

International Atomic Energy Agency's Coordinated Research Project

On

Development of Small Reactors without On Site Refuelling

IAEA Research contract Number: 13216/R2/Regular Budget Fund

Title of the research project:

**Contribution to the assessment of the technical feasibility of Small Reactors
without On Site Refuelling**

Institute where research were carried out:

Laboratoire de Physique Nucléaire, Faculté des Sciences, Rabat Morocco

Chief Scientific Investigator:

Prof. A. CHETAINE

Progress Report on second Year's Work (September 2007– July 2008)

Analysis of whole core for PFPWR50 (Japan) and BWR-PB (Russia) assembly with cermet fuel.

A. Chetaine, L. Erradi, H. Amsil and A. Benchrif

I. Background Informations:

The international Generation IV nuclear reactor program is chartered with the design and development of a new class of commercial power reactors to meet the growing demand worldwide for electricity and the production of hydrogen gas. The new Generation IV reactor designs must be better than the current Generation II operating commercial power reactors, and better even than the Generation III plants which have yet to be deployed. This requires the Generation IV reactors to have superior reactor safety, economics, sustainability, and proliferation-resistance relative to the earlier nuclear reactor generations.

The fuel channels are filled with fuel compacts containing TRISO-coated fuel particles bound in a graphite matrix. The TRISO-coated particles are micro-spheres approximately 1-mm in diameter or less. The basic TRISO-coated particle consists of a central spheroid kernel of uranium oxide (UO₂) or uranium oxy-carbide (UCO) coated with multiple layers of carbide materials. The first coating around the kernel is a relatively thick, low density graphite buffer to absorb fission fragment kinetic energy and accommodate fission product gases and semi-volatile species. The buffer layer is then coated with a high-density pyrolytic graphite layer known as the inner pyrolytic coating (IPyC). The next coating is a silicon carbide (SiC) layer designed to contain fission product migration and provide high strength pressure vessel containment for the particle as a whole. The final coating is another high-density pyrolytic graphite layer known as the outer pyrolytic coating (OPyC). TRISO-coated particle designs may also have additional coatings which might include graphite protective coatings. Each particle has a specified diameter, enrichment, kernel diameter, kernel density, and fissile and fertile uranium loading.

The TRISO-coated particle has since its inception been the fuel form of choice for high-temperature gas-cooled reactors (HTGRs) primarily because of the particle's strength and fission product containment barrier. It is essentially a miniature pressure vessel boundary, a pressure vessel boundary capable of limiting the release of fission products during particle burn-up under both normal and off-normal reactor operational conditions.

In addition to the narrow thermal safety margin mentioned previously, the use of TRISO-coated particle fuel has an additional drawback relative to the prismatic block VHTR core designs. Due to the need for excess reactivity at the beginning of each power cycle, the prismatic block reactor requires a certain amount of fissile uranium (U-235) that is required to meet power cycle lengths. The fissile uranium loading can be achieved with increased particle packing fraction, higher enrichment, or both. Unfortunately, the current particle packing fraction in the fuel compacts is practically limited to less than approximately 35%. The limited particle packing fraction inhibits the VHTR core performance in several ways: (1) it limits the density of uranium loading and hence the amount of U235 mass (grams) in a fuel compact which in turn can limit the length of the VHTR power cycle, (2) it drives up the uranium enrichment (approximately 15 wt % U235 for reload enrichments) to meet the fissile uranium loading requirement, and (3) the fuel channels

or fuel rod diameters must be relatively large (approximately 12.45 mm in diameter) in order to accommodate enough TRISO-coated particles and again meet fissile uranium loading requirements.

It should be noted that the relatively large fuel rod or compact diameters severely decrease the overall total core reactivity. First, the larger fuel rod diameter displaces prismatic high density graphite (1.74 g/cc) with fuel compact materials, thereby displacing and hence reducing both the overall block carbon-to-uranium ratio (C:U). Reduction of carbon in the block inhibits the neutron moderation and thermalization of fission neutrons resulting in a loss of reactivity. Second, the relatively large diameter fuel rods reduce the U-238 self-shielding effect. The fertile, thermal neutron-absorbing U-238 atoms are spread over a wider area (reduced fuel lumping) with the result being that thermal neutron absorption is increased and core reactivity is again reduced. In conclusion, the larger the fuel rod diameter in a prismatic block, the less reactive the fuel block becomes and impacts the overall core reactivity and the power cycle length.

1. Summary of the LWRs with coated particles concept:

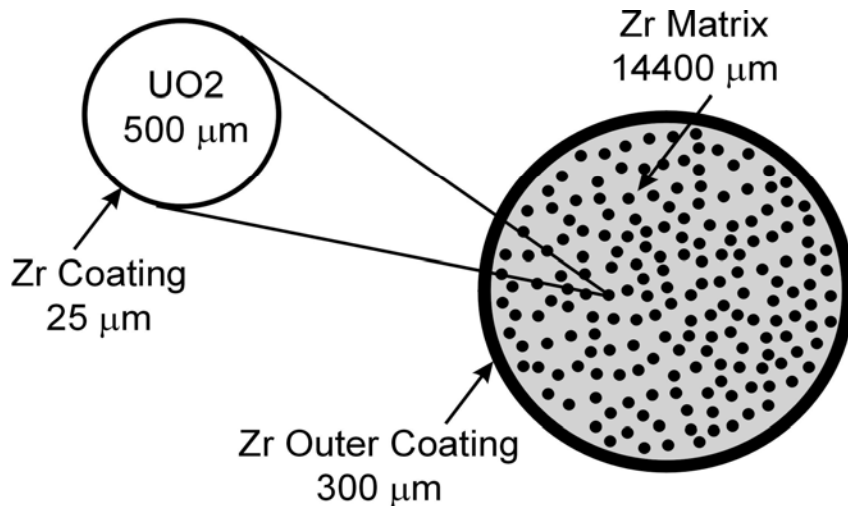
Concepts of small reactors with coated particle based fuel are being considered in the USA (AFPR-100), the Russian Federation (BWR-PB), Japan (PFPWR50) and Brazil (FBNR) to achieve enhanced protection against human actions of malevolent character, enhanced proliferation resistance, to eliminate radiological consequences of severe accidents and achieve reduced complexity of the overall plant design. Such reactors target non-electrical applications, such as district heating or potable water production, that benefit from the NPP being located in the immediate vicinity of the customer. They sound and transparent safety concept is considered as a factor to improve public acceptance. The ceramic-coated particle fuel for the LWRs might be not encapsulated (AFPR-100, BWRPB) or encapsulated in the matrix material, e.g., graphite or SiC. When coated particles are not encapsulated, they are called micro fuel elements (MFE) and, different from the fuel of high temperature gas cooled reactors, use SiC or other but not pyro-carbon outer coating layer. This design of MFE has extremely important benefits for reactor safety. Strong negative coolant and void reactivity coefficients combined with a very short thermal delay time (< 0.01 s) allow the reactor to shutdown quickly in the event of a malevolent human action such as a premeditated reactivity or power excursion. The heat transfer surface area is larger by several orders of magnitude than in standard fuel rod assemblies of LWR due to the small spherical dimensions of the MFE. Therefore, the normal operating temperature of fuel is low (about 300°C for BWR and not more than 600°C for the supercritical water pressure reactor coolant temperature). Small diameter of the fuel kernel and large heat exchange surface of MFE significantly lowers the fuel peak temperatures, minimizing heat energy stored in the fuel and eliminating heat exchange crisis. The larger heat exchange surface significantly simplifies residual heat removal by natural convection and radiation from the core to a subsequent passive heat removal system.

2. Task description and objective

As all reactors in this group are at a pre-conceptual or early conceptual design stage, the general objective is to validate key enabling technologies for such reactors. The specific tasks include studies of SiC corrosion, optimization of coated particle size, retrieval of data on the achievable burn-up and fluence of coated particle fuel in LWR conditions, benchmark calculations to validate neutronic and thermal-hydraulic codes, and planning and performance of necessary tests.

During the Research Coordination Meeting of June 4-8, 2007, it was concluded that the swelling of SiC at low temperatures during irradiation causes doubts about the integrity of TRISO fuel particles in the LWR environment. It was decided that we should use CERMET fuel in the water cooled reactors.

As the group decided to recalculate all benchmarks for cells and whole core, now with the cermet fuel, we made the calculations.



In the framework of our research contract, we will participate in the analysis of numerical tests and verification of codes for the two cases proposed. In the first stage, a simplified data on each reactor concept has been prepared for preliminary calculations and comparison.

3. Benchmarks specifications:

In this study the specifications of whole core benchmarks representing PFPWR50 (Japan) and BWR-PB (Russia) assembly. The first benchmark representative of the PFPWR50 design is proposed by the Okaido University (Japan). The second case benchmark representative of the BWR-PB is proposed by the Kurchatov Institute (Russia).

II. Codes and data libraries used in the analysis:

1. Brief description of the APOLLO code:

The main capabilities of the APOLLO [2] code are: accurate space dependent resonance self shielding by the use of the Background Matrix model, cross sections collapsing and homogenisation are performed with the SPH equivalence method in order to preserve reaction rates, P_{ij} and S_n methods capabilities (classical finite differences and nodal numerical schemes) and the use of the Xmas 172 group structure. In addition to the modelling capabilities, the APOLLO code uses the CEA-93 cross sections library based on the European JEF2.2 nuclear data file, containing the most recent and reliable evaluations available. It is important to mention that the current APOLLO library does not have any cross section adjustments. The APOLLO code was developed by CEA/DEN/SACLAY, as a part of the French reactor calculations system SAPHYR.

2. Monte Carlo reference calculations:

The APOLLO code has been used in the analysis of the whole set of the proposed benchmarks. In order to validate the APOLLO calculations results at least in the zero burn up situation we performed Monte Carlo (MCNP) modelling of the five benchmarks in order to obtain reference values for k-infinity. The Endf-b6 library (release 8) was used in the MCNP calculations.

3. The evaluation of the double heterogeneity effects:

The APOLLO code has the capability of taking into account the real structure of the fuel with coated particles by calculating the flux inside the particles using the PIJ method. This characteristic of the code allows us to evaluate the double heterogeneity effect on the kinfinity for the considered benchmarks.

III. The results of our analysis:

III-1. PFPWR50 (Japan):

III-1.1. Information on data and methodology used:

Cell description

The geometry and dimensions of the PFPWR50 cell are same as adopted in the previous analysis [1]. The fuel used is the Cermet Fuel: 0.5 mm diameter Fuel Particle covered with Zr layer (to form the MFP 'Micro Fuel Particle'). Volume ratio of the Fuel Particle by the Zr layer is 28:72. In order to respect the design and the philosophy proposed by the developer of the PFPWR50 concept, we have adopted the Zr as the matrix instead of the graphite matrix used in previous calculations. And the Micro Fuel Particles are embedded in the Zr matrix with the porosity of 28% to form the fuel rod (see Fig. a) .

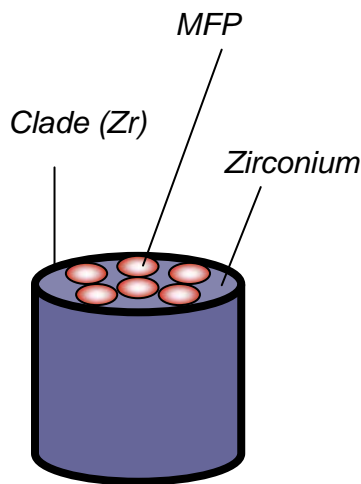


Fig a: fuel rod description

Methodology used

The same methodology adopted in the previous analysis was adopted in our analysis [2]. The Micro Fuel Particle and Zr matrix were homogenized.

III-1.2. Calculations results:

The results of the calculations for cell are presented in the tables: **1** flux, **2** multigroup cross section and eigenvalue. **3**. two groups cross section **4** scattering cross section **5** burnup dependant parameters.

Figures: fig1 flux fig2 macroscopic cross section. Fig3-5: spectrum index, infinite multiplication factor and instantaneous conversion ratio respectively.

The results of the calculations for different assemblies are presented in the tables: 1a-ab for flux at the BOC and EOC, 2a-2e multigroup cross sections. 3a-3b ...8a-8b 2 groups cross sections for FU BP1-5 and GT respectively.

Corresponding Figures: fig1a and 1b for flux at the BOC and EOC, fig2a-2e. macroscopic cross section, 3a-f two groups constants for different assemblies, 4a-f a scattering matrix for different assemblies, 5 burnup dependent parameters and 6 number density of elements

IV. BWR-PB (Russia)

IV.1 Information on the methodology used: We have started the analysis of this Benchmark (BWR-PB) with APOLLO code by using the proposed unit cell. The kernel particles used in the fuel region consist of the new spherical cermet fuel. Is a coated uranium dioxide kernel embedded in zirconium matrix, (see the PNNL-16245 report).

The reflective condition was used at the external boundary of the cell and each assembly's part. For the self-shielding calculations, APOLLO has several options and we have used the recommended ones.

A full two dimension model of the BWR-PB assembly was constructed with explicit and independent treatment of each part of assembly (top, middle and bottom). The homogenised modelling has been used in the calculation. The double heterogeneity effect has not been evaluated in the present rapport.

IV.2 Calculations results:

Unit cell results

-The results of the calculations for cell are presented in the tables: **1** flux, **2** multigroup cross sections. **3**. & **4** two groups cross section **and** scattering matrix **5** burnup steps, K_{inf} , spectrum index and instantaneous conversion ratio. Tab 6 number densities at the BOC and EOC.

Corresponding Figures: fig1 flux fig2a-c fission nu fission and capture cross sections. Fig3-5: spectrum index, infinite multiplication factor and instantaneous conversion ratio respectively.

-The calculations results for different assemblies are presented in the tables: 1a-ab for flux in the TOP MIDDLE and BOTTOM assemblies, 2a-2c multigroup cross sections, 3&4 two group constants and scattering matrix, 5a-c burnup K_{inf} , spectrum index & instantaneous conversion ratio, 6a-c number densities for TOP MID. And BOTTOM assemblies.

The results of the calculations for cell are presented in the tables: **1** flux, **2** multigroup cross section and eigenvalue. **3**. two groups cross section **4** scattering cross section **5** burnup dependant parameters.

Corresponding Figures: fig1a-c flux in the TOP, MIDDLE and BOTTOM, fig2a-2b fission and capture cross section. Fig3-5: spectrum index, infinite multiplication factor and instantaneous conversion ratio respectively.

V. Comparison with Monte Carlo calculations

This comparison concerns only the k-infinity of the homogeneous model at the beginning of cycle. The results are presented in Table I. We can notice the relatively good agreement between Monte Carlo (MCNP) values and APOLLO results. The MCNP eigenvalue shown in table I below was calculated using 4 millions active histories (950 active and 50 skipped cycles with 4000 histories per cycle). The results are obtained with a standard deviation of about 30 pcm. Table I. Comparison of the k-infinity obtained using APOLLO and MCNP

VI. CONCLUDING REMARKS

The analysis of the set of whole core benchmarks corresponding to the PFPWR50(JAPAN) and BWR-PB(RUSSIA) with cermet fuel designs in the framework of the CRP on Small Reactors without on Site Refuelling performed using the French APOLLO code shows that the proposed designs are potentially valid as a long life cores To have a good reference our group decided to use Apollo French code to evaluates neutronic parameters for innovatives reactors proposed in the last meeting.

References

1. benchmarks specifications on coated particles fuel in steam-water coolant, prepared by Prof. Y. SHIMAZU for the IAEA CRP on the Development of Small Reactors without on Site Refuelling (group 2).
2. R. SANCHEZ and Al. "APOLLO-II: A User-Oriented, Portable, Modular Code for Multigroup Transport Assembly Calculations" Proc. Int. Top. Mtg. Advances in Reactor Physics, Mathematics and Computation, Paris, France, April 27-30 (1987).

Different neutronic parameters for PFPWR50(Japan)

Double heterogeneity effect:

The double heterogeneity effect was analyzed for the FU assembly

	Apollo2	Apollo2		
<i>K inf</i>	Heter	Homog	<i>DK inf</i>	<i>DK inf/ K inf(hetero) (pcm)</i>
FU	1,2822E+00	1,2760E+00	0,0062	485,3702

A- cell results

Fig. 1 : Spectrum VS. Neutron Energy groups (PFPWR50 CERMET FUEL CELL)

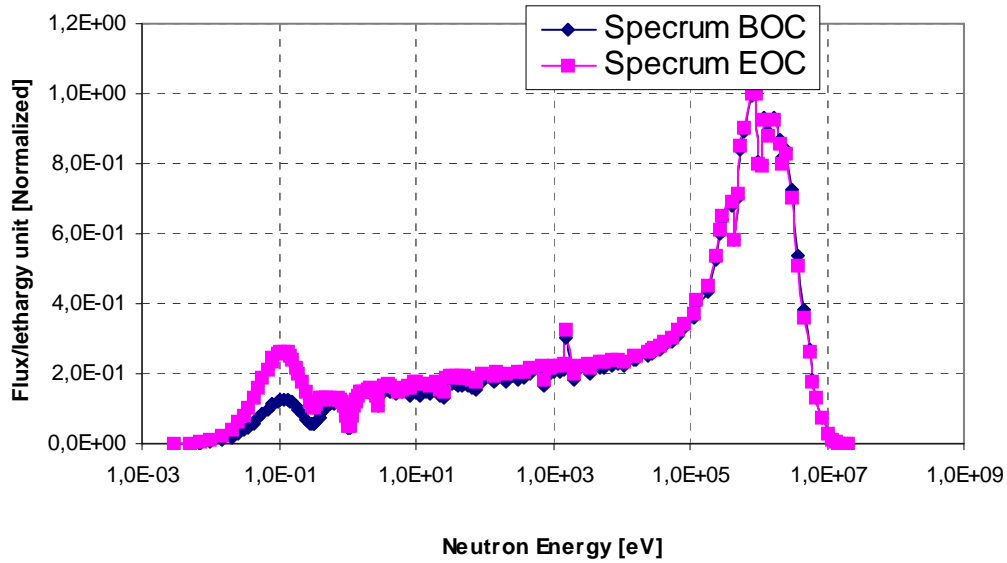


Table1: Flux/lethargy [$\text{cm}^2.\text{s}$] and energy structure PFPWR50 CERMET FUEL CELL

GROUP	Ei-1 [eV]	Ei [eV]	Spectrum BOC	Spectrum EOC
1	1,73E+7	2,0E+07	6,64E-05	7,52E-05
2	1,49E+7	1,7E+07	2,91E-04	3,12E-04
3	1,38E+7	1,5E+07	8,64E-04	9,16E-04
4	1,16E+7	1,4E+07	2,81E-03	2,90E-03
5	1,00E+7	1,2E+07	9,45E-03	9,58E-03
6	8,19E+6	1,0E+07	2,82E-02	2,81E-02
7	6,70E+6	8,2E+06	7,32E-02	7,19E-02
8	6,07E+6	6,7E+06	1,32E-01	1,30E-01
9	5,49E+6	6,1E+06	1,80E-01	1,75E-01
10	4,49E+6	5,5E+06	2,71E-01	2,62E-01
11	3,68E+6	4,5E+06	3,82E-01	3,62E-01
12	3,01E+6	3,7E+06	5,37E-01	5,11E-01
13	2,47E+6	3,0E+06	7,25E-01	7,05E-01
14	2,23E+6	2,5E+06	8,38E-01	8,28E-01
15	2,02E+6	2,2E+06	8,19E-01	8,03E-01
16	1,65E+6	2,0E+06	8,69E-01	8,56E-01
17	1,35E+6	1,7E+06	9,34E-01	9,26E-01
18	1,22E+6	1,4E+06	8,92E-01	8,83E-01
19	1,11E+6	1,2E+06	9,30E-01	9,27E-01
20	1,00E+6	1,1E+06	8,03E-01	7,94E-01
21	9,07E+5	1,0E+06	8,08E-01	7,98E-01
22	8,21E+5	9,1E+05	1,00E+00	9,98E-01

23	6,08E+5	8,2E+05	9,92E-01	1,00E+00
24	5,50E+5	6,1E+05	8,89E-01	9,01E-01
25	4,98E+5	5,5E+05	8,40E-01	8,52E-01
26	4,50E+5	5,0E+05	7,06E-01	7,14E-01
27	4,08E+5	4,5E+05	5,81E-01	5,85E-01
28	3,02E+5	4,1E+05	6,83E-01	6,93E-01
29	2,73E+5	3,0E+05	6,41E-01	6,53E-01
30	2,47E+5	2,7E+05	6,01E-01	6,14E-01
31	1,83E+5	2,5E+05	5,24E-01	5,38E-01
32	1,23E+5	1,8E+05	4,36E-01	4,49E-01
33	1,11E+5	1,2E+05	3,98E-01	4,12E-01
34	8,23E+4	1,1E+05	3,61E-01	3,74E-01
35	6,74E+4	8,2E+04	3,31E-01	3,44E-01
36	5,52E+4	6,7E+04	3,10E-01	3,23E-01
37	4,09E+4	5,5E+04	2,89E-01	3,02E-01
38	3,70E+4	4,1E+04	2,78E-01	2,91E-01
39	2,93E+4	3,7E+04	2,67E-01	2,80E-01
40	2,74E+4	2,9E+04	2,61E-01	2,74E-01
41	2,48E+4	2,7E+04	2,57E-01	2,70E-01
42	1,66E+4	2,5E+04	2,51E-01	2,64E-01
43	1,50E+4	1,7E+04	2,38E-01	2,51E-01
44	1,11E+4	1,5E+04	2,39E-01	2,53E-01
45	9,12E+3	1,1E+04	2,22E-01	2,36E-01
46	7,47E+3	9,1E+03	2,26E-01	2,41E-01
47	5,53E+3	7,5E+03	2,24E-01	2,38E-01
48	5,00E+3	5,5E+03	2,17E-01	2,31E-01
49	3,53E+3	5,0E+03	2,20E-01	2,35E-01
50	3,35E+3	3,5E+03	2,01E-01	2,15E-01
51	2,25E+3	3,4E+03	2,14E-01	2,30E-01
52	2,03E+3	2,3E+03	2,09E-01	2,25E-01
53	1,51E+3	2,0E+03	1,84E-01	1,98E-01
54	1,43E+3	1,5E+03	3,01E-01	3,26E-01
55	1,23E+3	1,4E+03	2,11E-01	2,28E-01
56	1,01E+3	1,2E+03	2,05E-01	2,22E-01
57	9,14E+2	1,0E+03	2,07E-01	2,24E-01
58	7,49E+2	9,1E+02	2,02E-01	2,20E-01
59	6,77E+2	7,5E+02	1,67E-01	1,81E-01
60	4,54E+2	6,8E+02	2,04E-01	2,23E-01
61	3,72E+2	4,5E+02	1,99E-01	2,17E-01
62	3,04E+2	3,7E+02	1,87E-01	2,05E-01
63	2,04E+2	3,0E+02	1,85E-01	2,05E-01
64	1,49E+2	2,0E+02	1,78E-01	1,97E-01
65	1,37E+2	1,5E+02	1,84E-01	2,05E-01
66	9,17E+1	1,4E+02	1,76E-01	1,96E-01
67	7,57E+1	9,2E+01	1,76E-01	2,00E-01
68	6,79E+1	7,6E+01	1,56E-01	1,78E-01
69	5,56E+1	6,8E+01	1,60E-01	1,84E-01
70	5,16E+1	5,6E+01	1,66E-01	1,91E-01
71	4,83E+1	5,2E+01	1,69E-01	1,93E-01
72	4,55E+1	4,8E+01	1,72E-01	1,94E-01
73	4,02E+1	4,6E+01	1,64E-01	1,87E-01

74	3,73E+1	4,0E+01	1,66E-01	1,86E-01
75	3,37E+1	3,7E+01	1,73E-01	1,94E-01
76	3,05E+1	3,4E+01	1,73E-01	1,92E-01
77	2,76E+1	3,1E+01	1,73E-01	1,93E-01
78	2,50E+1	2,8E+01	1,67E-01	1,91E-01
79	2,26E+1	2,5E+01	1,34E-01	1,51E-01
80	1,95E+1	2,3E+01	1,34E-01	1,52E-01
81	1,59E+1	2,0E+01	1,53E-01	1,75E-01
82	1,37E+1	1,6E+01	1,42E-01	1,65E-01
83	1,12E+1	1,4E+01	1,48E-01	1,74E-01
84	9,91E+0	1,1E+01	1,39E-01	1,70E-01
85	9,19E+0	9,9E+00	1,51E-01	1,76E-01
86	8,32E+0	9,2E+00	1,51E-01	1,75E-01
87	7,52E+0	8,3E+00	1,36E-01	1,60E-01
88	6,16E+0	7,5E+00	1,47E-01	1,67E-01
89	5,35E+0	6,2E+00	1,48E-01	1,55E-01
90	5,04E+0	5,4E+00	1,50E-01	1,48E-01
91	4,13E+0	5,0E+00	1,45E-01	1,61E-01
92	4,00E+0	4,1E+00	1,47E-01	1,65E-01
93	3,38E+0	4,0E+00	1,52E-01	1,69E-01
94	3,30E+0	3,4E+00	1,52E-01	1,68E-01
95	2,77E+0	3,3E+00	1,49E-01	1,66E-01
96	2,72E+0	2,8E+00	1,32E-01	1,40E-01
97	2,60E+0	2,7E+00	1,07E-01	1,06E-01
98	2,55E+0	2,6E+00	1,31E-01	1,38E-01
99	2,36E+0	2,6E+00	1,42E-01	1,53E-01
100	2,13E+0	2,4E+00	1,46E-01	1,54E-01
101	2,10E+0	2,1E+00	1,47E-01	1,58E-01
102	2,02E+0	2,1E+00	1,47E-01	1,58E-01
103	1,93E+0	2,0E+00	1,47E-01	1,56E-01
104	1,84E+0	1,9E+00	1,47E-01	1,52E-01
105	1,76E+0	1,8E+00	1,46E-01	1,48E-01
106	1,67E+0	1,8E+00	1,46E-01	1,46E-01
107	1,59E+0	1,7E+00	1,45E-01	1,50E-01
108	1,50E+0	1,6E+00	1,44E-01	1,50E-01
109	1,48E+0	1,5E+00	1,43E-01	1,49E-01
110	1,44E+0	1,5E+00	1,42E-01	1,47E-01
111	1,37E+0	1,4E+00	1,40E-01	1,38E-01
112	1,34E+0	1,4E+00	1,37E-01	1,25E-01
113	1,30E+0	1,3E+00	1,34E-01	1,24E-01
114	1,24E+0	1,3E+00	1,27E-01	1,18E-01
115	1,17E+0	1,2E+00	1,10E-01	1,10E-01
116	1,15E+0	1,2E+00	9,15E-02	9,61E-02
117	1,12E+0	1,2E+00	7,50E-02	8,11E-02
118	1,11E+0	1,1E+00	6,09E-02	6,75E-02
119	1,10E+0	1,1E+00	5,32E-02	5,98E-02
120	1,07E+0	1,1E+00	4,68E-02	5,27E-02
121	1,05E+0	1,1E+00	4,42E-02	4,95E-02
122	1,04E+0	1,1E+00	4,42E-02	4,97E-02
123	1,02E+0	1,0E+00	4,52E-02	5,11E-02
124	9,96E-1	1,0E+00	4,95E-02	5,61E-02

125	9,86E-1	1,0E+00	5,73E-02	6,45E-02
126	9,72E-1	9,9E-01	6,37E-02	7,13E-02
127	9,50E-1	9,7E-01	7,27E-02	8,08E-02
128	9,30E-1	9,5E-01	8,18E-02	9,04E-02
129	9,10E-1	9,3E-01	8,89E-02	9,80E-02
130	8,60E-1	9,1E-01	9,80E-02	1,08E-01
131	8,50E-1	8,6E-01	1,04E-01	1,15E-01
132	7,90E-1	8,5E-01	1,09E-01	1,20E-01
133	7,80E-1	7,9E-01	1,12E-01	1,25E-01
134	7,05E-1	7,8E-01	1,15E-01	1,28E-01
135	6,25E-1	7,1E-01	1,18E-01	1,31E-01
136	5,40E-1	6,3E-01	1,17E-01	1,28E-01
137	5,00E-1	5,4E-01	1,13E-01	1,32E-01
138	4,85E-1	5,0E-01	1,10E-01	1,34E-01
139	4,33E-1	4,9E-01	1,04E-01	1,34E-01
140	4,00E-1	4,3E-01	9,33E-02	1,32E-01
141	3,91E-1	4,0E-01	8,59E-02	1,29E-01
142	3,50E-1	3,9E-01	7,48E-02	1,23E-01
143	3,20E-1	3,5E-01	6,07E-02	1,12E-01
144	3,15E-1	3,2E-01	5,60E-02	1,06E-01
145	3,00E-1	3,2E-01	5,46E-02	1,04E-01
146	2,80E-1	3,0E-01	5,43E-02	1,07E-01
147	2,48E-1	2,8E-01	5,90E-02	1,21E-01
148	2,20E-1	2,5E-01	7,08E-02	1,46E-01
149	1,89E-1	2,2E-01	8,69E-02	1,79E-01
150	1,80E-1	1,9E-01	9,85E-02	2,02E-01
151	1,60E-1	1,8E-01	1,07E-01	2,19E-01
152	1,40E-1	1,6E-01	1,17E-01	2,41E-01
153	1,34E-1	1,4E-01	1,23E-01	2,53E-01
154	1,15E-1	1,3E-01	1,26E-01	2,61E-01
155	1,00E-1	1,2E-01	1,27E-01	2,65E-01
156	9,50E-2	1,0E-01	1,26E-01	2,63E-01
157	8,00E-2	9,5E-02	1,22E-01	2,56E-01
158	7,70E-2	8,0E-02	1,17E-01	2,47E-01
159	6,70E-2	7,7E-02	1,10E-01	2,34E-01
160	5,80E-2	6,7E-02	9,97E-02	2,13E-01
161	5,00E-2	5,8E-02	8,75E-02	1,88E-01
162	4,20E-2	5,0E-02	7,40E-02	1,59E-01
163	3,50E-2	4,2E-02	5,97E-02	1,29E-01
164	3,00E-2	3,5E-02	4,78E-02	1,04E-01
165	2,50E-2	3,0E-02	3,75E-02	8,17E-02
166	2,00E-2	2,5E-02	2,75E-02	6,00E-02
167	1,50E-2	2,0E-02	1,81E-02	3,97E-02
168	1,00E-2	1,5E-02	9,99E-03	2,19E-02
169	6,90E-3	1,0E-02	4,86E-03	1,06E-02
170	5,00E-3	6,9E-03	2,49E-03	5,45E-03
171	3,00E-3	5,0E-03	1,12E-03	2,45E-03
172	1,10E-3	3,0E-03	9,71E-05	2,08E-04

Fig. 2 : Macroscopic Cross Section VS. Neutron Energy (PPFWR50 CERMET FUEL CELL)

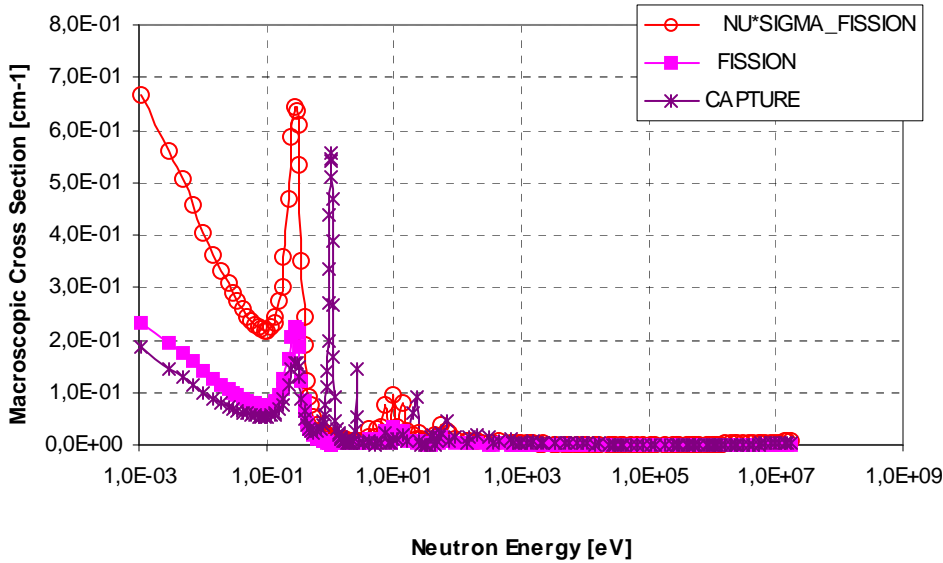


TABLE 2: Multi-group cross sections and Energy structure

GROUP	Ei-1 [eV]	Ei [eV]	ABSORPTION	NU*SIGMA_FISSION	FISSION	CAPTURE
1	1,73E+7	1,96E+007	4,07E-3	8,07E-3	1,63E-3	2,44E-3
2	1,49E+7	1,73E+007	5,01E-3	7,07E-3	1,53E-3	3,48E-3
3	1,38E+7	1,49E+007	5,17E-3	6,23E-3	1,41E-3	3,76E-3
4	1,16E+7	1,38E+007	5,23E-3	5,14E-3	1,23E-3	4,00E-3
5	1,00E+7	1,16E+007	5,28E-3	4,61E-3	1,17E-3	4,11E-3
6	8,19E+6	1,00E+007	4,57E-3	4,44E-3	1,22E-3	3,36E-3
7	6,70E+6	8,19E+006	3,90E-3	4,28E-3	1,27E-3	2,63E-3
8	6,07E+6	6,70E+006	3,18E-3	3,05E-3	9,23E-4	2,25E-3
9	5,49E+6	6,07E+006	1,51E-3	2,34E-3	7,13E-4	8,01E-4
10	4,49E+6	5,49E+006	2,26E-3	2,27E-3	7,20E-4	1,54E-3
11	3,68E+6	4,49E+006	1,93E-3	2,22E-3	7,36E-4	1,20E-3
12	3,01E+6	3,68E+006	9,88E-4	2,16E-3	7,36E-4	2,52E-4
13	2,47E+6	3,01E+006	9,57E-4	2,06E-3	7,13E-4	2,44E-4
14	2,23E+6	2,47E+006	9,91E-4	2,03E-3	7,18E-4	2,73E-4
15	2,02E+6	2,23E+006	1,03E-3	2,05E-3	7,32E-4	2,97E-4
16	1,65E+6	2,02E+006	9,89E-4	1,91E-3	6,75E-4	3,14E-4
17	1,35E+6	1,65E+006	9,85E-4	1,78E-3	6,34E-4	3,50E-4
18	1,22E+6	1,35E+006	8,60E-4	1,39E-3	4,64E-4	3,96E-4
19	1,11E+6	1,22E+006	8,58E-4	1,29E-3	4,27E-4	4,31E-4
20	1,00E+6	1,11E+006	8,86E-4	1,26E-3	4,18E-4	4,68E-4
21	9,07E+5	1,00E+006	9,30E-4	1,22E-3	4,08E-4	5,23E-4
22	8,21E+5	9,07E+005	9,57E-4	1,17E-3	3,95E-4	5,62E-4
23	6,08E+5	8,21E+005	9,46E-4	1,08E-3	3,66E-4	5,80E-4
24	5,50E+5	6,08E+005	9,25E-4	9,97E-4	3,38E-4	5,87E-4
25	4,98E+5	5,50E+005	9,09E-4	9,52E-4	3,23E-4	5,86E-4
26	4,50E+5	4,98E+005	8,98E-4	9,20E-4	3,12E-4	5,86E-4
27	4,08E+5	4,50E+005	8,89E-4	8,94E-4	3,03E-4	5,86E-4

28	3,02E+5	4,08E+005	8,80E-4	8,60E-4	2,94E-4	5,87E-4
29	2,73E+5	3,02E+005	8,83E-4	8,49E-4	2,91E-4	5,93E-4
30	2,47E+5	2,73E+005	8,90E-4	8,44E-4	2,90E-4	6,00E-4
31	1,83E+5	2,47E+005	9,20E-4	8,36E-4	2,88E-4	6,32E-4
32	1,23E+5	1,83E+005	1,01E-3	8,39E-4	2,89E-4	7,20E-4
33	1,11E+5	1,23E+005	1,10E-3	8,58E-4	2,96E-4	8,04E-4
34	8,23E+4	1,11E+005	1,19E-3	8,72E-4	3,00E-4	8,86E-4
35	6,74E+4	8,23E+004	1,33E-3	8,91E-4	3,07E-4	1,03E-3
36	5,52E+4	6,74E+004	1,50E-3	8,99E-4	3,09E-4	1,19E-3
37	4,09E+4	5,52E+004	1,61E-3	9,15E-4	3,13E-4	1,29E-3
38	3,70E+4	4,09E+004	1,74E-3	9,33E-4	3,18E-4	1,42E-3
39	2,93E+4	3,70E+004	1,91E-3	9,42E-4	3,21E-4	1,59E-3
40	2,74E+4	2,93E+004	2,09E-3	9,37E-4	3,20E-4	1,77E-3
41	2,48E+4	2,74E+004	2,20E-3	9,46E-4	3,23E-4	1,87E-3
42	1,66E+4	2,48E+004	2,55E-3	9,85E-4	3,38E-4	2,21E-3
43	1,50E+4	1,66E+004	2,21E-3	1,04E-3	3,60E-4	1,85E-3
44	1,11E+4	1,50E+004	2,96E-3	1,07E-3	3,71E-4	2,59E-3
45	9,12E+3	1,11E+004	3,09E-3	1,12E-3	3,86E-4	2,70E-3
46	7,47E+3	9,12E+003	3,52E-3	1,28E-3	4,42E-4	3,08E-3
47	5,53E+3	7,47E+003	4,86E-3	1,28E-3	4,44E-4	4,42E-3
48	5,00E+3	5,53E+003	3,96E-3	1,39E-3	4,80E-4	3,48E-3
49	3,53E+3	5,00E+003	6,21E-3	1,56E-3	5,39E-4	5,67E-3
50	3,35E+3	3,53E+003	3,28E-3	1,36E-3	4,72E-4	2,81E-3
51	2,25E+3	3,35E+003	5,95E-3	2,10E-3	7,29E-4	5,22E-3
52	2,03E+3	2,25E+003	5,77E-3	1,75E-3	6,06E-4	5,16E-3
53	1,51E+3	2,03E+003	7,92E-3	2,09E-3	7,27E-4	7,19E-3
54	1,43E+3	1,51E+003	2,94E-3	2,66E-3	9,20E-4	2,02E-3
55	1,23E+3	1,43E+003	6,78E-3	3,36E-3	1,16E-3	5,62E-3
56	1,01E+3	1,23E+003	5,14E-3	3,21E-3	1,11E-3	4,03E-3
57	9,14E+2	1,01E+003	7,25E-3	4,46E-3	1,54E-3	5,70E-3
58	7,49E+2	9,14E+002	6,66E-3	3,48E-3	1,20E-3	5,46E-3
59	6,77E+2	7,49E+002	1,42E-2	2,82E-3	9,75E-4	1,33E-2
60	4,54E+2	6,77E+002	8,90E-3	5,76E-3	2,00E-3	6,90E-3
61	3,72E+2	4,54E+002	5,32E-3	4,89E-3	1,69E-3	3,63E-3
62	3,04E+2	3,72E+002	1,73E-2	5,22E-3	1,81E-3	1,55E-2
63	2,04E+2	3,04E+002	2,34E-2	9,15E-3	3,17E-3	2,02E-2
64	1,49E+2	2,04E+002	2,01E-2	9,48E-3	3,29E-3	1,69E-2
65	1,37E+2	1,49E+002	6,47E-3	9,04E-3	3,14E-3	3,33E-3
66	9,17E+1	1,37E+002	1,98E-2	1,10E-2	3,82E-3	1,60E-2
67	7,57E+1	9,17E+001	1,42E-2	2,38E-2	8,26E-3	5,92E-3
68	6,79E+1	7,57E+001	5,36E-2	2,72E-2	9,47E-3	4,41E-2
69	5,56E+1	6,79E+001	3,60E-2	3,94E-2	1,36E-2	2,24E-2
70	5,16E+1	5,56E+001	1,82E-2	9,07E-3	3,22E-3	1,50E-2
71	4,83E+1	5,16E+001	1,24E-2	1,66E-2	5,76E-3	6,63E-3
72	4,55E+1	4,83E+001	8,03E-3	1,90E-2	6,53E-3	1,50E-3
73	4,02E+1	4,55E+001	2,39E-2	9,02E-3	3,19E-3	2,07E-2
74	3,73E+1	4,02E+001	1,64E-2	5,07E-3	1,74E-3	1,47E-2
75	3,37E+1	3,73E+001	2,91E-3	3,59E-3	1,24E-3	1,67E-3
76	3,05E+1	3,37E+001	3,86E-3	8,29E-3	2,85E-3	1,02E-3

77	2,76E+1	3,05E+001	4,37E-3	9,78E-3	3,34E-3	1,03E-3
78	2,50E+1	2,76E+001	1,49E-2	2,22E-2	7,70E-3	7,22E-3
79	2,26E+1	2,50E+001	9,44E-2	1,02E-2	3,51E-3	9,09E-2
80	1,95E+1	2,26E+001	6,90E-2	2,05E-2	7,17E-3	6,18E-2
81	1,59E+1	1,95E+001	1,83E-2	2,57E-2	8,93E-3	9,37E-3
82	1,37E+1	1,59E+001	4,56E-2	8,06E-2	2,79E-2	1,77E-2
83	1,12E+1	1,37E+001	2,37E-2	3,27E-2	1,14E-2	1,23E-2
84	9,91E+0	1,12E+001	4,27E-2	9,40E-2	3,27E-2	9,95E-3
85	9,19E+0	9,91E+000	7,67E-3	1,64E-2	5,59E-3	2,08E-3
86	8,32E+0	9,19E+000	1,16E-2	2,28E-2	7,78E-3	3,87E-3
87	7,52E+0	8,32E+000	4,89E-2	7,81E-2	2,72E-2	2,17E-2
88	6,16E+0	7,52E+000	1,44E-2	3,34E-2	1,14E-2	2,92E-3
89	5,35E+0	6,16E+000	1,21E-2	2,98E-2	1,02E-2	1,93E-3
90	5,04E+0	5,35E+000	6,43E-3	1,35E-2	4,63E-3	1,81E-3
91	4,13E+0	5,04E+000	1,75E-2	2,99E-2	1,02E-2	7,32E-3
92	4,00E+0	4,13E+000	7,79E-3	1,37E-2	4,69E-3	3,10E-3
93	3,38E+0	4,00E+000	5,41E-3	9,21E-3	3,16E-3	2,25E-3
94	3,30E+0	3,38E+000	5,17E-3	8,01E-3	2,76E-3	2,41E-3
95	2,77E+0	3,30E+000	8,23E-3	7,80E-3	2,69E-3	5,54E-3
96	2,72E+0	2,77E+000	5,43E-2	7,48E-3	2,58E-3	5,17E-2
97	2,60E+0	2,72E+000	1,46E-1	7,01E-3	2,42E-3	1,44E-1
98	2,55E+0	2,60E+000	3,02E-2	7,55E-3	2,61E-3	2,76E-2
99	2,36E+0	2,55E+000	9,33E-3	7,81E-3	2,70E-3	6,63E-3
100	2,13E+0	2,36E+000	7,10E-3	8,13E-3	2,81E-3	4,29E-3
101	2,10E+0	2,13E+000	7,25E-3	8,34E-3	2,88E-3	4,36E-3
102	2,02E+0	2,10E+000	7,43E-3	8,42E-3	2,91E-3	4,51E-3
103	1,93E+0	2,02E+000	7,81E-3	8,55E-3	2,96E-3	4,85E-3
104	1,84E+0	1,93E+000	8,40E-3	8,77E-3	3,04E-3	5,36E-3
105	1,76E+0	1,84E+000	9,25E-3	9,20E-3	3,19E-3	6,06E-3
106	1,67E+0	1,76E+000	1,04E-2	9,88E-3	3,42E-3	7,01E-3
107	1,59E+0	1,67E+000	1,20E-2	1,06E-2	3,66E-3	8,36E-3
108	1,50E+0	1,59E+000	1,44E-2	1,12E-2	3,88E-3	1,06E-2
109	1,48E+0	1,50E+000	1,67E-2	1,16E-2	4,02E-3	1,27E-2
110	1,44E+0	1,48E+000	1,84E-2	1,18E-2	4,09E-3	1,43E-2
111	1,37E+0	1,44E+000	2,24E-2	1,22E-2	4,22E-3	1,82E-2
112	1,34E+0	1,37E+000	2,81E-2	1,25E-2	4,34E-3	2,38E-2
113	1,30E+0	1,34E+000	3,43E-2	1,28E-2	4,43E-3	2,98E-2
114	1,24E+0	1,30E+000	5,00E-2	1,31E-2	4,54E-3	4,54E-2
115	1,17E+0	1,24E+000	9,76E-2	1,31E-2	4,54E-3	9,31E-2
116	1,15E+0	1,17E+000	1,72E-1	1,24E-2	4,29E-3	1,68E-1
117	1,12E+0	1,15E+000	2,70E-1	1,08E-2	3,73E-3	2,67E-1
118	1,11E+0	1,12E+000	3,90E-1	8,23E-3	2,86E-3	3,87E-1
119	1,10E+0	1,11E+000	4,72E-1	6,04E-3	2,10E-3	4,70E-1
120	1,07E+0	1,10E+000	5,46E-1	3,54E-3	1,23E-3	5,45E-1
121	1,05E+0	1,07E+000	5,59E-1	2,47E-3	8,60E-4	5,58E-1
122	1,04E+0	1,05E+000	5,40E-1	2,70E-3	9,40E-4	5,39E-1
123	1,02E+0	1,04E+000	5,14E-1	3,49E-3	1,22E-3	5,12E-1
124	9,96E-1	1,02E+000	4,40E-1	6,02E-3	2,09E-3	4,38E-1
125	9,86E-1	9,96E-001	3,38E-1	9,43E-3	3,28E-3	3,35E-1

126	9,72E-1	9,86E-001	2,74E-1	1,15E-2	4,00E-3	2,70E-1
127	9,50E-1	9,72E-001	2,02E-1	1,39E-2	4,82E-3	1,97E-1
128	9,30E-1	9,50E-001	1,48E-1	1,58E-2	5,50E-3	1,42E-1
129	9,10E-1	9,30E-001	1,15E-1	1,73E-2	6,00E-3	1,09E-1
130	8,60E-1	9,10E-001	8,27E-2	1,94E-2	6,73E-3	7,59E-2
131	8,50E-1	8,60E-001	6,51E-2	2,10E-2	7,31E-3	5,78E-2
132	7,90E-1	8,50E-001	5,38E-2	2,31E-2	8,02E-3	4,58E-2
133	7,80E-1	7,90E-001	4,61E-2	2,52E-2	8,77E-3	3,73E-2
134	7,05E-1	7,80E-001	4,13E-2	2,85E-2	9,93E-3	3,14E-2
135	6,25E-1	7,05E-001	3,84E-2	3,67E-2	1,28E-2	2,56E-2
136	5,40E-1	6,25E-001	4,30E-2	5,27E-2	1,84E-2	2,47E-2
137	5,00E-1	5,40E-001	5,35E-2	7,48E-2	2,61E-2	2,74E-2
138	4,85E-1	5,00E-001	6,19E-2	9,07E-2	3,16E-2	3,02E-2
139	4,33E-1	4,85E-001	7,96E-2	1,23E-1	4,29E-2	3,67E-2
140	4,00E-1	4,33E-001	1,18E-1	1,91E-1	6,65E-2	5,11E-2
141	3,91E-1	4,00E-001	1,48E-1	2,44E-1	8,51E-2	6,30E-2
142	3,50E-1	3,91E-001	2,09E-1	3,50E-1	1,22E-1	8,72E-2
143	3,20E-1	3,50E-001	3,16E-1	5,33E-1	1,86E-1	1,30E-1
144	3,15E-1	3,20E-001	3,61E-1	6,09E-1	2,13E-1	1,48E-1
145	3,00E-1	3,15E-001	3,76E-1	6,35E-1	2,22E-1	1,55E-1
146	2,80E-1	3,00E-001	3,82E-1	6,45E-1	2,25E-1	1,58E-1
147	2,48E-1	2,80E-001	3,49E-1	5,88E-1	2,05E-1	1,44E-1
148	2,20E-1	2,48E-001	2,78E-1	4,70E-1	1,63E-1	1,14E-1
149	1,89E-1	2,20E-001	2,13E-1	3,58E-1	1,25E-1	8,79E-2
150	1,80E-1	1,89E-001	1,80E-1	3,02E-1	1,05E-1	7,48E-2
151	1,60E-1	1,80E-001	1,63E-1	2,73E-1	9,49E-2	6,81E-2
152	1,40E-1	1,60E-001	1,46E-1	2,45E-1	8,49E-2	6,13E-2
153	1,34E-1	1,40E-001	1,39E-1	2,32E-1	8,04E-2	5,82E-2
154	1,15E-1	1,34E-001	1,34E-1	2,24E-1	7,77E-2	5,62E-2
155	1,00E-1	1,15E-001	1,30E-1	2,18E-1	7,56E-2	5,45E-2
156	9,50E-2	1,00E-001	1,29E-1	2,17E-1	7,53E-2	5,41E-2
157	8,00E-2	9,50E-002	1,30E-1	2,20E-1	7,61E-2	5,44E-2
158	7,70E-2	8,00E-002	1,32E-1	2,23E-1	7,73E-2	5,49E-2
159	6,70E-2	7,70E-002	1,34E-1	2,27E-1	7,87E-2	5,57E-2
160	5,80E-2	6,70E-002	1,39E-1	2,35E-1	8,13E-2	5,73E-2
161	5,00E-2	5,80E-002	1,44E-1	2,45E-1	8,48E-2	5,95E-2
162	4,20E-2	5,00E-002	1,52E-1	2,58E-1	8,93E-2	6,24E-2
163	3,50E-2	4,20E-002	1,61E-1	2,74E-1	9,49E-2	6,61E-2
164	3,00E-2	3,50E-002	1,70E-1	2,90E-1	1,00E-1	7,00E-2
165	2,50E-2	3,00E-002	1,81E-1	3,08E-1	1,07E-1	7,42E-2
166	2,00E-2	2,50E-002	1,94E-1	3,31E-1	1,14E-1	7,98E-2
167	1,50E-2	2,00E-002	2,13E-1	3,61E-1	1,25E-1	8,76E-2
168	1,00E-2	1,50E-002	2,39E-1	4,05E-1	1,40E-1	9,90E-2
169	6,90E-3	1,00E-002	2,72E-1	4,58E-1	1,58E-1	1,14E-1
170	5,00E-3	6,90E-003	3,02E-1	5,05E-1	1,75E-1	1,28E-1
171	3,00E-3	5,00E-003	3,38E-1	5,58E-1	1,93E-1	1,45E-1
172	1,10E-3	3,00E-003	4,18E-1	6,68E-1	2,31E-1	1,87E-1

Table: 3 Two groups constants PFPWR50 CELL
 Unite: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	5,895E-2	5,064E-3	1,749E-3	5,331E-3	2,940E-1
2	9,049E-2	2,658E-1	9,232E-2	6,673E-2	7,242E-1

Table: 4a Scattering matrix P0 G -> g
 Unite: s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,304E+1	6,227E-3
2	4,676E-1	1,615E+0

Table: 4b Scattering matrix P1 G -> g
 Unite: s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	2,447E+1	6,459E-3
2	5,016E-1	2,329E+0

Fig. 3 : Spectrum Index VS. Burnup Steps (PFPWR50 CERMET FUEL CELL)

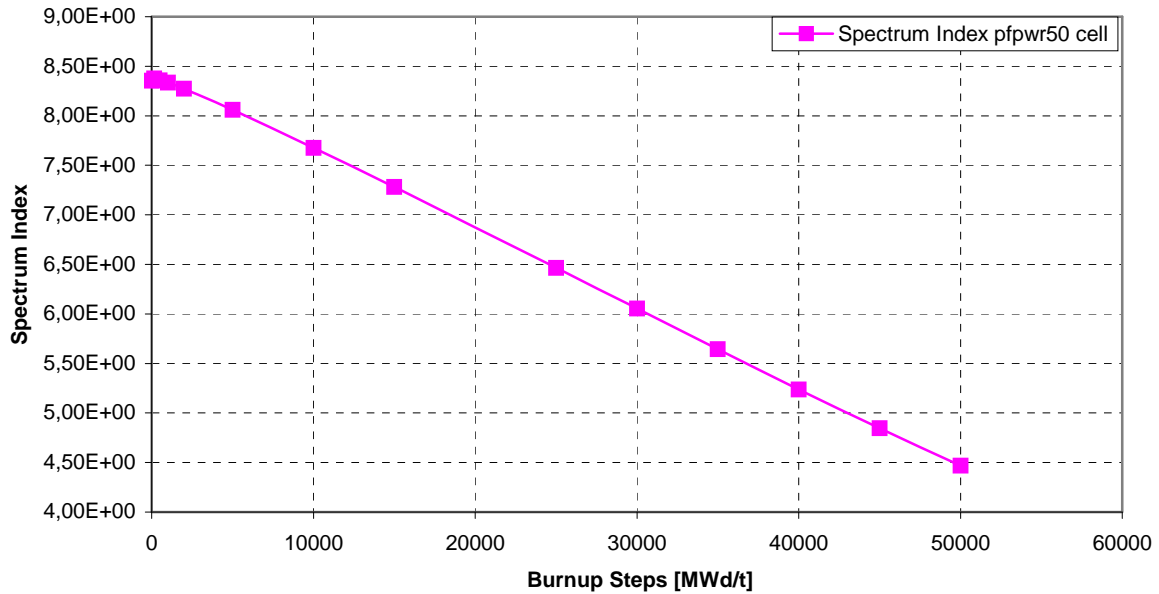


Fig. 4 : Infinite Multiplication Factor VS. Burnup Steps PFPWR50 CERMET FUEL CELL

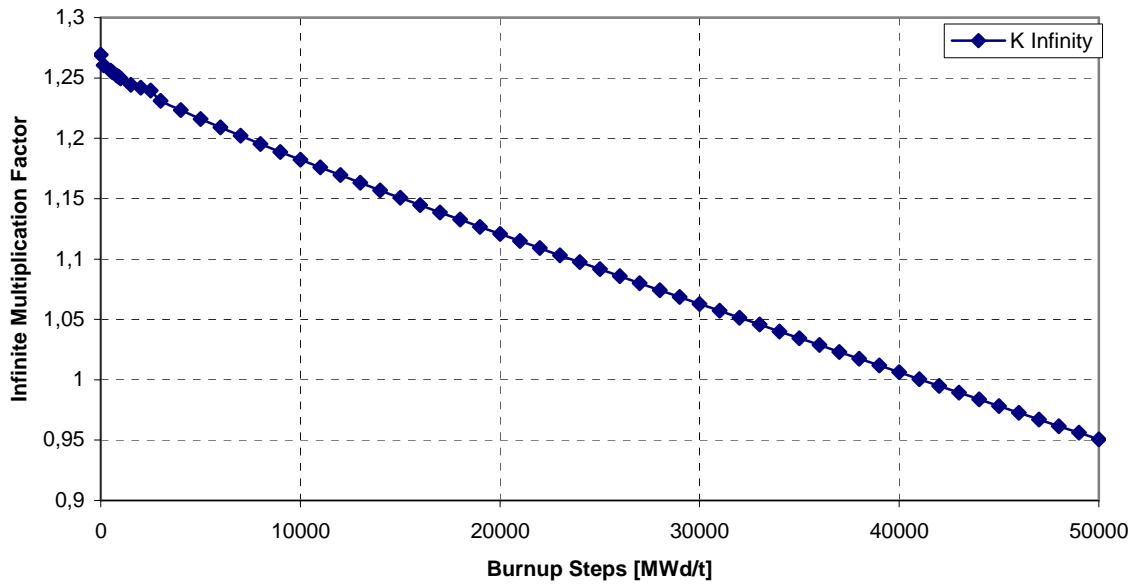


Fig. 5 : Instantaneous Conversion Ratio VS. Burnup Steps (PFPWR50 CERMET FUEL CELL)

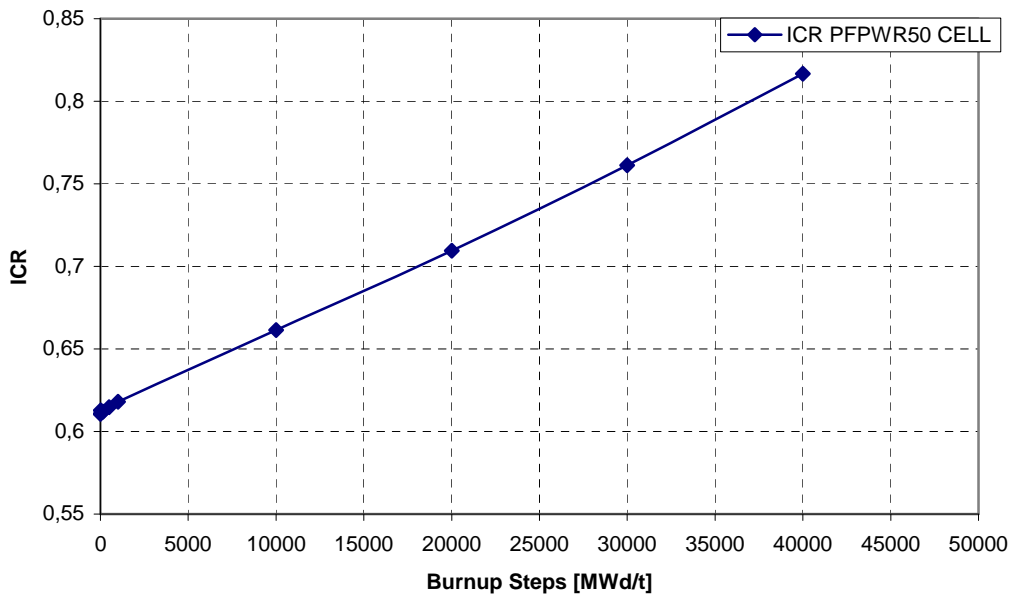


Table 5. Burnup dependent parameters pfpwr50 cell

Burnup Steps	IS	K Infinity	ICR
0	8,36E+00	1,26936531	0,6106813
150	8,38E+00	1,26049	0,612072
500	8,36E+00	1,25612	0,614785
600		1,25474	
800		1,25213	

900		1,2509	
1000	8,33E+00	1,24972	0,617984
1500		1,24431	
2000	8,27E+00	1,24185	
2500		1,23951	
3000		1,231	
4000		1,22328	
5000	8,06E+00	1,21599	
6000		1,20895	
7000		1,2021	
8000		1,19537	
9000		1,18877	
10000	7,68E+00	1,18225	0,661352
11000		1,17584	
12000		1,16948	
13000		1,16321	
14000		1,15699	
15000	7,28E+00	1,15085	
16000		1,14474	
17000		1,1387	
18000		1,13268	
19000		1,12672	
20000		1,12078	0,709583
21000		1,11489	
22000		1,10902	
23000		1,10318	
24000		1,09736	
25000	6,47E+00	1,09156	
26000		1,08578	
27000		1,08002	
28000		1,07428	
29000		1,06855	
30000	6,05E+00	1,06283	0,761218
31000		1,05713	
32000		1,05143	
33000		1,04575	
34000		1,04007	
35000	5,64E+00	1,03441	
36000		1,02875	
37000		1,0231	
38000		1,01746	
39000		1,01182	
40000	5,24E+00	1,00619	0,816685
41000		1,00056	
42000		0,994958	
43000		0,989352	
44000		0,983772	
45000	4,85E+00	0,978191	
46000		0,972645	

47000		0,9671	
48000		0,961598	
49000		0,956097	
50000	4,47E+00	0,950649	

Table 6: Number density of elements [$10^{24}/\text{cm}^3$]

Element	BOC	EOC
235U	0,0000E+0	3,6948E-7
236U	0,0000E+0	1,1411E-7
238U	0,0000E+0	4,3498E-10
237Np	0,0000E+0	1,5313E-7
238Pu	8,9876E-6	1,1670E-5
239Pu	2,8311E-4	9,3155E-5
240Pu	8,5382E-5	8,9260E-5
241Pu	5,3926E-5	3,8333E-5
242Pu	1,7975E-5	2,5451E-5
241Am	0,0000E+0	1,4542E-5
242mAm	0,0000E+0	2,3370E-7
243Am	0,0000E+0	5,2803E-6
242Cm	0,0000E+0	7,1444E-7
243Cm	0,0000E+0	1,6086E-8
244Cm	0,0000E+0	1,5310E-6
233U	0,0000E+0	4,9120E-5
234U	0,0000E+0	2,9172E-6
230Th	0,0000E+0	1,6990E-11
232Th	4,1599E-3	2,1524E-3
231Pa	0,0000E+0	1,1292E-7
233Pa	0,0000E+0	3,8821E-7

B-PFPWR50 Cermet Fuel Assemblies Results.

Fig. 1a :Flux/lithargy vs. Neutron energy at BOC

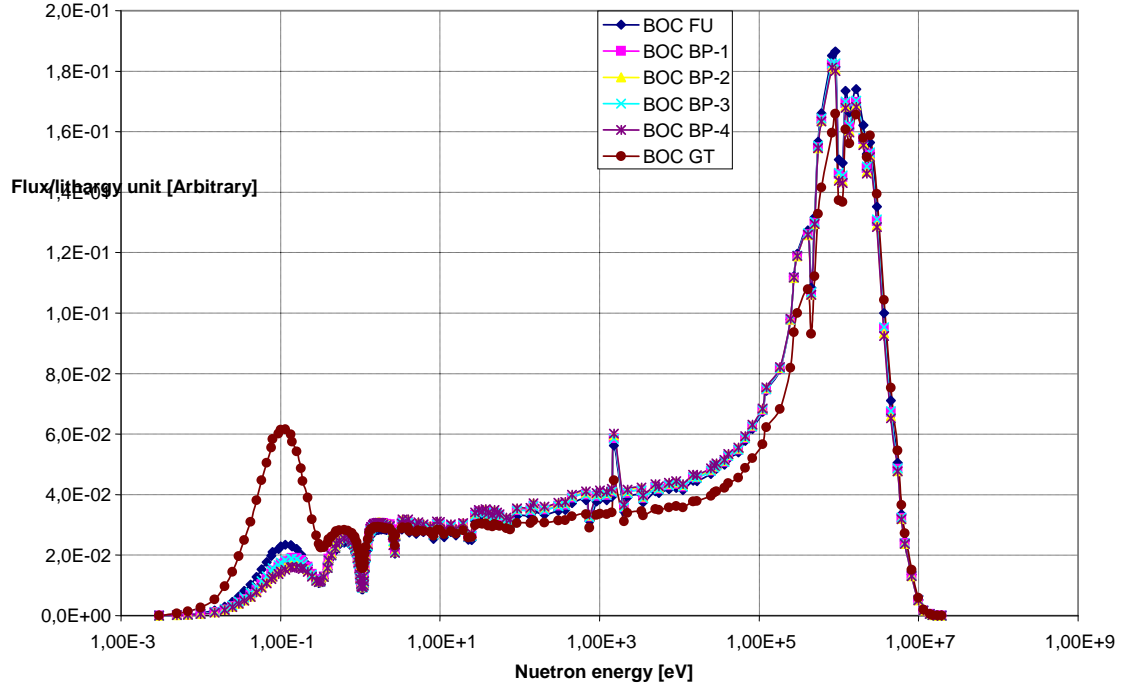


Fig. 1b : Flux/lithargy vs. Neutron energy at the EOC

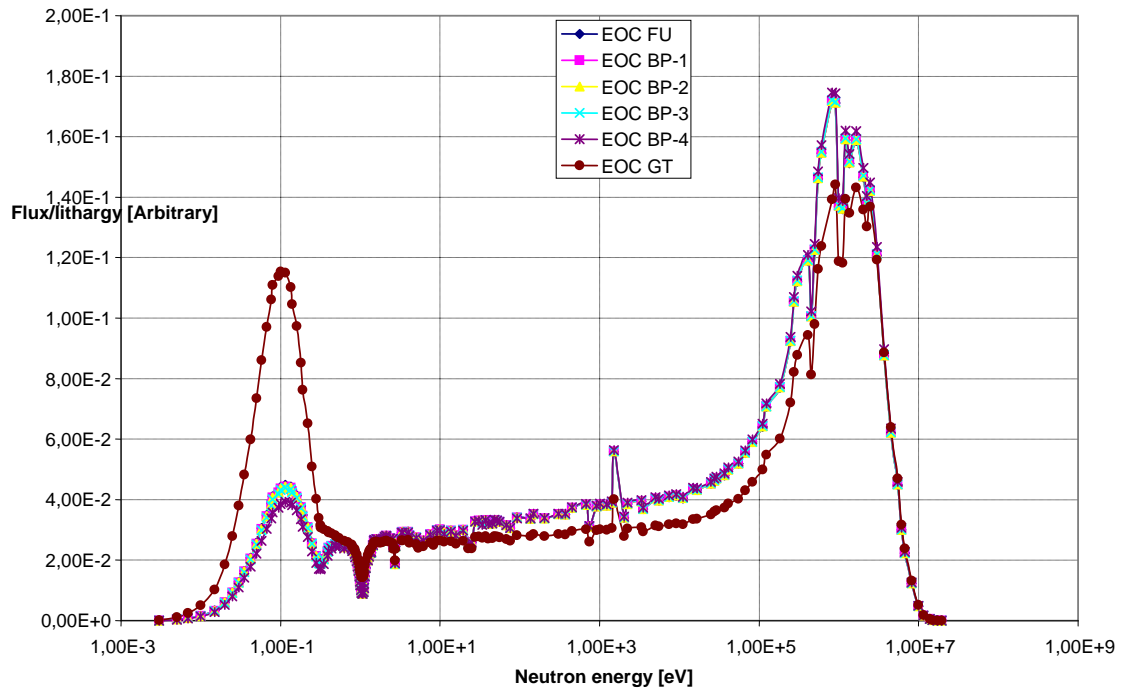


Table1a : Flux/lethargy[cm²,s] and energy structure BOC

Group	Ei-1 [eV]	Ei [eV]	BOC FU	BOC BP-1	BOC BP-2	BOC BP-3	BOC BP-4	BOC GT
1	1,73E+7	1,96E+7	1,23E-5	1,25E-5	1,28E-5	1,25E-5	1,30E-5	1,45E-5
2	1,49E+7	1,73E+7	5,43E-5	5,46E-5	5,55E-5	5,47E-5	5,63E-5	6,30E-5
3	1,38E+7	1,49E+7	1,61E-4	1,61E-4	1,63E-4	1,61E-4	1,65E-4	1,86E-4
4	1,16E+7	1,38E+7	5,24E-4	5,18E-4	5,20E-4	5,19E-4	5,23E-4	5,97E-4
5	1,00E+7	1,16E+7	1,76E-3	1,73E-3	1,73E-3	1,73E-3	1,74E-3	1,99E-3
6	8,19E+6	1,00E+7	5,25E-3	5,12E-3	5,11E-3	5,14E-3	5,11E-3	5,87E-3
7	6,70E+6	8,19E+6	1,36E-2	1,32E-2	1,31E-2	1,32E-2	1,31E-2	1,51E-2
8	6,07E+6	6,70E+6	2,47E-2	2,39E-2	2,38E-2	2,40E-2	2,37E-2	2,73E-2
9	5,49E+6	6,07E+6	3,35E-2	3,23E-2	3,20E-2	3,24E-2	3,18E-2	3,66E-2
10	4,49E+6	5,49E+6	5,05E-2	4,85E-2	4,79E-2	4,86E-2	4,76E-2	5,46E-2
11	3,68E+6	4,49E+6	7,11E-2	6,73E-2	6,59E-2	6,76E-2	6,53E-2	7,53E-2
12	3,01E+6	3,68E+6	1,00E-1	9,50E-2	9,32E-2	9,54E-2	9,24E-2	1,04E-1
13	2,47E+6	3,01E+6	1,35E-1	1,31E-1	1,29E-1	1,31E-1	1,28E-1	1,39E-1
14	2,23E+6	2,47E+6	1,56E-1	1,53E-1	1,52E-1	1,53E-1	1,52E-1	1,59E-1
15	2,02E+6	2,23E+6	1,53E-1	1,48E-1	1,47E-1	1,49E-1	1,46E-1	1,52E-1
16	1,65E+6	2,02E+6	1,62E-1	1,57E-1	1,56E-1	1,58E-1	1,56E-1	1,58E-1
17	1,35E+6	1,65E+6	1,74E-1	1,70E-1	1,69E-1	1,70E-1	1,68E-1	1,66E-1
18	1,22E+6	1,35E+6	1,66E-1	1,62E-1	1,60E-1	1,62E-1	1,60E-1	1,56E-1
19	1,11E+6	1,22E+6	1,73E-1	1,69E-1	1,68E-1	1,70E-1	1,68E-1	1,61E-1
20	1,00E+6	1,11E+6	1,50E-1	1,45E-1	1,44E-1	1,46E-1	1,43E-1	1,37E-1
21	9,07E+5	1,00E+6	1,51E-1	1,46E-1	1,44E-1	1,46E-1	1,44E-1	1,37E-1
22	8,21E+5	9,07E+5	1,87E-1	1,82E-1	1,81E-1	1,83E-1	1,80E-1	1,66E-1
23	6,08E+5	8,21E+5	1,85E-1	1,82E-1	1,81E-1	1,83E-1	1,81E-1	1,60E-1
24	5,50E+5	6,08E+5	1,66E-1	1,64E-1	1,63E-1	1,64E-1	1,63E-1	1,42E-1
25	4,98E+5	5,50E+5	1,57E-1	1,55E-1	1,55E-1	1,55E-1	1,55E-1	1,33E-1
26	4,50E+5	4,98E+5	1,32E-1	1,30E-1	1,29E-1	1,30E-1	1,29E-1	1,12E-1
27	4,08E+5	4,50E+5	1,08E-1	1,07E-1	1,06E-1	1,07E-1	1,06E-1	9,32E-2
28	3,02E+5	4,08E+5	1,27E-1	1,26E-1	1,26E-1	1,26E-1	1,26E-1	1,08E-1
29	2,73E+5	3,02E+5	1,20E-1	1,19E-1	1,19E-1	1,19E-1	1,19E-1	1,00E-1
30	2,47E+5	2,73E+5	1,12E-1	1,12E-1	1,12E-1	1,12E-1	1,12E-1	9,36E-2
31	1,83E+5	2,47E+5	9,79E-2	9,78E-2	9,79E-2	9,79E-2	9,81E-2	8,19E-2
32	1,23E+5	1,83E+5	8,13E-2	8,16E-2	8,19E-2	8,17E-2	8,21E-2	6,83E-2
33	1,11E+5	1,23E+5	7,44E-2	7,48E-2	7,51E-2	7,49E-2	7,54E-2	6,23E-2
34	8,23E+4	1,11E+5	6,73E-2	6,79E-2	6,82E-2	6,80E-2	6,85E-2	5,66E-2
35	6,74E+4	8,23E+4	6,18E-2	6,24E-2	6,28E-2	6,25E-2	6,31E-2	5,20E-2
36	5,52E+4	6,74E+4	5,78E-2	5,86E-2	5,90E-2	5,86E-2	5,93E-2	4,88E-2
37	4,09E+4	5,52E+4	5,40E-2	5,48E-2	5,52E-2	5,48E-2	5,55E-2	4,56E-2
38	3,70E+4	4,09E+4	5,19E-2	5,27E-2	5,32E-2	5,28E-2	5,35E-2	4,38E-2
39	2,93E+4	3,70E+4	4,99E-2	5,08E-2	5,12E-2	5,08E-2	5,15E-2	4,22E-2
40	2,74E+4	2,93E+4	4,87E-2	4,96E-2	5,01E-2	4,96E-2	5,03E-2	4,11E-2
41	2,48E+4	2,74E+4	4,80E-2	4,89E-2	4,94E-2	4,90E-2	4,97E-2	4,06E-2
42	1,66E+4	2,48E+4	4,68E-2	4,78E-2	4,83E-2	4,78E-2	4,86E-2	3,95E-2
43	1,50E+4	1,66E+4	4,45E-2	4,55E-2	4,60E-2	4,55E-2	4,64E-2	3,79E-2
44	1,11E+4	1,50E+4	4,46E-2	4,58E-2	4,63E-2	4,58E-2	4,66E-2	3,78E-2
45	9,12E+3	1,11E+4	4,15E-2	4,26E-2	4,32E-2	4,26E-2	4,35E-2	3,58E-2
46	7,47E+3	9,12E+3	4,23E-2	4,35E-2	4,41E-2	4,35E-2	4,44E-2	3,61E-2
47	5,53E+3	7,47E+3	4,18E-2	4,31E-2	4,36E-2	4,30E-2	4,40E-2	3,57E-2
48	5,00E+3	5,53E+3	4,05E-2	4,18E-2	4,24E-2	4,18E-2	4,28E-2	3,49E-2
49	3,53E+3	5,00E+3	4,11E-2	4,24E-2	4,30E-2	4,24E-2	4,34E-2	3,52E-2

50	3,35E+3	3,53E+3	3,75E-2	3,88E-2	3,94E-2	3,88E-2	3,97E-2	3,31E-2
51	2,25E+3	3,35E+3	4,00E-2	4,14E-2	4,20E-2	4,14E-2	4,24E-2	3,45E-2
52	2,03E+3	2,25E+3	3,91E-2	4,06E-2	4,12E-2	4,05E-2	4,16E-2	3,40E-2
53	1,51E+3	2,03E+3	3,44E-2	3,57E-2	3,63E-2	3,57E-2	3,66E-2	3,11E-2
54	1,43E+3	1,51E+3	5,63E-2	5,87E-2	5,96E-2	5,86E-2	6,01E-2	4,48E-2
55	1,23E+3	1,43E+3	3,93E-2	4,10E-2	4,16E-2	4,09E-2	4,20E-2	3,40E-2
56	1,01E+3	1,23E+3	3,82E-2	3,99E-2	4,06E-2	3,98E-2	4,10E-2	3,35E-2
57	9,14E+2	1,01E+3	3,86E-2	4,03E-2	4,10E-2	4,02E-2	4,13E-2	3,36E-2
58	7,49E+2	9,14E+2	3,78E-2	3,95E-2	4,02E-2	3,94E-2	4,06E-2	3,32E-2
59	6,77E+2	7,49E+2	3,12E-2	3,26E-2	3,32E-2	3,25E-2	3,34E-2	2,91E-2
60	4,54E+2	6,77E+2	3,81E-2	4,00E-2	4,07E-2	3,98E-2	4,10E-2	3,35E-2
61	3,72E+2	4,54E+2	3,71E-2	3,90E-2	3,97E-2	3,89E-2	4,00E-2	3,29E-2
62	3,04E+2	3,72E+2	3,49E-2	3,66E-2	3,73E-2	3,65E-2	3,76E-2	3,16E-2
63	2,04E+2	3,04E+2	3,46E-2	3,64E-2	3,70E-2	3,62E-2	3,73E-2	3,14E-2
64	1,49E+2	2,04E+2	3,33E-2	3,51E-2	3,57E-2	3,50E-2	3,60E-2	3,07E-2
65	1,37E+2	1,49E+2	3,44E-2	3,64E-2	3,70E-2	3,62E-2	3,72E-2	3,15E-2
66	9,17E+1	1,37E+2	3,29E-2	3,48E-2	3,54E-2	3,46E-2	3,57E-2	3,06E-2
67	7,57E+1	9,17E+1	3,29E-2	3,48E-2	3,54E-2	3,46E-2	3,55E-2	3,06E-2
68	6,79E+1	7,57E+1	2,92E-2	3,09E-2	3,15E-2	3,07E-2	3,18E-2	2,85E-2
69	5,56E+1	6,79E+1	2,98E-2	3,16E-2	3,22E-2	3,14E-2	3,24E-2	2,89E-2
70	5,16E+1	5,56E+1	3,09E-2	3,28E-2	3,33E-2	3,26E-2	3,35E-2	2,96E-2
71	4,83E+1	5,16E+1	3,16E-2	3,35E-2	3,39E-2	3,32E-2	3,40E-2	2,99E-2
72	4,55E+1	4,83E+1	3,21E-2	3,41E-2	3,47E-2	3,39E-2	3,49E-2	3,03E-2
73	4,02E+1	4,55E+1	3,07E-2	3,26E-2	3,31E-2	3,23E-2	3,33E-2	2,95E-2
74	3,73E+1	4,02E+1	3,10E-2	3,30E-2	3,37E-2	3,28E-2	3,39E-2	2,97E-2
75	3,37E+1	3,73E+1	3,23E-2	3,44E-2	3,50E-2	3,41E-2	3,52E-2	3,05E-2
76	3,05E+1	3,37E+1	3,24E-2	3,43E-2	3,46E-2	3,39E-2	3,45E-2	3,03E-2
77	2,76E+1	3,05E+1	3,23E-2	3,44E-2	3,48E-2	3,40E-2	3,49E-2	3,04E-2
78	2,50E+1	2,76E+1	3,12E-2	3,33E-2	3,39E-2	3,30E-2	3,40E-2	2,98E-2
79	2,26E+1	2,50E+1	2,50E-2	2,66E-2	2,70E-2	2,64E-2	2,72E-2	2,60E-2
80	1,95E+1	2,26E+1	2,51E-2	2,64E-2	2,64E-2	2,60E-2	2,61E-2	2,58E-2
81	1,59E+1	1,95E+1	2,86E-2	3,04E-2	3,06E-2	3,00E-2	3,05E-2	2,82E-2
82	1,37E+1	1,59E+1	2,65E-2	2,82E-2	2,86E-2	2,79E-2	2,87E-2	2,71E-2
83	1,12E+1	1,37E+1	2,77E-2	2,95E-2	3,00E-2	2,93E-2	3,01E-2	2,79E-2
84	9,91E+0	1,12E+1	2,60E-2	2,78E-2	2,83E-2	2,76E-2	2,84E-2	2,69E-2
85	9,19E+0	9,91E+0	2,83E-2	3,03E-2	3,09E-2	3,00E-2	3,11E-2	2,84E-2
86	8,32E+0	9,19E+0	2,83E-2	3,03E-2	3,09E-2	3,01E-2	3,11E-2	2,84E-2
87	7,52E+0	8,32E+0	2,53E-2	2,71E-2	2,74E-2	2,68E-2	2,75E-2	2,64E-2
88	6,16E+0	7,52E+0	2,74E-2	2,93E-2	2,95E-2	2,89E-2	2,94E-2	2,77E-2
89	5,35E+0	6,16E+0	2,77E-2	2,97E-2	3,01E-2	2,93E-2	3,02E-2	2,79E-2
90	5,04E+0	5,35E+0	2,81E-2	3,01E-2	3,07E-2	2,98E-2	3,08E-2	2,83E-2
91	4,13E+0	5,04E+0	2,70E-2	2,91E-2	2,96E-2	2,88E-2	2,98E-2	2,76E-2
92	4,00E+0	4,13E+0	2,75E-2	2,96E-2	3,02E-2	2,93E-2	3,03E-2	2,80E-2
93	3,38E+0	4,00E+0	2,88E-2	3,11E-2	3,16E-2	3,07E-2	3,18E-2	2,91E-2
94	3,30E+0	3,38E+0	2,89E-2	3,11E-2	3,17E-2	3,08E-2	3,18E-2	2,92E-2
95	2,77E+0	3,30E+0	2,84E-2	3,05E-2	3,07E-2	3,00E-2	3,05E-2	2,87E-2
96	2,72E+0	2,77E+0	2,52E-2	2,69E-2	2,67E-2	2,63E-2	2,62E-2	2,65E-2
97	2,60E+0	2,72E+0	2,05E-2	2,16E-2	2,12E-2	2,10E-2	2,07E-2	2,32E-2
98	2,55E+0	2,60E+0	2,51E-2	2,58E-2	2,44E-2	2,47E-2	2,32E-2	2,57E-2
99	2,36E+0	2,55E+0	2,73E-2	2,85E-2	2,76E-2	2,75E-2	2,66E-2	2,75E-2
100	2,13E+0	2,36E+0	2,82E-2	3,01E-2	3,00E-2	2,95E-2	2,96E-2	2,87E-2

101	2,10E+0	2,13E+0	2,84E-2	3,03E-2	3,03E-2	2,97E-2	2,99E-2	2,89E-2
102	2,02E+0	2,10E+0	2,84E-2	3,03E-2	3,01E-2	2,96E-2	2,95E-2	2,88E-2
103	1,93E+0	2,02E+0	2,85E-2	3,03E-2	3,00E-2	2,96E-2	2,94E-2	2,88E-2
104	1,84E+0	1,93E+0	2,85E-2	3,06E-2	3,05E-2	2,99E-2	3,02E-2	2,91E-2
105	1,76E+0	1,84E+0	2,85E-2	3,06E-2	3,08E-2	3,01E-2	3,05E-2	2,92E-2
106	1,67E+0	1,76E+0	2,85E-2	3,06E-2	3,08E-2	3,01E-2	3,07E-2	2,92E-2
107	1,59E+0	1,67E+0	2,84E-2	3,05E-2	3,08E-2	3,00E-2	3,07E-2	2,92E-2
108	1,50E+0	1,59E+0	2,82E-2	3,04E-2	3,07E-2	2,99E-2	3,06E-2	2,92E-2
109	1,48E+0	1,50E+0	2,80E-2	3,02E-2	3,05E-2	2,97E-2	3,04E-2	2,92E-2
110	1,44E+0	1,48E+0	2,79E-2	3,01E-2	3,04E-2	2,96E-2	3,03E-2	2,91E-2
111	1,37E+0	1,44E+0	2,75E-2	2,97E-2	3,00E-2	2,92E-2	2,99E-2	2,89E-2
112	1,34E+0	1,37E+0	2,70E-2	2,91E-2	2,94E-2	2,87E-2	2,93E-2	2,87E-2
113	1,30E+0	1,34E+0	2,64E-2	2,85E-2	2,88E-2	2,80E-2	2,87E-2	2,83E-2
114	1,24E+0	1,30E+0	2,50E-2	2,69E-2	2,72E-2	2,65E-2	2,72E-2	2,74E-2
115	1,17E+0	1,24E+0	2,17E-2	2,34E-2	2,36E-2	2,30E-2	2,36E-2	2,52E-2
116	1,15E+0	1,17E+0	1,81E-2	1,94E-2	1,96E-2	1,91E-2	1,96E-2	2,27E-2
117	1,12E+0	1,15E+0	1,48E-2	1,59E-2	1,61E-2	1,57E-2	1,61E-2	2,03E-2
118	1,11E+0	1,12E+0	1,20E-2	1,29E-2	1,30E-2	1,27E-2	1,30E-2	1,82E-2
119	1,10E+0	1,11E+0	1,05E-2	1,13E-2	1,14E-2	1,11E-2	1,14E-2	1,71E-2
120	1,07E+0	1,10E+0	9,22E-3	9,89E-3	9,99E-3	9,75E-3	9,98E-3	1,61E-2
121	1,05E+0	1,07E+0	8,70E-3	9,33E-3	9,42E-3	9,20E-3	9,41E-3	1,57E-2
122	1,04E+0	1,05E+0	8,69E-3	9,32E-3	9,42E-3	9,19E-3	9,41E-3	1,57E-2
123	1,02E+0	1,04E+0	8,90E-3	9,55E-3	9,65E-3	9,42E-3	9,64E-3	1,59E-2
124	9,96E-1	1,02E+0	9,75E-3	1,05E-2	1,06E-2	1,03E-2	1,06E-2	1,66E-2
125	9,86E-1	9,96E-1	1,13E-2	1,21E-2	1,23E-2	1,19E-2	1,22E-2	1,78E-2
126	9,72E-1	9,86E-1	1,26E-2	1,35E-2	1,36E-2	1,33E-2	1,36E-2	1,88E-2
127	9,50E-1	9,72E-1	1,44E-2	1,54E-2	1,56E-2	1,52E-2	1,56E-2	2,03E-2
128	9,30E-1	9,50E-1	1,62E-2	1,74E-2	1,76E-2	1,71E-2	1,76E-2	2,17E-2
129	9,10E-1	9,30E-1	1,76E-2	1,90E-2	1,92E-2	1,87E-2	1,91E-2	2,28E-2
130	8,60E-1	9,10E-1	1,95E-2	2,10E-2	2,12E-2	2,07E-2	2,11E-2	2,43E-2
131	8,50E-1	8,60E-1	2,08E-2	2,24E-2	2,26E-2	2,20E-2	2,25E-2	2,53E-2
132	7,90E-1	8,50E-1	2,19E-2	2,35E-2	2,37E-2	2,32E-2	2,36E-2	2,61E-2
133	7,80E-1	7,90E-1	2,27E-2	2,44E-2	2,46E-2	2,40E-2	2,45E-2	2,68E-2
134	7,05E-1	7,80E-1	2,33E-2	2,51E-2	2,53E-2	2,47E-2	2,51E-2	2,73E-2
135	6,25E-1	7,05E-1	2,41E-2	2,59E-2	2,60E-2	2,54E-2	2,58E-2	2,81E-2
136	5,40E-1	6,25E-1	2,41E-2	2,59E-2	2,59E-2	2,53E-2	2,56E-2	2,84E-2
137	5,00E-1	5,40E-1	2,34E-2	2,51E-2	2,50E-2	2,46E-2	2,46E-2	2,82E-2
138	4,85E-1	5,00E-1	2,27E-2	2,44E-2	2,42E-2	2,38E-2	2,38E-2	2,79E-2
139	4,33E-1	4,85E-1	2,15E-2	2,29E-2	2,28E-2	2,24E-2	2,23E-2	2,73E-2
140	4,00E-1	4,33E-1	1,92E-2	2,05E-2	2,03E-2	2,00E-2	1,99E-2	2,62E-2
141	3,91E-1	4,00E-1	1,76E-2	1,87E-2	1,86E-2	1,83E-2	1,82E-2	2,53E-2
142	3,50E-1	3,91E-1	1,52E-2	1,62E-2	1,60E-2	1,58E-2	1,57E-2	2,40E-2
143	3,20E-1	3,50E-1	1,22E-2	1,30E-2	1,29E-2	1,27E-2	1,27E-2	2,26E-2
144	3,15E-1	3,20E-1	1,12E-2	1,19E-2	1,18E-2	1,16E-2	1,16E-2	2,25E-2
145	3,00E-1	3,15E-1	1,09E-2	1,15E-2	1,14E-2	1,13E-2	1,13E-2	2,27E-2
146	2,80E-1	3,00E-1	1,08E-2	1,13E-2	1,12E-2	1,11E-2	1,11E-2	2,36E-2
147	2,48E-1	2,80E-1	1,16E-2	1,20E-2	1,18E-2	1,17E-2	1,16E-2	2,65E-2
148	2,20E-1	2,48E-1	1,37E-2	1,38E-2	1,34E-2	1,35E-2	1,30E-2	3,18E-2
149	1,89E-1	2,20E-1	1,66E-2	1,61E-2	1,52E-2	1,57E-2	1,45E-2	3,90E-2
150	1,80E-1	1,89E-1	1,87E-2	1,75E-2	1,62E-2	1,70E-2	1,54E-2	4,45E-2
151	1,60E-1	1,80E-1	2,02E-2	1,83E-2	1,67E-2	1,78E-2	1,58E-2	4,87E-2

152	1,40E-1	1,60E-1	2,20E-2	1,90E-2	1,70E-2	1,86E-2	1,61E-2	5,43E-2
153	1,34E-1	1,40E-1	2,28E-2	1,91E-2	1,70E-2	1,89E-2	1,61E-2	5,75E-2
154	1,15E-1	1,34E-1	2,33E-2	1,88E-2	1,66E-2	1,88E-2	1,58E-2	5,98E-2
155	1,00E-1	1,15E-1	2,34E-2	1,80E-2	1,59E-2	1,82E-2	1,52E-2	6,16E-2
156	9,50E-2	1,00E-1	2,29E-2	1,71E-2	1,52E-2	1,76E-2	1,46E-2	6,14E-2
157	8,00E-2	9,50E-2	2,20E-2	1,59E-2	1,43E-2	1,67E-2	1,38E-2	6,01E-2
158	7,70E-2	8,00E-2	2,10E-2	1,48E-2	1,34E-2	1,58E-2	1,30E-2	5,83E-2
159	6,70E-2	7,70E-2	1,98E-2	1,37E-2	1,25E-2	1,48E-2	1,21E-2	5,55E-2
160	5,80E-2	6,70E-2	1,76E-2	1,20E-2	1,10E-2	1,31E-2	1,07E-2	5,05E-2
161	5,00E-2	5,80E-2	1,53E-2	1,03E-2	9,54E-3	1,13E-2	9,28E-3	4,47E-2
162	4,20E-2	5,00E-2	1,28E-2	8,56E-3	7,96E-3	9,46E-3	7,76E-3	3,81E-2
163	3,50E-2	4,20E-2	1,02E-2	6,83E-3	6,37E-3	7,57E-3	6,22E-3	3,10E-2
164	3,00E-2	3,50E-2	8,10E-3	5,41E-3	5,06E-3	6,00E-3	4,94E-3	2,50E-2
165	2,50E-2	3,00E-2	6,29E-3	4,22E-3	3,96E-3	4,68E-3	3,87E-3	1,97E-2
166	2,00E-2	2,50E-2	4,56E-3	3,08E-3	2,89E-3	3,41E-3	2,83E-3	1,45E-2
167	1,50E-2	2,00E-2	2,97E-3	2,03E-3	1,91E-3	2,24E-3	1,87E-3	9,63E-3
168	1,00E-2	1,50E-2	1,61E-3	1,12E-3	1,06E-3	1,23E-3	1,04E-3	5,36E-3
169	6,90E-3	1,00E-2	7,78E-4	5,50E-4	5,21E-4	6,01E-4	5,10E-4	2,65E-3
170	5,00E-3	6,90E-3	3,96E-4	2,85E-4	2,70E-4	3,10E-4	2,65E-4	1,38E-3
171	3,00E-3	5,00E-3	1,78E-4	1,31E-4	1,24E-4	1,41E-4	1,22E-4	6,33E-4
172	1,10E-3	3,00E-3	1,54E-5	1,17E-5	1,12E-5	1,25E-5	1,10E-5	5,68E-5

Table1b : Flux/lethargy[cm²,s] and energy structure EOC 45000MWd/t

Group	Ei-1 [eV]	Ei [eV]	EOC FU	EOC BP-1	EOC BP-2	EOC BP-3	EOC BP-4	EOC GT
1	1,73E+7	1,96E+7	1,30E-5	1,30E-5	1,30E-5	1,30E-5	1,29E-5	1,50E-5
2	1,49E+7	1,73E+7	5,36E-5	5,37E-5	5,37E-5	5,37E-5	5,39E-5	6,14E-5
3	1,38E+7	1,49E+7	1,58E-4	1,58E-4	1,58E-4	1,58E-4	1,59E-4	1,78E-4
4	1,16E+7	1,38E+7	4,98E-4	4,99E-4	4,99E-4	4,99E-4	5,04E-4	5,54E-4
5	1,00E+7	1,16E+7	1,64E-3	1,65E-3	1,65E-3	1,65E-3	1,67E-3	1,81E-3
6	8,19E+6	1,00E+7	4,82E-3	4,83E-3	4,83E-3	4,83E-3	4,90E-3	5,23E-3
7	6,70E+6	8,19E+6	1,23E-2	1,24E-2	1,24E-2	1,24E-2	1,26E-2	1,32E-2
8	6,07E+6	6,70E+6	2,23E-2	2,23E-2	2,23E-2	2,23E-2	2,27E-2	2,38E-2
9	5,49E+6	6,07E+6	3,00E-2	3,01E-2	3,01E-2	3,01E-2	3,07E-2	3,17E-2
10	4,49E+6	5,49E+6	4,49E-2	4,50E-2	4,50E-2	4,50E-2	4,59E-2	4,70E-2
11	3,68E+6	4,49E+6	6,20E-2	6,21E-2	6,21E-2	6,22E-2	6,35E-2	6,39E-2
12	3,01E+6	3,68E+6	8,76E-2	8,77E-2	8,77E-2	8,79E-2	8,97E-2	8,86E-2
13	2,47E+6	3,01E+6	1,21E-1	1,21E-1	1,21E-1	1,21E-1	1,24E-1	1,19E-1
14	2,23E+6	2,47E+6	1,42E-1	1,42E-1	1,42E-1	1,42E-1	1,45E-1	1,37E-1
15	2,02E+6	2,23E+6	1,37E-1	1,38E-1	1,38E-1	1,38E-1	1,40E-1	1,30E-1
16	1,65E+6	2,02E+6	1,47E-1	1,47E-1	1,47E-1	1,47E-1	1,50E-1	1,36E-1
17	1,35E+6	1,65E+6	1,59E-1	1,59E-1	1,59E-1	1,59E-1	1,62E-1	1,43E-1
18	1,22E+6	1,35E+6	1,51E-1	1,51E-1	1,51E-1	1,52E-1	1,54E-1	1,35E-1
19	1,11E+6	1,22E+6	1,59E-1	1,59E-1	1,59E-1	1,59E-1	1,62E-1	1,39E-1
20	1,00E+6	1,11E+6	1,36E-1	1,36E-1	1,36E-1	1,36E-1	1,39E-1	1,18E-1
21	9,07E+5	1,00E+6	1,37E-1	1,37E-1	1,37E-1	1,37E-1	1,40E-1	1,19E-1
22	8,21E+5	9,07E+5	1,71E-1	1,71E-1	1,71E-1	1,72E-1	1,74E-1	1,44E-1
23	6,08E+5	8,21E+5	1,72E-1	1,72E-1	1,72E-1	1,72E-1	1,75E-1	1,39E-1

24	5,50E+5	6,08E+5	1,55E-1	1,55E-1	1,55E-1	1,55E-1	1,57E-1	1,24E-1
25	4,98E+5	5,50E+5	1,46E-1	1,46E-1	1,46E-1	1,47E-1	1,49E-1	1,16E-1
26	4,50E+5	4,98E+5	1,22E-1	1,23E-1	1,23E-1	1,23E-1	1,25E-1	9,81E-2
27	4,08E+5	4,50E+5	1,00E-1	1,01E-1	1,01E-1	1,01E-1	1,02E-1	8,13E-2
28	3,02E+5	4,08E+5	1,19E-1	1,19E-1	1,19E-1	1,19E-1	1,21E-1	9,44E-2
29	2,73E+5	3,02E+5	1,12E-1	1,12E-1	1,12E-1	1,12E-1	1,14E-1	8,78E-2
30	2,47E+5	2,73E+5	1,05E-1	1,05E-1	1,05E-1	1,06E-1	1,07E-1	8,22E-2
31	1,83E+5	2,47E+5	9,23E-2	9,24E-2	9,24E-2	9,26E-2	9,38E-2	7,20E-2
32	1,23E+5	1,83E+5	7,71E-2	7,72E-2	7,72E-2	7,73E-2	7,83E-2	6,01E-2
33	1,11E+5	1,23E+5	7,07E-2	7,08E-2	7,08E-2	7,09E-2	7,18E-2	5,49E-2
34	8,23E+4	1,11E+5	6,41E-2	6,42E-2	6,42E-2	6,43E-2	6,51E-2	5,00E-2
35	6,74E+4	8,23E+4	5,90E-2	5,91E-2	5,91E-2	5,92E-2	5,99E-2	4,59E-2
36	5,52E+4	6,74E+4	5,54E-2	5,55E-2	5,55E-2	5,56E-2	5,62E-2	4,31E-2
37	4,09E+4	5,52E+4	5,18E-2	5,19E-2	5,19E-2	5,20E-2	5,26E-2	4,03E-2
38	3,70E+4	4,09E+4	4,99E-2	5,00E-2	5,00E-2	5,01E-2	5,06E-2	3,88E-2
39	2,93E+4	3,70E+4	4,80E-2	4,81E-2	4,81E-2	4,82E-2	4,87E-2	3,74E-2
40	2,74E+4	2,93E+4	4,69E-2	4,71E-2	4,71E-2	4,71E-2	4,76E-2	3,65E-2
41	2,48E+4	2,74E+4	4,63E-2	4,64E-2	4,64E-2	4,65E-2	4,70E-2	3,60E-2
42	1,66E+4	2,48E+4	4,53E-2	4,53E-2	4,53E-2	4,54E-2	4,59E-2	3,51E-2
43	1,50E+4	1,66E+4	4,31E-2	4,32E-2	4,32E-2	4,33E-2	4,37E-2	3,37E-2
44	1,11E+4	1,50E+4	4,34E-2	4,34E-2	4,34E-2	4,35E-2	4,40E-2	3,36E-2
45	9,12E+3	1,11E+4	4,04E-2	4,05E-2	4,05E-2	4,05E-2	4,09E-2	3,18E-2
46	7,47E+3	9,12E+3	4,12E-2	4,13E-2	4,13E-2	4,14E-2	4,18E-2	3,21E-2
47	5,53E+3	7,47E+3	4,08E-2	4,09E-2	4,09E-2	4,10E-2	4,14E-2	3,18E-2
48	5,00E+3	5,53E+3	3,97E-2	3,97E-2	3,97E-2	3,98E-2	4,02E-2	3,11E-2
49	3,53E+3	5,00E+3	4,03E-2	4,04E-2	4,04E-2	4,04E-2	4,08E-2	3,14E-2
50	3,35E+3	3,53E+3	3,68E-2	3,69E-2	3,69E-2	3,69E-2	3,73E-2	2,95E-2
51	2,25E+3	3,35E+3	3,94E-2	3,94E-2	3,94E-2	3,95E-2	3,98E-2	3,08E-2
52	2,03E+3	2,25E+3	3,85E-2	3,86E-2	3,86E-2	3,87E-2	3,90E-2	3,04E-2
53	1,51E+3	2,03E+3	3,40E-2	3,40E-2	3,40E-2	3,41E-2	3,44E-2	2,79E-2
54	1,43E+3	1,51E+3	5,58E-2	5,59E-2	5,59E-2	5,60E-2	5,64E-2	4,01E-2
55	1,23E+3	1,43E+3	3,90E-2	3,91E-2	3,91E-2	3,91E-2	3,93E-2	3,05E-2
56	1,01E+3	1,23E+3	3,80E-2	3,81E-2	3,81E-2	3,81E-2	3,85E-2	3,00E-2
57	9,14E+2	1,01E+3	3,85E-2	3,85E-2	3,85E-2	3,85E-2	3,87E-2	3,02E-2
58	7,49E+2	9,14E+2	3,77E-2	3,77E-2	3,77E-2	3,78E-2	3,81E-2	2,98E-2
59	6,77E+2	7,49E+2	3,11E-2	3,11E-2	3,11E-2	3,11E-2	3,13E-2	2,61E-2
60	4,54E+2	6,77E+2	3,82E-2	3,83E-2	3,83E-2	3,83E-2	3,85E-2	3,02E-2
61	3,72E+2	4,54E+2	3,72E-2	3,73E-2	3,73E-2	3,73E-2	3,75E-2	2,96E-2
62	3,04E+2	3,72E+2	3,51E-2	3,51E-2	3,51E-2	3,51E-2	3,53E-2	2,85E-2
63	2,04E+2	3,04E+2	3,52E-2	3,52E-2	3,52E-2	3,52E-2	3,54E-2	2,86E-2
64	1,49E+2	2,04E+2	3,38E-2	3,38E-2	3,38E-2	3,38E-2	3,39E-2	2,79E-2
65	1,37E+2	1,49E+2	3,51E-2	3,52E-2	3,52E-2	3,52E-2	3,53E-2	2,87E-2
66	9,17E+1	1,37E+2	3,37E-2	3,37E-2	3,37E-2	3,37E-2	3,38E-2	2,79E-2
67	7,57E+1	9,17E+1	3,42E-2	3,41E-2	3,41E-2	3,41E-2	3,38E-2	2,81E-2
68	6,79E+1	7,57E+1	3,06E-2	3,06E-2	3,06E-2	3,06E-2	3,05E-2	2,63E-2
69	5,56E+1	6,79E+1	3,16E-2	3,16E-2	3,16E-2	3,16E-2	3,16E-2	2,69E-2
70	5,16E+1	5,56E+1	3,27E-2	3,27E-2	3,27E-2	3,27E-2	3,27E-2	2,75E-2
71	4,83E+1	5,16E+1	3,30E-2	3,30E-2	3,30E-2	3,30E-2	3,31E-2	2,78E-2
72	4,55E+1	4,83E+1	3,33E-2	3,33E-2	3,33E-2	3,33E-2	3,33E-2	2,79E-2
73	4,02E+1	4,55E+1	3,21E-2	3,21E-2	3,21E-2	3,21E-2	3,21E-2	2,72E-2
74	3,73E+1	4,02E+1	3,20E-2	3,20E-2	3,20E-2	3,20E-2	3,20E-2	2,71E-2

75	3,37E+1	3,73E+1	3,32E-2	3,32E-2	3,32E-2	3,32E-2	3,33E-2	2,79E-2
76	3,05E+1	3,37E+1	3,29E-2	3,26E-2	3,26E-2	3,24E-2	3,17E-2	2,73E-2
77	2,76E+1	3,05E+1	3,31E-2	3,31E-2	3,31E-2	3,30E-2	3,29E-2	2,78E-2
78	2,50E+1	2,76E+1	3,28E-2	3,28E-2	3,28E-2	3,27E-2	3,26E-2	2,76E-2
79	2,26E+1	2,50E+1	2,58E-2	2,58E-2	2,58E-2	2,58E-2	2,58E-2	2,38E-2
80	1,95E+1	2,26E+1	2,60E-2	2,59E-2	2,59E-2	2,57E-2	2,52E-2	2,38E-2
81	1,59E+1	1,95E+1	3,00E-2	3,00E-2	3,00E-2	3,00E-2	2,98E-2	2,64E-2
82	1,37E+1	1,59E+1	2,83E-2	2,82E-2	2,82E-2	2,82E-2	2,80E-2	2,54E-2
83	1,12E+1	1,37E+1	2,98E-2	2,98E-2	2,98E-2	2,97E-2	2,95E-2	2,63E-2
84	9,91E+0	1,12E+1	2,92E-2	2,91E-2	2,91E-2	2,90E-2	2,86E-2	2,61E-2
85	9,19E+0	9,91E+0	3,02E-2	3,01E-2	3,01E-2	3,01E-2	2,99E-2	2,65E-2
86	8,32E+0	9,19E+0	2,99E-2	2,99E-2	2,99E-2	2,98E-2	2,97E-2	2,63E-2
87	7,52E+0	8,32E+0	2,73E-2	2,73E-2	2,73E-2	2,73E-2	2,71E-2	2,49E-2
88	6,16E+0	7,52E+0	2,86E-2	2,86E-2	2,86E-2	2,85E-2	2,84E-2	2,58E-2
89	5,35E+0	6,16E+0	2,66E-2	2,65E-2	2,65E-2	2,65E-2	2,65E-2	2,45E-2
90	5,04E+0	5,35E+0	2,53E-2	2,53E-2	2,53E-2	2,53E-2	2,55E-2	2,40E-2
91	4,13E+0	5,04E+0	2,75E-2	2,75E-2	2,75E-2	2,75E-2	2,74E-2	2,52E-2
92	4,00E+0	4,13E+0	2,82E-2	2,82E-2	2,82E-2	2,82E-2	2,80E-2	2,56E-2
93	3,38E+0	4,00E+0	2,94E-2	2,94E-2	2,94E-2	2,93E-2	2,92E-2	2,66E-2
94	3,30E+0	3,38E+0	2,93E-2	2,92E-2	2,92E-2	2,92E-2	2,91E-2	2,65E-2
95	2,77E+0	3,30E+0	2,92E-2	2,91E-2	2,91E-2	2,91E-2	2,90E-2	2,65E-2
96	2,72E+0	2,77E+0	2,46E-2	2,46E-2	2,46E-2	2,46E-2	2,47E-2	2,36E-2
97	2,60E+0	2,72E+0	1,86E-2	1,86E-2	1,86E-2	1,86E-2	1,89E-2	1,99E-2
98	2,55E+0	2,60E+0	2,42E-2	2,42E-2	2,42E-2	2,42E-2	2,43E-2	2,37E-2
99	2,36E+0	2,55E+0	2,70E-2	2,70E-2	2,70E-2	2,70E-2	2,70E-2	2,55E-2
100	2,13E+0	2,36E+0	2,73E-2	2,72E-2	2,72E-2	2,72E-2	2,72E-2	2,59E-2
101	2,10E+0	2,13E+0	2,80E-2	2,80E-2	2,80E-2	2,80E-2	2,79E-2	2,63E-2
102	2,02E+0	2,10E+0	2,81E-2	2,81E-2	2,81E-2	2,80E-2	2,80E-2	2,64E-2
103	1,93E+0	2,02E+0	2,78E-2	2,77E-2	2,77E-2	2,77E-2	2,77E-2	2,63E-2
104	1,84E+0	1,93E+0	2,72E-2	2,71E-2	2,71E-2	2,71E-2	2,71E-2	2,61E-2
105	1,76E+0	1,84E+0	2,64E-2	2,64E-2	2,64E-2	2,63E-2	2,64E-2	2,58E-2
106	1,67E+0	1,76E+0	2,61E-2	2,61E-2	2,61E-2	2,61E-2	2,62E-2	2,56E-2
107	1,59E+0	1,67E+0	2,67E-2	2,67E-2	2,67E-2	2,67E-2	2,67E-2	2,59E-2
108	1,50E+0	1,59E+0	2,69E-2	2,69E-2	2,69E-2	2,69E-2	2,69E-2	2,60E-2
109	1,48E+0	1,50E+0	2,67E-2	2,67E-2	2,67E-2	2,67E-2	2,67E-2	2,59E-2
110	1,44E+0	1,48E+0	2,64E-2	2,64E-2	2,64E-2	2,63E-2	2,64E-2	2,58E-2
111	1,37E+0	1,44E+0	2,48E-2	2,48E-2	2,48E-2	2,48E-2	2,49E-2	2,50E-2
112	1,34E+0	1,37E+0	2,25E-2	2,24E-2	2,24E-2	2,24E-2	2,27E-2	2,38E-2
113	1,30E+0	1,34E+0	2,23E-2	2,23E-2	2,23E-2	2,23E-2	2,24E-2	2,36E-2
114	1,24E+0	1,30E+0	2,12E-2	2,12E-2	2,12E-2	2,12E-2	2,12E-2	2,28E-2
115	1,17E+0	1,24E+0	2,00E-2	2,00E-2	2,00E-2	2,00E-2	1,99E-2	2,17E-2
116	1,15E+0	1,17E+0	1,74E-2	1,74E-2	1,74E-2	1,74E-2	1,74E-2	1,99E-2
117	1,12E+0	1,15E+0	1,47E-2	1,47E-2	1,47E-2	1,47E-2	1,46E-2	1,80E-2
118	1,11E+0	1,12E+0	1,23E-2	1,23E-2	1,23E-2	1,23E-2	1,22E-2	1,64E-2
119	1,10E+0	1,11E+0	1,08E-2	1,08E-2	1,08E-2	1,09E-2	1,07E-2	1,55E-2
120	1,07E+0	1,10E+0	9,54E-3	9,54E-3	9,54E-3	9,54E-3	9,46E-3	1,47E-2
121	1,05E+0	1,07E+0	8,96E-3	8,96E-3	8,96E-3	8,96E-3	8,89E-3	1,43E-2
122	1,04E+0	1,05E+0	8,98E-3	8,98E-3	8,98E-3	8,98E-3	8,91E-3	1,43E-2
123	1,02E+0	1,04E+0	9,25E-3	9,25E-3	9,25E-3	9,25E-3	9,17E-3	1,45E-2
124	9,96E-1	1,02E+0	1,02E-2	1,02E-2	1,02E-2	1,02E-2	1,01E-2	1,51E-2
125	9,86E-1	9,96E-1	1,17E-2	1,17E-2	1,17E-2	1,17E-2	1,16E-2	1,61E-2

126	9,72E-1	9,86E-1	1,30E-2	1,30E-2	1,30E-2	1,30E-2	1,28E-2	1,70E-2
127	9,50E-1	9,72E-1	1,47E-2	1,47E-2	1,47E-2	1,47E-2	1,46E-2	1,82E-2
128	9,30E-1	9,50E-1	1,65E-2	1,65E-2	1,65E-2	1,65E-2	1,64E-2	1,95E-2
129	9,10E-1	9,30E-1	1,79E-2	1,79E-2	1,79E-2	1,79E-2	1,78E-2	2,05E-2
130	8,60E-1	9,10E-1	1,98E-2	1,98E-2	1,98E-2	1,98E-2	1,97E-2	2,19E-2
131	8,50E-1	8,60E-1	2,11E-2	2,11E-2	2,11E-2	2,11E-2	2,09E-2	2,29E-2
132	7,90E-1	8,50E-1	2,22E-2	2,22E-2	2,22E-2	2,22E-2	2,21E-2	2,37E-2
133	7,80E-1	7,90E-1	2,31E-2	2,31E-2	2,31E-2	2,31E-2	2,29E-2	2,44E-2
134	7,05E-1	7,80E-1	2,39E-2	2,38E-2	2,38E-2	2,38E-2	2,37E-2	2,51E-2
135	6,25E-1	7,05E-1	2,47E-2	2,47E-2	2,47E-2	2,47E-2	2,45E-2	2,60E-2
136	5,40E-1	6,25E-1	2,43E-2	2,42E-2	2,42E-2	2,42E-2	2,39E-2	2,64E-2
137	5,00E-1	5,40E-1	2,51E-2	2,51E-2	2,51E-2	2,51E-2	2,47E-2	2,73E-2
138	4,85E-1	5,00E-1	2,54E-2	2,53E-2	2,53E-2	2,53E-2	2,48E-2	2,77E-2
139	4,33E-1	4,85E-1	2,53E-2	2,52E-2	2,52E-2	2,52E-2	2,46E-2	2,82E-2
140	4,00E-1	4,33E-1	2,48E-2	2,47E-2	2,47E-2	2,46E-2	2,38E-2	2,89E-2
141	3,91E-1	4,00E-1	2,42E-2	2,41E-2	2,41E-2	2,40E-2	2,30E-2	2,92E-2
142	3,50E-1	3,91E-1	2,30E-2	2,28E-2	2,28E-2	2,27E-2	2,14E-2	2,96E-2
143	3,20E-1	3,50E-1	2,05E-2	2,04E-2	2,04E-2	2,03E-2	1,87E-2	3,02E-2
144	3,15E-1	3,20E-1	1,93E-2	1,92E-2	1,92E-2	1,90E-2	1,74E-2	3,08E-2
145	3,00E-1	3,15E-1	1,90E-2	1,88E-2	1,88E-2	1,87E-2	1,70E-2	3,16E-2
146	2,80E-1	3,00E-1	1,93E-2	1,91E-2	1,91E-2	1,90E-2	1,72E-2	3,40E-2
147	2,48E-1	2,80E-1	2,15E-2	2,13E-2	2,13E-2	2,11E-2	1,91E-2	4,02E-2
148	2,20E-1	2,48E-1	2,58E-2	2,56E-2	2,56E-2	2,53E-2	2,29E-2	5,10E-2
149	1,89E-1	2,20E-1	3,11E-2	3,08E-2	3,08E-2	3,06E-2	2,76E-2	6,52E-2
150	1,80E-1	1,89E-1	3,50E-2	3,46E-2	3,46E-2	3,43E-2	3,10E-2	7,63E-2
151	1,60E-1	1,80E-1	3,78E-2	3,75E-2	3,75E-2	3,71E-2	3,35E-2	8,53E-2
152	1,40E-1	1,60E-1	4,13E-2	4,09E-2	4,09E-2	4,05E-2	3,65E-2	9,73E-2
153	1,34E-1	1,40E-1	4,32E-2	4,28E-2	4,28E-2	4,24E-2	3,81E-2	1,05E-1
154	1,15E-1	1,34E-1	4,44E-2	4,39E-2	4,39E-2	4,35E-2	3,90E-2	1,10E-1
155	1,00E-1	1,15E-1	4,48E-2	4,44E-2	4,44E-2	4,39E-2	3,93E-2	1,15E-1
156	9,50E-2	1,00E-1	4,41E-2	4,37E-2	4,37E-2	4,32E-2	3,86E-2	1,15E-1
157	8,00E-2	9,50E-2	4,28E-2	4,23E-2	4,23E-2	4,18E-2	3,73E-2	1,14E-1
158	7,70E-2	8,00E-2	4,11E-2	4,06E-2	4,06E-2	4,01E-2	3,58E-2	1,11E-1
159	6,70E-2	7,70E-2	3,89E-2	3,84E-2	3,84E-2	3,79E-2	3,37E-2	1,06E-1
160	5,80E-2	6,70E-2	3,50E-2	3,46E-2	3,46E-2	3,41E-2	3,03E-2	9,70E-2
161	5,00E-2	5,80E-2	3,06E-2	3,02E-2	3,02E-2	2,98E-2	2,64E-2	8,62E-2
162	4,20E-2	5,00E-2	2,58E-2	2,54E-2	2,54E-2	2,51E-2	2,22E-2	7,35E-2
163	3,50E-2	4,20E-2	2,07E-2	2,04E-2	2,04E-2	2,02E-2	1,78E-2	6,00E-2
164	3,00E-2	3,50E-2	1,64E-2	1,62E-2	1,62E-2	1,60E-2	1,41E-2	4,82E-2
165	2,50E-2	3,00E-2	1,28E-2	1,27E-2	1,27E-2	1,25E-2	1,10E-2	3,80E-2
166	2,00E-2	2,50E-2	9,32E-3	9,19E-3	9,19E-3	9,06E-3	7,98E-3	2,79E-2
167	1,50E-2	2,00E-2	6,09E-3	6,00E-3	6,00E-3	5,92E-3	5,21E-3	1,85E-2
168	1,00E-2	1,50E-2	3,32E-3	3,27E-3	3,27E-3	3,23E-3	2,84E-3	1,02E-2
169	6,90E-3	1,00E-2	1,60E-3	1,58E-3	1,58E-3	1,55E-3	1,37E-3	5,02E-3
170	5,00E-3	6,90E-3	8,12E-4	8,01E-4	8,01E-4	7,89E-4	6,94E-4	2,59E-3
171	3,00E-3	5,00E-3	3,63E-4	3,58E-4	3,58E-4	3,53E-4	3,11E-4	1,18E-3
172	1,10E-3	3,00E-3	3,08E-5	3,04E-5	3,04E-5	2,99E-5	2,64E-5	1,03E-4

Fig. 2a :Macroscopic Nu*Fission Cross Section vs. Neutron Energy

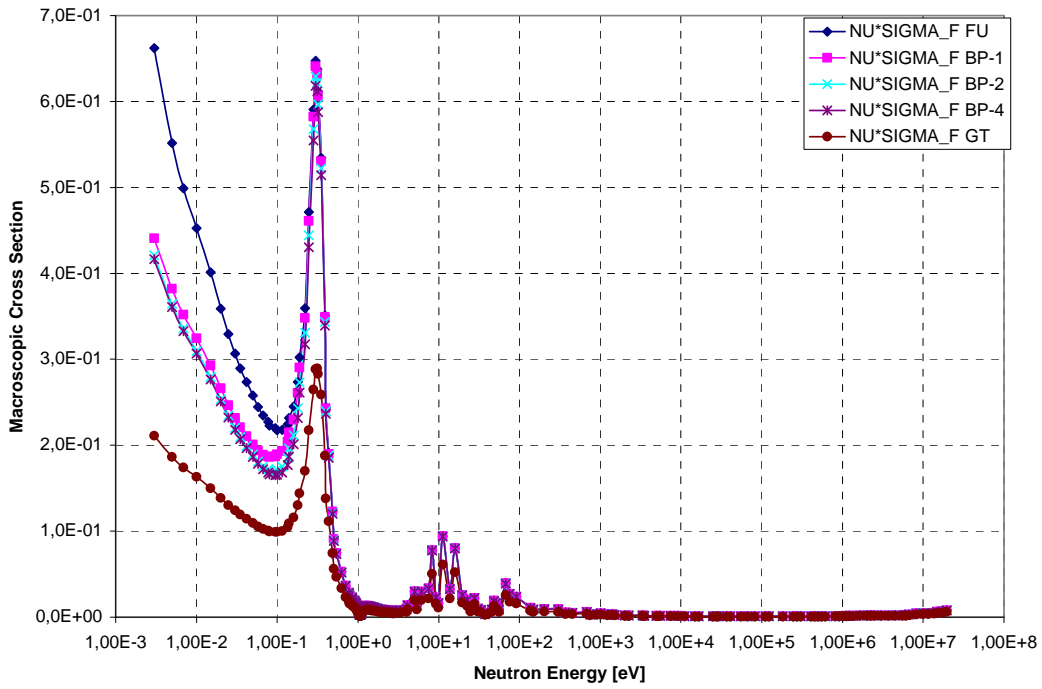


Fig. 2b : Macroscopic Fission Cross Section vs. Neutron energy

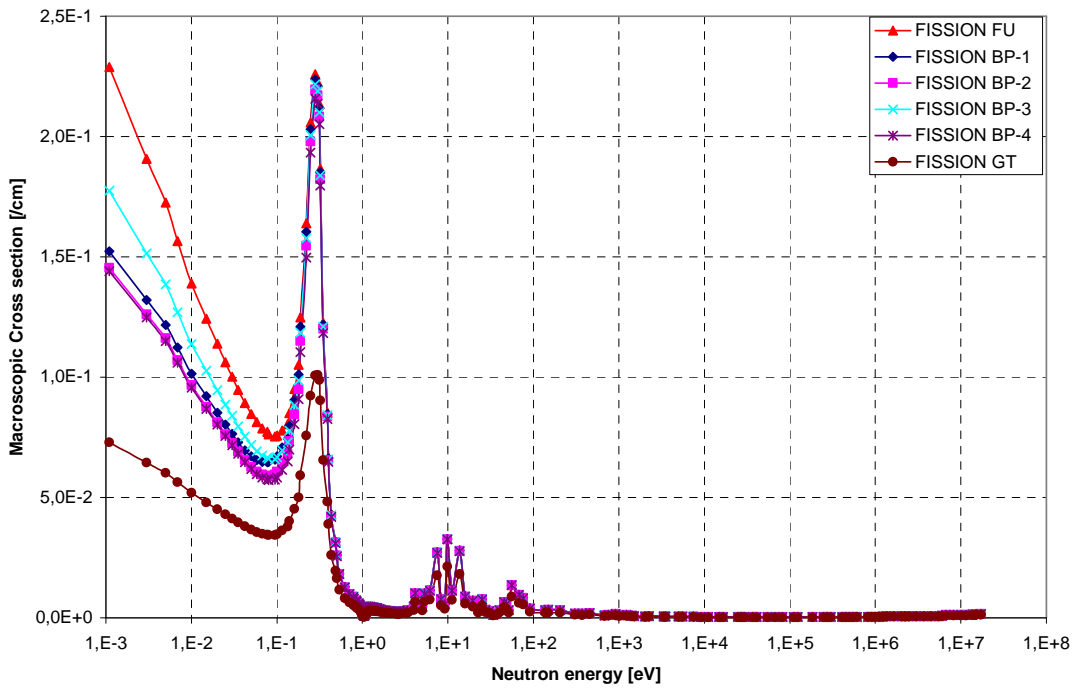


Fig. 2c : Macroscopic Capture Cross section vs. Neutron Energy

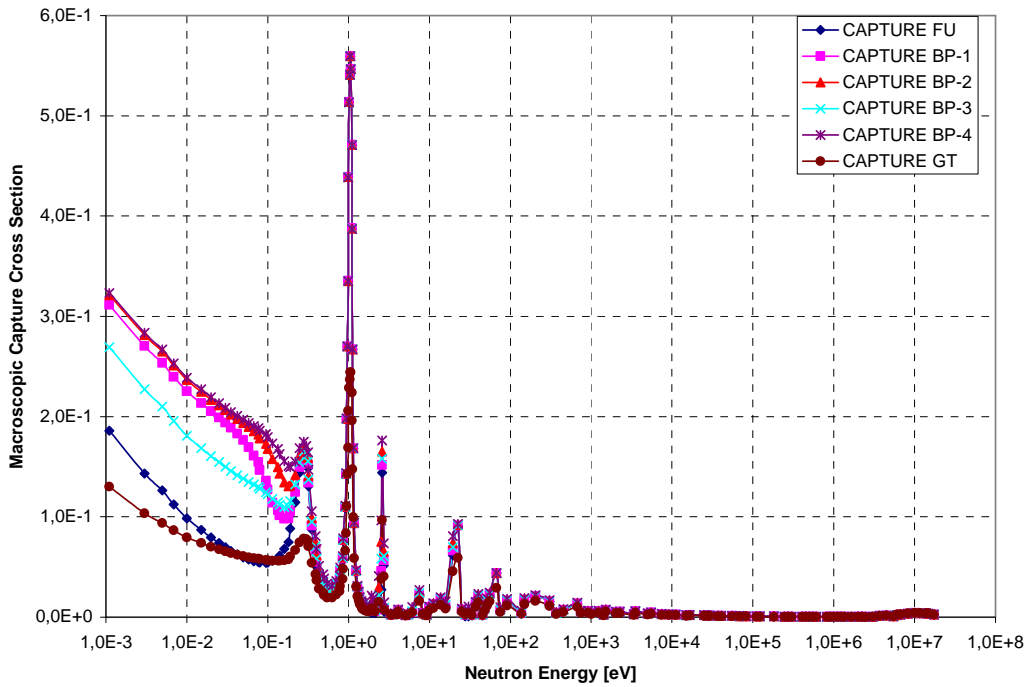


TABLE 2a : Multi-group cross sections and Energy structure FU						
Group	Ei-1 [eV]	Ei [eV]	NU*SIGMA_F FU	ABSOR FU	FISSION FU	CAPTURE FU
1	1,73E+7	1,96E+7	8,0662E-3	4,0736E-3	1,6322E-3	2,4414E-3
2	1,49E+7	1,73E+7	7,0676E-3	5,0119E-3	1,5309E-3	3,4810E-3
3	1,38E+7	1,49E+7	6,2289E-3	5,1688E-3	1,4072E-3	3,7616E-3
4	1,16E+7	1,38E+7	5,1382E-3	5,2263E-3	1,2264E-3	3,9999E-3
5	1,00E+7	1,16E+7	4,6120E-3	5,2805E-3	1,1720E-3	4,1085E-3
6	8,19E+6	1,00E+7	4,4370E-3	4,5746E-3	1,2166E-3	3,3580E-3
7	6,70E+6	8,19E+6	4,2815E-3	3,8996E-3	1,2702E-3	2,6294E-3
8	6,07E+6	6,70E+6	3,0468E-3	3,1770E-3	9,2331E-4	2,2537E-3
9	5,49E+6	6,07E+6	2,3436E-3	1,5141E-3	7,1319E-4	8,0091E-4
10	4,49E+6	5,49E+6	2,2665E-3	2,2616E-3	7,2026E-4	1,5413E-3
11	3,68E+6	4,49E+6	2,2241E-3	1,9312E-3	7,3588E-4	1,1953E-3
12	3,01E+6	3,68E+6	2,1614E-3	9,8790E-4	7,3631E-4	2,5159E-4
13	2,47E+6	3,01E+6	2,0565E-3	9,5708E-4	7,1342E-4	2,4366E-4
14	2,23E+6	2,47E+6	2,0330E-3	9,9112E-4	7,1766E-4	2,7346E-4
15	2,02E+6	2,23E+6	2,0532E-3	1,0290E-3	7,3208E-4	2,9692E-4
16	1,65E+6	2,02E+6	1,9073E-3	9,8942E-4	6,7521E-4	3,1421E-4
17	1,35E+6	1,65E+6	1,7791E-3	9,8478E-4	6,3429E-4	3,5049E-4
18	1,22E+6	1,35E+6	1,3905E-3	8,6017E-4	4,6370E-4	3,9647E-4
19	1,11E+6	1,22E+6	1,2939E-3	8,5794E-4	4,2725E-4	4,3069E-4
20	1,00E+6	1,11E+6	1,2591E-3	8,8582E-4	4,1825E-4	4,6757E-4
21	9,07E+5	1,00E+6	1,2178E-3	9,3009E-4	4,0757E-4	5,2252E-4
22	8,21E+5	9,07E+5	1,1748E-3	9,5686E-4	3,9457E-4	5,6229E-4
23	6,08E+5	8,21E+5	1,0845E-3	9,4585E-4	3,6588E-4	5,7997E-4

24	5,50E+5	6,08E+5	9,9687E-4	9,2524E-4	3,3810E-4	5,8714E-4
25	4,98E+5	5,50E+5	9,5227E-4	9,0945E-4	3,2308E-4	5,8637E-4
26	4,50E+5	4,98E+5	9,2000E-4	8,9819E-4	3,1211E-4	5,8608E-4
27	4,08E+5	4,50E+5	8,9382E-4	8,8952E-4	3,0343E-4	5,8609E-4
28	3,02E+5	4,08E+5	8,6046E-4	8,8032E-4	2,9352E-4	5,8680E-4
29	2,73E+5	3,02E+5	8,4899E-4	8,8326E-4	2,9061E-4	5,9265E-4
30	2,47E+5	2,73E+5	8,4455E-4	8,8979E-4	2,8958E-4	6,0021E-4
31	1,83E+5	2,47E+5	8,3644E-4	9,1983E-4	2,8766E-4	6,3217E-4
32	1,23E+5	1,83E+5	8,3855E-4	1,0095E-3	2,8893E-4	7,2057E-4
33	1,11E+5	1,23E+5	8,5791E-4	1,0996E-3	2,9560E-4	8,0400E-4
34	8,23E+4	1,11E+5	8,7218E-4	1,1863E-3	3,0043E-4	8,8587E-4
35	6,74E+4	8,23E+4	8,9091E-4	1,3332E-3	3,0681E-4	1,0264E-3
36	5,52E+4	6,74E+4	8,9892E-4	1,4952E-3	3,0947E-4	1,1857E-3
37	4,09E+4	5,52E+4	9,1489E-4	1,6076E-3	3,1301E-4	1,2946E-3
38	3,70E+4	4,09E+4	9,3289E-4	1,7370E-3	3,1832E-4	1,4187E-3
39	2,93E+4	3,70E+4	9,4158E-4	1,9121E-3	3,2129E-4	1,5908E-3
40	2,74E+4	2,93E+4	9,3673E-4	2,0870E-3	3,1962E-4	1,7674E-3
41	2,48E+4	2,74E+4	9,4574E-4	2,1972E-3	3,2268E-4	1,8745E-3
42	1,66E+4	2,48E+4	9,8493E-4	2,5521E-3	3,3817E-4	2,2139E-3
43	1,50E+4	1,66E+4	1,0399E-3	2,2081E-3	3,5955E-4	1,8486E-3
44	1,11E+4	1,50E+4	1,0718E-3	2,9610E-3	3,7071E-4	2,5903E-3
45	9,12E+3	1,11E+4	1,1158E-3	3,0868E-3	3,8608E-4	2,7007E-3
46	7,47E+3	9,12E+3	1,2766E-3	3,5174E-3	4,4186E-4	3,0755E-3
47	5,53E+3	7,47E+3	1,2822E-3	4,8592E-3	4,4370E-4	4,4155E-3
48	5,00E+3	5,53E+3	1,3867E-3	3,9591E-3	4,8004E-4	3,4791E-3
49	3,53E+3	5,00E+3	1,5572E-3	6,2121E-3	5,3919E-4	5,6729E-3
50	3,35E+3	3,53E+3	1,3627E-3	3,2795E-3	4,7237E-4	2,8071E-3
51	2,25E+3	3,35E+3	2,1047E-3	5,9482E-3	7,2928E-4	5,2189E-3
52	2,03E+3	2,25E+3	1,7487E-3	5,7699E-3	6,0631E-4	5,1636E-3
53	1,51E+3	2,03E+3	2,0940E-3	7,9137E-3	7,2706E-4	7,1866E-3
54	1,43E+3	1,51E+3	2,6599E-3	2,9453E-3	9,2047E-4	2,0248E-3
55	1,23E+3	1,43E+3	3,3636E-3	6,7818E-3	1,1647E-3	5,6171E-3
56	1,01E+3	1,23E+3	3,2078E-3	5,1443E-3	1,1101E-3	4,0342E-3
57	9,14E+2	1,01E+3	4,4572E-3	7,2445E-3	1,5423E-3	5,7022E-3
58	7,49E+2	9,14E+2	3,4775E-3	6,6632E-3	1,2031E-3	5,4601E-3
59	6,77E+2	7,49E+2	2,8238E-3	1,4239E-2	9,7453E-4	1,3264E-2
60	4,54E+2	6,77E+2	5,7575E-3	8,9009E-3	1,9984E-3	6,9025E-3
61	3,72E+2	4,54E+2	4,8851E-3	5,3186E-3	1,6923E-3	3,6263E-3
62	3,04E+2	3,72E+2	5,2154E-3	1,7294E-2	1,8090E-3	1,5485E-2
63	2,04E+2	3,04E+2	9,1475E-3	2,3405E-2	3,1734E-3	2,0232E-2
64	1,49E+2	2,04E+2	9,4838E-3	2,0140E-2	3,2853E-3	1,6855E-2
65	1,37E+2	1,49E+2	9,0427E-3	6,4702E-3	3,1405E-3	3,3297E-3
66	9,17E+1	1,37E+2	1,0998E-2	1,9772E-2	3,8194E-3	1,5953E-2
67	7,57E+1	9,17E+1	2,3841E-2	1,4180E-2	8,2580E-3	5,9220E-3
68	6,79E+1	7,57E+1	2,7231E-2	5,3569E-2	9,4721E-3	4,4097E-2
69	5,56E+1	6,79E+1	3,9403E-2	3,6026E-2	1,3631E-2	2,2395E-2
70	5,16E+1	5,56E+1	9,0711E-3	1,8239E-2	3,2153E-3	1,5024E-2
71	4,83E+1	5,16E+1	1,6558E-2	1,2392E-2	5,7626E-3	6,6294E-3
72	4,55E+1	4,83E+1	1,9033E-2	8,0339E-3	6,5340E-3	1,4999E-3

73	4,02E+1	4,55E+1	9,0189E-3	2,3852E-2	3,1914E-3	2,0661E-2
74	3,73E+1	4,02E+1	5,0664E-3	1,6432E-2	1,7355E-3	1,4697E-2
75	3,37E+1	3,73E+1	3,5936E-3	2,9082E-3	1,2380E-3	1,6702E-3
76	3,05E+1	3,37E+1	8,2904E-3	3,8622E-3	2,8461E-3	1,0161E-3
77	2,76E+1	3,05E+1	9,7822E-3	4,3720E-3	3,3393E-3	1,0327E-3
78	2,50E+1	2,76E+1	2,2197E-2	1,4917E-2	7,6993E-3	7,2177E-3
79	2,26E+1	2,50E+1	1,0184E-2	9,4378E-2	3,5083E-3	9,0870E-2
80	1,95E+1	2,26E+1	2,0522E-2	6,8937E-2	7,1624E-3	6,1775E-2
81	1,59E+1	1,95E+1	2,5731E-2	1,8294E-2	8,9243E-3	9,3697E-3
82	1,37E+1	1,59E+1	8,0586E-2	4,5616E-2	2,7918E-2	1,7698E-2
83	1,12E+1	1,37E+1	3,2682E-2	2,3659E-2	1,1379E-2	1,2280E-2
84	9,91E+0	1,12E+1	9,4014E-2	4,2669E-2	3,2728E-2	9,9410E-3
85	9,19E+0	9,91E+0	1,6366E-2	7,6736E-3	5,5923E-3	2,0813E-3
86	8,32E+0	9,19E+0	2,2761E-2	1,1643E-2	7,7752E-3	3,8678E-3
87	7,52E+0	8,32E+0	7,8027E-2	4,8915E-2	2,7233E-2	2,1682E-2
88	6,16E+0	7,52E+0	3,3433E-2	1,4365E-2	1,1443E-2	2,9220E-3
89	5,35E+0	6,16E+0	2,9752E-2	1,2099E-2	1,0165E-2	1,9340E-3
90	5,04E+0	5,35E+0	1,3515E-2	6,4320E-3	4,6275E-3	1,8045E-3
91	4,13E+0	5,04E+0	2,9915E-2	1,7541E-2	1,0221E-2	7,3200E-3
92	4,00E+0	4,13E+0	1,3704E-2	7,7896E-3	4,6940E-3	3,0956E-3
93	3,38E+0	4,00E+0	9,2085E-3	5,4078E-3	3,1630E-3	2,2448E-3
94	3,30E+0	3,38E+0	8,0033E-3	5,1614E-3	2,7541E-3	2,4073E-3
95	2,77E+0	3,30E+0	7,7984E-3	8,2266E-3	2,6872E-3	5,5394E-3
96	2,72E+0	2,77E+0	7,4787E-3	5,4313E-2	2,5807E-3	5,1732E-2
97	2,60E+0	2,72E+0	7,0080E-3	1,4633E-1	2,4212E-3	1,4391E-1
98	2,55E+0	2,60E+0	7,5457E-3	3,0236E-2	2,6052E-3	2,7631E-2
99	2,36E+0	2,55E+0	7,8121E-3	9,3240E-3	2,6983E-3	6,6257E-3
100	2,13E+0	2,36E+0	8,1328E-3	7,1013E-3	2,8118E-3	4,2895E-3
101	2,10E+0	2,13E+0	8,3357E-3	7,2419E-3	2,8839E-3	4,3580E-3
102	2,02E+0	2,10E+0	8,4211E-3	7,4257E-3	2,9143E-3	4,5114E-3
103	1,93E+0	2,02E+0	8,5476E-3	7,8036E-3	2,9596E-3	4,8440E-3
104	1,84E+0	1,93E+0	8,7693E-3	8,3938E-3	3,0378E-3	5,3560E-3
105	1,76E+0	1,84E+0	9,1997E-3	9,2422E-3	3,1874E-3	6,0548E-3
106	1,67E+0	1,76E+0	9,8770E-3	1,0431E-2	3,4213E-3	7,0097E-3
107	1,59E+0	1,67E+0	1,0574E-2	1,2021E-2	3,6623E-3	8,3587E-3
108	1,50E+0	1,59E+0	1,1204E-2	1,4443E-2	3,8810E-3	1,0562E-2
109	1,48E+0	1,50E+0	1,1599E-2	1,6741E-2	4,0185E-3	1,2723E-2
110	1,44E+0	1,48E+0	1,1815E-2	1,8393E-2	4,0938E-3	1,4299E-2
111	1,37E+0	1,44E+0	1,2172E-2	2,2438E-2	4,2184E-3	1,8220E-2
112	1,34E+0	1,37E+0	1,2532E-2	2,8136E-2	4,3440E-3	2,3792E-2
113	1,30E+0	1,34E+0	1,2774E-2	3,4264E-2	4,4287E-3	2,9835E-2
114	1,24E+0	1,30E+0	1,3077E-2	4,9952E-2	4,5350E-3	4,5417E-2
115	1,17E+0	1,24E+0	1,3099E-2	9,7650E-2	4,5440E-3	9,3106E-2
116	1,15E+0	1,17E+0	1,2355E-2	1,7227E-1	4,2873E-3	1,6798E-1
117	1,12E+0	1,15E+0	1,0765E-2	2,7064E-1	3,7370E-3	2,6690E-1
118	1,11E+0	1,12E+0	8,2346E-3	3,9035E-1	2,8601E-3	3,8749E-1
119	1,10E+0	1,11E+0	6,0472E-3	4,7290E-1	2,1018E-3	4,7080E-1
120	1,07E+0	1,10E+0	3,5475E-3	5,4746E-1	1,2349E-3	5,4623E-1
121	1,05E+0	1,07E+0	2,4714E-3	5,5998E-1	8,6159E-4	5,5912E-1

122	1,04E+0	1,05E+0	2,7024E-3	5,4147E-1	9,4178E-4	5,4053E-1
123	1,02E+0	1,04E+0	3,5010E-3	5,1462E-1	1,2190E-3	5,1340E-1
124	9,96E-1	1,02E+0	6,0336E-3	4,4094E-1	2,0983E-3	4,3884E-1
125	9,86E-1	9,96E-1	9,4423E-3	3,3832E-1	3,2819E-3	3,3504E-1
126	9,72E-1	9,86E-1	1,1536E-2	2,7387E-1	4,0093E-3	2,6986E-1
127	9,50E-1	9,72E-1	1,3887E-2	2,0213E-1	4,8262E-3	1,9730E-1
128	9,30E-1	9,50E-1	1,5837E-2	1,4762E-1	5,5043E-3	1,4212E-1
129	9,10E-1	9,30E-1	1,7266E-2	1,1519E-1	6,0014E-3	1,0919E-1
130	8,60E-1	9,10E-1	1,9360E-2	8,2690E-2	6,7310E-3	7,5959E-2
131	8,50E-1	8,60E-1	2,1032E-2	6,5132E-2	7,3141E-3	5,7818E-2
132	7,90E-1	8,50E-1	2,3067E-2	5,3841E-2	8,0241E-3	4,5817E-2
133	7,80E-1	7,90E-1	2,5214E-2	4,6095E-2	8,7733E-3	3,7322E-2
134	7,05E-1	7,80E-1	2,8523E-2	4,1292E-2	9,9283E-3	3,1364E-2
135	6,25E-1	7,05E-1	3,6722E-2	3,8371E-2	1,2791E-2	2,5580E-2
136	5,40E-1	6,25E-1	5,2661E-2	4,3005E-2	1,8356E-2	2,4649E-2
137	5,00E-1	5,40E-1	7,4830E-2	5,3508E-2	2,6095E-2	2,7413E-2
138	4,85E-1	5,00E-1	9,0756E-2	6,1875E-2	3,1656E-2	3,0219E-2
139	4,33E-1	4,85E-1	1,2304E-1	7,9614E-2	4,2927E-2	3,6687E-2
140	4,00E-1	4,33E-1	1,9077E-1	1,1777E-1	6,6576E-2	5,1194E-2
141	3,91E-1	4,00E-1	2,4420E-1	1,4828E-1	8,5235E-2	6,3045E-2
142	3,50E-1	3,91E-1	3,5103E-1	2,0997E-1	1,2254E-1	8,7430E-2
143	3,20E-1	3,50E-1	5,3444E-1	3,1698E-1	1,8660E-1	1,3038E-1
144	3,15E-1	3,20E-1	6,1111E-1	3,6225E-1	2,1337E-1	1,4888E-1
145	3,00E-1	3,15E-1	6,3733E-1	3,7795E-1	2,2250E-1	1,5545E-1
146	2,80E-1	3,00E-1	6,4714E-1	3,8402E-1	2,2585E-1	1,5817E-1
147	2,48E-1	2,80E-1	5,9051E-1	3,4994E-1	2,0582E-1	1,4412E-1
148	2,20E-1	2,48E-1	4,7112E-1	2,7856E-1	1,6394E-1	1,1462E-1
149	1,89E-1	2,20E-1	3,5923E-1	2,1302E-1	1,2490E-1	8,8120E-2
150	1,80E-1	1,89E-1	3,0240E-1	1,8002E-1	1,0510E-1	7,4920E-2
151	1,60E-1	1,80E-1	2,7368E-1	1,6330E-1	9,5090E-2	6,8210E-2
152	1,40E-1	1,60E-1	2,4487E-1	1,4637E-1	8,5028E-2	6,1342E-2
153	1,34E-1	1,40E-1	2,3190E-1	1,3870E-1	8,0495E-2	5,8205E-2
154	1,15E-1	1,34E-1	2,2411E-1	1,3400E-1	7,7765E-2	5,6235E-2
155	1,00E-1	1,15E-1	2,1811E-1	1,3019E-1	7,5648E-2	5,4542E-2
156	9,50E-2	1,00E-1	2,1741E-1	1,2948E-1	7,5385E-2	5,4095E-2
157	8,00E-2	9,50E-2	2,1974E-1	1,3055E-1	7,6173E-2	5,4377E-2
158	7,70E-2	8,00E-2	2,2296E-1	1,3221E-1	7,7272E-2	5,4938E-2
159	6,70E-2	7,70E-2	2,2716E-1	1,3445E-1	7,8713E-2	5,5737E-2
160	5,80E-2	6,70E-2	2,3471E-1	1,3864E-1	8,1310E-2	5,7330E-2
161	5,00E-2	5,80E-2	2,4471E-1	1,4427E-1	8,4751E-2	5,9519E-2
162	4,20E-2	5,00E-2	2,5762E-1	1,5153E-1	8,9203E-2	6,2327E-2
163	3,50E-2	4,20E-2	2,7357E-1	1,6069E-1	9,4706E-2	6,5984E-2
164	3,00E-2	3,50E-2	2,8960E-1	1,7006E-1	1,0024E-1	6,9820E-2
165	2,50E-2	3,00E-2	3,0667E-1	1,8015E-1	1,0613E-1	7,4020E-2
166	2,00E-2	2,50E-2	3,2910E-1	1,9339E-1	1,1388E-1	7,9510E-2
167	1,50E-2	2,00E-2	3,5907E-1	2,1134E-1	1,2423E-1	8,7110E-2
168	1,00E-2	1,50E-2	4,0141E-1	2,3716E-1	1,3886E-1	9,8300E-2
169	6,90E-3	1,00E-2	4,5261E-1	2,6907E-1	1,5655E-1	1,1252E-1
170	5,00E-3	6,90E-3	4,9902E-1	2,9899E-1	1,7259E-1	1,2640E-1

171	3,00E-3	5,00E-3	5,5151E-1	3,3406E-1	1,9073E-1	1,4333E-1
172	1,10E-3	3,00E-3	6,6185E-1	4,1481E-1	2,2887E-1	1,8594E-1

TABLE 2b : Multi-group cross sections and Energy structure BP-1

Group	Ei-1 [eV]	Ei [eV]	NU*SIGMA_F BP-1	ABSOR BP-1	FISSION BP-1	CAPTURE BP-1
1	1,73E+7	1,96E+7	7,9759E-3	4,0539E-3	1,6137E-3	2,4402E-3
2	1,49E+7	1,73E+7	6,9912E-3	4,9963E-3	1,5140E-3	3,4823E-3
3	1,38E+7	1,49E+7	6,1636E-3	5,1556E-3	1,3921E-3	3,7635E-3
4	1,16E+7	1,38E+7	5,0868E-3	5,2168E-3	1,2138E-3	4,0030E-3
5	1,00E+7	1,16E+7	4,5670E-3	5,2731E-3	1,1602E-3	4,1129E-3
6	8,19E+6	1,00E+7	4,3943E-3	4,5660E-3	1,2044E-3	3,3616E-3
7	6,70E+6	8,19E+6	4,2405E-3	3,8897E-3	1,2576E-3	2,6321E-3
8	6,07E+6	6,70E+6	3,0193E-3	3,1708E-3	9,1462E-4	2,2562E-3
9	5,49E+6	6,07E+6	2,3239E-3	1,5074E-3	7,0692E-4	8,0048E-4
10	4,49E+6	5,49E+6	2,2476E-3	2,2571E-3	7,1399E-4	1,5431E-3
11	3,68E+6	4,49E+6	2,2064E-3	1,9265E-3	7,2975E-4	1,1968E-3
12	3,01E+6	3,68E+6	2,1453E-3	9,8215E-4	7,3049E-4	2,5166E-4
13	2,47E+6	3,01E+6	2,0421E-3	9,5205E-4	7,0813E-4	2,4392E-4
14	2,23E+6	2,47E+6	2,0191E-3	9,8620E-4	7,1245E-4	2,7375E-4
15	2,02E+6	2,23E+6	2,0392E-3	1,0240E-3	7,2679E-4	2,9721E-4
16	1,65E+6	2,02E+6	1,8952E-3	9,8523E-4	6,7068E-4	3,1455E-4
17	1,35E+6	1,65E+6	1,7688E-3	9,8123E-4	6,3038E-4	3,5085E-4
18	1,22E+6	1,35E+6	1,3839E-3	8,5816E-4	4,6145E-4	3,9671E-4
19	1,11E+6	1,22E+6	1,2883E-3	8,5631E-4	4,2540E-4	4,3091E-4
20	1,00E+6	1,11E+6	1,2535E-3	8,8392E-4	4,1638E-4	4,6754E-4
21	9,07E+5	1,00E+6	1,2125E-3	9,2804E-4	4,0579E-4	5,2225E-4
22	8,21E+5	9,07E+5	1,1705E-3	9,5528E-4	3,9311E-4	5,6217E-4
23	6,08E+5	8,21E+5	1,0809E-3	9,4479E-4	3,6468E-4	5,8011E-4
24	5,50E+5	6,08E+5	9,9376E-4	9,2457E-4	3,3705E-4	5,8752E-4
25	4,98E+5	5,50E+5	9,4942E-4	9,0907E-4	3,2211E-4	5,8696E-4
26	4,50E+5	4,98E+5	9,1711E-4	8,9791E-4	3,1113E-4	5,8678E-4
27	4,08E+5	4,50E+5	8,9077E-4	8,8926E-4	3,0239E-4	5,8687E-4
28	3,02E+5	4,08E+5	8,5817E-4	8,8108E-4	2,9274E-4	5,8834E-4
29	2,73E+5	3,02E+5	8,4701E-4	8,8480E-4	2,8994E-4	5,9486E-4
30	2,47E+5	2,73E+5	8,4273E-4	8,9180E-4	2,8895E-4	6,0285E-4
31	1,83E+5	2,47E+5	8,3489E-4	9,2240E-4	2,8713E-4	6,3527E-4
32	1,23E+5	1,83E+5	8,3736E-4	1,0132E-3	2,8852E-4	7,2468E-4
33	1,11E+5	1,23E+5	8,5690E-4	1,1043E-3	2,9526E-4	8,0904E-4
34	8,23E+4	1,11E+5	8,7138E-4	1,1919E-3	3,0015E-4	8,9175E-4
35	6,74E+4	8,23E+4	8,9033E-4	1,3402E-3	3,0661E-4	1,0336E-3
36	5,52E+4	6,74E+4	8,9849E-4	1,5036E-3	3,0932E-4	1,1943E-3
37	4,09E+4	5,52E+4	9,1460E-4	1,6183E-3	3,1291E-4	1,3054E-3
38	3,70E+4	4,09E+4	9,3264E-4	1,7493E-3	3,1823E-4	1,4311E-3
39	2,93E+4	3,70E+4	9,4142E-4	1,9255E-3	3,2124E-4	1,6043E-3
40	2,74E+4	2,93E+4	9,3659E-4	2,1011E-3	3,1957E-4	1,7815E-3
41	2,48E+4	2,74E+4	9,4565E-4	2,2124E-3	3,2265E-4	1,8898E-3
42	1,66E+4	2,48E+4	9,8486E-4	2,5698E-3	3,3814E-4	2,2317E-3
43	1,50E+4	1,66E+4	1,0399E-3	2,2278E-3	3,5955E-4	1,8683E-3

44	1,11E+4	1,50E+4	1,0719E-3	2,9843E-3	3,7073E-4	2,6136E-3
45	9,12E+3	1,11E+4	1,1160E-3	3,1135E-3	3,8612E-4	2,7274E-3
46	7,47E+3	9,12E+3	1,2767E-3	3,5481E-3	4,4189E-4	3,1062E-3
47	5,53E+3	7,47E+3	1,2822E-3	4,8963E-3	4,4371E-4	4,4526E-3
48	5,00E+3	5,53E+3	1,3868E-3	3,9991E-3	4,8005E-4	3,5191E-3
49	3,53E+3	5,00E+3	1,5572E-3	6,2625E-3	5,3921E-4	5,7233E-3
50	3,35E+3	3,53E+3	1,3628E-3	3,3331E-3	4,7242E-4	2,8607E-3
51	2,25E+3	3,35E+3	2,1047E-3	6,0163E-3	7,2927E-4	5,2870E-3
52	2,03E+3	2,25E+3	1,7488E-3	5,8413E-3	6,0635E-4	5,2350E-3
53	1,51E+3	2,03E+3	2,0942E-3	8,0068E-3	7,2711E-4	7,2797E-3
54	1,43E+3	1,51E+3	2,6586E-3	3,0754E-3	9,2003E-4	2,1554E-3
55	1,23E+3	1,43E+3	3,3634E-3	6,9101E-3	1,1646E-3	5,7455E-3
56	1,01E+3	1,23E+3	3,2084E-3	5,2593E-3	1,1104E-3	4,1489E-3
57	9,14E+2	1,01E+3	4,4569E-3	7,3782E-3	1,5422E-3	5,8360E-3
58	7,49E+2	9,14E+2	3,4778E-3	6,8521E-3	1,2032E-3	5,6489E-3
59	6,77E+2	7,49E+2	2,8237E-3	1,4469E-2	9,7448E-4	1,3495E-2
60	4,54E+2	6,77E+2	5,7573E-3	9,1248E-3	1,9983E-3	7,1265E-3
61	3,72E+2	4,54E+2	4,8847E-3	5,6222E-3	1,6922E-3	3,9300E-3
62	3,04E+2	3,72E+2	5,2147E-3	1,7628E-2	1,8087E-3	1,5819E-2
63	2,04E+2	3,04E+2	9,1452E-3	2,3782E-2	3,1726E-3	2,0609E-2
64	1,49E+2	2,04E+2	9,4805E-3	2,0604E-2	3,2841E-3	1,7320E-2
65	1,37E+2	1,49E+2	9,0394E-3	7,0738E-3	3,1394E-3	3,9344E-3
66	9,17E+1	1,37E+2	1,0996E-2	2,0213E-2	3,8184E-3	1,6395E-2
67	7,57E+1	9,17E+1	2,3828E-2	1,4942E-2	8,2535E-3	6,6885E-3
68	6,79E+1	7,57E+1	2,7235E-2	5,3596E-2	9,4736E-3	4,4122E-2
69	5,56E+1	6,79E+1	3,9392E-2	3,6480E-2	1,3628E-2	2,2852E-2
70	5,16E+1	5,56E+1	9,0694E-3	1,8961E-2	3,2147E-3	1,5746E-2
71	4,83E+1	5,16E+1	1,6542E-2	1,3589E-2	5,7569E-3	7,8321E-3
72	4,55E+1	4,83E+1	1,9027E-2	8,5461E-3	6,5318E-3	2,0143E-3
73	4,02E+1	4,55E+1	9,0170E-3	2,4398E-2	3,1907E-3	2,1207E-2
74	3,73E+1	4,02E+1	5,0660E-3	1,6579E-2	1,7353E-3	1,4844E-2
75	3,37E+1	3,73E+1	3,5925E-3	3,3887E-3	1,2376E-3	2,1511E-3
76	3,05E+1	3,37E+1	8,2771E-3	5,8224E-3	2,8415E-3	2,9809E-3
77	2,76E+1	3,05E+1	9,7733E-3	5,3972E-3	3,3363E-3	2,0609E-3
78	2,50E+1	2,76E+1	2,2193E-2	1,5185E-2	7,6979E-3	7,4871E-3
79	2,26E+1	2,50E+1	1,0180E-2	9,4864E-2	3,5069E-3	9,1357E-2
80	1,95E+1	2,26E+1	2,0453E-2	7,3324E-2	7,1384E-3	6,6186E-2
81	1,59E+1	1,95E+1	2,5700E-2	1,9825E-2	8,9133E-3	1,0912E-2
82	1,37E+1	1,59E+1	8,0554E-2	4,6081E-2	2,7908E-2	1,8173E-2
83	1,12E+1	1,37E+1	3,2677E-2	2,4056E-2	1,1377E-2	1,2679E-2
84	9,91E+0	1,12E+1	9,4034E-2	4,2793E-2	3,2735E-2	1,0058E-2
85	9,19E+0	9,91E+0	1,6366E-2	7,7385E-3	5,5926E-3	2,1459E-3
86	8,32E+0	9,19E+0	2,2764E-2	1,1689E-2	7,7762E-3	3,9128E-3
87	7,52E+0	8,32E+0	7,7992E-2	5,0056E-2	2,7221E-2	2,2835E-2
88	6,16E+0	7,52E+0	3,3382E-2	1,5972E-2	1,1425E-2	4,5470E-3
89	5,35E+0	6,16E+0	2,9739E-2	1,2486E-2	1,0161E-2	2,3250E-3
90	5,04E+0	5,35E+0	1,3514E-2	6,4986E-3	4,6273E-3	1,8713E-3
91	4,13E+0	5,04E+0	2,9919E-2	1,7602E-2	1,0222E-2	7,3800E-3
92	4,00E+0	4,13E+0	1,3705E-2	7,8672E-3	4,6942E-3	3,1730E-3

93	3,38E+0	4,00E+0	9,2082E-3	5,6064E-3	3,1629E-3	2,4435E-3
94	3,30E+0	3,38E+0	8,0019E-3	5,4025E-3	2,7537E-3	2,6488E-3
95	2,77E+0	3,30E+0	7,7844E-3	1,0178E-2	2,6823E-3	7,4957E-3
96	2,72E+0	2,77E+0	7,4443E-3	5,9086E-2	2,5689E-3	5,6517E-2
97	2,60E+0	2,72E+0	6,9380E-3	1,5415E-1	2,3970E-3	1,5175E-1
98	2,55E+0	2,60E+0	7,4123E-3	4,8605E-2	2,5592E-3	4,6046E-2
99	2,36E+0	2,55E+0	7,7395E-3	1,7791E-2	2,6732E-3	1,5118E-2
100	2,13E+0	2,36E+0	8,1116E-3	8,5727E-3	2,8045E-3	5,7682E-3
101	2,10E+0	2,13E+0	8,3170E-3	8,9006E-3	2,8774E-3	6,0232E-3
102	2,02E+0	2,10E+0	8,3938E-3	1,0533E-2	2,9048E-3	7,6282E-3
103	1,93E+0	2,02E+0	8,5166E-3	1,1381E-2	2,9488E-3	8,4322E-3
104	1,84E+0	1,93E+0	8,7531E-3	9,6983E-3	3,0322E-3	6,6661E-3
105	1,76E+0	1,84E+0	9,1902E-3	9,8898E-3	3,1841E-3	6,7057E-3
106	1,67E+0	1,76E+0	9,8704E-3	1,0894E-2	3,4191E-3	7,4749E-3
107	1,59E+0	1,67E+0	1,0569E-2	1,2409E-2	3,6606E-3	8,7484E-3
108	1,50E+0	1,59E+0	1,1200E-2	1,4796E-2	3,8795E-3	1,0917E-2
109	1,48E+0	1,50E+0	1,1595E-2	1,7082E-2	4,0172E-3	1,3065E-2
110	1,44E+0	1,48E+0	1,1811E-2	1,8731E-2	4,0925E-3	1,4639E-2
111	1,37E+0	1,44E+0	1,2168E-2	2,2775E-2	4,2171E-3	1,8558E-2
112	1,34E+0	1,37E+0	1,2528E-2	2,8475E-2	4,3427E-3	2,4132E-2
113	1,30E+0	1,34E+0	1,2770E-2	3,4606E-2	4,4274E-3	3,0179E-2
114	1,24E+0	1,30E+0	1,3073E-2	5,0297E-2	4,5336E-3	4,5763E-2
115	1,17E+0	1,24E+0	1,3095E-2	9,7986E-2	4,5428E-3	9,3443E-2
116	1,15E+0	1,17E+0	1,2353E-2	1,7258E-1	4,2866E-3	1,6829E-1
117	1,12E+0	1,15E+0	1,0766E-2	2,7096E-1	3,7372E-3	2,6722E-1
118	1,11E+0	1,12E+0	8,2377E-3	3,9072E-1	2,8612E-3	3,8786E-1
119	1,10E+0	1,11E+0	6,0511E-3	4,7336E-1	2,1031E-3	4,7126E-1
120	1,07E+0	1,10E+0	3,5504E-3	5,4799E-1	1,2359E-3	5,4675E-1
121	1,05E+0	1,07E+0	2,4732E-3	5,6044E-1	8,6223E-4	5,5958E-1
122	1,04E+0	1,05E+0	2,7041E-3	5,4186E-1	9,4237E-4	5,4092E-1
123	1,02E+0	1,04E+0	3,5028E-3	5,1497E-1	1,2196E-3	5,1375E-1
124	9,96E-1	1,02E+0	6,0351E-3	4,4122E-1	2,0988E-3	4,3912E-1
125	9,86E-1	9,96E-1	9,4415E-3	3,3857E-1	3,2817E-3	3,3529E-1
126	9,72E-1	9,86E-1	1,1533E-2	2,7415E-1	4,0082E-3	2,7014E-1
127	9,50E-1	9,72E-1	1,3881E-2	2,0247E-1	4,8240E-3	1,9765E-1
128	9,30E-1	9,50E-1	1,5828E-2	1,4804E-1	5,5010E-3	1,4254E-1
129	9,10E-1	9,30E-1	1,7254E-2	1,1567E-1	5,9974E-3	1,0967E-1
130	8,60E-1	9,10E-1	1,9345E-2	8,3268E-2	6,7259E-3	7,6542E-2
131	8,50E-1	8,60E-1	2,1015E-2	6,5789E-2	7,3080E-3	5,8481E-2
132	7,90E-1	8,50E-1	2,3046E-2	5,4590E-2	8,0166E-3	4,6573E-2
133	7,80E-1	7,90E-1	2,5188E-2	4,6940E-2	8,7643E-3	3,8176E-2
134	7,05E-1	7,80E-1	2,8489E-2	4,2275E-2	9,9166E-3	3,2358E-2
135	6,25E-1	7,05E-1	3,6665E-2	3,9667E-2	1,2771E-2	2,6896E-2
136	5,40E-1	6,25E-1	5,2547E-2	4,4790E-2	1,8316E-2	2,6474E-2
137	5,00E-1	5,40E-1	7,4618E-2	5,5797E-2	2,6022E-2	2,9775E-2
138	4,85E-1	5,00E-1	9,0461E-2	6,4434E-2	3,1553E-2	3,2881E-2
139	4,33E-1	4,85E-1	1,2256E-1	8,2552E-2	4,2760E-2	3,9792E-2
140	4,00E-1	4,33E-1	1,8983E-1	1,2112E-1	6,6248E-2	5,4872E-2
141	3,91E-1	4,00E-1	2,4284E-1	1,5173E-1	8,4760E-2	6,6970E-2

142	3,50E-1	3,91E-1	3,4878E-1	2,1322E-1	1,2176E-1	9,1460E-2
143	3,20E-1	3,50E-1	5,3051E-1	3,1934E-1	1,8523E-1	1,3411E-1
144	3,15E-1	3,20E-1	6,0642E-1	3,6410E-1	2,1173E-1	1,5237E-1
145	3,00E-1	3,15E-1	6,3219E-1	3,7961E-1	2,2071E-1	1,5890E-1
146	2,80E-1	3,00E-1	6,4104E-1	3,8566E-1	2,2372E-1	1,6194E-1
147	2,48E-1	2,80E-1	5,8238E-1	3,5267E-1	2,0299E-1	1,4968E-1
148	2,20E-1	2,48E-1	4,6105E-1	2,8507E-1	1,6044E-1	1,2463E-1
149	1,89E-1	2,20E-1	3,4807E-1	2,2633E-1	1,2102E-1	1,0531E-1
150	1,80E-1	1,89E-1	2,9053E-1	1,9944E-1	1,0098E-1	9,8460E-2
151	1,60E-1	1,80E-1	2,6063E-1	1,8838E-1	9,0557E-2	9,7823E-2
152	1,40E-1	1,60E-1	2,2964E-1	1,8114E-1	7,9739E-2	1,0140E-1
153	1,34E-1	1,40E-1	2,1473E-1	1,8085E-1	7,4537E-2	1,0631E-1
154	1,15E-1	1,34E-1	2,0414E-1	1,8504E-1	7,0837E-2	1,1420E-1
155	1,00E-1	1,15E-1	1,9343E-1	1,9436E-1	6,7090E-2	1,2727E-1
156	9,50E-2	1,00E-1	1,8923E-1	2,0157E-1	6,5616E-2	1,3595E-1
157	8,00E-2	9,50E-2	1,8697E-1	2,1139E-1	6,4813E-2	1,4658E-1
158	7,70E-2	8,00E-2	1,8620E-1	2,1913E-1	6,4533E-2	1,5460E-1
159	6,70E-2	7,70E-2	1,8677E-1	2,2580E-1	6,4717E-2	1,6108E-1
160	5,80E-2	6,70E-2	1,8895E-1	2,3493E-1	6,5457E-2	1,6947E-1
161	5,00E-2	5,80E-2	1,9356E-1	2,4353E-1	6,7038E-2	1,7649E-1
162	4,20E-2	5,00E-2	2,0074E-1	2,5231E-1	6,9509E-2	1,8280E-1
163	3,50E-2	4,20E-2	2,1049E-1	2,6169E-1	7,2867E-2	1,8882E-1
164	3,00E-2	3,50E-2	2,2069E-1	2,7040E-1	7,6387E-2	1,9401E-1
165	2,50E-2	3,00E-2	2,3178E-1	2,7927E-1	8,0215E-2	1,9906E-1
166	2,00E-2	2,50E-2	2,4649E-1	2,9050E-1	8,5292E-2	2,0521E-1
167	1,50E-2	2,00E-2	2,6603E-1	3,0536E-1	9,2039E-2	2,1332E-1
168	1,00E-2	1,50E-2	2,9303E-1	3,2638E-1	1,0137E-1	2,2501E-1
169	6,90E-3	1,00E-2	3,2459E-1	3,5191E-1	1,1227E-1	2,3964E-1
170	5,00E-3	6,90E-3	3,5200E-1	3,7546E-1	1,2174E-1	2,5372E-1
171	3,00E-3	5,00E-3	3,8181E-1	4,0259E-1	1,3204E-1	2,7055E-1
172	1,10E-3	3,00E-3	4,4055E-1	4,6367E-1	1,5235E-1	3,1132E-1

TABLE 2c : Multi-group cross sections and Energy structure

Group	Ei-1 [eV]	Ei [eV]	NU*SIGMA_F BP-2	ABSOR BP-2	FISSION BP-2	CAPTURE BP-2
1	1,73E+7	1,96E+7	7,8787E-3	4,0343E-3	1,5934E-3	2,4409E-3
2	1,49E+7	1,73E+7	6,9098E-3	4,9792E-3	1,4957E-3	3,4835E-3
3	1,38E+7	1,49E+7	6,0947E-3	5,1406E-3	1,3759E-3	3,7647E-3
4	1,16E+7	1,38E+7	5,0331E-3	5,2047E-3	1,2003E-3	4,0044E-3
5	1,00E+7	1,16E+7	4,5202E-3	5,2621E-3	1,1477E-3	4,1144E-3
6	8,19E+6	1,00E+7	4,3490E-3	4,5539E-3	1,1913E-3	3,3626E-3
7	6,70E+6	8,19E+6	4,1959E-3	3,8763E-3	1,2435E-3	2,6328E-3
8	6,07E+6	6,70E+6	2,9901E-3	3,1618E-3	9,0513E-4	2,2567E-3
9	5,49E+6	6,07E+6	2,3037E-3	1,5006E-3	7,0025E-4	8,0035E-4
10	4,49E+6	5,49E+6	2,2280E-3	2,2510E-3	7,0721E-4	1,5438E-3
11	3,68E+6	4,49E+6	2,1878E-3	1,9207E-3	7,2301E-4	1,1977E-3
12	3,01E+6	3,68E+6	2,1279E-3	9,7682E-4	7,2400E-4	2,5282E-4
13	2,47E+6	3,01E+6	2,0265E-3	9,4774E-4	7,0217E-4	2,4557E-4
14	2,23E+6	2,47E+6	2,0040E-3	9,8210E-4	7,0654E-4	2,7556E-4

15	2,02E+6	2,23E+6	2,0240E-3	1,0199E-3	7,2076E-4	2,9914E-4
16	1,65E+6	2,02E+6	1,8822E-3	9,8220E-4	6,6555E-4	3,1665E-4
17	1,35E+6	1,65E+6	1,7573E-3	9,7888E-4	6,2584E-4	3,5304E-4
18	1,22E+6	1,35E+6	1,3774E-3	8,5809E-4	4,5922E-4	3,9887E-4
19	1,11E+6	1,22E+6	1,2828E-3	8,5662E-4	4,2360E-4	4,3302E-4
20	1,00E+6	1,11E+6	1,2481E-3	8,8400E-4	4,1460E-4	4,6940E-4
21	9,07E+5	1,00E+6	1,2074E-3	9,2784E-4	4,0407E-4	5,2377E-4
22	8,21E+5	9,07E+5	1,1658E-3	9,5513E-4	3,9153E-4	5,6360E-4
23	6,08E+5	8,21E+5	1,0767E-3	9,4506E-4	3,6327E-4	5,8179E-4
24	5,50E+5	6,08E+5	9,8997E-4	9,2537E-4	3,3576E-4	5,8961E-4
25	4,98E+5	5,50E+5	9,4583E-4	9,1025E-4	3,2090E-4	5,8935E-4
26	4,50E+5	4,98E+5	9,1361E-4	8,9948E-4	3,0994E-4	5,8954E-4
27	4,08E+5	4,50E+5	8,8728E-4	8,9119E-4	3,0121E-4	5,8998E-4
28	3,02E+5	4,08E+5	8,5502E-4	8,8402E-4	2,9166E-4	5,9236E-4
29	2,73E+5	3,02E+5	8,4400E-4	8,8888E-4	2,8891E-4	5,9997E-4
30	2,47E+5	2,73E+5	8,3978E-4	8,9649E-4	2,8794E-4	6,0855E-4
31	1,83E+5	2,47E+5	8,3206E-4	9,2788E-4	2,8616E-4	6,4172E-4
32	1,23E+5	1,83E+5	8,3465E-4	1,0202E-3	2,8759E-4	7,3261E-4
33	1,11E+5	1,23E+5	8,5419E-4	1,1127E-3	2,9432E-4	8,1838E-4
34	8,23E+4	1,11E+5	8,6870E-4	1,2020E-3	2,9923E-4	9,0277E-4
35	6,74E+4	8,23E+4	8,8768E-4	1,3524E-3	3,0569E-4	1,0467E-3
36	5,52E+4	6,74E+4	8,9587E-4	1,5179E-3	3,0842E-4	1,2095E-3
37	4,09E+4	5,52E+4	9,1196E-4	1,6364E-3	3,1201E-4	1,3244E-3
38	3,70E+4	4,09E+4	9,2998E-4	1,7701E-3	3,1732E-4	1,4528E-3
39	2,93E+4	3,70E+4	9,3875E-4	1,9482E-3	3,2033E-4	1,6279E-3
40	2,74E+4	2,93E+4	9,3394E-4	2,1256E-3	3,1866E-4	1,8069E-3
41	2,48E+4	2,74E+4	9,4299E-4	2,2381E-3	3,2175E-4	1,9164E-3
42	1,66E+4	2,48E+4	9,8210E-4	2,5986E-3	3,3720E-4	2,2614E-3
43	1,50E+4	1,66E+4	1,0371E-3	2,2611E-3	3,5855E-4	1,9026E-3
44	1,11E+4	1,50E+4	1,0689E-3	3,0227E-3	3,6971E-4	2,6530E-3
45	9,12E+3	1,11E+4	1,1129E-3	3,1583E-3	3,8505E-4	2,7733E-3
46	7,47E+3	9,12E+3	1,2731E-3	3,5999E-3	4,4066E-4	3,1592E-3
47	5,53E+3	7,47E+3	1,2786E-3	4,9586E-3	4,4246E-4	4,5161E-3
48	5,00E+3	5,53E+3	1,3829E-3	4,0681E-3	4,7871E-4	3,5894E-3
49	3,53E+3	5,00E+3	1,5528E-3	6,3480E-3	5,3769E-4	5,8103E-3
50	3,35E+3	3,53E+3	1,3591E-3	3,4297E-3	4,7111E-4	2,9586E-3
51	2,25E+3	3,35E+3	2,0986E-3	6,1364E-3	7,2717E-4	5,4092E-3
52	2,03E+3	2,25E+3	1,7439E-3	5,9678E-3	6,0466E-4	5,3631E-3
53	1,51E+3	2,03E+3	2,0882E-3	8,1708E-3	7,2502E-4	7,4458E-3
54	1,43E+3	1,51E+3	2,6503E-3	3,3266E-3	9,1716E-4	2,4094E-3
55	1,23E+3	1,43E+3	3,3527E-3	7,1437E-3	1,1609E-3	5,9828E-3
56	1,01E+3	1,23E+3	3,1999E-3	5,5006E-3	1,1074E-3	4,3932E-3
57	9,14E+2	1,01E+3	4,4429E-3	7,6205E-3	1,5374E-3	6,0831E-3
58	7,49E+2	9,14E+2	3,4677E-3	7,2064E-3	1,1997E-3	6,0067E-3
59	6,77E+2	7,49E+2	2,8146E-3	1,4890E-2	9,7135E-4	1,3919E-2
60	4,54E+2	6,77E+2	5,7396E-3	9,5410E-3	1,9922E-3	7,5488E-3
61	3,72E+2	4,54E+2	4,8688E-3	6,2053E-3	1,6867E-3	4,5186E-3
62	3,04E+2	3,72E+2	5,1975E-3	1,8237E-2	1,8028E-3	1,6434E-2
63	2,04E+2	3,04E+2	9,1137E-3	2,4468E-2	3,1616E-3	2,1306E-2

64	1,49E+2	2,04E+2	9,4400E-3	2,1462E-2	3,2701E-3	1,8192E-2
65	1,37E+2	1,49E+2	9,0065E-3	8,2268E-3	3,1280E-3	5,0988E-3
66	9,17E+1	1,37E+2	1,0957E-2	2,1014E-2	3,8051E-3	1,7209E-2
67	7,57E+1	9,17E+1	2,3732E-2	1,6392E-2	8,2202E-3	8,1718E-3
68	6,79E+1	7,57E+1	2,7164E-2	5,3510E-2	9,4491E-3	4,4061E-2
69	5,56E+1	6,79E+1	3,9257E-2	3,7256E-2	1,3581E-2	2,3675E-2
70	5,16E+1	5,56E+1	9,0399E-3	2,0317E-2	3,2042E-3	1,7113E-2
71	4,83E+1	5,16E+1	1,6462E-2	1,5803E-2	5,7291E-3	1,0074E-2
72	4,55E+1	4,83E+1	1,8959E-2	9,5289E-3	6,5083E-3	3,0206E-3
73	4,02E+1	4,55E+1	8,9863E-3	2,5384E-2	3,1799E-3	2,2204E-2
74	3,73E+1	4,02E+1	5,0501E-3	1,6823E-2	1,7299E-3	1,5093E-2
75	3,37E+1	3,73E+1	3,5794E-3	4,3248E-3	1,2331E-3	3,0917E-3
76	3,05E+1	3,37E+1	8,2260E-3	9,6038E-3	2,8240E-3	6,7798E-3
77	2,76E+1	3,05E+1	9,7248E-3	7,3388E-3	3,3197E-3	4,0191E-3
78	2,50E+1	2,76E+1	2,2118E-2	1,5666E-2	7,6720E-3	7,9940E-3
79	2,26E+1	2,50E+1	1,0141E-2	9,5577E-2	3,4935E-3	9,2084E-2
80	1,95E+1	2,26E+1	2,0272E-2	8,1071E-2	7,0752E-3	7,3996E-2
81	1,59E+1	1,95E+1	2,5572E-2	2,2434E-2	8,8692E-3	1,3565E-2
82	1,37E+1	1,59E+1	8,0263E-2	4,6858E-2	2,7807E-2	1,9051E-2
83	1,12E+1	1,37E+1	3,2572E-2	2,4767E-2	1,1341E-2	1,3426E-2
84	9,91E+0	1,12E+1	9,3801E-2	4,2921E-2	3,2654E-2	1,0267E-2
85	9,19E+0	9,91E+0	1,6320E-2	7,8509E-3	5,5766E-3	2,2743E-3
86	8,32E+0	9,19E+0	2,2702E-2	1,1753E-2	7,7549E-3	3,9981E-3
87	7,52E+0	8,32E+0	7,7697E-2	5,2134E-2	2,7118E-2	2,5016E-2
88	6,16E+0	7,52E+0	3,3189E-2	1,8895E-2	1,1359E-2	7,5360E-3
89	5,35E+0	6,16E+0	2,9628E-2	1,3212E-2	1,0123E-2	3,0890E-3
90	5,04E+0	5,35E+0	1,3473E-2	6,6203E-3	4,6131E-3	2,0072E-3
91	4,13E+0	5,04E+0	2,9836E-2	1,7680E-2	1,0194E-2	7,4860E-3
92	4,00E+0	4,13E+0	1,3666E-2	8,0081E-3	4,6808E-3	3,3273E-3
93	3,38E+0	4,00E+0	9,1797E-3	5,9929E-3	3,1531E-3	2,8398E-3
94	3,30E+0	3,38E+0	7,9754E-3	5,8742E-3	2,7445E-3	3,1297E-3
95	2,77E+0	3,30E+0	7,7345E-3	1,3870E-2	2,6651E-3	1,1205E-2
96	2,72E+0	2,77E+0	7,3573E-3	6,7918E-2	2,5388E-3	6,5379E-2
97	2,60E+0	2,72E+0	6,7910E-3	1,6757E-1	2,3462E-3	1,6522E-1
98	2,55E+0	2,60E+0	7,1661E-3	7,7516E-2	2,4742E-3	7,5042E-2
99	2,36E+0	2,55E+0	7,5936E-3	3,1996E-2	2,6228E-3	2,9373E-2
100	2,13E+0	2,36E+0	8,0504E-3	1,1393E-2	2,7833E-3	8,6097E-3
101	2,10E+0	2,13E+0	8,2583E-3	1,2086E-2	2,8571E-3	9,2289E-3
102	2,02E+0	2,10E+0	8,3181E-3	1,6423E-2	2,8787E-3	1,3544E-2
103	1,93E+0	2,02E+0	8,4335E-3	1,8124E-2	2,9200E-3	1,5204E-2
104	1,84E+0	1,93E+0	8,6969E-3	1,2209E-2	3,0127E-3	9,1963E-3
105	1,76E+0	1,84E+0	9,1452E-3	1,1142E-2	3,1685E-3	7,9735E-3
106	1,67E+0	1,76E+0	9,8289E-3	1,1787E-2	3,4047E-3	8,3823E-3
107	1,59E+0	1,67E+0	1,0528E-2	1,3152E-2	3,6464E-3	9,5056E-3
108	1,50E+0	1,59E+0	1,1159E-2	1,5462E-2	3,8653E-3	1,1597E-2
109	1,48E+0	1,50E+0	1,1554E-2	1,7720E-2	4,0028E-3	1,3717E-2
110	1,44E+0	1,48E+0	1,1769E-2	1,9359E-2	4,0780E-3	1,5281E-2
111	1,37E+0	1,44E+0	1,2126E-2	2,3391E-2	4,2023E-3	1,9189E-2
112	1,34E+0	1,37E+0	1,2485E-2	2,9080E-2	4,3276E-3	2,4752E-2

113	1,30E+0	1,34E+0	1,2726E-2	3,5199E-2	4,4121E-3	3,0787E-2
114	1,24E+0	1,30E+0	1,3029E-2	5,0853E-2	4,5180E-3	4,6335E-2
115	1,17E+0	1,24E+0	1,3051E-2	9,8397E-2	4,5277E-3	9,3869E-2
116	1,15E+0	1,17E+0	1,2314E-2	1,7275E-1	4,2733E-3	1,6848E-1
117	1,12E+0	1,15E+0	1,0738E-2	2,7086E-1	3,7274E-3	2,6713E-1
118	1,11E+0	1,12E+0	8,2219E-3	3,9044E-1	2,8557E-3	3,8758E-1
119	1,10E+0	1,11E+0	6,0432E-3	4,7308E-1	2,1003E-3	4,7098E-1
120	1,07E+0	1,10E+0	3,5481E-3	5,4784E-1	1,2351E-3	5,4660E-1
121	1,05E+0	1,07E+0	2,4723E-3	5,6038E-1	8,6193E-4	5,5952E-1
122	1,04E+0	1,05E+0	2,7030E-3	5,4179E-1	9,4199E-4	5,4085E-1
123	1,02E+0	1,04E+0	3,5007E-3	5,1486E-1	1,2189E-3	5,1364E-1
124	9,96E-1	1,02E+0	6,0277E-3	4,4104E-1	2,0963E-3	4,3894E-1
125	9,86E-1	9,96E-1	9,4215E-3	3,3844E-1	3,2747E-3	3,3517E-1
126	9,72E-1	9,86E-1	1,1503E-2	2,7414E-1	3,9976E-3	2,7014E-1
127	9,50E-1	9,72E-1	1,3837E-2	2,0270E-1	4,8087E-3	1,9789E-1
128	9,30E-1	9,50E-1	1,5772E-2	1,4853E-1	5,4816E-3	1,4305E-1
129	9,10E-1	9,30E-1	1,7190E-2	1,1635E-1	5,9750E-3	1,1038E-1
130	8,60E-1	9,10E-1	1,9268E-2	8,4218E-2	6,6989E-3	7,7519E-2
131	8,50E-1	8,60E-1	2,0927E-2	6,6933E-2	7,2774E-3	5,9656E-2
132	7,90E-1	8,50E-1	2,2945E-2	5,5941E-2	7,9814E-3	4,7960E-2
133	7,80E-1	7,90E-1	2,5072E-2	4,8496E-2	8,7240E-3	3,9772E-2
134	7,05E-1	7,80E-1	2,8349E-2	4,4109E-2	9,8678E-3	3,4241E-2
135	6,25E-1	7,05E-1	3,6460E-2	4,2111E-2	1,2699E-2	2,9412E-2
136	5,40E-1	6,25E-1	5,2195E-2	4,8151E-2	1,8193E-2	2,9958E-2
137	5,00E-1	5,40E-1	7,4029E-2	6,0080E-2	2,5816E-2	3,4264E-2
138	4,85E-1	5,00E-1	8,9678E-2	6,9197E-2	3,1280E-2	3,7917E-2
139	4,33E-1	4,85E-1	1,2136E-1	8,7967E-2	4,2340E-2	4,5627E-2
140	4,00E-1	4,33E-1	1,8762E-1	1,2720E-1	6,5477E-2	6,1723E-2
141	3,91E-1	4,00E-1	2,3975E-1	1,5790E-1	8,3679E-2	7,4221E-2
142	3,50E-1	3,91E-1	3,4381E-1	2,1889E-1	1,2002E-1	9,8870E-2
143	3,20E-1	3,50E-1	5,2214E-1	3,2317E-1	1,8230E-1	1,4087E-1
144	3,15E-1	3,20E-1	5,9660E-1	3,6698E-1	2,0830E-1	1,5868E-1
145	3,00E-1	3,15E-1	6,2166E-1	3,8221E-1	2,1703E-1	1,6518E-1
146	2,80E-1	3,00E-1	6,2911E-1	3,8838E-1	2,1956E-1	1,6882E-1
147	2,48E-1	2,80E-1	5,6766E-1	3,5752E-1	1,9786E-1	1,5966E-1
148	2,20E-1	2,48E-1	4,4413E-1	2,9600E-1	1,5455E-1	1,4145E-1
149	1,89E-1	2,20E-1	3,3069E-1	2,4618E-1	1,1498E-1	1,3120E-1
150	1,80E-1	1,89E-1	2,7326E-1	2,2563E-1	9,4976E-2	1,3065E-1
151	1,60E-1	1,80E-1	2,4298E-1	2,1896E-1	8,4425E-2	1,3454E-1
152	1,40E-1	1,60E-1	2,1146E-1	2,1655E-1	7,3428E-2	1,4312E-1
153	1,34E-1	1,40E-1	1,9630E-1	2,1787E-1	6,8138E-2	1,4973E-1
154	1,15E-1	1,34E-1	1,8544E-1	2,2206E-1	6,4346E-2	1,5771E-1
155	1,00E-1	1,15E-1	1,7502E-1	2,2834E-1	6,0704E-2	1,6764E-1
156	9,50E-2	1,00E-1	1,7141E-1	2,3222E-1	5,9435E-2	1,7279E-1
157	8,00E-2	9,50E-2	1,7012E-1	2,3744E-1	5,8972E-2	1,7847E-1
158	7,70E-2	8,00E-2	1,7041E-1	2,4134E-1	5,9060E-2	1,8228E-1
159	6,70E-2	7,70E-2	1,7191E-1	2,4502E-1	5,9569E-2	1,8545E-1
160	5,80E-2	6,70E-2	1,7547E-1	2,5041E-1	6,0786E-2	1,8962E-1
161	5,00E-2	5,80E-2	1,8115E-1	2,5630E-1	6,2739E-2	1,9356E-1

162	4,20E-2	5,00E-2	1,8909E-1	2,6311E-1	6,5475E-2	1,9764E-1
163	3,50E-2	4,20E-2	1,9925E-1	2,7112E-1	6,8977E-2	2,0214E-1
164	3,00E-2	3,50E-2	2,0954E-1	2,7904E-1	7,2526E-2	2,0651E-1
165	2,50E-2	3,00E-2	2,2048E-1	2,8740E-1	7,6302E-2	2,1110E-1
166	2,00E-2	2,50E-2	2,3477E-1	2,9820E-1	8,1238E-2	2,1696E-1
167	1,50E-2	2,00E-2	2,5359E-1	3,1265E-1	8,7735E-2	2,2492E-1
168	1,00E-2	1,50E-2	2,7948E-1	3,3316E-1	9,6679E-2	2,3648E-1
169	6,90E-3	1,00E-2	3,0967E-1	3,5808E-1	1,0711E-1	2,5097E-1
170	5,00E-3	6,90E-3	3,3589E-1	3,8105E-1	1,1617E-1	2,6488E-1
171	3,00E-3	5,00E-3	3,6439E-1	4,0747E-1	1,2602E-1	2,8145E-1
172	1,10E-3	3,00E-3	4,2074E-1	4,6668E-1	1,4549E-1	3,2119E-1

TABLE 2d : Multi-group cross sections and Energy structure BP-3

Group	Ei-1 [eV]	Ei [eV]	NU*SIGMA_F BP-3	ABSORP BP-3	FISSION BP-3	CAPTURE BP-3
1	1,73E+7	1,96E+7	7,9435E-3	4,0487E-3	1,6068E-3	2,4419E-3
2	1,49E+7	1,73E+7	6,9643E-3	4,9918E-3	1,5079E-3	3,4839E-3
3	1,38E+7	1,49E+7	6,1410E-3	5,1520E-3	1,3867E-3	3,7653E-3
4	1,16E+7	1,38E+7	5,0693E-3	5,2138E-3	1,2093E-3	4,0045E-3
5	1,00E+7	1,16E+7	4,5518E-3	5,2697E-3	1,1561E-3	4,1136E-3
6	8,19E+6	1,00E+7	4,3793E-3	4,5620E-3	1,2000E-3	3,3620E-3
7	6,70E+6	8,19E+6	4,2254E-3	3,8849E-3	1,2527E-3	2,6322E-3
8	6,07E+6	6,70E+6	3,0096E-3	3,1674E-3	9,1138E-4	2,2560E-3
9	5,49E+6	6,07E+6	2,3174E-3	1,5054E-3	7,0470E-4	8,0070E-4
10	4,49E+6	5,49E+6	2,2412E-3	2,2547E-3	7,1169E-4	1,5430E-3
11	3,68E+6	4,49E+6	2,2003E-3	1,9244E-3	7,2743E-4	1,1970E-3
12	3,01E+6	3,68E+6	2,1394E-3	9,8060E-4	7,2822E-4	2,5238E-4
13	2,47E+6	3,01E+6	2,0367E-3	9,5090E-4	7,0600E-4	2,4490E-4
14	2,23E+6	2,47E+6	2,0138E-3	9,8514E-4	7,1031E-4	2,7483E-4
15	2,02E+6	2,23E+6	2,0339E-3	1,0230E-3	7,2461E-4	2,9839E-4
16	1,65E+6	2,02E+6	1,8907E-3	9,8462E-4	6,6883E-4	3,1579E-4
17	1,35E+6	1,65E+6	1,7647E-3	9,8084E-4	6,2869E-4	3,5215E-4
18	1,22E+6	1,35E+6	1,3818E-3	8,5875E-4	4,6073E-4	3,9802E-4
19	1,11E+6	1,22E+6	1,2865E-3	8,5703E-4	4,2482E-4	4,3221E-4
20	1,00E+6	1,11E+6	1,2518E-3	8,8458E-4	4,1583E-4	4,6875E-4
21	9,07E+5	1,00E+6	1,2109E-3	9,2857E-4	4,0524E-4	5,2333E-4
22	8,21E+5	9,07E+5	1,1688E-3	9,5570E-4	3,9255E-4	5,6315E-4
23	6,08E+5	8,21E+5	1,0793E-3	9,4533E-4	3,6414E-4	5,8119E-4
24	5,50E+5	6,08E+5	9,9227E-4	9,2533E-4	3,3654E-4	5,8879E-4
25	4,98E+5	5,50E+5	9,4798E-4	9,0999E-4	3,2162E-4	5,8837E-4
26	4,50E+5	4,98E+5	9,1574E-4	8,9906E-4	3,1066E-4	5,8840E-4
27	4,08E+5	4,50E+5	8,8946E-4	8,9062E-4	3,0195E-4	5,8867E-4
28	3,02E+5	4,08E+5	8,5683E-4	8,8280E-4	2,9228E-4	5,9052E-4
29	2,73E+5	3,02E+5	8,4567E-4	8,8703E-4	2,8948E-4	5,9755E-4
30	2,47E+5	2,73E+5	8,4138E-4	8,9425E-4	2,8849E-4	6,0576E-4
31	1,83E+5	2,47E+5	8,3354E-4	9,2523E-4	2,8666E-4	6,3857E-4
32	1,23E+5	1,83E+5	8,3597E-4	1,0167E-3	2,8804E-4	7,2866E-4
33	1,11E+5	1,23E+5	8,5545E-4	1,1084E-3	2,9476E-4	8,1364E-4
34	8,23E+4	1,11E+5	8,6989E-4	1,1969E-3	2,9964E-4	8,9726E-4

35	6,74E+4	8,23E+4	8,8879E-4	1,3461E-3	3,0607E-4	1,0400E-3
36	5,52E+4	6,74E+4	8,9692E-4	1,5105E-3	3,0878E-4	1,2017E-3
37	4,09E+4	5,52E+4	9,1298E-4	1,6269E-3	3,1235E-4	1,3146E-3
38	3,70E+4	4,09E+4	9,3099E-4	1,7592E-3	3,1767E-4	1,4415E-3
39	2,93E+4	3,70E+4	9,3974E-4	1,9363E-3	3,2066E-4	1,6156E-3
40	2,74E+4	2,93E+4	9,3491E-4	2,1132E-3	3,1900E-4	1,7942E-3
41	2,48E+4	2,74E+4	9,4394E-4	2,2246E-3	3,2207E-4	1,9025E-3
42	1,66E+4	2,48E+4	9,8310E-4	2,5832E-3	3,3754E-4	2,2457E-3
43	1,50E+4	1,66E+4	1,0381E-3	2,2435E-3	3,5890E-4	1,8846E-3
44	1,11E+4	1,50E+4	1,0699E-3	3,0022E-3	3,7006E-4	2,6321E-3
45	9,12E+3	1,11E+4	1,1139E-3	3,1345E-3	3,8541E-4	2,7491E-3
46	7,47E+3	9,12E+3	1,2743E-3	3,5725E-3	4,4109E-4	3,1314E-3
47	5,53E+3	7,47E+3	1,2798E-3	4,9256E-3	4,4289E-4	4,4827E-3
48	5,00E+3	5,53E+3	1,3843E-3	4,0318E-3	4,7918E-4	3,5526E-3
49	3,53E+3	5,00E+3	1,5543E-3	6,3029E-3	5,3822E-4	5,7647E-3
50	3,35E+3	3,53E+3	1,3604E-3	3,3797E-3	4,7155E-4	2,9082E-3
51	2,25E+3	3,35E+3	2,1008E-3	6,0738E-3	7,2791E-4	5,3459E-3
52	2,03E+3	2,25E+3	1,7456E-3	5,9020E-3	6,0524E-4	5,2968E-3
53	1,51E+3	2,03E+3	2,0902E-3	8,0853E-3	7,2573E-4	7,3596E-3
54	1,43E+3	1,51E+3	2,6537E-3	3,1993E-3	9,1831E-4	2,2810E-3
55	1,23E+3	1,43E+3	3,3565E-3	7,0231E-3	1,1622E-3	5,8609E-3
56	1,01E+3	1,23E+3	3,2027E-3	5,3917E-3	1,1084E-3	4,2833E-3
57	9,14E+2	1,01E+3	4,4479E-3	7,4953E-3	1,5391E-3	5,9562E-3
58	7,49E+2	9,14E+2	3,4712E-3	7,0252E-3	1,2009E-3	5,8243E-3
59	6,77E+2	7,49E+2	2,8178E-3	1,4673E-2	9,7246E-4	1,3701E-2
60	4,54E+2	6,77E+2	5,7459E-3	9,3276E-3	1,9944E-3	7,3332E-3
61	3,72E+2	4,54E+2	4,8745E-3	5,9091E-3	1,6887E-3	4,2204E-3
62	3,04E+2	3,72E+2	5,2038E-3	1,7923E-2	1,8049E-3	1,6118E-2
63	2,04E+2	3,04E+2	9,1254E-3	2,4114E-2	3,1657E-3	2,0948E-2
64	1,49E+2	2,04E+2	9,4589E-3	2,1021E-2	3,2766E-3	1,7744E-2
65	1,37E+2	1,49E+2	9,0191E-3	7,6392E-3	3,1324E-3	4,5068E-3
66	9,17E+1	1,37E+2	1,0971E-2	2,0600E-2	3,8101E-3	1,6790E-2
67	7,57E+1	9,17E+1	2,3770E-2	1,5651E-2	8,2333E-3	7,4177E-3
68	6,79E+1	7,57E+1	2,7188E-2	5,3533E-2	9,4573E-3	4,4076E-2
69	5,56E+1	6,79E+1	3,9308E-2	3,6847E-2	1,3598E-2	2,3249E-2
70	5,16E+1	5,56E+1	9,0510E-3	1,9622E-2	3,2081E-3	1,6414E-2
71	4,83E+1	5,16E+1	1,6495E-2	1,4659E-2	5,7407E-3	8,9183E-3
72	4,55E+1	4,83E+1	1,8985E-2	9,0290E-3	6,5173E-3	2,5117E-3
73	4,02E+1	4,55E+1	8,9977E-3	2,4873E-2	3,1839E-3	2,1689E-2
74	3,73E+1	4,02E+1	5,0559E-3	1,6694E-2	1,7319E-3	1,4962E-2
75	3,37E+1	3,73E+1	3,5843E-3	3,8511E-3	1,2348E-3	2,6163E-3
76	3,05E+1	3,37E+1	8,2481E-3	7,6675E-3	2,8316E-3	4,8359E-3
77	2,76E+1	3,05E+1	9,7448E-3	6,3432E-3	3,3265E-3	3,0167E-3
78	2,50E+1	2,76E+1	2,2146E-2	1,5417E-2	7,6816E-3	7,7354E-3
79	2,26E+1	2,50E+1	1,0156E-2	9,5182E-2	3,4986E-3	9,1683E-2
80	1,95E+1	2,26E+1	2,0358E-2	7,6953E-2	7,1053E-3	6,9848E-2
81	1,59E+1	1,95E+1	2,5628E-2	2,1045E-2	8,8883E-3	1,2157E-2
82	1,37E+1	1,59E+1	8,0376E-2	4,6446E-2	2,7846E-2	1,8600E-2
83	1,12E+1	1,37E+1	3,2611E-2	2,4398E-2	1,1354E-2	1,3044E-2

84	9,91E+0	1,12E+1	9,3878E-2	4,2840E-2	3,2680E-2	1,0160E-2
85	9,19E+0	9,91E+0	1,6336E-2	7,7934E-3	5,5821E-3	2,2113E-3
86	8,32E+0	9,19E+0	2,2723E-2	1,1718E-2	7,7621E-3	3,9559E-3
87	7,52E+0	8,32E+0	7,7812E-2	5,1057E-2	2,7158E-2	2,3899E-2
88	6,16E+0	7,52E+0	3,3273E-2	1,7373E-2	1,1388E-2	5,9850E-3
89	5,35E+0	6,16E+0	2,9671E-2	1,2841E-2	1,0138E-2	2,7030E-3
90	5,04E+0	5,35E+0	1,3488E-2	6,5595E-3	4,6182E-3	1,9413E-3
91	4,13E+0	5,04E+0	2,9864E-2	1,7637E-2	1,0204E-2	7,4330E-3
92	4,00E+0	4,13E+0	1,3679E-2	7,9375E-3	4,6854E-3	3,2521E-3
93	3,38E+0	4,00E+0	9,1898E-3	5,7996E-3	3,1566E-3	2,6430E-3
94	3,30E+0	3,38E+0	7,9852E-3	5,6380E-3	2,7479E-3	2,8901E-3
95	2,77E+0	3,30E+0	7,7565E-3	1,1968E-2	2,6727E-3	9,2953E-3
96	2,72E+0	2,77E+0	7,3992E-3	6,3282E-2	2,5533E-3	6,0729E-2
97	2,60E+0	2,72E+0	6,8662E-3	1,6027E-1	2,3722E-3	1,5790E-1
98	2,55E+0	2,60E+0	7,3022E-3	6,0672E-2	2,5212E-3	5,8151E-2
99	2,36E+0	2,55E+0	7,6703E-3	2,4119E-2	2,6493E-3	2,1470E-2
100	2,13E+0	2,36E+0	8,0788E-3	9,9409E-3	2,7931E-3	7,1478E-3
101	2,10E+0	2,13E+0	8,2850E-3	1,0449E-2	2,8663E-3	7,5827E-3
102	2,02E+0	2,10E+0	8,3537E-3	1,3364E-2	2,8910E-3	1,0473E-2
103	1,93E+0	2,02E+0	8,4730E-3	1,4607E-2	2,9337E-3	1,1673E-2
104	1,84E+0	1,93E+0	8,7220E-3	1,0922E-2	3,0214E-3	7,9006E-3
105	1,76E+0	1,84E+0	9,1641E-3	1,0506E-2	3,1751E-3	7,3309E-3
106	1,67E+0	1,76E+0	9,8456E-3	1,1335E-2	3,4105E-3	7,9245E-3
107	1,59E+0	1,67E+0	1,0544E-2	1,2776E-2	3,6520E-3	9,1240E-3
108	1,50E+0	1,59E+0	1,1175E-2	1,5124E-2	3,8708E-3	1,1253E-2
109	1,48E+0	1,50E+0	1,1569E-2	1,7396E-2	4,0083E-3	1,3388E-2
110	1,44E+0	1,48E+0	1,1785E-2	1,9039E-2	4,0835E-3	1,4956E-2
111	1,37E+0	1,44E+0	1,2142E-2	2,3076E-2	4,2079E-3	1,8868E-2
112	1,34E+0	1,37E+0	1,2501E-2	2,8768E-2	4,3333E-3	2,4435E-2
113	1,30E+0	1,34E+0	1,2743E-2	3,4891E-2	4,4179E-3	3,0473E-2
114	1,24E+0	1,30E+0	1,3045E-2	5,0557E-2	4,5239E-3	4,6033E-2
115	1,17E+0	1,24E+0	1,3068E-2	9,8154E-2	4,5333E-3	9,3621E-2
116	1,15E+0	1,17E+0	1,2328E-2	1,7260E-1	4,2781E-3	1,6832E-1
117	1,12E+0	1,15E+0	1,0747E-2	2,7079E-1	3,7307E-3	2,6706E-1
118	1,11E+0	1,12E+0	8,2262E-3	3,9042E-1	2,8572E-3	3,8756E-1
119	1,10E+0	1,11E+0	6,0445E-3	4,7302E-1	2,1008E-3	4,7092E-1
120	1,07E+0	1,10E+0	3,5478E-3	5,4770E-1	1,2350E-3	5,4647E-1
121	1,05E+0	1,07E+0	2,4719E-3	5,6023E-1	8,6178E-4	5,5937E-1
122	1,04E+0	1,05E+0	2,7026E-3	5,4167E-1	9,4187E-4	5,4073E-1
123	1,02E+0	1,04E+0	3,5006E-3	5,1476E-1	1,2189E-3	5,1354E-1
124	9,96E-1	1,02E+0	6,0294E-3	4,4100E-1	2,0969E-3	4,3890E-1
125	9,86E-1	9,96E-1	9,4283E-3	3,3840E-1	3,2771E-3	3,3512E-1
126	9,72E-1	9,86E-1	1,1514E-2	2,7405E-1	4,0015E-3	2,7005E-1
127	9,50E-1	9,72E-1	1,3854E-2	2,0252E-1	4,8146E-3	1,9771E-1
128	9,30E-1	9,50E-1	1,5794E-2	1,4823E-1	5,4893E-3	1,4274E-1
129	9,10E-1	9,30E-1	1,7216E-2	1,1597E-1	5,9840E-3	1,0999E-1
130	8,60E-1	9,10E-1	1,9299E-2	8,3712E-2	6,7099E-3	7,7002E-2
131	8,50E-1	8,60E-1	2,0963E-2	6,6335E-2	7,2900E-3	5,9045E-2
132	7,90E-1	8,50E-1	2,2987E-2	5,5242E-2	7,9961E-3	4,7246E-2

133	7,80E-1	7,90E-1	2,5121E-2	4,7695E-2	8,7409E-3	3,8954E-2
134	7,05E-1	7,80E-1	2,8409E-2	4,3168E-2	9,8886E-3	3,3279E-2
135	6,25E-1	7,05E-1	3,6550E-2	4,0858E-2	1,2731E-2	2,8127E-2
136	5,40E-1	6,25E-1	5,2355E-2	4,6420E-2	1,8249E-2	2,8171E-2
137	5,00E-1	5,40E-1	7,4304E-2	5,7863E-2	2,5912E-2	3,1951E-2
138	4,85E-1	5,00E-1	9,0048E-2	6,6723E-2	3,1409E-2	3,5314E-2
139	4,33E-1	4,85E-1	1,2193E-1	8,5140E-2	4,2541E-2	4,2599E-2
140	4,00E-1	4,33E-1	1,8870E-1	1,2401E-1	6,5853E-2	5,8157E-2
141	3,91E-1	4,00E-1	2,4127E-1	1,5464E-1	8,4211E-2	7,0429E-2
142	3,50E-1	3,91E-1	3,4627E-1	2,1587E-1	1,2088E-1	9,4990E-2
143	3,20E-1	3,50E-1	5,2630E-1	3,2108E-1	1,8376E-1	1,3732E-1
144	3,15E-1	3,20E-1	6,0150E-1	3,6539E-1	2,1001E-1	1,5538E-1
145	3,00E-1	3,15E-1	6,2694E-1	3,8077E-1	2,1888E-1	1,6189E-1
146	2,80E-1	3,00E-1	6,3519E-1	3,8689E-1	2,2168E-1	1,6521E-1
147	2,48E-1	2,80E-1	5,7542E-1	3,5492E-1	2,0056E-1	1,5436E-1
148	2,20E-1	2,48E-1	4,5347E-1	2,8993E-1	1,5780E-1	1,3213E-1
149	1,89E-1	2,20E-1	3,4085E-1	2,3436E-1	1,1851E-1	1,1585E-1
150	1,80E-1	1,89E-1	2,8386E-1	2,0903E-1	9,8661E-2	1,1037E-1
151	1,60E-1	1,80E-1	2,5436E-1	1,9833E-1	8,8378E-2	1,0995E-1
152	1,40E-1	1,60E-1	2,2417E-1	1,8987E-1	7,7841E-2	1,1203E-1
153	1,34E-1	1,40E-1	2,1007E-1	1,8729E-1	7,2918E-2	1,1437E-1
154	1,15E-1	1,34E-1	2,0064E-1	1,8749E-1	6,9622E-2	1,1787E-1
155	1,00E-1	1,15E-1	1,9229E-1	1,8908E-1	6,6692E-2	1,2239E-1
156	9,50E-2	1,00E-1	1,9002E-1	1,9073E-1	6,5887E-2	1,2484E-1
157	8,00E-2	9,50E-2	1,9037E-1	1,9389E-1	6,5993E-2	1,2790E-1
158	7,70E-2	8,00E-2	1,9199E-1	1,9662E-1	6,6537E-2	1,3008E-1
159	6,70E-2	7,70E-2	1,9467E-1	1,9954E-1	6,7457E-2	1,3208E-1
160	5,80E-2	6,70E-2	1,9997E-1	2,0426E-1	6,9274E-2	1,3499E-1
161	5,00E-2	5,80E-2	2,0748E-1	2,0997E-1	7,1857E-2	1,3811E-1
162	4,20E-2	5,00E-2	2,1748E-1	2,1695E-1	7,5304E-2	1,4165E-1
163	3,50E-2	4,20E-2	2,2999E-1	2,2549E-1	7,9621E-2	1,4587E-1
164	3,00E-2	3,50E-2	2,4258E-1	2,3410E-1	8,3966E-2	1,5013E-1
165	2,50E-2	3,00E-2	2,5595E-1	2,4329E-1	8,8579E-2	1,5471E-1
166	2,00E-2	2,50E-2	2,7344E-1	2,5526E-1	9,4616E-2	1,6064E-1
167	1,50E-2	2,00E-2	2,9657E-1	2,7138E-1	1,0261E-1	1,6877E-1
168	1,00E-2	1,50E-2	3,2876E-1	2,9436E-1	1,1372E-1	1,8064E-1
169	6,90E-3	1,00E-2	3,6685E-1	3,2246E-1	1,2689E-1	1,9557E-1
170	5,00E-3	6,90E-3	4,0053E-1	3,4851E-1	1,3852E-1	2,0999E-1
171	3,00E-3	5,00E-3	4,3775E-1	3,7866E-1	1,5139E-1	2,2727E-1
172	1,10E-3	3,00E-3	5,1318E-1	4,4674E-1	1,7746E-1	2,6928E-1

TABLE 2d : Multi-group cross sections and Energy structure BP-4

Group	E _{i-1} [eV]	E _i [eV]	NU*SIGMA_F BP-4	ABSOR BP-4	FISSION BP-4	CAPTURE BP-4
1	1,73E+7	1,96E+7	7,7921E-3	4,0181E-3	1,5754E-3	2,4427E-3
2	1,49E+7	1,73E+7	6,8375E-3	4,9654E-3	1,4795E-3	3,4859E-3
3	1,38E+7	1,49E+7	6,0336E-3	5,1291E-3	1,3615E-3	3,7676E-3
4	1,16E+7	1,38E+7	4,9856E-3	5,1955E-3	1,1884E-3	4,0071E-3
5	1,00E+7	1,16E+7	4,4789E-3	5,2531E-3	1,1365E-3	4,1166E-3

6	8,19E+6	1,00E+7	4,3089E-3	4,5436E-3	1,1795E-3	3,3641E-3
7	6,70E+6	8,19E+6	4,1561E-3	3,8644E-3	1,2309E-3	2,6335E-3
8	6,07E+6	6,70E+6	2,9643E-3	3,1538E-3	8,9664E-4	2,2572E-3
9	5,49E+6	6,07E+6	2,2858E-3	1,4948E-3	6,9432E-4	8,0048E-4
10	4,49E+6	5,49E+6	2,2106E-3	2,2453E-3	7,0116E-4	1,5441E-3
11	3,68E+6	4,49E+6	2,1713E-3	1,9155E-3	7,1697E-4	1,1985E-3
12	3,01E+6	3,68E+6	2,1125E-3	9,7224E-4	7,1816E-4	2,5408E-4
13	2,47E+6	3,01E+6	2,0126E-3	9,4411E-4	6,9679E-4	2,4732E-4
14	2,23E+6	2,47E+6	1,9905E-3	9,7868E-4	7,0119E-4	2,7749E-4
15	2,02E+6	2,23E+6	2,0103E-3	1,0166E-3	7,1530E-4	3,0130E-4
16	1,65E+6	2,02E+6	1,8705E-3	9,7978E-4	6,6091E-4	3,1887E-4
17	1,35E+6	1,65E+6	1,7470E-3	9,7706E-4	6,2170E-4	3,5536E-4
18	1,22E+6	1,35E+6	1,3718E-3	8,5843E-4	4,5727E-4	4,0116E-4
19	1,11E+6	1,22E+6	1,2780E-3	8,5730E-4	4,2202E-4	4,3528E-4
20	1,00E+6	1,11E+6	1,2434E-3	8,8448E-4	4,1306E-4	4,7142E-4
21	9,07E+5	1,00E+6	1,2029E-3	9,2805E-4	4,0256E-4	5,2549E-4
22	8,21E+5	9,07E+5	1,1615E-3	9,5532E-4	3,9011E-4	5,6521E-4
23	6,08E+5	8,21E+5	1,0729E-3	9,4560E-4	3,6198E-4	5,8362E-4
24	5,50E+5	6,08E+5	9,8647E-4	9,2641E-4	3,3457E-4	5,9184E-4
25	4,98E+5	5,50E+5	9,4251E-4	9,1165E-4	3,1977E-4	5,9188E-4
26	4,50E+5	4,98E+5	9,1038E-4	9,0131E-4	3,0884E-4	5,9247E-4
27	4,08E+5	4,50E+5	8,8411E-4	8,9338E-4	3,0013E-4	5,9325E-4
28	3,02E+5	4,08E+5	8,5205E-4	8,8713E-4	2,9065E-4	5,9648E-4
29	2,73E+5	3,02E+5	8,4112E-4	8,9307E-4	2,8792E-4	6,0515E-4
30	2,47E+5	2,73E+5	8,3694E-4	9,0121E-4	2,8697E-4	6,1424E-4
31	1,83E+5	2,47E+5	8,2930E-4	9,3341E-4	2,8521E-4	6,4820E-4
32	1,23E+5	1,83E+5	8,3193E-4	1,0272E-3	2,8665E-4	7,4055E-4
33	1,11E+5	1,23E+5	8,5144E-4	1,1211E-3	2,9338E-4	8,2772E-4
34	8,23E+4	1,11E+5	8,6594E-4	1,2120E-3	2,9828E-4	9,1372E-4
35	6,74E+4	8,23E+4	8,8490E-4	1,3644E-3	3,0473E-4	1,0597E-3
36	5,52E+4	6,74E+4	8,9308E-4	1,5319E-3	3,0746E-4	1,2244E-3
37	4,09E+4	5,52E+4	9,0914E-4	1,6541E-3	3,1104E-4	1,3431E-3
38	3,70E+4	4,09E+4	9,2711E-4	1,7904E-3	3,1634E-4	1,4741E-3
39	2,93E+4	3,70E+4	9,3586E-4	1,9703E-3	3,1934E-4	1,6510E-3
40	2,74E+4	2,93E+4	9,3106E-4	2,1498E-3	3,1768E-4	1,8321E-3
41	2,48E+4	2,74E+4	9,4007E-4	2,2630E-3	3,2075E-4	1,9423E-3
42	1,66E+4	2,48E+4	9,7910E-4	2,6269E-3	3,3617E-4	2,2907E-3
43	1,50E+4	1,66E+4	1,0339E-3	2,2933E-3	3,5746E-4	1,9358E-3
44	1,11E+4	1,50E+4	1,0656E-3	3,0600E-3	3,6858E-4	2,6914E-3
45	9,12E+3	1,11E+4	1,1095E-3	3,2015E-3	3,8387E-4	2,8176E-3
46	7,47E+3	9,12E+3	1,2692E-3	3,6500E-3	4,3931E-4	3,2107E-3
47	5,53E+3	7,47E+3	1,2746E-3	5,0187E-3	4,4109E-4	4,5776E-3
48	5,00E+3	5,53E+3	1,3787E-3	4,1349E-3	4,7725E-4	3,6577E-3
49	3,53E+3	5,00E+3	1,5480E-3	6,4307E-3	5,3601E-4	5,8947E-3
50	3,35E+3	3,53E+3	1,3549E-3	3,5238E-3	4,6967E-4	3,0541E-3
51	2,25E+3	3,35E+3	2,0920E-3	6,2531E-3	7,2487E-4	5,5282E-3
52	2,03E+3	2,25E+3	1,7385E-3	6,0907E-3	6,0279E-4	5,4879E-3
53	1,51E+3	2,03E+3	2,0815E-3	8,3300E-3	7,2271E-4	7,6073E-3
54	1,43E+3	1,51E+3	2,6416E-3	3,5730E-3	9,1414E-4	2,6589E-3

55	1,23E+3	1,43E+3	3,3411E-3	7,3706E-3	1,1569E-3	6,2137E-3
56	1,01E+3	1,23E+3	3,1904E-3	5,7514E-3	1,1041E-3	4,6473E-3
57	9,14E+2	1,01E+3	4,4277E-3	7,8554E-3	1,5321E-3	6,3233E-3
58	7,49E+2	9,14E+2	3,4565E-3	7,5520E-3	1,1959E-3	6,3561E-3
59	6,77E+2	7,49E+2	2,8047E-3	1,5298E-2	9,6794E-4	1,4330E-2
60	4,54E+2	6,77E+2	5,7205E-3	9,9458E-3	1,9855E-3	7,9603E-3
61	3,72E+2	4,54E+2	4,8517E-3	6,7745E-3	1,6807E-3	5,0938E-3
62	3,04E+2	3,72E+2	5,1789E-3	1,8825E-2	1,7963E-3	1,7029E-2
63	2,04E+2	3,04E+2	9,0799E-3	2,5129E-2	3,1499E-3	2,1979E-2
64	1,49E+2	2,04E+2	9,4044E-3	2,2288E-2	3,2578E-3	1,9030E-2
65	1,37E+2	1,49E+2	8,9716E-3	9,3214E-3	3,1158E-3	6,2056E-3
66	9,17E+1	1,37E+2	1,0916E-2	2,1772E-2	3,7908E-3	1,7981E-2
67	7,57E+1	9,17E+1	2,3630E-2	1,7795E-2	8,1848E-3	9,6102E-3
68	6,79E+1	7,57E+1	2,7087E-2	5,3408E-2	9,4220E-3	4,3986E-2
69	5,56E+1	6,79E+1	3,9112E-2	3,7975E-2	1,3531E-2	2,4444E-2
70	5,16E+1	5,56E+1	9,0086E-3	2,1610E-2	3,1931E-3	1,8417E-2
71	4,83E+1	5,16E+1	1,6381E-2	1,7825E-2	5,7009E-3	1,2124E-2
72	4,55E+1	4,83E+1	1,8886E-2	1,0481E-2	6,4833E-3	3,9977E-3
73	4,02E+1	4,55E+1	8,9537E-3	2,6312E-2	3,1684E-3	2,3144E-2
74	3,73E+1	4,02E+1	5,0330E-3	1,7059E-2	1,7240E-3	1,5335E-2
75	3,37E+1	3,73E+1	3,5655E-3	5,2329E-3	1,2284E-3	4,0045E-3
76	3,05E+1	3,37E+1	8,1742E-3	1,3215E-2	2,8062E-3	1,0409E-2
77	2,76E+1	3,05E+1	9,6758E-3	9,1452E-3	3,3030E-3	5,8422E-3
78	2,50E+1	2,76E+1	2,2038E-2	1,6128E-2	7,6443E-3	8,4837E-3
79	2,26E+1	2,50E+1	1,0099E-2	9,6232E-2	3,4792E-3	9,2753E-2
80	1,95E+1	2,26E+1	2,0105E-2	8,7843E-2	7,0170E-3	8,0826E-2
81	1,59E+1	1,95E+1	2,5451E-2	2,4629E-2	8,8271E-3	1,5802E-2
82	1,37E+1	1,59E+1	7,9960E-2	4,7584E-2	2,7702E-2	1,9882E-2
83	1,12E+1	1,37E+1	3,2460E-2	2,5446E-2	1,1302E-2	1,4144E-2
84	9,91E+0	1,12E+1	9,3543E-2	4,3035E-2	3,2564E-2	1,0471E-2
85	9,19E+0	9,91E+0	1,6268E-2	7,9614E-3	5,5591E-3	2,4023E-3
86	8,32E+0	9,19E+0	2,2633E-2	1,1814E-2	7,7314E-3	4,0826E-3
87	7,52E+0	8,32E+0	7,7388E-2	5,4086E-2	2,7010E-2	2,7076E-2
88	6,16E+0	7,52E+0	3,3001E-2	2,1490E-2	1,1295E-2	1,0195E-2
89	5,35E+0	6,16E+0	2,9510E-2	1,3910E-2	1,0083E-2	3,8270E-3
90	5,04E+0	5,35E+0	1,3428E-2	6,7412E-3	4,5977E-3	2,1435E-3
91	4,13E+0	5,04E+0	2,9746E-2	1,7755E-2	1,0163E-2	7,5920E-3
92	4,00E+0	4,13E+0	1,3623E-2	8,1480E-3	4,6661E-3	3,4819E-3
93	3,38E+0	4,00E+0	9,1488E-3	6,3744E-3	3,1425E-3	3,2319E-3
94	3,30E+0	3,38E+0	7,9470E-3	6,3391E-3	2,7347E-3	3,6044E-3
95	2,77E+0	3,30E+0	7,6849E-3	1,7299E-2	2,6481E-3	1,4651E-2
96	2,72E+0	2,77E+0	7,2746E-3	7,5915E-2	2,5103E-3	7,3405E-2
97	2,60E+0	2,72E+0	6,6616E-3	1,7864E-1	2,3015E-3	1,7634E-1
98	2,55E+0	2,60E+0	6,9629E-3	9,8808E-2	2,4041E-3	9,6404E-2
99	2,36E+0	2,55E+0	7,4685E-3	4,3488E-2	2,5796E-3	4,0908E-2
100	2,13E+0	2,36E+0	7,9925E-3	1,4065E-2	2,7633E-3	1,1302E-2
101	2,10E+0	2,13E+0	8,2011E-3	1,5121E-2	2,8373E-3	1,2284E-2
102	2,02E+0	2,10E+0	8,2450E-3	2,1923E-2	2,8534E-3	1,9070E-2
103	1,93E+0	2,02E+0	8,3533E-3	2,4372E-2	2,8923E-3	2,1480E-2

104	1,84E+0	1,93E+0	8,6412E-3	1,4612E-2	2,9934E-3	1,1619E-2
105	1,76E+0	1,84E+0	9,0993E-3	1,2357E-2	3,1526E-3	9,2044E-3
106	1,67E+0	1,76E+0	9,7858E-3	1,2659E-2	3,3897E-3	9,2693E-3
107	1,59E+0	1,67E+0	1,0485E-2	1,3879E-2	3,6316E-3	1,0247E-2
108	1,50E+0	1,59E+0	1,1115E-2	1,6116E-2	3,8503E-3	1,2266E-2
109	1,48E+0	1,50E+0	1,1509E-2	1,8345E-2	3,9875E-3	1,4358E-2
110	1,44E+0	1,48E+0	1,1725E-2	1,9974E-2	4,0626E-3	1,5911E-2
111	1,37E+0	1,44E+0	1,2080E-2	2,3993E-2	4,1866E-3	1,9806E-2
112	1,34E+0	1,37E+0	1,2438E-2	2,9669E-2	4,3115E-3	2,5358E-2
113	1,30E+0	1,34E+0	1,2679E-2	3,5775E-2	4,3957E-3	3,1379E-2
114	1,24E+0	1,30E+0	1,2981E-2	5,1389E-2	4,5014E-3	4,6888E-2
115	1,17E+0	1,24E+0	1,3005E-2	9,8775E-2	4,5114E-3	9,4264E-2
116	1,15E+0	1,17E+0	1,2273E-2	1,7287E-1	4,2589E-3	1,6861E-1
117	1,12E+0	1,15E+0	1,0706E-2	2,7067E-1	3,7164E-3	2,6695E-1
118	1,11E+0	1,12E+0	8,2036E-3	3,9005E-1	2,8493E-3	3,8720E-1
119	1,10E+0	1,11E+0	6,0333E-3	4,7266E-1	2,0969E-3	4,7056E-1
120	1,07E+0	1,10E+0	3,5447E-3	5,4752E-1	1,2339E-3	5,4629E-1
121	1,05E+0	1,07E+0	2,4708E-3	5,6017E-1	8,6139E-4	5,5931E-1
122	1,04E+0	1,05E+0	2,7012E-3	5,4159E-1	9,4137E-4	5,4065E-1
123	1,02E+0	1,04E+0	3,4977E-3	5,1463E-1	1,2179E-3	5,1341E-1
124	9,96E-1	1,02E+0	6,0187E-3	4,4075E-1	2,0931E-3	4,3866E-1
125	9,86E-1	9,96E-1	9,3992E-3	3,3822E-1	3,2670E-3	3,3495E-1
126	9,72E-1	9,86E-1	1,1469E-2	2,7406E-1	3,9860E-3	2,7007E-1
127	9,50E-1	9,72E-1	1,3790E-2	2,0288E-1	4,7924E-3	1,9809E-1
128	9,30E-1	9,50E-1	1,5713E-2	1,4897E-1	5,4611E-3	1,4351E-1
129	9,10E-1	9,30E-1	1,7122E-2	1,1700E-1	5,9513E-3	1,1105E-1
130	8,60E-1	9,10E-1	1,9187E-2	8,5129E-2	6,6707E-3	7,8458E-2
131	8,50E-1	8,60E-1	2,0835E-2	6,8038E-2	7,2455E-3	6,0793E-2
132	7,90E-1	8,50E-1	2,2840E-2	5,7247E-2	7,9449E-3	4,9302E-2
133	7,80E-1	7,90E-1	2,4952E-2	5,0001E-2	8,6822E-3	4,1319E-2
134	7,05E-1	7,80E-1	2,8205E-2	4,5881E-2	9,8178E-3	3,6063E-2
135	6,25E-1	7,05E-1	3,6251E-2	4,4461E-2	1,2627E-2	3,1834E-2
136	5,40E-1	6,25E-1	5,1843E-2	5,1352E-2	1,8071E-2	3,3281E-2
137	5,00E-1	5,40E-1	7,3449E-2	6,4119E-2	2,5614E-2	3,8505E-2
138	4,85E-1	5,00E-1	8,8913E-2	7,3662E-2	3,1013E-2	4,2649E-2
139	4,33E-1	4,85E-1	1,2019E-1	9,2998E-2	4,1934E-2	5,1064E-2
140	4,00E-1	4,33E-1	1,8551E-1	1,3278E-1	6,4739E-2	6,8041E-2
141	3,91E-1	4,00E-1	2,3680E-1	1,6352E-1	8,2651E-2	8,0869E-2
142	3,50E-1	3,91E-1	3,3911E-1	2,2400E-1	1,1838E-1	1,0562E-1
143	3,20E-1	3,50E-1	5,1428E-1	3,2659E-1	1,7956E-1	1,4703E-1
144	3,15E-1	3,20E-1	5,8743E-1	3,6955E-1	2,0510E-1	1,6445E-1
145	3,00E-1	3,15E-1	6,1186E-1	3,8452E-1	2,1361E-1	1,7091E-1
146	2,80E-1	3,00E-1	6,1818E-1	3,9081E-1	2,1574E-1	1,7507E-1
147	2,48E-1	2,80E-1	5,5475E-1	3,6175E-1	1,9336E-1	1,6839E-1
148	2,20E-1	2,48E-1	4,3029E-1	3,0470E-1	1,4973E-1	1,5497E-1
149	1,89E-1	2,20E-1	3,1771E-1	2,5998E-1	1,1046E-1	1,4952E-1
150	1,80E-1	1,89E-1	2,6132E-1	2,4183E-1	9,0827E-2	1,5100E-1
151	1,60E-1	1,80E-1	2,3171E-1	2,3587E-1	8,0507E-2	1,5536E-1
152	1,40E-1	1,60E-1	2,0128E-1	2,3277E-1	6,9895E-2	1,6288E-1

153	1,34E-1	1,40E-1	1,8699E-1	2,3263E-1	6,4906E-2	1,6772E-1
154	1,15E-1	1,34E-1	1,7708E-1	2,3464E-1	6,1447E-2	1,7319E-1
155	1,00E-1	1,15E-1	1,6813E-1	2,3770E-1	5,8315E-2	1,7939E-1
156	9,50E-2	1,00E-1	1,6541E-1	2,3981E-1	5,7355E-2	1,8246E-1
157	8,00E-2	9,50E-2	1,6505E-1	2,4325E-1	5,7214E-2	1,8604E-1
158	7,70E-2	8,00E-2	1,6602E-1	2,4600E-1	5,7538E-2	1,8846E-1
159	6,70E-2	7,70E-2	1,6801E-1	2,4888E-1	5,8215E-2	1,9067E-1
160	5,80E-2	6,70E-2	1,7216E-1	2,5337E-1	5,9638E-2	1,9373E-1
161	5,00E-2	5,80E-2	1,7824E-1	2,5868E-1	6,1730E-2	1,9695E-1
162	4,20E-2	5,00E-2	1,8645E-1	2,6509E-1	6,4560E-2	2,0053E-1
163	3,50E-2	4,20E-2	1,9676E-1	2,7283E-1	6,8116E-2	2,0471E-1
164	3,00E-2	3,50E-2	2,0710E-1	2,8061E-1	7,1684E-2	2,0893E-1
165	2,50E-2	3,00E-2	2,1803E-1	2,8889E-1	7,5455E-2	2,1344E-1
166	2,00E-2	2,50E-2	2,3226E-1	2,9963E-1	8,0367E-2	2,1926E-1
167	1,50E-2	2,00E-2	2,5093E-1	3,1402E-1	8,6816E-2	2,2720E-1
168	1,00E-2	1,50E-2	2,7660E-1	3,3446E-1	9,5683E-2	2,3878E-1
169	6,90E-3	1,00E-2	3,0652E-1	3,5929E-1	1,0602E-1	2,5327E-1
170	5,00E-3	6,90E-3	3,3251E-1	3,8216E-1	1,1500E-1	2,6716E-1
171	3,00E-3	5,00E-3	3,6076E-1	4,0845E-1	1,2476E-1	2,8369E-1
172	1,10E-3	3,00E-3	4,1665E-1	4,6733E-1	1,4408E-1	3,2325E-1

TABLE 2e : Multi-group cross sections and Energy structure GT

Group	Ei-1 [eV]	Ei [eV]	NU*SIGMA_F GT	ABSOR GT	FISSION GT	CAPTURE GT
1	1,73E+7	1,96E+7	5,7619E-3	3,5964E-3	1,1655E-3	2,4309E-3
2	1,49E+7	1,73E+7	5,0661E-3	4,7332E-3	1,0968E-3	3,6364E-3
3	1,38E+7	1,49E+7	4,4784E-3	4,9873E-3	1,0112E-3	3,9761E-3
4	1,16E+7	1,38E+7	3,7117E-3	5,1645E-3	8,8542E-4	4,2791E-3
5	1,00E+7	1,16E+7	3,3399E-3	5,2825E-3	8,4822E-4	4,4343E-3
6	8,19E+6	1,00E+7	3,2220E-3	4,5040E-3	8,8280E-4	3,6212E-3
7	6,70E+6	8,19E+6	3,1158E-3	3,7538E-3	9,2370E-4	2,8301E-3
8	6,07E+6	6,70E+6	2,2154E-3	3,0959E-3	6,7085E-4	2,4251E-3
9	5,49E+6	6,07E+6	1,7119E-3	1,3206E-3	5,2055E-4	8,0005E-4
10	4,49E+6	5,49E+6	1,6561E-3	2,1707E-3	5,2588E-4	1,6448E-3
11	3,68E+6	4,49E+6	1,6382E-3	1,8070E-3	5,4156E-4	1,2654E-3
12	3,01E+6	3,68E+6	1,5896E-3	7,5318E-4	5,4103E-4	2,1215E-4
13	2,47E+6	3,01E+6	1,5028E-3	7,1783E-4	5,2090E-4	1,9693E-4
14	2,23E+6	2,47E+6	1,4840E-3	7,4267E-4	5,2338E-4	2,1929E-4
15	2,02E+6	2,23E+6	1,5102E-3	7,7629E-4	5,3799E-4	2,3830E-4
16	1,65E+6	2,02E+6	1,4035E-3	7,4575E-4	4,9646E-4	2,4929E-4
17	1,35E+6	1,65E+6	1,3061E-3	7,3928E-4	4,6529E-4	2,7399E-4
18	1,22E+6	1,35E+6	1,0247E-3	6,4999E-4	3,4166E-4	3,0833E-4
19	1,11E+6	1,22E+6	9,5112E-4	6,4696E-4	3,1407E-4	3,3289E-4
20	1,00E+6	1,11E+6	9,3460E-4	6,7361E-4	3,1046E-4	3,6315E-4
21	9,07E+5	1,00E+6	9,0032E-4	7,0636E-4	3,0131E-4	4,0505E-4
22	8,21E+5	9,07E+5	8,5979E-4	7,2153E-4	2,8877E-4	4,3276E-4
23	6,08E+5	8,21E+5	7,9053E-4	7,1016E-4	2,6671E-4	4,4345E-4
24	5,50E+5	6,08E+5	7,2496E-4	6,9335E-4	2,4588E-4	4,4747E-4

25	4,98E+5	5,50E+5	6,9129E-4	6,8079E-4	2,3454E-4	4,4625E-4
26	4,50E+5	4,98E+5	6,6823E-4	6,7313E-4	2,2670E-4	4,4643E-4
27	4,08E+5	4,50E+5	6,5167E-4	6,6936E-4	2,2122E-4	4,4814E-4
28	3,02E+5	4,08E+5	6,1892E-4	6,5531E-4	2,1113E-4	4,4418E-4
29	2,73E+5	3,02E+5	6,0789E-4	6,5623E-4	2,0808E-4	4,4815E-4
30	2,47E+5	2,73E+5	6,0284E-4	6,6017E-4	2,0670E-4	4,5347E-4
31	1,83E+5	2,47E+5	5,9287E-4	6,7923E-4	2,0390E-4	4,7533E-4
32	1,23E+5	1,83E+5	5,8858E-4	7,4113E-4	2,0280E-4	5,3833E-4
33	1,11E+5	1,23E+5	5,9955E-4	8,0499E-4	2,0658E-4	5,9841E-4
34	8,23E+4	1,11E+5	6,0566E-4	8,6394E-4	2,0862E-4	6,5532E-4
35	6,74E+4	8,23E+4	6,1548E-4	9,6623E-4	2,1195E-4	7,5428E-4
36	5,52E+4	6,74E+4	6,1858E-4	1,0812E-3	2,1296E-4	8,6824E-4
37	4,09E+4	5,52E+4	6,2731E-4	1,1680E-3	2,1462E-4	9,5338E-4
38	3,70E+4	4,09E+4	6,3852E-4	1,2674E-3	2,1787E-4	1,0495E-3
39	2,93E+4	3,70E+4	6,4282E-4	1,3978E-3	2,1935E-4	1,1785E-3
40	2,74E+4	2,93E+4	6,3889E-4	1,5306E-3	2,1799E-4	1,3126E-3
41	2,48E+4	2,74E+4	6,4416E-4	1,6133E-3	2,1979E-4	1,3935E-3
42	1,66E+4	2,48E+4	6,7103E-4	1,8896E-3	2,3039E-4	1,6592E-3
43	1,50E+4	1,66E+4	7,0402E-4	1,5814E-3	2,4341E-4	1,3380E-3
44	1,11E+4	1,50E+4	7,2806E-4	2,1996E-3	2,5182E-4	1,9478E-3
45	9,12E+3	1,11E+4	7,5113E-4	2,2637E-3	2,5989E-4	2,0038E-3
46	7,47E+3	9,12E+3	8,6350E-4	2,6199E-3	2,9889E-4	2,3210E-3
47	5,53E+3	7,47E+3	8,6685E-4	3,7205E-3	2,9998E-4	3,4205E-3
48	5,00E+3	5,53E+3	9,3373E-4	2,9165E-3	3,2323E-4	2,5933E-3
49	3,53E+3	5,00E+3	1,0518E-3	4,7991E-3	3,6422E-4	4,4349E-3
50	3,35E+3	3,53E+3	9,0672E-4	2,2898E-3	3,1431E-4	1,9755E-3
51	2,25E+3	3,35E+3	1,4171E-3	4,4345E-3	4,9102E-4	3,9435E-3
52	2,03E+3	2,25E+3	1,1740E-3	4,2716E-3	4,0707E-4	3,8645E-3
53	1,51E+3	2,03E+3	1,3783E-3	5,8716E-3	4,7857E-4	5,3930E-3
54	1,43E+3	1,51E+3	1,8988E-3	2,3960E-3	6,5707E-4	1,7389E-3
55	1,23E+3	1,43E+3	2,2644E-3	4,8401E-3	7,8409E-4	4,0560E-3
56	1,01E+3	1,23E+3	2,1529E-3	3,7100E-3	7,4506E-4	2,9649E-3
57	9,14E+2	1,01E+3	2,9987E-3	5,1679E-3	1,0377E-3	4,1302E-3
58	7,49E+2	9,14E+2	2,3313E-3	4,9977E-3	8,0657E-4	4,1911E-3
59	6,77E+2	7,49E+2	1,8295E-3	1,0851E-2	6,3137E-4	1,0220E-2
60	4,54E+2	6,77E+2	3,8742E-3	6,4747E-3	1,3447E-3	5,1300E-3
61	3,72E+2	4,54E+2	3,2728E-3	4,2020E-3	1,1338E-3	3,0682E-3
62	3,04E+2	3,72E+2	3,4515E-3	1,2315E-2	1,1972E-3	1,1118E-2
63	2,04E+2	3,04E+2	6,0640E-3	1,8043E-2	2,1037E-3	1,5939E-2
64	1,49E+2	2,04E+2	6,2548E-3	1,4962E-2	2,1667E-3	1,2795E-2
65	1,37E+2	1,49E+2	6,0240E-3	5,3214E-3	2,0922E-3	3,2292E-3
66	9,17E+1	1,37E+2	7,2640E-3	1,4043E-2	2,5226E-3	1,1520E-2
67	7,57E+1	9,17E+1	1,5778E-2	1,0704E-2	5,4651E-3	5,2389E-3
68	6,79E+1	7,57E+1	1,7680E-2	3,5210E-2	6,1501E-3	2,9060E-2
69	5,56E+1	6,79E+1	2,5661E-2	2,4549E-2	8,8775E-3	1,5672E-2
70	5,16E+1	5,56E+1	6,0128E-3	1,3351E-2	2,1313E-3	1,1220E-2
71	4,83E+1	5,16E+1	1,0929E-2	1,0112E-2	3,8035E-3	6,3085E-3
72	4,55E+1	4,83E+1	1,2649E-2	6,2747E-3	4,3422E-3	1,9325E-3
73	4,02E+1	4,55E+1	5,9513E-3	1,6774E-2	2,1060E-3	1,4668E-2

74	3,73E+1	4,02E+1	3,3451E-3	1,1334E-2	1,1459E-3	1,0188E-2
75	3,37E+1	3,73E+1	2,3917E-3	2,8408E-3	8,2397E-4	2,0168E-3
76	3,05E+1	3,37E+1	5,4936E-3	5,7458E-3	1,8859E-3	3,8599E-3
77	2,76E+1	3,05E+1	6,4989E-3	4,6263E-3	2,2185E-3	2,4078E-3
78	2,50E+1	2,76E+1	1,4727E-2	1,0486E-2	5,1086E-3	5,3774E-3
79	2,26E+1	2,50E+1	6,3743E-3	6,1366E-2	2,1959E-3	5,9170E-2
80	1,95E+1	2,26E+1	1,2903E-2	5,0235E-2	4,5033E-3	4,5732E-2
81	1,59E+1	1,95E+1	1,6894E-2	1,4308E-2	5,8595E-3	8,4485E-3
82	1,37E+1	1,59E+1	5,2098E-2	3,0496E-2	1,8049E-2	1,2447E-2
83	1,12E+1	1,37E+1	2,1454E-2	1,6422E-2	7,4699E-3	8,9521E-3
84	9,91E+0	1,12E+1	6,1255E-2	2,8247E-2	2,1324E-2	6,9230E-3
85	9,19E+0	9,91E+0	1,0805E-2	5,4454E-3	3,6922E-3	1,7532E-3
86	8,32E+0	9,19E+0	1,5048E-2	8,0574E-3	5,1404E-3	2,9170E-3
87	7,52E+0	8,32E+0	5,0485E-2	3,3718E-2	1,7621E-2	1,6097E-2
88	6,16E+0	7,52E+0	2,1888E-2	1,2071E-2	7,4915E-3	4,5795E-3
89	5,35E+0	6,16E+0	1,9613E-2	8,9435E-3	6,7012E-3	2,2423E-3
90	5,04E+0	5,35E+0	8,9572E-3	4,7420E-3	3,0669E-3	1,6751E-3
91	4,13E+0	5,04E+0	1,9735E-2	1,2072E-2	6,7428E-3	5,3292E-3
92	4,00E+0	4,13E+0	9,0716E-3	5,7022E-3	3,1072E-3	2,5950E-3
93	3,38E+0	4,00E+0	6,1155E-3	4,3505E-3	2,1006E-3	2,2499E-3
94	3,30E+0	3,38E+0	5,3147E-3	4,2767E-3	1,8289E-3	2,4478E-3
95	2,77E+0	3,30E+0	5,1319E-3	8,8505E-3	1,7683E-3	7,0822E-3
96	2,72E+0	2,77E+0	4,7291E-3	4,2065E-2	1,6319E-3	4,0433E-2
97	2,60E+0	2,72E+0	4,1228E-3	9,8166E-2	1,4244E-3	9,6742E-2
98	2,55E+0	2,60E+0	4,6158E-3	3,9477E-2	1,5937E-3	3,7883E-2
99	2,36E+0	2,55E+0	4,9850E-3	1,7024E-2	1,7218E-3	1,5302E-2
100	2,13E+0	2,36E+0	5,3338E-3	7,4763E-3	1,8441E-3	5,6322E-3
101	2,10E+0	2,13E+0	5,4761E-3	7,8879E-3	1,8945E-3	5,9934E-3
102	2,02E+0	2,10E+0	5,5111E-3	1,0087E-2	1,9072E-3	8,1798E-3
103	1,93E+0	2,02E+0	5,5854E-3	1,0985E-2	1,9339E-3	9,0511E-3
104	1,84E+0	1,93E+0	5,7685E-3	8,1616E-3	1,9983E-3	6,1633E-3
105	1,76E+0	1,84E+0	6,0681E-3	7,7560E-3	2,1024E-3	5,6536E-3
106	1,67E+0	1,76E+0	6,5196E-3	8,2753E-3	2,2584E-3	6,0169E-3
107	1,59E+0	1,67E+0	6,9770E-3	9,2211E-3	2,4165E-3	6,8046E-3
108	1,50E+0	1,59E+0	7,3818E-3	1,0770E-2	2,5570E-3	8,2130E-3
109	1,48E+0	1,50E+0	7,6304E-3	1,2264E-2	2,6436E-3	9,6204E-3
110	1,44E+0	1,48E+0	7,7628E-3	1,3340E-2	2,6898E-3	1,0650E-2
111	1,37E+0	1,44E+0	7,9726E-3	1,5968E-2	2,7630E-3	1,3205E-2
112	1,34E+0	1,37E+0	8,1723E-3	1,9643E-2	2,8328E-3	1,6810E-2
113	1,30E+0	1,34E+0	8,2891E-3	2,3551E-2	2,8738E-3	2,0677E-2
114	1,24E+0	1,30E+0	8,3792E-3	3,3361E-2	2,9057E-3	3,0455E-2
115	1,17E+0	1,24E+0	8,0927E-3	6,1745E-2	2,8074E-3	5,8938E-2
116	1,15E+0	1,17E+0	7,2300E-3	1,0226E-1	2,5089E-3	9,9751E-2
117	1,12E+0	1,15E+0	5,8807E-3	1,4930E-1	2,0414E-3	1,4726E-1
118	1,11E+0	1,12E+0	4,1359E-3	1,9752E-1	1,4365E-3	1,9608E-1
119	1,10E+0	1,11E+0	2,8587E-3	2,2500E-1	9,9357E-4	2,2401E-1
120	1,07E+0	1,10E+0	1,5774E-3	2,4486E-1	5,4908E-4	2,4431E-1
121	1,05E+0	1,07E+0	1,0726E-3	2,4448E-1	3,7394E-4	2,4411E-1
122	1,04E+0	1,05E+0	1,1776E-3	2,3741E-1	4,1039E-4	2,3700E-1

123	1,02E+0	1,04E+0	1,5490E-3	2,2917E-1	5,3936E-4	2,2863E-1
124	9,96E-1	1,02E+0	2,8057E-3	2,0657E-1	9,7573E-4	2,0559E-1
125	9,86E-1	9,96E-1	4,7170E-3	1,7061E-1	1,6395E-3	1,6897E-1
126	9,72E-1	9,86E-1	6,0359E-3	1,4494E-1	2,0977E-3	1,4284E-1
127	9,50E-1	9,72E-1	7,6563E-3	1,1316E-1	2,6608E-3	1,1050E-1
128	9,30E-1	9,50E-1	9,1036E-3	8,6646E-2	3,1640E-3	8,3482E-2
129	9,10E-1	9,30E-1	1,0197E-2	6,9883E-2	3,5443E-3	6,6339E-2
130	8,60E-1	9,10E-1	1,1772E-2	5,2256E-2	4,0929E-3	4,8163E-2
131	8,50E-1	8,60E-1	1,3001E-2	4,2343E-2	4,5212E-3	3,7822E-2
132	7,90E-1	8,50E-1	1,4425E-2	3,5892E-2	5,0177E-3	3,0874E-2
133	7,80E-1	7,90E-1	1,5892E-2	3,1431E-2	5,5297E-3	2,5901E-2
134	7,05E-1	7,80E-1	1,8074E-2	2,8775E-2	6,2913E-3	2,2484E-2
135	6,25E-1	7,05E-1	2,3336E-2	2,7524E-2	8,1284E-3	1,9396E-2
136	5,40E-1	6,25E-1	3,3278E-2	3,1133E-2	1,1600E-2	1,9533E-2
137	5,00E-1	5,40E-1	4,6720E-2	3,8199E-2	1,6293E-2	2,1906E-2
138	4,85E-1	5,00E-1	5,6119E-2	4,3501E-2	1,9574E-2	2,3927E-2
139	4,33E-1	4,85E-1	7,4643E-2	5,4190E-2	2,6042E-2	2,8148E-2
140	4,00E-1	4,33E-1	1,1127E-1	7,5421E-2	3,8832E-2	3,6589E-2
141	3,91E-1	4,00E-1	1,3813E-1	9,0962E-2	4,8212E-2	4,2750E-2
142	3,50E-1	3,91E-1	1,8762E-1	1,1958E-1	6,5498E-2	5,4082E-2
143	3,20E-1	3,50E-1	2,5887E-1	1,6080E-1	9,0386E-2	7,0414E-2
144	3,15E-1	3,20E-1	2,8278E-1	1,7476E-1	9,8733E-2	7,6027E-2
145	3,00E-1	3,15E-1	2,8917E-1	1,7868E-1	1,0096E-1	7,7720E-2
146	2,80E-1	3,00E-1	2,8844E-1	1,7887E-1	1,0067E-1	7,8200E-2
147	2,48E-1	2,80E-1	2,6466E-1	1,6661E-1	9,2247E-2	7,4363E-2
148	2,20E-1	2,48E-1	2,1753E-1	1,4240E-1	7,5698E-2	6,6702E-2
149	1,89E-1	2,20E-1	1,6992E-1	1,1944E-1	5,9078E-2	6,0362E-2
150	1,80E-1	1,89E-1	1,4408E-1	1,0767E-1	5,0077E-2	5,7593E-2
151	1,60E-1	1,80E-1	1,3032E-1	1,0203E-1	4,5279E-2	5,6751E-2
152	1,40E-1	1,60E-1	1,1579E-1	9,6426E-2	4,0209E-2	5,6217E-2
153	1,34E-1	1,40E-1	1,0891E-1	9,3925E-2	3,7805E-2	5,6120E-2
154	1,15E-1	1,34E-1	1,0427E-1	9,2585E-2	3,6182E-2	5,6403E-2
155	1,00E-1	1,15E-1	1,0006E-1	9,1498E-2	3,4705E-2	5,6793E-2
156	9,50E-2	1,00E-1	9,8867E-2	9,1362E-2	3,4282E-2	5,7080E-2
157	8,00E-2	9,50E-2	9,8959E-2	9,1997E-2	3,4304E-2	5,7693E-2
158	7,70E-2	8,00E-2	9,9559E-2	9,2707E-2	3,4504E-2	5,8203E-2
159	6,70E-2	7,70E-2	1,0065E-1	9,3630E-2	3,4875E-2	5,8755E-2
160	5,80E-2	6,70E-2	1,0274E-1	9,5267E-2	3,5593E-2	5,9674E-2
161	5,00E-2	5,80E-2	1,0569E-1	9,7387E-2	3,6606E-2	6,0781E-2
162	4,20E-2	5,00E-2	1,0960E-1	1,0008E-1	3,7949E-2	6,2131E-2
163	3,50E-2	4,20E-2	1,1439E-1	1,0343E-1	3,9601E-2	6,3829E-2
164	3,00E-2	3,50E-2	1,1909E-1	1,0683E-1	4,1219E-2	6,5611E-2
165	2,50E-2	3,00E-2	1,2398E-1	1,1046E-1	4,2906E-2	6,7554E-2
166	2,00E-2	2,50E-2	1,3035E-1	1,1524E-1	4,5104E-2	7,0136E-2
167	1,50E-2	2,00E-2	1,3866E-1	1,2175E-1	4,7972E-2	7,3778E-2
168	1,00E-2	1,50E-2	1,5001E-1	1,3118E-1	5,1890E-2	7,9290E-2
169	6,90E-3	1,00E-2	1,6308E-1	1,4297E-1	5,6406E-2	8,6564E-2
170	5,00E-3	6,90E-3	1,7424E-1	1,5424E-1	6,0263E-2	9,3977E-2
171	3,00E-3	5,00E-3	1,8629E-1	1,6792E-1	6,4426E-2	1,0349E-1

172	1,10E-3	3,00E-3	2,1074E-1	2,0295E-1	7,2876E-2	1,3007E-1
-----	---------	---------	-----------	-----------	-----------	-----------

Table: 3 Tow groups constants FU Assembly
Unit: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	5,880E-2	5,092E-3	1,759E-3	5,426E-3	2,955E-1
2	8,658E-2	2,643E-1	9,180E-2	6,651E-2	9,358E-1

Table: 3a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,320E+1	7,432E-3
2	4,664E-1	2,226E+0

Table: 3b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	2,469E+1	7,618E-3
2	3,901E-1	2,231E+0

Table: 4 Tow groups constants BP-1 Assembly
Unit: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	5,954E-2	5,290E-3	1,827E-3	5,882E-3	2,990E-1
2	9,337E-2	2,409E-1	8,375E-2	1,172E-1	9,848E-1

Table: 4a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,593E+1	9,460E-3
2	5,929E-1	2,268E+0

Table: 4b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	2,989E+1	9,705E-3
2	4,964E-1	2,432E+0

Table: 5 Tow groups constants BP-2 Assembly
Unit: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	5,977E-2	5,309E-3	1,834E-3	6,298E-3	3,005E-1
2	9,616E-2	2,302E-1	8,005E-2	1,357E-1	1,010E+0

Table: 5a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,719E+1	1,016E-2
2	6,418E-1	2,323E+0

Table: 5b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	3,228E+1	1,045E-2
2	5,372E-1	2,531E+0

Table: 6 Tow groups constants BP-3 Assembly
Unit: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	5,947E-2	5,242E-3	1,811E-3	6,006E-3	2,990E-1
2	9,271E-2	2,426E-1	8,432E-2	1,107E-1	9,835E-1

Table: 6a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,572E+1	9,159E-3
2	5,771E-1	2,287E+0

Table: 6b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	2,948E+1	9,409E-3
2	4,829E-1	2,421E+0

Table: 7 Tow groups constants BP-4 Assembly
Unit: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	5,988E-2	5,290E-3	1,827E-3	6,631E-3	3,014E-1
2	9,740E-2	2,246E-1	7,810E-2	1,441E-1	1,023E+0

Table: 7a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,792E+1	1,043E-2
2	6,646E-1	2,357E+0

Table: 7b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	3,363E+1	1,076E-2
2	5,560E-1	2,581E+0

Table: 8 Tow groups constants GT Assembly
Unit: cm-1

G	D	Nu*fission	Fission	Capture	Totale
1	7,515E-2	3,643E-3	1,258E-3	7,183E-6	2,942E-1
2	1,204E-1	1,244E-1	4,318E-2	4,391E-3	1,2E+00

Table: 8a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	1,170E+1	9,934E-3
2	7,022E-1	7,224E+0

Table: 8b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1
1 -> 2	2 -> 2

1	2,847E+1	1,315E-2
2	6,082E-1	7,339E+0

Fig.3 : Kinf vs. Burnup

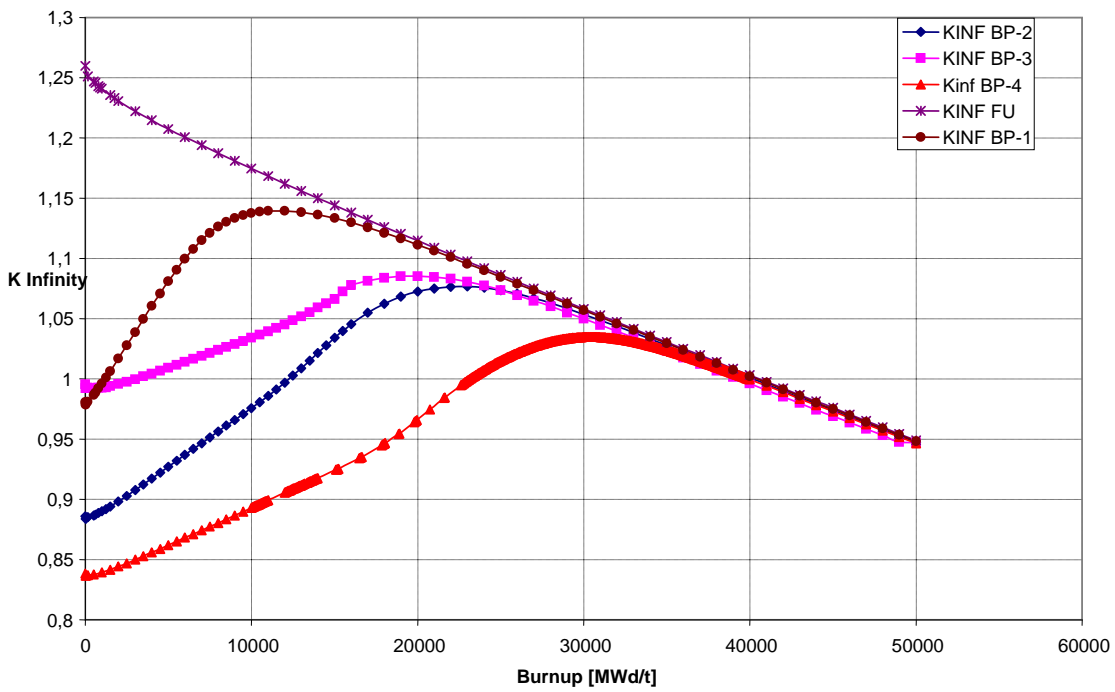


Fig. 4: Instantaneous conversion ratio vs. Burnup.

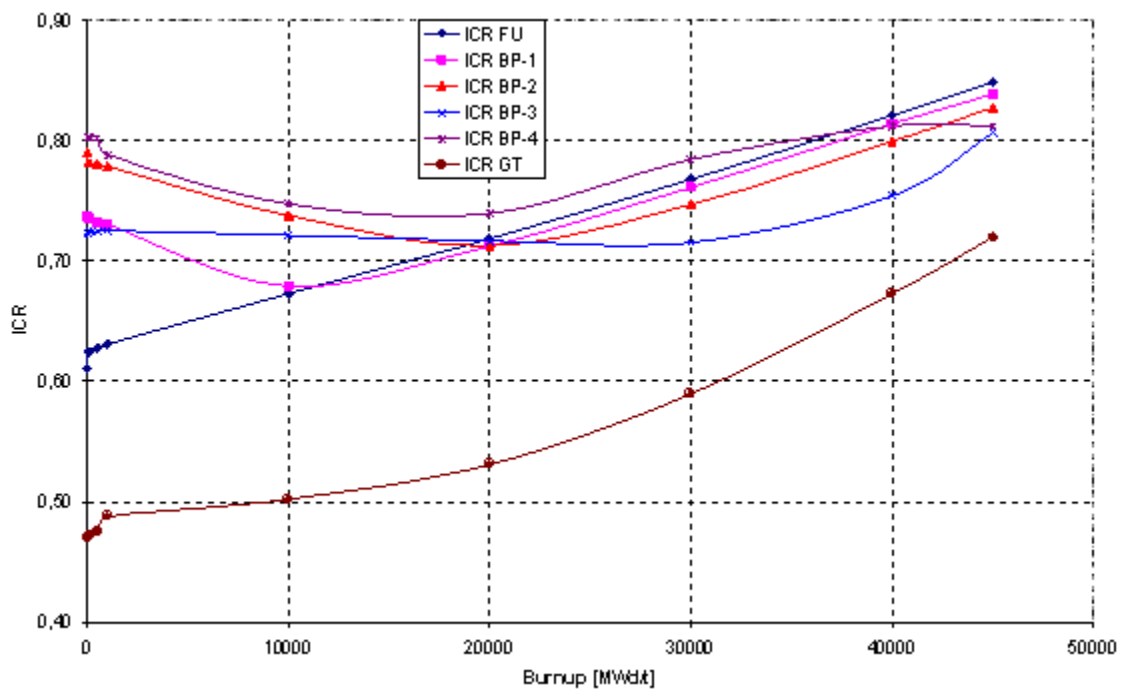


Table 9a: Burnup dependent parameters FU

BURNUP	SPECTRUM INDEX	KINF	ICR
0	8,396409578	1,25973	0,623854275
50	8,418764119		0,624325687
150	8,37600914	1,25123	0,625203846
500		1,24699	
600		1,24564	
800		1,24309	
900		1,24189	
1000	8,11006556	1,24073	0,631022223
1500		1,23542	
1750		1,23300	
2000		1,23069	
3000		1,22230	
4000		1,21472	
5000		1,20757	
6000		1,20068	
7000		1,19397	
8000		1,18740	
9000		1,18094	
10000	7,734167937	1,17458	0,672746563
11000		1,16831	
12000		1,16211	
13000		1,15598	
14000		1,14992	
15000		1,14392	
16000		1,13797	
17000		1,13207	
18000		1,12622	
19000		1,12040	
20000	7,34303612	1,11463	0,718815911
21000		1,10888	
22000		1,10316	
23000		1,09746	
24000		1,09179	
25000		1,08614	
26000		1,08051	
27000		1,07490	
28000		1,06930	
29000		1,06372	
30000		1,05816	0,767956681
31000		1,05267	
32000		1,04714	
33000		1,04161	
34000	6,528540112	1,03609	
35000		1,03057	
36000		1,02507	

37000		1,01957	
38000		1,01407	
39000		1,00859	
40000	6,11324918	1,00311	0,821017793
41000		0,99765	
42000		0,99220	
43000		0,98675	
44000		0,98132	
45000	5,702874793	0,97590	0,849030681
46000		0,97045	
47000		0,96507	
48000		0,95970	
49000		0,95436	
50000		0,94904	

Table 9b: Burnup dependent parameters BP-1

BURNUP	SPECTRUM INDEX	KINF	ICR
0	9,932839493	0,98061	0,737043254
25	9,946644048	0,97848	0,624325687
50		0,97961	
150	9,914671146	0,98105	0,735215577
500	9,834837729	0,98674	0,73259285
600		0,98855	
800		0,99226	
1000	9,71817544	0,99614	0,485561649
1250		1,00119	
1500		1,00637	
2000		1,01703	
2500		1,02794	
3000		1,03887	
3500		1,04976	
4000		1,06043	
4500		1,07088	
5000		1,08098	
5500		1,09064	
6000		1,09965	
6500		1,10788	
7000		1,11509	
7500		1,12126	
8000		1,12631	
8500		1,13038	
9000		1,13351	
9500		1,13588	
10000	7,947371406	1,13757	0,679084445
10500		1,13872	
11000		1,13937	
12000		1,13954	
13000		1,13845	
14000		1,13634	
15000		1,13343	

16000		1,12985	
17000		1,12576	
18000		1,12126	
19000		1,11645	
20000	7,000133666	1,11142	0,712694553
21000		1,10622	
22000		1,10090	
23000		1,09548	
24000		1,09002	
25000		1,08452	
26000		1,07900	
27000		1,07347	
28000		1,06793	
29000		1,06240	
30000	6,165479566	1,05687	0,761162276
31000		1,05142	
32000		1,04592	
33000		1,04041	
34000		1,03492	
35000		1,02943	
36000		1,02395	
37000		1,01847	
38000		1,01301	
39000		1,00755	
40000	5,345989533	1,00210	0,814185872
41000		0,99667	
42000		0,99124	
43000		0,98582	
44000		0,98040	
45000	4,949571271	0,97501	0,838797709
46000		0,96959	
47000		0,96423	
48000		0,95888	
49000		0,95355	
50000		0,94825	

Table 9c: Burnup dependent parameters BP-2

BURNUP	SPECTRUM INDEX	KINF	ICR
0	10,57437879	0,88604	0,79053175
25	10,59097654	0,88398	0,781567064
150	10,56788897	0,88506	0,781541845
500	10,51605306	0,88671	0,780828535
600		0,88731	
800		0,88862	
1000	10,43892188	0,89006	0,778960116
1250		0,89199	
1500		0,89404	
2000		0,89837	
2500		0,90296	

3000		0,90767	
3500		0,91249	
4000		0,91733	
4500		0,92222	
5000		0,92709	
5500		0,93198	
6000		0,93686	
6500		0,94175	
7000		0,94662	
7500		0,95151	
8000		0,95634	
8500		0,96118	
9000		0,96597	
9500		0,97082	
10000	8,894980509	0,97569	0,737982467
10500		0,98070	
11000		0,98585	
11500		0,99124	
12000		0,99685	
12500		1,00275	
13000		1,00885	
13500		1,01516	
14000		1,02152	
14500		1,02789	
15000		1,03404	
15500		1,03994	
16000		1,04539	
17000		1,05489	
18000		1,06244	
19000		1,06820	
20000	7,273365897	1,07237	0,713088983
21000		1,07512	
22000		1,07649	
23000		1,07660	
24000		1,07556	
25000		1,07351	
26000		1,07062	
27000		1,06705	
28000		1,06295	
29000		1,05845	
30000	6,279469069	1,05367	0,747210379
31000		1,04876	
32000		1,04363	
33000		1,03838	
34000		1,03307	
35000		1,02772	
36000		1,02233	
37000		1,01693	
38000		1,01153	
39000		1,00612	
40000	5,45329315	1,00071	0,799521213

41000		0,99534	
42000		0,98995	
43000		0,98456	
44000		0,97919	
45000	5,055577017	0,97382	0,827467686
46000		0,96845	
47000		0,96311	
48000		0,95779	
49000		0,95248	
50000		0,94720	

Table 9d: Burnup dependent parameters BP-3

BURNUP	SPECTRUM INDEX	KINF	ICR
0	9,623781538	0,99559	0,724157957
25	9,644694088	0,99235	0,72358458
150	9,628393628	0,99276	0,724075155
500	9,592277852	0,99232	0,724870456
600		0,99234	
800		0,99250	
1000	9,538194408	0,99263	0,725215569
1250		0,99280	
1500		0,99400	
2000		0,99564	
2500		0,99760	
3000		0,99972	
3500		1,00199	
4000		1,00433	
4500		1,00673	
5000	9,028253713	1,00914	
5500		1,01160	
6000		1,01406	
6500		1,01655	
7000		1,01904	
7500		1,02155	
8000		1,02404	
8500		1,02653	
9000		1,02900	
9500		1,03151	
10000	8,363063007	1,03402	0,721461306
10500		1,03662	
11000		1,03932	
11500		1,04218	
12000		1,04520	
12500		1,04844	
13000		1,05182	
13500		1,05537	
14000		1,05898	
14500		1,06262	
15000		1,06613	
15500		1,07254	

16000		1,07766	
17000		1,08136	
18000		1,08377	
19000		1,08504	
20000	7,048829561	1,08528	0,716948793
21000		1,08456	
22000		1,08295	
23000		1,08052	
24000		1,07739	
25000		1,07367	
26000		1,06948	
27000		1,06492	
28000		1,06009	
29000		1,05506	
30000	6,123337139	1,04996	0,715445557
31000		1,04470	
32000		1,03936	
33000		1,03398	
34000		1,02857	
35000		1,02315	
36000		1,01772	
37000		1,01228	
38000		1,00685	
39000		1,00142	
40000	5,313012466	0,99601	0,754063699
41000		0,99060	
42000		0,98519	
43000		0,97980	
44000		0,97441	
45000	4,922424153	0,96902	0,806645729
46000		0,96366	
47000		0,95832	
48000		0,95301	
49000		0,94771	
50000		0,94720	

Table 9e: Burnup dependent parameters BP-4 Assembly

BURNUP	SPECTRUM INDEX	KINF	ICR
0	10,7429769	0,83853	0,802879136
25	10,76064943	0,836493	0,803154612
50	10,74075165	0,837122	0,803067038
150	10,69782542	0,83714	0,802096395
500		0,837713	
1000	10,63470315	0,83941	0,788367539
1500		0,841658	
2000		0,84422	
2500		0,846978	
3000		0,849871	
3500		0,85285	

4000		0,855886	
4500		0,858954	
5000	10,05604521	0,86203	0,773181891
5500		0,865106	
6000		0,868164	
6500		0,871215	
7000		0,874249	
7500		0,877302	
8000		0,880359	
8500		0,883464	
9000		0,886591	
9500		0,889772	
10000	9,308633308	0,892961	0,747396599
10500		0,896182	
11000		0,899393	
12000		0,905642	
13000		0,911743	
14000		0,917731	
15000		0,923872	
16000		0,930482	
17000		0,937852	
18000		0,94624	
18050		0,946689	
19000		0,955763	
20000	6,356441245	0,966305	0,739642503
21000		0,977397	
22000		0,988341	
23000		0,99846	
24000		1,00739	
25000		1,01507	
26000		1,02155	
27000		1,02683	
28000		1,03084	
29000		1,03347	
30000	6,279469069	1,03482	0,784563337
31000		1,03465	
32000		1,03327	
33000		1,03085	
34000		1,0276	
35000		1,02371	
36000		1,01936	
37000		1,01467	
38000		1,00974	
39000		1,00465	
40000	5,467506816	0,999503	0,812386775
41000		0,994239	
42000		0,988937	
43000		0,983611	
44000		0,978274	
45000	5,073097688	0,972937	0,812386775
46000		0,967602	

47000	0,962277
48000	0,956962
49000	0,951663
50000	0,946381

Table 9f: Burnup dependent parameters GT

BURNUP	SPECTRUM INDEX	KINF	ICR
0	3,173868641	1,07034	0,469925649
25	3,181125185	1,06304	0,470821489
150	3,178169659	1,06208	0,471691455
500	3,169811138	1,06029	0,473460497
600		1,05996	
800		1,05949	
1000	3,156693207	1,05933	0,475541804
1250		1,05922	
1500		1,05912	
2000		1,05923	
2500		1,05948	
3000		1,05986	
3500		1,06087	
4000		1,06209	
4500		1,06343	
5000	3,033172447	1,06483	0,487612596
5500		1,06627	
6000		1,06769	
6500		1,06912	
7000		1,07061	
7500		1,07220	
8000		1,07386	
8500		1,07559	
9000		1,07736	
9500		1,07914	
10000	2,868721574	1,08081	0,502219942
10500		1,08239	
11000		1,08386	
11500		1,08530	
12000		1,08669	
12500		1,08813	
13000		1,08969	
13500		1,09143	
14000		1,09342	
14500		1,09571	
15000		1,09836	
15500		1,10138	
16000		1,10478	
16500		1,10863	
17000		1,11264	
17500		1,11678	

18000		1,12093	
18500		1,12493	
19000		1,12868	
19500		1,13214	
20000	2,506889087	1,13530	0,531008028
20500		1,13816	
21000		1,14073	
21500		1,14310	
22000		1,14507	
22500		1,14669	
23000		1,14791	
23500		1,14904	
24000		1,14825	
25000		1,14561	
26000		1,14148	
27000		1,13609	
28000		1,12984	
29000		1,12300	
30000	2,186209348	1,11577	0,589646652
31000		1,10832	
32000		1,10064	
33000		1,09281	
34000		1,08487	
35000		1,07685	
36000		1,06879	
37000		1,06063	
38000		1,05239	
39000		1,04409	
40000	1,893883667	1,03573	0,672937005
41000		1,02734	
42000		1,01888	
43000		1,01036	
44000		1,00180	
45000	1,750011312	0,99320	0,720198242
46000		0,98458	
47000		0,97593	
48000		0,96726	
49000		0,95857	
50000		0,94989	

TABLE-10a

PFPWR50 FU ASS CERMET FUEL

	BOC	EOC
235U	0,0000E+0	4,86E-7
236U	0,0000E+0	1,30E-7
238U	0,0000E+0	4,97E-10
237Np	0,0000E+0	0,00E+0
238Pu	1,7076E-5	1,29E-5

239Pu	5,3791E-4	7,59E-5
240Pu	1,6223E-4	8,48E-5
241Pu	1,0246E-4	3,79E-5
242Pu	3,4153E-5	2,66E-5
241Am	0,0000E+0	1,48E-5
242mAm	0,0000E+0	2,49E-7
243Am	0,0000E+0	5,98E-6
242Cm	0,0000E+0	8,09E-7
243Cm	0,0000E+0	2,00E-8
244Cm	0,0000E+0	1,99E-6
233U	0,0000E+0	5,35E-5
234U	0,0000E+0	3,59E-6
230Th	0,0000E+0	4,34E-11
232Th	7,9038E-3	4,08E-3
231Pa	0,0000E+0	2,30E-7
233Pa	0,0000E+0	7,64E-7

TABLE-10b

PFPPWR50 BP-1 ASS CERMET FUEL

	BOC	EOC
235U	0,0000E+0	2,57E-7
236U	0,0000E+0	6,76E-8
238U	0,0000E+0	2,58E-10
237Np	0,0000E+0	9,41E-8
238Pu	4,7217E-6	6,80E-6
239Pu	1,4873E-4	4,07E-5
240Pu	4,4856E-5	4,44E-5
241Pu	2,8330E-5	2,01E-5
242Pu	9,4434E-6	1,39E-5
241Am	0,0000E+0	7,87E-6
242mAm	0,0000E+0	1,33E-7
243Am	0,0000E+0	3,15E-6
242Cm	0,0000E+0	4,27E-7
243Cm	0,0000E+0	1,05E-8
244Cm	0,0000E+0	1,06E-6
233U	0,0000E+0	2,81E-5
234U	0,0000E+0	1,89E-6
230Th	0,0000E+0	2,30E-11
232Th	2,1737E-3	2,13E-3
231Pa	0,0000E+0	1,21E-7
233Pa	0,0000E+0	3,98E-7

TABLE-10c

PFWR50 BP-2 ASS CERMET FUEL

	BOC	EOC
235U	0,0000E+0	2,59E-7
236U	0,0000E+0	6,59E-8
238U	0,0000E+0	2,52E-10
237Np	0,0000E+0	9,38E-8
238Pu	4,7056E-6	6,83E-6
239Pu	1,4823E-4	4,22E-5
240Pu	4,4703E-5	4,38E-5
241Pu	2,8234E-5	2,03E-5
242Pu	9,4112E-6	1,37E-5
241Am	0,0000E+0	8,01E-6
242mAm	0,0000E+0	1,36E-7
243Am	0,0000E+0	3,15E-6
242Cm	0,0000E+0	4,27E-7
243Cm	0,0000E+0	1,05E-8
244Cm	0,0000E+0	1,07E-6
233U	0,0000E+0	2,81E-5
234U	0,0000E+0	1,90E-6
230Th	0,0000E+0	2,31E-11
232Th	2,1429E-3	2,10E-3
231Pa	0,0000E+0	1,21E-7
233Pa	0,0000E+0	3,91E-7

TABLE-10d :

PFWR50 BP-3 ASS CERMET FUEL

	BOC	EOC
235U	0,0000E+0	1,98E-7
236U	0,0000E+0	5,78E-8
238U	0,0000E+0	2,22E-10
237Np	0,0000E+0	8,04E-8
238Pu	4,7137E-6	6,32E-6
239Pu	1,4848E-4	5,04E-5
240Pu	4,4780E-5	4,55E-5
241Pu	2,8282E-5	2,11E-5
242Pu	9,4274E-6	1,32E-5
241Am	0,0000E+0	7,85E-6
243Am	0,0000E+0	2,82E-6
242Cm	0,0000E+0	3,89E-7
243Cm	0,0000E+0	8,72E-9
244Cm	0,0000E+0	8,67E-7
233U	0,0000E+0	2,58E-5
234U	0,0000E+0	1,55E-6
230Th	0,0000E+0	1,72E-11

232Th	2,1583E-3	1,32E-5
231Pa	0,0000E+0	1,12E-7
233Pa	0,0000E+0	3,79E-7

TABLE-10e :

PFPPWR50 BP-3 ASS CERMET FUEL

	BOC	EOC
235U	0,0000E+0	2,64E-7
236U	0,0000E+0	6,45E-8
238U	0,0000E+0	2,46E-10
237Np	0,0000E+0	9,31E-8
238Pu	4,6897E-6	6,85E-6
239Pu	1,4773E-4	4,37E-5
240Pu	4,4553E-5	4,31E-5
241Pu	2,8138E-5	2,06E-5
242Pu	9,3795E-6	1,36E-5
241Am	0,0000E+0	8,12E-6
242mAm	0,0000E+0	1,39E-7
243Am	0,0000E+0	3,14E-6
242Cm	0,0000E+0	4,26E-7
243Cm	0,0000E+0	1,06E-8
244Cm	0,0000E+0	1,09E-6
233U	0,0000E+0	2,82E-5
234U	0,0000E+0	1,90E-6
230Th	0,0000E+0	2,32E-11
232Th	2,1125E-3	2,07E-3
231Pa	0,0000E+0	1,21E-7
233Pa	0,0000E+0	3,84E-7

TABLE-10f :

PFPPWR50 GT ASS CERMET FUEL

	BOC	EOC
235U	0,0000E+0	7,36E-8
236U	0,0000E+0	3,20E-8
238U	0,0000E+0	1,26E-10
237Np	0,0000E+0	2,99E-8
238Pu	3,1825E-6	3,44E-6
239Pu	1,0025E-4	2,51E-5
240Pu	3,0233E-5	3,45E-5
241Pu	1,9095E-5	1,22E-5
242Pu	6,3649E-6	1,04E-5
241Am	0,0000E+0	3,56E-6
242mAm	0,0000E+0	4,28E-8
243Am	0,0000E+0	1,52E-6

242Cm	0,0000E+0	2,68E-7
243Cm	0,0000E+0	4,33E-9
244Cm	0,0000E+0	3,35E-7
233U	0,0000E+0	1,36E-5
234U	0,0000E+0	7,71E-7
230Th	0,0000E+0	6,37E-12
232Th	1,4536E-3	1,43E-3
231Pa	0,0000E+0	6,39E-8
233Pa	0,0000E+0	3,12E-7

a. Conclusion

The burn up characteristics of the cell and assemblies predict relatively the same operating life of the PFPWR50. The sub criticality is achieved at 33000 MWD/t the equivalent of 8.4 operating years without refuelling.

BWR-PB CELL RESULTS WITH CERMET COMPOSITION

BWR-PB (UNIT CELL)
Fig.1: Flux/MeVahrgie vs. Neutron energy (eV)

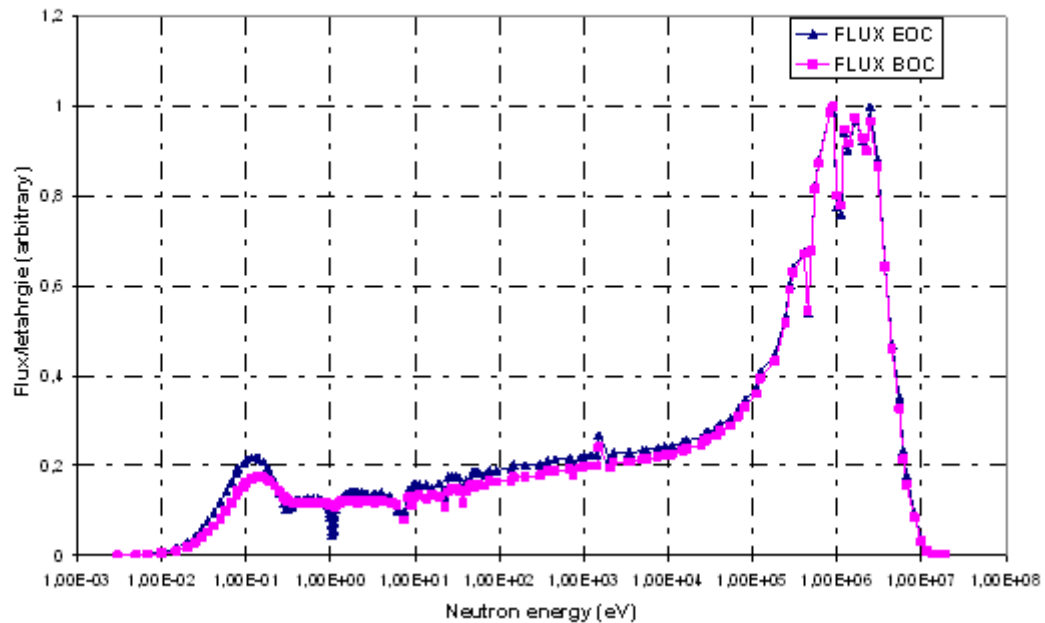


Fig.2a: Fission Cross Section vs. Neutron Energy

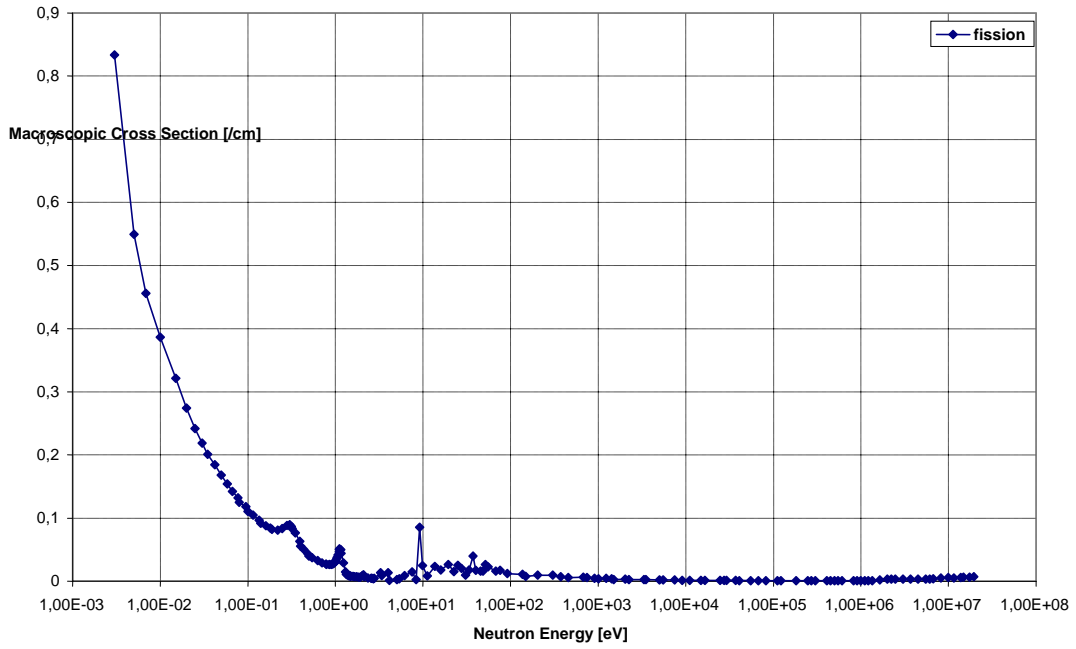


Fig.2b: Nu Fission Cross Section vs. Neutron Energy

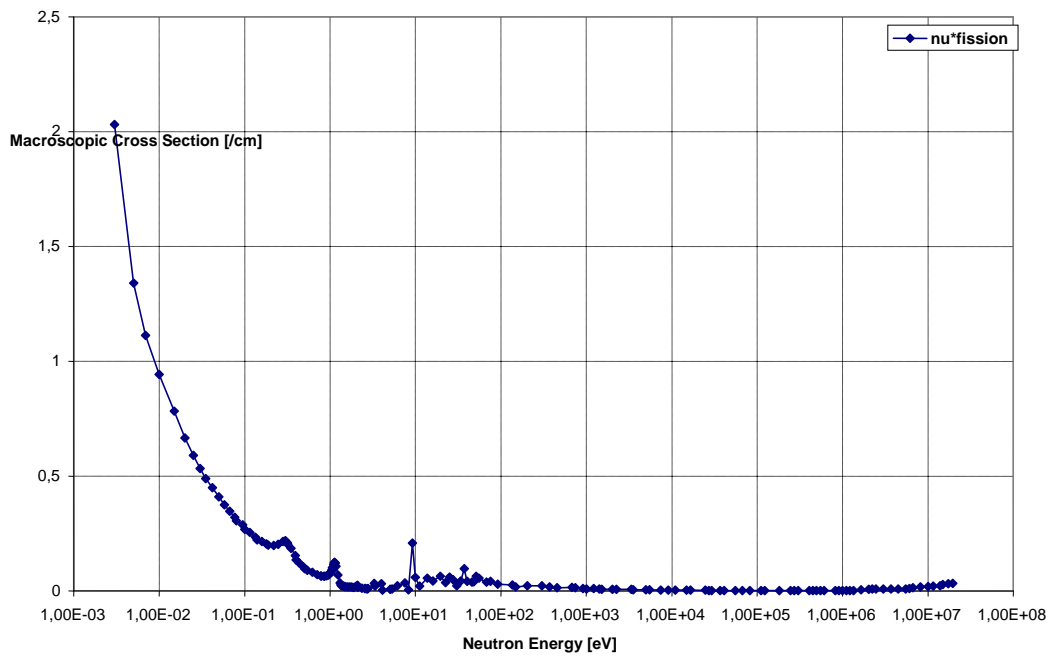


Fig.2c: Capture Cross Section vs. Neutron Energy

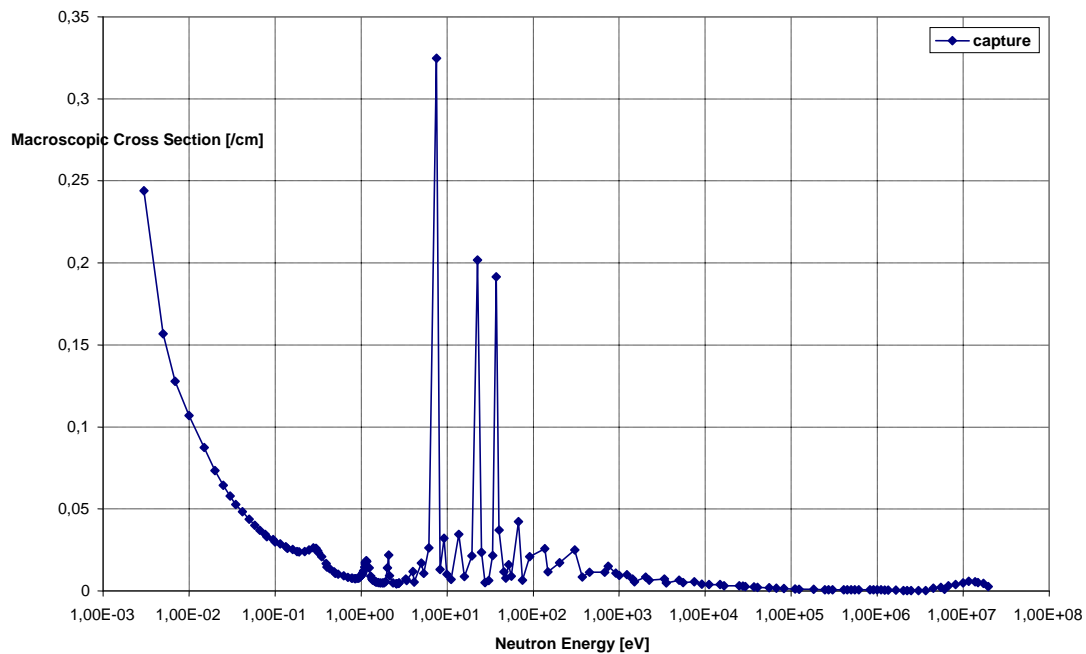


Fig.3: Spectrum Index vs. Burnup(Mwd/t)

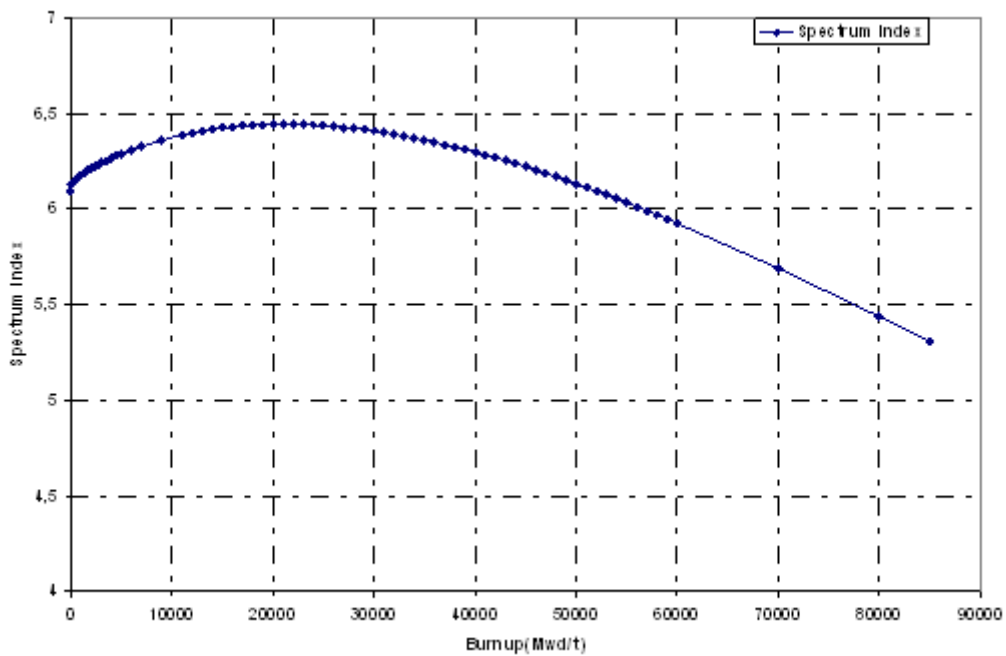


Fig.4 :Infinite multiplication factor vs. Burnup (MWd/t) (unit cell)

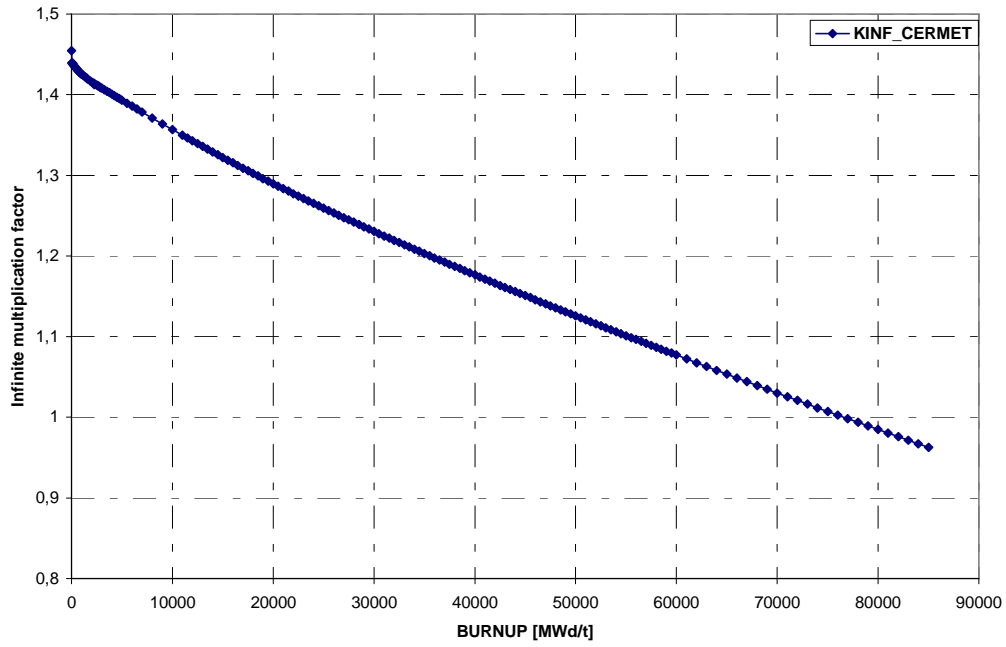
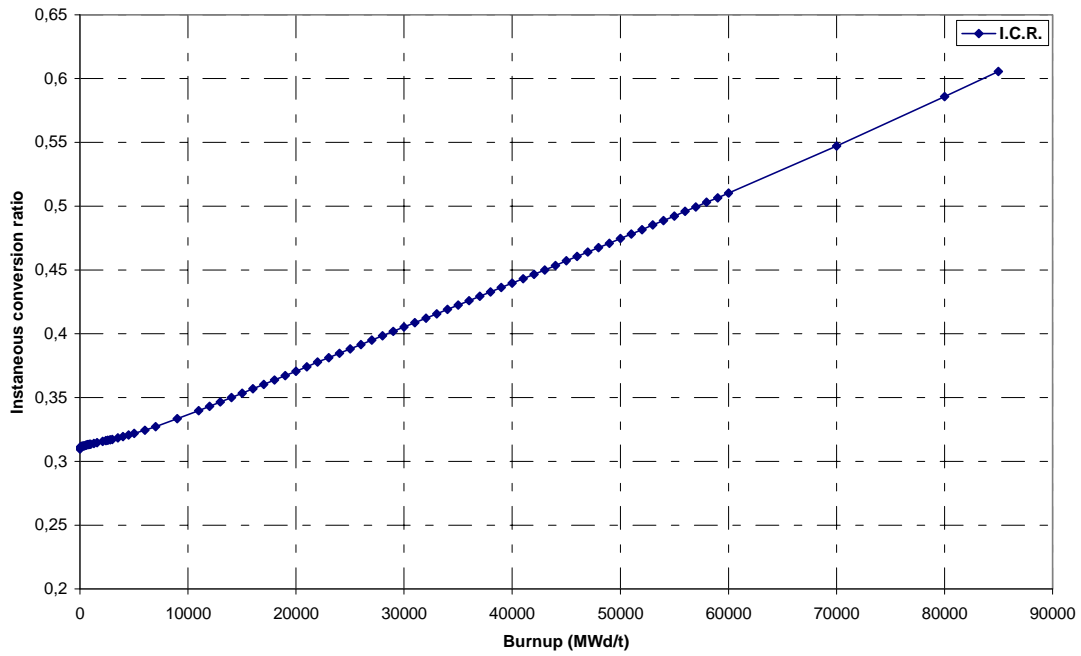


Fig.5 Instantaneous conversion ratio vs. Burnup (Mwd/t)



**Table1 : Flux/ lethargy and energy structure at beginning of cycle
BWR-PB(unit cell)**

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>FLUX BOC</i>	<i>FLUX EOC</i>
1	1,73E+07	1,96E+07	6,96E+08	1,38E+09
2	1,49E+07	1,73E+07	3,31E+09	6,07E+09
3	1,38E+07	1,49E+07	1,02E+10	1,80E+10
4	1,16E+07	1,38E+07	3,50E+10	5,79E+10
5	1,00E+07	1,16E+07	1,22E+11	1,96E+11
6	8,19E+06	1,00E+07	3,66E+11	5,79E+11
7	6,70E+06	8,19E+06	9,96E+11	1,52E+12
8	6,07E+06	6,70E+06	1,84E+12	2,79E+12
9	5,49E+06	6,07E+06	2,49E+12	3,68E+12
10	4,49E+06	5,49E+06	3,80E+12	5,54E+12
11	3,68E+06	4,49E+06	5,34E+12	7,41E+12
12	3,01E+06	3,68E+06	7,49E+12	1,02E+13
13	2,47E+06	3,01E+06	1,01E+13	1,39E+13
14	2,23E+06	2,47E+06	1,12E+13	1,58E+13
15	2,02E+06	2,23E+06	1,05E+13	1,43E+13
16	1,65E+06	2,02E+06	1,08E+13	1,46E+13
17	1,35E+06	1,65E+06	1,13E+13	1,53E+13
18	1,22E+06	1,35E+06	1,07E+13	1,43E+13
19	1,11E+06	1,22E+06	1,10E+13	1,48E+13
20	1,00E+06	1,11E+06	9,05E+12	1,20E+13
21	9,07E+05	1,00E+06	9,31E+12	1,23E+13
22	8,21E+05	9,07E+05	1,16E+13	1,55E+13
23	6,08E+05	8,21E+05	1,15E+13	1,56E+13
24	5,50E+05	6,08E+05	1,02E+13	1,39E+13
25	4,98E+05	5,50E+05	9,48E+12	1,30E+13
26	4,50E+05	4,98E+05	7,88E+12	1,07E+13
27	4,08E+05	4,50E+05	6,32E+12	8,54E+12
28	3,02E+05	4,08E+05	7,80E+12	1,07E+13
29	2,73E+05	3,02E+05	7,33E+12	1,01E+13
30	2,47E+05	2,73E+05	6,87E+12	9,52E+12
31	1,83E+05	2,47E+05	6,03E+12	8,40E+12
32	1,23E+05	1,83E+05	5,03E+12	7,07E+12
33	1,11E+05	1,23E+05	4,58E+12	6,47E+12
34	8,23E+04	1,11E+05	4,18E+12	5,93E+12
35	6,74E+04	8,23E+04	3,84E+12	5,47E+12
36	5,52E+04	6,74E+04	3,60E+12	5,15E+12
37	4,09E+04	5,52E+04	3,36E+12	4,82E+12
38	3,70E+04	4,09E+04	3,22E+12	4,63E+12
39	2,93E+04	3,70E+04	3,10E+12	4,47E+12

40	2,74E+04	2,93E+04	3,02E+12	4,37E+12
41	2,48E+04	2,74E+04	2,98E+12	4,31E+12
42	1,66E+04	2,48E+04	2,87E+12	4,17E+12
43	1,50E+04	1,66E+04	2,78E+12	4,05E+12
44	1,11E+04	1,50E+04	2,73E+12	3,99E+12
45	9,12E+03	1,11E+04	2,62E+12	3,84E+12
46	7,47E+03	9,12E+03	2,61E+12	3,84E+12
47	5,53E+03	7,47E+03	2,56E+12	3,77E+12
48	5,00E+03	5,53E+03	2,51E+12	3,72E+12
49	3,53E+03	5,00E+03	2,49E+12	3,71E+12
50	3,35E+03	3,53E+03	2,42E+12	3,61E+12
51	2,25E+03	3,35E+03	2,43E+12	3,63E+12
52	2,03E+03	2,25E+03	2,42E+12	3,63E+12
53	1,51E+03	2,03E+03	2,27E+12	3,41E+12
54	1,43E+03	1,51E+03	2,81E+12	4,24E+12
55	1,23E+03	1,43E+03	2,33E+12	3,52E+12
56	1,01E+03	1,23E+03	2,32E+12	3,53E+12
57	9,14E+02	1,01E+03	2,31E+12	3,51E+12
58	7,49E+02	9,14E+02	2,27E+12	3,46E+12
59	6,77E+02	7,49E+02	2,09E+12	3,20E+12
60	4,54E+02	6,77E+02	2,24E+12	3,44E+12
61	3,72E+02	4,54E+02	2,18E+12	3,36E+12
62	3,04E+02	3,72E+02	2,17E+12	3,36E+12
63	2,04E+02	3,04E+02	2,07E+12	3,22E+12
64	1,49E+02	2,04E+02	2,03E+12	3,18E+12
65	1,37E+02	1,49E+02	2,02E+12	3,18E+12
66	9,17E+01	1,37E+02	1,94E+12	3,06E+12
67	7,57E+01	9,17E+01	1,90E+12	3,00E+12
68	6,79E+01	7,57E+01	1,91E+12	2,99E+12
69	5,56E+01	6,79E+01	1,80E+12	2,86E+12
70	5,16E+01	5,56E+01	1,82E+12	2,94E+12
71	4,83E+01	5,16E+01	1,80E+12	2,90E+12
72	4,55E+01	4,83E+01	1,84E+12	2,93E+12
73	4,02E+01	4,55E+01	1,82E+12	2,74E+12
74	3,73E+01	4,02E+01	1,66E+12	2,63E+12
75	3,37E+01	3,73E+01	1,38E+12	2,28E+12
76	3,05E+01	3,37E+01	1,67E+12	2,74E+12
77	2,76E+01	3,05E+01	1,74E+12	2,80E+12
78	2,50E+01	2,76E+01	1,73E+12	2,81E+12
79	2,26E+01	2,50E+01	1,65E+12	2,77E+12
80	1,95E+01	2,26E+01	1,26E+12	2,04E+12
81	1,59E+01	1,95E+01	1,52E+12	2,53E+12
82	1,37E+01	1,59E+01	1,58E+12	2,38E+12
83	1,12E+01	1,37E+01	1,49E+12	2,50E+12
84	9,91E+00	1,12E+01	1,57E+12	2,51E+12

85	9,19E+00	9,91E+00	<i>1,52E+12</i>	<i>2,55E+12</i>
86	8,32E+00	9,19E+00	<i>1,32E+12</i>	<i>2,41E+12</i>
87	7,52E+00	8,32E+00	<i>1,51E+12</i>	<i>2,29E+12</i>
88	6,16E+00	7,52E+00	<i>9,29E+11</i>	<i>1,56E+12</i>
89	5,35E+00	6,16E+00	<i>1,30E+12</i>	<i>1,58E+12</i>
90	5,04E+00	5,35E+00	<i>1,37E+12</i>	<i>1,87E+12</i>
91	4,13E+00	5,04E+00	<i>1,37E+12</i>	<i>2,09E+12</i>
92	4,00E+00	4,13E+00	<i>1,40E+12</i>	<i>2,16E+12</i>
93	3,38E+00	4,00E+00	<i>1,39E+12</i>	<i>2,21E+12</i>
94	3,30E+00	3,38E+00	<i>1,40E+12</i>	<i>2,20E+12</i>
95	2,77E+00	3,30E+00	<i>1,38E+12</i>	<i>2,20E+12</i>
96	2,72E+00	2,77E+00	<i>1,41E+12</i>	<i>2,14E+12</i>
97	2,60E+00	2,72E+00	<i>1,41E+12</i>	<i>1,96E+12</i>
98	2,55E+00	2,60E+00	<i>1,42E+12</i>	<i>2,16E+12</i>
99	2,36E+00	2,55E+00	<i>1,41E+12</i>	<i>2,17E+12</i>
100	2,13E+00	2,36E+00	<i>1,41E+12</i>	<i>2,22E+12</i>
101	2,10E+00	2,13E+00	<i>1,41E+12</i>	<i>2,24E+12</i>
102	2,02E+00	2,10E+00	<i>1,36E+12</i>	<i>2,20E+12</i>
103	1,93E+00	2,02E+00	<i>1,38E+12</i>	<i>2,21E+12</i>
104	1,84E+00	1,93E+00	<i>1,40E+12</i>	<i>2,22E+12</i>
105	1,76E+00	1,84E+00	<i>1,41E+12</i>	<i>2,23E+12</i>
106	1,67E+00	1,76E+00	<i>1,41E+12</i>	<i>2,22E+12</i>
107	1,59E+00	1,67E+00	<i>1,41E+12</i>	<i>2,23E+12</i>
108	1,50E+00	1,59E+00	<i>1,40E+12</i>	<i>2,18E+12</i>
109	1,48E+00	1,50E+00	<i>1,42E+12</i>	<i>2,15E+12</i>
110	1,44E+00	1,48E+00	<i>1,42E+12</i>	<i>2,15E+12</i>
111	1,37E+00	1,44E+00	<i>1,41E+12</i>	<i>2,11E+12</i>
112	1,34E+00	1,37E+00	<i>1,41E+12</i>	<i>2,04E+12</i>
113	1,30E+00	1,34E+00	<i>1,41E+12</i>	<i>2,01E+12</i>
114	1,24E+00	1,30E+00	<i>1,37E+12</i>	<i>1,93E+12</i>
115	1,17E+00	1,24E+00	<i>1,34E+12</i>	<i>1,88E+12</i>
116	1,15E+00	1,17E+00	<i>1,30E+12</i>	<i>1,78E+12</i>
117	1,12E+00	1,15E+00	<i>1,28E+12</i>	<i>1,62E+12</i>
118	1,11E+00	1,12E+00	<i>1,28E+12</i>	<i>1,39E+12</i>
119	1,10E+00	1,11E+00	<i>1,28E+12</i>	<i>1,18E+12</i>
120	1,07E+00	1,10E+00	<i>1,29E+12</i>	<i>8,76E+11</i>
121	1,05E+00	1,07E+00	<i>1,30E+12</i>	<i>7,15E+11</i>
122	1,04E+00	1,05E+00	<i>1,31E+12</i>	<i>7,44E+11</i>
123	1,02E+00	1,04E+00	<i>1,32E+12</i>	<i>8,47E+11</i>
124	9,96E-01	1,02E+00	<i>1,32E+12</i>	<i>1,11E+12</i>
125	9,86E-01	9,96E-01	<i>1,33E+12</i>	<i>1,37E+12</i>
126	9,72E-01	9,86E-01	<i>1,33E+12</i>	<i>1,49E+12</i>
127	9,50E-01	9,72E-01	<i>1,34E+12</i>	<i>1,62E+12</i>
128	9,30E-01	9,50E-01	<i>1,34E+12</i>	<i>1,71E+12</i>
129	9,10E-01	9,30E-01	<i>1,35E+12</i>	<i>1,78E+12</i>

130	8,60E-01	9,10E-01	<i>1,35E+12</i>	<i>1,84E+12</i>
131	8,50E-01	8,60E-01	<i>1,36E+12</i>	<i>1,89E+12</i>
132	7,90E-01	8,50E-01	<i>1,35E+12</i>	<i>1,91E+12</i>
133	7,80E-01	7,90E-01	<i>1,36E+12</i>	<i>1,95E+12</i>
134	7,05E-01	7,80E-01	<i>1,35E+12</i>	<i>1,96E+12</i>
135	6,25E-01	7,05E-01	<i>1,35E+12</i>	<i>1,99E+12</i>
136	5,40E-01	6,25E-01	<i>1,37E+12</i>	<i>2,00E+12</i>
137	5,00E-01	5,40E-01	<i>1,37E+12</i>	<i>1,99E+12</i>
138	4,85E-01	5,00E-01	<i>1,38E+12</i>	<i>1,99E+12</i>
139	4,33E-01	4,85E-01	<i>1,36E+12</i>	<i>1,97E+12</i>
140	4,00E-01	4,33E-01	<i>1,38E+12</i>	<i>1,98E+12</i>
141	3,91E-01	4,00E-01	<i>1,38E+12</i>	<i>1,94E+12</i>
142	3,50E-01	3,91E-01	<i>1,38E+12</i>	<i>1,86E+12</i>
143	3,20E-01	3,50E-01	<i>1,38E+12</i>	<i>1,71E+12</i>
144	3,15E-01	3,20E-01	<i>1,40E+12</i>	<i>1,64E+12</i>
145	3,00E-01	3,15E-01	<i>1,42E+12</i>	<i>1,62E+12</i>
146	2,80E-01	3,00E-01	<i>1,45E+12</i>	<i>1,64E+12</i>
147	2,48E-01	2,80E-01	<i>1,53E+12</i>	<i>1,84E+12</i>
148	2,20E-01	2,48E-01	<i>1,66E+12</i>	<i>2,20E+12</i>
149	1,89E-01	2,20E-01	<i>1,80E+12</i>	<i>2,60E+12</i>
150	1,80E-01	1,89E-01	<i>1,91E+12</i>	<i>2,89E+12</i>
151	1,60E-01	1,80E-01	<i>1,96E+12</i>	<i>3,07E+12</i>
152	1,40E-01	1,60E-01	<i>2,03E+12</i>	<i>3,31E+12</i>
153	1,34E-01	1,40E-01	<i>2,05E+12</i>	<i>3,42E+12</i>
154	1,15E-01	1,34E-01	<i>2,03E+12</i>	<i>3,47E+12</i>
155	1,00E-01	1,15E-01	<i>1,97E+12</i>	<i>3,45E+12</i>
156	9,50E-02	1,00E-01	<i>1,89E+12</i>	<i>3,38E+12</i>
157	8,00E-02	9,50E-02	<i>1,78E+12</i>	<i>3,24E+12</i>
158	7,70E-02	8,00E-02	<i>1,67E+12</i>	<i>3,08E+12</i>
159	6,70E-02	7,70E-02	<i>1,56E+12</i>	<i>2,90E+12</i>
160	5,80E-02	6,70E-02	<i>1,37E+12</i>	<i>2,59E+12</i>
161	5,00E-02	5,80E-02	<i>1,18E+12</i>	<i>2,26E+12</i>
162	4,20E-02	5,00E-02	<i>9,73E+11</i>	<i>1,89E+12</i>
163	3,50E-02	4,20E-02	<i>7,71E+11</i>	<i>1,52E+12</i>
164	3,00E-02	3,50E-02	<i>6,08E+11</i>	<i>1,21E+12</i>
165	2,50E-02	3,00E-02	<i>4,72E+11</i>	<i>9,48E+11</i>
166	2,00E-02	2,50E-02	<i>3,43E+11</i>	<i>6,93E+11</i>
167	1,50E-02	2,00E-02	<i>2,24E+11</i>	<i>4,57E+11</i>
168	1,00E-02	1,50E-02	<i>1,24E+11</i>	<i>2,54E+11</i>
169	6,90E-03	1,00E-02	<i>6,06E+10</i>	<i>1,25E+11</i>
170	5,00E-03	6,90E-03	<i>3,15E+10</i>	<i>6,52E+10</i>
171	3,00E-03	5,00E-03	<i>1,45E+10</i>	<i>3,01E+10</i>
172	1,10E-03	3,00E-03	<i>1,32E+09</i>	<i>2,75E+09</i>

Table 2 : Multi-group cross sections and energy structure
BWR-PB

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>fission</i>	<i>nu*fission</i>	<i>capture</i>
1.	1.73E+07	1.96E+07	6.6874E-03	3.3336E-02	2,77610E-03
2.	1.49E+07	1.73E+07	6.5960E-03	3.1017E-02	4,56500E-03
3.	1.38E+07	1.49E+07	6.2014E-03	2.7838E-02	5,10560E-03
4.	1.16E+07	1.38E+07	5.4441E-03	2.2924E-02	5,62590E-03
5.	1.00E+07	1.16E+07	5.3093E-03	2.0921E-02	5,93070E-03
6.	8.19E+06	1.00E+07	5.3845E-03	1.9803E-02	4,84350E-03
7.	6.70E+06	8.19E+06	5.1331E-03	1.7672E-02	3,77980E-03
8.	6.07E+06	6.70E+06	4.0595E-03	1.3388E-02	3,23470E-03
9.	5.49E+06	6.07E+06	3.1403E-03	1.0061E-02	9,23300E-04
10.	4.49E+06	5.49E+06	3.0009E-03	9.2067E-03	2,17150E-03
11.	3.68E+06	4.49E+06	3.0399E-03	8.8344E-03	1,66950E-03
12.	3.01E+06	3.68E+06	2.9705E-03	8.2488E-03	1,90400E-04
13.	2.47E+06	3.01E+06	3.0064E-03	8.0841E-03	2,02500E-04
14.	2.23E+06	2.47E+06	3.0652E-03	8.1454E-03	2,57600E-04
15.	2.02E+06	2.23E+06	3.0677E-03	8.0986E-03	2,99700E-04
16.	1.65E+06	2.02E+06	2.8463E-03	7.4512E-03	3,56700E-04
17.	1.35E+06	1.65E+06	2.0739E-03	5.3763E-03	4,33300E-04
18.	1.22E+06	1.35E+06	8.9868E-04	2.3068E-03	5,18920E-04
19.	1.11E+06	1.22E+06	7.7982E-04	1.9913E-03	5,93480E-04
20.	1.00E+06	1.11E+06	7.0295E-04	1.7864E-03	6,63650E-04
21.	9.07E+05	1.00E+06	6.6437E-04	1.6816E-03	7,06230E-04
22.	8.21E+05	9.07E+05	6.0696E-04	1.5305E-03	7,04740E-04
23.	6.08E+05	8.21E+05	5.7162E-04	1.4321E-03	6,87980E-04
24.	5.50E+05	6.08E+05	5.6793E-04	1.4156E-03	6,60370E-04
25.	4.98E+05	5.50E+05	5.7330E-04	1.4259E-03	6,59900E-04
26.	4.50E+05	4.98E+05	5.8122E-04	1.4428E-03	6,65480E-04
27.	4.08E+05	4.50E+05	5.9682E-04	1.4790E-03	6,76880E-04
28.	3.02E+05	4.08E+05	6.1353E-04	1.5160E-03	6,99870E-04
29.	2.73E+05	3.02E+05	6.1996E-04	1.5280E-03	7,26240E-04
30.	2.47E+05	2.73E+05	6.3770E-04	1.5701E-03	7,50000E-04
31.	1.83E+05	2.47E+05	6.6855E-04	1.6431E-03	8,03650E-04
32.	1.23E+05	1.83E+05	7.1357E-04	1.7495E-03	9,25530E-04
33.	1.11E+05	1.23E+05	7.5222E-04	1.8418E-03	1,04088E-03
34.	8.23E+04	1.11E+05	7.7432E-04	1.8944E-03	1,16498E-03
35.	6.74E+04	8.23E+04	8.4042E-04	2.0544E-03	1,37638E-03
36.	5.52E+04	6.74E+04	8.8148E-04	2.1536E-03	1,61362E-03
37.	4.09E+04	5.52E+04	9.1278E-04	2.2289E-03	2,01552E-03
38.	3.70E+04	4.09E+04	9.4690E-04	2.3115E-03	2,28370E-03
39.	2.93E+04	3.70E+04	1.0101E-03	2.4652E-03	2,49490E-03
40.	2.74E+04	2.93E+04	1.0640E-03	2.5962E-03	2,70120E-03
41.	2.48E+04	2.74E+04	1.0509E-03	2.5641E-03	2,81200E-03

42.	1.66E+04	2.48E+04	1.1579E-03	2.8245E-03	3,23230E-03
43.	1.50E+04	1.66E+04	1.2149E-03	2.9631E-03	3,17850E-03
44.	1.11E+04	1.50E+04	1.3579E-03	3.3116E-03	3,87530E-03
45.	9.12E+03	1.11E+04	1.4701E-03	3.5846E-03	3,94840E-03
46.	7.47E+03	9.12E+03	1.4773E-03	3.6018E-03	4,13570E-03
47.	5.53E+03	7.47E+03	1.7138E-03	4.1782E-03	5,67530E-03
48.	5.00E+03	5.53E+03	1.9440E-03	4.7393E-03	5,01590E-03
49.	3.53E+03	5.00E+03	2.1702E-03	5.2906E-03	6,52840E-03
50.	3.35E+03	3.53E+03	2.4099E-03	5.8746E-03	4,83000E-03
51.	2.25E+03	3.35E+03	2.5749E-03	6.2767E-03	7,25910E-03
52.	2.03E+03	2.25E+03	2.5824E-03	6.2948E-03	6,57000E-03
53.	1.51E+03	2.03E+03	3.0348E-03	7.3975E-03	8,61320E-03
54.	1.43E+03	1.51E+03	2.7122E-03	6.6109E-03	5,55540E-03
55.	1.23E+03	1.43E+03	3.7876E-03	9.2323E-03	7,39040E-03
56.	1.01E+03	1.23E+03	4.2615E-03	1.0388E-02	9,88050E-03
57.	9.14E+02	1.01E+03	3.6147E-03	8.8108E-03	9,36830E-03
58.	7.49E+02	9.14E+02	4.4743E-03	1.0906E-02	1,08247E-02
59.	6.77E+02	7.49E+02	5.5512E-03	1.3533E-02	1,49808E-02
60.	4.54E+02	6.77E+02	6.5152E-03	1.5880E-02	1,13218E-02
61.	3.72E+02	4.54E+02	5.9134E-03	1.4413E-02	1,15366E-02
62.	3.04E+02	3.72E+02	6.8739E-03	1.6755E-02	8,61610E-03
63.	2.04E+02	3.04E+02	9.2906E-03	2.2645E-02	2,50094E-02
64.	1.49E+02	2.04E+02	9.6037E-03	2.3408E-02	1,72643E-02
65.	1.37E+02	1.49E+02	7.4386E-03	1.8131E-02	1,17464E-02
66.	9.17E+01	1.37E+02	1.0568E-02	2.5718E-02	2,56620E-02
67.	7.57E+01	9.17E+01	1.2088E-02	2.9391E-02	2,09100E-02
68.	6.79E+01	7.57E+01	1.7202E-02	4.1862E-02	6,65000E-03
69.	5.56E+01	6.79E+01	1.5746E-02	3.8158E-02	4,23470E-02
70.	5.16E+01	5.56E+01	2.2608E-02	5.4929E-02	8,90300E-03
71.	4.83E+01	5.16E+01	2.6285E-02	6.3887E-02	1,60010E-02
72.	4.55E+01	4.83E+01	1.6068E-02	3.9066E-02	7,73700E-03
73.	4.02E+01	4.55E+01	1.5956E-02	3.8807E-02	1,16590E-02
74.	3.73E+01	4.02E+01	1.7201E-02	4.1879E-02	3,70840E-02
75.	3.37E+01	3.73E+01	3.9757E-02	9.6726E-02	1,91623E-01
76.	3.05E+01	3.37E+01	1.7931E-02	4.3595E-02	2,16420E-02
77.	2.76E+01	3.05E+01	9.2854E-03	2.2618E-02	6,32960E-03
78.	2.50E+01	2.76E+01	1.9918E-02	4.8539E-02	5,11800E-03
79.	2.26E+01	2.50E+01	2.5291E-02	6.1467E-02	2,36950E-02
80.	1.95E+01	2.26E+01	1.5236E-02	3.6967E-02	2,01704E-01
81.	1.59E+01	1.95E+01	2.6832E-02	6.5031E-02	2,14980E-02
82.	1.37E+01	1.59E+01	1.7580E-02	4.2605E-02	8,69000E-03
83.	1.12E+01	1.37E+01	2.3233E-02	5.6399E-02	3,44150E-02
84.	9.91E+00	1.12E+01	8.3862E-03	2.0412E-02	7,03280E-03
85.	9.19E+00	9.91E+00	2.4378E-02	5.9335E-02	1,02100E-02
86.	8.32E+00	9.19E+00	8.5550E-02	2.0888E-01	3,21100E-02

87.	7.52E+00	8.32E+00	2.4466E-03	5.9680E-03	1,30954E-02
88.	6.16E+00	7.52E+00	1.4244E-02	3.4675E-02	3,24776E-01
89.	5.35E+00	6.16E+00	8.9352E-03	2.1729E-02	2,61748E-02
90.	5.04E+00	5.35E+00	3.5906E-03	8.7317E-03	1,07544E-02
91.	4.13E+00	5.04E+00	2.6750E-03	6.5050E-03	1,69210E-02
92.	4.00E+00	4.13E+00	1.3024E-03	3.1672E-03	5,29360E-03
93.	3.38E+00	4.00E+00	1.3124E-02	3.1923E-02	1,19520E-02
94.	3.30E+00	3.38E+00	8.7075E-03	2.1196E-02	6,36750E-03
95.	2.77E+00	3.30E+00	1.3246E-02	3.2243E-02	7,26500E-03
96.	2.72E+00	2.77E+00	4.2876E-03	1.0437E-02	4,94690E-03
97.	2.60E+00	2.72E+00	3.6905E-03	8.9833E-03	4,51110E-03
98.	2.55E+00	2.60E+00	4.1409E-03	1.0080E-02	4,29600E-03
99.	2.36E+00	2.55E+00	4.6273E-03	1.1264E-02	4,25830E-03
100.	2.13E+00	2.36E+00	5.3414E-03	1.3002E-02	4,96460E-03
101.	2.10E+00	2.13E+00	6.7026E-03	1.6316E-02	9,32040E-03
102.	2.02E+00	2.10E+00	1.0226E-02	2.4893E-02	2,19650E-02
103.	1.93E+00	2.02E+00	8.6298E-03	2.1007E-02	1,40402E-02
104.	1.84E+00	1.93E+00	6.5655E-03	1.5982E-02	5,61950E-03
105.	1.76E+00	1.84E+00	6.5900E-03	1.6042E-02	4,92300E-03
106.	1.67E+00	1.76E+00	6.8035E-03	1.6561E-02	4,85050E-03
107.	1.59E+00	1.67E+00	7.0833E-03	1.7242E-02	4,93470E-03
108.	1.50E+00	1.59E+00	7.4289E-03	1.8084E-02	5,13410E-03
109.	1.48E+00	1.50E+00	7.7472E-03	1.8858E-02	5,35080E-03
110.	1.44E+00	1.48E+00	7.9611E-03	1.9379E-02	5,50890E-03
111.	1.37E+00	1.44E+00	8.5044E-03	2.0652E-02	5,90760E-03
112.	1.34E+00	1.37E+00	9.4046E-03	2.2838E-02	6,51240E-03
113.	1.30E+00	1.34E+00	1.0570E-02	2.5670E-02	7,19900E-03
114.	1.24E+00	1.30E+00	1.4559E-02	3.5356E-02	9,09700E-03
115.	1.17E+00	1.24E+00	2.8859E-02	7.0082E-02	1,41030E-02
116.	1.15E+00	1.17E+00	4.4026E-02	1.0691E-01	1,79390E-02
117.	1.12E+00	1.15E+00	4.9895E-02	1.2117E-01	1,84080E-02
118.	1.11E+00	1.12E+00	5.1372E-02	1.2475E-01	1,75980E-02
119.	1.10E+00	1.11E+00	5.0361E-02	1.2230E-01	1,65500E-02
120.	1.07E+00	1.10E+00	4.6946E-02	1.1401E-01	1,46960E-02
121.	1.05E+00	1.07E+00	4.1637E-02	1.0177E-01	1,24170E-02
122.	1.04E+00	1.05E+00	3.8209E-02	9.3419E-02	1,11450E-02
123.	1.02E+00	1.04E+00	3.6146E-02	8.8375E-02	1,04470E-02
124.	9.96E-01	1.02E+00	3.3502E-02	8.1931E-02	9,60200E-03
125.	9.86E-01	9.96E-01	3.1645E-02	7.7485E-02	9,04100E-03
126.	9.72E-01	9.86E-01	3.0602E-02	7.4929E-02	8,74100E-03
127.	9.50E-01	9.72E-01	2.9342E-02	7.1845E-02	8,39300E-03
128.	9.30E-01	9.50E-01	2.8202E-02	6.9053E-02	8,09000E-03
129.	9.10E-01	9.30E-01	2.7420E-02	6.7139E-02	7,89000E-03
130.	8.60E-01	9.10E-01	2.6593E-02	6.5114E-02	7,69000E-03
131.	8.50E-01	8.60E-01	2.6304E-02	6.4407E-02	7,62500E-03

132.	7.90E-01	8.50E-01	2.6238E-02	6.4244E-02	7,61700E-03
133.	7.80E-01	7.90E-01	2.6456E-02	6.4779E-02	7,67700E-03
134.	7.05E-01	7.80E-01	2.7143E-02	6.6460E-02	7,84600E-03
135.	6.25E-01	7.05E-01	2.9264E-02	7.1653E-02	8,34100E-03
136.	5.40E-01	6.25E-01	3.3041E-02	8.0901E-02	9,20200E-03
137.	5.00E-01	5.40E-01	3.7163E-02	9.0995E-02	1,01500E-02
138.	4.85E-01	5.00E-01	3.9736E-02	9.6389E-02	1,07430E-02
139.	4.33E-01	4.85E-01	4.3747E-02	1.0612E-01	1,17210E-02
140.	4.00E-01	4.33E-01	5.0835E-02	1.2331E-01	1,34910E-02
141.	3.91E-01	4.00E-01	5.5432E-02	1.3515E-01	1,47030E-02
142.	3.50E-01	3.91E-01	6.3113E-02	1.5387E-01	1,68700E-02
143.	3.20E-01	3.50E-01	7.6342E-02	1.8613E-01	2,09670E-02
144.	3.15E-01	3.20E-01	8.3273E-02	2.0303E-01	2,32970E-02
145.	3.00E-01	3.15E-01	8.6401E-02	2.1065E-01	2,44990E-02
146.	2.80E-01	3.00E-01	8.9517E-02	2.1859E-01	2,59630E-02
147.	2.48E-01	2.80E-01	8.8200E-02	2.1537E-01	2,62300E-02
148.	2.20E-01	2.48E-01	8.3420E-02	2.0370E-01	2,49700E-02
149.	1.89E-01	2.20E-01	8.1134E-02	1.9799E-01	2,39460E-02
150.	1.80E-01	1.89E-01	8.2084E-02	2.0010E-01	2,38560E-02
151.	1.60E-01	1.80E-01	8.3983E-02	2.0473E-01	2,41270E-02
152.	1.40E-01	1.60E-01	8.8083E-02	2.1472E-01	2,51570E-02
153.	1.34E-01	1.40E-01	9.1493E-02	2.2304E-01	2,61070E-02
154.	1.15E-01	1.34E-01	9.6438E-02	2.3509E-01	2,70920E-02
155.	1.00E-01	1.15E-01	1.0455E-01	2.5486E-01	2,86700E-02
156.	9.50E-02	1.00E-01	1.1040E-01	2.6937E-01	2,98300E-02
157.	8.00E-02	9.50E-02	1.1820E-01	2.8841E-01	3,14600E-02
158.	7.70E-02	8.00E-02	1.2511E-01	3.0527E-01	3,29600E-02
159.	6.70E-02	7.70E-02	1.3179E-01	3.2158E-01	3,44900E-02
160.	5.80E-02	6.70E-02	1.4222E-01	3.4702E-01	3,70100E-02
161.	5.00E-02	5.80E-02	1.5403E-01	3.7583E-01	4,00700E-02
162.	4.20E-02	5.00E-02	1.6806E-01	4.0962E-01	4,38000E-02
163.	3.50E-02	4.20E-02	1.8457E-01	4.4987E-01	4,82900E-02
164.	3.00E-02	3.50E-02	2.0115E-01	4.9027E-01	5,28600E-02
165.	2.50E-02	3.00E-02	2.1867E-01	5.3299E-01	5,77700E-02
166.	2.00E-02	2.50E-02	2.4203E-01	5.8991E-01	6,43200E-02
167.	1.50E-02	2.00E-02	2.7392E-01	6.6693E-01	7,34600E-02
168.	1.00E-02	1.50E-02	3.2177E-01	7.8344E-01	8,74700E-02
169.	6.90E-03	1.00E-02	3.8667E-01	9.4346E-01	1,06870E-01
170.	5.00E-03	6.90E-03	4.5583E-01	1.1122E+00	1,27900E-01
171.	3.00E-03	5.00E-03	5.4966E-01	1.3397E+00	1,56820E-01
172.	1.10E-03	3.00E-03	8.3337E-01	2.0313E+00	2,44030E-01

Table 3 and 4 : Tow group constants and scattering matrix

Table:3 Tow groups constants
Unit : cm-1

BWR (unit cell)

G	D	Nu*fission	Fission	Capture	Totale	Absorption	TRANSP
1	1,52632141	1,0293E-02	4,1354E-03	6,6746E-03	3,1067E-01	1,0810E-02	2,1839E-01
2	1,04713138	2,7274E-01	1,1185E-01	3,0560E-02	8,9409E-01	1,4241E-01	3,1833E-01

Table :4a

Scattering matrix P0 G -> g		
Unit : s-1		
	1 -> 1	2 -> 1
	1 -> 2	2 -> 2
1	8,7996E+00	5,2668E-03
2	3,7248E-01	1,8845E+00

Table :4b

Scattering matrix P1 G -> g		
Unit : s-1		
	1 -> 1	2 -> 1
	1 -> 2	2 -> 2
1	1,9663E+01	6,7791E-03
2	3,7523E-01	2,3941E+00

**Table 5. Burnup steps and spectrum index
BWR-PB(unit cell)**

Steps	BURNUP[MWd/t]	KINF_CERMET
1	0	1,45460701
2	25	1,43985
3	50	1,43872
4	75	1,43907
5	100	1,4386
6	150	1,43767
7	200	1,43675
8	250	1,43586
9	300	1,43498
10	350	1,43415
11	400	1,43334
12	450	1,43257
13	500	1,43182
14	550	1,43109

15	600	1,43038
16	650	1,4297
17	700	1,42903
18	750	1,42839
19	800	1,42776
20	850	1,42716
21	900	1,42656
22	950	1,42598
23	1000	1,42541
24	1150	1,42378
25	1300	1,42226
26	1450	1,42078
27	1600	1,41939
28	1850	1,41718
29	2100	1,41507
30	2250	1,41386
31	2240	1,41265
32	2500	1,41187
33	2600	1,41109
34	2700	1,41031
35	2800	1,40954
36	2900	1,40877
37	3000	1,40801
38	3250	1,40611
39	3500	1,40423
40	3750	1,40237
41	4000	1,40051
42	4250	1,39867
43	4500	1,39681
44	4750	1,39499
45	5000	1,39314
46	5500	1,38947
47	6000	1,38577
48	6500	1,3821
49	7000	1,3784
50	8000	1,37108
51	9000	1,36376
52	10000	1,35667
53	11000	1,34948
54	11500	1,34611
55	12000	1,34258
56	12500	1,33915
57	13000	1,33565
58	13500	1,33228
59	14000	1,32882
60	14500	1,32548
61	15000	1,32208
62	15500	1,31876
63	16000	1,3154

64	16500	1,31213
65	17000	1,30882
66	17500	1,3056
67	18000	1,30233
68	18500	1,29916
69	19000	1,29593
70	19500	1,2928
71	20000	1,28961
72	20500	1,28653
73	21000	1,28338
74	21500	1,28033
75	22000	1,27722
76	22500	1,27422
77	23000	1,27114
78	23500	1,26817
79	24000	1,26514
80	24500	1,2622
81	25000	1,2592
82	25500	1,2563
83	26000	1,25333
84	26500	1,25046
85	27000	1,24753
86	27500	1,24469
87	28000	1,24178
88	28500	1,23897
89	29000	1,23609
90	29500	1,2333
91	30000	1,23046
92	30500	1,22769
93	31000	1,22487
94	31500	1,22213
95	32000	1,21933
96	32500	1,21661
97	33000	1,21384
98	33500	1,21113
99	34000	1,20838
100	34500	1,2057
101	35000	1,20297
102	35500	1,20031
103	36000	1,1976
104	36500	1,19496
105	37000	1,19227
106	37500	1,18964
107	38000	1,18697
108	38500	1,18437
109	39000	1,18171
110	39500	1,17912
111	40000	1,17649
112	40500	1,17391

113	41000	1,17129
114	41500	1,16873
115	42000	1,16613
116	42500	1,16359
117	43000	1,161
118	43500	1,15847
119	44000	1,15589
120	44500	1,15337
121	45000	1,15081
122	45500	1,1483
123	46000	1,14576
124	46500	1,14325
125	47000	1,14072
126	47500	1,13823
127	48000	1,13571
128	48500	1,13323
129	49000	1,13072
130	49500	1,12826
131	50000	1,12576
132	50500	1,1233
133	51000	1,12082
134	51500	1,11837
135	52000	1,11589
136	52500	1,11345
137	53000	1,11099
138	53500	1,10856
139	54000	1,1061
140	54500	1,10368
141	55000	1,10124
142	55500	1,09882
143	56000	1,09639
144	56500	1,09399
145	57000	1,09156
146	57500	1,08916
147	58000	1,08675
148	58500	1,08436
149	59000	1,08195
150	59500	1,07957
151	60000	1,07717
152	61000	1,07241
153	62000	1,06764
154	63000	1,06288
155	64000	1,05814
156	65000	1,05342
157	66000	1,04871
158	67000	1,04402
159	68000	1,03934
160	69000	1,03468
161	70000	1,03004

162	71000	1,02558
163	72000	1,02097
164	73000	1,01637
165	74000	1,0118
166	75000	1,00723
167	76000	1,00269
168	77000	0,998156
169	78000	0,993641
170	79000	0,989142
171	80000	0,98466
172	81000	0,980229
173	82000	0,975785
174	83000	0,971354
175	84000	0,966944
176	85000	0,962553

Steps	Burnup [MWd/t]	Spectrum index	Ins, Conv, Ratio
1	0	6,0921E+00	3,09593629E-01
2	50	6,1316E+00	3,11307811E-01
3	100	6,1322E+00	3,11556703E-01
4	200	6,1382E+00	3,11826087E-01
5	300	6,1441E+00	3,12089433E-01
6	400	6,1498E+00	3,12336258E-01
7	500	6,1551E+00	3,12544107E-01
8	600	6,1601E+00	3,12777056E-01
9	700	6,1648E+00	3,12997171E-01
10	800	6,1694E+00	3,13188904E-01
11	900	6,1738E+00	3,13395304E-01
12	1000	6,1779E+00	3,13576819E-01
13	1300	6,1894E+00	3,14148197E-01
14	1600	6,1999E+00	3,14659869E-01
15	2100	6,2156E+00	3,15587177E-01
16	2400	6,2244E+00	3,16133263E-01
17	2600	6,2299E+00	3,16530930E-01
18	2800	6,2354E+00	3,16914195E-01
19	3000	6,2407E+00	3,17303240E-01
20	3500	6,2532E+00	3,18350552E-01
21	4000	6,2652E+00	3,19462093E-01
22	4500	6,2767E+00	3,20627909E-01
23	5000	6,2877E+00	3,21859235E-01
24	6000	6,3081E+00	3,24502158E-01
25	7000	6,3273E+00	3,27305282E-01
26	9000	6,3602E+00	3,33357779E-01
27	11000	6,3872E+00	3,39791245E-01
28	12000	6,3988E+00	3,43123618E-01
29	13000	6,4087E+00	3,46501442E-01
30	14000	6,4173E+00	3,49905823E-01

31	15000	6,4248E+00	3,53337627E-01
32	16000	6,4309E+00	3,56788402E-01
33	17000	6,4359E+00	3,60248820E-01
34	18000	6,4397E+00	3,63752519E-01
35	19000	6,4424E+00	3,67217846E-01
36	20000	6,4440E+00	3,70700602E-01
37	21000	6,4445E+00	3,74174083E-01
38	22000	6,4441E+00	3,77672231E-01
39	23000	6,4427E+00	3,81146647E-01
40	24000	6,4403E+00	3,84609096E-01
41	25000	6,4370E+00	3,88073979E-01
42	26000	6,4330E+00	3,91555368E-01
43	27000	6,4280E+00	3,94994748E-01
44	28000	6,4223E+00	3,98433696E-01
45	29000	6,4158E+00	4,01914658E-01
46	30000	6,4083E+00	4,05354348E-01
47	31000	6,4002E+00	4,08786676E-01
48	32000	6,3915E+00	4,12210703E-01
49	33000	6,3820E+00	4,15682210E-01
50	34000	6,3718E+00	4,19103151E-01
51	35000	6,3610E+00	4,22538226E-01
52	36000	6,3496E+00	4,25994553E-01
53	37000	6,3375E+00	4,29430675E-01
54	38000	6,3249E+00	4,32855128E-01
55	39000	6,3115E+00	4,36324556E-01
56	40000	6,2977E+00	4,39762129E-01
57	41000	6,2834E+00	4,43202715E-01
58	42000	6,2685E+00	4,46666271E-01
59	43000	6,2531E+00	4,50113535E-01
60	44000	6,2371E+00	4,53589172E-01
61	45000	6,2207E+00	4,57038585E-01
62	46000	6,2040E+00	4,60538357E-01
63	47000	6,1866E+00	4,64013762E-01
64	48000	6,1689E+00	4,67525688E-01
65	49000	6,1508E+00	4,71040921E-01
66	50000	6,1321E+00	4,74532376E-01
67	51000	6,1131E+00	4,78055319E-01
68	52000	6,0938E+00	4,81603371E-01
69	53000	6,0740E+00	4,85157550E-01
70	54000	6,0538E+00	4,88672686E-01
71	55000	6,0334E+00	4,92244598E-01
72	56000	6,0125E+00	4,95819276E-01
73	57000	5,9914E+00	4,99404121E-01
74	58000	5,9698E+00	5,02999235E-01
75	59000	5,9480E+00	5,06605181E-01
76	60000	5,9260E+00	5,10230071E-01
77	70000	5,6904E+00	5,47304797E-01
78	80000	5,4369E+00	5,85864077E-01
79	85000	5,3068E+00	6,05628290E-01

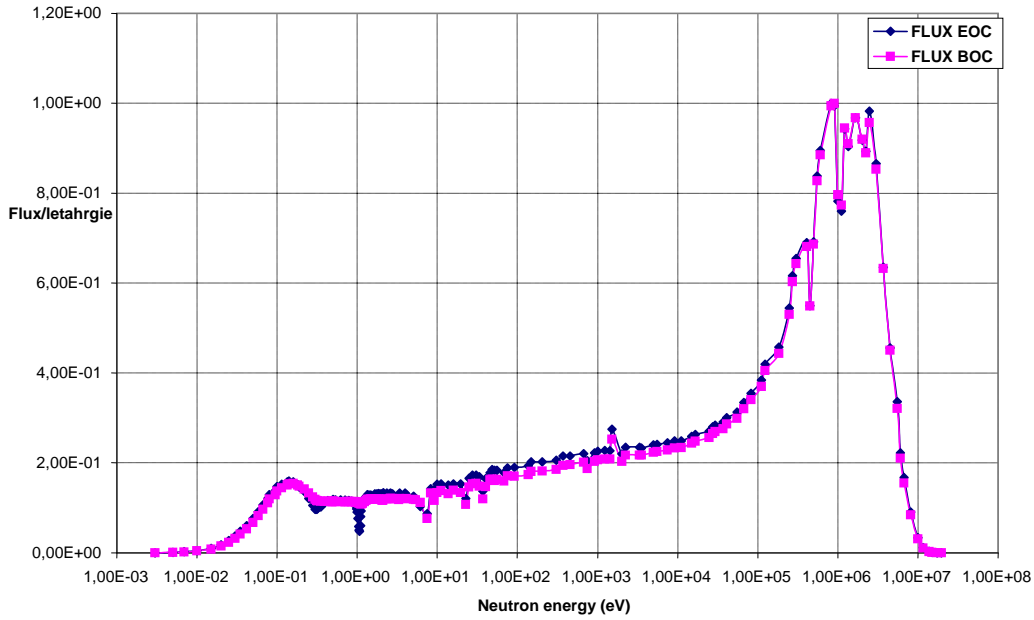
**Tables 6: Number density of elements [$/\text{cm}^3$] at BOC and EOC in fuel assembly
BWR-PB (unit cell)**

<i>Elements</i>	<i>BOC</i>	<i>EOC</i>
<i>U235</i>	4.915012E-04	1.212836E-04
<i>U236</i>	0	1.227004E-04
<i>U238</i>	4.423512E-03	4.193268E-03
<i>PU238</i>	0	4.740687E-06
<i>PU239</i>	0	4.891209E-05
<i>PU240</i>	0	1.714925E-05
<i>PU241</i>	0	1.223131E-05
<i>PU242</i>	0	4.731241E-06
<i>AM241</i>	0	2.098871E-06
<i>AM242M</i>	0	3.582041E-08
<i>AM243</i>	0	1.164327E-06
<i>CM242</i>	0	2.053976E-07
<i>CM243</i>	0	6.562968E-09
<i>CM244</i>	0	4.551568E-07
<i>U233</i>		
<i>U234</i>		
<i>TH230</i>		
<i>TH232</i>		
<i>PA231</i>		
<i>PA233</i>		

BWR FUEL ASSEMBLY RESULTS WITH CERMET COMPOSITION:

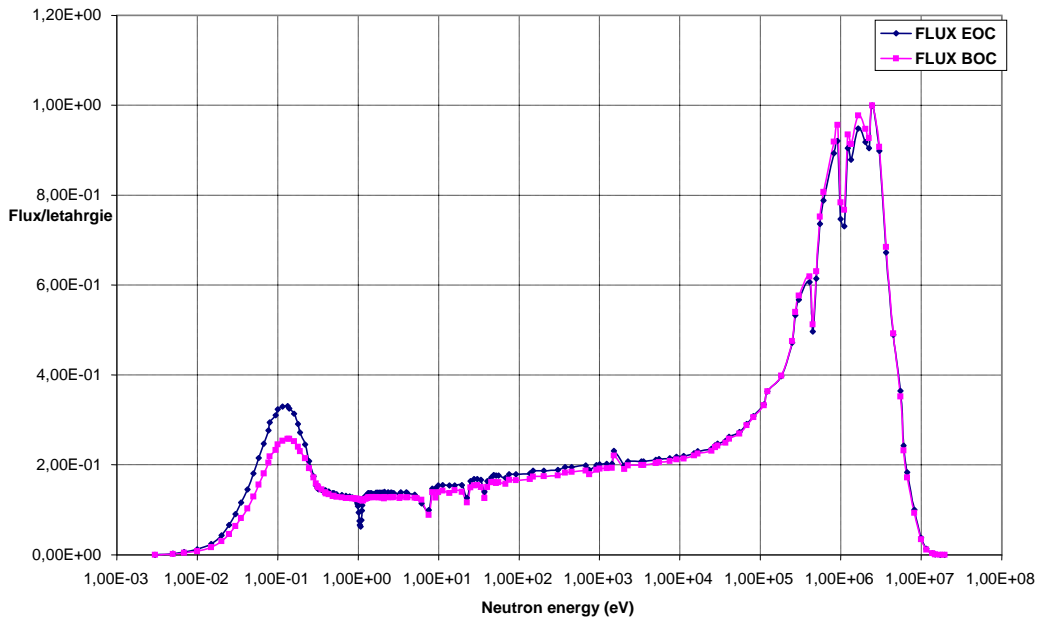
TOP PART

Fig.1a: Flux/letahrgie vs. Neutron energy (eV)



MIDDLE PART

Fig.1b: Flux/letahrgie vs. Neutron energy (eV)



BOTTOM PART
Fig.1c: Flux/letahrgie vs. Neutron energy (eV)

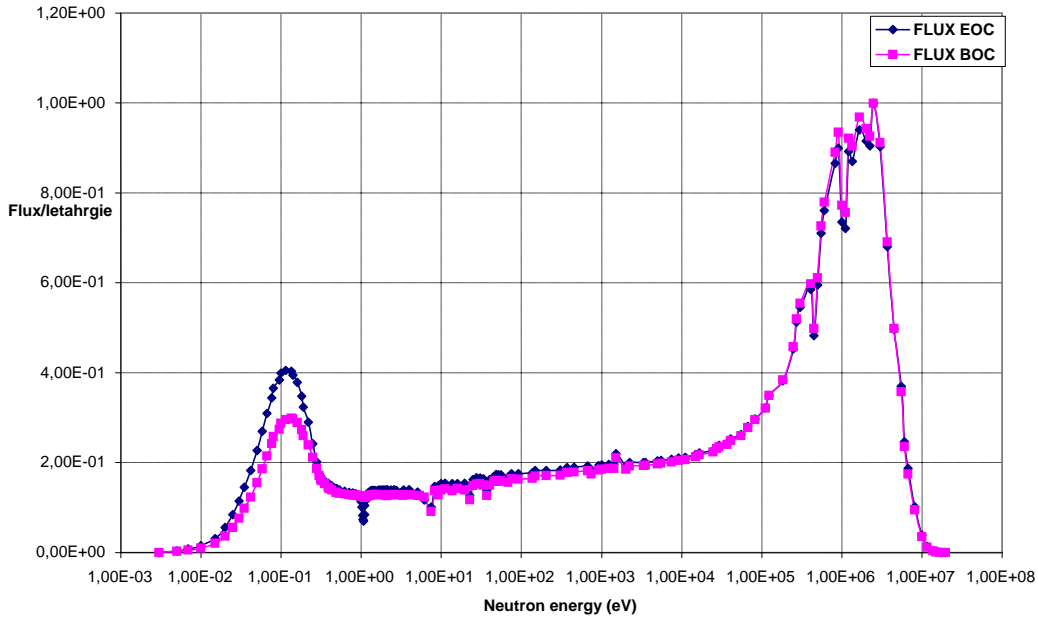


Fig.2a: Fission Cross Section vs. Neutron Energy

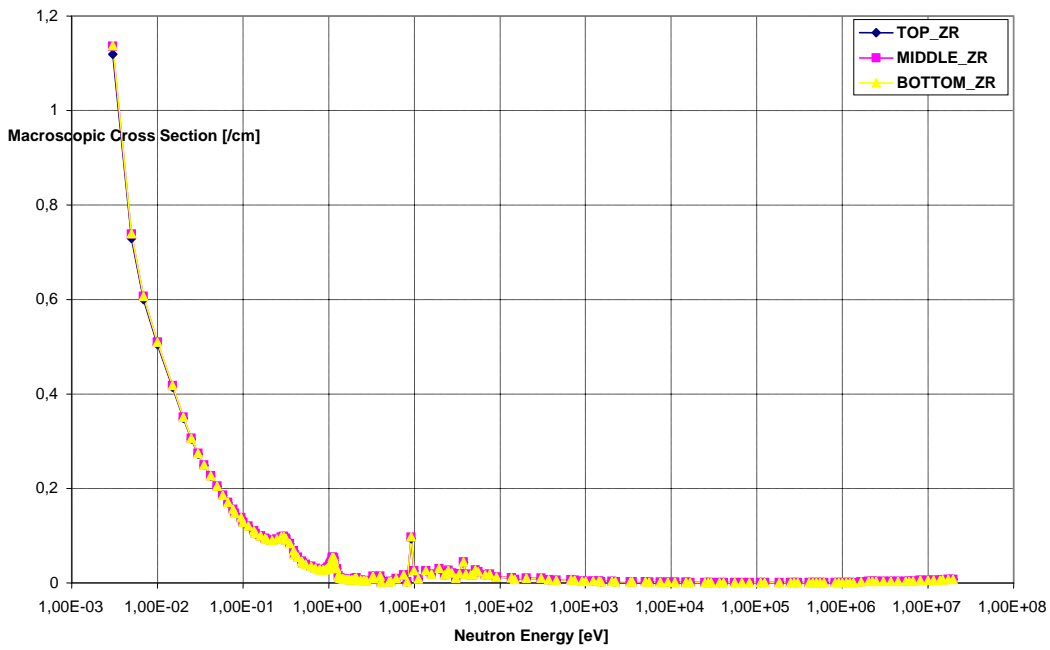


Fig.2b: Capture Cross Section vs. Neutron Energy

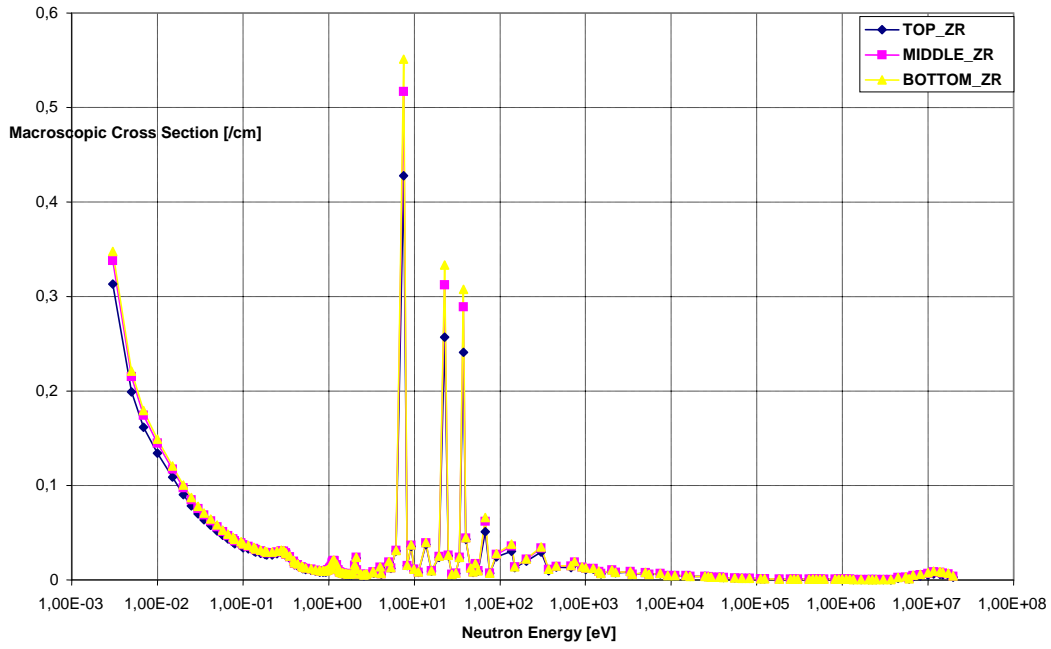


Fig.3: Spectrum index vs. Burnup(Mwd/t)

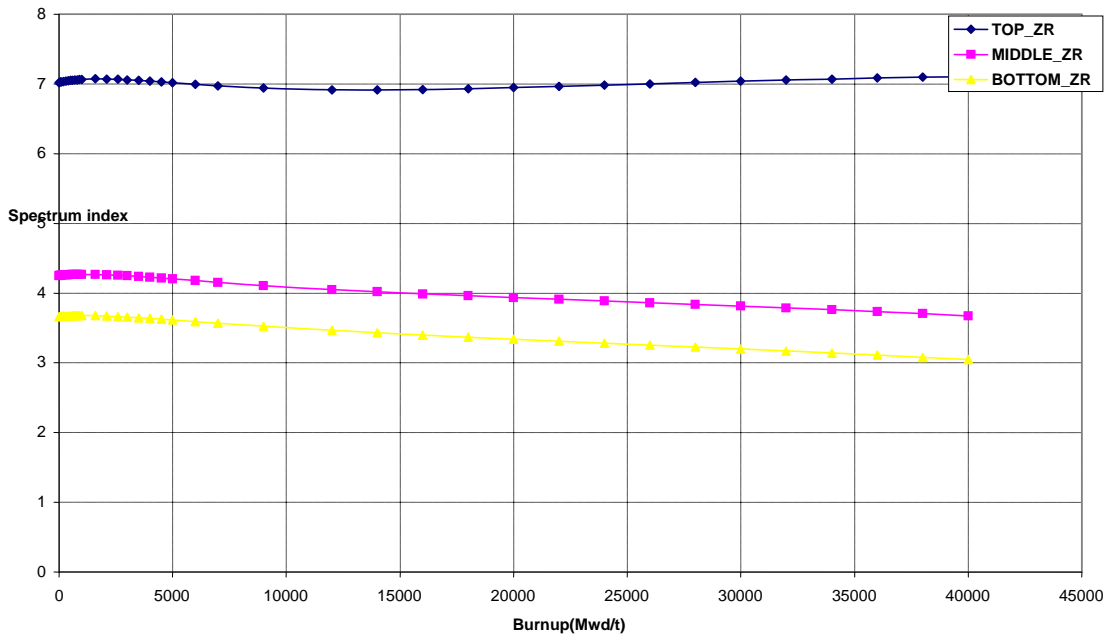


Fig.4: Infinite multiplication factor vs. Burnup (MWd/t)

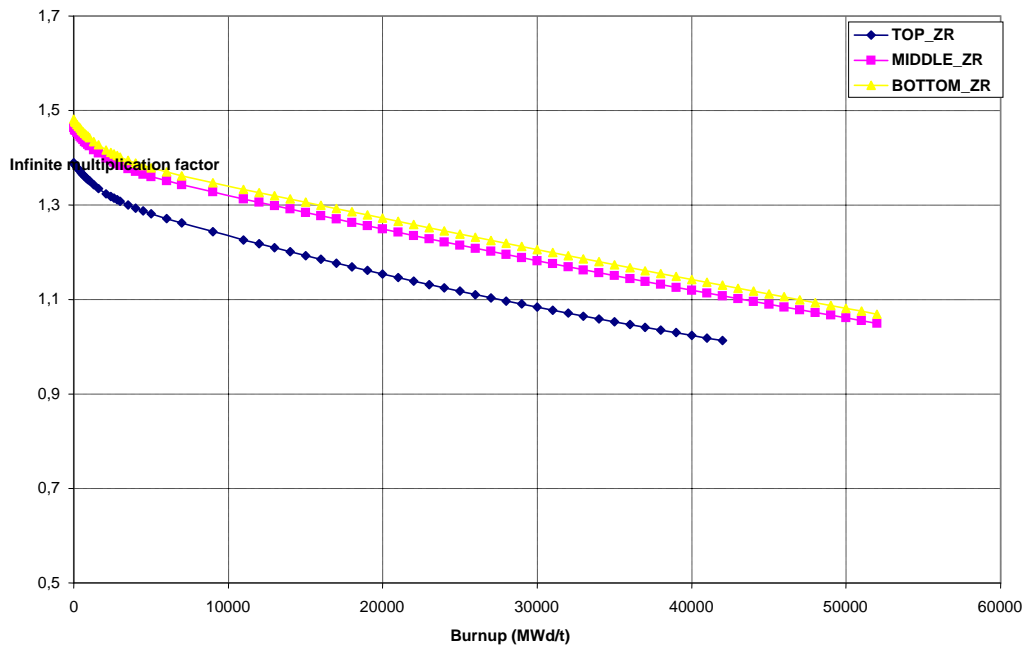
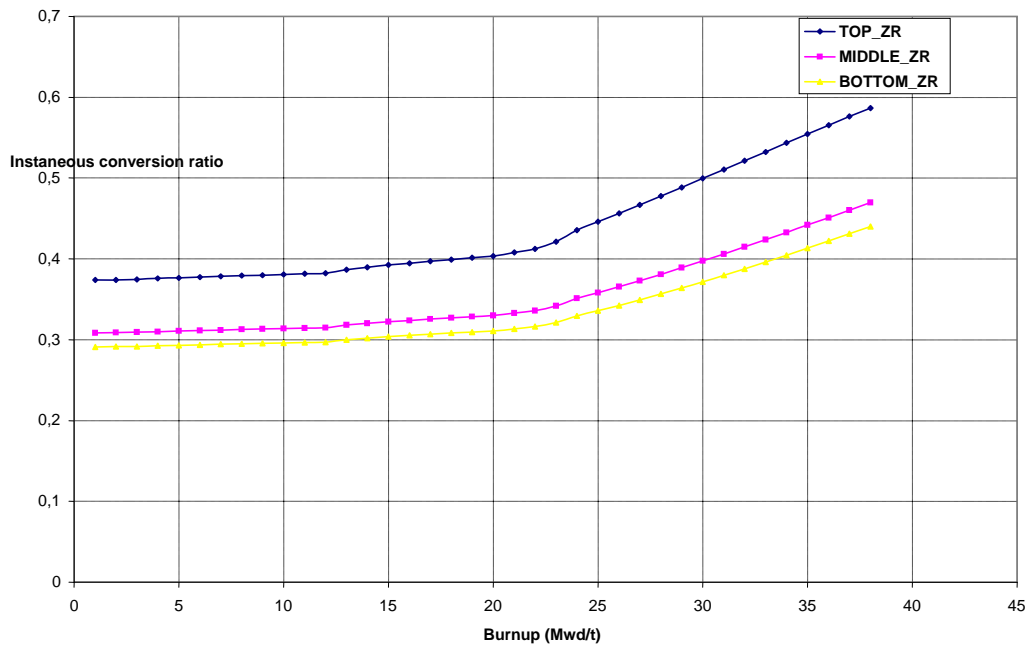


Fig.5 Instantaneous conversion ratio vs. Burnup (Mwd/t)



**Table 1a : Flux/ lethargy and energy structure
TOP PART**

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>FLUX BOC</i>	<i>FLUX EOC</i>
1	1,73E+07	1,96E+07	2.659311E+11	4.173977E+11
2	1,49E+07	1,73E+07	1.263219E+12	1.888330E+12
3	1,38E+07	1,49E+07	3.898465E+12	5.674325E+12
4	1,16E+07	1,38E+07	1.331327E+13	1.868154E+13
5	1,00E+07	1,16E+07	4.654030E+13	6.405909E+13
6	8,19E+06	1,00E+07	1.393228E+14	1.904562E+14
7	6,70E+06	8,19E+06	3.795620E+14	5.065316E+14
8	6,07E+06	6,70E+06	7.016020E+14	9.350067E+14
9	5,49E+06	6,07E+06	9.495462E+14	1.242365E+15
10	4,49E+06	5,49E+06	1.447962E+15	1.879943E+15
11	3,68E+06	4,49E+06	2.030944E+15	2.546267E+15
12	3,01E+06	3,68E+06	2.854122E+15	3.546159E+15
13	2,47E+06	3,01E+06	3.850747E+15	4.837045E+15
14	2,23E+06	2,47E+06	4.319382E+15	5.490906E+15
15	2,02E+06	2,23E+06	4.014201E+15	4.991909E+15
16	1,65E+06	2,02E+06	4.147465E+15	5.128883E+15
17	1,35E+06	1,65E+06	4.363927E+15	5.405717E+15
18	1,22E+06	1,35E+06	4.107390E+15	5.051108E+15
19	1,11E+06	1,22E+06	4.259987E+15	5.267010E+15
20	1,00E+06	1,11E+06	3.488636E+15	4.249425E+15
21	9,07E+05	1,00E+06	3.591531E+15	4.369691E+15
22	8,21E+05	9,07E+05	4.511561E+15	5.554922E+15
23	6,08E+05	8,21E+05	4.484944E+15	5.587833E+15
24	5,50E+05	6,08E+05	3.991642E+15	5.000354E+15
25	4,98E+05	5,50E+05	3.732144E+15	4.683180E+15
26	4,50E+05	4,98E+05	3.095460E+15	3.866385E+15
27	4,08E+05	4,50E+05	2.475389E+15	3.072845E+15
28	3,02E+05	4,08E+05	3.074517E+15	3.856918E+15
29	2,73E+05	3,02E+05	2.899543E+15	3.657283E+15
30	2,47E+05	2,73E+05	2.722331E+15	3.443386E+15
31	1,83E+05	2,47E+05	2.392757E+15	3.040779E+15
32	1,23E+05	1,83E+05	2.002179E+15	2.559582E+15
33	1,11E+05	1,23E+05	1.827671E+15	2.345023E+15
34	8,23E+04	1,11E+05	1.669016E+15	2.148287E+15
35	6,74E+04	8,23E+04	1.535701E+15	1.982434E+15
36	5,52E+04	6,74E+04	1.443188E+15	1.867524E+15
37	4,09E+04	5,52E+04	1.348248E+15	1.749706E+15
38	3,70E+04	4,09E+04	1.293699E+15	1.682200E+15
39	2,93E+04	3,70E+04	1.246339E+15	1.623825E+15
40	2,74E+04	2,93E+04	1.214886E+15	1.585133E+15
41	2,48E+04	2,74E+04	1.197367E+15	1.563706E+15

42	1,66E+04	2,48E+04	1.155575E+15	1.512938E+15
43	1,50E+04	1,66E+04	1.119216E+15	1.469703E+15
44	1,11E+04	1,50E+04	1.099535E+15	1.447055E+15
45	9,12E+03	1,11E+04	1.056190E+15	1.393824E+15
46	7,47E+03	9,12E+03	1.052209E+15	1.391265E+15
47	5,53E+03	7,47E+03	1.032477E+15	1.367861E+15
48	5,00E+03	5,53E+03	1.014943E+15	1.347950E+15
49	3,53E+03	5,00E+03	1.008322E+15	1.342217E+15
50	3,35E+03	3,53E+03	9.789253E+14	1.305821E+15
51	2,25E+03	3,35E+03	9.817252E+14	1.312384E+15
52	2,03E+03	2,25E+03	9.800648E+14	1.314052E+15
53	1,51E+03	2,03E+03	9.163518E+14	1.231196E+15
54	1,43E+03	1,51E+03	1.140753E+15	1.535822E+15
55	1,23E+03	1,43E+03	9.415964E+14	1.269993E+15
56	1,01E+03	1,23E+03	9.407426E+14	1.271670E+15
57	9,14E+02	1,01E+03	9.331377E+14	1.262433E+15
58	7,49E+02	9,14E+02	9.172364E+14	1.244185E+15
59	6,77E+02	7,49E+02	8.439542E+14	1.146567E+15
60	4,54E+02	6,77E+02	9.064009E+14	1.235557E+15
61	3,72E+02	4,54E+02	8.837124E+14	1.206490E+15
62	3,04E+02	3,72E+02	8.777683E+14	1.201912E+15
63	2,04E+02	3,04E+02	8.349656E+14	1.148178E+15
64	1,49E+02	2,04E+02	8.203839E+14	1.131672E+15
65	1,37E+02	1,49E+02	8.174126E+14	1.130494E+15
66	9,17E+01	1,37E+02	7.832249E+14	1.082084E+15
67	7,57E+01	9,17E+01	7.670438E+14	1.059766E+15
68	6,79E+01	7,57E+01	7.714132E+14	1.057631E+15
69	5,56E+01	6,79E+01	7.206675E+14	9.964256E+14
70	5,16E+01	5,56E+01	7.346379E+14	1.027842E+15
71	4,83E+01	5,16E+01	7.250581E+14	1.027102E+15
72	4,55E+01	4,83E+01	7.420091E+14	1.036641E+15
73	4,02E+01	4,55E+01	7.342465E+14	9.963917E+14
74	3,73E+01	4,02E+01	6.629159E+14	9.213843E+14
75	3,37E+01	3,73E+01	5.401298E+14	7.663585E+14
76	3,05E+01	3,37E+01	6.682891E+14	9.446446E+14
77	2,76E+01	3,05E+01	6.974513E+14	9.679527E+14
78	2,50E+01	2,76E+01	6.916859E+14	9.672984E+14
79	2,26E+01	2,50E+01	6.617828E+14	9.280058E+14
80	1,95E+01	2,26E+01	4.856986E+14	6.763168E+14
81	1,59E+01	1,95E+01	6.044179E+14	8.588478E+14
82	1,37E+01	1,59E+01	6.292921E+14	8.562184E+14
83	1,12E+01	1,37E+01	5.911221E+14	8.441702E+14
84	9,91E+00	1,12E+01	6.225490E+14	8.555356E+14
85	9,19E+00	9,91E+00	6.039119E+14	8.504994E+14
86	8,32E+00	9,19E+00	5.246456E+14	7.818983E+14

87	7,52E+00	8,32E+00	5.989288E+14	7.957136E+14
88	6,16E+00	7,52E+00	3.439608E+14	4.874989E+14
89	5,35E+00	6,16E+00	5.056034E+14	5.770240E+14
90	5,04E+00	5,35E+00	5.321044E+14	6.627167E+14
91	4,13E+00	5,04E+00	5.348688E+14	7.034038E+14
92	4,00E+00	4,13E+00	5.450420E+14	7.251446E+14
93	3,38E+00	4,00E+00	5.382466E+14	7.416509E+14
94	3,30E+00	3,38E+00	5.428195E+14	7.426128E+14
95	2,77E+00	3,30E+00	5.310839E+14	7.220100E+14
96	2,72E+00	2,77E+00	5.429702E+14	7.340939E+14
97	2,60E+00	2,72E+00	5.411929E+14	7.165916E+14
98	2,55E+00	2,60E+00	5.473238E+14	7.416064E+14
99	2,36E+00	2,55E+00	5.415162E+14	7.375582E+14
100	2,13E+00	2,36E+00	5.417424E+14	7.420618E+14
101	2,10E+00	2,13E+00	5.419656E+14	7.463298E+14
102	2,02E+00	2,10E+00	5.232938E+14	7.285454E+14
103	1,93E+00	2,02E+00	5.301251E+14	7.322104E+14
104	1,84E+00	1,93E+00	5.365510E+14	7.345713E+14
105	1,76E+00	1,84E+00	5.393702E+14	7.368704E+14
106	1,67E+00	1,76E+00	5.383426E+14	7.342467E+14
107	1,59E+00	1,67E+00	5.406053E+14	7.353236E+14
108	1,50E+00	1,59E+00	5.343836E+14	7.101298E+14
109	1,48E+00	1,50E+00	5.411660E+14	6.999979E+14
110	1,44E+00	1,48E+00	5.415275E+14	7.168746E+14
111	1,37E+00	1,44E+00	5.363525E+14	7.199519E+14
112	1,34E+00	1,37E+00	5.364020E+14	7.192782E+14
113	1,30E+00	1,34E+00	5.379661E+14	7.210990E+14
114	1,24E+00	1,30E+00	5.237803E+14	7.010775E+14
115	1,17E+00	1,24E+00	5.118110E+14	6.767128E+14
116	1,15E+00	1,17E+00	4.976592E+14	6.372519E+14
117	1,12E+00	1,15E+00	4.902555E+14	5.890646E+14
118	1,11E+00	1,12E+00	4.895953E+14	5.225468E+14
119	1,10E+00	1,11E+00	4.905665E+14	4.532504E+14
120	1,07E+00	1,10E+00	4.915999E+14	3.382756E+14
121	1,05E+00	1,07E+00	4.955942E+14	2.658237E+14
122	1,04E+00	1,05E+00	4.998385E+14	2.801219E+14
123	1,02E+00	1,04E+00	5.013912E+14	3.260894E+14
124	9,96E-01	1,02E+00	5.041404E+14	4.268402E+14
125	9,86E-01	9,96E-01	5.059330E+14	5.079596E+14
126	9,72E-01	9,86E-01	5.067915E+14	5.428160E+14
127	9,50E-01	9,72E-01	5.080161E+14	5.748592E+14
128	9,30E-01	9,50E-01	5.091633E+14	5.974509E+14
129	9,10E-01	9,30E-01	5.105639E+14	6.119153E+14
130	8,60E-01	9,10E-01	5.102177E+14	6.249948E+14
131	8,50E-01	8,60E-01	5.141454E+14	6.374272E+14

132	7,90E-01	8,50E-01	5.111114E+14	6.397963E+14
133	7,80E-01	7,90E-01	5.154047E+14	6.498273E+14
134	7,05E-01	7,80E-01	5.114079E+14	6.492712E+14
135	6,25E-01	7,05E-01	5.095511E+14	6.526315E+14
136	5,40E-01	6,25E-01	5.128653E+14	6.599300E+14
137	5,00E-01	5,40E-01	5.120212E+14	6.588290E+14
138	4,85E-01	5,00E-01	5.182234E+14	6.653116E+14
139	4,33E-01	4,85E-01	5.082146E+14	6.498872E+14
140	4,00E-01	4,33E-01	5.156123E+14	6.482062E+14
141	3,91E-01	4,00E-01	5.150552E+14	6.368004E+14
142	3,50E-01	3,91E-01	5.144439E+14	6.139071E+14
143	3,20E-01	3,50E-01	5.155942E+14	5.685325E+14
144	3,15E-01	3,20E-01	5.217457E+14	5.476394E+14
145	3,00E-01	3,15E-01	5.244813E+14	5.385110E+14
146	2,80E-01	3,00E-01	5.344283E+14	5.414579E+14
147	2,48E-01	2,80E-01	5.584508E+14	5.878088E+14
148	2,20E-01	2,48E-01	5.993805E+14	6.749730E+14
149	1,89E-01	2,20E-01	6.404034E+14	7.614298E+14
150	1,80E-01	1,89E-01	6.690128E+14	8.179098E+14
151	1,60E-01	1,80E-01	6.816053E+14	8.481496E+14
152	1,40E-01	1,60E-01	6.943476E+14	8.819042E+14
153	1,34E-01	1,40E-01	6.939494E+14	8.914325E+14
154	1,15E-01	1,34E-01	6.817096E+14	8.843762E+14
155	1,00E-01	1,15E-01	6.508490E+14	8.544646E+14
156	9,50E-02	1,00E-01	6.220452E+14	8.224095E+14
157	8,00E-02	9,50E-02	5.812451E+14	7.750068E+14
158	7,70E-02	8,00E-02	5.398275E+14	7.254997E+14
159	6,70E-02	7,70E-02	4.990465E+14	6.752903E+14
160	5,80E-02	6,70E-02	4.359606E+14	5.960284E+14
161	5,00E-02	5,80E-02	3.713230E+14	5.127891E+14
162	4,20E-02	5,00E-02	3.051117E+14	4.255246E+14
163	3,50E-02	4,20E-02	2.399781E+14	3.377925E+14
164	3,00E-02	3,50E-02	1.884454E+14	2.672179E+14
165	2,50E-02	3,00E-02	1.456469E+14	2.077808E+14
166	2,00E-02	2,50E-02	1.053565E+14	1.512425E+14
167	1,50E-02	2,00E-02	6.869465E+13	9.922088E+13
168	1,00E-02	1,50E-02	3.769444E+13	5.476919E+13
169	6,90E-03	1,00E-02	1.844855E+13	2.692742E+13
170	5,00E-03	6,90E-03	9.584887E+12	1.402836E+13
171	3,00E-03	5,00E-03	4.424266E+12	6.488655E+12
172	1,10E-03	3,00E-03	4.039299E+11	5.935989E+11

**Table1b : Flux/ lethargy and energy structure
MIDDLE PART**

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>FLUX BOC</i>	<i>FLUX EOC</i>
1	1,73E+07	1,96E+07	3.377169E+11	2.990407E+11
2	1,49E+07	1,73E+07	1.513156E+12	1.364434E+12
3	1,38E+07	1,49E+07	4.523193E+12	4.116517E+12
4	1,16E+07	1,38E+07	1.478818E+13	1.362330E+13
5	1,00E+07	1,16E+07	5.026706E+13	4.664350E+13
6	8,19E+06	1,00E+07	1.480324E+14	1.379476E+14
7	6,70E+06	8,19E+06	3.902733E+14	3.663089E+14
8	6,07E+06	6,70E+06	7.163201E+14	6.731027E+14
9	5,49E+06	6,07E+06	9.460916E+14	8.933293E+14
10	4,49E+06	5,49E+06	1.421053E+15	1.345374E+15
11	3,68E+06	4,49E+06	1.909661E+15	1.822945E+15
12	3,01E+06	3,68E+06	2.622242E+15	2.510233E+15
13	2,47E+06	3,01E+06	3.502032E+15	3.348250E+15
14	2,23E+06	2,47E+06	3.899776E+15	3.721710E+15
15	2,02E+06	2,23E+06	3.529648E+15	3.383007E+15
16	1,65E+06	2,02E+06	3.581258E+15	3.436956E+15
17	1,35E+06	1,65E+06	3.697924E+15	3.548937E+15
18	1,22E+06	1,35E+06	3.428835E+15	3.295016E+15
19	1,11E+06	1,22E+06	3.527103E+15	3.386647E+15
20	1,00E+06	1,11E+06	2.849543E+15	2.742927E+15
21	9,07E+05	1,00E+06	2.911566E+15	2.803084E+15
22	8,21E+05	9,07E+05	3.590218E+15	3.450270E+15
23	6,08E+05	8,21E+05	3.483247E+15	3.342242E+15
24	5,50E+05	6,08E+05	3.075100E+15	2.948164E+15
25	4,98E+05	5,50E+05	2.871540E+15	2.752351E+15
26	4,50E+05	4,98E+05	2.396859E+15	2.298955E+15
27	4,08E+05	4,50E+05	1.935964E+15	1.858587E+15
28	3,02E+05	4,08E+05	2.365020E+15	2.266709E+15
29	2,73E+05	3,02E+05	2.212604E+15	2.118834E+15
30	2,47E+05	2,73E+05	2.079559E+15	1.990586E+15
31	1,83E+05	2,47E+05	1.838584E+15	1.758671E+15
32	1,23E+05	1,83E+05	1.550541E+15	1.481813E+15
33	1,11E+05	1,23E+05	1.418399E+15	1.354777E+15
34	8,23E+04	1,11E+05	1.303311E+15	1.244279E+15
35	6,74E+04	8,23E+04	1.203082E+15	1.148144E+15
36	5,52E+04	6,74E+04	1.134340E+15	1.082177E+15
37	4,09E+04	5,52E+04	1.063812E+15	1.014476E+15
38	3,70E+04	4,09E+04	1.022516E+15	9.748185E+14
39	2,93E+04	3,70E+04	9.884667E+14	9.420958E+14
40	2,74E+04	2,93E+04	9.649700E+14	9.195100E+14
41	2,48E+04	2,74E+04	9.527500E+14	9.077484E+14

42	1,66E+04	2,48E+04	9.213510E+14	8.775165E+14
43	1,50E+04	1,66E+04	8.975829E+14	8.545348E+14
44	1,11E+04	1,50E+04	8.826432E+14	8.400535E+14
45	9,12E+03	1,11E+04	8.561455E+14	8.145194E+14
46	7,47E+03	9,12E+03	8.515858E+14	8.099567E+14
47	5,53E+03	7,47E+03	8.386273E+14	7.973927E+14
48	5,00E+03	5,53E+03	8.291323E+14	7.880954E+14
49	3,53E+03	5,00E+03	8.243154E+14	7.832706E+14
50	3,35E+03	3,53E+03	8.100992E+14	7.695202E+14
51	2,25E+03	3,35E+03	8.105550E+14	7.697220E+14
52	2,03E+03	2,25E+03	8.105296E+14	7.693844E+14
53	1,51E+03	2,03E+03	7.760567E+14	7.364285E+14
54	1,43E+03	1,51E+03	9.012208E+14	8.549813E+14
55	1,23E+03	1,43E+03	7.896515E+14	7.489300E+14
56	1,01E+03	1,23E+03	7.902018E+14	7.492157E+14
57	9,14E+02	1,01E+03	7.855437E+14	7.446939E+14
58	7,49E+02	9,14E+02	7.784341E+14	7.376940E+14
59	6,77E+02	7,49E+02	7.368963E+14	6.981552E+14
60	4,54E+02	6,77E+02	7.748149E+14	7.337028E+14
61	3,72E+02	4,54E+02	7.624403E+14	7.218093E+14
62	3,04E+02	3,72E+02	7.605099E+14	7.196812E+14
63	2,04E+02	3,04E+02	7.360096E+14	6.960555E+14
64	1,49E+02	2,04E+02	7.305047E+14	6.904804E+14
65	1,37E+02	1,49E+02	7.309302E+14	6.905475E+14
66	9,17E+01	1,37E+02	7.065910E+14	6.675093E+14
67	7,57E+01	9,17E+01	6.988085E+14	6.598603E+14
68	6,79E+01	7,57E+01	6.993942E+14	6.607065E+14
69	5,56E+01	6,79E+01	6.665269E+14	6.290734E+14
70	5,16E+01	5,56E+01	6.871781E+14	6.475866E+14
71	4,83E+01	5,16E+01	6.878180E+14	6.471366E+14
72	4,55E+01	4,83E+01	6.901008E+14	6.507620E+14
73	4,02E+01	4,55E+01	6.716254E+14	6.348545E+14
74	3,73E+01	4,02E+01	6.387298E+14	6.024335E+14
75	3,37E+01	3,73E+01	5.449604E+14	5.122366E+14
76	3,05E+01	3,37E+01	6.489694E+14	6.105543E+14
77	2,76E+01	3,05E+01	6.572039E+14	6.195985E+14
78	2,50E+01	2,76E+01	6.583247E+14	6.199175E+14
79	2,26E+01	2,50E+01	6.407750E+14	6.032401E+14
80	1,95E+01	2,26E+01	4.947862E+14	4.663439E+14
81	1,59E+01	1,95E+01	6.067701E+14	5.697705E+14
82	1,37E+01	1,59E+01	6.027679E+14	5.701880E+14
83	1,12E+01	1,37E+01	6.019450E+14	5.647221E+14
84	9,91E+00	1,12E+01	6.055205E+14	5.702802E+14
85	9,19E+00	9,91E+00	6.032013E+14	5.670430E+14
86	8,32E+00	9,19E+00	5.760922E+14	5.372084E+14

87	7,52E+00	8,32E+00	5.741889E+14	5.432555E+14
88	6,16E+00	7,52E+00	3.862645E+14	3.626463E+14
89	5,35E+00	6,16E+00	4.461141E+14	4.284540E+14
90	5,04E+00	5,35E+00	4.975051E+14	4.746892E+14
91	4,13E+00	5,04E+00	5.211367E+14	4.934402E+14
92	4,00E+00	4,13E+00	5.317156E+14	5.025943E+14
93	3,38E+00	4,00E+00	5.428922E+14	5.115127E+14
94	3,30E+00	3,38E+00	5.419661E+14	5.112577E+14
95	2,77E+00	3,30E+00	5.309072E+14	5.013591E+14
96	2,72E+00	2,77E+00	5.361596E+14	5.084546E+14
97	2,60E+00	2,72E+00	5.240150E+14	5.021268E+14
98	2,55E+00	2,60E+00	5.404368E+14	5.119224E+14
99	2,36E+00	2,55E+00	5.390433E+14	5.095357E+14
100	2,13E+00	2,36E+00	5.420069E+14	5.116357E+14
101	2,10E+00	2,13E+00	5.448735E+14	5.139583E+14
102	2,02E+00	2,10E+00	5.373176E+14	5.060911E+14
103	1,93E+00	2,02E+00	5.390266E+14	5.081270E+14
104	1,84E+00	1,93E+00	5.398375E+14	5.093490E+14
105	1,76E+00	1,84E+00	5.410955E+14	5.106751E+14
106	1,67E+00	1,76E+00	5.400923E+14	5.098584E+14
107	1,59E+00	1,67E+00	5.411710E+14	5.110142E+14
108	1,50E+00	1,59E+00	5.299403E+14	5.021724E+14
109	1,48E+00	1,50E+00	5.258131E+14	5.003639E+14
110	1,44E+00	1,48E+00	5.338432E+14	5.062677E+14
111	1,37E+00	1,44E+00	5.350396E+14	5.065931E+14
112	1,34E+00	1,37E+00	5.345442E+14	5.067704E+14
113	1,30E+00	1,34E+00	5.358636E+14	5.078814E+14
114	1,24E+00	1,30E+00	5.265878E+14	4.991387E+14
115	1,17E+00	1,24E+00	5.155651E+14	4.900215E+14
116	1,15E+00	1,17E+00	4.956224E+14	4.739178E+14
117	1,12E+00	1,15E+00	4.686910E+14	4.531848E+14
118	1,11E+00	1,12E+00	4.284751E+14	4.228062E+14
119	1,10E+00	1,11E+00	3.835075E+14	3.875781E+14
120	1,07E+00	1,10E+00	3.021558E+14	3.191912E+14
121	1,05E+00	1,07E+00	2.465748E+14	2.688164E+14
122	1,04E+00	1,05E+00	2.587111E+14	2.804535E+14
123	1,02E+00	1,04E+00	2.949088E+14	3.134373E+14
124	9,96E-01	1,02E+00	3.680202E+14	3.757835E+14
125	9,86E-01	9,96E-01	4.213581E+14	4.180537E+14
126	9,72E-01	9,86E-01	4.426515E+14	4.343145E+14
127	9,50E-01	9,72E-01	4.613033E+14	4.484142E+14
128	9,30E-01	9,50E-01	4.739455E+14	4.579641E+14
129	9,10E-01	9,30E-01	4.818758E+14	4.640573E+14
130	8,60E-01	9,10E-01	4.891968E+14	4.694909E+14
131	8,50E-01	8,60E-01	4.962093E+14	4.753283E+14

132	7,90E-01	8,50E-01	4.981487E+14	4.764869E+14
133	7,80E-01	7,90E-01	5.042796E+14	4.818249E+14
134	7,05E-01	7,80E-01	5.052869E+14	4.822652E+14
135	6,25E-01	7,05E-01	5.103193E+14	4.863385E+14
136	5,40E-01	6,25E-01	5.199074E+14	4.948538E+14
137	5,00E-01	5,40E-01	5.266463E+14	5.008737E+14
138	4,85E-01	5,00E-01	5.352968E+14	5.089893E+14
139	4,33E-01	4,85E-01	5.357622E+14	5.087663E+14
140	4,00E-01	4,33E-01	5.511924E+14	5.227135E+14
141	3,91E-01	4,00E-01	5.559638E+14	5.269704E+14
142	3,50E-01	3,91E-01	5.608156E+14	5.314587E+14
143	3,20E-01	3,50E-01	5.648369E+14	5.357085E+14
144	3,15E-01	3,20E-01	5.706435E+14	5.416025E+14
145	3,00E-01	3,15E-01	5.769115E+14	5.475114E+14
146	2,80E-01	3,00E-01	6.030868E+14	5.713749E+14
147	2,48E-01	2,80E-01	6.812924E+14	6.412190E+14
148	2,20E-01	2,48E-01	8.114057E+14	7.559084E+14
149	1,89E-01	2,20E-01	9.579641E+14	8.833105E+14
150	1,80E-01	1,89E-01	1.062999E+15	9.740349E+14
151	1,60E-01	1,80E-01	1.134006E+15	1.034431E+15
152	1,40E-01	1,60E-01	1.224349E+15	1.110446E+15
153	1,34E-01	1,40E-01	1.267917E+15	1.145968E+15
154	1,15E-01	1,34E-01	1.289800E+15	1.161849E+15
155	1,00E-01	1,15E-01	1.286822E+15	1.154278E+15
156	9,50E-02	1,00E-01	1.260932E+15	1.128398E+15
157	8,00E-02	9,50E-02	1.209236E+15	1.079596E+15
158	7,70E-02	8,00E-02	1.148132E+15	1.023090E+15
159	6,70E-02	7,70E-02	1.079449E+15	9.605775E+14
160	5,80E-02	6,70E-02	9.662559E+14	8.582400E+14
161	5,00E-02	5,80E-02	8.414986E+14	7.462079E+14
162	4,20E-02	5,00E-02	7.062178E+14	6.252970E+14
163	3,50E-02	4,20E-02	5.662417E+14	5.006750E+14
164	3,00E-02	3,50E-02	4.516796E+14	3.989437E+14
165	2,50E-02	3,00E-02	3.535225E+14	3.119767E+14
166	2,00E-02	2,50E-02	2.591085E+14	2.284490E+14
167	1,50E-02	2,00E-02	1.710802E+14	1.507047E+14
168	1,00E-02	1,50E-02	9.501619E+13	8.362929E+13
169	6,90E-03	1,00E-02	4.691196E+13	4.126456E+13
170	5,00E-03	6,90E-03	2.449639E+13	2.153972E+13
171	3,00E-03	5,00E-03	1.134196E+13	9.970678E+12
172	1,10E-03	3,00E-03	1.033325E+12	9.084224E+11

**Table 1c : Flux/ lethargy and energy structure
BOTTOM PART**

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>FLUX BOC</i>	<i>FLUX EOC</i>
1	1,73E+07	1,96E+07	1.811778E+11	3.028252E+11
2	1,49E+07	1,73E+07	8.600924E+11	1.360107E+12
3	1,38E+07	1,49E+07	2.654222E+12	4.069883E+12
4	1,16E+07	1,38E+07	9.057698E+12	1.332215E+13
5	1,00E+07	1,16E+07	3.151417E+13	4.526192E+13
6	8,19E+06	1,00E+07	9.370825E+13	1.330701E+14
7	6,70E+06	8,19E+06	2.538251E+14	3.506174E+14
8	6,07E+06	6,70E+06	4.663573E+14	6.427965E+14
9	5,49E+06	6,07E+06	6.286631E+14	8.484212E+14
10	4,49E+06	5,49E+06	9.525827E+14	1.272551E+15
11	3,68E+06	4,49E+06	1.329964E+15	1.709186E+15
12	3,01E+06	3,68E+06	1.842842E+15	2.339534E+15
13	2,47E+06	3,01E+06	2.430117E+15	3.106654E+15
14	2,23E+06	2,47E+06	2.666493E+15	3.441020E+15
15	2,02E+06	2,23E+06	2.469298E+15	3.113427E+15
16	1,65E+06	2,02E+06	2.514799E+15	3.149403E+15
17	1,35E+06	1,65E+06	2.583583E+15	3.234771E+15
18	1,22E+06	1,35E+06	2.409586E+15	2.994093E+15
19	1,11E+06	1,22E+06	2.458022E+15	3.068766E+15
20	1,00E+06	1,11E+06	2.017673E+15	2.481372E+15
21	9,07E+05	1,00E+06	2.059519E+15	2.531025E+15
22	8,21E+05	9,07E+05	2.491992E+15	3.095726E+15
23	6,08E+05	8,21E+05	2.374649E+15	2.977465E+15
24	5,50E+05	6,08E+05	2.078575E+15	2.619962E+15
25	4,98E+05	5,50E+05	1.937114E+15	2.445203E+15
26	4,50E+05	4,98E+05	1.628432E+15	2.046857E+15
27	4,08E+05	4,50E+05	1.328316E+15	1.660117E+15
28	3,02E+05	4,08E+05	1.594398E+15	2.013411E+15
29	2,73E+05	3,02E+05	1.478795E+15	1.877330E+15
30	2,47E+05	2,73E+05	1.385683E+15	1.763846E+15
31	1,83E+05	2,47E+05	1.220187E+15	1.559990E+15
32	1,23E+05	1,83E+05	1.023559E+15	1.316060E+15
33	1,11E+05	1,23E+05	9.325868E+14	1.203369E+15
34	8,23E+04	1,11E+05	8.550205E+14	1.106455E+15
35	6,74E+04	8,23E+04	7.872487E+14	1.021396E+15
36	5,52E+04	6,74E+04	7.407534E+14	9.631804E+14
37	4,09E+04	5,52E+04	6.929768E+14	9.034359E+14
38	3,70E+04	4,09E+04	6.647907E+14	8.682803E+14
39	2,93E+04	3,70E+04	6.417044E+14	8.396048E+14
40	2,74E+04	2,93E+04	6.256002E+14	8.196243E+14
41	2,48E+04	2,74E+04	6.172839E+14	8.093927E+14

42	1,66E+04	2,48E+04	5.954772E+14	7.825857E+14
43	1,50E+04	1,66E+04	5.789706E+14	7.628322E+14
44	1,11E+04	1,50E+04	5.680400E+14	7.498828E+14
45	9,12E+03	1,11E+04	5.504612E+14	7.284564E+14
46	7,47E+03	9,12E+03	5.461011E+14	7.239665E+14
47	5,53E+03	7,47E+03	5.369551E+14	7.131982E+14
48	5,00E+03	5,53E+03	5.300640E+14	7.055437E+14
49	3,53E+03	5,00E+03	5.257542E+14	7.012096E+14
50	3,35E+03	3,53E+03	5.167977E+14	6.906310E+14
51	2,25E+03	3,35E+03	5.155934E+14	6.903065E+14
52	2,03E+03	2,25E+03	5.140167E+14	6.899854E+14
53	1,51E+03	2,03E+03	4.936654E+14	6.639541E+14
54	1,43E+03	1,51E+03	5.622335E+14	7.573933E+14
55	1,23E+03	1,43E+03	4.991490E+14	6.734672E+14
56	1,01E+03	1,23E+03	4.983489E+14	6.737206E+14
57	9,14E+02	1,01E+03	4.950891E+14	6.699410E+14
58	7,49E+02	9,14E+02	4.901508E+14	6.646775E+14
59	6,77E+02	7,49E+02	4.662817E+14	6.332462E+14
60	4,54E+02	6,77E+02	4.857803E+14	6.617765E+14
61	3,72E+02	4,54E+02	4.780402E+14	6.524222E+14
62	3,04E+02	3,72E+02	4.755887E+14	6.508256E+14
63	2,04E+02	3,04E+02	4.599238E+14	6.317879E+14
64	1,49E+02	2,04E+02	4.555363E+14	6.279044E+14
65	1,37E+02	1,49E+02	4.547758E+14	6.284050E+14
66	9,17E+01	1,37E+02	4.404704E+14	6.089407E+14
67	7,57E+01	9,17E+01	4.357012E+14	6.035585E+14
68	6,79E+01	7,57E+01	4.378734E+14	6.043918E+14
69	5,56E+01	6,79E+01	4.157064E+14	5.775691E+14
70	5,16E+01	5,56E+01	4.245331E+14	5.948950E+14
71	4,83E+01	5,16E+01	4.212544E+14	5.953308E+14
72	4,55E+01	4,83E+01	4.269003E+14	5.969628E+14
73	4,02E+01	4,55E+01	4.241881E+14	5.831235E+14
74	3,73E+01	4,02E+01	3.994569E+14	5.581201E+14
75	3,37E+01	3,73E+01	3.375791E+14	4.790520E+14
76	3,05E+01	3,37E+01	3.996201E+14	5.651596E+14
77	2,76E+01	3,05E+01	4.089947E+14	5.711945E+14
78	2,50E+01	2,76E+01	4.070665E+14	5.722496E+14
79	2,26E+01	2,50E+01	3.968548E+14	5.589096E+14
80	1,95E+01	2,26E+01	3.126637E+14	4.384723E+14
81	1,59E+01	1,95E+01	3.723286E+14	5.317069E+14
82	1,37E+01	1,59E+01	3.815803E+14	5.290348E+14
83	1,12E+01	1,37E+01	3.672060E+14	5.284459E+14
84	9,91E+00	1,12E+01	3.785321E+14	5.312672E+14
85	9,19E+00	9,91E+00	3.717370E+14	5.292359E+14
86	8,32E+00	9,19E+00	3.414656E+14	5.087130E+14

87	7,52E+00	8,32E+00	3.700254E+14	5.069031E+14
88	6,16E+00	7,52E+00	2.431815E+14	3.488321E+14
89	5,35E+00	6,16E+00	3.286181E+14	4.028215E+14
90	5,04E+00	5,35E+00	3.382737E+14	4.448336E+14
91	4,13E+00	5,04E+00	3.390560E+14	4.633461E+14
92	4,00E+00	4,13E+00	3.424837E+14	4.713486E+14
93	3,38E+00	4,00E+00	3.422239E+14	4.807060E+14
94	3,30E+00	3,38E+00	3.435560E+14	4.797835E+14
95	2,77E+00	3,30E+00	3.386809E+14	4.710571E+14
96	2,72E+00	2,77E+00	3.434826E+14	4.757051E+14
97	2,60E+00	2,72E+00	3.427638E+14	4.669533E+14
98	2,55E+00	2,60E+00	3.450407E+14	4.790516E+14
99	2,36E+00	2,55E+00	3.429421E+14	4.778020E+14
100	2,13E+00	2,36E+00	3.431981E+14	4.801283E+14
101	2,10E+00	2,13E+00	3.435347E+14	4.824654E+14
102	2,02E+00	2,10E+00	3.367086E+14	4.767003E+14
103	1,93E+00	2,02E+00	3.395118E+14	4.781185E+14
104	1,84E+00	1,93E+00	3.419521E+14	4.787960E+14
105	1,76E+00	1,84E+00	3.430309E+14	4.798705E+14
106	1,67E+00	1,76E+00	3.427625E+14	4.792193E+14
107	1,59E+00	1,67E+00	3.437971E+14	4.802373E+14
108	1,50E+00	1,59E+00	3.417553E+14	4.722731E+14
109	1,48E+00	1,50E+00	3.444720E+14	4.698619E+14
110	1,44E+00	1,48E+00	3.446866E+14	4.755770E+14
111	1,37E+00	1,44E+00	3.429424E+14	4.762539E+14
112	1,34E+00	1,37E+00	3.431944E+14	4.760679E+14
113	1,30E+00	1,34E+00	3.440174E+14	4.771282E+14
114	1,24E+00	1,30E+00	3.390727E+14	4.700197E+14
115	1,17E+00	1,24E+00	3.351648E+14	4.619736E+14
116	1,15E+00	1,17E+00	3.301221E+14	4.469899E+14
117	1,12E+00	1,15E+00	3.274582E+14	4.263745E+14
118	1,11E+00	1,12E+00	3.274420E+14	3.950117E+14
119	1,10E+00	1,11E+00	3.279701E+14	3.588932E+14
120	1,07E+00	1,10E+00	3.285589E+14	2.906286E+14
121	1,05E+00	1,07E+00	3.303531E+14	2.418534E+14
122	1,04E+00	1,05E+00	3.321617E+14	2.529375E+14
123	1,02E+00	1,04E+00	3.328574E+14	2.849194E+14
124	9,96E-01	1,02E+00	3.340712E+14	3.468594E+14
125	9,86E-01	9,96E-01	3.348706E+14	3.899305E+14
126	9,72E-01	9,86E-01	3.352873E+14	4.066135E+14
127	9,50E-01	9,72E-01	3.358925E+14	4.210000E+14
128	9,30E-01	9,50E-01	3.365098E+14	4.306580E+14
129	9,10E-01	9,30E-01	3.372354E+14	4.367211E+14
130	8,60E-01	9,10E-01	3.374727E+14	4.423492E+14
131	8,50E-01	8,60E-01	3.393952E+14	4.478915E+14

132	7,90E-01	8,50E-01	3.387467E+14	4.495232E+14
133	7,80E-01	7,90E-01	3.410603E+14	4.545585E+14
134	7,05E-01	7,80E-01	3.403655E+14	4.556672E+14
135	6,25E-01	7,05E-01	3.417795E+14	4.605655E+14
136	5,40E-01	6,25E-01	3.467875E+14	4.700282E+14
137	5,00E-01	5,40E-01	3.511142E+14	4.780178E+14
138	4,85E-01	5,00E-01	3.568718E+14	4.868589E+14
139	4,33E-01	4,85E-01	3.581621E+14	4.906136E+14
140	4,00E-01	4,33E-01	3.710878E+14	5.095525E+14
141	3,91E-01	4,00E-01	3.775413E+14	5.180559E+14
142	3,50E-01	3,91E-01	3.882359E+14	5.298173E+14
143	3,20E-01	3,50E-01	4.087964E+14	5.474493E+14
144	3,15E-01	3,20E-01	4.245552E+14	5.612637E+14
145	3,00E-01	3,15E-01	4.344592E+14	5.723406E+14
146	2,80E-01	3,00E-01	4.561613E+14	6.056744E+14
147	2,48E-01	2,80E-01	4.992426E+14	6.928839E+14
148	2,20E-01	2,48E-01	5.644554E+14	8.342202E+14
149	1,89E-01	2,20E-01	6.386702E+14	9.969671E+14
150	1,80E-01	1,89E-01	6.925152E+14	1.115243E+15
151	1,60E-01	1,80E-01	7.280193E+14	1.197835E+15
152	1,40E-01	1,60E-01	7.720803E+14	1.304465E+15
153	1,34E-01	1,40E-01	7.915143E+14	1.358129E+15
154	1,15E-01	1,34E-01	7.980382E+14	1.389112E+15
155	1,00E-01	1,15E-01	7.875210E+14	1.395387E+15
156	9,50E-02	1,00E-01	7.668581E+14	1.372433E+15
157	8,00E-02	9,50E-02	7.303343E+14	1.320978E+15
158	7,70E-02	8,00E-02	6.892212E+14	1.257955E+15
159	6,70E-02	7,70E-02	6.448595E+14	1.185211E+15
160	5,80E-02	6,70E-02	5.732039E+14	1.064125E+15
161	5,00E-02	5,80E-02	4.959092E+14	9.291681E+14
162	4,20E-02	5,00E-02	4.135487E+14	7.817042E+14
163	3,50E-02	4,20E-02	3.296268E+14	6.281324E+14
164	3,00E-02	3,50E-02	2.617223E+14	5.019700E+14
165	2,50E-02	3,00E-02	2.040763E+14	3.934575E+14
166	2,00E-02	2,50E-02	1.489900E+14	2.888209E+14
167	1,50E-02	2,00E-02	9.799475E+13	1.909735E+14
168	1,00E-02	1,50E-02	5.422402E+13	1.062138E+14
169	6,90E-03	1,00E-02	2.669714E+13	5.249337E+13
170	5,00E-03	6,90E-03	1.391783E+13	2.742736E+13
171	3,00E-03	5,00E-03	6.436308E+12	1.270335E+13
172	1,10E-03	3,00E-03	5.858755E+11	1.156768E+12

Table 2a : Multi-group cross sections and energy structure
TOP PART

<i>l</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>fission</i>	<i>nu*fission</i>	<i>capture</i>
1.	1.73E+07	1.96E+07	7,47870E-03	3,72790E-02	3,00330E-03
2.	1.49E+07	1.73E+07	7,36420E-03	3,46310E-02	4,91880E-03
3.	1.38E+07	1.49E+07	6,91340E-03	3,10350E-02	5,49560E-03
4.	1.16E+07	1.38E+07	6,06490E-03	2,55390E-02	6,05210E-03
5.	1.00E+07	1.16E+07	5,91460E-03	2,33060E-02	6,37540E-03
6.	8.19E+06	1.00E+07	5,99420E-03	2,20460E-02	5,20680E-03
7.	6.70E+06	8.19E+06	5,71580E-03	1,96770E-02	4,06350E-03
8.	6.07E+06	6.70E+06	4,52240E-03	1,49150E-02	3,47750E-03
9.	5.49E+06	6.07E+06	3,49070E-03	1,11850E-02	9,97100E-04
10.	4.49E+06	5.49E+06	3,33150E-03	1,02230E-02	2,33520E-03
11.	3.68E+06	4.49E+06	3,36630E-03	9,78500E-03	1,79630E-03
12.	3.01E+06	3.68E+06	3,28510E-03	9,12200E-03	2,09800E-04
13.	2.47E+06	3.01E+06	3,32590E-03	8,94160E-03	2,24800E-04
14.	2.23E+06	2.47E+06	3,39000E-03	9,00810E-03	2,86400E-04
15.	2.02E+06	2.23E+06	3,38550E-03	8,93750E-03	3,32800E-04
16.	1.65E+06	2.02E+06	3,13500E-03	8,20750E-03	3,96500E-04
17.	1.35E+06	1.65E+06	2,26520E-03	5,87340E-03	4,82400E-04
18.	1.22E+06	1.35E+06	9,38880E-04	2,41050E-03	5,78020E-04
19.	1.11E+06	1.22E+06	8,05610E-04	2,05750E-03	6,62090E-04
20.	1.00E+06	1.11E+06	7,17050E-04	1,82250E-03	7,39150E-04
21.	9.07E+05	1.00E+06	6,75180E-04	1,70920E-03	7,86920E-04
22.	8.21E+05	9.07E+05	6,15070E-04	1,55110E-03	7,85930E-04
23.	6.08E+05	8.21E+05	5,75800E-04	1,44260E-03	7,66400E-04
24.	5.50E+05	6.08E+05	5,71530E-04	1,42460E-03	7,34570E-04
25.	4.98E+05	5.50E+05	5,77080E-04	1,43540E-03	7,33820E-04
26.	4.50E+05	4.98E+05	5,85160E-04	1,45260E-03	7,39640E-04
27.	4.08E+05	4.50E+05	6,00950E-04	1,48930E-03	7,51850E-04
28.	3.02E+05	4.08E+05	6,18260E-04	1,52760E-03	7,76840E-04
29.	2.73E+05	3.02E+05	6,25050E-04	1,54060E-03	8,05750E-04
30.	2.47E+05	2.73E+05	6,43380E-04	1,58410E-03	8,32120E-04
31.	1.83E+05	2.47E+05	6,75770E-04	1,66080E-03	8,92230E-04
32.	1.23E+05	1.83E+05	7,23260E-04	1,77330E-03	1,02924E-03
33.	1.11E+05	1.23E+05	7,63250E-04	1,86880E-03	1,15845E-03
34.	8.23E+04	1.11E+05	7,86990E-04	1,92540E-03	1,29941E-03
35.	6.74E+04	8.23E+04	8,55270E-04	2,09070E-03	1,53833E-03
36.	5.52E+04	6.74E+04	8,98040E-04	2,19410E-03	1,80846E-03
37.	4.09E+04	5.52E+04	9,31050E-04	2,27350E-03	2,26755E-03
38.	3.70E+04	4.09E+04	9,66410E-04	2,35910E-03	2,57439E-03
39.	2.93E+04	3.70E+04	1,03190E-03	2,51830E-03	2,81460E-03
40.	2.74E+04	2.93E+04	1,08750E-03	2,65360E-03	3,04900E-03
41.	2.48E+04	2.74E+04	1,07450E-03	2,62170E-03	3,17700E-03
42.	1.66E+04	2.48E+04	1,18450E-03	2,88940E-03	3,65490E-03
43.	1.50E+04	1.66E+04	1,24480E-03	3,03600E-03	3,62770E-03
44.	1.11E+04	1.50E+04	1,39160E-03	3,39380E-03	4,39680E-03
45.	9.12E+03	1.11E+04	1,50930E-03	3,68020E-03	4,48320E-03

46.	7.47E+03	9.12E+03	1,51560E-03	3,69530E-03	4,69160E-03
47.	5.53E+03	7.47E+03	1,75960E-03	4,28990E-03	6,46630E-03
48.	5.00E+03	5.53E+03	1,99770E-03	4,87010E-03	5,71720E-03
49.	3.53E+03	5.00E+03	2,23000E-03	5,43620E-03	7,45320E-03
50.	3.35E+03	3.53E+03	2,48300E-03	6,05290E-03	5,54210E-03
51.	2.25E+03	3.35E+03	2,65030E-03	6,46040E-03	8,32570E-03
52.	2.03E+03	2.25E+03	2,65730E-03	6,47740E-03	7,48170E-03
53.	1.51E+03	2.03E+03	3,14310E-03	7,66150E-03	9,91590E-03
54.	1.43E+03	1.51E+03	2,74790E-03	6,69810E-03	6,24560E-03
55.	1.23E+03	1.43E+03	3,90750E-03	9,52440E-03	8,50750E-03
56.	1.01E+03	1.23E+03	4,39610E-03	1,07160E-02	1,13809E-02
57.	9.14E+02	1.01E+03	3,72990E-03	9,09140E-03	1,08351E-02
58.	7.49E+02	9.14E+02	4,62380E-03	1,12700E-02	1,25172E-02
59.	6.77E+02	7.49E+02	5,79400E-03	1,41250E-02	1,75090E-02
60.	4.54E+02	6.77E+02	6,73410E-03	1,64140E-02	1,31809E-02
61.	3.72E+02	4.54E+02	6,12350E-03	1,49250E-02	1,33995E-02
62.	3.04E+02	3.72E+02	7,11900E-03	1,73520E-02	9,82500E-03
63.	2.04E+02	3.04E+02	9,67330E-03	2,35780E-02	2,94677E-02
64.	1.49E+02	2.04E+02	1,00010E-02	2,43780E-02	1,99200E-02
65.	1.37E+02	1.49E+02	7,75430E-03	1,89000E-02	1,32677E-02
66.	9.17E+01	1.37E+02	1,10360E-02	2,68580E-02	3,04160E-02
67.	7.57E+01	9.17E+01	1,26330E-02	3,07150E-02	2,44200E-02
68.	6.79E+01	7.57E+01	1,80070E-02	4,38200E-02	7,16200E-03
69.	5.56E+01	6.79E+01	1,66440E-02	4,03350E-02	5,12500E-02
70.	5.16E+01	5.56E+01	2,376800E-02	5,77470E-02	9,44300E-03
71.	4.83E+01	5.16E+01	2,763800E-02	6,71750E-02	1,68790E-02
72.	4.55E+01	4.83E+01	1,682000E-02	4,08940E-02	8,18800E-03
73.	4.02E+01	4.55E+01	1,667200E-02	4,05490E-02	1,24970E-02
74.	3.73E+01	4.02E+01	1,834000E-02	4,46510E-02	4,32390E-02
75.	3.37E+01	3.73E+01	4,374900E-02	1,06440E-01	2,40901E-01
76.	3.05E+01	3.37E+01	1,911600E-02	4,64780E-02	2,34870E-02
77.	2.76E+01	3.05E+01	9,741200E-03	2,37280E-02	6,84480E-03
78.	2.50E+01	2.76E+01	2,086400E-02	5,08440E-02	5,60700E-03
79.	2.26E+01	2.50E+01	2,668000E-02	6,48420E-02	2,57090E-02
80.	1.95E+01	2.26E+01	1,690200E-02	4,10090E-02	2,56808E-01
81.	1.59E+01	1.95E+01	2,915700E-02	7,06660E-02	2,38810E-02
82.	1.37E+01	1.59E+01	1,850600E-02	4,48490E-02	9,32800E-03
83.	1.12E+01	1.37E+01	2,507600E-02	6,08740E-02	3,75110E-02
84.	9.91E+00	1.12E+01	8,787100E-03	2,13880E-02	7,84990E-03
85.	9.19E+00	9.91E+00	2,567300E-02	6,24870E-02	1,10240E-02
86.	8.32E+00	9.19E+00	9,372400E-02	2,28840E-01	3,55160E-02
87.	7.52E+00	8.32E+00	2,568800E-03	6,26610E-03	1,50912E-02
88.	6.16E+00	7.52E+00	1,633700E-02	3,97690E-02	4,28053E-01
89.	5.35E+00	6.16E+00	9,505200E-03	2,31150E-02	3,08448E-02
90.	5.04E+00	5.35E+00	3,787100E-03	9,20950E-03	1,23859E-02
91.	4.13E+00	5.04E+00	2,827800E-03	6,87670E-03	1,85882E-02
92.	4.00E+00	4.13E+00	1,365400E-03	3,32050E-03	5,97250E-03
93.	3.38E+00	4.00E+00	1,390300E-02	3,38180E-02	1,29840E-02
94.	3.30E+00	3.38E+00	9,165600E-03	2,23110E-02	7,00340E-03

95.	2.77E+00	3.30E+00	1,395800E-02	3,39760E-02	7,92800E-03
96.	2.72E+00	2.77E+00	4,512300E-03	1,09840E-02	5,45070E-03
97.	2.60E+00	2.72E+00	3,876900E-03	9,43720E-03	4,99170E-03
98.	2.55E+00	2.60E+00	4,339700E-03	1,05640E-02	4,75760E-03
99.	2.36E+00	2.55E+00	4,855800E-03	1,18200E-02	4,71610E-03
100.	2.13E+00	2.36E+00	5,605300E-03	1,36450E-02	5,45470E-03
101.	2.10E+00	2.13E+00	7,047400E-03	1,71550E-02	1,00796E-02
102.	2.02E+00	2.10E+00	1,076100E-02	2,61940E-02	2,33050E-02
103.	1.93E+00	2.02E+00	9,089100E-03	2,21250E-02	1,50489E-02
104.	1.84E+00	1.93E+00	6,895100E-03	1,67840E-02	6,14090E-03
105.	1.76E+00	1.84E+00	6,913200E-03	1,68280E-02	5,40180E-03
106.	1.67E+00	1.76E+00	7,136800E-03	1,73730E-02	5,32420E-03
107.	1.59E+00	1.67E+00	7,425800E-03	1,80760E-02	5,41020E-03
108.	1.50E+00	1.59E+00	7,800400E-03	1,89880E-02	5,62560E-03
109.	1.48E+00	1.50E+00	8,122000E-03	1,97710E-02	5,84900E-03
110.	1.44E+00	1.48E+00	8,346100E-03	2,03160E-02	6,01490E-03
111.	1.37E+00	1.44E+00	8,928200E-03	2,16820E-02	6,43780E-03
112.	1.34E+00	1.37E+00	9,875100E-03	2,39810E-02	7,07590E-03
113.	1.30E+00	1.34E+00	1,109800E-02	2,69500E-02	7,79600E-03
114.	1.24E+00	1.30E+00	1,535000E-02	3,72750E-02	9,81800E-03
115.	1.17E+00	1.24E+00	3,052000E-02	7,41160E-02	1,51310E-02
116.	1.15E+00	1.17E+00	4,669700E-02	1,13400E-01	1,92380E-02
117.	1.12E+00	1.15E+00	5,302600E-02	1,28770E-01	1,97750E-02
118.	1.11E+00	1.12E+00	5,462800E-02	1,32660E-01	1,89290E-02
119.	1.10E+00	1.11E+00	5,355900E-02	1,30060E-01	1,78190E-02
120.	1.07E+00	1.10E+00	4,993600E-02	1,21270E-01	1,58510E-02
121.	1.05E+00	1.07E+00	4,425000E-02	1,08160E-01	1,34170E-02
122.	1.04E+00	1.05E+00	4,055700E-02	9,91590E-02	1,20540E-02
123.	1.02E+00	1.04E+00	3,834800E-02	9,37590E-02	1,13080E-02
124.	9.96E-01	1.02E+00	3,551100E-02	8,68420E-02	1,04050E-02
125.	9.86E-01	9.96E-01	3,351800E-02	8,20690E-02	9,80500E-03
126.	9.72E-01	9.86E-01	3,240500E-02	7,93450E-02	9,48800E-03
127.	9.50E-01	9.72E-01	3,106200E-02	7,60560E-02	9,11900E-03
128.	9.30E-01	9.50E-01	2,984600E-02	7,30790E-02	8,79800E-03
129.	9.10E-01	9.30E-01	2,900900E-02	7,10290E-02	8,58600E-03
130.	8.60E-01	9.10E-01	2,814400E-02	6,89120E-02	8,37900E-03
131.	8.50E-01	8.60E-01	2,781500E-02	6,81050E-02	8,30700E-03
132.	7.90E-01	8.50E-01	2,777800E-02	6,80160E-02	8,30800E-03
133.	7.80E-01	7.90E-01	2,798600E-02	6,85250E-02	8,37000E-03
134.	7.05E-01	7.80E-01	2,875200E-02	7,04010E-02	8,56000E-03
135.	6.25E-01	7.05E-01	3,105800E-02	7,60470E-02	9,10400E-03
136.	5.40E-01	6.25E-01	3,510200E-02	8,59480E-02	1,00360E-02
137.	5.00E-01	5.40E-01	3,957600E-02	9,69040E-02	1,10700E-02
138.	4.85E-01	5.00E-01	4,228400E-02	1,02570E-01	1,17020E-02
139.	4.33E-01	4.85E-01	4,678200E-02	1,13480E-01	1,27920E-02
140.	4.00E-01	4.33E-01	5,447600E-02	1,32140E-01	1,47120E-02
141.	3.91E-01	4.00E-01	5,955500E-02	1,45200E-01	1,60460E-02
142.	3.50E-01	3.91E-01	6,810900E-02	1,66060E-01	1,84400E-02
143.	3.20E-01	3.50E-01	8,305600E-02	2,02500E-01	2,30040E-02

144.	3.15E-01	3.20E-01	9,091000E-02	2,21650E-01	2,56200E-02
145.	3.00E-01	3.15E-01	9,457600E-02	2,30580E-01	2,69940E-02
146.	2.80E-01	3.00E-01	9,835700E-02	2,40170E-01	2,86830E-02
147.	2.48E-01	2.80E-01	9,734200E-02	2,37700E-01	2,90880E-02
148.	2.20E-01	2.48E-01	9,240500E-02	2,25640E-01	2,77750E-02
149.	1.89E-01	2.20E-01	9,039300E-02	2,20590E-01	2,67770E-02
150.	1.80E-01	1.89E-01	9,184100E-02	2,23890E-01	2,67590E-02
151.	1.60E-01	1.80E-01	9,444400E-02	2,30230E-01	2,71660E-02
152.	1.40E-01	1.60E-01	9,971900E-02	2,43090E-01	2,84510E-02
153.	1.34E-01	1.40E-01	1,041300E-01	2,53840E-01	2,96400E-02
154.	1.15E-01	1.34E-01	1,104100E-01	2,69160E-01	3,08900E-02
155.	1.00E-01	1.15E-01	1,207800E-01	2,94440E-01	3,29000E-02
156.	9.50E-02	1.00E-01	1,282000E-01	3,12800E-01	3,43500E-02
157.	8.00E-02	9.50E-02	1,381900E-01	3,37190E-01	3,64000E-02
158.	7.70E-02	8.00E-02	1,472600E-01	3,59300E-01	3,83100E-02
159.	6.70E-02	7.70E-02	1,559500E-01	3,80520E-01	4,02400E-02
160.	5.80E-02	6.70E-02	1,695900E-01	4,13790E-01	4,34300E-02
161.	5.00E-02	5.80E-02	1,852800E-01	4,52070E-01	4,73100E-02
162.	4.20E-02	5.00E-02	2,040100E-01	4,97240E-01	5,20700E-02
163.	3.50E-02	4.20E-02	2,263700E-01	5,51760E-01	5,78400E-02
164.	3.00E-02	3.50E-02	2,487800E-01	6,06370E-01	6,37100E-02
165.	2.50E-02	3.00E-02	2,727500E-01	6,64800E-01	7,00700E-02
166.	2.00E-02	2.50E-02	3,046400E-01	7,42530E-01	7,85500E-02
167.	1.50E-02	2.00E-02	3,485600E-01	8,48670E-01	9,04400E-02
168.	1.00E-02	1.50E-02	4,146100E-01	1,00950E+00	1,08720E-01
169.	6.90E-03	1.00E-02	5,045200E-01	1,23100E+00	1,34100E-01
170.	5.00E-03	6.90E-03	5,999400E-01	1,46380E+00	1,61570E-01
171.	3.00E-03	5.00E-03	7,293300E-01	1,77770E+00	1,99310E-01
172.	1.10E-03	3.00E-03	1,119400E+00	2,72830E+00	3,13000E-01

Table 2b : Multi-group cross sections and energy structure
MIDDLE PART

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>fission</i>	<i>nu*fission</i>	<i>capture</i>
1.	1.73E+07	1.96E+07	7,49E-03	3,73E-02	3,79E-03
2.	1.49E+07	1.73E+07	7,37E-03	3,47E-02	6,40E-03
3.	1.38E+07	1.49E+07	6,92E-03	3,11E-02	7,20E-03
4.	1.16E+07	1.38E+07	6,07E-03	2,56E-02	7,97E-03
5.	1.00E+07	1.16E+07	5,92E-03	2,33E-02	8,44E-03
6.	8.19E+06	1.00E+07	6,00E-03	2,21E-02	6,89E-03
7.	6.70E+06	8.19E+06	5,72E-03	1,97E-02	5,38E-03
8.	6.07E+06	6.70E+06	4,53E-03	1,49E-02	4,60E-03
9.	5.49E+06	6.07E+06	3,50E-03	1,12E-02	1,27E-03
10.	4.49E+06	5.49E+06	3,34E-03	1,02E-02	3,08E-03
11.	3.68E+06	4.49E+06	3,37E-03	9,80E-03	2,36E-03
12.	3.01E+06	3.68E+06	3,29E-03	9,13E-03	2,22E-04
13.	2.47E+06	3.01E+06	3,33E-03	8,95E-03	2,26E-04

14.	2.23E+06	2.47E+06	3,39E-03	9,02E-03	2,87E-04
15.	2.02E+06	2.23E+06	3,39E-03	8,95E-03	3,34E-04
16.	1.65E+06	2.02E+06	3,14E-03	8,22E-03	3,98E-04
17.	1.35E+06	1.65E+06	2,27E-03	5,88E-03	4,84E-04
18.	1.22E+06	1.35E+06	9,40E-04	2,41E-03	5,79E-04
19.	1.11E+06	1.22E+06	8,07E-04	2,06E-03	6,63E-04
20.	1.00E+06	1.11E+06	7,18E-04	1,82E-03	7,41E-04
21.	9.07E+05	1.00E+06	6,76E-04	1,71E-03	7,88E-04
22.	8.21E+05	9.07E+05	6,16E-04	1,55E-03	7,87E-04
23.	6.08E+05	8.21E+05	5,76E-04	1,44E-03	7,68E-04
24.	5.50E+05	6.08E+05	5,72E-04	1,43E-03	7,36E-04
25.	4.98E+05	5.50E+05	5,78E-04	1,44E-03	7,35E-04
26.	4.50E+05	4.98E+05	5,86E-04	1,45E-03	7,41E-04
27.	4.08E+05	4.50E+05	6,02E-04	1,49E-03	7,53E-04
28.	3.02E+05	4.08E+05	6,19E-04	1,53E-03	7,78E-04
29.	2.73E+05	3.02E+05	6,25E-04	1,54E-03	8,07E-04
30.	2.47E+05	2.73E+05	6,44E-04	1,59E-03	8,34E-04
31.	1.83E+05	2.47E+05	6,76E-04	1,66E-03	8,94E-04
32.	1.23E+05	1.83E+05	7,24E-04	1,77E-03	1,03E-03
33.	1.11E+05	1.23E+05	7,64E-04	1,87E-03	1,16E-03
34.	8.23E+04	1.11E+05	7,87E-04	1,93E-03	1,30E-03
35.	6.74E+04	8.23E+04	8,56E-04	2,09E-03	1,54E-03
36.	5.52E+04	6.74E+04	8,98E-04	2,20E-03	1,81E-03
37.	4.09E+04	5.52E+04	9,31E-04	2,27E-03	2,27E-03
38.	3.70E+04	4.09E+04	9,67E-04	2,36E-03	2,58E-03
39.	2.93E+04	3.70E+04	1,03E-03	2,52E-03	2,83E-03
40.	2.74E+04	2.93E+04	1,09E-03	2,65E-03	3,06E-03
41.	2.48E+04	2.74E+04	1,08E-03	2,62E-03	3,19E-03
42.	1.66E+04	2.48E+04	1,19E-03	2,89E-03	3,67E-03
43.	1.50E+04	1.66E+04	1,25E-03	3,04E-03	3,68E-03
44.	1.11E+04	1.50E+04	1,39E-03	3,40E-03	4,45E-03
45.	9.12E+03	1.11E+04	1,51E-03	3,68E-03	4,54E-03
46.	7.47E+03	9.12E+03	1,52E-03	3,70E-03	4,80E-03
47.	5.53E+03	7.47E+03	1,76E-03	4,29E-03	6,65E-03
48.	5.00E+03	5.53E+03	2,00E-03	4,87E-03	5,83E-03
49.	3.53E+03	5.00E+03	2,23E-03	5,44E-03	7,74E-03
50.	3.35E+03	3.53E+03	2,48E-03	6,06E-03	5,78E-03
51.	2.25E+03	3.35E+03	2,65E-03	6,46E-03	8,65E-03
52.	2.03E+03	2.25E+03	2,66E-03	6,48E-03	7,93E-03
53.	1.51E+03	2.03E+03	3,15E-03	7,67E-03	1,05E-02
54.	1.43E+03	1.51E+03	2,75E-03	6,70E-03	6,65E-03
55.	1.23E+03	1.43E+03	3,91E-03	9,53E-03	9,04E-03
56.	1.01E+03	1.23E+03	4,40E-03	1,07E-02	1,22E-02
57.	9.14E+02	1.01E+03	3,73E-03	9,10E-03	1,20E-02
58.	7.49E+02	9.14E+02	4,63E-03	1,13E-02	1,35E-02
59.	6.77E+02	7.49E+02	5,81E-03	1,42E-02	1,90E-02
60.	4.54E+02	6.77E+02	6,75E-03	1,64E-02	1,46E-02
61.	3.72E+02	4.54E+02	6,14E-03	1,50E-02	1,44E-02
62.	3.04E+02	3.72E+02	7,13E-03	1,74E-02	1,09E-02

63.	2.04E+02	3.04E+02	9,71E-03	2,37E-02	3,36E-02
64.	1.49E+02	2.04E+02	1,00E-02	2,45E-02	2,18E-02
65.	1.37E+02	1.49E+02	7,79E-03	1,90E-02	1,37E-02
66.	9.17E+01	1.37E+02	1,11E-02	2,70E-02	3,58E-02
67.	7.57E+01	9.17E+01	1,27E-02	3,08E-02	2,70E-02
68.	6.79E+01	7.57E+01	1,82E-02	4,42E-02	7,31E-03
69.	5.56E+01	6.79E+01	1,69E-02	4,09E-02	6,22E-02
70.	5.16E+01	5.56E+01	2,40E-02	5,82E-02	9,69E-03
71.	4.83E+01	5.16E+01	2,79E-02	6,77E-02	1,71E-02
72.	4.55E+01	4.83E+01	1,69E-02	4,12E-02	8,36E-03
73.	4.02E+01	4.55E+01	1,67E-02	4,07E-02	1,27E-02
74.	3.73E+01	4.02E+01	1,86E-02	4,53E-02	4,44E-02
75.	3.37E+01	3.73E+01	4,46E-02	1,08E-01	2,89E-01
76.	3.05E+01	3.37E+01	1,95E-02	4,75E-02	2,40E-02
77.	2.76E+01	3.05E+01	9,82E-03	2,39E-02	7,04E-03
78.	2.50E+01	2.76E+01	2,09E-02	5,10E-02	5,78E-03
79.	2.26E+01	2.50E+01	2,68E-02	6,53E-02	2,61E-02
80.	1.95E+01	2.26E+01	1,72E-02	4,17E-02	3,12E-01
81.	1.59E+01	1.95E+01	3,06E-02	7,41E-02	2,50E-02
82.	1.37E+01	1.59E+01	1,86E-02	4,51E-02	9,58E-03
83.	1.12E+01	1.37E+01	2,59E-02	6,29E-02	3,93E-02
84.	9.91E+00	1.12E+01	8,80E-03	2,14E-02	8,13E-03
85.	9.19E+00	9.91E+00	2,58E-02	6,28E-02	1,14E-02
86.	8.32E+00	9.19E+00	9,71E-02	2,37E-01	3,69E-02
87.	7.52E+00	8.32E+00	2,57E-03	6,27E-03	1,54E-02
88.	6.16E+00	7.52E+00	1,66E-02	4,03E-02	5,17E-01
89.	5.35E+00	6.16E+00	9,52E-03	2,31E-02	3,11E-02
90.	5.04E+00	5.35E+00	3,79E-03	9,21E-03	1,28E-02
91.	4.13E+00	5.04E+00	2,85E-03	6,92E-03	1,92E-02
92.	4.00E+00	4.13E+00	1,37E-03	3,32E-03	6,41E-03
93.	3.38E+00	4.00E+00	1,40E-02	3,41E-02	1,35E-02
94.	3.30E+00	3.38E+00	9,17E-03	2,23E-02	7,49E-03
95.	2.77E+00	3.30E+00	1,40E-02	3,40E-02	8,45E-03
96.	2.72E+00	2.77E+00	4,51E-03	1,10E-02	5,98E-03
97.	2.60E+00	2.72E+00	3,88E-03	9,44E-03	5,53E-03
98.	2.55E+00	2.60E+00	4,34E-03	1,06E-02	5,31E-03
99.	2.36E+00	2.55E+00	4,86E-03	1,18E-02	5,28E-03
100.	2.13E+00	2.36E+00	5,61E-03	1,36E-02	6,05E-03
101.	2.10E+00	2.13E+00	7,05E-03	1,72E-02	1,07E-02
102.	2.02E+00	2.10E+00	1,08E-02	2,62E-02	2,39E-02
103.	1.93E+00	2.02E+00	9,09E-03	2,21E-02	1,57E-02
104.	1.84E+00	1.93E+00	6,90E-03	1,68E-02	6,79E-03
105.	1.76E+00	1.84E+00	6,91E-03	1,68E-02	6,06E-03
106.	1.67E+00	1.76E+00	7,14E-03	1,74E-02	6,00E-03
107.	1.59E+00	1.67E+00	7,43E-03	1,81E-02	6,10E-03
108.	1.50E+00	1.59E+00	7,80E-03	1,90E-02	6,34E-03
109.	1.48E+00	1.50E+00	8,12E-03	1,98E-02	6,57E-03
110.	1.44E+00	1.48E+00	8,35E-03	2,03E-02	6,75E-03
111.	1.37E+00	1.44E+00	8,93E-03	2,17E-02	7,18E-03

112.	1.34E+00	1.37E+00	9,88E-03	2,40E-02	7,84E-03
113.	1.30E+00	1.34E+00	1,11E-02	2,70E-02	8,57E-03
114.	1.24E+00	1.30E+00	1,54E-02	3,73E-02	1,06E-02
115.	1.17E+00	1.24E+00	3,05E-02	7,41E-02	1,59E-02
116.	1.15E+00	1.17E+00	4,67E-02	1,13E-01	2,01E-02
117.	1.12E+00	1.15E+00	5,31E-02	1,29E-01	2,06E-02
118.	1.11E+00	1.12E+00	5,47E-02	1,33E-01	1,98E-02
119.	1.10E+00	1.11E+00	5,36E-02	1,30E-01	1,87E-02
120.	1.07E+00	1.10E+00	5,00E-02	1,21E-01	1,67E-02
121.	1.05E+00	1.07E+00	4,43E-02	1,08E-01	1,43E-02
122.	1.04E+00	1.05E+00	4,06E-02	9,92E-02	1,29E-02
123.	1.02E+00	1.04E+00	3,84E-02	9,38E-02	1,22E-02
124.	9.96E-01	1.02E+00	3,55E-02	8,69E-02	1,13E-02
125.	9.86E-01	9.96E-01	3,35E-02	8,21E-02	1,07E-02
126.	9.72E-01	9.86E-01	3,24E-02	7,94E-02	1,04E-02
127.	9.50E-01	9.72E-01	3,11E-02	7,61E-02	1,00E-02
128.	9.30E-01	9.50E-01	2,99E-02	7,31E-02	9,71E-03
129.	9.10E-01	9.30E-01	2,90E-02	7,11E-02	9,51E-03
130.	8.60E-01	9.10E-01	2,82E-02	6,89E-02	9,32E-03
131.	8.50E-01	8.60E-01	2,78E-02	6,81E-02	9,27E-03
132.	7.90E-01	8.50E-01	2,78E-02	6,80E-02	9,29E-03
133.	7.80E-01	7.90E-01	2,80E-02	6,86E-02	9,37E-03
134.	7.05E-01	7.80E-01	2,88E-02	7,04E-02	9,59E-03
135.	6.25E-01	7.05E-01	3,11E-02	7,61E-02	1,02E-02
136.	5.40E-01	6.25E-01	3,51E-02	8,60E-02	1,12E-02
137.	5.00E-01	5.40E-01	3,96E-02	9,70E-02	1,23E-02
138.	4.85E-01	5.00E-01	4,23E-02	1,03E-01	1,30E-02
139.	4.33E-01	4.85E-01	4,68E-02	1,14E-01	1,41E-02
140.	4.00E-01	4.33E-01	5,45E-02	1,32E-01	1,61E-02
141.	3.91E-01	4.00E-01	5,96E-02	1,45E-01	1,75E-02
142.	3.50E-01	3.91E-01	6,82E-02	1,66E-01	1,99E-02
143.	3.20E-01	3.50E-01	8,31E-02	2,03E-01	2,46E-02
144.	3.15E-01	3.20E-01	9,10E-02	2,22E-01	2,72E-02
145.	3.00E-01	3.15E-01	9,47E-02	2,31E-01	2,86E-02
146.	2.80E-01	3.00E-01	9,85E-02	2,40E-01	3,04E-02
147.	2.48E-01	2.80E-01	9,75E-02	2,38E-01	3,08E-02
148.	2.20E-01	2.48E-01	9,25E-02	2,26E-01	2,96E-02
149.	1.89E-01	2.20E-01	9,05E-02	2,21E-01	2,87E-02
150.	1.80E-01	1.89E-01	9,19E-02	2,24E-01	2,88E-02
151.	1.60E-01	1.80E-01	9,45E-02	2,30E-01	2,93E-02
152.	1.40E-01	1.60E-01	9,98E-02	2,43E-01	3,08E-02
153.	1.34E-01	1.40E-01	1,04E-01	2,54E-01	3,20E-02
154.	1.15E-01	1.34E-01	1,11E-01	2,70E-01	3,34E-02
155.	1.00E-01	1.15E-01	1,21E-01	2,95E-01	3,56E-02
156.	9.50E-02	1.00E-01	1,28E-01	3,13E-01	3,72E-02
157.	8.00E-02	9.50E-02	1,38E-01	3,38E-01	3,94E-02
158.	7.70E-02	8.00E-02	1,48E-01	3,60E-01	4,15E-02
159.	6.70E-02	7.70E-02	1,56E-01	3,81E-01	4,36E-02
160.	5.80E-02	6.70E-02	1,70E-01	4,15E-01	4,70E-02

161.	5.00E-02	5.80E-02	1,86E-01	4,54E-01	5,12E-02
162.	4.20E-02	5.00E-02	2,05E-01	4,99E-01	5,63E-02
163.	3.50E-02	4.20E-02	2,27E-01	5,54E-01	6,25E-02
164.	3.00E-02	3.50E-02	2,50E-01	6,09E-01	6,88E-02
165.	2.50E-02	3.00E-02	2,74E-01	6,68E-01	7,57E-02
166.	2.00E-02	2.50E-02	3,06E-01	7,47E-01	8,48E-02
167.	1.50E-02	2.00E-02	3,51E-01	8,55E-01	9,76E-02
168.	1.00E-02	1.50E-02	4,18E-01	1,02E+00	1,17E-01
169.	6.90E-03	1.00E-02	5,09E-01	1,24E+00	1,45E-01
170.	5.00E-03	6.90E-03	6,06E-01	1,48E+00	1,74E-01
171.	3.00E-03	5.00E-03	7,38E-01	1,80E+00	2,15E-01
172.	1.10E-03	3.00E-03	1,14E+00	2,77E+00	3,38E-01

Table 2c : Multi-group cross sections and energy structure
BOTTOM PART

<i>I</i>	<i>E_{i-1}</i>	<i>E_i</i>	<i>fission</i>	<i>nu*fission</i>	<i>capture</i>
1.	1.73E+07	1.96E+07	7,49180E-03	3,73440E-02	4,12320E-03
2.	1.49E+07	1.73E+07	7,37710E-03	3,46910E-02	7,02590E-03
3.	1.38E+07	1.49E+07	6,92560E-03	3,10890E-02	7,91740E-03
4.	1.16E+07	1.38E+07	6,07560E-03	2,55840E-02	8,79140E-03
5.	1.00E+07	1.16E+07	5,92510E-03	2,33480E-02	9,31690E-03
6.	8.19E+06	1.00E+07	6,00490E-03	2,20850E-02	7,61010E-03
7.	6.70E+06	8.19E+06	5,72600E-03	1,97130E-02	5,93700E-03
8.	6.07E+06	6.70E+06	4,53040E-03	1,49420E-02	5,08190E-03
9.	5.49E+06	6.07E+06	3,49690E-03	1,12050E-02	1,38450E-03
10.	4.49E+06	5.49E+06	3,33740E-03	1,02420E-02	3,40160E-03
11.	3.68E+06	4.49E+06	3,37250E-03	9,80300E-03	2,60430E-03
12.	3.01E+06	3.68E+06	3,29110E-03	9,13850E-03	2,26400E-04
13.	2.47E+06	3.01E+06	3,33150E-03	8,95680E-03	2,26100E-04
14.	2.23E+06	2.47E+06	3,39580E-03	9,02350E-03	2,87600E-04
15.	2.02E+06	2.23E+06	3,39170E-03	8,95390E-03	3,34200E-04
16.	1.65E+06	2.02E+06	3,14070E-03	8,22240E-03	3,98000E-04
17.	1.35E+06	1.65E+06	2,26920E-03	5,88360E-03	4,84000E-04
18.	1.22E+06	1.35E+06	9,40510E-04	2,41470E-03	5,79890E-04
19.	1.11E+06	1.22E+06	8,06950E-04	2,06100E-03	6,63950E-04
20.	1.00E+06	1.11E+06	7,18370E-04	1,82590E-03	7,41230E-04
21.	9.07E+05	1.00E+06	6,76360E-04	1,71210E-03	7,89040E-04
22.	8.21E+05	9.07E+05	6,15950E-04	1,55330E-03	7,87850E-04
23.	6.08E+05	8.21E+05	5,76540E-04	1,44450E-03	7,68260E-04
24.	5.50E+05	6.08E+05	5,72240E-04	1,42630E-03	7,36360E-04
25.	4.98E+05	5.50E+05	5,77780E-04	1,43710E-03	7,35520E-04
26.	4.50E+05	4.98E+05	5,85930E-04	1,45450E-03	7,41470E-04
27.	4.08E+05	4.50E+05	6,01870E-04	1,49150E-03	7,53930E-04
28.	3.02E+05	4.08E+05	6,18940E-04	1,52930E-03	7,78760E-04
29.	2.73E+05	3.02E+05	6,25640E-04	1,54200E-03	8,07660E-04
30.	2.47E+05	2.73E+05	6,43960E-04	1,58550E-03	8,34140E-04

31.	1.83E+05	2.47E+05	6,76360E-04	1,66230E-03	8,94440E-04
32.	1.23E+05	1.83E+05	7,23850E-04	1,77470E-03	1,03185E-03
33.	1.11E+05	1.23E+05	7,63820E-04	1,87020E-03	1,16158E-03
34.	8.23E+04	1.11E+05	7,87580E-04	1,92680E-03	1,30292E-03
35.	6.74E+04	8.23E+04	8,55870E-04	2,09220E-03	1,54263E-03
36.	5.52E+04	6.74E+04	8,98660E-04	2,19560E-03	1,81334E-03
37.	4.09E+04	5.52E+04	9,31670E-04	2,27510E-03	2,27343E-03
38.	3.70E+04	4.09E+04	9,67030E-04	2,36060E-03	2,58347E-03
39.	2.93E+04	3.70E+04	1,03250E-03	2,51990E-03	2,82510E-03
40.	2.74E+04	2.93E+04	1,08820E-03	2,65530E-03	3,06080E-03
41.	2.48E+04	2.74E+04	1,07520E-03	2,62340E-03	3,18980E-03
42.	1.66E+04	2.48E+04	1,18520E-03	2,89110E-03	3,67570E-03
43.	1.50E+04	1.66E+04	1,24550E-03	3,03790E-03	3,68300E-03
44.	1.11E+04	1.50E+04	1,39240E-03	3,39560E-03	4,46620E-03
45.	9.12E+03	1.11E+04	1,51020E-03	3,68250E-03	4,55310E-03
46.	7.47E+03	9.12E+03	1,51640E-03	3,69730E-03	4,82300E-03
47.	5.53E+03	7.47E+03	1,76050E-03	4,29220E-03	6,69660E-03
48.	5.00E+03	5.53E+03	1,99880E-03	4,87290E-03	5,85100E-03
49.	3.53E+03	5.00E+03	2,23110E-03	5,43890E-03	7,82390E-03
50.	3.35E+03	3.53E+03	2,48470E-03	6,05700E-03	5,84740E-03
51.	2.25E+03	3.35E+03	2,65170E-03	6,46380E-03	8,74230E-03
52.	2.03E+03	2.25E+03	2,66030E-03	6,48470E-03	8,05970E-03
53.	1.51E+03	2.03E+03	3,14810E-03	7,67370E-03	1,07259E-02
54.	1.43E+03	1.51E+03	2,74900E-03	6,70080E-03	6,76290E-03
55.	1.23E+03	1.43E+03	3,91130E-03	9,53380E-03	9,19070E-03
56.	1.01E+03	1.23E+03	4,40300E-03	1,07330E-02	1,23790E-02
57.	9.14E+02	1.01E+03	3,73540E-03	9,10480E-03	1,24536E-02
58.	7.49E+02	9.14E+02	4,63260E-03	1,12920E-02	1,37404E-02
59.	6.77E+02	7.49E+02	5,80980E-03	1,41640E-02	1,94582E-02
60.	4.54E+02	6.77E+02	6,75000E-03	1,64530E-02	1,50400E-02
61.	3.72E+02	4.54E+02	6,13870E-03	1,49630E-02	1,47243E-02
62.	3.04E+02	3.72E+02	7,13850E-03	1,73990E-02	1,13255E-02
63.	2.04E+02	3.04E+02	9,71760E-03	2,36860E-02	3,50364E-02
64.	1.49E+02	2.04E+02	1,00500E-02	2,44960E-02	2,25020E-02
65.	1.37E+02	1.49E+02	7,80440E-03	1,90220E-02	1,38216E-02
66.	9.17E+01	1.37E+02	1,10900E-02	2,69900E-02	3,78860E-02
67.	7.57E+01	9.17E+01	1,26970E-02	3,08700E-02	2,78190E-02
68.	6.79E+01	7.57E+01	1,82040E-02	4,43000E-02	7,37100E-03
69.	5.56E+01	6.79E+01	1,69450E-02	4,10620E-02	6,64500E-02
70.	5.16E+01	5.56E+01	2,401300E-02	5,83420E-02	9,76900E-03
71.	4.83E+01	5.16E+01	2,792800E-02	6,78810E-02	1,71800E-02
72.	4.55E+01	4.83E+01	1,695400E-02	4,12220E-02	8,43100E-03
73.	4.02E+01	4.55E+01	1,672700E-02	4,06830E-02	1,27770E-02
74.	3.73E+01	4.02E+01	1,867000E-02	4,54570E-02	4,46210E-02
75.	3.37E+01	3.73E+01	4,482700E-02	1,09060E-01	3,07433E-01
76.	3.05E+01	3.37E+01	1,964600E-02	4,77650E-02	2,42020E-02
77.	2.76E+01	3.05E+01	9,839200E-03	2,39670E-02	7,11480E-03
78.	2.50E+01	2.76E+01	2,094700E-02	5,10440E-02	5,85700E-03
79.	2.26E+01	2.50E+01	2,689400E-02	6,53610E-02	2,62890E-02

80.	1.95E+01	2.26E+01	1,728400E-02	4,19350E-02	3,33536E-01
81.	1.59E+01	1.95E+01	3,098400E-02	7,50950E-02	2,53350E-02
82.	1.37E+01	1.59E+01	1,861900E-02	4,51210E-02	9,68300E-03
83.	1.12E+01	1.37E+01	2,616200E-02	6,35100E-02	3,98110E-02
84.	9.91E+00	1.12E+01	8,802200E-03	2,14250E-02	8,25180E-03
85.	9.19E+00	9.91E+00	2,584500E-02	6,29070E-02	1,15020E-02
86.	8.32E+00	9.19E+00	9,802400E-02	2,39340E-01	3,73060E-02
87.	7.52E+00	8.32E+00	2,571800E-03	6,27340E-03	1,55152E-02
88.	6.16E+00	7.52E+00	1,662200E-02	4,04650E-02	5,51128E-01
89.	5.35E+00	6.16E+00	9,522500E-03	2,31570E-02	3,13355E-02
90.	5.04E+00	5.35E+00	3,788600E-03	9,21330E-03	1,29414E-02
91.	4.13E+00	5.04E+00	2,852000E-03	6,93550E-03	1,94050E-02
92.	4.00E+00	4.13E+00	1,365400E-03	3,32050E-03	6,59720E-03
93.	3.38E+00	4.00E+00	1,405000E-02	3,41750E-02	1,37310E-02
94.	3.30E+00	3.38E+00	9,166100E-03	2,23120E-02	7,69390E-03
95.	2.77E+00	3.30E+00	1,398500E-02	3,40410E-02	8,66400E-03
96.	2.72E+00	2.77E+00	4,512500E-03	1,09840E-02	6,20950E-03
97.	2.60E+00	2.72E+00	3,877000E-03	9,43760E-03	5,76340E-03
98.	2.55E+00	2.60E+00	4,339500E-03	1,05630E-02	5,54220E-03
99.	2.36E+00	2.55E+00	4,856000E-03	1,18210E-02	5,51900E-03
100.	2.13E+00	2.36E+00	5,605600E-03	1,36450E-02	6,29740E-03
101.	2.10E+00	2.13E+00	7,047600E-03	1,71550E-02	1,09474E-02
102.	2.02E+00	2.10E+00	1,076900E-02	2,62130E-02	2,42060E-02
103.	1.93E+00	2.02E+00	9,095300E-03	2,21400E-02	1,59687E-02
104.	1.84E+00	1.93E+00	6,895800E-03	1,67860E-02	7,06020E-03
105.	1.76E+00	1.84E+00	6,913500E-03	1,68290E-02	6,34350E-03
106.	1.67E+00	1.76E+00	7,137300E-03	1,73740E-02	6,28870E-03
107.	1.59E+00	1.67E+00	7,426100E-03	1,80770E-02	6,39690E-03
108.	1.50E+00	1.59E+00	7,801400E-03	1,89900E-02	6,63860E-03
109.	1.48E+00	1.50E+00	8,122300E-03	1,97710E-02	6,88170E-03
110.	1.44E+00	1.48E+00	8,346400E-03	2,03170E-02	7,05760E-03
111.	1.37E+00	1.44E+00	8,929100E-03	2,16840E-02	7,49990E-03
112.	1.34E+00	1.37E+00	9,876200E-03	2,39840E-02	8,15880E-03
113.	1.30E+00	1.34E+00	1,109900E-02	2,69520E-02	8,89300E-03
114.	1.24E+00	1.30E+00	1,535400E-02	3,72870E-02	1,09390E-02
115.	1.17E+00	1.24E+00	3,053500E-02	7,41520E-02	1,62840E-02
116.	1.15E+00	1.17E+00	4,673100E-02	1,13480E-01	2,04190E-02
117.	1.12E+00	1.15E+00	5,307100E-02	1,28880E-01	2,09710E-02
118.	1.11E+00	1.12E+00	5,467500E-02	1,32780E-01	2,01370E-02
119.	1.10E+00	1.11E+00	5,360400E-02	1,30170E-01	1,90330E-02
120.	1.07E+00	1.10E+00	4,997700E-02	1,21370E-01	1,70730E-02
121.	1.05E+00	1.07E+00	4,428400E-02	1,08240E-01	1,46500E-02
122.	1.04E+00	1.05E+00	4,058400E-02	9,92270E-02	1,32960E-02
123.	1.02E+00	1.04E+00	3,837300E-02	9,38200E-02	1,25560E-02
124.	9.96E-01	1.02E+00	3,553200E-02	8,68950E-02	1,16630E-02
125.	9.86E-01	9.96E-01	3,353700E-02	8,21160E-02	1,10730E-02
126.	9.72E-01	9.86E-01	3,242300E-02	7,93890E-02	1,07640E-02
127.	9.50E-01	9.72E-01	3,107800E-02	7,60960E-02	1,04080E-02
128.	9.30E-01	9.50E-01	2,986200E-02	7,31170E-02	1,01020E-02

129.	9.10E-01	9.30E-01	2,902300E-02	7,10640E-02	9,90500E-03
130.	8.60E-01	9.10E-01	2,815800E-02	6,89460E-02	9,72400E-03
131.	8.50E-01	8.60E-01	2,782700E-02	6,81350E-02	9,67300E-03
132.	7.90E-01	8.50E-01	2,779200E-02	6,80490E-02	9,70100E-03
133.	7.80E-01	7.90E-01	2,799900E-02	6,85550E-02	9,79100E-03
134.	7.05E-01	7.80E-01	2,876700E-02	7,04370E-02	1,00240E-02
135.	6.25E-01	7.05E-01	3,107600E-02	7,60910E-02	1,06530E-02
136.	5.40E-01	6.25E-01	3,512300E-02	8,60010E-02	1,16930E-02
137.	5.00E-01	5.40E-01	3,960500E-02	9,69740E-02	1,28200E-02
138.	4.85E-01	5.00E-01	4,231300E-02	1,02640E-01	1,35040E-02
139.	4.33E-01	4.85E-01	4,682600E-02	1,13590E-01	1,46630E-02
140.	4.00E-01	4.33E-01	5,452700E-02	1,32270E-01	1,66730E-02
141.	3.91E-01	4.00E-01	5,961800E-02	1,45350E-01	1,80580E-02
142.	3.50E-01	3.91E-01	6,819100E-02	1,66260E-01	2,05250E-02
143.	3.20E-01	3.50E-01	8,317800E-02	2,02790E-01	2,52120E-02
144.	3.15E-01	3.20E-01	9,104900E-02	2,21990E-01	2,78810E-02
145.	3.00E-01	3.15E-01	9,472800E-02	2,30960E-01	2,92920E-02
146.	2.80E-01	3.00E-01	9,852000E-02	2,40570E-01	3,10600E-02
147.	2.48E-01	2.80E-01	9,750000E-02	2,38080E-01	3,15700E-02
148.	2.20E-01	2.48E-01	9,253800E-02	2,25970E-01	3,04120E-02
149.	1.89E-01	2.20E-01	9,051500E-02	2,20890E-01	2,95750E-02
150.	1.80E-01	1.89E-01	9,195900E-02	2,24170E-01	2,97010E-02
151.	1.60E-01	1.80E-01	9,457200E-02	2,30540E-01	3,02380E-02
152.	1.40E-01	1.60E-01	9,986200E-02	2,43440E-01	3,17280E-02
153.	1.34E-01	1.40E-01	1,042900E-01	2,54220E-01	3,30600E-02
154.	1.15E-01	1.34E-01	1,106000E-01	2,69610E-01	3,44800E-02
155.	1.00E-01	1.15E-01	1,210100E-01	2,94990E-01	3,67800E-02
156.	9.50E-02	1.00E-01	1,284600E-01	3,13450E-01	3,84100E-02
157.	8.00E-02	9.50E-02	1,385100E-01	3,37960E-01	4,07000E-02
158.	7.70E-02	8.00E-02	1,476200E-01	3,60190E-01	4,28500E-02
159.	6.70E-02	7.70E-02	1,563700E-01	3,81540E-01	4,49900E-02
160.	5.80E-02	6.70E-02	1,701100E-01	4,15050E-01	4,85300E-02
161.	5.00E-02	5.80E-02	1,859200E-01	4,53630E-01	5,28200E-02
162.	4.20E-02	5.00E-02	2,048100E-01	4,99200E-01	5,80500E-02
163.	3.50E-02	4.20E-02	2,273900E-01	5,54240E-01	6,44000E-02
164.	3.00E-02	3.50E-02	2,500400E-01	6,09440E-01	7,08800E-02
165.	2.50E-02	3.00E-02	2,743000E-01	6,68560E-01	7,79100E-02
166.	2.00E-02	2.50E-02	3,066100E-01	7,47320E-01	8,72600E-02
167.	1.50E-02	2.00E-02	3,511600E-01	8,54990E-01	1,00400E-01
168.	1.00E-02	1.50E-02	4,182800E-01	1,01840E+00	1,20630E-01
169.	6.90E-03	1.00E-02	5,098100E-01	1,24390E+00	1,48770E-01
170.	5.00E-03	6.90E-03	6,071200E-01	1,48140E+00	1,79270E-01
171.	3.00E-03	5.00E-03	7,392300E-01	1,80180E+00	2,21140E-01
172.	1.10E-03	3.00E-03	1,14E+00	2,77E+00	3,47600E-01

Table 3 and 4 : Tow group constants and scattering matrix

Table:3 Tow groups constants
Unit : cm-1

TOP_PART

G	D	Nu*fission	Fission	Capture	Totale	Absorption	TRANSP
1	1,47603655	1,0924E-02	4,3881E-03	7,8969E-03	3,3743E-01	1,2285E-02	2,2583E-01
2	1,10430125	3,0976E-01	1,2703E-01	3,4370E-02	7,8004E-01	1,6140E-01	3,0185E-01

Table : 4a Scattering matrix P0 G -> g
Unit : s-1

	1 -> 1	2 -> 1	
1	9,4824E+00		5,2421E-03
2	3,6254E-01		1,3315E+00

Table : 4b Scattering matrix P1 G -> g
Unit : s-1

	1 -> 1	2 -> 1	
1	2,0120E+01		6,3943E-03
2	3,9237E-01		1,9504E+00

Table:3 Tow groups constants
Unit : cm-1

MIDDLE PART

G	D	Nu*fission	Fission	Capture	Totale	Absorption	TRANSP
1	0,95061552	1,1621E-02	4,6637E-03	9,4413E-03	4,2617E-01	1,4105E-02	3,5065E-01
2	0,68208171	3,3716E-01	1,3827E-01	4,0030E-02	1,1034E+00	1,7830E-01	4,8870E-01

Table : 4a Scattering matrix P0 G -> g
Unit : s-1

	1 -> 1	2 -> 1	
1	7,60E+00		5,55E-03
2	4,29E-01		2,12E+00

Table : 4b Scattering matrix P1 G -> g
Unit : s-1

	1 -> 1	2 -> 1	
1	2,00E+01		8,15E-03
2	4,73E-01		3,36E+00

Table:3 Tow groups constants
Unit : cm-1

BOTTOM_PART

G	D	Nu*fission	Fission	Capture	Totale	Absorption	TRANSP
1	0,82622777	1,1802E-02	4,7352E-03	1,0006E-02	4,6397E-01	1,4741E-02	4,0344E-01
2	0,58687512	3,4485E-01	1,4143E-01	4,2120E-02	1,2416E+00	1,8355E-01	5,6798E-01

Table :4a Scattering matrix P0 G -> g
Unit : s-1

1 -> 1	2 -> 1	
1 -> 2	2 -> 2	

1	7,17E+00	5,64E-03
2	4,47E-01	2,45E+00

Table :4b Scattering matrix P1 G -> g
Unit : s-1

1 -> 1	2 -> 1	
1 -> 2	2 -> 2	

1	2,00E+01	8,64E-03
2	4,95E-01	3,94E+00

Table 5a. Burnup steps and spectrum index
TOP PART

Steps	Burnup [MWd/t]	Kinf
1	0	1,389353395
2	50	1,38554
3	100	1,38385
4	200	1,37956
5	300	1,37545
6	400	1,37153
7	500	1,36778
8	600	1,36418
9	700	1,36071
10	800	1,3574
11	900	1,35421
12	1000	1,35115
13	1300	1,34264
14	1600	1,335
15	2100	1,32392
16	2400	1,31811
17	2600	1,31448
18	2800	1,31107
19	3000	1,30782
20	3500	1,30032
21	4000	1,2936
22	4500	1,28747
23	5000	1,28178
24	6000	1,27129
25	7000	1,26161
26	9000	1,2434
27	11000	1,22612
28	12000	1,21773
29	13000	1,20937
30	14000	1,20114
31	15000	1,193
32	16000	1,18493
33	17000	1,17696
34	18000	1,16911
35	19000	1,16137
36	20000	1,15374
37	21000	1,14623
38	22000	1,13884
39	23000	1,13158
40	24000	1,12442
41	25000	1,11738
42	26000	1,11046
43	27000	1,10364

44	28000	1,09694
45	29000	1,09034
46	30000	1,08384
47	31000	1,07745
48	32000	1,07115
49	33000	1,06495
50	34000	1,05884
51	35000	1,05282
52	36000	1,04689
53	37000	1,04104
54	38000	1,03527
55	39000	1,02958
56	40000	1,02397
57	41000	1,01844
58	42000	1,01299

Steps	Burnup [MWd/t]	Spectrum index	Ins, Conv, Ratio
1	0	7,01670173	3,74113097E-01
2	50	7,02573208	3,74087330E-01
3	100	7,0279497	3,74664070E-01
4	200	7,03387886	3,75663504E-01
5	300	7,03921485	3,76601480E-01
6	400	7,04401867	3,77511344E-01
7	500	7,04837812	3,78399854E-01
8	600	7,05229494	3,79276221E-01
9	700	7,05597309	3,80089706E-01
10	800	7,05906844	3,80912077E-01
11	900	7,06152452	3,81691016E-01
12	1000	7,06388988	3,82440926E-01
13	1600	7,07115427	3,86638783E-01
14	2100	7,07036658	3,89674166E-01
15	2600	7,06536558	3,92440834E-01
16	3000	7,05908884	3,94526851E-01
17	3500	7,04949687	3,96950305E-01
18	4000	7,03855087	3,99296402E-01
19	4500	7,02700905	4,01524936E-01
20	5000	7,01503764	4,03717216E-01
21	6000	6,99186819	4,08074018E-01
22	7000	6,97143077	4,12410384E-01
23	9000	6,93946842	4,21378809E-01
24	12000	6,91605057	4,35713220E-01
25	14000	6,91334182	4,45796323E-01
26	16000	6,91884671	4,56194859E-01
27	18000	6,93026254	4,66839955E-01
28	20000	6,94558048	4,77663369E-01
29	22000	6,96318414	4,88586409E-01
30	24000	6,98240543	4,99524155E-01
31	26000	7,00173465	5,10530221E-01
32	28000	7,02066402	5,21499494E-01

33	30000	7,03864428	5,32466813E-01
34	32000	7,0555218	5,43379720E-01
35	34000	7,07052004	5,54302418E-01
36	36000	7,08361974	5,65126449E-01
37	38000	7,09468515	5,75939714E-01
38	40000	7,10358565	5,86696819E-01

Table 5b. Burnup steps and spectrum index
MIDDLE PART

Steps	Burnup [MWd/t]	Kinf
1	0	1,463753343
2	50	1,45962
3	100	1,45759
4	200	1,45332
5	300	1,44922
6	400	1,44531
7	500	1,44158
8	600	1,43801
9	700	1,43459
10	800	1,43131
11	900	1,42817
12	1000	1,42516
13	1300	1,41683
14	1600	1,40945
15	2100	1,39884
16	2400	1,39329
17	2600	1,38989
18	2800	1,3867
19	3000	1,38369
20	3500	1,37678
21	4000	1,3707
22	4500	1,36522
23	5000	1,36019
24	6000	1,35106
25	7000	1,34278
26	9000	1,32744
27	11000	1,31284
28	12000	1,30559
29	13000	1,29841
30	14000	1,29128
31	15000	1,28418
32	16000	1,27711
33	17000	1,27006
34	18000	1,26305
35	19000	1,25607
36	20000	1,24913

37	21000	1,24223
38	22000	1,23537
39	23000	1,22856
40	24000	1,22179
41	25000	1,21506
42	26000	1,20836
43	27000	1,20171
44	28000	1,19511
45	29000	1,18856
46	30000	1,18206
47	31000	1,17561
48	32000	1,16921
49	33000	1,16286
50	34000	1,15655
51	35000	1,15029
52	36000	1,14408
53	37000	1,13791
54	38000	1,13178
55	39000	1,12569
56	40000	1,11964
57	41000	1,11363
58	42000	1,10766
59	43000	1,10171
60	44000	1,09581
61	45000	1,08993
62	46000	1,08408
63	47000	1,07826
64	48000	1,07247
65	49000	1,0667
66	50000	1,06095
67	51000	1,05523
68	52000	1,04952

Steps	Burnup [MWd/t]	Spectrum index	Ins, Conv, Ratio
1	0	4,24923445	3,08340075E-01
2	50	4,25438455	3,08643480E-01
3	100	4,25561875	3,09082153E-01
4	200	4,25819736	3,09820724E-01
5	300	4,26036116	3,10545535E-01
6	400	4,26236295	3,11249576E-01
7	500	4,26397297	3,11909601E-01
8	600	4,26542311	3,12555259E-01
9	700	4,26657912	3,13179811E-01
10	800	4,26748219	3,13794914E-01
11	900	4,26809351	3,14390865E-01
12	1000	4,26856868	3,14949165E-01
13	1600	4,26742583	3,18055457E-01
14	2100	4,26255139	3,20298566E-01
15	2600	4,25511901	3,22287253E-01

16	3000	4,24768247	3,23750936E-01
17	3500	4,23739943	3,25460385E-01
18	4000	4,22610223	3,27049949E-01
19	4500	4,21419053	3,28581397E-01
20	5000	4,2019675	3,30073477E-01
21	6000	4,17752615	3,32976355E-01
22	7000	4,15353229	3,35828429E-01
23	9000	4,10852615	3,41723205E-01
24	12000	4,05102809	3,51239882E-01
25	14000	4,01808205	3,58127740E-01
26	16000	3,9882651	3,65405008E-01
27	18000	3,96089859	3,73008503E-01
28	20000	3,93511968	3,80932189E-01
29	22000	3,91041767	3,89115381E-01
30	24000	3,88615226	3,97491403E-01
31	26000	3,86195854	4,06091077E-01
32	28000	3,83765422	4,14848446E-01
33	30000	3,81263389	4,23740307E-01
34	32000	3,78674914	4,32734683E-01
35	34000	3,75984555	4,41855472E-01
36	36000	3,73188729	4,51058473E-01
37	38000	3,70265401	4,60365971E-01
38	40000	3,67218899	4,69743406E-01

Table 5c. Burnup steps and spectrum index
BOTTOM PART

Steps	Burnup [MWd/t]	Kinf
1	0	1,481235862
2	50	1,47704
3	100	1,47494
4	200	1,47069
5	300	1,46659
6	400	1,46269
7	500	1,45897
8	600	1,45541
9	700	1,452
10	800	1,44874
11	900	1,44562
12	1000	1,44262
13	1300	1,43434
14	1600	1,42702
15	2100	1,41651
16	2400	1,41107
17	2600	1,4077
18	2800	1,40455
19	3000	1,40159

20	3500	1,39483
21	4000	1,38888
22	4500	1,38355
23	5000	1,37867
24	6000	1,36988
25	7000	1,36189
26	9000	1,34718
27	11000	1,33323
28	12000	1,32636
29	13000	1,31947
30	14000	1,31261
31	15000	1,30578
32	16000	1,29897
33	17000	1,29217
34	18000	1,28538
35	19000	1,27862
36	20000	1,27187
37	21000	1,26514
38	22000	1,25844
39	23000	1,25176
40	24000	1,24511
41	25000	1,23848
42	26000	1,23188
43	27000	1,22531
44	28000	1,21877
45	29000	1,21226
46	30000	1,20576
47	31000	1,1993
48	32000	1,19286
49	33000	1,18645
50	34000	1,18008
51	35000	1,17373
52	36000	1,16742
53	37000	1,16113
54	38000	1,15487
55	39000	1,14863
56	40000	1,14242
57	41000	1,13623
58	42000	1,13006
59	43000	1,12391
60	44000	1,11777
61	45000	1,11166
62	46000	1,10556
63	47000	1,09947
64	48000	1,09339
65	49000	1,08732
66	50000	1,08126
67	51000	1,0752
68	52000	1,06915

Steps	Burnup [MWd/t]	Spectrum index	Ins, Conv, Ratio
1	0	3,66120523	2,90962647E-01
2	50	3,66558138	2,91309335E-01
3	100	3,66659259	2,91698009E-01
4	200	3,66853847	2,92395365E-01
5	300	3,67034437	2,93061005E-01
6	400	3,67184094	2,93703354E-01
7	500	3,67306532	2,94311590E-01
8	600	3,67415245	2,94918655E-01
9	700	3,67496933	2,95493167E-01
10	800	3,67538369	2,96053675E-01
11	900	3,67589467	2,96598345E-01
12	1000	3,67613817	2,97108120E-01
13	1600	3,67411092	2,99951799E-01
14	2100	3,6690744	3,01999629E-01
15	2600	3,66197474	3,03826929E-01
16	3000	3,65495881	3,05155034E-01
17	3500	3,6450781	3,06708312E-01
18	4000	3,63462997	3,08143862E-01
19	4500	3,6234363	3,09526398E-01
20	5000	3,61206984	3,10853059E-01
21	6000	3,58881093	3,13445334E-01
22	7000	3,56596837	3,16005480E-01
23	9000	3,52256848	3,21233993E-01
24	12000	3,46460492	3,29711357E-01
25	14000	3,43008921	3,35831796E-01
26	16000	3,39814593	3,42374696E-01
27	18000	3,36798081	3,49244319E-01
28	20000	3,33905584	3,56435725E-01
29	22000	3,31099132	3,63907028E-01
30	24000	3,2833021	3,71650789E-01
31	26000	3,25558165	3,79617570E-01
32	28000	3,22759616	3,87757846E-01
33	30000	3,19920141	3,96102178E-01
34	32000	3,17024394	4,04614609E-01
35	34000	3,14036099	4,13246347E-01
36	36000	3,10961205	4,22048745E-01
37	38000	3,07789801	4,30988663E-01
38	40000	3,04509552	4,40042079E-01

**Tables 6a: Number density of elements [$/\text{cm}^3$] at BOC and EOC in fuel assembly
TOP PART**

<i>Elements</i>	<i>BOC</i>	<i>EOC</i>
<i>U235</i>	5.045682E-04	2.473335E-04
<i>U236</i>	0	9.472721E-05
<i>U238</i>	5.101611E-03	4.955712E-03
<i>PU238</i>	0	5.892729E-08
<i>PU239</i>	0	3.836811E-05
<i>PU240</i>	0	1.129228E-05
<i>PU241</i>	0	8.195510E-06
<i>PU242</i>	0	1.205944E-06
<i>AM241</i>	0	2.236639E-09
<i>AM242M</i>	0	3.657543E-11
<i>AM243</i>	0	1.554205E-07
<i>CM242</i>	0	7.434613E-10
<i>CM243</i>	0	1.159358E-11
<i>CM244</i>	0	3.086328E-08
<i>U233</i>		
<i>U234</i>		
<i>TH230</i>		
<i>TH232</i>		
<i>PA231</i>		
<i>PA233</i>		

**Tables 6b: Number density of elements [$/\text{cm}^3$] at BOC and EOC in fuel assembly
MIDDLE PART**

<i>Elements</i>	<i>BOC</i>	<i>EOC</i>
<i>U235</i>	5.045682E-04	1.926310E-04
<i>U236</i>	0	1.045180E-04
<i>U238</i>	5.101611E-03	4.952703E-03
<i>PU238</i>	0	7.244886E-08
<i>PU239</i>	0	3.375985E-05
<i>PU240</i>	0	1.231040E-05
<i>PU241</i>	0	8.108227E-06
<i>PU242</i>	0	1.825327E-06
<i>AM241</i>	0	2.594053E-09
<i>AM242M</i>	0	3.536720E-11
<i>AM243</i>	0	2.110223E-07
<i>CM242</i>	0	1.103033E-09
<i>CM243</i>	0	1.571517E-11

<i>CM244</i>	0	3.879583E-08
<i>U233</i>		
<i>U234</i>		
<i>TH230</i>		
<i>TH232</i>		
<i>PA231</i>		
<i>PA233</i>		

*Tables 6c: Number density of elements [$/\text{cm}^3$] at BOC and EOC in fuel assembly
BOTTOM PART*

<i>Elements</i>	<i>BOC</i>	<i>EOC</i>
<i>U235</i>	5.045682E-04	1.895096E-04
<i>U236</i>	0	1.038516E-04
<i>U238</i>	5.101611E-03	4.961940E-03
<i>PU238</i>	0	6.020984E-08
<i>PU239</i>	0	3.142329E-05
<i>PU240</i>	0	1.176131E-05
<i>PU241</i>	0	7.223887E-06
<i>PU242</i>	0	1.681287E-06
<i>AM241</i>	0	2.300461E-09
<i>AM242M</i>	0	2.932872E-11
<i>AM243</i>	0	1.732145E-07
<i>CM242</i>	0	9.549973E-10
<i>CM243</i>	0	1.238274E-11
<i>CM244</i>	0	2.843861E-08
<i>U233</i>		
<i>U234</i>		
<i>TH230</i>		
<i>TH232</i>		
<i>PA231</i>		
<i>PA233</i>		