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Fission Product Fast Reactor Constants System of JNDC



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# Fission Product Fast Reactor Constants System of JNDC

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# Abstract

The Fission Product Fast Reactor Constants System of JNDC has been developed for providing the FP group constants set rather automatically from the Japanese Evaluated Nuclear Data Library (JENDL). In the present version, the evaluation by JNDC was adopted for the 28 important nuclides and the evaluation by Cook was supplementally used for the other nuclides to obtain the lumped group constants.

The burn-up time dependence of the lumped constants were examined. The change of capture cross sections are about 5% between 60 days and 720 days of burn-up for any type of fast reactors. The 28 important nuclides take more than 80% of total capture by fission products and cover 40% of elastic scattering and 60% of inelastic scattering.

The JNDC FP lumped constants were compared with those based on Cook's evaluation and on the ENDF/B-4. The discrepancies among the three are 15% for capture and 10% for both of elastic and inelastic scattering.

A benchmark test was performed using the integral measurements made in RCN, Petten, the Netherlands, in order to check the reliability of the JNDC FP group constants. The JNDC constants give better agreements than the Cook and ENDF/B-4 constants with the experiments both for FP mixtures and for separated isotopes.

# JNDC-FP 高速炉定数システム

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### 要 旨

シグマ委員会 (JNDC) で評価され, JENDL (Japanese Evaluated Nuclear Data Library) に収納され た FP 核データから,半自動的に FP 炉定数を作成するシステムを開発し, JNDC-FP 高速炉定数シス テムと命名した. 今回は, 重要 28 核種に対して JNDC の評価値を, その他の核種に対しては Cook の評価値を用いて, ランプ化定数を作成した.

ランプ化定数の燃焼度依存性を調べた結果, 捕獲断面積の変化は, 60 日から 720 日の間で約 5% で あった. 重要 28 核種のランプ化定数への寄与は, 捕獲, 弾性散乱, 非弾性散乱に対して, それぞれ 80%, 40%, 60% である. 今回の定数を, ENDF/B-4 や Cook の評価値によるものと比較すると, 捕 獲で 15%, 弾性・非弾性散乱で 10% 程度の不一致が見られた.

今回の定数の信頼性を確認するために、オランダの Petten 研究所で測定された積分実験値を用いて、ベンチマークテストを行なった.その結果、今回の定数は、ENDF/B-4 や Cook による定数より、実験値を良好に再現できる事が判明した.

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# 1. Introduction

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Effects of fission products (FP) have an important role in predicting long term characteristics of fast reactors. When the JAERI-Fast set<sup>1,2)</sup> was produced in 1969, however, no evaluated FP data were available in Japan and rather old values in the ABBN-set<sup>3)</sup> were temporarily adopted. Since then several evaluations<sup>4-9)</sup> have been carried out in other countries. However, there exist considerable discrepancies among them, since most of FP nuclides are radioactive and therefore their experimental data are generally scarce. It is difficult to select the most reliable set among them, because the details of these evaluations are not known for us. Hence it has been much required to evaluate FP nuclear data by ourselves.

Under this situation, the Japanese Nuclear Data Committee started evaluation of FP nuclear data in 1970. At the first stage 28 nuclides were selected as important ones because of their large macroscopic cross sections in the equilibrium core of typical fast reactors, and main efforts were devoted to evaluation of these nuclides.

Preliminary results of this work<sup>10)</sup> were released in 1973. A set of group constants of JAERI-Fast set type was produced and various tests were performed.<sup>11,12)</sup> It was pointed out from these tests that the capture cross sections were too high in this preliminary version. This may be caused partly by negligence of the Porter-Thomas fluctuation of neutron width and partly by applying the statistical model in the energy range down to 100 eV where the resonance structure cannot be neglected. Bearing in mind these drawbacks in the preliminary evaluation, a revision work was carried out on the 28 important nuclides using a more sophisticated model and taking accout of the resonance structure. The revised version<sup>13)</sup> of evaluation was released early in 1975. The group constants were also revised with these new data. This report concerns the revised version of JNDC FP group constants.

As widely known, the group constants of individual FP nuclides are not generally used in actual reactor calculations, and they must be lumped to the constants of a few pseudo FP nuclides by using their concentrations as weights. Though the present 28 important FP nuclides cover more than 80% of total capture by fission products, the number of 28 is not sufficient to produce the lumped group constants. On the other hand, we already have group constants of 192 FP nuclides<sup>14)</sup> based on evaluated data by Cook<sup>6)</sup>. These constants of 192 nuclides were used supplementally in producing the lumped cross sections.

Evaluation of another 68 FP nuclides are now in progress by JNDC, and the group constants of these nuclides must be produced in future. Considering such a situation, we have developed a system in which the lumped group constants can be produced rather automatically from the evaluated cross sections of the ENDF/B format. This system is named as JNDC FP Fast Reactor Constants System. Detailed description of the system is given in Chapter 2.

In Chapter 3 some problems are discussed concerning the JNDC group constants. Burn-up time dependence of the lumped cross sections is examined for two typical fast reactors. The JNDC group constants are compared with various other sets. Contribution of the 28 nuclides is discussed to capture, elastic scattering and inelastic scattering by fission products.

The JNDC group constants were tested by the use of integral measurements performed at the STEK facility in RCN, Petten, the Netherlands, with which they adjusted their FP group constants<sup>15,16</sup>). Central reactivity worths were calculated with the JNDC constants for three FP mixture samples and for some separated isotope samples. The calculated results were compared with the experimental ones. The applicability of the JNDC constants was thus proved to be excellent. The discussion is given in Chapter 4.

The group constants of the 28 nuclides are tabulated in Appendix 1. The lumped constants at burn-up of 360 days are given in Appendix 2 and the concentrations of each nuclide are given in Appendix 3 at various burn-up stages. User's guides to drive the JNDC FP Fast Reactor Constants System are given in Appendix 4.

# 2. JNDC FP Fast Reactor Constants System

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#### 2.1 General Description

A block diagram of the system is shown in **Fig. 1**. The process codes UKTOA, COMPLE-TION, REPLACE, FPYD and FPLUMP were developed for the present purpose. On the other hand, the codes PROF-GROUCH-G-II<sup>17</sup>, PROF-GROUCH-G<sup>18</sup> and FP-S<sup>19</sup> were already developed for more general purposes and only subsystems of these codes are used in the present system.

The evaluated data by JNDC are stored in the JENDL-1 (the Japanese Evaluated Nuclear Data Library Version 1) with the ENDF/B-4 format. The 28 important nuclides are:

<sup>90</sup>Sr, <sup>93</sup>Zr, <sup>95</sup>Mo, <sup>97</sup>Mo, <sup>99</sup>Tc, <sup>101</sup>Ru, <sup>102</sup>Ru, <sup>104</sup>Ru, <sup>106</sup>Ru, <sup>103</sup>Rh, <sup>105</sup>Pd, <sup>107</sup>Pd, <sup>109</sup>Ag, <sup>129</sup>I, <sup>131</sup>Xe, <sup>133</sup>Cs, <sup>135</sup>Cs, <sup>137</sup>Cs, <sup>144</sup>Ce, <sup>143</sup>Nd, <sup>144</sup>Nd, <sup>145</sup>Nd, <sup>147</sup>Pm, <sup>147</sup>Sm, <sup>149</sup>Sm, <sup>151</sup>Sm, <sup>155</sup>Eu, <sup>155</sup>Eu.

The evaluated quantities are total, elastic scattering, inelastic scattering and capture cross sections, the angular distribution of elastically scattered neutrons and the energy distribution of inelastically scattered neutrons. These data are processed with the PROF-GROUCH-G-II<sup>17)</sup> code and multi-group constants of 25 or 70 group structure are produced. They are stored on tapes with the format of the JNDC group constants. The detail of production will be described in section 2.2.

As mentioned in the previous chapter supplemental group constants are required to obtain the lumped constants. We adopted the group constants of 192 FP nuclides based on evaluation by Cook for this purpose. The evaporation model was adopted to estimate the energy distribution of secondary neutrons. After that <sup>82</sup>Se was added to this supplemental library. Detailed description will be given on the supplemental library in section 2.3.

The REPLACE code replaces the group constants in the supplemental library with the JNDC group constants for the 28 nuclides, providing the JNDC FP Fast Reactor Constants Library which consists of the JNDC group constants for the 28 nuclides and of the supplemental ones for the other 165 nuclides. This process will be described in section 2.4.

Concentrations of 193 nuclides are obtained by solving  $\beta$ -decay chains with the independent yield data evaluated by Meek and Rider<sup>20)</sup>. The detail of the calculation will be discussed in section 2.5. The JNDC lumped group constants are finally obtained by the FPLUMP code using the concentrations as weights. The lumped constants will be explained in section 2.6.

Two standard formats are used for storing group constants on magnetic tapes. The format of the JNDC group constants is designed to store the group constants of each nuclide independently. This format is used to store the output of PROF-GROUCH-G-II<sup>17</sup> and the lumped group constants. The detailed description of this format is given in Appendix 4.1. On the other hand, the format of the JNDC FP constants library is designed to store the group constants of the 193 nuclides as a whole. A heading information precedes the group constants of the 193 FP nuclides whose order is fixed in this format. This format is used in the supplemental library and in the JNDC FP Fast Reactor Constants Library. Details are written concerning this format in Appendix 4.2.



Fig. 1 Block diagram of JNDC FP Fast Reactor Constants System.

#### 2.2 Production of Multi-group Constants

A set of group constants of 70 and 25 group structures was produced fully automatically from a nuclear data library of the ENDF/B format by the PROF-GROUCH-G-II<sup>17</sup>) system. The group structures are the same as those of the JAERI-Fast set and are given in TABLE 1.

Only the group constants for an infinitely dilute system were provided, since the resonance self-shielding effects were concluded to be negligible for each FP nuclide. This is based on the following observations :

	70 Group	structure		25 Group structure		
Group number	Upper energy (eV)	Lower energy (eV)	Δu	Group number	Upper energy (eV)	Lower energy (eV)
1	1.05 +7	8.30 +6	0.2351	1	1.05 +7	6.50 +6
2	8.30 +6	6.50 + 6	0.2445	2	6.50 +6	4.00 +6
3	6.50 +6	5.10 +6	0.2426	3	4.00 + 6	2.50 + 6
4	5.10 + 6	4.00 + 6	0.2429	4	2.50 + 6	
р 6	4.00 + 0 3 10 + 6	3.10 + 6 2.50 + 6	0.2549	5	1.40 + 0 8 00 + 5	4.00 + 5
v 7	2.50 + 6	1,90 + 6	0.2744	7	4.00 +5	2.00 +5
8	1.90 +6	1.40 +6	0.3054	8	2.00 +5	1.00 +5
9	1.40 +6	1.10 +6	0.2412	9	1.00 +5	4.65 +4
10	1.10 + 6		0.3185	10	4.65 + 4	2.15 + 4
11	6.00 + 5 6.30 + 5	5.00 + 5	0.2369	12	1.00 + 4	1.00 + 4 4.65 + 3
13	5.00 +5	4.00 +5	0.2231	13	4.65 +3	2.15 +3
14	4.00 +5	3.10 +5	0.2549	14	2.15 +3	1.00 +3
15	3.10 + 5	2.50 + 5	0.2151	15	1.00 +3	4.65 +2
16 17	2.50 + 5 2.00 + 5	2.00 + 5 1 50 + 5	0.2231	16 17	4.65 + 2	2.15 + 2
18	1.50 + 5	1.30 + 5 1.20 + 5	0.2231	18	1.00 + 2	4.65 + 1
19	1.20 +5	1.00 +5	0.1823	19	4.65 +1	2.15 +1
20	1.00 +5	7.73 +4	0.2575	20	2.15 +1	1.00 +1
21	7.73 + 4	5.98 +4	0.2567	21	1.00 +1	4.65
22	5,98 + 4	4.65 + 4 3.60 + 4	0.2510	22	4.65	2.15
24	3.60 + 4	2.78 + 4	0.2585	23	1.00	4.65 -1
25	2.78 +4	2.15 +4	0.2570	25	4.65 -1	2.15 -1
26	2.15 +4	1.66 +4	0.2587	·	<u> </u>	I
27	1,66 + 4	1.29 + 4	0.2522		•	
29	1.23 + 4 1.00 + 4	7.73 + 3	0.2575			
30	7.73 +3	5.98 +3	0.2567			
31	5.98 +3	4.65 +3	0.2516			
32	4.65 +3	3.60 + 3	0.2559			
34	$2.78 \pm 3$	2.16 + 3 2.15 + 3	0.2585			
35	2.15 +3	1.66 + 3	0.2587			
36	1.66 +3	1.29 +3	0.2522			
37	1.29 + 3	1.00 + 3	0.2546			
39	1.00 + 3 7 73 + 2	7.73 + 2 5 98 + 2	0.2575			
40	5.98 + 2	4.65 + 2	0.2516			
41	4.65 +2	3.60 +2	0.2559			
42	3.60 + 2		0.2585			
43 44	2.78 + 2 2 15 $\pm 2$	2.15 + 2 1.66 + 2	0.2570			
45	1.66 + 2	1.29 + 2	0.2522			
46	1.29 +2	1.00 +2	0.2546			
47	1.00 + 2		0.2575			
43	$5.98 \pm 1$	$4.65 \pm 1$	0.2516			
50	4.65 +1	3.60 +1	0.2559			
51	3.60 +1	2.78 +1	0.2585			
52	2.78 +1	2.15 + 1	0.2570			
53 54	2.15 + 1	1.00 + 1 1.29 + 1	0.2522			
55	1.29 + 1	1.00 + 1	0.2546			
56	1.00 +1	7.73	0.2575			
57	7.73	5.98	0.2567			
59	5.98 4.65	4.65	0.2510			
60	3.60	2.78	0.2585			
61	2.78	2.15	0.2570			
62	2.15	1.66	0.2587			
63 64	1,00 1,20	1.29	0.2522			
65	1.00	7.73 -1	0.2575			
66	7.73 -1	5.98 -1	0.2567			
67	5.98 -1	4.65 - 1	0.2516			
68 60	4.65 - 1	3.60 - 1	0.2559			
70	2,78 -1	2.13 - 1 2.15 - 1	0.2570			

5

∆u 0.4796

0.4855

0.4700 0.5798 0.5596 0.6931

0.6931 0.6931 0.7657

0.7714 0.7655 0.7657

0.7714 0.7655 0.7657

0.7714 0.7655 0.7657 0.7714

0.7655 0.7657 0.7714

0.7655

0.7657

0.7714

- 1) About 10% of fissile nuclides disappear with fission at the final stage of burn-up.
- 2) The effective admixture cross section  $(\sigma_0)$  for fissile nuclides is more than 100 barns for a typical fast reactor.
- 3) Therefore the  $\sigma_0$ -value for a pseudo FP nuclide is more than 1,000 barns.
- 4) Any individual FP nuclide has a concentration no higher than 10% of the total.
- 5) Hence the effective admixture cross section is more than 10,000 barns for any individual FP nuclide.

The weighting spectrum is the same as that of the JAERI-Fast set, i.e., assumed to be 1/E spectrum below 1 MeV and to be fission spectrum above 1 MeV as:

$$\phi(E) = A_0 \exp(-E/A_1) \sinh \sqrt{A_2 \times E},$$

6

where  $A_0$ ,  $A_1$  and  $A_2$  are  $4.84 \times 10^{-7}$ ,  $1 \times 10^6$  eV and  $2 \times 10^{-6}$  eV<sup>-1</sup> respectively, and energy is in eV unit.

The elastic removal cross sections and the average value of the cosine of the angle in elastic scattering were calculated with the angular distribution of elastically scattered neutrons stored in file 4 of JENDL-1. The transfer matrices due to inelastic scattering were calculated with the angular and energy distribution of scattered neutrons.

Detailed description of the PROF-GROUCH-G-II system is given in Appendix 4.1, where input specifications are described with examples of input data preparation as well as the job





control language list. Here only the general function will be described.

For production of FP group constants, only a subsystem of the PROF-GROUCH-G-II is used. The process flow is shown in **Fig. 2**. The process is divided into the following three steps : 1) Multi-group constants production

- Multi-group constants of a fine group structure (70 for the present case) are produced by the subcode SPTG4Z2T from a nuclear data library with the ENDF/B format (up to version 4). The produced group constants are stored under binary form in a specified file.
- 2) Collapsing of the group constants

The group constants obtained in the foregoing step are collapsed into a coarse group structure (25 for the present case) in this step with the subcode XTABZ2. These constants of two group structures are stored in separated files with the standard format of the JNDC group constants. A tabulated list of the group constants is also obtained in this step.

3) Editing of the group constants on a tape

It is often impossible to process all the nuclides at one time because of limit in computing time. In such a case, processing is performed in parts, resulting in more than one output file from XTABZ2 for the same group structure. In this step, the data in several files are combined and stored in one file for each group structure by the subcode LISTA.

### 2.3 Supplemental Group Constants Library

Supplemental group constants are required in order to obtain the lumped group constants. We have already had a set of constants for 192 FP nuclides<sup>14</sup>) based on the evaluation by Cook<sup>6</sup>), and have performed various tests concerning behaviors of the lumped group cross sections<sup>11,14</sup>). Hence this set was adopted as the supplemental library. Some drawbacks were pointed out<sup>14,21</sup> for Cook's evaluation especially on inconsistencies between the resonance and the smooth cross section. Nevertheless the errors in the supplemental library affect little the lumped constants, since more than 80% of total capture is due to the 28 important nuclides. <sup>82</sup>Se, which has a considerable yield, was not contained in Cook's evaluation. The capture cross section was taken from the 1968 UKNDL<sup>22</sup>, and the elastic and inelastic scattering cross sections were assumed to be the same as those of <sup>82</sup>Kr.

The reactions evaluated by Cook are the total, elastic scattering, nonelastic, total inelastic, capture and transport cross sections. Neither angular distribution nor energy distribution of the scattered neutrons was given by Cook. Then the following ad hoc evaluation was carried out<sup>14)</sup>.

- 1) As to the average value of the cosine of the angle for elastically scattered neutrons  $(\mu_L)$ , we assumed them to be 2/3A instead of using the transport cross sections evaluated by Cook.
- 2) The elastic removal cross section  $(\sigma_{el,r})$  was calculated as

$$\sigma_{el.r} = \sigma_{el} \times \frac{\xi}{\Delta u}$$

where  $\sigma_{el}$  is the elastic scattering cross section,  $\Delta u$  the lethargy width of the group and  $\xi$  the mean lethargy gain due to one event of elastic scattering.

3) As to the inelastic matrices, the energy distribution of the scattered neutrons was estimated with the evaporation model as

$$F(E)dE = \frac{E}{T^2} \exp(-E/T)dE,$$

where the nuclear temperature (T) was assumed to be the same for all the nuclides and was determined to be 0.638 MeV with averaging the recommended values by Gilbert and Cameron<sup>23)</sup>.

The actual process is as follows: Cook's evaluated data were sent from CCDN with the UKNDL format in 1971. At that time a multi-group constants production code in JAERI could treat only the ENDF/A format. Therefore the UKNDL format was converted to the ENDF/A format with a small program UKTOA. Then the PROF-GROUCH-G<sup>18</sup> code produced the group constants. The COMPLETION code added  $\mu_L$ , the elastic removal cross sections and the inelastic matrices, and stored the data with the format of the JNDC FP constants library on a magnetic tape as a multi-file, providing the complete supplemental library.

#### 2.4 JNDC FP Fast Reactor Constants Library

The JNDC FP Fast Reactor Constants Library is a complete library containing the group constants of 193 nuclides and will be released to users as the standard FP group constants library in Japan. This library consists of the constants based on evaluation by JNDC for the 28 important nuclides and of the constants contained in the supplemental library for the other 165 nuclides. The REPLACE code has a function to replace the constants of specified nuclides on the library by the corresponding new group constants.

The data are stored in a BCD card image format as a multi-file; the first file contains the constants of 25 group structure and the second file contains those of 70 group structure. The library consists of a heading information and 193 sets of material data. The heading information consists of control data, a label of the library, comments, group structure, weighting flux for collapsing and a list of the materials. The material data consist of asterisks for material separation, material identification and control data as well as the group constants. The format is described in Appendix 4.2 in detail.

#### 2.5 Concentrations

The concentration of each FP nuclide depends not only on its fission yield but also on the burn-up or cooling time, since most of FP nuclides are radioactive and transform themselves through  $\beta$ -decays. Therefore it is necessary to solve  $\beta$ -decay chains so as to obtain the concentrations at various burn-up time stages. The  $\beta$ -decay chains are solved with the FP-S code<sup>19</sup>. The transfer to another  $\beta$ -decay chain by neutron capture reaction was proved<sup>12</sup> to be very small under normal conditions of fast reactors and therefore was neglected in the present work.

The fission yield data were taken from the recommendation by Meek and Rider<sup>20)</sup>. A total of 123  $\beta$ -decay chains was solved in the present calculation and the concentrations of 427 FP nuclides were obtained. The FPYD code renormalizes the output of the FP-S code and calculates the concentrations of 193 nuclides. In the FPYD code, the concentration of a nuclide other than the 193 nuclides was added to that of the daughter nuclide in the  $\beta$ -decay chain. The error of this approximation is expected to be small, for such nuclides other than the 193 are short-lived and their concentrations are small. Sum of the concentrations of the 193 nuclides is normalized to two. The detail of the FP-S and FPYD codes is given in Appendix 4.3.

#### 2.6 Lumped Group Constants

The group constants in the JNDC FP Fast Reactor Constants Library were lumped to those of a pseudo FP nuclide with the FPLUMP code by using the concentrations as weights. The average cosine of the angle in elastic scattering  $(\bar{\mu}_L)$  is lumped as

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where  $y_i$  is the concentration,  $\sigma_{el}^i$  the elastic scattering cross section and  $\mu_L^i$  the average cosine, respectively, for nuclide *i*.

It should be noted that the lumped cross section is microscopic cross section of fission products per one fission event, as the concentrations are normalized to two. Therefore a pseudo fission product has a mass and cross sections almost twice as much as the individual FP nuclide has.

Three types of the lumped constants were produced, corresponding to the fission products due to <sup>239</sup>Pu fission with thermal neutrons, to <sup>235</sup>U fission with thermal neutrons and to <sup>238</sup>U fission with fission spectrum neutrons. We calculated each of them for burn-up of 1, 30, 60, 180, 360 and 720 days. The lumped constants at 360 days of burn-up are tabulated in Appendix 2. The lumped group constants are stored on a tape as a multi-file system. The standard format of the JNDC group constants were used, since a set of the lumped constants is treated as that of a nuclide.

It is also possible to lump the JNDC FP Fast Reactor Constants Library with an arbitrary set of concentrations. In such a case, the concentrations must be given as card input. The detail of FPLUMP is described in Appendix 4.4.

# 3. JNDC FP Group Constants Set

In this chapter we discuss problems concerning lumping, and compare the JNDC FP group constants set with some constants sets based on other evaluations. Hereafter an abbreviated name of the JNDC set will be used including both the JNDC FP Fast Reactor Constants Library and the JNDC FP Lumped Constants. Brief descriptions are given here concerning the other FP group constants sets.

- Cook set<sup>14</sup>; using Cook's evaluation<sup>6</sup> for all the 192 nuclides.
- JNDC-P set<sup>12</sup>; using the preliminary evaluation<sup>10</sup> by JNDC for the 28 nuclides.
- ENDF/B-4 set; using data in the ENDF/B-4<sup>8)</sup> for 163 nuclides. This set was obtained by the use of the present system.
- ABBN-set<sup>3)</sup>; the 25 group cross sections in the ABBN set. They are given only as the lumped FP constants due to fission of <sup>233</sup>U, <sup>235</sup>U and <sup>239</sup>Pu.
- RCN-set<sup>9)</sup>; the 25 group cross sections evaluated at RCN, Petten, the Netherlands. This set is compared in limited cases, since only capture cross sections are available and their weighting spectrum is different from ours.

Benzi's evaluation<sup>4,5)</sup> was ignored in this report, as his evaluation is limited to the energy range above 1 keV.

### 3.1 Burn-up Time Dependence

As mentioned before, the lumped group constants depend on burn-up and cooling time. Therefore we produced the constants at various burn-up time steps. It is not easy task, however, to change the lumped constants according to the burn-up time step in an actual calculation. In this section, the burn-up time dependence is examined for the lumped constants and the errors are estimated if the time dependence is neglected.

To make the comparison easier, the group constants are collapsed to one group with neutron spectra of two typical fast reactors, i.e., an experimental reactor of JOYO class and a large commercial reactor of 1000 MWe. The spectra are shown in TABLE 2 and the collapsed group cross sections are given for various burn-up time stages in TABLE 3. It is known from TABLE 3 that the time dependence is the largest for capture, smaller for inelastic scattering and negligible for elastic scattering.

To make the burn-up time dependence clearer, the cross sections are normalized to those at 360 days, for the one-group cross sections depend on the collapsing spectra and on the mother nuclide from which fission products are born. The normalized capture and inelastic scattering cross sections are shown for two spectra in Fig. 3 and for two mother nuclides in Fig. 4. It was found that the cross sections varried considerably between 1 day and 60 days, during which effects of fission products are small because of their rather small number densities. After that, the changes are about 5% for capture and less than 1.5% for inelastic scattering until 720 days of burn-up. It was also found that the burn-up time dependence was much affected neither by the spectra nor by the mother nuclides.

The burn-up time dependence are examined with various sets. The one group capture cross sections are shown in Fig. 5. The same tendencies are observed for all the sets.

The disagreements of cross section value are, however, much larger among the sets than the

Group	A commercial FBR with 1000 MWe	An EFBR of JOYO class
1	1.6608 -3	2.5700 -3
2	8.7706 -3	1.5370 - 2
3	2.3138 -2	3.9090 -2
4	4.6475 -2	8.6470 -2
5	7.1985 -2	1.0418 -1
6	9.8439 -2	1.7831 —1
7	1,5100 —1	1.7483 -1
8	1.5240 - 1	1.5312 -1
9	1.5202 -1	1.0919 - 1
10	1.2448 -1	6.7980 -2
11	7.2622 - 2	3.9160 $-2$
12	3. 6823 -2	1.5560 - 2
13	2.0977 -2	5.0600 - 3
14	2. 2819 -2	6. 4300 -3
15	1.0795 -2	2.0500 - 3
16	4. 1293 - 3	5. 2000 $-4$
17	1.1887 —3	1.00004
18	2. 3320 -4	1.0000 - 5
19	4.5502 -5	0.
20	5. 6878 -6	0.
21	0.	0.
22	0,	0.
23	0.	0.
24	0.	0.
25	0.	0.
Sum	1.0	1.0

TABLE 2 25 group spectra of two typical fast reactor

TABLE 3 One group lumped cross sections at various burn-up stages FP due to fission of  $^{239}$ Pu with thermal neutrons

Burn-up	$\sigma_{\epsilon}$ (barn)		σei	(barn)	$\sigma_{in}$ (barn)	
(days)	A	В	A	В	A	В
1	0. 385	0. 195	16. 11	14. 28	0. 506	0. 845
30	0. 531	0. 273	15. 91	14. 07	0. 541	0. 886
60	0. 545	0. 281	15. 89	14. 02	0. 545	0. 891
180	0. 560	0. 290	15. 88	13. 98	0. 551	0. 899
360	0. 567	0. 295	15. 90	13. 98	0. 554	0. 903
720	0. 575	0. 297	15. 92	13. 97	0. 554	0. 904

FP due to fission of  $^{235}U$  with thermal neutrons

Burn-up	$\sigma_c$ (barn)		σει	(barn)	$\sigma_{in}$ (barn)	
(days)	A	В	A	В	А	В
1	0.284	0.139	16.46	14. 51	0.456	0. 763
30	0.399	0.199	16.24	14.28	0.480	0.791
60	0.411	0.205	16.19	14.22	0.483	0.793
180	0.424	0.213	16.18	14.18	0.486	0.798
360	0.430	0. 217	16.21	14.18	0.489	0.801
720	0. 435	0. 220	16.26	14. 18	0.490	0.803

FP due to fission of <sup>238</sup>U with fission spectrum neutrons

Burn-up	$\sigma_e$ (barn)		(Tel	(barn)	$\sigma_{in}$ (barn)	
(days)	А	В	А	В	А	В
1 30 60 180 360	0. 373 0. 511 0. 525 0. 541 0. 549	0. 186 0. 258 0. 266 0. 276 0. 280	16. 33 16. 13 16. 09 16. 08 16. 10	14. 42 14. 19 14. 14 14. 10 14. 10	0. 492 0. 526 0. 530 0. 535 0. 538	0.822 0.860 0.864 0.872 0.875
720	0. 554	0. 283	16.14	14.10	0. 539	0.876

 $\boldsymbol{A}:$  Collapsed with the spectrum of 1000 MWe FBR.

B: Collapsed with the spectrum of JOYO class FBR.















Fig. 5 Burn-up time dependence of one group capture cross sections of FP due to <sup>239</sup>Pu fission collapsed with the spectrum of 1000 MWe FBR.

change due to burn-up time dependence.

On the other hand, the lumped cross sections are expected to decrease a little according to burn-up, if it is taken into consideration that some gaseous fission products may leak from fuel pellets to plenums. This effect was discussed in our previous work<sup>11,12)</sup> and was found to compensate considerably the burn-up time dependence presently discussed.

It could be concluded from the above observations that the errors caused by negligence of the burn-up time dependence are not significant, considering the uncertainties of evaluated data and the errors resulting from other origins. Hence the lumped constants at 360 days will be mainly discussed hereafter. It should be noted that the burn-up time dependence is not affected by the flux density of reactors, since the effect of neutron capture was proved<sup>12</sup>) to be negligible on the concentration of each fission product.

#### 3.2 Contribution of 28 Nuclides in Lumped Cross Sections

Contributions of the 28 nuclides in the lumped cross sections were evaluated in order to confirm the importance of these 28 nuclides. TABLE 4 shows the contributions to total capture, to total elastic scattering and to total inelastic scattering at burn-up of 360 days. It is clearly shown that the 28 nuclides cover more than 80% of total capture by FP for all the cases, while their contributions to elastic and inelastic scattering are about 45% and 60% respectively. The contributions of the individual nuclides are given in TABLES 5.1 to 5.3 for the 1000 MWe FBR. The present selection of the important nuclides are proved to be reasonable, though some nuclides such as <sup>90</sup>Sr, <sup>106</sup>Ru, <sup>137</sup>Cs, <sup>144</sup>Ce and <sup>144</sup>Nd have rather minor role for capture.

Considering the contributions of the other nuclides in TABLES 5.1 to 5.3, JNDC selected the following 68 nuclides as the secondarily important ones and their evaluation is now in progress:

<sup>81</sup>Br, <sup>82</sup>Se, <sup>83</sup>Kr, <sup>84</sup>Kr, <sup>85</sup>Kr, <sup>86</sup>Kr, <sup>85</sup>Rb, <sup>87</sup>Rb, <sup>88</sup>Sr, <sup>89</sup>Sr, <sup>89</sup>Sr, <sup>89</sup>Y, <sup>91</sup>Y, <sup>91</sup>Zr, <sup>92</sup>Zr, <sup>94</sup>Zr, <sup>95</sup>Zr, <sup>96</sup>Zr, <sup>95</sup>Nb, <sup>96</sup>Mo, <sup>98</sup>Mo, <sup>100</sup>Mo, <sup>100</sup>Ru, <sup>103</sup>Ru, <sup>105</sup>Rh, <sup>104</sup>Pd, <sup>106</sup>Pd, <sup>108</sup>Pd, <sup>110</sup>Pd, <sup>110m</sup>Ag, <sup>110</sup>Cd, <sup>111</sup>Cd, <sup>112</sup>Cd, <sup>113</sup>Cd, <sup>127m</sup>Te, <sup>128</sup>Te, <sup>129m</sup>Te, <sup>130</sup>Te, <sup>127</sup>I, <sup>131</sup>I, <sup>132</sup>Xe, <sup>133</sup>Xe, <sup>134</sup>Xe, <sup>135</sup>Xe, <sup>136</sup>Xe, <sup>134</sup>Cs, <sup>138</sup>Ba, <sup>140</sup>Ba, <sup>139</sup>La, <sup>140</sup>Ce, <sup>141</sup>Ce, <sup>142</sup>Ce, <sup>141</sup>Pr, <sup>143</sup>Pr, <sup>142</sup>Nd, <sup>146</sup>Nd, <sup>147</sup>Nd, <sup>148</sup>Nd, <sup>150</sup>Nd, <sup>148</sup>Pm, <sup>148m</sup>Pm, <sup>148</sup>Sm, <sup>150</sup>Sm, <sup>152</sup>Sm, <sup>154</sup>Sm, <sup>154</sup>Eu, <sup>155</sup>Gd, <sup>156</sup>Gd, <sup>157</sup>Gd.

Their evaluation will be completed early in 1977. The group constants will be easily produced with the present system. Adding these 68 nuclides to the 28, more than 98% will be covered for all the types of reaction.

Mother nuclide	Reaction	1000 MWe FBR (%)	JOYO class (%)
	σε	83.3	84. 5
<sup>239</sup> Pu	Jel	46.5	46.8
	σ <sub>in</sub>	64. 9	62.6
	σε	80.4	81, 2
-235U	Jei	40.3	40.0
	σιπ	57.1	55. 3
· · · · · · · · · · · · · · · · · · ·	σε	82.0	82.9
<sup>238</sup> U	Oet	44.4	44. 5
	σin	62.4	60.7

TABLE 4 Contribution of the 28 nuclides at 360 days of burn-up

TABLE 5.1 Contribution of the individual FP nuclides to total capture

NUCLIDE         1-6.C.S.* (GARN)         CONCENTRATION         ACCUMLTD (%)         ACCUMLTD (%)           1 RU101 *         0.75890E+00         0.60539E-01         0.80960E+01         0.80960E+01         0.80960E+01           2 PD105 *         0.60738E+00         0.58825E-01         0.76353E+01         0.75396E+01         0.23042E+02           3 RH103 *         0.70516E+00         0.66735E-01         0.76353E+01         0.23042E+02           4 CC 9 *         0.758476E+00         0.66848E-01         0.63337E+01         0.23948E+02           6 SM149 *         0.23668E+01         0.12365E-01         0.7337E+01         0.4117E+02           7 PD107 *         0.60019E+00         0.5076E-01         0.39395E+01         0.51673E+01         0.43385E+02           8 CS135 *         0.921708E+00         0.5576E-01         0.3945E+01         0.51675E+02           10 MO 97 *         0.34950E+00         0.5576E-01         0.23945E+01         0.52758E+02           11 SM151 *         0.24773E+00         0.6202E-01         0.25748E+01         0.62758E+02           12 ND144 *         0.41840E+00         0.61022E-01         0.25442E+01         0.7091E+02           15 ND145 *         0.4310E+00         0.3022E+01         0.75555E+01         0.25542E+01         0.75697E+	PU-239 (THERMAL)	, E	SURN-UP	360 DAYS		
$ \begin{array}{c} 1 & \text{RU101} * & 0.758^{9}0E+00 & 0.60539E-01 & 0.80960E+01 & 0.80960E+01 \\ 2 & \text{PO105} * & 0.80738E+00 & 0.53673E-01 & 0.75363E+01 & 0.57372E+02 \\ 3 & \text{RT103} * & 0.70516E+00 & 0.63753E-01 & 0.66137E+01 & 0.29656E+02 \\ 5 & \text{C5133} * & 0.53767E+00 & 0.6638E-01 & 0.6137E+01 & 0.29656E+02 \\ 2 & \text{C5133} * & 0.53767E+00 & 0.6384E-01 & 0.6337E+01 & 0.43937E+02 \\ 8 & \text{C5135} * & 0.32120E+00 & 0.72209E-01 & 0.40872E+01 & 0.43937E+02 \\ 9 & \text{PM147} * & 0.12713E+01 & 0.16502E-01 & 0.3995E+01 & 0.5562E+02 \\ 1 & \text{SM151} * & 0.24773E+01 & 0.16502E-01 & 0.3995E+01 & 0.5562E+02 \\ 1 & \text{SM151} * & 0.24773E+01 & 0.76035E-02 & 0.33932E+01 & 0.6562E+02 \\ 1 & \text{SM151} * & 0.24773E+01 & 0.76035E-02 & 0.33932E+01 & 0.6562E+02 \\ 1 & \text{SM151} * & 0.24773E+01 & 0.76035E-02 & 0.33932E+01 & 0.6572E+02 \\ 1 & \text{SM151} * & 0.24773E+00 & 0.51746E-01 & 0.22774E+00 \\ 0 & \text{O} 77 & 0.34931E+00 & 0.3202E-01 & 0.22974E+01 & 0.7796E+02 \\ 1 & \text{RU104} * & 0.34981E+00 & 0.30202E-01 & 0.22948E+01 & 0.770976E+02 \\ 1 & \text{RU104} * & 0.18640E+00 & 0.3799E-01 & 0.21554E+01 & 0.7224FE+02 \\ 1 & \text{RU104} * & 0.18640E+00 & 0.3799E-01 & 0.19911E+01 & 0.74237E+00 \\ 2 & \text{RU104} * & 0.18160E+00 & 0.52148E-01 & 0.17308E+01 & 0.76091E+02 \\ 1 & \text{RU104} * & 0.18640E+00 & 0.52148E-01 & 0.17308E+01 & 0.76091E+02 \\ 2 & \text{RU104} * & 0.18160E+00 & 0.52214E-01 & 0.14432E+01 & 0.71237E+02 \\ 2 & \text{M0} 98 & 0.1815E+00 & 0.7189E-01 & 0.18254E+01 & 0.77427E+02 \\ 2 & \text{M141} & 0.15732E+00 & 0.52214E-01 & 0.14475E+01 & 0.78237E+02 \\ 2 & \text{M152} & 0.23751E+00 & 0.52214E-01 & 0.14475E+01 & 0.78237E+02 \\ 2 & \text{M152} & 0.6376E+00 & 0.5679E-01 & 0.19392E+01 & 0.78392E+02 \\ 2 & \text{M152} & 0.6376E+00 & 0.5679E-01 & 0.19352E+01 & 0.7874E+02 \\ 2 & \text{M143} & 0.5392E+00 & 0.1677E-02 & 0.7933E+00 & 0.88516E+02 \\ 2 & \text{M154} & 0.4362E+00 & 0.51090E-01 & 0.13052E+01 & 0.88616E+02 \\ 2 & \text{M144} & 0.5969E-01 & 0.57647E-02 & 0.7933E+00 & 0.9377E+02 \\ 2 & \text{M152} & 0.6372E+00 & 0.57647E-01 & 0.22641E+00 & 0.93376E+02 \\ 2 & \text{M144} & 0.5969E-01 & 0.2315E-01 & 0.22641E+00 & 0.93376E$	NUCLIDE	1-G.C.S.* (BARN)	CONCI	ENTRATION**	CONTRIBUTION	ACCUMLTD
2 PD105 * 0,80738E+00 0,53673E-01 0,75363E+01 0,25042E+02 3 RH103 * 0,70516E+00 0,68825E-01 0,66137E+01 0,29656E+02 5 CS133 * 0,53767E+00 0,66348E-01 0,6337E+01 0,41147E+02 7 PD107 * 0,80019E+00 0,30046E-01 0,42367E+01 0,45383E+02 8 CS135 * 0,32120E+00 0,72209E-01 0,4087E+01 0,45383E+02 9 PM147 * 0,12713E+01 0,16502E-01 0,39668E+01 0,53167E+02 10 M0 97 * 0,34530E+00 0,5766E+01 0,3395E+01 0,56562E+02 13 ND151 * 0,24773E+01 0,76035E-02 0,33192E+01 0,56562E+02 13 ND143 * 0,34531E+00 0,57693E+01 0,28770E+01 0,56582E+02 13 ND143 * 0,34931E+00 0,61012E+01 0,227445E+01 0,55381E+02 14 RU102 * 0,22743E+00 0,61012E+01 0,224452E+01 0,65735E+02 15 ND145 * 0,43110E+00 0,30202E-01 0,22944E+01 0,65735E+02 16 AG109 * 0,88640E+00 0,51698E+01 0,21554E+01 0,76091E+02 17 RU104 * 0,27556E+01 0,38187E+02 0,18543E+01 0,76091E+02 18 EU153 * 0,27556E+01 0,38187E+02 0,18543E+01 0,76091E+02 20 M0 95 & 0,32761E+00 0,5128E+01 0,18543E+01 0,76091E+02 21 M0 98 0,18135E+00 0,516882=01 0,14305E+01 0,77691E+02 21 M0 98 0,18135E+00 0,2981E+01 0,18256E+01 0,77091E+02 22 PK141 0,15732E+00 0,5224E+01 0,14305E+01 0,77091E+02 23 M0100 0,11724E+00 0,36878E+01 0,14305E+01 0,76091E+02 24 ZR 93 + 0,20895E+00 0,36879E+01 0,14305E+01 0,83576E+02 24 ZR 93 + 0,20895E+00 0,36879E+01 0,14305E+01 0,83597E+02 25 SM150 0,6836E+00 0,11072E+01 0,14230E+01 0,83597E+02 26 XE132 0,11496E+00 0,51090E+01 0,1254E+01 0,86597E+02 27 RU103 0,50432E+00 0,11725E+01 0,3825E+01 0,8639E+02 28 EU155 * 0,24992E+01 0,17251E=02 0,75973E+00 0,9376E+02 29 SM150 0,6836E+00 0,11072E+01 0,94804E+00 0,86597E+02 20 ND148 0,23712E+00 0,5215E=01 0,5264E+01 0,8639E+02 20 SM147 * 0,14251E+01 0,52545E+01 0,5264E+01 0,86597E+02 23 SM147 * 0,14251E+01 0,52545E+01 0,5264E+00 0,9338E+02 24 RU106 * 0,9469E+01 0,52545E+01 0,5264E+00 0,9338E+02 25 SM154 0,16376E+00 0,53545E+01 0,5264E+00 0,9338E+02 26 ZR 91 0,10037E+00 0,126315E+00 0,5264E+00 0,9338E+02 27 SM144 * 0,9699E+01 0,22635E+02 0,22748E+00 0,9338E+02 27 SM144 * 0,9699E+01 0,226487E+01 0,22748E+00 0,9535E+02	1 RU101 *	0.758908+00	0,60	)539E-01	0,80960E+01	0,80960E+01
3 RH103 *       0,705162+00       0,5825E-01       0,730962+01       0,230422+02         4 TC 99 *       0,53767E+00       0,66848E-01       0,63337E+01       0,3598402         5 C5133 *       0,53767E+00       0,66848E-01       0,63337E+01       0,45984+02         6 SM149 *       0,22566E+02       0,12365E-01       0,42367E+01       0,45382E+02         8 C5135 *       0,32120E+00       0,7229E-01       0,40872E+01       0,45582E+02         10 MO 97 *       0,34930E+00       0,35786E-01       0,33945E+01       0,55786E+02         11 SM151 *       0,24773E+01       0,7693E-02       0,33192E+01       0,55786E+02         12 XE131 *       0,44313E+00       0,42062E+01       0,22742E+01       0,65351E+02         13 ND143 *       0,34930E+00       0,30202E+01       0,2294E+01       0,7090E+02         14 RU102 *       0,42743E+00       0,64982-01       0,21954E+01       0,717917E+02         17 RU104 *       0,48640E+00       0,31799E-01       0,1254E+01       0,77917E+02         18 EU153 *       0,4778E+00       0,6483E+01       0,14842E+01       0,77917E+02         19 MO 98       0,3276E+00       0,6483E+01       0,14842E+01       0,77917E+02         19 MO 98       0,3276E+00	2 PD105 *	0,80738E+00	0,5	3673E-01	0,76363E+01	0,15732E+02
4         TC 99 *         0.58#70E+00         0.66137E+01         0.29656E+02           5         C5133 *         0.23668E+01         0.12365E-01         0.51573E+01         0.41147E+02           7         PP107 *         0.80019E+00         0.7209E-01         0.4037E+01         0.44347E+02           9         PM147 *         0.12713E+01         0.16502E-01         0.39495E+01         0.5562E+02           10         M0 97 *         0.33435E+01         0.5652E+02         0.33192E+01         0.5652E+02           11         SM151 *         0.24773E+01         0.46037E+02         0.33192E+01         0.55351E+02           13         N143 *         0.34981E+00         0.42062E-01         0.22928E+01         0.65351E+02           13         N143 *         0.349451E+00         0.61012E-01         0.244452E+01         0.67736E+02           14         RU102 *         0.22743E+00         0.61012E+01         0.1254E+01         0.72246E+02           16         M619 *         0.4313E+00         0.51879E+01         0.1854E+01         0.74237E+12           17         RU104 *         0.48546E+00         0.64378E+01         0.1854E+01         0.7794FE+02           18         M0.98         0.18115E+00         0.57189E+01 <th>3 RH103 *</th> <th>0,705168+00</th> <th>0,50</th> <th>3825E-01</th> <th>0,73096E+01</th> <th>0.23042E+02</th>	3 RH103 *	0,705168+00	0,50	3825E-01	0,73096E+01	0.23042E+02
5 CS133 *       0.53767E+00       0.66848E-01       0.63337E+01       0.41147E+02         6 SM149 *       0.23668E+01       0.12365E-01       0.42357E+01       0.44147E+02         7 PD107 *       0.60019E+00       0.30046E-01       0.40872E+01       0.44343E+02         8 CS135 *       0.32120E+00       0.3046E-01       0.40872E+01       0.49470E+02         10 M0 97 *       0.34530E+00       0.5576E-01       0.33945E+01       0.5562E+02         11 SM151 *       0.24732E+01       0.6035E-02       0.33192E+01       0.65258E+02         12 XE131 *       0.43313E+00       0.37693E-01       0.28770E+01       0.62758E+02         13 ND143 *       0.43941E+00       0.42062E-01       0.24452E+01       0.67796E+02         14 RU102 *       0.42745E+00       0.61012E-01       0.24452E+01       0.67796E+02         15 ND145 *       0.43100E+00       0.30202E-01       0.2154E+01       0.72091E+02         16 AG109 *       0.48640E+00       0.31799E-01       0.18256E+01       0.76091E+02         17 RU104 *       0.18640E+00       0.57189E+01       0.18256E+01       0.76091E+02         19 M0 98       0.18115E+00       0.57189E+01       0.18256E+01       0.76371E+02         19 M0 98       0.218756E+00<	4 TC 99 *	0.58870E+00	0,6:	3753E-01	0,66137E+01	0,29656E+02
6       SM149       0.32668E+01       0.12365E-01       0.51573E+01       0.41147E+02         7       PD107       0.80019E+00       0.30046E-01       0.42367E+01       0.45383E+02         9       PM147       0.12713E+01       0.16502E+01       0.36968E+01       0.53167E+02         10       M0 97       0.34530E+00       0.55786E+02       0.33192E+01       0.56562E+02         11       SM151       0.24773E+01       0.76035E+02       0.33192E+01       0.56562E+02         13       ND143       0.43313E+00       0.42062E+01       0.28770E+01       0.62758E+02         13       ND143       0.43100E+00       0.30202E+01       0.22944E+01       0.7090E+02         15       ND143       0.43100E+00       0.30202E+01       0.21554E+01       0.77224E+02         16       AG109       0.8860E+00       0.6489E+01       0.1911E+01       0.74237E+02         16       W153       0.27556E+01       0.38187E-02       0.18246E+01       0.77917E+02         17       RU104       0.18680E+00       0.66838E+01       0.14812E+01       0.41297E+02         17       W103       0.27556E+01       0.37197E+01       0.18256E+01       0.77917E+02         20       MO 98	5 CS133 *	0.53767E+00	0,60	5848E-01	0,63337E+01	0,35989E+02
r         pD107         w         0,80519E+00         0,42367E+01         0,42367E+01         0,43382E+02           8         CS135         w         0,32120E+00         0,72209E-01         0,36968E+01         0,49470E+02           9         PM147         w         0,22735E+01         0,16502E+01         0,36968E+01         0,553652E+02           10         MO 97         w         0,34930E+00         0,5766E+02         0,33192E+01         0,56562E+02           12         XE131         w         0,43313E+00         0,61012E+01         0,28770E+01         0,62738E+02           13         ND143         w         0,4310E+00         0,30202E+01         0,22944E+01         0,7090E+02           15         ND145         w         0,43110E+00         0,30202E+01         0,21554E+01         0,74237E+02           16         AG109         w         0,8640E+00         0,13799E+01         0,18256E+01         0,74717E+02           17         RU104         w         0,8640E+00         0,6489E+01         0,14825E+01         0,74717E+02           20         MO 98         0,32756E+00         0,14825E+01         0,74717E+02         0,8377E+02           21         J         J         y         0,49	6 SM149 *	0,23668E+01	0,12	2365E-01	0.51573E+01	0.41147E+02
is $CS_{1}S_{5} *$ $0,32120E+00$ $0,72209E+01$ $0,40872E+01$ $0,49470E+02$ 9PM147 * $0,12713E+01$ $0,16502E+01$ $0,36968E+01$ $0,53167E+02$ 11SM151 * $0.24773E+01$ $0,76035Fe02$ $0,33945E+01$ $0,56562E+02$ 12XE131 * $0.43313E+00$ $0,37693E+01$ $0.25770E+01$ $0.62758E+02$ 13ND143 * $0.43313E+00$ $0,37693E+01$ $0.25928E+01$ $0.63758E+02$ 14RU102 * $0.22743E+00$ $0.61012E+01$ $0.22744E+01$ $0.67796E+02$ 15ND145 * $0.486402+00$ $0.61012E+01$ $0.22744E+01$ $0.72246E+02$ 16AG109 * $0.886402+00$ $0.6489E+01$ $0.18543E+01$ $0.74237E+02$ 17RU104 * $0.18602+00$ $0.67198E+01$ $0.17308E+01$ $0.74246E+02$ 18EU153 * $0.27556E+01$ $0.38187E+02$ $0.18543E+01$ $0.77246E+02$ 20MO 95 * $0.27516E+00$ $0.29981E+01$ $0.14812E+01$ $0.4129E+02$ 21129 * $0.49786E+00$ $0.16835E+01$ $0.14812E+01$ $0.48257E+02$ 22PR141 $0.51722E+00$ $0.37222E+01$ $0.14812E+01$ $0.8399E+02$ 24ZR 93 * $0.22995E+00$ $0.37822E+01$ $0.14832E+01$ $0.83592E+02$ 25SM150 $0.6336E+00$ $0.10025E-01$ $0.1326E+01$ $0.885392E+02$ 25SM152 $0.6336E+00$ $0.51090E-01$ $0.10350E+01$ $0.885392E+02$ 26XE132 $0.1172E+00$ $0.57$	7 PD107 *	0.80019E+00	) მ.30	046E-01	0.42367E+01	0+45383E+02
•         •	8 CS135 *	0.32120E+00	0.72	209E-01	0.40872E+01	0,49470E+02
10       MO       97       #       0.34550E+00       0.55786E+01       0.33192E+01       0.56562E+02         11       SM151       #       0.44313E+00       0.37693E+01       0.28770E+01       0.62758E+02         12       XE131       #       0.43313E+00       0.42062E+01       0.25728E+01       0.66758E+02         13       ND143       #       0.43913E+00       0.42062E+01       0.22944E+01       0.7099E+02         14       RU102       #       0.24743E+00       0.61012E+01       0.22944E+01       0.7099E+02         15       ND145       #       0.48640E+00       0.60489E+01       0.19911E+01       0.74247E+02         17       RU104       #       0.18640E+00       0.60489E+01       0.18543E+01       0.77697E+02         20       MO       98       0.1315E+00       0.5214E+01       0.14812E+01       0.71497E+02         21       1.29       #       0.49786E+00       0.168879E+01       0.14412E+01       0.81129E+02         22       MO100       0.11724E+00       0.68879E+01       0.14230E+01       0.83597E+02         23       MO100       0.51392E+00       0.31922E+01       0.12054E+01       0.86597E+02         24       ZR	9 PM147 *	0.12713E+01	0.10	502E-01	0,36968E+01	0,53167E+02
11       SM151 *       0.2473E+01       0.76035E-02       0.33192E+01       0.59881E+02         12       XE131 *       0.43318E+00       0.37693E-01       0.28770E+01       0.62758E+02         13       ND143 *       0.34981E+00       0.42062E-01       0.25928E+01       0.66756E+02         14       RU102 *       0.22743E+00       0.61012E-01       0.24452E+01       0.67796E+02         15       ND145 *       0.43110E+00       0.30202E-01       0.22944E+01       0.72246E+02         16       AG109 *       0.88640E+00       0.60499E+01       0.195154E+01       0.74237E+02         18       EU153 *       0.27556E+01       0.31817E-02       0.18543E+01       0.77017E+02         20       MO 98       0.18115E+00       0.52981E+01       0.14230E+01       0.7717E+02         21       129 *       0.49786E+00       0.52244E+01       0.14432E+01       0.82576E+02         23       M0100       0.11724E+00       0.68879E+01       0.14230E+01       0.86599E+02         24       R       93 *       0.20895E+00       0.31792E+01       0.85599E+02       0.86577E+02         25       M100       0.11724E+00       0.68879E+01       0.14230E+01       0.86597E+02	10 MO 97 *	0.34530E+00	0.5	5786E-01	0.33945E+01	0,56562E+02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	11 SM151 *	0.24773E+01	0.7	5035E-02	0.33192E+01	0,59881E+02
13         ND143         0.34981£+00         0.42062E-01         0.25928E+01         0.65351E+02           14         RU102         #         0.22743E+00         0.61012E-01         0.2442E+01         0.67796E+02           15         ND145         #         0.43110E+00         0.30202E-01         0.22944E+01         0.7090E+02           16         AG109         #         0.88640E+00         0.6409E-01         0.1954E+01         0.72246E+02           17         RU104         #         0.18640E+00         0.57189E-01         0.18256E+01         0.7791Fe+02           18         EU153         #         0.7256E+01         0.17308E+01         0.77947E+02           20         MO 98         0.18115E+00         0.57189E-01         0.14412E+01         0.47948E+02           21         J 129         #         0.49786E+00         0.68879E-01         0.144732E+01         0.8257E+02           22         PR141         0.51332E+00         0.37822E-01         0.1326E+01         0.85397E+02           24         ZR         93         0.20895E+00         0.1005E-01         0.10350E+01         0.8637E+02           25         M150         0.63366+00         0.10005E-01         0.13050E+01         0.86397E+02	12 XE131 *	0.43313E+00	0.3	7693E-01	0.28770E+01	0.62758E+02
14 $RU102$ 0.22743E+000.61012E-010.24452E+010.67796E+0215ND145*0.43110E+000.30202E-010.22444E+010.70090E+0216AG109*0.88640E+000.60489E-010.121554E+010.72246E+0217RU104*0.18680E+000.60489E-010.1854E+010.77237E+0218EU153*0.27556E+010.38187E-020.1854E+010.77917E+0220M095*0.32761E+000.29981E-010.17308E+010.77944E+0221JJ29*0.49786E+000.58847E+010.14432E+010.8129E+0222PR1410.5732E+000.52214E+010.14432E+010.82576E+0223M01000.11724E+000.68879E+010.12054E+010.82576E+0224ZR93*0.20895E+000.3782E+010.12054E+010.84597E+0225SM1500.68366E+000.110705E+010.10254E+010.86597E+020.75973E+000.88376E+0227RU1030.50432E+000.51090E+010.10254E+010.8616E+020.90081E+0229SM1520.69376E+000.57697E+020.75973E+000.89376E+0229SM1520.69376E+010.58549E+010.58166E+000.91438E+0230ND1480.3212E+000.58549E+010.58166E+000.91343E+0231LA1390.56396E+010.258549E+010.58166E+000.93394E+0232SM1470.14255401	13 ND143 *	0.34981E+00	0.4	2062E-01	0,25928E+01	0+65351E+02
15ND145# $0.43110E+00$ $0.30202E-01$ $0.22944E+01$ $0.70090E+02$ 16AG109# $0.88640E+00$ $0.13799E-01$ $0.21554E+01$ $0.72246E+02$ 17RU104# $0.188640E+00$ $0.60489E+01$ $0.19911E+01$ $0.74237E+02$ 18EU153# $0.27556E+01$ $0.38187E-02$ $0.18543E+01$ $0.76091E+02$ 19MO98 $0.18115E+00$ $0.57189E-01$ $0.18256E+01$ $0.77917E+02$ 20MO95# $0.32761E+00$ $0.29981E+01$ $0.14812E+01$ $0.8129E+02$ 21JJ9 $0.49786E+00$ $0.16883E-01$ $0.14812E+01$ $0.82576E+02$ 23MO100 $0.11724E+00$ $0.52214E+01$ $0.14475E+01$ $0.82576E+02$ 24ZR93 $0.20895E+00$ $0.37822E-01$ $0.13926E+01$ $0.8399E+02$ 25SM150 $0.6836E+00$ $0.10005E-01$ $0.12054E+01$ $0.86597E+02$ 26XE132 $0.11476E+00$ $0.51090E-01$ $0.10350E+01$ $0.8776E+02$ 27RU103 $0.50432E+00$ $0.11072E+01$ $0.98401E+00$ $0.88616E+02$ 29SM152 $0.64376E+00$ $0.57697E+02$ $0.75336E+00$ $0.9376E+02$ 29SM152 $0.64376E+01$ $0.58549E-01$ $0.5804E+00$ $0.9376E+02$ 30ND148 $0.23212E+00$ $0.16625E-01$ $0.68004E+00$ $0.9376E+02$ 31LA139 $0.56396E+01$ $0.25135E+01$ $0.5860E+00$ $0.93292E+00$ <tr< th=""><th>14 RU102 *</th><th>0.22743E+00</th><th>0.6</th><th>L012E-01</th><th>0,24452E+01</th><th>0,677962+02</th></tr<>	14 RU102 *	0.22743E+00	0.6	L012E-01	0,24452E+01	0,677962+02
16AG109 $0.88440E+00$ $0.13799E-01$ $0.21554E+01$ $0.72246E+02$ 17RU104 $0.18640E+00$ $0.60489E-01$ $0.1991E+01$ $0.74237E+02$ 18EU153 $0.27556E+01$ $0.38187E+02$ $0.18543E+01$ $0.76091E+02$ 20M095 $0.32756E+01$ $0.57169E-01$ $0.18256E+01$ $0.77917E+02$ 20M095 $0.32761E+00$ $0.29981E-01$ $0.17308E+01$ $0.79648E+02$ 21JJ29 $0.49786E+00$ $0.16883E+01$ $0.14812E+01$ $0.82576E+02$ 23M0100 $0.11724E+00$ $0.68879E+01$ $0.14230E+01$ $0.83999E+02$ 24ZR93 $0.20895E+00$ $0.37822E+01$ $0.13926E+01$ $0.8597E+02$ 25SM150 $0.68366E+00$ $0.10025-01$ $0.1350E+01$ $0.86597E+02$ 26XE132 $0.11496E+00$ $0.51090E+01$ $0.13550E+01$ $0.88616E+02$ 27RU103 $0.50432E+00$ $0.57697E+02$ $0.75973E+00$ $0.89376E+02$ 29SM152 $0.69376E+00$ $0.57697E+02$ $0.70536E+00$ $0.9081E+02$ 20ND148 $0.23212E+00$ $0.56396E+01$ $0.58186E+00$ $0.93939E+02$ 32SM147 $0.14253E+01$ $0.21470E+02$ $0.53925E+00$ $0.93394E+02$ 33PD108 $0.11809E+00$ $0.25315E+01$ $0.52681E+00$ $0.92926E+02$ 35I127 $0.54860E+00$ $0.28476E+01$ $0.39272E+00$ $0.93394E+02$ 36ZR96	15 ND145 #	0.43110F+00	0.30	202F=01	0.22944E+01	0.70090E+02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	16 AG109 *	0.88640E+00	0.1	3799E-01	0.21554E+01	0.72246E+02
18EU153 $0.27556E+01$ $0.38187E-02$ $0.18543E+01$ $0.76091E+02$ 19MO98 $0.18115E+00$ $0.57189E-01$ $0.18256E+01$ $0.77917E+02$ 20MO95 $*$ $0.32761E+00$ $0.29981E-01$ $0.17308E+01$ $0.77917E+02$ 211129 $*$ $0.49786E+00$ $0.29981E-01$ $0.14812E+01$ $0.81129E+02$ 22PR141 $0.15732E+00$ $0.52214E-01$ $0.14475E+01$ $0.82576E+02$ 23MO100 $0.11724E+00$ $0.68879E-01$ $0.14230E+01$ $0.83992E+02$ 24ZR $93$ $0.20895E+00$ $0.37822E-01$ $0.12054E+01$ $0.83592E+02$ 25SM150 $0.68366E+00$ $0.10005E-01$ $0.12054E+01$ $0.86597E+02$ 26KE132 $0.11496E+00$ $0.51090E-01$ $0.99401E+00$ $0.88616E+02$ 28EU155 $0.24992E+01$ $0.17251E-02$ $0.75973E+00$ $0.88616E+02$ 29SM152 $0.69376E+00$ $0.56549E-01$ $0.8806E+00$ $0.90761E+02$ 30ND148 $0.32912E+00$ $0.21470E-02$ $0.53925E+00$ $0.91882E+02$ 34RU106 $0.34604E-01$ $0.3921E-01$ $0.5466E+00$ $0.92409E+02$ 34RU106 $0.34604E-01$ $0.3921E-01$ $0.42504E+00$ $0.93394E+02$ 35I127 $0.5460E+00$ $0.48473E-02$ $0.46660E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49436E-01$ $0.32212+00$ $0.94675E+02$ 37 <t< th=""><th>17 RU104 #</th><td>0.18680E+00</td><td>0.60</td><td>0489E-01</td><td>0.19911E+01</td><td>0.74237E+02</td></t<>	17 RU104 #	0.18680E+00	0.60	0489E-01	0.19911E+01	0.74237E+02
19         MO         98         0.18115E+00         0.57169E-01         0.18256E+01         0.77917E+02           20         MO         95         #         0.32761E+00         0.29981E-01         0.17308E+01         0.79648E+02           21         J         J         9         #         0.49786E+00         0.16833E-01         0.14812E+01         0.81129E+02           22         PR141         0.15732E+00         0.52214E-01         0.14475E+01         0.82576E+02           23         MO100         0.11724E+00         0.68879E-01         0.14230E+01         0.83995E+02           24         ZR         93         *         0.20895E+00         0.37822E-01         0.14230E+01         0.8597E+02           25         SM150         0.68366E+00         0.51090E-01         0.10350E+01         0.87632E+02           26         XE132         0.11496E+00         0.51090E-01         0.7053E+00         0.88616E+02           29         SM152         0.69376E+00         0.57697E-02         0.70536E+00         0.90081E+02           30         ND148         0.23212E+00         0.16625E-01         0.68004E+00         0.91343E+02           31         LA139         0.56396E-01         0.25315E-01         0.	18 EU153 *	0.27556E+01	0.38	187E-02	0,18543E+01	0.76091E+02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	19 MO 98	0.18115F+00	) 0.5	71896-01	0.18256E+01	0.77917E+02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	20 MO 95 *	0.32761E+00	0.29	9981E-01	0.17308E+01	0.79648E+02
22PR1410.15732E+000.52214E=010.14475E+010.82576E+0223MO1000.11724E+000.68879E=010.14230E+010.83999E+0224ZR 93*0.20895E+000.37822E=010.13926E+010.85392E+0225SM1500.6836E+000.1005E=010.12054E+010.86597E+0226XE1320.11496E+000.51090E=010.10350E+010.86597E+0227RU1030.50432E+000.11072E=010.98401E+000.88616E+0228EU155*0.24992E+010.17251E=020.7536E+000.9081E+0229SM1520.69376E+000.57697E=020.70536E+000.9081E+0230ND1480.23212E+000.16625E=010.68004E+060.91343E+0231LA1390.56396E=010.21470E=020.53265E+000.91343E+0233PD1080.11809E+000.25315E=010.52681E+000.92409E+0234RU106*0.94804E=010.30921E=010.51657E+000.93394E+0237ND1460.9698E=010.24867E=010.42504E+000.93857E+0238CE1420.44663E=010.42867E=010.322212E+000.95596E+0239ZR 910.10037E+000.11737E=010.32321E+000.95596E+0239ZR 910.10037E+000.127546E=010.22732E+000.9685E+0241CE144#<0.9669E=010.72413E=010.22732E+000.96356E+0244KR 830.44079E+000.92826E=02	21 1 129 *	0.49786F+00	0.10	6883E-01	0.14812E+01	0.81129E+02
23MO100 $0.11724\pm00$ $0.68879\pm01$ $0.14230\pm01$ $0.83999\pm02$ 24ZR93* $0.20895\pm00$ $0.37822\pm01$ $0.13926\pm01$ $0.85392\pm02$ 25SM150 $0.68366\pm00$ $0.10005\pm01$ $0.12054\pm01$ $0.86597\pm02$ 26XE132 $0.11496\pm00$ $0.51090\pm01$ $0.01050\pm01$ $0.87632\pm02$ 27RU103 $0.50432\pm00$ $0.11072\pm01$ $0.98401\pm00$ $0.88616\pm02$ 28EU155 $0.24992\pm01$ $0.17251\pm02$ $0.75973\pm00$ $0.99081\pm02$ 29SM152 $0.69376\pm00$ $0.57697\pm02$ $0.70536\pm00$ $0.90081\pm02$ 30ND148 $0.23212\pm00$ $0.16625\pm01$ $0.58186\pm00$ $0.90081\pm02$ 31LA139 $0.56396\pm01$ $0.21470\pm02$ $0.53925\pm00$ $0.91882\pm02$ 33PD108 $0.11809\pm00$ $0.22315\pm01$ $0.52681\pm00$ $0.92926\pm02$ 34RU106 $0.94804\pm01$ $0.3921\pm01$ $0.5426\pm02$ $0.93394\pm02$ 37ND146 $0.96998\pm01$ $0.49876\pm01$ $0.442504\pm00$ $0.93394\pm02$ 38CE142 $0.44683\pm01$ $0.18780\pm01$ $0.3221\pm00$ $0.94675\pm02$ 39ZR91 $0.10037\pm00$ $0.18780\pm01$ $0.22880\pm00$ $0.95356\pm02$ 40PD106 $0.15264\pm00$ $0.12737\pm01$ $0.22840\pm00$ $0.95356\pm02$ 41CE144 $0.99489=01$ $0.72413\pm01$ $0.22880\pm00$ $0.9685\pm02$ 43KE134 $0.1809\pm01$ $0.72413\pm01$ $0.22880\pm00$ $0.9635\pm02$ 44	22 PR141	0.15732E+00	0.5	214E-01	0.14475E+01	0.82576E+02
242R93 $0.20895E00$ $0.37822E-01$ $0.13926E+01$ $0.85392E+02$ 25SM150 $0.6836E+00$ $0.10005E-01$ $0.12054E+01$ $0.86597E+02$ 26XE132 $0.11496E+00$ $0.51090E-01$ $0.10350E+01$ $0.87632E+02$ 27RU103 $0.50432E+00$ $0.11072E-01$ $0.98401E+00$ $0.88616E+02$ 28EU155 $0.24992E+01$ $0.17251E-02$ $0.75973E+00$ $0.9081E+02$ 29SM152 $0.69376E+00$ $0.57697E-02$ $0.70536E+00$ $0.90081E+02$ 30ND148 $0.23212E+00$ $0.16625E-01$ $0.58186E+00$ $0.90081E+02$ 31LA139 $0.56396E-01$ $0.25315E-01$ $0.58186E+00$ $0.91343E+02$ 32SM147 $*$ $0.14253E+01$ $0.21470E-02$ $0.53925E+00$ $0.92409E+02$ 34RU106 $*$ $0.7460E+00$ $0.30921E-01$ $0.51657E+00$ $0.9226E+02$ 35I<127 $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.42504E+00$ $0.94232E+02$ 38CE142 $0.44663E-01$ $0.24867E-01$ $0.32216E+00$ $0.94265E+02$ 39ZR91 $0.10c37E+00$ $0.18737E-01$ $0.3221E+00$ $0.9594E+02$ 40PD166 $0.15626E+00$ $0.11737E-01$ $0.32216E+00$ $0.95936E+02$ 41CE144 $*$ $0.99699E-01$ $0.22987E-02$ $0.22748E+00$ $0.96332E+02$ 42CS137 <td< th=""><th>23 M0100</th><th>0.11724F+00</th><th>0.6</th><th>3879F-01</th><th>0.14230E+01</th><th>0.83994E+02</th></td<>	23 M0100	0.11724F+00	0.6	3879F-01	0.14230E+01	0.83994E+02
25SM150 $0.68366E+00$ $0.10005E-01$ $0.12054E+01$ $0.86597E+02$ 26XE132 $0.11496E+00$ $0.51090E-01$ $0.10350E+01$ $0.87632E+02$ 27RU103 $0.50432E+00$ $0.11072E-01$ $0.98401E+00$ $0.88616E+02$ 28EU155 $0.24992E+01$ $0.17251E-02$ $0.75973E+00$ $0.89376E+02$ 29SM152 $0.69376E+00$ $0.57697E-02$ $0.70536E+00$ $0.90081E+02$ 30ND148 $0.23212E+00$ $0.16625E-01$ $0.68004E+00$ $0.90081E+02$ 31LA139 $0.56396E-01$ $0.58549E-01$ $0.58186E+00$ $0.90761E+02$ 31LA139 $0.56396E-01$ $0.21470E-02$ $0.53925E+00$ $0.91882E+02$ 33PD108 $0.11809E+00$ $0.22315E-01$ $0.52681E+00$ $0.92926E+02$ 34RU106 $*$ $0.94604E-01$ $0.30921E-01$ $0.51657E+00$ $0.92926E+02$ 35I<127 $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR 96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.94282E+02$ 38CE142 $0.44683E-01$ $0.49876E-01$ $0.32216E+00$ $0.95336E+02$ 39ZR 91 $0.10c37E+00$ $0.11737E-01$ $0.32231E+00$ $0.95336E+02$ 39ZR 91 $0.10c37E+00$ $0.125156E-01$ $0.26424E+00$ $0.95336E+02$ 41CE144 $0.99699E-01$ $0.72413E-01$ $0.22738E+00$ $0.96355E+02$ 42CS137 $0.22909E-01$ $0.64754E-01$ <th>24 ZR 93 *</th> <th>0.20895E+00</th> <th>0.3</th> <th>7822E-01</th> <th>0.13926E+01</th> <th>0+85392E+02</th>	24 ZR 93 *	0.20895E+00	0.3	7822E-01	0.13926E+01	0+85392E+02
26XE132 $0.11496E+00$ $0.51090E-01$ $0.10350E+01$ $0.87632E+02$ 27RU103 $0.50432E+00$ $0.11072E-01$ $0.98401E+00$ $0.88616E+02$ 28EU155 $0.24992E+01$ $0.17251E-02$ $0.75973E+00$ $0.89376E+02$ 29SM152 $0.69376E+00$ $0.57697E-02$ $0.70536E+00$ $0.90081E+02$ 30ND148 $0.23212E+00$ $0.16625E-01$ $0.68004E+00$ $0.90761E+02$ 31LA139 $0.56396E-01$ $0.58549E-01$ $0.58186E+00$ $0.90761E+02$ 32SM147 $*$ $0.14253E+01$ $0.21470E-02$ $0.53925E+00$ $0.91882E+02$ 33PD108 $0.11809E+00$ $0.25315E-01$ $0.52681E+00$ $0.9226E+02$ 34RU106 $*$ $0.94604E-01$ $0.30921E-01$ $0.51657E+00$ $0.9226E+02$ 35JJ $0.5460E+00$ $0.48473E-02$ $0.46806E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.93857E+02$ 37ND146 $0.96998E-01$ $0.24867E-01$ $0.3221E+00$ $0.94675E+02$ 38CE142 $0.44663E-01$ $0.49376E-01$ $0.3221E+00$ $0.95336E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.32231E+00$ $0.95336E+02$ 41CE144 $0.59609E-01$ $0.72413E-01$ $0.22980E+00$ $0.95336E+02$ 42CS137 $*$ $0.22909E-01$ $0.64754E-01$ $0.222980E+00$ $0.96085E+02$ 44KR $3$ <	25 SM150	0.68366E+00	0.10	0005E-01	0.12054E+01	0.86597E+02
27       RU103       0.50432E+00       0.11072E-01       0.98401E+00       0.88616E+02         28       EU155 *       0.24992E+01       0.17251E-02       0.75973E+00       0.89376E+02         29       SM152       0.69376E+00       0.57697E-02       0.70536E+00       0.90081E+02         30       ND148       0.23212E+00       0.16625E-01       0.68004E+00       0.90761E+02         31       LA139       0.56396E-01       0.58549E-01       0.58186E+00       0.91882E+02         32       SM147       0.14253E+01       0.21470E-02       0.53925E+00       0.91882E+02         33       PD108       0.11809E+00       0.25315E-01       0.56681E+00       0.92926E+02         34       RU106 *       0.94804E-01       0.30921E-01       0.91657E+00       0.93394E+02         36       Z R       96       0.53116E-01       0.49403E-01       0.46240E+00       0.93857E+02         37       ND146       0.96998E-01       0.24867E-01       0.39272E+00       0.94675E+02         39       Z R       91       0.10037E+00       G.18780E-01       0.32216E+00       0.95936E+02         40       PD106       0.15626E+00       0.11737E-01       0.322321E+00       0.95856E+02      <	26 XE132	0.11496E+00	0.5	L090E-01	0.10350E+01	0.87632E+02
28EU155 * $0.24992E+01$ $0.17251E-02$ $0.75973E+00$ $0.89376E+02$ $29$ SM152 $0.69376E+00$ $0.57697E-02$ $0.70536E+00$ $0.90081E+02$ $30$ ND148 $0.23212E+00$ $0.16625E-01$ $0.68004E+00$ $0.90081E+02$ $31$ LA139 $0.56396E-01$ $0.58549E-01$ $0.58186E+00$ $0.91343E+02$ $32$ SM147 * $0.14253E+01$ $0.21470E-02$ $0.53925E+00$ $0.91882E+02$ $33$ PD108 $0.11809E+00$ $0.25315E-01$ $0.52681E+00$ $0.92409E+02$ $34$ RU106 * $0.94804E+01$ $0.30921E-01$ $0.51657E+00$ $0.92926E+02$ $35$ I127 $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ $36$ ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.94857E+02$ $37$ ND146 $0.96998E-01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ $38$ CE142 $0.44683E-01$ $0.49403E-01$ $0.33216E+00$ $0.94267E+02$ $39$ ZR91 $0.10037E+00$ $0.11737E-01$ $0.32321E+00$ $0.95594E+02$ $40$ PD106 $0.15626E+00$ $0.11737E-01$ $0.22980E+00$ $0.96985E+02$ $42$ CS137 $*$ $0.22909E-01$ $0.22187E-02$ $0.22748E+00$ $0.96085E+02$ $44$ KR $83$ $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96085E+02$ $45$ ND144 $0.99489E-01$ $0.12681E-01$ $0.20273E+00$ $0.96085E+02$ <	27 RU103	0.50432E+00	0.1	1072E-01	0.98401E+00	0.88616E+02
29 $SM152$ 0.69376E+000.57697E-020.70536E+000.90081E+0230ND1480.23212E+000.16625E-010.68004E+000.90761E+0231LA1390.56396E-010.58549E-010.58186E+000.91343E+0232SM147*0.14253E+010.21470E-020.53925E+000.91882E+0233PD1080.11809E+000.25315E-010.52681E+000.92409E+0234RU106*0.94804E-010.30921E-010.51657E+000.92926E+0235I 1270.54860E+000.49403E-010.46680E+000.93394E+0236ZR960.53116E-010.49403E-010.46240E+000.93857E+0237ND1460.96998E=010.24867E-010.39272E+000.94675E+0238CE1420.44663E-010.49876E-010.3221E+000.9530E+0240PD1060.15626E+000.11737E-010.32321E+000.95594E+0241CE144*0.59609E-010.25156E-010.26424E+000.95594E+0242CS137*0.22909E-010.64754E-010.22980E+000.96085E+0244KR830.44079E+000.29287E-020.22748E+000.9633E+0244KR830.44079E+000.29287E-020.22748E+000.96535E+0245ND1440.99489E-010.12601E-010.20273E+000.96746E+0246NB950.18179E+000.65820E-020.21085E+000.96746E+0247ZR <t< th=""><th>28 EU155 *</th><th>0.24992E+01</th><th>0.1</th><th>7251E-02</th><th>0.75973E+00</th><th>0.89376E+02</th></t<>	28 EU155 *	0.24992E+01	0.1	7251E-02	0.75973E+00	0.89376E+02
30ND148 $0.23212E+00$ $0.16625E-01$ $0.68004E+06$ $0.90761E+02$ 31LA139 $0.56396E-01$ $0.58549E-01$ $0.58186E+00$ $0.91343E+02$ 32SM147 $*$ $0.14253E+01$ $0.21470E-02$ $0.53925E+00$ $0.91882E+02$ 33PD108 $0.11809E+00$ $0.25315E-01$ $0.52681E+00$ $0.92409E+02$ 34RU106 $*$ $0.94604E-01$ $0.30921E-01$ $0.51657E+00$ $0.92926E+02$ 35III $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.93857E+02$ 37ND146 $0.96998E-01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44683E+01$ $0.49876E-01$ $0.33216E+00$ $0.95007E+02$ 39ZR91 $0.10c37E+00$ $c.18780E-01$ $0.3221E+00$ $0.9530E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.3221E+00$ $0.9559E+02$ 42CS137 $v.22909E-01$ $0.64754E-01$ $0.22980E+00$ $0.96085E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22232E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.23882E-02$ $0.20778E+00$ $0.96085E+02$ 45ND144 $*$ $0.99489E-01$ $0.12681E-01$ $0.2273E+00$ $0.96746E+02$ <t< th=""><th>29 SM152</th><th>0.69376E+00</th><th>0.5</th><th>7697E-02</th><th>0.70536E+00</th><th>0,90081E+02</th></t<>	29 SM152	0.69376E+00	0.5	7697E-02	0.70536E+00	0,90081E+02
31LA139 $0.56396E-01$ $0.58549E-01$ $0.58186E+00$ $0.91343E+02$ 32SM147 $*$ $0.14253E+01$ $0.21470E-02$ $0.53925E+00$ $0.91882E+02$ 33PD108 $0.11809E+00$ $0.25315E-01$ $0.52681E+00$ $0.92409E+02$ 34RU106 $*$ $0.94804E+01$ $0.30921E-01$ $0.51657E+00$ $0.92926E+02$ 35I127 $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.933957E+02$ 37ND146 $0.96998E-01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44683E-01$ $0.49876E-01$ $0.39272E+00$ $0.94675E+02$ 39ZR91 $0.10037E+00$ $0.11737E-01$ $0.32321E+00$ $0.95336E+02$ 41CE144 $0.59609E-01$ $0.25156E-01$ $0.26424E+00$ $0.95856E+02$ 42CS137 $*$ $0.22909E-01$ $0.64754E-01$ $0.22980E+00$ $0.96085E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22232E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96746E+02$ 45ND144 $0.99489E-01$ $0.12504E-01$ $0.20273E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.23882E-02$ $0.20129E+00$ $0.96746E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97333E+02$	30 ND148	0.23212E+00	0.10	625E-01	0.68004E+00	0.90761E+02
32SM147 * $0,14253E+01$ $0,21470E-02$ $0,53925E+00$ $0,91882E+02$ 33PD108 $0,11809E+00$ $0,25315E-01$ $0.52681E+00$ $0.92409E+02$ 34RU106 * $0.94604E-01$ $0,30921E-01$ $0.51657E+00$ $0.92926E+02$ 35I127 $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.93857E+02$ 37ND146 $0.96998E+01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44663E-01$ $0.49876E-01$ $0.39272E+00$ $0.94675E+02$ 39ZR91 $0.10037E+00$ $0.18780E-01$ $0.32216E+00$ $0.95330E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.3221E+00$ $0.95330E+02$ 41CE144 * $0.59609E-01$ $0.25156E-01$ $0.26424E+00$ $0.95856E+02$ 42CS137 * $0.22909E-01$ $0.64754E-01$ $0.22980E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96332E+02$ 45ND144 * $0.99489E-01$ $0.12681E-01$ $0.20273E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.23882E-02$ $0.20129E+00$ $0.96746E+02$ 47ZR95 $0.92004E-01$ $0.12504E-01$ $0.20273E+00$ $0.96746E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97333E+02$ 49CE140 <th>31 LA139</th> <th>0.56396E-01</th> <th>0.58</th> <th>3549E-01</th> <th>0.58186E+00</th> <th>0+91343E+02</th>	31 LA139	0.56396E-01	0.58	3549E-01	0.58186E+00	0+91343E+02
33PD108 $0,11809E+00$ $0,25315E-01$ $0,52681E+00$ $0,92409E+02$ 34RU106 * $0,94804E-01$ $0,30921E-01$ $0,51657E+00$ $0,92926E+02$ 35I127 $0.54860E+00$ $0,48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0,53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.93857E+02$ 37ND146 $0.96998E+01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44683E-01$ $0.49876E-01$ $0.39272E+00$ $0.94675E+02$ 38CE142 $0.10037E+00$ $0.11737E-01$ $0.32321E+00$ $0.95007E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.22980E+00$ $0.95594E+02$ 42CS137 $0.22909E-01$ $0.64754E-01$ $0.22980E+00$ $0.95856E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22232E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96746E+02$ 45ND144 $0.99489E-01$ $0.12681E-01$ $0.20273E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.23862E-02$ $0.20129E+00$ $0.96746E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.96746E+02$ 49CE140 $0.2001E-01$ $0.51867E-01$ $0.18251E+00$ $0.97333E+02$ 50CE141 $0.13161E+00$ $0.75424E-02$ $0.17492E+00$ $0.97530E+02$	32 SM147 *	0.14253E+01	0.2	470E-02	0,53925E+00	0,91882E+02
34RU106 * $0.94804E-01$ $0.30921E-01$ $0.51657E+00$ $0.92926E+02$ 35I127 $0.5480E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.93394E+02$ 37ND146 $0.96998E-01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44663E-01$ $0.49876E-01$ $0.39272E+00$ $0.94675E+02$ 39ZR91 $0.10037E+00$ $0.18780E-01$ $0.33216E+00$ $0.95007E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.32321E+00$ $0.95594E+02$ 41CE144 $0.59609E-01$ $0.25156E-01$ $0.26424E+00$ $0.95594E+02$ 42CS137 $*$ $0.22909E-01$ $0.64754E-01$ $0.22980E+00$ $0.96085E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22980E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96313E+02$ 45ND144 $0.99489E-01$ $0.12681E-01$ $0.22232E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.65820E-02$ $0.21085E+00$ $0.96746E+02$ 47ZR95 $0.92004E-01$ $0.12504E-01$ $0.20273E+00$ $0.96746E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97333E+02$ 49CE140 $0.2001E-01$ $0.51867E-01$ $0.18281E+00$ $0.97333E+02$ 50CE141<	33 PD108	0.118092+00	0.2	5315E-01	0.52681E+00	0.92409E+02
35I127 $0.54860E+00$ $0.48473E-02$ $0.46860E+00$ $0.93394E+02$ 36ZR96 $0.53116E-01$ $0.49403E-01$ $0.46240E+00$ $0.93394E+02$ 37ND146 $0.96998E-01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44663E-01$ $0.49876E-01$ $0.39272E+00$ $0.94675E+02$ 39ZR91 $0.10037E+00$ $0.18780E-01$ $0.33216E+00$ $0.95007E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.32321E+00$ $0.95594E+02$ 41CE144 $0.59609E-01$ $0.25156E-01$ $0.26424E+00$ $0.95594E+02$ 42CS137 $0.22909E-01$ $0.64754E-01$ $0.22980E+00$ $0.96085E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22980E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96313E+02$ 45ND144 $0.99489E-01$ $0.12681E-01$ $0.22232E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.65820E-02$ $0.21085E+00$ $0.96746E+02$ 47ZR95 $0.92004E-01$ $0.12504E-01$ $0.2073E+00$ $0.96949E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97333E+02$ 49CE140 $0.20001E-01$ $0.51867E-01$ $0.18281E+00$ $0.97333E+02$ 50CE141 $0.13161E+00$ $0.75424E-02$ $0.17492E+00$ $0.97508E+02$	34 RU106 *	0.94804E-01	0.30	0921E-01	0.51657E+00	0,92926E+02
36 $ZR$ $96$ $0.53116E=01$ $0.49403E=01$ $0.46240E+00$ $0.93857E+02$ $37$ ND146 $0.96998E=01$ $0.24867E=01$ $0.42504E+00$ $0.94282E+02$ $38$ CE142 $0.44663E=01$ $0.49876E=01$ $0.39272E+00$ $0.94675E+02$ $39$ ZR $91$ $0.10037E+00$ $0.18780E=01$ $0.33216E+00$ $0.95007E+02$ $40$ PD196 $0.15626E+00$ $0.11737E=01$ $0.32321E+00$ $0.95594E+02$ $41$ CE144 $*$ $0.59609E=01$ $0.25156E=01$ $0.26424E+00$ $0.95594E+02$ $42$ CS137 $*$ $0.22909E=01$ $0.64754E=01$ $0.26141E+00$ $0.95856E+02$ $43$ XE134 $0.18009E=01$ $0.72413E=01$ $0.22980E+00$ $0.96085E+02$ $44$ KR $83$ $0.44079E+00$ $0.29287E=02$ $0.22748E+00$ $0.96313E+02$ $45$ ND144 $*$ $0.99489E=01$ $0.12681E=01$ $0.22232E+00$ $0.96746E+02$ $46$ NB $95$ $0.18179E+00$ $0.65820E=02$ $0.21085E+00$ $0.96746E+02$ $47$ ZR $95$ $0.92004E=01$ $0.12504E=01$ $0.20273E+00$ $0.96949E+02$ $48$ PR143 $0.47829E+00$ $0.23882E=02$ $0.20129E+00$ $0.97333E+02$ $49$ CE140 $0.20001E=01$ $0.51867E=01$ $0.18281E+00$ $0.97333E+02$ $50$ CE141 $0.13161E+00$ $0.75424E=02$ $0.17492E+00$ $0.97508E+02$	35 I 127	0.54a60E+00	0.4	3473E-02	0,46860E+00	0.93394E+02
37ND146 $0.96998E-01$ $0.24867E-01$ $0.42504E+00$ $0.94282E+02$ 38CE142 $0.44683E-01$ $0.49876E-01$ $0.39272E+00$ $0.94675E+02$ 39ZR91 $0.10037E+00$ $0.18780E-01$ $0.33216E+00$ $0.95007E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.32321E+00$ $0.95330E+02$ 41CE144 $0.59609E-01$ $0.25156E-01$ $0.26424E+00$ $0.95594E+02$ 42CS137 $*$ $0.22909E-01$ $0.64754E-01$ $0.26141E+00$ $0.95856E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22980E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96313E+02$ 45ND144 $0.99489E-01$ $0.12681E-01$ $0.22232E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.65820E-02$ $0.21085E+00$ $0.96746E+02$ 47ZR95 $0.92004E-01$ $0.12504E-01$ $0.2073E+00$ $0.96949E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97150E+02$ 49CE140 $0.20001E-01$ $0.51867E-01$ $0.18281E+00$ $0.97333E+02$ 50CE141 $0.13161E+00$ $0.75424E-02$ $0.17492E+00$ $0.97508E+02$	36 ZR 96	0,53116E-01	0.4	9403E=01	0.46240E+00	0,938572+02
38       CE142       0,44683E-01       0,49876E-01       0,39272E+00       0,94675E+02         39       ZR       91       0,10037E+00       0,18780E-01       0,33216E+00       0,95007E+02         40       PD196       0.15626E+00       0,11737E-01       0,32321E+00       0,95330E+02         41       CE144       0,59609E-01       0,25156E-01       0.26424E+00       0,95594E+02         42       CS137       #       0.22909E-01       0,64754E-01       0.26141E+00       0.96856E+02         43       XE134       0.18009E-01       0,72413E-01       0.22980E+00       0.96085E+02         44       KR       83       0.44079E+00       0.29287E-02       0.22748E+00       0.96313E+02         45       ND144       0.99489E-01       0,12681E-01       0.22232E+00       0.96746E+02         46       NB       95       0.18179E+00       0.65820E-02       0.21085E+00       0.96746E+02         47       ZR       95       0.92004E-01       0.12504E-01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E-02       0.20129E+00       0.97333E+02         49       CE140       0.2001E-01       0.51867E-01       0.18281E+00	37 ND146	0.96998E-01	0.24	+867E-01	0.42504E+00	0,94282E+02
39ZR91 $0.10c37E+00$ $0.18780E-01$ $0.33216E+00$ $0.95007E+02$ 40PD106 $0.15626E+00$ $0.11737E-01$ $0.32321E+00$ $0.95330E+02$ 41CE144 $0.59609E-01$ $0.25156E+01$ $0.26424E+00$ $0.95594E+02$ 42CS137 $#$ $0.22909E-01$ $0.64754E-01$ $0.26141E+00$ $0.95856E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22980E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96335E+02$ 45ND144 $*$ $0.99489E-01$ $0.12681E-01$ $0.22232E+00$ $0.96746E+02$ 46NB95 $0.18179E+00$ $0.65820E-02$ $0.21085E+00$ $0.96746E+02$ 47ZR95 $0.92004E-01$ $0.12504E-01$ $0.20273E+00$ $0.96949E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97150E+02$ 49CE140 $0.20001E-01$ $0.51867E-01$ $0.18281E+00$ $0.97333E+02$ 50CE141 $0.13161E+00$ $0.75424E-02$ $0.17492E+00$ $0.97508E+02$	38 CE142	0,44683E-01	0.4	876E-01	0.39272E+00	0,94675E+02
40PD106 $0.15626E+00$ $0.11737E-01$ $0.32321E+00$ $0.95330E+02$ 41CE144 * $0.59609E-01$ $0.25156E-01$ $0.26424E+00$ $0.95594E+02$ 42CS137 * $0.22909E-01$ $0.64754E-01$ $0.26141E+00$ $0.95856E+02$ 43XE134 $0.18009E-01$ $0.72413E-01$ $0.22980E+00$ $0.96085E+02$ 44KR83 $0.44079E+00$ $0.29287E-02$ $0.22748E+00$ $0.96085E+02$ 45ND144 * $0.99489E-01$ $0.12681E-01$ $0.22232E+00$ $0.96735E+02$ 46NB95 $0.18179E+00$ $0.65820E-02$ $0.21085E+00$ $0.96746E+02$ 47ZR95 $0.92004E-01$ $0.12504E-01$ $0.20129E+00$ $0.96746E+02$ 48PR143 $0.47829E+00$ $0.23882E-02$ $0.20129E+00$ $0.97150E+02$ 49CE140 $0.20001E-01$ $0.75424E-02$ $0.17492E+00$ $0.97508E+02$ 50CE141 $0.13161E+00$ $0.75424E-02$ $0.17492E+00$ $0.97508E+02$	39 ZR 91	0.10037E+00	0,18	3780E-01	0,33216E+00	0.95007E+02
41       CE144 *       0,59609E-01       0,25156E-01       0.26424E+00       0,95594E+02         42       CS137 *       0.22909E-01       0.64754E-01       0.26141E+00       0.95856E+02         43       XE134       0.18009E-01       0,72413E-01       0.22980E+00       0.96085E+02         44       KR       83       0.44079E+00       0.29287E-02       0.22748E+00       0.96085E+02         45       ND144 *       0.99489E-01       0.12681E-01       0.22232E+00       0.96535E+02         46       NB       95       0.18179E+00       0.65820E-02       0.21085E+00       0.96746E+02         47       ZR       95       0.92004E-01       0.12504E-01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E-02       0.20129E+00       0.97150E+02         49       CE140       0.20001E-01       0.51867E-01       0.18281E+00       0.97333E+02         50       CE141       0.13161E+00       0.75424E-02       0.17492E+00       0.97508E+02	40 PD106	0.15626E+00	0.1	1737E-01	0.32321E+00	0+95330E+02
42       CS137 *       0.22909E-01       0.64754E-01       0.26141E+00       0.95856E+02         43       XE134       0.18009E-01       0.72413E-01       0.22980E+00       0.96085E+02         44       KR       83       0.44079E+00       0.29287E-02       0.22748E+00       0.96085E+02         45       ND144 *       0.99489E-01       0.12681E-01       0.22232E+00       0.96535E+02         46       NB       95       0.18179E+00       0.65820E-02       0.21085E+00       0.96746E+02         47       ZR       95       0.92004E-01       0.12504E-01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E-02       0.20129E+00       0.97150E+02         49       CE140       0.20001E-01       0.51867E-01       0.18281E+00       0.97333E+02         50       CE141       0.13161E+00       0.75424E-02       0.17492E+00       0.97508E+02	41 CE144 *	0.59609E-01	0.2	5156E-01	0.26424E+00	0.95594E+02
43       XE134       0.18009E-01       0.72413E-01       0.22980E+00       0.96085E+02         44       KR       83       0.44079E+00       0.29287E-02       0.22748E+00       0.96313E+02         45       ND144       0.99489E-01       0.12681E-01       0.22232E+00       0.96535E+02         46       NB       95       0.18179E+00       0.65820E-02       0.21085E+00       0.96746E+02         47       ZR       95       0.92004E-01       0.12504E-01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E-02       0.20129E+00       0.97150E+02         49       CE140       0.20001E-01       0.51867E-01       0.18281E+00       0.97333E+02         50       CE141       0.13161E+00       0.75424E-02       0.17492E+00       0.97508E+02	42 CS137 *	0.22909E-01	0.64	+754E-01	0.26141E+00	0.95856E+02
44 KR 83       0.44079E+00       0.29287E=02       0.22748E+00       0.96313E+02         45 ND144 #       0.99489E=01       0.12681E=01       0.22232E+00       0.96535E+02         46 NB 95       0.18179E+00       0.65820E=02       0.21085E+00       0.96746E+02         47 ZR 95       0.92004E=01       0.12504E=01       0.20273E+00       0.96949E+02         48 PR143       0.47829E+00       0.23882E=02       0.20129E+00       0.97150E+02         49 CE140       0.20001E=01       0.51867E=01       0.18281E+00       0.97333E+02         50 CE141       0.13161E+00       0.75424E=02       0.17492E+00       0.97508E+02	43 XE134	0.18009E-01	0.7	2413E-01	0,22980E+00	0,96085E+02
45       ND144 #       0.99489E-01       0.12681E-01       0.22232E+00       0.96535E+02         46       NB 95       0.18179E+00       0.65820E-02       0.21085E+00       0.96746E+02         47       ZR 95       0.92004E-01       0.12504E-01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E-02       0.20129E+00       0.97150E+02         49       CE140       0.20001E-01       0.51867E-01       0.18281E+00       0.97333E+02         50       CE141       0.13161E+00       0.75424E-02       0.17492E+00       0.97508E+02	44 KR 83	0.44079E+00	0.29	287E-02	0.22748E+00	0.96313E+02
46       NB       95       0.18179E+00       0.65820E=02       0.21085E+00       0.96746E+02         47       ZR       95       0.92004E=01       0.12504E=01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E=02       0.20129E+00       0.97150E+02         49       CE140       0.20001E=01       0.51867E=01       0.18281E+00       0.97333E+02         50       CE141       0.13161E+00       0.75424E=02       0.17492E+00       0.97508E+02	45 ND144 *	0,99489E-01	0.1	2681E-01	0.22232E+00	0,96535E+02
47       ZR       95       0.92004E=01       0.12504E=01       0.20273E+00       0.96949E+02         48       PR143       0.47829E+00       0.23882E=02       0.20129E+00       0.97150E+02         49       CE140       0.20001E=01       0.51867E=01       0.18281E+00       0.97333E+02         50       CE141       0.13161E+00       0.75424E=02       0.17492E+00       0.97508E+02	46 NB 95	0.18179E+00	) 0.6	5820E-02	0,21085E+00	0,96746E+02
48         PR143         0.47829E+00         0.23882E-02         0.20129E+00         0.97150E+02           49         CE140         0.20001E-01         0.51867E-01         0.18281E+00         0.97333E+02           50         CE141         0.13161E+00         0.75424E-02         0.17492E+00         0.97508E+02	47 ZR 95	0.92004E-01	0.1	2504E-01	0,20273E+00	0.96949E+02
49         CE140         0.2001E-01         0.51867E-01         0.18281E+00         0.97333E+02           50         CE141         0.13161E+00         0.75424E-02         0.17492E+00         0.97508E+02	48 PR143	0.47829E+00	) 0.2	882E-02	0,20129E+00	0,97150E+02
50 CE141 0,13161E+00 0,75424E-02 0,17492E+00 0,97508E+02	49 CE140	0.20001E-01	0.5	1867E-01	0,18281E+00	0,97333E+02
	50 CE141	0,13161E+00	0.7	5424E-02	0,17492E+00	0,97508E+02

\* One group cross section.

\*\* Normalized to 2., i.e., per fission.

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# TABLE 5.1 (Cont.)

PU-2	239 (THERMAL	) BUI	RN-UP 360 DAYS		
5	NUCLIDE	1-G.C.S.* (BARN)	CONCENTRATION**	CONTRIBUTION	ACCUMLTD (%)
51	BR 01	0.53584E+00	0,18188E-02	0.17174E+00	0,97680E+02
52	SM154	0.29944E+00	0.272C9E-02	0.14358E+00	0.97823E+02
53	RB 85	0.15912E+00	0.46637E-02	0.13077E+00	0+97954E+02
54	CD111	0.24979E+00	0.26420E-02	0.11629E+00	0,98070E+02
55	BA140	0.20(65E+00	0,28224E-02	0.10278E+00	0,98173E+02
. 56	GD157	0.74480E+00	0.75466E=03	0.99047E-01	0.98272E+02
57	ZR 94	0.12247E-01	0,43063E-01	0,92938E-01	0,98365E+02
58	ND147	0.59741E+00	0.86888E=03	0.91471E-01	0.98456E+02
59	GD155	0.14684E+01	0.34726E-03	0.89856E-01	0,98546E+02
60	TE128	0.52974E-01	0.84587E-n2	0.78961E-01	0.98625E+02
61	BA138	0.74738E-02	0.57049E-01	0.75134E-01	0.98700E+02
62	TB159	0.16847E+01	0.224265-03	0.66578E=01	0.987675+02
63	28 92	0.122635-01	0.29337E-01	0.63394F-01	0.98830F+02
64	PD110	0.485086=01	0.74071E = 02	0.633165=01	0.98894F+02
65	GD156	0.459356+00	0.777036=03	0.628985-01	0.989576+02
66	KR 84	0.71112E=01	0.469425-02	0.58824E=01	0.99015E+02
67	RR 87	0.322136-01	0.951295-02	0.540008=01	0.990695+02
68	Y 91	0.532141 = 01	0.555916=02	0.52129E=01	0.991225+02
69	XE136	G. 38/22F=02	0.656835=01	0.44472F=01	0.991666+02
70	CD113	0.296236+00	0.841365-03	0.43920E=01	0,992105+02
71	1 1 3 1	0 1 2 3645 400	0.125775-02	0 40698E=01	0,992106102
70	CB 00 #	0.109645-01	0.210085-01	0.40590E+01	0,302016402
73	CD112	0 105595+00	0.116975-02	0.403146+01	0,303316+02
74	TE130	0.818756-02	0.243565-01	0.387475-01	0.003705+02
. 75	MO 99	0.010701-02	0.721825-03	0.361035-01	0,990102+02
76	KR 85	0.131735+00	0, 12402E-00	34066E+01	0.304405+02
77	S8121	0 437065400	0.413915-03	0.318785-01	0,004706+02
70	IN115	0.515268+00	0.349395-03	0.31724E=01	0,997,26,02
70	YEING	0.11.646+00	0 1/4776-02	0.287345-01	0.005335+02
00	V 10	0.116516-01	0 133645-01	0.201000-01	0,99999992402
91	1 07	0.140425+00	0 938675-03	0,20908656-01	0,990000000
01	60152	0 33/805.00		0.350245-01	0,590016+02
02	GU100	0.104176+00	0 11/(355-03	0.250215-01	0,990120+02
0)	EN117	0.124176401	0,114335-03	0.193305-01	0 0000565500
04	5N111	0.309102+00	0.320445-03	0.185325-01	0,990000002
02	55125	0.326205400		0,178325-01	0.004025402
00	SE 17	0.10.211.00	0.055005 62	0.169915-01	0+990925+02
5/	DAT30	0.100216+00	0.900926-00	0 + 100010 = 01	0+997092+02
80		0.282012+00	0.351175-05	0.16467E-UI	0.997265+02
89	EU134	0.31209E+01	0,29870E=04	0.154096-01	0+997426+02
90	CD114	0.16718E+00	0,54268E=03	0.159872-01	0.99758E+02
91	EU126	0.181246+01	0,49358E=04	0,15790E=01	0,99774E+02
92	TE124	0.13222E+00	0.67413E-03	0,157078-01	0+99790E+02
93	BA137	0.11428E+00	0,74412E-03	0,15025E-01	0,99805E+02
94	KH105	0.25683E+00	0.32390E-03	U,14629E-01	0,99819E+02
95	SN119	0.21651E+00	0,35934E-03	0,13710E-01	U+99833E+02
96	SB124	0.34203E+00	0.20903E-03	0,12599E-01	0.99846E+02
97	SK 88	C.48747E-02	0,13497E-01	0.11594E-01	0.99857E+02
98	TE126	0.74212E-01	0.77680E-03	0,10159E-01	0,99867E+02
99	SM153	0.16712E+01	0.30230E-04	0,89026E-02	0,99876E+02
100	DY161	0.11403E+01	0.43935E=04	0.88282E-02	0+99885E+02

\* One group cross sections.

#### TABLE 5.1 (Cont.)

1	PU-2	239 (THERMAL)	<i>i</i> 1	BURN-UP	360 DAYS		
	٩	NCLIDE	1-G.C.5.* (BARN)	CONC	ENTRATION **	CONTRIBUTIO	N ACCUMLTD
	101	PM151	0.126816+0	1 0,3	6024E-04	0,80502E-02	0+99893E+02
	102	SR 89	0.11874E-0	1 0,3	4564E-02	0.72322E-02	0,99900E+02
	103	KR 86	0.53915E-0	2 0.7	4471E-02	0.70753E-02	0+99907E+02
	104	SN118	0,10838E+0	0,3	4963E-03	0.66775E-02	0,99914E+02
	105	TE125	0+32009E+0	0,1	1112E-03	0,62681E-02	0,99920E+02
	106	CE143	0.14135E+0	0.2	4313E-03	0,60562E-02	0,99926E+02
	107	SN123	0.13802E+0	0,2	4309E-03	0,59125E-02	0,99932E+02
	108	AG111	0.30889E+0	0.8	2048E-04	0.44661E-02	0,99937E+02
	109	SE 77	0.27563E+0	0.8	5297E-04	0.41430E-02	0.99941E+02
	110	5N124	0.33603E-0	1 0.6	9601E-03	0,41214E-02	0,99945E+02
	111	SE 78	0.90951F-0	1 0.2	8597E-03	0.407948-02	0.999496+02
	112	SE 80	0.45566E-0	1 0.4	7794E-03	0.38376E-02	0,99953E+02
	113	SE 82	0.11735F-0	0.1	6269E-02	0.33644E-02	0.99956E+02
	114	SN122	0.38703F-0	1 0.4	7444E=03	0.32358E-02	0,99960E+02
	115	SN120	0.46427F-0	0.3	7335F-03	0.30545E-02	0.99963E+02
	116	SN126	0.12096E=0	1 0.1	3652E=02	0.29100E-02	0.99966E+02
	117	58126	0.39104++0	0.4	0917E+04	0.28195E-02	0.99968E+02
	118	CD116	0.40687E=0	0.3	6986E=03	0.26518F-02	0.99971E+02
	119	XE130	0.25201E+0	0.4	7325E=04	0.21017F-02	0.99973E+02
	120	SB127	0.131638+0	0.8	32295-04	0.19305E=02	0.999751+02
	121	DY160	0.34470E+00	0.1	2967F-04	0.19301E-02	0.99977E+02
	122	PR145	0.359286+00		04375-04	0.1927nE=02	0.99979E+02
	122	RU105	0.33294E+00	1 0.3	19018-04	0.187178+02	0.999816+02
	124	PD109	0 305345+00		34185-04	0.18158E=02	0.999835+02
	125	CS136	0.186165+0	0.5	2491E=04	0.17497E-02	0.99984F+02
	126	RUIDO	0.508778+00		82346-04	0.16347E=02	0.939865+02
	120	TB160	0.167206+0		92625-05	0.14515E=02	0.99987E+02
	129	7R 97	0.51:528-0		5530E-03	0 140535-02	0.999895+02
	120	6D160	0.770766-0		80946-04	0.13323E+02	0.399905+02
	130	AS 75	0.475005+0		38835-04	0.116215-02	0.000016+02
	121		0 17 26 L 10		506525-04	0 110705-02	0 0000000000000000000000000000000000000
	132	TC709	0 460385+00		41095-05	0,110/02-02	0.009935401
	122	SN1 25	0 114005+0	) 0.7	72095-04	0.701010-00	
	134	MU 07	0.104265+0		7207E=04 6654E=04	-0.47348E=03	0.000056+02
	125	TF629	0 120655+0		6098E-04	0.591385-03	0 000055+02
	124	CN115	D 14+03E+0		0000 <u>0</u> -04	0.521855-03	0 000046407
	127	TEROS	0.101036+00		0.370E-04 7350E-05	0.021002-00	
	120	FU167	0.110295+0		0212E-05	0,407796-03	
	120	FOT 21	0+11947670.		6212E-UJ 5363E	0.381745-03	0 · 777776702
Ľ	140	TE107	0.34.316.0		10175 05	0.349505-03	0+777712+02
	140	16127	0.244212+0		11265 02	0.343JUE-03	0.0000000
	141	AE133	0.154025-0		11296-03	0.020116-00	
	142	78 00	U+73072E=U.		6101E=04	0.260085-02	0.999982+02
	143	CD115	0 347400-0		34505-05	0,200702-03	U+33330C+U2
	144 176		0.30/475+00	, U+3	JJJZE=07		U+99998E+02
	1/1/2	LOTOT.	0 240545 0		217JE=U7 20545-25	0 182515-03	0.000000000
	140	CP 01	0 1 90447 0	J U.4. 1 0 3	JVJ46-0J	0,102015-03	0,00005.02
	140		0+10904E=0	L U-3	11336-04	0,124096-03	0,999992+02
	145	LAI4U	0,20999E+0	J 0.2	9001E-00	0.10/54E-03	0+99999E+02
	149	VETS8	0.384/3E+0	0.1	5401E=05	0.10441E=03	U+99999E+02
	120 T	GE 13	U+22094E+0	0.2	4/59E=05	U.96395E-04	0+99999E+02

\* One group cross section.

ACCUMLTD

(%)

0+99999E+02 0.99999E+02

0.99999E+02

0.10000E+03 0.10000E+03

0+1000CE+03

0.10000E+03

0.10000E+03 0+10000E+03

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0.10000E+03

0.1000CE+03

0.10000E+03

0.1000CE+03

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0.10000E+03

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0.10000E+03

0.1000UE+03

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0.10000E+03

0.10000E+03

0+10000E+03

0.10006E+03

0+10000E+03

PU-2	239 (THERM	AL) BU	RN-UP 360 DAYS	
. 1	NUCLIDE	1-G.C.S.* (BARN)	CONCENTRATION **	CONTRIBUTION
151	SN121	0.27376E+00	0,185576-05	0.89525E-04
152	TE132	0.70326E-03	0.66448E-03	0.82347E-04
153	SM156	0.45882E+00	0.96087E-06	0.17689E-04
154	GE 76	0.13468E-01	0.30743E-C4	0.72966E-04
155	CS134	0.48513E+00	0.649518-06	0,55525E-04
156	GD159	0.35887E+00	0.65877E-06	0.45143E-04
157	PD112	0.64249E-01	0,39517E-05	0.44741E-04
158	Y 90	0,43381E-01	0.54046E-05	0.41316E-04
159	SB128	0.17850E+00	0,124228-05	0.39074E-04
160	AS 77	0.38103E+00	0.55584E-06	0.37322E-04

6.29950E-04

0.33648E-06

0,213998-06

0.67807E-04

0.24484E=03

0.951548-07

0.36785E-06

0.595428-05

0.62850E-06

0,97939E-07

0,11431E-06

0.12354E-06

0.11014E-05

0.43583E-05

0,16227E-06

0.12706E-C6

0,10269E-07

0.41729E-08

0.29076E-07

0.26197E-08

0,86391E-08

0.93519E-10

0.21755E-09

0.96694E-12

0,31177E-04

0.257678-04

0.23155E-04

0.21592E-04

0.17406E-04

0.16933E-04

0.15704E-04

0.14950E-04

0.14207E-04

0,10986E-04

0.82810E-05

0,68393E-05

0,40959E-05

0.28679E-05

0.24491E-05

0.86742E-06

0.59725E-06

0,55383E-06

0,43467E-06

0,97971E-07

0.70334E-08

0.542878-08

0.38669E-08

0.14075E-09

0.0

0,0

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0.0

185	TE123	0.46605E+00	(i. 0
186	ND150	0.11758E+00	0.0
187	DY162	0.44459E+00	0.0
188	DY163	0,66()46E+00	0.0
189	DY164	0 <b>.11</b> 367E+00	0,0
190	HO165	0.15917E+01	υ.Ο
191	GD 815	0.38540E+00	0.0
192	TE823	0.50546E+00	Ú.O
193	PM848	0,15C06F+01	0,0

0.596736-02

0.434576+00

0.61404E+00

0.18070E-02

0.40342E-03

0.10098E+01

0.24226E+00

0.14249E-01

0.12827E+00

0.63655E+00

0.41109E+00

0.31417E+00

0.21103E-01

0.37343E-02

0.856506-01

0.38742E-01

0.33004E+00

0.75316E+00

0.848346-01

0.21222E+00

0.51455E-02

0.32942E+00

0.100871+00

0.82606E+00

LUMPED ONE GROUP CROSS SECTION

0.56748E+00

\* One group cross section.

\*\* Normalized to 2., i.e., per fission.

161 TE831

162 PD104

163 BR 82

164 | 135 165 | 133

166 PM148

167 TE122

168 GE 74

169 SN116

170 I 130

171 BA134

172 CD110

173 GE 72

174 TE131

175 GE 77

176 SR 86

177 RB 86

178 SB122

179 ND142

180 GA 72

181 ZN 72

182 PR142 183 SE 76 184 AS 76

185

#### TABLE 5.1 (Cont.)

# 3. JNDC FP Group Constants Set

TABLE 5.2 Contribution of the individual FP nuclides to total capture

U-235(THERMAL)	8	IURN-UP	360 DAYS		
NUCLIDE	1-G.C.S.* (BARN)	CONC	ENTRATION*	* CONTRIBUTION (%)	ACCUMLTD (%)
1 RU101 *	0.758901+00	0.5	0967E-01	0.89855E+01	0.89855E+0 <u>1</u>
2 TC 99 *	0,58870E+00	0.6	0607E-01	0.82887E+01	0.17274E+02
3 CS133 *	0.53767E+00	0.6	5930E-01	0.82351E+01	0.25509E+02
4 SM149 *	0.23668E+01	. 0.1	0603E-01	0,58298E+01	0.31339E+02
5 PM147 *	0.12713E+01	0,1	9050E-01	0.56262E+01	0.36965E+02
6 CS135 *	0.32120E+00	0.6	7027E-01	0.50015E+01	0.41967E+02
7 MO 97 *	0,34530E+00	0.5	9247E-01	0.47527E+01	0.46719E+02
8 ND143 *	0.34981E+00	0.5	6330E-01	0.45776E+01	0.51297E+02
9 RH103 *	0.70516E+00	0,2	6112E=01	0.42775E+01	0.55575E+02
10 ND145 *	0.43110E+00	0.3	9400E-01	0,39519E+01	0+59526E+02
11 28 93 *	0.205925+00	0.6	39626-01	0.31048E+01	0.62631E+02
12 MU 95 R	0.000101000	0.4	JIDIE=()1	0.05000082+01	0:6568(E+02
10 MCL 04	0 101150.00	0.2	5012E-01	0,209(96+01	0.50303E+U2
14 MU 70	0.18110E+00	0.2		0,243396401	0.700212+02
10 DH101 #	0.247132+01	0.4		0,240916+01	0.754505+02
17 D0102 *	0.167320.00	0,4	20006-01	0.185775+01	0+(24225702
10 PD105 x	0.207386+00	0,0	000000000	0.176345+01	0 700745.00
19 MO100 *	0.117241+00	0.5	28335-01	0.171/26+01	0+190+2E+02 0.207956+02
20 XE132	0.11/965+00	0.0	07035-01	0.108716+01	0.818728402
21 78 91	0.100376+00		56086-01	0.106356+01	0.239356+02
22 FU153 *	0.27556F+01	0.1	52285=02	0.103895+01	0.839746+02
23 SM150	0.68366(+00	Ü 64	4933E=02	0.10313E+01	0.850058402
24 [ 129 *	0.49786F+00	0.8	5160F-02	0.98494F+00	0,859906+02
25 ND148	0.23212 + 00	0.1	6894E-01	0.91102E+00	0.86901E+02
26 LA139	0.563966-01	0.6	5829F-01	0.86245F+00	0.87764E+02
27 SM147 *	0.14253F+01	0.2	4785F-02	0.82068E+00	0+88584E+02
28 RU104 *	0,186802+00	0.1	3316E-01	0.79482E+00	0.89379E+02
29 ZR 96	0.53116E-01	0.6	2790E+01	0.77478E+00	0.90154E+02
30 ND146	0.96998E-01	0.29	9963E-01	0.67518E+00	0.90829E+02
31 CE142	0.446838=01	0.5	3520E-01	0,61784E+00	0.91447E+02
32 RU103	0.50432E+00	0.4	20-150E	0.57583E+00	0.92023E+02
33 KR 83	0.44079E+00	0.5	3493E-02	0.54777E+00	0.92571E+02
34 CE144 *	0.596092-01	0.30	5204E-01	0.50134E+00	0.93072E+02
35 SM152	0.69376E+00	0.20	5469E-02	0.42659E+00	0.93496E+02
36 ND144 *	0.99489E-01	0.18	3241E-01	0.42159E+00	0.93920E+02
37 RB 85	0,15912E+00	0,10	)388E-01	0.38398E+00	0,94304E+02
38 NB 95	0.181/9E+00	0.8	7180E-02	0.36816E+00	0.94672E+02
39 PR143	0.47829E+00	0.3	2248E-02	0.35831E+00	0.95030E+02
40 PD107 *	0.80019E+00	0,19	9111E-02	0.35525E+00	0.95386E+02
41 ZR 95	0.92004E-01	0,10	5562E-01	0,35399E+00	0.95740E+02
42 CS137 *	0.223096-01	0.6	520E-01	0.32741E+00	0.96067E+02
43 XE134	0.18009E=01	0,7;	876E-01	0.300/0E+00	0+96368E+02
44 CE140	0.200016-01	0.59	0511E-01	0.27651E+00	0.96644E+02
43 DR 01 44 CE141	U 10150046+00	0,19	1072E=02	0.24463E+00	U+96889E+02
47 BA 97	0 330135-01	0.1	1970E=()2	0,200162+00	0+97127E+02
τι το στ Δα 72 ολ		0.2	リンフィビー()上	0.191062+00	U+97318E+02
10 40 74 S	0.10.4422476401	0,04	+70JE=U1	0,1705/5/00	0+97202E+02
77 65 76 50 V 91	0 52014E-01	0.25	74/25=()1 14005 - 51	0.1450051400	U+97672E+02
20 I 71	V+33214E=01	0.13	0742E-01	V.10273E+00	U+97838E+02

\* One group cross section.

\*\* Normalized to 2., i.e., per fission.

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# TABLE 5.2 (Cont.)

U=2:	35(THERMAL)	808	RN-UP 3	060 DAYS		
١	NUCLIDE	1-G.C.S.* (BARN)	CONCE	TRATION**	CONTRIBUTION	ACCUML TD
51	KR 84	0.711126-01	0.991	24E-02	0,16474E+00	0.98003E+02
52	EU155 *	0.243925+01	0.276	592E-03	0.16077E+00	0.98164E+02
53	BA140	0.20665E+00	0.322	291E-02	0.15502E+00	0.98319E+02
54	1 127	0.54360E+00	0.120	)13E-02	0,15310E+00	0.98472E+02
55	SR 90 #	0.10964E-01	0.585	86E-01	0.14923E+00	0+98621E+02
56	ND147	0.597415+00	0,100	)31E+02	0.13921E+00	0.9876JE+02
57	BA138	0.747385-02	0.674	18E-01	0,11705E+00	0.98877E+02
58	Y 89	0.11511E-01	0.381	151E+01	0,10202E+00	0.98979E+02
59	KR 85	0.131732+00	0,296	48E-02	0.90729E-01	0+39070E+02
60	RU106 #	0.948045-01	0,283	344E=()2	0,62424E-01	0+99132E+02
61	AG109 *	0.886402+00	0.273	39E-03	0.562978-01	0.99189E+02
62	XE136	0.384225-02	0,611	L67E-01	0.54597E-01	0,99243E+02
63	SE 79	0,408232+00	0.550	)36E=03	0.52194E-01	0+99296E+02
64	TE128	0.52974E-01	0.402	230E - 02	0.49508E-01	0.99345E+02
65	SM154	0,299442+00	0.710	020E-03	0.49404E-01	0.99394E+02
66	MO 99	0.28384E+00	0,636	519E-03	0.45246E-01	0+99440E+02
67	SH dö	0.48747E=02	0.364	100E-01	0.41289E-01	0.99481E+02
68	PD106	0.15426E+00	0.10	20E-02	0.3891/E-01	0+99520E+02
69	I 131	0,18364E+00	0,894	⊧18E=03	0.38147E-01	0+99558E+02
70	TE130	0.819756-02	0.200	296-01	0,38096E-01	0.99596E+02
71	XE133	0,11264E+00	0.142	277E-02	0.37359E-01	0+99634E+02
72	FM149	0.124176+01	0,931	27E-04	0.283056-01	0.99662E+02
73	SR 89	0.113745-01	0.994	19E-02	0.27424E-01	0,99689E+02
74	KR 36	0.53915E-02	0,193	061E-01	0.24249E-01	0,99714E+02
75	PD108	0.11809E+00	0.704	H07E-03	0.19316E+01	0.99733E+02
75	BA137	0.11458E+00	0,720	005E-03	0,19166E-01	0,99752E+02
77	60155	0.14k84E+01	Ü.55:	91E-04	0,18963E-01	0.99771E+02
78	S8121	0.43706E+00	0,17	28E-03	0,18000E-01	0+99789E+02
79	GD156	0.45935E+00	0.12	11E-03	0,13351E-01	0+99802E+02
80	IN115	0.51526E+00	0.991	L61E-04	0.118/0E-01	0.99814E+02
81	SN117	0.30915E+00	0,160	088E-03	0.11554E-01	0.998268+02
82	GD157	0,74480E+00	0,64(	)41E-04	0.11081E-01	0+99837E+02
83	TE827	U.28251E+00	0,167	/82E=03	0,11014E-01	0+99848E+02
84	CE143	<b>0,14135E+00</b>	0.326	41E-03	0.10719E-01	0+99859E+02
85	SB123	0.328201+00	0.13	589E+03	0.10361E-01	0.99869E+02
86	CD111	0.249795+00	0,176	55E-03	0,10251E-01	0,99879E+02
87	SE BO	U.45366E-01	0.946	648E-03	0.10019E-01	0.99889E+02
88	CD113	0.296232+00	0.12	190E-03	0.88015E-02	0+99898E+02
89	58125	0.16242E+00	0.216	606E-(13	0.81520E-02	0+99906E+02
90	SE 82	0.11735E-01	0.243	39E-02	0.66356E+02	0,99913E+02
91	·SN119	0.216516+00	0.126	08E+03	0.63414E-02	0+99919E+02
92	PM151	0.12581E+01	ს.198	371E-04	0.58542E-02	0+99925E+02
93	SE 77	0.27563E+00	0.910	J73E-04	0,58315E-U2	0,999 <u>31</u> E+02
94	CD112	0.195 <b>59</b> E+00	0.12	23E-03	0,57809E-02	0+99937E+02
95	CU114	0.16718E+00	0.125	35E-03	0,50235E-02	0.99942E+02
96	SM153	0.16712E+01	0,118	89E-04	0.46157E-02	0,99946E+02
97	T8159	0,16847E+01	0,10	\$77E-04	0,42571E-02	0.9995UE+02
98	SE 78	0.80951E-01	0,203	27E-03	0.38227E-02	0.99954E+02
99	5N118	0.10338E+00	0.14	53E-03	0,37145E=02	0+99958E+02
100	RH105	0.256838+00	0,567	42E-04	0.33855E-02	0+99961E+02

\* One group cross section.

U-23	5 (THERMAL)	BUR	N-UP	360 DAYS		
٢	NUCLIDE	1-G.C.S.* (BARN)	CONCI	ENTRATION**	CONTRIBUTION	ACCUMLTD (%)
101	EU156	0,181546+01	0.8	00356-05	0.33754E-02	0+99965E+02
102	GD158	0.33-886+00	0.4	2776E-04	0.33477E-02	0+99968E+02
103	SN123	0.13802E+00	0.10	0356E-03	0.33207E-02	0+999718+02
104	PR145	0.35928E+00	0.3	9771E-04	0.33195E-02	0.99975E+02
105	PD110	0.48508£-01	0,2	0005E-03	0,22544E-02	0.99977E+02
106	ZR 97	0.513526-01	0.1	6829E-03	0.20076E-02	0:99979E+02
107	TE125	0.320092+00	0.2	5452E-04	0.18927E-02	0+99981E+02
108	BA136	0.10021E+00	0,6	6311E-04	0.15438E-02	0.99982E+02
109	SN126	0.12096E-01	0,5	0254E-03	0.14121E-02	0.99984E+02
110	SN120	0.46427E-01	0.1	3063E-03	0,14090E+02	0+99985E+02
111	SN124	0.33603E-01	0.1	7835E-03	0.13923E-02	0.99987E+02
112	SN122	0.38703E-01	0.1	5062E=03	0.13542E-02	0+99988E+02
113	AS 75	0.47500E+00	0,1	2071E-04	0.13320E-02	0+99989E+02
114	EU154	0.31269E+01	0,1	6627E-05	0,12078E-02	0,99991E+02
115	CD116	0.408878-01	0.1	1064E-03	0,10453E-02	0.99992E+02
116	ZR 90	0.589516-02	0.7	0497E-03	0.96545E+03	0.99993E+02
117	TC799	0.45438E+00	0.8	9465E-05	0.954758-03	0:99994E+02
118	Y 93	0.331432-01	0.1	1051E-03	0,85086E-03	0:99994E+02
119	RU105	0.33294E+00	0.7	2163E-05	0.55815E-03	0+99995E+02
120	58127	U.13163E+00	0.1	8144E-04	0.55480E-03	0+99995E+02
121	SR 91	0.18964E-01	0.9	2516E-04	0.40757E-03	0.99996E+02
122	XE135	0.16482E-01	Ü.1	0324E+03	0.39529E-03	0+99996E+02
123	AG111	0.30889E+00	0.5	4861E=05	0.39367E-03	0,99997E+02
124	TE126	0.74212E-01	0.1	9050E-04	0.32843E-03	0+99997E+02
125	SN125	0.111091+00	0.9	3853E-05	0.24221E-03	0+9999/E+02
126	DY161	U.11403E+01	<b>0,8</b> 3	2004E-06	0,21723E-03	0+99997E+02
127	SN115	0.16103E+00	0.5	2210E-05	0.1953 <u>2</u> E-03	0.99998E+02
128	XE130	0.25201E+00 -	0.3	1756E-05	0.18592E-03	0.99998E+02
129	CS136	0.16916E+00	0.3	5275E-05	0.15501E-03	0,99998E+02
130	Y 90	0.433815-01	0,1	5119E-04	0,15237E-03	0,99998E+02
131	TE129	U.93592E+01	0.6.	3077E-05	0,14849E-03	0.99998E+02
132	TE825	0.31700E+00	0,2	00526-05	0,14766E-03	0+99998E+02
133	RU100	0.50877E+00	0.1	2489E-)5	0.14751E-03	0+99999E+02
134	MO 96	0.10426E+00	U.5	13556-05	0.12438E-03	0,999995+02
135	TE127	0.24421E+00	0.2	1055E-05	0,11951E-03	0.99999E+02
136	GE 76	0.13468E-01	0.3	5199E-04	0,11013E-03	0+99999E+02
137	SR 86	0.38742E+01	0.1	1247E-04	0,10122E-03	0.99999E+02
138	SB126	0.391046+00	0.1	0036F-05	0.91169E-04	0,999995+02
139	TE132	0.70326E-03	0.5	3490E-03	0.87389E-04	0+99999E+02
140	CD115	0.36749E+00	0.9	4535E-06	0,80707E-04	0.99999E+02
141	SM148	0.24056E+00	0.1:	1732E-05	0.65563E-04	0+99999E+02
142	RB 86	0.33004E+00	0.8	2261E-06	0,630/0E-04	0+99999E+02
143	GD160	0.77076E-01	0.3	3071E-05	0.59215E-04	0+99999E+02
144	GE 73	0.22094E+00	0,10	0391E-05	0.53332E-04	0.10000E+03
145	AS 77	0,38103E+00	0.5	9347E-06	0,52533E-04	0.10000E+03

0.59347E-06

0,80381E-06

0.66215E-06

0,16063E-06 0.38167E-06

0.71569E-04

0.51121E-04

0.47430E-04 0.44513E-04

0.34112E-04

0,30044E-04

0.10000E+03 0.10000E+03

0+10000E+03

0.1000UE+03

0+10000E+03

TABLE 5.2 (Cont.)

\* One group cross section.

145 AS 77

146 SN121

147 PD109

148 EU157

149 XE128

150 I 135

\*\* Normalized to 2., i.e., per fission.

0.38103E+00

0.27376E+00

0.30834E+00

0.11929E+01

0.38473E+00

0.18070E-02

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# TABLE 5.2 (Cont.)

U-235(THERMAL)	BU	RN-UP 360 DAYS		
NUCLIDE	1-G.C.S.* (BARN)	CONCENTRATION**	CONTRIBUTION	ACCUMLTD (%)
151       SB128         152       KR       82         153       I       133         154       SM156         155       CS134         156       TE831         157       GE       74         158       TE829         159       PD112         160       PM148         161       TE124         166       LA140         167       SB124         166       LA140         167       SB124         168       BA134         169       TE122         170       SN116         171       GE         172       I         173       DY160         174       BR         175       TB160         176       PD104         177       SB122         178       GA         179       ND142         180       CD110         181       ZN         182       SE         183       PR142         184       AS         185       TE123         186       ND150      <	(BAFN) 0.17850E+00 0.17425E+00 0.40342E-03 0.45882E+00 0.40342E-03 0.45882E+00 0.59073E-02 0.14249E-01 0.12865E+00 0.64249E-01 0.10498E+01 0.91439E+00 0.37343E-02 0.13222E+00 0.37343E-02 0.13222E+00 0.20999E+00 0.34203E+00 0.24226E+00 0.24226E+00 0.212327E+00 0.2103E-01 0.63655E+00 0.21222E+01 0.43457E+00 0.51455E-02 0.1087L+00 0.32942E+00 0.32942E+00 0.31417E+00 0.51455E-02 0.1087L+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.32942E+00 0.46605E+00	$\begin{array}{c} 0.64407 = -06\\ 0.64640 = -06\\ 0.24154 = -03\\ 0.18885 = -06\\ 0.12149 = -06\\ 0.85309 = -05\\ 0.34070 = -05\\ 0.34070 = -05\\ 0.25748 = -07\\ 0.25748 = -07\\ 0.25748 = -07\\ 0.25748 = -07\\ 0.25748 = -07\\ 0.32982 = -07\\ 0.3595 = -05\\ 0.91532 = -07\\ 0.3595 = -05\\ 0.91532 = -07\\ 0.33595 = -07\\ 0.23838 = -07\\ 0.21383 = -07\\ 0.21383 = -07\\ 0.21383 = -07\\ 0.21383 = -07\\ 0.23440 = -06\\ 0.65887 = -08\\ 0.31310 = -08\\ 0.31310 = -08\\ 0.37556 = -08\\ 0.3125 = -09\\ 0.27916 = -09\\ 0.55752 = -09\\ 0.98895 = -09\\ 0.13710 = -09\\ 0.18386 = -08\\ 0.71022 = -10\\ 0.31808 = -11\\ 0.31566 = +12\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.$	( %) 0.26708E-04 0.26166E-04 0.22637E-04 0.20129E-04 0.13692E-04 0.11278E-04 0.11278E-04 0.72812E-05 0.61192E-05 0.60405E-05 0.29795E-05 0.29795E-05 0.29144E-05 0.28115E-05 0.28115E-05 0.22592E-05 0.20420E-05 0.20420E-05 0.13844E-05 0.13815E-05 0.13845E-05 0.11491E-05 0.97432E-06 0.61441E-06 0.53573E-06 0.46812E-06 0.46812E-06 0.46812E-06 0.468843E-07 0.27487E-07 0.27487E-07 0.21977E-08 0.16642E-08 0.24342E-09 0.60576E-10 0.0 0.0 0.0 0.0 0.0	<pre>(%) (%) (%) (%) (%) (%) (%) (%) (%) (%)</pre>
189 DY164 190 H0165 191 CD815 192 TE823 193 PM848	0.11387E+00 0.15917E+01 0.38540E+00 0.50546E+00 0.15006E+01	0,0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0:10000E+03 0:10000E+03 0:10000E+03 0:10000E+03 0:10000E+03

LUMPED ONE GROUP CROSS SECTION 0.43046E+00

\* One group cross section.

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U-2.	38 (FISSION	SPECT) BUI	N-UP 360 DAYS		
I	NUCLIDE	1-G.C.S.* (BARN)	CONCENTRATION**	CUNTRIBUTION (%)	ACCUMLTD (%)
1	RU101 *	0.758900+00	0.63698E-01	0,88045E+01	0.68045E+01
2	SM149 *	0.23668E+01	0.18243E-01	0,78640E+01	0.16669E+02
3	RH103 *	0,70516E+00	0,53759E-01	0,69044E+01	0+23575E+02
4	TC 99 *	0,58870E+00	0,63436E-01	0.68018E+01	0.30375E+02
5	C\$133 *	0.53767E+00	0,63044E-01	0.61738E+01	0.36548E+02
6	PM147 *	0.12713E+01	0.21666E-01	0.50167E+01	0.41565E+02
7	PD105 *	0,80738E+00	0.32052E-01	0.47133E+01	C.46278E+02
8	SM151 *	0.24773E+01	0.91603E-02	0.41331E+01	0.50412E+02
9	CS135 *	0.32120E+CO	0.66467E-01	0.38864E+01	0.54300E+02
10	MO 97 *	0,34530E+00	0.59384E-01	0.37347E+01	0.58035E+02
11	NU145 *	0,43110E+00	0.37274E-01	0,29266E+01	0,60961E+02
12	XE131 *	0.43313E+00	0.35405E-01	0.27930E+01	0,63754E+02
13	ND143 *	0.34981E+00	0.42554E-01	0.27112E+01	0.66466E+02
14	RU102 *	0.22743E+00	0.63699E=01	0.26386E+01	0.69104E+02
15	MO 95 *	0,32761E+00	0.34045E-01	0.20314E+01	0.71136E+02
16	EU153 *	0.27556E+01	0.40438E-02	0.20296E+01	0.73165E+02
17	MO 98	0.18115E+00	0.60200E-01	0.19862E+01	0.75151E+02
18	PD107 *	0.80019E+00	0.13054E-01	0.19025E+01	0.77054E+02
19	ZR 93 *	0.20895E+00	0.48139E-01	0.18321E+01	0.78886E+02
20	SM150	0.68366F+00	0.12839F-01	0.15987E+01	0.80485E+02
21	RU104 *	0.18680E+00	0.45044E-01	0.15325E+01	0.82017E+02
22	MOIUO	0.11724E+00	0.63643F-01	0.13590E+01	0.83376E+02
23	PR141	0.15732F+00	0.47181F-01	0.13519F+01	0.84728E+02
24	XE132	0.11496F+00	0.52526F-01	0.10998E+01	0.85828E+02
25	1 127	0.54860F+00	0.99055E=02	0.98976F+00	0.86818E+02
26	RU103	0.50432F+00	0.10119F-01	0.92946E+00	0.877475+02
27	ND148	0.23212F+00	0.21135F - 01	0.89353F+00	0.68641E+02
28	SM147 *	0.14253E+01	0.28914F = 02	0.75059E+00	0.89391F+02
29	SM152	0.69376F+00	0.58379F=02	0.73766F+00	0.90129F+02
30	ZR 91	0,10037F+00	0.34477E = 01	0.63027F+00	0.90759E+02
31	ND146	0,96998E=01	0.33827E = 01	0.59761E+00	0.91357E+02
32	I 129 *	0.49786F+00	0.63306F=02	0.57404F+00	0.91931E+02
33	LA139	0.56396F=01	0.53105E = 01	0.54547F+00	0.92476E+02
34	ZR 96	0.53116F=01	0.54887E - 01	0.53099E+00	0.93007E+02
35	EU155 *	0.24992F+01	0.11567E-02	0.52652F+00	0.93534E+02
36	AG109 #	0.88640F+00	0.26931E=02	0.43478E+00	0.93969F+02
37	CE142	0.44683E = 01	0.46917E = 01	0.38162F+00	0.94350F+02
38	RU106 *	0.94804F = 01	0.205456-01	0.354756+00	0.94705E+02
39	KR 83	0.44079E+00	0.41192E=02	0.33070E+00	0.95036E+02
40	CF144 *	0.596096-01	0.30192E = 01	0.327795+00	0.953646+02
41	ND144 ¥	0.99489F = 01	0.15181E-01	0.27509E+00	0.95639E+02
<u>4</u> 2	NR 95	0.101795+00	0,747485-02	0 247485+00	0.058848+02
43	XE134	0.160095-01	0 752115-01	0 246695+00	0.950082+02
44	CS137 #	0:22909E=01	0.587776+01	0.245258+00	0,96179E+02
45	ZR 95	0.920045-01	0.142055-01	0.238045+00	0.966145402
44	PD106	0 154045-00		0 22120540	0,048376102
70 47	PR142	0 47020E+00		0.214955+00	0 070505400
40	CE140	0,700015-01	0,240125-02	0 203825400	0,710225402
70 40		0 166126+00	0+227216=01	0 183695400	0 076405+00
77	CE141	0 121615+00	0.03310E=U2	0,103475400	0 074135.00
20	CC141	0.T2T0TE+00	U . 12302E=02	01113315400	019710136402

TABLE 5.3 Contribution of the individual FP nuclides to total capture

\* One group cross section.

# TABLE 5.3 (Cont.)

U=2:	38 (FISSION	SPECT)	BURN-UP	360	DAYS		
1	NUCLIDE	1+G.C.S.* (BARN)	CONC	ENTRA	ATION**	CONTRIBUTION (%)	ACCUMLTD (%)
51	BR 81	0.53584E+	00 G.1	58848	-02	0,15502E+00	0.97768E+02
52	PD108	0.11809E+	00 0.6	4052E	-02	0.13777E+00	0.97906E+02
53	SM154	0.29944F+	00 0.2	44566	- 02	0.13338F+00	0.980396+02
54	ND147	0.59741F+	00 0.1	13996	- 02	0.124046+00	0.98163E+02
55	BA140	0.20665F+	00 (.3	04705	5-02	0.11469E+00	0.98278F+02
56	78 94	0 120471-	01 0.5	13546	5-01	0.114556+00	0.983925+02
57	KR 84	0.711126-	01 019	12240	5-02	0 109945+00	0 005005402
50	V G1	0 630146		40000		0.101335+00	
50	70 00	0.100430-	01 0.1	04226		0,101335+00	0,900046+02
29	LR 72	0.122036-		90026	-01	0.000000001	01986916+02
00		0.322136-	01 0.1	41428	. <b>~</b> 01	0.029082-01	0,98774E+02
61	BA138	0.14138E-	02 0.5	91205	01	0.80476E=01	0.988542+02
62	SR 90 *	0.10964E-	01 0.3	23878	-01	0.646/7E-01	0.98919E+02
63	GU155	0.14684E+	01 0.2	32138	E-03	0,62081E-01	0.98981E+02
64	GD156	0.45935E+	00 0.7	01418	E-03	0,58683E-01	0.99040E+02
65	GD157	0.74480E+	00 0.3	77826	E-03	0.51253E-01	0,99091E+02
66	Y 89	0.11511E-	01 0.2	38966	5-01	0,501008-01	0+99141E+02
67	XE136	0.38422E-	02 0.6	74728	E-01	0.47217E-01	0,99188E+02
68	[N115	0.51526E+	00 0.5	0109E	E-03	0.47025E-01	0.99235E+02
69	CD111	′0,24979E+	00 C.9	9728E	E-03	0.45371E-01	0+99281E+02
70	KR 65	0,13173E+	00 0.1	8056E	E-02	0.43321E-01	0+99324E+02
71	I 131	0.18364E+	00 C.1	1800E	E-02	0.39469E-01	0.99364E+02
72	PM149	0.124171+	01 0.1	6856E	-03	0.38122E-01	0.99402E+02
73	TE827	0.28251E+	00 0.7	3896E	-03	0.38023E-01	0+99440E+02
74	MO 99	0.28384E+	00 0.7	1825E	-03	0.37131E-01	0.994776+02
75	CÚ112	0,19559E+	0.8	8221E	-03	0.31427E-01	0.99508E+02
76	SE 79	0.408236+	CO C.4	10508	-03	0.30522E-01	0.99539E+02
77	TE128	0.52974E-	01 0.3	0948	-02	0.29859E-01	0.99569E+02
78	58121	0.43706E+	00 0.3	7408E	-03	0.29778E-01	0.99598E+02
79	CD113	0.29623E+	00 0.5	4577F	-03	0.29446F-01	0.99628E+02
80	SB125	0.16242E+	00 0.9	62328	E=03	0.28467E-01	0.99656E+02
81	XE133	0.11264F+	co c.1	36516	-02	0.28007F-01	0.99684F+02
82	TB159	0.16847E+	01 ē.s	72316	-04	0.26766E-01	0.99711E+02
83	SN117	0.30915F +	00 0.4	0075F	-03	0.22565F-01	0.99734E+02
84	TE130	0.81875E	02 0.1	46756	-01	0.21884E=01	0.99756F+02
85	SR 88	0.48747F-	02 0.1	6757F	-01	0.14877F-01	0.99770E+02
86	EU156	0.161548+	01 0.4	4934F	-04	0.14858E=01	0.997856+02
87	SN119	0.21651E+	00 0.3	69265	5-03	0.14561E=01	0.998005+02
88	SB123	0.32820E+	CO 0.2	38114	- 03	0.14234E=01	0.998145+02
80	84137	0.11658E+		72675	- c3	0 140385-01	0.008266+02
90	58 89	0.114762+	01 0.6	22716	-02	0 134675=01	0,008425402
01	KP 86	0 530156-		36365	-02	0 133815-01	0.008566402
21	CD114	0.1471861		20105	-01	0 127925-01	0.308685+02
02	P0110		00 0,4	A 1 7 0 C	-03	0 125205-01	0.000000000
0.4	C0169	01400000		73965	-(12	0 106475-01	0,000015+02
74 CK	DM151	- U+2250051+1 - 0 122816-4		13005 35/175	-05	0,1000/E=01	0 00001ET05
72	CM152			205075	04		0+333076405
76	5PT175	0.25/225+		2000E	-04	0.970001=02	0+999112+02
71	80103	0.2268324		7019E	-03	0,00904E=02	U+99920E+02
78	SE CU	U+45566E-	0.8	810/E	-03	0.731/1E=02	0+99927E+02
.99	SNIIS	U.10838E+0	00 0.3	6075E	-03	0,72791E=02	0+99934E+02
100	16123	U.32009E+0	UU 0,1	13265	:-03	0.66032E=02	U,99941E+02

\* One group cross section.

# TABLE 5.3 (Cont.)

U-238 (FISSION	SPECT)	3URN-UP	360 DAYS		
NUCLIDE	1-G.C.S.* (BARN)	CONC	ENTRATION	<pre>** CONTRIBUTION    (%)</pre>	ACCUMLTD (%)
101 CE143	0.14135E+00	o 0.2	5126E-03	0.64686E-02	0.99947E+02
102 SE 82	0.11735E-01	1 0.2	6420E-02	0,56470E-02	0.99953E+02
103 SN123	0.13802E+00	0.1	8175E-03	0.45689E-02	0,99958E+02
104 TE629	0,12865E+00	0,1	9027E-03	0.44582E-02	0.99962E+02
105 DY161	0.11403E+01	1 0,1	9269E-04	0,40019E-02	C+99966E+02
106 SN120	0,46427E-01	0,3	7026E-03	0.31309E-02	0.99969E+02
107 SN124	0,33603E-01	L 0,4	6345E-03	0,28365E-02	0.99972E+02
108 CD116	0.40687E-01	L 0.3	7713E-03	0,27948E-02	0+99975E+02
109 SN122	0.38703E-01	1 0.3	8529E-03	0,27160E-02	0.99977E+02
110 PR145	0,35928E+00	0.3	75678-04	0.24583E=02	0,99980E+02
111 SE 78	0.80951E-01	1 0 <b>.1</b>	4256E-03	0.21020E-02	0+99982E+02
112 BA136	0,10021E+00	o o.i	0850E-03	0,19805E-02	0+99984E+02
113 SE 77	0.27563E+00	) 0 <b>.</b> 3	7581E-04	0.18866E-02	0+99986E+02
114 AG111	0.30889E+00	0,3 U,3	0971E-C4	0.17424E-02	0.999886+02
115 ZR 97	0,51352E-01	1 0,1	6420E-03	0,15358E-02	0+99989E+02
116 SN126	0.12096E-01	1 0.6	3541E-03	0.13998E-02	0+99991E+02
117 RU105	0.33294E+00	0.1	9653E-04	0.11916E-02	0.99992E+02
118 SN125	0.11109E+00	0,4	2439E=04	0.85869E-03	0.99993E+02
119 TC799	0.45938E+00	0.9	3640E-05	0.78347E-03	0.99993E+02
120 SN115	0.16103E+00	D G.2	6372E-04	0,77346E-03	0.99994E+02
121 TE127	0.24421E+00	0.1	6435E-04	0,73101E-03	0+99995E+02
122 TE825	0,31700E+00	0.8	9226E-05	0,51516E-03	0.99995E+02
123 Y 93	0.33143E-01	L 0,8	3215E-04	0,50232E-03	0.99996E+02
124 GD160	0.77076E-01	1 0.3	39716-04	0.47689E-03	0.99996E+02
125 ZR 90	0,58951E-02	2 0,4	04428-03	0.43423E-03	0.99997E+02
126 SB127	0,13163E+00	0,1	5594E-04	0.37385E-03	0.99997E+02
127 PD109	0.30834E+00	0.6	4662E-05	0,36313E-03	0+99998E+02
128 CD115	0,36749E+00	0,4	7851E-05	0.32028E-03	0+99998E+02
129 AS 75	0.47500E+00	0,3	4566E-05	0.29904E-03	0.99998E+02
130 XE135	0,16482E-01	L 0,8	8202E-04	0.26477E-03	0+99998E+02
131 SR 91	0.18964E-01	L 0.7	2837E-04	0,25157E+03	0+99999E+02
132 EU157	0.11929E+01	L 0,9	6172E-06	0.20894E-03	0,999996+02
133 CS136	0,18916E+00	0.5	9629E-05	0,20544E-03	0+99999E+02
134 SM156	0.45882E+00	0.1	1677E-05	0.97580E-04	0+999995+02
135 TE129	0,93892E-01	L 0.5	6315E-05	0.96304E-04	0.99999E+02
136 TB161	0.91439E+00	0.5	4817E-06	0.91294E-04	0•99999E+02
137 TE132	0,70326E-03	9,0	8972E-03	0,88345E-04	0+10000E+03
138 SN121	0.27376E+00	0,1	6976E-05	0,84645E=04	0.10000E+03
139 MO 96	0,10426E+00	0,4	1852E-05	0.79472E-04	0,10000E+03
140 Y 90	0.43381E-01	1 0.8	3589E-05	0.66125E-04	0+10000E+03
141 PD112	0,64249E-01	L 0,3	1043E-05	0,36327E-04	0.10000E+03
142 TE126	0.74212E-01	L 0,1	8051E-()5	0,24399E-04	0.10000E+03
143 GE 76	0,13468E-01	1 0,9	7787E-05	0,23988E-04	0.10000E+03
144 I 135	0.18070E-02	2 0.6	3684E-04	0.20960E-04	0.10000E+03
145 SB128	0.17850E+00	0,5	8755E-06	0.19101E-04	0.10000E+03
146 GD159	0.38887E+00	0,2	6734E-06	0.18934E-04	0.10000E+03
147 EU154	0.31269E+01	1 0,3	2268E-07	0.18377E-04	0.10000E+03
148 A5 77	0.38103E+00	0.2	4490E-06	0.16996E-04	0.10000E+03
149   133	0,40342E-03	3 0,2	3013E-03	0,16909E-04	0.10000E+03
150 GE 73	U,22094E+00	0.2	8/67E-06	0,11576E-04	0+10000E+03

\* One group cross section.

# TABLE 5.3 (Cont.)

U <del>-</del> 23	B (FISSION	SPECT)	BURN-UP	360 (	DAYS			
1	NUCLIDE	1-G.C.S.*	CONC	ENTRA	** NG I T	CONTRIBUTION	N AC	CUMLTD
		(BARN)				(%)		(%)
151	TE831	0.59073E-0	0,6	5427E	-05	0,70394E-05	ο,	10000E+03
152	SB126	0.39104E+C	0.9	4874E-	-07	0.67571E-05	0,	10000E+03
153	DY160	0,84470E+C	0 0.3	2944E	-07	0,50684E-05	0.	10000E+03
154	TB160	0.16720E+0	0.1	2803E-	-07	0.38989E-05	0.	10000E+03
155	TE131	0.37343E-0	2 0.4	8707E	-05	0.33127E-05	Ó.	10000E+03
156	RU100	0.50877E+0	0.3	4360E-	-07	0.31839E-05	0.	10000E+03
157	GE 74	0.14249E+0	0.9	7887E	-06	0.25404E-05	0.	10000E+03
158	XE130	0.25201E+0	0 0.3	2296E-	-07	0.14824E-05	Ó,	10000E+03
159	GE 77	0.85650E-0	0.7	1507E-	-07	0.11155E-05	0.	10000E+03
160	TE124	0,13222E+0	0 0.3	5834E	-07	0.86294E-06	Ó,	10000E+03
161	SB124	0.34203E+0	0.1	1112E	~07	0.69219E-06	0.	10000E+03
162	GE 72	0.21103E-0	0.4	3010E-	-07	0.16531E-06	0,	10000E+03
163	KR 82	0;17425E+0	0.3	1576E-	-08	0.10021E-06	G.	10000E+03
164	CS134	0.48513E+C	0.8	6634E-	-09	0,76549E-07	0,	10000E+03
165	SN116	0,12827E+0	0,2	0976E	-08	0,49005E-07	· 0.	10000E+03
166	SM148	0,24056E+0	0.1	0554E-	-08	0,46243E-07	0.	10000E+03
167	LA140	0.20999E+0	0,8	1882E-	-09	0,31317E-07	0.	10000E+03
168	TE122	0.24226E+C	0.5	4616E	-09	0,24099E-07	0.	10000E+03
169	BA134	0.41109E+0	0.1	5248E	-09	0.11416E-07	0.	10000E+03
170	SR 86	0.38742E-C	0.1	3955E-	-08	0.98467E-08	0.	10000E+03
171	I 130	0.63655E+0	0,6	7006E-	-10	0,77685E-08	0.	10000E+03
172	RB 86	0.33004E+C	0.1	1279E-	-09	0.67798E-08	0,	10000E+03
173	XE128	0.384732+0	0.7	8709E	-10	0.55154E-08	0.	10000E+03
174	PD104	0.43457E+C	0.6	8682E	-10	0.54362E-08	0.	10000E+03
175	PM148	0,10098E+C	0,2	3307E	-10	0.42867E-08	0,	10000E+03
176	GA 72	0.21222E+0	0 0.1	0230E.	-09	0,39543E-08	0,	10000E+03
177	BR 82	0.61404 <u>č</u> +C	0,1	8743E-	-10	0,20962E=08	0.	10000E+03
178	SB122	0.75316E+0	0,6	1980E	-11	0.85022E-09	0.	10000E+03
179	ZN 72	0.514552-0	0.3	3736E	-09	0.31617E-09	0.	10000E+03
180	CD110	0.31417E+C	0 0.4	3283E	-11	0.24767E-09	0.	10000E+03
181	SE 76	0.10087E+C	0,6	6527E	-12	0,12222E-10	0.	10000E+03
182	ND142	0.84834E-C	0.4	0124E	-13	0.61997E-12	0,	10000E+03
183	AS 76	0,82606E+0	0,2	9269E	-1.4	0,44487E-12	0.	10000E+03
184	PR142	0.32942E+0	0 0,1	2905E	-15	0,77430E=14	0.	10000E+03
185	16123	0.46605E+0	0.0			0.0	. 0.	10000E+03
186	NU150	0.11758E+C	0.0			0.0	0.	10000E+03
187	DY162	0.44409E+0	0.0			0.0	0.	10000E+03
188	DY163	0,66046E+C	0.0			0.0	0.	10000E+03
193		0.1130/E+C				0.0	0.	10000E+03
140	HU167	U+159175+0				0.0	<u>0</u> +	100006+03
100	C0010	0 50540E+C				0.0	U.	T0000E+03
192	ILOZJ DM942	0+50546E+0				0.0	0.	100001+03
7.43	F!1040	0.12000E+C	0+0			0.0	0.	100006+03

LUMPED ONE GROUP CROSS SECTION 0.54904E+00

\* One group cross section.

#### 3.3 Comparison with Other Sets

As shown in section 3.1, disagreements of FP cross sections among various sets are larger than the uncertainties due to burn-up dependence. The JNDC set is compared with the other sets in this section. The burn-up time dependence is neglected here and the lumped constants are compared at burn-up of 360 days.

The 25 group lumped cross sections are compared with each other in Figs. 6.1, 6.2 and 6.3. Considerable discrepancies are observed in the capture and inelastic scattering cross sections. Agreements are fairly good for the elastic scattering. As for the capture cross sections, the JNDC and the ENDF/B-4 sets have larger values above 1 MeV and smaller ones below 500 keV than the Cook and the JNDC-P sets. The difference of energy dependence is caused between the JNDC and the JNDC-P sets by the fact that the Porter-Thomas fluctuation was taken into







Fig. 6.3 Lumped inelastic scattering cross sections of FP due to <sup>239</sup>Pu fission at burn-up of 360 days.

account in the JNDC set but not in the JNDC-P set. The Cook set has a discontinuity at 4.65 keV which cannot be explained by the statistical fluctuation<sup>14,21)</sup>.

As for the inelastic scattering cross sections, disagreements are evident in the threshold energy. The Cook set has much higher threshold energy than the other sets. The JNDC and the JNDC-P sets have the same threshold energy, which is determined by the threshold of  $^{151}$ Sm. No threshold energy exists in the ENDF/B-4 set, since  $^{153}$ Eu has very small (n, n' $\alpha$ ) cross section down to the thermal energy and this cross section is treated as the inelastic scattering in the present group constants<sup>\*</sup>. The threshold lies at 100 keV in the ABBN set.

To make these characteristics clearer for each set, we compare in TABLE 6 one group cross sections collapsed with the spectra of the two typical fast reactors. The following, were observed:

- 1) The JNDC-P set has the largest capture cross sections.
- 2) The ENDF/B-4 set has the smallest capture cross sections.
- 3) The Cook set has the largest elastic scattering cross sections and rather small inelastic scattering cross sections.
- 4) The JNDC set has no extreme values for all the cases.
- 5) The maximum discrepancies are about 40% in capture, 50% in inelastic scattering and 20% in elastic scattering.
- 6) The discrepancies are decreased to be 15%, 10% and 10% in capture, inelastic scattering and elastic scattering respectively, when we exclude the JNDC-P set, which is preliminary, and the ABBN set, details of which are not known.

Though fairly good agreements are observed in the one-group lumped cross sections among the JNDC, Cook and ENDF/B-4 sets, this does not mean that the cross sections of the individual nuclides agree with each other. One group cross sections of 28 nuclides are compared in TABLES 7.1 to 7.3. The Cook set has smaller capture cross sections than the JNDC set for most of nuclides but has much larger ones for <sup>101</sup>Ru, whose concentration is large, resulting in nearly the same values of the one group lumped capture cross section.

It is difficult to say which set is the most reliable without carrying out what is called the benchmark test. This will be discussed in Chapter 4.

\* The  $(n, n'\alpha)$  cross section was ignored in the evaluation by JNDC.
TABLE 6 One group lumped cross sections at 360 days of burn-up for various sets FP due to fission of  $^{239}$ Pu with thermal neutrons

Set	σ. (b	arn)	Oei (	barn)	$\sigma_{in}$ (barn)	
	A	В	A	В	A	В
JNDC	0.567	0. 295	15, 90	13.98	0. 554	0.903
JNDC-P	0.703	0.353	15.80	13.85	0.637	1.022
Cook	0.552	0.299	16.46	14.49	0. 499	0.843
ENDF/B-4	0.511	0.269	15.20	13.31	0. 520	0.830
ABBN	0. 596	0.310	13.92	12.91	0. 638	1.045

FP due to fission of <sup>235</sup>U with thermal neutrons

Set	$\sigma_{c}$ (barn)		Jei (	(barn)	$\sigma_{in}$ (barn)	
	A	В	A	В	А	В
JNDC	0.430	0.217	16.21	14.18	0. 489	0.801
JNDC-P	0. 545	0. 263	16.16	14.10	0.554	0.895
Cook	0.442	0.232	16.98	14.84	0.469	0.793
ENDF/B-4	0. 383	0.198	15. 50	13.46	0. 443	0. 712
ABBN	0.498	0.254	14.00	12. 97	0.638	1.045

FP due to fission of <sup>238</sup>U with fission spectrum neutrons

Set	σ. (	barn)	σei	(barn)	$\sigma_{in}$ (barn)	
	A	В	A	В	A	В
JNDC	0. 549	0.280	16.10	14. 10	0. 538	0.875
JNDC-P	0.675	0. 332	16.02	13.99	0. 619	0.990
Cook	0.551	0, 296	16.78	14.70	0. 489	0.827
ENDF/B-4	0.492	0. 256	15. 50	13.46	0. 511	0.811
ABBN	—	—			l	

A: Collapsed with the spectrum of 1000 MWe FBR.

B: Collapsed with the spectrum of JOYO class FBR.

 TABLE 7.1
 One group capture cross sections\* of the 28 nuclides in various sets (barns)

Nuclide	JNDC	Cook	ENDF/B-4	JNDC-P	RCN
Sr-90	0.011	0.007	0. 013	0.028	0. 025
Zr-93	0. 209	0. 134	0. 123	0. 257	0. 210
Mo-95	0. 328	0. 320	0. 321	0. 400	0. 332
Mo-97	0.345	0. 278	0. 305	0. 393	0.360
Tc-99	0. 589	0. 514	0. 533	0. 758	0. 737
Ru-101	0.759	1.601	0.569	0. 970	0. 781
Ru-102	0.227	0.306	0.194	0. 323	0. 298
Ru-104	0. 187	0.159	0.161	0. 188	0. 297
Ru-106	0. 095	0.069	0.091	0. 144	0.276
Rh-103	0. 705	0. 584	0.759	0.810	0.605
Pd-105	0.807	0. 499	0.880	1.039	0.872
Pd-107	0.800	0.496	0.604	1.029	0.863
Ag-109	0.886	0.625	0.556	1.117	1.082
I–129	0. 498	0. 290	0. 420	0. 746	0.445
Xe-131	0. 433	0.464	0. 228	0.663	0. 370
Cs-133	0. 538	0. 439	0. 550	0.827	0.600
Cs-135	0. 321	0. 225	0.841	0.464	0. 255
Cs-137	0.023	0.018	0.016	0. 035	0, 219
Ce-144	0.060	0.072	0. 057	0. 899	—
Nd-143	0.350	0. 479	0. 359	0. 566	0. 319
Nd-144	0.099	0.143	0. 103	0. 128	0.076
Nd-145	0. 431	0. 410	0.406	0. 695	. 0. 434
Pm-147	1.271	1.296	1.465	1.960	1. 320
Sm-147	1. 425	1. 370	0.960	1.941	1.035
Sm-149	2. 367	1.589	1.688	2.465	1.878
Sm-151	2. 477	2. 841	2.606	1.443	2. 349
Eu-153	2. 756	2.146	2.668	3. 564	2.700
Eu-155	2. 499	1.922	2.935	1.631	1.991

\* Collapsed with the spectrum of a 1000 MWe FBR.

Nuclide	JNDC	Cook	ENDF/B-4	INDC-P
Sr-90	7.53	8.82	7.02	7.91
Zr-93	7.86	7.30	7.49	7.76
Mo-95	7.74	7.09	7. 23	7.58
Mo-97	7.83	12. 32	7.16	7.72
Tc-99	7.40	7.58	7.18	7.12
Ru-101	7.07	6. 28	6, 51	6.71
Ru-102	7.72	7.75	6.99	7.68
Ru-104	7.79	7.40	7.15	7.63
Ru-106	7.55	6.75	6. 81	7.48
Rh-103	7.24	7.68	6.94	6.97
Pd-105	6.88	6. 43	6.30	6. 59
Pd-107	6, 69	6.17	6.17	6.39
Ag-109	6.67	6.50	7.81	6.27
I–129	6.02	6.20	5.64	5. 79
Xe-131	6. 30	6.65	6.78	6.12
Cs-133	6. 09	7.10	6, 99	6.17
Cs-135	6. 93	7.24	6. 52	6.97
Cs-137	7.27	6.86	6. 53	7.81
Ce-144	8.56	12. 59	7.72	9.31
Nd-143	8.99	11.89	12.82	8.82
Nd-144	12.90	12.92	13.27	9.39
Nd-145	8.62	10.08	13.31	8.85
Pm-147	8, 83	10.96	16.31	8.51
Sm-147	9.62	11.75	16.35	9, 59
Sm-149	8.34	11.28	9.17	8. 39
Sm-151	7.37	7.95	7.72	8.07
Eu-153	7.98	8.02	8.43	7.72
Eu-155	8. 71	7.64	7. 59	9.76

TABLE 7.2One group elastic scattering cross sections\* of the<br/>28 nuclides in various sets (barns)

\* Collapsed with the spectrum of a 1000 MWe FBR.

28 nuclides in various sets (barns)										
Nuclide	JNDC	Cook	ENDF/B-4	JNDC-P						
Sr-90	0. 151	0. 182	0.108	0.196						
Zr-93	0.209	0.301	0.161	0.262						
Mo-95	0. 329	0. 317	0.263	0. 395						
Mo97	0. 261	0. 171	0.217	0.296						
Tc-99	0.409	0. 327	0.411	0. 506						
Ru-101	0. 553	0. 325	0.492	0. 666						
Ru-102	0. 247	0.220	0.186	0.317						
Ru-104	0. 298	0.260	0. 198	0. 375						
Ru-106	0.346	0.274	0. 273	0. 440						
Rh-103	0.399	0.270	0. 474	0. 479						
Pd-105	0.430	0.270	0. 363	0. 506						
Pd-107	0.485	0. 271	0.444	0.565						
Ag-109	0.353	0. 318	0.407	0. 435						
I–129	0. 478	0. 362	0.404	0.635						
Xe-131	0. 441	0. 360	0. 490	0. 548						
Cs-133	0.461	0. 369	0. 520	0. 548						
Cs-135	0.285	0. 337	0, 246	0.322						
Cs-137	0. 165	0.358	0. 169	0.198						
Ce-144	0.308	0. 413	0.056	0.390						
Nd-143	0.130	0. 199	0.148	0.160						
Nd-144	0.214	0.209	0.164	0.272						
Nd-145	0. 495	0. 424	0.493	0.610						

0.424

0.416

0.370

0.438

0.434

0.428

0.542

0.478

1.175

2.233

0.986

0.864

0.618

0.535

1.014

2.188

1.144

0.965

 TABLE 7.3 One group inelastic scattering cross sections\* of the 28 nuclides in various sets (barns)

\* Collapsed with the spectrum of a 1000 MWe FBR.

0.495

0.425

0.700

1.386

0.786

0.675

Pm-147

Sm-147 Sm-149

Sm-151

Eu-153

Eu-155

As pointed out in section 3.3, there remains considerable discrepancy among the existing sets of evaluated FP cross sections. Moreover it is not easy to say which set is the most reliable, since experimental data are scarce for most of FP nuclides.

On the other hand, central reactivity worths of FP mixtures and of some FP isotopes were measured at various cores of STEK facility in Petten, the Netherlands. Detailed descriptions of the experiments are given in Refs. 15 and 16. The results\* of the experiments were already published<sup>15,16,24,25,26</sup>). Therefore it seems very useful to perform the benchmark test using various FP group constants in order to confirm their reliability, though some of the published experimental results are noted as preliminary ones. Five STEK cores were used; they are STEK-4000, STEK-3000, STEK-2000, STEK-1000 and STEK-500. STEK-4000 has the softest spectrum and STEK-500 has the hardest one. The newest values of the flux and the adjoint flux for these cores were sent from RCN as a private communication<sup>27)</sup>.

It should be noted, however, that the STEK cores were designed as mock-up experiments of steam cooled fast reactors and their spectra are softer than those of LMFBR. As an example the capture rates of the lumped FP are shown in Fig. 7 for two STEK cores. It is evident that more than 25% of capture occurs below 100 eV for STEK-4000 and that even STEK-1000 has a softer spectrum than SNR-300, a prototype LMFBR. Therefore the results with STEK-500, STEK-1000 and STEK-2000 will be regarded as important for LMFBR in the following benchmark tests. On the other hand, the results with STEK-3000 and STEK-4000 should be considered only as references.



Fig. 7 Neutron capture rates in two STEK and SNR-3000 spectra.

<sup>\*</sup> In these references, the reactivity worth ho is always normalized with respect to a normalizing worth  $ho_0$ , obtained from the apparent reactivity effect of a  $^{252}C_f$  source and the absolute fission rate of a thin  $^{235}U$  foil. The detail is given in Ref. 16. Our calculated worths are also normalized to  $\rho_0$ .

## 4.1 Integral Quantities of Pseudo FP Nuclides in SNR-300

In Ref. 16, the integral quantities of pseudo FP mixtures in SNR-300 are calculated with different cross section sets. Then the same quantities were calculated with the JNDC, JNDC-P, Cook and ENDF/B-4 sets before carrying out the benchmark test. The concentration of these mixtures are given in Ref. 16 as well as the flux and the adjoint flux of SNR-300. The calculated results are compared in TABLE 8 with the values calculated in RCN. This table is useful to understand the relation among various sets. The Cook set and the Australian set in TABLE 8 are based on the same evaluated data and the difference between them might be caused by the different weighting flux used in producing the group cross sections.

TABLE 8 Calculated integral quantities of pseudo FP mixtures in SNR-300 for various cross section sets

	Capture rate per fission per sec $(\times 10^9)$										
Mixture	JNDC	JNDC-P	Cook	ENDF/B-4	RCN-1 *	ABBN *	UKNDL *	Australian *	Benzi <i>et al.</i> *		
235U	1. 91	2.40	1.98	1.72	1.96± 9%	2. 19	2.08	1.95	1.94		
238U	2.37	2.90	2.42	2.15	$2.43 \pm 10\%$	-	2.66	2. 38	2.42		
<sup>239</sup> Pu	2.50	3. 09	2.50	2.28	$2.65 \pm 10\%$	2.64	2.89	2.47	2. 57		
<sup>241</sup> Pu	2.62	3. 23	2, 52	2, 39	$2.84 \pm 10\%$	_	3.06	2.49	2.70		

	Negative reactivity due to capture (arbitrary units)											
Mixture	JNDC	JNDC-P	Cook	ENDF/B-4	RCN-1 *	ABBN *	UKNDL	Australian *	Benzi <i>et al.</i>			
235U	0.885	1.11	0.912	0.797	0.905± 9%	1.02	0.973	0.898	0.898			
<sup>238</sup> U	1.10	1.35	<b>1</b> . 11	0.992	$1.12 \pm 9\%$		1.24	1.09	1.12			
<sup>239</sup> Pu	1.16	1.43	1.15	1.05	$1.22 \pm 10\%$	1.23	1, 35	1. 13	1. 19			
<sup>241</sup> Pu	1. 21	1. 49	1.16	1.10	$1.31 \pm 10\%$		1. 43	1. 14	1.25			

\* Taken from Ref. 16.

### 4.2 Mixture of Fission Products

The central reactivity worths were measured at STEK-1000, -2000, -3000, and -4000 for two irradiated FP mixture samples; HFR-101 (with a burn-up of 60% FIMA) and HFR-102 (with 30% FIMA), and a mock-up sample (KFK-sample). The experimental values were reported in Refs. 15 and 16\*, as well as the calculation with the RCN-1 set.<sup>9)</sup> Then we calculated the reactivity worths due to capture with the JNDC, JNDC-P, Cook and ENDF/B-4 sets.

The calculated results are compared in TABLE 9 with the experimental values. The ratios of calculated value to experimental one, C/E, are illustrated in Fig. 8. The following can be pointed out from this comparison:

- The JNDC, RCN and Cook sets underestimate the negative reactivities by about 10% for the HFR-101 sample, while the ENDF/B-4 set underestimates them by more than 20% and the JNDC-P set overestimates them by 10%.
- 2) The JNDC, RCN and Cook sets underestimate the reactivities by 20~25% for the HFR-102 sample, while the JNDC-P set shows fairly good agreement with the experimental data.
- The C/E values with the JNDC, JNDC-P, Cook and ENDF/B-4 sets depend on the core for the KFK-sample, while the results with the RCN-set do not.
- \* Revised values were sent from RCN later as a private communication<sup>27)</sup> and they are used in this comparison.

STEK	Samala	Ree	JN	DC	JNE	DC-P	Co	ok	END	F/B-4	RCN	[-127)
core	Sample	Exp.	Value	C/E	Value	C/E	Value	C/E	Value	C/E	Value	C/E
4000	HFR-101	-0.501	-0.431	0. 859	-0.501	1.000	-0.409	0.816	-0.396	0. 790	0. 465	0. 928
	HFR-102	-0.579	-0.459	0. 703	-0.533	0.921	-0.437	0.754	-0.424	0. 732	0. 492	0. 850
	KFK	-0.631	-0.539	0. 854	-0.590	0.935	-0.508	0.805	-0.500	0. 792	0. 679	1. 076
3000	HFR-101	-0.406	0. 353	0. 869	-0.431	1.061	-0.341	0. 840	-0.315	0.776	0. 360	0. 887
	HFR-102	-0.451	0. 371	0. 823	-0.455	1.008	-0.360	0. 798	-0.332	0.736	0. 374	0. 829
	KFK	-0.434	0. 418	0. 963	-0.473	1.090	-0.394	0. 907	-0.374	0.862	0. 460	1. 060
2000	HFR-101	-0.346	-0.307	0.887	-0. 389	1. 125	-0.302	0.873	-0.272	0.786	-0.302	0.873
	HFR-102	-0.435	-0.321	0.738	-0. 403	0. 926	-0.316	0.726	-0.284	0.653	-0.311	0.715
	KFK	-0.350	-0.358	1.023	-0. 413	1. 179	-0.340	0.971	-0.318	0.909	-0.364	1.04
1000	HFR-101	0.287	0. 256	0. 892	-0.322	1. 121	-0.258	0.898	-0.228	0.794	-0.254	0.885
	HFR-102	0.359	0. 266	0. 740	-0.337	0. 937	-0.268	0.746	-0.237	0.660	-0.261	0.727
	KFK	0.267	0. 300	1. 122	-0.347	1. 298	-0.288	1.079	-0.268	1.004	-0.304	1.139
500	HFR-101 HFR-102 KFK		0. 181 0. 187 0. 216		-0.223 -0.232 -0.247		-0.190 -0.200 -0.213		-0. 165 -0. 171 -0. 196			

TABLE 9 Comparison of capture components of the central reactivity worths ( $\rho/\rho_0$ ) for FP mixtures



4) The results with the JNDC, Cook and RCN sets agree with each other for the cores of harder spectrum (STEK-1000, -2000) but deviates from each other for cores of soft spectrum.

5) The ENDF/B-4 set gives the smallest C/E values and the JNDC-P set gives the largest ones. It is not clear from the present comparison why the C/E values are 10% lower for the HFR-102 sample than for the HFR-101 sample with all the sets. This may suggest some systematic errors in the experiments. It is also questionable why such a strong core dependence appears in our calculation with the JNDC, JNDC-P, Cook and ENDF/B-4 sets only for the KFK sample.

It is difficult to say which set is the most reliable from the present comparison, since the mixture

is composed of so many isotopes and the error of each nuclide cancels each other. Hence the integral data for separated isotopes seem more helpful. This will be discussed in the next section.

#### 4.3 Reactivity Worths of FP Isotopes

The reactivity worths of 57 isotopic samples were also measured at STEK cores, and the results were already published in Refs. 24, 25 and 26. The correction of self-shielding effect is difficult in these experiments, and the results are noted to be preliminary. It is, however, worth-while to check our set with these integral data\*, as they are the only available integral data at present time. The results reported in Refs. 24, 25 and 26 are the total reactivity worths. The flux and the adjoint flux are independently required in order to calculate the reactivity worths due to elastic scattering and inelastic scattering. They were informed as a private communication<sup>27)</sup>.

TABLE 10 gives the experimental data and the calculated ones with various sets. They are illustrated in Fig. 9. The results with the JNDC-P set are given only when necessary. The C/E ratios are shown in Fig. 10. First we discuss on each nuclide.

- Zr-93: The core dependence is different between experiments and calculations. As for STEK-1000 and -500, the JNDC set gives the best value.
- Mo-95: The calculated results agree with each other and agree well with the experiments for STEK-2000, -1000 and -500.
- Mo-97: The JNDC set gives the best results for STEK-1000 and -500.
- Tc-99: The JNDC, Cook and ENDF/B-4 sets underestimate the negative reactivities. The JNDC-P set gives fairly good results. Considering the existing differential data, however, the JNDC-P set cannot be adopted.
- Ru-101: The JNDC set gives very good results, while the Cook set much overestimates the negative reactivities and the ENDF/B-4 set underestimates them.
- Ru-102: The results with the JNDC and ENDF/B-4 sets agree well with the experiments for STEK-4000 to STEK-2000, but are higher than the experiments for STEK-1000 and -500.
- Ru-104: All the calculations overestimate the negative reactivities.
- Rh-103: The ENDF/B-4 set gives the best agreements. The results with the JNDC-set are also satisfactory.
- Pd-105: The calculations show underestimation. The JNDC-P set gives better results than the other sets. The ENDF/B-4 set seem better than the JNDC set for this nuclide.
- Pd-107: The JNDC-P set gives the best results. The JNDC set is better than the ENDF/B-4 and Cook sets.
- Ag-109: The JNDC and JNDC-P sets give satisfactory results.

\* The reactivity worths of other nuclides were also measured. The calculation was also performed for B and <sup>235</sup>U using the JAERI-Fast set, in order to confirm that there are no systematic errors in the measurement at STEK. The calculated results agree very well with the experimental ones as shown below for these cases.

 $(\rho/\rho_0)$  per gram of <sup>235</sup>U and B

0.		235U		В		
Core	Exp.	Cal.	C/E	Exp.	Cal.	C/E
STEK-4000	0.524±0.009	0. 4924	0. 940	$-17.1 \pm 0.7$	-15.17	0.892
STEK-3000	$0.610 \pm 0.008$	0. 5914	0. 970	$-12.32\pm0.21$	-11.88	0.964
STEK-2000	0.70 ±0.01	0.6549	0. 936	$-11.54 \pm 0.21$	-10.57	1.092
STEK-1000	$0.820 \pm 0.004$	0. 7685	0.937	$-9.84 \pm 0.17$	9, 00	0.915
STEK-500	1.026±0.015	0. 9873	0.962	$-7.50 \pm 0.14$	-6.69	0.892
			1		1	1

I-129: The JNDC set gives the best agreement.

- Cs-133: The JNDC and ENDF/B-4 sets underestimate the negative reactivities a little, but give better agreements than the other sets.
- Cs-135: The core dependence of the experimental values is contrary to that of the calculations. Some systematic errors might exist in the experiments. Hence we ignore this case.
- Nd-143: The JNDC and ENDF/B-4 sets give satisfactory agreements with the experiments.
- Nd-144: The JNDC set gives better results than the other sets, though it still overestimates the negative reactivities.
- Nd-145: The JNDC, Cook and ENDF/B-4 sets underestimate the negative reactivities for STEK-1000 and -500.
- Pm-147: The JNDC-P set gives the best results. The JNDC, Cook and ENDF/B-4 sets may a little underestimate the negative reactivities.
- Sm-147: The JNDC-set shows very satisfactory agreement with the experiments.
- Sm-149: The JNDC-set gives better results than the other sets, though it underestimates the negative reactivities for STEK-2000 to -500.
- Sm-151: A slight underestimation is observed with the JNDC and ENDF/B-4 sets.
- Eu-153: The JNDC and ENDF/B-4 sets underestimate the negative reactivities, while the JNDC-P set overestimates them.

The following can be said from the above observations:

1) The JNDC set gives satisfactory results for

93Zr, 95Mo, 97Mo, 101Ru, 103Rh, 109Ag, 129I, 133Cs, 143Nd and 147Sm. (Category 1)

2) The results with the JNDC set deviate from the experiments, but give the best or one of the best agreement with the experiments for

<sup>102</sup>Ru, <sup>104</sup>Ru, <sup>144</sup>Nd, <sup>145</sup>Nd, <sup>149</sup>Sm, <sup>151</sup>Sm and <sup>153</sup>Eu. (Category 2)

- 3) The JNDC-P set seems to give the best agreement with the experimental data for <sup>99</sup>Tc, <sup>105</sup>Pd, <sup>107</sup>Pd and <sup>147</sup>Pm. (Category 3)
- 4) The Cook set often shows the extreme values, for example, for <sup>101</sup>Ru, <sup>102</sup>Ru, <sup>105</sup>Pd, <sup>144</sup>Nd, <sup>153</sup>Eu and <sup>151</sup>Sm.
- 5) The ENDF/B-4 set gives slightly better results than the JNDC set for <sup>103</sup>Rh, <sup>105</sup>Pd and <sup>147</sup>Pm but gives much worse results for <sup>101</sup>Ru and <sup>149</sup>Sm.

Based on the benchmark test by the use of the presently available integral data, it can be said that the JNDC set is the most reliable one among the four sets compared here. Further investigation should be required for the nuclides of categories 2 and 3. Especially we are examining the cases of <sup>105</sup>Pd, <sup>107</sup>Pd and <sup>147</sup>Pm for which the JNDC-P set gives better results and no differential experimental data exist above 1keV. It should be noted, however, that it seems dangerous to rely too much on one set of integral measurements. Hence we made no adjustment of FP group constants using the present benchmark test.

		I OI THE CENTRALITER	cuvity worth	s (p/po) per	gram of FF	isotopes
Nuclide	STEK-Core	Experiments	JNDC	JNDC-P	Cook	ENDF/B-4
Zr-93	4000 3000 2000 1000	$ \begin{array}{c} -0.540 \pm 0.21 \\ -0.305 \pm 0.038 \\ -0.242 \pm 0.046 \\ -0.400 \pm 0.21 \end{array} $	-0.708 -0.621 -0.512 -0.372	-0.513 -0.510 -0.479 -0.397	-0.556 -0.462 -0.354 -0.221	-0.625 -0.516 -0.390
	4000	$ \begin{array}{c} -0.24 \pm 0.24 \\ -0.694 \pm 0.054 \end{array} $	-0.372 -0.187 -1.074	-0.245 -1.315	$ \begin{array}{c c} -0.221 \\ -0.051 \\ \hline -1.018 \end{array} $	-0.079 -1.022
Mo-95	3000 2000 1000 500	$-0.556 \pm 0.052$ $-0.607 \pm 0.093$ $-0.495 \pm 0.043$ $-0.470 \pm 0.15$	-0.801 -0.635 -0.486 -0.307	-1.043 -0.847 -0.645 -0.386	$ \begin{array}{c} -0.770 \\ -0.615 \\ -0.475 \\ -0.309 \end{array} $	$ \begin{array}{r} -0.768 \\ -0.616 \\ -0.480 \\ -0.315 \end{array} $
Mo-97	4000 3000 2000 1000 500	$\begin{array}{c} -0.560\pm 0.064\\ -0.472\pm 0.032\\ -0.68\pm 0.16\\ -0.441\pm 0.021\\ -0.354\pm 0.034\end{array}$	-0.518 -0.538 -0.535 -0.470 -0.318	$\begin{array}{r} -0.\ 761 \\ -0.\ 747 \\ -0.\ 701 \\ -0.\ 587 \\ -0.\ 377 \end{array}$	$ \begin{array}{c} -0.\ 407 \\ -0.\ 419 \\ -0.\ 418 \\ -0.\ 376 \\ -0.\ 274 \end{array} $	0. 451 0. 463 0. 455 0. 402 0. 283
Tc-99	4000 3000 2000 1000 500	$\begin{array}{c} -1.47 \ \pm 0.10 \\ -1.30 \ \pm 0.10 \\ -1.30 \ \pm 0.15 \\ -1.26 \ \pm 0.16 \\ -1.03 \ \pm 0.12 \end{array}$	-1. 190 -1. 023 -0. 942 -0. 827 -0. 617	$-1.328 \\ -1.206 \\ -1.155 \\ -1.045 \\ -0.804$	$ \begin{array}{c} -1.086 \\ -0.907 \\ -0.818 \\ -0.703 \\ -0.505 \end{array} $	1. 403 1. 069 0. 929 0. 784 0. 552
Ru-101	4000 3000 2000 1000 500	$\begin{array}{c} -1. \ 19 \ \pm 0. \ 09 \\ -1. \ 12 \ \pm 0. \ 07 \\ -1. \ 19 \ \pm 0. \ 08 \\ -1. \ 17 \ \pm 0. \ 11 \\ -0. \ 8 \ \pm 0. \ 08 \end{array}$	1. 335 1. 223 1. 134 0. 996 0. 751	-1.455-1.419-1.377-1.259-0.992	$\begin{array}{r} -1.504 \\ -1.628 \\ -1.736 \\ -1.831 \\ -1.826 \end{array}$	$ \begin{array}{r} -1.016 \\ -0.900 \\ -0.824 \\ -0.721 \\ -0.540 \end{array} $
Ru-102	4000 3000 2000 1000 500	$\begin{array}{c} -0.\ 198 \pm 0.\ 044 \\ -0.\ 235 \pm 0.\ 062 \\ -0.\ 21 \ \pm 0.\ 05 \\ -0.\ 11 \ \pm 0.\ 02 \\ -0.\ 43 \ \pm 0.\ 033 \end{array}$	-0. 175 -0. 211 -0. 239 -0. 242 -0. 212	$\begin{array}{r} -0.\ 412 \\ -0.\ 435 \\ -0.\ 434 \\ -0.\ 397 \\ -0.\ 307 \end{array}$	$ \begin{array}{c c} -0.386 \\ -0.420 \\ -0.431 \\ -0.394 \\ -0.290 \end{array} $	-0. 165 -0. 196 -0. 217 -0. 216 -0. 185
Ru-104	4000 3000 2000 1000 500	$\begin{array}{c} -0.\ 155 \pm 0.\ 052 \\ -0.\ 140 \pm 0.\ 030 \\ -0.\ 14 \ \pm 0.\ 03 \\ -0.\ 085 \pm 0.\ 027 \\ -0.\ 071 \pm 0.\ 024 \end{array}$	-0.258 -0.266 -0.256 -0.211 -0.120	0. 280 0. 280 0. 264 0. 215 0. 119	$ \begin{array}{c c} -0.205 \\ -0.217 \\ -0.214 \\ -0.177 \\ -0.093 \end{array} $	0. 223 0. 235 0. 231 0. 200 0. 132
Rh-103	4000 3000 2000 1000 500	$\begin{array}{c} -2.65 \pm 0.10 \\ -1.37 \pm 0.05 \\ -1.19 \pm 0.03 \\ -1.05 \pm 0.03 \\ -0.814 \pm 0.035 \end{array}$	-1.964 -1.216 -1.037 -0.929 -0.705	-2.004 -1.294 -1.143 -1.050 -0.825	$ \begin{array}{c} -1.777 \\ -1.027 \\ -0.850 \\ -0.766 \\ -0.602 \end{array} $	-2. 080 -1. 329 -1. 150 -1. 028 -0. 774
Pd-105	4000 3000 2000 1000 500	$\begin{array}{c} -1.\ 635\pm 0.\ 091\\ -2.\ 11\ \pm 0.\ 21\\ -1.\ 61\ \pm 0.\ 11\\ -1.\ 375\pm 0.\ 064\\ -1.\ 17\ \pm 0.\ 11\end{array}$	-1. 198 -1. 136 -1. 089 -0. 995 -0. 795	-1. 423 -1. 408 -1. 384 -1. 287 -1. 046	-0.822 -0.738 -0.681 -0.610 -0.485	1.267 1.240 1.220 1.134 0.924
Pd-107	4000 3000 2000 1000 500	$\begin{array}{c} -1.98 \pm 0.36 \\ -1.9 \pm 1.1 \\ -2.33 \pm 0.60 \\ -1.44 \pm 0.27 \\ -0.87 \pm 0.50 \end{array}$	1. 210 1. 128 1. 073 0. 971 0. 762	-1. 340 -1. 341 -1. 331 -1. 243 -1. 008	-0.763 -0.698 -0.657 -0.595 -0.477	0. 936 0. 863 0. 802 0. 713 0. 556
Ag-109	4000 3000 2000 1000 500	$\begin{array}{rrrr} -2.51 \ \pm 0.17 \\ -3.0 \ \pm 0.4 \\ -1.8 \ \pm 0.5 \\ -1.4 \ \pm 0.2 \\ -1.2 \ \pm 0.2 \end{array}$	-3.278 -1.914 -1.426 -1.149 -0.869	-3. 330 -2. 052 -1. 624 -1. 389 -1. 123	$\begin{array}{r} -3.\ 097 \\ -1.\ 711 \\ -1.\ 193 \\ -0.\ 885 \\ -0.\ 584 \end{array}$	3.092 1.679 1.147 0.820 0.498
I-129	4000 3000 2000 1000 500	$\begin{array}{c} -0.54 \pm 0.13 \\ -0.63 \pm 0.18 \\ -0.70 \pm 0.19 \\ -0.21 \pm 0.07 \\ -0.34 \pm 0.11 \end{array}$	$\begin{array}{c} -0.742 \\ -0.726 \\ -0.680 \\ -0.571 \\ -0.372 \end{array}$	-1.207 -1.179 -1.093 -0.901 -0.559	-0.365 -0.349 -0.324 -0.277 -0.192	0. 570 0. 566 0. 542 0. 472 0. 332

TABLE 10 Comparison of the central reactivity worths  $(\rho/\rho_0)$  per gram of FP isotopes

		<del></del>	1	1		1
Nuclide	STEK-Core	Experiments	JNDC	JNDC-P	Cook	ENDF/B-4
	4000	$-1.66 \pm 0.10$	-1.370	-1.854	-1.157	-1.312
	3000	-110 + 0.06	-1 016	-1 511	-0.825	-0.978
Ce-133	2000	$-0.95 \pm 0.06$	0.822	-1 288	-0 654	0.800
05-100	1000	$0.724 \pm 0.022$	0.622	1,200	-0.407	-0.630
	1000	$-0.734\pm0.022$	-0.020	-1.003	0.906	0,406
	500	$-0.51 \pm 0.05$	-0.373	-0. 594	-0.296	-0.400
	4000	$+0.93 \pm 0.61$	-0.705	-0. 780	-0.874	0. 378
	3000	$+0.12 \pm 0.64$	-0.598	-0.749	-0.715	-0.259
Cs-135	2000	-0.24 + 0.58	-0.494	-0.677	-0.532	-0, 175
	1000	$-0.88 \pm 0.72$	-0.366	-0.538	-0.327	-0.101
	500	$-0.33 \pm 0.55$	-0.192	-0.306	-0.085	-0.027
			1	· · · · · · · · · · · · · · · · · · ·		1
	4000	$-0.80 \pm 0.11$	-0.882	-1.075	-0.957	-0.871
	3000	$-0.685\pm0.090$	-0.723	-0.987	0. 865	-0.715
Nd-143	2000	$-0.58 \pm 0.12$	-0.584	-0.862	-0.743	-0. 579
	1000	$-0.351 \pm 0.035$	-0.427	-0.674	-0.564	-0.420
	500	$-0.33 \pm 0.12$	-0.228	-0.395	-0.300	-0.215
	4000	$-0.095 \pm 0.030$	-0.095	-0, 138	-0.143	-0.095
	3000	$-0.051 \pm 0.014$	-0.092	-0 130	-0.144	-0.096
Nd-144	2000	$-0.039 \pm 0.014$	-0.082	-0 116	-0.135	-0.089
	1000	-0.020+0.008	-0.061	-0.092	-0.111	-0.075
	500	$\pm 0.015 \pm 0.012$	-0.024	-0.052	-0.068	-0.048
· · · · · · · · · · · · · · · · · · ·		+0.013_0.012		-0.002	0.000	0.010
	4000	$-1.65 \pm 0.33$	1. 163	-1.704	-1.264	-1.010
	3000	$-0.85 \pm 0.10$	-0.877	-1.370	-0.931	- 0. 769
Nd-145	2000	$-0.83 \pm 0.10$	0. 688		-0.706	-0.613
	1000	$-0.645 \pm 0.086$	0.492	-0.828	-0.485	-0. 449
	500	$-0.61 \pm 0.13$	-0.240	-0. 437	-0.216	-0.231
	4000	$-4.8 \pm 0.7$	-4.32	5. 75	-4.52	-4.64
	3000	$-3.38 \pm 0.51$	-2.70	-4.05	-2.86	-2.98
Pm-147	2000	-40 + 08	-2.00	-3 19	-2.12	-2.27
1 141	1000	$-20 \pm 0.2$		-2 30	_1 55	-1 70
	500	$-1.42 \pm 0.46$	-0.870	-1.36	-0.910	-1.02
			0.010		0.010	
	4000	$-3.75 \pm 0.40$	-3.68		-3.24	-3.15
	3000	$-2.65 \pm 0.28$	-2.80	-3.82	-2.56	-2.22
Sm-147	2000	$-2.27 \pm 0.17$	-2.24	-3.17	-2.09	-1.65
	1000	$-1.80 \pm 0.13$	-1.69	-2.40	-1.60	-1.16
	500	$-1.23 \pm 0.24$	-1.00	-1.34	-0.968	-0.641
	4000	-7 11 +0 59	-7 30	-7 91	-5 10	-5.52
	3000	$-5.59 \pm 0.48$	-1 01	_4 88	-2.98	-3 47
Sm-1/0	2000	-5 01 +0 48	_3 86	-3.03	-2 20	-2.63
511-145	1000	$-3.01 \pm 0.40$	-3.80	-3.93	1 80	-2.00
	500	$-3.72 \pm 0.30$	-2.90		-1.00	1. 50
		$-2.54 \pm 0.50$	-1.70	-1.70	-1.10	
	4000	$-16.4 \pm 5.7$	-8.37	-3.51	- 5. 04	-7.64
	3000	$-10.4 \pm 4.3$	5. 36	-2.12	3. 75	5. 16
Sm-151	2000	$-4.4 \pm 2.3$	-4.07	-1.65	-3.30	-4.05
	1000	$-6.2 \pm 3.0$	-3.03	-1.37	-2.88	-3.10
	500	3.4 ±3.3	-1.74	-1.02	-2.17	-1.86
	4000	-6.14 + 0.41	-5,37	-6,73	-3, 54	
	3000	$-5.05 \pm 0.48$	-4.21	-5.71	-2.73	-4.22
Eu-153	2000	-4 44 $+0$ 42	-3.63	-5.01	-2.41	-3 58
	1000	-341 + 0.24	-2.98	<u> </u>	2 10	-2.89
	500	$-264 \pm 0.24$	_2.00	2 16	_1 50	
·		2,04 1,0,24	-2.00	2, 40	-1.09	-1.90

TABLE 10 Continued



Fig. 9 Central reactivity worths of FP isotopes. They are normalized to  $\rho_0$  obtained from the reactivity of a <sup>252</sup>Cf source and the absolute fission rate of a thin <sup>235</sup>U foil.





Fig. 9 Continued

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## 5. Conclusion

The JNDC FP Fast Reactor Constants System has been developed for providing the FP group constants set which is important to predict long term characteristics of fast reactors. The group constants of 28 important nuclides are derived on the basis of the evaluation by JNDC, and the evaluation by Cook is supplementally used. The present system can produce rather auto matically the lumped group constants from the JENDL-1 Library. Thus the production of constants will be easy when JNDC evaluates more FP nuclides in future.

The burn-up time dependence of the lumped constants was examined. The change of the capture cross section does not depend on the reactor type nor on mother fissile nuclides from which the fission products are born. The extent of the change is about 5% between 60 days and 720 days of burn-up. This is less than the uncertainties of FP cross sections themselves. Therefore the fixed lumped cross sections can be used for most of burn-up calculations.

The 28 important nuclides take more than 80% of total capture but cover only 40% of elastic scattering and 60% of inelastic scattering. When 68 secondarily important nuclides are added to the 28, more than 98% will be covered for all the types of reaction. The evaluation of the 68 nuclides will be completed in a year.

The JNDC lumped FP constants were compared with those based on Cook's evaluation and on the ENDF/B-4. The discrepancies among the three are 15% for capture and 10% for both of elastic and inelastic scattering, when collapsed to one group with spectra of typical fast reactors.

The reliability of the JNDC group constants set was examined by the integral measurements performed at the STEK facility in RCN, Petten, the Netherlands. The JNDC set underestimates the negative reactivities of FP mixtures. However, the Cook and ENDF/B-4 sets underestimates them more. As for the benchmark test of separated isotopes, the JNDC set gives the best agreements for most of nuclides, tough there exist poor agreements between the experiments and the calculations for some nuclides. As a whole it can be concluded that the JNDC set is more reliable than the Cook and ENDF/B-4 sets.

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# Appendices

Appendix 1: Tables of the JNDC Group Constants of 25 group structure for the 28 nuclides.

Appendix 2: Tables of the JNDC Lumped Constants at 360 days of burn-up

Appendix 3: Tables of the concentrations at various burn-up stages

Appendix 4: User's guides for driving the present system

A. 4.1 PROF-GROUCH-G-II

A. 4. 2 REPLACE

A. 4. 3 FP-S and FPYD

A. 4. 4 FPLUMP

# Appendix 1. Tables of the JNDC Group Constants of 25 Group Structure of the 28 Nuclides.

#### NUCLID = 385R 90 MAT NO = 3890 INFINITE DILUTION CROSS SECTION PAGE 1 OF CAPTUHE ELASTIC INELA N2N 3.23949E-04 2.52433E+00 1.75109E+00 0.0 1.0817E-03 2.15203E+00 1.75109E+00 0.0 3.8117E-03 2.25505E+00 1.7505E+00 0.0 3.9617E-03 2.25505E+00 1.79691E+00 0.0 5.7847E+03 3.25701E+00 1.13481E+00 0.0 8.7942E+03 3.25701E+00 1.91910E+01 0.0 8.7942E+03 3.40177E+00 0.0 0.0 8.7942E+03 8.4473E+00 0.0 0.0 1.00157E+02 8.5220E+00 0.0 0.0 1.00157E+02 8.5220E+00 0.0 0.0 2.64911E+02 8.4473E+00 0.0 0.0 2.64912E+02 7.83526E+00 0.0 0.0 2.51521E+03 5.98300E+00 0.0 0.0 3.51521E+03 5.98300E+00 0.0 0.0 3.51521E+03 5.98300E+00 0.0 0.0 3.61350E+00 0.0 0.0 0.0 GROUPTOTAL FISSION NU UPTOTAL F13 4.275752+00 0.0 3.893632+00 0.0 3.855322+00 0.0 4.497442+00 0.0 5.847332+00 0.0 7.416952+00 0.0 8.437072+00 0.0 6.13438E-01 4.70880E-01 4.14221E-01 3.80025E-01 2.80679E-01 1.71384E-01 +00 8-506248+00 8-506248+00 7-885328+00 5-985568+00 5-986768+00 +00 +00 +00 +00 18 6.00044±+00 0.0 19 6.00862±+00 0.0 20 6.0261±+00 0.0 21 6.03815±+00 0.0 22 6.06400±+00 0.0 23 6.10194±+00 0.0 24 6.15741±+00 0.0 25 6.23916±+00 0.0 1.72730E-01 7.47907E-03 1.74070E-01 2.63 7.47907E-03 1.74013E-01 2.63 1.69583E-02 1.72731E-01 2.65 NUCLID = MAT NUMBER = 3890 181 + 385R 90 0 TABLE OF INELA+ (N. 2N) MATRICES PAGE 1 OF 1 EXIT GROUP \*\* KK \*\* KK = I + J - 1 J= 1 2 3 4 11 12 GROUP 6 8 10 1.85785E-03 7.11431E-02 2.65852E-01 5.27865E-01 4.42611E-01 2.92453E-01 1.05699E-01 3.18324E-02 9.14638E-03 2.08430E-03 4.54491E-04 9.62071E-05 1 1.45969E-02 1.65378E-01 4.46014E-01 5.10772E-01 3.91193E-01 1.54952E-01 4.89101E-02 1.43974E-02 3.32251E-03 7.28766E-04 1.59797E-04 2.52324E-05 3 9.22358E-02 4.64912E-01 3.34638E-01 3.60138E-01 1.80563E-01 1.17802E-01 3.58387E-02 8.41387E-03 1.86041E-03 4.09450E-04 8.95182E-05 7.21046E-06 1.30526E-01 5.07800E-01 3.56031E-01 7.82793E-02 4.39474E-02 1.40823E-02 3.17808E-03 6.91485E-04 1.47859E-04 3.88810E-05 4.25030E-06 0.0 5 1.968866-01 2.370044-01 7.93783E-02 4.24529E-02 1.98282E-02 9.10760E-03 4.33155E-03 1.90814E-03 1.01307E-03 0.0 NUCLID = 402R 93 MAT NO = 4093 INFINITE DILUTION CROSS SECTION PAGE 1 OF 1

GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CH1
1 4.27027E+00	0.0	0.0	1.25862L-03	2.50879E+00	1.76023E+00	0.0	7,61735E-01	7.30989E-02	1,69804E-02	0.0
2 3.68901E+00	0.0	0.0	6.65705E-03	2.13756E+00	1.74479E+00	0.0	6.03721E-01	7.11899E-02	B,92878E→02	0.0
3 3.87086L+00	0.0	0.0	4.33654E-02	2.44243E+00	1.38504E+00	0.0	4.56308E-01	8.65734E-02	1,79938E-01	0.0
4 4.69256E+00	0.0	0.0	5.61967E-02	3.67553E+00	9,60853E=01	0.0	4,16610E-01	9.45873E-02	2,58407E-01	0.0
5 6.14265E+00	0.0	0.0	4.64804E-02	5,50979E+00	5.86384E-01	0.0	4,01003E-01	1.42585E-01	2.02345E-01	0.0
6 7.75062E+00	0.0	0.0	4.13630E-02	7,16246E+00	5.46790E-01	0.0	3.26673E-01	1.81696E-01	2,38821E-01	0.0
7 8.78447E+00	0.0	0.0	4.52092E-02	A.61934E+00	1.19921E-01	0.0	2,00344E-01	2.40078E-01	2,38821E-01	0.0
8 9.00634E+00	0.0	0.0	6.06475E=02	8.94569E+00	0.0	0.0	1,04438E-01	2,58036E-01	2,38821E-01	0.0
9 8.78003E+00	0.0	0.0	9.56481L=02	8.68438E+00	0.0	0.0	4.85733E-02	2.32989E-01	2.63825E-01	0.0
10 8.48871E+00	0.0	0.0	1.71790E-01	8.31692E+00	0.0	0.0	2.25649t=02	2.26637E-01	2,65782E-01	0.0
11 8.425698+00	0.0	0.0	3.02067E=01	8.12363E+00	0.0	0.0	1,09614E-02	2,28263E-01	2,63739E-01	0.0
12 8.69366E+00	0.0	0.0	4,91996E-01	8,20168E+00	0,0	0.0	7,23758E-03	2,34929E-01	2,63825E=01	0.0
13 9;37972E+00	0,0	0.0	7.43619L-01	8,63611E+00	0.0	0.0	7,23758E-03	2,50518E-01	2,65782E-01	0.0
14 1.05845E+01	0.0	0.0	1.10543E+00	9,47912E+00	0.0	0.0	7,23758E-03	2.82142E-01	2,63739E-01	0.0
15 1.24954±+01	0.0	0.0	1,73146E+00	1.07640E+01	0.0	0.0	7,23758E-03	3.24261E-01	2,63825E-01	0.0
16 1,28505E+01	0.0	0.0	2.04606E+00	1,08044E+01	0.0	0.0	7,23758E-03	1.80195E-01	2,65782E-01	0.0
17 6.34462E+01	0.0	0.0	3,17625E+01	3,16838E+01	0.0	0.0	7.23758E-03	8.46884E-02	2,63739E-01	0.0
18 5,09559E+00	0.0	0.0	3.74242E-01	4,72135E+00	0.0	0.0	7.23758E-03	1.48126E-01	2,63825E-01	0.0
19 5.46246E+00	0.0	0.0	7.68705E-02	5.38559E+00	0,0	0.0	7.23758E-03	1,52567E-01	2.65782E-01	0.0
20 5.56886E+00	0.0	0.0	7.455106-02	5.49433E+00	0.0	0.0	7.23758E-03	1.554016-01	2,63739E-01	0.0
21 5,62475E+00	0.0	0.0	9,30689E-02	5,53168E+00	0.0	0,0	7,23758E-03	1,55999E-01	2,63825E-01	0.0
22 5,67457E+00	0.0	0.0	1,27478E-01	5.54710E+00	0.0	0.0	7.23758E-03	1,55129E-01	2.65762E-01	0.0
23 5,735216+00	0.0	0.0	1,81333E-01	5.55388E+00	0,0	0,0	7.23758E=03	1,56455E-01	2,63739E-01	0.0
24 5.81907E+00	0,0	0.0	2,62131E-01	5,55694E+00	0.0	0,0	7.23758E-03	1,56462E-01	2.63825E-01	0.0
25 5,94076E+00	0.0	0.0	3,824186-01	5,55835E+00	0.0	0,0	1.64175E-02	1,55335E-01	2.65782E-01	0,0
		NUCLID =	40ZH 93	MAT NUMBER	= 4093	IPL -	0			
			TABLE OF IN	LA+ (N+2N) M	TRICES					
							PAGE	1 OF 1		

EXIT GROUP \*\* KK \*\* KK = ! + J = 1 J= 1 2 3 4 11 12 5 10 1 9.41227E-04 5.62548E-02 2.666997E-01 5.34016E-01 4.50422E-01 2.98697E-01 1.08198E-01 3.26224E-02 9.37885E-03 2.13793E-03 4.66252E-04 9.87297E-05 2 2.12562E-02 1.57918E-01 3.77595E-01 5.39241E-01 4.13088E-01 1.64063E-01 5.18572E-02 1.52757E-02 3.52650E-03 7.73644E-04 1.69651E-04 2.67828E-05 3 1,31104E-01 4,12824E-01 3,43218E-01 2,68766E-01 1,26366E-01 6,08504E-02 3,22513E-02 7,54773E-03 1,66152E-03 3.64220E-04 7,90583E-05 5,77029E-06 2.16744E-01 2.64174E-01 2.72992E-01 1.31092E-01 5.25769E-02 1.74380E-02 4.19298E-03 1.11063E-03 3.14421E-04 1.77668E-04 3.98935E-05 0.0 2.46989E-01 2.94354E-01 2.67928E-02 1.14076E-02 5.26348E-03 1.23230E-03 2.68406E-04 5.86811E-05 1.35932E-05 2.74461E-06 6.77998E-07 0.0 1,45618E-01 2.87121E-01 1.14051E-01 0.0 0,0 0,0 0.0 0.0 0.0 0.0 0.0 0.0

7 0,0 3,27709E-02 6,34968E-02 1,52702E-02 4,51533E-03 2,10348E-03 9,83610E-04 4,47961E-04 2.08430E-04 1,00597E-04 2,35760E-05 0.0 NUCLIO = 42MO 95 MAT NO = 4295 INFINITE DILUTION CROSS SECTION

							PAGE 1 OF	1
GROUPTOTAL FISSION 1 4,26456±00 0.0 2 3,89620±00 0.0 3 3,97045±00 0.0 4 4,8185±00 0.0 5 6,27404±00 0.0 7 7,92407±00 0.0 9 8,1904±00 0.0 9 8,1904±00 0.0 11 8,3612±00 0.0 11 8,3612±00 0.0 13 9,15189±00 0.0 13 9,15189±00 0.0 13 9,15189±00 0.0 13 1,20451±00 0.0 13 1,20451±00 0.0 13 1,20451±00 0.0 13 4,239±00 0.0 13 4,2451±00 0.0 13 2,8502±00 0.0 23 5,3548±00 0.0 24 7,4345±00 0.0 25 8,74385±00 0.0	NU 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	CAPTURE .16933E-03 2 .1293E-03 2 .12986E-02 2 .12886E-02 2 .201216-02 3 .87768E-02 3 .87768E-02 3 .17707E-01 6 .0333E-01 7 .17277E-01 6 .0333E-01 7 .28258E-00 1 .28258E-00 1 .28258E-00 1 .28258E-00 1 .28558E-00 1 .28558E-00 1 .28558E-00 1 .01287E-00 4 .0128758E-00 4 .123550E-00 4 .125690E+00 4 .126995	ELASTIC 49976E+00 1. 07998E+00 1. 12349E+00 1. 12349E+00 1. 12349E+00 1. 12349E+00 1. 0792E+00 0. 57649E+00 0. 57649E+00 0. 12595E+00 0. 12592E+00 0. 55034E+01 0. 55034E+00 0. 55234E+00 0. 55232E+00 0. 55252E+00 0. 55252E+0	INELA INELA 1764632400 812792400 8127978200 136102400 27978201 0 0 0 0 0 0 0 0 0 0 0 0 0	N2N 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	EL MU 7.59045-017 3.14017E-015 5.371945-015 5.371945-015 4.596364-011 2.226735-012 2.226735-012 2.226735-012 2.226735-012 2.226735-012 2.226735-012 2.226735-012 2.226735-012 2.226755-012 2.226755-01	EL REMOVAL ,200055-02 ,878175-02 ,878175-02 ,878475-01 ,323865-01 ,323865-01 ,335205-01 ,317645-01 ,21285-01 ,31764-01 ,215775-01 ,147275-01 ,147275-01 ,147275-01 ,147955-01 ,200766-01 ,24035-01 ,24036-01 ,24036-01 ,24036-01 ,27351E-01 ,263965-01	FLUX CHI 1.69804E-02 0.0 6.92878E-02 0.0 1.79938E-01 0.0 2.02345E-01 0.0 2.02345E-01 0.0 2.02345E-01 0.0 2.38821E-01 0.0 2.65825E-01 0.0 2.65782E-01 0
	TA	BLE OF INEL	A+(N+2N) MATI	RICES		04/1		
GROUP EXIT GROUP .	* ** ** **	l + J - 1				PAGE	1011	
i J= 1 2 11 12	3	4	5	6	7	8	9	10
1 3.71977E-03 7.58169	E-02 2.47500E-0	1 5.200425-01	4.526336-01	3,06036E-0	01 1.12194E=0	1 3.40348F-07	2 9.815758-0	03 2,24119+-03
4.89145E-04 1.03562	E-04			31000002-0			. ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	55 11241196-05
2.967816-02 2.15440	L-01 4.50449E-0	1 4,97376E-01	3.91833E-01	1.57944E-C	01 5.03047E-0	2 1.48767E-02	2 3,44142E-0	03 7.55701E-04
1,65790E-04 2,61393 3	L-05							
9.79693E-02 5.10505 5.12500E-05 3.13578	E-01 4.74575E-0. F-06	1 4.36918E-01	1.98092E-01	6.70431t-0	2 2.045908-0	2 4.81091E-03	3 1,06455E-0	03 2.34376E-04
4								
1.15012E-05 0.0	2=01 3.923642=0	1 2.3/8/02-01	7.423452-02	2.630366+0	2 6,133/32-0	3 1.35655E-03	3 2.8/042E+0	J4 6.43312E-05
5 1.787676-01 3.85980	E-01 3.16086E-0	1 1.66681E-01	6.20083E-02	1.814086-0	2 5.50453E-0	3 2.252826-03	3 5,34697t-0	04 1.22632E-04
2.098916-05 0.0								
2.31818E-01 3.65620 0.0 0.0	E-01 1,98386E-0	2 0.0	2,93852E-03	5.80283E-C	03 1.35065E-0	3 4.74138E-04	+ 1.08563E-0	04 2.579548-05
7 0.0 0.00								·
V+U 1+89489								
3.41965E-05 0.0	E-01 9.15552E-0	2 2.031006-02	7.77649E-03	3.61911E-0	)3 1.69133E-0	3 7.84065E-04	· 3.63721E-0	04 1.75562L-04
3.41965E-05 0.0	E-01 9.15552E-03	2 2.031005-02	7.77649E-03	3.61911E-0	)3 1.69133E-0	3 7.84065E-04	• 3.6372 <u>1</u> E-0	)4 1.75562L-04
3.419656-05 0.0	E-01 9.15552E-0	2 2.03100E+02 NUCL INFINITE 011	7.77649E-03	3.61911E-0 97 M S SECTION	)3 1.69133E-0 SAT NO = 424	3 7.84065E-04 97	• 3.63721E-(	04 1.75562 <u>1</u> -04
3.41965E-05 0.0	L-01 9.15552E-0	2 2.03100E-02 NUCL INFINITE 011	7.77649E-03 .ID = 42M0 .UTION CROSS	3.61911E-0 97 M 5 SECTION	03 1.69133E-0 NAT NO = 424	3 7.84065E-04 97	¥ 3.6372 <u>1</u> E-(	)4 1.75562 <u>L</u> -04
3.41965E-05 0.0	L-Ol 9.15552E-0	2 2.03100E+02 NUCL INFINITE 011	7.77649E-03 ID = 42MO UTION CROSS	3.61911E-0 97 M 5 SECTION	)J 1.69133E-0 NAT NO = 424	3 7.84065E-04	* 3.63721E-( PAGE 1 OF	04 1.75562上-04 1
3.41965E-05 0.0 GROUPTOTAL FISSION 1.4.23805±00 0.0 2.3.69617±00 0.0 3.4.01660±00 0.0 4.9.9303±00 0.0 5.4.3138±00 0.0 5.4.3138±00 0.0 5.9.3051±00 0.0 1.9.93251±00 0.0 1.174±00 0.0 1.2.4.61976±00 0.0 1.2.4.61976±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.3.4.40196±00 0.0 1.4.62216±01 0.0 1.5.3275±00 0.0 2.5.3275±00 0.0 2.5.34305±00 0.0 2.5.34305±00 0.0 2.5.34305±00 0.0 2.5.34455±00 0.0 2.5.74456±00 0.0	NU 0.6 1 0.0 1	2         2.03100E-02           NUCCI         INFINITE           INFINITE         010           LA375L-03         2.           .28331L-03         2.           .24337L-02         2.           .43375L-02         2.           .43375L-02         2.           .43575L-02         2.           .43575L-01         4.           .2022L-01         5.           .2022L-01         5.           .34595L-01         5.           .34956L-01         5.           .34956L-01         5.           .34956L-01         5.           .20252L-01         5.           .2192UE-01         5.	7.77649E-03 ID - 42MO ID - 42MO ID - 42MO CROSS CASTIC 480956-00 1. 101756-00 1. 101756-00 1. 101756-00 1. 101756-00 1. 1053956-00 0. 175295-00 0. 831527+00 0. 831527+00 0. 195295-00 0. 195295-00 0. 195295-00 0. 195495-00 0. 195495-00 0. 102895-00 0. 102845-00 0. 102845-00 0. 114295-00 0. 1122215-00 0. 122215-00 0. 122215-00 0. 122215-00 0. 122215-00 0.	3.61911E-0 97 M 5 SECTION 1NELA 7755/E+00 83611E+00 698922+00 30697E+00 66599E-01 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	N2N N2N 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6	EL MU 7.56096t-017 .13084t-015 .30300t-015 .32728t-016 .55656t-011 .32728t-016 .35654t-012 .35654t-012 .35654t-012 .35654t-012 .35654t-012 .35654t-012 .35654t-012 .35864t-031 .93884t-03	PAGE 1 OF EL REMOVAL .07734E-02 .60147L-02 .60147L-02 .60147L-02 .39139E-02 .21527E-01 .8326LE-01 .21527E-01 .21527E-01 .8326LE-01 .10248E-01 .10248E-01 .3018E-01 .3018E-01 .38015E-01 .3827E-01 .3827E-01 .3828E-01 .37286E-01	1 FLUX CHI 1.69304-02 0.6 8.92476E-02 0.0 1.7993E-01 0.0 2.08407E-01 0.0 2.08421E-01 0.0 2.38621E-01 0.0 2.38621E-01 0.0 2.65782E-01 0.0 2.65782E-01 0.0 2.65782E-01 0.0 2.65782E-01 0.0 2.65782E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65739E-01 0.0 2.65782E-01 0.0
3.41965E-05 0.0 GROUPTOTAL FISSION 1.4.23805±00 0.0 2.3.69617±00 0.0 3.4.01660±00 0.0 4.9.9303±00 0.0 5.4.3138±00 0.0 6.8.02872±00 0.0 7.9.1174±00 0.0 8.9.32051±00 0.0 11.8.40190E+00 0.0 12.4.65795±00 0.0 13.4.3994±01 0.0 13.1.53894±01 0.0 13.1.53894±01 0.0 13.1.53894±01 0.0 13.1.53894±01 0.0 13.1.53894±00 0.0 13.1.53894±00 0.0 13.1.275±00 0.0 13.1.275±00 0.0 13.1.275±00 0.0 13.1.275±00 0.0 13.1.275±00 0.0 13.1.2375±00 0.0 13.1.2375±00 0.0 23.5.41053±00 0.0 23.5.41053±00 0.0 23.5.41053±00 0.0 23.5.74456±00 0.0	NU 0.6 0.6 0.0 0.0 0.0 0.0 0.0 0.0	2         2.03100E-02           NUCCI         NUCCI           INFINITE         014           Linstant         1.153431-032           Linstant         2.133751-022           Linstant         2.133751-022           Linstant         2.133751-022           Linstant         2.133751-022           Linstant         2.13271-012           Linstant         2.13271-013           Linstant         2.13271-014           Linstant         2.142951-013           Linstant         2.142951-001           Linstant         2.14291-01           Linstant         2.14291-01           Linstant         2.14291-01           Linstant         2.14291-01           Linstant         2.142921-0	7.77649E-03 ID = 42H0 ID = 42H0 ID = 42H0 CROSS CASTIC 480956:00 1.0 CROSS 10175E-00 1.1 10175E-00 1.1 10175E-00 1.1 10175E-00 0.2 07365E-00 0.1 17525E-00 0.1 17525E-00 0.1 17525E-00 0.1 17545E-00 0.1 10248E+00 0.1 10248E+00 0.1 10248E+00 0.1 11425E+00 0.1 11221EE+00 0.1 12221EE+00 0.1 12224EE+00 0.1 12244E+00 0.1 12244E+	3.61911E-0 97 M 5 SECTION 1NELA 77557E+00 83611E+00 698922+00 30697E+00 60599E-01 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	NZN NZN NZN 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0	EL MU 7.56096t-017 .13084t-015 .30300t-015 .32728t-016 .55656t-011 .572728t-016 .572728t-016 .572728t-016 .5755t-011 .5755t-011 .5755t-011 .5755t-012 .33654t-012 .73584t-031 .75584t-031 .75784t-031	A 3.63721E-0 PAGE 1 OF EL REMOVAL .07734E-02 .601202-02 .601202-02 .30139E-02 .215272-01 .83261E-01 .215272-01 .83261E-01 .215272-01 .32140E-01 .40596-01 .22322E-01 .33015E-01 .34015E-01 .34240E-01 .34015E-01 .34245E-01 .3428E-01 .3428E-01 .3428E-01 .3428E-01 .3428E-01 .3428E-01 .3428E-01 .3428E-01	1 FLUX CHI 1.69804E-02 0.6 8.92478E-02 0.6 8.92478E-02 0.0 1.79938E-01 0.0 2.02435E-01 0.0 2.02435E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.45732E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0
3.41965E-05 0.0 GROUPTOTAL FISSION 1.4.23805±00 0.0 2.3.69617±00 0.0 3.4.01660±00 0.0 3.4.01650±00 0.0 5.4.91381±00 0.0 6.4.02872±00 0.0 7.9.1174±00 0.0 1.9.93201±00 0.0 1.9.93201±00 0.0 1.1.53894±01 0.0 1.1.53894±01 0.0 1.1.53894±01 0.0 1.1.53894±01 0.0 1.2.53894±00 0.0 1.2.53894±00 0.0 2.3.474995±00 0.0 2.3.474995±00 0.0 2.3.41051±00 0.0 2.5.34305±00 0.0 2.5.34351±00 0.0 2.5.34351±00 0.0 2.5.34351±00 0.0 2.5.34351±00 0.0 2.5.34351±00 0.0 2.5.344551±00 0.0 2.5.744561±00 0.0	NU 0.6 0.6 0.0 0.0 0.0 0.0 0.0 0.0	2         2.03100E-02           NUCCI         INFINITE           INFINITE         010           LADTUNE         16           LADTUNE         17           LADTUE         17           LADTUE         17           LADTUE         17           LADTUE         17           LADTUE         17           LADTUE         15	7.77649E-03 .UT 0N CROSS .UT	3.61911E-0 97 M 5 SECTION INELA 7755/E-00 836112+00 440712+00 836972-00 060 060 00 00 00 00 00 00 00	NZN NZN NZN 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0	EL MU 7.56096t-017 .13084t-015 .30300t-015 .32728t-016 .56056t-011 .57528t-01 .56056t-011 .57528t-012 .36765t-022 .36765t-022 .36765t-022 .36765t-022 .36765t-022 .36765t-022 .37584t-031 .9386t-031 .9386t-031	A 3.63721E-0 PAGE 1 OF EL REMOVAL .07734E-02 .601202-02 .601202-02 .391392-02 .215272-01 .83261E-01 .10288E-01 .213135-02 .10288E-01 .32140F-01 .30186E-01 .34015E-01 .3425E-01 .3428E-01	1 FLUX CHI 1.69804E-02 0.0 8.92478E-02 0.0 1.79938E-02 0.0 1.79938E-01 0.0 2.02435E-01 0.0 2.02435E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45739E-01 0.0 2.45739E-01 0.0 2.45739E-01 0.0 2.45739E-01 0.0 2.45739E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45732E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0 2.45782E-01 0.0
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3.41965E-05 0.0 GROUPTUIAL FISSION 1.4.23805E-00 0.0 2.569617E-00 0.0 3.4.01660E-00 0.0 3.4.01660E-00 0.0 5.4.43138E-00 0.0 5.4.43138E-00 0.0 5.4.43138E-00 0.0 7.9.11746E-00 0.0 1.8.40190E-00 0.0 1.8.47499E-00 0.0 1.8.47499E-00 0.0 1.5.3554E-01 0.0 1.5.3554E-01 0.0 2.5.3475E-00 0.0 2.5.3475E-00 0.0 2.5.3475E-00 0.0 2.5.5.4745E+00 0.0 2.5.3475E-00 1.0 2.5.34559E-00 1.0 3.5.4555E-00 1.0 3.	NU 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0	2         2.03100E-02           NUCCI         INFINITE           INFINITE         011           (INFINITE         012           (INFINITE         014           (INFINITE         015           (INFINITE         015           (INFINITE         015           (INFINITE         015           (INFINITE <td>7.77649E-03 </td> <td>3.61911E-0 97 M SECTION INELA 77557E+00 836112+00 698922+00 30897E+00 00 00 00 00 00 00 00 00 00</td> <td>N2N N2N 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7</td> <td>EL MU FL MU 57 EL MU 56096t-01 7 50300t-01 5 502728t-01 6 5032728t-01 6 5032728t-01 6 5032728t-01 2 50300t-02 2 503004t-02 2 503004t-02 2 503864t-03 1 503884t-03 1 50388</td> <td>PAGE 1 OF EL REMOVAL 07734E-02 .60120E-02 .30139E-02 .60147E-02 .30139E-02 .30139E-02 .31318E-01 .10284E-01 .04624E-01 .04624E-01 .04624E-01 .04624E-01 .30454E-01 .30454E-01 .30454E-01 .30454E-01 .30454E-01 .3025E-01 .3025E-01 .30297E-01 .37286E-00</td> <td>1 FLUX CH1 1.69304-02 0.6 8.92478E-02 0.0 1.7993E-01 0.0 2.02345-01 0.0 2.02345-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.63739E-01 0.0 2.63782E-01 0.0 2.63782E-00 0.0 2.63782E-00 0.0 2.63782E-00 0.</td>	7.77649E-03 	3.61911E-0 97 M SECTION INELA 77557E+00 836112+00 698922+00 30897E+00 00 00 00 00 00 00 00 00 00	N2N N2N 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	EL MU FL MU 57 EL MU 56096t-01 7 50300t-01 5 502728t-01 6 5032728t-01 6 5032728t-01 6 5032728t-01 2 50300t-02 2 503004t-02 2 503004t-02 2 503864t-03 1 503884t-03 1 50388	PAGE 1 OF EL REMOVAL 07734E-02 .60120E-02 .30139E-02 .60147E-02 .30139E-02 .30139E-02 .31318E-01 .10284E-01 .04624E-01 .04624E-01 .04624E-01 .04624E-01 .30454E-01 .30454E-01 .30454E-01 .30454E-01 .30454E-01 .3025E-01 .3025E-01 .30297E-01 .37286E-00	1 FLUX CH1 1.69304-02 0.6 8.92478E-02 0.0 1.7993E-01 0.0 2.02345-01 0.0 2.02345-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.38821E-01 0.0 2.63739E-01 0.0 2.63782E-01 0.0 2.63782E-00 0.0 2.63782E-00 0.0 2.63782E-00 0.
3.41965E-05 0.0 GROUPTOTAL FISSION 1.4.23805E-00 0.0 2.3.69617E+00 0.0 3.4.01660E+00 0.0 3.4.01660E+00 0.0 5.4.43138E+00 0.0 5.4.43138E+00 0.0 5.4.43138E+00 0.0 7.9.11746E+00 0.0 1.9.3224E+00 0.0 1.9.3224E+00 0.0 1.1.53894E+01 0.0 1.1.53894E+01 0.0 1.1.53894E+01 0.0 1.1.53894E+01 0.0 1.1.53894E+01 0.0 1.2.5312E+01 0.0 1.2.5312E+01 0.0 1.3.474990E+00 0.0 2.3.541032E+00 0.0 2.3.541032E+00 0.0 2.3.541032E+00 0.0 2.3.541032E+00 0.0 2.3.541032E+00 0.0 2.3.574456E+00 0.0 2.5.74456E+00 0.0 3.42032E-01 4.16367E 2.1.9126E-02 1.76693E 1.90343E-04 3.00566E 3.7.21327E-02 4.32015E 4.1.47412E-01 6.05918E 3.83434E+05 0.0 5.5	NU 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0	2         2         03100E-02           NUCCI         NUCCI           INFINITE         011           (1NFINITE         011           (1NFINITE         011           (1NFINITE         011           (1NFINITE         011           (1S34315-032)         2           (1S4250-012)         3           (1C4245001)         1           (1C4245001)         1           (1C4245001)         1           (1C4245001)         1           (1C4245001)         1           (1C4252501)         1           (1S40450-01)         1           (1S40450-01)         1           (1S40450-01)         1           (1S40470-01)         1           (1S40470-01)         1           (1S40970-01)         1           (1S4129126-01)         1	7.77649E-03 	3.61911E-0 97 M SECTION INELA 7755/200 836112+00 698922+00 308972+00 00 00 00 00 00 00 00 00 00	N2N N2N 0.6 0.7 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	EL MU 7.56096±-017 .13084±-015 .30300±-015 .32728±-016 .56096±-017 .3040±-015 .32728±-016 .5656±-011 .36765±-017 .36765±-017 .36765±-017 .36765±-017 .36765±-017 .37864±-031 .73865±-032 .73865±-032	PAGE 1 OF EL REMOVAL .07734E-02 .60120E-02 .60120E-02 .30139E-02 .39139E-02 .39139E-02 .39139E-02 .21527E-01 .321527E-01 .3015E-01 .02527E-01 .30135E-01 .30135E-01 .30135E-01 .30135E-01 .332325E-01 .3325E-01 .33235E-01 .3325E-01 .3325E-01 .33278E-01 .37285E-01 .37286E-01 .37286E-01 .394137E-0 .3,94137E-0 .23,94137E-0 .23,94137E-0 .23,94137E-0 .23,94137E-0	1 FLUX CHI 1,69804E-02 0.6 8,92478E-02 0.0 1,7993E-02 0.0 2,58407E-01 0.0 2,58407E-01 0.0 2,02435-01 0.0 2,02435-01 0.0 2,03421E-01 0.0 2,03421E-01 0.0 2,03422E-01 0.0 2,03739E-01 0.0 2,03782E-01 0
3.41965E-05 0.0 GROUPTOTAL FISSION 1 +.238052+00 0.0 2 .696172+00 0.0 3 +.01660172+00 0.0 3 +.01660172+00 0.0 5 +.31391-06 0.0 5 +.31391-06 0.0 5 +.31391-06 0.0 7 +.117842+00 0.0 9 .325242+00 0.0 1 +.537952+00 0.0 1 +.637952+00 0.0 1 +.537952+00 0.0 1 5 +.537942+01 0.0 1 5 +.537942+00 0.0 1 5 +.537942+00 0.0 1 5 +.537942+00 0.0 2 5 +.347942+00 0.0 2 5 +.345254-04 1.163674 2 +.9472592-04 +.163674 2 +.24482=05 3.465977 4 +.24482=05 3.465971 4 +.24482=05 3.465971 4 +.24482=05 3.465971 4 +.24482=05 0.0 525921E-02 5.437044 00 525921E-02 5.437044 00 525921E-02 5.437044 00 525921E-02 5.437044 525921E-02 5.437044 5259291E-02 5.437044	NU 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0	2         2.03100E-02           NUCCI         INFINITE           INFINITE         011           INFINITE         012           INFINITE         014           INFINITE         015           INFINITE         015           INFINITE         015           INFINITE         015           INFINITE         015     <	7.77649E-03 ID = 42MO UTION CROSS 48095200 1. 05378E-00 1. 16175E-00 1. 16175E-00 1. 16175E-00 1. 16175E-00 1. 16175E-00 0. 19292E-00 0. 24076E-00 0. 19252E-00 0. 19551E-00 0. 19551E-00 0. 19758E-00 1. 19758E-00 0. 19758E-00 0. 19758E-00 0. 19758E-00 0. 19758E-00 0. 19224E-00 0. 1224E-00 0. 12	3.61911E-0 97 M 5 SECTION (INELA 77557E+00 836112+00 698922+00 30697E+00 00 60599E-01 0 0 0 0 0 0 0 0 0 0 0 0 0	N2N N2N N2N 0.6 0.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0	EL MU FL MU FL MU FL S6096E-01 7 53030E-01 5 532728E-01 6 532728E-01 6 532728E-01 7 53030E-01 5 532728E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549753E-01 1 549758E-03 1 53884E-03 1 53884E	PAGE 1 OF EL REMOVAL .07734E-02 .60120E-02 .39139E-02 .60147E-02 .39139E-02 .39139E-02 .32131E-01 .046245-01 .046245-01 .046245-01 .046245-01 .39454E-01 .39454E-01 .39454E-01 .39454E-01 .39454E-01 .39454E-01 .3846E-01 .37286E-01 .37486E-01 .37486E-01 .37486E-01 .37486E-	1 FLUX CHI 1.698044-02 0.0 8.92478E-02 0.0 1.7993E-01 0.0 2.023452-01 0.0 2.3821E-01 0.0 2.3821E-01 0.0 2.3821E-01 0.0 2.3821E-01 0.0 2.3821E-01 0.0 2.63735E-01 0.0 2.63782E-01 0.0

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1	3,19 5,98	635E-03 792E-04	5,09965E	-02 -04	2.090	084E	-01	5,07	720E-0	1 4,86060E-0	1 3.485962-01	1.32543E-01	4.09651E-02	1,19284	E-02	2.73718E-03
2	3.48 2.04	892E-02 633E+04	1,65143E 3,22675E	-01 -05	4.177	791E	-01	5,21	1318-0	1 4.41582E-0	1 1.86221E-01	6.07070E-02	1.81697E-02	4,22958	E=03	9,31496E-04
3	1,51 5,89	097E-01 393E-05	4,59021E 3,50251E	-01 -06	4.32	270E	-01	4,49	463E-0	1 2.15232E=0	1 7.49414E-02	2.32082E-02	5.49945E-03	1,22129	E-03	2.69332E-04
4	3.78 1.18	266E-01 227E-05	6,91636E	-01	4.25	52,0E	-01	1.86	323E-0	1 7.06843E-0	2 2.29427E-02	5,57186E-03	1,25173E-03	2,77519	€=04	6.08823E-05
5	3,28 4,19	537E-01 511E-06	8.88483 <u>6</u> 0.0	-01	3.624	465E	-01	1,26	979E-0	1 4,06035E-0	2 9.05975E-03	2,332138-03	5.35332E-04	1,17270	)E=04	2.73598E-05
6	3,13 3,66	914E-01 903E-06	7.51778E	-01	3,98	581E	-01	1,02	787E-0	1 1,95499E-0	2 4.24240E-03	1.84833E-03	6.68047E-04	1,46455	E-04	3.34312E-05
	1.66 9,48	010E-01 532E-06	3.25989E	-01	1,690	016E	-01	2,62	690E-0	2 5.77796E-0	3 1,26450E-03	2.81284E-04	6,06895E-05	1,40306	E-05	1,854158+05
в	0.0	961E-05	5.869848 5 0.0	-02	6,10;	237E	-02	9.70	644E=0	3 4,27616E-0	3 1.99729E-03	9.17487E-04	4.24959E=04	2,13743	SE-04	8.91419E-05

GROUPTUTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4.25477E+00	0.0	0.0	5.27978E-03	2.45493E+00	1.79455E+00	0.0	7.51168E-01	6.83814E-02	1,69804E-02	0.0
2 3 91211E+00	0.0	0.0	2.37206E-02	2.03736E+00	1.85103E+00	0.0	6,11360E=01	5.53950E-02	8,92878E-02	0.0
3 4.10277E+00	0.0	0.0	5.13320E-02	2.23916E+00	1,81229E+00	0.0	5,68072E-01	5.40489E-02	1.79938E-01	0.0
4 5.15229E+00	0.0	0.0	6.706678-02	3.30268E+00	1,78255E+00	0.0	5,67578L-01	5.57101E-02	2.58407E-01	0.0
5 6 64484E+00	0.0	0.0	8.27486E-02	4.80295E+00	1,75914E+00	0,0	5.48704E-01	8.89009E-02	2.02345E-01	0.0
6 B 08472E+00	0.0	0.0	1.381136-01	6.35305E+00	1.59355E+00	0.0	4.52834E-01	1,28508E-01	2,38821E-01	0.0
7 9.033475+00	0.0	0.0	2.73171E=01	8.06559E+00	6.94711E-01	0.0	2.901108-01	1,899118-01	2.38821E-01	0,0
8 9 1739×F+00	0.0	0.0	4.41135E-01	8.59548E+00	1.37364E-01	0.0	1.70011E-01	2,17513E-01	2,38821E-01	0.0
9 8 980145+00	<b>N N</b>	0.0	7 111371-01	8,26902E+00	0.0	0.0	9.33372E-02	1,91731E-01	2.63825E-01	0.0
10 8 505315+00	0.0	0.0	1.068766+00	7.43655E+00	0.0	0.0	4,85463E-02	1,76552E-01	2,65782E-01	0,0
11 8 207945+00	0.0	0.0	1.446636+00	6.76124F+00	0.0	0.0	2.61438E-02	1,67385E-01	2.63739E-01	0.0
12 8 22728E+00	0.0	0.0	1.79544++00	6.43184F+00	0.0	0.0	1,54218E-02	1,64516E-01	2.63825E-01	0.0
13 8 439306+00	0.0	0.0	2,23171++00	6.40748F+00	0.0	0.0	7.556948-03	1.66082E-01	2.65782E-01	0.0
14 0 51517E+00	0.0	0.0	2.98282E+00	6.53235E+00	0.0	0.0	6.66380E-03	1.71580E-01	2.63739E-01	0.0
14 9.919112:00		0.0	3 843135+00	8-15527E+00	0.0	0.0	6,663802-03	2,59814E-01	2,63825E-01	0.0
14 3 301036+01	Ň.	0.0	9 735198+00	1.31830E+01	0.0	6.0	6.66380E=03	1.381186-01	2,65782E-01	0.0
10 2.271826.01	<b>.</b>	0.0	9 047605+00	6.663485+00	0.0	0.0	6.66380E-03	2,67613E-01	2,63739E-01	0.0
10 3 333175+01	<b>č</b> .č	0.0	2 314456+01	1.00872E+01	0.0	0.0	6.66380E-03	1,438426-01	2,63825E-01	0.0
18 3, 323110+01	0.0	0.0	2 15717E+01	6.14771E+00	0.0	0.0	6.663802-03	1,31965E-01	2,65782E-01	0.0
19 2.111946-01	.0.0	0.0	5 842675+01	6.12408F+00	0.0	0.0	6.66380E-03	1,15534E-01	2,63739E=01	0.0
20 8.455082+01	0.0	0.0	5 52039E-01	4.60345E+00	0.0	0.0	6.66380E=03	1.214256-01	2,63825E-01	0.0
21 5,155496+00	0.0	0.0	4 32250F=01	4.71424E+00	0.0	0.0	6.66380E-03	1,21930E-01	2,65782E-01	0,0
22 9.140492.00		0.0	5 20073E=01	4.74804F+00	0.0	0.0	6.66380E-03	1,23401E-01	2,63739E-01	0,0
23 5,200122400	0.0	0.0	7 035856-01	4.76155E+00	0.0	0.0	6.66380E=03	1.23587E-01	2.638256-01	0,0
24 5,465142400	0.0	010	9 971 226-01	4.76748E+00	0.0	0.0	1.51334E-02	1.227778-01	2,65782E-01	0,0
25 5,764612400	0.0	0.0	9,971222-01	-1101-02+00		010				
		NUCLID =	44RU101	MAT NUMBER	= 4401	PL ■	0			
			TABLE OF IN	ELA+ (N+2N) M	ATRICES					

NUCLID = 44RUIDI MAT NO = 4401 INFINITE DILUTION CROSS SECTION

G

U.U 1.90886E-02 4.64436E-02 2.46796E-02 5.94205E-03 1.05244E-03 4.21593E-04 1.82318E-04 8.21644E-05 3.82442E-05 6.59835E-06 0.0

PAGE 1 OF 1

FLUX

TABLE OF INELA+ (N+2N) MATRICES PAGE 1 OF 1 EXIT GHOUP \*\* KK \*\* KK = 1 + J - 1 J= 1 2 3 4 11 12 GROUP 8 10 5 6 7 9 2.60415E-03 5.32431E-02 2.18705E-01 5.11530E-01 4.77773E-01 3.37445E-01 1.27093E-01 3.90905E-02 1.13541E-02 2.60204E-03 5.68882E-04 1.20537E-04 2.55341E-02 1.41349E-01 4.34933E-01 5.26947E-01 4.38345E-01 1.82752E-01 5.92250E-02 1.76722E-02 4.10723E-03 9.03877E-04 1.98498E-04 3.13667E-05 1.02498E-01 3.27742E-01 4.95171E-01 5.02461E-01 2.37481E-01 8.21271E-02 2.53438E-02 5.99443E-03 1.33007E-03 2.93202E-04 6.41511E-05 3.99967E-06 3 3.05475E-01 3.81451E-01 3.38306E-01 2.78734E-01 1.04036E-01 3.36472E-02 8.15804E-03 1.83129E-03 4.05868E-04 8.90246E-05 1.74961E-05 0.0 5 3.76701E-01 3.82755E-01 1.35116E-01 4.78731E-02 1.11527E-02 9.66076E-04 1.20284E-02 3.97947E-03 8.75252E-04 1.88122E-04 2.16111E-05 0.0 4.14208E-01 4.32689E-01 9.89201E-03 1.32105E-02 7.78302E-03 2.22539E-03 4.88439E-04 1.08944E-04 2.37676E-05 5.45777E-06 0.0 0.0 1.55522E-01 3.876435-01 1.68597E-01 1.03182E-02 1.46150E-03 0.0 0.0 0.0 0.0 0.0 0.0 0.0

								PAGE 1 OF	1
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX C
1 4.25588E+00	0.0	0.0	5.00325E-03	2,46874E+00	1,78213E+00	0.0	7,53607E-01	6,96472E-02	1.69804E-02 0.0
2 3,902876+00	0.0	0.0	2.02022E-02	2.05067E+00	1,83200E+00	0,0	6,10203E-01	5,75969E-02	8,92878E-02 0,0
3 4,06003E+00	0.0	0.0	4,16312E-02	2,23788E+00	1,78051E+00	0,0	5,50114E-01	5,90784E-02	1.79938E-01 0.0
4 5,05330E+00	0,0	0.0	9,53144E+02	3,50583E+00	1,45215E+00	0,0	5,13007E-01	7.41915E=02	2,584078-01 0.0
5 6,56666E+00	0.0	0.0	1.54632E-01	5.44037E+00	9,71656E-01	0,0	4.70592E-01	1,20139E+01	2,02345E+01 0,0
6 8,09466E+00	0,0	0.0	1.45440E-01	7,06859E+00	8,80635E-01	0,0	3.95347E-01	1,48199E=01	2,38821E-01 0.0
7 9,12007E+00	0,0	0.0	1.70228E-01	8,22630E+00	7,23541E-01	0.0	2,71213E-01	2.03201E-01	2,38821E-01 0.0
8 9,20851E+00	0.0	0.0	2,72590E-01	8.837992+00	9,79372E-02	0,0	1,53420E-01	2,32730E-01	2,38821E-01 0,0
9 9.03887E+00	0,0	0.0	4,59199E-01	8.57967E+00	0.0	0,0	8.084728-02	2.06552E=01	2.63825E-01 0.0
10 8,56801E+00	0,0	0.0	7.39969E-01	7,82804E+00	0.0	0,0	4,072948-02	1,92072E-01	2,65782E-01 0.0
11 B,29056E+00	0,0	0.0	1,09041E+00	7,20015E+00	0.0	0,0	2,187BOE-02	1,82936E-01	2.63739E-01 0.0
12 8,33534E+00	0,0	0.0	1,45583E+00	6.87951E+00	0.0	0,0	1,24169E+02	1,80868E-01	2.63825E-01 0.0
13 8,80985£+00	0,0	0.0	1.91770E+00	6.89215E+00	0.0	0.0	6,79854E-03	1,83130E-01	2.65782E-01 0.0
14 9,95036E+00	0,0	0.0	2,83379E+00	7.11657E+00	0.0	0,0	6.79854E=03	1,92178E-01	2.63739E-01 0.0
15 1,16803E+01	0.0	0.0	4,24492E+00	7.43537E+00	0.0	0.0	6,79854E-03	2.01065E-01	2,63825E-01 0,0
16 1.39939E+01	0.0	0.0	6.66495E+00	7.32895E+00	0.0	0,0	6,79854E-03	1,29961E-01	2,657828-01 0.0
17 2,33468E+01	0.0	0,0	1.39315E+01	9.41536E+00	0,0	0,0	6,79854E-03	1,05863E-01	2,63739E-01 0.0
18 6,84195E+00	0,0	0.0	2.48450E+00	4.35745E+00	0.0	0,0	6,79854E-03	1,15646E-01	2,63825E-01 0.0
19 7.69383E+00	0.0	0.0	3.03421E+00	4,65962E+00	0.0	0,0	6,79854E-03	1.56287E-01	2.65782E-01 0.0
20 3,98592E+01	0.0	0.0	3.50797E+01	4,77954E+00	0.0	0.0	6,79854E-03	1.18179E-01	2.63739E-01 0.0
21 1,82352E+02	0.0	0.0	1.76551E+02	5.80119E+00	0.0	0.0	6.79854E-03	7.71008E-02	2,63825E=01 0.0
22 1.42613E+01	0.0	0.0	1.06817E+01	3,57963E+00	0.0	0,0	6,79854E-03	1.00035E-01	2,65782E-01 0.0
23 8,03743E+00	0.0	0.0	4.16307E+00	3,87436E+00	0.0	0.0	6.79854E+03	1.03634E-01	2.63739E-01 0.0
24 8,28322E+00	0.0	0.0	4,34677E+00	3,93646E+00	0.0	0.0	6,79854E-03	1.04521E=01	2,63825E-01 0.0
25 9.53956E+00	0.0	0.0	5.58054E+00	3,95902E+00	0,0	0,0	1,54453E-02	1,04123E-01	2,65782E-01 0.0
		NUCLID =	43TC 99	MAT NUMBER	- 4399	IPL =	0		

NUCLID = 43TC 99 MAT NO = 4399 INFINITE DILUTION CROSS SECTION

JAERI 1248 Appendix 1 Tables of the JNDC Group Constants of 25 Group Structure for the 28 Nuclides

#### NUCLID = 44RU102 MAT ND = 4402 INFINITE DILUTION CROSS SECTION

									PAGE 1 OF	1
GROU 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23 24 25 25 25 25 25 25 25 25 25 25	PTOTAL 4,256035400 0 3,91831E+00 0 5,13381E+00 0 6,644302400 0 8,066972+00 0 9,20132E+00 0 9,20132E+00 0 8,45025+00 0 8,151857E+00 0 5,45825+00 0 5,45822E+00 0 5,45822E+00 0 5,45822E+00 0 5,45825E+00 0 5,59164E+00 0 5,59164E+00 0 5,59164E+00 0 5,79173E+00 0	FISSION -0 -0 -0 -0 -0 -0 -0 -0 -0 -0	NU 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	CAPTURE 4.366551-03 2.25316E-02 5.56341E-02 7.12232L-02 8.91812E-02 8.91812E-02 8.91812E-02 8.91812E-02 8.91812E-02 9.5596E-01 1.23374E-01 1.02586E-00 9.5596E-01 1.02586E-00 3.78657E-01 2.54984-02 5.48651E-02 5.48651E-02 1.87396E-01 2.54298E-01 2.73376E-01 2.73376E-01	ELASTIC 2.45023E-00 2.05103E-00 3.62165E-00 5.50376E-00 7.53500E-00 9.07794E-00 8.15470E-00 8.15470E-00 8.15470E-00 8.15470E+00 8.25470E+00 5.36967E+00 5.36967E+00 5.36967E+00 5.36967E+00 5.36967E+00 5.4173E+00 5.4173E+00 5.41837E+00 5.41835E+00	INELA INELA I.80144475E+00 I.464475E+00 I.71599E+00 I.066622E+00 4.82784E-01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	N2N 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	EL MU 7.49378L-01 6.06722E-01 5.49832L-01 5.49832L-01 5.49832L-01 3.86464E-01 1.65277E-01 9.19436E-02 4.69099E-02 2.485996E-02 1.47020E-02 4.96099E-02 1.47020E-02 6.39903E-03	EL 6K00VAL 6,79172E-02 5,71909E-02 6,86931E-02 6,86931E-02 1,16819E-01 1,96819E-01 2,04187E-01 2,04581E-01 1,90554E-01 1,90554E-01 1,90554E-01 1,37831E-01 1,37831E-01 1,37831E-01 1,37847E-01 1,37167E-01 1,39197	$\begin{array}{c} F_{LUX} & CH1 \\ 1.69804E-02 & 0.0 \\ 8.92878E-02 & 0.0 \\ 1.79938E-01 & 0.0 \\ 2.58407E-01 & 0.0 \\ 2.58407E-01 & 0.0 \\ 2.98821E-01 & 0.0 \\ 2.98821E-01 & 0.0 \\ 2.38821E-01 & 0.0 \\ 2.38821E-01 & 0.0 \\ 2.53825E-01 & 0.0 \\ 2.653782E-01 & 0.$
			TAI	BLE OF INF	LA+(N+2N) MA	TRICES	IPL 4	0		
GROUP	EXIT	GROUP ++ K	K ++ KK =	i + J = 1				PAGE	1 OF 1	
1	J= 1 11	12 12	3	4	5	6	7	8	9	10
-	1.43482E-03 6.25269E-04	4.94875E-0 1.32528E-0	2 2,00578E-0.	1 5,03411E-0	1 4,92533E-C	1 3.58049E-0	1.37281E-0	01 4.26117E-0	2 1,24352E-	02 2.85677E-03
2	2.15846E-02	1.80972E-0	1 4,16421E-0	1 5.119178-0	1 4.40703E-0	1 1.876885-0	)1 6.14970E-0	02 1,84546E-0	2 4,301788-	03 9.48003E-04
з	2.08321E-04	3,273238-0	5							
4	6.35269E-05	4.24711E-0	1 4.11847E-0: 6	1 3.34942E-C	1 2,18938E-0	1 8.096532-0	)2 2,49082E-(	02 5.91579E-03	3 1,31530E-0	03 2.90222E-04
-	1,90087E-01 2,04284E-05	5.60891E=0. 0.0	1 4.15180E-0	1 1.97995E-C	1 6.49362E=0	2 2.20620E-0	2 7.52064E-0	)3 1.75483E-03	3 3,943352~0	04 8,95252E-05
5	1,04759E-01	5.88001E-0	1 2.57298E-01	1 7.789168-0	2 2.91973E-0	2 7.41741E-0	3 1.60298E-0	3 3,55126E-04	+ 7.70772E-0	05 1,95494E-05
6	2,690881-06	0.0								
	4,055078-05	0.0	I 1,463862=U	1 6.36513E-C	2 2.960682-0	2 3,58923E-0	3 1.17772E-0	03 5.50101E-04	4 2.52699E-0	04 1.18915E-04
				NU INFINITE D	CLID = 44R ILUTION CRO	U104 M SS SECTION	AT NO = 44	04		
				NU INFINITE D	CLID = 44R ILUTION CRO	U104 M SS SECTION	AT NO = 44	04	PAGE 1 OF	1
GROUP 1 4 5 3 4 5 5 6 8 7 8 8 9 8 9 8 9 8 10 8 12 8 8 12 8 8 12 8 8 14 1 15 1 15 1 15 1 15 2 20 5 22 5 22 5 22 25 5	TOTAL F. .259994-00 G. .37854-00 G. .37854-00 G. .37854-00 G. .73484-00 G. .73484-00 G. .73484-00 G. .751271-00 G. .751271-00 G. .751271-00 G. .452271-00 G. .452271-00 G. .248054-01 G. .248054-01 G. .248054-01 G. .248054-00 G. .3213794-00 G. .34264-00 G. .34264-00 G. .34264-00 G. .34264-00 G. .34264-00 G. .34264-00 G.	155 jun 0	NU 	CAPTURE .361AVE-03 .412662-02 .30985-02 .425651-02 .425651-02 .425651-02 .427652-02 .427652-02 .427652-02 .008352-01 .724435-01 .943552-02 .008352-01 .586245-02 .233332+00 .8294712+00 .087642-02 .546742-02 .546742-02 .546742-02 .546742-02 .546742-02 .17213E-01	CLID = 44R ILUTION CRO ELASTIC 2.43560E*00 2.39892E*00 2.39892E*00 3.70590E*00 3.70590E*00 3.70590E*00 3.70590E*00 3.63094E*00 3.63094E*00 1.7390E*00 3.73395*00 3.2364E*00 3.2364E*00 2.2364E*00 2.28458E*00 2.28452E*00 2.2904E*00 3.2904E*00 2.2852E*00 2.2904E*00 3.2904E*000500000000000000000000000000000000	U104 M INELA I	AT NO = 44 N2N C.C G.O C.O C.O C.O C.O C.O C.O C.O C	EL MU 7.47090L-016 6.08940L-015 5.52472-016 4.99971E-011 2.31650L-011 2.31650L-011 2.31650L-011 2.31650L-011 2.73805L-021 1.77330L-021 2.73805L-021 3.471422-031 6.471422-0	PAGE 1 OF EL REMOVAL .678166-02 .604255-02 .604255-02 .604255-02 .122345-01 .793955-01 .793955-01 .793587-01 .793587-01 .793587-01 .793587-01 .793587-01 .7331625-01 .331625-01 .33265-01 .332715-01 .332715-01 .332735-01 .332735-01	1 FLUX CH1 1.6980%±-02 0.0 8.92878±-02 0.0 1.79938±-01 0.0 2.03451±-01 0.0 2.38421±-01 0.0 2.38421±-01 0.0 2.38421±-01 0.0 2.63825±-01 0.0 2.63735±-01 0.0 2.63735±-0
GROUP 4 2 3 3 4 5 6 8 8 5 6 8 8 7 7 9 8 8 8 7 7 9 8 8 8 10 11 12 8 8 11 12 18 8 11 12 12 12 12 12 12 12 12 12 12 12 12	TOTAL F 259594-00 0. 338344-00 0. 370554-00 0. 283114-00 0. 223218-00 0. 022328-00 0. 022328-00 0. 003984-00 0. 31024-00 0. 31024-00 0. 31024-00 0. 348244-01 0. 114364-01 0. 248224-01 0. 114364-01 0. 248244-01 0. 114364-01 0. 248244-00 0. 31794-00 0. 324264-00 0. 370106+00 0. 407694-00 0.	15510N 0	NU 	CAPTUNE .361A02-03 .41266c-02 .41266c-02 .42665-02 .42665-02 .426825-02 .426825-02 .427825-02 .449825-02	CLID = 44R ILUTION CRO ELASTIC 2.435602+00 2.398922+00 2.398922+00 3.708902+00 5.90422+00 3.708902+00 3.708902+00 3.708902+00 3.73995+00 3.73995+00 3.73995+00 3.73995+00 3.7395+00 3.7395+00 3.7395+00 3.74102+00 2.258842+00 2.258842+00 2.258842+00 2.258842+00 2.258842+00 2.258842+00 2.25822+00 2.2590242+00 2.2590242+00 2.2590242+00 2.2590242+00 2.2590242+00 2.25022+00 2.25022+00 2.25022+00 2.25024000 2.250240000 2.250240000 2.250240000 2.250240000 2.25024000000000000000000000000000000000	U104 M INELA I.821635+UC I.73955+UC I.73935+UC I.73935+UC I.73955+UC I.73955+UC I.73955+UC I.739555+UC I.7451855-UC I.75955+UC I.759555+UC I.759555+UC I.759555+UC I.759555+UC I.75955	AT NO = 44 N2N G.G G.G G.G G.G G.G G.G G.G G.	EL MU 7.47090£-016 6.08940E-015 5.5247E-016 6.08940E-015 5.5247E-016 4.95971E-011 2.36150E-011 2.36150E-011 2.77330E-012 1.01042E-011 1.99270E-021 7.41091E-032 6.47142E-031 6.47142E-03	PAGE 1 OF EL REMOVAL .678165-02 .604255-02 .604255-02 .122345-01 .793955-01 .793955-01 .7935875-01 .7935875-01 .7935875-01 .7935875-01 .204405-02 .21025-01 .31625-01 .331625-01 .331625-01 .332715-01 .332715-01 .332715-01 .332715-01 .332715-01 .332715-01 .32235-01	1 FLUX CHI 1.6980%-020.0 8.926786-020.0 1.79938E-010.0 2.534016-010.0 2.534016-010.0 2.386216-010.0 2.386216-010.0 2.4518226-010.0 2.6518226-010.0 2.6518226-010.0 2.6518226-010.0 2.6518226-010.0 2.6518226-010.0 2.6518226-010.0 2.6518256-0100000000000000000000000000000000000
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GROUP 1 4 3 3 4 5 6 8 8 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	TOTAL F .259594-00 C .33654-00 C .283114-00 C .283114-00 C .283114-00 C .283114-00 C .32324-00 C .32324-00 C .32324-00 C .32324-00 C .32324-00 C .32324-00 C .20815E-00 C .20815E-00 C .248024-00 C .248024-00 C .248024-00 C .248024-00 C .323894-00 C .323894-00 C .321494-00 C .323894-00 C .32154-00 C .32174-00 C .32174-	ISSION 0 0 0 0 0 0 0 0 0	NU 10 10 10 10 10 10 10 10 10 10	NU INFINITE D CAPTURE .361702-03 .312662-02 .30985-02 .30985-02 .45555-02 .45555-02 .45555-02 .478555-02 .478555-02 .302425-02 .302425-02 .383994+00 .23332+00 .23332+00 .234745-02 .377822-02 .37822-02 .37825-01 .494945-02 .17213E-02 .984962-02 .17213E-01 .172145-01 .44,94985E-0 .28231E-0 4.22640E-0 .38450E-0	CLID = 44R ILUTION CRO ELASTIC 2.435605+00 2.435605+00 2.39392E+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.708905+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73395+00 3.73955+00 3.739055+00055+00055+00055+00055+00055+00055+00055+00055+00055+00055+00055+00055+00055+00055+000	U104 M SS SECTION INELA 1.821635+UG 1.8731A5+00 1.734035+UG 1.734035+UG 1.73535+UG 1.73535+UG 1.73535+UG 1.73535+UG 1.73535+UG 1.73535+UG 1.73535+UG 1.74035 1.74035 1.748222E-0 2.1.765512E-0 2.1.06512E-0	AT NO = 44 N2N 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	EL MU 7.47090L-016 6.05940L-015 5.5247L-016 4.9597LE-01 2.35450L-01 2.35450L-01 2.35450L-01 2.77330L-02 1.77330L-02 2.77850L-02 1.77330L-02 2.77850L-02 1.77342-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 4.71422-03 1.465322-02 2.206118L-02 2.5.58049L-02 2.5.58049L-03 3.9.75831E-04 3.6.31573L-04	PAGE 1 OF EL REMOVAL .678166-02 .604255-02 .004255-02 .004255-02 .004255-02 .004255-02 .122345-01 .793687-01 .793687-01 .793687-01 .293677-01 .319455-01 .32245-01 .32245-01 .32245-01 .32245-01 .32295-01 .3205-0	1 FLUX CHI 1.69804E-02 0.0 8.9278E-02 0.0 1.79938E-01 0.0 2.02345E-01 0.0 2.38621E-01 0.0 2.38621E-01 0.0 2.38621E-01 0.0 2.63825E-01 0.0 2.63825E-01 0.0 2.63739E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 2.63782E-01 0.0 3.1.06387E-03 3.1.06387E-03 3.2.74344E-04 4.3.76793E-05
GROUP 1 4 3 3 4 5 5 5 6 6 7 7 8 9 9 9 8 8 1 12 8 1 12 1 5 5 221 5 5 225 5 GROUP 1 1 2 3 4 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7	TOTAL F. 259994-00 G. 19051-00 G. 233312-00 G. 233312-00 G. 193545-00 G. 193545-00 G. 193545-00 G. 19352-00 G. 19352-00 G. 19324-00 G. 19324-00 G. 19324-00 G. 19324-00 G. 28452-00 G. 28452-00 G. 28452-00 G. 28452-00 G. 28452-00 G. 28452-00 G. 28452-00 G. 298672-00 G. 200702-05 0.00702-05 0.00702-05 0.00702-05 0.00702-05 0.005762-01 0.333102-06 0.00501E-02 0.0	ISSION 0 0 0 0 0 0 0 0 0 0 0 0 0	NU 	NU INFINITE D CAPTUNE 3.513/02-03 .42353-02 .452851-02 .452851-02 .452851-02 .452851-02 .452851-02 .452851-01 .72432-01 .734242-02 .731324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .737324-02 .734940-01 .234490-01 .232445-01 .721324-02 .73490-01 .232445-01 .721324-02 .73490-01 .232400-01 .232400-01 .232445-02 .282312-01 .283312-01 .283312-	CLID = 44R ILUTION CRO ELASTIC 2.43560E+00 2.43560E+00 2.3892E+00 3.50942E+00 3.50942E+00 3.50942E+00 3.50942E+00 3.50942E+00 3.50942E+00 3.50942E+00 3.50942E+00 3.2385E+00 3.2454E+00 3.2554E+00 3.2	U104 M SS SECTION INELA I.821453:400 I.3731A2400 I.73803:400 I.73803:400 I.73803:400 I.73803:400 I.73803:400 I.738983:400 I.738983:400 I.20177E-02 I	AT NO = 44 N2N 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0	EL MU 7.47090L-016 6.08940L-015 5.567471-016 4.95971E-011 2.51650L-011 2.51650L-011 2.73650L-012 1.77330L-02 2.728650L-021 7.41091L-032 4.47142E-031 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 6.47142E-034 1.449855E-022 2.2.06118E-022 2.2.06118E-022 2.2.06118E-024 3.9.75831E-04 0.0	PAGE 1 OF EL REMOVAL .678166-02 .604255-02 .01917E-02 .604255-02 .122345-01 .73345-01 .74455-01 .74455-01 .74455-01 .74455-01 .74455-01 .74455-01 .73155-01 .73155-01 .73155-01 .73205-01 .72205-01 .72005-01 .72005-01 .72005-01 .7205-01 .7205-	1 FLUX CHI 1.6980%E-02 0.0 8.9278E-02 0.0 1.79938E-01 0.0 2.53407E-01 0.0 2.3821E-01 0.0 2.3821E-01 0.0 2.3822E-01 0.0 2.45782E-01 0.

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22 23 24 25	1,39164  1,15424  1,70610  1,59050	E+01 E+03 E+02 E+01	0.0 0.0 0.0 0.0		000000000000000000000000000000000000000	.0			8. 1. 1. 7.	45 14 67 23	233	E+00 E+02 E+02 E+02	2 2 3	464 300 842 545	+091 0361 2171 5301	+00 +00 +00	0.0.0.	0 0 0 0		0000	0			6.5	3428 3428 3428 1041	E-03 E-03 E-03 E-02	1. 4. 8. 9.	5533 5982 5520 2393	11E-0 2E-0 8E-0 6E-0	1 2 2 2 2 2 2 2	65782E=0 63739E=0 63825E=0 65782E=0	1 0. 1 0. 1 0.
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								7	ABL	E	OF	11	EL	A+ (N	1,21	() M.	ATK	ICES								PAG	F 1	1.05	1			
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1	118578 613373	371-0; 326-04	3 4.34 4 1.34	740E	-02 -04	2.0	171	2E-	01	5.0	78	28E-	01	4,9	783	46-1	01	3,62	343E-	01	1.39	033	3E-0	14	. 317	20E-	02 1	1,26	0128	-02	2.89520E	-03
2	1,9896 2,2391	63E-02	2 1.2	9174E 9024E	-01	4 • 2	5390	6E-	01	5.4	66	1,7E-	01	4.7	197	5E-1	01 3	2,01	371E-	01	6.60	0415	¢⊧=0	21	.982	78E-	02 4	+.62	301E	-03	1.01891E	-03
3	9,1512 7,2644	28E-02 4E-02	2 3.14	8451E 9843E	-01 -06	5.1	048	4E-	01	5.3	165	94E-	01	2.6	100	0E-1	01 9	9,16	1882-	02	2.84	921	/E-0	2 6	.766	53E-	031	1,50	423E	-03	3,31886E	-04
4	3.0513 1.9037	35E-01 74E-01	5.20	5189E	-01	4.9	036	96-	01	2.5	50	54E-	01	1.1	806	6E-1	01 :	3,63	810E-	02	8,86	440	) <b>≟</b> =0	3 1	• 994	45E-I	03 4	4,42	503E-	-04	9.71085E	-05
,	3.5152	4E-01	L 7.4	2577E	-01	2.3	2350	0E-	01	1.0	27	17E-	01	3.9	583	35-(	2 1	1.15	231E-	02	2.56	695	6 <b>-</b> -0	35	. 625	51E-1	04 J	1.23	617E-	-04	3,09171 <sub>E</sub> .	-05
6	2.3845 0.0	0E-01	0.0	9018	-01	3,3	424	7E-	01	5.4	90	33E-	02	6.7	677	4E=(		5.75	972E-	04	1.48	099	9E-0	43	.278	728-0	05 6	5.20	823E-	•06	8.62538E	-07
·	9.1687 2.0205	5E-02	2 1.33	833E	-02	5.0	597:	38-0	02	2.0	48	/2E-	02	6.3	435	4E=(	)3 I	1,40	691E-	03	3,23	243	E-0	47	.059	038-0	051	1,54	489E-	-05	3,71706E.	-06
в	1.0018	72-02	6.93 0.0	9454E	-03	2.6	3385	5E-0	04 :	5.0	87	80E-	05	1.1	249	16-0	<b>5</b> 0	0.0			0.0			0	.0		C	•••			0.0	
9	7.8515 0:0	8E-04	1.25	894E	-03	2.4	6026	5E-(	04	7.1	46	88E-	05	7.0	047	5t-(	96 1	1,51	522E-	06	3.33	185	E+0	77	. 357	28E-0	08 1	. 65	8516-	•08	2.24973E.	-09
10	0.0		0.0			5.3	3341	18-0	06	9.8	149	978-	06	4.5	149	5E-0	6 2	2.09	994E-	06	9,86	573	E-0	74	• 556	80E-(	07 2	2.01	496E-	07	1.03964E-	-07

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GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVA	L FLUX	CHI
1 4,258568+00	0.0	0.0	2.83242E-03	2.441812+00	1,01392E+00	0.0	7,49089E-01	6.70144E-0	2 1.69804E-02	0.0
2 3.931118+00	0.0	0.0	1.37508E=02	2.031166+00	1.006202+00	0.0	6.13020E-01	5-37196E-0	2 8.92878E=02	0+0
3 4.14895E*00	0.0	0.0	3.182816-02	2.270296+00	1.04683E+00	0.0	5.79590E-01	5.25176E-0	2 1./9938E-01	0.0
4 5.23824£+00	0.0	0.0	6.62719E-02	3.42936E+0U	1 /4261E+00	0+0	5.68148E-01	5.90585E~0	2 2.58407E-01	0+0
5 6.69866E+00	0.0	0,0	8.95996E-02	5.12550E+00	1.48356E+00	0.0	5.26891E-01	9.96551E=0	2 2.023458-01	0.0
6 8.05354E+00	0.0	0.0	1.27633E-01	6.72671L+00	1,19913E+00	0.0	4.367642-01	1.35704E=0	1 2.38821E-01	0.0
7 8.90464E+0U	0.0	0.0	2.722956-01	8.448021+00	1.043196-01	0.0	2.80357E-01	1,90911E-0	1 2.38821E-01	0.0
8 9.101721+00	0.0	0.0	4,165528-01	8.66789E+00	1.72788E-02	0.0	1.700485-01	2.08355E-0	1 2.388215-01	0.0
9 8.84375E+UO	0.0	0.0	6.41959E-01	8.19942E+00	2.37054E-03	0.0	1.023236-01	1.856378-0	1 2.63825E-01	0.0
10 8.386612+00	0.0	0.0	9.59020E+01	1.42756E+00	2,351128-05	0.0	5.39723E=02	1.72836E-0	1 2-65782E-01	0.0
11 8.093766+00	0.0	0.0	1.28976E+00	6.80401L+00	0.0	0.0	2.90246E-02	1.65431E-0	1 2.63739E-01	0.0
12 8.10946E+OU	0.0	0.0	1.58535E+0U	6.52411E+00	0.0	0.0	1.67790E-02	1.642338-0	1 2.63825E-01	0.0
13 9.30825E+00	0.0	0.0	2.08615E+00	1,22210E+00	0.0	0.0	1.61479E-02	1.29782L-0	1 2.65782E-01	0.0
14 1.083962+01	0.0	0.0	-2.90890E+00	7.930/UE+0U	0.0	0.0	6.53428E-03	1.32267E-0	1 2.63739E-01	0+0
15 1.229932+01	0,0	0.0	4.10128E+00	8,197961+00	0.0	0.0	6.53428E-03	1.44314L-0	1 2.63825E-01	0.0
16 1.97057E+01	0.0	0.0	1.02121E+01	9.493655+00	0.0	0.0	6.23426E-03	1.19652E-0	1 2.65782E-01	0.0
17 1.89538E+U1	0.0	0,0	9,68672E+00	9,26705E+00	0.0	0.0	6.53428E-03	1.15337E-0	1 2.63739E-01	0.0
15 6.70941E+00	0.0	0.0	2.07776E+00	4.63166L+00	0.0	0.0	6.23428E-03	1.28988E-0	1 2.63825E-01	0.0
19 4.894958+00	0.0	0.0	2.19497L-01	4.675466+00	0.0	0.0	6.53428E-03	1.19675E-0	1 2.65782E-01	0.0
20 4.86973E+00	0.0	0.0	7.94176E-02	4.79031E+00	0.0	0.0	6.53426E-03	1.23240E-0	1 2.63739E-01	0.0
21 5.52087E+0U	0.0	0.0	5.74535E-01	4,946336+00	0.0	0.0	6.23428E-03	1.29111E-0	1 2.63825E-01	0.0
22 1.39164E+01	0.0	0,0	8.45233E+00	5.45409E+00	0.0	0.0	6.53428E-03	1.55331E-D	1 2.657821-01	0.0
23 1.15424E+03	0.0	0.0	1.14493E+03	9.30036E+00	0.0	0.0	6.53428E-03	4.598226-0	2 2.63739E-01	0.0
24 1.70610E+02	0.0	0.0	1.67768E+02	2.84217E+00	0.0	0.0	6.53428E-03	8.55208E-0	2 2.638258-01	0.0
25 7.59050E+01	0.0	0.0	7.23597E+01	3.54530E+00	0.0	0.0	1.51043E-02	9.23936E=0	2 2.65782E=01	0.0
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# NUCLID = 45RH103 MAT NO = 4503 INFINITE DILUTION CHOSS SECTION

3.18452E-01 6.08405E-01 2.01251E-01 7.86970E-02 3.08270E-02 6.87965E-03 1.58520E-03 4.15231E-04 1.08016E-04 1.68878E-05 3.43475E-06 0.0 2.35946E-01 4.86278E-01 2.09339E-01 4.14658E-03 1.64517E-03 3.55879E-04 7.82217E-05 1.72818E-05 5.08333E-04 5.02257E-04 0.0 0.0 U.O 5.750602-02 1.21367E-01 3.448946-02 9.753522-03 4.53305E-03 2.11954E-03 9.81600E-04 4.34846E-04 2.29222E-04 5.24791E-05 0.0

2.02390E-01 4.27141E-01 3.25271E-01 4.57549E-01 2.11960E-01 7.59852E-02 2.38903E-02 5.70600E-03 1.27186E-03 2.80965E-04 6.15341E-05 3.54595E-06 4.67633E-01 6.01131E-01 2.43681E-01 7.15765E-02 6.22475E-02 2.94483E-02 6.82285E-03 1.50825E-03 3.31118E-04 7.61726E-05 1.33104E-05 0.0

19 5 20 5 21 5 22 5 23 5 24 5	15116E+0 15310E+0 15595E+0 16015E+0 16630E+0 17530E+0 18857E+0			2,03035 4,157096 6,103866 8,950466 1,314526 1,930116 2,830246	-03 5.14700E -03 5.14700E -03 5.14700E -03 5.14700E -02 5.14700E -02 5.14700E	00 0.0 00 0.0 00 0.0 00 0.0 00 0.0	0.0 6 0.0 6 0.0 6 0.0 6 0.0 6 0.0 6	34921E-03 1. 34921E-03 1. 34921E-03 1. 34921E-03 1. 34921E-03 1. 34921E-03 1. 34921E-03 1.	26288E-01 2 27267E-01 2 27225E-01 2 26288E-01 2 27267E-01 2 27267E-01 2	65782E-01 0. 65782E-01 0. 63739E-01 0. 63825E-01 0. 63739E-01 0. 63825E-01 0. 63825E-01 0.
	120001210		NUCLID	= 44RU106 TABLE OF	MAT NUM	BER = 4406	IPL • 0		202002-01 2.	.0,,822-01 0.
GROUP I	J= 1 11	T GROUP	** KK ** 2 12	КК = I + J = 3	1	5 6	7	PAGE 8	1 OF 1 9	10
1	2.02166E 7.31313E	-03 3.52 -04 1,55	897E-02 1.7 1206-04	4550E-01 4.9159	936-01 5,1872	1E-01 3.95282	E-01 1,56042E-01	4.91647E-02	1,44584E-02	3.33491E-03
2	3.17977E 2.46857E	-02 1.37 -04 3.88	950E-01 3.9 206E-05	9391E-01 5,3203	3E-01 4.8550	DE-01 2,14374	E-01 7.15643E-02	2.16839E-02	5.08002E-03	1.12215E-03

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GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4,26471±+00	0.0	0.0	9.35939E-04	2,42243E+00	1.84134E+00	0.0	7.44746E-01	6.55319E-02	1.69804E-02	0.0
2 3,96020L+00	0.0	0.0	7.73941E-03	2.05168E+00	1.90078E+00	0.0	6.07698E-01	5.52653E=02	8.92878E=02	0.0
3 4,21580E+00	0.0	0.0	2.235216-02	2,46194E+00	1.73151E+00	0.0	5.61659E-01	6.08211E-02	1.79938E-01	0.0
4 5,34753E+00	0,0	0.0	2,49333E-02	3,83813E+00	1.48447E+00	0.0	5.35108E-01	6.67055E-02	2.58407E-01	0.0
5 6,77237E+00	0,0	0.0	1.70119E-02	5.50872E+00	1.24664E+00	0.0	5.03618E-01	1.07913E-01	2.02345E-01	0.0
6 7,93182E+00	0.0	0.0	2.00858E-02	6,97292E+00	9.38817E-01	0.0	4.28432E-01	1.29467E-01	2.38821E-01	0.0
7 8.57894E+00	0.0	0.0	3.083236-02	8.31664E+00	2.31466E-01	0.0	2.99070E-01	1.82598E-01	2.38821E-01	0.0
8 8,77418E+00	0.0	0.0	4.66973E-02	8.72748E+00	0.0	0.0	1.87047E-01	2.03542E-01	2.38821E-01	0.0
9 8,54118E+00	0.0	0.0	5.99677E-02	6,48121E+00	0.0	0,0	1.08446E-01	1,89551E-01	2.63825E-01	0.0
10 8.14007E+00	0.0	0.0	1.013126-01	8,03876E+00	0.0	0.0	5.65374E-02	1.85893E-01	2.65782E=01	0.0
11 7.89138E+00	0.0	0.0	1.789268-01	7,71245E+00	0.0	0.0	2.97385E-02	1.85565E-01	2.63739E-01	0.0
12 7.94071E+00	0.0	0,0	2.97650E-01	7.64306E+00	0.0	0.0	1.68632E-02	1.89380E-01	2.63825E=01	0.0
13 8.37616E+00	0,0	0.0	4,50690E-01	7,92547E+00	0.0	0.0	8.84792E-03	2.00896E-01	2.65782E-01	0.0
14 9,27793L+00	0.0	0.0	6.32075E-01	8,64585E+00	0.0	0.0	6.34921E-03	2.26322E-01	2.63739E=01	0.0
15 1.01721E+01	0,0	0.0	7,88958E-01	9.38312E+00	0.0	0.0	6.34921E-03	1.27225E-01	2,63825E-01	0.0
16 5.148312+00	0.0	0.0	1.31465E-03	5.14700E+00	0.0	0.0	6.34921E-03	1.26288E-01	2.65782E-01	0.0
17 5,14893L+00	0.0	0.0	1,930316-03	5.14700E+00	0.0	0.0	6.34921E-03	1.272678-01	2.63739E=01	0.0
18 5,149836+00	0.0	0.0	2,83053E-03	5.14700E+00	0,0	0.0	6.34921E-03	1.27225E-01	2.63825E-01	0.0
19 5,15116±+00	0.0	0,0	4,15709E=03	5.14700E+00	0.0	0.0	6.34921E-03	1.26288E-01	2.65782E-01	0.0
20 5.15310L+00	0.0	0.0	6,10386E-03	5.14700E+00	0,0	0.0	6.34921E-03	1,27267E-01	2.63739E-01	0.0
21 5,15595±+00	0.0	0.0	8,95046E-03	5.14700E+00	0,0	0.0	6,34921E-03	1,27225E-01	2.63825E-01	0.0
22 5,16015E+00	0.0	0.0	1.31452E-02	5.14700E+00	0.0	0.0	6.34921E-03	1.26288E-01	2.65782E-01	0.0
23 5,16630E+00	0.0	0.0	1,93011E=02	5.14700E+00	0.0	0.0	6.34921E-03	1.27267E-01	2.63739E-01	0.0
24 5,17530E+00	0.0	0.0	2.83024E-02	5,14700E+00	0,0	0.0	6,349216-03	1,27225E-01	2.63825E-01	0.0
25 5,18857E+00	0.0	0.0	4,156682-02	5.14700E+00	0.0	0.0	1,44238E-02	1.262886-01	2,65782E-01	0.0
	,	NUCE TO a	4480104	MAT NUMBER	- 4404	- 191	0			

NUCLID = 44RU106 MAT NO = 4406 INFINITE DILUTION CROSS SECTION

PAGE 1 OF 1

NUCLID = 46PD105 MAT NO = 4605 INFINITE DILUTION CROSS SECTION

								PAGE 1 OF	1	
GROUPTOTAL	FISSION	NÜ	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4.26123E+00	0.0	0,0	4.48020E-03	2.42924E+0U	1.82/50E+00	0,0	7.46494E-01	6.59210E-02	1,69804E-02	0.0
2 3.94906E+00	0.0	0.0	2.38823E-02	2.03522E+00	1.68996E+00	0.0	6+12332E-01	5.323926-02	8,92678E-02	0+0
3 4.19268E+00	0.0	0.0	5.47178E-02	2.33550E+00	1.80246E+00	0.0	5.81841E-01	5.32127E-02	1,79938E-01	0.0
4 5.31827E+00	0.0	0.0	8.27773E-02	3.50702E+00	1,72848E+00	0.0	5.74979E-01	5,63362E-02	2,58407E-01	0.0
5 6.74833E+00	0.0	0,0	9.88065E-02	4.98354E+00	1.66598E+00	0.0	5.51718E-01	8.58954L-02	2,02345E-01	0.0
6 7.96279E+00	0.0	0.0	1.59125E-01	6.38994L+OU	1.41372E+00	0.0	4.65215E-01	1.21286E-01	2,386216-01	0.0
7 8.70174E+00	0.0	0.0	3.40235E-01	8.100902+00	1.94601E-01	0.0	3.026438-01	1.78287t-01	2.38821E-01	0.0
8 8,89903L+00	0.0	0.0	5,17852E-01	8.38117L+00	0.0	0.0	1,91500L-01	1.941168-01	2.38821E-01	0.0
9 8.65993E+00	0.0	0.0	7.798876-01	7.68004E+00	0.0	0.0	1.13296E-01	1.727018-01	2.63825E-01	0.0
10 8.23462E+00	0.0	0.0	1.14826E+00	7.08636E+00	0.0	0.0	6.11687t-02	1.601918-01	2.65782E-01	0.0
11 7,96607E+00	0.0	0.0	1.52287E+00	6.44320L+00	0.0	0.0	3,313916-02	1.52712E-01	2163739E-01	0.0
12 7,99934E+00	0.0	0.0	1.863802+00	6.135532+00	0.0	0.0	1.86638E=02	1.50654E-01	2.63825E-01	0+0
13 8.41730E+00	0.0	0.0	2,30505E+00	6.11225±+00	0.0	0.0	1.03622E-02	1.52333E-01	2.65782E-01	0.0
14 9,29585E+00	0.0	0.0	3.07605E+00	6.21981E+00	0.0	0.0	6.40970E-03	1.569726-01	2.63739E-01	0.0
15 1,078271+01	0.0	0.0	4.41748E+00	6.36523E+00	0.0	0.0	6.40970E-03	1.605908-01	2.63825E-01	0.0
16 1.31132E+01	0.0	0.0	6,60642E+00	6.50673E+00	0.0	0.0	6.40970E-03	1.62742E-01	2.65782E-01	0+0
17 1.20350E+01	0.0	0.0	6,24390E+00	5.79113E+00	0.0	0.0	6.40970E-03	1.379556-01	2,63739E-01	Ū+0
18 2.95758£+01	0.0	0.0	2,20488E+01	6.72698E+00	0.0	0.0	6.40970E-03	1.159686-01	2-63825E-01	0.0
19 2,37620E+01	0.0	0.0	1.84614£+01	5.30066E+00	0.0	0.0	6,40970E-03	1.13003E-01	2.657826-01	0.0
20 5,09581E+01	0.0	0.0	4.54465E+01	5.51160E+00	0.0	0+0	6.40970E-03	1.076622-01	2.63739E-01	0.0
21 5,91952E+00	0.0	0.0	1.35336E+00	4.56616t+00	0.0	0.0	6.40970E-03	1.16383L-01	2.63825E-01	0.0
22 6.08389E+00	0.0	0.0	1.38739E+00	4.69650E+00	0.0	0.0	6.40970E-03	1.16852E-01	2.657828-01	0.0
23 6.64623E+00	0.0	0.0	1.91764E+00	4.72859E+0U	0.0	0.0	6.40970E-03	1.18220E-01	2.63739E-01	0.0
24 7,49530E+00	0.0	0.0	2.75453E+00	4.740/6E+0U	0.0	0.0	6.40970E-03	1.18374t-01	2.638256-01	0+0-
25 8.75600E+00	0.0	0.0	4,011992+00	4,74600E+00	0.0	0.0	1.456212-02	1.17587E-01	2.65782L-01	0.0

NUCLID = 4620105 MAT NUMBER = 4605 IPL = TABLE OF INELA+(N+2N) MATHICES

PAGE 1 OF 1 EXII GHOUP \*\* KK \*\* KK \* j + J - 1 J= 1 2 3 4 11 12 5 10 2.29623E-03 4.22027E-02 1.93844E-01 5.04490E-01 5.05456E-01 3.72918E-01 1.44297E-01 4.49499E-02 1.31639E-02 3.0279[E-03 6.63151E-04 1.40584E-04 2.72209E-02 1.44584E-01 4.00847E-01 5.30964E-01 4.73008E-01 2.03862E-01 6.72084E-02 2.02377E-02 4.72406E-03 1.0418/E-03 2.29030E-04 3.61314E-05 1.31037E-01 4.14237E-01 4.36197E-01 4.72874E-01 2.32572E-01 8.21132E-02 2.56133E-02 6.09226E-03 1.35534E-03 2.99136E-04 6.54865E-05 3.88581E-06

3.51174E-01 6.78987E-01 3.82304E-01 2.05364E-01 7.73425E-02 2.53396E-02 6.18418E-03 1.39248E-03 3.09055E-04 6.78342E-05 1.31878E-05 0.0 5 2.75644E-01 9.29228E-01 3.24738E-01 9.03327E-02 3.56409E-02 8.03245E-03 1.77970E-03 3.73330E-04 8.60205E-05 6.72966E-05 2.91278E-05 0.0 1.55277t-01 6.56456t-01 4.57871E-01 1.12450E-01 2.39040t-02 5.48239E-03 1.68239E-03 4.69801E-04 1.03098E-04 2.42575E-05 2.05470t-06 0.0

0.0 1.12991E-02 1.14095E-01 5.842/0E-02 /.1/749E-03 2.25808E-03 0.08926E-04 3.19691E-04 1.40735E-04 6.66123E-05 8.80041E-06 0.0

## NUCLID = 46PD107 MAT NO = 4607 INFINITE DILUTION CROSS SECTION

 
 CAPTUNE
 ELASTIC
 INELA
 N2N

 2.78891E-03
 2.4172xE+00
 1.0\*497E+00
 0.0

 1.83654E-02
 2.037666E+00
 1.0\*497E+00
 0.0

 1.83654E-02
 2.037666E+00
 1.0\*497E+00
 0.0

 1.9423E-02
 2.037666E+00
 1.0\*367E+00
 1.4302E+00
 0.0

 1.9423E-02
 2.03766E+00
 1.4302E+00
 0.0

 1.923E-03
 1.9759E+00
 1.4302E+00
 0.0

 1.7327E-01
 1.9759E+00
 1.7336E=0
 0.0

 2.7735E-01
 1.64705E+00
 0.6178E-02
 0.0

 1.7422E-01
 1.64705E+00
 0.0
 0.0
 0.0

 1.3155E+00
 6.91169E+00
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 1.3155E+00
 6.9128E+00
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 6.9128E+00
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 1.3052E+00
 6.930350 PAGE 1 OF 1 GROUPTOTAL F1S 1 4.268995-00 0.0 2 3.97501±00 0.0 3 4.24368±00 0.0 4 5.390431:00 0.0 5 6.77566±00 0.0 6 7.86866±00 0.0 8 8.623071:00 0.0 8 8.623071:00 0.0 10 8.04784±00 0.0 11 7.85175:00 0.0 12 7.89144±00 0.0 13 8.3437175:00 0.0 14 9.264335:00 0.0 15 1.080231:01 0.0 15 1.32026±01 0.0 16 1.32026±01 0.0 17 1.661501:01 0.0 18 2.215691:01 0.0 19 3.00491E:01 0.0 PAGE 1 0 H 1

LL MU LL REMOVAL FLUX CH
7.4452E-01 6.46210E-02 1.69804E-02 0.0
6.15074E-01 5.19165E-02 8.92878E-02 0.0
5.53698E-01 5.31668E-02 2.58407E-01 0.0
5.53698E-01 8.09248E-02 2.02345E-01 0.0
3.19301E-01 1.62781E-01 2.38821E-01 0.0
2.04160E-01 1.62781E-01 2.38821E-01 0.0
2.04160E-01 1.63252E-01 2.63825E-01 0.0
3.04159E-02 1.45698E-01 2.65782E-01 0.0
3.04159E-02 1.45698E-01 2.65782E-01 0.0
3.04159E-03 1.52652E-01 2.65782E-01 0.0
3.28978E-03 1.52642E-01 2.65782E-01 0.0
3.28978E-03 1.65394E-01 2.65739E-01 0.0
3.28978E-03 1.65394E-01 2.65732E-01 0.0
3.28978E-03 1.65394E-01 2.65732E-01 0.0
3.28978E-03 1.65394E-01 2.65732E-01 0.0
3.28978E-03 1.65397E-01 2.65732E-01 0.0
3.28978E-03 1.653767E-01 0.0
3.28978E-03 1.653767E-01 0.0
3.28978E-03 1.65378E-01 0.0
3 FISSION ΝU 6.28786-03 1.651946-02 2.658256-01 0.0 6.28786-03 1.657876-01 2.657826-01 0.0 6.28786-03 1.684631-01 2.657396-01 0.0 6.28786-03 1.240825-01 2.658256-01 0.0 6.28786-03 1.231696-01 2.657826-01 0.0 6.28786-03 1.241236-01 2.657394-01 0.0 6.28786-03 1.240826-01 2.65256-01 0.0 1.429016-02 1.231686-01 2.657826-01 0.0 18 2.213692+01 0.0 19 3.00691E+01 0.0 20 4.17378E+01 0.0 21 5.26297E+01 0.0 22 5.96703E+00 0.0 23 6.38632E+00 0.0 24 7.00489E+00 0.0 25 7.91316E+00 0.0 0.0

#### MAT NUMBER = 4607 NUCLID = 46P0107 IPL = 0 TABLE OF INELA+(N+2N) MATRICES

PAGE 1 OF 1

EXIT GROUP \*\* KK \*\* KK = I + J = 1 J= 1 2 3 4 11 12 GROUP 5 6 7 8 9 10 1.87962E-03 3.59535E-02 1.81300E-01 4.99073E-01 5.18789E-01 3.91652E-01 1.53716E-01 4.82882E-02 1.41790E-02 3.26765E-03 7.16340E-04 1.51916E-04 2.55044E-02 1.26401E-01 3.99605E-01 5.50877E-01 4.97434E-01 2.18211E-01 7.25984E-02 2.19586E-02 5.13968E-03 1.13484E-03 2.49600E-04 3.93996E-05 1.35732L-01 3.69530E-01 4.41099E-01 4.95851E-01 2.49227E-01 8.89954E-02 2.79238E-02 6.66227E-03 1.48428E-03 3.27812E-04 7.17865E-05 4.26429E-06 4.02506E-01 6.48426E-01 3.53314E-01 2.17568E-01 8.45045E-02 2.78933E-02 6.83408E-03 1.54164E-03 3.42451E-04 7.51940E-05 1.46203E-05 0.0 5 3.85513E-01 9.99677E-01 2.17107E-01 7.70504E-02 2.32646E-02 6.63535E-03 1.39170E-03 3.94689E-04 8.74492E-05 1.89808E-05 2.12777E-06 0.0 1.83564E-01 7.41608E-01 4.64523E-01 1.42865E-01 2.67914E-02 7.02114E-03 1.77423E-03 3.46202E-04 7.17882E-05 1.70451E-05 6.72749E-07 0.0 9.51077t-02 1.38719t-01 8.06115E-02 2.85653E-02 9.35077t-03 2.75316t-03 1.61438t-03 4.80448E-04 1.08438t-04 2.48303E-05 8.00786E-07 0.0 0.0 3.87143E-02 2.06331E-02 5.73135E-03 2.66820E-03 7.53087E-04 6.47868E-05 3.01565E-05 1.40950E-05 6.46582E-06 2.26315E-06 0.0

# NUCLID = 47AG109 MAT NO = 4709 INFINITE DILUTION CROSS SECTION

								PAGE	1 OF	1	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL R	MOVAL	FLUX	CHI
1 4.27503E+00	0.0	0.0	3,81775E-03	2,40196E+00	1.86925E+00	0,0	7.41714E-01	6.339	70£-02	1,69804E-02	0.0
2 4,00302E+00	0.0	0.0	2.43807E-02	2.04113E+00	1.93750E+00	0,0	6.17865E-01	5.069	32E-02	8,92878E-02	0.0
3 4,30142E+00	0.0	0.0	6.61895E-02	2.42608E+00	1,80916E+00	0.0	6.00300E-01	5.131	59E-02	1.79938E-01	0.0
4 5.46050E+00	0.0	0.0	1.12613E-01	3.67948E+00	1,66841E+00	0.0	5.83380E-01	5.713	39E-02	2.58407E-01	0.0
5 6,78695E+00	00	0.0	1.42139E-01	5+22229E+00	1,42252E+00	0.0	5.38730E-01	9.102	32E-02	2.02345E-01	0.0
6 7.73478E+00	0.0	0.0	2.31289E-01	6.58391E+00	9.19588E-01	0.0	4.53068E-01	1,173	58E-01-	2,38821E-01	0.0
7 8.24531E+00	0.0	0,0	4.11515E-01	7.711596+00	1,22203E-01	0.0	3.23105E-01	1.5340	9E-01	2,38821E-01	0+0
8 8.33609E+00	0.0	0.0	5.89826E-01	7.735318+00	1.09562E-02	0.0	2.14909E-01	1.6791	338-01	2:38821E-01	0,0
9 8.14356E+UO	0.0	0.0	8.55472E-01	7.288002+00	7.90679E-05	0.0	1.31456E-01	1.5211	L3E-01	2.63825E-01	0.0
10 7.82579E+00	0.0	0+0	1.18813E+00	6,63766L+00	0.0	0+0	7.21913E-02	1,4464	+2E-01	2.65782E-01	0.0
11 7.66051E+00	0.0	0.0	1.49915E+00	6.16137E+00	0.0	0.0	3.88044E-02	1.4171	L8E-01	2.63739E-01	0.0
12 7.78956E+00	0.0	0.0	1.78975E+00	5,99981E+00	0.0	0.0	2.14088E-02	1.4302	28E-01	2.63825E-01	0.0
13 8.30689E+00	0.0	0.0	2,22151E+00	6.08539E+00	0.0	0.0	1.25431E-02	1.4710	59E-01	2,65782E-01	0+0
14 9.30223E+UU	0.0	0.0	3,01690E+00	6.28534E+00	0.0	0.0	6.17433E-03	1.5211	13L-01	2.63739E-01	0.0
15 1.68043E+01	0.0	0.0	6.09467E+00	1,07096±+01	0.0	0+0	6.17433E-03	2,330	71E-01	2.63825E-01	0+0
16 1.68325E+01	0.0	0.0	7,00662E+00	9.825911+00	0.0	0.0	6.17433E-03	1,2830	3E-01	2,65782E-01	0.0
17 3,19923E+01	0.0	0,0	1.82065E+01	1.37858E+01	0.0	0.0	6.17433E-03	1.067	35E-01	2.63739E-01	0+0
18 4.58067E+01	0.0	0.0	3.38805E+01	1,19262L+01	0.0	0.0	6.17433E-03	1,013	77E-01	2.63825E-01	0+0
19 4.91199E+01	0.0	0,0	4.27517E+01	6,36822E+00	0.0	0.0	6.17433E-03	1,033	19E-01	2.65782E-01	0.0
20 7.24798E+00	0.0	0.0	1,77311E+00	5.47487E+00	0.0	0.0	6.17433E-03	1.7260	04E+01	2.63739E-01	0.0
21 1.82584E+03	0,0	0,0	1.66156E+03	1,642862+02	0.0	0.0	6,174338-03	1,0522	278+00	2.63825E-01	0.0
22 1.00186E+02	0.0	0,0	9,68141E+01	3.37432E+00	0.0	0.0	6,17433E-03	2,8936	54E-02	2+65782E-01	0+0
23 2.4858BE+01	0.0	0.0	2.33974E+01	1,46134L+00	0.0	0+0	6.174338-03	3.9478	376-02	2.63739E-01	0.0
24 2.47619E+01	0.0	0,0	2.30150E+01	1.74694E+00	0.0	0.0	6.174338-03	4,380	53E-02	2.63825E-01	0.0
25 3.07721E+01	0.0	0.0	2.89053E+01	1.86679E+00	0.0	0.0	1.41673E-02	4.533	53E-02	2.657828-01	0+0

47AG109 MAT NUMBER = 4709

TABLE OF INELA+(N+2N) MATRICES

NUCLID -

NUCLIO =

EXIT GROUP \*\* KK \*\* KK = [ + J = 1 J= 1 2 3 4 11 12

2.30903E=01 1.24408E=01 0.0 0.0 0.0

1.19298E-01 1.50149E-01 2.09724E-02 0.0 0.0 0.0

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			14	BLC OF THEE	A. (11217 1161	NICES.		PAGE	1 OF 1	
GROUP I	EXIT J= 1 11	GROUP ** KK 2 12	** KK = 3	I + J = 1 4	5	6	۲	8	9	10
1	1.32925E-03 7.31355E-04	3.51693E-02 1.55094E-04	1.812432-0	1 5.03020E-01	5,25711E-01	3.98215E-01	1,56618E-01	4,92525E-02	1,44701E-02	3,3359VE-03
2	1.76719E-02 2.56156E-04	2 1.21843E-01 4.04526E-05	4.03381E-0	1 5,59869E-01	5.07746t=01	2.23332E-01	7.44052E=02	2.25213E-02	5,27334E-03	1.16455E-03
3	9,46969E-02 7,43382E-05	2 3.65916E-01 4.41458E-06	4.51454L-0	1 5.10118E-01	2.57222E-01	9.200418-02	2.88929t-02	6.89663E-03	1.53682E-03	3.39447E-04
4	2.68906E-01 1.48181E-05	5.72924E-01 0.0	4.86492E-0	1 2.17243E-01	8,56202⊾-02	2.828656-02	6,93359E-03	1.56443E-03	3.475472-04	7.6316/E-05
5	2.57800E-01 2.30862E-06	6.5/429E-01	2.96775E-0	1 1.534916-01	4.47136E-02	9.54106E-03	2.15687E-03	4.77029E-04	1.059498-04	2.529675-05
6	1.62468E-01 7.85164E-07	4.21473E-01 0.0	2.31269E-0	1 8.22040E-02	1,73475E-02	3.76726L-03	6,27421E-04	1.81485E-04	4.00892E-05	9.49504L-06
7	5.23380E-02 0.0	2,42681E-02 0,0	3.05402L-0	2 1.17488E-02	2.57902L-03	5,68808L-04	1.25767E-04	2.687492-05	6.33148E-06	1.0589/1-06
a	1.21406E-03 0.0	6.94162E-03	2.22237E-0	3 5,561246-04	1.71606E-05	3.78598E-06	8.21197E-07	1,78686E-07	3.89056E-08	5.21652E-09
9	0.0 0.0	0.0	7.11476E-0	6 3,865>3E-0>	1.80655E-05	8,31238E-06	3.866901-06	1,79828E-06	8.69648L-07	3,85228E-07

NUCLID = 531 129 MAT NO = 5329 INFINITE DILUTION CROSS SECTION

								PAGE	1 OF	1	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL RE	MOVAL	FLUX	CH]
1 4,41427E+00	0.0	0.0	1.27946E-03	2,32892E+00	2.00408E+00	0,0	7,22693E-01	5.3888	9E-02	1.69804E-02	0.0
2 4.42072E+00	0.0	0,0	8,064286-03	2.28956E+00	2.12310E+00	0.0	6.62945E-01	4.3146	2L-02	8.928785-02	0.0
3 5.23025E+0U	0.0	0.0	2.53316E-02	3.11481E+00	2,09012E+00	0.0	6.74537E-01	4,7118	0E=02	1./9938E-01	0+0
4 6.23123E+00	ō.u	0.0	6.U4683E-02	4.426146+00	1.74462E+00	0.0	6.014328-01	5,6430	1E-02	2,584076-01	0,0
5 6.61579E+00	0.0	0.0	8.08277E-02	5.31318E+00	1,22178E+00	0.0	4,95993E-01	6.0081	9E=02	2.02345E-01	0.0
6 6.28748E+00	0.0	0.0	1.183986-01	5,541346+00	6.277428-01	0.0	4.23151E-01	1,3790	9E-02	2.38821E-01	0.0
1 5.91779F+00	0.0	0.0	1.39594E-01	5.35216E+00	4.26034E-01	0.0	3.471276-01	6.3941	3E=02	2.388218-01	0.0
8 5.89911E+00	0.0	0.0	1.848862-01	5,358922+00	3,553116-01	0.0	2,36152E-01	9.8962	9E=02-	2.38821E-01	0.0
9 6.150738+00	0.0	0.0	2.77989E-01	5.56232E+00	2.904198-01	0.0	1,381246-01	1,0663	8t-01	2.63825E-01	0.0
10 6.723356+00	0.0	0.0	4.74018E-01	6,13774E+00	1.11590E-01	0.0	6.78012E-02	1.2633	58-01	2.65782E-01	0.0
11 7.754456+00	0.0	0.0	7.54531E-01	6.99992L+00	0.0	0.0	3.20585E-02	1.4965	7E-01	2.637398-01	0.0
12 9.337636+00	0.0	0.0	1.14620F+00	8.19144E+00	0.0	0.0	1.61551E-02	1.8032	4E-01	2.638258-01	0.0
13 1.176078+01	0.0	0.0	1.84646E+00	9.91423E+00	0.0	0.0	6.20000E-03	2.2046	3E-01	2.65782E-01	0.0
14 1.537876+01	0.0	0.0	3.168645+00	1.22100E+01	0.0	0.0	5.21273E-03	2.7473	8E-01	2.63739E-01	0.0
15 2.07238E+01	0.0	0.0	5.60485E+00	1.51190E+01	0.0	0.0	5-21273E-03	3.4009	BE-01	2.63825E-01	0+0
16 2.863686+01	0.0	0.0	9.95176F+00	1.868512+01	0.0	0.0	5.21273E-03	4.1615	1E-01	2.65782E-01	0+0
17 2.585376+01	0.0	0.0	1.27192E+01	1.313458+01	0.0	0.0	5-21273E-03	7.9074	1E=02	2.63739E-01	0.0
18 1.133166+01	0.0	0.0	6.82454F+00	4.50708E+00	0.0	0.0	5.21273E-03	7.7249	6E-02	2.63825E-01	0.0
19 4.625726+00	0.0	0.0	7.78704E-01	3.64702E+00	0.0	0.0	5.21273E-03	7.8084	1E-02	2.65782E-01	0.0
20 5.019036+00	0.0	0.0	1.13740F+00	3.881636+00	0.0	0.0	5.21273E-03	1.9025	4E-02	2.63739E-01	0.0
21 5.557786+00	0.0	0.0	1.66577E+00	3.692016+00	0.0	0.0	5.21273E-03	7.9126	5E-02	2+63825E=01	0.0
22 6.34162E+00	0.0	0.0	2.445646+00	3,896185+00	0.0	0.0	5.21273E-03	7.8597	кE-02	2.65782E-01	0.0
23 7.48807F+00	0.0	0.0	3.590076+00	3.89800E+00	0.0	0.0	5.21273E-03	1.9232	1E-02	2.63739E-01	0.0
24 9 143135+00	0.0	0.0	5.264311+00	3.898822+00	0.0	0.0	5.21273E-03	1.9217	4E-02	2.63825E-01	0.0
25 1.1630/E+01	0.0	0.0	7.73127E+00	3.89920E+00	0.0	0.0	1.10652E-02	7.8638	8E-02	2.65782E-01	0+0

MAT NUMBER =

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2:22942E-03 5.42523E-02 2.37055E-01 5.86699E-01 5.6874E-01 4.11078E-01 1.57054E-01 4.86604E-02 1.4187E-02 3.25764E-03 7.12869E-04 1.51073E-04

2.59630E-02 1.72031E-01 4.78875E-01 6.06698E-01 5.19183E-01 2.20288E-01 7.20393E-02 2.15966E-02 5.03157E-03 1.10856E-03 2.43575E-04 3.84426E-05 1.39672E-01 4.56828E-01 5.36814E-01 5.56401E-01 2.68525E-01 9.38777E-02 2.91337E-02 6.91114E-03 1.53559E-03 3.38723E-04 7.41328E-03 4.45039E-06

3.72956E-01 6.07176E-01 4.59918E-01 1.61529E-01 9.50482E-02 3.65731E-02 8.66690E-03 1.99388E-03 4.40530E-04 9.8440UE-05 1.85083E-03 0.0 3,70927E-01 4,48825E-01 2,47349E-01 1.0977TE-01 3,23804E-02 9,86022E-03 2.08338E-03 4,52843E-04 9,8444TE-05 2,37447E-05 2,61332E-06 0.0

3,75033E-01 1,59708E-01 5,53622E-02 2.02397E-02 1.00779E-02 4.94043E-03 1.78710E-03 4.66431E-04 1.02227E-04 2.2588/E-05 2.21358E-06 0.0 3.02272E-01 8.65737E-02 2.23350E-02 9.05174E-03 4.51614E-03 1.00404E-03 2.20317E-04 4.77649E-05 1.07159E-05 2.17434E-06 3.01739E-07 0.0

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5.66151E-02 3.10861E-02 1.29264E-02 5.93481E-03 2.77236E-03 1.29135E-03 6.18325E-04 3.07357E-04 3.84434E-05

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TABLE OF INELA+(N+2N) MATRICES

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PAGE 1 OF 1

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22 1 23 7 24 8 25 1	13087E+01 0. 36468E+00 0. 43527E+00 0. 07631E+01 G.	0 0, 0 0, 0 0, 0 0,	0 9. 0 5. 0 6. 0 8.	69202E+00 1 45974E+00 1 44721E+00 1 74309E+00 2	.61663E+00 0. .90494E+00 0. .98805E+00 0. .01999E+00 0.	5533 I	5.05598E-03 5.05598E-03 5.05598E-03 1.15382E-02 PL = 0	3,564994E-02 2.6 3,86403L=02 2.6 3,95831E-02 2.6 3,96865E-02 2.6	57822-01 0.0 3739E-01 0.0 3825E-01 0.0 5782E-01 0.0
			TAB	LE OF INEL	A+ (N+2N) MATH	LICES	PAG	E 1 OF 1	
GROUP I	EX∣T J≂ 1 11	GROUP ** KK 2 12	** KK = I 3	+ J = 1 4	5	6	7 8	9	10
1	2,20117E-03 7,14759E-04	5.53228E-02 1.51488E-04	2,42327E-01	5.95250E-01	5.74177E-01	4,137288-01 1.	57765E-01 4.88328E-	02 1,42302E-02 3	.26668E-03
	2.48701E-02 2.46793E-04	1.63495E-01 3.90077E-05	4.917998-01	6.19628E-01	5.28379E-01	2.23699E-01 7.	30715E-02 2.18932E-	02 5,09910E-03 1	·12328E-03
3	1.20979E-01 7.37510E-05	4.77393E-01 4.77773E-06	5.66606E-01	5.94149E-01	2.86013E-01	9.98589E-02 3.	09685E-02 7,34376E-	03 1,63144E-03 3	.59838E-04
4	3.61179E-01 1.63685E-05	7.04854E-01 0.0	5,47885t-01	2,55105E-01	9.74968E-02	3.16962E-02 7.	70421E-03 1.73144E-	03 3.83947E-04 8	1.42377E-05
,	3.68118E-C1 1.32082E-06	5.92363E-01 0.0	3.469278-01	1,47266E-01	4.86713E-02	1.45194E-02 3,	16688E-03 6.53440E-	04 1,22B40E-04 1	02479E-05
7	3,75800E-01 6,65327E-07	2,52769E-01 0.0	4,61368E-02	3,47260L-0;	2 1.17630E-02	7.33890E-03 3.	19093E-03 1.41088E-	03 3,07782E-04 6	.96523E-05
, a	1.81883E-01 0.0	2,38617E-01 0.0	4.96445E-02	7.308618-03	9,35244E-04	7.47723E-04 1.	63968E-04 3,55269E-	05 7.83344E-06 1	.78792E-06
•	3,25738E-02 0,0	1.15597E-01 0.0	7,31571E-02	1,36131E-02	2 1,20533E-03	2,65065E-04 5,	748386-05 1,251156-	05 2.77193E-06 2	.82745E-07
,	0.0	0.0	1,23996E-02	8.11340E-0	3.78518E-03	1.74932E-03 8.	24863E-04 3.73947E-	04 1.991148-04 1	.54235E-05

								PAGE 1 OF	1	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4,43694E+00	0.0	0.0	3.06633E-04	2,32816E+00	2,10797E+00	0.0	7.20507E-01	5,25847E-02	1.69804E-02	0.0
2 4,53099E+00	0.0	0.0	5,18032t-03	2,37247E+00	2,15334E+00	0.0	6,73670E-01	4.17396E-02	8.92878E-02	0.0
3 5,45108E+00	0.0	0.0	1,51458E-02	3,25055E+00	2.185398+00	0.0	6.94781E-01	4.38301E-02	1.79938E-01	0.0
4 6.45213E+00	0.0	0.0	3.237526-02	4.41162E+00	2.00814E+00	0,0	6.28384E-01	5.06254E-02	2.58407E-01	0.0
5 6,66170L+00	0.0	0.0	5,74436E-02	5.08241E+00	1,52184E+00	0.0	5.04436E-01	7,39692E-02	2.02345E-01	0.0
6 6,C9663E+OU	0.0	0.0	1,121776-01	5.25094E+00	7.335138-01	0.0	4.11083E-01	6.90912E-02	2.38821E-01	0.0
7 5,65803E+00	0.0	0.0	1.45744E-01	5.03294E+00	4.793458-01	0.0	3.34641E-01	7.857728-02	2.38821E-01	0.0
8 5,66719E+00	0.0	0.0	2,06198E-01	5.22451E+00	2.364842-01	0.0	2.20335E-01	9.81764L-02	2.38821E-01	0.0
9 6:15374E+00	0.0	0.0	3.28847E-01	5.79743E+00	2.74608E-02	n.0	1.219816-01	1.10912E-01	2.63825E-01	0.0
10 7.07604E+00	0.0	0.0	5.06773E-01	6.56927E+00	0.0	0.0	5.89623E-02	1.33336E-01	2.65782E-01	0.0
11 8.52683E+00	0.0	0.0	7,737771-01	7.75305E+00	0.0	0.0	2.75924E-02	1.651531-01	2.63739E-01	0.0
12 1.072436+01	0.0	0.0	1,21014E+00	9,51413E+00	0.0	0.0	1.38714E-02	2.07556E-01	2,63825E-01	0.0
13 1,402108+01	0.0	0.0	2,03023E+00	1.19908E+01	0.0	0.0	5.82591E-03	2.632305+01	2,65782E-01	0.0
14 1.57818E+01	0.0	0.0	3.45281E+00	1.23290E+01	0,0	0,0	5.05598E-03	/.10537E-02	2,637398-01	0.0
15 1.29542E+01	0.0	0.0	5.05554E+00	7.89870E+00	0.0	0.0	5.05598E-03	1,271176-01	2.63825E-01	0.0
16 3.64282E+01	0,0	0.0	1,20768E+01	2.43514E+01	0,0	0.0	5.05598E-03	3.87741E-02	2.657828-01	0.0
17 2,85729E+01	0.0	0.0	1,647401+01	1.20989E+01	0.0	0,0	5.05598E-03	5.541056-02	2.63739E-01	0.0
18 3.43105E+01	0.0	0.0	2.75545E+01	6,755982+00	0.0	0.0	5,05598E-03	2.43149E-01	2.63825E=01	0.0
19 3.729222+01	0.0	0.0	3,27335E+01	4,55869E+00	0.0	0,0	5,05598E-03	2.67475E-02	2,65782E=01	0.0
20 4.28888E+CU	0,0	0.0	1,73016E+00	2,55872E+00	0.0	0,0	5,05598E-03	6.23105E-02	2.63739E=01	0.0
21 4.17896E+02	0.0	0.0	3.940076+02	2,38891E+01	0.0	0,0	5,05598E-03	2.65112E-02	2.63825E-01	0.0
22 1,13087E+01	0.0	0.0	9.69202E+00	1,61663E+00	0.0	0.0	5.05598E-03	3,56494E-02	2.65782E-01	0.0
23 7.36468L+00	0.0	0.0	5,45974E+00	1,904942+00	0.0	0.0	5,055988-03	3,86403L-02	2,63739E-01	0.0
24 8.43527E+00	0.0	0.0	6.447212+00	1,98805E+00	0.0	0.0	5.05598E-03	3.95831E-02	2.63825E-01	0.0
25 1.07631E+01	6.0	0.0	8,74309E+00	2,01999E+00	0.0	0.0	1,15382E-02	3.96865E-02	2,65782E-01	0.0
		NUCL ID .	55C5133	MAT NUMBER	• 5533	iPL .	0			

NUCLID = 25CS133 MAT NO = 5533 INFINITE DILUTION CHOSS SECTION

NUCLID = 54xE131 MAT NUMBER = 5431 1PL = 0 TABLE OF INELA+ (N, 2N) MATRICES PAGE 1 OF 1 EXIT GROUP ++ KK ++ KK = 1 + J = 1 J= 1 2 3 4 11 12 GROUP 5 7 8 10 - 6 2.39493E-03 5.33806E-02 2.38991E-01 5.90802E-01 5.72275E-01 4.13432E-01 1.57406E-01 4.89168E-02 1.42607E-02 3.27441E-03 7.16525E-04 1.51863E-04 2 2.52482E-02 1.53683E-01 4.88119E-01 6.18159E-01 5.28846E-01 2.24349E-01 7.33603E-02 2.19916E-02 5.12345E-03 1.12879E-03 2.48019E-04 3.92052E-05 3 1.32044E-01 4.31985E-01 5.63437E-01 5.93148E-01 2.86228E-01 1.00061E-01 3.10515E-02 7.36597E-03 1.63663E-03 3.61010E-04 7.90105E-05 4.78876E-06 3,98791E-01 6,62178E-01 4.67650E-01 2.51451E-01 9.62369E-02 3.13098E-02 7.61323E-03 1.71131E-03 3.79514E-04 8.32684E-05 1.61890E-05 0.0 5 4.03963E-01 7.29815E-01 2.19665E-01 1.00921E-01 2.94891E-02 6.41403E-03 1.46759E-03 3.28152E-04 7.22759E-05 1.55116E-05 1.72826E-06 0.0 6 2.50697E-01 3.79610E-01 1.90523E-01 8.15322E-02 1.66591E-02 2.40642E-03 5.27297E-04 1.17449E-04 2.47232E-05 6.17200E-06 0.0 0.0 1.37434E-01 1.44896E-01 1.77604E-02 1.74119E-02 7.19523E-03 1.57997E-03 3.46187E-04 7.52975E-05 1.68085E-05 3.82939E-06 0.0 0.0 3.31551E-02 1.02875E-01 4.96041E-02 5.22080E-03 7.05877E-05 1.54481E-05 3.33631E-06 7.64726E-07 0.0 0.0 0.0 0.0 9 1,06630E-02 6.33855E-03 2.96604E-03 1.35565E-03 6.44180E-04 2.87166E-04 1.74619E-04 6.14521E-07 0.0 0.0

								PAGE 1 OF	1	
ROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	СНІ
1 4.42528E+00	0.0	0.0	8.81250E-04	2,32789E+00	2,09650E+00	0,0	T,21639E-01	5.31845E-02	1.69804E-02	0,0
2 4,47167E+00	0.0	0.0	5,52870E-03	2,32584E+00	2,14030E+00	0.0	6,68182E-01	4,229586-02	8,92878E-02	0,0
3 5,33398E+00	0.0	0.0	1,60516E-02	3.17053E+00	2,14740E+00	0.0	6.85541E-01	4.50809E-02	1,79938E-01	0.0
4 6,33372E+00	0.0	0.0	2.984048-02	4,38646E+00	1,91742E+00	0.0	6,18331E-01	5.22958E-02	2.58407E-01	0,0
5 6.64232E+00	0.0	0.0	4.24734E-02	5,10770E+00	1,49215E+00	0.0	5.09365E-01	7,19075E-02	2.02345E-01	0.0
6 6,19415E+00	0.0	0.0	7.18077E-02	5,20024E+00	9,22103E-01	0.0	4.34342E-01	7.00720E-02	2.388218-01	0.0
7 5,76300E+00	0.0	0.0	1,29686E-01	5,30459E+00	3,28719E-01	0.0	3.35317E-01	8.40962E-02	2.36821E-01	0.0
8 5.79383E+00	0.0	0.0	1.80325E-01	5,42256E+00	1,90945E-01	0.0	2,23781E-01	1.01258E-01	2.388216-01	0.0
9 6,12899E+00	0.0	0.0	2,687808-01	5.83778E+00	2,24298E-02	0.0	1.27171E-01	1.11533E-01	2.63825E-01	0.0
10 6,86805E+00	0.0	0.0	4.14176E-01	6,45388E+00	0.0	0.0	6,25050E-02	1,310468-01	2.65782E-01	0.0
11 8,06499E+00	0.0	0.0	6.312572-01	7.43373E+00	0.0	0.0	2.95995E-02	1.58845E-01	2.63739E-01	0.0
12 9,90900L+00	0.0	0.0	9.67597E-01	8,94140E+0G	0.0	0.0	1,48648E-02	1,96533E-01	2.63825E-01	0.0
13 1,27044F+01	0.0	0.0	1.577482+00	1.11270E+01	0.0	0.0	5.99138F-03	2.46951F-01	2.65782F-01	0.0
14 1,68573E+01	0.0	0.0	2.75020E+00	1,41071E+01	0.0	0.0	5.13314E-03	3.17019E-01	2.63739E-01	0.0
15 1.58956E+01	0.0	0.0	3.56718E+00	1.23284E+01	0.0	0.0	5-13314E-03	2.07050E=01	2.63825E-01	0.0
16 2.87095E+01	0.0	0.0	5.353118+00	2.33564E+01	0.0	0.0	5.13314E-03	1.312008-01	2.65782E-01	0.0
17 1.393765+02	0.0	0.0	2.97538E+01	1.09622E+02	0.0	0.0	5.13314F+03	2.54283F-02	2.63739F-01	0.0
18 1.11654E+01	0.0	0.0	7.01027E+00	4.15509E+00	0.0	0.0	5.133146-03	2.25973E-01	2.63825E=01	0.0
19 3.327546+01	0.0	0.0	1.78163E+01	1.54591E+01	0.0	0.0	5.13314E-03	7.59669E-01	2.65782F-01	0.0
20 3.48192F+03	0.0	0.0	1.049611+03	2.432316+03	0.0	0.0	5.13314E-03	1,13635F+00	2.63739E-01	0.0
21 3.75529E+01	0.0	0.0	1.83680E+01	1.91849E+01	0.0	0.0	5.13314E-03	1.62052E-01	2.63825E-01	0.0
22 1.77166F+01	0.0	0.0	1.187256+01	5.84405E+00	0.0	0.0	5.13314F-03	9.10210F-02	2.65782F-01	0.0
23 1.77797E+01	0.0	0.0	1.373772+01	4.04143E+00	0.0	0.0	5.13314F-03	7.374436-02	2.63739E-01	0.0
24 2.18438F+01	0.0	0.0	1.83503F+01	3.49351E+00	0.0	0.0	5.13314F-03	6.71690F-02	2.63825E-01	0.0
25 2,91517E+01	0,0	0,0	2,58735£+01	3.27817E+00	0.0	0,0	1,15699E-02	6.39497E-02	2.65782E-01	0.0

NUCLID = 54XE131 MAT NO = 5431 INFINITE DILUTION CROSS SECTION

# NUCLID = 55CS135 MAT NO = 5535 INFINITE DILUTION CROSS SECTION

								PAGE 1 OF	1	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4.44218E+00	0.0	0.0	6.13222E-04	2.32714E+00	2.11442E+00	0.0	7.19072E-01	5.20607E-02	1,69804E-02	0.0
2 4-57680F+00	0.0	0.0	2.72218E-03	2,41396E+00	2.16011E+00	0.0	6,76401E-01	4,17056E+02	8.92878E=02	0.0
3 5.54085F+00	0.0	0.0	7.08011E-03	3.34228E+00.	2,19149E+00	0.0	6,95763E-01	4,48431E-02	1,79938E-01	0.0
4 6.54467E+00	0.0	0.0	2.27156E-02	4,69131E+00	1,83064E+00	0.0	6.01121E-01	6.18111E-02	2,58407E-01	0.0
5 6.68433E+00	0.0	0.0	5.05557E-02	5.64729E+00	9,86480E-01	0.0	4,48543E-01	8,65045E-02	2.02345E-01	0.0
6 6.03191E+00	0.0	0.0	6,72985E-02	5.56048E+00	4,04138E-01	0,0	3,73028E-01	7.58186E-02	2.38821E-01	0,0
7 5.53374E+00	0.0	0.0	8,66192E-02	5.34396E+00	1,03158E-01	0.0	3,006598-01	8.66294E-02	2,38821E-01	0.0
8 5+65502E+00	0.0	0.0	1.20489E-01	5,53453E+00	0.0	0.0	1,985716-01	1,031246-01	2,38821E-01	0.0
9 6.19584E+00	0.0	0.0	1,71149E-01	6.02469E+00	0,0	0.0	1,12562E-01	1,15528E-01	2,63825E=01	0,0
10 7.27339E+00	0.0	0.0	2,68872E-01	7,00452E+00	0.0	0.0	5.35314E-02	1.42687E-01	2,65782E-01	0.0
11 8,94636E+00	0.0	0.0	4.27425E-01	8,51893E+00	0.0	0,0	2.47491E-02	1,81647E-01	2.63739E-01	0.0
12 1.14556E+01	0.0	0.0	6.775728-01	1,07780E+01	0,0	0.0	1.13700E-02	2.36623E-01	2.63825E-01	0,0
13 1.52041E+01	0.0	0.0	1,12957E+00	1,40745E+01	0.0	0,0	4.98107E-03	3,09996E-01	2,65782E=01	0.0
14 2.07318E+01	0,0	0,0	2,01990E+00	1.87119E+01	0.0	0.0	4,98107E-03	4.17269E-01	2.63739E-01	0.0
15 2.88470E+01	0.0	0.0	3.77238E+00	2,50746E+01	0,0	0,0	4,98107E-03	5.60003E-01	2.63825E=01	0.0
16 4.08230E+01	0.0	0.0	7,14606E+00	3,36769E+01	0,0	0.0	4,98107E-03	7,46335E-01	2.65782E-01	0.0
17 5,84123E+01	0.0	0,0	1,34293E+01	4,49830E+01	0.0	0.0	4,98107E-03	9,99513E-01	2,63739E-01	0.0
18 8,408568+01	0,0	0.0	2,47597E+01	5,93259E+01	0.0	0.0	4,98107E-03	1.30880E+00	2.63825E-01	0.0
19 6,51181E+01	0.0	0.0	2,23212E+01	4,27969E+01	0.0	0.0	4,98107E-03	6.54978E-02	2.65782E-01	0,0
20 3,76153E+00	0.0	0,0	3,63526E-01	3.39800E+00	0,0	0.0	4,98107E-03	6.60054E-02	2.63739E-01	0.0
21 3,93108E+00	0.0	0.0	5,33075E-01	3.39800E+00	0.0	0.0	4,98107E-03	6,59838E-02	2,63825E-01	0,0
22 4,18093E+00	0,0	0.0	7,82929E-01	3.39800E+00	0.0	0.0	4,98107E-03	6,54978E-02	2.65782E-01	0.0
23 4.54761E+00	0.0	0.0	1.14961E+00	3.39800E+00	0,0	0.0	4,98107E-03	6,60063E-02	2.63739E-01	0,0
24 5.08378E+00	0.0	0.0	1,68578E+00	3.39800E+00	0,0	0.0	4,98107E-03	6.59849E-02	2.63825E-01	0.0
25 5,87391E+00	0.0	0.0	2,47591E+00	3.39800E+00	0.0	0.0	1,13423E-02	6.54988E-02	2,65782E-01	0.0
		NUCLID =	55CS135	MAT NUMBER	5535	IPL =	0			
			TABLE OF INE	LA+(N+2N) MA	TRICES		PAGE	1 OF 1		

										PAGE 1	OF 1	
1	J=	1	GROUP	** KK ** 2	3	+ J = 1 4	5	6	7	в	9	10
		11		12								

2.58846E-03 7.80807E-02 2.93812E-01 6.24931E-01 5.48317E-01 3.72574E-01 1.37007E-01 4.16272E-02 1.20151E-02 2.74451E-03 5.99113E-04 1.26855E-04 2 1.81701E-02 1.76926E-01 5.55725E-01 6.24581E-01 4.95515E-01 2.00605E-01 6.40347E-02 1.89588E-02 4.38835E-03 9.63908E-04 2.11495E-04 3.34788E-05

5,92003E-02 3,82912E-01 6,70657E-01 6,44890E-01 2,94200E-01 9,98899E-02 3,05332E-02 7,18605E-03 1,59076E-03 3,50293E-04 7,66039E-05 4,87012E-06

2,21080E-01 5,23706E-01 4,80092E-01 3,98564E-01 1,46046E-0 4,66827E-02 1,12468E-02 2,51711E-03 5,57096E-04 1,22117E-04 2,40700E-05 0.0

5 2,41391E-01 4,99974E-01 1,53173E-01 4,11130E-02 1,49615E-02 2,10097E-02 1,17898E-02 2,41177E-03 5,29793E-04 1,13822E-04 1,31900E-05 0,0

6

9,37459E-02 1,98409E-01 8.25439E-02 1,46768E-02 3,40747E-03 6,04222E-03 4,15405E-03 9,13679E-04 1,99170E-04 4,53344E-05 7,83581E-07 0,0 7

0,0 0,0

GROU

1234567890112345678901222222

GROUP I

1

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## NUCLID = 55CS137 MAT NO = 5537 INFINITE DILUTION CROSS SECTION

3.99306E-02 4.15128E-02 1.17280E-02 5.40215E-03 2.49956E-03 1.16228E-03 5.55429E-04 2.42793E-04 1.24889E-04 0.0

#### PAGE 1 OF 1

10

4,45305E+00	1130101			FI # 3 1 1 1		N 2 N			FI 114	C.H.I
41493092400		A A .	2 059005-04	2 332025404	2 120825+00	0.0	7 177195-01	5 18954E=02	1 498045-02	0.0
	0.0	0.0	7 252505-04	2 496456400	2 122055400	0.0	6 485385-01	A 631546-02	8.9287#5=02	0.0
***********	0.0	0.0	7,202002-04	1 70 701 0 00	1 404605.00	0,0	6 414045-01	4 958000-02	1 700305-01	8 <b>.</b> 8
5,61635E+00	0.0	0.0	2,76512E=05	5.727012+00	1.880362+00	0.0	0,41020E-01	7 71 2020 -02	1,199300-01	2.0
5,59010E+00 (	0,0	0.0	8,98570E-03	5.59794E+00	9,83178E-01	0.0	5,133378-01	7.71322E-02	2,58407E=01	0.0
6,72417E+00 (	0.0	0,0	7.34012E-03	6.18801E+00	5,28820E-01	0.0	4.05066E-01	9.68997E-02	2.023458-01	0.0
5,98153E+00 (	0,0	0.0	5,08742£~03	5,81480E+00	1,60642E-01	0.0	3,42259E-01	8.17493E-02	2.38821E-01	0.0
5.49144E+00 /	0.0	0,0	6,56305E-03	5,48487E+00	0.0	0.0	2,78719E-01	8,77820E-02	2,38821E+01	0.0
5.64694E+00 #	0.0	0.0	8,78096E-03	5,63816E+00	0.0	0,0	1,85947E-01	1.05932E-01	2,38821E-01	0.0
6.30613E+00 /	0.0	0.0	1.34424E-02	6,29269E+00	0.0	0.0	1,03419E-01	1.21619E-01	2,63825E-01	0.0
7.57687E+00	0.0	0.0	2.17243F-02	7.55514F+00	0.0	0.0	4.81882F-02	1.54626E-01	2.65782E-01	0.0
9.52105E+00	0.0	0.0	3.66484E=02	9.48440E+00	0.0	0.0	2.20538E-02	2.02436E-01	2.63739E-01	0.0
24108F+01	0.0	0.0	6.456145-02	1.23463F+01	0.0	0.0	1.03119E-02	2.70538E-01	2.63825E-01	0.0
1.671395+01	0.0	0.0	1.11841E=01	1.66020E+01	0.0	0.0	4.908355-03	3.65726E-01	2.65782E-01	0.0
2 304405+01 (			1 981105-01	2 285585+01	0.0	0.0	A 90835E=03	5.116086-01	2.63739E=01	0.0
2 40610C+01		0.0	2 346645-01	2 4203302701	0.0	0.0	A 90835E-03	A 133206-02	2.439255=01	0.0
21473102701	0.0	0.0	2,343302-01	21411846401	0.0	V.V	4,900392-03	6 000000 00	21050250-01	
3'502AAF+00	0.0	0.0	9,90133E=04	3.2020000+00	0.0	0.0	4,908356-03	6.080046-02	2,627820-01	ו•
3.20645E+00	0.0	0,0	1.45383E=05	3,20500E+00	0.0	0.0	4,908355-03	6.135216-02	5.03134E-01	0.0
3,20713E+00	0,0	0.0	2.13188E-03	3.20500E+00	0.0	0.0	4,90835E-03	6.13320E-02	2.63825E-01	0.0
3,20813E+00 (	0.0	0,0	3,13106E-03	3,20500E+00	0.0	0.0	4,90835E=03	6,08804E-02	2,65782E-01	0,0
3,20960E+00 /	0.0	0,0	4.59740E-03	3,20500E+00	0,0	0.0	4,90835E-03	6.13521E-02	2.63739E-01	0,0
3,21174E+00 /	0.0	0.0	6,74155E-03	3,20500E+00	0.0	0.0	4,90835E-03	6.13320E-02	2+63825E=01	0.0
3,21490E+00 #	0.0	0.0	9,90123E-03	3,20500E+00	0,0	0.0	4,90835E-03	6.08804E-02	2,65782E-01	0.0
3.21954F+00 (	0.0	0.0	1.45382E-02	3.20500E+00	0.0	0.0	4.90835E-03	6.13511E-02	2.63739E-01	0,0
3.22632F+00	0.0	0.0	2.13186E-02	3.20500E+00	0.0	0.0	4.90835E-03	6.13311E-02	2.63825E-01	0.0
3.23631F+00	0.0	0.0	3.13103E-02	3.20500E+00	0.0	0.0	1.11776E-02	6.08793E-02	2.65782E-01	0.0

55CS137 MAT NUMBER [ PL TABLE OF INELA+(N.2N) MATRICES

5

NUCLID .

KK = I + J - 13
4

EXIT GROUP \*\* KK \*\* J= 1 2 11 12

2,34502E-03 7,17040E-02 2,94333E-01 6,28167E-01 5,52390E-01 3,75859E-01 1,38333E-01 4,20483E-02 1,21394E-02 2,77322E-03 6,03414E-04 1,28198E-04

1,74403E-02 1.39424E-01 5.39163E-01 6.31658E-01 5.01905E-01 2.03387E-01 6.49548E-02 1.92361E-02 4.45314E-03 9.78199E-04 2.14636E-04 3.39552E-05 1,10651E-01 3,61858E-01 3,68146E-01 5,41970E-01 3,41657E-01 1,16058E-01 3,55167E-02 8,36401E-03 1,85205E-03 4.07884E-04 8,92036E-05 6.10962E-06

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2.59127E-01 4.73968E-01 1.61346E-01 2.69039E-02 3.14413E-02 2.14884E-02 5.05899E-03 2.56015E-03 1.01123E-03 2.24490E-04 . 4.78784E-05 0.0 8.20807E-02 2.85433E-01 1.12999E-01 2.61004E-02 1.47926E-02 5.12015E-03 1.71965E-03 4.49458E-04 9.78560E-05 2.35082E-05 3.68344E-06 0.0

0.0 7.74843E-02 4.89092E-02 2.44730E-02 5.88657E-03 2.10654E-03 9.81138E-04 4.58430E-04 2.10565E-04 9.68280E-05 3.49607E-05 0.0

				1	PAGE 1 OF 1
$\begin{array}{rcl} GROUPTOTAL & FISSION \\ I + 50123 \pm 00 & 0, 0 \\ 2 + 824 TLE \pm 00 & 0, 0 \\ 3 - 933 A 6E \pm 00 & 0, 0 \\ 4 & 6, 9503 6E \pm 00 & 0, 0 \\ 5 & 6, 9505 8E \pm 00 & 0, 0 \\ 6 & 5, 9622 TE \pm 00 & 0, 0 \\ 6 & 5, 9622 TE \pm 00 & 0, 0 \\ 7 & 5, 452 2 0E \pm 00 & 0, 0 \\ 7 & 5, 453 5E \pm 00 & 0, 0 \\ 10 & 9, 3613 5E \pm 00 & 0, 0 \\ 11 & 1, 2624 2E \pm 01 & 0, 0 \\ 13 & 2, 4416 4E \pm 01 & 0, 0 \\ 14 & 3, 4713 3E \pm 01 & 0, 0 \\ 15 & 4, 4868 5E \pm 00 & 0, 0 \\ 16 & 2, 66800 E \pm 00 & 0, 0 \\ 17 & 2, 6722 2E \pm 00 & 0, 0 \\ 18 & 2, 6783 6E \pm 00 & 0, 0 \\ 12 & 2, 7007 6E \pm 00 & 0, 0 \\ 22 & 2, 7007 6E \pm 00 & 0, 0 \\ 22 & 2, 74900 E \pm 00 & 0, 0 \\ 23 & 2, 7911 6E \pm 00 & 0, 0 \\ 24 & 2, 8527 9E \pm 00 & 0, 0 \\ 25 & 2, 94362 E \pm 00 & 0, 0 \\ \end{array}$	NU         C           0.0         7.           0.0         1.           0.0         1.           0.0         1.           0.0         1.           0.0         2.           0.0         3.           0.0         3.           0.0         3.           0.0         4.           0.0         3.           0.0         4.           0.0         3.           0.0         4.           0.0         1.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         4.           0.0         1.           0.0         1.           0.0         1.           0.0         2. <td>APTURE ELASTIC 314435_0-04 \$CORT-03 2,34605E+00 \$CORT-03 2,643346E+00 \$CORT-03 2,64346E+00 \$5335E-02 5,04223E+00 04931E-02 5,341642E+00 16495E-02 5,41642E+00 16495E-02 7,11220E+00 46331E-02 9,29640E+00 17495E-02 1,23345E+01 31606E-01 1,72617E+01 0025E-03 2,65900E+00 93784E-02 2,65900E+00 93784E-02 2,65900E+00 00041E-02 2,65900E+00 00041E-02 2,65900E+00 03154E-02 2,65900E+00 034620E-01 2,65900E+00</td> <td>INELA         N2N           2.15495+00         0.0           2.17295+00         0.0           2.17295+00         0.0           1.85092+00         0.0           1.277025+00         0.0           1.277025+00         0.0           0.0         0.0&lt;</td> <td>EL MU <math>T_1 18077E-01</math> 4 6,90372E-01 4 6,96870E-01 4 5,96870E-01 4 7,9882E-01 8 2,2982E-01 8 2,29724E-01 8 1,49846E-01 1 1,47886E-01 1 1,47886E-01 1 1,63724E-02 1 3,51224E-02 1 3,51224E-02 1 3,66974E-03 4 4,66974E-03 4 4,6974E-03 4 4,6974E-</td> <td>EL REMOVAL FLUX CHI \$64287E-02 1,698046-02 0.0 21778E-02 8,92878E-02 0.0 21778E-02 8,92878E-02 0.0 \$65021E-02 1,79936E-01 0.0 95763E-02 2,02345E-01 0.0 14895E-02 2,02345E-01 0.0 14895E-02 2,38821E-01 0.0 12823E-01 2,38821E-01 0.0 12823E-01 2,38821E-01 0.0 12823E-01 2,38821E-01 0.0 859316E-01 2,63782E-01 0.0 67867E-01 2,63782E-01 0.0 41397E-01 2,63782E-01 0.0 41397E-01 2,63739E-01 0.0 840316E-02 2,63739E-01 0.0 840316E-02 2,63739E-01 0.0 840376E-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844326E-02 2,63782E-01 0.0 84436E-02 2,63782E-01 0.0 84436E-02 2,63782E-01 0.0 845426E-02 2,65782E-01 0.0 845426E-02 2,65782E-01 0.0 845426E-02 2,65782E-01</td>	APTURE ELASTIC 314435_0-04 \$CORT-03 2,34605E+00 \$CORT-03 2,643346E+00 \$CORT-03 2,64346E+00 \$5335E-02 5,04223E+00 04931E-02 5,341642E+00 16495E-02 5,41642E+00 16495E-02 7,11220E+00 46331E-02 9,29640E+00 17495E-02 1,23345E+01 31606E-01 1,72617E+01 0025E-03 2,65900E+00 93784E-02 2,65900E+00 93784E-02 2,65900E+00 00041E-02 2,65900E+00 00041E-02 2,65900E+00 03154E-02 2,65900E+00 034620E-01 2,65900E+00	INELA         N2N           2.15495+00         0.0           2.17295+00         0.0           2.17295+00         0.0           1.85092+00         0.0           1.277025+00         0.0           1.277025+00         0.0           0.0         0.0<	EL MU $T_1 18077E-01$ 4 6,90372E-01 4 6,96870E-01 4 5,96870E-01 4 7,9882E-01 8 2,2982E-01 8 2,29724E-01 8 1,49846E-01 1 1,47886E-01 1 1,47886E-01 1 1,63724E-02 1 3,51224E-02 1 3,51224E-02 1 3,66974E-03 4 4,66974E-03 4 4,6974E-03 4 4,6974E-	EL REMOVAL FLUX CHI \$64287E-02 1,698046-02 0.0 21778E-02 8,92878E-02 0.0 21778E-02 8,92878E-02 0.0 \$65021E-02 1,79936E-01 0.0 95763E-02 2,02345E-01 0.0 14895E-02 2,02345E-01 0.0 14895E-02 2,38821E-01 0.0 12823E-01 2,38821E-01 0.0 12823E-01 2,38821E-01 0.0 12823E-01 2,38821E-01 0.0 859316E-01 2,63782E-01 0.0 67867E-01 2,63782E-01 0.0 41397E-01 2,63782E-01 0.0 41397E-01 2,63739E-01 0.0 840316E-02 2,63739E-01 0.0 840316E-02 2,63739E-01 0.0 840376E-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 8443746-02 2,63739E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844376E-02 2,63782E-01 0.0 844326E-02 2,63782E-01 0.0 84436E-02 2,63782E-01 0.0 84436E-02 2,63782E-01 0.0 845426E-02 2,65782E-01 0.0 845426E-02 2,65782E-01 0.0 845426E-02 2,65782E-01
	NUCLID = 580	E144 MAT NUMBER	= 5844 I	PL = 0	
GROUP EXIT GROUP		+ J = 1	ATRICES	PAGE	1 OF 1
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1 1.897516-03 4.44154	E-02 2.18670E-01	5.876488-01 6,012968-	01 4.494856-01 1.	75341E-01 5,49092E-02	1.60971E-02 3.70680E-03
2 2 2.456605=02 1.47416	E-04	6.268655-01 5.591795-	01 2.434465-01 8.	06774E=02 2.43529E=02	5.694076-03 1.256636-03
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1.36370E-01 4.59081 8.30729E-05 4.93795	E-01 5,28239E-01 E-06	5.84913E-01 2.91250E-	01 1.03494E-01 3.	23906E-02 7.71777E-03	1.71836E-03 3.79402E-04
4.27874E-01 7.27642	E-01 3,62534E-01	2.07193E-01 8.07827E-	02 2,65379E-02 6.	48575E-03 1.46135E-03	3,24439E-04 7,12210E-05
5 3.20303E-01 8.45417	E-01 5,67795E-02	3.60229E-02 1.18873E-	02 5.11737E-03 1.	16704E-03 2.59325E-04	5.75273E-05 1.25239E-05
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		11.CLD - 60			
	1	INFINITE DILUTION CR	ND143 MAT N OSS SECTION	iO = 6043	
	1	INFINITE DILUTION CR	ND143 MAT N OSS SECTION	iO = 6043	PAGE 1 OF 1
GROUPTOTAL FISSION 1 4,49269E+00 0.0 2 4,79883E+00 0.0 3 5,89029E+00 0.0 4 6,88028E+00 0.0 5 6,88036E+00 0.0 5 6,88936E+00 0.0 7 5,42787E+00 0.0 1 1,21746E+01 0.0 1 1,21746E+01 0.0 1 1,21746E+01 0.0 1 3,72832E+01 0.0 1 3,72832E+01 0.0 1 3,72832E+01 0.0 1 3,74083E+01 0.0 1 3,74083E+01 0.0 1 3,74083E+01 0.0 2 1,93563E+00 0.0 2 5,12324E+00 0.0 2 5,1234E+01 0.0 2 5,14555E+01 0.0 2 5,1454E+02 0.0	NU C 0,0 2; 0,0 2; 0,0 3; 0,0 1; 0,0 1; 0,0 1; 0,0 1; 0,0 2; 0,0 2; 0,0 3; 0,0 4; 0,0 4; 0,0 4; 0,0 4; 0,0 5; 0,0 4; 0,0 5; 0,0 5; 0,0,	NUCLIO = GO INFINITE DILUTION CR CAPTURE ELASTIC 02280E-04 2.34119E+00 38344E-03 2.61656E+00 2.137TE-01 3.73773E+00 38484E-03 2.82492E+00 2.137TE-01 3.73773E+00 38485E-03 3.82492E+00 38485E-03 3.82492E+00 38485E-01 8.85418E+00 38485E-01 8.85418E+00 38485E-01 8.85418E+00 38485E-01 8.85418E+00 38485E-01 1.85535E+01 .23962E+00 3.50438E+01 .23952E+00 3.0438E+01 .22052E+01 3.23778E+02 .51026E+01 1.2305TE+01 .2305E+01 3.43778E+02 .51026E+01 1.2305TE+01 .23052E+00 3.0091E+00 .65575E+00 3.0093E+00 .23772E+01 2.48403E+01 .49096E+01 2.96364E+01	ND143 MAT N OSS SECTION INELA N2N 2.15129E+00 0.0 2.1799E+00 0.0 2.1799E+00 0.0 1.02936E+01 0.0 3.19621E-03 0.0 0.0 0.0	00 =         6043           6         EL         MU           7.17877E-01 4         6.90372E-01 4           6.90372E-01 4         6.82408E-01 6           5.25392E-01 8         3.69376E-01 1           2.92933E-01 8         2.83370E-01 8           2.38370E-01 8         2.2220E-02 1           3.70766E-02 1         1.69887E-02 2           6.87297E-03 3         4.70239E-03 3           4.70239E-03 3         4.70239E-03 2           4.70239E-03 2         4.70239E-03 2           4.70239E-03 3         4.70239E-03 3           4.70239E-03 3         4.70239E-03 2           4.70239E-03 2         4.70239E-03 2           4.70239E-03 2         4.70239E-03 2           4.70239E-03 2         4.70239E-03 2           4.70239E-03 2         4.70239E-03 2	PAGE 1 0F 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.6980AE-02 0.0 ,195A8E-02 1.79938E-01 0.0 ,03314E-01 2.02395F-01 0.0 ,03314E-01 2.02395F-01 0.0 ,05347E-01 2.038821E-01 0.0 ,05371E-01 2.038821E-01 0.0 ,05371E-01 2.038821E-01 0.0 ,05371E-01 2.03825E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,263782E-01 2.63782E-01 0.0 ,37531E-01 2.63782E-01 0.0 ,37531E-01 2.63782E-01 0.0 ,3574E-02 2.63739E-01 0.0 ,2638E-02 2.63739E-01 0.0 ,22698E-02 2.63739E-01 0.0 ,2368E-01 2.63782E-01 0.0 ,2368E-01 2.63782E-01 0.0 ,2368E-01 2.63782E-01 0.0 ,2368E-01 2.63782E-01 0.0 ,2368E-01 2.63782E-01 0.0 ,2368E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0
GROUPTOTAL FISSION 1 4,492695:00 0.0 2 4,79835:00 0.0 3 5,85025:00 0.0 4 6,86028:00 0.0 5 6,86028:00 0.0 5 4,84776:00 0.0 6 5,49776:00 0.0 7 5,44770:00 0.0 10 9,08751:00 0.0 11,96135:01 0.0 12 1.469135:01 0.0 13 3,46010:02 0.0 14 3,7234:01 0.0 15 2,11399:00 0.0 14 3,7234:01 0.0 15 3,46010:02 0.0 17 3,6610:02 0.0 17 3,6610:0:02 0.0 17 3,6635:01 0.0 2 1.9353:00 0.0 2 3,6455:01 0.0 2 3.04855:01 0.0 2 4 7.8667:01 0.0 2 3.04855:01 0.0 2 3.14546:02 0.0 3 5.14546:02 0.0 3 5	NU 2 0,0 2 0,0 3 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 3 0,0	NUCLIO = 60 NFINITE DILUTION CR CAPTURE ELASTIC .023802-04 2.34119E+00 .38344E-03 2.61656E+00 .2137TE-01 3.73775E+00 .97950E-02 3.82492E+00 .97950E-02 3.82492E+00 .97950E-02 3.82492E+00 .97950E-02 3.82492E+00 .97950E-03 8.8349E+00 .97950E-03 8.8349E+00 .97950E-03 8.8349E+00 .97952E+00 1.8042E+01 .97949E-01 1.2037E+01 .97349E+00 1.2137E+02 .3209E+01 2.45257E+00 .92032E+00 1.43102E+01 .92032E+00 1.43102E+01 .92032E+00 1.43102E+01 .92032E+01 2.64903E+01 .92032E+01 2.64903E+01 .92032E+01 2.64903E+01 .92032E+01 2.64903E+01 .92032E+01 2.96364E+01	ND143 MAT N OSS SECTION INELA N2N 2.151295+00 0.0 2.171995+00 0.0 2.127995+00 0.0 1.0293640 0.0 1.02175+00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	IO =         6043           FL MU         7.1787FE-01 4           6,90372E-01 4         6.82408E-01 6           5,25592E-01 8         3.69376E-01 1           2,92938E-01 6         2.38370E-01 8           1,54409E-01 1         3.70766E-02 1           3,70766E-02 1         3.70766E-02 1           1,64887E-02 2         6.87297E-03 3           4,70239E-03 4         4.70239E-03 4           4,70239E-03 4         4.70239E-03 2           4,70239E-03 2         4.70239E-03 2           4,70239E-03 3         4.70239E-03 3           4,70239E-03 2         4.70239E-03 2           1,09173E-02 5         1.09173E-02 5	PAGE 1 0F 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.7993BE-01 0.0 ,195AE-02 1.7993BE-01 0.0 ,03314E-01 2.02345E-01 0.0 ,0534E-02 2.38821E-01 0.0 ,055AE-02 2.38821E-01 0.0 ,055AE-02 2.38821E-01 0.0 ,057AE-01 2.63782E-01 0.0 ,3714E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,260782E-01 2.63782E-01 0.0 ,260782E-01 2.63782E-01 0.0 ,3714E-02 2.63782E-01 0.0 ,3714E-02 2.63782E-01 0.0 ,3714E-02 2.63782E-01 0.0 ,3714E-02 2.63782E-01 0.0 ,3714E-02 2.63782E-01 0.0 ,374641E-02 2.63782E-01 0.0 ,37478F-01 2.63782E-01 0.0 ,37478F-01 2.63782E-01 0.0 ,37478F-01 2.63782E-01 0.0 ,37478F-01 2.63782E-01 0.0 ,37478F-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0
GROUPTOTAL F15510N 1 4,492695400 0,0 2 4,789835+00 0,0 4 6,860365+00 0,0 4 6,860365+00 0,0 7 5,427875+00 0,0 7 5,427875+00 0,0 9 7,013795+00 0,0 11 1,217465+01 0,0 12 1,660135+01 0,0 13 1,962325+01 0,0 14 3,72335+01 0,0 15 2,113995+02 0,0 17 3,660105+02 0,0 17 3,660105+02 0,0 17 3,660105+02 0,0 12 1,317345+01 0,0 23 5,048595+01 0,0 21 1,317345+01 0,0 22 1,346575+01 0,0 23 5,048595+01 0,0 24 7,866755+01 0,0 25 1,145465+02 0,0 600000 600000000000000000000000000000	NU ( 0,0 2 0,0 2 0,0 3 0,0 1 0,0 1 0,0 4 0,0 5 0,0	NUCLIO = 60 NFINITE DILUTION CR CAPTURE ELASTIC .023802-04 2.3A119E+00 .38344E-03 .61556E+00 .2137TE-01 .737715E-00 .73936E-02 .535263E+00 .73936E-02 .535263E+00 .73936E-01 .73193E+00 .59648E-01 .63848E2E+00 .75018E-01 .64848E2E+00 .75018E-01 .64848E2E+00 .75018E-01 .64848E2E+00 .75028E+00 .84848E2E+00 .73649E+00 .84848E2E+00 .73649E+00 .12337TE+00 .3239E+01 .2357TE+01 .3239E+00 .12337TE+02 .3239E+01 .2357TE+02 .3239E+01 .2357TE+02 .3239TE+01 .2355TE+02 .3239TE+01 .23557TE+02 .3239TE+01 .2355TE+02 .3239TE+01 .2357TE+02 .3239TE+01 .2357TE+02 .3239TTE+00 .25555TE+00 .3239TTE+00 .25555TE+00 .3239TTE+00 .25555TE+00 .3239TTE+00 .2555TE+00 .3239TTE+00 .25555TE+00 .3237TTE+00 .25555TE+00 .3337TTE+00 .25555TE+00 .3337TTE+00 .25555TE+00 .3337TTE+00 .25555TE+00 .3337TTE+00 .25555TE+00 .3337TTE+00 .25555TE+00 .337TTE+00 .2	ND143 MAT N OSS SECTION INELA N22 2.151292400 0.0 2.174949400 0.0 2.02996400 0.0 1.020178400 0.0 1.026126-01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	<pre>IO = 6043      EL MU     7.17897E-014     6.90372E-014     6.92592E-018     3.69376E-014     3.69376E-014     3.69376E-014     3.69376E-014     3.69376E-014     3.69376E-024     3.70766E-024     3.70766E-024     3.70766E-024     3.70759E-033     4.70239E-033     4.70239E-035     1.09173E-025 PL = 0 PAGE</pre>	PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.79936E-01 0.0 ,19348E-02 1.79936E-01 0.0 ,03314E-01 2.02345E-01 0.0 ,05344E-02 2.38821E-01 0.0 ,05344E-02 2.38821E-01 0.0 ,0534E-01 2.03825E-01 0.0 ,0534E-01 2.03825E-01 0.0 ,0534E-01 2.63782E-01 0.0 ,05378E-01 2.63782E-01 0.0 ,05398E-01 2.63782E-01 0.0 ,05399E-01 2.63782E-01 0.0 ,05398E-01 2.63782E-01 0.0 ,05398E-01 2.63782E-01 0.0 ,03497E-01 2.63782E-01 0.0 ,35468E-01 2.63782E-01 0.0 ,35468E-01 2.63782E-01 0.0 ,35468E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0
GROUPTOTAL         FISSION           1 4,492695400         0.0           2 4,798451+00         0.0           3 5,890295400         0.0           4 6,880285+00         0.0           4 6,880285+00         0.0           5 6,869365+00         0.0           5 7,9925+00         0.0           7 5,427875+00         0.0           9 7,013795+00         0.0           11,1217465+01         0.0           12 1,669152+01         0.0           13 1,962322+01         0.0           14 3,723345+01         0.0           15 2,113995+02         0.0           17 3,660105+02         0.0           19 3,73345+01         0.0           12 1,935245+00         0.0           19 3,7345+01         0.0           2 2,834659±01         0.0           2 1,13734650         0.0           2 1,13734650         0.0           2 1,13734650         0.0           2 1,1354655±01         0.0           2 1,145465±02         0.0	NU CCLID = 600 NUCLID = 600 TABLE 32 NUCLID = 3 NUCLID = 600 TABLE 32 NUCLID = 3 NUCLID = 3	NUCLIO = 60 INFINITE DILUTION CR CAPTURE ELASTIC 02380E-04 2.34119E+00 38344E-03 2.61656E+00 2137TE-01 3.73773E+00 13877E-01 3.73773E+00 13877E-01 3.73773E+00 137776E-01 3.73193E+00 17776E-01 3.73193E+00 17776E-01 3.73193E+00 17776E-01 3.73193E+00 17776E-01 3.63514E+00 38685E-01 4.8482E+00 1.23962E+00 3.5043E+01 12233E+00 3.0091E+00 40366E+01 1.21307TE+01 21772E+01 2.16493TE+01 21772E+01 2.16493TE+01 21772E+01 2.16493TE+01 21772E+01 2.16493TE+01 4096E+01 2.9636E+01 4096E+01 2.9636E+01 4096E+01 4096E+01 4096E+01 4096E+01 4096E+01 4096E+01 4096E+01 4096E+01 4096	ND143 MAT N INELA N2R 2.1512974-00 0.0 2.1579974-00 0.0 2.1799974-00 0.0 1.029614-00 0.0 1.029614-01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	<pre>IO = 6043 I EL MU 7.17897E-014 6.90372E-01 4 6.92408E-01 6.52592E-01 8.54008E-01 8.29293E-01 8.29293E-01 8.29293E-01 8.29293E-01 8.29293E-01 8.29293E-01 9.470239E-03 4.70239E-03 4.7023E-03 4.7025E-02 4.7725-03 4.7725-02 4.7725-02 4.7725-02 4.7725</pre>	PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 8.92878E-02 0.0 ,19274E-02 8.92878E-01 0.0 ,19386E-02 1.7938E-01 0.0 ,03314E-01 2.02395-01 0.0 ,05344E-02 2.38821E-01 0.0 ,05347E-01 2.02395E-01 0.0 ,05371E-01 2.03822E-01 0.0 ,05371E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,37741E-02 2.53782E-01 0.0 ,2608E-02 2.63739E-01 0.0 ,37512E-02 2.63739E-01 0.0 ,37512E-02 2.63739E-01 0.0 ,39531E-01 2.63782E-01 0.0 ,37531E-01 2.63782E-01 0.0 ,37
GROUPTOTAL         FISSION           1         4,49269E+00         0.0           2         4,79883E+00         0.0           3         5,8929E+00         0.0           4         6,88028E+00         0.0           5         6,88036E+00         0.0           5         6,88036E+00         0.0           5         6,84970E+00         0.0           7         5,43776E+00         0.0           1         1,21746E+01         0.0           13         1,96232E+01         0.0           13         1,96232E+01         0.0           14         3,77834E+01         0.0           15         2,11395E+01         0.0           16         1,31096E+02         0.0           17         3,66010E+02         0.0           23         5,04859E+01         0.0           23         5,04859E+01         0.0           23         1,04859E+01         0.0           25         1,14546E+02         0.0           14         11         11           11         11         11	NU 0,0 2,0 0,0 0,0 1,0 1	NUCLIO = 60 INFINITE DILUTION CR CAPTURE ELASTIC 02380E-04 2.34119E+00 38344E-03 2.61656E+00 2.137TE-01 3.73773E+00 38834E-02 3.82492E+00 2.137TE-01 3.73719E+00 38836E-02 3.83299E+00 17776E-01 3.73199E+00 38885E-01 4.84882E+00 38685E-01 4.84882E+00 38685E-01 4.84882E+00 09725E+00 3.50438E+01 23962E+00 3.60438E+01 32309E+01 3.32779E+02 51026E+01 4.2305TE+01 23052E+00 3.0043E+01 12233E+00 3.0049E+01 21772E+01 2.464903E+01 21772E+01 2.464903E+01 49096E+01 2.9634E+01 HD143 MAT NUMBER LE OF INELA+(N.2N) M + J - 1 4 5	ND143 MAT N OSS SECTION INELA N2R 2.15129E+00 0.0 2.17999E+00 0.0 2.02996E+00 0.0 1.0217E+00 0.0 1.0217E+00 0.0 1.0247E-01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 = 6043 4 EL MU 7.17897E-014 6.90372E-014 6.90372E-016 5.2592E-018 3.69376E-011 2.92933E-018 4.54409E-011 3.70766E-021 1.69887E-022 6.87297E-033 4.70239E-033 4.70239E-033 4.70239E-033 4.70239E-033 4.70239E-033 4.70239E-033 4.70239E-032 4.70239E-032 4.70239E-033 4.70239E-032 4.70239E-032 4.70239E-032 4.70239E-032 4.70239E-032 4.70239E-032 4.70239E-032 4.70239E-032 5.109173E-02 5.109173E-022	PAGE 1 0F 1 EL REMOVAL FLUX CH1 ,771,7E-02 1.698064-02 0.0 ,19274E-02 1.698064-02 0.0 ,19536E-02 1.79936E-01 0.0 ,10314E-01 2.238621E-01 0.0 ,03314E-01 2.02395E-01 0.0 ,05544E-02 2.38821E-01 0.0 ,0554E-02 2.38821E-01 0.0 ,0554E-01 2.63782E-01 0.0 ,0554E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26080E-01 2.63782E-01 0.0 ,27531E-01 2.63782E-01 0.0 ,26378E-02 2.63739E-01 0.0 ,25458E-02 2.63739E-01 0.0 ,25458E-02 2.63739E-01 0.0 ,25458E-01 2.65782E-01 0.0 ,25458E-01 2.65782E-01 0.0 ,25458E-01 2.65782E-01 0.0 ,25458E-01 2.65782E-01 0.0 ,25458E-01 2.65782E-01 0.0 ,25799E-01 2.65782E-01 0.0 ,57996E-01 2.65782E-01 0.0
GROUPTOTAL FISSION 1 4.49269E+00 0.0 2 4.79883E+00 0.0 3 5.89029E+00 0.0 4 6.88028E+00 0.0 5 6.88036E+00 0.0 5 6.88736E+00 0.0 7 5.4273FE+00 0.0 10 9.08751E+00 0.0 11 1.21746E+01 0.0 12 1.66913E+01 0.0 13 1.96232E+01 0.0 13 1.96232E+01 0.0 14 3.7283E+01 0.0 15 2.11395E+01 0.0 15 2.11395E+01 0.0 16 1.31096E+02 0.0 17 3.66010E+02 0.0 18 3.74083E+01 0.0 21 1.3134E+01 0.0 22 2.838659E+01 0.0 23 5.08559E+01 0.0 23 5.08559E+01 0.0 24 7.86675E+01 0.0 25 1.14346E+02 0.0 GROUP EXIT GROUP 4 1 J= 1 1.77231E=04 2.56477 9.41434E=04 1.99883 2 1.26292E=03 4.6004	NU ( 0,0 2; 0,0 3; 0,0 1; 0,0 1; 0,0 1; 0,0 1; 0,0 2; 0,0 1; 0,0 2; 0,0 3; 0,0 0; 0,0 0;	NUCLIO = 60 INFINITE DILUTION CR CAPTURE ELASTIC 02380E-04 2.34119E+00 38344E-03 2.61656E+00 2.137TE-01 3.73773E+00 38042E-03 2.82492E+00 13776E-01 3.73193E+00 13776E-01 3.73193E+00 13776E-01 3.73193E+00 13776E-01 3.73193E+00 13776E-01 3.73193E+00 13776E-01 3.73193E+00 36885E-01 8.84882E+00 13776E+01 3.73193E+00 09725E+00 3.50438E+01 1.23062E+01 3.23778E+02 51026E+01 1.23057E+01 2.23072E+01 3.32778E+02 51026E+01 1.23057E+01 2.23072E+01 3.23057E+01 2.23072E+01 2.12337E+00 2.21722+01 2.64903E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 2.21722+01 2.464905E+01 4.9096E+01 2.9654E+01 MD143 MAT NUMBER .E OF INELA+(N.2M) M + J = 1 4 5 5.54744E-01 6.18469E-	ND143 MAT N OSS SECTION INELA N2N 2.151296+00 0.0 2.179996+00 0.0 2.02996400 0.0 1.020176+00 0.0 1.020176+00 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.	00 = 6043 4 EL MU 7.17877E-01 4 6.90372E-01 4 6.92408E-01 6 5.25592E-01 8 3.69376E-01 1 2.92933E-01 8 2.38370E-01 8 2.38370E-01 8 3.70766E-02 1 3.70766E-02 1 4.70239E-03 3 4.70239E-03 2 4.70239E-03 2 4	PAGE 1 0F 1 EL REMOVAL FLUX CH1 .97717E-02 1.6980AE-02 0.0 .19274E-02 1.9987E-01 0.0 .195A8E-02 1.79938E-01 0.0 .03314E-01 2.02395F-01 0.0 .03314E-02 2.38821E-01 0.0 .05347E-01 2.038821E-01 0.0 .05347E-01 2.38821E-01 0.0 .0537E-01 2.63782E-01 0.0 .47949E-01 2.63782E-01 0.0 .47949E-01 2.63782E-01 0.0 .47949E-01 2.63782E-01 0.0 .48639E-01 2.63782E-01 0.0 .48595E-01 2.63782E-01 0.0 .47531E-02 2.63782E-01 0.0 .47531E-02 2.63782E-01 0.0 .45595E-01 2.63782E-01 0.0 .45595E-01 2.63782E-01 0.0 .45595E-01 2.63782E-01 0.0 .45595E-01 2.63782E-01 0.0 .43947E-01 2.63782E-01 0.0 .43947E-01 2.63782E-01 0.0 .43947E-01 2.63782E-01 0.0 .43947E-01 2.63782E-01 0.0 .43947E-01 2.63782E-01 0.0 .57996E-01 2.63782E-01 0.
GROUPTOTAL         FISSION           1         4.49269E+00         0.0           2         4.79883E+00         0.0           3         5.89129E+00         0.0           4         6.86028E+00         0.0           5         6.8936E+00         0.0           5         6.8936E+00         0.0           5         6.89736E+00         0.0           5         6.84970E+00         0.0           7         7.4274E+00         0.0           11         1.21746E+01         0.0           12         1.31936E+00         0.0           13         7.40334E+01         0.0           14         3.17465E+01         0.0           15         2.11392E+00         0.0           16         3.1395E+00         0.0           16         3.1395E+01         0.0           20         1.1324E+00         0.0           21         0.3365E+01         0.0           22         0.8495E+01         0.0           23         0.495E+01         0.0           24         7.86675E+01         0.0           25         1.1434E+02         0.0           21	NU ( 0,0 2: 0,0 3: 0,0 1: 0,0 1: 0,0 1: 0,0 1: 0,0 2: 0,0 2: 0,0 2: 0,0 2: 0,0 2: 0,0 3: 0,0 4: 0,0 4: 0,0 4: 0,0 5: 0,0 4: 0,0 5: 0,0 5: 0,0 4: 0,0 5: 0,0 5:	NUCLIO = & 00 INFINITE DILUTION CR CAPTURE ELASTIC 02280E-04 2.34119E+00 38344E-03 2.61656E+00 2.137TE-01 3.73773E+00 38384E-03 2.61656E+00 137TE-01 3.73773E+00 137TE-01 3.73193E+00 137TE-01 3.73193E+00 137TE-01 3.73193E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8848E+00 38885E-01 4.8482E+00 12335E+00 3.0043E+00 12335E+00 3.0043E+00 12235E+00 3.0043E+00 12235E+00 3.0043E+00 20022E+01 2.94805E+01 2.97028E+01 2.94805E+01 2.97028E+01 2.94805E+01 2.97058E+01 2.94805E+01 2.97058E+01 2.94805E+01 4.959881E-01 6.29683E=	ND143 MAT N OSS SECTION INELA N2N 2.151295:400 0.0 2.171995:400 0.0 2.171995:400 0.0 1.02936:400 0.0 1.02936:400 0.0 1.02171:400 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	00 = 6043         4         7,17877E-01 4         6,90372E-01 4         6,82408E-01 6         5,2592E-01 8         3,69376E-01 1         2,9293E-01 8         2,38370E-01 8         2,38370E-01 8         2,70756E-02 1         3,70766E-02 1         3,70766E-02 1         4,70239E-03 3         4,70239E-03 3         4,70239E-03 2         4,70239E-03 2         4,70239E-03 2         4,70239E-03 3         4,70239E-03 2         4,70239E-03 2         4,70239E-03 3         4,70239E-03 2         4,70239E-03 2         4,70239E-03 3         4,70239E-03 2         4,70239E-03 2         4,70239E-03 2         4,70239E-03 2         9,0713E-02 5         1,09173E-02 5         PL = 0         PAGE         7       8         96721E-01 6,26639E-02         .67964E-02 2,95470E-02	PAGE 1 0F 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.7993BE-01 0.0 ,195A8E-02 1.7993BE-01 0.0 ,103314E-01 2.02345E-01 0.0 ,03314E-02 2.38821E-01 0.0 ,0534E-02 2.38821E-01 0.0 ,0537E-01 2.63782E-01 0.0 ,075A7E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26060E-01 2.63782E-01 0.0 ,26080E-02 2.63739E-01 0.0 ,26080E-02 2.63739E-01 0.0 ,2638E-01 2.63782E-01 0.0 ,2638E-01 2.63782E-01 0.0 ,37374E-01 2.63782E-01 0.0 ,35374E-01 2.63782E-01 0.0 ,37374E-01 2.63782E-01 0.0 ,2638E-01 2.63782E-01 0.0 ,2638E-01 2.63782E-01 0.0 ,27996E-01 2.63782E-01 0.0 ,37976E-01 2.63782E-01 0.0 ,37976E-01 2.63782E-01 0.0 ,37976E-01 2.63782E-01 0.0 ,37976E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0 ,107 1 9 10 1 0F 1 9 10
GROUPTOTAL         FISSION           1         4,492695:00 0.0           2         4,798835:00 0.0           3         7,8935:00 0.0           4         6,86028:00 0.0           5         6,8028:00 0.0           6         6,86028:00 0.0           5         6,80736:00 0.0           6         6,80736:00 0.0           7         5,44706:00 0.0           7         7,44706:00 0.0           10         9,03751:00 0.0           11         1,9632:00 0.0           12         1,4613:00 0.0           13         1,9632:00 0.0           14         3,7234:00 0.0           15         2,113978:00 0.0           16         1,3106:02 0.0           13         1,9632:24:00 0.0           20         5,1234:00 0.0           21         1,9353:10 0.0           22         2,8545:01 0.0           23         5,04857:01 0.0           24         7,8667:02 0.0           25         1,14546:02 0.0           21         1           1         12           1         1           1         1           1         1 <td>NU ( 0,0 2 0,0 3 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 2 0,0 3 0,0 4 0,0 4 0,0</td> <td>NUCLIO = 60 INFINITE DILUTION CR CAPTURE ELASTIC 023802-04 2.34119E+00 38344E-03 2.61656E+00 2137TE-01 3.73775E+00 38384E-03 2.61656E+00 13776-01 3.73775E+00 38884E-03 4.83418E+00 38884E-03 4.83418E+00 38884E-03 4.83418E+00 38884E-03 4.83418E+00 38885E-01 1.80426+00 107786E+01 1.2357E+00 73849E+00 1.80426+01 039428-01 1.80426+01 039428-01 1.2357E+00 73849E+00 1.2357E+00 73849E+00 1.2357E+00 32309E+01 2.4357E+00 1.43102E+01 2.4363E+01 49096E+01 2.96364E+01 49096E+01 2.96364E+01 49096E+01 2.96364E+01 49096E+01 6.438459E- 5.54744E-01 6.18469E- 5.06165E+01 4.74767E-</td> <td>ND143 MAT N OSS SECTION INELA N2N 2.151295+00 0.0 2.171995+00 0.0 2.171995+00 0.0 1.0293640 0.0 1.0293640 0.0 1.0247861-03 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td> <td>IO = 6043         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII</td> <td>PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.7993BE-01 0.0 ,195AE-02 1.7993BE-01 0.0 ,03314E-01 2.038821E-01 0.0 ,0534E-02 2.38821E-01 0.0 ,05371E-01 2.038821E-01 0.0 ,05371E-01 2.63782E-01 0.0 ,47939E-01 2.63782E-01 0.0 ,4953E-01 2.63782E-01 0.0 ,4957E-01 2.63782E-01 0.0 ,4957E-01 2.63782E-01 0.0 ,4957E-01 2.63782E-01 0.0 ,3957E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0 ,37996E</td>	NU ( 0,0 2 0,0 3 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 2 0,0 3 0,0 4 0,0	NUCLIO = 60 INFINITE DILUTION CR CAPTURE ELASTIC 023802-04 2.34119E+00 38344E-03 2.61656E+00 2137TE-01 3.73775E+00 38384E-03 2.61656E+00 13776-01 3.73775E+00 38884E-03 4.83418E+00 38884E-03 4.83418E+00 38884E-03 4.83418E+00 38884E-03 4.83418E+00 38885E-01 1.80426+00 107786E+01 1.2357E+00 73849E+00 1.80426+01 039428-01 1.80426+01 039428-01 1.2357E+00 73849E+00 1.2357E+00 73849E+00 1.2357E+00 32309E+01 2.4357E+00 1.43102E+01 2.4363E+01 49096E+01 2.96364E+01 49096E+01 2.96364E+01 49096E+01 2.96364E+01 49096E+01 6.438459E- 5.54744E-01 6.18469E- 5.06165E+01 4.74767E-	ND143 MAT N OSS SECTION INELA N2N 2.151295+00 0.0 2.171995+00 0.0 2.171995+00 0.0 1.0293640 0.0 1.0293640 0.0 1.0247861-03 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	IO = 6043         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.7993BE-01 0.0 ,195AE-02 1.7993BE-01 0.0 ,03314E-01 2.038821E-01 0.0 ,0534E-02 2.38821E-01 0.0 ,05371E-01 2.038821E-01 0.0 ,05371E-01 2.63782E-01 0.0 ,47939E-01 2.63782E-01 0.0 ,4953E-01 2.63782E-01 0.0 ,4957E-01 2.63782E-01 0.0 ,4957E-01 2.63782E-01 0.0 ,4957E-01 2.63782E-01 0.0 ,3957E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37796E-01 2.63782E-01 0.0 ,37996E-01 2.63782E-01 0.0 ,37996E
GROUP TOTAL FISSION 1 4,49269500 0.0 2 4,78835+00 0.0 4 5,80025+00 0.0 5 ,80025+00 0.0 5 4,80035+00 0.0 5 4,8035+00 0.0 7 5,42787E+00 0.0 7 5,42787E+00 0.0 9 7,01379E+00 0.0 10 9,08751E+00 0.0 11 1,21746E+01 0.0 12 1,66105+01 0.0 13 1,96232E+01 0.0 13 3,60105+02 0.0 14 3,7234E+01 0.0 15 2,113976E+02 0.0 17 3,66105+02 0.0 17 3,66105+02 0.0 13 3,6035E+01 0.0 22 2,8365E+01 0.0 23 5,04857E+01 0.0 23 5,04857E+01 0.0 24 7,86675E+01 0.0 25 1,14546E+02 0.0 1 J= 1 1 1,77231E=04 2,5647 9,41434E=04 1,99882 2 1,26292E=03 6,80355 3 3,38567E+02 2,30365 1,5587E=02 2,30365 1,5587E=02 2,33560 0,000 2,14457E=05 0,000 4,67781E=02 3,33600 0,0000 2,14457E=05 0,000 1,91224E=00 0,000 2,14457E=00 0,0000 2,14457E=00 0,0000 2,1445	NU ( 0,0 2 0,0 2 0,0 3 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 1 0,0 3 0,0 3 0,0 4 0,0	NUCLIO = 60 INFINITE DILUTION CR CAPTURE ELASTIC 023802-04 2.3A119E+00 38344E-03 2.61656E+00 2137TE-01 3.73775E+00 2137TE-01 3.73775E+00 139778-02 3.82492E+00 2137TE-01 3.73795E+00 139778-02 3.82492E+00 139784E-01 6.3533E+01 139784E-01 1.60820E+01 69920E-01 1.86333E+01 09725E+00 1.80426E+01 09725E+00 1.80426E+01 12336E+00 7.50762E+00 60575E+00 7.50762E+00 60575E+00 7.50762E+00 45076E+01 2.96364E+01 149096E+01 2.96364E+01 45096E+01 2.96364E+01 45056E+01 6.18469E- 5.54744E-01 6.18469E- 5.06165E+01 4.74767E- 1.69733E-01 5.9438TE-	ND143 MAT N OSS SECTION INELA N2N 2.151295+00 0.0 2.171995+00 0.0 2.171995+00 0.0 1.0297640 0.0 1.0297640 0.0 1.0297640 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 = 6043 4 EL MU 7.17877E-01 4 6.90372E-01 4 6.82408E-01 6 5.25592E-01 8 3.69376E-01 1 2.92938E-01 8 2.38370E-01 8 2.38370E-03 4 7.70239E-03 4 4.70239E-03 3 4.70239E-03 4 4.70239E-03 2 4.70239E-03 2 4	PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.7993BE-01 0.0 ,195AE-02 1.7993BE-01 0.0 ,05314E-01 2.02345E-01 0.0 ,05344E-02 2.38821E-01 0.0 ,05344E-02 2.38821E-01 0.0 ,05371E-01 2.63782E-01 0.0 ,80721E-01 2.63782E-01 0.0 ,80791E-01 2.63782E-01 0.0 ,94512E-02 2.63739E-01 0.0 ,94512E-02 2.63739E-01 0.0 ,94512E-02 2.63739E-01 0.0 ,94512E-02 2.63739E-01 0.0 ,94541E-01 2.63782E-01 0.0 ,94541E-01 2.63789E-01 0.0 ,357996E-01 2.63789E-01 0.0 ,37996E-01 2.63789E-01 0
GROUPTOTAL         FISSION           1         4.492695400         0.0           2         4.789835+000         0.0           4         6.860365+000         0.0           4         6.860365+000         0.0           4         6.860365+000         0.0           5         5.993726+000         0.0           7         5.42787E+000         0.0           9         7.013795+000         0.0           9         7.013795+000         0.0           11         1.217465+010         0.0           12         1.660152+010         0.0           13         1.962326+0010         0.0           14         3.72345+010         0.0           15         2.113995±000         0.0           16         1.31096±020         0.0           17         3.660102±020         0.0           12         1.93052±010         0.0           21         1.31734€±010         0.0           23         1.045322±000         0.0           25         1.14546±020         0.0           25         1.14546±020         0.0           25         1.14546±020         0.0 <tr< td=""><td>NU ( 0,0 2 0,0 2 0,0 3 0,0 1 0,0 1 0,0 4 0,0 5 0,0 5 0,0</td><td>NUCLIO = 60 NFINITE DILUTION CR CAPTURE ELASTIC 023802-04 2.3A119E+00 38344E-03 2.61656E+00 2137TE-01 4.73773E+00 38348E-02 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3968E-01 6.8548E2E+00 09725E+00 1.8042E+01 09725E+00 1.8042E+01 09725E+00 1.8042E+01 09725E+00 1.8042E+01 32307E+01 2.8526FE+01 1.43002E+01 4.9096E+01 2.9538E+01 1.43002E+01 4.9096E+01 2.96364E+01 ND143 MAT NUMBER LE OF INELA+(N.2N) M + J = 1 4 5 5.54744E-01 6.18469E- 6.59881E-01 4.7476FE- 1.69753E-01 5.94387E+0 3.60362E-02 2.26734E-</td><td>ND143 MAT N OSS SECTION INELA N2N 2.151295+00 0.0 2.171995+00 0.0 2.171995+00 0.0 1.0293640 0.0 1.0293640 0.0 1.0293640 0.0 0.0 0.0 0.0</td><td><pre>IO = 6043 I EL MU 7.17897E-014 6.90372E-01 4 6.92408E-01 6.25992E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2992E-03 9.470239E-03 9.47029E-02 9.8809E-03 9.480E 9.480E</pre></td><td>PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.6980AE-02 0.0 ,19346E-02 1.79936E-01 0.0 ,05344E-02 2.38802E-01 0.0 ,05347E-01 2.03842E-01 0.0 ,05347E-01 2.03882E-01 0.0 ,09347E-01 2.63782E-01 0.0 ,09347E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2608E-02 2.63739E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,39741E-02 2.63739E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3979E-01 2.63782E-01 0.0 ,3979E-01 2.63782E-01 0.0 ,3779E-01 2.63782E-01 0.0 ,3789E-01 2.6378E-01 0.0 ,3789E-01 2.6378E-01 0.0 ,3789E-01 2.6378E-01 0.0 ,3789E-0</td></tr<>	NU ( 0,0 2 0,0 2 0,0 3 0,0 1 0,0 1 0,0 4 0,0 5 0,0	NUCLIO = 60 NFINITE DILUTION CR CAPTURE ELASTIC 023802-04 2.3A119E+00 38344E-03 2.61656E+00 2137TE-01 4.73773E+00 38348E-02 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3997E-03 5.85283E+00 3968E-01 6.8548E2E+00 09725E+00 1.8042E+01 09725E+00 1.8042E+01 09725E+00 1.8042E+01 09725E+00 1.8042E+01 32307E+01 2.8526FE+01 1.43002E+01 4.9096E+01 2.9538E+01 1.43002E+01 4.9096E+01 2.96364E+01 ND143 MAT NUMBER LE OF INELA+(N.2N) M + J = 1 4 5 5.54744E-01 6.18469E- 6.59881E-01 4.7476FE- 1.69753E-01 5.94387E+0 3.60362E-02 2.26734E-	ND143 MAT N OSS SECTION INELA N2N 2.151295+00 0.0 2.171995+00 0.0 2.171995+00 0.0 1.0293640 0.0 1.0293640 0.0 1.0293640 0.0 0.0	<pre>IO = 6043 I EL MU 7.17897E-014 6.90372E-01 4 6.92408E-01 6.25992E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2993E-01 8.2992E-03 9.470239E-03 9.47029E-02 9.8809E-03 9.480E 9.480E</pre>	PAGE 1 OF 1 EL REMOVAL FLUX CH1 ,97717E-02 1.6980AE-02 0.0 ,19274E-02 1.6980AE-02 0.0 ,19346E-02 1.79936E-01 0.0 ,05344E-02 2.38802E-01 0.0 ,05347E-01 2.03842E-01 0.0 ,05347E-01 2.03882E-01 0.0 ,09347E-01 2.63782E-01 0.0 ,09347E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2600E-01 2.63782E-01 0.0 ,2608E-02 2.63739E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,39741E-02 2.63739E-01 0.0 ,3959E-01 2.63782E-01 0.0 ,3979E-01 2.63782E-01 0.0 ,3979E-01 2.63782E-01 0.0 ,3779E-01 2.63782E-01 0.0 ,3789E-01 2.6378E-01 0.0 ,3789E-01 2.6378E-01 0.0 ,3789E-01 2.6378E-01 0.0 ,3789E-0
GROUPTOTAL         F15S10N           1         4.4926950000.00           2         4.798435+0000.00           3         4.8935+0000.00           4         6.863365+0000.00           4         6.863365+0000.00           5         5.89925+0000.00           5         5.89925+0000.00           5         5.99925+0000.00           6         5.9699726+0000.00           9         7.013795+0000.00           11         1.217465+010.00           12         1.669135+010.00           13         1.962322+0100.00           14         3.723345+010.00           15         2.113995+0100.00           16         1.310955+0200.00           17         3.660102+0200.00           21         1.933245+0100.00           22         2.834657±010.00           23         5.048595±010.00           23         5.048595±010.00           23         1.1317345±010.00           23         1.145465±020.00           11         11           11         12           1.1         12           1.1         13           1.1         12	NU C 0.0 2 0.0 2 0.0 3 0.0 1 0.0 1 0.0 1 0.0 1 0.0 1 0.0 2 0.0 2 0.0 2 0.0 2 0.0 3 0.0 2 0.0 3 0.0 2 0.0 3 0.0 2 0.0 3 0.0 2 0.0 3 0.0 2 0.0 3 0.0 2 0.0 2 0.0 2 0.0 3 0.0 2 0.0 4 0.0 2 0.0 3 0.0 2 0.0 5 0.0	NUCLIO = 60 NFINITE DILUTION CR CAPTURE ELASTIC 02380E-04 2.341195-00 38344E-02 3.62456=00 38344E-02 3.62456=00 38344E-02 3.62456=00 38348E-02 3.62458E-00 17776-01 6.55281E+00 38685E-01 6.73193E+00 38685E-01 6.73193E+00 39645E-01 6.84842E+00 09725E+00 1.80426E+01 09725E+00 1.80426E+01 09725E+00 1.80426E+01 32305E+01 2.4535FE+01 32305E+01 2.4535FE+01 32305E+01 2.4535FE+01 32305E+01 2.4535FE+01 49096E+01 2.96364E+01 ND143 MAT NUMBER .E OF INELA+(N.2N) M + J = 1 4 5 5.54744E-01 6.18469E- 6.59881E-01 4.74767E- 1.69735E-01 3.94387E- 3.60362E-02 2.26734E-	ND143 MAT N OSS SECTION INELA N2R 2.15129E+00 0.0 2.17999E+00 0.0 2.02996E+01 0.0 1.02017E+00 0.0 1.02017E+00 0.0 1.0217E+00 0.0 0.0 0.0	00 = 6043 4 EL MU 7.17897E-014 6.90372E-014 6.90372E-016 5.2592E-018 3.69376E-011 2.92933E-018 8.2408E-02 3.8370E-018 2.38370E-03 4.70239E-03 4.7023E	PAGE 1 OF 1 EL REMOVAL FLUX CH1 .77717E-02 1.69804E-02 0.0 .19274E-02 1.79936E-01 0.0 .1934E-02 1.79936E-01 0.0 .03314E-01 2.02395E-01 0.0 .0534E-02 2.38821E-01 0.0 .0534E-02 2.38821E-01 0.0 .0534E-02 2.38821E-01 0.0 .0534E-01 2.63782E-01 0.0 .0534E-01 2.63782E-01 0.0 .0534E-01 2.63782E-01 0.0 .0534E-02 2.63739E-01 0.0 .060201 2.63782E-01 0.0 .07595E-01 2.63782E-01 0.0 .07595E-01 2.63782E-01 0.0 .07595E-01 2.63782E-01 0.0 .07595E-01 2.63782E-01 0.0 .07595E-01 2.63782E-01 0.0 .26458E-02 2.63739E-01 0.0 .26458E-02 2.63739E-01 0.0 .27458E-02 2.63782E-01 0.0 .27458E-02 2.63782E-01 0.0 .27458E-02 2.63782E-01 0.0 .27458E-02 2.63782E-01 0.0 .27596E-01 2.63782E-01 0.0 .37996E-01 2.63782E-01 0.0 .37996E

0.0 3.51555E-04 1.54413E-03 7.10289E-04 3.30458E-04 1.53592E-04 7.17565E-05 3.44273E-05 0.0

0.0 0.0

# NUCLID = 60ND144 MAT ND = 6044 INFINITE DILUTION CROSS SECTION

								PAGE 1 OF	1	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4,50141E+00	0,0	0.0	2.02077E-04	2,34520E+00	2,15601E+00	0.0	7,18367E-01	4,948198-02	1,69804E=02	0.0
2 4,82365E+00	0.0	0,0	2,31048E-03	2,63923E+00	2,18212E+00	0.0	6,91459E-01	4,19972E-02	8,92878E-02	0.0
3 5,92375E+00	0.0	0,0	1.64276E-02	3,79492E+00	2,11240E+00	0.0	6.94082E-01	5.14466E-02	1,79938E-01	0.0
4 6,90930E+00	0.0	0.0	3.65831E-02	5,29423E+00	1.57848E+00	0.0	5.73885E-01	6.75834E-02	2.58407E-01	0.0
5 6,90184E+00	0.0	0,0	4.28038E-02	5,97007E+00	8.88966E-01	0.0	4.04365E-01	9.280796-02	2.02345E-01	0.0
6 5,96119E+00	0.0	0.0	4,99564E-02	5,85777E+00	5,34687E-02	0,0	2,87692E-01	8,17678E-02	2.38821E-01	0.0
7 5.45220E+0U	0.0	0,0	4,46726E-02	5,40752E+00	0.0	0.0	2.30096E-01	8.87086E-02	2,30821E-01	0.0
8 5,91961E+00	0,0	0.0	5,09204E-02	5.86869E+00	0.0	0.0	1,48114E-01	1,12631E-01	2.38821E-01	0.0
9 7,16382E+00	0.0	0,0	6,14463E-02	7.10238E+00	0.0	0.0	7.833376-02	1,388318-01	2.638258-01	0.0
10 9,36140E+00	0,0	0.0	7,63440E-02	9,28505E+00	0.0	0.0	3,51616E-02	1.89070E-01	2.65782E-01	0.0
11 1.26242E+01	0.0	0.0	1.05992E-01	1,25182E+01	0.0	0.0	1.614578-02	2.62599E-01	2.63739E-01	0.0
12 2.03347E+01	0.0	0,0	1,56580E-01	2.01781E+01	0,0	0.0	5,404928-03	1,48103E-02	2,63825E-01	0.0
13 1.34788E+01	0.0	0.0	1.643916-01	1.33144E+01	0.0	0.0	4,66974E-03	2.59372E-01	2.65T82E-01	0.0
14 1.33556E+02	0.0	0.0	6,72017E-01	1,32884E+02	0.0	0.0	4.66974E-03	1,641216-02	2,63739E-01	0.0
15 1.42221E+01	0.0	0.0	1,04447E+00	1.31776E+01	0,0	0.0	4.66974E-03	9.35285E-01	2,63825E-01	0.0
16 6,01786E+02	0.0	0.0	2,99660E+00	5,98789E+02	0.0	0.0	4.66974E-03	2,99911E-01	2.65782E-01	0.0
17 8.06670E+00	0.0	0.0	9.82586E-02	7,96844E+00	0.0	0.0	4.66974E-03	8.11141E-02	2.63739E-01	0.0
18 3,48573E+00	0.0	0.0	8,91844E-02	3,39654E+00	0.0	0.0	4.66974E-03	5.01510E-02	2.63825E-01	0.0
19 2,55600E+00	0.0	0.0	1,12766E-01	2,44324E+00	0.0	0.0	4.66974E-03	4,03242E-02	2.65782E-01	0.0
20 2.27002E+00	0.0	0.0	1.560808-01	2,11394E+00	0.0	0.0	4.66974E-03	3.69619E-02	2.63739E-01	0.0
21 2.20240E+00	0.0	0.0	2.23014E-01	1,97939E+00	0.0	0.0	4.66974E-03	3,53695E-02	2.63825E-01	0.0
22 2.24370E+00	0,0	0.0	3.23754E-01	1,91995E+00	0.0	0.0	4.66974E-03	3,44018E-02	2.65782E-01	0.0
23 2,36591E+00	0.0	0.0	4.72841E-01	1.89307E+00	0.0	0.0	4.66974E-03	3,43459E-02	2.63739E-01	0.0
24 2.57263E+00	0.0	0.0	6,918408-01	1.88079E+00	0,0	0.0	4,669748-03	3,41860E-02	2,63825E-01	0.0
25 2.89003E+00	0.0	0.0	1,01493E+00	1,87510E+00	0.0	0.0	1.06336E-02	3,38653E-02	2.65782E-01	0.0

#### NUCLID = MAT NUMBER = 6044 60ND144 INELA+(N,2N) MATRICES TABLE OF PAGE 1 OF 1

EXIT GRUUP \*\* KK \*\* 1 2 11 12 GROUP  $\frac{KK = I + J - 1}{3}$ ∎ ل 10 5 а 9 6 7 2.61482E-04 2.51092E-02 1.70667E-01 5.44186E-01 6.22807E-01 4.99392E-01 2.03452E-01 6.51484E-02 1.93194E-02 4.47553E-03 9.83436E-04 2.08852E-04 5.15938E-U3 1.21390E-O1 3.95946E-O1 6.30602E-O1 6.13197E-O1 2.81639E-O1 9.59564E-O2 2.93831E-O2 6.92177E-O3 1.53292E-O3 3.31624E-O4 5.33077E-O5 6.12368E-02 4.68042E-01 5.22747E-01 4.51881E-01 3.14292E-01 2.08939E-01 6.51037E-02 1.56889E-02 3.51170E-03 7.77262E-04 1.73339E-05 1.86216E-03 6.45055E-01 4.37612E-01 1.78854E-01 8.66321E-02 3.45419E-07 7.34854E-03 1.58304E-03 3.47383E-04 7.72731E-05 1.41393E-05 0.0 5 0.0 4.59868E-01 2.80127E-01 1.38938E-01 7.17602E-03 2.23930E-03 4.82468E-04 1.05393E-04 2.33917E-05 4.91199E-06 6.69691E-07 0.0 9.21900E-05 2.80238E-02 1.37243E-02 6.32827E-03 2.92978E-03 1.36380E-03 6.42830E-04 3.63778E-04 0.0 0.0

# NUCLID = 60ND145 MAT NO = 6045 INFINITE DILUTION CROSS SECTION

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#### PAGE 1 OF 1

PAGE 1 OF 1

SRO	UPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	сні
1	4,50854E+00	0.0	0.0	1.08334E-04	2.34739E+00	2.16104E+00	0.0	7.18344E-01	4.919748-02	1.69804F-02	0.0
2	4.857491+00	0.0	0.0	1,15437E-03	2.652951+00	2,20339E+00	0.0	6.97277E-01	4.00529E-02	8,92878E-02	0.0
3	5.98333E+00	0.0	0.0	5.71443E-03	3.70107E+00	2,27654E+00	0.0	7,211078-01	4.11475E-02	1.79938E-01	0.0
4	6,97781E+00	0.0	0.0	3.57554E-02	4.68364E+00	2.05842E+00	0.0	6.26149E-01	5.84552E+02	2.58407E-01	0.0
5	6,898192+00	0.0	0.0	9.039428-02	5.61320E+00	1,19460E+00	0.0	4.277078-01	8.33906E-02	2.02345E-01	0.0
6	5,971136+00	0.0	0.0	8.32303E-02	5.11905E+00	7.68843E-01	0.0	3.19967E-01	6.89034E-02	2.36821E-01	0.0
7	5,47194F+00	0.0	0.0	9.246085-02	4 . 842136+00	5.37355F+01	0.0	2.478281-01	7.91121E-02	2.388215=01	0.0
8	5,99511E+00	0.0	0.0	1.241296-01	5.454618+00	4.16372t-01	0.0	1.543846-01	1.05488E-01	2.3B821F=01	0.0
9	7.34368F+00	0.0	0.0	1.91316F-01	7.03808£+00	1.14284F-01	0.0	7.70548E-02	1.397126-01	2.638255-01	0.0
10	9.721071+00	0.0	0.0	2.94204E-01	9.426876+00	0.0	0.0	3.403421-02	1.91306F-01	2.65782E=01	0.0
11	1.32294E+01	0.0	0.0	4.601861-01	1.27692F+01	0.0	0.0	1-56912E-02	2.664235-01	2.63739E-01	0.0
12	1.83521E+01	0.0	5.0	7.59098E=01	1.75930E+01	0.0	0.0	5.558156+03	3.717826=01	2.638255-01	0.0
13	2+878061+01	0.0	0.0	1.394706+00	2.738596+01	0.0	0.0	4.637558-03	3.813176-01	2-657825-01	0.0
14	3.19970E+01	0.0	0.0	3.091516+00	2.890551+01	0.0	0.0	4.63755E-03	2.69606F+00	2.63739F=01	0.0
15	5-85233F+01	0.0	0.0	6.511216+00	5.201216+01	0.0	0.0	4.63755E+03	1.670975+00	2.638255-01	0.0
16	3,99487E+01	0.0	0.0	1.07572++01	2.91914F+01	0.0	0.0	4.63755E=03	1.29486F=02	2.65782E=01	0.0
17	7.606056+01	0.0	0.0	2.97733++01	4.628725+01	0.0	0 0	4.63755E=03	5.00826E+00	2.63739F+01	0.0
18	1.51273++01	0.0	0.0	7.202901+00	7.92442F+00	0.0	0.0	4.637555-03	9.57896E=01	2.63825E=01	0.0
19	4.599856+02	0.0	0.0	6.68670E+01	3.931186+02	0.0	<b>0</b> 0	4.437556-03	1 888005+02	2.457025-01	0.0
20	2.438036+00	0.0	0.0	1.81804F+00	6.199305-01	0.0	0.0	A-63755E=03	8.060216-03	2.637395-01	0.0
21	4.391296+00	0.0	0.0	3.962826+00	4.1184635-01	0.0	0.0	4.437555-03	9.493716-03	2.439265-01	0.0
22	2.041976+02	0.0	0.0	1 023925+02	5 215456400		0.0	4/03756E-03	9 093305-03	2,000202 01	0.0
55	6.868306+00	0.0	0.0	6 399696+00	4.686091=01	0.0	0.0	4.437555-03	8 132036-03	2.637305-01	0.0
26	8.971255+00	0.0	0.0	8 478986+00	4 422705-01	0.0	0.0	4.637556-03	7 808175-03	2 6 3 8 3 4 5 - 01	
55	1.255496+01	0.0	0.0	1 212016+01	4.347826-01	0.0	0.0	1 054125-02	7 772226-03	2.030255-01	0.0
27	1.1.2.2.2.4.76.101		v.v	1,211010-01	+13+1820-01		V.U	11007122-02	1112322-03	2102/826-01	010

#### NUCLID = 60ND145 MAT NUMBER .

TABLE OF INELA+ (N+2N) MATRICES

EXIT GROUP \*\* KK \*\* KK = I + J - 1 1 2 3 4 11 12 GRDUP 1 J= 10 8 5 6 7 6.61484t-04 3.57146t-02 2.02696t-01 5.76273E-01 6.11829E-01 4.68028E-01 1.85198E-01 5.84220E-02 1.71916E-02 3.96663t-03 8.69976E-04 1.84597E-04 1 6.15523E-03 9.67848E-02 4.60285E-01 6.51913E-01 5.98886E-01 2.65528E-01 8.86981E-02 2.69441E-02 6.31594E-03 1.39552E-03 3.07034E-04 4.86701E-05 3.42221E-02 2.09096E-01 6.65515E-01 7.72464E-01 3.94608E-01 1.42105E-01 4.47837E-02 1.07093E-02 2.38847E-03 5.27772E-04 1.15602E-04 7.47802E-06 3.04606E-01 2.67357E-01 6.70761E-01 3.71810E-01 3.08034E-01 1.03187E-01 2.53316E-02 5.72327E-03 1.26805E-03 2.81900E-04 5.47798E-05 0.0 6.83560[-01 2.35566E-01 1.40066E-01 8.64859E-02 3.83173E-02 8.18636E-03 1.88933E-03 4.13900E-04 9.20068E-05 2.10258E-D5 2.21547E-05 0.0 5.938996-01 1.64706E-01 0.0 0.0 0.0 8,85788E-05 7,81025E-03 1,82830E-03 3,99428E-04 8.81240E-05 1,91860E-05 4.18736E-06 3,15534E-01 2,21822E-01 0,0 0,0 0,0 0.0 0,0 0,0 0.0 0.0 0.0 0,0 9,97488E-02 2,21030E-01 9,55935E-02 0.0 0.0 0.0 0,0 0.0 0.0 0,0 0.0 0.0 0,0 2.85919£-02 5.54442E-02 2.40854E-02 3.83145E-03 1.39450E-03 5.45311E-04 2.30700E-04 1.02960E-04 5.78034E-05 8.07860±-08 0.0

NUCLID = 61PM197 MAT NO = 6147

								PAGE 1 OF	1	
GROUPTOTAL	FISSION	яU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	сні
1 4.64933E+00	0.0	0.0	1.11622E-03	2,429601+00 2	.21861E+0U (	7 0.0	,33384E-01 4	.80296E-02 1	.69804E .02 0	+0
2 5.01320E+00	0.0	0.0	8.809196-03	2.75335E+00 2	.20098E+00 (	2.0 7	06307E-01 4	.01239E-02 8	92878E-02 0	•0
4 7 05274E+00	0.0	0.0	5.10391E-02	3.10100E+00 2	. #7235+00 (		+40375 01 4	300082E-02 1	+79938E=01 0	•••
5 1.032441+00	0.0	0.0	2.01048E=01	5.05135++00 1	. /8003E+00 (	0.0 0	+9305E-01 7	286485-02 2	.02345E-01 0	.0
6 6.193916+00	0.0	0.0	3.2/383E-01	5-09289E+00 7	.73635E-01 (	1.0 3	329655~01 7	12840F=02 2	38821E-01 0	
7 5.87741E+00	0.0	0.0	3.72711E-01	5.100241+00 4	.04458E-01 0	2.	45524E-01 8	.28494E-02 2	3B821E-01 0	•0
8 6.58083E+00	0.0	0.0	4.48342E-01	5.83594E+00 2	.96556E-01 (	0.0 1	.53773E-01 1	.12261E-01 2	.38821E-01 0	•0
9 8.17796E+00	0.0	0.0	6.22607E-01	7.54220E+00 1	.51519E-02 (	0.0 7	.81706E-02 1	.455316-01 2	.63825E-01 0	•0
10 1.08605E+01	0.0	0.0	9.22829E-01	9,93766E+00 0	•u (	0.0 3	54041E-02 1	.97723E-01 2	.65782E-01 0	•0
11 1.475916+01	0.0	0.0	1.513916+00	1.324522+01 0	•• (	1	+64669E=02 2	.69396E-01 2	.03739E-01 0	•0
13 2.465056+01	0.0	0.0	4.966165+00	2.368441+01 0		0.0 6	57445E-03 3	*02851E=01 2	45792E-01 0	•0
14 4.07229F+01	0.0	0.0	9.243945+00	3.147895+01 0.		0.0 4	J/445E-03 6	41358F=01 2	.63739E=01 0	
15 5.834651+01	0.0	0.0	1.69951E+01	4.13515++01 0			57445E=03 8	-36743E=01 2	.63825F=01 0	
16 7.92436E+01	0.0	0.0	2.67897E+01	5.245396+01 0	, ŭ	0.0 4	514456-03 1	.88222E-01 2	65782E-01 0	.0
17 1.18245E+02	0.0	0.0	4.08013E+01	7.74442E+01 0	,u (	0.0 4	57445E-03 1	.60065E-01 2	.63739E-01 0	•0
18 9.72784E+01	0.0	0,0	6.56768E+01	3.100178+01 0	, v (	J+O 4	57445E-03 9	.12444E-02 2	.63825E-01 U	•0
19 1.08208E+02	0.0	0.0	8.32106E+01	2.499788+01 0	.v c	0.0 4	.57445E-03 4	.05571E-02 2	.65782E-01 0	•0
20 4.957482+01	0.0	0.0	4,41147E+01	5.46006L+00 0		0.0 4	57445E-03 1	-36211E-01 2	.63739E-01 0	•0
21 3,401/18+03	0.0	0.0	2.42/14E+03	9.44566E+02 0	,u (	0.0 4	.5/445E-03 2	43484E+00 2	-63825E-01 0	•0
22 0.940646101	0.0	0.0	0,7/77755701	1.96070E+01 0		1.0 4	+7/445E-03 6	178831E=02 2	.65/82E-01 0	•0
24 3.32646F+01	0.0	0.0	3.168085+01	1.583261+00 0	.0 (	0.0 4	57445C-03 3	504446-02 2	+3026L-01 ()	
25 4.913256+01	0.0	0.0	4.77281E+01	1.404412+00 0.	.v i	0.0	029761-02 2	.433201-02 2	+65782F=01 0	
		NUCLID =	619M147 TABLE OF IN	MAT NUMBER =	6147 KICES	1PL = 0				
							PAGË	1 OF 1		
GROUP EXII	GROUP ++	KK #* K	x = [ + J = 1				-		• •	
1 5 1	12		3 4	2		'	ö	4	10	
1 6.94132E- 9.75005E-	04 2.999482 04 2.009912	-02 1.8474 -04	8E-01 5.69264E-0	01 6.3/093t-01	5.03718E-0	1 2.034376-01	6.48531E-02	2 1,91876E-02	4.439652-03	)
2 7.55771E- 3.40114E-	03 9.44940E 04 5.36730E	-02 4.3684 -05	6E-01 6.59111E-0	01 e+305396+01	2.866801-0	1 9.71609L-02	2.96109E-07	• ••97961E-03	1.544702-03	)
3										
4.001116-	02 3.00186E	-01 6.1094	6E-01 7.39456E-	D1 3,89117E-01	1,42318E-0	1 +.52144E=02	1.08280E-03	2,426436-03	5.36650E-04	•
1,1/3966-	04 1.363708	-05								
4	01 5.502211	-01 7.9449	35-01 4.973385-0	01 2.023834-01	6.799046-0	2 1.681294 =02	3. 409156-03	8.47H416#04	1.863005=04	
2 678816-	01 0.002210	-01 /150037	3C-01 41713346-0	1 1022036-01	01133082-0	2 11001276-02	31009196-03	014/0415-04	1.003405-04	
21010010	05 010									
3.00136E-	01 6.42793E	-01 4.2569	4L-01 2.84774F-0	1 4.457784-02	2.448081-0	2 5.658461-03	1.77118E-03	2.805931-04	6.02615E-05	,
9.14153E-	06 0.0	••								
6										
3.099906-	01 2.437956	-01 1.0521	0E-01 6.27196E-0	02 2.608532-02	9.48669E-0	3 1.02269E=02	4.80748E-01	1.03958E-03	2.337516-04	
4.05930E-	05 0.0									
7									_	
1.933928-	01 2.11066E	-01 0.0	0.0	0.0	0.0	0.0	0.0	V.O	0.0	
0.0	0.0									
8	02 1 534476	-01 7 0 205					0.0	0.0	0.0	
1,300896-	0.0	-01 114440	20-05 2+92010F=0	/2 / MO200C=U3	0.0	0.0	010	0.0	010	
	0.0									
, 0.0	0.0	0.0	5.715488~0	3 4.03731L-03	1.857371-0	3 8.6051504	4.060836-04	1.17795L-04	9.6743/6-05	<b>j</b> .
0.0	0.0	• • •								

NU 0.V CAPTURE ELASTIC INELA N2N 5.041626-04 2.412466+00 2.211706+00 0.0 GROUPTOTAL FISSION 1 4.63066E+00 0.0 EL MU EL REMOVAL FLUX CHI 7.31540E+01 4.79085E−02 1.69804E−02 0.0

NUCLID = 625M147 MAT NO = 6247 INFINITE DILUTION CHOSS SECTION

2	5.072021+00	0.0	0.0	5.51105E-03	2. ±19/0E+00	2.24681E+00	0.0	7.12616E-01	4.044816-02	8.92878E-02	0.0
3	6.18002E+00	0.0	0.0	2.10743E-02	3.57861:+00	2.27433E+00	0.0	7.24431E-01	4.177216-02	1.79938E-01	0.0
4	7.071556+00	0.0	0.0	1.06066E-01	4.79326E+0u	2.172236+00	0.0	6.503285-01	4.86786L-02	2.58407E-01	0.0
Ś	6.94609F+00	0.0	0.0	2,90186E-01	5.31851E+00	1,3374UE+00	0.0	4.50670E-01	1.81325L-02	2.02345E-01	0,0
6	6.206566100	0.0	0.0	3.71167E-01	5.13706E+00	6.76353E-01	0.0	3.65191E-01	7,24177E-02	2.36821E-01	0.0
ž	5.950566+00	0.0	0.0	4.00304E-01	5.12020E+00	4.300548-01	0.0	2.22749E-01	8.70828L-02	2.38821E-01	0.0
Å	6.78051E+00	0.0	0.0	4.908151-01	6.16353E+00	1.201636-01	0.0	1.34873E-01	1,24188E-01	2.38821E-01	0.0
ě.	8 751498+00	0.0	0.0	6.62153F-01	8.089332+00	0.0	0.0	6.67643E-02	1.587816-01	2.63825E-01	0.0
ń	1.188255+01	0.0	0.0	9.49456E-01	1.089301+01	0.0	0.0	3.12485E-02	2.192226-01	2.65782E-01	0.0
ĩ	1. 441941+01	0.0	0.0	1.659546+00	1.475962+01	0.4	0.0	1.47963E-02	3.02341E-01	2.637398-01	0.0
2	2.29625F+01	0.0	0.0	2.99566E+00	1.996696+01	0.0	0.0	5.44702E-03	4.10884t-01	2.63825E-01	0.0
1	3. 25310E+01	0.0	0.0	5.59566E+0U	2.693441+01	0.0	0.0	4.57445E-03	5.49247E-01	2.65782E-01	0+0
-	4.65160E+01	0.0	0.0	1.09716E+01	3.60444±+01	0.0	0.0	4.57445E=03	7.364116-01	2.63739E-01	0.0
	6. A4465E+01	0.0	0.0	1.890126+01	4.754541+01	ñ.u	0.0	4.574458-03	8.06285E-02	2.63825F=01	0.0
1	8 14905E+01	0.0	0.0	2. 5087E+01	5.298216+01	0.0	0.0	4.57445E-03	5.89605E-02	2.65782E-01	0.0
2	1 722206+02	0.0	0.0	5.524586+01	1.109/56+02	0.0	0.0	4.574456-03	3.78540E+00	2.63739E-01	0,0
	1 560485+02	0.0	0.0	7.46596+01	8.140251+01	0.4	0.0	4.57445E-03	3.651568-02	2.63825E-01	0.0
10	2 000745+02	0.0	0.0	1 817185+02	1.151626+02	0.0	0.0	4.574451-03	1.263805-01	2.65782E=01	0.0
20	4 356396+02	0.0	0.0	3.353176+02	3.005124+02	0.0	0.0	4.57445E-03	2.31725E-02	2.63739E-01	0.0
51	3 461466+00	0.0	0.0	2 /58556+00	7. 229241-01	0.0	0-0	4.579451-03	1.139475-02	2-638256-01	0.0
	3 434075+03	0.0	0.0	2 581166+02	5.290526+00	0.0	0.0	4.57445E-03	2.136741-03	2.65782E=01	0.0
1	6 033476+00	0.0	0.0	5.905046+00	1.186291-01	0.0	0.0	4.57445E=03	2.127621-03	2.637395+01	0.0
	7 301044400	0.0	0.0	7 27109E+00	1,199641-01	0.0	0.0	4.574456-03	2.155031-03	2-638255-01	0.0
	1 201726 +01	0.0	0.0	1 245626401	1 220155-01	0.0	0.0	1.048255+02	2.102075=03	2.657825-01	0.0
. >	11231/22401	0.0	0.0	1.503355401	1.220136-01	010		11040236402		2.000.020-01	

MAT NUMBER = 6247

5.27331L-04 3.09536L-02 1.8#508E-01 5.72964E-01 0.35526L-01 4.99669E-01 2.01103L-01 6.39945E-02 1.89162L-02 4.37476E-03 9.60537E-04 2.03492E-04

5.91920E-03 9.84244E-02 4.41240E-01 6.5%>66E-01 0.2>654E-01 2.83235E-01 4.57794E-02 2.92152E-02 6.86828E-03 1.51963E-03 3.34550E-04 5.29%00E-05 3.20437E-U2 2.92576E-01 6.21675E-01 7.40335E-01 3.87619E-01 1.41396E-01 4.48598E-02 1.07651E-02 2.40486E-03 5.31797E-04 1.16524E-04 7.33207E-06

1,77157L-01 4,45227L-01 6.91524L-01 5.67565E-01 2.01598L-01 6.76072E-02 1.67024L-02 3.78248E-03 8.41734E-04 1.84980E-04 3.65323E-05 0.0

4.83439E-01 3.92899E-01 2.07880E-01 1.44645E-01 \*.78391E-02 3.55375E-02 1.91925E-02 4.67959E-03 1.03276E-03 2.26644E-04 2.69974E-05 0.0 4.03475L-01 2.66570E-01 6.25385E-04 1.71302E-02 6.69834E-03 1.44730E-03 3.17451E-04 6.98970E-05 1.49512E-05 3.66204E-06 0.0 0.0

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TABLE OF INELA+ (N+2N) MATHICES

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1.22991E-01 2.32969E-01 6.70530E-02 4.65057E-03 1.52219E-03 5.69703E-04 2.33450E-04 6.40951E-05 0.0 0.0 0.0 0.0 6.01877E-02 4,19309E-02 8,72462E-03 4.07823E-03 1.91127E-03 1.44058E-03 1.35552E-03 3,98773E-04 1.35237E-04

20 21 22 23 24 25	7.37 5.61 4.70 2.25 8.53 1.11	229 567 722 964 333 173	E+02 E+02 E+02 E+02 E+02 E+02	0.00	0000		0 0 0 0		-	6	6.5 5.3 4.6 2.2 8.4 1.10 2SH	2328 7640 2062 3992 9334 0579 151	E+02 E+02 E+02 E+03 E+02 E+03	8.490 2.392 8.659 1.972 3.998 5.931 MAT	2762+0 2762+0 9822+0 2312+0 2312+0 7822+0 NUMB8	01 0 01 0 00 0 00 0 00 0		251		) ) ) ]PL	-	4.45 4.45 4.45 4.45 1.05	326E 326E 326E 326E 326E 326E 326E	-03 -03 -03 -03 -02	1.1 2.9 1.1 8.7 1.1	9231 4100 8555 6220 7669	E=01 E=01 E=01 E=02 E=01	2.6 2.6 2.6 2.6 2.6 2.6	3825E 5782E 3739E 3825E 5782E	-01 -01 -01 -01	0.0
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2	1.	806 701	07E- 18E-	-02	8.00 5.85	00250 3628	-02	3.9	7554	+L-0	1 6	451	90E-0	1 6.	468821	-01	3.0	28046-	-01	1.041	88E-0	13	2067	10E-0	2 7	. 574	13E-	03 1	.6794	9E-0	03
3	1.	270	18L- 08E-	-01 -04	2.68	7406 3896	-01 -06	5.3	5726	•E = 0	1 6	.857	092-0	13.	135921	-01	1.3	9151E-	-01	4.462	94i -0	2 1.	.0770	)8E-0	2 2	,412	55E-	03 5	.3415	3E-0	04
4	6 - 2 -	284	87E-	-01 -05	4.78 0.0	4736	-01	5+1	1814	6-3	13	.415	91E-0	1 1.4	417156	-01	4.8	0948F.	-02	1,195	65E-0	2 2	,7156	57E-0	36	.051	552-	04 1	.3307	4E-0	04
5	1.2	189	34E	-00	6.70 0.0	1056	-01	1,9	4845	9E-0	1 9	.459	42E-0	2 3.1	467941	-02	9.0	5738E-	-03	2.049	82E-0	34,	7238	76-0	4 1	.043	40L-	04 2	.2422	8E-0	55
6	1.	120 0	56E	+00	6.48 U.O	3458	-01	1.1	4484	-C	1 4	,189	84L-0	2 7.	724691	-03	1.8	5144E	03	4.230	02i-0	9. 9	<b>, 41</b> 09	98E-0	o5 2	.029	26E-	05 4	. 2651	2E-0	06
7	7.	416	84E	-01 -06	6.7: 0.0	1398	-01	1.5	6190	)t-0	1 4	·94U	298-0	2 0.1	266388	-03	1.3	8849E.	-03	3.067	74E-0	94 1.	. 2346	52E-0	4 1	.13)	71E-	04 2	.4540	06E-0	55
8	5.	455 0	49E-	-01	5.60	6596	-01	2.4	0827	'E-0	13	, 231	55E+0	2 7.9	981286	-03	1.6	7953E.	-03	3.637	29t-0	14 7	,7241	L8E-0	)5 I	.723	.56L-	05 3	601	/6E-(	06
9	5 - 1 -	.527 .199	55E	-01	2.20	3796	-01	1.3	7452	£-0	1 6	. 895	40E-0	2 2.5	539848	-02	5.6	5867£.	-03	1.231	60 <b></b> 0	3 2	,7031	L 6E - 0	)4 5	.828	41E-	05 1	.5114	178-0	05
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12	8	908 0	65E	-02	5.31	18158	-01	2.6	5259	PE-C	919	.413	416-0	2 4.	396291	L-02	2.0	2596E	-02	9.482	54E-0	93 4	. 323)	11E-C	3 1	• 89	1368-	03 1	. 1620	)4E-(	69

CHOURTOTAL	FISSION	MI	CAPTURE	FLASTIC	INELA	N2N		ÉL MU	EL REMOVAL	FLUX	СН
GROOP TOTAL	0.0	0.0	4.670846-03	2.458951+04	2.23540E+00	0.0		7.35944L-01	4.69466E-02	1.69804E-02	0.0
1 41699010.00	0.0	0.0	3 575545-02	2. +10361+00	2.236511+00	0.0		7.10020E-01	3.95345E-02	8.92878E-02	0.0
2 5,082852700	0.0	6.0	1.313095-01	3. #69671+00	2.18841E+00	0.0		7.23610L-01	4.06053E-02	1.79938E-01	0.0
3 8,189372+00	0.0	0.0	2.520595-01	4.72147E+00	2.16561E+00	0.0		6.69618E-01	3.95794E-02	2.58407E-01	0.0
4 7.139142.00	0.0	0.0	2.91880E=01	4.62650F+00	2.19613E+00	0.0		5.35872E-01	5.29939E-02	2.02345E-01	0.0
5 7.114512+00	0.0	0.0	3.146225=01	4.064421+00	1.93540E+00	0.0		4.06279E-01	4.77954E-02	2.38821E-01	0.0
7 5 996115+00	0.0	0.0	3.963694-01	3.95910E+00	1.63064E+00	0.0		3.04378E-01	5.95988L-02	2.388211-01	0.0
1 J. 78011E. 00	0.0	0.0	5.689126-01	4.71499E+0U	1.359472+00	0.0		1.848642-01	8.845718-02	2.38821E-01	0.0
9 8 500375+00	0.0	C.U	1.028905+00	6.509291+00	1.01217E+00	0.0		8.85974E-02	1.25602E-01	2.63825E-01	0.0
10 1 155075+01	0.0	0.0	1.79256E+00	8.79104E+00	9,71210E-01	0.0		3.91460E-02	1.683846-01	2.65782E-01	0.0
11 1.583936+01	0.0	0.0	3.113926+00	1.14663E+01	1,25908E+00	0.0		1.021646-02	2.241292-01	2.63739E-01	0.0
12 2 196815401	0.0	0.0	5.635451+00	1.50713E+01	1.06138E+00	0.0		7.87133E-03	3.00915E-01	2.63825E-01	0.0
13 3.089971+01	0.0	.0.0	1.11365F+01	1.97632E+01	0.0	0.0		4.45326E-03	3.81124E-01	2.65782E-01	0.0
16 4.628196+01	0.0	0.0	1.563261+01	2.46493L+01	0.0	0.0		4.45326E-03	4.72416E-01	2.63739E-01	0.0
15 6.357356+01	0.0	0.0	3.36019E+01	2.99716E+01	0.0	0.0		4.45326E=03	5.680128-01	2.63825E-01	0,0
16 9 197975 +01	0.0	0.0	5.63416F+01	3.56381E+01	0.0	0.0		4.45326E-03	6.63514E-01	2.65782E-01	0.0
17 1.336826+02	0.0	0.0	9.23254E+01	4.135646+01	0.0	0.0		4.45326E-03	7.663102-01	2.63739E-01	0,0
18 1.944846+02	0.0	0.0	1.47735E+02	4.67506E+01	0.0	0.0		4+45326E-03	8,55994E-01	2.63825E-01	0.0
19 2.839136+02	0.0	0.0	2.32302E+02	5.16103E+01	0.0	0.0		4.45326E-03	9.29403E-01	2.65782E-01	0.0
20 7.372291+02	0.0	0.0	6.52328E+02	8.4901UE+01	0.0	0.0		4.45326E-03	2,99789E-01	2.63739E-01	0.0
21 5.61567E+02	0.0	0.0	5.37640E+02	2.392762+01	0.0	0.0		4.45326E-03	1.192316=01	2.63825E-01	0.0
22 4.707221+02	0.0	0.0	4.62062E+02	8.659822+00	0.0	0.0		4.45326E-03	2.94100E-01	2.65782E-01	0.0
23 2 259646+03	0.0	0.0	2.23992E+03	1.97231E+01	0.0	0.0		4.45326E-03	1.185556-01	2+637398-01	0.0
24 8.53333F+02	0.0	0.0	8.49334E+02	3.998711+00	0.0	0.0		4.45326E-03	8,76220L-02	2.63825E-01	0.0
25 1.11173F+03	0.0	0.0	1.10579E+03	5.937822+00	0.0	0.0		1+09893E-02	1.17669E=01	2.65782E-01	0.0
		UCLID =	625M151	MAI NUMBER	= 6251	IPL	•	0			
			TABLE OF IN	ELA+(N+2N) M	ATRICES			PAG	F 1 0F 1		

NUCLID = 625M151 MAT NO = 6251 INFINITE DILUTION CROSS SECTION

PAGE 1 OF 1

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,			NU INFINITE D	CLID = 625	M149 N SS SECTION	AT NO .	6249			
								PAGE 1 OF	1	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 4.662395+00	0.0	0.0	4,560B3E-03	2,43550E+00	2,22231E+00	0.0	7,33814E-01	4.74152E-02	1.69804E-02	0.0
2 5.07093F+00	0.0	0.0	3.752501-02	2.81159E+0U	2.22181E+00	0.0	7.108868-01	4.00173E-02	8.92878E-02	0.0
3 6.178055+00	0.0	0.0	1,219486-01	3,87155E+00	2.184562+00	0.0	7.23408E-01	4.12428E-02	1,79938E-01	0.0
4 7.10294F+00	0.0	0.0	2,52585E-01	4.72956E+00	2.12077E+00	0.0	6.63497E-01	4.21993E-02	2.58407E=01	0+0
5 7.057885+00	0.0	0.0	4.01961E-01	4.52808E+00	1.82/84E+00	0.0	5,05479E-01	6.28560E-02	2.02345E-01	0.0
6 6.239995+00	0.0	0.0	5,37642E-01	4.6U487E+00	1.09748E+00	0.0	3,50967E-01	6.17288t-02	2.38821E-01	0.0
7 5.915021+00	0.0	0.0	6.35179E-01	4.72393E+00	5-55921E-01	0.0	2.49726E-01	7,83288E-02	2,38821E-01	0+0
8 6.81679F+00	0.0	0.0	7.73518E-01	5.59087E+00	4,52403E-01	0.0	1,527348-01	1,06278E-01	2.38821E-01	0+0
9 8.639345+00	0.0	0.0	1.01786E+00	1.09097E+00	5,30507E-01	0.0	7,99983E-02	1.35423E-01	2,63825E-01	0.0
10 1.160225+01	0.0	0.0	1,635696+00	9.52664E+0U	4.39889E-01	0+0	3.58835E-02	1.92098E-01	2.65782E-01	0.0
11 1.601725+01	0.0	0.0	2.97719E+00	1.30400E+01	0.0	0.0	1,63732E-02	2,59330E-01	2.63739E-01	0+0
12 2.232661+01	0.0	0.0	5.31037E+00	1.70163E+01	0.0	0.0	6.72643E-03	3.38940E-01	2.63825E-01	0+0
13 3.154385+01	0.0	0.0	9.582788+00	2.19610E+01	0.0	0.0	4.51304E-03	4.31922E-01	2.65782E-01	0.0
14 4.502236+01	0.0	0.0	1.710866+01	2.79135E+01	0.0	0.0	4,51304E-03	5.48261E-01	2.63739E-01	0+0
15 6.468841+01	0.0	0.0	2.99052E+01	3.47832L+01	0.0	0.0	4.51304E-03	6.75983E-01	2.63825E-01	0.0
16 9.366395+01	0.0	0.0	5.12174E+01	4.24268E+01	0.u	0.0	4,51304E-03	8.10276E-01	2.65782E-01	0+0
17 1.462415+02	0.0	0.0	7.502536+01	7.12158E+01	0.0	0.0	4.51304E-03	5.72926E-01	2.637398-01	0+0
18 4.88554F+02	0.0	0.0	2.5U233E+02	2.36322E+02	0.0	0.0	4.51304E-03	3.86664E-01	2,63825E-01	0+0
19 4.07578F+02	0.0	0.0	2.66914E+02	1.406651+02	0.0	0.0	4.51304E-03	3.30093E-02	2.657828-01	0.0
20 1.337475+02	0.0	0.0	1.22473E+02	1.12736E+01	0.0	0.0	4.51304E-03	1.57314E-01	2.63739E-01	0+0
21 6.25408F+02	0.0	0.0	5.75176E+02	5.02319E+01	0.0	0.0	4.51304E-03	7.60409E-02	2.63825E-01	0+0
22 2.522321+01	0.0	0.0	2.11211E+01	4.10212E+00	0.0	0.0	4.513046-03	1.04572E-01	2,65782E-01	0+0
23 1.75145F+02	0.0	0.0	1.627728+02	1.23734L+01	0.0	0.0	4.51304E-03	6.07889E-01	2.63739E-01	0.0
24 3.013901+03	0.0	0.0	2.97337F+03	4.05271E+01	0.0	0.0	4.51304E-03	2.59545E-01	2.63825E-01	0+0
25 2.22960E+03	0.0	0.0	2.19053E+03	3,906971+01	0.0	0.0	1.71658E-02	1.51678£+00	2.65782E-01	0.0
		NUCLID =	625H149	MAT NUMBER	= 6249	1PL -	0			
				1 A+ (N. 2N) M	THICES					

NUCLID = 63EU153 MAT NO = 6353 INFINITE DILUTION CROSS SECTION

GROUPTOTAL         FISSION         N           1 4.71708E+00 0.0         0.0         0.0           2 5.1647E+00 0.0         0.0         0.0           3 6.26687E+00 0.0         0.0         0.0           4 7.1792E+00 0.0         0.0         0.0           5 7.1647E+00 0.0         0.0         0.0           6 6.35658E+00 0.0         0.0         0.0           7 0.7329E+00 0.0         0.0         0.0           6 6.35658E+00 0.0         0.0         0.0           1 1.71246E+01 0.0         0.0         0.0           1 2.3966E+01 0.0         0.0         0.0           1 3.24787E+01 0.0         0.0         0.0           1 4.474745E+01 0.0         0.0         0.0           1 4.947475E+01 0.0         0.0         0.0           1 4.947475E+01 0.0         0.0         0.0           1 4.9473512+02 0.0         0.0         0.0           2 2.967312+02 0.0         0.0         0.0           2 9.7949532+02 0.0         0.0         0.0           2 9.7312+02 0.0         0.0         0.0           2 9.73532+02 0.0         0.0         0.0           2 9.479535402 0.0         0.0         0.0           2 9.5754501 0.0	AU         CAPTURE         ELASTIC           2.76647E-03         2.66525E-00         2.56735E+00           1.22003E-01         3.93316E+00         3.1740E+00           4.7170E+00         4.77470E+00         4.77470E+00           4.49103E-01         4.70470E+00         4.76374E+01           5.5135E+01         4.21416E+00         0.5135E+01         4.21416E+00           2.5662E+00         9.85796E+00         4.32566E+00         1.50318E+01           1.9664E+01         2.05119E+01         1.9262E+01         4.5202E+01           1.9242E+01         4.5250E+01         1.5050E+00         1.2374E+01           1.2374E+01         3.5556E+00         1.25202E+01         1.05128E+02           1.23757E+01         3.5556E+01         1.2074E+02         1.72714E+01           1.05128E+02         1.80218E+01         1.95155E+02         1.80218E+01           1.05128E+02         1.80218E+01         1.7714E+01         1.7714E+01           1.95155E+02         1.80218E+01         1.95155E+02         1.80218E+01           1.9515E+02         1.80218E+01         1.7714E+01         1.7566E+01           1.6338E+02         5.80390E+00         1.35040E+02         5.81180E+00	INELA N2N 2:24906±00 0.0 2:25306±00 0.0 2:25306±00 0.0 2:20872±00 0.0 1:97492±00 0.0 1:33858±00 0.0 0:0	EL         MU         EL         REMOVAL         FLUX         CH1           7.35376E-01         4.63549E-02         1.69804E-02         0.0           7.14760E-01         3.93034E-02         1.69804E-02         0.0           7.25699E-01         4.05594E-02         1.79938E-01         0.0           5.66884E-01         4.03593E-02         2.5607E-01         0.0           5.7916E-01         5.18790E-02         2.38821E-01         0.0           7.7516E-01         1.05206E-01         2.38821E-01         0.0           7.56842E-01         1.65804E-01         2.63821E-01         0.0           7.5761E-02         1.86975E-01         2.63782E-01         0.0           7.4730E-02         1.86975E-01         2.63782E-01         0.0           7.4730E-03         3.13274E-01         2.63782E-01         0.0           4.3504E-03         3.13274E-01         2.63782E-01         0.0           4.3504E-03         3.63789E-01         2.63782E-01         0.0           4.3504E-03         3.63789E-01         2.63782E-01         0.0           4.3504E-03         3.63789E-01         2.63782E-01         0.0           4.3504E-03         3.63782E-01         2.63782E-01         0.0
NUCL	D = 63EU153 MAT NUMBER	= 6353 IPL =	<b>o</b> .
GROUP EXIT GROUP ** KK *	TABLE OF [NELA+(N+2N) M	ATRICES	PAGE 1 OF 1
	3 4 5	6 7	8 9 10
1 5.66538E-04 2.28836E-02 1 1.09601E-03 2.32815E-04	.61245E-01 5.48261E-01 6.54381E-	01 5.38774E-01 2.23121E-	)1 7.20513E-02 2.14595E-02 4.98258E-03
2 1.10904E-02 7.38368E-02 4 3.76360E-04 5.95531E-05	.00127E-01 6.52095E-01 6.55572E-	01 3.073856-01 1.05856E-	)1 3.25949E-02 7.70064E-03 1.70773E-03
3 7,92470E-02 2,63295E-01 5 1,22013E-04 7,47041E-04	.53389E-01 7.10999E-01 3.88281E-	01 1.44800E-01 4.64708E-0	)2 1.12190E-02 2.51332E-03 5.56506E-04
4 4.52081E-01 4.79861E-01 5	.637542-01 3.68940E-01 1.53295E-	01 5.20669E-02 1.29494E-4	)2 2.94177E-03 6.55601E-04 1.44173E-04
5 9,79916E-01 6.41926E-01 1	.75448E-01 1.23589E-01 4.05040E-	02 1.04266E-02 2.41870E-	)3 5.44276E-04 1,20234E-04 2,58400L-05
2.88060E-06 0.0 6 9.18039E-01 6.85502E-01 5	.09326E-02 1.05621E-02 5.85010E-	03 1.705608-03 4.083538-0	04 9.40956E-05 2.17296E-05 5.96104E-06
0.0 0.0 7 3.714735-01 6.808755-01 2	.DOg851-01 7.392705-02 9.094445-	03 1.939285-03 3.024345-0	04 6.537521-05 1.38050F-05 3.210235-06
		02 6 201645 03 8 344606 4	
0.0 0.0 9	· 87[132=01 1,3/134E=02 1,48736E=	02 5.211042-05 8.544502-0	1,537302-04 3,346302-03 6,366382-06
0.0 0.0 1	.97122E-02 1.90841E-02 9.08475E-	03 6.70658E-03 2.67437E-0	3 1,11213E-03 4,89478E-04 1,12691E-04
	NUCLID = 65 INFIGURE STRUTION C.	EULDD MATING = 6. DSS SECTION	,55
			2464 1 04 1
GROUPTOTAL         Fistion           1 4.85352+00 0.0         0.0           2 5.25352+00 0.0         0.0           3 6.32524+00 0.0         0.0           4 7.225324+00 0.0         0.0           5 7.213024+00 0.0         0.0           5 7.213024+00 0.0         0.0           5 7.213024+00 0.0         0.0           6 0.449564+00 0.0         0.0           7 6.155966+00 0.0         0.0           10 1.22704+01 0.0         0.0           11 1.649202+01 0.0         0.0           12 3.3647140 0.0         0.0           13 3.349114+01 0.0         0.0           14 4.74421+01 0.0         0.0           15 0.635400 0.0         0.0           12 3.56470 0.0         0.0           13 3.349114+01 0.0         0.0           15 0.6371554+01 0.0         0.0           16 2.16305400 0.0         0.0           17 1.448574+02 0.0         0.0           13 3.097765+02 0.0         0.0           12 9.675064+02 0.0         0.0           13 3.135402 0.0         0.0           14 3.145356+02 0.0         0.0           15 3.1356402 0.0         0.0           12 9.675064+02 0.0         0.0           14	$\begin{array}{rcrcrc} \text{vol} & CAPTJHt & ELASTIC \\ 1.59795_{2} \text{-}03 & 2.\text{-}10.\text{-}11^{+}\text{c}\text{i}\text{c} \\ 1.35221_{2} \text{-}02 & 2.35221_{2}\text{+}09 \\ 6.\text{-}13221_{2} \text{-}33221_{2}\text{-}93 \\ 6.\text{-}13221_{2} \text{-}33221_{2}\text{-}93 \\ 9.\text{-}10232_{2} \text{-}3321_{2}\text{-}93 \\ 9.\text{-}02320_{2} \text{-}01 & 5.3833_{2}\text{-}100 \\ 9.\text{-}02690_{2} \text{-}01 & 8.37320_{2}\text{-}00 \\ 7.30574(_{2}\text{-}01 & 8.37320_{2}\text{-}00 \\ 7.30574(_{2}\text{-}01 & 8.37320_{2}\text{-}00 \\ 1.3520_{2}\text{-}00 & 7.74934_{2}\text{-}00 \\ 1.3520_{2}\text{-}00 & 1.97437_{2}\text{-}01 \\ 3.77825_{2}\text{-}00 & 1.97437_{2}\text{-}01 \\ 3.20643_{2}\text{-}01 & 3.74737_{2}\text{-}01 \\ 3.20643_{2}\text{-}01 & 3.74737_{2}\text{-}01 \\ 3.20643_{2}\text{-}01 & 3.74712_{2}\text{-}01 \\ 3.20643_{2}\text{-}01 & 3.74712_{2}\text{-}01 \\ 3.23574_{2}\text{-}01 & 4.4792_{2}\text{-}11 \\ 9.1571_{2}\text{-}12 & 6.16304_{2}\text{-}01 \\ 3.5174_{2}\text{-}12 & 6.16304_{2}\text{-}01 \\ 3.5174_{2}\text{-}12 & 6.12397_{2}\text{-}01 \\ 3.5173_{2}\text{-}03 & 6.71731_{2}\text{-}01 \\ 5.7603_{2}\text{-}12 & 8.24992_{2}\text{-}23 \\ 5.7603_{2}\text{-}33 & 6.71731_{2}\text{-}01 \\ 7.82946_{2}\text{-}02 & 5.347012_{2}\text{-}00 \\ 1.14946_{2}\text{-}53 & 5.347002_{2}\text{-}00 \end{array}$	I/IELA         N2%           2. 2756bE+00         0.0           2. 31530E+00         0.0           2. 31530E+00         0.0           1. 416532e+00         0.0           1. 416572e+00         0.0           1. 416572e+00         0.0           1. 416572e+01         0.0           9.0 + 0622e+01         0.0           1. 4202e+01         0.0           9.0 + 0622e+01         0.0           9.0         0.0	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
NUCLI	0 = 635,155 МАТ КОМВЕМ		0
68001P FX11 45000 #2 YX #	IABLE OF INELA+(N,2N) -	ATAICES	PAGE 1 OF 1
i J= 1 2 11 12	3 4 5	6 7	8 9 10
4.539916-C+ 2.609756-02 1 1.053556-03 2.23/176-04	.751591-01 5.69#73E-01 0.384071-	01 5.310952-01 2.171682-	U1 6.96728E-U2 2.06414E-02 4.79349E-03
4 6.10574E-03 7.626096-02 4 3.706936-04 5.87266E-05	.33222E-01 0.79335E-01 6.60190E-	01 3.075816-01 1.050798-	01-3.22215E-02 7.59594E-03 1.68280E-03
3 4.17459E-02 1.67914E-01 F 1.31873F-04 5.41100F-44	.144402-01 7.96150E-01 4.27353E-	01 i,57936E-01 p.04469E-	U2 1.21492L-02 2.71856E-03 6.01628E-04
4 4,109342-01 2,42373E-01 4 5,98585-05 - 0	.77978E-01 2.92131E-01 2.51466c-	01 1.072326-01 2.663596-	U2 6.04741E-03 1.34734E-03 2.96256E-04
5 5.333618-01 5.656546-01 5	.88860E-02 3.57369E-02 1.524766-	02 4.92066E-03 1.30287E-	03 2.92686E-04 1.66186E-04 1.42275E-04

1.57648L-01 5.65940L-01 5.25731E-01 1.15743E-02 4.25429E-04 3.07700E-04 6.72891E-05 1.47474E-05 3.19203E-06 0.0 0.0 0.0

3.43406E-01 4.45214E-01 1.22006E-01 3.75231E-02 5.83253E-03 1.28007E-03 3.52986E-04 8.04568E-04 1.92622E-04 4.15866E-05 7.56359E-06 0.0 8.50773E-02 9.49001E-01 1.57347E-01 1.15163E-02 2.79557E-03 c.16915E-04 1.32554E-04 2.90591E-05 6.25725E-06 1.63463E-06 1.35067E-07 C.0 0.0 1.50246E-02 6.46091E-02 3.00294E-02 1.40840E-02 2.42296E-03 5.97528E-04 2.79117E-04 1.28685E-04 5.95246E-05 1.18041E-05 0.0

PAGE 1 OF 1

# Appendix 2. Tables of the JNDC Lumped Constants at 360 Days of Burn-up

## Fission products due to fission of <sup>239</sup>Pu with thermal neutrons.

NUCLIU = 949FP237 MAT NO = 4905 INFINITE DILUTION CROSS SECTION

								PAGE 1 OF	1	
GROUPTOTAL	FISSION	NO	CAPTORE	ELASTIC	INELA	NZN	EL MU	EL REMOVAL	FLUX	сні
1 8,60512c+00	0.0	3.9	2.56351c-03	4.53416E+00	4,06840E+00	0.0	3.91751E-01	1.37604E-01	1.69804E-02	0.0
2.8,55775=+06	0.0	0.0	1,297406-02	4.43403E+C0	4,11075±+00	0.0	3.254276-01	1.26278L-01	8,92878E-02	0.0
3 9.8513UE+00	0.0	0.0	3,667342-02	5.84213E+00	3,972508+00	0.0	3.007336-01	1.611535-01	1,79938E-01	0.0
4 1,14701E+01	0.0	0.0	6,651272-02	8.42161E+00	2,987932+00	0.0	2,72425=-01	1.803986-01	2.58407E-01	0.0
5 1,297586+01	0.0	0.0	9.11435t-02	1.102558+01	1,85916E+0C	0.0	2,32594E-01	2.71500E-01	2.02345E-01	0.0
6 1,38709E+01	0.0	0.0	1,21563±-01	1,284986+01	8,99540E-01	0.0	1,920032-01	2.520876-01	2,38821E-01	0.0
7 1.50518c+01	Ű.O	0.0	1,79306E-01	1.46191E+01	2,53370E-01	0.0	1,34652E-01	3.403168-01	2.388212-01	0.0
8 1.64032E+01	0.0	0.0	2.524946-01	1.606666401	6,40680E-02	0.0	8.02311E-02	3.86887E-01	2,38821E-01	0.0
9 1.72037±+01	0.0	0,0	3,83415c-01	1.67942E+01	2,60954L=U2	0.0	4.46822L=02	3.718996-01	2.63825E-01	0.0
10 1,80026E+01	0.0	0.0	6.00012E-01	1.73881E+01	1,47094E-02	0,0	2.35085E-02	3.84076E-01	2,65782E-01	0.0
11 1,981546+01	0.0	0.0	9.07025c-01	1.88988E+01	9.573406-03	0,0	1.30574L+02	4.20526E-01	2,63739E-01	0.0
12 2.32794E+01	0.0	0.0	1.332116+00	2.193928+01	8.070196-03	0.0	8.000606-03	4,83225E-01	2,63825E-01	0.0
13 2.52103c+01	0.0	0.0	2.000232+00	2.320216+01	0.0	0.0	5.958691-03	5.095336-01	2.65782E-01	0.0
14 2.95067c+01	0.0	0.0	3.005666+00	2,65010E+01	0.0	0.0	5,35554L~03	5.423202-01	2.63739E-01	0.0
15 3,98037£+01	0.0	0.0	5.30749±+00	3.44962E+01	0.0	0.0	5.261288-03	6,67467E+01	2.63825E-01	0.0
16 5,61036±+01	0.0	0.0	9,742512+00	4.63611E+01	0.0	0.0	5.16174t-03	6,07277E-01	2.657828-01	0.0
17 5,44742c+01	0.0	0.0	1.404556+01	4.042876+01	0.0	0.0	5,16626t=03	5.27664E-01	2,63739E-01	0.0
18 4.42416E+01	0.0	0.0	1,9871dE+01	2.43698E+01	0.0	0.0	5.36276E-03	5,49974E-01	2.63825E-01	0.0
19 7.07757±+01	0,0	0.0	3,143936+01	3.93364E+01	5.0	0.0	5,45114E-03	4.063261-01	2.65782E-01	0.0
20 1.66858c+02	0.0	0.7	6.13570c+01	1.055018+02	0.0	0.0	5.18609E-03	3.10409E-01	2.63739E-01	0.0
21 1.81138c+02	0,0	0.0	1,293052+02	5.18297E+C1	0.0	0.0	4.65041E-03	6.40683L-01	2.63825E-01	0.0
22 3,491171+01	0.0	6.0	2,27414E+01	1.21703E+01	0.0	0.0	5.659332-03	2.621066-01	2.65782E-01	0.0
23 1,08066E+02	0.0	0.0	9,569001+01	1,23762E+01	0.0	0.0	5.60894E-03	2.66579E-01	2.63739E-01	0.0
24 9.22514E+01	0.0	0.0	7,20233E+01	2.022P1E+01	0,0	0.0	5,862422-03	4.58530E-01	2.63825E-01	0.0
25 9,59108±+01	0.0	J.n	7,778696+01	1.612396+01	<b>0.</b> 0	0.0	7,82097L-03	3.91054E-01	2,65782E=01	0.0

TABLE OF INELASTIC MATRICES PAGE 1 OF 1 EXIT 1 11 кқ өз кк » (+ J = 1 3 4 13 14 GROUP ++ 8 10 7 5 15 12 16 2.97338E-03 7.81924E-02 4.06253E-01 1.09288E+00 1.13979E+00 8.65587E-01 3.41353E-01 1.07615E-01 3.25665E-02 7.33732E-03 0.65349E-04 1.45761--04 3.17992E-05 4.87155E-06 0.0 0.0 2.77328t-02 3.29078E-01 1.00061E+00 1.19037E+00 9.77766E+01 4.04790E+01 1.30261E+01 3.97445E+02 9.05673E+03 1.05069E+03 2.30912E+04 5.04506E+05 9.96910E+06 0.0 0.0 0.0 1.880049E=01 9.69395E=01 1.11285E=00 1.00786E=00 4.66643E=01 1.63689E=01 5.00853E=02 1.16124E=02 1.65702E=03 3.65597E=04 #.00073E=05 1.71238=05 9.78225E=07 0.0 0.0 0.0 0.0 5.37935E-01 1.04688E+00 8.19443E-01 3.78749E-01 1.42537E-01 4.73118E-02 1.10644E-02 3.38986E-03 4.82782E-04 1.11264E-04 2.39564E-05 3.31321E-06 3.08068E-07 2.32807E-08 0.0 0.0 4.66980E-01 6.53334E-01 3.#7024E-01 1.30356E-01 4.35470E-02 1.22622E-02 4.33742E-03 9.90670E-04 2.#3071E-04 6.94173E=05 1.0##81E=05 2.06519:-06 5.##10E=07 2.3#195E-07 8.#3713E=08 0.0 2.64719±-01 3.891532-01 1.72515E-01 5.24761E=02 1.43581E=02 4.05981E=03 1.48258E=03 5.20137E=04 1.63271E=04 7.09789E=05 1.58540E=05 4.55002±-06 1.33196E=06 5.50442E=07 1.45026E=07 2.83740E=08 7.6322026-02 1.05032.-01 5.226532-02 1.37116E-02 3.83333E-03 1.30355E-03 5.08024E-04 2.04787E-04 8.48117E-05 4.08101E-05 1.235582-05 1.48671E-06 3.77375E-07 1.39142E-07 6.28817E-08 1.34027E-08 1.95412t-02 3.72191t-02 2.119212-02 4.64653E-03 1.02694E-03 2.66407E-04 9.74050E-05 4.31582t-05 1.98659E-05 8.37827E-06 2.16069t-06 4.89426t-07 1.68074E-07 1.04943E-08 5.97666E-09 0.0 9.25623E-03 8.73216E-03 4.50586E-03 2.25654E-03 7.99794E-04 3.13730E-04 1.30723E-04 5.62902E-05 2.84728E-05 5.04456E-06 5.32031E-07 2.33680E-08 9.67925E-09 2.57762E-09 0.0 0.0 10 5.66504±-03 6.02381±-03 1.98667E-03 5.58594E-04 2.55921E=04 1.19679±-04 5.58096E=05 2.59470E=05 1.20635E=05 4.88397E=06 0.0 0.0 0.0 0.0 0.0 0.0 11 0.0 J.0 4.41203L-03 5.16134t-03 0.0 0.0 5.0 0.0 0.0 6.J 6.0 0.0 0.0 0.0 0.0 12 6.773086-04 4.04365,-03 2.01669E-03 7.15748E-04 3.34271E-04 1.54044c-04 7.21004E-05 3.28707t-05 1.44266E-05 8.83556E-06 0.0 0.0 0.0 0.0 0.0

MAT NUMBER = 4905

IPL =

NUCLID

## Fission products due to fission of 235U with thermal neutrons.

NUCLID = 925FP234 MAT NO = 2505 INFINITE DILUTION CROSS SECTION

### PAGE 1 OF 1

PAGE 1 OF 1

$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	Сн
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1 8,589062+00	0.0	0.0	1,91995E-03	4.52821E+00	4.05893E+00	0.0	3.39016E-01	1.44862E-01	1,69804E-02	0.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2 8,524271+00	0.0	0.0	9.06176L-03	4.43458E+00	4,08063E+30	0.0	2,90075E-01	1.32715E-01	8,92878E-02	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3 9 795786+00	C.U	0.0	2.75230E-02	5.83194E+00	3.936226+30	0.0	2.69444E-01	1,704256-01	1,799386-01	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	4 1.12/974+01	0.0	0.0	5,48007E-02	8.42684E+00	2.79802E+0C	0.0	2,35798E-01	2,01892E-01	2,58407E-01	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	5 1,276071+01	0.0	0.0	7,466256-02	1,11004E+01	1,58559E+00	0.0	1.92798E-01	2.94509E-01	2,02345E=01	0.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	6 1 375201+01	0.0	0.0	9,64073E-02	1,29973E+01	6.58337E-01	0.0	1.532766-01	3,03195E-01	2,38821E-01	0,0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	7 1,503716+01	0.0	0.0	1,27#63E-01	1.47051E+01	2,041326-01	0.0	1,05915E-01	3.605548-01	2,36821E-01	0.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	8 1.65424E+01	0.0	0.0	1,753466-01	1.62956E+01	7,14358E-02	ċ.o	6.21994t-02	4.098626-01	2,38821E-01	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	9 1,741146+01	0.0	0.0	2,653522-01	1.71263E+01	1.970058-02	0.0	3.48082E-C2	3.93633E-01	2,63825E-01	0.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10 1.810161+01	0.0	0.0	+.22010E-01	1.77499E+01	9.640728-03	0.0	1.90244E-02	4.04106E-01	2.65782E-01	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	11 2.00934±+01	0.0	0.6	6,60619E=01	1.94275E+01	5.27077E-03	0.0	1.11492E-02	4.43404E-01	2,63739E-01	0.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	12 2,40288:+01	0.0	0.0	1.008621+00	2.30157E+D1	4.44316E-03	0.0	7.229628-03	5.14530E-01	2.63825E-01	0.0
14         3:00040±+01         0.0         5.3270E+03         5.77032E+01         2.63739E+01         0.0         5.32770E+03         5.77032E+01         2.63739E+01         0.0         5.27732E+03         6.9905E+01         2.63739E+01         0.0         5.27732E+03         6.9005E+01         2.63739E+01         0.0         5.12752E+03         6.07987E+01         2.65782E+01         0.0         5.14574E+03         5.3570E+01         2.63739E+01         0.0         5.43739E+01         0.0         5.43739E+01         2.63739E+01         0.0         5.43739E+01         0.0         5.43739E+01         0.0         5.43739E+01         0.0         5.43739E+01         0.0         5.43739E+01         0.0         5.4472E+03         0.005E+03         5.63739E+01         0.0         5.43739E+01         0.0         5.4052E+03         5.0054E+03         5.03739E+01         0.0         5.4052E+03         5.0452E+01         0.0         5.4052E+03         5.0452E+01         0.0         5.4052E+03         5.0452E+01         0.0         5.4052E+03	13 2.57678E+01	0.0	0.0	1.564941+00	2.42029E+01	0.0	0,0	5.79164E-03	5.41352E-01	2.65782E-01	0.0
15         3,95941±01         0.0         0.4         3,95941±01         0.0         0.4         3,95941±01         0.0         0.4         3,95941±01         0.0         0.4         3,95941±01         0.0         0.4         3,95941±01         0.0         0.4         3,27732±03         6,99405±01         2,0325701         0.0         0.0         5,17141±03         6,77971±01         2,63735±01         0.0         0.0         5,14054±03         0.0         5,14054±03         0.0         5,14054±03         0.0         5,14054±03         0.0         5,14054±03         0.0         5,14054±03         0.0         5,14054±03         0.0         5,14054±03         0.0         0.0         1,147450         0.07871±01         2,63739±01         0.0         0.0         5,14054±03         0.0211±03         2,3570E=01         2,63739±01         0.0         0.0         5,43735±03         0.62711±03         2,3570E=01         0.05782E=01         0.0         0.0         5,43825±01         0.0         0.0         4,23057±03         0.0561±02         2,63739±01         0.0         0.0         4,23057±03         0.6264±01         2,61734±03         0.0564±01         2,63735±01         0.0         0.0         4,23057±03         0.0564±02         0.07574±01         0.07574±01         0	14 3,00040E+01	0.0	0.0	2,368441+00	2.76356E+01	0.0	0.0	5.34270E-03	5,77032E-01	2,63739E-01	0.0
16         5,84154±01         0,0         5,0         5,17417±03         6,07987E=01         2,65782E=01         0           17         5,62596±01         0.0         0,177*65±314         0,10         0.0         5,145745±03         5,357149E=01         2,63739E=01         0           18         3,65926±01         0.0         0.0         1,277*65±31         0,10         0.0         5,43791E=03         2,33739E=01         0         0         5,43791E=03         5,335716=01         2,33329E=01         0         0         0         5,43791E=03         5,335716=01         2,34325E=01         0,0         0         5,4435E=03         0,211E=01         2,63739E=01         0         0         0         5,4435E=03         0,2121E=01         2,63739E=01         0         0         0         5,4435E=03         0,2121E=01         2,63739E=01         0         0         0         5,4435E=03         0,025782E=01         0,00         2,0374E=03         2,0257E=03         5,0456E=01         2,63739E=01         0         0         0         0         4,93735E=01         0,00         4,93735E=01         0,00         4,93735E=01         0,00         4,93735E=01         0,00         4,93735E=01         0,00         2,37375E=01         0,33492E=01         0,00<	15 3,95941&+01	0.0	0.0	4,39196L+00	3.519516+01	0.0	0.0	5.27732E-03	6,99405E-01	2.63825E-01	0.0
17         5:652964+01         0.0         5:57199E-01         2:63739E-01           18         3:652964+01         0.0         5:40546+01         0.0         5:40546+01         2:40739E-01           18         3:652964+01         0.0         5:40546+01         0.0         5:43739E-01         2:47346E+01         0.0         5:43739E-01         2:47346E+01         0.0         5:43739E-01         2:47346E+01         0.0         5:43739E-01         2:47240         3:425641         0.0         5:43739E-01         2:4325E-01         0:0         5:43735E-02         3:6252610         2:47240         2:47240         0:0         5:43735E-03         3:62211E-01         2:65782E-01         0:0         2:23057E-03         3:6264E-01         2:65782E-01         0:0         2:6782E-03         4:6264E-01         2:63739E-01         0:0         2:23057E-03         3:6264E-01         2:65782E-01         0:0         2:63825E-01         0:0         2:23057E-03         3:0456E-01         2:65782E-01         0:0         2:23057E-03         3:6264E-01         2:65782E-01         0:0         2:63825E-01         0:0         2:63825E-01         0:0         2:65782E-01         2:65782E-01         0:3582E-01         2:65782E-01         2:65782E-01         2:65782E-01         2:63739E-01         2:63739E-01	16 5.881544+01	0.0	0.4	0.23200E+00	5.05833E+01	0.0	0.0	5,17417E-03	6.07987E-01	2.65782E-01	0.0
18         3,65926+01         0.0         5,437912+03         5,335702-01         2,634252+01         0.0         5,437912+03         5,335702-01         2,634252+01         0.0         5,437912+03         5,335702-01         2,634252+01         0.0         0.0         5,437912+03         5,335702-01         2,634252+01         0.0         0.0         5,443521+03         5,355702-01         2,634252+01         0.0         0.0         5,443521+03         3,00456201         2,637392-01         0.0         0.0         5,443521+03         5,6626201         2,637392-01         0.0         0.0         4,923252-03         4,6626201         2,637392-01         0.0         2,2373412+01         0.0         0.0         4,923252-03         4,6626201         2,6718252-03         0.05626201         2,637392-01         0.0         2,2373421-03         4,623221-03         4,62562201         2,6718252-01         0.0         3,633252-01         0.0         2,671822-03         4,637322-01         2,671822-01         2,671822-01         2,671822-01         0.0         3,633252-03         4,6373322-01         2,671822-01         0.0         3,633252-03         4,6373322-01         2,671822-01         0.0         3,237772-01         2,638252-01         0.0         5,712662-03         3,2327722-01         2,638252-01         0.0	17 5.652961+01	0.0	0.0	1.277465+31	4.37548E+01	0.0	0.0	5.10054E-03	5.57199E-01	2,63739E-01	0.0
19         6:19002±+01         0.0         5,44856±-03         3,02211E=01         2,5782E=01         0           20         1,20066±02         0.0         0.0         5,44856±-03         3,02211E=01         2,6782E=01         0           20         1,20066±02         0.0         0.0         5,23057E=03         3,0625E=01         2,67339E=01         0           21         1,41666±02         0.0         0.0         1,0060r±+02         4,10579E±01         0.0         0.0         4,92325E=03         4,66266E=01         2,63339E=01         2,67184E=01         2,677264E=03	18 3.65926E+01	0.0	0.0	1.50404E+01	2,15524E+01	ύ, ΰ	0.0	5.437916-03	5.35570E-01	2.63825E-01	0.0
20 1,200664+02 0,0 0,0 0,0 4,9177±-01 7,61493€+01 0,0 0,0 5,23057±-03 3,00456E+01 2,63739E+01 0,0 21 1,41666±+00 0,0 0,0 4,92325±-03 4,6256E+01 2,63739E+01 0,0 22 2,93141±+01 0,0 0,0 1,71971±+01 1,21204±+01 0,0 0,0 5,8054E+03 2,67184E+01 2,65782E+01 0,0 23 5,863825±+01 0,0 0,0 4,58307±+01 0,0 0,0 5,8139E+01 2,63739E+00 1,0 24 6,33492±+01 0,0 0,0 5,8139E+03 2,73373E+00 1,2375±+01 0,0 0,0 5,8139E+03 2,73732E+01 2,63739E+00 1,0 0,0 5,71256E+03 3,23277E+01 2,63825E+01 0,0 0,0 0,0 5,71256E+03 3,230277E+01 2,63825E+01 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0	19 6,19002++01	0.0	0.0	2,24910E+01	3.94C84E+01	0.0	0,0	5.44856t-03	3.02211E-01	2,65782E-01	0.0
21         1 41665702         0.0         0.0         4.92325E-03         4.66266E-01         2.93425E-03         4.66266E-01         2.93425E-03         4.66266E-01         2.93425E-03         4.66266E-01         2.93425E-03         4.66266E-03         2.67188E-01         2.63325E-03         0.0         5.86054E-03         2.67188E-01         2.63735E-01         0.0         0.0         5.86054E-03         2.67188E-01         2.63735E-01         0.0         0.0         5.8189E-03         2.67188E-01         2.63735E-01         0.0         0.0         5.8189E-03         2.67335E-01         2.63735E-01         0.0         0.0         5.8189E-03         2.67335E-01         2.63735E-01         0.0         0.0         5.71266E-03         2.7335E-01         2.63727E-01         2.637277E-01         2.637277F-01         2.637277F-01<	20 1,200662+02	0.0	0.0	4,19177±+01	7.61483E+01	0.0	0.0	5,23057E-03	3,00456E+01	2,63739E-01	0.0
22 2;93141±+01 0,0 0,7 1,71971±+01 1,21204±+01 0,0 0,0 5,80054E-03 2,67188E-01 2,65782E-01 0 25 5,86382E+01 0,0 0,0 4,63807±+01 1,22575±+01 0,0 0,0 5,81385±-03 2,63735E-01 2,63735E-01 0,0 24 6,33492±+01 0,0 0,0 0,0 4,88574±+01 1,44918E+01 0,0 0,0 5,77266E-03 3,23277E=01 2,63825E-01 0,0 25 7,03700±+01 0,0 0,0 0,0 5,7265E-03 3,23277E=01 2,63825E-01 0,0	21 1,41866E+02	0.0	0.0	1,006071+02	4.10579E+01	0.0	0.0	4.92325E-03	4.66266E-01	2,63825E-01	0.0
23 5,86382E+01 0,0 0,0 4,63807E+01 1,22575E+01 0,0 0,0 5,81389E-03 2,78332E-01 2,63739E-01 0 24 6,33492E+01 0,0 0,6 4,88574E+01 1,44918E+01 0,0 0,0 5,77266E-03 3,23277E-01 2,63825E-01 0 25 7,03700E+01 0,0 0,0 5,7 5,24072E+01 1,79528E+01 0,0 0,0 7,78565=03 3,2938E+01 2,65782E+01 0	22 2,931416+01	0.0	0.0	1,7193/E+01	1.21204E+01	0.0	0.0	5.86054E-03	2.67188E-01	2,65782E-01	0.0
24 6.33492±+01 0.0 0.0 0.0 2.6 4.28574±+01 1.449185+01 0.0 0.0 5.77266E-03 3.23277E-01 2.638252E-01 0.0 2.7.03700±+01 0.0 0.0 5.24972±+01 1.39528E+01 0.0 0.0 7.75856E=03 5.259281E+01 2.65782E+01 0.0	23 5.86382E+01	0.0	0.0	4.63807E+G1	1.225756+01	0.0	0.0	5.81389E-03	2.78332E-01	2.63739E-01	0.0
25 7.03700E+01 0.0 0.0 5.24072E+01 1.79628E+01 0.0 0.0 7.75856E-03 3.92938E-01 2.65782E-01 0	24 6 334926+01	0.0	0.6	4.86574L+01	1.44918E+01	0.0	0.0	5.772668-03	3.23277E-01	2,63825E-01	0.0
	25 7.03700L+01	0.0	0.0	5.24072E+01	1,79628E+01	0.0	0.0	7.75856E-03	3,92938E-01	2,65782E-01	0.0

NUCLID = 925+234 MAT NUMBER = 2505 IPL = 0

#### TABLE OF INELASTIC MATRICES

								PAGE	1 OF 1	
GROUP	U= 1 J= 1 11	GROUP ** KK 2 12	. ++* KK ≕   3 13	+ J - 1 4 14	5 15	6 16	7	ಕೆ	9	10
1	1.63033E-0	13 7.69400E=02	3.96949E-01 2.68603E-05	1.08581E+00 3.98838E-06	1.13737E+00 0.0	8.65173E-01 0.0	3.41596E-01	1.077721-01	3.27285E-02	7.35615E-03
2	2.38396t-0	2 3.296711-01	1.00609E+UU	1,18540E+00	9.63608E-01	3.962636-01	1.270016-01	3,880692-02	d.81138E-03	8.91915E-04
з	1.738391-0	1 9.737818-03	1.118621+00	9.88609E-01	4.55154E-01	1.62736E-01	4.99646E-02	1.15476E-02	1,54260E-03	3.40264E-04
4	7.44423E-0	5 1.593398-05	1.18375L-06	U.0	0.0	0.0	1 031615 03	2 25 2045 -04		
5	2.25304c-0	5 3./24961-05	3.98754E-07	3.93/09E-04	0.0	0.0	1.021916-02	3,233482-33	4.3/2226-04	1.043312-04
6	4.06497E-0 0.56147E-0	1 7.03/3/2-01 6 1./2/292-06	3.04842E-01 5.46710E-07	1.15276E-01 3.05983E-07	3.82630E-02 1.15460E+07	1.12636t-02 0.0	4.24105E-03	1.062981-03	2.94991E-04	1.007791-04
	∠.26410c-0 ⊥.10126E-0	11 2.76550E-01 15 3.06450r-06	1.05174E-01 4.11-31E-07	3.37662E-02 3.26063E-07	1.07737E-02 8.99387E-08	3.56364E-03 5.47691E-09	1.354826-03	5.07J31E-04	1.51121E-04	6.22104E-05
7	6.26455E-0 7.04296E-0	2 9.20/986=02 6 1.02643/+06	J.80320E-02	1.66105E-03	2.34677E-03 5.29388E-08	8.28358L-04	3.155658-04	1.30677E-04	5.61648E-05	2.75270E-05
8	1.52297E-0	2 3.208946-02	1.85705E-02	4.049758-03	8,44553E=04	2.04932E-04	8.252592-05	3.74711E-05	1.71618E-05	7.23845E-06
9	2.92538L-0	18 4.31918; -07 13 0.41662c=03	4.101572-03	2.09376E-03	6.32173E-04	2.77296E-04	1.19199E-04	5.22029E-05	2.63261E-05	5.41583E-06
10	2.25746t-C	7 5.45160c-09	1.5150746-09	4.13766E-10	0.0	0.0	4 013326-05	1 955146-05	\$ 5070) F-04	3 954145-04
11	0.0	0.0	0,U	u.0	0.0	0.0	41013322-03	1.077102-07	913010IE-08	51756142-08
12	2.42911±-ü J.0	3 2.3416503 0.0	0.0 0.0	u.0 u.0	0.0	0.0	0.0	0.0	0.0	0.0
	J.72935E-0 ∪.0	4 2,2262903 0.0	1.11043c-03 0.0	3.94065E-04 0.0	1.84038E-04 0.0	8,46110E-05 0.0	3.90959E-0>	1,009756-05	7,94275L-06	4.86454E-06

Fission products due to fission of  $^{\mbox{238}}\mbox{U}$  with fission spectrum neutrons.

NUCLID = 928FP237 MAT NO = 2805 INFINITE DILUTION CROSS SECTION

								1405 1 01	-	
GROUPTOTAL	FISSION	NU	CAPTORE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CH
1 8.604606+00	0.0	0.0	2.41976E-03	4.53776E+00	4.06442E+00	0.0	3.74373E-01	1,403346-01	1,69804E-02	0.0
2 8.556516+00	0.0	0.0	1,20946L-02	4.44495E+00	4.09948E+00	6.0	3.14116E-01	1.28744E-01	8,92878E-02	0.0
3 9.839466+00	0.0	0.0	3.44573=-02	5.84359E+00	3.96091E+00	0.0	2.90726E=01	1.64266E-01	1.79938E-01	0.0
4 1.14044c+01	0.0	0,0	6.649202-02	5.40984E+00	2,92809E+00	0.0	2,60897E-01	1,92709E-01	2,58407E-01	0.0
5 1.29037±+01	0.0	0.0	3.02000L-02	1.10359E+01	1.77756E+00	0.0	2.19058E-01	2,79546E-01	2,02345E-01	0,0
6 1.38503c+01	0.0	0.0	1,187106-01	1,29050E+01	0.26570E-01	0.0	1,76128E-01	2.90311E-01	2,38821E-01	0,0
7 1.509268+01	0.0	0.0	1.671146-01	1,46790E+01	2.46640E=01	0.0	1.24053E-01	3,48889E-01	2,38821E-01	0.0
8 1.65310±+01	0.0	0.0	2.32745E-01	1.62110E+01	8,72238E-02	0.0	7.33406E-02	3,97195±-01	2.38821E-01	0.0
9 1.73870±+01	0.0	0.0	3.532136-01	1,70054E+01	2.83724E-02	0.0	4.07787E-02	3.81974E-01	2,63825E-01	0.0
10 1.821116+01	0.0	0.0	5.57090E-01	1.76364E+01	1.762916-02	0.0	2,16813E-02	3,93841E-01	2.65782E-01	0.0
11 2.01093E+01	0.0	0.0	6.57957E-01	1,92398E+01	1.15336E-02	0.0	1.22576E-02	4,31666E-01	2.63739E-01	0.0
12 2.382186+01	0.0	0.0	1,29050L+00	2,25215E+01	9.72259E-03	0.0	7.636146-03	4,97835E=01	2,63825E-01	0.0
13 2.593996+01	0.0	0.0	1.972896+00	2.39670E+01	0.0	0.0	5.86862E-03	5,272596-01	2.65782E-01	0.0
14 3.044576+01	0.0	6.5	2.99796E+00	2,74477E+01	0.0	0.0	5.351956-03	5,73933E=01	2.63739E-01	0.0
15 4.122308+01	0.0	0.0	5.44593E+00	3.57771E+01	0.0	0.0	5.24482t-03	7,00636E-01	2.63825E-01	0.0
16 5.833221+01	0.0	6.0	9.299222+00	4.84330E+01	0.0	0.0	5.15678E-03	6.14436E-01	2.65782E-01	0,0
17 5.603+56+01	0.0	0.0	1.464166+01	4,13929E+01	0.0	0.0	5.16792E-03	5,66842E-01	2,63739E-01	0.0
18 4,49581E+01	0.0	6.0	2.0176+E+01	2.47815E+01	0.0	0.0	5,29648L-03	5,43081E-01	2,63825E-01	0.0
19 7.10496E+01	0.0	0.0	3.00650E+01	4.09838E+01	0.0	0.0	5.36472E-03	3.47009E-01	2,65782E-01	0.0
20 1.60306E+02	0.0	0.0	5.98027E+01	1,00503E+02	0.0	0.0	5.19023E-03	3,21838E-01	2,63739E-01	0,0
21 1.805806+02	0.0	6.0	1.25277c+02	5,53032E+01	0.0	0.0	4,78952E-03	6.56753E-01	2.63825E-01	0.0
22 3.588965+01	G.U	0.0	2.36267E+01	1,22629E+01	0.0	0.0	5.70274E-03	2.64884E-01	2.65782E-01	0.0
23 1.060585+02	0.0	0.0	9.36400E+01	1.24180E+01	0.0	0.0	5.73679E-03	2,73204E-01	2,63739E-01	0.0
24 1.023646+02	0.0	0.0	a.50700E+01	1,72944E+01	0.0	0.0	5.81154E-03	3.85414E-01	2,63825E-01	0.0
25 1.00182E+02	0.0	0.è	8.30504E+01	1.71319E+01	0.0	0.0	8.101196-03	3.79145E-01	2.65782E-01	0.0

NUCLID = 928FP237 MAT NUMBER = 2805 IPL = 0

TABLE OF INELASTIC MATRICES

PAGE 1 OF

EXIT GROUP ++ KK 4\* KK = 1 + J = 1 J= 1 2 3 ++ 11 12 13 14 7 8 10 6 16 15 1.34064E-03 7.74427E-02 3.94723E-01 1.09049E+00 1.13918E+00 8.66203E-01 3.41880E-01 1.07832E-01 3.26721E-02 7.35600E-03 0.34046E-04 1.389022E-04 3.03030E-05 4.61862E-06 0.0 0.0 2:63041E-02 3:20075E-01 1:00105E+00 1:18016E+00 9:73516E-01 4:02421E-01 1:29378E-01 3:95008E-02 8:99199E-03 1:00191E-03 2:20190E-04 4:81080E-05 9:50273E-06 0:0 0:0 0:0 1.424392-01 9.69804E-01 1.11608E+00 1.00239E+00 4.63147E=01 1.63316E=01 5.00615E=02 1.15964E=02 1.62083E=03 3.57597E=04 /.82506E=05 1.67485E=05 1.66426E=06 0.0 0.0 0.0 5.107676-01 1.018162+00 8.12174E-01 3.(55802-01 1.41541E-01 4.68765E-02 1.09783E-02 J.37480E-03 4.73355E-04 1.10374E-04 2.36299E-05 3.64659E-06 3.32164E-07 2.96317E-08 0.0 U.U 5 4.51802E-01 8.04170;-01 3.34867E-01 1.26620E-01 4.22682E-02 1.19760E-02 4.29643E-03 1.01111E-03 2.58158E-04 7.83681E-05 9.61374E-06 1.93559F-06 6.47745E-07 2.89025E-07 1.09061E-07 0.0 2.59159£-01 3.528602-01 1.49040E-01 4.59167E-02 1.34475E-02 3.88872E-03 1.45365E-03 5.31789E-04 1.63575E-04 6.96019E-05 1.44576E-05 4.20063:-06 1.25427E-06 5.25307E-07 1.27958E-07 2.06074E-08 /.63030E-02 1.05434E-01 4.60129E-02 1.15645E-02 3.40008E-03 1.14874E-03 4.31584E-04 1.73945E-04 7.29983E-05 3.53541E-05 ..04931E-05 1.41219E-06 3.95177E-07 1.49936E-07 6.61630E-08 1.41021E-08 2.02779£-02 3.36521E-02 2.20465E-02 4.76447E-03 1.03780E-03 2.6338E=04 1.004606E-04 4.50363E-05 2.05968E-05 8.64608E-06 2.1659E=06 4.67320E=07 1.1747E=07 4.99948E=09 2.59674E=09 0.0 1.02912E-02 9.36633E-03 4.76540E-03 2.50472E-03 8.59850E-04 3.32256E-04 1.36543E-04 5.84326E-05 2.90794E-05 5.90314E-06 0.63729E-07 1.71664-09 6.49021E-09 1.72836E-09 0.0 0.0 1v v.75624E-03 7.23671E-03 2.35326E-03 5.83633E-04 2.68635E-04 1.24990E-04 5.83137E-05 2.67778E-05 1.20808E-05 6.48775E-06 u.0 0.0 0.0 0.0 0.0 11 0,0 0,0 0.0 0.0 0.0 0.0 0.31541E-03 6.21614E-03 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 12 ø,1m0b2E=04 4.871605=03 2.42966E=03 0.62300E=04 4.02715E=04 1.85585E=04 8.66632E=05 3,96011E=05 1.73804E=05 1.06447E=05 0.0 0.0 0.0 0.0 0.0 0.0

### Fission Product Fast Reactor Constants System of JNDC

Fission products due to fission of  $^{239}\mathrm{Pu}$  with thermal neutrons.

NUCLID = 949FP237 MAT NO = 4905 INFINITE OILUTION CROSS SECTION

								PAGE 1 OF	2	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CHI
1 8.86707E+00	0,0	0.0	1,124848-03	4,89804E+00	3.96791E+00	0.0	4,14486E-01	2.47999E-01	3,73649E-03	0,0
2 8.54622E+00	0,0	0.0	2,96876E-03	4,45485E+00	4,08840E+00	0.0	3,82676E-01	2.26324E-01	1,32440E-02	0.0
3 8,37588E+00	0.0	0,0	7,63398E-03	4.28027E+00	4.08798E+00	0.0	3,40937E-01	2.20484E-01	3.16559E-02	0.0
4 8.66400E+00	0.0	0.0	1,59064E-02	4,52285E+00	4.12524E+00	0.0	3,17056E-01	2,33372E-01	5,76319E-02	0.0
5 9.44637E+00	0,0	0.0	2,79680E-02	5,33388E+00	4.08452E+00	0.0	3,06154E-01	2.57657E-01	8,84748E-02	0.0
6 1.02404E+01	0.0	0,0	4,50856E-02	6,33072E+00	3,86459E+00	0.0	2,96458E-01	3,61073E-01	9.14632E-02	0,0
7 1,10904L+01	0.0	0,0	6.12718E-02	7,65987E+00	3,36927E+00	0.0	2.828202-01	3.51960E-01	1.26293E-01	0.0
8 1,18319E+01	0,0	0,0	7,54146E-02	9,12422E+00	2,63231E+00	0,0	2,64831E-01	3,80583E-01	1,321148-01	0,0
9 1.26638E+01	0.0	0,0	8,66353E-02	1.04113E+01	2,16590E+00	0.0	2.44063E-01	5,63154E-01	9.18870E-02	010
10 1,32337E+01	0.0	0,0	9.49591E-02	1,155268+01	1,586148+00	0.0	2,236818-01	5,01833E-01	1,10458E-01	0,0
11 1.35602E+01	0.0	0,0	1.07956E-01	1,23009E+01	1,15137E+00	0.0	2.07945E-01	7,29530E-01	8.23092E-02	0,0
12 1.39138E+01	0.0	0,0	1,21326E-01	1.28427E+01	9,49793E=01	0.0	1,93161E-01	8,09926E-01	7,96285E-02	0.0
13 1.41089E+01	0.0	0,0	1.36299E-01	1,33948E+01	5,77783E-01	0.0	1.75872E-01	8,98655E-01	7.688318-02	0,0
14 1,45309E+01	0.0	0,0	1.57995E-01	1,40102E+01	3,626668=01	0.0	1,551578-01	8,471552-01	8.782208-02	0,0
15 1.49694E+O1	0.0	0,0	1,82730E-01	1.45707E+01	2,15954E=01	0.0	1,34479E-01	1.06047E+00	7,41157E-02	0.0
16 1.53848E+01	0.0	0.0	1.99699E-01	1.50205E+01	1.64593E=01	0.0	1,158948-01	1,07343E+00	7.688328-02	0,0
17 1.58799E+01	0,0	0.0	2,25443E-01	1.55424E+01	1,120678-01	0,0	9,50273E-02	8,80056E-01	9,91197E-02	0,0
18 1.63612E+01	0.0	0.0	2.57947E-01	1.60341E+01	6,91575E-02	0.0	7.643698-02	1,184422+00	7.688328-02	0.0
19 1.68012E+01	0.0	0.0	2,87477E-01	1,64556E+01	5,81378E-02	0.0	6,48732E=02	1,49812E+00	6,28182E-02	0,0
20 1,70404E+01	0.0	0.0	3,26371E-01	1.66725E+01	4,15738E-02	0.0	5.45162E-02	1,08383E+00	8+87124E-02	0.0
21 1,71793E+01	0.0	0.0	3.81692E-01	1.67785E+01	1,907658-02	0,0	4,400108-02	1,09934E+00	8,84409E+02	0,0
22 1.73956E+01	0.0	0.0	4,435458-01	1.69346E+01	1.74147E-02	0.0	3,54615E-02	1,13613E+00	8.66716E-02	0.0
23 1,75950E+01	0,0	0,0	5,14529E-01	1,70629E+01	1,757548-02	0,0	2,87104E-02	1,12588E+00	8.61807E-02	0,0
24 1.78769E+01	0.0	0.0	5,96249E-01	1,72643E+01	1.63358E-02	0.0	2,32612E-02	1,12673E+00	8.90592E-02	0,0
25 1.85304E+01	0.0	0.0	6,88500E-01	1,78317E+01	1,021928-02	0.0	1.87973E-02	1,17250E+00	8,85424E-02	0,0
26 1,90735E+01	0.0	0.0	7,914298-01	1.82731E+01	8,92559E-03	0.0	1.54507E-02	1,19084E+00	8,91168E-02	0.0
27 1.97177E+01	0,0	0.0	9,03348E=01	1,68047E+01	9,63438E-03	0,0	1.29267E-02	1,25272E+00	8.68860E-02	0.0
28 2:05449E+01	0.0	0.0	1.02658E+00	1.95081E+01	1.01709E-02	0.0	1.09546E-02	1,28140E+00	8.77359E-02	0.0
29 2.15553E+01	0,0	0,0	1,16743E+00	2.03776E+01	1.03044E-02	0.0	9,35768E-03	1.32154E+00	8,87124E=02	0.0
30 2.36163E+01	0.0	0,0	1,33135E+00	2,22757E+01	9.29679E-03	0.0	7.88139E-03	1,45030E+00	8.844092-02	0.0
31 2,42820E+01	0.0	0.0	1,49860E+00	2,27789E+01	4.531778-03	0.0	6.92667E-03	1,49798E+00	8,66716E=02	0.0
32 2,34847E+01	0,0	0,0	1,69049E+00	2,17942E+01	0.0	0,0	6,27124E-03	1,41183E+00	8,81807E-02	0.0
33 2,54513E+01	0.0	0,0	2,07366E+00	2.33776E+01	0.0	0.0	6.18596E-03	1,60862E+00	8,90592E-02	0.0
34 2.66881E+01	0,0	0,0	2,25851E+00	2,442962+01	0.0	0.0	5,46163E-03	1,54202E+00	8,85424E-02	0.0
35 2.96041E+01	0.0	0.0	2.57529E+00	2,70288E+01	0.0	0,0	5,31714E-03	1,69377E+00	8,91169E-02	0,0

TO BE CONTINUED

#### NUCLID = 949FP237 MAT NO = 4905 INFINITE DILUTION CROSS SECTION

								PAGE	2 OF	2	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL R	EMOVAL	FLUX	сні
36 2+88410E+0	1 0.0	0,0	3.03514E+00	2.58059E+01	0,0	0.0	5.40837E-03	2,235	58E+00	8.68860E-02	0.0
37 3.00634E+0	1 0.0	0,0	3,41364E+00	2.66498E+U1	0,0	0.0	5.34446E+03	1,546	52E +00	8,77359E-02	0.0
38 3.32295E+0	1 0.0	0.0	4.43637E+00	2,87931E+01	0.0	0.0	5.28409E-03	2,092	50E+00	8.87124E-02	0.0
39 5.08463E+0	1 0.0	0,0	5.46262E+00	4,53837E+01	0,0	0,0	5,14560E-03	2,432	96E+00	8,84409E-02	0.0
40 3.52421E+0	1 0.0	0,0	6.04065E+00	2.92014E+01	0.0	0.0	5.42236E-03	1.756	57E+00	8.66716E-02	0.0
41 6.37000E+0	1 0.0	0,0	8.81925E+00	5.48807E+01	0,0	0.0	5,17539E-03	3,686	39E+00	8.81807E-02	0.0
42 5.38398E+0	1 0.0	0,0	1,03081E+01	4.353172+01	0.0	0.0	5,199918-03	1,9670	01E+00	8,905928-02	0.0
43 5.08279E+0	1 0.0	0,0	1,00962E+01	4.07317E+01	0.0	0.0	5,10227E-03	2.099	10E+00	8,81424E-02	0,0
44 5.12132E+0	1 0.0	0,0	1,11805E+01	4.00327E+01	0,0	0.0	5.07545E-03	1,1650	07E+00	8.91169E-02	0.0
45 5.02059E+0	1 0.0	0.0	1,18350E+01	3.83709E+01	0.0	0.0	5,11040E-03	1,557.	15E+00	8,68860E-02	0.0
46 6,20141E+0	1 0.0	0.0	1,91450E+01	4,28691E+01	0.0	0.0	5.30190E-03	1.568	74E+00	8.77359E-02	0,0
47 4,34241E+0	1 0.0	0,0	1,74760E+01	2.59481E+01	0.0	0.0	5,417068-03	1,548;	18E+00	8.87124E-02	0.0
48 4.54408E+0	1 0.0	0.0	2.09218E+01	2,45190E+01	0,0	0.0	5.30062E-03	1.573	41E+00	8.84408E-02	0.0
49 4,386472+0	1 0.0	0,0	2,12560E+01	2,26087E+01	0,0	0.0	5.36783E-03	1,5250	05E+00	8.66716E-02	0.0
50 1,231402+0	2 0.0	0.0	4,66889E+01	7,64508E+01	0.0	0.0	5.320048-03	1,3464	\$7E+00	8.81807E-02	0,0
51 5.33207E+0	1 0.0	0,0	2,67516E+01	2.65691E+01	0.0	0,0	5.75589E-03	1.530	58E+00	8.90592E-02	0.0
52 3,61602E+0	1 0.0	0.0	2.09532E+01	1.52070E+01	0.0	0.0	5.57104E-03	9,560	33E-01	8,85424E-02	0.0
53 4.48193E+0	1 0.0	0.0	2,38869E+01	2.09324L+01	0.0	0.0	5,31598E-03	1,549;	20E+00	8.91169E-02	0.0
54 4.20943E+0	2 0.0	0.0	1,41358E+02	2,79585E+02	0,0	0.0	5,15869E-03	2,3280	00+34C	8.68860E-02	0.0
55 3,921778+0	1 0.0	0.0	2.02048E+01	1.90129E+01	0.0	0.0	5.43943E-03	9.1421	54E-01	8,77360E-02	0.0
56 1.00156E+0	2 0.0	0.0	4,38329E+01	5.63229E+01	0.0	0,0	4.68502E-03	2,977	27E+00	8.87124E=02	0.0
57 9.354318+0	1 0.0	0.0	6.15926E+01	3,19505E+01	0.0	0.0	4.93528E-03	2.2491	6E+00	8.84409E-02	0.0
58 3,53355E+0	2 0.0	0.0	2,85874E+02	6,74807E+01	0,0	0,0	4.95095E-03	9,590;	25E-01	8.66716E-02	0.0
59 4,90722E+0	1 0.0	0.0	3,62142E+01	1,28580E+01	0.0	0.0	5.60359E-03	7,874	86E-01	8,81807E-02	0.0
60 2,61640E+0	1 0.0	0.0	1,43703E+01	1,17937E+01	0.0	0.0	5.68960E-03	7,724	946-01	8,90592E-02	0,0
61 2.96079E+0	1 0.0	0.0	1,77438E+01	1,18641E+01	0.0	0.0	5.68923E-03	7,851	88E-01	8,85424E-02	0.0
62 3,90659E+0	1 0.0	0.0	2,70720E+01	1,19939E+01	0.0	0.0	5.69290E-03	7,913	17E-01	8,91168E-02	0.0
63 9.52445E+0	1 0.0	0.0	8.25973E+01	1,26472E+01	0.0	0.0	5.71528E-03	9.057	52E-01	8.68860E-02	0.0
64 1,90851E+0	2 0.0	0.0	1,78355E+02	1.24962E+01	0.0	0.0	5.65868E-03	8,0320	D1E-01	8.773598-02	0.0
65 1.37645E+0	2 0.0	0.0	1.244446+02	1,32009E+01	0.0	0.0	5.56155E-03	7.982	178-01	8.87124E-02	0.0
66 5.52638E+0	1 0.0	0.0	3,92830E+01	1.59808E+01	0.0	0.0	5.79017E-03	1.077	83E+00	8.84409E-02	0.0
67 8.35160E+0	1 0.0	0.0	5,17696E+01	3,17464E+01	0.0	0.0	6,02745E-03	2.271	87E+00	8,66716E-02	0.0
68 5.76354E+0	1 0.0	0.0	4.30003E+01	1.46351E+01	0.0	ō.0	5.53517E-03	9.488	23E-01	8.81807E-02	0.0
69 8.25823E+0	1 0.0	0.0	6.54252E+01	1.71571E+01	0.0	0.0	5.4442BE-03	1.085	67E+00	8.90592E-02	0.0
70 1,47442E+0	2 0.0	0.0	1,24870E+02	2,25719E+01	0.0	0.0	1.11140E-02	1,409	83E+00	8.85424E-02	0.0

	NUCLID = 949FP237 MAT NUMBER = 4905											
			TAB	LE OF INEL	ASTIC MATRI	CES		PAGE	1 OF 4			
GROUP J	EXIT J= 1 11 21 31	GROUP ## KK 2 12 22 32	** KK = 1 3 13 23 33	+ J - 1 4 14 24 34	5 15 25 35	6 16 26 36	7 17 27 37	8 18 26 36	9 19 29 39	10 20 30 40		
1	41 9,53861E-05 3,50071E-01 9,59234E-03 2,14128E-05	42 3,81477E=03 2,62484E=01 6,17522E=03 1,31401E=05	43 2,49383E=02 1,91467E=01 3,33358E=03 7,94534E=06	44 7,47103E-02 1,55373E-01 2.84664E-03 4,72141E-06	43 1,78977E-01 9,19405E-02 4,58828E-04 2,84000E-06	46 2,56540E-01 6,52302E-02 2,77791E-04 3,66204E-07	47 4.65553E-01 5.45920E-02 1.63317E-04 0.0	6.25929E-01 2.70305E-02 9.97899E-05 0.0	5.02154E-01 1.62302E-02 6.06785E-05 0.0	5.838888E-01 1.37989E-02 3.62661E-05 0.0		
2	0,0 1,42696E-03 2,87853E-01 6.89714E-03 1.70504E-05	0,0 1,74228E=02 2,11360E=01 3,76833E=03 1,03113E=05	0.0 5.72558E-02 1.72532E-01 3.14180E-03 6.12811E-06	0,0 1,53087E-01 1,02484E-01 5,93375E-04 3,68649E-06	2,35923E-01 7,30628E-02 3,59579E-04 1,55490E-06	0,0 4,52726E-01 6,13184E-02 2,11550E-04 0,0	0.0 6.38731E=01 3.04105E=02 1.29331E=04 0.0	5,25968E-01 1.81936E-02 7.86747E-05 0.0	6.26714E-01 1.56181E-02 4.70375E-05 0.0	3.80260E-01 1.07590E-02 2.77796E-05 0.0		
3	8,75010E-03 2,27753E-01 4,20439E-03 1,33705E-05 0,0	4,66142E=02 1,87468E=01 3,40001E=03 7,94725E=06 0,0	1.20695E-01 1.11981E-01 7.66321E-04 4.78134E-06 0.0	2,07384L-01 8,03719L-02 4,64871E-04 2,79743E-06 0,0	4.20814E-01 6.77337E-02 2.73717E-04 3.15429E-07	6,22391E-01 3,36798E-02 1,67441E-04 0,0 0,0	5.29918E-01 2.00656E-02 1.01907E-04 0.0 0.0	6.47700E-01 1.74391E-02 6.09504E-05 0.0	4.00876E-01 1.18820E-02 3.60068E-05 0.0	3.07359E=01 7.57801E=03 2.21050E=05 0.0		
4	2.52354E-02 2.04004E-01 3.74748E-03 9.94225E-06 0.0	1.42165E-01 1.22826E-01 9.54205E-04 5.98230E-06 0.0	1.86746E-01 9.09942E-02 5.79532E-04 3.50040E-06 0.0	3.78447L-01 7.52902E-02 3.41540E-04 1.62611E-06 0.0	5.97821E-01 3.75906E-02 2.09076E-04 0.0 0.0	5,28714E-01 2,23575E-02 1,27316E-04 0,0 0,0	6.64539E-01 1.96306E-02 7.61801E-05 0.0 0.0	4,21914E-01 1,32809E-02 4,50184E-05 0,0	3.29126E-01 8.44368E-03 2.76443E-05 0.0	2.45224E=01 4.74244E-03 1.67243E-05 0.0		
5	7,91251E-02 1,32681E-01 1,17085E-03 7,38145E-06 0,0	2.35898E-01 9.90183E-02 7.12082E-04 4.31953E-06 0.0	3,79799E-01 8.48660E-02 4,20098E-04 2,62994E-06 0,0	5,46960E-01 4,15245E-02 2,57373E-04 3,32724E-07 0,0	4,86390E=01 2,46795E=02 1,56826E=04 0,0 0,0	6.57338E-01 2.19084E-02 9.38834E-05 0.0 0.0	4.30096E-01 1.47295E-02 5.55011E-05 0.0 0.0	3,46516E=01 9,34050E=03 3,40912E=05 0,0	2,60955E-01 5,31375E-03 2,06293E-05 0,0	2,20335E-01 4,10227E-03 1,22659E-05 0,0		
6	1.07934E-01 1.12555E-01 9.81030E-04 5.97459E-06 0.0	4.44971E-01 9.73474E-02 5.79363E-04 3.64341E-06 0.0	5,52150E-01 4,98680E-02 3.55361E-04 1,20943E-06 0,0	4.62576E-01 2.87426L-02 2.16628E-04 2.97042E-07 0.0	6.07031E-01 2.79921E-02 1.29743E-04 9.61623E-08 0.0	3.95229E-01 1.72434E-02 7.66720E-05 0.0 0.0	3.21950E-01 1.08713E-02 4.71124E-05 0.0 0.0	2.50352E-01 6.32794E-03 2.85220E-05 0.0	2.16547E-01 4.67473E-03 1.69684E-05 0.0	1.46164E-01 1.61100E-03 1.02074E-05 0.0		
,	2.15672L-01 8.09522L-02 5.37213E-04 3.96470L-06 0.0	6.35147E-01 4.16706E-02 3.31641E-04 1.80554E-06 0.0	4,79159E-01 2,41970E-02 2,01911E-04 6,05611E-07 0,0	5.35146E-01 2.37152E-02 1.22099E-04 2.48357E-07 0.0	3,53348E-01 1,46160E-02 7,42534E-05 1,35545E-07 0,0	2.98326E-01 9.21157E-03 4.74420E-05 9.48535E-08 0.0	2.31724E-01 5.37017E-03 3.05072E-05 6.62304E-08 0.0	1.98904E-01 3.96478E-03 1.83538E-05 4.76346E-08	1.20916E-01 1.38823E-03 1.09592E-05 0.0	9.36121E-02 8.47014E-04 6.37038E-06 0.0		
U	2,66514E-01 3,83858E-02 4,72179E-04 2,65559E-06 0,0	4.91510E-01 2.20659E-02 2.88526E-04 1.21090E-06 0.0	5.79086E-01 2,18029E-02 1.72880E-04 4,62783E-07 0,0	3.44938E-01 1.56436E-02 1.02169E-04 1.52152E-07 0.0	2,36940E-01 9,29462E-03 6,32274E-05 9,96480E-08 0,0	1,72576E-01 5.67781E-03 3,88114E-05 6.72419E-08 0,0	1.60661E-01 3.98413E-03 2.35266E-05 0.0 0.0	1.02434E-01 2.87522E-03 1.38667E-05 0.0	8,06503E-02 1,08216E-03 7,97963E-06 0,0	7.42651E-02 7.26706E-04 4.65486E-06 0.0		
								TO BE	CONTINUED			
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			TAB	LE OF INEL	ASTIC MATRI	Es						
GROUP	EXIT	GROUP ** KK	** KK = 1	+ J = 1				PAGE	2 OF 4			
J	J= 1 11 21 31 41	2 12 22 32 42	3 13 23 33 43	4 14 24 34 44	5 25 35 45	6 16 26 36 46	7 17 27 37 47	8 18 28 38	9 19 29 39	10 20 30 40		
,	1,88824E-01 1,76299E-02 6,35280E-04 3,58879E-06 1,14279E-07	6.10580E-01 1.67449E-02 3.91660E-04 2.01327E-06 8.43646E-08	3.49385E-01 1.10659E-02 2.36985E-04 1.34880E-06 6.29541E-08	2.74528E-01 6.65159E-03 1.46316E-04 9.38508E-07 4.72844E-08	2,32507E-01 4,43939E-03 8,94483E-05 6,40832E-07 0,0	1.81054E-01 3.72981E-03 5.17218E-05 4.95402E-07 0.0	1.00394E-01 3.32376E-03 3.28915E-05 3.43323E-07 0.0	7.23076E-02 1.97085E-03 1.87674E-05 2.71859E-07	5.74595E-02 1.63589E-03 1.12824E-05 2.37018E-07	2.90279E-02 1.01434E-03 7.08239E-06 1.64427E-07		
10	1.94030E-01 2.52740E-02 2.36191E-04 1.37205E-06 0.0	3.34795E-01 1.56199E-02 1.48739E-04 7.31226E-07 0.0	3.08174E-01 9.95549E-03 9.48888E-05 3.78535E-07 0.0	1.95334E-01 6.21673E-03 7.01506E-05 2.37574E-07 0.0	1,59151E-01 3,94655E-03 4,10850E-05 1,53478E+07 0,0	9.67163E-02 2.67527E-03 3.31241E-05 0.0 0.0	7.97260E-02 1.89589E-03 2.79015E-05 0.0 0.0	8.12534E-02 8.81552E-04 1.37787E-05 0.0	4.35744E-02 5.82568E-04 4.78648E-06 0.0	2.52808E-02 3.78428E-04 2.50252E-06 0.0		
12	9.82336E-02 1.40816E-02 5.23666E-04 9.63079E-06 1.35711E-07	2.03756E-01 1.03317E-02 3.34591E-04 6.26240E-06 1.01641E-07	2.29901E-01 6,99248E-03 2.08470E-04 4.19895E-06 8.00356E-08	2,51888E-01 4.71036E-03 1.29166E-04 2.44629E-06 6.20152E-08	1,20589E-01 3,63325E-03 8,95433E-05 1,47760E-06 4,95714E-08	7.46001E-02 2.57707E-03 6.63201E-05 9.68604E-07 4.14584E-08	6.36725E-02 1,63380E-03 5,37425E-05 6.95806E-07 3,30173E-08	2.59001E-02 1.50601E-03 4.33822E-05 4.81361E-07	1.64345E-02 9.60974E-04 2.99435E-05 2.40671E-07	1.77316E-02 7.13674E-04 1.97672E-05 1.78817E-07		
13	7.18947E-02 1.08827E-02 9.55891E-05 6.52695E-07 0.0	1.67955E-01 7.03210E-03 5.81627E-05 3.33555E-07 0.0	1.45865L-01 4.75648E+03 3.48668E-05 1.89905E-07 0.0	1.67576E=01 3.30676E=03 2.10662E=05 0.0 0.0	1,60474E=01 1,68466E=03 1,24902E=05 0,0 0,0	1.03352E-01 1.09283E-03 7.65663E-06 0.0 0.0	4,45503E-02 4,41455E-04 4,86148E-06 0,0 0,0	2.23078E-02 2.92055E-04 2.84803E-06 0.0	2:05945E-02 2:30960E-04 1:59588E-06 0:0	1.51075E-02 1.55200E-04 1.02372E-06 0.0		
14	2.22893E-02 7.86904L-03 2.24103E-04 6.72738L-06 8.00551E-08	1.08005E-01 2.69435E-03 1.58330E-04 5.13302E-06 8.37208E-08	7.52533E-02 1.61706E-03 1.09904E-04 2.19883E-06 8.15691E-08	4.38437E=02 1.30466E=03 8.19598E=05 1.36734E=06 8.40611E=09	1.07402E-01 9.15990E-04 4.82183E+05 9.13405E-07 0.0	8.31732E-02 6.50461E-04 4.83992E-05 9.08682E-07 0.0	5,13896E-02 4,95353E-04 4,02856E-05 7,97464E-07 0,0	4.04527E-02 5.83205E-04 2.24951E-05 8.16904E-07	1,66550E-02 4,70859E-04 1,11222E-05 3,72360E-07	1.16275±-02 3.18237E-04 7.89889E-06 7.50260±-08		
15	1.74639£-02 8.73613E-03 1.19683E-04 5.63428E-06 0.0	6,43139E-02 4,65669E-03 8,22560E-05 5,37996E-06 0,0	8.22661E-02 2.63754E-03 5.72136E-05 7.16938E-08 0.0	5.86896E=02 1.72439E=03 4.10542E=05 4.68461E=08 0.0	1,77739E-02 1,24456E-03 3,03136L-05 2,57667E-08 0,0	1.60693E-02 7.75629E-04 2.16001E-05 0.0 0.0	2.61153E-02 4.91467E-04 1.44081E-05 0.0 0.0	2.77918E-02 3.19789E-04 1.48102E-05 0.0	1.80347E-02 2.27852E-04 7.53596E-06 0.0	1.27542E-02 1.73509E-04 5.65751E-06 0.0		

8.04884E-03 3,59829E-02 6.76280E-02 4.88787E-02 2.00330L-02 1.22141E-02 5.09441E-03 3.74181E-03 2.14854E-03 2.16623E-03 2.08106E-03 1.96657E-03 1.44951E-03 1.1004E-03 8.41976E-04 6.43970E-04 6.61212E-04 3.65372E-04 2.81442E-04 2.02587E=04 1.56024E-04 1.17511E-04 9.08994E-05 6.98983E-05 4.97931E=05 3.86164E-05 4.25922E-05 2.52565E-05 1.3757E-05 1.7056E-05 8.12572E-06 3.49071E-06 2.66531E-06 1.20350E-06 8.02101E=07 3.8548E=07 3.86545E=07 2.72203E=07 1.97614E=07 1.42621E=07 1.08118E=07 8.42920E-08 6.62132E=08 5.21164E=08 4.31871E=08 0.0 0.0

IPL = 0

MAT NUMBER = 4905

NUCLID =

949FP237

			TAB	LE OF INEL	ASTIC MATRI	CES		. PAGE	3 OF A	
GROUP	EXJT J= 1 11 21 31 41	GROUP ++ KK 2 12 22 32 42	** KK = I 3 13 23 33 43	+ J = 1 4 24 34 44	5 15 25 35 45	6 16 26 36 46	7 17 27 37 47	8 18 28 38	9 19 29 39	10 20 30 40
17	7.78760E-03 1.79678E-03 7.87594E-06 3.21881E-08 5.83915E-10	1.03146E-02 1.30332E-03 5.52964E-06 2.13764E-08 0.0	1.75277E-02 8.31641E-04 3.39383E-06 1.10966E-08 0.0	2,50814E-02 1,90199E-04 2,10076E-06 7,1720TE-09 0,0	1.43105E-02 1.08339E-04 1.15510E-06 4.87437E-09 0.0	9.84907E-03 6.64387E-05 7.47644E-07 3.17068E-09 0.0	8.11239E-03 4.07983E-05 5.35982E-07 2.07306E-09 0.0	7.04634E-03 2.41606E-05 3.00751E-07 1.39295E-09	5,24569E-03 1,44324E-05 1,40717E-07 1,12904E-09	2.38465E-03 9.07875E-06 5.27436E-08 5.78011E-10
18	3.89327E=03 5.85811E=04 5.07444E=05 1.15317E=06 0.0	8.74440E-03 4.75579E-04 3.74199E-05 7.59145E-07 0.0	4.02054E-03 4.55782E-04 2.79244E-05 4.47353E-07 0.0	1.64195E-02 3.51404E-04 2.51898E-05 4.59549E-07 0.0	1.94189E-02 2.77111E-04 1.44643E-05 4.72451E-07 0.0	9.14156E-03 1.95104E-04 1.74081E-05 4.99085E-07 0.0	2.05510E-03 1.36796E-04 9.26926E-06 2.41589E-08 0.0	6.65949E-04 1.07021E-04 7.87449E-06 0.0	1.07071E-03 8.01638E-05 7.61190E-06 0.0	7.93823E-04 6.29030E-05 4.43628E-06 0.0
19	2,60444E-03 4.65978E-04 1.47258E-06 8.76966E-08 1.42296E-08	1.06398E-02 5.64952E-05 1.06818E-06 6.17310E-08 8.49237E-09	2.55759E-03 3.60671E-05 8.00661E-07 5.44146E-08 0.0	1,82182E-03 2,48665E-05 5,91449E-07 3,23428E-08 0,0	1.15058E-02 1.94832E-05 4.47233E-07 3.30173E-08 0.0	1.44081E-02 1.57735E-05 3.39637E-07 2.25070E-08 0.0	7.93952E-03 7.83945E-06 2.47650E-07 1.18434E-08 0.0	4.29584E-03 4.02420E-06 1.86793E-07 1.22535E+08	9,66967E-04 2,84146E-06 1,44985E-07 1,26955E-08	7.56647E-04 2.06148E-06 1.09691E-07 1.31147E-08
20	3.10566E-03 1.77263E-03 7.53386E-05 1.24029E-06 0.0	8.42587E-03 1.13616E-03 5.39644E-05 1.36285E-07 0.0	4.40901E→03 6.20806E-04 4.79262E-05 5.03709E-09 0.0	1,16195E-04 4,81890E-04 3,74110E-05 2,12499E-09 0,0	9.79421E-04 3.71507E-04 2.12514E-05 2.04781E-09 0.0	4.27347E-03 2.92116E-04 2.67182E-05 1.18263E-09 0.0	4.35297E-03 2.15889E-04 2.55185E-05 0.0 0.0	4.37964E-03 1.70230E-04 6.71205E-06 0.0	3,46609E-03 1,31913E-04 1,24602E-06 0,0	2.47138E-03 1.02302E-04 1.21064E-06 0.0
21	2.93103E-03 4.82325E-04 1.25478E-05 6.29425E-08 0.0	5.25731E=03 4.29733E=04 8.97310E=06 4.65389E=08 0.0	6.73231E-03 2.90844E-04 6.66719E-06 2.85820E-08 0.0	1,37864E-03 1,86532E-04 5,36478E-06 2,37483E-08 0,0	4.38936E-05 1.21943E-04 3.24060E-06 1.20061E-08 0.0	1.67703E-05 7.96801E-05 2.61703E-06 9.45287E-09 0.0	0,0 5,39354E-05 2,13389E-06 9,62805E-09 0,0	1.05697E-04 3.65625E-05 2.00589E-06 9.79294E-09	3,23480E-04 2,56712E-05 1,71159E-06 7,68917E-09	5.17389E-04 1.72166E-05 9.41362E-08 0.0
22	3.53466E-03 0.0 0.0 0.0 0.0 0.0	2.80996E-03 0.0 0.0 0.0 0.0 0.0	5.58519E-03 0.0 0.0 0.0 0.0 0.0	4.36838E-03 0.0 0.0 0.0 0.0 0.0	1.08517E-03 0.0 0.0 0.0 0.0 0.0	1.09806E-05 0.0 0.0 0.0 0.0	8,60597E-06 0.0 0.0 0.0 0.0	6.74145E-06 0.0 0.0 0.0 0.0	4.86470E-06 0.0 0.0 0.0	1.61019E-07 0.0 0.0 0.0
25	3.28811E-03 5.70792E-07 4.49693E-08 0.0 0.0	3.34736E-03 4.38634E-07 3.33450E-08 0.0 0.0	1.46229E-03 3.41078E-07 2.48542E-08 0.0 0.0	4.04835E-03 2.57478E-07 2.25937E-08 0.0 0.0	3,69152E-03 2,01954E-07 1,12290E-08 0,0 0,0	1.01132E-03 1.58321E-07 1.74536E-08 0.0 0.0	7.21164E-04 1.21625E-07 7.04305E-09 0.0 0.0	1,23645E-06 9,23763E-08 7,00634E-09 0,0	8.79185E-07 7.25599E-08 7.15670E-09 0.0	7.30788E-07 5.74273E-08 4.26992E-09 0.0
24	2.70052E-03 1.64359E-04 1.25610E-05 0.0 0.0	4.66784E-03 1.27463E-04 9.92082E-06 0.0 0.0	0.0 9.64431E-05 8.67276E-06 0.0 0.0	2,54787E-04 7,51220E-05 3,30037E-06 0,0 0,0	2.47781E-03 5.97472E-05 6.15419E-06 0.0 0.0	1.99037E-03 4.55498E-05 6.03175E-06 0.0 0.0	1,95085E-03 3,43896E-05 1,93699E-06 0,0 0,0	1,08994E-03 2,66636E-05 0.0 0,0	2.73608E-04 2.18944E-05 0.0 0.0	2.13334E=04 1.65075E=05 0.0 0.0
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 5,71845E=05
 4,23794E=05

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Fission products due to fission of  $^{235}$  U with thermal neutrons,

NUCLID = 925FP234 MAT NO = 2505 INFINITE DILUTION CROSS SECTION

						•		PAGE 1 OF	2	
GROUPTOTAL	FISSION	NU	CAPTURE	ELAST1C	INELA	N2 N	EL MU	EL REMOVAL	FLUX	СНІ
1 8,82988E+00	0.0	0.0	8.62634E-04	4,87420E+00	3,95482E+00	0.0	3.570106-01	2,71697E-01	3.73649E-03	0.0
2 8,53718E+00	0,0	0,0	2,21720E-03	4,45579E+00	4,07917E+00	0.0	3,31579E-01	2,46153E-01	1.32440E-02	0,0
3 8,34990E+00	0.0	0.0	5.38033E-03	4,28806E+00	4,05646E+00	0,0	3.01324E-01	2,37093E-01	3.16559E-02	0,0
4 8,62738E+00	0.0	0,0	1.10833E-02	4,51999E+00	4,09631E+00	0,0	2.83904E-01	2,48454E-01	5.76319E-02	0.0
5 9,40611E+00	0.0	0,0	2,02774E-02	5.32102E+00	4.06481E+00	0,0	2.74899E-01	2,73704E-01	8.84748E-02	0.0
6 1:01675E+01	0.0	0,0	3.47228E+02	6,32073E+00	3,81207E+00	0,0	2,65228E-01	3,84793E-01	9.14632E-02	0,0
7 1.09442E+01	0.0	0,0	4,88788E-02	7,65681E+00	3,23848E+00	0.0	2.48809E-01	3,76140E-01	1,26293E-01	0,0
8 1.15809E+01	0.0	0,0	6,04455E+02	9,13306E+00	2,38738E+00	0.0	2,27927E+01	4,10400E=01	1,32114E-01	0,0
9 1.24265E+01	0.0	0,0	7,08835E-02	1.04567E+01	1.89894E+00	0,0	2.04989E-01	6,11634E-01	9.18870E-02	0+0
10 1:30410E+01	0.0	0,0	7,78698L-02	1,16565E+01	1.30660E+00	0,0	1.83373E-01	5,46846E-01	1.10458E-01	0.0
11 1.33991E+01	0.0	0,0	8,76355E-02	1,24379E+01	8.73517E-01	0,0	1.674878-01	7,96487E-01	8,23092E-02	0,0
12 1,37932E+01	0,0	0,0	9,68414E-02	1,29979E+01	6.98422E-01	0,0	1.53926E-01	8,82655E-01	7,96285E-02	0,0
13 1,40185E+01	0.0	0,0	1.05272E-01	1.35269E+01	3,86292E-01	0.0	1.39378E-01	9,71772E-01	7.68831E-02	0.0
14 1,44706E+01	0,0	0,0	1,15962E-01	1,408112+01	2,735638-01	0.0	1,22677E-01	9,04538E-01	8.78220E-02	0,0
15 1,49247E+01	0.0	0,0	1,28739E-01	1.46087E+01	1,87305E-01	0,0	1.05981E-01	1,12760E+00	7.41157E-02	0.0
16 1,53755E+01	0.0	0,0	1,39939E-01	1,50945E+01	1,41043E-01	0,0	9,07505E-02	1,13909E+00	7,68832E-02	0,0
17 1,59336E+01	0,0	0,0	1,57141E-01	1,56817E+01	9.47831E-02	0,0	7.39893E-02	9.324838-01	9.91197E-02	0.0
18 1.64888E+01	0.0	0,0	1,78912E-01	1,62512E+01	5.87048E-02	0,0	5,92940E-02	1,25572E+00	7,68832E-02	0.0
19 1,69860E+01	0.0	0,0	1,98684E-01	1.67371E+01	5.01782E-02	0.0	5.01772E-02	1,58987E+00	6.28182E-02	0.0
20 1,72422E+01	0.0	0,0	2,25381E-01	1,698232+01	3.44954E-02	0.0	4,22176E-02	1.14853E+00	8.87124E-02	0.0
21 1.73769E+01	0,0	0,0	2.640626-01	1.71000E+01	1.285826-02	0,0	3.42998E-02	1.16178E+00	8.84409E-02	0,0
22 1,76196E+01	0.0	0,0	3,07567E-01	1,73005E+01	1.15392E=02	0,0	2,78766E-02	1,20045E+00	8.66716E-02	0,0
23 1.77644E+01	0.0	0.0	3.58461E-01	1,73942E+01	1.17600E-02	0.0	2.29010E-02	1,18333E+00	8,81807E-02	0,0
24 1.79838E+01	0.0	0,0	4,18364E-01	1,75544E+01	1.102058-02	0.0	1.88840E-02	1,17757E+00	8.90592E-02	0,0
25 1.87919E+01	0,0	0.0	4,88592E-01	1,82970E+01	6.26232E-03	0.0	1.54928E-02	1,23591E+00	8.85424E-02	0.0
26 1.93545E+01	0.0	0,0	5.68138E-01	1,87814E+01	4.91411E-03	0.0	1,29370E-02	1,25545E+00	8,91168E-02	0.0
27 1.99980E+01	0.0	0.0	6.57229E-01	1.93355E+01	5.30435E-03	0,0	1.10624E-02	1.31890E+00	8.68860E-02	0.0
28 2.08157E+01	0.0	0.0	7,56983E-01	2,00531E+01	5.59973E-03	0.0	9.56853E-03	1,34643E+00	8.77359E-02	0,0
29 2.18975E+01	0,0	0.0	8.73529E-01	2,10183E+01	5.67324E-03	0,0	8.31080E-03	1,39179E+00	8.87124E-02	0,0
30 2,47501E+01	0.0	0.0	1,01322E+00	2,37318E+01	5.118488-03	0,0	7.11290E-03	1.57997E+00	8.84409E-02	0,0
31 2.50331E+01	0,0	0.0	1.14001E+00	2.38906E+01	2,49503E-03	0.0	6.40842E-03	1.59864E+00	8.66716E-02	0.0
32 2.34992E+01	0.0	0.0	1,295B3E+00	2,22034E+01	0.0	0,0	5.94984E-03	1,45373E+00	8.81807E-02	0.0
33 2.65856E+01	0,0	0,0	1.62921E+00	2,49564E+01	0.0	0.0	5.91939E-03	1,77768E+00	8.90592E-02	0,0
34 2.72039E+01	0,0	0.0	1,76796E+00	2.54359E+01	0.0	0.0	5.52731E-03	1.63377E+00	8.85424E-02	0,0
35 3+03637E+01	0,0	0.0	2.02644E+00	2.83373E+01	0.0	0.0	5.34082E-03	1.78650E+00	8.91169E-02	0,0

TO BE CONTINUED

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#### NUCLID = 925FP234 MAT NO = 2505 INFINITE DILUTION CROSS SECTION

GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL REMOVAL	FLUX	CH1
36 2.93795E+01	0.0	0.0	2.41343E+00	2,69661E+01	0.0	0.0	5.46543E-03	2.54102E+00	8.68860E-02	0.0
37 3.02513E+01	0.0	0.0	2.67125E+00	2,75801E+01	0.0	0.0	5,34630E-03	1.61510E+00	8.77359E-02	0.0
38 3.20672E+01	0.0	0.0	3,66468E+00	2,84025E+01	0,0	0.0	5,32723E-03	2,19673E+00	8.87124E-02	0.0
39 5.09589F+01	0.0	0.0	4.36618E+00	4.65927E+01	0.0	0.0	5,11656E-03	2,571196+00	8.84409E-02	0.0
40 3.56778E+01	0.0	0.0	5,18392E+00	3,04939E+01	0.0	0.0	5,48111E=03	1.86382E+00	8,66716E-02	0.0
41 7,18218E+01	0.0	0.0	7,54567E+00	6.42761E+01	0,0	0.0	5.14118E-03	4,57683E+00	8.81807E-02	0.0
42 5.72278E+01	0.0	0.0	9,23236E+00	4.79954E+U1	0.0	0.0	5.22984E=03	1.96465E+00	8,905926-02	0.0
43 4.74728E+01	0.0	0.0	7.91344E+00	3.95594E+01	0,0	0.0	5,15951E=03	2.05429E+00	8,854246-02	0.0
44 5.42885E+01	0.0	0.0	9,12411E+00	4.51644E+01	0.0	0,0	5.05625E=03	1.12060E+00	8.91169E-02	0,0
45 5.20948F+01	0.0	0.0	9.53846E+00	4,25563E+01	0,0	0.0	5,08306E-03	1.61780E+00	8.68860E-02	0.0
46 6.31982F+01	0.0	0.0	1.96881E+01	4.35101E+01	0.0	0.0	5.40600E-03	1.65055E+00	8.77359L-02	0.0
47 3.04699E+01	0.0	0.0	1,06430E+01	1.98269E+01	0.0	0.0	5,42880E-03	1.12433E+00	8.87124E-02	0.0
48 3.94049F+01	0.0	0.0	1.66746E+01	2.27303E+01	0.0	0.0	5,411278-03	1.48072E+00	8.84408E-02	0.0
49 3.99906E+01	0.0	0.0	1,78729E+01	2,21177E+01	0,0	0.0	5.474188-03	1.58915E+00	8,66716E-02	0.0
50 1,32578E+02	0.0	0.0	4,40462E+01	8,853172+01	0.0	0.0	5,35209E-03	1.17864£+00	8.81807E-02	0.0
51 2+42952F+01	0.0	0.0	8,32111E+00	1.59741E+01	0,0	0.0	5.65052E-03	8.235198-01	8.90592E-02	0.0
52 2,93397E+01	0.0	0.0	1,52800E+01	1.40597E+01	0.0	0.0	5.82251E-03	9.224688-01	8,85424E-02	0.0
53 3.70015E+01	0.0	0.0	1,83870E+01	1.86145E+01	0,0	0.0	5,46021E-03	1,31733E+00	8,91169E-02	0.0
54 2.99217E+02	0.0	0.0	9,75011E+01	2.01716E+02	0.0	0,0	5.17646E-03	1.86124E+00	8,68860E-02	0.0
55 2.70402E+01	0.0	0.0	1,07846E+01	1+62556E+01	0,0	0.0	5,62799E-03	8.69893E-01	8,77360E-02	0.0
56 6.06161E+01	0.0	0.0	2,70881E+01	3.35280E+U1	0,0	0.0	4.925482-03	1.85014E+00	8.87124E-02	0.0
57 7,36761E+01	0.0	0.0	5,11396E+01	2.25365E+01	0.0	0.0	5,21119E-03	1.77500E+00	8,84409E-02	0.0
58 2.94587E+02	0.0	0.0	2,26938E+02	6.76485E+01	0.0	0.0	4,82436E-03	9.36685E-01	8,66716E-02	0.0
59 4.64806E+01	0.0	0.0	3,36413E+01	1.28393E+U1	0,0	0.0	5.72843E-03	8.02204E-01	8,818076-02	0.0
60 2.07332E+01	0.0	0.0	8,99434E+00	1.17389E+01	0.0	0.0	5.83979E-03	7.89155E-01	8.90592E-02	0.0
61 2,08486E+01	0.0	0.0	9,06034E+00	1,17883E+01	0.0	0.0	5.83945E-03	8.01664E-01	8.85424E-02	0.0
62 2.67494E+01	0.0	0.0	1.48037E+01	1.19457E+01	0.0	0,0	5.83127E-03	8,06645E-01	8,91168E-02	0.0
63 5.07075E+01	0.0	0.0	3,83837E+01	1.23238E+01	0.0	0.0	5.82880E-03	8.74687E=01	8.68860E-02	0.0
64 9.88830E+01	0.0	0.0	8.63745E+01	1,25085E+01	0.0	0,0	5,78249E-03	8,40580E-01	8.77359E-02	0,0
65 1.09456E+02	0.0	0.0	9,60848E+01	1.33716E+01	0.0	0.0	5.68894E-03	8,36373E-01	8,87124E-02	010
66 3.80748E+01	0.0	0.0	2,46566E+01	1.34182E+01	0.0	0.0	5.78171E-03	9.03968E-01	8.84409E-02	0.0
67 4.19442E+01	0.0	0.0	2,52117E+01	1.67325E+01	0.0	0.0	5.83369E-03	1,16072E+00	8.66716E-02	0,0
68 4.36477E+01	0.0	0.0	2,88657E+01	1,47820E+01	0.0	0,0	5.64233E-03	9.76291E-01	8,81807E-02	0.0
69 6.1715BE+01	0.0	0.0	4.46257E+01	1,70901E+01	0.0	0.0	5.54332E-03	1,10003E+00	8.90592E-02	010
70 1,05691E+02	0.0	0,0	8.36817E+01	2,20091E+01	0.0	0,0	1.09042E-02	1,39410E+00	8,65424E-02	0.0

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		NUC	LID = 9	25FP234	MAT NUMBER -	2505	IPL = 0	•		
GROUP	EXIT	GROUP 44 KI	. ** KK =	I + J - 1	ASTIC MAINI	(25	-	PAGE	1 OF 4	10
'	11 21 31 41	12 22 32 42	13 23 33 43	14 24 34 44	15 25 35 45	16 26 36 46	17 27 37 47	18 28 38	19 29 39	20 30 40
	8.75407E-05 3.51304E-01 9.78477E-03 1.80465E-05 0.0	3.36547E-03 2.63878E-03 6.33749E-03 1.10741E-03 0.0	2,47316E=0 1,92928E=0 3,37601E=0 6,69603E=0 0,0	2 7.32812E-02 1 1.56686E-01 3 2.96532E-03 6 3.97898E-06 0.0	1.75457E-01 9.28895E-02 3.86802E-04 2.39340E-06 0.0	2,52104E=01 6,57983E=02 2,34165E=04 3,64937E=07 0,0	4.59826E-01 5.51094E-02 1.37660E-04 0.0 0.0	6,21280E-01 2.73252E-02 8,41092E-05 0,0	5,00737£-01 1,65158E-02 5,11417E-05 0,0	5.84186E-01 1.38990E-02 3.05653E-05 0.0
2	1,11610E-03 2,87122E-01 6,98728E-03 1,44094E-05 0,0	1.65140E-02 2.11031E-01 3.76382E-02 8.71407E-00 0.0	5,73120E-( 1,72214E-( 3,23389E-( 5,17877E-( 0,0	02 1.53580E-01 01 1.02399E-01 03 5.01634E-04 06 3.11537E-06 0.0	2,35741E-01 7,28347E-02 3,03957E-04 1,22004E-06 0,0	4,51872E-01 6,11387E-02 1,78814E-04 0,0 0,0	6.37118E-01 3.03510E-02 1.09312E-04 0.0 0.0	5.24521E-01 1.82782E-02 6.64937E-05 0.0	6,25161E-01 1,55206E-02 3,97535E-05 0,0	3.79278E-01 1.08314E-02 2.34772E-05 0.0
3	7.37970E-03 2.24214E-01 4.11630E-03 1.12895E-05 0.0	4.55300E-02 1.84253E-03 3.43644E-02 6.71025E-08 0.0	1,20062E-0 1,10057E-0 6,47312E-0 4,03708E-0 0,0	01 2.09745E-01 01 7.87429E-02 04 3.92636E-04 06 2.36196E-06 0.0	4,23451E-01 6,63260E-02 2,31166E-04 3.67676E-07 0,0	6,21850E-01 3,29934E-02 1,41402E-04 0,0 0,0	5.26735E-01 1.97839E-02 8.60552E-05 0.0 0.0	6,41430E-01 1,69972E-02 5,14677E-05 0,0	3,95698E-01 1,17335E-02 3,04039E-05 0,0	3.02771E-01 7.53126E-03 1.86649E-05 0.0
4	2,19517E-02 1,99490E-01 3,75010E-03 8,45632E-06 0,0	1.36923E-01 1.19965E-03 8.11962E-04 5.08815E-06 0.0	1.91895E-0 8.88235E-0 4.93085E-0 2.97718E-0 0.0	01 3.80528E-01 02 7.31534E-02 04 2.90568E-04 06 1.20630E-06 0.0	6.03029E-01 3.65152E-02 1.77861E-04 0.0 0.0	5,29745E-01 2,18474E-02 1,08302E-04 0,0 0,0	6.60602E-01 1.89610E-02 6.48002E-05 0.0 0.0	4.16811E-01 1.29895E-02 3.82923E-05 0.0	3,23854E=01 8,30917E=03 2,35134E=05 0,0	2.40529E-01 4.59730E-03 1.42250E-05 0.0
5	7.06975E-02 1.30425E-01 1.02777E-03 6.47644E-06 0.0	2.25915E-01 9.71904E-02 6.24995E-04 3.78990E-06 0.0	3,89908E=( 8,31832E=( 3,68688E=( 2,30746E=( 0,0	01 5.61656E-01 02 4.05245E-02 04 2.25862E-04 06 3.93003E-07 0.0	4.83713E-01 2.42010E-02 1.37617E-04 0.0 0.0	6.52437E-01 2.12593E-02 8.23811E-05 0.0 0.0	4.27183E-01 1.44456E-02 4.86997E-05 0.0 0.0	3.45100E-01 9.20798E-03 2.99128E-05 0.0	2.58507E-01 5.16851E-03 1.81005E-05 0.0	2.17397E-01 4.10437E-03 1.07621L-05 0.0
6	1,02633E-01 1,12832E-01 9,50036E-04 5,78037E-06 0,0	4,21185E-01 9,75312E-02 5,60956E-04 3,52890E-06 0,0	5,58969E=0 5,03509E=0 3,44117E=0 1,34365E=0 0,0	01 4.75036E-01 02 2.92424E-02 04 2.09722E-04 06 4.76229E-07 0.0	6.11655E+01 2.85022E-02 1.25595E-04 1.28781E-07 0.0	3.86264E-01 1.75300E-02 7.41744E-05 0.0 0.0	3.10524E-01 1.10783E-02 4.55780E-05 0.0 0.0	2.38057E-01 6.40289E-03 2.75970E-05 0.0	2,04099E-01 4,80010E-03 1,64224E-05 0,0	1,41438E-01 1,56055E-03 9,87494E-06 0,0
7	2,00014E-01 7.51886E*02 4.72287E-04 3.98692E-06 0.0	5.83136E-01 3.84449E-02 2.92632E-04 1.94037E-08 0.0	4.70894E-0 2.23399E-0 1.77533E-0 8.63344E-0 0.0	1 5.27995E-01 2 2.19834E-02 4 1.08819E-04 7 4.00608E-07 0.0	3.50227E-01 1.35111E-02 6.72790E-05 2.29226E-07 0.0	2.93192E-01 8.54987E-03 4.45102E-05 1.60410E+07 0.0	2.26130E-01 4.91388E-03 2.99190E-05 1.12005E-07 0.0	1.91203E-01 3.72857E-03 1.81622E-05 8.05566E-08	1,15821E-01 1,16325E-03 1,07475E-05 0.0	8.80950E-02 7.11815E-04 6.32964E-06 0.0
8	2.37659E-01 3.62350E-02 4.33714E-04 2.51776E-06 0.0	4.16439E-01 2.07440E-02 2.65050E-04 1.22322E-06 0.0	5.25341E-0 2.03257E-0 1.58362E-0 4.81655E-0 0.0	11 3.22280E-01 22 1.47601E-02 14 9.37180E-05 17 1.41844E-07 0.0	2,21548E=01 8,74528E=03 5,79217E=05 9,46720E=08 0,0	1.58248E-01 5.28843E-03 3.56576E-05 6.38841E-08 0.0	1,50664E-01 3,74725E-03 2,19738E-05 0,0 0,0	9.36809E-02 2.74887E-03 1.25960E-05 0.0	7.54436E-02 9.87555E-04 7.14029E-06 0.0	7.07355E-02 6.65891E-04 4.19591E-06 0.0
								TO 45	CONTINUES	
								10 62	CONTINUED	
		NUC	LID = 92	5FP234	MAT NUMBER =	2505	1PL = 0	10 82	CONTINUED	
6-0-0		NUC	LID = 92 TA	5FP234 BLE OF INEL	MAT NUMBER =	2505 CES	IPL = 0	PAGE	2 OF 4	
GROUP I	EX!T J= 1 11 21 31 41	NUC GROUP ** KK 2 12 22 32 42	LID = 92 TA ** XK = 3 13 23 33 33	5FP234 BLE OF INEL 1 + J - 1 4 14 24 34 34	MAT NUMBER = ASTIC MATRIG 5 15 25 35 35	2505 CES 6 16 26 36	IPL = 0 7 17 27 37 37	PAGE 8 18 28 38	2 DF 4 9 19 29 39	10 20 30 40
GROUP I 9	EX!T J= 1 11 21 31 41 1.50492E-01 1.55938E-02 3.56845E-06 3.56845E-06	NUC GROUP •• KK 2 12 22 3.0 42 5.00834E-01 1.47233E-02 3.69431E-04 2.01948E-06	LID = 92 TA ** XK = 3 3 2.95736E-0 9.92448E-0 2.24763E-0 1.39091E-0 1.390912=0	5FP234 BLE OF INEL 1 + J = 1 4 24 34 1 2,49377E-01 3 5,96817E-03 4 1,39734E-04 4 1,39734E-04 6 1,07204E-06 6 0,17748E-08	MAT NUMBER = ASTIC MATRIC 5 15 25 35 45 2,12379E-01 3,33845E-03 7,03279E-07 0,0	2505 25 16 26 36 46 1.64466E-01 3.33509E-03 5.66706E-07 0.0	IPL = 0 7 17 27 37 47 9,14915E-02 3,04561E-03 3,16237E-05 4,21241E-07 0.0	PAGE 8 18 28 38 6.27441E-02 1.77775E-03 1.76791E-05 3.55191E-07	2 OF 4 9 19 29 39 5-26682E-02 1.50230E-03 3.09670E-07	10 20 30 40 2.64662E-02 9.35415E-04 7.0547E-04 2.14829E-07
GROUP I 9 10	EX!T J= 1 11 21 31 41 1.80492E-01 1.95938E-02 1.49309E-07 1.49309E-07 1.49309E-07 1.42347E-01 2.17927E-02 0.0	NUC GROUP + KK 22 12 22 32 42 5,00834E-01 1,47235E-02 1,0225E-07 1,36101E-02 2,03504E-04 3,15238E-07 0,0	LID = 92 TA ** XK = 3 23 33 43 2.95736E=C 9.92448E=C 1.32901E=C 8.22512E=C 8.22512E=C 8.22512E=C 1.32841E=C 1.52841E=C 0.00	5FP234 BLE OF INEL 1 + J = 1 4 14 24 34 1 2.49377E-01 3 5.96417E-03 4 1.39754E-04 6 1.00204E-06 8 1.39754E-04 1 .151550E-01 3 5.66760E-03 1 .13455E-04 1 .13455E-04 0.0	MAT NUMBER = ASTIC MATRIC 5 15 25 35 45 2.12379E-01 3.738408E-03 7.03279E-07 0.0 1.33404E-01 3.70377E-03 6.0977E-03 6.0977E-03 0.0	2505 25 16 26 36 46 1.64466E-01 3.33509E-03 5.66706E-07 0.0 8.29122E-02 2.61023E-03 5.90970E-05 0.0	IPL = 0 7 17 27 37 47 9,14915E-02 3,04561E-03 3,16237E-05 4,21241E-07 0,0 1,08150E-02 1,90601E-03 5,38887E-05 0,0	PAGE 8 18 28 38 6.27441E-02 1.77775E-03 3.55191E-07 6.99143E-02 9.45367E-04 2.15790E-05 0.0	2 OF 4 9 19 29 39 5-26682E-02 1-50230E-03 1-08630E-05 3.09670E-07 3.80112E-02 6.62030E-04 2.84443E-06 0.0	10 20 30 40 2.64662E-02 9.35415E-04 2.14829E-07 2.22626E-02 4.5114E-04 1.54926E-06 0.0
6ROUP 9 10 11	EX!T J= 1 11 21 31 41 1.80492E-01 1.95938E-02 3.92120E-04 3.954845L-06 1.49309E-07 1.42347E-01 2.17927E-02 9.06419E-02 1.1606E-02 9.06419E-02 1.24399E-08	NUC GROUP •• KK 12 22 32 42 5,00834E-01 1.47235E-02 1.0225E-07 1.36943E-06 1.10225E-07 1.36101E-02 2.03504E-04 3.15238E-07 0.0 1.90255E-01 8.24576E-03 3.20466E-04 3.0255E-01 8.24576E-03 3.20466E-04 3.00743E-06 9.31693E-09	LID = 92 TA ** XK = 3 23 33 43 2.95736E=C 9.92448E=C 1.39091E=C 8.22512E=C 8.22512E=C 1.32841E=C 1.32842841E=C 1.32842841E=C 1.3284284284284284284284848484848484848484	5FP234 BLE OF INEL 1 + J = 1 4 14 24 34 4 1 2.49377E-01 3 5.96417E-03 4 1.39734E-04 6 1.00204E-06 8 1.39734E-04 1 1.31550E-01 3 5.66760E-03 1 1.3455E-04 1 1.3455E-04 1 1.3957E-01 3 3.99220E-03 0.0 1 1.27075E-04 1.27075E-04 5 .6864LE-09	MAT NUMBER = ASTIC MATRIC 5 15 25 35 45 2,12379E-01 3,738408E-03 7,03279E-07 0,0 1,33404E-01 3,70577E-03 6,0977E-03 6,0975E-05 6,73713E-08 0,0 8,35544E-02 3,24498E-03 5,44106E-07 4,5439E-03 5,44106E-07	2505 25 16 26 36 46 1.64466E-01 3.33509E-03 5.66706E-07 0.0 8.29122E-02 2.61023E-03 5.90970E-05 0.0 0.0 5.91574E-02 2.37046E-03 3.16930E-05 3.28231E-07 3.80236E-07	IPL - 0 7 17 27 37 47 9,14915E-02 3,04561E-03 3,16237E-05 4,21241E-07 0,0 7,08150E-02 1,90601E-03 5,38887E-05 0,0 0,0 5,12001E-02 1,9025E-02 1,9	PAGE 8 18 28 38 6.27441E-02 1.77775E-03 3.55191E-07 6.99143E-02 9.45367E-04 2.15790E-05 0.0 2.10748E-02 1.36312E-03 2.50335E-05 1.62552E-07	2 OF 4 9 19 29 39 5-26682E-02 1.50230E-03 3.09670E-07 3.80112E-02 6.62030E-04 0.00 1.27075E-02 8.61122E-04 1.83929E-05 2.20611E-08	10 20 30 40 2.64662E-02 9.35415E-04 7.0547E-04 7.10547E-04 2.14829E-07 2.22626E-02 4.5114E-04 1.54926E-06 0.0 1.37246E-02 6.58124E-04 1.35249E-05 1.63912E-08
GROUP 1 9 10 11	EX!T J= 1 11 21 31 41 1.80492E-01 1.95938E-02 1.49309E-07 1.49309E-07 1.49309E-07 1.47927E-02 3.05756E-04 7.72159E-07 0.0 9.06419E-02 1.21606E-02 1.21606E-02 8.30375E-03 6.62848E-02 8.30375E-03 5.70574E-07 0.0	NUC GROUP •• KK 12 22 32 42 5,00834E-01 1,47235E-02 1,0225E-01 1,36431E-04 2,01948E-06 1,10225E-01 1,36101E-02 2,03504E-04 3,15238E-07 0.0 1,90255E-01 8,24576E-03 3,2046E-04 3,204	LID = 92 TA ** XK = 3 23 33 43 2.95736E=C 9.92448E=C 1.32903LE=C 8.22512E=C 8.22512E=C 0.0 2.22475212E=C 1.32841E=C 1.32841E=C 0.0 1.60731E=C 7.33645E=C 1.30938E=C 7.33645E=C 1.30938E=C 7.33645E=C 1.30938E=C 7.33645E=C 1.30938E=C 7.33645E=C 1.30928E=C 7.33645E=C 1.30928E=C 7.33645E=C 1.30928E=C 7.33645E=C 1.30928E=C 7.33645E=C 1.30928E=C 7.33645E=C 1.30928E=C 7.33645E=C 7.3645E=	SFP234 BLE OF INEL 1 + J = 1 4 14 24 34 4 1 2.49377E-01 3 5.96417E-03 4 1.39734E-04 6 1.00204E-06 8 6.17784E-08 6 1.13734E-04 1 1.315357E-01 3 3.99220E-03 1 1.49857E-01 3 3.99220E-03 1 1.0735E-04 1 1.2775E-04 6 1.0042E-06 9 1.0042E-06 9 1.0042E-05 1 1.02967E-01 3 2.58194E-03 5 1.7250E-05 0.0	MAT NUMBER = ASTIC MATRI 5 15 25 35 45 2.12379E-01 3.738408E-03 8.25942E-05 6.0977E-03 6.0977E-03 6.0977E-03 6.0977E-03 6.0977E-03 5.43408E-03 3.29402E-05 5.46106E-07 4.396E-09 5.46106E-07 4.396E-09 5.46106E-07 1.02164E-05 0.0	2505 2505 25 16 26 36 46 1.64466E-01 3.33509E-03 5.66706E-07 0.0 8.29122E-02 2.61023E-03 5.90970E-05 0.0 0.0 5.15930E-03 3.78231E-07 3.5026E-09 3.54930E-05 3.78231E-07 3.80028E-09 9.81811E-04 6.26315E-06 0.0	IPL - 0 7 17 27 37 47 9,14915E-02 3,04561E-03 3,16237E-05 4,21241E-07 0,0 1,90601E-03 5,38887E-05 0,0 5,38887E-05 0,0 5,12001E-02 1,9035E-03 3,62077E-05 2,44981E-07 3,022653E-09 3,05216E-02 3,05245E-02 3,0525E-02 3,0525E-02 3,0525E-02 3,0525E-02 3,0525E-02 3,0525E-02 3,0525E	PAGE 8 18 28 38 6.27441E-02 1.77775E-03 3.55191E-07 6.99143E-02 9.45367E-04 2.15790E-05 0.0 2.10748E-02 1.36312E-03 1.62552E-07 1.79758E-02 2.44967E-04 2.33534E-06 0.0	2 OF 4 9 19 29 39 5.26682E-02 1.50230E-03 3.09670E-07 3.80112E-02 6.62030E-04 2.84443E-06 0.0 1.27075E-02 8.61122E-04 1.83929E-05 2.20611E-08 1.59770E-02 1.85764E-04 1.36213E-06 0.0	10 20 30 40 2.64662E-02 9.35415E-04 2.14829E-07 2.22626E-02 4.5114E-04 1.54926E-06 0.0 1.37246E-02 1.5245-04 1.32245E-05 1.63912E-08 1.13426E-02 1.27051E-04 8.96614E-07 0.0
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GROUP 9 10 11 12 13	EXIT J 1 11 21 31 41 1.80492E-01 1.95938E-02 5.92120E-04 3.56845E-06 1.49309E-07 1.42347E-01 2.17927E-02 3.05756E-04 7.72159E-07 0.0 9.06419E-02 1.24399E-08 6.62848E-02 8.30375E-03 5.70574E-07 0.0 1.80639E-02 3.9216E-03 5.70574E-07 1.80639E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.41279E-03 4.14558E-02 3.14638E-06 0.0	NUC GROUP •• KX 12 22 32 42 5,00834E-01 1,47235E-02 1,0225E-07 1,3025E-07 1,3025E-07 1,30255E-01 8,24576E-03 3,20466E-04 3,15238E-07 0,0 9,31693E-07 1,90255E-01 8,24576E-03 2,03504E-04 3,00745E-06 1,55717E-01 5,42506E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,93611E-07 0,0 9,56724E-02 1,8452E-03 2,9264E-06 5,8954E-03 2,8152E-05 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,6602E-04 1,752E-05 1,6602E-04 1,752E-05 1,6602E-04 1,752E-05	LID = 92 TA ** XK = 3 13 23 33 2.95736E=-C 9.92448E-C 1.32907E=-C 2.224765E-C 1.32281E=-C 2.2247E=-C 8.22512E=-C 2.2247E=-C 8.22512E=-C 1.32281E=-C 0.0 1.60731E=-C 5.82989E=-C 1.30928E=-C 3.66497E=-O 1.30928E=-C 3.66497E=-O 1.30928E=-C 3.66497E=-O 1.30928E=-C 3.66497E=-O 1.30928E=-C 3.66497E=-O 1.30928E=-C 3.66497E=-O 1.30928E=-C 3.66497E=-O 1.73010E=-C 5.65310E=-C 6.76559E=-O 1.71088E=-O 1.7088E=-C 3.66032E=-O 0.76559E=-O 1.71088E=-O 3.66032E=-O 0.76559E=-O 1.71088E=-O 3.66032E=-O 0.91094=-O 4.56032E=-O 0.91094=-O 4.56032E=-O 0.00000000000000000000000000000000000	5FP234 BLE OF INEL 1 + J = 1 4 14 24 34 4 12.49377E-01 3.5.96417E-03 4.139734E-04 6.107204E-06 8.017748-08 1.13734E-04 1.0204E-06 8.017748-03 1.13455-04 1.13455-04 1.13455-04 1.13455-04 1.13455-04 1.13455-04 1.13455-04 1.13455-04 1.27075E-04 5.68461E-03 2.58794E-03 5.142550E-05 1.02967E-01 2.3,98769E-02 3.9.88769E-02 3.9.88769E-04 3.9.70424E-09 2.5.39536E-02 3.7.70675E-04 5.136042E-06 1.13652E-06 1.136622-06 1.13652E-02 3.7.70675E-04 5.136042E-09 2.5.39536E-02 3.7.70675E-04 5.136042E-09 2.5.39536E-02 3.7.70675E-04 5.136042E-09 2.5.39536E-02 3.7.70675E-04 5.136042E-09 0.0	MAT NUMBER = ASTIC MATRI 5 15 25 35 45 2,12379E-01 3,3849E-03 8,22942E-05 7,03279E-07 0,0 1,33404E-01 3,70571E-03 6,09771E-03 6,09751E-05 6,373713E-08 0,0 8,35544E-02 3,24498E-03 1,02164E-05 5,44106E-07 4,54396E-09 8,44145E-02 1,43926E-03 1,02164E-05 7,15449E-03 1,02164E-05 7,3534E-04 4,77850E-04 4,77850E-04 1,02164E-05 7,3534E-04 1,02164E-05 7,3534E-04 1,02164E-05 7,3534E-04 1,77784E-02 5,73534E-04 1,77784E-02 1,777	2505 2505 26 16 26 36 46 1.64466-01 3.3509E-03 5.66706E-07 0.0 8.29122E-02 2.61023E-03 5.06706E-07 0.0 5.91574E-02 2.37046-03 5.16930E-05 3.28231E-07 3.82028E-09 5.82645E-02 9.81811E-04 6.26315E-06 0.0 3.86064E-02 5.3224E-04 7.05137E-06 0.0 1.29546E-02 3.49792E-04 7.05137E-06 0.0 0.0	IPL    -    0      17    27      37    -      37    -      37    -      304561E-03    -      3.0427E-05    -      4.7    -      7.08150E-02    -      1.90601E-03    -      1.5033E-03    -      3.6207E-05    2.44981E-07      3.02526E-02    3.0253E-03      3.02526E-02    3.0253E-03      3.035216E-02    -      3.7033E-04    3.98331E-06      0.0    -      2.14555E-02    4.6720E-05      4.67250E-02    4.55495E-04      4.55496E-04    -      4.55496E-04    -      0.0    0.0	PAGE 8 18 28 38 6.27441E-02 1.77775E-03 3.55191E-07 6.99143E-02 9.45367E-04 2.15790E-05 0.0 2.10748E-02 1.36312E-03 1.62552E-07 1.79758E-02 2.44967E-04 2.33534E-06 0.0 1.77272E-02 5.81288E-04 4.33534E-05 6.03282E-07 1.51736E-02 1.36400E-04 4.63361E-06 0.0	2 OF 4 9 19 29 39 5.26682E-02 1.50230E-03 3.09670E-07 3.80112E-02 6.62030E-04 3.09670E-07 3.80112E-02 6.62030E-04 1.28443E-06 0.0 1.27075E-02 8.61122E-04 1.83729E-05 2.20611E-08 1.59770E-02 1.3674E-04 1.36213E-06 0.0 7.94084E-03 4.7603E-04 9.00347E-05 2.30114E-06 0.0	10 20 30 40 2.64662E-02 9.35415E-04 7.05947E-04 7.105947E-04 7.105947E-04 7.05947E-04 7.05947E-04 1.54926E-05 1.54926E-06 0.0 1.37246E-02 1.32245E-04 8.96614E-07 0.0 5.44922E-03 3.21487E-04 8.96614E-07 0.0 5.44922E-03 3.21487E-04 8.96614E-06 7.96819E-08 5.62315E-03 6.22123E-05 1.70738E-06 0.0
GROUP 9 10 11 12 13 14 15	EXIT J 1 11 21 31 41 1.80492E-01 1.55938L-02 5.92120L-04 3.56845L-06 1.49309E-07 1.42347E-01 2.17927L-02 3.05756E-04 7.72159E-07 0.0 9.06419E-02 1.2139E-07 9.06419E-02 1.22397E-03 6.62848E-02 8.30375E-03 5.70574E-07 1.80639L-02 3.92516E-03 5.70574E-07 1.80639L-02 3.92516E-03 5.70574E-07 1.80639L-02 3.92516E-03 1.2239E-02 3.92516E-03 1.71663E-06 0.0 4.99317E-03 1.6447E-04 1.04047E-04 5.12213E-06	NUC GROUP •• KX 12 22 32 42 5.00834E-01 1.47235E-02 2.03504E-04 3.1948E-06 0.1948E-06 1.90255E-01 8.24576E-03 3.20466E-04 3.0255E-01 1.90255E-01 3.2046E-04 3.00745E-06 3.22506E-03 2.3351E-07 0.9 9.56724E-02 1.87256E-03 2.9351E-07 1.66028E-04 5.42895E-02 2.06264E-03 5.42895E-02 2.06264E-03 5.42895E-02 2.06264E-03 5.42895E-02 2.06264E-03 5.42895E-02 2.06264E-03 5.42895E-02 2.06264E-03 5.42895E-02 2.06264E-03 5.42895E-02 1.62753E-06 0.0 3.22835E-02 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 1.90778E-06 3.792364E-05 3.79346E-05 3.79346E	LID = 92 TA ** XK = 3 13 23 33 43 2.95736E=-C 9.92448E-C 1.32907E=-C 2.224765=-C 1.32841E=-C 1.32841E=-C 1.32841E=-C 1.32841E=-C 1.30928E=-C 3.66391E=-C 0.0 1.60731E=-C 3.66497E=-C 1.30928E=-C 3.66497E=-C 1.30928E=-C 3.66497E=-C 1.73010E=-C 6.65391E=-C 0.0 6.85262E=-C 1.73010E=-C 5.66391E=-C 0.0 5.66913E=-C 1.91094E=-C 3.57436E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5545E=-C 3.5555E=-C	5FP234 BLE OF INEL 1 + J = 1 4 14 24 34 12.49377E-01 3.5.96417E-03 4.139734E-04 6.107394E-04 6.17734E-04 1.0204E-06 8.6177734E-04 1.1345570E-01 3.5.65760E-03 1.13455-04 1.13455-04 1.13455-04 1.13455-04 1.27075E-04 5.68461E-03 3.2.58794E-03 5.68461E-03 3.2.58794E-03 5.68461E-03 3.3.98765E-01 3.2.58794E-03 5.1.2505E-02 3.9.88765E-04 3.3.98765E-02 3.7.70675E-04 5.39536E-02 3.7.70675E-04 5.39536E-02 3.7.70675E-04 5.39536E-02 3.7.70675E-04 5.39536E-02 3.7.70675E-04 5.39536E-02 3.7.70675E-04 5.4.8024E-09 0.00 2.4.17885E-02 3.4.8241E-04 4.48241E-04 3.4.8241E-04 3.4.8241E-05 4.4.8241E-04 3.4.8241E-04 3.4.8241E-04 3.4.8241E-05 4.4.8241E-04 3.4.8241E-04 3.4.8241E-04 3.4.8241E-05 4.4.8241E-05 4.4.8241E-04 3.4.8241E-05 4.4.8241E-04 3.4.8241E-04 3.4.8241E-04 3.4.8241E-04 3.4.8241E-05 4.4.845E-02 4.4.8241E-05 4.4.845E-02 4.4.	MAT NUMBER = ASTIC MATRI 5 15 25 35 45 2,12379E-01 3,3849E-03 8,32942E-05 7,03279E-07 0,0 1,33404E-01 3,70571E-03 6,00775E-05 6,1077E-03 5,44145E-02 1,43926E-03 1,02164E-05 5,44106E-07 4,5439E-03 1,02164E-05 7,16449E-03 1,02164E-05 7,16449E-03 1,02164E-05 7,16449E-07 1,0775E-02 7,15554E-04 9,0532E-04 1,02164E-05 7,15554E-04 1,02164E-05 1,02164E-05 7,15554E-04 1,02164E-05 7,15554E-04 1,02164E-05 7,15554E-04 1,02164E-05 7,15554E-04 1,02164E-05 7,15554E-04 1,02164E-05 7,155554E-04 1,02164E-05 7,155556E-04 1,02164E-05 1,02164E-	2505 2505 25 16 26 36 46 1.64466E-01 3.3509E-03 5.66706E-07 0.0 8.29122E-02 2.61023E-03 5.90970E-05 0.0 5.91574E-02 2.37046E-03 3.8028E-07 5.16930E-05 3.8204E-07 5.38308E-05 7.24594E-07 1.29546E-02 3.48792E-04 7.05137E-06 0.0 1.29546E-02 3.48792E-04 7.05137E-06 0.0 1.29546E-02 3.48792E-04 7.05137E-06 0.0 1.21643E-02 4.8136E-02 4.8136E-02 4.8136E-02 3.48292E-04 7.05137E-06 0.0 1.21643E-02 4.8136E-07 4.8137E-07 4.8136E-07 4.813	IPL    -    0      17    27      37    -      37    -      30.4541E-03    -      31.6237E-05    -      3.04551E-02    -      1.90601E-03    -      1.90501E-02    -      1.50335E-03    -      3.62077E-05    -      3.04526E-02    -      3.05216E-02    -      3.0531E-06    -      0.0    -      1.51516E-02    -      2.15559E-04    +      4.56496E-06    -      0.0    -      5.69559E-03    3.02947E-04      3.02947E-04    -      3.02947E-05    -      3.02947E-04    -      3.02947E-04    -      3.02947E-05    -      3.02947E-04	PAGE 8 18 28 38 6.27441E-02 1.77775E-03 3.55191E-07 6.99143E-02 9.45367E-04 2.15790E-05 0.0 2.10748E-02 1.36312E-03 1.62552E-07 1.79758E-02 2.44467E-04 2.33534E-05 0.0 1.77272E-02 3.81288E-04 4.33534E-06 0.0 1.36436E-02 1.36436E-04 4.63361E-06 0.0 4.20372E-03 2.4134E-04 1.79728E-05 2.27376E-07 2.27376E-07	2 OF 4 9 19 29 39 5.26682E=02 1.50230E=03 3.09670E=07 3.80112E=02 6.52030E=04 3.09670E=07 3.80112E=04 6.52030E=04 1.27075E=02 8.61122E=04 1.83729E=05 2.20611E=08 1.59770E=02 1.35674E=04 1.35273E=06 0.0 7.94084E=03 4.76043E=04 7.94084E=03 9.09946E=03 9.17377E=05 2.30114E=06 0.0 2.15037E=03 1.8509E=07	10 20 30 40 2.64662E-02 9.35415E-04 7.05947E-04 7.105947E-04 7.05947E-04 7.05947E-04 7.05947E-04 7.05947E-04 1.54926E-05 1.54926E-06 1.37246E-02 1.37246E-02 1.37246E-02 1.37246E-02 1.27051E-04 8.96614E-07 0.0 5.44922E-03 3.21487E-04 6.70516E-06 7.96819E-08 5.62315E-03 6.22123E-05 1.3028E-06 7.28532E-06 1.3133E-07

TO BE CONTINUED

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		NUC	LID = 9258	FP234 I	MAT NUMBER =	2505	IPL = 0			
			TABL	LE OF INEL	ASTIC MATRI	CES		PAGE	3 OF 4	
GROUP	EXIT (	GROUP ++ KK	** KK = I	+ J - 1	5	6	7	8	9	10
•	11 21 31	12 22 32	13 23 33	14 24 34	15 25 35 45	16 26 36	17 27 37 47	18 28 38	19 29 39	20 30 40
17	5,00514E-03 1,62034E-03 7,12783E-06 3,46485E-08 6,74086E-10	7.61253E-03 1.18512E-03 5.24481E-06 2.22140E-08 0.0	1.67673E-02 7.57718E-04 3.21939E-06 1.28102E-08 0.0	2,32239E-02 1,53548E-04 1,99208E-06 8.27962E-09 0,0	1,12791E=02 8,49599E=05 1,08714E=06 5,62709E=09 0,0	7.64707E-03 5.20833E-05 7.18733E-07 3.66032E-09 0.0	6,53002E-03 3,20467E-05 5,11676E-07 2,39319E-09 0,0	6.12378E-03 1.89648E-05 2.73981E-07 2.60806E-D9	4.54581E-03 1.13181E-05 1.32588E-07 1.30339E+09	2.10449E-03 7.29761E-06 5.58150E-08 6.67270E-10
18	2.47336L-03 3.92327E-04 4.46232E-05 1.09627E-06 0.0	5.77889E-03 3.23217E-04 3.29884E-05 7.21685E-07 0.0	2.48014E-03 3.34171E-04 2.46192E-05 4.25278E-07 0.0	1,59620E-02 2,58570E-04 2,21142E-05 4,36873E-07 0,0	1,85920E-02 2,03952E-04 1,28116E-05 4,49138E-07 0,0	8,03864E-03 1,58511E-04 1,52059E-05 4,74458E-07 0,0	1,73839E-03 1.20407E-04 8.28022E-06 2.29668E-08 0.0	2,40624E=04 9,41767E=05 6,92231E=06 0.0	6,83160E-04 7.05913E-05 6.62825E+06 0.0	5,24637E-04 5,53584E-05 3,87585E-06 0,0
19	1.43391E-03 4.73629E-04 2.57220E-07 5.57799E-09 9.05083E-10	7.37386E-03 2.70851E-05 1.69948E-07 3.92643E-09 5.40162E-10	1.35968E-03 1.71218E-05 1.12226E-07 3.46107E-09 0.0	1,42944E-03 1,16762E-05 6,94897E-08 2,05718E-09 0,0	1,13777E-02 8,10850E-06 5,04456E-08 2,10009E-09 0,0	1,37195E-02 5,66719E-06 3,64821E-08 1,43157E-09 0,0	7.24498E-03 2.45315E-06 2.15849E-08 7.53305E-10 0.0	3,94035E-03 1,00904E-06 1,26246E-08 7,79391E-10	9.78867E-04 6.30222E-07 9.30891E-09 8.07506E-10	7.71361E-04 4.10729E-07 6.97693E-09 8.34169E-10
20	1.71111E-03 1.79276E-03 6.70647E-05 1.42169E-06 0.0	5.89947E-03 1.13258E-03 4.77379E-05 1.52173E-07 0.0	2.77319E-03 5.35116E-04 4.31410E-05 2.14064E-09 0.0	5,15781E-05 4,15420E-04 3,37815E-05 9,03068E-10 0,0	6.42893E-04 3.20706E-04 1.90629E-05 8.70269E-10 0.0	4,15914E-03 2,53054E-04 2,38836E-05 5.02589E-10 0,0	4,16884E-03 1,88197E-04 2,24479E-05 0,0 0,0	4,10497E-03 1,50191E-04 6,29627E-06 0,0	3.31558E-03 1.16412E-04 1.41177E-06 0.0	2.40484E-03 9.15527E-05 1.37873E-06 0.0
21	1.61372L-03 3.29339L-04 1.33318E-05 2.16300E-08 0.0	3.73929E-03 3.52053E-04 9.82123E-06 1.40960E-08 0.0	4.70953E-03 2.44695E-04 7.52869E-06 9.55273E-09 0.0	6.91994E-04 1.63076E-04 6.16961E-06 3.8121>E-09 0.0	1,94841E-05 1,09779E-04 3,66525E-06 1,92726E-09 0,0	7.44420E-06 7.31221E-05 3.10255E-06 1.51740E-09 0.0	0,0 5,10321E-05 2,50616E-06 1,54552E-09 0,0	5.83313E-05 3.58067E-05 2.41905E-06 1.57199E-09	2,22751E-04 2,60008E-05 2,11589E-06 1,23429E-09	3.42048E-04 1.78972E-05 3.40640E-08 0.0
22	1.94606E-03 0.0 0.0 0.0 0.0	1.66174E-03 0.0 0.0 0.0 0.0 0.0	4.36821E~03 0.0 0.0 0.0 0.0	3,00241E-03 0,0 0,0 0,0 0,0 0,0	5,46919E-04 0.0 0.0 0,0 0,0 0,0	4,87421E-06 0.0 0.0 0.0 0.0	3,82013E-06 0,0 0,0 0,0 0,0	2,99248E-06 0.0 0.0 0.0	2,15941E-06 0.0 0.0 0.0	7.14752E-08 0.0 0.0 0.0
23	1.81031E-03 2.53370E-07 1.99615E-08 0.0 0.0	1,84294E-03 1,94707E-07 1,48016E-08 0,0 0,0	1.25386E-03 1.51402E-07 1.10326E-08 0.0 0.0	3.26653E-03 1.14293E-07 1.00292E-08 0.0 0.0	2,71002E-03 8,96457E-08 4,98446E-09 0.0 0.0	5.10115E-04 7.02774E-08 7.74755E-09 0.0 0.0	3.63759E-04 5.39885E-08 3.12636E-09 0.0 0.0	6.19651E-07 4.10052E+08 3.11006E-09 0.0	3,90264E=07 3,22088E=08 3,17681E=09 0,0	3,24391E-07 2.54916E-08 1.89539E-09 0,0
24	1,48681E-03 8,29035E-05 6,33583E-06 0.0 0.0	2.56995E-03 6.42929E-05 5.00411E-06 0.0 0.0	0.0 4.86464E-05 4.37458E-06 0.0 0.0	2.18470E-04 3.78919E-05 1.66472E-06 0.0 0.0	2,12462E-03 3,01368E-05 3,10420E-06 0,0 0,0	1,68901E-03 2,29756E-05 3,04244E-06 0,0 0,0	1.51226E-03 1.73463E-05 9.77027E-07 0.0 0.0	8.12280E-04 1.34493E-05 0.0 0.0	1,38009E-04 1,10437E-05 0,0 0,0	1.07607E-04 8.32644E-06 0.0 0.0
								το Βε	CONTINUED	
		NUC	LID = 9250	FP234	MAT NUMBER =	2505	IPL = 0			
			ŢÁBĮ	LE OF INEL	ASTIC MATRIC	CES		PAGE	4 OF 4	
GRUUP	EXIT (	GROUP ** KK 2	** KK = I 3	+ J - 1 4	5	6	7	8	9	10
25	11 21 31 41	12 22 32 42	13 23 33 43	14 24 34 44	15 25 35 45	16 26 36 46	17 27 37 47	18 28 38	19 29 39	20 30 40
	8,41809E-04	3.52843E=03	1,15189E-04	0.0	0,0 6,09305E-05	0.0 4.71377E-05	1.56613E-04 3.65324E-05	3.67419E+04 2.87458E=05	2.86893E-04 2.21035E-05	2,20234E-04

	11 21 31 41	12 22 32 42	13 23 33 43	14 24 34 44	15 25 35 45	16 26 36 46	17 27 37 47	18 28 38	19 29 39	20 30 40
25	8,41809E-04 1,71768E-04 1,27775E-05	3.52843E-03 1.29135E-04 9.46875E-06	1.15189E-04 1.01797E-04 8.12482E-06	0.0 7.91788E-05 6.54091E-06	0,0 6,09305E-05 2,99741E-06	0.0 4,71377E-05 5.45755E-06	1.56613E-04 3.65324E-05 5.42694E-06	3.67419E-04 2.87458E-05 0.0	2.86893E-04 2.21035E-05 0.0	2.20234E-04 1.75997E-05 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
26	9,04661E-06	3,59452E-03	1,31056E-03	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
21	0.0	2,33315E-03	2.97120E-03	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
28	0.0	4.33825E-04	3,42514E-03	1,74077E-03	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
29										
	0.0	0.0	1.10909E-03	2,65952E=03	1.904626+03	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			
30	0.0	0.0	0.0	1.95669F-04	1.867346=03	1.453056-03	1.09715E-03	5.05284E=04	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
31	0.0	0.0	0,0	0.0	0,0	0.0	0.0			
	0.0 2,35323E-04 1.81571E-05 0.0 0.0	0.0 1.83919E-04 1.35982E-05 0.0 0.0	0,0 1,40963E-04 1,12301E-05 0,0 0,0	0.0 1.09965E-04 8.26237E-06 0.0 0.0	0,0 8,37351E-05 4,68500E-06 0,0 0,0	0.0 6,44605E-05 7.90478E-06 0.0 0.0	2.62243E-04 5.03597E-05 6.90264E-06 0.0 0.0	5,09010E-04 3,89895E-05 0.0 0.0	3,91923E-04 3,14837E-05 0,0 0,0	2,98587E+04 2,33326E-05 0,0 0,0

## Fission Product Fast Reactor Constants System of JNDC

Fission products due to fission of <sup>238</sup>U with fission spectrum neutrons.

NUCLID = 928FP237 MAT ND = 2803 INFINITE DILUTION CROSS SECTION

								PAGE	1 OF	2	
GROUPTOTAL	FISSION	NU	CAPTURE	ELASTIC	INELA	N2N	EL MU	EL RE	IOVAL	FLUX	CHI
1 8:85462E+00	0.0	0.0	1.07033E-03	4.89110E+00	3.96245E+00	0,0	3,95554E-01	2.56277	/E-01	3,736498-03	0.0
2 8,54915E+00	0.0	0,0	2,79969E-03	4.46176E+00	4,08459E+00	0,0	3,65866E-01	2,33555	5E-01	1,32440E=02	0,0
3 B:37778E+00	0.0	0.0	7,103508-03	4.29333E+00	4.07735E+00	0.0	3.28117E-01	2,26704	¥E-01	3,16559E-02	0.0
4 B,66126E+00	0.0	0.0	1,48198E-02	4.53276E+00	4,11368E+00	0.0	3.06524E-01	2,38975	5E-01	5.76319E-02	0.0
5 9,44174E+00	0.0	0.0	2.64209E-02	5.33866E+00	4,07666E+00	0,0	2,96108E-01	2,63454	E=01	8.84746E-02	0,0
6 1.02211E+01	0.0	0.0	4,32066E-02	6.32870E+00	3,84918E+00	0.0	2,86484E-01	3.6889	LE-01	9,14632E=02	0.0
7 1,10395E+01	0.0	0.0	5,92317E-02	7.64921E+00	3.33103E+00	0,0	2.71911E-01	3,5957	LE-01	1.26293E-01	0.0
8 1,17358E+01	0+0	0.0	7.34075E-02	9,10989E+00	2,55249E+00	0,0	2.52815E-01	3,90180	5E-01	1,32114E-01	0,0
9 1.25781E+01	0.0	0.0	8,53267E-02	1.04085E+01	2,08424E+00	0,0	2.31012E-01	5.7940	€-01	9.18870E-02	0.0
10 1:31747E+01	0.0	0,0	9,43336E-02	1+15755E+01	1.50485E+00	0,0	2.09795E-01	5,17663	LE-01	1,10458E-01	0,0
11 1.35195E+01	0.0	0,0	1.06505E-01	1,23423E+0 <u>1</u>	1.07071E+00	0.0	1,93683E-01	7,53893	3E-01	8.23092E-02	0,0
12 1.38919E+01	0.0	0.0	1,18763E-01	1.29007E+01	8.72415E-01	0.0	1.79084E-01	8,3748	7E-01	7.96285E-02	0.0
13 1.41043E+01	0.0	0.0	1.31637E-01	1,34552E+01	5.17510E-01	0,0	1.62621E-01	9,2707	3E-01	7.68831E-02	0.0
14 1.45477E+01	0.0	0.0	1,49133E-01	1.40570E+01	3.415846-01	0,0	1,43282E-01	8,7026	3E-01	8.78220E-02	0,0
15 1.50009E+01	0.0	0.0	1,69443E-01	1,46144L+01	2.170598+01	0.0	1.23975E-01	1,08834	¥E+00	7.41157E-02	0.0
16 1.54390E+01	0.0	0.0	1.84723E-01	1,50876E+01	1,66705E-01	0.0	1.06517E-01	1,10140	5E+00	7.68832E-02	0,0
17 1,59683E+01	0.0	0,0	2,08094E-01	1,56457E+01	1.14527E-01	0.0	8,70725E-02	9,03053	€ <b>=</b> 01	9,91197E-02	0,0
18 1.64884E+01	0.0	0.0	2,37665E-01	1.61782E+01	7.248798-02	0,0	6,98629E-02	1,2162	3E+00	7.68832E-02	0,0
19 1.69608E+01	0.0	0,0	2,64548E-01	1.66341E+01	6.21772E-02	0,0	5.91702E-02	1,53954	+E +00	6.28182E-02	0.0
20 1,72144E+01	0.0	0,0	3.00276E-01	1.68691E+01	4.49970E-02	0,0	4.96967E-02	1,11343	3E+00	8.87124E-02	0,0
21 1.73588E+01	0.0	0.0	3.51583E-01	1,69866E+01	2.06462E-02	0.0	4.01612E-02	1,1283	5E+00	8.84409E-02	0.0
22 1.75923E+01	0.0	0.0	4.09043E-01	1,71640E+0 <u>1</u>	1.92405E-02	0,0	3,24314E-02	1,1659	7E+00	8.66716E-02	0,0
23 1.77854E+01	0.0	0.0	4.75523E-01	1,72897E+01	2.01667E-02	0,0	2,63662E-02	1,15353	3E+00	8.81807E-02	0.0
24 1.80602E+01	0.0	0.0	5,52896E-01	1,74875E+01	1,98458E-02	0.0	2.14761E-02	1,15242	2E+00	8,90592E-02	0.0
25 1.87821E+01	0,0	0.0	6,42102E-01	1,81271E+01	1.28723E-02	0.0	1.74345E-02	1,20300	)E+00	8,85424E-02	0.0
26 1,934768+01	0.0	0.0	7.42624E-01	1.85942E+0 <u>1</u>	1.075318-02	0,0	1.44082E-02	1.22191	3E+00	8,91168E=02	0.0
27 2.00101E+01	0.0	0.0	8,53617E-01	1,91449E+0 <u>1</u>	1.160716-02	0.0	1.21446E-02	1.28489	9E+00	8.68860E-02	0.0
28 2,08579E+01	0.0	0,0	9,77711E-01	1,98679E+01	1,22534E-02	0,0	1.03656E-02	1,31365	5E+00	8,77359E-02	0,0
29 2.192578+01	0.0	0.0	1,121522+00	2.07918E+01	1.24143E-02	0,0	8.89633E-03	1,35633	3E+00	8,87124E-02	0.0
30 2.42976E+01	0.0	0.0	1,29139E+00	2.29950E+01	1.12003E-02	0,0	7.50277E-03	1,50605	SE+00	8.84409E=02	0.0
31 2.486652+01	0,0	0.0	1.45977E+00	2.34013E+01	5.45967E-03	0+0	6.66450E-03	1,54460	DE +00	8.66716E-02	0.0
32 2.39479E+01	0.0	0.0	1,64888E+00	2,22990E+01	0.0	0,0	6,09676E-03	1,44854	¥E+00	8,81807E-02	0.0
33 2.62940E+01	0.0	0.0	2,03040E+00	2,42636±+01	0.0	0.0	6,08167E-03	1.7001	5E+00	8.90592E-02	0.0
34 2.75693E+01	0.0	0.0	2.23743E+00	2.53319E+01	0,0	0.0	5.46269E-03	1,60394	¥E+00	8,85424E-02	0.0
35 3.07037E+01	0.0	0.0	2.56520E+00	2,81385E+0 <u>1</u>	0.0	0,0	5.31092E-03	1.74406	E+00	8,91169E-02	0.0

TO BE CONTINUED

# NUCLID = 928FP237 MAT NO = 2805 INFINITE DILUTION CROSS SECTION

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EL MU	EL REMOVAL	FLUX	CHI
5,423026-03	2,38703E+00	8.68860E-02	0.0
5.32597E-03	1,61996E+00	8.77359E-02	0,0
5.28963E-03	2,09295E+00	8.87124E-02	0.0
5,10589E-03	2,56893E+00	8,84409E-02	0,0
5.42247E-03	1,85165E+00	8.66716E-02	0,0
5.15140E-03	4,07611E+00	8.81807E-02	0.0
5,19697E-03	2,09910E+00	8,90592E-02	0,0
5.11718E-03	2,04692E+00	8,85424E-02	0.0
5.06981E-03	1,16845E+00	8,91169E-02	0.0
5,09186E-03	1,67076E+00	8.68860E-02	0,0
5.32823E-03	1,67627E+00	8.77359E-02	0.0
5,29609E-03	1,30089E+00	8,87124E-02	0,0
5,24379E-03	1,78420E+00	8.84408E-02	0,0
5.35864E-03	1.58718E+00	8.66716E-02	0,0
5,26849E-03	1,30372E+00	8,81807E-02	0,0
5.61779E-03	1,01029E+00	8,90592E-02	0.0
5,59648E-03	9,79792E-01	8,85424E-02	0.0
5.28834E-03	1.55944E+00	8,91169E-02	0.0
5,161896-03	2,22648E+00	8,68860E=D2	0.0
5.46531E-03	9.115658-01	8.77360E-02	0.0
4.68840E-03	3,00755E+00	8.87124E=02	0.0
4.93533E-03	2,24653E+00	8,84409E-02	0.0
4,8050 <u>1</u> E-03	9,69539E-01	8.66716E-02	0.0
5,62790E-03	7,98428E-01	8.81807E-02	0.0
5.74268E-03	7,80906E-01	8,90592E-02	0.0
5,74491E-03	7,93146E-01	8.85424E-02	0.0
5.74704E-03	7,97888E-01	8.91168E-02	0,0
5.76541E-03	9,11544E-01	8.68860E-02	0.0
5,69840E-03	8,20646E-01	8,77359E-02	0,0
5.56948E-03	8,06153E-01	8.87124E-02	0.0
5,78838E-03	9,73640E-01	8,84409E-02	0.0
2,96812E-03	1,69324E+00	8.66716E-02	D.0
5.59694E-03	9,32702E-01	8.81807E-02	0.0
5.50541E+03	1,04794E+00	8.90592E-02	0.0
1.18426E=02	1.32423E+00	8.85424E=02	0.0

GROUPTOTAL	FISSION	NU
36 2.98098E+01	0.0	0.0
37 3.08087E+01	0.0	0.0
38 3,35743E+01	0.0	0.0
39 5.31495E+01	0.0	0.0
40 3.68580E+01	0.0	0.0
41 6,75705E+01	0.0	0.0
42 5.74758E+01	0.0	0,0
43 5.00080E+01	0,0	0.0
44 5.23087E+01	0.0	0.0
45 5.12829E+01	0,0	0,0
46 6+45245E+01	0.0	0.0
47 3+95544E+01	0.0	0,0
48 4.97860E+01	0.0	0,0
49 4.55674E+01	0.0	0,0
20 1+41289E+02	0.0	0.0
51 3.54306E+UI	0.0	0.0
22 3+69320E+01	0.0	0,0
54 3.047716402	0.0	0.0
55 3.001075+01	0.0	0.0
56 1.05866E+02	0.0	0.0
57 9.93482F+01	0.0	0.0
58 3.398896+02	0.0	0.0
59 5.25291E+01	0.0	0.0
60 2.60661E+01	0.0	0.0
61 2.91989E+01	0.0	0,0
62 4,06309E+01	0,0	0,0
63 9.14239E+01	0.0	0,0
64 1.87008E+02	0,0	0,0
65 1.80191E+02	0.0	0,0
66 5+62911E+01	0.0	0,0
67 6.97105E+01	0.0	0,0
68 5+94986E+01	0.0	0,0
69 8.62225E+01	0.0	0,0
70 1+54745E+02	0.0	0,0

# CAPTURE ELASTIC INELA 3.03430E+00 2.67755E+U1 0.0 3.40160E+00 2.74071E+U1 0.0

4.61728E+00	2.89570E+01	0,0
5,52451E+00	4,76250E+01	0.0
6,21375E+00	3.06442E+01	0.0
8,95552E+00	5,86150E+01	0,0
1.06809E+01	4.67949E+U1	0.0
1.00564E+01	3.99516E+01	0,0
1.14438E+01	4,08649E+01	0,0
1.18936E+01	3,93893E+01	0,0
2.06111E+01	4.39134E+01	0,0
1,57163E+01	2,38381E+01	0.0
2.279B3E+01	2,69877E+01	0.0
2,20684E+01	2,34990E+01	0,0
5,27282E+01	8+85603E+01	0.0
1,64006E+01	1,90300E+01	0.0
2.12447E+01	1,56873E+01	0.0
2,61539E+01	2,21563E+01	0,0
1,33408E+02	2.63363E+02	0.0
2.11066E+01	1,88131E+01	010
4.84317E+01	5,74340E+01	0,0
6.69165E+01	3.24317E+01	0+0
2,63464E+02	7,64249E+01	0,0
3,94350E+01	1,30941E+01	0,0
1,42344E+01	1,18317E+01	0,0
1.73300E+01	1,18689E+01	0,0
2,86355E+01	1.19954E+01	0.0
7.87593E+01	1,26646E+01	0,0
1,74405E+02	1.26031E+01	0,0
1.66473E+02	1,37177E+01	0,0
4.18564E+O1	1.443472+01	0,0
4,58417E+O1	2.38688E+01	0,0
4,52949E+01	1.42037E+01	0.0
6,98971E+01	1,63254E+01	0,0
1.33885E+02	2.08600E+01	010

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		NUCL	.ID = 9281	FP237 N	AT NUMBER -	2805	IPL = 0			
			TAB	E OF INEL	STIC MATRIC	ES		PAGE	1 OF 4	
GROUP I	EXIT J= 1 11 21 31	GROUP ++ KK 2 12 22 32	** KK = i 3 13 23 33	+ J - 1 4 14 24 34	5 15 25 35	6 16 26 36	7 17 27 37	8 18 28 38	9 19 29 39	10 20 30 40
1	9,36410E-05 3,50727E-01 9,66872E-03 2,03899E-05	42 3.61867E-03 2.63178E-01 6.23661E-03 1.25124E-05	2,47082E-02 1,92145E-01 3,35252E-03 7,56578E-06	7.38766E-02 1.55983E-01 2.88883E-03 4.49586E-06	1,77223E-01 9,23650E-02 4,36913E-04 2,/0433E-06	2.54512E-01 6.55025E-02 2.64522E-04 4.02967E-07	4,63068E-01 5,48368E-02 1,55515E-04 0.0	6.24081E-01 2.71653E-02 9.50231E-05 0.0	5.01702E-01 1.63460E-02 5.77799E-05 0.0	5.84232E=01 1.38526E=02 3.45337E=05 0.0
2	0.0 1.31259E=03 2.87883E=01 6.93744E=03 1.62508E=05	0.0 1.70746E-02 2.11486E-01 3.77348E-03 9.82776E-06	5,70392E-02 1,72646E-01 3,17632E-03 5,84071E-06	1.52752E-01 1.02596E-01 5.65553E-04 3.51360E-06	2,35319E-01 7,30963E-02 3,42718E-04 1,53141E-06	4.51788E-01 6.13552E-02 2.01630E-04 0.0	6.37771E-01 3.04401E-02 1.23266E-04 0.0	5.25439E-01 1.82500E-02 7.49852E-05 0.0	6.26422E-01 1.56133E-02 4.48316E-05 0.0	3.80205E-01 1.08002E-02 2.64768E-05 0.0
3	0.0 8.21855E-03 2.26850E-01 4.18382E-03 1.27326E-05 0.0	0.0 4.62433E-02 1.86661E-01 3.41778E-03 7.56809E-06 0.0	0,0 1,20255E-01 1,11514E-01 7,29773E-04 4,55322E-06 0,0	0.0 2.07707E-01 7.99658E-02 4.42698E-04 2.66396E-06 0.0	0,0 4,21037E-01 6,73871E-02 2,60661E=04 3,71973E-07 0,0	0,0 6,21699E=01 3,35146E=02 1,59453E=04 0,0 0,0	0.0 5.28737E-01 2.00090E-02 9.70454E-05 0.0 0.0	6,45792E-01 1,73276E-02 5,80427E-05 0,0	3,99432E-01 1,18553E-02 3,42890E-05 0,0	3.06134E-01 7.57651E-03 2.10504E-05 0.0
4	2.39849L-02 2.02673E-01 3.75301E-03 9.48618L-06 0.0	1,39790E-01 1,22001E-01 9,10448E-04 5,70788E-06 0.0	1,88842E-01 9.03784E-02 5.52954E-04 3.33983E-06 0,0	3,78616E-01 7,46812E-02 3,25876E-04 1,50613E-06 0,0	5,98550E-01 3,72876E-02 1,99486E-04 0,0 0,0	5,28495E-01 2,22199E-02 1,21476E-04 0,0 0,0	6.62880E-01 1.94405E-02 7.26857E-05 0.0 0.0	4.20199E-01 1.32042E-02 4.29534E-05 0.0	3.27472L-01 8.41131E-03 2.63762E-05 0.0	2.43806E-01 4.70237E-03 1.59572E-05 0.0
5	7,59827E-02 1,32003E-01 1,12670E-03 7,10312E-06 0,0	2.31299E-01 9.84819E-02 6.85231E-04 4.15665E-06 0.0	3.83435E-01 8.43819E-02 4.04258E-04 2.53078E-06 0.0	5,53135E-01 4,12364E-02 2,47669E-04 3,88748E-07 0,0	4,85093E-01 2,45473E-02 1,50912E-04 0,0 0,0	6,55011E-01 2,17209E-02 9,03434E-05 0,0 0,0	4.28646E-01 1.46530E-02 5.34083E-05 0.0 0.0	3,45941E-01 9,30757E-03 3.28057E-05 0.0	2,60145E-01 5,27302E-03 1,98515E-05 0.0	2,19426E-01 4.10721E-03 1.18034E-05 0.0
6	1.05960E-01 1.12459E-01 9.70531E-04 5.90921E-06 0.0	4.34431E-01 9.72219E-02 5.73139E-04 3.60509E-06 0.0	5,53445E-01 4,99719E-02 3,51569E-04 1,27786E-06 0,0	4.68012E-01 2.88951E-02 2.14300E-04 3.42560E-07 0.0	6,10902E-01 2,81479E-02 1,28346E-04 9,72873E-08 0,0	3,93591E-01 1,73312E-02 7,58290E-05 0,0 0,0	3,18934E-01 1.09359E-02 4,65949E-05 0.0 0.0	2,46507E-01 6.35071E-03 2.82104E-05 0.0	2.12995E-01 4.71490E-03 1.67848E-05 0.0	1.44356E-01 1.59388E-03 1.00954E-05 0.0
7	2.10302E-01 7.98783E-02 5.19448E-04 4.02524E-06 U.0	6.13454E-01 4.09208E-02 3.20896E-04 1.89620E-06 0.0	4,73621E=01 2,37464E=02 1,95158E=04 7.09578E=07 0,0	5.33553E-01 2.33121E-02 1.18555E-04 3.01717E-07 0.0	3,54228E-01 1,43545E-02 7,25679E-05 1,72522E-07 0,0	2.98715E-01 9.05641E-03 4.68509E-05 1.20729E-07 0.0	2.31923E-01 5.26015E-03 3.06233E-05 8.42979E-08 0.0	1.98372E-01 3.91292E-03 1.85371E-05 6.06292E-08	1,20328E-01 1,33238E-03 1,10411E-05 0,0	9.25956E-02 8.14109E-04 6.43288E-06 0.0
8	2.57700E=01 3.83002E-02 4.66337E-04 2.64204E-06 0.0	4.64465E-01 2.19842E-02 2.85032E-04 1.24669E-06 0.0	5,55867E-01 2,16603E-02 1,70591E-04 4,68284E-07 0,0	3,36021E-01 1,56612E-02 1,00968E-04 1,37293E-07 0,0	2,33412E-01 9.31904E-03 6.24067E-05 9.04497E-08 0.0	1,68705E-01 5,69736E-03 3,83244E-05 6,10349E-08 0,0	1.58301E-01 3.99704E-03 2.33730E-05 0.0 0.0	1.00818E-01 2.88228E-03 1.36727E-05 0.0	8,01855E-02 1.08612E-03 7,82838E-06 0.0	7.45246E-02 7.21012E-04 4.55677E-06 0.0
								TO BE	CONTINUED	
		NUCI	LID = 928	FP237 I	MAT NUMBER =	2805	1PL = 0			
			TAB	LE OF INEL	ASTIC MATRI	CES				
GROUP	EXIT	GROUP ** KK	** KK = I	+ J = 1			-	PAGE	2 OF 4	10
1	J= 1 11 21 31 41	12 22 32 42	3 13 23 33 43	4 14 24 34 44	5 15 25 35 45	6 16 26 36 46	17 27 37 47	18 28 38	19 29 39	20 30 40
,0	1.89951E-01 1.72805E-02 6.18901E-04 3.56041E-06 1.41034E-07	5.73383E-01 1.63753E-02 3.82588E-04 2.03386E-06 1.04116E-07	3.32684E-01 1.08743E-02 2.31737E-04 1.38679E-06 7.76929E-08	2.63732E-01 6.53555E-03 1.43111E-04 9.89856E-07 5.83547E-08	2,24349E-01 4,35578E-03 8,75425E-05 6,93531E-07 0,0	1.75912E-01 3.60827E-03 5.05506E-05 5.52870E-07 0.0	9.88441E-02 3.20215E-03 3.22540E-05 4.05347E-07 0.0	7.07951E+02 1.89621E-03 1.84155E-05 3.35507E-07	5.75581E-02 1.58917E-03 1.10391E-05 2.92508E-07	2.87383E-02 9.85743E-04 6.94661E-06 2.02923E-07
10	1.96191E-01 2.43302E-02 2.58406E-04 1.08188E-06 0.0	3.15519E-01 1.50472E-02 1.65942E-04 5.45476E-07 0.0	2.80045E-01 9.69909E-03 1.06766E-04 2.73651E-07 0.0	1.82520E-01 6.06705E-03 8.34616E-05 1.72641E-07 0.0	1.52497E-01 3.86608E-03 4.87602E-05 1.10378E-07 0.0	9.16498E-02 2.65398E-03 4.08364E-05 0.0 0.0	7.60771E-02 1.89674E-03 3.55167E-05 0.0 0.0	7.75364E-02 9.03758E-04 1.58736E-05 0.0	4.21010E-02 6.10139E-04 3.99726E-06 0.0	2.44683E=02 4.01996E=04 2.09959E=06 0.0
11	1.00262E-01 1.29196E-02 4.92773E-04 7.46642E-06 9.01698E-08	2.05076E-01 9.46234E-03 3.17180E-04 4.88267E-06 6.75329E-08	2.06295E-01 6.58304E-03 1.98716E-04 3.35847E-06 5.31776E-08	2,14046E-01 4,49112E-03 1,23918E-04 1.88281E-06 4,12044E-08	1.08760E-01 3.47580E-03 8.43913E-05 1.11371E-06 3.29365E-08	7.15931E-02 2.47520E-03 5.92663E-05 7.20936E-07 2.75460E-08	6,25724E-02 1,55847E-03 4,62191E-05 5,19977E-07 2,19375E-08	2.50542E-02 1.40831E-03 3.59768E-05 3.56484E-07	1,54124E-02 8,93169E-04 2,53314E-05 1,59908E-07	1.62855E-02 6.67596E-04 1.72236E-05 1.18810E-07
12	7.31612E-02 1.06701E-02 9.55296E-05 6.84812E-07 0.0	1.70277E-01 7.05610E-03 5.80875E-05 3.37123E-07 0.0	1.42375E-01 4.84294E-03 3.48409E-05 1.94393E-07 0.0	1.43849E-01 3.39524E-03 2.10498E-05 0.0 0.0	1.32396E=01 1.71996E=03 1.24698E=05 0.0 0.0	8,52426E-02 1,09395E-03 7,65746E-06 0,0 0,0	3.95129E-02 4.35377E-04 4.85748E-06 0.0 0.0	2,10080E-02 2.91534E-04 2.84622E-06 0.0	1.96545E-02 2.29505E-04 1.62060E-06 0.0	1.48089E-02 1.55029E-04 1.06328E+06 0.0
13	2,29044L-02 6,33765E-03 2,47316E-04 6,73209E-06 8,52184E-08	1.10022E-01 2.26282E-03 1.74275E-04 5.05433E-06 8.91205E-08	7,54419E-02 1.38672E-03 1.20670E-04 2.34597E-06 8.68300E-08	4.25787L-02 1.14398E-03 9.00096E-05 1.46688L-06 1.10368E-08	9.06072E-02 8.39851E-04 5.15067E-05 9.77387E-07 0.0	6,66798E-02 6.18765E-04 5.33264E-05 9,66749E-07 0,0	4.02681E-02 4.77834E-04 4.49012E-05 8.42469E-07 0.0	3.10514E-02 6.33967E-04 2.42442E-05 8.62525E-07	1.33068E-02 5.20513E-04 1.11852E-05 3.93335E-07	9.23308E-03 3/50140E-04 8.01642E-06 7.98649E-08
14	1,76123E-02 6,73327E-03 8,66136E-05 4,16569E-06 0,0	6.53537E-02 3.78949E-03 5.98029E-05 3.98975E-06 D.0	8.01905E-02 2.12466E-03 4.16251E-05 3.11495E-08 0.0	5.89276E-02 1.37846E-03 3.00454E-05 2.03537E-08 0.0	1.79719E-02 9.86821E-04 2.22680E-05 1.11951E-08 0.0	1,48450E-02 6.08722E-04 1.59464E-05 0.0 0,0	2,22121E-02 3.82668E-04 1.05558E-05 0.0 0,0	2.29489E-02 2.48224E-04 1.09346E-05 0.0	1.46686E-02 1.73387E-04 5.53137E-06 0.0	1.00053E-02 1.26165E-04 4.15167E-06 0.0
15	7.77529E-03	3.71407E-02	6.83212E-02	4.83979E-02	1,99716E-02	1.27423E-02	5.48703E-03	3.92276E-03	2,12731E-03	1.95490E-03

1,39606E-03 1,05622E-03 7,92932E-04 5,88065E-04 4,20893E-04 3,22392E-04 2,33492E-04 1,74516E-04 7,89002E-05 6,05976E-05 4,23813E-05 3,36398E-05 3,70909E-05 2,18659E-05 1,0822E-05 1,0202E-05 2,18259E-05 1,0822E-05 1,0202E-05 2,18259E-08 6,125164E-06 4,34516E-07 3,80041E-07 4,07057E-07 2,85188E-07 2,07060E-07 1,49424E-07 6,96683E-08 5,48359E-08 4,54407E-08 0,0 0,0 96E-03 1.88451E 22E-04 1.01071E 56E-06 2.99415E 60E-07 8.86906E 

TO BE CONTINUED

IPL = 0

# NUCLID = 928FP237 MAT NUMBER = 2805

	TABLE OF INELASTIC MATRICES									
GROUP	EXIT O		** XX = 1	+ 1 = 1				PAGE	3 01 4	
I	J= 1 11 21 31 41	2 12 22 32 42	3 13 23 33 43	4 14 24 34 44	5 15 25 35 45	6 16 26 36 46	7 17 27 37 47	8 18 28 38	9 19 29 39	10 20 30 40
17	8.02938E=03 1.79866E=03 8.85753E=06 4.23580E=08 7.86367E=10	9.87292E-03 1.30359E-03 6.43949E-06 2.78161E-08 0.0	1,87940L-02 8,31583E-04 3,93065E-06 1,49439E-08 0,0	2.68336L-02 1.92624L-04 2.41941E-06 9.65873E-09 0.0	1.42386E-02 1.10035E-04 1.36396E-06 6.56438E-09 0.0	9.68896E-03 6.74865E-05 8.63667E-07 4.27001E-09 0.0	7.85499E-03 4.14251E-05 6.06235E-07 2.79181E-09 0.0	7.02929E-03 2.45253E-05 3.50078E-07 1.87591E-09	5,36917E-03 1,46649E+05 1,67222E-07 1,52050E-09	2,39749E-03 9.33500E+06 6.90291E-08 7.78415E-10
18	4.87957L=03 5.36890E=04 5.29193E=05 1.14744E=06 0.0	8.23595E-03 4.37188E-04 3.90268E-05 7.55370E-07 0.0	3.31448E-03 4.25920E-04 2.91110E-05 4.45128E-07 0.0	1.83118E-02 3.28627E-04 2.63058E-05 4.57264E-07 0.0	2.08976E-02 2.09159E-04 1.49911E-05 4.70102E-07 0.0	9,37966L-03 1,93589E-04 1,82247L-05 4,96603E-07 0,0	2.37068E-03 1.42605E-04 9.70106E-06 2.40387E-08 0.0	5.53841£-04 1,11574E-04 8,20358E-06 0,0	1.00586E-03 8.35830E-05 7.89353E-06 0.0	7.38906E→04 6.55557E-05 4.59367E-06 0.0
. 19	3.13771L-03 5.94021L-04 9.02797E-07 3.81024E-08 6.18248E-09	1.11006E-02 6.30454E-05 6.28013E-07 2.68208E-08 3.68976E-09	1.50428E-03 4.01518E-05 4.46477E-07 2.36420E-08 0.0	2,20165E-03 2,75482E-05 3,08374E-07 1,40523E-08 0,0	1.33852E-02 1.99096E-05 2.29628E-07 1.43454E-08 0.0	1.53466E-02 1.46589E-05 1.71462E-07 9.77881E-09 0.0	8.06759E-03 6.63178E-06 1.16992E-07 5.14571E-09 0.0	4,47669E-03 2,95916E-06 8,25032E-08 5,32390E-09	1,21972E-03 1,95762E-06 6,32050E-08 5,51595E-09	9,61836E-04 1,34524E-06 4,76583E-08 5,69808E-09
20	3.74265±-03 1.93218±-03 7.56133E=05 1.62349±-06 0.0	9,13586E-03 1.20913E-03 5,46705E-05 1.77139E-07 0.0	3.46492E-03 6.14188E-04 4.79345E-05 5.33408E-09 0.0	1.06188E-04 4.76355E-04 3.74567E-05 2.25028E-09 0.0	1.18353E-03 3.67014E-04 2.15619E-05 2.16855E-09 0.0	5.17704E-03 2.91145E-04 2.65978E-05 1.25236E-09 0.0	5.02123E-03 2.17481E-04 2.49164E-05 0.0 0.0	4.82637E-03 1.71244E-04 7.33337E-06 0.0	3.82275E-03 1.32620E-04 1.62287E-06 0.0	2.70141E-03 1.02580E-04 1.57914E-06 0.0
21	3.53117E-03 5.83560E-04 1.50589E-05 5.22109E-08 0.0	6.60149E-03 5.22207E-04 1.07600E-05 3.44639E-08 0.0	6,62074E-03 3,53681E-04 7,99764E-06 2,16066E-08 0,0	5.47181L-04 2.27071E-04 6.44457E-06 1.59239E-08 0.0	4.01135E-05 1.48179E-04 3.86844E-06 8.05045E-09 0.0	1,53260E-05 9,60482E-05 3,13225E-06 6,33841E-09 0,0	0.0 6,49580E-05 2.55517E-06 6.45587E-09 0.0	1.27344E-04 4.39928E-05 2.41753E-06 6.56643E-09	3,91448E-04 3,08758E-05 2,06900E-06 5,15580E-09	6.25547E-04 2.06790E-05 8.17578E-08 0.0
22	4,25839L-03 0.0 0.0 0.0 0.0	3.48641E-03 0.0 0.0 0.0 0.0	6,92814E-03 0.0 0.0 0.0 0.0 0.0	4.12808E-03 0.0 0.0 0.0 0.0 0.0	4.10859E-04 0.0 0.0 0.0 0.0	1,00350E-05 0.0 0.0 0.0 0.0	7,86482E=06 0.0 0.0 0.0 0.0 0.0	6.16088E-06 0.0 0.0 0.0	4,44575E-06 0.0 0.0 0.0	1.47152E-07 0.0 0.0 0.0
23	3.96136E-03 5.21635E-07 4.10965E-08 0.0 0.0	4.03274E-03 4.00859E-07 3.04733E-08 0.0 0.0	2.15733E-03 3.11704E-07 2.27138E-08 0.0 0.0	5.33434E-03 2.35304E-07 2.06479E-08 0.0 0.0	4.02706E-03 1.84561E-07 1.02619E-08 0.0 0.0	3,79206E-04 1,44686E-07 1,59505E-08 0,0 0,0	2.70408E-04 1.11151E-07 6.43650E-09 0.0 0.0	4.99425E-07 8.44208E-08 6.40295E-09 0.0	8.03470E-07 6.63111E-08 6.54036E-09 0.0	6.67852E-07 5.24816E-08 3.90219E-09 0.0
27	3.25346E-03 6.16282E-05 4.70989E-06 0.0 0.0	5,62360E-03 4,77936E-05 3,71992E-06 0,0 0,0	0,0 3,61624E-05 3,25195E-06 0,0 0,0	3.75889E-04 2.81678E-05 1.23751E-06 0.0 0.0	3.65552E-03 2.24029E-05 2.30758E-06 0.0 0.0	2.88136E-03 1.70794E-05 2.26167E-06 0.0 0.0	2.37784E-03 1.28948E-05 7.26295E-07 0.0 0.0	1.22683E=03 9.99783E=06 0.0 0.0	1.02592E-04 8.20957E-06 0.0 0.0	7.99920E-05 6.18965E-06 0.0 0.0
								TO BE	CONTINUED	

		NUCL	.ID = 928F	P237 M	AT NUMBER =	2805	1PL = 0			
			TAB	E OF INELA	STIC MATRIC	ES		01/15	4 05 4	
GROUP	EXIT (		++ ×K = 1	+ J = 1				PAGE	4 OF 4	
1	J= 1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35	36	57	36	39	40
35	41	42	43		•,	40	47			
27	1,84206E-03	7.72097E-03	2.52059E-04	0.0	0.0	0.0	2.69460E-04	6,32163E-D4	4,93614E-04	3,78925E=04
	2.9999982-04	2+221040-04	1 307926-05	1.125408=05	5.157216-06	9.389995-04	9.33732F-06	0.0	0.0	0.0
	2,176432=03	1.027152-05	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			
26										
-	1.97959E-05	7.865598-03	2.86778E-03	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	0,0	0.0	0.0	0.0	0.0			
21	• •	A 105445-03	6 501635-03	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	0,0	0.0	0,0	0.0	0.0			
28										
	0.0	9.49304E-04	7.494946-03	3.80919E-03	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			
29	0.0	0.0	0.0	010						
27	0.0	0.0	2.42692E-03	5.81960E-03	4.16772E-03	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	0.0	0.0	0.0			
30				4 383455-04	A 00(155-03	3 170404-03	2 400795-03	1 105475-03	A 0	0.0
	0.0	0.0	0.0	4,201070-04	0.0	0.0	21400192-03	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			
31										
	0.0	0.0	0,0	0.0	0,0	0.0	5,73844E-04	1.11382E-03	8,57612E-04	6.53373E-04
	5.14938E-04	4.02454E-04	3.08458E-04	2,40628E-04	1.83230E-04	1.41054E-04	1.10198E-04	8.53173E-05	6,88932E-05	5,10568E-05
	3.97317E-05	2.97558E-05	2.45738E-05	1,80798E-05	1.02518E-05	1.72974E-05	1,51045E-05	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	010			

# Appendix 3. Tables of the concentrations at various Burn-up Stages

PU-239	(THERMAL)						P.	AGE 1
NO		NCAT	1 DAY	30 DAYS	BURN-UP TIME	180 DAYS	360 DAYS	720 DAYS
	3074 72	3	9 363075-07	1 035255=07	5 1×796E=08	1.728145-08	8 639155=09	A-31924F=09
2	31GA 72	2	1.228458-07	3.14633E~08	1.57318E-08	5.24035E-U9	2.61971E-09	1.309755-09
4	32GE 72 37GE 73	2	2,47704E-06	2,179678-06	2.473055-06	2.47635E-06	2,475910-06	2.475725-06
5	32GE 74	2	5.95692E-06 3.07574E+05	5.96326E-06 3.07901E-05	5.95735E-06 3.07699E-05	5.95527E-06 3.07488E-05	5.954216-06 3.074346-05	5.95375E=06 3.07410E-05
ĩ	32GE 77	î	4.50348E-05	1.95018E-06	9.74452E-07	3.24595E-07	1.62269E-07	8,11281E-08
9	33AS 76	2	1.38595E-05 1.62362E-10	1.162096-11	5.806668-12	1,93423E-12	9.669436-13	4,83434E-13
10	33AS 77 345E 76	1 2	3.51809E-05 5.62591E-11	6,68018E-06 2.07233E-10	3.33791E-06 2.12904E-10	1.11188E-06 2.16626E-10	5.55839E-07 2.17555E-1C	2,77898E-07 2,18021E-10
12	345E 77	1	5.83886E-06	7.75158E-05	5.17773E-05 2.86219F-04	3.45942E-05	8,52973E-05 2,85973E-04	8,56498E-05 2.85951F-04
14	345E 79	1	2.48005E-04	2.48268E-04	2.48105E-04	2.47935E-04	2.478906-04	2,47870E-04
15	345E 80 3588 81	2	4.78157E-04 1.81957E-03	1.32153E-03	4.78352E-04 1.82033E-03	1.01908E-03	1,818765-04	1,81862E-03
17	35BR 82 36KH 82	2	2.89369±=05 7.34588E=06	2.57178E-06 3.37496E-05	1.28505E-06 3.50125E-05	4.28056E-07 3.58447E-05	2,139905-07 3,605235-05	1.06987E-07 3.61565E-05
19	36KR 83	1	2.93000E-03	2. 33312E-03	2.931208-03	2.92919E-03	2,92867E=03	2,928456-03
21	36KH 85	ì	1.51514E-03	1.512935-03	1.50795E-03	1.49110E-03	1.46753E-03	1.42225E-03
22	36KR 86 3768 85	2	1.45049E-03 4.61882E-03	4.02/63E-03	4.62358E-03	4.64123E-03	4.663722-03	4,708526-03
24	3788 86 3788 87	2	1.34870E-07 9.51727E-03	8.29235E-08 9.52739E-03	5,50300E-08 7,52115E-03	2.05168E-08 9.51463E-03	1.026948-08 9.512948-03	5.13430E-09 9.51221E-03
26	385R 86	2	2,52044E-09	5.46130E-08	8,24163E+08	1+16835E-07	1,270588-07	1.32183E-07
28	355R 89	í	1.66200E-02	1.38056E-02	1.15228E-02	6.33860E-03	3,45638E-03	1.74230E-03
29 30	3858 90 3858 91	3	2,1273>E-02 1,09798E-02	2.12/53E-02 4.46270E-04	2.12398E-02 2.22939E-04	2.11395E-02 7.42786E-05	2.10080E-02 3.71327E-05	2.07539E-02 1.85649E+05
31	397 89 397 90	1	1,07349E-04	2, 14014E+03 4, 82746E=06	5.21194E-03	1.038476-02	1,32639E=02	1.49767E-02
33	39Y 91	ĩ	1.29062E-02	1. 287785-02	1.70538E-02	7.92249E-U3	5.55911E-03	2.819505-03
35	407R 90	2	6.24706E-08	1.67821E-05	3.79556E-05	1.23493E-04	2.512216-04	5.036892-04
36 37	40ZR 91 40ZR 92	1 2	5.01004E-04 2.93503E-02	4.08689E-03 2.93615E-02	7.11J16E-03 2.93522E-02	1.43834E-02 2.93421E-02	1.87/96E-02 2.93369E-02	2.15359E-02 2.93347E-02
38	40ZR 93	3	1,89718E-02	3.71591E-02	3.75273E-02	3.77631E-02	3.782175-02	3.78515E-02
40	40ZH 75	1	4.89183E-02	4.20477E-02	3.62679E-02	2.18127E-02	1.250402-02	6.38605E-03
41 42	4028 96 4028 97	2	4.94251E-02 3.49107E-02	4.947776-02	4.94452E-02 9.32599E-34	4.94114E-02 3.10653E-04	4.940256-02	4.93988E-02 7.76436E-05
43	41EB 95	1	2,6943dE-04	5.35054E-03	8.81947E-03 4.02193E-03	9.86777E-03	6.58201E-03	3.44481E-03 3.92323E-02
45	42MD 96	ş	3.66742E-05	3.57132E-05	3.668918-05	3.66640E-05	3.665756-05	3.66547E-05
47	42M0 98	2	5.72147E-02	5. 127562-02	5.72380E-02	5.719858-02	5.718876-02	5.71843E-02
48 49	42MU 99 42MO100	1	5.71609E-J2 6.89100E-02	3.47000E-03 5.99839E-02	4.33468E-03 6.89386E-02	1.44390E→03 5.88914E-02	7.21824E-04 6.887925-02	3.60834E-04 6.88739E-02
50	431C 79	3	6.64714E-03	5.57993E-02	5.01487E-02	6.30330E-02	6.37536ē-02	6.41136E-02
PU=239	(THERMAL)						P	AGE 2
PU=239 NO	(THERMAL)	NCAT	1 DAY	30 DAYS	BURN-UP TIME 60 DAYS	180 DAYS	P 360 DAYS	AGE 2 720 DAYS
PU-239 NO 51	NUCLIDE	NCAT 2	1 DAY 1.d2418E-05	30 DAYS 1.32612E-05	BURN-UP TIME 60 DAYS 1.82493E-05	180 DAYS 1.82368E-05	P 360 DAYS 1.823352-05	AGE 2 720 DAYS 1.82321E-05
PU-239 NO 51 52 53	O(THERMAL) NUCLIDE 44R0100 44R0101 44R0102	NCAT S S	1 DAY 1.42413E-05 5.05670E-02 6.10400E-02	30 DAYS 1.32612E-05 6.06314E-02 6.11050E-02	BURN-UP TIME 60 DAYS 1.82493E-05 6.05916E-02 6.10649E-02	180 DAYS 1.82368E-05 6.05501E-02 6.10231E-02	P 360 DAYS 1.82335±-05 6.05394±-02 6.10123E-02	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.10076E-02
PU-239 NO 51 52 53 54 55	(THERMAL) NUCLIDE 44R0100 44R0101 44R0102 44R0103 44R0104	NCAT 2 3 1 3	1 DAY 1.d2413E-05 6.05670E-02 6.10400E-02 6.9322VE-02 6.05167E-92	30 DAYS 1.32612E-05 0.1050E-07 5.44009E-02 0.0510E-02	BURN-UP TIME 60 DAYS 1.82493E-05 6.05916E-02 6.10649E-02 4.33045E-02 6.0541E-02	180 DAYS 1.82368E-05 6.05501E-02 6.10231E-02 2.12392E-02 6.04998E-02	P 360 DAYS 1.82335E-05 6.05394E-02 6.10123E-02 1.10724E-02 6.04891E-02	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.10076E-02 5.54594E-03 6.04845E-02
PU-239 NO 51 52 53 54 55 56	0([HERMAL) NUCLIDE 44R0100 44R0102 44R0103 44R0103 44R0103 44R0104 44R0104	NCAT 2 3 1 3 1 3	1 DAY 1.d2413E-05 6.05670E-02 6.10400E-02 6.05167E-02 1.01846-02 4.22043E-02	30 DAYS 1.32A12E-05 0.16314E-02 0.11050E-07 5.44009E-02 0.3510E-02 3.3398E-04 1.43398E-04	BURN-UP TIME 60 DAYS 1.82493E-05 6.05416E-02 6.10549E-02 4.33045E-02 4.33045E-02 1.91573E-02 1.91573E-04 4.03339E-02	180 DAYS 1.82368E-05 6.05501E-02 6.10231E-02 2.12392E-02 6.38141E-05 3.413314E-05 3.413314-02	P 360 DAYS 1.82335E-05 6.05394E-02 6.10123E-02 1.10724E-02 6.04891E-02 3.19014E-05 3.19014E-05	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.10076E-02 5.54594E-03 6.04845E-02 1.59495E-05 2.39917E-02
PU-235 NO 51 52 53 54 55 56 57 58	V(THERMAL) NUCLIDE 44RU100 44RU102 44RU102 44RU103 44RU104 44RU106 45RH103	NCAT 2 3 1 3 1 3 3 3 3	1 DAY 1.d2418E-05 6.05670E-02 6.10400E-02 6.35228E-02 6.35167E-02 1.12148E-02 4.25943E-02 4.25943E-03	30 DAYS 1.32A12E-05 0.36314E-02 0.105314E-02 0.35310E-02 3.43398E-02 4.14332E-02 4.14332E-02 1.55426E-03	BURY-UP [11] 60 DAYS 1.824931-05 6.05916E-02 6.15649E-02 6.05413E-02 6.05413E-02 4.03239E-02 4.03239E-02 2.65491E-02	180 DAYS 1.82368E-05 6.05501E-02 6.10231E-02 6.10231E-02 6.38141E-05 3.61333E-02 4.85102E-02	P 360 DAt5 1.823352-05 6.053942-02 6.10123E-02 1.10124E-02 6.04891E-02 3.19014E-05 3.90204E-02 3.826349E-02	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.10076E-02 5.54594E-03 6.04845E-02 1.59495E-05 2.32917E-02 6.43460E-02 6.43460E-02
PU-239 NO 51 52 53 54 55 56 57 58 59 60	NUCL IDE 44RU100 44RU101 44RU103 44RU103 44RU103 44RU103 44RU104 44RU106 45RH103 45RH103 45RH103	NCAT 2 3 1 3 1 3 3 1 3 2 2	1 DAY 1. d2419E-05 6. 03670E-02 6. 10400E-02 6. 93278-02 6. 03167E-02 4. 23943E-02 4. 23943E-02 4. 23943E-02 5. 35631E-07	30 DAYS 1.32612E-05 0.36514E-02 0.1050E-07 0.35510E-02 0.35510E-02 1.33398E-04 4.14332E-02 1.55426E-03 3.89266E-03 3.39266E-03	BURN-UP TIME 60 DAYS 1.82495E-05 6.05916E-02 6.15916E-02 6.05916E-02 6.05915E-02 6.05915E-02 6.05915E-02 1.91073E-04 4.03239E-02 2.65491E-02 1.94506E-03 3.36768E-07	180 DAYS 1.82368E-05 6.05501E-02 6.10231E-02 5.02998E-02 6.03994E-02 6.38141E-05 3.61333E-02 6.47908E-04 3.36537E-07	P 360 DAYS 1.82335±-05 6.05394±-02 6.101232-02 1.10724E-02 6.04891E-02 3.19014E-05 3.09209E-02 3.23897E-04 3.36478E-07	AGE 2 720 DAYS 1.82321E-05 6.05397E-02 6.10076E-02 5.94554E-03 6.04845E-02 1.95495E-05 2.52917E-02 6.3460E-02 1.61936E-04 3.36452E-07
PU-235 NO 51 52 53 54 55 56 57 58 59 60 61 62	NUCL IDE 44RU101 44RU101 44RU103 44RU103 44RU103 44RU103 44RU104 44RU104 44RU106 44RU106 44RU106 44RU106 44RU106 44RU106 44RU106 44RU106 44RU106 44RU106 44RU106 44RU107 45RU107 45	NCAT 2 3 1 3 1 3 1 3 1 2 3 2 2 2	1 DAY 1.d2415E-05 6.05670E-02 6.195070E-02 6.93278E-02 6.93278E-02 6.051672-02 1.12148E-02 4.25943E-02 6.05291E-04 3.35011E-02 7.51344E-03 3.35001E-05	30 DAYS 1.32612E-05 n.36314E-02 o.1050E-07 0.35310E-02 1.3398E-04 4.14932E-02 1.59426E-03 3.3982662-03 3.3982667 4.983442-02 1.22994E-03	BUR Y-UP TIME 60 DAYS 1.82493E-05 6.05916E-02 6.10549E-02 6.05915E-02 6.05413E-02 1.91573E-04 4.03239E-02 2.65491E-02 1.94506E-03 3.36768E-01 5.19383E-02 2.37122E-03	180 DAYS 1.82368E-05 6.05501E-02 6.0231E-02 7.1239E-02 6.04998E-02 6.04998E-02 6.038141E-05 3.6133E-02 6.47908E-04 3.6537E-07 5.33262E-02 6.3265E-03	P 360 DAY5 1.823356-05 6.053946-02 6.101238-02 1.00724E-02 6.04891E-02 3.19014E-05 3.09209E-02 3.23897E-04 3.36478E-07 5.36726E-02 1.173752-02	AGE 2 T20 DAYS 1.82321E-05 6.05347E-02 6.10076E-02 6.10076E-02 6.4345E-03 1.59495E-05 2.52917E-02 6.43460E-02 1.61936E-04 3.36452E-07 5.38463E-02
PU-235 NO 51 52 53 54 55 56 57 58 56 60 61 62 63 64	NUCL IDE 44RU100 44RU101 44RU102 44RU102 44RU102 44RU102 44RU104 44	NCA 1 2 3 1 3 1 3 1 3 1 2 3 2 3 2 3 2 3 2	1 DAY 1.d2413E-05 6.05670E-02 6.19600E-02 6.93228E-02 6.051672-02 1.121484-02 4.25943E-02 4.25943E-02 5.3561E-07 7.51346E-03 3.35001E-05 3.00592E-02 5.3616F-02	30 DAYS 1.32612E-05 n.36314E-02 n.36314E-02 n.36314E-02 n.35510E-02 3.3398E-04 4.14332E-02 1.5322E-02 3.3926E-03 3.36989E-07 4.98344E-02 1.22994E-03 3.00912E-02 2.33336E-02	BUR Y-UP T1/1E 60 DAYS 1.82493E-05 6.05916E-02 6.05916E-02 6.05913E-02 6.05913E-02 1.91073E-04 4.03239E-02 1.94506E-03 3.36/68E-01 5.19383E-02 3.36/68E-01 5.19383E-02 3.36/05E-02	180 DAYS 1.82368E-05 6.05501E-02 6.0231E-02 5.0239E-02 6.04998E-02 6.03934E-05 3.61333E-02 6.486705E-02 6.47908E-04 3.36537E-07 5.33262E-02 6.33262E-02 5.3265E-03 3.00509E-02 2.53196E-02	P 360 DAY5 1.823356-05 6.053946-02 6.101236-02 1.00724E-02 6.04891E-02 3.19014E-05 3.09709E-02 3.23897E-04 3.5474E-07 5.56726E-02 3.00455E-02 3.0345E	AGE 2 T20 DAYS 1.82321E-05 6.05347E-02 6.10076E-02 6.10076E-02 6.3460E-02 1.59495E-05 2.52917E-02 6.3460E-02 1.61936E-02 3.36452E-07 5.38463E-02 3.00432E-02 3.0
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PU-235 NO 51 52 53 54 55 56 57 58 59 61 62 62 63 64 65 66	NUCLIDE        14RU100        44RU101        44RU102        44RU102        44RU104        44RU105        44RU106        44RU106        44RU106        44RU106        44RU106        44RU106        44RU106        45R103        45R106        46P0106        46P0108        46P0108        46P0109        46P01010        46P01010        46P01010        46P01010        46P01010        46P01010	NCA1 2 3 1 3 3 1 3 3 2 2 3 2 2 1 2 2 2 2	1 DAY 1. d2419E-05 6. 05670E-02 6. 1040V-02 6. 05167E-02 1. 12184E-02 1. 2184E-02 1. 3531E-02 3. 3501E-02 3. 3501E-02 3. 3501E-02 3. 3501E-02 3. 3501E-02 2. 55267E-02 2. 55267E-02 3. 7172E-04	30 DAYS 1.32412E-05 n.36314E-02 0.36314E-02 0.36310E-02 3.4308E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.3486E-03 3.4926E-03 3.36989E-07 1.22994E-03 3.00912E-02 2.33336E-02 4.3182E-03 4	BUR Y-UP TITE 60 DAYS 1.82493E-05 6.05916E-22 6.10649E-27 4.33045E-02 1.91573E-02 1.91573E-02 2.66491E-22 1.94506E-03 3.36768E-07 3.19335E-02 2.53170E-02 2.53170E-02 2.53170E-02 2.53170E-02 2.53170E-03	180 DAYS 1.82368E-05 6.05501E-02 6.0231E-02 6.04998E-02 6.04998E-02 6.04998E-02 6.38141E-05 3.6133E-02 4.86705E-02 6.486705E-02 6.33657E-07 3.36537E-07 3.36537E-07 3.36537E-07 5.33265E-02 6.53846E-05 7.40844E-03 7.40844E-05 7.40844E-	P 360 DAYS 1.82335±-05 6.05394±-02 6.101235=02 1.01734±-02 6.04891E-02 3.19014±-05 3.09204E-02 3.28897E-04 3.54*78E-07 5.36736E-02 3.34518E-07 5.36736E-02 2.53151E-06 7.40712E-03 3.4951E-06	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.0076E-02 5.5459E-03 1.93495E-03 1.93495E-03 1.53452E-07 1.61936E-04 3.36452E-07 1.536452E-07 1.93634E-02 2.53132E-02 1.67079E-05 7.0655E-03 1.9757LE-06
PU-235 NO 51 52 53 54 55 55 56 57 57 58 66 61 62 63 64 65 67 68	C(HERMAL) NUCLIDE 14R0100 44R0101 44R0102 44R0103 44R0105 44R0106 44R0106 45R100 45P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 46P0105 4766105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 4776105 47777575 47777575 47777575 477775757575	NCAT 2 3 1 3 1 3 3 2 3 2 2 3 2 3 2 3 2 3 1 2 3 3 1 2 3 3 1 2 3 3 1 3 3 1 3 3 1 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3	1 DAY 1. d2418E-05 6. 105670E-02 6. 106000E-02 6. 405167E-02 1. 12184E-02 1. 12184E-02 1. 12184E-03 6. 06291E-04 3. 3501E-02 3. 3501E-02 3. 3502E-02 2. 55267E-02 2. 55267E-02 3. 7. 41049E-03 7. 41049E-03 7. 4329E-04 5. 32239E-03 2. 60862E-03	30 DAYS 1.32412E-05 n.16314E-02 0.36314E-02 5.44004E-02 3.43098E-04 1.43398E-04 1.5328E-02 1.55426E-03 3.36989E-07 1.22994E-03 3.36989E-07 1.22994E-03 3.00912E-02 2.53336E-02 4.01629E-04 7.41838E-03 1.34517E-02 1.34517E-0	8UR Y-UP TITE 60 DAYS 1.82493E-05 6.05916E-02 6.10649E-02 4.33045E-02 1.9173E-02 1.9173E-02 1.9173E-02 2.66491E-02 1.94506E-03 3.36768E-01 5.1983E-02 2.337122E-03 3.0715E-02 2.337125E-02 2.3370E-02 1.36435E-02 4.90796E-04	180 DAYS 1.82368E-05 6.05501E-02 6.105501E-02 2.12392E-02 6.38141E-05 3.61331E-02 4.86705E-02 6.47908E-02 6.3708E-02 6.3708E-02 6.33265E-02 6.33265E-02 6.33265E-02 6.3846E-05 7.4084E-05 7.4084E-05 7.4084E-05 1.64126E-04	260 DAYS 1.823352-05 6.053942-02 6.10123E-02 1.10724E-02 8.09829E-02 3.09204E-02 3.09204E-02 3.09204E-02 3.09204E-02 3.09457E-02 3.23897E-04 3.36478E-07 3.04554E-02 1.17375e-02 3.34182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 3.45182-05 7.407122-03 7.40712-03 7.407122-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.40712-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03 7.4072-03	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.00347E-02 5.54594E-03 6.00845E-02 1.59495E-05 3.22917E-02 6.43460E-02 1.59495E-05 3.36452E-07 1.5454E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5554E-02 1.5
PU-235 NO 51 52 53 54 55 56 61 62 63 64 65 66 66 67 68 67 71	C(HERMAL) NUCLIDE *4R0100 *4R0101 *4R0102 *4R0102 *4R0102 *4R0105 *4 *4R0105 *4 *4 *4R0105 *4 *4 *4 *4 *4 *4 *4 *4 *4 *4 *4 *4 *4	NCAT 2 3 1 3 3 1 3 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3	1 DAY 1. d2419E-05 6. 05670E-02 6. 106000E-02 6. 0310F1E-02 1. 01671E-02 1. 01671E-02 1. 0291E-04 6. 05291E-04 3. 3261E-07 3. 3264E-03 3. 3261E-07 3. 3264E-03 3. 32621E-04 3. 3201E-04 3. 3201E-04 3. 3201E-04 3. 3201E-04 3. 3201E-04 3. 32239E-03 3. 41049E-04 5. 32239E-03 1. 23594E-07 1. 12656E-04	30 DAYS 1. 32h12E-05 n.36314E-02 0.105010-07 5.44004E-02 4.3398E-04 1.55426E-03 3.36989E-07 1.55426E-03 3.36989E-07 1.22994E-03 3.36989E-07 1.22994E-03 3.30942-02 1.239326-02 1.33338E-03 1.34517E-02 1.23726E-07 1.33137E-03	8UR Y-UP [1116 60 DAYS 1.82493E-05 6.05916E-02 4.33045E-02 1.9173E-04 4.33045E-02 1.9173E-04 4.03239E-02 2.6491E-02 1.94036E-03 3.36758E-02 2.194306E-03 3.36758E-02 2.35370E-02 2.35370E-02 1.36435E-02 1.36435E-02 1.23644E-07 2.23564E-03	180 DAYS 1.82368E-05 6.05501E-02 2.12392E-02 2.12392E-02 2.12392E-02 6.04999E-02 6.04999E-02 6.04999E-02 6.049996E-02 6.3815E-02 6.3855E-03 3.06537E-07 5.3325E-02 6.3875E-02 7.4084E-05 7.4084E-0	260 DAY5 1. e23352-05 6. 05394-02 6. 01235-02 1. 0724E-02 6. 010125-02 1. 0724E-02 1. 0724E-02 1. 0724E-02 1. 0724E-02 1. 0724E-02 1. 0725E-02 1. 17375E-02 1. 0455E-02 1. 0455E-02 1. 0455E-02 1. 0455E-02 1. 0455E-02 1. 0455E-02 1. 0455E-02 1. 37898E-02 1. 37898E-02 1. 23538E-05 1. 25568E-05 1. 25568E-05 1. 25568E-05 1. 25568E-05 1. 25568	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 5.54594E-03 1.93495E-05 1.93495E-05 1.2937E-02 6.43460E-02 1.54936E-04 3.36452E-07 1.39635E-02 1.93632E-02 2.53132E-02 1.64936E-02 1.93632E-02 1.64936E-02 1.93632E-02 1.64936E-02 1.95750E-06 1.93149E-02 1.95750E-06 1.93570E-06 1.3324E-07 2.63241E-03 1.95550E-06 1.33528E-07 2.65241E-03 1.6555E-03 1.95550E-06 1.33528E-07 2.65241E-03 1.6555E-03 1.95550E-06 1.33528E-07 2.65241E-03 2.5525E-03 2.5555E-03 2.55555E-03 2.55555E-03 2.
PU-235 NO 51 52 53 54 55 56 66 66 66 66 66 66 66 670 712	NUCLIDE        **R0100        **R0101        **R0101        **R0102        **R0105        **R0106        **R0105	NCAT 2 3 1 3 1 3 3 1 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1 d2419E-05 6 1000-E-02 6 1000-E-02 6 103167E-02 1 3224-02 4 23943E-02 4 23943E-02 4 23943E-03 3 3503E-03 3 3503E-03 3 3503E-03 3 3003E-05 3 3003E-05 3 3003E-05 3 51618E-02 8 5364E-02 8 51618E-02 8 5161	30 DAYS 1.3212E-05 n.36314E-02 n.1050L-07 5.44004E-02 1.3338E-04 4.1432E-02 3.4338E-04 1.3526E-02 3.4928E-02 3.4928E-02 1.2294E-02 1.2294E-02 1.2294E-02 1.2294E-02 1.2294E-02 1.2294E-02 1.2294E-02 1.2494E-02 1.3451E-02 1.3451E-02 1.2494E-04 1.23726E-03 1.2172E-03 1.2172E-03 1.2172E-03 1.2172E-03 1.2172E-04 1.2172	BUR Y-UP [11] 60 DAYS 1.824931-05 6.05416E-02 6.05416E-02 6.05413E-02 1.91573E-06 4.03239E-02 1.94506E-03 1.94506E-03 3.36168E-02 2.53310E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5330E-02 3.5350E-02 3.5350E-02 3.5350E-02 3.5350E-02 3.5350E-02 3.5350E-02 3.550E-02 5.550E-02	180 DAYS 1.82368E-05 6.05101E-02 6.0231E-02 2.12392E-02 6.03914E-05 3.6133E-02 4.1332E-02 6.38144E-05 3.6133E-02 6.3826E-02 3.3652E-02 3.3652E-02 3.3652E-02 3.3652E-02 3.3652E-02 3.4034E-03 7.90481E-03 7.90481E-03 1.6376F-02 1.6376F-02 1.6376E-03 1.6393E-03 1.6395E-03 1	A 23352-05 6.053942-02 6.10123E-02 6.10124E-02 6.04891E-02 3.190142-05 3.09204E-02 3.23897E-04 3.38478E-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.384782-02 3.34832-02 3.34822-02 3.3482-	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.0074E-02 5.0074E-02 5.0549FE-05 2.3297E-02 6.43460E-02 2.3449E-03 3.3449E-02 1.6497E-02 3.0497E-0
PU-235 NO 51 52 54 55 55 55 55 55 55 55 55 55 55 55 55	NUCLIDE        14R0100        14R0101        14R0102        44R0103        44R0104        44R0105        44R0105        44R0106        45R103        45R104        46P0104        45P106        45P107        46P0108        45P109        45P104        45P0107        45P0108        45P0109        45P0107        45P0108        45P0109        45P0107        45P0108        45P0109        45P0108        45P0108        45P0109        45P0108        45P0118        45P0118        45P0118        45P0118        45P01	NCAT 2 3 1 3 1 3 3 1 2 3 2 2 2 2 2 2 2 2 1 2 2 1 2 2 1 2 2 1 2 3 1 2 3 2 3 1 2 3 2 3 2 3 1 2 3 3 1 2 3 2 3 2 3 2 3 1 2 3 3 1 2 3 2 3 2 3 2 3 3 1 2 3 3 1 2 3 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1 d2418E-05 6 03670E-02 6 10400E-02 6 03167E-02 6 03167E-02 6 03167E-02 4 02948E-02 4 02948E-02 4 02948E-02 4 02948E-02 5 0361E-03 7 0392E-02 8 0300E-03 8 0300E-03 1 23594E-03 1 23594E-03 2 53254E-03 2	30 DAYS 1. 32A12E=05 0. 16314E=02 0. 16314E=02 0. 3510E=02 0. 3510E=02 0. 3510E=02 0. 3510E=02 0. 3510E=02 0. 3520E=03 0. 3620E=03 0. 0912E=02 0. 3530E=02 0. 1629E=04 0. 1629E=04 0. 1629E=04 0. 1629E=04 0. 123726E=07 1. 23736E=07 1. 23736E=07 1. 23736E=07 1. 23736E=07 1. 23736E=07 1. 23726E=07 1. 2257E=04 0. 2657E=04 0. 2657E=04 0. 2657E=04 0. 2657E=04 0. 2650E=04 0. 2650E=04	BURN-UP [114 60 DAYS 1.824931-05 6.05918E-02 6.05918E-02 6.03415E-02 6.03415E-02 6.03415E-02 1.91573E-04 4.03239E-02 1.94508E-03 3.36648E-01 5.19333E-02 2.05310E-02 2.05310E-02 2.53310E-02 2.35315E-02 2.35315E-02 2.35315E-02 2.35315E-02 3.442048E-04 1.15091E-03 8.42048E-04	180 DAYS 1, 82368E-05 6, 05501E-02 6, 07501E-02 6, 035101E-02 6, 04998E-02 6, 04998E-02 6, 3814E-05 3, 6133E-02 4, 86705E-02 6, 47908E-04 3, 3653E-07 3, 3653E-07 3, 3653E-07 3, 3655E-03 3, 00509E-02 6, 53265E-03 3, 00509E-02 6, 53265E-03 3, 00509E-02 6, 5326E-02 1, 5396E-02 1, 63848E-03 7, 90481E-06 1, 37679E-02 1, 63426E-04 1, 23560-0E-07 2, 56040E-07 2, 56040E-07 2, 5472E-04	360 DAY5 1.823352-05 6.053942-02 6.101232-02 6.048912-02 6.048912-02 3.190144-05 3.092042-02 3.293972-04 3.29484-05 3.682496-02 3.238972-04 3.567362-02 3.567362-02 3.567362-02 3.54132-02 3.54132-03 3.551712-03 3.55172-03 3.5572-04 3.5572-0	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 6.4345E-02 1.54459E-05 2.52917E-02 1.643460-02 1.6435E-07 3.5645E-07 3.5645E-07 3.5645E-07 3.5645E-07 3.06432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-03 1.73570E-06 1.73572E-07 2.68241E-03 8.41294E-04 5.42634E-04
PU-235 NO 51 52 53 54 55 55 55 55 55 55 55 55 55 55 55 55	P([HEKMAL]) NUCLIDE 14R0100 44R0101 44R0102 44R0102 44R0103 44R0106 44R0106 45R0103 45R0103 45R0103 45R0103 45R0103 45P010 45P01	NCAT 2 3 1 3 1 3 1 3 1 2 3 1 2 2 1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 2 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 2 2 1 2 3 2 2 1 2 2 3 1 2 2 3 2 2 1 2 2 3 1 2 2 3 2 2 1 2 2 3 1 2 2 3 2 2 1 2 2 3 1 2 2 3 1 2 2 3 2 2 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1. d2419E-05 6. 03670E-02 6. 10400E-02 6. 9327WE-02 6. 03167E-02 1. 12148-02 4. 22943E-02 4. 22943E-02 4. 22943E-02 4. 02691E-04 3. 35031E-07 7. 51344E-03 3. 35031E-07 7. 51344E-03 3. 35031E-07 7. 51348E-03 7. 10592E-02 8. 51618E-03 7. 41049E-03 7. 41049E-03 7. 41049E-03 1. 23594E-07 1. 16666E-04 3. 42938E-07 1. 16666E-04 3. 42938E-07 1. 16666E-04 3. 42938E-07 1. 25984E-04 3. 42984E-04 3. 42984E-	30 DAYS 1. 32A12E-05 n. 36314E-02 b. 1050E-02 b. 3510E-02 b. 3510E-02 b. 35348E-04 w. 14932E-02 1. 55426E-03 3. 86986E-07 4. 98344E-02 1. 25926E-03 3. 00912E-02 2. 53336E-02 4. 31629F-04 7. 41338E-03 w. 74925E-05 1. 22792E-03 8. 42537E-02 9. 24449E-04 1. 23726E-07 1. 30373E-03 3. 42537E-04 4. 00793E-05 3. 7022E-04 4. 00793E-05 3. 7022E-04 5. 7022E-04 5	BUR Y-UP TIME 60 DAYS 1.82493E-05 6.05418E-02 6.05418E-02 6.05418E-02 6.05418E-02 6.05418E-02 6.05418E-02 6.05418E-02 1.91573E-04 4.03239E-02 1.94508E-01 5.19333E-02 2.05431E-03 3.05715E-02 2.05431E-03 3.05715E-02 2.05310E-02 2.05310E-02 2.0535E-02 4.90790E-04 1.23644E-07 2.23561E-03 8.42048E-04 2.02235E-04 4.00223E-04 2.02235E-04 2.0225E-04 2.0225E-04	180 DAYS 1.82368E-05 6.05501E-02 6.02510E-02 6.03501E-02 6.03994E-02 6.03994E-02 6.03934E-05 3.61333E-02 6.43814E-05 3.3653E-07 5.33262E-02 6.47908E-04 5.3265E-03 3.00509E-02 6.63834E-05 7.90481E-06 1.37679E-02 1.64126E-04 1.2356040E-03 7.90481E-06 1.37679E-02 1.64126E-04 1.4593E-03 3.41508E-04 5.42772E-04 6.67153E-06 3.69229E-04	360 DAYS 1.82335±-05 6.05394±-02 6.101232-02 1.01724E-02 6.04891E-02 3.19014±-05 3.09709E-02 3.23897E-04 3.36478E-07 5.88296E-02 3.36478E-07 5.8829E-02 3.36478E-07 5.8829E-02 3.36478E-07 5.8829E-02 3.36478E-07 5.8829E-02 3.36478E-07 5.8829E-02 3.341835E-07 3.4698E-03 8.41358E-04 2.64200E-03 1.16598E-03 8.41358E-04 3.35517E-06 3.35517E-06 3.35517E-06 3.35517E-06 3.35517E-06 3.35517E-06 3.35517E-06 3.35517E-06 3.5586E-04 3.35517E-06 3.5686E-04 3.5586E-04 3.	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.10076C-02 5.54554E-03 6.04835E-05 2.52917E-02 6.3460E-02 1.9495E-05 2.52917E-02 6.3460E-02 1.61936E-03 1.9455E-03 1.9455E-03 1.9455E-03 1.9455E-03 1.9455E-03 1.9455E-03 1.9570E-06 1.32152E-07 2.6324E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.00432E-02 3.12157E-03 1.95570E-06 1.32152E-07 2.68241E-03 1.71577E-03 8.41294E-04 1.66746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.6746E-06 3.677750E-06 3.677750E-06 3.677750E-06 3.67750E-06 3.67750E-06
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PU-235 NO 51 52 53 54 55 56 56 56 56 66 66 66 66 70 77 77 77 77 77 77 77 77 77 77 77 77	C(HERMAL) NUCL 1DE 14R01001 14R0102 44R0101 44R0103 44R0103 44R0104 44R0106 45R0105 46P0105 46	NCA1 2 3 1 3 3 1 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1. d2419E-05 6. 05670E-02 6. 10400E-02 6. 0327E-02 1. 12184E-02 1. 12184E-02 1. 12184E-03 6. 06291E-04 3. 35211E-02 3. 3631E-07 7. 5134E-03 8. 33001E-05 9. 0592E-02 2. 55261E-02 2. 55261E-02 7. 4109E-04 5. 42594E-03 1. 25594E-03 1. 25594E-03	30 DAYS 1.32+12E-05 n.36314E-02 0.36314E-02 0.36314E-02 1.3598E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.3485E-02 1.35426E-03 1.36889E-07 1.22994E-03 1.35356E-02 1.35356E-02 1.34517E-02 1.34572E-03 1.34517E-02 1.34572E-03 1.	BUR Y-UP TITL 60 DAYS 1.82493E-05 6.05916E-02 6.05916E-02 6.05418E-02 6.05418E-02 1.94096E-03 1.94096E-03 3.3678E-07 2.66491E-02 1.94096E-03 3.3678E-07 2.3737E-05 2.3737E-05 2.3737E-05 1.36435E-02 2.37307E-05 1.36435E-02 2.37307E-05 1.36435E-02 2.37307E-05 1.36435E-02 3.3044E-04 5.43144E-04 5.4334E-04 5.4334E-04 5.4544E-04 5.4544E-04 5.4544E-04 5.4544	180 DAYS 1.823685-05 6.055015-02 6.102315-02 2.123925-02 6.302315-02 6.302395-02 6.302985-02 6.0439985-02 6.4739085-02 6.4739085-02 6.332652-02 6.332652-02 6.332652-02 6.332652-02 6.332652-02 6.332652-02 6.332652-02 7.408445-03 7.90481-04 1.376795-02 1.641265-04 1.641265-04 1.6421265-04 3.427725-04 6.6713515-06 3.422685-04 1.822685-04 1.822685-04 1.822685-04	360 DAYS 1.823352-05 6.05394E-02 6.05394E-02 1.10724E-02 3.19014E-02 3.09204E-02 3.09204E-02 3.38249E-02 3.38478E-07 3.58726E-02 1.173752-02 3.34785E-07 1.473752-02 3.345185-05 1.23538E-07 1.407122-03 3.45171E-06 1.37989E-02 3.24878E-05 1.23538E-07 1.69883E-04 3.33517E-06 3.69863E-04 3.459862-04 1.69885E	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 5.54594E-03 6.04845E-02 1.59495E-05 6.04845E-02 1.59495E-05 6.3460E-02 1.61936E-04 3.36452E-07 1.61936E-04 3.06452E-07 7.60655E-03 1.97570E-06 1.3512E-02 1.67079E-05 7.60655E-03 1.97570E-06 1.3512E-02 1.67079E-05 7.60655E-03 1.97570E-06 1.3512E-02 1.6725E-06 1.3512E-02 1.6725E-06 1.3512E-02 1.6725E-06 1.3512E-02 1.6725E-06 1.3512E-02 1.6725E-06 1.3512E-02 1.6725E-05 1.6752E-05 1.7552E-05 1.755
PU-233 NO 51 52 53 54 55 56 55 56 55 56 61 62 62 62 63 64 64 65 66 67 71 72 73 74 75 77 78 9 80	C(HERMAL) NUCL IDE 14R0100 14R0101 14R0102 44R0103 44R0103 44R0104 44R0105 46P0104 44R0106 45R0106 45P0109 46P0107 46P0109 46P0107 46P0108 46P0107 46P0108 46P0107 46P0108 46C0113 48C0114 48C0115 48C0114 48C0115 30SN115 50SN15 50	NCA1 2 3 1 3 1 3 3 1 2 3 2 2 3 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 3 1 2 3 2 3 1 2 3 2 3 1 2 3 2 3 2 3 1 2 3 2 3 1 2 3 2 3 1 2 3 2 3 1 2 3 2 3 1 2 3 2 3 1 2 3 2 3 1 2 3 2 2 3 1 2 2 3 1 2 3 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 1 2 1 2 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1. d2418E-05 6. 05670E-02 6. 106000E-02 6. 05167E-02 1. 12184E-02 1. 12184E-02 1. 12184E-03 6. 06291E-04 3. 3521E-02 3. 3501E-02 3. 3501E-02 3. 3501E-02 3. 3526E-02 3. 3526E-02 3. 32239E-03 1. 16666E-04 3. 23594E-07 3. 21629E-04 5. 31629E-04 5. 31629E-04 5. 32239E-03 1. 23594E-07 3. 51639E-07 3. 55149E-04 4. 47784E-04 1. 4978E-04 1. 4	30 DAYS 1.32412E-05 n.165314E-02 0.36314E-02 1.30510E-02 3.4398E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.22994E-03 3.36989E-07 1.22994E-03 3.36989E-07 1.22994E-03 3.00912E-02 2.33336E-02 4.3125E-04 1.34517E-02 1.3500E-04 1.35502E-04 1.55527E-04 1.55557E-04 1.55557E-04 1.55557E-04 1.55557E-04 1.55557E-04 1.	80R UP [1/16 60 Days 1.82 + 93 05 6.05 + 16 02 6.05 + 16 02 6.05 + 16 02 6.05 + 16 02 1.91 73 04 4.33 04 1.91 73 04 1.91 73 04 1.94 05 1.94 05 1.94 05 1.94 05 1.94 05 1.94 05 1.36 05 1.35 05	180 DAYS 1,82368E-05 6,05501E-02 2,12392E-02 6,10231E-02 2,12392E-02 6,38141E-05 3,6133E-02 4,86705E-02 6,38346E-02 4,35637E-07 3,33652E-02 6,333265E-03 3,00509E-02 2,53196E-02 6,638346E-05 1,64126E-04 1,23560E-07 1,64126E-04 1,23560E-07 1,64126E-04 1,23560E-07 1,6593E-02 1,64126E-04 1,23560E-07 1,65929E-04 3,45929E-04 1,82268E-04 1,82268E-04 1,82268E-04 1,82268E-04 1,82268E-04 1,82268E-04 1,82268E-04	360 DAYS 1.823352-05 6.053942-02 6.10123E-02 1.10724E-02 3.190142-05 3.09204E-02 3.8249E-02 3.309704E-02 3.30478E-07 3.5478E-07 3.5478E-07 3.5478E-07 3.5478E-07 3.5478E-04 3.5458E-04 1.59863E-04 3.49875E-04 3.4987E-0	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 5.54594E-03 5.0459E-02 1.59495E-05 1.2927E-02 6.43460E-02 1.59495E-04 3.36452E-07 1.38452E-02 1.53122E-02 1.53122E-02 1.57079E-05 7.40655E-03 1.97570E-06 1.35124-02 1.53528E-07 1.64722E-05 3.59482E-04 1.64722E-05 1.6578E-04 1.66728E-04 1.66748E-06 3.599834E-04 1.66728E-07 3.54960E-04
PU-233 NO 51 52 53 54 55 56 57 58 56 57 58 56 57 58 60 61 62 62 63 64 64 65 66 66 66 67 70 71 72 73 73 74 76 77 77 80 80 80 82 83	P(THERMAL) NUCLIDE 14R0100 14R0101 14R0102 44R0103 44R0105 44R0105 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 44R0106 48D0107	NCA1 2 3 1 3 1 3 1 2 3 2 3 2 1 2 3 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 3 2 1 2 2 3 2 2 2 3 2 2 2 3 2 2 2 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1. d2418E-05 6. 100400E-02 6. 100400E-02 6. 101600E-02 6. 03167E-02 1. 0167E-02 1. 0167E-02 1. 0167E-02 3. 36531E-07 3. 35031E-07 3. 35031E-02 3. 35031E-02 3. 35031E-02 3. 35031E-02 3. 35267E-02 3. 35267E-02 3. 25594E-04 3. 20394E-04 3. 20394E	30 DAYS 1. 32h12E-05 n.36314E-02 0.11050E-07 5.44009E-02 1.3398E-04 1.43398E-04 1.43398E-04 1.43398E-04 1.3398E-04 1.3398E-04 1.3398E-04 1.22994E-03 1.3528E-04 1.3338E-03 1.34517E-02 1.33356E-02 1.34517E-02 1.23726E-04 1.3373E-03 1.12792E-03 1.2792E-03 1.2792E-03 1.2792E-03 1.2792E-03 1.2792E-03 1.2792E-03 1.3350E-02 1.3350E-02 1.3350E-02 1.3350E-02 1.3350E-02 1.3350E-04 1.3350E-04 1.3350E-04 1.35527E-04 3.5527E-04 3.5527E-04 3.5528E-07 3.5527E-04 3.59885E-07 3.5528E-04 3.59885E	8UR Y-UP [1116 60 DAYS 1.82493E-05 6.05916E-02 4.33045E-02 4.33045E-02 1.9173E-04 4.02539E-02 2.19173E-04 4.02539E-02 2.35126E-02 2.35126E-02 2.35126E-02 2.35370E-02 2.35370E-02 2.35370E-05 1.36435E-02 2.353146E-03 1.23644E-04 2.23564E-03 1.23644E-04 3.3144E-04	180 DAYS 1.823685-05 6.055015-02 2.123925-02 2.123925-02 2.123925-02 2.123925-02 2.381415-05 3.613315-02 4.867055-02 4.867055-02 4.532555-03 3.335252-02 6.332552-02 6.332552-02 2.532552-02 2.532552-02 2.532552-02 2.533552-02 2.533552-02 2.533552-02 2.533552-02 2.533552-02 2.533552-02 2.533552-02 2.533552-02 2.53552-02 2.53552-02 1.64225252-02 2.550502-02 3.4257252-04 3.427252-04 3.4252682-04 1.422682-04 1.422682-04 1.422682-04 1.422682-04 1.429682-04 1.429682-04 1.429682-04 1.429682-04 1.429682-04 1.429682-04 1.429682-04 1.429682-04	2400 DAY5 1.823352-05 6.053942-02 6.101235-02 1.107245-02 6.04891E-02 3.090142-05 3.09024E-02 3.09024E-02 3.08269E-02 3.08269E-02 3.08269E-02 3.08478E-07 3.047182-02 1.173752-02 3.047182-03 1.157869E-02 3.045182-05 7.407122-03 3.945112-06 1.37389E-02 3.24675E-04 3.3511E-06 3.69863E-04 3.4939E-04 1.69863E-04 3.4939E-04 1.69863E-04 3.4939E-04 1.63903E-05 3.4987E-04 3.4939E-04 3.4935E-04 3.493	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 5.54594E-03 5.54594E-03 6.06845E-02 1.59495E-05 7.2927E-02 6.43460E-02 1.59454E-04 3.36452E-07 1.59634E-02 1.595312E-02 1.57076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.75076E-05 1.5252E-07 1.64722E-05 5.249834E-04 5.242634E-04 5.242634E-04 5.42634E-04 5.42634E-04 5.59834E-04 1.66774E-06 3.59984E-04 1.68722E-05 1.48722E-05 1.84722E-05 5.2496E-04 3.599834E-04 1.68722E-05 3.4960E-04 3.4968E-04 3.59983E-04 1.68722E-05 3.4960E-04 3.4968E-04 3.59931E-04 3.5932E-04 3.5932E-04 3.
PU-233 NO 51 52 53 54 55 56 57 58 56 60 61 62 63 64 65 66 66 66 67 70 71 72 73 74 76 70 71 72 73 80 80 81 82 83 84 84	P(THERMAL) NUCLIDE 14R0100 44R0101 44R0102 44R0102 44R0102 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0105 44R0113 44R0114 44R0115 44R015 44R0	NCA1 2 3 1 1 3 1 3 3 2 1 2 2 3 2 1 2 2 3 1 2 1 2	1 DAY 1. d2419E-05 6. 05670E-02 6. 106000E-02 6. 03670E-02 6. 03167E-02 1. 12186E-02 1. 12186E-02 3. 35631E-07 3. 35631E-07 3. 35631E-07 3. 35720E-03 2. 55267E-02 2. 55267E-02 3. 253267E-03 1. 12586E-03 3. 2039E-03 2. 55267E-03 3. 2039E-03 2. 55267E-03 3. 2039E-03 2. 55267E-03 3. 2039E-03 2. 55267E-03 3. 2039E-03 2. 55169E-07 3. 55149E-04 3. 4379E-04 3. 4379E-04 3	30 DAYS 1. 3212E-05 n.36314E-02 s.10090E-07 5.44004E-02 s.3398E-04 1.43398E-04 1.43398E-04 1.43398E-04 1.43398E-04 1.4338E-03 1.32894E-07 1.22994E-03 3.09912E-02 2.53536E-02 3.09912E-02 2.53538E-02 1.43538E-03 1.45517E-02 1.23726E-07 1.23726E-07 1.23726E-07 1.23726E-07 1.23726E-07 1.23726E-07 1.3373E-03 1.12792E-03 3.15017E-04 3.55227E-04 3.55227E-04 3.55227E-04 3.55227E-04 3.59885E-04	8UR Y-UP [1116 60 Days 1.82-931-05 6.159168-02 6.159168-02 6.150498-02 7.6159168-02 6.059188-02 7.91738-04 7.91738-04 7.91738-04 7.91738-02 7.945918-0	180 DAYS 1.82368E-05 6.05301E-02 6.10231E-02 6.03976E-02 6.03976E-02 6.03976E-02 6.03976E-02 6.04976E-02 6.047706E-02 6.047706E-02 6.047706E-02 6.04765E-06 6.04755E-06 6.26612E-07 7.55030E-04 7.42268E-05 6.26612E-07 7.55030E-04 7.42268E-05 6.26612E-07 7.55030E-04 7.42268E-04 7.4226E-04 7.426E-04	2360 DAY5 1.823352-05 6.05394:-02 6.103394:-02 6.10474:-02 1.10724:-02 1.10724:-02 1.10724:-02 1.10724:-02 1.10724:-02 1.10724:-02 1.10724:-02 1.10724:-02 1.107352:-02 1.07352:-02 1.07352:-02 1.07352:-02 1.07352:-02 1.07352:-02 1.07352:-02 1.07452:-02 1.07452:-02 1.07352:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07452:-02 1.07552:-02 1.07552:-02 1.07552:-02 1.07552:-02 1.07552:-02 1.059682:-03 1.169682:-03 1.059682:-04 1.639032:-04 1.639032:-04 1.639032:-04 1.635742:-04 1.73534:-04 1.73534:-04 1.655742:-04 1.73534:-04 1.655742:-04 1.73534:-04 1.73534:-04 1.73534:-04 1.73534:-04 1.73534:-04 1.73534:-04 1.73534:-04 1.73534:-04 1.7354:-04	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 5.54574E-03 6.06485E-02 1.3292E-05 6.04845E-02 1.3495E-06 1.3495E-06 1.35452E-07 1.35452E-07 1.35452E-07 1.35452E-07 1.35452E-07 1.35452E-07 1.4575E-06 1.4575E-06 1.4572E-07 1
PU-235 NO 51 52 53 54 56 56 56 56 56 56 56 56 56 56 56 56 56	P([HERMAL] NUCLIDE *4R0100 *4R0101 *4R0102 *4R0102 *4R0102 *4R0105 *4R0115 *4R015 *4R0	NCA1 2 3 1 1 3 1 3 1 3 1 2 2 2 2 2 2 2 2 2	1 DAY 1 d2418E-05 6 105670E-02 6 105670E-02 6 105184E-02 6 105184E-02 4 259491E-04 3 55211E-06 7 35184E-07 3 555186-07 3 555186-07 3 555186-07 3 555186-07 3 555186-07 3 555186-07 1 16666E-03 3 20586E-03 3 2058	30 DAYS 1.3212E-05 n.105014E-02 0.105010-07 5.44004E-02 0.3398E-04 1.5398E-02 1.5398E-03 3.43988E-03 3.43984E-02 1.2294E-03 3.4384E-02 1.2294E-03 3.09286E-04 1.2272E-03 1.2272E-03 1.2272E-03 1.2272E-03 1.2272E-03 1.2272E-03 1.2272E-03 3.0073E-04 3.5019E-04 3.5019E-04 3.5018E-04 3.	BUR Y-UP TITLE 60 DAYS 1.82493E-05 6.05416E-02 6.05416E-02 6.05415E-02 6.05415E-02 6.05415E-02 1.91573E-06 4.05239E-02 1.94506E-03 3.36168E-02 2.06493E-02 2.06493E-02 2.054310E-02 2.05310E-02 2.05315E-02 2.05315E-02 2.05315E-02 2.05315E-02 2.05315E-02 2.05315E-02 2.05315E-02 2.05315E-02 2.05315E-02 3.055E-04 3.0703E-04 3.55846E-04 3.5584E-04 3.7585E-04 3.75876E-04	180 DAYS 1.82368E-05 6.05101E-022 6.03978E-02 7.0231E-022 6.04998E-04 7.61331E-02 7.61331E-02 7.61331E-02 7.61331E-02 7.33262E-02 7.33262E-02 7.33262E-02 7.40348E-03 7.40348	360 DAYS 1.823352-05 6.05394:-02 6.10128:-02 6.05394:-02 6.06481E-02 3.09204E-02 3.09204E-02 3.29397E-04 3.39478:-07 5.567264:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-02 3.09452:-04 3.09452	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.00346E-03 6.06845E-02 1.53495E-05 2.3297E-02 6.43460E-02 2.3465E-02 1.6493E-03 3.3452E-02 1.0547E-02 1.0547E-02 1.0547E-02 1.0545E-02 1.0547E-02 1.0545E-02 1.0545E-02 1.0545E-02 1.0545E-02 1.0545E-02 1.0545E-02 1.0555E-03 1.0555E-03 1.955E-03
PU-233 N 0 522354 5567 5567 5567 5567 5567 5567 5567 55	P([HERMAL] NUCLIDE *4R0100 *4R0101 *4R0102 *4R0102 *4R0102 *4R0105 *4R0115 *5058115 *5058115 *5058115 *5058125 *5	NCA1 2 3 1 1 2 2 2 2 2 2 2 1 2 2 2 2 2 2 2	1 DAY 1 d2418E-05 6 105670E-02 6 105670E-02 6 19322VE-02 7 1322VE-02 1 1442-02 4 25943E-02 4 25943E-03 3 3563E-07 7 53134E-05 3 3051E-07 7 53134E-05 3 3051E-07 7 53134E-07 8 33001E-05 3 00592E-02 8 5364E-07 1 16666E-04 8 41741E-04 8	30 DAYS 1. 32A12E-05 n.36334E-02 b.36334E-02 b.35310E-02 b.35310E-02 b.35310E-02 b.35310E-02 b.35310E-02 b.343398E-04 c.35326E-02 J.36986E-03 J.6834E-02 J.8634E-02 J.8634E-02 J.8634E-02 J.8634E-02 J.22944E-03 J.0032E-03 4.01237E-03 4.02537E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0275E-04 J.0392E-04 J.039	BUR Y-UP [11] 60 DAYS 1.82493E-05 6.05916E-02 6.05916E-02 6.05916E-02 6.05916E-03 1.91573E-06 4.03239E-02 1.91573E-06 4.03239E-02 1.94506E-03 3.36168E-02 2.37122E-03 3.0615E-02 2.05310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 2.53310E-02 3.5294E-04 3.53836E-04 3.55294E-	180 DAYS 1.82368E-05 6.05501E-02 6.0231E-02 6.0399E-02 6.0399E-02 6.03914E-05 3.6133E-02 6.4814E-05 3.6133E-02 6.47908E-04 3.3637E-07 3.3637E-07 3.3637E-07 3.3637E-07 3.3637E-07 3.3637E-07 3.3657E-07 4.6442-05 1.6428E-02 1.6428E-03 3.4050E-07 1.6593E-03 3.4150E-07 3.4057E-03 3.4050E-07 3.4057E-04 6.67153E-06 3.4057E-04 6.67153E-06 3.4057E-04 6.67153E-06 3.4057E-04 6.67153E-06 3.4057E-04 3.4057E-04 6.67153E-04 3.4057E-04 3.4057E-04 6.67153E-04 3.4057E-04 3.4057E-04 3.4057E-04 3.4057E-04 3.4057E-04 3.4057E-04 3.5501E-04 3.7121E-04 6.732E-04 3.5511E-04 6.7452E-04 3.5511E-04 6.6135E-04 7.4051E-04 1.5511E-04 1.423E-04 1.5511E-04 1.423E-04 1.423E-04 1.5511E-04 1.423E-04 1.423E-04 1.5511E-04 1.423E-04 1.423E-04 1.5511E-04 1.423E-04 1.423E-04 1.5511E-04 1.5511E-04 1.423E-04 1.423E-04 1.5511E-04 1.423E-04 1.5511E-04 1.423E-04 1.5511E-04 1.423E-04 1.5511E-04 1.423E-04 1.425E-04 1.5511E-04 1.5511E-04 1.425E-04 1.425E-04 1.5511E-04 1.5511E-04 1.425E-04 1.5511E-04 1.5511E-04 1.425E-04 1.5511E-05 1.551E-04 1.551E-04 1.551E-04 1.551E-04 1.551E-04 1	360 DAY5 1.823352-05 6.053942-02 6.10123E-02 6.04891E-02 6.04891E-02 3.09204E-02 3.29204E-02 3.29204E-02 3.29397E-04 3.39478E-07 5.36726E-02 3.39478E-07 5.36726E-02 3.394183E-07 5.36726E-02 3.394183E-07 3.394183E-07 3.394183E-07 3.394183E-07 3.394183E-07 3.394183E-07 3.395171E-06 8.41358E-04 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 3.3933517E-06 4.73334E-04 3.393350E-03 3.593350E-04 3.393350E-04 3.59350E-04 3.59350E-04 3.59350E-04 3.59350E-04 3.59350E-04 3.59350E-04 3.59550E-	AGE 2 720 DAYS 1.82321E-05 6.00347E-02 6.10074E-02 5.08594E-03 1.93497E-05 2.32947E-05 2.32947E-05 2.32947E-05 2.32947E-05 2.32947E-05 2.32947E-05 2.32947E-05 2.32947E-05 2.32947E-05 3.36452E-07 1.93654E-03 1.97570E-06 2.3212E-05 1.92528E-07 2.68224E-05 1.84528E-04 3.56758E-04 3.56758E-04 3.56758E-04 3.59958E-04 3.
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PU-235 NO 51 52 53 54 55 56 57 58 56 56 57 58 56 66 62 64 55 66 66 66 66 70 71 72 73 74 57 76 778 79 80 81 82 83 84 88 88 88 88 88 89 90 92 92 93 94 99 94 99 94 99	PC(FHERMAL) NUCLIDE 14R01000 14R01000 14R01000 14R01000 14R01000 14R01000 14R01000 1	NCA1 2 3 1 3 1 3 1 3 1 3 2 1 2 3 2 1 2 3 2 1 2 3 2 1 2 3 2 1 2 3 2 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 2 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	1 DAY 1. d2419E-05 6. 005670E-02 6. 005670E-02 6. 00100E-02 6. 00107E-02 1. 12186E-02 1. 12186E-02 1. 12186E-03 3. 35631E-07 3. 35631E-07 3. 35631E-07 3. 35720E-03 2. 55267E-02 3. 20092E-03 2. 55267E-03 3. 20092E-03 2. 55267E-03 3. 20092E-03 2. 55267E-03 3. 20092E-03 2. 55267E-03 3. 20092E-03 2. 55267E-04 3. 20092E-03 3. 2009	30 DAYS 1. 32112E-05 n.36314E-02 s.11050E-07 5.4400YE-02 s.3398E-04 1.43398E-04 1.43398E-04 1.43398E-04 1.43398E-04 1.43398E-04 1.23934E-02 1.33538E-02 1.35358E-02 1.35358E-02 1.35358E-02 1.35358E-02 1.35358E-02 1.35358E-02 1.34517E-02 1.23726E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.43578E-03 1.55527E-04 3.5528E-04 1.55528E-04 3.59885E-04 3.59855E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.5955E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-04 3.59555E-	8UR Y-UP [1116 60 DAYS 1.82-931-05 6.059168-02 6.150458-02 6.059168-02 6.059168-02 6.059168-02 6.059188-02 1.91738-04 0.05918-02 1.945046-03 1.945048-03 1.945048-03 1.945048-03 1.950458-03 1.950458-03 1.950498-04 1.050918-03 1.350448-04 1.235448-04 1.235448-04 1.235448-04 1.235448-04 1.235448-04 1.235448-04 1.350488-04 1.3552948-04 1.3552948-04 1.3552948-04 1.3552948-04 1.3552948-04 1.3552948-04 1.3552948-04 1.3552948-04 1.3552988-04 1.355	180 DAYS 1.82368E-05 6.05301E-02 6.10231E-02 6.003976E-02 6.03976E-02 6.03976E-02 6.03976E-02 6.04976E-02 6.047906E-02 6.047906E-02 6.047906E-02 6.047906E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04766E-02 6.04765E-06 6.04755E-06 6.04755E-06 6.0426E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.04626E-02 6.0426E-02	2360 DAY5 1.823352-05 6.05394:-02 6.103374:-02 6.06394:-02 6.06912-05 3.09012-05 3.09012-05 3.09012-05 3.0922-04 3.09022-04	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 5.54574E-03 6.00845E-02 1.94978E-05 6.04845E-02 1.34978E-04 3.4952E-05 1.35452E-07 1.35452E-07 1.35452E-07 1.35452E-07 1.35452E-07 1.35452E-07 1.41972E-02 1.4572E-05 1.4572E-05 1.4572E-05 1.4572E-05 1.4572E-07 1.4572E-05 1.4572E-07 1.4572E-05 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4572E-07 1.4502E-07 1.5512E-07
PU-235 NO 51 52 53 54 56 56 56 56 56 56 56 56 56 56 56 56 56	PC(HERMAL) NUCLIDE *4R0100 *4R0101 *4R0102 *4R0102 *4R0102 *4R0105 *4R0106 * * * * * * *	NCA1 2 3 1 1 3 1 3 1 3 1 3 1 2 1 2 1 2 1 2	1 DAY 1. d2419E-05 6. 100000-027 6. 100000-027 6. 93278-02 6. 93278-02 6. 93278-02 6. 93278-02 6. 93278-02 6. 9328-02 6. 9328-02 7. 10128-02 7. 10128-02 8. 51288-02 8. 52288-02 8. 52888-02 8. 5288-	30 DAYS 1.32112E-05 n.105014E-02 s.105016-07 s.34004E-02 s.34105E-02 s.34105E-02 s.34105E-02 s.34105E-02 s.3425E-02 s.3425E-02 s.3425E-02 s.3425E-02 s.3425E-02 s.3425E-02 s.3425E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3455E-02 s.3552E-02 s.3552E-02 s.3552E-02 s.3552E-02 s.3552E-02 s.3552E-02 s.3552E-04 s.3552E-04 s.3552E-04 s.3552E-04 s.3552E-04 s.3552E-04 s.3522E-04	BUR Y-UP TITLE 60 DAYS 1.82-931-05 6.05416E-02 6.05416E-02 6.05418E-02 6.05418E-02 6.05418E-02 1.91573E-06 7.19382E-03 3.3618E-02 7.19382E-03 3.3618E-02 7.05418E-03 3.3618E-02 7.0542E-03 3.0118E-02 7.0542E-03 3.0118E-02 7.0501E-03 8.4204E-04 7.23544E-04 7.23544E-04 7.23544E-04 7.23544E-04 7.23544E-04 7.23544E-04 7.23544E-04 7.25524E-03 8.4204E-04 7.25524E-03 8.4204E-04 7.25524E-03 7.2524E-04 7.25524E-04 7.2525E-05 8.50016E-04 7.5591E-	180 DAYS 1.82368E-05 6.05001E-022 6.03932E-02 6.03932E-02 6.03932E-02 6.03932E-02 6.038142E-05 3.61332E-02 6.63842E-03 3.053262E-02 6.63842E-03 3.00372E-02 6.63842E-03 3.00372E-02 6.63842E-03 3.00372E-02 6.63842E-03 3.00372E-02 6.63842E-03 3.00372E-04 6.53262E-03 3.16593E-03 6.45722E-04 6.63623E-03 6.45722E-04 6.553142E-04 6.54492E-04 6.54492E-04 6.54492E-04 6.54492E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54892E-04 6.54737E-07 0.5577E-07 0.5577E-07	360 DAY5 1.823352-05 6.05394:-02 6.10123E-02 6.06391E-02 6.06481E-02 3.09204E-02 3.09204E-02 3.09204E-02 3.09204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.097204E-02 3.09721E-06 3.09804E-04 3.09804E-04 3.09804E-04 3.09804E-04 3.09804E-04 3.09804E-04 3.09804E-04 3.0932E-0	AGE 2 720 DAYS 1.82321E-05 6.05347E-02 6.05347E-02 6.05347E-02 6.04845E-02 1.53495E-05 7.3546E-03 7.35462E-07 7.35462E-07 7.35462E-02 7.055E-03 7.055E-03 1.4727E-02 7.055E-03 1.4717FE-03 8.41294E-04 5.3642E-03 1.4717FE-03 8.41294E-04 5.3642E-07 7.5528E-07 7.5466E-04 7.5528E-05 7.5528E-07 7.5466E-04 7.5528E-05 7.5

Appendix 3.1 FP due to <sup>239</sup>Pu fission with thermal neutrons

# Fission Product Fast Reactor Constants System of JNDC

JAERI 1248

PAGE 4

NO      NUCLIDE      NCAT      1 DAY      D0 pAYS      60 DAYS      180 pAYS      360 DAYS      720 pAYS        101      527E126      2      2,11474      1	PU=239	(THERMAL)						P	AGE 3
101      327E125      1      1.48907E-07      4.94785E-06      1.31887E-05      5.18885E-05      1.11125E-04      2.19711E-04        102      327E126      2      2.19498E-04      4.90788E-05      5.18885E-05      1.11125E-04      7.76798E-04      7.76798E-04      7.76798E-04        103      327E126      1      5.80615E-04      1.8001E-05      8.12885E-05      1.11125E-04      7.76798E-04        104      327E127      1      5.98641E-02      2.6497E-02      2.6877E-02      2.68578E-02      1.97648E-03      5.3777E-06      2.7777E-06      2.77777E-06      2.77777E-06      2.77	NO	NUCLIDE	NCAT	1 DAY	30 DAYS	BURN-UP TIME 60 DAYS	180 DAYS	360 DAYS	72C DAYS
102    527E126    2,114946-00    4,20736-04    5,81527E-06    7,36015E-06    7,767956-04    7,97796E-04    7,972011E-06    1,2304E-004    7,97201E-05    8,23572E-03    8,23572E-03    8,23572E-03    8,23572E-02    2,68535E-02    2,69527E-03    1,27076E-03    8,69726E-03    8,	101	52TE125	1	1,48907E-07	4.94785t-C6	1.31687E-05	5.18485E-05	1.111256-04	2.19711E-04
103    527L127    1    1.90740E-02.    6.524040E-03    6.43786E-03    6.5650E-03    8.4378E-03    1.56501E-05    8.4378E-03    1.64565E-03    8.43786E-03    1.67668E-05    8.43578E-03    1.67668E-05    8.43578E-03    1.67668E-05    8.43578E-03    1.67668E-05    8.43578E-03    1.67668E-05    8.43578E-06    2.685578E-02    2.685578E-02    2.685578E-02    2.685578E-02    2.685578E-02    2.685578E-02    2.685578E-02    2.685578E-02    2.685578E-02    2.68558E-02    4.83582E-06    2.78787E-06    3.78218E-03    3.9018E-03    1.92778E-03    4.8778E-03    3.9218E-03    4.97257E-03    4.8778E-02    3.64058E-03    4.8778E-02    4.8778E-02    4.8778E-05    4.8778E-05    4.8778E-03	102	52TE126	2	2.31494E-05	4.203786-04	5.81527E-04	7.36015E-04	7.767998-04	7.97201E-04
104    571L28    2    6,01640E-03    8,45786-06    8,45786-06    8,4587E-03    8,4587E-03    8,4587E-03    8,4587E-03    8,4587E-03    8,4587E-03    8,4587E-02    2,68538E-02    2,68538E-02    2,68538E-02    2,68538E-02    2,68538E-02    2,68538E-02    2,68538E-02    2,7787E-06    8,1272E-05    6,1787E-03    6,5488E-04    3,2214E-04      106    5271E131    1    1,5937E-07    1,6070E-07    4,5925E-03    4,5972E-03    6,6448E-04    3,2214E-04      107    531127    1    1,08577E-07    1,6670E-07    4,5925E-03    4,6472E-03    1,6647E-03    4,6925E-03    1,6647E-03    4,6925E-03    1,6647E-03    4,6925E-03    1,6647E-03    1,6647E-03    1,6647E-03    1,6647E-03    1,6647E-03    1,6647E-03    1,6647E-03    1,6647E-03    1,6725E-03    1,6647E-03    1,6725E-03    1,6647E-03    1,6725E-03    1,6647E-03    1,6725E-03    1,6735E-04    1,52246E-02    1,5237E-04    1,5244EE-05    1,5247E-03    1,69376E-02    1,6735E-02	103	52TE127	1	1.90740E-04	8.520406-05	4.39757E-05	1.56501E-05	8.12165E-00	4.123J4E-06
105    527E129    1    5,86641E-03    2.01354E-04    1.00646E-06    3.3334E-05    1.67668E-05    2.468538E-02    2.468528E-03    3.9213E-03    4.84728E-03    5.4488E-04    3.3234E-03    4.84728E-03    5.4488E-04    3.3234E-03    4.84728E-03    5.40452E-03    4.48728E-03    5.40452E-03    4.84728E-03    5.40452E-03    4.84728E-03    5.40452E-04    1.48931E-02    1.49732E-03    4.84748E-04    1.3334E-04    5.7861E-05    3.3334E-04    5.7861E-05    3.3334E-04    5.7861E-02    3.3334E-04    5.7861E-02    3.3334E-04    5.7861E-02    3.3334E-04    5.7861E-02    3.3534E-04    5.7861E-02    3.3534E-04    5.78637E-04    3.3534E-04    5.78672E-04    3.3534E-04    5.78672E-04    3.3534E-04    5.78672E-04    3.3534E-02    5.33336E-02    5.33336E-02    5.74472E-04	104	52TE128	2	8,01640E-03	8.457882-03	6.45990E-03	8.45897E-03	8.458726-03	8,45869E-03
106    527E130    2    2,668516-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-02    2,685796-03    3,322146-06      109    531    127    1    1,0901E-06    3,68076-03    1,08477E-03    1,68478E-02    1,68438E-02    1,68438E-02    1,68438E-02    1,68438E-02    1,68438E-02    1,68438E-02    1,68438E-03    6,28768E-03    6,38276-04    7,30706E-03    7,37306E-03    6,383276-04    7,30706E-03    7,37306E-03    7,37306E-03    7,37306E-03    7,37306E-03    7,37306E-03    7,3	105	52TE129	1	5.58641E-03	2.01354E-04	1.00646E-04	3.35384E-05	1,676682-05	8.38276E-06
107    527E131    1    1,55396E-03    2,21787E-05    2,61722E-05    8,7809E-05    6,54480E-04    3,5227E-06    2,17877E-06      109    531    127    1    1,9001E-04    3,56087E-03    4,08225E-03    4,68776E-03    5,04059E-03    1,68771E-05    1,66076-02    1,67725E-02    1,6467E-02    1,6487E-02    1,6487E-02    1,6487E-02    1,6487E-02    1,6487E-02    1,6487E-02    1,2576E-06    6,2476E-04    1,3276E-06    6,2476E-04    1,3276E-06    6,2476E-04    1,3276E-06    6,2476E-04    1,3276E-06    6,2476E-04    1,3276E-06    1,2421E-04    1,3477E-04    1,3477E-04    1,3531E-07    1,3477E-06    1,2440E-06    1,5403E-06    1,3407E-03    1,3477E-03    1,3477E-06    1,3477E-06    1,3477E-03    1,3477	106	52TE130	2	2.68681E+02	2.689676-02	2.68791E-02	2.68607E-02	2.685596-02	2.685385-02
100    527E132    2    4,39662C=07    7,9728E=03    1,39918E=03    6,84480E=04    3,32216E=03      100    531    127    1    1,0807Te=03    1,6677E=03    4,68726E=03    4,8726E=03    5,6037E=03      110    531    120    2    1,0877Te=07    1,667780E=02    1,6847E=02    1,8643E=02    1,8643E=03    6,24762E=03    6,24762E=03      112    531    131    1    3,15241E=02    1,3370E=02    7,50802E=03    2,51577E=03    1,27766E=03    6,24762E=04      113    531    2,23826E=02    1,4972E=04    4,07194E=04    1,35348E=04    6,24762E=04      115    548128    2    1,54077E=06    1,4910E=06    1,5304E=04    6,7807E=03    3,5903E=02      115    548129    2    1,5401E=02    4,68100E=02    4,68106E=02    4,7306E=02    5,6037E=03    7,8937E=04    4,7306E=02    5,60437E=03    7,8973E=04    4,7306E=02    5,60437E=02    5,10472E=02    5,1418550    2,0727E=07    7,2476E=02    5,10437E=02    5,10437E=02    5,1418550    2,0727E=03    7,2476E=02    5,1048E=02    5,1072E=02    5,1418550<	107	52TE131	1	1.55398E-03	5.23787E-05	2.61722E-05	8,71809E-06	4.35827E-06	2.17897E-06
109    531    127    1    1:9001E-04    3.50087E-03    4.08225E-03    4.0847E-02    1.6847E-02    1.5558E-04    1.5758E-04    1.5758E-05    1.5758E-03    1.5758E-02	108	52TE132	2	4,59662E-02	7.97258E-03	3.99U31E-03	1.32919E-03	6.6448UE-04	3.32214E-04
	109	531 127	1	1.19001E-04	3.56087E-03	4.08225E-03	4.59275E-03	4.84726E-03	5.040592-03
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	110	531 129	3	1,085771-02	1,660706-02	1.67295E-02	1.684478-02	1.688336-02	1.690348-02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	111	531 130	2	2,605271-05	1.17706E-06	5.881428-07	1.95913E-07	9.79391E-08	4.696582-08
	112	531 131	1	3,15581E-02	1.39370E-02	7.508026-03	2.51577E-03	1,25766E-03	6.28752E-04
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	113	531 133	1	4,822662-02	2.94259E-03	1.47033E-03	4.89774E-04	2.44844E-C4	1.22412E-04
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	114	531 135	1	2,238266-02	8,149226-04	4.071948-04	1,356388-04	6,780712-05	3,39010E-05
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	115	54XE128	2	1,540778-06	1,54241E+06	1.54140E-06	1.540348-06	1.540078-06	1.53995E-06
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	116	54×E130	2	2.139216-05	4.63182E-05	4.68760E-05	4.72357E-U5	4.73253E-05	4.73706E-05
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	117	54XE131	3	1,29915E-03	2.46949E-02	3.13046E-02	3.64075E-02	3.76930E-02	3.833612-02
119    544k134    1,54200E-07    1,69938E-02    8,68962E-03    2,69938E-03    1,44767E-03    7,23780E-04      120    544k134    7,24461E-02    7,24260E-02    7,24260E-02    7,24260E-02    7,24260E-02    7,24260E-02    7,24260E-02    7,24260E-02    7,24260E-02    7,24260E-02    5,56212E-05    5,7371E-07    7,03652E-07    6,49310E-07    5,57371E-07    7,03652E-07    7,0375E-07    7,03652E-07    7,0375E-07    7,03652E-07    7,0375E-07    7,03652E-07    7,0375E-07    7,03675E-07    7,0375E-07    7	118	54XE132	2	5,81211E-03	4.38608E-02	4.78C91E-02	5.04347E-02	5,10902E-02	5.14185E-02
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	119	54XE133	1	1.94200E-02	1,69938E+02	8.68962E-03	2.89586E-03	1,44767E-03	7.237BOE-04
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	120	54XE134	2	7.24461E-02	7.25232E-02	7.24756E-02	7.24260E-02	7.241318-02	7.24076E-02
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	121	54XE135	1	2,62690E-02	1.33704L-05	6.68081E-04	2.22541E-04	1,112515-64	5.56212E-05
123    3555133    3    6,91661-02    4,81092-02    5,4396E-02    6,51611E-02    6,68480E-02    6,78691E-02      124    3555134    3    7,63612E-07    7,33525E-07    7,03622E-07    6,49510E-07    7,203622E-07    7,20362E-07    7,30472E-07    7,30572E-07    7,30372E-07    7,30372E-07    7,30372E-07    7,30372E-07    7,30372E-07    7,30372E-07    7,30372E-07    7,30372E-07    7,30472E-02    7,30	122	54 XE 136	2	6.57131E-02	6.57430E-02	6.57399E-J2	6.56948E-02	6,56832E-02	6.56781E-02
124    555154    3    1,63811207    1,94922007    1,0365207    1,0365207    6,43502207    6,43502007    5,5311207    5,2312007    5,2312007    5,2312007    5,2312007    7,229404002    5,22334007    5,2312007    7,229404002    5,249082007    7,22940402    5,249082007    7,229404002    5,249082007    7,229404002    5,244082007    5,1345007    7,229404002    6,47340007    5,249082007    6,43140007    2,249082007    6,42340007    6,42340007    6,42940007    6,42340007    6,42940007    6,429407    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,42940707    6,4294	123	5505133	3	8,95168E+04	4,870836-02	2.84396E-02	6.51671E-02	6,68480E-02	6.76891E-02
125    355313    3    2,36991-02    1,03451-07    1,04515-07    1,04515	124	5505134	3	7.63817E-07	7.54452E-07	7.43625E-07	7.03662E-07	6,49510E-07	5.57371E-07
160    255136    2    7,81612+04    2,03421+04    3,02331+04    1,04933-04    2,24061+03    2,14234+05      127    555137    3    6,55224+07    6,53145+02    6,13436-02    6,13436-02    6,47340-02    6,47340-02    6,47340-02    6,47340-02    0,40196+02      128    5634134    2    3,53641+01    1,03322+08    2,065916+08    6,029702+06    1,14312+07    2,063942+07      129    5634137    1    5,78122+06    6,75121+07    1,77832+04    3,752856+04    7,44124±04    1,473492+03      131    5583135    2    5,70746+02    1,73335+02    5,70872+02    5,64556+03    2,32244+03    1,41111+03      133    3714190    2    5,7536+02    2,4676+02    3,46931+02    4,66343+02    4,66432+02    4,66432+02    5,64345+02    3,54971+02    5,9051-02 <td< td=""><td>125</td><td>5505135</td><td>3</td><td>2.376996-02</td><td>1.034652+02</td><td>7.13/5/E=02</td><td>7-204318-02</td><td>7.22094E-C2</td><td>7.22934E-02</td></td<>	125	5505135	3	2.376996-02	1.034652+02	7.13/5/E=02	7-204318-02	7.22094E-C2	7.22934E-02
12    325313    3    6.3224E=07    6.32426E=02    6.31435=02    6.31435=02    6.47340E=02    6.47340E=02    6.0334E=01      128    5634134    2    5.3547E=12    6.30376E=03    6.0270E=02    6.1434E=07    2.0334E=07      129    5634136    2    7.72341=05    5.00518E=04    7.05921E=04    9.3593E=04    9.5518E=04    9.82084E=04      130    5634137    1    5.7812E=06    6.37512E=01    7.7832E=04    9.3593E=04    9.5518E=02    9.70487E=02    5.70487E=02    5.70487E=02    5.70487E=02    5.70487E=02    5.70487E=02    5.84587E=02    5.85597E=02    5.85458E=02    5.85597E=02    5.85487E=02    5.85597E=02    5.85487E=02    5.85597E=02    5.85487E=03    5.77285E=03      133    57LA190    1    .56286E=02    3.46432=02    4.86432=02    3.18775E=02    5.8597E=02    5.85487E=02    5.8597E=02    5.8597E=02	126	2202136	2	9.81612E+04	5.034212-04	3.02357E-04	1.04993E=04	5.24408E-05	2.624346-05
129    563A136    2    57243±-05    5.06531E-04    7.06931E-04    9.0393E-04    7.0393E-04    7.0393E-04    7.0393E-04    7.0393E-04    7.03393E-04    7.044124E-04    1.47349E-03      131    5634136    2    7.0746±-02    7.13335±-02    5.00979E-02    5.06535E-03    2.82244±-03    1.4111E-03      133    37LA109    1    5.85758±-02    2.83538E+02    2.85395E-02    5.85595E-02    5.8547E-02    5.8647E-02      134    37LA104    2    2.96626±-06    2.91129±-06    2.90704E-06    2.90061±-06    2.90061±-06    2.90061±-06    2.90061±-06    3.9355±-02    3.9595±-02    3.9595±-02    3.9595±-02    3.9595±-02    3.9595±-03    3.77285±-03    3.7285±-03    3.7285±-03    3.7595±-02    3.9595±-02    4.9635±-04    4.9635±-04    4.9635±-04    4.9635±-04    4.9635±-04    4.9635±-04    4.9635±-04    4.9635±-02    4.9635±-02    3.9595±-03    <	121	5505137	د	0.002248-02	5.55319C-02	0.5426BE-02	6.01345E-02	6.47540E-02	6.40196E-02
12    360A136    2    2.12332-00    3.03332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    9.33332-00    7.441342-03    1.41342-03    1.41342-03    1.41342-03    1.41342-03    1.41342-03    1.41142-03    1.223152-02    5.645542-03    2.322442-03    1.411412-03    1.223152-02    5.645542-03    2.322442-03    1.411142-03    1.411412-03    1.423152-02    5.645542-03    2.322442-03    1.411142-03    1.411412-03    1.411412-03    1.423152-02    5.645542-02    5.855952-02    5.854972-02    5.855972-02    5.855972-02    5.85597	120	J05A134	2	3.530472-10	1,000220=00 5,005126,06	2.003762-08	0.02910E=08	1.143146-07	2.063941-07
130    363A136    1    7.5/012C+00    6.5/212C+00    3.7/282E+00    7.44124E+04    1.4/394E+02      131    568A136    2    7.0746E+02    5.7/037E+02    5.70586E+03    2.32244E+03    1.4/114E+05      132    568A140    2    5.38538E+02    2.72384E+02    1.62913E+02    5.64558E+03    2.32244E+03    1.4/114E+05      133    57LA140    2    2.9628E+06    2.91129E+06    2.59093E+02    5.64558E+03    2.32244E+03    1.4/114E+05      134    57LA140    2    2.9628E+06    2.91129E+06    2.50093E+02    5.68599E+02    5.86493E+02    5.86493E+02    5.86493E+02    5.86493E+02    5.86493E+02    5.908E+02    5.958E+02    4.9035E+02    4.9035E+02    4.9035E+02    4.9635E+02    4.9128E+02    4.9335E+02    4.9128E+02    4.9128E+02    4.9128E+02    4.9128E+02	129	JODA1 36	ź	2.129436-03	J.08J13E=04	7.069212-04	9.033932-04	7.557162-04	9.82086E-04
132    563/1.80    2    3.103834E-02    3.10384E-02    3.10384E-0	130	5654137	1	5.570122-06	6,5/212C=02	5 700705.00	5.752856-04	7,441245-04	1.4/349E-03
123    57.000.10    2    57.000.100    2    17.000.100    2    17.000.100    2    17.000.100    2    17.000.100    2    17.000.100    2    17.000.100    2    17.000.100	131	2024120	2	5.101402-02	3 133945-02	1 420155 32	5.10508E-02	3.704876-02	5,704432=02
134    512,124    1    512,124,124    1    512,124,124    1 <td>1 2 2</td> <td>571 41 30</td> <td>÷.</td> <td>5 55758-02</td> <td>5 943816-02</td> <td>5 854475-02</td> <td>5 845945 03</td> <td>5 454926-03</td> <td>1,41111C-03</td>	1 2 2	571 41 30	÷.	5 55758-02	5 943816-02	5 854475-02	5 845945 03	5 454926-03	1,41111C-03
155    54CL140    2    1,7003/L-06    1,712/L-02    1,7003/L-06    1,7155/L-02    1,7155/L-03    1,7150/L-03    1,7155/L-03    1,7155/L-03 </td <td>134</td> <td>571 6160</td> <td>4</td> <td>2 003265-02</td> <td>2 011296-04</td> <td>2 604316-04</td> <td>2 807045-02</td> <td>2 000116-02</td> <td>2,824475-02</td>	134	571 6160	4	2 003265-02	2 011296-04	2 604316-04	2 807045-02	2 000116-02	2,824475-02
156      58CE141      1      5.62266=02      4.23962E=02      3.74058E=02      1.447510E=02      7.54236E=03      5.77285E=03        137      58CE142      2      4.9494E=02      4.9519E=02      4.94312E=02      4.9432E=02      4.9535E=04      2.43135E=04      1.9155E=02      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=02      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03      1.9155E=03	135	58CF140	5	1 9005/5-04	2.445765-02	3.669435-02	A. 84843E-02	5 186755=02	5 345955-02
137      58CE1a2      2      4,99998-03      4,99519E-02      4,99192E-02      4,9850E-02      4,98762E-02	136	58CE141	ĥ	5.642461-02	4.239622-02	3.24658Ee02	1.47510E=02	7.542365+03	3.772855=03
138    5xCE143    1    3:467064-02    2:92051-03    1:46007E-03    4:66355E-04    2:31352-04    1:3155E-04      139    5xCE144    3    3:77756E-07    3:6097E-02    3:05995E-02    2:01556E-02    1:78007E-02      140    5xPR141    1    3:5095E-03    1:74510E-02    3:05995E-02    2:01556E-02    1:78007E-02      140    5xPR141    1    3:5095E-03    1:74510E-02    3:5197E-02    4:50160E-02    5:22141E-02    5:57996E-01      141    5xPR143    1    9:0168E-03    1:7155E-02    1:5917E-02    4:50160E-02    2:3824E-03    1:402505      143    5xPR145    1    1:02835E-02    3:5917E-02    4:5017E-02    3:04370E-05    1:52173E-05      144    6:004142    2    6:624E-09    2:6070E-04    5:66332E-04    2:9076E-04    2:9076E-04 <td>137</td> <td>58CE142</td> <td>5</td> <td>4 949896-00</td> <td>4 995191-02</td> <td>4.991925-02</td> <td>4.988506-02</td> <td>4 697626=02</td> <td>A 987036-02</td>	137	58CE142	5	4 949896-00	4 995191-02	4.991925-02	4.988506-02	4 697626=02	A 987036-02
139      58CE144      3      3.77756E-02      3.65093E-02      3.05995E-02      2.51556E-02      1.78007E-02        140      5978141      1      3.39905E-03      1.74510E-02      2.73422E-02      4.50160E-62      5.2141E-62      5.5979E-02        141      5978143      1      3.39905E-03      1.74510E-09      5.65398E-10      1.87071E-10      9.51591E-11      4.7560E-11        142      5978143      1      9.01088E-03      2.17755E-02      1.35917E-02      4.77678E-03      2.38824E-03      1.19403E-03        143      5978145      1      0.02835E-02      2.65798E-04      1.42779E-04      6.08847E-05      3.04570E-05      1.52173E-05        144      6000142      2      6.62548E-04      2.6602E-02      2.9612E-02      4.90482E-03      3.0437E-04      6.03847E-03      2.9128E-04      2.9128E-02        145      6000143      3      1.6228E-03      2.06622E-02      2.96402E-03      1.26812E-02      2.00322E-02        146      6000143      3      1.94932E-05      1.38005E-03      2.178405E-03      3.0278E-02      2.00322E-02      3.02025E-02	138	58CE143	5	3.46706F-02	2.922051-03	1.460076=03	4.86355E=04	2 431355-04	1.21556F-04
140      55781641      1      3.35905E-03      1.74510E-02      2.73422E-02      4.56160E-62      5.22141E-62      5.57960E-02        141      559F142      2      1.95204E-06      1.12391E-01      4.67360E-103        142      559F143      1      9.01088E-03      2.17765E-02      1.65139FE-10      1.67071E-10      9.55131E-11      4.67360E-103        143      559F145      1      1.02835E-02      3.65788E-04      1.87971FE-02      4.77678E-03      2.38824E-03      1.19403E-03        143      59F145      1      1.02835E-02      3.65788E-04      1.87779E-04      6.08847E-05      3.04370E-05      1.52173E-05        144      6040142      2      5.6224E-09      2.8090E-08      2.98612E-02      4.98778E-04      2.9071E-03      1.28612E-02      4.1274405E-03      2.91208E-03        145      6040143      3      1.5228E-03      2.0052E-02      2.9482E-02      3.94382E-02      4.20521E-02      4.30744E-02        145      6040144      3      7.8432E-07      2.94915E-02      3.00778E-02      3.02725E-02      3.02725E-02      3.02725E-02      3.02725E	139	58CE144	1	3.77756F+02	3.650936-02	3.519735-02	3.059956+02	2.515566-62	1.78007E=02
141      59Ph142      2      1,95204E-06      1,12393E-09      5,61599E-10      1,67071E-10      9,35191E-11      4,67560E-11        142      59Ph143      1      9,0108E-03      2,1745E-02      1,5991E-10      4,67560E-11        143      59Ph145      1      0,0108E-03      2,1745E-02      1,5991E-02      4,77618E-03      2,38224E-03      1,19403E-03        143      59Ph145      1      0,02835E-02      3,65798E-04      1,8779E-04      6,08847E-05      3,00470E-05      1,52173E-05        144      60N0142      2      9,65254E-09      2,80900E-08      2,8632E-08      2,89877E-08      2,99761E-04      4,9712E-02      4,90761E-06      2,91208E-08        145      60N0143      3      1,5228E-03      1,06625E-02      2,96802E-03      1,26812E-02      4,20021E-02      4,37448E-03        146      60N0144      3      7,82433E-05      1,38005E-03      2,0625E-02      3,0074E-20      3,0205E-02      2,48648E-02      1,48405E-03      3,0174E-02      3,0035E-02      2,48648E-02      1,48405E-03      3,0174E-02      3,0205E-02      2,48648E-02      1,48405E-03	140	54PH141	ĩ	3.35905E-03	1.74510E-02	2.734225-02	4.50160E+02	5.221415-02	5.59790E-02
102      59Px163      1      9.01088E-03      2.17765E-02      1.35917E-02      4.77678E-03      2.58824E-03      1.194035E-03        143      59Px165      1      1.02835E-02      3.65736E-04      1.47779E-02      6.08847E-02      3.04776E-03      2.58726E-03      1.52173E-05        144      60W0142      2      9.65254E-09      2.60900E-08      2.48532E-02      2.49761E-04      2.49761E-04      2.91206E-08        145      60W0143      3      1.63228E-03      2.06620E-02      2.946602E-02      3.94382E-02      4.20221E-02      4.13744E-02        146      60W0143      3      1.62228E-03      1.38005E-03      2.60762E-02      3.01742E-02      3.02025E-02      3.02025E-02      3.02025E-02      3.01742E-02      3.020325E-02      3.02125E-02      3.01742E-02      3.020325E-02      3.02125E-02      3.02125E-02      3.02125E-02      3.02125E-02      3.02125E-02      3.02025E-02      3.02125E-02	141	59Pk142	2	1.952046-08	1.12393E-09	5.615998-10	1.87071F-10	9.351918-11	4.67560F=11
143      59PF145      1      1,02335E-02      3,65798E-04      1,42779E-04      6,08847E-05      3,64370E-05      1,52173E-05        144      60N0142      2      5,66254E-09      2,8090E-08      2,86332E-08      2,8987TE-08      2,99761E-04      4,20521E-02      4,20621E-02      1,3174E-05        145      60N0143      3      1,62276E-03      2,0662E-02      2,96802E-03      7,24802E-04      4,20621E-02      2,0332E-02        146      60N0144      3      7,62433E-05      1,3800E-03      2,67212E-03      7,24405E-03      1,26812E-02      2,0332E-02        146      60N0144      3      7,62433E-05      1,3800E-03      2,67212E-03      7,24405E-03      1,26812E-02      2,0332E-02        147      60N0145      1,79432E-02      2,99131E-02      3,0074E-02      3,02025E-02      3,02154-03        147      60N0146      2      2,48045E-02      2,4812E-02      2,48665E-02      2,48648E-02      3,4872E-02      3,4872E-04      4,34407E-04        149      60N0146      2      1,46332E-02      1,46393E-03      1,73805E-03      8,68882E-04      4,34407E-0	142	59PR143	ī	9.01088E-03	2.17/658-02	1,35917E-02	4.77678E-03	2.38824F-03	1.194035-03
144      60N0142      2      9,66254E-04      2.80900E-08      2.86332E-08      2.89877E-08      2.90761E-06      2.91206E-08        145      60N0143      3      1.6328E-03      2.0652E-02      2.96612E-03      7.9332E-02      2.96612E-03      7.9332E-02      2.96612E-03      7.9332E-02      2.96612E-03      7.9332E-02      2.96612E-03      7.26405E-03      1.26612E-02      2.90032E-02        147      60N0143      3      7.82433E-05      1.33005E-03      2.4712E-03      7.26405E-03      1.26612E-02      3.00132E-02        147      60N0143      3      1.79632E-07      2.99131E-02      3.00162E-03      3.0174E-02      3.02025E-02      3.02154E-02        148      60N0146      2      7.46712E-02      2.44045E-02      2.48682E-02      2.48682E-02      2.48682E-02      2.48682E-02      2.48682E-02      2.48682E-04      4.34407E-04        150      60N0147      1      1.8632E-02      1.66573E-02      1.66573E-0	143	59PR145	ī	1.02835E-02	3.65798E-04	1.82779E-04	6.08847E-05	3.04370E-05	1.52173E-05
145      60N0143      3      1.5328E=03      2.06626±-02      2.98602E=02      3.94382E=02      4.20621E=02      4.33748=02        146      60N0144      3      7.82435E=05      1.3805E=03      2.687212E=02      7.24405E=03      1.26812E=02      2.00332E=02        147      60N0145      3      7.9432E=05      1.3805E=03      2.687212E=02      3.02025E=02      3.02025E=02      3.02154=02      3.02154=02        147      60N0145      3      7.9432E=07      2.49045E=02      2.00176E=02      3.02025E=02      3.02154=02        148      60ND146      2      7.4673E=07      2.49045E=02      2.48182E=02      2.4812E=02      3.02154=02      2.48666E=02      2.48648E=02        149      60N0147      1.59439E=02      8.68384E=03      5.09468E=03      1.73805E=03      8.68882E=04      4.34407E=04        150      60N0148      2      1.66325E=02      1.66539E=02      1.66274E=02      1.66	144	60N0142	2	9.66254E-09	2.80900E-08	2.86332E-08	2.89877E-08	2.90761E-0d	2.91206E-08
146 60ND144 3 7,62433E-05 1,38705E-03 2,67212E-03 7,24405E-03 1,26812E-02 2,00332E-02 147 60N0145 3 1,79452E-07 2,99131E-02 3,00762E=02 3,01774E-02 3,02025E-02 3,02154E-02 148 60ND146 2 2,46781E-02 2,44045E-02 2,48862E-02 2,48566E-02 2,48668E-02 149 60ND146 2 1,6632E-02 8,83841E-03 5,09468E-03 1,73805E-03 8,68882E-04 4,34407E-04 150 60ND148 2 1,6632E-02 1,66502E-02 1,66539E-03 1,73805E-03 8,68882E-04 4,34407E-04	145	60N0143	Ś	1.C3228E-03	2,006266-02	2.966U2E-02	3.94382E-02	4,20621E-02	4,33744E-02
147 60N0145 3 1,39632E=02 2.99131E=02 3.00762E=02 3.01774E=02 3.02025E=02 3.02154E=02 148 60N0146 2 2,48781E=02 2.49055E=02 2.48882E=02 2.48712E=02 2.48668E=02 2.48868E=02 149 60N0147 1 1.69439E=02 8.83841E=03 5.09468E=03 1.73805E=03 8.68882E=04 4.34407E=02 150 60N0148 2 3.66325E=02 1.66502E=02 1.66393E=02 1.66279E=02 1.66256E=02 1.66237E=02	140	60ND144	3	7.62433E-05	1,380058-03	2.67212E-03	7.24405E-03	1,26812E-02	2.00332E-02
148 60ND146 2 2,46781E-D2 2,49045E-D2 2,48862E-D2 2,48712E-D2 2,48666E-D2 2,48666E-D2 2,48646E-D2 1,49 60N0147 1 1,59439E-D2 8,883841E-D3 5.09468E-D3 1,73805E-D3 8,68882E-D4 4,34407E-D4 1,565393E-U2 1,66279E-U2 1,66255E-D2 1,6523TE-D2 1,66239E-D2 1,66279E-U2 1,66255E-D2 1,6523TE-D2 1,6523TE-D2 1,66239E-D2 1,66238E-D2	147	60N0145	ذ	1,99632E-02	2.9913LE-02	3.007626-02	3.01774E-02	3.02025E-02	3.02154E-02
149 60N0147 1 1.67437E-02 8.83841E-03 5.09468E-03 1.73805E-03 8.68882E-04 4.34407E-04 150 60N0148 2 1.66325E-02 1.66502E-02 1.66393E-02 1.66279E-02 1.66256E-02 1.66237E-02	148	60ND146	2	2,46781E-02	2.49045E-02	2.42882E-02	2.48712E-02	2.4866#E=02	2.486486-02
150 60N0148 2 1.66325E-02 1.66502E-02 1.66393E-02 1.66279E-02 1.66250E-02 1.66237E-02	149	60N0147	L	1.69439E-02	8.83841E-03	5.09468E-03	1.73805E-03	8,68882E-04	4.34407E-04
	150	60N0148	2	1.663258-02	1.665021-02	1.66393E-02	1.66279E-02	1,662508-02	1.662371-02

# PU-239(THERMAL)

					BUEN-UP TIME			
NO	NUCL I DE	NCAT	ι ίλα	30 DAYS	60 DAYS	150 DAYS	360 DAYS	720 DAYS
151	60NL150	2	<b>6.</b> 0	0.0	6.0	0.0	0.0	0.0
152	61PM147	3	5.82327E-04	1.06212E-02	1.41858E-02	1.67578E-02	1.65016E-02	1.49441E-02
153	61PM148	2	4.128556-06	1.119278-06	5.71160E-07	1+903428-07	9.515438-08	4.757358-08
154	£1PM149	1	1,10421E-02	1.37420E-03	6.86706E-04	2.287456-04	1.14352E-04	5.717178-05
155	61PM151	1	5.81173E-03	4,32945E-04	2,16331E-04	7.20609E-05	3.60240E-05	1,801062-05
156	625M147	3	1.39833E+07	o.75323L-05	2.538458-04	1.02514E-03	2,14697E-03	4.13747E-03
157	625M148	2	2.73957E-07	3.26792E-06	3.633142-06	4.210948-06	4.305352-06	4.352596-06
158	625M149	3	1.44338E-03	1.112466-02	1.13039E-02	1.22533[-02	1.23655E-02	1.24217E-02
159	625M150	2	1,00098E-02	1.00204E-02	1.00139E+02	1.0007UE-02	1.00052E-02	1,00045E-02
160	625M151	3	1.86104E-03	7.245756-03	1.45463E-03	7.58382E-03	7.60349E-03	7.591026-03
161	625M152	2	5.77236L-03	5.77850E-03	5.77472E-03	5.77076E-03	5.76974E-03	5.76929E-03
162	62SM153	1	3.24544E-03	3.632986-04	1.81535E-04	6.04701E-05	3.02297E-05	1.51137E-05
163	625M154	2	2.7216L-05	2.72506E-03	2.72327E-03	2.72141t-03	2.72093E-03	2.72072E-03
164	625M156	2	2.87107E-04	1.15479E-05	5.77G18E-06	1.92207E-06	9.60867E-07	4.80396E-07
165	63EU153	3	6.05209E+04	3.491456-03	3.67068E-03	3.78911E-03	3.8186/8-03	3.83349E-03
166	63EV154	2	3.05249E-05	3.050496-05	3.04307E-05	3.01946E-05	2,98702E-05	2.924326-05
167	63EU155	د	2.07119E-03	2.042178-03	2.00922F-03	1.68784E-03	1.72509E-03	1.453662-03
168	63EU156	2	5.24025E-04	4.41933L-04	2.77507E-04	9.87086E+05	4.93576E-05	2.46770E-05
169	6320157	1	4.36371L-04	2.120762-05	1.09366E-05	3.643051-00	1,82120E-06	9.105318-07
120	64G0155	1	2,11272E-06	3.33330E-05	o.492d2E-05	1,848896-04	3.47264E+04	6.185402-04
171	64GD156	2	1,65893E-05	3.75121E-04	5.44781E+04	7.26861F-04	7.77026E-04	8.021246-04
172	64GD157	1	3,204558-04	7.35744E-04	7,45198E-04	7.52973E-UA	7.54661E-04	7.55513E-04
173	64G0158	2	C.21732E-04	4.27181E-04	4.219046-04	4.21615E-04	4.21540E-04	4.21508E-04
174	64GD159	1	1,430956-04	7.91729E-00	3.95605E-06	1,31778E-06	6,58773E-07	3.293616-07
175	64GD160	2	0,81305E-05	9,82432E-05	4.81788E-05	9.81116E-05	9.80942E-05	9.20866E-05
176	65T8159	1	8,19293E-05	2.173476-04	2.21160E-04	2.23644E-04	2.24264E-04	2.24576E-04
177	6518160	2	1,752578-05	1.50143E-05	1.33871E-05	8.37084E-06	4.92621E-06	2.54025E-06
178	65TB161	ī	4.19715E-05	1.39340E-02	7.30436E-06	2.43900E-06	1,21928E-06	6.09595E-07
179	66DY160	2	3.75205E-07	2.60556E-05	4.52108E-05	9.525056-06	1.29665E-05	1.53511É-05
180	66DY161	ī	3,20313E-06	3,12887E-05	3.758878-05	4,27231E-05	4,39345E-05	4-45410E-05
181	66D¥162	2	0.0	0.0	ú.O	0.0	0.0	0.0
182	66DY163	ī	0.0	0.0	0.9	0.0	0.0	C.0
183	66DY164	2	0.0	0.0	0.0	5.0	0.0	0.0
184	67H0165	1	0.0	U.O	0.0	0.0	0.0	0.0
185	43TC799	1	7.G36G7E-04	1.136346-04	5.65133E-05	1.88249E-05	9.41077E-06	4.705026-06
186	48CD815	1	0.0	J.O	0.0	9.0	0.0	0.0
187	52TE823	ī	0.0	0.0	<b>9.0</b>	0.ŭ	0.0	0.0
188	52TE825	1	1.0/9296-07	1.16579E-06	2.559/1E-06	0.66631E-uc	8,73591E-06	9,140532-06
189	52TE827	ī	6.36465E-05	6.361152-04	0.48304E+04	4.95822E-U4	3,31167E-04	1.63048E-04
190	52TE829	1	1.89726E-04	1.43531L-04	1.10624E-04	5.083508-05	2,60863E-05	1.30506E-05
191	52TE 831	1	4.59153E-03	3.599498-04	1,79856E-04	5.99111E-05	2,99502E=05	1.49740E-05
192	61PM848	1	G.U	0.0	0.0	0.0	0.0	0.0
193	345E 82	2	1.62761E-03	1,62935E-03	1.62s28E-03	1.62716E-03	1.62687E-C3	1.62675E-03

# Appendix 3.2 FP due to <sup>235</sup>Pu fission with thermal neutrons

U-235	(THERMAL)							PAGE 1
					BURN-UP TIME			
NO	NUCL I DE	NCAT	1 DAY	30 DAYS	60 DAYS	180 DAYS	360 DAYS	720 DAYS
1	302N 72	2	1,99184E-07	2.21009E-03	1,J0424E-08	3.677885-09	1,83856E-09	9.19189E-10
2	31GA 72	2	2.614736-08	6.70175E-09	3.34845E→09	1.115278-09	5.57519E-10	2.78732E-10
3	32GE 72	2	1,16024E-08	2.08405E-07	2,22638E-07	2.32048E-07	2,34396E-01	2.35571E-07
4	32GE 73	ī	1,03971E-06	1.040916-06	1.04013E-06	1.03930E-06	1,03909E-06	1.038996-06
5	32GE 74	2	3,40905E-06	3.41298E-03	3,41041E+06	3.40772E-06	3,40701E-06	3.40668E-06
6	32GE 76	2	3,52202E-05	3.52608E-0>	3,52342E~05	3.52064E-05	3.51991E-05	3.51957E=05
7	32GE 77	1	4,809482-05	2.082886-06	1,04065E-06	3.46611E-07	1,732698-07	8.36262E-08
8	33AS 75	1	1.20784E-05	1.20724E-05	1,20333E-05	1.20737E+05	1,20712E-05	1.20700E-05
9	33AS 76	2	5,30115E-11	3.79460E-12	1.39587E-12	6.31457E-13	3,15663E-13	1.57816E+13
10	33AS 77	1	3,75655E-05	7.134168-06	3.56440E-06	1.18720E~U6	5,93475E-07	2.96708E-07
11	34SE 76	2	1,8368/E-11	6.76079E-11	6.75127E-11	7.07208E-11	7,10217E-11	7.11726E-11
12	34SE 77	1	0.23415E-06	d.27834E-05	8.73260E-05	9.03247E-05	9.10727E-05	9,14471E-05
13	345E 78	2	2.03393E-04	2.030286-04	2.03474E-04	2.03314E-04	2.03272E-04	2.03252E-04
14	34SE 79	1	5.50697E-04	5.51332E-04	5.50916E-04	5.50480E-04	5.50364E-04	5.50307L-04
15	34SE 80	2	9.47044E-04	€.48137E-04	9.47422E-04	9.46674E-04	9,46477E-04	9.46385E-04
16	35BR 81	1	1,96636E-03	1.968636-03	1,96715E-03	1.965598-03	1,96519E-03	1.96499E-03
17	35BR 82	2	5.07929E-07	4.51+648-08	2.25562E-08	7.51279E-09	3,75562E-07	1.87762E-09
18	36KK 82	2	1.42620E-07	6.061532-07	6.24252E-07	6.42782E-07	6,46404E-07	6.48218E-07
19	36KH 83	1	5,35248E-03	5.35865E-03	5.35461E-03	5.35038E-03	5.34927E-03	5.34875E-03
20	36KH 84	2	9.97835E-03	9,98986E-03	9.98232E+03	9.97444E-03	9,97237E-03	9.97139E-03
21	36KH 85	1	3.06148E-03	3.05/22E-03	3.04685E-03	3.01249E-03	2.96477E=03	2.87323E-03
22	36KH 86	2	1.93723E-02	1,93946E-02	1.93800E-02	1.93647E-02	1.93607E-02	1,93588E-02
23	37R8 85	1	1.02991E-02	1.0J188E-02	1,03191E-02	1.03429E-02	1.03878E-02	1,04781E-02
24	37R8 86	2	1.080506-05	6.64396E-06	4.40366E-06	1.64350E-06	8.22606E-07	4.11263E-07
25	37R8 87	1	2.554706-02	2.557656-02	2.55572E-02	2.55370E-02	2.55317E-02	2.55292E-02
26	33SR 86	2	1.271638-06	5.44062E-05	7,67280E-06	1.04284E-05	1.12468E-05	1+16570E-05
27	385K 88	2	3,64818E-02	3.65239E-02	3.64364E-02	3.64676E-02	3.64600E-02	3.64564±-02
59	385H 89	1	4.74142E-02	3,97196E-02	3.31486E-02	1.62329E-02	9.94192E-03	5.01143E-03
29	385H 90	3	5.93348E-02	5.934516-02	5,92403E-02	5.89543E-02	5,85857E-02	5.78760E-02
30	3858 91	1	2,73600E-02	1.11214E-03	5.55648E-04	1.850/0E-04	9.25158E-05	4.62534E-05
31	397 89	1	3,0/683E-04	8.45/82E-03	1.49925E-02	2.95702E-02	3,81511E-02	4.30769E-02
32	398 90	2	5.82701E-06	1.40338E-05	1.4/065E-05	1.30987E=05	1,511946-05	1.499311-05
33	344 41	1	3.032612-02	4.798106-02	4.114646-02	2.395/5E-02	1.34222E=02	6,80/43E=03
34	399 93	1	3.201426-02	1,320446403	6.63/212-04	2.21066E-04	1,105106=04	5,524756-05
35	4028 90	ź	1.020376-07	2.05/282-02	1.100072-04	3.487308-04	1.047665-04	1.409032-03
20	4028 91	1	1.4/2016-03	1.01332E=02	1.742926-02	5.499248402	4.060806-02	5,220321-02
	4028 92	4	5.990136-02	5.797000-02	3,373146402	J.98841E-02	5,98/100-02	2,706396-02
20	4028 73	3	4.209042-02	0.20J010-02	6 4547255-02	5.36643E=02	6 448305-02	6,401010-02
57	4078 95	ž	6,452172-02	5 570692-02	6 90.095-02	3 800205-02	1 (56315-02	2 459416-02
40	4020 92	2	6 222736-02	5 31998F-02	4 38534E-02	6 2003261-02	6 378976-02	6 078366-03
41	4070 97	4	743695-02	2 023056-03	1.010766=03	3.366545-04	1 682925-02	8.413785-02
4 1	41MB 95	÷	3 573065-02	7 766915-03	1.168365-03	1 307035-02	8 71706C-01	0 562615-03
44	4240 95	1	4 432845+04	2.052435=03	5.769336=03	2.348216-02	4 (115156=0)	5.240416+02
45	4210 96	2	5 138575-0-	5.164505=06	5.140525=06	5.136566-06	5 135496-00	5.134995-06
45	42MD 97	1	2 151456=02	5 744695-02	5.84643E=02	5.90915E=02	5 92475E=02	5.93252F=02
47	42M0 98	2	5.79176E=02	5.798452=02	5.79407F=02	5.789505-02	5.788300-02	5.78773F=02
48	42M0 90	î	5.434728-02	6.24396E-03	4.12127E+03	1.372675-03	6.86193E-04	3.430631-04
49	42M0100	2	6.26704E-02	5.294296-02	6.28954E-02	6.28458E-02	6.28327E-02	6.28266t =02
50	43TC 99	3	6.32281E-03	5,30584L-02	5.71H05E-02	5,99245E-02	6.06071E-02	6,094868-02
		-						
0-200	(INCRMAL)							PAGE 2

					BORN-OP TIME	-		
NO	NUCLIDE	NCAT	1 DAY	30 DAYS	60 DAYS	180 DAYS	360 DAYS	720 DAYS
51	44RU100	,	1 249655++06	1.25109E=05	1.250155-06	1.269165-06	1 248905-0-	1. 348785-04
52	44RU101	1	5.099756-02	5.105636=02	5.101785-02	5.097756-02	5-09669E-02	5.096205-02
53	4480102	5	6.20855F-02	4.21341E=02	4.21023E=02	4.206915-02	4. 20603E=02	4.205625=02
54	44Ru103	í	3.07764F-02	2.418051-02	1.92270E-02	9.428255=03	4.914986-03	2.461756=03
55	4480104	3	1.832711-02	1.834836-02	1.833+4F=02	1.83199F-U2	1.831615+02	1.431431=02
56	44Ru105	. í	2.5+803++03	8.674735-05	4.33409F-05	1.443565=05	7.216295-06	3.607795-06
57	44RU106	3	3,90496E-03	3.80436F-03	3.69679F-03	3.312255-03	2-83436E-01	2.:34981+03
58	45RH103	3	2.69130E-04	0.900848-03	1.18309E-02	2.16051F-02	2.61119F-02	2. 356215-02
59	45RH105	1	5.783425-03	6.82096E=04	3.40791F-04	1.13507E=04	5.674191-00	2.836821-05
60	4620104	2	9,95698F-1)	9.96846E-10	9.96094F-10	9.95308F-10	9,951016+10	9.45004E-10
61	46PD105	3	1.14898E-03	8.712526-03	9.09008E-03	9.33879F-03	9.40081F-03	9.431865-03
62	46P0106	2	3.77432E-06	1.06883E-04	2.13505E-04	5.94953F-04	1.072095-01	1.771036-03
63	46P0107	3	1.912216-03	1.914411-03	1.912975-03	1.91146E-03	1.91106F=03	1.91088E=03
64	46P0108	2	7.04494E+04	7.05307E-04	7.04775E-04	7.04219F-04	7.04072E-04	7.04003F-04
65	46PD109	ī	1.68764E-04	7.95976E-06	3.97688E-06	1.32458E-06	6.62152E=07	3.310445=07
66	46PD110	2	2.00174E-04	2.00405E-04	2.00254F-04	2.000965-04	2.000541-04	2.000355-04
67	46P0112	2	8.08012E-05	4.92830E-06	2,46229E-06	8,20116E-07	4.09973E-07	2.049665-07
68	47AG109	3	1.05456E-04	2.66577E-04	2.103528-04	2.72788E-04	2.73394E-04	2.736986-04
69	47AG111	i	1.74448E-04	6.18267E-05	3.28205E-05	1.09744E=05	5.48606F=0p	2.742768-06
70	48C0110	2	1.37181E-10	1.37340E-10	1.37236E-10	1.37128F-10	1.37099E-10	1.37086E-10
71	48CD111	ī	7.801798-06	1.20633E-04	1,49501E-04	1+71204E-04	1.76654E-04	1.79380E=04
72	48CD112	2	4.691338-05	1.22934E-04	1,25303E-04	1.268448-04	1.272285-04	1.27421E-04
73	46CD113	ī	1.27973E-04	1.24121E-04	1,28024E-04	1.27923E-04	1.27897L=04	1.27884E-04
74	48CD114	2	1.29424E-04	1.29573E-04	1.29+76E-04	1.29373E-04	1.29347E=0+	1.29334E-04
75	48CD115	1	5,09978E-05	1.13631t-05	5.67777E-06	1.89110E-06	9.45352E-07	4.72630E-07
76	48C0116	2	1.10709E-04	1.10037E-04	1.10753E-04	1.10666E-04	1,106436-04	1,10632E-04
77	49[N115	1	1.36713E-05	8.943986-05	9.47n52E-05	9.82835E-05	9.91612E-05	9.96005E-05
78	50SN115	1	7,21584E=07	4.70940E-06	4,98969E-06	5-17486E-05	5,22105E-06	5.244178-06
79	50SN116	2	4,63871E-08	4.64406E-08	4.64056E-08	4.63690E-08	4.63593E-08	4,53548E-08
80	50SN117	1	1,60975E-04	1.61161E-04	1.61039E-04	1.60912E-04	1.60879E-04	1,60863E-04
81	50SN118	2	1,47619E-04	1.47789E-09	1.47678E-04	1.47561E-04	1.47531E-04	1,47516E-04
82	505N119	1	1.261538-04	1.262998-04	1.26204E-04	1,26104E+04	1.26078E-04	1.26066E-04
83	50SN120	2	1.30713E-04	1.30864E-04	1.30765E-04	1,30662E-04	1.30635E-04	1,30622E-04
84	50SN121	1	1,331838-04	9.66269L-06	4.82770E-00	1.60796E-06	8.03815E-07	4,01868E=07
85	50SN122	2	1.507076-04	1.50881E-04	1.507678-04	1,50648E-04	1.506178-04	1.50602E-04
86	50SN123	1	2.387228-04	2.20786E=04	2.03714E-04	1.51378E-04	1.03564E+04	5.58100E-05
87	50SN124	2	1,784602-04	1.78666E-04	1.785318-04	1,78391E-04	1.78354E-04	1.78336E-04
88	50SN125	1	2,40321E-04	1.00471E-04	5.56924E-05	1,877448-05	9,38526E-06	4.09217E=06
89	50SN126	2	5.02840E-04	5.03420E-04	5.030+0E-04	5.02643E=04	5,02537E-04	5.02486E-04
90	51SB121	1	4,50072E-05	1.68733E-04	1.73434E-04	1.76513E-04	1.77280E-04	1,77664E-04
91	5158122	2	2.20512E=08	3.35375E-09	1.676b1E=09	5.58428E-10	2.79156E-10	1.395648-10
92	515B123	1	8,71768E-07	1.90832E-05	3,59745E-05	8.812176-05	1.35886E-04	1.80616E=04
93	51SB124	2	1,14296E-07	1.015198-07	8.650ú3E+08	5.046875-08	2.83827E-08	1.44117E-08
94	515B125	1	1,271496-05	1.516171-04	1.93996E-04	2.20883E-04	2.16055E-04	1,955496-04
95	51SB126	2	1,949756-05	9.77705E-06	5.81039E-06	2,00734E-06	1.00360E-06	5.01835E-07
96	5158127	1	1,06784E-03	2.17087E-04	1.08969E-04	3.62950E-05	1.81437E-05	9.07098E=06
97	515B128	2	2.32005E-04	7.74242E-06	3.86829E-06	1.28841E-06	6,44073E-07	3.22005E=07
98	52TE122	2	2.841926-09	2,156802-08	2,32264E-08	2.43249E-08	2.45990E-08	2.47362E-08
99	52TE123	1	0.0	0.0	0.0	0+0	0.0	0.0
100	5278124	2	6,90414E-10	1,86062E-08	3.34451E-08	6.94710E-08	9.153216-08	1.05491E-07

U=235	(THERMAL)							PAGE 3
					BURN-UP TIME			
NÖ	NUCL I DE	NCAT	1. DAY	30 DAYS	60 DAYS	180 DAYS	360 DAYS	720 DAYS
101	52TE125	1	5,876412-09	1.01873E-06	2.88249E-06	1.177620-05	2.54524E-05	5.05269E-05
102	52TE126	2	5,66681E-07	1.03104E-05	1.4/6218-05	1.80498E-05	1.90503E⊷05	1,95518E-05
103	52TE127	1	4,066562-05	1.929996-05	1.02764E-05	3.918665-06	2,10649E-06	1.084102-06
104	52TE128	2	3,794026-03	4.02293E-03	4.02376E-03	4.02316E-03	4.02297E-03	4,022906-03
105	52TE129	1	2.39204E-03	8,18337E-05	4.08H63E-05	1.361818-05	6.80765E-06	3.403498-06
106	52TE130	2	2,00410E-02	2.00641L-02	2.00490E-02	2.003316-02	2.00290E-02	2,002708-02
107	52TE131	1	1,20565E-03	4.03852E-05	2.01774E-05	6.72048E-06	3,35954E-06	1,67961E-06
108	52TE132	2	3,70076E-02	0.41934E-03	3.21259E-03	1.07002E-03	5.34899E-0+	2.674236-04
109	531 127	1	2.48144E-05	7.94560E-04	9.27+546-04	1.096262-03	1.20131E-03	1.28653E-03
110	531 129	3	6,13437E-03	8.454856-03	6.48967E-03	8,51076E-03	8.51603E-03	8.51872E-03
111	531 130	2	1.75289E-06	7.92025E-08	3.95714E-06	1.31800E-08	6.58865E-0Y	3.29401E-09
112	531 131	. ī	2.42158E-02	9.924826-03	5.33933E-03	1.78873E-03	8.94180E-04	4.47046E-04
113	531 133	ī	4.75835E-02	2.903578-03	1.450698-03	4.831825-04	2.41541F-04	1.20759E-04
114	531 135	ĩ	2.36277E-02	8.60334E-04	4.29842E-04	1.43168F-04	7.15690E-05	3.57810E=05
115	54XE128	2	3 81897E-07	3.82337E-07	3.82.)495-07	3.81747E-07	3.81668E=07	3.81631E=07
116	54XE130	5	1.431225-06	3.108591-06	3.143816-06	3.15969E-00	3.17562E=06	3.178605=06
117	54XF131	3	1.005418-03	1.76991E+02	2.23352E-02	2.591155=02	2.681226-02	2.726265-02
118	54XE132	2	4.25532E-03	3.48912E=02	3.80558F-02	4.01768E=02	A.07033E=02	4.09668E=02
119	54KE133	1	1 91736E-02	1.676291-02	8.570695-03	2.855935-03	1 427675=03	7.137645-04
120	54xF134	2	7.19188E-02	7.20017E=02	7.19474E-02	7.18907E=02	7.18757E=02	7.186876=02
121	5411135	i	2 34591F=02	1.24105[-03	6.20059E=04	2.065235-04	1 032405-04	5.16150E=05
122	54XE136	2	6.12036E-02	6.12742E-02	6.12280E-02	6.11796F-02	6.11669E-02	6.11609E-02
123	5505133	-	6 228×2E=0#	A 80515E-02	5.76455E+02	6.427446 02	6 593025-02	4.47583E=02
124	5505134	៍ដ	1.42894F-07	1.41155E+07	1.391156-07	1.31625F-07	1.21492E-07	1.042556-07
125	5505135	3	2.01553F=02	6.52183E-02	6.62190F-02	6.68661E=02	6.70270E-02	6.71078E=02
126	5505136	2	6 59766F-05	3.35396F-05	2.032205-05	7.056056-06	3.527536=06	1.763596-06
127	5505137	3	6.225941-02	6.227411=02	6-21680E-02	6.18838E-02	6.15205E=02	6.08215E=02
128	568A134	ž	6.61974E-11	1.97053E-09	3,90202E-09	1.127908-08	2.13826F-08	3.86055F-08
129	5686136	2	3.90395F=06	3.612161-05	4.95864F-05	6.27972F-05	6.63112E=05	6.806835-05
130	56BA137	ī	1. 53924E-05	7.55896E-05	1.34562E+04	3.69642F-04	7.200495-04	1.41296F-03
131	568A138	2	6.74581F+02	6.75359F-02	6.74850E-02	6.743175-02	6.74177E-02	6.74111E=02
132	5684140	5	6.13140F+02	3.11707++02	1.86+15F+02	6.459255-03	3.2291+E=03	1.61441E=03
133	571 4139	ĩ	6.58687E=02	6.594476-02	6.58950F-02	6.58430E=02	6.58293E=02	6.58228E=02
134	571 A140	2	5.52846F-08	5.53471E-08	5.530405-08	5.525518-08	5.523586=08	5.52147E-08
135	58CE140	2	2.453155-04	2.81567E=02	4.215116+02	5.586935-02	5.9510bE=02	6.13313E=02
135	58CF141	ĩ	5 52827F+02	4.37964E+02	3.353475-02	1.523518-02	7.789666=03	3.69647E=03
137	58CF142	5	5.95560E-02	5.96247E-02	5.457976-02	5.95327F-02	5-952035=02	5.95145E-02
1 38	5801143	- î	6 65526F-02	3.923821-03	1.96043E-03	6.529616.04	3.264125-04	1.631908-04
139	54CF144	3	5.43746E-02	5.25563E-02	5.06627F+02	4.40400F-02	3.62039E-02	2.56182F=02
140	5998141	ĩ	3.74896F-04	1,492888-02	2.514628-02	4.33995E-02	5-08328E=02	5.47203F=02
141	59PH142	ŝ	6.64031E=10	3.82367E-11	1.91039E-11	6.362945-12	3.18081E=12	1.590256=12
142	59PH143	ĩ	1,243051+02	2.941671-02	1.83557F+02	6.45019F-0	3.224805-03	1.612245=03
143	5922145	î	1.34390F=02	4.78090E-04	2.388656-04	7.955878-05	3.97711E-05	1.98836F=05
144	60ND142	2	3.266931-10	9.556321+10	9.74016F-10	9.859735-10	9.88949F=10	9,90442E=10
145	60ND143	;	9.331965-0-	2.66452E-0	3.962448-02	5.279008-02	5.43295E=02	5.809948-02
145	60N0144	1	1.028285-04	1.94402E-03	3.83663E=03	1.04161F=02	1.824045-02	2.882136-02
147	60ND145	ž	2.608465-02	3.909138-02	3,93007E-02	3.94285F-02	3.94604E=02	3.44764E-02
148	60N0144	ź	2.99814F=02	3.00160E-02	2.999346-02	2.996975-02	2.94635E=02	2.996056-02
149	60NU147	ĩ	2.18730E-02	1.02059E-02	5.882378-03	2.00656E-03	1.003098-03	5.014946-04
150	60NU148	ż	1.690436-02	1.69238E-02	1.69110E-02	1.68977L-02	1.68941E+02	1.68925E+02
		_						

U-235	(THERMAL)						Ρ	AGE 4
					BURN-UP TIME	•		
NO	NUCLIDE	NCAT	1 DAY	JO DAYS	60 DAYS	130 DAYS	360 DAYS	720 DAYS
151	60ND150	2	0.0	0.0	0.0	0.0	0.0	0.0
152	61PM147	3	6.71843E-04	1.22540E-02	1.63786E-02	1.93462E-02	1.904998-02	1.72515E-02
153	61PM148	2	1,117326-06	3.029406-07	1,54574E-07	5.15071E-06	2.57482E-08	1.287285-08
154	61PM149	ī	9.47660E-03	1.1/949E-03	5.89350E-04	1.962956-04	9.81270E-05	4.90587E-05
155	61PM151	ī	3,206298-03	2.388768-04	1,193485+04	3.97512E-05	1.98715E-05	9.93477E-06
156	525M147	3	1.61266F-07	1.01070E-04	2.930a1E-04	1.183461-03	2.47851E-03	4.77631E=03
157	625M148	2	8.234368-08	8.9H110E-07	1.04557E-06	1.14769F-0p	1,17320F-06	1.185965-06
158	625M149	3	1.230866-03	9.54032E=03	1.01224F-02	1.05070F-02	1.06029F-02	1.06509E-02
159	625M150	2	6.49721E-03	6.50471E-03	6.49980E-03	6.49467E=03	6.49332E-03	6.492692-03
160	625M151	1	1.01870E-03	3.96977E-03	4.10473E-03	4.17547E-03	4.18621E-03	4.17928E=03
161	625M152	2	2.648458-03	2.65150E-03	2.64450F-03	2.64741F+03	2.64686F-0.3	2.64660F-03
162	625M153	ĩ	1.27656E=03	1,42912E-04	7.15038E=05	2.37825E+05	1,188885-05	5.94381F=06
163	625M154	2	7 106228-04	7.114421-04	7.10906E-04	7.103445-04	7.101976-04	7.10127E=04
164	6254156	2	5.64351++05	2.27013E-06	1,13421E-06	3.77771E-07	1.888465 -07	9.441385-08
165	6351:153	-	3 591506=04	1.494681-01	1.56495E=03	1.61128E=03	1.622845=03	1.628625=03
166	6360154	2	1 69963E-06	1.656465-06	1.59417E+06	1.680845-06	1.662735=06	1.62780F-06
167	63EU155	3	3.32521E=04	3.27892E-04	3.22559F-04	3.03050E-04	2.769175-04	2.33340F-04
168	6360156	2	7.539765-05	7.15751E=05	4.49918E-05	1.60063E=05	8.00348F=06	4.00135F=06
169	5370157	i	3.849356-05	1.930946-06	9.64744E-07	3.21328F-07	1.606305-07	8.030736-08
170	6+0D155	ĩ	1.867576-07	5.19934E-06	1.02714E-05	2.952748-05	5.55914E-05	9.91354E-05
171	64GD156	2	1.54992E-06	5.9-914E-05	8.75100E-05	1.169475-04	1.251116-04	1.29194E-04
172	645D157	ĩ	2.57963E=05	6.23829E-05	6.33006F-05	6.389338-05	6.40407E-05	6.41147E-05
173	64GD158	2	4.28016E-05	4.28510E-05	4.28187E-05	4.27849E→05	4.27760F-05	4.27718E-05
174	64GD159	ī	7.16484E=06	3.964761-07	1.98089E-07	6.59774E-08	3.29819E-05	1.64893E-08
175	64GD160	2	3.30908E-06	3.31290E-06	3.31040E-06	3.30779E-06	3.30710E-06	3.30677E-06
176	6516159	-	3.751998-06	1.053291-05	1.07231E-05	1-084665-45	1.087736-05	1.08927E-05
177	55T8160	2	4.28816E-04	3.747438-09	3.27550E-09	2.04793E-09	1.20516E-09	6.21443E-10
178	6518161	5	7.49194E-07	2.653465-07	1.39084F-07	4.64366F-08	2.321356-08	1.16056E-08
179	66DY160	2	5.063736+11	5.96368E=10	1.06502E+09	2.28916E-09	3.13103E-09	3.71433E-09
180	66DY161	ī	4.45646E-08	5.79386E-07	7.05011E-07	7.969926-07	8.20040E=07	8.31566E-07
181	66DY162	2	0.0	0.0	0.0	0.0	0.0	0.0
182	66DY163	ĩ	e.ŭ	9.0	6.0	0.0	ō.ň	0.0
183	66DY164	2	0.0	0.0	0.0	0.0	0.0	0.0
184	67H0165	ĩ	0.0	u.o	0.0	0.0	0.0	0.0
185	4316799	1	6.6905UE-04	1.074826-04	5.37323E-05	1.78966E-05	8.946465-06	4.47279E-06
186	48CD815	· 1	0.0	0.0	0.0	0.0	0.0	0.0
187	52TE823	ī	0.0	0.0	0.0	0.0	0.0	0.0
188	5218825	ī	7.54875E-09	2.345216-07	5.79154E-07	1.517176-06	2.005171-06	2.10501E-06
189	52TE 827	ĩ	2.56893E-04	3.508728-04	3.44069E-04	2.53194E-04	1.67820E=04	9.25568E-05
190	52TF829	ĩ	1.77218F=06	1.340811-06	1.03330F-06	4.75248F-07	2.436291=07	1.218526-07
191	52TE 831	î	1.30802F-03	1.02551E-04	5-12366E-05	1.70654E-05	8.530928-06	4.265C4E-06
192	61PM648	ī	0.0	0.0	0.0	0.0	0.0	0.0
193	345E 82	2	2,43540E-03	2,43821E-03	2.43637E-03	2.43445E-03	2,43394E-03	2,43371E-03

# Appendix 3.3 FP due to <sup>238</sup>Pu fission with thermal neutrons

U=238	(FISSION S	SPECT)					¢	AGE 1
					BURN-UP TIME			
NO	NUCLIDE	NCAT	1 DAY	30 DAYS	60 DAYS	180 DAYS	360 DAYS	720 0AYS
1	30ZN 72	2	3.65443E-08	4.05489E-09	2.02606E+09	6,748538-10	3.373626-10	1.686678-10
ź	31GA 72	2	4,79724E-09	1,22958E-09	6.14375E-10	2.04640E-10	1.02301E-10	5,11462E-11
3	32GE 72	2	2.128686-09	3.82364E-08	4.08496E-08	4.25785E-08	4.30100E-08	4.32263E-08
4	32GE 73	1	2.87803E-07	2,88138E-07	2.879346-07	2.87722E+07	2.87667£-07	2,87643E-07
5	32GE 74	2	9.79328E-07	9.80469E-07	9.79776E-07	9.79053E-07	9.78866E-07	9.78786E-07
6	32GE 76	2	9.78329E-06	9.79469E-00	9.78177E-06	9.78054E-06	9.77867E-06	9,77788E-06
. 7	32GE 77	ĩ	1,98458E-05	8.59488E-07	4.29++UE-U7	1,43041E-07	7.15069E-08	3.575051-08
8	33A5 75	1	3.45823E-06	3.46226E-06	3.45981E-06	3.45725E-06	3,4566CE-06	3,45631E-06
9	33AS 76	2	4,96502E-13	3.55403E-14	1.77576E-14	5.91483E-15	2,956858-15	1.478318-15
10	33AS 77	ī	1.54977E-05	2.94355E-06	1.47074E-06	4.898856-07	2,448966-07	1.22438E-07
11	34SE 76	2	1.7204CE-13	5,33780E-13	6.510906-13	6.62439E-13	6.652698-13	6,66693E-13
12	34SE 77	1	2.57173E-06	3,41564E-05	3.60324E-05	3,72716E-05	3.75809E-05	3.773618-05
13	345E 78	ż	1,42632E-04	1,42798E-04	1.42697E-04	1.42592E-04	1.42565E-04	1.42553E-04
14	34SE 79	1	4.10698E-04	4.11177E-04	4.105868-04	4.10582E-04	4.105022-04	4.104671-04
15	34SE 80	2	8.82085E-04	8.83113t-04	6,82488E-04	8.81837E-04	8.81669E-04	8.81597E-04
16	35BR 81	1	1.58917E-03	1.59102E-03	1.58990E-03	1.58872E-03	1.58842E-03	1.56829L-03
17	355k 82	2	2,534626-09	2.25288E-10	1.12565E-10	3.74938E-11	1.874338-11	9.370918-12
18	36KR 82	2	6,43197E-10	2.956236-09	3.06671E-09	3.13943E-09	3.15758E-09	3.16669E-09
19	36KR 83	1	4,12111E-03	4.12591E-03	4.12300E-03	4.11995E-03	4,11917E-03	4,11883E-03
20	36KH 84	2	8.47206E-03	8.50195E-03	8.49594E-03	8.489672-03	8.48805E-03	8.48736E-03
21	36KH 85	ī	1.86426E-03	1,86169E-03	1,85546E-03	1.83463E-03	1.80560E-03	1.74986E-03
22	36KR 86	2	1.363278-02	1.364856-02	1.36389E-Q2	1,362888-02	1,362626-02	1.36251E-02
23	37RB 85	1	6,27673E-03	6,28879E=03	6.28926E-03	6.30407E-03	6.33155E-03	6.38661E-03
24	3788 86	2	1,48128E-09	9.10845E-10	6.04428E-1J	2.25336E-10	1.127878-10	5.63891E-11
25	3788 87	1	1.41516E-02	1,41080E=02	1.41580E-02	1.41476E-02	1.414498-02	1.41437E-02
26	355R 86	2	2.76822E-11	5.99878E-10	9.05228E-10	1.28320E-09	1,395475-09	1.451748-09
27	385R 88	2	1.67646E-02	1.67842E-02	1.67723E-02	1.67599E-02	1.67567E-02	1.675542-02
28	385R 89	1	2.99443E-02	2.48752E-02	2.07610E-02	1.14198E-02	6.227065-03	3.13893E-03
29	385R 90	3	3.279718-02	3.28U31E-02	3.27468E-02	3.25903E-02	3.23672E-02	3.199538-02
30	385K 91	1	2.15376E-02	B.15476E-04	4.37428E-04	1.45702E-04	7.2837CE-05	3.641556-05
31	39Y 89	1	1.926335-04	5,29682E-03	9.38972E-03	1.87086E-02	2.389576-02	2.698138-02
32	39Y 90	2	4,100308-06	7.38536E-06	8.19352E-06	8.36801E-06	8.36891E-06	8.29388E-06
33	39Y 91	1	2.33922E-02	3./3633E-02	3.205536-02	1.86609E-02	1.045516-02	5.30265E-03
34	39Y 93	1	2.410396-02	1.00021E-03	4.99/54E-04	1.664622-04	8.321492-05	4,360418-05
35	40ZR 90	2	1,422826-05	4.261932-05	7.54/15E-05	2.07474E-04	4.04418E-04	7.936516-04
36	407.H 91	1	9,58724E~05	6.93933E-03	1.25235E-02	2.62064E-02	3.44765E-02	3.96617E-02
37	402H 92	2	3,907076-02	3,91162E-02	3.90886E+U2	3.905978-02	3.90523E-02	3,90491E-02
38	40ZR 93	3	2.41415E-02	4.73614E-02	4.77677E-J2	4.806548-02	4.81394E-02	4.817716-02
39	40ZR 94	2	5.13785E-02	5.14384E-02	5.140208-02	5.13641E-02	5.13543E-02	5.13501E-02
40	40ZR 95	1	5.54618E-02	4.77747E-02	4.12056E-32	2.47611E-02	1.42054E-02	7,25496E-03
41	4028 96	2	5.49120E-02	5.49768E-02	5.49379E-02	5.48973E-02	5.48869E+02	5.488248-02
42	40ZR 97	L	3.691258-02	1,97365E-03	9.86126E-J4	3.284668-04	1.64202E-04	8.20941E-05
43	41NB 95	L	2.87570E-D4	6.63787E-03	1.000635-02	1.12050E-02	7.474752-03	3.91210E-03
44	42MO 95	3	1.64573E-06	1.40365E-03	4.56283E-03	1.97494E-02	3.40446E-02	4.45533E-02
45	42MD 96	2	4.18/1JE-06	4,19201E-06	4.189045-06	4.18595E-06	4.18015E-06	4,18481E-06
46	42M0 97	3	2.266331-02	5.76716E-02	5.86170E-J2	5.92306E-02	5.93836E-02	5.946088-02
47	42MD 98	2	6.02286E-02	0.02988E-02	6.02561E=02	6.02116E-02	6.02002E-02	6.01953E-02
48	42MO 99	1	5.68789E-02	8,62809E=03	4.31350E-03	1.43677E-03	(.18250E-04	3.59096E-04
49	42N0100	2	6.36730E-02	6.37472E-02	6.370216-02	6.36551E-U2	6.36430E-02	6,36378E-02
50	43TC 99	3	6,6100UE-03	2.35282E-02	2.98536E-02	0127203E-02	6.34359L-02	6.3/944E-C2

U-238(	FISSION S	SPECT)						PAGE 2
NO	NUCL I DE	NCAT	1 044	30 DAYS	BURN-UP TIME 60 DAYS	180 DAYS	360 DAYS	720 DAYS
51	44RU100	2	3.43764E-08	3,441658-08	3.43921E-08	3.43667E-08	3,43602E-08	3.43574E-08
52	44RU101	3	6.37285E-02	6.38028E-02	6.37577E-02	6.371C6E-02	6.369855-02	6.36933E-02
53	44RU102	د	6.37287E-02	6.38029E-02	6,37578E-02	6.37107E-02	6.369865-02	6.36934E-02
54	44RU103	1	6,33539E-02	4.97767E-02	3.95615E-02	1.941C4E-02	1,01189E-02	5.06831E-03
55	44RU104	3	4.50651E-02	4.51176E-02	4.50558E-02	4.50525E-02	4,504392-02	4.50402E-02
56	44RU105	1	.6,91114E-03	2.36219E-04	1.18026E-04	3,93129E-05	1,96527E-05	9.82555E-06
57	44RU106	3	2,83011E-02	2.75724E-02	2.67940E-02	2.40081E-02	2.05446E-02	1.547556-02
58	45RH103	3	5.5400UE-04	1,42057E-02	2.435568-02	4.44795E-U2	5,37589E-02	5.88043E-02
59	45RH105	1	2.05110E-02	2,26097E-03	1.142186-03	3.80445E-04	1.901868-04	9.50854E-05
60	46PD104	2	6.87148E=11	6.37948E-11	6.87462E-11	6.86954E-11	6.86824E-11	6.86768E-11
61	+6P0105	3	4.854452-03	2,97920E-02	3,103126-02	3.184/BE-02	3,205166-02	3.21539E-02
62	46PD106	2	3,16185E-05	7.73607E-04	1.55193E-03	4.31686E-03	7.77502E-03	1,284185-02
63	46P0107	3	1.306035-02	1,30755E-02	1.305636-02	L.30567E-U2	1.30542E-02	1.30531E-02
64	46PD108	2	6.40826E-03	6.41573E-03	6.41120E-03	6,40646E-03	6,405246-03	6.40472E-03
65	46FU1C9	1	1,647836+03	7.77209E-05	3,88330E-05	1,29348E-05	6.46616E-06	3,23281E-06
66	46PU110	2	1.41771E-03	1.41936t→05	1.41s36E-03	1.41731E-03	1,417046-03	1,41692E-03
67	46PD112	2	6.11753E-04	3.73130E-05	1.864336-05	6.20985E-06	3.10434E-06	1,55204E-06
68	47AG109	3	1.05297E-03	2.62623E-03	2.66321E-03	2.68711E-03	2.69307E-03	2,69608E-03
69	4746111	1	9.846946-04	3.48994E-04	1.85271E-U4	6.19534E-05	3.09708E-05	1.54841E-05
70	46CD110	2	4.330308-12	4,33543E-12	4.332368-12	4,32916E-12	4,328348-12	4,32798E-12
71	48C0111	1	4,403936-05	6,86937E-04	6.439318-04	9.66489E+04	9,972766-04	1,012688-03
72	48CD112	2	2.739802-04	8.494512-04	8.67494E-04	8.79273E-04	8.8221DE-04	8.836902-04
73	48CD113	1	5.46026E-04	5,46562E-04	5.462758-04	5.458/2E-04	5.45768E-04	5.45723E-04
74	48CD114	2	4,20302E-04	4.20/91E-04	4.20194E-04	4.20183E-04	4,20103E-04	4.20069E-04
75	48CD115	1	4.605342-04	5.75102E-05	2.87373E-05	9.57203E-U6	4,78510E-06	2.39236E-06
76	48C0116	2	3.773118-04	3.77751E→04	3.77484E-04	3.77205E-04	3,77133E-04	3.771022-04
77	491N115	1	6.836552-05	4.51828E-04	4.78504E=04	4.96637E-04	5.01088E-04	5.03320E-04
78	50SN115	1	3,596708-06	2.37789E-05	2.51987E-05	2.61373E-05	2.63716E-05	2.648916-05
79	505N116	2	2.098562-09	2.10101E-09	2.09952E-09	2.097976-09	2.09757E-09	2.097408-09
80	50SN117	1	4.00935E-04	4.01402E-04	4.01118E-04	4.00822E-04	4.00746E-04	4.007136-04
81	505N11B	2	3.689286-04	3.69358E-04	3.69097E-04	3.68824E-04	3.68754E-04	3.68724E-04
82	505N119	1	3.69431E-04	3,698618-04	3,69600E-04	3.69327E-04	3.69256E-04	3.69226E-04
83	505N120	2	3.704365-04	3.70867E-04	3,70605E-04	3.70332E-04	3.70261E-04	3.70231E-04
84	505N121	1	2.81235E-04	2.04044E-05	1,01950E-05	3.39582E-06	1.69759E-06	8.48723E+07
85	505N122	2	3.854766-04	3.85925E-04	3.85652E-04	3.853678-04	3.85294E-04	3.852628-04
86	505N123	1	4.188916-04	3.87424E-04	3.57484E-04	2.65656E-04	1.817498-04	1.03210E-04
87	50SN124	2	4.63672E-04	4.n4212E-04	4.63884E-04	4.63541E-04	4.63453L-04	4.63415E-04
88	505N125	1	1.08655E-03	4.54260t-04	2,51814E-04	8.48932E-05	4.243866-05	2.12176E-05
89	205N126	2	6.35714E-04	6.36454E-04	6,36004E-04	6.35534E-04	6.354128-04	6.35358E-04
90	5158121	1	9.47173E-05	3.55986E-04	3.65929E-04	3.72451E-04	3.74077E-04	3,74895E-04
91	5158122	2	4.89531E-10	7.44534E-11	3.72225E-11	1.23984E-11	6.1980CE-12	3.09875E-12
92	5158123	1	1,17110E-06	3.312718-05	6.27703E+05	1.54288E-04	2.381158-04	3.16619E-04
93	5158124	2	4.66975E-OB	3.973926-08	3.38955E-08	2.97577E-06	1.111168-08	5.64214E⊷09
94	<b>D1SB125</b>	1	4,09130E-05	0.69053E+04	8,60917E-04	9,83209E-04	9.62325E-04	8.71253E-04
95	5156126	2	1.83924E-06	9.22397E-07	5.48278E-07	1.89558E-07	9.487416-08	4.75421E∺08
96	5158127	1	9,175736-04	1.86563E-04	9,36512E-05	3.11947E-05	1.55944E-05	7,79656E-06
97	5158128	2	2.11618E-04	7,06215E-06	3.528588-06	1.17532E-06	5,87550E-07	2.93751E-07
98	52TE122	2	6,30899E-11	4.78811E-10	5.150516-10	5.40067E-10	5.461628-10	5.49216E-10
99	52TE123	1	0.0	0.0	0.0	0.0	0.0	0.0
100	>2TE124	2	2.70257E-10	7,28331E-09	1,30938E-08	2.71969E+08	3.58340E-05	4,12997E-08

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					1			
NO	NUCL THE	NCAT	1 DAY	30 DAVS	SURN-UP I ME	180 04%5	340 DAVE	720 0446
			1 641	50 0000	1	100 0413	200 DA13	120 0413
101	52TE125	1	1.022306-08	4,44694E-06	1.27234E-05	5.232368-05	1,132618-04	2.20010E-04
102	52TE126	2	5,94808E-08	9,78712E-07	1,35167E-06	1.70971E-06	1.805126-06	1.85447E-06
103	52TE127	1	3.774568-03	1,717398-04	8.83940E-05	3.15952E-05	1.64352F-05	8.35131E+06
104	52TE128	2	2.885206-03	3,09336E-03	3.09470E-03	3.09477E-03	3.09477E-03	3.C9481E-03
105	52TE129	1	1.919246-03	6,65688E-05	3.35172E-05	1.125668-05	5.63151F-06	2.81558E-06
106	52TE130	2	1.468216-02	1,46992E-02	1.46888E-02	1.46779E-02	1.46751E=02	1.46739E-02
107	52TE131	1	1.750846-03	5.35439E-05	2.92513E+05	9.743225-06	4.87068F=06	2.43514F-06
108	52TE132	2	4.77132E-02	8,27645E-03	4.14218E-03	1.37971E-03	6.897242-04	3.44834E-04
109	531 127	ī	4.25773c-03	8.64405E-03	8,94904E-03	2.49577E-03	9,905556=03	1.02525F→02
110	531 129	ĩ	3,226498-03	5.42360E=03	5.69211E-03	6.145328-03	6.3305#F=03	6.427951-03
111	531 130	2	1.78244E-08	8.95383E-10	4.02407E+10	1.34037E-10	6.70055E=11	3.35000F=11
112	531 131	ĩ	3.24962F-02	1.31009F-02	7.04000E-03	2.36054E=03	1.180055=03	5.89975E+04
113	531 133	ĩ	4.534018-02	2.766085-03	1.38206F-U3	4.603475-04	2.301305-04	1.150556-04
114	531 135	î	2.1021dF=02	7.65458E-04	3.82458F=04	1.27392F=04	6.368395=05	3.183936-05
115	54 XF 128	2	7.874605-11	1.48377E=11	7.87420E+11	7.872385-11	7.870886-11	7.870245-11
116	54XE130	5	1 455346-08	3.161011-08	3.19902E-UB	3.22346E-08	3 229556-05	3. 232645-08
117	54XE131	1	1.363678-03	2.341835-02	2,951595=02	3.42200E=02	3.540505=02	3.599785-02
114	54XF132	2	5 52716E=03	4.502605-02	4.91226Em()2	5.184576-02	5 262666-02	5 284616=02
110	34YE133		1 807545-02	1 602716-02	8 194795-03	2 730815-02	1 366165-02	4 036146-04
120	54XE135	5	7 524705-02	7 633446-02	7 52-145-02	7 633645-03	7 401146-00	7 420525-04
120	54 YE1 26	÷.	1 976955-02	1 060155-03	5 392015-04	1 74 5 275 - 44	P P26146-04	1.520532-02
122	54YE134	5	4 750425-02	6 766296-03	6 753605-03	1 7.0500	6.820182-03	4,409122-00
122	5575133	5	6.130420-02	6 605146-02	5 51 1225-02	6 · 14832E=02	6 00(175-02	6.140002-02
120	5565130	,	8.539555-00	+ 04-04-02	B 010665-10	0.14601E-02	6.30437E=02	6.30361E=U2
124	5566124	2	1.010632-09	1.000446-07	7.719446-10	9.385866-10	8.66344E=10	· /.43442E=10
125	5505135	د ا	2.585956=02	5 710546-05	3 434075-05	0.63272E-02	6.64663E-02	6.633/0E-02
120	5505130	2	1.117120-04	5 046086-02	5,434972-03	1.192736-03	3,90291E=00	2.901216-00
121	3363137	و	5.94/516=02	3.940900-02	3,939140-02	5+91228E-02	5.8//6/E-02	2.810ARF-05
120	200A134	<	4.114656-13	5 7 5935-05	2.702270-11	0.042/1E=11	1.524/65=10	2,/5295E-10
129	300A136		3.004282-06	5.745956-05	8.022412-05	1.02562E+04	1.082056-04	1.114776-04
130	366A137	1	2.790100-06	2.691040-03	1,132716-04	3.37881E-04	0.726692-04	1,334/0E-03
191	265A128	2	5.914/32-02	5.921646-02	5.91745E-02	5+91308E-02	5,91196E-02	5.91148E-02
132	565A140	4	5./84B8E=U2	2.940946-02	1,756916-02	5.09489E-03	3.04/045-03	1,52340E-03
200	57LA139	1	5.313036-02	3.319226-02	2.315468-02	5-31154E+02	5.31052E-02	5.31009E-02
134	5724140	ć	8.194576-10	0.203736-10	8,19//4E=10	0.19091E-10	0.188185-10	8,30018E-10
135	38CE140	2	1.9/1596-04	2.631700-07	3.93/446-02	5-251552-02	2.595105-02	5.76693E-02
136	20CE141	1	5.408982=02	4.064610-02	3.112406-02	1.414066-02	7.23016E=03	3.01000E=03
137	58CE142	2	4.693912-02	4.699386-02	4.69606E+02	4.69259E-02	4.69170E-02	4.69131E-02
138	58CE143	1	3.58296E-02	3.02003E-03	1,50595E-03	5.02612E+04	2.51258E-04	1,25619E-04
139	35CE144	د	4.53393E-02	4.38236E-02	4.224672402	3.67260E-02	3.01918L-02	2.13643E-02
140	39PR141	1	3.477072-04	1.38547E-02	2.33382E-02	4.02814E-02	4.718156-02	5.07905E-02
141	39PR142	2	2.693818-14	1.551198-15	7,75044E-16	2.58157E-16	1.290546-16	6,45218E-17
142	53PR143	1	9.301876-03	2.250138-02	1.40435802	4.93530E→03	2.46746E-03	1,23363E-03
143	39PH145	1	1.26927E-02	4.51545E-04	2,25613E-04	7.51487E-05	3.756726-05	1.87821E-05
144	00ND142	-2	1.33343E-14	3.87681L-14	3.951588-14	4.00029E-14	4.012436-14	4.018568-14
145	60ND143	د	1.62904E-04	1.98256E-02	2.97.25E-02	3.984362-02	4.255416-02	4.39099E-02
146	60ND144	3	5.525626-05	1.623846-03	3,16863E-03	8.65578E-03	1,518136-02	2.40051E-02
147	50ND145	3	2.463608-02	3.69206L-02	3.71201E-02	3.72430E-02	3.72735E-02	3.72893E-02
148	3GN0146	2	3.364266-02	3.386228-02	3.38582E-02	3.38332E-02	3.38268E-02	3.382406-02
149	60\0147	1	2.48542E-02	1.15971E-02	6.68451E-03	2,28030E-03	1.13995c=03	5.69927E-04
150	3CnD148	2	2.114475-02	2.11693E-02	2.11544E-02	2.11387E-02	2.11347E-02	2.113306-02

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					BURN-UP TIME			
NO	3C1120V	NCAT	1 DAY	30 DAYS	O DAYS	180 DAYS	360 0AYS	720 DAYS
151	60N0150	2	0.0	0.0	0.0	0.0	0.0	0.0
152	61PM147	3	7,62389E-04	1.39545E-02	1,86306E-02	2.20032E-02	2.16658E=02	1.96204E-02
153	51PM148	2	1.011246-09	2.74181E-10	1,39906E-10	4.66219E-11	2.33065E-11	1,16523E-11
154	610M149	1	1.627696-02	2,025928-03	1,01233E-03	3.37194E-04	1,685656-04	8.42755E-05
155	61PM151	1	7.01905t-03	5.22942t-04	2.61286E-04	8./0311E-05	4.35073E-05	2.175196-05
150	325M147	3	7.262028-05	1.875668-04	4,05917E-04	1.41852E-03	2.89135E-03	5.50466E-03
157	525M148	ž	6.8020ot-11	8.06337E-10	9,378485-10	1.03233E-09	1.055446-09	1.06701E-09
158	025M149	3	2.14318t-03	1.641076-02	1,74162E-02	1,80777E-02	1.82429E-02	1.832578-02
159	625M150	2	1,234468-02	1.285986-02	1,20507E-02	1.28412E-02	1,283871-02	1.2B377E-02
160	o25M151	š	2,222046-03	5.72919E-03	5,98129E-03	9.13664E-03	9.160338-03	9.14532E-03
161	-25M152	5	5.842658-03	5.94746E-03	5 84333E-V3	5.83901F-03	5.83790E-03	5.83742E=03
162	625M153	ĩ	3,440918+03	3.852198-04	1,92478E-04	6.41119E-05	3,204946-05	1.602365-05
163	025M154	2	2.44671E-03	2.449565-03	2.44783E-03	2.44602F-03	2.445565-03	2.44536F=03
164	p25M156	2	3.4890pE=04	1.403506-05	7.01255E=06	2.33579E-06	1,167676-06	5.83789E-07
165	63FU153	1	6.36085E-04	3.697338-03	3.85718F-03	4.01253E=03	4.043825-03	4.05951E=03
166	6350124	5	3,29/546-08	3.295716-08	3,287535-08	3.26184F=08	3.226765-08	3.159016-08
167	5 3EU1 55	î	1 344616-03	1.369395-03	1.347325-03	1.265865-03	1.156725=03	9.747136=04
168	b 370156	2	3 920916-04	4.014716+04	2.52542E=04	8.986355-05	4 493446=05	2.246545=05
164	63511157	ĩ	3 304 176-04	1,155956=05	5.77567E-06	1,903806-06	9 417165-07	4 608205-07
170	04GD155	÷.	6.954676=07	2.163165-05	4.28179E=05	1.232545-04	2.321296=04	4.140255=04
171	50G0156	2	6 860916-04	3 332325-04	4 895555-04	6 56457E-110	7 016135-04	7 34-046-04
172	A400150	÷.	1 005736-04	3 478435-04	1 713595-04	3 769305-04	3 778205-04	1 783705-04
173	6460158	2	1.485252-04	1.741435-04	1.740205-04	1.739915-04	1 738555-04	1 738406=04
174	64CD159	1	5 406565-05	3 21 3295-06	1 605515-06	5 367745-07	2 673365-07	1,134575-07
175	4460140	ţ	2 208/75-05	1 403436-05	3 +0000005-06	3 307715 05	1 10 2020-01	1.336316-01
175	-679150	ę,	3.390672-03	8 402032-03	A 54145E-05	3.39//12-05	8 723125-05	3,370172-05
110	-67-140		2.741440-01	3 UPUA16-09	3 470495-09	3 1 76 5 66 100	1 200205-09	4 (0) 00( -00
170	5510100	÷.	4.554952-08	4 34 53 35 -06	3 340135-06	2.1/00000000	1.280302-08	0.001772-07
113	3408160	-	1.681002-09	5,28923E-00	1 0204100-00	1,046556-06	3.481696-01	2.140626-07
1 1 7	5601160	÷.	2.145002-10	1 358435-05	1 455135-06	2:399992=00	3.294406-00	3.914136-06
180	6607101	-	9.364236-07	1.336432-05	11000132-00	1.8/2432-03	1.920092-05	1,994146-09
181	6607162	ť.	0.0	0.0	0.0	0.0	0.0	0.0
102	46091103	÷	0.0	0.0	0.0	0.0	0.0	0.0
185	6001104	÷.	0.0	0.0	0.0	0.0	0.0	0.0
104	6110100	÷	7.000046-04	1 100865-00	5 4234 6 C - OF	1 873375 05	0.0	0.0
185	4310179	+	7.000882-04	1.124000-04	0.023032=03	1.0/31/E-05	7.36404E#00	4.601040-00
100	4000010	1	0.0	0.0	0.0	0.0	0.0	0.0
187	5210023		0.0	5.000744 04	0.0	0.0	0.0	0.0
160	JZ10023	1	1.95/202-09	1 401445-03	2+343646=06	0+130335-00	0.922012-00	7.3/4/66-06
187	5375430	ţ	1.131/16=03	1.071000-03	1.000076-00	3 731675 -03	1.003/75/2=04	4.0/0182=04
140	3210029	i.	1.383646-03	7.04/010-03	0.009210-04	J. 11141E-04	1.902676=04	7.518(4E=05
191	5212831	1	1.003058-03	1.864141.705	3192929E=03	L+30880E=05	0.04274h-06	3.2/110E-06
192	01PM048	1	0.0	0.0	0.0	0.0	0.0	0.0
193	345E B2	2	2.643228-03	2.640JUL-UJ	21044436-03	2.0424(L=03	<b>∡.</b> 64197E≠03	2.641756=03

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# Appendix 4. User's Guides for Driving the Present System

User's guides to drive the JNDC FP Fast Reactor Constants System are given in this section. Some of programs have been developed for more general purposes, and only limited functions are used for the present system. In such cases, descriptions are limited to the necessary parts.

# Appendix 4.1 PROF-GROUCH-G-II

The PROF-GROUCH-G-II code system is a very large computer code system which produces multi-group constants for diffusion and  $S_n$  calculations automatically from a nuclear data library of the ENDF/B format. Only a small subsystem is used for the production of FP group constants. As it is not feasible to describe the whole system of PROF-GROUCH-G-II in this section, the description is limited to the necessary subsystem. In the input specifications, some values are fixed without explanation. For further information, the full manual<sup>1)</sup> of the PROF-GROUCH-G-II should be consulted.

The process flow was already illustrated in Fig. 2, and a brief description was given in section 2.2 for each step, i.e., SPTG4Z2T, XTABZ2 and LISTA. Actual data treatment and input specifications will be described for each step in this section.

#### A. 4. 1. 1 SPTG4Z2T

#### (1) Outline

This is the main part of the PROF-GROUCH-G-II code system. This code is a combination of the PROF-GROUCH-G code<sup>2)</sup> and the SUPERTOG code<sup>3)</sup>, and has been polished by their refinement. A set of fine group constants is obtained from a nuclear data file with the format of ENDF/B up to version 4. Only limited parts of this code are used for FP group constants. An interrelation among data files is shown in **Fig. A. 1**. Nuclear data with the ENDF/B format are read from a tape of logical unit number 8 and the resultant fine-group constants are written on a tape of logical unit number 9 sequentially in binary form.

(2) Input Specifications

The description on input cards is limited only to the case of JNDC FP group constants, where cross sections are calculated only for an infinitely dilute system and more than one nuclide is processed successively in one job.

**#**0

(815) NO1, NO2, NO3, NO4, NO5, NO6, NO7, NO8
 Fixed Parameters
 NO1=NO2=NO3=NO6=NO7=0
 NO4=8
 NO5=100
 NO8=6

The following cards are repeated when more than one nuclide is processed in one job.

#1 (4I5, 4E10.0, 2I5)

INALL, MATNO, LORDER, IREW, SIGP, AJIN, RFACT, SFACT, KCHECK, MUOP

2) Tone, T. and Katsuragi, S.: PROF-GROUCH-G, JAERI 1192 (1970).

3) Wright, R. Q. et al.: SUPERTOG, ORNL-TM-2679 (1969).

<sup>1)</sup> Hasegawa, A. and Katsuragi, S.: PROF-GROUCH-G-II, to be published.



MULTI-GROUP CONSTANTS OUTPUT FILE (Sequential file in binary format) Fig. A.1 Interrelation of data files in SPTG4Z2T.

- INALL Col. 1-5
  - =-1: All input cards are necessary. This is for the first case.
  - =-2: Only cards #1 and #11 are read. This option can be used for the succeeding cases.
- MATNO Col. 6-10

Material number in the nuclear data file with the ENDF/B format for the nuclide to be processed.

• LORDER Col. 11–15

Order of  $P_n$  for elastic scattering ( $\leq 10$ ). In the present processing, LORDER=3 was used.  $\circ$  IREW Col. 16-20

- =1: For the first case. ENDF/B tape is rewound
- =0: For the succeeding cases. ENDF/B tape is not rewound.
- SIGP Col. 21-30
  - =1.0E10 (Admixture cross section for an infinitely dilute system.)
- AJIN Col. 31-40
- RFACT Col. 41-50

=blank

=10

- SFACT Col. 51-60
- =blank

• KCHECK Col. 61-65

=0 (Check prints are skipped.)

• MUOP Col. 66-70

=1 (When anisotropy is small for elastic scattering, angular distribution is treated as isotropic one in C.M.S..)

#11 (A8, 4X, 2I6, E12.5, 6I6)

NUCLIDE, NSEQN, NSIGO, SIGO, IOUT1, IOUTN, ING, IFG, IT, IPL

• NUCLIDE Col. 1-8

Nuclide identification (Z, symbol of the element, A; I3, A2, I3) like "\_46PD105". In the

	case of meta-st	able state nuclide, add 700 to A. For example _43TC799 for <sup>99m</sup> Tc.
0	NSEQN	Col. 13-18
	=blank	
0	NSIG0	Col. 19-24
	=1	(Number of the admixture cross sections.)
0	SIG0	Col. 25–36
	=1.0E+10	
0	IOUT1	Col. 37-42
	=-1	(Detailed output on the disk of logical unit number 9.)
0	IOUTN	Col. 43-48
	=blank	
0	ING	Col. 49-54
	=1	(Initial energy group number for processing.)
0	IFG	Col. 55–60
	=MAXG in #	2 card. (Number of multi-group=70.)
0	IT	Col. 61-66
	=1	
0	IPL	Col. 67-72
	=LORDER in	#1 card.
#2	2 (9I5)	IDTAP, MODE, MCODE, MAXG, IEU, IW, ISPEC, IRES, IPUN
0	IDTAP	Col. 1-5
	Identification n	umber of ENDF/B tape. When IDTAP does not coincide with the number
	in the tape lab	el, a warning message will be printed but process will be continued.
0	MODE	Col. 6-10
	=2	(ENDF/B tape is in BCD mode.)
0	MCODE	Col. 11-15
	=2	(Multi-group code is GAM-II.)
0	MAXG	Col. 16-20 Number of multi-groups.
0	IEU	Col. 21-25
	=3	(Energy structure must be given in #5 cards.)
0	IW	Col. 26–30
	=3	(Weighting spectrum must be given in #4 cards.)
0	ISPEC	Col. 31–35
	=0	(No spectrum calculation.)
0	IRES	Col. 36-40
	=1	(Option for resolved resonance data)
0	IPUN	Col. 41-45
	=0	(No card out-put.)
#3	s (5I5)	LINK1, LINK2, LINK3, LINK4, LINK5
	Options desired	for this run. $(0=no, 1=yes)$
0	LINK1	Col. 1–5 Resonance calculation.
0	LINK2	Col. 6-10 Smooth cross section.
0	LINK3	Col. 11-15 Elastic scattering.
0	LINK4	Col. 16-20 Inelastic scattering.
0	LINK5	Col. 21-25 (n, 2n) scattering.
п. 4		N #40\

#4 Cards (#41, #42, #43)

This set of cards consists of the desired weighting function as tabulated data as well as the

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interpolation scheme used with these tabulated points. The weighting function must be given from low to high in energy. The format of the card is the same as for the standard ENDF/B tape TAB1 records.<sup>4)</sup>

₩41	(44X, 2111)	Ņ1, N2	
3 T 1	<b>.</b>		-

• N1 Col. 45-55 Number of interpolation ranges.

• N2 Col. 56-66 Number of weighting function points.

42 (6I11) (NBT(I), JNT(I), I=1, N1)

• NBT(I) Last point number in the I-th interpolation range.

• JNT(I) Interpolation scheme for the I-th range. See the manual of ENDF/B.4)

#43 (6E11. 4) (BLOK3(I), BLOK4(I), I=1, N2)

• BLOK3(I) The I-th energy point.

• BLOK4(I) Weight at this energy point.

BLOK3(1) $\leq$ the lowest energy in group structure,

BLOK3(N2) $\geq$ the highest energy in group structure.

#5 Cards (#51)

This set of cards gives the desired group structure. The energy breakpoints of the structure are given from low to high in energy.

#51 (6E11. 4) (XX(I), I=1, MAXG), XX(MAXG+1)

• XX(I) The lower energy limit of the I-th energy group.

• XX(MAXG+1) The upper energy limit of the highest energy group.

# A. 4. 1. 2 XTABZ2

(1) Outline

This is a utility code for the data file obtained in the previous step "SPTG4Z2T". This code has following functions using the sequential files of fine group constants.

- (1) Collapsing the constants from fine group to coarse group.
- (2) Tabulation of fine and coarse group constants.
- (3) Production of fine and coarse group sequential file in binary form for the next step of updating the cross sections.
- (4) Production of fine and coarse group constants with the standard format of the JNDC Group Constants in EBCDIC form. They are stored on tapes of logical unit numbers 2 and 3 respectively.

The interrelation of the data files is illustrated in Fig. A. 2.

(2) Input Specifications

(24I3)

Description is limited to the case of FP data processing.

#1

IN, KP, NCASE, NCNDX, ISG, ITS, ICONT, IFPOUT, IOFP1, IOFP2, ISKPC, IPROP, INELN

- IN=1 Col. 1-3 Logical unit number of INFILE.
- KP=0 Col. 4-6
- NCASE Col. 7-9
  - =1
- NCNDX Col. 10–12 Option for collapsing.

=-1: No collapsing.

- =0: Standard collapsing from 70 to 25 as the JAERI-Fast set.
- >0: Collapsing to any group structure defined in #2 cards.

4) Drake, M.K.: Data Formats and Procedures for the ENDF Neutron Cross Section Library, BNL-50274 (1970).



Fig. A.2 Interrelation of data files in XTABZ2.

binary tape for the EXPANDA codes.

。ISG=0	Col. 13–15					
• ITS=0	Col. 16-18					
• ICONT	Col. 19-21					
=1	(Option for processing more than one nuclide in a time.)					
• IFPOUT	Col. 22–24					
=1	(Option for production of fine and coarse group constants with the standard					
	format of the JNDC Group Constants.)					
• IOFP1	Col. 25–27					
=2	(Logical unit number for fine group constants with the standard format of					
	the JNDC Group Constants.)					
• IOFP2	Col. 28–30					
=3	(Logical unit number for coarse group constants with the standard format of					
	the JNDC Group Constants.)					
• ISKPC=0	Col. 31-33					
• IPROP	Col. 34-36 Print option for cross section table.					
= -1:	All outputs are printed out.					
$\neq -1$ :	Only one-dimensional cross sections in an infinitely dilute system are printed out.					
• INELN	Col. 37-39 Option for inelastic matrices.					
=30	(The maximum matrix length for exit group.)					
\$2 (24I3)	(IX(J), J=1, NCNDX)					
This card is n	ecessary only for the case of $NCNDX > 0$ .					

Lower energy boundary group numbers in fine group structure are given for each coarse group.

For example, in the following collapsing,

coarse group	fine group
1	$1 \sim \frac{2}{2}$
2	3~ 4॒
•	•
•	•
•	•
25	67 <b>~</b> <u>70</u> ,

underlined numbers should be assigned for (IX(J), J=1, NCNDX).

(3) Format Specification for Outputs on the Data File of "FPOUT"

This is the standard format of the JNDC Group Constants. For each nuclide, following one set of data is stored in EBCDIC card image form on a tape;

		(NUCLID, MAT, NREAC	)	A8, 2I4
	Ц	– ('FLUX', MT, ING, IFG	)	A8, 3I4
~	NA	- (DATA(I), I=ING, IFG	)	6E12.5
Ë	OI .	┌─ ('TOTAL', MT, ING, IFG	)	A8, 3I4
A	IAS	$\Box$ (DATA(I), I=ING, IFG	)	6E12.5
БN	ME	·		
ZĄ	ID	·		
010	ONE	Z ('MU', MT, ING, IFG	)	A8, 3I4
DE		$\square$ (DATA(I), I=ING, IFG	)	6E12.5
RE	DIMENSIONAL DATA	('INELA_MATRIX'	)	3A4
P A		('MATRIXLI', MT, IMX, JMX	)	A8, 3I4
ЦÜ		- (DM(1, J), J=1, JMX	)	6E12.5
E E E		(DM(2, J), J=1, JMX)	)	6E12.5
臣				
6				
	ΓWC	(DM(IMX, J), J=1, JMX)	)	6E12.5
	ι.	(BLANK CARD: TRAILER RECO	ORD)	80H

where the data lists in the parentheses are output in one write statement according to the format specified on the right. The meaning of data lists is as follows:

$\Gamma_{1}$ ONE DIVISION TO DATA	Α.	ONE	DIMENSIONAL	DATA
-----------------------------------	----	-----	-------------	------

NUCLID	:	A8	:	Nuclide identification in literal.
				For example '50SN121' for <sup>121</sup> Sn
MAT	:	I4	:	Material (nuclide) identification number.
				(MAT number in JENDL-1.)
NREAC	:	I4	:	Number of one dimensional data (reactions) for this nuclide.
				For FP nuclides, NREAC=7 should be specified.
				The details are listed in TABLE A. 1.
'FLUX	)			
'TOTAL'	}:	A8	:	Reaction identification in literal.
etc	]			
MT	:	<b>I</b> 4	:	Reaction identification number; the details are given in
				TABLE A. 1.
ING	:	I4	:	Initial group number for data given.
IFG	:	I4	:	Final group number for data given.
				IFG≧ING

DATA

#### : 6E12.5: One dimensional data for each reaction specified by MT.

TABLE A.1 Dictionary for reaction identification and reaction identification number (MT)

ORDER	REACTION	REACTION ID NUMBER (MT)
1	'FLUX '	999
2	'TOTAL '	1
3	'CAPTURE '	102
4	'ELASTIC '	2
5	'INELA'	4
6	'ELA. REMO'	992
7	'MU '	993

B. TWO DIMENSIONAL DATA

MT	I	:	400, for inelastic matrix.
IMX	: I4	:	The maximum group number of $i$ for which the transfer
			element $\sigma_{in}^{i \to k}$ is not equal to zero.
JMX	: I4	: :	The maximum group number of $j$ for which the transfer
			element $\sigma_{in}^{i \rightarrow i+j-1}$ is not equal to zero, where self-scattering
			is assigned as $j=1$ and only down scatterings are allowed.
DM(I, J)			Transfer element for $\sigma^{I \rightarrow I+J-1}$
			$1 \leq J \leq JMX$ , $1 \leq I \leq IMX$

# A. 4. 1. 3 LISTA

(1) Outline

It often occurs that the computation process is performed by parts because of the limit of computing time. In such a case, more than one file is obtained from XTABZ2 for the same group structure. The LISTA code accumulates several data files and makes one file. Interrelation of the data files are shown in Fig. A. 3. It is possible to add the data after other data already written on the tape of logical unit number IOUT. The data on the output tape are written with the standard format of the JNDC Group Constants.

(2) Input Specifications

\$1 (10I3) INMX, IOUT, IOPT, IWRT

• INMX Col. 1-3 Number of data files to be combined. (INMX $\leq 4$ )

File definition statement is necessary for logical unit number 1 to INMX in JCL.



Fig. A.3 Interrelation of data files in LISTA

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• IOUT	Col. 4-6 Logical unit number for output new data file. (IOUT $\geq$ 8)
• IOPT	Col. 7-9 Option for new tape.
= -1 or 0:	Output tape is a new tape and this is the first writing on this tape.
=1:	Adding new data after the data already written on the output tape.
• IWRT	Col. 10-12 Print option for the data on logical unit number "IOUT".
=0:	Print-out.
$\neq 0$ :	No print-out.

# A. 4. 1. 4 An Example of Job Control Language and Input Data

a) Example of "SPTG4Z2T" step.

This is an input example for processing six FP nuclides (Xe-131, Cs-133, Cs-135, Cs-137, Ce-144 and Nd-147) sequentially in one step. In this case, the processing is intended in one step. The evaluated nuclear data of these nuclides are stored in the file of logical unit number 8 with the order described in the parenthesis. The tape assigned to the logical unit number 9 is the output tape from this SPTG4Z2T step, and the processed multi-group constants are written on this tape which is passed to the next step.

b) Example of "XTABZ2" step.

This is an input example for collapsing and tabulation of cross sections from the data file passed from the previous step. In this case, 2 nuclides are tabulated.

c) Example of "LISTA" step.

This is an input example for accumulation of data files specified by logical unit number 1 to 4. Final output data are obtained on a file designated by logical unit number 8.





#### Appendix 4.2 REPLACE

#### A. 4. 2. 1 Outline

The REPLACE code was developed in order to replace the cross section data of some materials on the old library tape by those of the corresponding materials, obtained by the PROF-GROUCH-G-II code, and then to make a new library tape.

Four units for tapes and/or disks are required to run the code. No. 1 unit is used as a tape or disk unit for the new data obtained by the PROF-GROUCH-G-II code, No. 2 unit is used as a scratch unit for recording the new data temporarily, No. 3 unit is used as a tape unit for the old library, and No. 4 unit is used as an output tape unit for the new library. It should be noted that all the materials on the tape or disk of logical unit No. 1 are processed without any selection.

#### A. 4. 2. 2 Input Specifications

\$1 (614) LIB, NOC, JSTEP, L, IOPT, MULT

Q	ĥ
0	υ

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• LIB	Col. 1-4	New library number.
• NOC	Col. 5–8	Number of comment cards.
∘ JSTEP =0	Cal. 9–12	Job step.
∘ L =4	Col. 13-16	Logical unit number of the new library tape.
• IOPT	Col. 17-20	Option for print out.
= -1:	All the ma	terials are printed out.
=0:	No print-ou	t.
>0:	IOPT mate	rials specified in #4 cards are printed out.
• MULT	Col. 21-24	Specification of multi-file.
=0:	Usual case	
=1:	The END	FILE mark will be checked by computer system.
#2 (20A4)	(H(I)	, I=1, 15)
• H	Col. 1-60	Label of the new library.
\$3 (20A4)	(H(I)	, I=16, IH); IH=NOC $*20+15$
• H	Comments.	Write them on NOC cards.
	Not necessa	ary if NOC=O.
\$4 (20I4)	(IOM	(I), $I=1$ , IOPT)
These cards a	re required v	when IOPT>0
• IOM	Number of	the order on the library for materials to be printed out.
	The order	of nuclides on the tape is shown in TABLE A. 2.

#### A. 4. 2. 3 Data Format of JNDC FP Fast Reactor Constants Library

The library consists of a heading information and 193 sets of material data.

I. Heading Information

Heading information consists of control data, a label of the library, comments, energy group boundaries, the weighting fluxes and a list of materials.

- (1) (5I4, 15A4) LIB, NOC, NG, NMAT, NOH, (H(I), I=1, 15)
  - LIB : Library No.
  - NOC : Number of comment cards.
  - NG : Number of groups.
  - NMAT : Number of materials.
  - NOH : Number of heading information cards, including this card (1) itself.
  - H : Label of the library.
- (2) (20 A 4) (H(I), I=16, IH); IH=NOC\*20+15

H : Comments. Written on NOC cards. Ignored if NOC is equal to 0.

(3) (6 A 4/(6 E 12.5)) (ICM(I), I=1, 6), (EN(I), I=1, NGG): NGG=NG+1

ICM : Title, 'ENERGY GROUP BOUNDARIES'

- EN : Boundary energies of the groups.
- (4) (A 8, 314/(1 P 6E12.5)) RT, IRN, NF, NL, (SX(I), I=NF, NL)
  - RT : Title, 'FLUX'.
  - IRN : Reaction type No., =999.
  - NF : Group No. of the first group, =1.
  - NL : Group No. of the last group, =25 or 70.
  - SX : Weighting flux.
- (5) (11 A 4/(5(3 X; A 2, I3, A 8))) (ICM(I), I=7, 17), (JND(I), NUM(I), ATM(I), I=1, NMAT) ICM : Title, 'LIST OF MATERIALS (\*\*DENOTES THE JNDC DATA)'
  - JND : Asterisks for the JNDC data, or blank for the other data.

NUM : Material No. in the order on the library tape.

ATM : Material identification.

(I3, A2, I3) NZ, NUC, NA; where NZ is a Z number, NUC is an element symbol, and NA is an A number.

For example, '\_\_ 55 CS 133', '\_\_ 53 I \_\_ 131'.

In the case of meta-stable state nuclides the NA is increased by 700.

II. Material Data

IS

This data block is repeated for 193 times. The format of these data resembles that of the JNDC Group Constants except that the weighting fluxes do not exist and that the mark for material separation is different.

- (1) (20 A 4) (IS, I=1, 20)
  - : Asterisks for material separation, \*\*\*…\*' (80 asterisks).
- (2) (A 8, 214) ATM, MAT, N1
  - ATM : Material identification. See I. (5).

MAT : A number assigned to a material.

(212) NZ, NA1; where NZ is a Z number and NA1 is a number of the last two figures at an A number.

For example, 5531 for '55 CS 131' and 5227 for '52 TE 827'.

N1 : Number of one dimensional data sets, =6.

(3) (A 8, 3 I 4/(1 P 6 E 12.5)) RT, IRN, NF, NL, (SIG(I), I=NF, NL)

RT : Title, 'TOTAL' for  $\sigma_i$ ,

'CAPTURE' for  $\sigma_c$ ,

'ELASTIC' for  $\sigma_{el}$ ,

'INELA' for  $\sigma_{in}$ ,

'ELA. REMO' for  $\sigma_{el.r}$ ,

'MU' for  $\mu_L$ .

IRN : Reaction type No.;

1, 102, 2, 4, 992, and 993 for  $\sigma_t$ ,  $\sigma_c$ ,  $\sigma_{el}$ ,  $\sigma_{in}$ ,  $\sigma_{el,r}$  and  $\mu_L$  respectively.

NF : Group No. of the first group, =1.

NL : Group No. of the last group, =25 or 70.

SIG :  $\sigma_{l}$ ,  $\sigma_{c}$ ,  $\sigma_{el}$ ,  $\sigma_{in}$ ,  $\sigma_{el.r}$  or  $\mu_{L}$ .

Records of this type are repeated for N1 times according to each reaction from  $\sigma_t$  to  $\mu_L$ . (4) (3 A 4/A 8, 3 I 4) (IRT(I), I=1, 3), RT, IRN, NL, NJ

- IRT : Title, 'INELA MATRIX'.
- RT : Title, 'MATRIX I'.
- IRN : Reaction type No., =400.
- NL : Last group No. of non-zero  $\sigma_{in}$ 's.
- NJ : Maximum slowing down group number in the  $\sigma_{in}$  matrix (slowing down to the same group is assigned to 1).
- (5) (1 P 6 E 12. 5) (SIGI(I, K), K=1, NJ); I=1, NL

SIGI :  $\sigma_{in}^{i \to j}$ , I=i, K=j-i+1.

Records of this type are repeated for NL times according to each group.

#### A. 4. 2. 4 An Example of the Library

A list of the data stored in the JNDC FP Fast Reactor Constants Library is shown in TABLE A.2. In this case only a few materials' data are shown for convenience.

#### TABLE A.2 JNDC FP Fast Reactor Constants Library. Order of 193 nuclides is as the list of materials in the heading information.

191 52TE3D1 192 61PH048 193 345E 82 302N 723072 6 TOTAL 1 25 3.99282E+00 3.01772E+00 3.55310E+00 3.57991E+00 4.20276E+00 5.25603E+00 5.43092E+00 3.0177E+00 4.7204E+00 6.55962E+00 7.48878E+00 9.15050E+00 4.82750E+00 4.72307E+00 4.72141E+00 4.7210E+00 4.72070E+00 4.72091E+00 4.72133E+00 4.72206E+00 4.72305E+00 4.72465E+00 4.72700E+00 4.73043E+00 4.72153E+00 4.72206E+00 4.72305E+00 4.72465E+00 4.72700E+00 4.73043E+00 A 172135E+00 4.72206E+00 4.72305E+00 4.72465E+00 4.72700E+00 4.73043E+00 4.73552E+00 4.73045E+00 4.72045E+00 4.72465E+00 4.73043E+00 4.76552E+04 5.69506E+04 1.17801E+03 1.25567E+03 1.52965E+03 3.29292E+03 4.46552E+04 5.69506E+04 1.17801E+03 7.65395E+03 1.06716E+02 1.43662E+02 1.76666E+04 2.06847E+04 3.20964E+04 4.66622E+04 7.28073E+04 1.07664E+03 1.58830E+03 2.32985E+03 3.41845E+03 5.02938E+03 7.38105E+03 1.08262E+02 1.59083E+02 2.159083E+02 2.159083E+02 2.159083E+00 4.73135E+00 1.73135E+00 2.04527E+30 3.07417E+00 4.57950E+00 5.14212E+00 5.30123E+00 5.035199E+00 7.74812E+00 9.13498E+00 4.72973E+00 4.72287E+00 4.72105E+00 4.72031E+00 4.71960E+00 4.71960E+00 4.71950E+00 4.71961E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71950E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71950E+00 4.7205E+00 4.7205E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71950E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71950E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71960E+00 4.71950E+00 4.71960E+00 4.71960E+0 

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 4.71960E+00
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 1.71961E+00
 1.8270E+00
 4.71960E+00
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 4.30591E-01

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 3.46653E-03
 1.54851E-01

 7.27580E-02
 1.637580E-01

 7.27580E-02
 1.637650E-03

 8.37580E-02
 1.63759E-02

 1.57760E-02
 1.53705E-03

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 1.57760E-03
 1.53642E-01

 1.577580E-01
 1.67438E-01

 1.577580E-02
 1.63758E-02

 1.5370E-03
 1.67438E-01

 1.5370E-03
 1.67438E-01

 1.5370E-03
 1.67438E-01

 1.02248E-01
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# Appendix 4.3 FP-S and FPYD

The concentrations of the 193 FP nuclides are calculated with a combination of the FP-S and FPYD codes. The FP-S code solves  $\beta$ -decay chains and calculates atom numbers of 427 nuclides at various burn-up stages. The FPYD code renormalizes these atom numbers and gives the concentrations of the 193 nuclides.

## A. 4. 3. 1 FP-S

(1) Outline

The program FP-S calculates the atom number of each fission-product nuclide for the arbitrary irradiation history and cooling time by using Bateman's equation and its integrated form repeatedly. The transmutation through the neutron capture reaction is not considered in the program. The results are stored on the disk or tape of logical unit number 10 in binary form.

This code has been developed for more general use and only limited functions are used for the present purpose. For further information the manual of FP-S<sup>1</sup> should be consulted. (2) Library

A library of nuclear data has been compiled, including half-lives, decay schemes, disintegration energies, and fission yields. 427 fission-product nuclides are included in the library, 127 of which are stable nuclides.

Decay data including half-lives, decay schemes, and disintegration energies are obtained from Lederer *et al.*<sup>2)</sup> and supplemented by Nuclear Data Sheets. Fission yields are obtained from the recommendation by Meek and Rider<sup>3)</sup>. The data by Meek and Rider consist of thermal-neutron fission yields of <sup>235</sup>U, <sup>239</sup>Pu, <sup>241</sup>Pu and <sup>233</sup>U, fission yields of <sup>235</sup>U, <sup>239</sup>Pu and <sup>232</sup>Th for fast-neutron-induced fission, and those of <sup>235</sup>U and <sup>238</sup>U for 14 MeV-neutron-induced fission. All of these are compiled in the library of FP-S.

(3) Input Specifications

#1 card specifies number of cases to be run in one job and the cards set  $#2\sim$ #6 must be repeated for each case.

#1 (I6) ICASE

Number of calculational cases.

#2 (18A 4) (THEME(I), I=1, 18)

Title of the calculational case.

#3	(915)	KTYPE,	ITB, I	Τ,	IDATA,	IDCH,	ISPC,	INDT,	ITOP,	IDISK
----	-------	--------	--------	----	--------	-------	-------	-------	-------	-------

- KTYPE Col. 1-5
- =0

• ITB Col. 6–10

=1 Number of time steps of irradiation history.

• IT Col. 11–15

Number of times to calculate atom number of each fission product.

- IDATA Col. 16-20
  =1
   IDCH Col. 21-25
  - =0

1) Tasaka, K. and Sasamoto, N.: FP-S, JAERI 1198 (1970).

2) Lederer, C. M., Hollander, J. M. and Perlman, I.: "Table of Isotopes", Sixth Edition, John Wiley and Sons, Inc. New York, London, Sydney, 1968.

3) Meek, M. E. and Rider, B. F.: Compilation of Fission Product Yields, NEDO-12154 (1972).

90 Fission Product Fast Reactor Constants System of JNDC **JAERI 1248** • ISPC Col. 26-30 =0• INDT Col. 31-35 Option for print out. Print the atom number and activity of each FP, and their summation. =0No print out. =1 ITOP Col. 36-40 = 0• IDISK Col. 41-45 =0No effect. =1Write the atom number and disintegration rate of each FP on a tape or disk of logical unit number 10. #4 (10E 8.4) (GX(I), I=1, 10)Fraction of each fission type for averaging the fission yields. GX(1) : <sup>235</sup>U (th) GX(2) : <sup>235</sup>U (fast) GX(3) : <sup>235</sup>U (14 MeV) GX(4) : <sup>238</sup>U (fast) GX(5) : <sup>238</sup>U (14 MeV) GX(6) : <sup>239</sup>Pu (th) GX(7) : <sup>239</sup>Pu (fast) GX(8) : <sup>241</sup>Pu (th) GX(9) : <sup>233</sup>U (th) GX(10): <sup>232</sup>Th (fast) To obtain atom numbers due to thermal fission of  $^{235}U$ , GX(1) = 1.0, and GX(2) = ...GX(10) = 0.0. **#**5 (5E 10.5) (TBIN(I, J), J=1, 4), PWR(I) Repeat ITB times (1 for the present purpose). • TBIN(I, J): Length of the I-th time step. TBIN(I, 1): (day) TBIN(I, 2): (hr) TBIN(I, 3): (min) TBIN(I, 4): (sec) TBND(I) =TBIN(I, 1) $\times$ 86400+TBIN(I, 2) $\times$ 3600 +TBIN(I, 3) $\times$ 60 +TBIN(I, 4) (sec)  $\circ$  PWR(I) Col. 41-50 Power of the I-th time step (W). For the present purpose the assumption of constant power is sufficient. Therefore ITB was set to 1. TBIN must be set so that TBND is longer than the longest burn-up time. PWR(1) can be set to an arbitrary positive value. (TMIN(I, J), J=1, 4)#6 (4E 10.5) Repeat IT times. : Time to calculate the atom number of each FP. • TMIN(I, J)TMIN(I, 1): (day) TMIN(I, 2): (hr) TMIN(I, 3): (min) TMIN(I, 4): (sec) =TMIN(I, 1)  $\times$  86400 + TMIN(I, 2)  $\times$  3600 TIME(I)  $+TMIN(I, 3) \times 60 +TMIN(I, 4)$ (sec)

## A. 4. 3. 2 FPYD

(1) Outline

The FPYD code renormalizes the atom numbers of 427 nuclides to the concentrations of 193 nuclides. The atom number of a nuclide other than the 193 nuclides is added to that of the daughter nuclide. This assumes that the cross section is the same for these two nuclides. The error due to this approximation is expected small, since most of these nuclides other than the 193 nuclides are short-lived, and therefore their atom densities are relatively small in advanced burn-up stages.

Three tapes or disks are necessary. A tape of logical unit number 3 is the output of FP-S and the results are stored on a tape of logical unit number 4. A disk of logical unit number 2 is used as a scratch one.

The resulting concentrations are normalized to 2., i.e., per fission.

(2) Input Specifications

#1 (215) NMF, NFP

0	NMF	Col. 1–5	Number of cases calculated in FP-S (ICASE). In the present
		i i	calculation, this is the number of mother fissile nuclides considered.
0	NFP = 193	Col. 6–10	Number of FP nuclides.
#2	2 (T 73, A	8, T1, 4I5,	, F 10. 5, 8 I 5)
	AX(K), NI(K),	NCAT(K),	NM, NB, FB, (NMAT(I), $I=1$ , NM)
	#2 card is repe	ated for NF	P times $(K=1, NFP)$
0	AX(K)	Col. 73-80	Nuclide identification like "44Ru 101". See TABLE A. 2.
0	NI(K) = K	Col. 1–5	Number of order in the library for the nuclide.
0	NCAT(K)	Col. 6–10	Category number.

You can specify some nuclides from others by giving a special category number to them. The FPLUMP code has an option to lump only the nuclides of a specified category.

NM	Col. 11–15	Number	of	nuclides	which	the	K-th	$\mathbf{FP}$	nuclide	represents,	in-
		cluding t	he	K-th nuc	lide itse	elf.					

• NB Col. 16–20 Number of nuclides on which the branching ratio is taken into account.

• FB Col. 21-30 Branching ratio. Default means 1.

• (NMAT(I), I=1, NM)

0

Numbers of order on the output of FP-S for the nuclides which the K-th nuclide represents. For the first NB nuclides, the branching ratio is considered.

NB and FB are complicated. As an example, a case of A=85 chain is shown below,

As 
$$\rightarrow$$
 Se  $\rightarrow$  Br 23%  $\downarrow$   $\mathcal{Rb}(307), K=23$   
(18) (25) (31)  ${}^{*}\mathrm{Kr}(39), K=21$ 

In the 193 nuclides, only <sup>85</sup>gKr and <sup>85</sup>Rb are contained. Their orders in the library are 21 and 23 respectively. Numbers in the parentheses are the order of 427 nuclides in the output of FP-S.

For <sup>85g</sup>Kr (K=21), NM=5 (including <sup>85g</sup>Kr), NB=4 (from As to <sup>85m</sup>Kr),

FB=0.23, and NMAT(I)=18, 25, 31, 38 and 39.

For <sup>85</sup>Rb (K=23), NM=5 (including <sup>85</sup>Rb), NB=4 (from As to <sup>85m</sup>Kr),

FB=0.77, and NMAT(I)=18, 25, 31, 38, and 307.

Then the atom number of <sup>85g</sup>Kr is calculated as

 $N(^{85g}Kr) = 0.23 (N(18) + N(25) + N(31) + N(38)) + N(39).$ 

where N(18), ...N(39) are the atom numbers calculated with the FP-S code.

The set of #3 and #4 cards is repeated for NMF times.

#3 (2I5, 5A4) IFF, NT, (TYPE(K), K=1, 5) • IFF Col. 1-5

Identification of mother fissile nuclide from which FP nuclides are born. The following are recommended as the standard :

U-233 : 923 U-235 : 925 U-238 : 928 Pu-239 : 949 Pu-240 : 940 Pu-241 : 941.

• NT Col. 6-10 Number of burn-up stages ( $\leq 6$ ).

• (TYPE(K), K=1,5) Col. 11-30 Description of the mother nuclide.

#4 (15 A 4) ((DAY(K, I), K=1, 3), I=1, NT)

• (DAY(K, I), K=1, 3) Description of the I-th burn-up stage.

(3) Output

The outputs of FPYD are stored on a tape of logical unit number 4 in binary form as; NMF, NFP



where DN(K) is the concentration of the K-th nuclide, and one line is written with one write statement.

Tables of the concentrations are printed out for each mother nuclide. They are shown in Appendix 3.

#### (4) Sample input

Input data for the present work are shown below. In this case, FP nuclides are categorized to three as;

NCAT=3 for the 28 nuclides,

=2 for the other even-A nuclides,

=1 for the other odd-A nuclides.

# JAE

*		• • <b>*</b> • •	, 2 .	• • • • • • • •	3,*.	•••4•	• • • * •	•••5•	•••*•	 • • * • • • • •	7 • • • • * • • • • 8
¥LIED ¥DISK	RUN F02										
¥TAPE ¥TAPE	F03+J F04+J2	925.	FP42	7.0LD.00	1304 350						
¥DATA			• • • •								
3	193	1			1						30ZN 72
2	2	î			2						31GA 72
3	2	1			290	7	-01				32GE 72
45	1	2			4	292	271				32GE 74
6	2	2			6	295					32GE 76
7	1	1			9	8	294				32GE 77 33AS 75
9	2	ĩ			12	•					33A5 76
10	1	1			13						33AS 77
12	1	ź			19	297					345E 77
13	2	3			10	14	298				34SE 78
14	1 2	2			15	300	21				345E 80
16	1	3			17	22	302				35BR 81
17	2	1			28						358R 82 36KR 82
19	1	â			23	29	37	304			36KR 83
20	2	3		0 00	24	30	305	2.0	20		36KR 84
21	1 2	2	4	0,23	18 32	308	31	38	39		36KR 86
23	· 1	5	4	0,77	18	25	31	38	307		37RB 85
24	2	1 4			50 26	33	40	310			37RB 86
26	2	í			309						38SR 86
27	2	4			34	41	51 52	312			3858 88
20	3	4			36	43	53	60			38SR 90
30	1	3			44	54	61				385R 91
31 32	1 2	1			66						397 90
33	1	2			67	68					39Y 91
34	1	4			40	20	63	70			40ZR 90
36	1	1			315						40ZR 91
37	2	5			45	55	62	69	316		40ZR 92
39	2	5			47	57	64	71	318		402R 94
40	ī	5			48	58	65	72	75		40ZR 95
41	2	2 1			76	321					402R 96
43	ī	2			80	81					41NB 95
44	3	1 2			320	322					42MO 95
45	3	3			83	84	323				42MO 97
47	2	3			77	85	324				42MO 98
48	2	2			87	327					4200 99 4200100

50	3	1			97					43TC 99
51	2	- 2			9.8	328				44RU100
52	3	4			88	90	99	379		44RU101
53		à			91	160	330	527		44RU102
50	- <u>.</u>	ă			92	101	106			4480103
24	2	2			76	102	222			4400100
22	1	3			94	103	107			44R0104
57	2	2			104	108	101			4401104
51	2	5			104	200				4480103
28	د	2			111	100				40KH105
59	1	2			113	114				4581105
60	2	2			112	333				46PD104
61	3	1			334					46PD105
62	2	2			115	335		_		4600106
63	3	4			105	109	116	120		46PD107
64	2	3			110	117	337			46PD108
65	. 1	2			118	121				46PD109
66	2	2			119	340				46PD110
67	2	1			123					46PD112
68	3	.1			339					47AG109
69	1	3			122	129	130			47AG111
70	2	2			128	341				48CD110
71	1	1			342					48CD111
72	2	2			131	343				48CD112
73	1	3			124	132	344			48CD113
74	2	Ś			125	133	346			48CD114
75	1	3			126	134	138			48CD115
76	2	Ż			135	350				48CD116
77	1	2	1	0,95	144	348				49 IN115
78	1	2	1	0,05	144	349				50SN115
79	2	2			145	351				50SN116
80	1	4			136	139	146	352		50SN117
81	2	3.			140	147	353			50SN118
82	1	5			141	148	149	155	354	50SN119
83	2	2			150	355				50SN120
84	1	3			142	151	156			505N121
85	Ž	2			ī52	357	_			505N122
86	1	Ż			153	157				50SN123
87	2	2			154	360				50SN124
88	1	1			158					50SN125
89	2	ĩ			159					50SN126
90	ī	i			356					5158121
91	2	ī			166					5158122
62	ī	ī			359					51SB123
93	2	ī			167					51SB124
94	ī	ī			168					5158125
95	5	2			169	170				51SB126
96	ĩ	2			160	171				51SB127
07	2	2			161	172				5158128
98	2	ī			358					52TE122
99	ĩ	ö			0-0					52TE123
100	5	1 .			361					52TE124
101	ī	ī			362					52TE125
102	5	ī			363					 52TF126
103	ī	ī			181					52TE127
104	2	ī			366					52TE128
	_									

, <b>, , , *</b> . ,	.,1,,		.,2*.,.3		•••4•	•••*•	5.	•••	*	7 * 8
105	1	3		183	162	173				52TE129
100	-	2		103	174	240				5275130
100	2	2		105	175	207				5275131
107	÷	2		100	175	104				5215132
108	2	2		102	1/0	186				2216132
109	1	Ť		365						531 147
110	3	1		193						531 129
111	2	1		194						531 130
112	1	1		195						531 131
113	1	4		177	187	188	197			531 133
114	1	3		178	190	199				531 135
115	2	2		192	367					54XE128
116	2	1		370						54XE130
117	3	2		204	371					54XE131
118	2	2		196	372					54XE132
119	1	2		205	206					54XE133
120	2	3		189	198	375				54XE134
121	ī	2		207	208	• • •				54XE135
122	2	ž		200	378					54XE136
123	3	1		374	÷.					55CS133
124	ž	ī		218						55CS134
125	ž	1		219						5505135
126	2	-		220						55(6136
120	2	3		201	209	221				56(6137
100	2	-		201	207	221				5684134
120	~			310	270					200A134
129	2	~		229	217					JODALJO
130	1	4		230	380					260A137
131	2	<b>4</b>		202	210	222	381			568A138
132	2	2		212	224	232				568A140
133	1	2		203	211	223	231	384		57LA139
134	2	1		287						57LA140
135	2	1		385						58CE140
136	1	2		213	222	233	238	242		58CE141
137	2	2		214	226	234	239	387		58CE142
138	1	5		215	227	235	240	243		58CE143
139	3	5		216	228	236	241	244		58CE144
140	1	1		386						59PR141
141	2	1		249						59PR142
142	1	1		250						59PR143
143	1	2		245	252					59PR145
144	2	1		388						60ND142
145	3	1		389						60ND143
146	3	2		251	390					60ND144
147	3	1		391	••••					60ND145
148	2	3		246	253	392				60ND146
149	1	3		247	254	257				60ND147
150	ž	3		248	255	395				60ND148
151	2	ō		2.0		5.5				60N0150
152	2	ĩ		261						61DM147
153	2	1		201						610M144
154	2	+ 2		202	258	262				01FM140
155	+	2		220	220	203				017M147 410M164
477	÷	4		207	201					CTENTST CTENTST
157	2	÷.		374						025M14/
150	4	÷		370						625M148
120	5	-		371	300					DZSM149
159	2	۲		264	398					625M120

, , , , \*, , , , 1, , , , \*, , , , 2, , , , \*, , , , 3, , , , \*, , , , 4, . , , \*, , , , 5, , , , \*, , , , 6, . , , \*, . , , 7, , , \*, . , , 8

·							
	160	3 1	270				62SM151
	161	2 2	266	401			625M152-
	162	1 2	267	271			62SM153
	163	2 2	268	404			62SM154
	164	2 1	273				625M156
	165	3 1	403				63EU153
	166	2 1	277				63EU154
	167	3 2	272	278			63EU155
	168	2 1	279				63EU156
	169	1 2	274	280			63EU157
	170	1 1	406				64GD155
	171	2 1	407				64GD156
	172	1 1	408				64GD157
	173	2 2	281	409			64GD158
	174	1 2	282	285			64GD159
	175	2 2	283	412			64GD160
	176	1 1	411				65TB159
	177	2 1	288				6578160
	178	1 2	286	289			65TB161
	179	2 1	413				66DY160
	180	1 1	414				66DY161
	181	2 0					66DY162
	182	1 0 .					66DY163
	183	2 0					66DY164
	184	1 0					67H0165
	185	1 1	96				43TC799
	186	1 0					48CD815
	187	1 0					52TE823
	188	1 1	179				52TE825
	189	1 1	180				52TE827
	190	1 1	182				52TE829
	191	1 1	184				52TE831
	192	1 0					61PM848
	193	2 2	426	427			34SE 82
	949	6PU-239(THERMAL)					
.1	DAY	30 DAYS 60 DAYS		180 DAYS	360 DAYS 7	20 DAYS	
	925	6U+235(THERMAL)					
1	DAY	30 DAYS 60 DAYS		180 DAYS	360 DAYS 7	20 DAYS	
	928	6U=238 (FISSION SPECT)					
1	DAY	30 DAYS 60 DAYS		180 DAYS	360 DAYS 7	20 DAYS	

## Appendix 4.4 FPLUMP

#### A. 4. 4. 1 General Description

The FPLUMP code lumps cross sections of 193 nuclides using their concentrations as weights. The total, elastic, inelastic, capture and elastic removal cross sections are lumped as

$$\overline{\sigma}_x = \sum_{i=1}^{193} y_i \sigma_x^i$$

where  $y_i$  is the concentration of the *i*-th nuclide. As for  $\mu_L$ -value, the lumped value is defined as

$$\overline{\mu}_L = \sum_{i=1}^{193} y_i \mu_L^i \sigma_{el}^i / \overline{\sigma}_{el}$$

The inelastic matrices are lumped as

$$\overline{\sigma}_{in}(g \to g') = \sum_{i=1}^{193} y_i \sigma_{in}{}^i(g \to g')$$

and the maximum group where the inelastic scattering occurs and the maximum group number for which the down scattering is allowed are automatically determined.

As for the concentration, the data provided by the FP-S and FPYD system are used as the standard process. You can lump only the desired nuclides, by specifying NCAT which were given in the FPYD code. It is also possible to provide the concentrations as card input.

It should be noted that the lumped cross section is microscopic cross section of fission products per one fission event, since the concentrations are normalized to two. Therefore a pseudo fission product has a mass and cross sections almost twice as much as those of the individual FP nuclide.

A. 4. 4. 2 Input Specifications Only #1 card is required for the standard procedure, and the remaining cards are required when the concentrations are given as card input. (314, 17A4) NINPT, NC, NOUT, TITL #1 NINPT Col. 1-4  $\leq 0$ : Concentrations are read from a tape of logical unit number 3. >0 : Concentrations are given as cards. • NC Col. 5-8 >0: The nuclides with NCAT=NC are lumped. =0 : All the nuclides are lumped. NC is set to 0, when NINPT>0. • NOUT Col. 9-12  $\neq 0$ : Editing the lumped cross sections on a tape of logical unit number 8. =0 : No editing. • TITL Col. 13-80 Title of the job The following cards are repeated when NINPT>0, according to each fissile nuclide from which the FP nuclides are born. (214, 5A4)#2 IFF, NT, (TYPE(K), K=1, 5)• IFF Col. 1-4 Identification of mother fissile nuclides from which the FP nuclides are born. The following are recommended as the standard : U-235 : 925 U-238 : 928 Pu-239 : 949 Pu-240 : 940 Pu-241 : 941 • NT Col. 5-8 Number of burn-up stages considered.  $(NT \leq 6)$ • (TYPE(K), K=1, 5)Col. 9-28 Description of mother fissile nuclide. ((BRNUP(K, J), K=1, 3), J=1, NT) #3 (18 A 4) Description of each burn-up stage. The #4 cards are repeated for 193 times. The order of nuclides must coincide with that in the library. (T 61, I 10, 2 X, A 8, T 1, 6 E 10.5) NIN, AXC, (DNX(J), J=1, NT) #4 • NIN Col. 61-70 Number of order in the library for this nuclide. See TABLE A. 2. • AXC Col. 73-80 Nuclide identification (Z, symbol of the element, A; I3, A2, I3) like "146 PD 105". This must be the same as in TABLE A. 2. • (DNX(J), J=1, NT)Col. 1-60 Concentration of the NIN-th nuclide at the burn-up stage J. A. 4. 4. 3 Auxiliary Memories In the unit of logical number 4 the tape of the JNDC FP Fast Reactor Constants Library is set, in which the group constants of 25 and 70 group structure are stored separately with multifile system. The concentrations are read from the tape or disk of logical unit number 3. When

the concentrations are given in card form, they are temporarily stored in the disk of logical unit number 3.

The lumped cross sections of 25 and 70 group structures are written on the disks of logical unit numbers 1 and 2 respectively, then they are edited on a tape of logical unit number 8 with the multi-file system.

#### A. 4. 4. 4 Output

The standard format of the JNDC FP Group Constants is used for the lumped group constants, since the lumped cross sections are treated as those of a nuclide. The atomic number of the pseudo FP nuclide is defined by considering the mother fissile nuclide as

925 : FP of <sup>235</sup>U fission

928 : FP of <sup>238</sup>U fission

949 : FP of <sup>239</sup>Pu fission

940 : FP of <sup>240</sup>Pu fission

941 : FP of <sup>241</sup>Pu fission

The mass number of a pseudo nuclide corresponds to the mass of total fission products per fission.