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Index to

BROND-2.2,CENDL-2.1,ENDF/B-6,JEF-2.2,JENDL-3.2 IRDF, EFF-2.4 and FENDL/E

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Abstract: This document contains a brief index to the five main data libraries for evaluated neutron reaction data, including BROND-2.2 from USSR (1993 update), CENDL-2.1 from China (1995 version), ENDF/B-6 from USA (including revisions 5,6,7 up to May 2000), JEF-2.2 from OECD/NEA (1992) and JENDL-3.2 (1994) from Japan. It also indexes IRDF-90, the International Reactor Dosimetry File from IAEA (1993 update), and the available data libraries for fission-product yield data, and two data libraries for fusion applications, i.e. EFF-2.4 (EU) and FENDL/E(IAEA).

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Note:

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IAEA-NDS-reports are updated whenever there is additional information of relevance to the users of the data library.

For citations care should be taken that credit is given to the author of the data library and/or to the data center which issued the data library. The editor of the IAEA-NDS-report is usually not the author of the data library.

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96/11

Citation guidelines:

Index to BROND, CENDL-2.1, ENDF/B-6, JEF-2.2, JENDL-3.2, IRDF EFF-2.4 and FENDL/E

Five data libraries for evaluated neutron reaction data have been released recently: BROND-2 from USSR, CENDL-2.1 from China, ENDF/B-6 from USA, JEF-2.2 from OECD/NEA, and JENDL-3.2 from Japan. These libraries include comprehensive data evaluations for all neutron reactions in the energy range from 0 to 20 MeV.

This index also considers IRDF-90, the International Reactor Dosimetry File of the IAEA. The neutron activation cross-section data that are included in IRDF-90 are supposed to be considered as internationally recommended data.

This index also considers two evaluated neutron reaction data libraries for fusion applications, i.e. EFF-2.4, the "European Fusion File" of the Fusion Program of the European Union, and FENDLE/E by the IAEA for the ITER project.

The present index gives a survey of the contents of these data libraries which should be a help for deciding how these libraries supplement or duplicate each other. The index indicates whether a data set has been revised since the last release of the data library. It also tries to indicate which of the five libraries contains the more recent evaluation. It should be noted, however, that this indication cannot be more than a rough approximation; for example, a data set marked as revised in 1991 may have been updated only in a limited region whereas other parts of the data set may be fairly old. Or, on the other hand, a data set evaluated in 1988 may be up-to-date still now if there were no new experimental data since then. For more detailed information the introductory text contained in all data libraries should be consulted. Also, the compactness of this index does not permit an indication whether, for example, double differential cross-sections, photon yield data, or covariance data have been included or not.

This index includes also a few references to ENDL-84 from the Lawrence Livermore National Laboratory, USA. In this case, however, only evaluations for those nuclides have been included for which the five recent libraries do not include a new evaluation.

Cross-sections for fission-product nuclei are included in ENDF/B-6, JEF-2, JENDL-3 and, less complete, in BROND-2

For more detailed summary documentation see the documents

IAEA-NDS-90	Rev. 8	for BROND-2.2, USSR, update 1994
IAEA-NDS-61	Rev. 3	for CENDL-2, China, update 1996
IAEA-NDS-100	Rev.10	for ENDF/B-6, USA, update 2000
IAEA-NDS-110	Rev. 5	for JENDL-3.2, Japan, update 1994
IAEA-NDS-120	Rev. 3	for JEF-2.2, NEA, 1996
IAEA-NDS-141	Rev. 4	for IRDF-90, IAEA, version 3 of 1996
IAEA-NDS-11	Rev. 5	for ENDL-84, USA, 1984
IAEA-NDS-170		for EFF-2.4, EC 1994, update 1995
IAEA-NDS-128	Rev.2	for FENDL/E, IAEA 1994

The last page of this document summarises the available data libraries for fission-product yield data.

Note: The present revision of this document was prepared to include the 2000 update of The ENDF/B-6 Release 7 library.

JEF REPORT 14

Available from the NEA Data Bank.

For the 5 libraries JEF-2.2, ENDF/B-6 (after 93 update), JENDL-3.2
BROND-2 and CENDL-2 this report quotes the values for

- 0.0253 eV cross-sections;
- thermal Maxwellian average cross-sections;
- resonance integrals;
- fission-spectrum average cross-sections;
- 14.0 Mev cross-sections.

Some statistics

The index includes evaluations for 410 elements or isotopes, of which about one half is fission-product nuclides. The number of materials in each of the five libraries is:

BROND-2.2 (92/93)	(which does not include a comprehensive fission products file): 121
CENDL-2 (91/93)	(not including fission products): 67
ENDF/B-6.2 (2000)	(including fission products): 319
JEF-2.2 (91/93)	(including fission products): 314
JENDL-3.2 (94)	(including fission products): 340

Evaluations for about 40 elements/isotopes exist in all five libraries; more than 90 elements/isotopes exist in four of the five libraries. It should be noted, however, that in only some of these cases there are really five or four independent evaluations. As a rather frequent example, the evaluations in three of the libraries may originate from a common root, such as ENDF/B-4.

There are several unique evaluations which exist only in one of the five libraries:

BROND:	6
CENDL:	2
JEF-2:	6
JENDL-3:	46

In addition ENDL-84 has evaluations for 5 nuclides that do not exist in any of above five libraries. (Obviously, the nuclides that are contained in only one of the libraries, are not of highest importance.)

No evaluated data files exist for the following 7 elements: 10-Ne, 69-Tm, 70-Yb, 84-Po, 85-At, 86-Rn, 87-Fr. However, partial evaluations for (n,2n) [though without a complete evaluation] exist for 69-Tm-169.

Explanations for the following table:

88	=	year of evaluation or last revision
89/94	=	evaluation of 1988 updated in 1994
old	=	older evaluation taken over in ENDF/B-6 after correction of any detected errors
old+	=	old, but new delayed fission-neutron data
-	=	not included
E6	=	taken over from ENDF/B-6
E6+	=	taken over from ENDF/B-6 with revisions
E5	=	taken over from ENDF/B-5
E5+	=	taken over from ENDF/B-5 with revisions
E5FP	=	taken over from the ENDF/B-5 fission-products library
E5A	=	taken over from the ENDF/B-5 actinides library V.2
E5A+	=	as E5A, but new delayed fission-neutron data
E4	=	taken over from ENDF/B-4
E3	=	taken over from ENDF/B-3
ENDL	=	taken over from ENDL-78
ENDL84(83)	=	ENDL84 contains an additional evaluation from 1983, see doc. IAEA-NDS-11 Rev.5
INDL/V	=	INDL/V library, see doc. IAEA-NDS-31 Rev.3
J2	=	taken over from JENDL-2
J3	=	taken over from JENDL-3
(Σ)	=	natural element, data to be computed from the isotopic files

Light elements

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
1-H-1	99.985%	E5/88	78/94	91/**99** *) ■	89 E5+ ▲	84/93	
1-H-2	0.015%	88/93 ■	91/94	91/95/**99**	92 E6+ ▲	83/93	
1-H-3		88	91 /94	old ■	67 E4 ▲	-	
2-He-3	0.0001%	88	91/94	91 *)	89 E5+ ▲	87/94	
2-He-4	100%	89/90	78/94	old	73 E4 ▲	87	
3-Li		(Σ)	(Σ)	(Σ)	(Σ)	(Σ)	
3-Li-6	7.5%	89/92	78/94	91 *)■	89 E5+▲	85/93	IRDF-90(=E6)
3-Li-7	92.5%	85/92	91	91 ■	81 E5+	88/92	▲ EFF-2.4
4-Be-7		-	-	-	-	-	ENDL84(78)
4-Be-9	100%	-	78	91 ■	79 E5+	89	▲ EFF-2.4
5-B-10	20%	-	91/94	89 *) ■	89 E6 ▲	88	IRDF-90(=E6)
5-B-11	80%	-	90	89 ■	89 E6 ▲	88	
6-C-12		E6	-	91/**99***) ▲■	73/89 E5	93	
6-C-13	1.1%	-	-	-	-	-	
7-N		(Σ)	-	(Σ)	(Σ)	(Σ)	
7-N-14	99.63%	88/93 ■	83	91/95/**99** ■	73 E4	89/94	
7-N-15	0.37%	88/93 ■	-	91 ■	88 J3	88/94	

*) Note: ENDF/B-6 evaluations are international reference standards for 1-H-1 and 6-C [elastic MF/MT = 3/2, diff. elastic MF/MT = 4/2], 2-He-3(n,p) [MF/MT = 3/103], 3-Li-6(n,t) [MF/MT = 3/105], and 5-B-10(n,α) [MF/MT = 3/800 and 3/801]. The latter two reactions from ENDF/B-6 are included also in IRDF-90.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.

■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Light elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
8-O-16	99.76%	90	92/94	91/**99** ▲■	91 E6	87/93	
8-O-17	0.04%	-	-	78 E5	78 E5	-	
8-O-18	0.2%	-	-	-	-		
9-F-19	100%	90	90	CENDL-2▲■	74 E4	89/94	
9-F-19(n,2n)		-	-	-	-	-	IRDF-90
10-Ne		-	-	-	-	-	
10-Ne-20	90.51%	-	-	-	-	-	
10-Ne-21	0.27%	-	-	-	-	-	
10-Ne-22	9.22%	-	-	-	-	-	
11-Na-22		-	-	-	82/85	-	
11-Na-23	100%	78/90	83/94	77/91	89 J3 ▲	89/93 ■	
11-Na-23(n,γ)		-	-	-	-	-	IRDF-90/2
12-Mg		-	83/94	old	74 E4	87/93 ▲■	
12-Mg-24	79%	-	-	old	-	87/93	
12-Mg-24(n,p)		-	-	-	-	-	IRDF-90
12-Mg-25	10%	-	-	-	-	87	
12-Mg-26	11%	-	-	-	-	87	
13-Al-27	100%	-	new 94	old,95/**97**/**99**	86 E4+	88/94 ■	▲ EFF-2.4
13-Al-27(n,p),(n,α)		-	-	-	-	-	IRDF-90
14-Si		85/93	83/94	old	86 E4+	88/94	
14-Si-28	92.23%	-	-	**new 98/99**	-	88/94	▲ EFF-2.4
14-Si-29	4.67%	-	-	**new 98/99**	-	88/94	
14-Si-30	3.10%	-	-	**new 98/99**	-	88/94	
15-P-31	100%	89/90	86/94	old/**99** ▲■	87 J3	87/93	
15-P-31(n,p)		-	-	-	-	-	IRDF-90

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.

■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Light elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
16-S		-	86/94	old ▲■	(Σ)	88/94	
16-S-32	95.02%	-	-	old	88 J3	88/94	
16-S-32(n,p)		-	-	-	-	-	IRDF-90
16-S-33	0.75%	-	-	-	87 J3	87/94	
16-S-34	4.21%	-	-	-	87 J3	87/94	
16-S-36	0.02%	-	-	-	87 J3	87/94	
17-Cl		90	new 94	72 E4 ■	72 E4 ▲	94	
17-Cl-35	75.77%	-	-	-	-	94	
17-Cl-37	24.23%	-	-	-	-	94	
18-Ar		-	-	-	(Σ)	-	
18-Ar-36	0.337%	-	-	-	82/85 ▲	-	
18-Ar-38	0.063%	-	-	-	82/85 ▲	-	
18-Ar-40	99.6%	-	-	old	82/87 ▲	94	
19-K		-	88/94	67/74 E4 ■	67/74 E4 ▲	87/94	
19-K-39	93.26%	-	-	-	-	87/94	
19-K-40	0.01%	-	-	-	-	87/94	
19-K-41	6.73%	-	-	old	-	87/94	
20-Ca		-	86/95	73/**99** E4	73 E4 ▲	87/94 ■	
20-Ca-40	96.94%	-	-	-	-	87/94	
20-Ca-42	0.65%	-	-	-	-	87/93	
20-Ca-43	0.13%	-	-	-	-	87/93	
20-Ca-44	2.09%	-	-	-	-	87/93	
20-Ca-46	0.004%	-	-	-	-	87/93	
20-Ca-48	0.19%	-	-	-	-	87/93	
21-Sc-45	100%	-	-	93	-	88/93	
21-Sc-45(n,γ)		-	-	-	-	-	IRDF-90/93

▲ Evaluation used in EFF-2.4.

■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Structural materials

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
22-Ti		-	86/94	77 E5	77 E5	88/94 ▲■	
22-Ti-46	8.2%	-	-	old	-	88/94	
22-Ti-46(n,p)		-	-	-	-	-	IRDF-90
22-Ti-47	7.4%	-	-	old	-	88/93	
22-Ti-47(n,p),(n,np)		-	-	-	-	-	IRDF-90/93*)
22-Ti-48	73.8%	-	-	old	-	88/93	
22-Ti-48(n,np)		-	-	-	-	-	IRDF-90*)
22-Ti-48(n,p)		-	-	-	-	-	IRDF-90
22-Ti-49	5.4%	-	-	-	-	88/93	
22-Ti-50	5.2%	-	-	old	-	88/93	
23-V		-	-	88 ▲■	72 E4	-	
23-V(n,α)		-	-	-	-	-	IRDF-90
23-V-50	0.25%	-	-	-	-	-	
23-V-51	99.75%	-	90/94	-	-	88/94	
24-Cr		84/91 **)	new 95	90	(Σ)	(Σ)	89/93
24-Cr-50	4.35%	84/90	new 95	91ORNL/**99**	91 ENEA	88/93	▲ EFF-2.4
24-Cr-52	83.79%	84/90	new 95	91ORNL/**99**	91 ENEA	88/93	▲ EFF-2.4
24-Cr-52(n,2n)		-	-	-	-	-	IRDF-90
24-Cr-53	9.50%	84/90	new 95	91ORNL/**99**	91 ENEA	88/93	▲ EFF-2.4
24-Cr-54	2.36%	84/90	new 95	91ORNL/**99**	91 ENEA	87/93	▲ EFF-2.4
25-Mn-55	100%	-	new 95	new/**98** ▲■	74/90 E4+	91/93 ■	
25-Mn-55(n,γ),(n,2n)		-	-	-	-	-	IRDF-90*)
26-Fe		90 **)	new 95	(Σ)	(Σ)	87/94	
26-Fe-54	5.8%	90	new 95	91/**98**/**99** ■	89 new ▲	87/93	
26-Fe-54(n,p)		-	-	-	-	-	IRDF-90
26-Fe-56	91.7%	90	new 95	91/**99** ■	89 new	87/94	▲ EFF-2.4
26-Fe-56(n,p)		-	-	-	-	-	IRDF-90*)
26-Fe-57	2.2%	90	new 95	91/**99** ■	89 new ▲	87/93	
26-Fe-58	0.3%	90	new 95	91/**98**/**99** ■	89 new ▲	87/93	
26-Fe-58(n,γ)		-	-	-	-	-	IRDF-90*)

*) In IRDF-90 the data for these reactions were taken from ENDF/B-6.

**) The BROND-2 files for natural Cr, Fe, Ni, Zr, Pb include γ-production data which are not included in the isotopic files.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.
■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Structural materials (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
27-Co-58		-	-	-	82 new	-	
27-Co-58m		-	-	-	82 new	-	
27-Co-59	100%	-	86	89/92 ▲■	82 E5	88/94	
27-Co-59(n,2n)		-	-	-	-	-	IRDF-90
27-Co-59(n,γ),(n,α)		-	-	-	-	-	IRDF-90*)
28-Ni		84 **)	90/94	(Σ)	(Σ)	87/93	
28-Ni-58	68.27%	84	-	91/**99** ■	91 E6	87/93	▲ EFF-2.4
28-Ni-58(n,p)		-	-	-	-	-	IRDF-90*)
28-Ni-58(n,2n)		-	-	-	-	-	IRDF-90
28-Ni-59		-	-	new ▲	87 RCN	-	
28-Ni-60	26.10%	84	-	89/**99** ■	89 E6	87/93	▲ EFF-2.4
28-Ni-60(n,p)		-	-	-	-	-	IRDF-90*)
28-Ni-61	1.13%	84	-	89/**99** ▲■	89 E6	87/93	
28-Ni-62	3.59%	84	-	89/**98**/**99**▲■	89 E6	87/93	
28-Ni-64	0.91%	84	-	89/**99** ▲■	89 E6	87/93	
29-Cu		81/91	new 95	(Σ)	75 E4	87/93	
29-Cu-63	69.17%	-	new 95	new/**99** ▲■	-	87/93	
29-Cu-63(n,γ),(n,α)		-	-	-	-	-	IRDF-90*)
(n,2n)		-	-	-	-	-	IRDF-90
29-Cu-65	30.83%	-	new 95	new/**99** ▲■	-	87/93	
29-Cu-65(n,2n)		-	-	-	-	-	IRDF-90*)
30-Zn		89/91	83/93	-	-	-	
30-Zn-64	48.6%	-	-	-	82 RCN	-	
30-Zn-64(n,p)		-	-	-	-	-	IRDF-90
30-Zn-66	27.9%	-	-	-	-	-	
30-Zn-67	4.1%	-	-	-	-	-	
30-Zn-68	18.8%	-	-	-	-	-	
30-Zn-70	0.6%	-	-	-	-	-	

*) In IRDF-90 the data for these reactions were taken from ENDF/B-6.

**)The BROND-2 files for natural Cr, Fe, Ni, Zr, Pb include γ-production data which are not included in the isotopic files.

▲ Evaluation used in EFF-2.4.
■ Evaluation used in FENDL/E.

Fission products and medium elements

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
31-Ga		-	-	old	78 ENDL+	94	
31-Ga-69	60.1%	-	-	-	-	94	
31-Ga-71	39.9%	-	-	-	-	94	
32-Ge		-	-	-	-	94	
32-Ge-70	20.5%	-	-	-	-	94	
32-Ge-72	27.4%	-	-	E5FP	74 E5+	94	
32-Ge-73	7.8%	-	-	E5FP	74 E5+	94	
32-Ge-74	36.5%	-	-	E5FP	74 E5+	94	
32-Ge-76	7.8%	-	-	E5FP	74 E5+	94	
33-As-74		-	-	-	-	-	ENDL84(83)
33-As-75	100%	-	-	E5FP	74 E5+	94	ENDL84(83)
34-Se-74	0.9%	-	-	E5FP	80 E5+	90	
34-Se-76	9.0%	-	-	E5FP	74 E5+	90	
34-Se-77	7.6%	-	-	E5FP	74 E5+	90	
34-Se-78	23.5%	-	-	E5FP	74 E5+	90	
34-Se-79		-	-	-	-	90	
34-Se-80	49.6%	-	-	E5FP	74 E5+	90/93	
34-Se-82	9.4%	-	-	E5FP	74 E5+	90	
35-Br-79	50.7%	-	-	E5FP	74 E5+	90/93	
35-Br-81	49.3%	-	-	E5FP	74 E5+	90/93	
36-Kr-78	0.35%	-	-	E5FP	78 E5+	90	
36-Kr-80	2.25%	-	-	E5FP	78 E5+	90	
36-Kr-82	11.6%	-	-	E5FP	78 E5+	90	
36-Kr-83	11.5%	-	-	E5FP	78 E5+	84/90	
36-Kr-84	57.0%	-	-	E5FP	78 E5+	84/90	
36-Kr-85		-	-	E5FP	79 E5+	84/90	
36-Kr-86	17.3%	-	-	E5FP	72 E5+	84/90	
37-Rb-85	72.2%	-	-	E5FP	80 E5+	84/90	
37-Rb-86		-	-	E5FP	79 E5+	-	
37-Rb-87	27.8%	-	-	E5FP	79 E5+	84/90	

+) Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
38-Sr-84	0.56%	-	-	E5FP	80 E5+	-	
38-Sr-86	9.86%	-	-	E5FP	74 E5+	84/90	
38-Sr-87	7.00%	-	-	E5FP	74 E5+	84/90	
38-Sr-88	82.58%	-	-	E5FP	74 E5+	84/93	
38-Sr-89		-	-	E5FP	79 E5+	90	
38-Sr-90		90	-	E5FP	79 E5+	84/93 ***)	
39-Y-88		-	-	-	-	-	ENDL84(83)
39-Y-89	100%	-	-	new	86/90	84/93	
39-Y-89(n,2n)		-	-	-	-	-	IRDF-90*)
39-Y-90		-	-	E5FP	79 E5+	-	
39-Y-91		-	-	E5FP	79 E5+	90	
40-Zr		88 **)	90/94	76/91	78 ENDL+■	88/94	ENDL84(78)
40-Zr-90	51.4%	93 ■	-	old	77 J1+	89/93	
40-Zr-90(n,2n)		-	-	-	-	-	IRDF-90
40-Zr-91	11.3%	93 ■	-	old	76/89	89/93	
40-Zr-92	17.2%	93 ■	-	old	77 J1+	89/94	
40-Zr-93		88	-	old	82/89	90	
40-Zr-94	17.3%	93 ■	-	old	77 J1+	89/93	
40-Zr-95		89	-	old	76/89	90	
40-Zr-96	2.8%	93 ■	-	old	76/89	89/93	
41-Nb-93	100%	88/90	new 95	91 ▲	75 E5+	88/94	
41-Nb-93(n,2n),(n,n')m,(n,γ)			-	-	-	-	IRDF-90/93
41-Nb-94		-	-	old	79 E5+	90	
41-Nb-95		90	-	old	76/89	90	

*) In IRDF-90 the data for this reaction were taken over from ENDF/B-6.

**)The BROND-2 file for natural Zr from 1988 includes γ-production data which may not agree with the sum of those in the isotopic files which were evaluated in 1993.

***) Note discrepant values in the thermal capture cross-section of Sr-90 (between 14 mb and 1b). See, e.g. H. Harada et al., J. Nucl. Sci. Technol. 31, 173, 1994. The new JENDL-3.2 evaluation gives a value of 15 mb.

+) Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

▲ Evaluation used in EFF-2.4.
■ Evaluation used in FENDL/E.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
42-Mo		-	83/94	old	86	89/94 ■	
42-Mo-92	14.8%	-	-	E5FP	80 E5+	89/93	▲ EFF-2.4
42-Mo-94	9.3%	-	-	E5FP	80 E5+	89/93	▲ EFF-2.4
42-Mo-95	15.9%	-	-	E5FP	80 J1+	89/93	▲ EFF-2.4
42-Mo-96	16.7%	-	-	E5FP	80 E5+	89/93	▲ EFF-2.4
42-Mo-97	9.6%	-	-	E5FP	80 J1+	89/93	▲ EFF-2.4
42-Mo-98	24.1%	-	-	E5FP	85/89	89/93	▲ EFF-2.4
42-Mo-99		-	-	E5FP	79 E5+	90	
42-Mo-100	9.6%	-	-	E5FP	85/89	89/93	▲ EFF-2.4
43-Tc-99		84	-	E5FP	78/89	90/93	
44-Ru-96	5.5%	-	-	E5FP	80 E5+	90	
44-Ru-98	1.9%	-	-	E5FP	80 E5+	90	
44-Ru-99	12.7%	-	-	E5FP	74 E5+	90/93	
44-Ru-100	12.6%	-	-	E5FP	80 E5+	90	
44-Ru-101	17.0%	84	-	E5FP/93	86 E5+	90/93	
44-Ru-102	31.6%	84	-	E5FP/93	80 E5+	90	
44-Ru-103		-	-	E5FP	85/89	90	
44-Ru-104	18.7%	84	-	E5FP	86/89	90	
44-Ru-105		-	-	E5FP	79 E5+	-	
44-Ru-106		85	-	E5FP	79 E5+	90	
45-Rh-103	100%	85	-	E5FP	82/89	90/94	
45-Rh-103(n,n')m		-	-	-	-	-	IRDF-90
45-Rh-105		-	-	E5FP	79 E5+	90	
46-Pd-102	1%	-	-	**new/98**	80 E5+	90	
46-Pd-104	11.1%	-	-	**new/98**	82/90	90	
46-Pd-105	22.3%	84	-	**new/98**	83/89	90/91	
46-Pd-106	27.3%	87	-	**new/98**	82/89	90	
46-Pd-107		85	-	E5FP	82/89	90/93	
46-Pd-108	26.5%	87	-	**new/98**	82/89	90	
46-Pd-110	11.7%	-	-	**new/98**	82/89	90	

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

▲ Evaluation used in EFF-2.4.
■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Fission products and medium elements (cont.)

Nucl.	BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
47-Ag	-	87/94**)	(Σ)	(Σ)	87/94 **)	
47-Ag-107 51.8%	-	87/94**)	E5FP	78 E5+	87/94 **)	
47-Ag-109 48.2%	85	87/94**)	E5FP	80/89	87/94 **)	
47-Ag-109(n,γ)	-	-	-	-	-	IRDF-90/93
47-Ag-110m	-	-	-	-	90	
47-Ag-111	-	-	old	79 E5+	-	
48-Cd	-	89/94	old	74 E4+	89/93	
48-Cd-(n,γ),total	-	-	-	-	-	IRDF-90*)
48-Cd-106 1.3%	-	-	E5FP/95	80 E5+	90	
48-Cd-108 0.9%	-	-	E5FP/95	74 E5+	90	
48-Cd-110 12.5%	-	-	E5FP/95	74 E5+	90/93	
48-Cd-111 12.8%	-	-	E5FP/95	77/89	90/93	
48-Cd-112 24.1%	-	-	E5FP/95	74 E5+	90	
48-Cd-113 12.2%	-	-	E5FP/95	79 E5+	90/93	
48-Cd-114 28.7%	-	-	E5FP/95	74 E5+	90	
48-Cd-115m	-	-	E5FP	79 E5+	-	
48-Cd-116 7.5%	-	-	E5FP/95	74 E5+	90	
49-In	-	89/94	new	(Σ)	(Σ)	
49-In-113 4.3%	-	-	E5FP	74 E5+	90 ▲	
49-In-115 95.7%	-	-	new	79 E5+	90/93 ▲	
49-In-115(n,n')m	-	-	-	-	-	IRDF-90*)
49-In-115(n,2n)	-	-	-	-	-	IRDF-90/93

*) In IRDF-90 the data for this reaction were taken over from ENDF/B-6.

**)For Ag-107 and -109 CENDL-2 and JENDL-3 have the same data from a joint Chinese/Japanese evaluation, but a revision was made for JENDL-3.2. The CENDL-2 evaluation for natural 47-Ag is an independent evaluation which is not fully consistent with the two isotopic evaluations.

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.

■ Evaluation used in FENDL/E.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
50-Sn		90/93 ■	89/94	(Σ)	(Σ)	(Σ)	
50-Sn-112	1.0%	-	-	80/91	82/89	90 ▲	
50-Sn-114	0.7%	-	-	80/91	80 E5+	90 ▲	
50-Sn-115	0.4%	-	-	E5FP	74 E5+	90 ▲	
50-Sn-116	14.7%	-	-	E5FP	74 E5+	90 ▲	
50-Sn-117	7.7%	-	-	E5FP	74 E5+	90/93 ▲	
50-Sn-118	24.3%	-	-	E5FP	74 E5+	90 ▲	
50-Sn-119	8.6%	-	-	E5FP	74 E5+	90 ▲	
50-Sn-120	32.4%	-	-	E5FP	74 E5+	90 ▲	
50-Sn-122	4.6%	-	-	E5FP	74 E5+	90 ▲	
50-Sn-123		-	-	E5FP	79 E5+	90	
50-Sn-124	5.6%	-	-	E5FP	74 E5+	90/93 ▲	
50-Sn-125		-	-	E5FP	79 E5+	-	
50-Sn-126		-	-	E5FP	79 E5+	90	
51-Sb		-	85/94	(Σ)	(Σ)	89/94	
51-Sb-121	57.3%	-	-	E5FP	80 E5+	89/94	
51-Sb-123	42.7%	-	-	E5FP	80 E5+	89/94	
51-Sb-124		-	-	E5FP	79 E5+	84/90	
51-Sb-125		-	-	E5FP	79 E5+	90	
51-Sb-126		-	-	E5FP	79 E5+	-	
52-Te-120	0.1%	-	-	E5FP	80 E5+	90	
52-Te-122	2.6%	-	-	E5FP	74 E5+	90/93	
52-Te-123	0.9%	-	-	E5FP	74 E5+	90/93	
52-Te-124	4.8%	-	-	E5FP	74 E5+	90/93	
52-Te-125	7.1%	-	-	E5FP	74 E5+	90/93	
52-Te-126	19.0%	-	-	E5FP	74 E5+	90/93	
52-Te-127m		-	-	E5FP	79 E5+	90	
52-Te-128	31.7%	-	-	E5FP	77 E5+	90	
52-Te-129m		-	-	E5FP	79 E5+	90	
52-Te-130	33.8%	-	-	E5FP	74 E5+	90	
52-Te-132		-	-	E5FP	79 E5+	-	

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.

■ Evaluation used in FENDL/E.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
53-I-127	100%	-	-	93	80/90	84/93	
53-I-127(n,2n)		-	-	-	-	-	IRDF-90/93
53-I-129		85	-	E5FP	82/91	84/90	
53-I-130		-	-	E5FP	79 E5+	-	
53-I-131		-	-	E5FP	79 E5+	90	
53-I-135		-	-	E5FP	79 E5+	-	
54-Xe-124	0.1%	-	-	E5FP	78 E5+	90	
54-Xe-126	0.1%	-	-	E5FP	78 E5+	90	
54-Xe-128	1.9%	-	-	E5FP	78 E5+	90	
54-Xe-129	26.4%	-	-	E5FP	78 E5+	90	
54-Xe-130	4.1%	-	-	E5FP	78 E5+	90	
54-Xe-131	21.2%	85	-	E5FP	78 E5+	90	
54-Xe-132	26.9%	-	-	E5FP	78 E5+	90	
54-Xe-133		-	-	E5FP	79 E5+	90	
54-Xe-134	10.4%	-	-	E5FP	78 E5+	90	
54-Xe-135		-	-	E5FP	75 E5+	90	
54-Xe-136	8.9%	-	-	E5FP	78 E5+	90	
55-Cs-133	100%	-	-	E5FP/**2000**	82/89	90	
55-Cs-134		-	-	**new/2000**	74 E5+	90	
55-Cs-135		85	-	E5FP/**2000**	86/89	90	
55-Cs-136		-	-	E5FP	79 E5+	90	
55-Cs-137		-	-	E5FP	77/89	90/93 **)	

**)For a revised value of the thermal capture cross-section of Cs-137 (ca. 0.25 barns instead of previously 0.11 barns) see a note by H. Takahashi: Proc. of the 2nd Int. Symp. on Adv. Nucl. En. Res., Mito, Jan 1990. See also H. Harada et al., NST 27 577 June 1990. Only the new JENDL-3.2 evaluation gives a value of 250 mb.

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
56-Ba-130	0.1%	-	-	-	-	90 ▲	
56-Ba-132	0.1%	-	-	-	-	90	
56-Ba-134	2.4%	-	-	new/**2000** ■	74 E5+	90	
56-Ba-135	6.6%	-	-	new ■	74 E5+	90/93	
56-Ba-136	7.9%	-	-	new ■	74 E5+	90	
56-Ba-137	11.2%	-	-	new ■	74 E5+	90/93	
56-Ba-138	71.7%	-	-	old Rev.95▲■	82/89	90/93	
56-Ba-140		-	-		82/89	90	
57-La-138	0.1%	-	-	-	-	90	
57-La-139	99.9%	-	-	E5FP	80/89	90/93	
57-La-140		-	-	E5FP	79 E5+	-	
58-Ce-136	0.2%	-	-	-	-	-	
58-Ce-138	0.3%	-	-	-	-	-	
58-Ce-140	88.5%	90	-	E5FP	74 E5+	90/93	
58-Ce-141		-	-	E5FP	76/91	90	
58-Ce-142	11.1%	90	-	E5FP	76/89	90/93	
58-Ce-143		-	-	E5FP	79 E5+	-	
58-Ce-144		85	-	E5FP	76/89	90	
59-Pr-141	100%	-	-	E5FP/**2000**	82/89	90/93	
59-Pr-142		-	-	E5FP	79 E5+	-	
59-Pr-143		-	-	E5FP	79 E5+	90	
60-Nd-142	27.1%	-	-	E5FP	74 E5+	90/93	
60-Nd-143	12.2%	85	-	E5FP/93	79/90	90/93	
60-Nd-144	23.8%	-	-	E5FP	78/89	90/93	
60-Nd-145	8.3%	85	-	E5FP/93	78/89	90/93	
60-Nd-146	17.2%	-	-	E5FP	78/90	90	
60-Nd-147		-	-	91	79 E5+	90	
60-Nd-148	5.8%	-	-	E5FP	78/90	90	
60-Nd-150	5.6%	-	-	E5FP	80 E5+	90/93	
61-Pm-147		85	-	91	79/89	90	
61-Pm-148		-	-	E5FP	79 E5+	90	
61-Pm-148m		-	-	E5FP	79 E5+	90	
61-Pm-149		-	-	E5FP	79 E5+	90	
61-Pm-151		-	-	E5FP	79 E5+	-	

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
62-Sm		89	-	(Σ)	(Σ)	(Σ)	
62-Sm-144	3.1%	89	-	E5FP	80 E5+	90/93	
62-Sm-147	15.0%	85	-	new	77/89	90/93	
62-Sm-148	11.3%	87	-	E5FP	80 E5+	90/93	
62-Sm-149	13.8%	85	-	E5FP/**2000**	77/89	90	
62-Sm-150	7.4%	87	-	E5FP/93	74 E5+	90/94	
62-Sm-151		85	-	91	79/89	90	
62-Sm-152	26.7%	87	-	E5FP/93	78/89	90/94	
62-Sm-153		-	-	E5FP	79 E5+	90	
62-Sm-154	22.7%	89	-	E5FP	74 E5+	90/94	
63-Eu		-	-	(Σ)	(Σ)	89/93	
63-Eu-151	47.8%	-	-	new	77 E5+	89	
63-Eu-152		-	-	new	73 E5+	90	
63-Eu-153	52.2%	85/89	-	new/**2000**	78 E5+	89/94 *)	
63-Eu-154		-	-	new/**2000**	73 E5+	90/93	
63-Eu-155		-	-	91/**2000**	76/89	90/93	
63-Eu-156		-	-	E5FP	79 E5+	90	
63-Eu-157		-	-	E5FP	80 E5+	-	
64-Gd		89	-	(Σ)	(Σ)	(Σ)	JEF-1 ***)
64-Gd(n,γ),total		-	-	-	-	-	IRDF-90**)
64-Gd-152	0.2%	89	-	**new/94**	-	90	
64-Gd-154	2.2%	89	-	**new/94**	74 E4+	90	
64-Gd-155	14.8%	89	-	old	77 J1+	90	
64-Gd-156	20.5%	89	-	old	76/91	90	
64-Gd-157	15.8%	89	-	old	77 J1+	90	
64-Gd-158	24.8%	89	-	old	74 E4+	90	
64-Gd-160	21.9%	89	-	old	74 E4+	90	

*)BROND-2, ENDF/B-6 and JENDL-3.2 give a Eu-153 thermal capture cross-section near 312 b, see S.F. Mughabghab, Neutron Cross-Sections, 1984. A new value by F. De Corte, which is also supported by A. Simonits (307 ± 4 barns, 88Mito p. 583) is a bit lower. JEF-2 gives 300 b.

**)In IRDF-90 the data for this reaction were computed from the isotopic files in ENDF/B-6.

***) JEF-1 contained a file for 64-Gd, which was basically the sum of the isotropic files but with the energy distribution for inelastic continuum added as taken from ENDL84.

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

Fission products and medium elements (cont.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2 +)	JENDL-3.2	Other
65-Tb-159	100%	-	-	E5FP	76/88	90	
65-Tb-160		-	-	E5FP	79 E5+	-	
66-Dy-156	0.1%	-	-	-	-	-	
66-Dy-158	0.1%	-	-	-	-	-	
66-Dy-160	2.3%	-	-	E5FP/**2000**	74 E5	-	
66-Dy-161	18.9%	-	-	E5FP/**2000**	74 E5	-	
66-Dy-162	25.5%	-	-	E5FP/**2000**	74 E5	-	
66-Dy-163	24.9%	-	-	E5FP/**2000**	74 E5	-	
66-Dy-164	28.2%	-	-	old/**2000**	67 E3	-	

+)Main changes from JEF-1 to JEF-2: addition of charged-particle producing activation cross-sections from ECN.

Heavy elements

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
67-Ho-165	100%	-	-	new/**98**	74 E5	-	
68-Er-162	0.1%	76/92	-	-	-	-	
68-Er-164	1.6%	76/92	-	-	-	-	
68-Er-166	33.6%	76/92	-	new	74 E5	-	
68-Er-167	23.0%	76/92	-	new	74 E5	-	
68-Er-168	26.8%	76/92	-	-	-	-	
68-Er-170	14.9%	76/92	-	-	-	-	
69-Tm-169	100%	-	-	-	-	-	
69-Tm-169(n,2n)		-	-	-	-	-	INDL/V
70-Yb-168	0.1%	-	-	-	-	-	
70-Yb-170	3.1%	-	-	-	-	-	
70-Yb-171	14.3%	-	-	-	-	-	
70-Yb-172	21.9%	-	-	-	-	-	
70-Yb-173	16.1%	-	-	-	-	-	
70-Yb-174	31.8%	-	-	-	-	-	
70-Yb-176	12.7%	-	-	-	-	-	
71-Lu		-	new 95	(Σ)	(Σ)		
71-Lu-175	97.4%	-	-	old/**2000**	67 E4	-	
71-Lu-176	2.6%	-	-	old/**2000**	67 E4	-	
72-Hf		-	83/94	(Σ)	(Σ) +)	89/94	ENL84(83)
72-Hf-174	0.2%	-	-	93	82	89/94	
72-Hf-176	5.2%	-	-	93	82	89/94	
72-Hf-177	18.6%	-	-	93	82	89/94	
72-Hf-178	27.1%	-	-	93	82	89/94	
72-Hf-179	13.7%	-	-	93	82	89/94	
72-Hf-180	35.2%	-	-	93	82	89/94	
73-Ta-180	0.01%	-	-	-	-	-	
73-Ta-181	99.99%	88/91	89/94	old ▲	72 E4	87/94 ■	
73-Ta-182		-	-	old	71 E4	-	

+)A file for natural 72-Hf existed in JEF-1 but was not included in JEF-2 although there seems to be no change in the isotopic files. The file for 72-Hf was basically the sum of the isotropic files, but with the energy distribution for inelastic continuum added as taken from ENDL-84.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.
■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Heavy elements (contd.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
74-W		(Σ)	86/94	82/91	(Σ)	89/94 ▲	
74-W-180	0.1%	-	-	-	-	-	
74-W-182	26.3%	83/90	-	old/**99** ■	73 E4	87/94	
74-W-183	14.3%	83/90	-	old/**99** ■	73 E4	87/94	
74-W-184	30.7%	83/90	-	old/**99** ■	73 E4	87/94	
74-W-186	28.6%	83/90	-	old/**99** ■	73 E4	87/94	
75-Re		88/91	-	(Σ)	(Σ)	-	
75-Re-185	37.4%	-	-	new ▲	68 E4	-	
75-Re-187	62.6%	-	-	new ▲	68 E4	-	
76-Os		90	-	-	-	-	
76-Os-184	0.02%	-	-	-	-	-	
76-Os-186	1.58%	-	-	-	-	-	
76-Os-187	1.6%	-	-	-	-	-	
76-Os-188	13.3%	-	-	-	-	-	
76-Os-189	16.1%	-	-	-	-	-	
76-Os-190	26.4%	-	-	-	-	-	
76-Os-192	41.0%	-	-	-	-	-	
77-Ir		90	-	-	-	-	
77-Ir-191	37.3%	-	-	-	-	-	
77-Ir-193	62.7%	-	-	-	-	-	
78-Pt		-	-	-	-	-	ENDL84(78)
78-Pt-190	0.01%	-	-	-	-	-	
78-Pt-192	0.79%	-	-	-	-	-	
78-Pt-194	32.9%	-	-	-	-	-	
78-Pt-195	33.8%	-	-	-	-	-	
78-Pt-196	25.3%	-	-	-	-	-	
78-Pt-198	7.2%	-	-	-	-	-	
79-Au-197	100%	E6	91/94	91 *)	77 E5	-	IRDF-90 *)

*)Note: The ENDF/B-6 evaluation for 79-Au-197(n,γ) is an international reference standard. This was also taken over in IRDF-90 where, however, the (n,2n) data are from a new evaluation.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.
■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Heavy elements (contd.)

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
80-Hg		-	new 95	-	-	-	
80-Hg-196	0.15%	-	-	-	-	-	
80-Hg-198	10.1%	-	-	-	-	-	
80-Hg-199	17.0%	-	-	-	-	-	
80-Hg-200	23.1%	-	-	-	-	-	
80-Hg-201	13.2%	-	-	-	-	-	
80-Hg-202	29.65%	-	-	-	-	-	
80-Hg-204	6.8%	-	-	-	-	-	
81-Tl-203	29.5%	-	new 95	-	-	-	
81-Tl-203(n,2n)		-	-	-	-	-	INDL/V
81-Tl-205	70.5%	-	-	-	-	-	
81-Tl-205(n,2n)		-	-	-	-	-	INDL/V
82-Pb		84/90 **)	86/94	(Σ)	71/86 E4+	89/94	▲ EFF-2.4
82-Pb-204	1.4%	90	-	-	-	89/94	
82-Pb-206	24.1%	90	-	new /**99**■	-	89/94	
82-Pb-207	22.1%	90	-	91/**99** ■	-	89/94	
82-Pb-208	52.4%	90	-	new/**99** ■	-	89/94	
83-Bi-209	100%	90	-	new/95/**99**	82 new ▲	89/94 ■	
84-Po		-	-	-	-	-	
85-At		-	-	-	-	-	
86-Rn		-	-	-	-	-	
87-Fr		-	-	-	-	-	

**)The BROND-2 files for natural Cr, Fe, Ni, Zr, Pb include γ-production data which are not included in the isotopic files.

▲ Evaluation used in EFF-2.4. In the case of JENDL: JENDL-3.1.
■ Evaluation used in FENDL/E. In the case of JENDL: JENDL-3.1

Actinides

Nucl.		BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
88-Ra-223		-	-	-	-	88	
88-Ra-224		-	-	-	-	88	
88-Ra-225		-	-	-	-	88	
88-Ra-226		-	-	-	-	88	
89-Ac-225		-	-	-	-	88	
89-Ac-226		-	-	-	-	88	
89-Ac-227		-	-	-	-	88	
90-Th-227		-	-	-	-	88/94	
90-Th-228		-	-	-	-	87/94	
90-Th-229		-	-	-	-	87/94	
90-Th-230		-	-	E5A	77 E5	87/94	
90-Th-231		-	-	-	-	-	ENDL84(78)
90-Th-232	100%	83	***)	E5A+	74 E4	89/93	
90-Th-232(n,f),(n,γ)		-	-	-	-	-	IRDF-90 *)
90-Th-233		-	-	-	-	83/94	
90-Th-234		-	-	-	-	83/94	
91-Pa-231		-	-	E5A+	77 E5	88	
91-Pa-232		-	-	-	-	88/94	
91-Pa-233		-	-	E5A	78 E5	87	
92-U-232		-	-	E5A+	77 E5	87/94	
92-U-233		90	-	old+	74 E4	87/94	
92-U-234	0.005%	-	-	E5A+	78 E5	87/94	
92-U-235	0.720%	85	92 *)	91/**95**/**98** **)	90	89/93	
92-U-235(n,f)		-	-	-	-	-	IRDF-90 *)
92-U-236		86	-	new	78 E5	88/93	
92-U-237		-	-	E5A+	76 E5	93	
92-U-238	99.275%	80/90	90/94	91/93/**98**	89	89/94	
92-U-238(n,f),(n,γ)		-	-	-	-	-	IRDF-90 *)
92-U-239		-	-	-	-	-	ENDL84(78)
92-U-240		-	-	-	-	-	ENDL84(78)

*) Note: The ENDF/B-6 evaluation for 92-U-235(n,f) is an international reference standard. This was also taken over in IRDF-90, where also the other selected actinide reactions were taken from ENDF/B-6. ENDF/B-6 data for U-235 were also taken over in CENDL-2, however with modifications for (n,2n), (n,3n), and delayed neutrons.

**) ENDF/B-6 U-235: fission energy release data were added in 1993, revised covariances in 1995.

***) For Th-232 data from JENDL-3 are used in China.

Actinides (contd.)

Nucl.	BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
93-Np-235	-	-	-	-	-	ENDL84(83)
93-Np-236	-	-	-	-	93	
93-Np-237	-	90/94	new	91	89/93	
93-Np-237(n,f)	-	-	-	-	-	IRDF-90 *)
93-Np-238	-	-	E5A+	75 E5	93	
93-Np-239	-	-	new	84 J2+	83/94	
94-Pu-236	-	-	E5A	78 E5	89/94	
94-Pu-237	-	-	E5A	78 E5	-	
94-Pu-238	87	-	E5A+	82/91	89/94	
94-Pu-239	80/90	90/94	89/93/**98**	90	89/93	
94-Pu-239(n,f)	-	-	-	-	-	IRDF-90(=E6)
94-Pu-240	80/85	92/94	91 **)	91 J2+	89/93	
94-Pu-241	79/85	-	91/95	91	89/93	
94-Pu-242	80/82	-	E5A+	84	89/94	
94-Pu-243	-	-	E5A	76 E5	-	ENDL84(78)
94-Pu-244	-	-	E5A	78 E5	-	
95-Am-241	90	88/92	CENDL-2 **)	81/89	88	
95-Am-242	90	-	75/91	80 J2	80	
95-Am-242m	90	-	78/91	91	88	
95-Am-243	90	-	new/**98**	84	88	
95-Am-244	-	-	-	-	88	
95-Am-244m	-	-	-	-	88	
96-Cm-241	-	-	E5A	78 E5	89	
96-Cm-242	87	-	E5A+	82/84	89	
96-Cm-243	-	-	E5A/**2000**	82/88	89	
96-Cm-244	88	-	E5A	85/89	89	
96-Cm-245	-	-	E5A+/**2000**	82/88	89/92	
96-Cm-246	-	-	E5A/**2000**	88 E5+	89	
96-Cm-247	-	-	E5A	88 E5+	89	
96-Cm-248	-	-	E5A	88 E5+	84	
96-Cm-249	-	-	-	-	84	
96-Cm-250	-	-	-	-	89/94	

*) Note: The ENDF/B-6 evaluation for 92-U-235(n,f) is an international reference standard. This was also taken over in IRDF-90, where also the other selected actinide reactions were taken from ENDF/B-6. ENDF/B-6 data for U-235 were also taken over in CENDL-2, however with modifications for (n,2n), (n,3n), and delayed neutrons.

**) ENDF/B-6, Pu-240, Am-241: fission energy release data were added in 1993, Am241 modified in 1995.

Actinides (contd.)

Nucl.	BROND-2	CENDL-2	ENDF/B-6	JEF-2	JENDL-3.2	Other
97-Bk-249	-	86	CENDL-2	88 E5+	85	
97-Bk-250	-	-	-	-	87	
98-Cf-249	-	89	CENDL-2	88 E5+	85	
98-Cf-250	-	-	E5A	88 E5+	86	
98-Cf-251	-	-	E5A+	88 E5+	86	
98-Cf-252	-	-	76/91	88 E5+	87	**)
98-Cf-253	-	-	E5A	88 E5+	-	
98-Cf-254	-	-	-	-	87/94	
99-Es-253	-	-	E5A	88 E5+	-	
99-Es-254	-	-	-	-	87/94	
99-Es-255	-	-	-	-	87/94	
100-Fm-255	-	-	-	-	87/94	

Number of elements/isotopes:

121	67	319	314	340

**) Evaluated spontaneous fission-neutron spectrum of Cf-252 see Mannhart's file of 1987 documented in IAEA-NDS-98 Rev. 1 and included in the ENDF/B-6 decay data file. This evaluation and the spontaneous fission neutron yield of Cf-252 are international reference standards which are included in the ENDF/B-6 decay data file MAT 9861.

Fission-product yield data

Recent evaluations of fission-product yield data are included in the following libraries:

E6 - ENDF/B-6 fission-product yield sublibrary (1993 revision); see IAEA-NDS-106.

U2 - JEF-2.2 fission-product yield sublibrary. This originates from UKFY2, the UK fission-product yield library; see IAEA-NDS-124.

JL - JENDL-3.2 fission-product yield sublibrary (1994); see IAEA-NDS-138; the data were taken from JNDC-FP2, see next item.

JN - JNDC-FP2, the JNDC nuclear data library of fission-products; see IAEA-NDS-51. Of this library the present list includes only those data (i.e. Cf-252) which were not incorporated into JENDL-3.2 FPY.

BWE - Brady, Wright, England: Fission-product yield data for minor actinides; see IAEA-NDS-102.

A - ASIYAD, a Russian fission-product yield data library by A.F. Grashin et al., see IAEA-NDS-133.

	Thermal	Fast	14 MeV	Spontaneous
90-Th-227	E6			
229	E6			
232		E6,U2,JL	E6,U2,JL	
91-Pa-231		E6		
92-U-232	E6,A	A		
233	E6,U2,JL	E6,U2,JL,A	E6,U2,JL	
234		E6,U2,A	E6	
235	E6,U2,JL,A	E6,U2,JL,A	E6,U2,JL	
236		E6,U2,JL,A	E6	
237	A	E6,A		
238		E6,U2,JL,A	E6,U2,JL	E6
239		A		
93-Np-236		A		
237	E6,U2,BWE	E6,U2,JL,A	E6,BWE	
238	U2,A	E6,U2,A		
239		A		
94-Pu-236	A	A		
238	U2	E6,U2	BWE	
239	E6,U2,JL,A	E6,U2,JL,A	E6,JL	
240	E6,BWE	E6,U2,JL,A	E6	
241	E6,U2,JL,A	E6,U2,JL,A		
242	E6,BWE	E6,U2,JL,A	E6,BWE	
243	A	A		
95-Am-241	E6,U2,A	E6,U2,BWE	E6	
242m	E6,U2,A	U2,A		
243	U2	E6,U2,BWE, A		
96-Cm-242		E6,BWE		U2
243	E6,U2,BWE	E6,U2,BWE		
244	U2,BWE	E6,U2,BWE		E6,U2,BWE
245	E6,U2,BWE,	U2,BWE		
246	A	E6,BWE		E6,BWE
247	BWE	BWE		
248	BWE	E6,BWE		E6,BWE
	BWE			
98-Cf-249	E6			
250				E6
251	E6			
252				E6,U2,JN
99-Es-253				E6
254	E6			
100-Fm-254				E6
255	E6			
256				E6