I	0,60	I,2	0,85	0,I8	0,05	0,09	0,07
II	2I,5-I0 "	I,50	0,93	0,50	0,08	0,I0	$<I\cdot I0^{-3}$	0,7I	I,4	0,90	I,6	I,2	0,25	0,06	0,I0	0,05
I2	I0-4,65 "	2,90	I,I	0,90	0,08	0,I0	$<I\cdot I0^{-3}$		2,I	I,2	I,3	I,4		0,07	0,I0	0,04
I3	4,65-2,I5 "	2,90	I,2	I,7	0,08	0,I0	$<I\cdot I0^{-3}$	-	3,3	2,0	I,7	I,8	-	0,04	0,I0	0,07
I4	2,I5-I "	7,70	I,4	3,0	0,08	0,I3	$<I\cdot I0^{-3}$	-	5,4	3,7	3 [illegible]	2,7	-	0,I2	0,I3	0,I2
I5	I000-465 эВ (eV)	7,70	I,6	6	0,08	0,32	$<I\cdot I0^{-3}$	-	8,5	9,8	6,5	-	-	0,20	0,32	0,23
I6	465-2I5 "	I5	2,6	II	0,5	0,65	$<I\cdot I0^{-3}$	-	I2,9	I4,9	I3	-	-	0,36	0,65	0,35
I7	2I5-I00 "	I5	3,0	23	0,5	0,70	$<I\cdot I0^{-3}$	-	I0,4	I0,6	I0	-	-	0,33	0,70	0,33
I8	I00-46,5 "	30	5,2	32	I,0	0,44	$<I\cdot I0^{-3}$	-	I4,6	I7,0	I2	-	-	0,44	0,43	0,40
I9	46,5-2I,5 "	30	6,2	50	I,0	0,49	$<I\cdot I0^{-3}$	-	2I,4	28,0	26	-	-	I,64	0,49	0,90
20	2I,5-I0 "	400	I2,I	68	I,0	0,34	$<I\cdot I0^{-3}$	-	33,4	35,7	30	-	-	I,27	0,34	I,I
Averaged over spectrum: fission		0,400	0,I00	0,025	I,74	I,42	0,974	0,067	0,I06	0,044	0,I26	-	I,72	I,63	I,40	I,59
core		I,22	0,452	0,463	0,466	0,4I0	0,I64	-	0,982	0,659	0,900	-	-	0,422	0,409	0,405
shield		I,96	0,639	I,04	0,296	0,28I	0,08	-	I,6I	I,26	I,42	-	-	0,262	0,280	0,254

Group radiative-capture and fission cross-sections for various transactinides obtained from the graphical data of Ref. [5]

Table 3

	Group No.	Energy range	^{234}U		^{236}Pu		^{237}Pu		^{242}Pu		^{244}Pu		^{242m}Am		^{241}Cm		^{243}Cm		^{248}Cm	
			$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f
	I	I0,5-6,5 МэВ	0,02	2,I	0,0I	2,3	0,023	2,2	0,02	I,9	0,022	I,7	0,025	2,4	0,032	2,4	0,022	2,0	0,026	2,4
	2	6,5-4,0 "	0,03	I,4	0,0I	I,7	0,027	2,I	0,0I	I,3	0,022	I,I	0,025	2,I	0,032	2,4	0,022	I,7	0,025	I,8
	3	4,0-2,5 "	0,05	I,5	0,02	I,9	0,0I	2,9	0,02	I,4	0,023	I,2	0,025	2,2	0,033	2,5	0,023	I,9	0,0I	I,8
MeV	4	2,5-I,4 "	0,I0	I,5	0,03	2,5	0,02	3,I	0,05	I,4	0,0I	I,3	0,026	2,0	0,0I	3,I	0,024	2,3	0,03	I,7
	5	I,4-0,8 "	0,3I	I,2	0,04	2,5	0,03	3,I	0,I0	I,4	0,02	I,3	0,0I	2,4	0,02	2,7	0,0I	2,3	0,08	I,6
	6	0,8-0,4 "	0,29	0,8	0,07	I,8	0,06	3,0	0,I7	0,4	0,04	0,3	0,03	2,3	0,04	2,3	0,02	I,6	0,08	0.3
	7	0,4-0,2 "	0,29	0,2	0,I	I,2	0,09	3,I	0,2I	0,07	0,04	0,03	0.06	2,3	0,I0	2,7	0,06	I,6	0,08	0,07
	8	0,2-0,I "	0,32	0,05	0,2	0,9	0,I2	3,0	0,27	0,02	0,05	0,0I	0,I3	2,8	0,I6	2,4	0,I4	I,7	0,I0	0,04
	9	I00-46,5 кэВ	0,42	0,02	0,3	0,8	0,I7	3,I	0,45	<0,0I	0,I0	0,0I	0,22	3,4	0,2I	2,6	0,25	2,I	0,I6	0,03
	I0	46,5-2I,5 "	0,65	0,02	0,5	I,I	0,24	3,2	0,74	<0,0I	0,22	0,02	0,50	3,7	0,28	2,8	0,30	2,3	0,34	0,04
keV	II	2I,5-I0 "	0,95	0,02	0,6	I,5	0,38	4,I	0,95	<0,0I	0,32	0,02	0,90	4,8	0,35	3,6	0,37	2,9	0,49	0,05
	I2	I0-4,6 "	I,4	0,02	I,9	3,3	0,5	5	I,0	<0,0I	0,6	0,02	I,I	2,6	0,5	4	0,9	3,0	0,8	0,0I
	I3	4,6-2,I5 "	2,0	0,02	2,7	5,I	0,7	8	I,3	<0,0I	I,2	0,0I	I,6	3,8	0,7	7	I,5	4,5	I,0	0,0I
	I4	2,I5-I "	3,2	0,03	4,9	7,5	I,2	II	2,2	<0,0I	2,2	-	2,5	6,0	I,I	I0	3	7	I,0	0,03
	I5	I000-465 эВ	4,7	0,04	5,7	4,8	2	I6	4	0,03	4	-	3,3	8,5	I,5	I6	4	I0	2,9	0,I0
eV	I6	465-2I5 "	9,5	-	9,5	6,I	3	25	5	0,04	9	-	5,5	I3	2,3	27	7	I8	3,5	0,I2
	I7	2I5-I00 "	I7	-	I3	I2	4	42	II	0,04	I6	-	8,4	I8	3,3	35	I0	22	I,9	0,05
	I8	I00-46,5 "	22	-	20	I9	6	56	2I	0,06	32	-	4,2	38	5	47	I8	36	3I	2,7
	I9	46,5-2I,5 "	45	-	28	30	9	60	I5	0,03	38	-	5,9	56	8	75	22	60	I50	3,2
	20	2I,5-I0 "	0,3	-	49	44	I2	I25	4	<0,0I	33	-	9,2	84	I2	II0	25	I50	0,5	0,02

Group cross-sections for transactinides obtained from the files of the ENDL-76 library

Table 4

	Group No.	Energy range	^{231}Th (7163)*/ σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{232}Th (7164) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{233}U (7166) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
	-I	I4,I-I4 МэВ	0,539	0,02I56	0,75	I,I2	5,33	0,347	0,0254	I,30	0,650	5,7	2,25	0,0228	0,470	0,0499	5,94
	0	I4-I0,5 "	0,388	0,02390	I,68	0,I50	5,3I	0,286	0,02693	I,83	0,0858	5,6	2,09	0,02355	0,640	0,03704	5,90
	I	I0,5-6,5 "	0,389	0,02756	I,76	0	6,08	0,326	0,0II7	0,832	0	6,3	2,I3	0,02544	0,248	0	6,25
	2	6,5-4,0 "	0,2I0	0,0I43	0,290	0	6,83	0,I48	0,0204	0	0	7,5I	I,58	0,0282I	0,02I84	0	7,53
MeV	3	4,0-2,5 "	0,207	0,0348	0	0	6,76	0,I28	0,0307	0	0	7,50	I,77	0,0I55	0	0	7,56
	4	2,5-I,4 "	0,208	0,0703	0	0	6,4I	0,I05	0,08I8	0	0	6,73	I,87	0,0299	0	0	6,70
	5	I,4-0,8 "	0,I9I	0,I26	0	0	7,08	$0,0^{2}79I$	0,I36	0	0	6,8I	I,82	0,0639	0	0	6,35
	6	0,8-0,4 "	0,I34	0,I46	0	0	8,65	0	0,I65	0	0	7,70	I,88	0,I28	0	0	7,I7
	7	0,4-0,2 "	0,I76	0,I86	0	0	9,38	0	0,I59	0	0	9,57	2,05	0,20I	0	0	8,62
	8	0,2-0,I "	0,3I2	0,234	0	0	I0,8	0	0,204	0	0	II,4	2,2I	0,223	0	0	I0,I
	9	I00-46,5 кэВ	0,476	0,4I2	0	0	II,9	0	0,340	0	0	I3,0	2,42	0,250	0	0	II,7
	I0	46,5-2I,5 "	0,667	0,7I6	0	0	I2,4	0	0,574	0	0	I4,I	2,98	0,333	0	0	I3,6
	II	2I,5-I0,0 "	0,934	0,93I	0	0	I2,9	0	0,766	0	0	I4,8	3,85	0,440	0	0	I5,4
keV	I2	I0,0-4,65 "	I,30	I,60	0	0	I3,9	0	0,9I7	0	0	I5,8	5,03	0,583	0	0	I6,9
	I3	4,65-2,I5 "	I,82	2,24	0	0	I5,I	0	I,26	0	0	32,6	6,89	0,786	0	0	I8,6
	I4	2,I5-I,0 "	2,56	2,70	0	0	I6,3	0	2,07	0	0	27,5	9,49	0,926	0	0	20,2
	I5	I000-465 эВ	4,52	6,4I	0	0	22,2	0	2,57	0	0	22,4	I2,7	I,42	0	0	24,6
	I6	465-2I5 "	9,74	25,2	0	0	46,9	0	II,4	0	0	39,6	I7,8	2,47	0	0	3I,5
	I7	2I5-I00 "	2I,0	98,5	0	0	I32	0	I5,9	0	0	4I,I	25,6	4,00	0	0	4I,6
	I8	I00-46,5 "	3I,2	I87	0	0	232	0	25,2	0	0	63,I	38,0	5,95	0	0	57,0
	I9	46,5-2I,5 "	33,6	20I	0	0	250	0	56,0	0	0	74,2	65,5	6,8I	0	0	86,3
	20	2I,5-I0,0 "	36,0	2I7	0	0	270	0	0,980	0	0	9,95	I09	I7,9	0	0	I40
eV	2I	I0,0-4,65 "	38,4	23I	0	0	288	0	0,I43	0	0	I0,7	95,4	I7,4	0	0	I25
	22	4,65-2,I5 "	I0,2	6I,0	0	0	85,0	0	0,29I	0	0	II,3	II8,5	46,3	0	0	I78
	23	2,I5-I,0 "	3,95	23,7	0	0	38,7	0	0,626	0	0	I2,0	348	60,0	0	0	409
	24	I,0-0,465 "	5,80	34,8	0	0	5I,6	0	I,I5	0	0	I2,8	I23	9,50	0	0	I45
	25	0,465-0,2I5 "	8,50	5I,0	0	0	70,5	0	I,9I	0	0	I3,7	I63	I4,4	0	0	I9I
	26	0,0252 "	26,0	I56	0	0	I93	0	6,40	0	0	I8,3	477	43,0	0	0	534

*/ File No. is shown in brackets.

Table 4 (continued)

	Group No.	Energy range	^{234}U (7167)					^{235}U (7168)					^{236}U (7169)				
			σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
	-I	I4,I-I4 МэВ	2,I2	0,025	0,250	0,300	5,79	2,05	0,0238	0,344	0,0737	5,79	I,6I	0,02657	0,250	0,700	5,80
	0	I4-I0,5 "	2,00	0,02624	0,727	0,0166	5,70	I,79	0,02455	0,579	0,02470	5,77	I,53	0,02799	I,04	0,I08	5,90
	I	I0,5-6,5 "	2,04	0,02960	0,3I7	0	6,63	I,67	0,0274	0,392	0	6,44	I,5I	0,0I4I	0,694	0	6,66
	2	6,5-4,0 "	I,40	0,0I70	0	0	7,72	I,II	0,0II4	0,02826	0	7,56	0,882	0,03I8	0	0	7,78
	3	4,0-2,5 "	I,53	0,04I6	0	0	7,98	I,22	0,0226	0	0	7,78	0,878	0,052I	0	0	7,96
MeV	4	2,5-I,4 "	I,50	0,0990	0	0	6,99	I,27	0,0570	0	0	7,03	0,759	0,I2I	0	0	6,97
	5	I,4-0,8 "	I,2I	0,2I6	0	0	6,83	I,I9	0,I06	0	0	6,80	0,436	0,3I0	0	0	6,87
	6	0,8-0,4 "	0,749	0,243	0	0	7,78	I,I3	0,I52	0	0	7,84	0,03I6	0,264	0	0	7,80
	7	0,4-0,2 "	0,I47	0,234	0	0	9,46	I,28	0,259	0	0	9,I3	0,02263	0,256	0	0	9,72
	8	0,2-0,I "	0,047	0,304	0	0	I0,9	I,45	0,390	0	0	I0,9	0,022I5	0,320	0	0	II,0
	9	I00-46,5 кэВ	0	0,487	0	0	II,8	I,73	0,604	0	0	I2,7	0,02300	0,468	0	0	II,8
	I0	46,5-2I,5 "	0	0,77I	0	0	I2,5	2,I2	0,827	0	0	I3,9	0,02425	0,66I	0	0	I2,0
	II	2I,5-I0,0 "	0	I,05	0	0	I3,0	2,76	I,03	0	0	I5,5	0,02483	0,904	0	0	I2,8
keV	I2	I0,0-4,65 "	0	I,38	0	0	I3,4	3,69	I,24	0	0	I7,I	0,02667	I,279	0	0	I3,3
	I3	4,65-2,I5 "	0	I,94	0	0	I5,9	5,0I	I,53	0	0	I8,9	0,02875	I,783	0	0	I3,8
	I4	2,I5-I,0 "	0	3,02	0	0	I5,0	7,00	3,38	0	0	22,8	0,02972	2,778	0	0	I4,8
	I5	I000-465 эВ	0	3,95	0	0	I6,0	II,0	6,73	0	0	30,4	0,0I38	5,25	0	0	I7,3
	I6	465-2I5 "	0	4,34	0	0	I6,3	I7,0	8,64	0	0	38,6	0,0I84	I6,4	0	0	28,4
	I7	2I5-I00 "	0	4,77	0	0	I6,8	20,5	I0,I	0	0	43,6	0,035I	I8,8	0	0	30,9
	I8	I00-46,5 "	0	5,73	0	0	I7,7	34,4	I5,I	0	0	62,4	0,I56	24,6	0	0	36,7
	I9	46,5-2I,5 "	0	7,46	0	0	I9,5	43,2	24,I	0	0	79,7	0,456	3I,6	0	0	44,0
	20	2I,5-I0,0 "	0	9,70	0	0	2I,2	5I,2	45,0	0	0	I09	0,500	0,500	0	0	I3,0
eV	2I	I0,0-4,65 "	C	I2,7	0	0	24,7	48,0	37,2	0	0	96,6	0,500	976	0	0	988
	22	4,65-2,I5 "	0	I6,7	0	0	28,7	I7,I	7,25	0	0	36,9	0,500	I,60	0	0	I4,I
	23	2,I5-I,0 "	0	2I,9	0	0	33,9	36,9	I2,4	0	0	63,4	0,500	0,907	0	0	I3,4
	24	I,0-0,465 "	0	29,I	0	0	4I,I	67,5	7,57	0	0	89,6	0,500	I,I9	0	0	I3,7
	25	0,465-0,2I5 "	0	38,9	0	0	50,9	I60	33,8	0	0	209	0,500	I,66	0	0	I4,2
	26	0,0252 "	0	9I,4	0	0	I03	50I	86,0	0	0	602	0,500	4,45	0	0	I7,0

Table 4 (continued)

	Group No.	Energy range	^{237}U (7170) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{238}U (7171) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{239}U (7172) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
MeV	-I	I4,I-I4 МэВ	I,49	0,023	0,322	0,778	5.88	I,I3	0,02I	0,897	0,434	5,85	0,969	0,00I	0,25	I,40	5,90
	0	I4-I0,5 "	I,26	0,02404	I,I4	0,I46	5,80	I,004	0,02I56	I,44	0,0595	5,82	0,767	0,00I6	I,36	0,47I	5,75
	I	I0,5-6,5 "	I,I8	0,02754	I,06	0	6,64	0,968	0,0238	0,847	0	6,59	0,675	0,0045	I,86	0	6,45
	2	6,5-4,0 "	0,693	0,0I45	0,039I	0	7,76	0,578	0,02943	0,07349	0	7,48	0,5I4	0,0I29	0,337	0	8,02
	3	4,0-2,5 "	0,663	0,0278	0	0	7,78	0,553	0,0233	0	0	7,82	0,526	0,0374	0	0	8.08
	4	2,5-I,4 "	0,682	0,0593	0	0	6,44	0,47I	0,0584	0	0	7,20	0,540	0,I27	0	0	7,I2
	5	I,4-0,8 "	0,734	0,I22	0	0	6,62	0,04I6	0,I20	0	0	7,I7	0,53I	0,287	0	0	7,I2
	6	0,8-0,4 "	0,693	0,I36	0	0	8,II	0,02II3	0,I2I	0	0	8,34	0,367	0,265	0	0	7,45
	7	0,4-0,2 "	0,632	0,I39	0	0	9,45	0	0,I26	0	0	I0,0	0,I80	0,287	0	0	7,95
	8	0,2-0,I "	0,576	0,I9I	0	0	I0,3	0	0,I69	0	0	II,5	0,0308	0,403	0	0	9,I2
keV	9	I00-46,5 кэВ	0,579	0,276	0	0	II,I	0	0,280	0	0	I2,8	0,02I7	0,575	0	0	9,74
	I0	46,5-2I,5 "	0,64I	0,407	0	0	II,7	0	0,453	0	0	I3,5	0,0238	0,839	0	0	I0,2
	II	2I,5-I0,0 "	0,707	0,600	0	0	I2,3	0	0,6I8	0	0	I4,0	0,0247	I,238	0	0	I0,6
	I2	I0,0-4,65 "	0,78I	0,882	0	0	I3,I	0	0,8I8	0	0	I4,4	0,04I7	I,937	0	0	I2,2
	I3	4,65-2,I5 "	0,863	I,30	0	0	I4,0	0	I,22	0	0	I5,2	0,0626	3,06	0	0	I4,6
	I4	2,I5-I,0 "	0,953	I,9I	0	0	I5,0	0	I,98	0	0	I9,5	0,0722	4,83	0	0	I6,8
eV	I5	I,0-465 эВ	I,23	2,78	0	0	I6,4	0	3,57	0	0	25,2	0,0900	6,76	0	0	I8,9
	I6	465-2I5 "	I,83	4,04	0	0	I8,3	0	4,8I	0	0	22,0	0,I84	8,52	0	0	20,7
	I7	2I5-I00 "	2,72	5,85	0	0	2I,I	0	20,9	0	0	93,I	3,I5	I0,7	0	0	25,9
	I8	I00-46,5 "	4,03	8,47	0	0	25,I	0	I6,3	0	0	42,8	II,6	I4,0	0	0	37,6
	I9	46,5-2I,5 "	5,99	I2,3	0	0	30,9	0	55,7	0	0	I29	I5,6	I8,8	0	0	46,6
	20	2I,0-I0,0 "	8,90	I7,8	0	0	39,4	0	79,6	0	0	II0	2I,0	25,2	0	0	58,2
	2I	I0,0-4,65 "	I3,2	25,7	0	0	5I,7	0	I69	0	0	I87	28,I	33,8	0	0	73,9
	22	4,65-2,I5 "	I4,I	37,3	0	0	64,3	0	0,747	0	0	8,34	37,8	45,4	0	0	95,2
	23	2,I5-I,0 "	I,36	54,0	0	0	68,4	0	0,5I4	0	0	8,30	30,2	36,9	0	0	79,I
	24	I,0-0,465 "	0,490	78,2	0	0	9I,7	0	0,6II	0	0	8,49	2,7I	4,27	0	0	I9,0
	25	0,465-0,2I5"	0,35	II3	0	0	I27	0	0,826	0	0	8,74	3,99	6,28	0	0	22,3
	26	0,0252 "	0,35	332	0	0	346	0	2,38	0	0	I0,3	I2,I	I9,I	0	0	43,2

Table 4 (continued)

Group No.	Energy range	²⁴⁰U (7173) σ_f	σ_nγ	σ_n,2n	σ_n,3n	σ_t	²³⁷Np (7174) σ_f	σ_nγ	σ_n,2n	σ_n,3n	σ_t	²³⁸Pu (7175) σ_f	σ_nγ	σ_n,2n	σ_n,3n	σ_t
MeV -I	I4,I-I4 МэВ	0,944	0,00875	0,4I4	0,I24	5,90	2,5	0,0249I	0,520	0,200	6,22	2,72	0,02875	0,I23	0,I02	5,96
0	I4-I0,5 "	0,799	0,0I07	I,34	0,500	5,86	2,42	0,0255I	0,7I7	0,0I49	6,20	2,52	0,0II6	0,4I3	0,02360	5,86
I	I0,5-6,5 "	0,749	0,00I7I	I,56	0	6,60	2,I4	0,02703	0,I95	0	6,69	2,4I	0,0226	0,257	0	6,58
2	6,5-4,0 "	0,459	0,0266	0,0506	0	7,72	I,48	0,0II6	0	0	7,68	2,20	0,0355	0	0	7,43
3	4,0-2,5 "	0,442	0,0429	0	0	7,99	I,6I	0,0242	0	0	7,98	2,26	0,0572	0	0	7,38
4	2,5-I,4 "	0,322	0,0703	0	0	7,2I	I,64	0,0574	0	0	7,65	2,28	0,0938	0	0	7,06
5	I,4-0,8 "	0,0333	0,II5	0	0	6,98	I,40	0,I37	0	0	7,53	2,I3	0,I54	0	0	7,I0
6	0,8-0,4 "	0	0,II9	0	0	7,90	0,748	0,309	0	0	8,46	I,66	0,I66	0	0	9,23
7	0,4-0,2 "	0	0,I08	0	0	9,34	0,0922	0,627	0	0	I0,2	I,II	0,I78	0	0	9,97
8	0,2-0,I "	0	0,I46	0	0	I0,8	0,0350	I,04	0	0	I2,0	0,872	0,204	0	0	II,0
keV 9	I00-46,5 кэВ	0	0,25I	0	0	I2,3	0,0233	I,59	0	0	I3,0	0,900	0,276	0	0	I3,0
I0	46,5-2I,5 "	0	0,463	0	0	I3,5	0,0I50	2,34	0	0	I4,I	0,963	0,437	0	0	I5,2
II	2I,5-I0,0 "	0	0,700	0	0	I4,2	0,0III	3,26	0	0	I5,4	0,992	0,658	0	0	I7,5
I2	I0,0-4,65 "	0	0,945	0	0	I4,0	0,025I	4,47	0	0	I7,5	I,322	0,960	0	0	20,0
I3	4,65-2,I5 "	0	I,28	0	0	I3,7	0,0438	6,I5	0	0	20,0	I,57	I,77	0	0	24,6
I4	2,I5-I,0 "	0	I,88	0	0	I4,0	0,I02	7,94	0	0	22,6	I,94	3,33	0	0	3I,I
eV I5	I000-465 эВ	0	3,3I	0	0	I4,0	0,0939	I2,5	0	0	27,8	2,70	6,26	0	0	40,6
I6	465-2I5 "	0	6,87	0	0	I5,9	0,I73	I9,8	0	0	35,9	3,33	II,9	0	0	54,4
I7	2I5-I00 "	0	I4,2	0	0	22,5	0,280	3I,0	0	0	47,8	6,90	27,0	0	0	75,8
I8	I00-46,5 "	0	2I,I	0	0	29,I	0,300	47,7	0	0	65,0	2.03	I5,5	0	0	32,8
I9	46,5-2I,5 "	0	23,3	0	0	3I,3	0,737	94,5	0	0	I2I	0,02560	0,0[illegible]5	0	0	I0,3
20	2I,5-I0,0 "	0	25,8	0	0	33,8	0,0233	9I,6	0	0	II0	2,96	55,[illegible]	0	0	73,6
2I	I0,0-4,65 "	0	28,5	0	0	36,5	0,0244	86,4	0	0	I0I	I,44	6,[illegible]	0	0	I7,6
22	4,65-2,I5 "	0	3I,5	0	0	39,5	0,0II8	47,9	0	0	60,9	I,57	47,[illegible]	0	0	59,I
23	2,I5-I,0 "	0	34,8	0	0	42,8	0,0I46	2I4	0	0	229	0,05I4	I,49	0	0	I2,6
24	I,0-0,465 "	0	38,2	0	0	46,2	0,0II5	292	0	0	308	0,530	I8,7	0	0	33,9
25	0,465-0,2I5 "	0	I5,0	0	0	23,0	0,0296	I07	0	0	I22	I,69	57,9	0	0	76,6
26	0,0252 "	0	I4,6	0	0	9,46	0,0I34	I42	0	0	I60	I3,4	45I	0	0	485

Table 4 (continued)

	Group No.	Energy range	^{239}Pu (7176) σ_f	$\sigma_{n,\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{240}Pu (7177) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{241}Pu (7178) σ_f	$\sigma_{n,\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
	-I	I4,I-I4 МэВ	2,25	0,02I6	0,I48	0,02884	5,87	2,23	0,02875	0,243	0,286	5,47	2,I3	0,027I4	0,I27	0,604	5,95
	0	I4-I0,5 "	2,2I	0,02I85	0,359	0,03482	5,86	2,I0	0,0I07	0,592	0,0373	5,55	2,04	0,02803	0,779	0,I22	6,00
	I	I0,5-6,5 "	2,II	0,02303	0,537	0	6,6I	2,09	0,0I7I	0,426	0	6,40	I,9I	0,02943	I,00	0	6,69
	2	6,5-4,0 "	I,72	0,024I8	0,05I3	0	7,66	I,56	0,0266	0	0	7,00	I,40	0,0I87	0,I76	0	7,36
	3	4,0-2,5 "	I,82	0,02604	0	0	7,86	I,66	0,0429	0	0	6,87	I,52	0,0352	0	0	7,7I
MeV	4	2,5-I,4 "	I,9I	0,0I62	0	0	7,I4	I,66	0,0723	0	0	6,68	I,66	0,0696	0	0	7,6I
	5	I,4-0,8 "	I,77	0,0393	0	0	7,0I	I,46	0,I25	0	0	7,38	I,57	0,I05	0	0	7,79
	6	0,8-0,4 "	I,62	0,0789	0	0	8,I5	0,625	0,I36	0	0	7,74	I,50	0,I98	0	0	8,85
	7	0,4-0,2 "	I,54	0,I6I	0	0	I0,0	0,I28	0,I37	0	0	9,43	I,72	0,382	0	0	I0,7
	8	0,2-0,I "	I,48	0,207	0	0	II,3	0,0633	0,I78	0	0	I0,6	I,99	0,5I0	0	0	I2,0
	9	I00-46,5 кэВ	I,53	0,254	0	0	I2,8	0,0662	0,3I2	0	0	II,3	2,24	0,6II	0	0	I2,8
	I0	46,5-2I,5 "	I,64	0,457	0	0	I4,I	0,0863	0,539	0	0	II,6	2,80	0,7I6	0	0	I3,5
	II	2I,5-I0,0 "	I,80	0,785	0	0	I5,3	0,0957	0,800	0	0	II,9	3,72	0,78I	0	0	I4,4
keV	I2	I0,0-4,65 "	2,26	I,69	0	0	I8,2	0,I22	I,07	0	0	I2,4	4,9I	0,864	0	0	I5,7
	I3	4,65-2,I5 "	3,23	3,08	0	0	22,2	0,2I4	I,84	0	0	22,7	5,59	I,38	0	0	I7,0
	I4	2,I5-I,0 "	4,6I	5,I0	0	0	26,4	0,2II	2,23	0	0	23,9	5,9I	I,86	0	0	I7,8
	I5	I000-4,65 эВ	7,29	8,40	0	0	30,2	0,238	4,55	0	0	3I,0	6,80	2,53	0	0	I9,3
	I6	465-2I5 "	I3,2	I4,9	0	0	46,8	0.0724	7,48	0	0	32.3	2I,6	8,60	0	0	40,2
	I7	2I5-I00 "	I9,I	I6,8	0	0	53,7	0,I76	20,2	0	0	56,4	35,9	I4,3	0	0	60,2
	I8	I00-46,5 "	56,9	37,5	0	0	II8	0,354	37,5	0	0	II2	40,4	I6,I	0	0	66,4
	I9	46,5-2I,5 "	22,8	35,3	0	0	73,I	0,470	64,5	0	0	I34	62,0	24,8	0	0	96,8
	20	2I,5-I0,0 "	I05	7I,6	0	0	I92	0,282	3I,9	0	0	47,2	I47	58,7	0	0	2I6
	2I	I0-4,65 "	33,4	29,0	0	0	72,5	0,03662	0,878	0	0	I4.6	23I	9I,6	0	0	333
eV	22	4,65-2,I5 "	II,I	I,07	0	0	22,6	0,02239	9,33	0	0	29,3	I05	48,0	0	0	I57
	23	2,I5-I,0 "	24,9	7,69	0	0	43,8	I,80	94I2	0	0	I0240	32,6	I3,0	0	0	55,6
	24	I,0-0,465 "	I02	46,0	0	0	I60	0,249	I30I	0	0	I36I	45,8	I8,2	0	0	74,0
	25	0,465-0,2I5 "	I634	I099	0	0	2747	0,03I9	I64	0	0	I66	905	362	0	0	I277
	26	0,0252 "	703	28I	0	0	994	0,0535	268	0	0	273	890	363	0	0	I263

Table 4 (continued)

	Group No.	Energy range	^{242}Pu (7180)					^{243}Pu (7181)					^{241}Am (7182)				
			σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
MeV	-I	I4,I-I4 МэВ	I,93	$0,0^{2}I72$	0,3	0,6I7	5,55	I,9	0,02I6	0,225	0,875	5,68	2,48	0,039	0,I50	0,35	5,63
	0	I4-I0,5 "	I,88	$0,0^{2}349$	0,807	0,I80	5,6I	I,78	0,02I85	0,994	0,284	5,76	2,I3	0,039	0,786	0,0343	5,75
	I	I0,5-6,5 "	I,88	$0,0^{2}689$	0,748	0	6,55	I,53	0,02303	I,33	0	6,57	2,22	0,02I50	0,8I0	0	6,60
	2	6,5-4,0 "	I,28	0,0I5	0,02I92	0	7,I4	I,I4	0,024I8	0,302	0	7,2I	I,96	0,02308	0,0462	0	7,22
	3	4,0-2,5 "	I,35	0,0352	0	0	6,95	I,29	0,02604	0	0	7,II	2,0	0,02642	0	0	7,07
	4	2,5-I,4 "	I,4I	0,0622	0	0	6,84	I,39	0,0I62	0	0	7,I0	I,80	0,0I49	0	0	7,07
	5	I,4-0,8 "	I,34	0,I23	0	0	7,87	I,08	0,0395	0	0	7,97	I,23	0,0379	0	0	8,20
	6	0,8-0,4 "	0,398	0,I33	0	0	8,62	0,428	0,0806	0	0	8,97	0,2I0	0,0964	0	0	9,28
	7	0,4-0,2 "	0,0656	0,I38	0	0	9,36	0,434	0,I59	0	0	9,98	0,0248	0,202	0	0	9,47
	8	0,2-0,I "	0,0224	0,I67	0	0	II,I	0,478	0,207	0	0	I0,7	0,0240	0,4I7	0	0	I0,3
keV	9	I00-46,5 кэВ	0,0I32	0,253	0	0	I3,3	0,563	0,254	0	0	II,3	0,0203	0,760	0	0	II,2
	I0	46,5-2I,5 "	0,0II0	0,429	0	0	I5,2	0,7I0	0,468	0	0	I2,0	0,208	I,26	0	0	I2,4
	II	2I,5-I0,0 "	0,02938	0,6I8	0	0	I6,I	0,894	0,788	0	0	I2,6	0,807	2,I3	0	0	I4,2
	I2	I0,0-4,65 "	0,026I3	0,85I	0	0	I2,I	I,I5	I,56	0	0	I3,9	0,592	3,48	0	0	I5,8
	I3	4,65-2,I5 "	0,0249I	I,26	0	0	I2,0	I,54	I,92	0	0	I4,8	I,03	5,65	0	0	I9,2
	I4	2,I5-I,0 эВ	0,0244I	2,43	0	0	23,8	2,I3	2,24	0	0	I5,8	I,325	9,08	0	0	23,8
eV	I5	I000-465 "	0,0I32	5,I0	0	0	48,4	2,99	2,99	0	0	I7,4	I,508	I4,I	0	0	29,9
	I6	465-2I5 "	0,0I07	7,0I	0	C	43,I	4,22	4,22	0	0	I9,9	I,396	22,0	0	0	39,0
	I7	2I5-I00 "	0,040I	I3,9	0	0	49,5	5,94	5,94	0	0	23,4	0,724	33,5	0	0	5I,3
	I8	I00-46,5 "	0,I49	36,9	0	0	I30	8,35	8,35	0	0	28,2	0,7I7	50,5	0	0	70,4
	I9	46,5-2I,5 "	0,0735	6,63	0	0	25,9	I3,3	I3,0	0	0	39,0	0,792	76,4	0	0	99,2
	20	2I,5-I0,0 "	0,02785	2,50	0	0	23,I	54,9	30,6	0	0	III	0,472	96,6	0	0	I22
	2I	I0,0-4,65 "	0,02I4	I,39	0	0	23,8	74,7	36,5	0	0	I35	I,28I	I63	0	0	I95
	22	4,65-2,I5 "	43,9	I583	0	0	I8I8	95,0	46,4	0	0	I64	0,567	I88	0	0	220
	23	2,I5-I,0 "	0,458	I6,57	0	0	3I,6	37I	I8I	0	0	576	4,70	70I	0	0	798
	24	I,0-0,465 "	0,I23	9,39	0	0	23,4	27,8	3I,7	0	0	78,4	3,II	63I	0	0	7I3
	25	0,465-0,2I5 "	0,03256	6,74	0	0	I8,I	5I,4	76,4	0	0	I43	II,6	I487	0	0	I673
	26	0,0252 "	0,0377I	I6,6	0	0	27,9	I57	233	0	0	402	29,I	456	0	0	523

Table 4 (continued)

	Group No.	Energy range	^{242m}Am (7183)					^{243}Am (7184)					^{242}Cm (7185)				
			σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
	-I	I4,I-I4 MэB	2,I6	0,02I56	0,I37	0,536	5,92	2,2	0,02I6	0,I25	0,650	5,63	2,65	0,02I56	0,I	0,333	5,7I
	0	I4-I0,5 "	2,03	0,02390	0,686	0,I90	5,97	I,78	0,02I85	I,II4	0,I2I	5,70	I,99	0,02390	0,954	0,0I64	5,82
	I	I0,5-6,5 "	2,I2	0,02756	0,908	0	6,94	I,77	0,02303	0,968	0	6,55	I,89	0,02756	0,5I5	0	6,72
	2	6,5-4,0 "	I,86	0,0I43	0,0837	0	7,37	I,4I	0,024I8	0,03332	0	7,23	I,6I	0,0I43	0	0	7,30
	3	4,0-2,5 "	I,99	0,0348	0	0	7,I9	I,52	0,02604	0	0	7,06	I,72	0,0348	0	0	7,04
MeV	4	2,5-I,4 "	2,I2	0,0703	0	0	6,68	I,53	0,0I62	0	0	7,04	I,75	0,0703	0	0	7,06
	5	I,4-0,8 "	2,23	0,I46	0	0	7,II	I,I2	0,0395	0	0	7,96	I,62	0,I46	0	0	8,I5
	6	0,8-0,4 "	2,38	0,I46	0	0	9,57	0,I54	0,0806	0	0	8,6I	0,766	0,I46	0	0	8,63
	7	0,4-0,2 "	2,55	0,I8I	0	0	II,6	0,02I8	0,I59	0	0	9,I9	0,I28	0,I8I	0	0	8,24
	8	0,2-0,I "	2,93	0,234	0	0	I2,9	0,0I28	0,207	0	0	I0,2	0,08II	0,234	0	0	I0,6
	9	I00-46,5кэB	3,40	0,4I2	0	0	I4,3	0,020I	0,254	C	0	I0,8	0,0800	0,4I2	0	0	I3,6
	I0	46,5-2I,5 "	3,67	0.7I6	0	0	I5,5	0,0352	0,468	0	0	II,I	0,0925	0,7I6	0	0	I5,8
	II	2I,5-I0,0 "	4,43	0,93I	0	0	I6,8	0,06I6	0,788	0	0	II,3	0,0983	0,93I	0	0	I7,0
keV	I2	I0,0-4,65 "	7,45	I,07	0	0	20,2	0,0864	I,56	0	0	I3,8	0,I	I,073	0	0	I3,8
	I3	4,65-2,I5 "	II,0	I,I7	0	0	23,9	0,I03	I,92	0	0	2I,2	0,I	I,I67	0	0	I9,5
	I4	2,I5-I,0 "	I3,5	I,35	0	0	26,7	0,I42	2,24	0	0	25,4	0,I25	I,35	0	0	23,2
	I5	I000-465 эB	I5,7	I,57	0	0	29,I	0,II5	2,99	0	0	27,8	0,320	I,57	0	0	35,0
	I6	465-2I5 "	25,9	2,59	0	0	40,4	0,I54	I0,9	0	0	36,6	0,647	2,59	0	0	50,8
	I7	2I5-I00 "	30,4	3,04	0	0	45,3	0,253	33,4	0	0	62,3	0,703	3,04	0	0	29,I
	I8	I00-46,5 "	5I,4	5,I4	0	0	68,4	0,4I4	36,0	0	0	59,0	0,434	5,I4	0	0	36,8
	I9	46,5-2I,5 "	62,3	6,23	0	0	80,4	0,520	62,6	0	0	86,9	0,490	6,23	0	0	32,6
	20	2I,5-I0,0 "	I2I	I2,I	0	0	I45	0,55I	II9	0	0	I45	0,338	I2,I	0	0	38,7
eV	2I	I0,0-4,65 "	I56	I5,6	0	0	I83	0,586	I62	0	0	I87	33,I2	I5,6	0	0	255
	22	4,65-2,I5 "	3II	3I,0	0	0	354	0,622	77,6	0	0	I02	0,456	3I,0	0	0	46,6
	23	2,I5-I,0 "	426	42,6	0	0	480	0,659	I770	0	0	I832	0,66I	42,6	0	0	56,8
	24	I,0-0,465 "	899	I08	0	0	I0I9	0,700	I0I	0	0	II6	0,966	I08	0	0	I24
	25	0,465-0,2I5 "	2462	47I	0	0	2945	0,745	36,2	0	0	49,8	I,42	I25	0	0	I39
	26	0,0252 "	6562	I850	0	0	8424	0,863	65,9	0	0	78,I	4,34	I6,3	0	0	32,0

Table 4 (continued)

	Group No.	Energy range	^{243}Cm (7186) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{244}Cm (7187) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	^{245}Cm (7188) σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
MeV	-I	I4,I-I4 МэВ	2,I7	0,02209	0,25	0,425	5,68	2,65	0,02I6	0,I0	0,333	5,77	2,I7	0,02209	0,25	0,425	5,67
	0	I4-I0,5 "	2,06	0,02275	0,773	0,0386	5,76	I,99	0,02I85	0,938	0,033	5,8I	2,06	0,02275	0,762	0,0490	5,79
	I	I0,5-6,5 "	2,08	0,02378	0,769	0	6,64	I,89	0,02303	0,534	0	6,72	2,08	0,02378	0,769	0	6,70
	2	6,5-4,0 "	I,86	0,02450	0,0594	0	7,30	I,57	0,024I8	0	0	7,30	I,86	0,02450	0,066	0	7,28
	3	4,0-2,5 "	2,0	0,02608	0	0	7,08	I,68	0,02604	0	0	7,0I	2,0	0,02608	0	0	7,02
	4	2,5-I,4 "	2,I3	0,0I62	0	0	7,04	I,70	0,0I62	0	0	7,00	2,I3	0,0I62	0	0	7,2I
	5	I,4-0,8 "	I,97	0,0375	0	0	8,28	I,58	0,0395	0	0	8,05	I,8I	0,0375	0	0	8,25
	6	0,8-0,4 "	I,87	0,0768	0	0	I0,3	0,766	0,0806	0	0	8,56	I,83	0,0768	0	0	I0,I
	7	0,4-0,2 "	I,86	0,I59	0	0	I2,6	0,I28	0,I59	0	0	8,22	2,07	0,I59	0	0	I2,I
	8	0,2-0,I "	I,96	0,207	0	0	I3,5	0,08II	0,207	0	0	I0,6	2,26	0,207	0	0	I3,2
keV	9	I00-46,5 кэВ	2,25	0,285	0	0	I3,2	0,0800	0,256	0	0	I3,5	2,4	0,285	0	0	I2,9
	I0	46,5-2I,5 "	2,84	0,45I	0	0	I4,I	0,0925	0,600	0	0	I5,7	2,64	0,45I	0	0	I3,I
	II	2I,5-I0,0 "	3,58	0,80I	0	0	I5,3	0,0983	0,897	0	0	I7,0	3,50	0,80I	0	0	I4,3
	I2	I0,0-4,65 "	4,30	I,59	0	0	I7,0	0,I	I,I7	0	0	I3,9	4,96	I,586	0	0	I6,5
	I3	4,65-2,I5 "	5,I4	2,3I	0	0	I8,8	0,I	2,00	0	0	20,4	6,36	2,3I	0	0	I8,7
	I4	2,I5-I,0 "	7,94	2,65	0	0	22,0	0,I25	3,67	0	0	25,5	I0,I	2,65	0	0	22,7
eV	I5	I000-465 эВ	I2,8	2,95	0	0	27,2	0,320	9,83	0	0	4I,7	I3,9	2,95	0	0	26,8
	I6	465-2I5 "	20,3	3,20	0	0	35,0	0,647	I4,9	0	0	65,2	I9,9	3,20	0	0	33,2
	I7	2I5-I00 "	32,8	3,49	0	0	47,8	0,703	I0,6	0	0	30,6	37,I	3,49	0	0	50,8
	I8	I00-46,5 "	70,7	4,93	0	0	87,I	0,434	I7,0	0	0	50,8	70,7	4,93	0	0	86,0
	I9	46,5-2I,5 "	63,8	7,23	0	0	83,7	0,490	28,0	0	0	53,9	63,8	7,24	0	0	8I,5
	20	2I,5-I0,0 "	39,5	I0,I	0	0	74,9	0,338	35,7	0	0	62,6	39,5	I0,I	0	0	6I,9
	2I	I0,0-4,65 "	I92	26,6	0	0	242	33,I	658	0	0	888	I92	26,6	0	0	243
	22	4,65-2,I5 "	207	26,3	0	0	256	0,II9	3,I5	0	0	I8,3	207	26,3	0	0	253
	23	2,I5-I,0 "	2I5	35,4	0	0	274	0,I46	3,36	0	0	I7,I	234	35,4	0	0	288
	24	I,0-0,465 "	I34	34,0	0	0	I87	0,2I4	3,42	0	0	I7,9	237	34,0	0	0	29I
	25	0,465-0,2I5 "	I97	67,5	0	0	279	0,3I3	3,09	0	0	I6,I	409	67,5	0	0	496
	26	0,0252 "	600	33I	0	0	94I	0,955	9,56	0	0	2I,9	I878	33I	0	0	2229

Table 4 (continued)

	Group No.	Energy range	^{246}Cm (7189)					^{247}Cm (7190)					^{248}Cm (7191)				
			σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
	-I	I4,I-I4 МэВ	2,I0	0,02I6	0,I75	0,7	5,6I	2,50	0,038	0,I	0,5	5,74	2,I	0,02I	0,I5	0,8	5,74
	0	I4 -I0,5 "	I,88	0,02I8	I,09	0,II7	5,77	2,30	0,03924	0,692	0,I20	5,80	I,76	0,02I56	I,032	0,27I	5,8I
	I	I0,5-6,5 "	I,87	0,0230	0,887	0	6,68	2,34	0,02I68	0,800	0	6,7I	I,89	0,0238	0,962	0	6,74
	2	6,5-4,0 "	I,60	0,024I8	0,0424	0	7,29	I,98	0,02246	0,I82	0	7,3I	I,5	0,02943	0,0^{2}40	0	7,35
MeV	3	4,0-2,5 "	I,77	0,02604	0	0	7,04	2,I4	0,02423	0	0	7,0I	I,68	0,0233	0	0	7,I0
	4	2,5-I,4 "	I,74	0,0I62	0	0	7,I3	2,I6	0,0I57	0	0	7,II	I,75	0,0584	0	0	7,23
	5	I,4-0,8 "	I,49	0,0395	0	0	8,07	2,02	0,0395	0	0	8,08	I,55	0,I20	0	0	8,24
	6	0,8-0,4 "	0,305	0,0806	0	0	8,35	I,96	0,0806	0	0	9,38	0,389	0,I2I	0	0	8,I0
	7	0,4-0,2 "	0,0795	0,I59	0	0	8,38	I,92	0,I59	0	0	9,89	0,0778	0,I26	0	0	8,00
	8	0,2-0,I "	0,0628	0,207	0	0	9,48	I,9I	0,207	0	0	II,8	0,0788	0,I69	0	0	9,I2
	9	I00-46,5 кэВ	0,0542	0,255	0	0	II,2	I,90	0,255	0	0	I3,3	0,08I0	0,280	0	0	I0,3
	I0	46,5-2I,5 "	0,0500	0,486	0	0	II,9	I,94	0,479	0	0	I3,8	0,082I	0,453	0	0	I0,8
	II	2I,5-I0,0 "	0,0478	0,788	0	0	I2,2	I,99	0,792	0	0	I4,2	0,0826	0,6I8	0	0	II,2
keV	I2	I0,0-4,65 "	0,0469	I,48	0	0	I2,9	2,52	I,48	0	0	I5,5	0,0828	0,8I8	0	0	II,7
	I3	4,65-2,I5 "	0,0465	I,90	0	0	I3,3	3,64	I,9	0	0	I7,0	0,0829	I,32	0	0	I2,6
	I4	2,I5-I,0 "	0,0463	2,09	0	0	I3,5	4,64	2,48	0	0	I8,6	0,0830	2,II	0	0	I8,4
	I5	I000-465 эВ	0,0462	2,72	0	0	23,I	I0,5	6,85	0	0	28,9	0,I70	2,55	0	0	58,4
	I6	465-2I5 "	0,I85	7,I5	0	0	4I,4	I7,0	II,0	0	0	39,5	0,252	6,63	0	0	46,6
	I7	2I5-I00 "	0,II5	6,92	0	0	36,4	20,I	I3,I	0	0	44,7	0,485	3,24	0	0	39,8
	I8	I00-46,5 "	0,534	25,2	0	0	67,5	52,9	30,4	0	0	I0I	I,0	30,0	0	0	2I3
	I9	46,5-2I,5 "	0,0462	0,035I	0	0	2I,2	I3,0	8,00	0	0	4I,9	3,49	I32	0	0	262
	20	2I,5-I0,0 "	0,I25	I9,I	0	0	4I,3	22,9	I7,2	0	0	62,2	0,0392	0,345	0	0	I4,3
eV	2I	I0,0-4,65 "	0,0507	I,95	0	0	23,9	82,6	54,5	0	0	I59	6,39	I82	0	0	224
	22	4,65-2,I5 "	0,7I6	III	0	0	I34	7,47	3,56	0	0	30,9	0,0308	0,558	0	0	I3,9
	23	2,I5-I,0 "	0,0434	0,373	0	0	2I,0	I07	36,2	0	0	I66	0,0450	0,493	0	0	I4,7
	24	I,0-0,465"	0,04I7	0,233	0	0	I9,9	837	289	0	0	II46	0,0659	0,894	0	0	I5,3
	25	0,465-0,2I5"	0,0486	0,342	0	0	I5,4	23,5	25,7	0	0	63,4	0,0968	0,90I	0	0	I3,8
	26	0,0252 "	0,I48	I,04	0	0	I2,6	7I,9	78,I	0	0	I62	0,295	2,65	0	0	I4,3

Table 4 (continued)

	Group No.	Energy range	^{249}Bk (7192)					^{249}Cf (7193)					^{250}Cf (7194)				
			σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
MeV	-I	I4,I-I4 МэВ	I,66	0,02I	0,300	I,I	5,75	2,4	0,02I	0,I85	0,565	5,79	2,5	0,02I	0,2	0,55	5,89
	0	I4-I0,5 "	I,47	0,02I56	I,48	0,I66	5,87	2,08	0,02I56	0,966	0,I22	5,86	2,24	0,02I56	0,9I4	0,074I	5,93
	I	I0,5-6,5 "	I,53	0,0238	I,08	0	6,79	2,I6	0,0238	0,865	0	6,79	2,22	0,02380	0,564	0	6,78
	2	6,5-4,0 "	I,25	0,02943	0,0236	0	7,37	I,80	0,02943	0,0604	0	7,35	I,95	0,02943	0	0	7,37
	3	4,0-2,5 "	I,33	0,0233	0	0	7,I9	I,89	0,0233	0	0	7,I0	2,08	0,0233	0	0	7,I7
	4	2,5-I,4 "	I,22	0,0584	0	0	7,25	I,76	0,0584	0	0	7,I2	2,I0	0,0584	0	0	7,28
	5	I,4-0,8 "	0,702	0,I20	0	0	7,84	I,42	0,I20	0	0	7,89	2,04	0,I20	0	0	8,35
	6	0,8-0,4 "	0,0536	0,I2I	0	0	8,32	I,5I	0,I2I	0	0	9,24	I,89	0,I2I	0	0	9,6I
	7	0,4-0,2 "	0,0II0	0,I26	0	0	8,35	I,83	0,I26	0	0	9,68	I,63	0,I26	0	0	9,92
	8	0,2-0,I "	0,0I30	0,I69	0	0	9,I6	2,I9	0,I69	0	0	II,2	I,II	0,I69	0	0	I0,2
keV	9	I00-46,5 кэВ	0,0I56	0,280	0	0	I0,2	2,43	0,280	0	0	I2,6	0,499	0,280	0	0	I0,7
	I0	46,5-2I,5 "	0,0I90	0,453	0	0	I0,8	2,73	0,453	0	0	I3,5	0,I43	0,453	0	0	I0,9
	II	2I,5-I0,0 "	0,0223	0,6I8	0	0	II,I	3,37	0,6I8	0	0	I4,4	0,I00	0,6I8	0	0	II,2
	I2	I0,0-4,65 "	0,0260	0,8I8	0	0	II,7	4,24	0,8I8	0	0	I8,3	0,I00	0,8I8	0	0	I4,2
	I3	4,65-2,I5 "	0,0304	I,32	0	0	I2,6	6,63	I,32	0	0	22,5	0,I	I,32	0	0	I6,0
	I4	2,I5-I,0 "	0,0353	2,II	0	0	I3,7	9,39	2,37	0	0	27,0	0,I	2,II	0	0	I7,4
eV	I5	I000-465 эВ	0,04II	6,24	0	0	I8,7	I3,3	6,66	0	0	35,0	0,I	7,90	0	0	23,8
	I6	465-2I5 "	0,0479	I3,5	0	0	26,9	24,5	I2,2	0	0	53,3	0,I	I8,0	0	0	34,7
	I7	2I5-I00 "	0,0544	2I,9	0	0	36,4	30,8	I5,4	0	0	63,4	0,I	26,5	0	0	48,2
	I8	I00-46,5 "	0,06II	35,4	0	0	5I,2	42,5	I7,4	0	0	85,9	0,I	52,2	0	0	9I,I
	I9	46,5-2I,5 "	0,0685	57,I	0	0	74,6	66,4	30,6	0	0	I23	0,I	I29	0	0	I68
	20	2I,5-I0,0 "	0,0769	III,4	0	0	I36	62,2	39,I	0	0	I23	0,I	2I3	0	0	258
	2I	I0,0-4,65 "	0,0864	396	0	0	449	80,8	30,7	0	0	I3I	0,I	I82	0	0	202
	22	4,65-2,I5 "	0,0975	526	0	0	565	40,5	43,3	0	0	I02	0,I	23I	0	0	255
	23	2,I5-I,0 "	0,I32	695	0	0	73I	I54	63,4	0	0	240	0,I	8I7	0	0	882
	24	I,0-0,465 "	0,I94	33I5	0	0	3428	2439	92,8	0	0	2553	0,I	I7480	0	0	I8490
	25	0,465-0,2I5 "	0,285	457	0	0	553	506	I36	0	0	658	0,I	I67	0	0	I82
	26	0,0252 "	0,868	I397	0	0	I4I7	I402	4I5	0	0	I829	0,I	I456	0	0	I468

Table 4 (concluded)

	Group No.	Energy range	^{251}Cf (7195)					^{252}Cf (7196)				
			σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t	σ_f	$\sigma_{n\gamma}$	$\sigma_{n,2n}$	$\sigma_{n,3n}$	σ_t
MeV	-I	I4,I-I4 MэB	2,40	0,02I	0,I69	0,552	5,76	2,54	0,03800	0,I5	0,264	5,75
	0	I4-I0,5 "	2,08	0,02I6	0,954	0,I28	5,86	2,4I	0,03924	0,468	0,0783	5,86
	I	I0,5-6,5 "	2,I6	0,0238	I,02	0	6,78	2,53	0,02292	0.427	0	6,79
	2	6,5-4,0 "	I,80	0,02943	0,I97	0	7,37	2,23	0,0253I	0,02575	0	7,29
	3	4,0-2,5 "	I,89	0,0233	0	0	7,I0	2,35	0,0283I	0	0	6,99
	4	2,5-I,4 "	I,76	0,0584	0	0	7,I2	2,47	0,0I48	0	0	7,09
	5	I,4-0,8 "	I,42	0,I20	0	0	7,89	2,04	0,0354	0	0	8,39
	6	0,8-0,4 "	I,5I	0,I20	0	0	9,24	0,866	0,0808	0	0	9,0I
	7	0,4-0,2 "	I,83	0,I26	0	0	9,72	0,I96	0,I45	0	0	8,26
	8	0,2-0,I "	2,20	0,I69	0	0	II,2	0,I34	0,I9I	0	0	8,37
keV	9	I00-46,5 кэВ	2,43	0,280	0	0	I2,6	0,I24	0,250	0	0	I4,0
	I0	46,5-2I,5 "	2,73	0,453	0	0	I3,5	0,I86	0,402	0	0	20,5
	II	2I,5-I0,0 "	3,37	0,6I8	0	0	I4,4	0,342	0,726	0	0	22,8
	I2	I0,0-4,65 "	4,24	0,8I8	0	0	I8,3	0,565	I,56	0	0	24,I
	I3	4,65-2,I5 "	6,75	I,32	0	0	22,6	0,87I	2,26	0	0	26,0
	I4	2,I5-I,0 "	I3,6	2,II	0	0	3I,0	I,36	2,52	0	0	27,9
eV	I5	I000-465 эВ	2I,7	7,90	0	0	45,4	2,03	2,78	0	0	30,I
	I6	465-2I5 "	3I,9	I8,0	0	0	66,5	3,I5	3,75	0	0	32,5
	I7	2I5-I00 "	46,8	26,5	0	0	9I,4	I2,3	5,94	0	0	4I,6
	I8	I00-46,5 "	68,6	4I,3	0	0	I33	22,6	8,62	0	0	55,6
	I9	46,5-2I,5 "	I36	87,6	0	0	252	2I,I	8,03	0	0	5I,6
	20	2I,5-I0,0 "	20I	I30	0	0	357	62,I	23,6	0	0	II2
	2I	I0,0-4,65 "	320	247	0	0	593	0,457	0,I74	0	0	I8,9
	22	4,65-2,I5 "	320	368	0	0	7II	I,00	0,382	0	0	I9,9
	23	2,I5-I,0 "	470	438	0	0	938	2,44	0,935	0	0	22,0
	24	I,0-0,465 "	690	I834	0	0	2672	5,62	2,84	0	0	27,I
	25	0,465-0,2I5"	I0I3	8I3	0	0	I888	9,6I	5,89	0	0	34,2
	26	0,0252 "	3087	2473	0	0	577I	29,3	I8,0	0	0	66,0

Table 5

Errors in single-group radiative-capture and fission cross-sections

Isotope	$\sigma_{n\gamma}$	σ_f
^{236}U	±40%	±15%
^{237}Np	±40%	±10%
^{238}Pu	±60%	±30%
^{241}Am	±30%	±15%
^{243}Am	Factor of 2	±20%
^{242}Cm	-"-	Factor of 2
^{244}Cm	-"-	±30%
^{234}U	-"-	±15%
^{236}Pu	Factor of 2-3	Factor of 2-3
^{237}Pu	-"-	-"-
^{242m}Am	Factor of 2	±50%
^{241}Cm	-"-	Factor of 2
^{243}Cm	-"-	-"-
^{248}Cm	-"-	±50%

Table 6

Single-group radiative-capture and fission cross-sections averaged over various spectra

Isotope	Averaged over spectrum						Isotope	Averaged over spectrum.					
	Fission		Core		Shield			Fission		Core		Shield	
	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f		$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f	$\sigma_{n\gamma}$	σ_f
^{231}Th	0,I0	0,20	0,86	0,64	2,5	I,I5	^{243}Pu	0,04	2,05	0,45	I,0	0,74	I,I
^{232}Th	0,I0	0,07	0,50	0,0I	0,94	0,005	^{244}Pu	0,02	I,0I	0,32	0,23	0,75	0,I3
^{233}U	0,I0	I,85	0,29	3,00	0,43	4,0	^{241}Am	0,27	I,44	I,9	0,3I	3,I	0,I7
^{234}U	0,I7	I,22	0,68	0,34	I,2	0,20	^{242m}Am	0,02	2,2.	0,42	3,2	0,73	3,8
^{235}U	0,I0	I,23	0,76	2,I2	I,3	3,0	^{243}Am	0,30	I,04	I,8	0,20	3,0	0,I0
^{236}U	0,I7	0,62	0,66	0,II	I,2	0,055	^{241}Cm	0,03	2,7	0,23	3,4	0,37	4,5
^{237}U	0,08	0,69	0,39	0,68	0,63	0,73	^{242}Cm	0,03	0,97	0,46	0,I6	I,0	0,08
^{238}U	0,08	0,3I	0,37	0,047	0,73	0,022	^{243}Cm	0,02	2,0	0,39	2,5	0,75	3,2
^{239}U	0,I7	0,47	0,85	0,I7	I,4	0,I6	^{244}Cm	0,II	I,6	0,98	0,42	I,6	0,26
^{240}U	0,08	0,23	0,42	0,03	0,79	0,0I5	^{245}Cm	0,04	2,0	0,46	3,0	0,73	4,I
^{237}Np	0,I7	I,29	I,8	0,32	3,I	0,I8	^{246}Cm	0,04	I,33	0,46	0,3I	0,8I	0,I8
^{236}Pu	0,05	2,08	0,62	I,77	I,I	2,II	^{247}Cm	0,04	2,I	0,56	2,3	I,I	2,9
^{237}Pu	0,03	2,94	0,24	3,88	0,40	5,02	^{248}Cm	0,05	I,37	0,29	0,3I	0,62	0,I6
^{238}Pu	0,06	I,98	0,90	I,I6	I,6	I,I4	^{249}Bk	0,08	0,87	0,5I	0,I7	I,I	0,I
^{239}Pu	0,04	I,78	0,70	I,93	I,4	2,47	^{249}Cf	0,08	I,7	0,5I	2,8	I,0	3,9
^{240}Pu	0,09	I,33	0,5I	0,37	I,0	0,25	^{250}Cf	0,08	2,0	0,56	I,0	I,3	0,8
^{241}Pu	0,I2	I,60	0,6I	2,6I	0,97	3,6	^{251}Cf	0,08	I,7	0,56	3,I	I,3	4,7
^{242}Pu	0,09	I,I3	0,55	0,27	0,90	0,I5	^{252}Cf	0,04	I,9	0,44	0,7	0,7	0,7

Table 7

Spectra used for averaging

Group No.	Energy range	Spectra used for averaging			Group No.	Energy range	Spectra used for averaging		
		Fission	Core	Shield			Fission	Core	Shield
I	I0,5–6,5MeV	0,0I8	0,002	0,039	II	2I,5–I0	0,00I	0,082	0,II4
2	6,5–4	0,095	0,0I0	0,025	I2	I0–4,65	0	0,045	0,07I
3	4–2,5	0,I88	0,025	0,0I2	I3	4,65–2,I5	0	0,0I2	0,024
4	2,5–I,4	0,269	0,048	0,022	I4	2,I5–I	0	0,030	0,048
5	I,4–0,8	0,I98	0,060	0,03I	I5	I000–465 eV	0	0,0I4	0,030
6	0,8–0,4	0,I37	0,II3	0,075	I6	465–2I5	0	0,005	0,0I6
7	0,4–0,2	0,059	0,I50	0,II5	I7	2I5–I00	0	0,00I	0,007
8	0,2–0,I	0,023	0,I5I	0,I37	I8	I00–46,5	0	0,032	0,002
9	I00–46,5 keV	0,009	0,I40	0,I5I	I9	46,5–2I,5	0	0,044	0,037
I0	46,5–2I,5	0,003	0,II2	0,I38	20	2I,5–I0	0	0	0,045

Table 8

The main integral experiments aimed at increasing the accuracy of transactinide cross-sections

Cross-section	Isotope	Experimental/theoretical value ratio	Brief description of experiment	Ref.
σ_f	^{242}Pu ^{241}Am ^{243}Am ^{244}Cm	0,81±0,04 0,79±0,03 1,14±0,04 0,74±0,06	Fission-chamber measurements on ZEBRA-14 plutonium assemblies. Normalization to ^{239}Pu cross-section. Error components of experimental values are given. Theoretical values from FGL-5 library data.	[28]
σ_f	^{241}Am	0,71±0,02	Fission-chamber measurements on SNEAK-9c plutonium assemblies.	[29]
σ_f	^{241}Am	(0,55÷0,75)±0,05	Fission-chamber measurements on ERMINE plutonium assemblies in a wide range of spectra.	[30]
α	^{241}Am	0,51±0,02	Small-sample reactivity measurements on SNEAK 9c assembly.	[29]
$\sigma_{n\gamma}$	^{241}Am	1,54±0,09	Activation measurements on ZEBRA-14 assembly.	[31] [32]
$\sigma_{n\gamma}$	^{237}Np ^{239}Np ^{238}Pu ^{242}Pu ^{241}Am ^{243}Am ^{244}Cm	1,32±0,15 0,95±0,19 0,88±0,03 0,64±0,05 0,92±0,12 0,90±0,10 0,81±0,15	Irradiation of highly-enriched samples in PHENIX reactor. Normalization to ^{238}U radiative-capture cross-section. Theoretical values from CARNAVAL-III library data.	[30]
σ_{n2n}	^{239}Pu	0,45±0,04	-	-

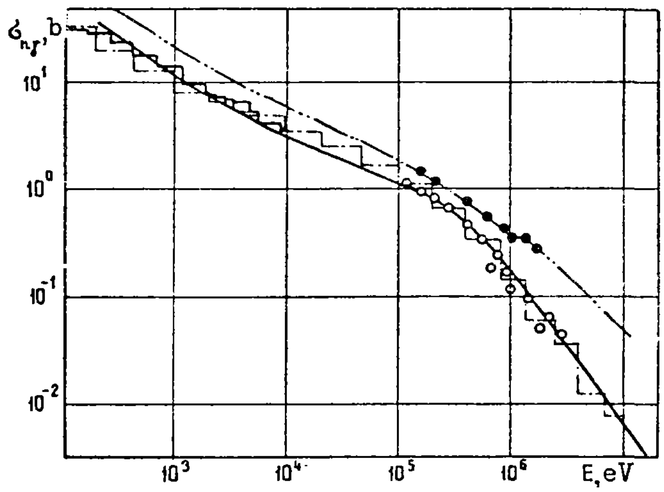


Fig. 1 Radiative capture cross-section of ^{237}Np

Data: ● - D.Stupegia e.a. (1967); ○ - M.Lindner e.a. (1973); —··—-[16]; —·—- ENDL-76 (1975); —— - HEDL (1977

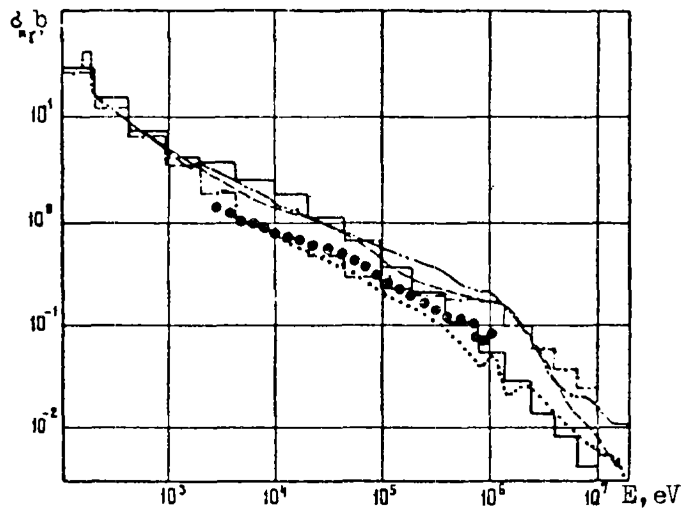


Fig. 2 Radiative capture cross-section of ^{238}Pu

Data: ··· - ENDF/B-IV (1967); — — - - M.Caner e.a. (1974); —·—·- ENDL-76 (1975); ● - P.Thomet (1975); —— - [17]; —··— - HEDL (1977)

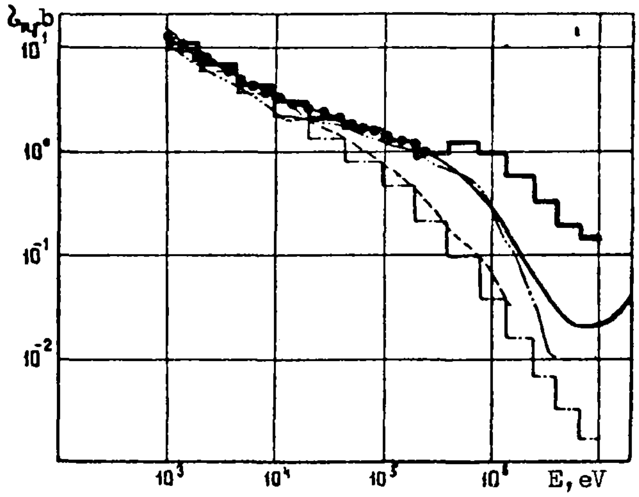
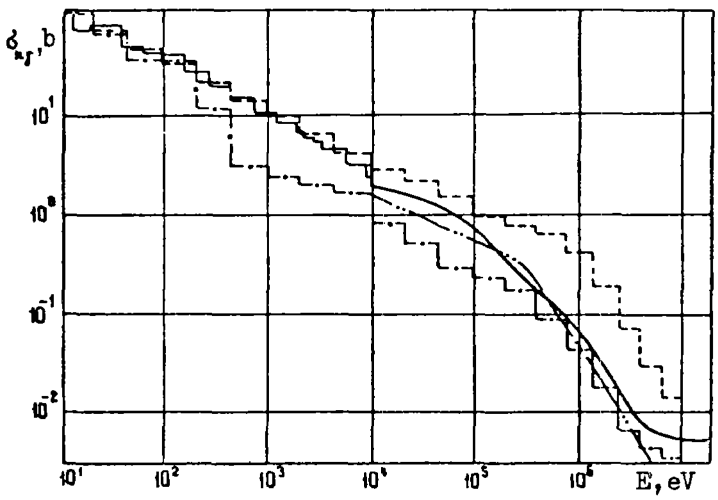


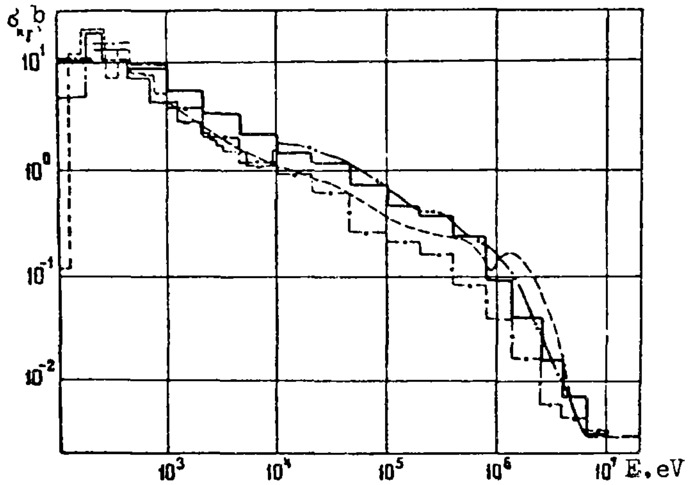
Fig. 3 Radiative capture cross-section of ^{241}Am

Data: ——[19]; – – – – ENDF/B-IV(1966); ● – L.Weston e.a.(1975); —·— – ENDL-76 (1977); —··—[22]; —— -HEDL (1977)



<u>Fig. 4</u> Radiative capture cross-section of ^{243}Am

Data: —··— - ENDF/B-IV (1967); —·— - ENDL-76 (1975); – – – - [17]; —- HEDL (1977)



<u>Fig. 5</u> Radiative capture cross-section of ^{244}Cm

Data: ——— - [17] ; —·— - ENDL-76 (1975); – – – - [22]; —··— - HEDL (1977)