**A Room Temperature
END/B-VI, Mod. 3
Cross Section Library**

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Introduction

The ENDF/B-VI Mod. 2 library distributed in July 1994 has now been updated to include the most recent modifications to ENDF/B-VI; namely, Mod. 3. Between the original distribution (Mod. 0) and Mod. 2 libraries, 74 evaluations were updated and distributed in July 1994 (see, UCRL-ID-117797). Between Mod. 2 and 3 libraries, 18 evaluations were updated. No completely new evaluations have been added to the library since the original Mod. 0 release of ENDF/B-VI.

Starting from the original evaluations, including cross sections represented in terms of a combination of resonance parameters and nominally 0 Kelvin cross sections, all of these evaluations have been processed using the ENDF/B Pre-processing codes, to produce room temperature, linearly interpolable tabulated cross sections, in the ENDF/B-VI format, ready for use in applications.

Data Processing

The steps required and codes used to produce room temperature, linearly interpolable tabulated cross sections, in the ENDF/B-VI format, are described below (the name of each code is given in parenthesis; for details of each code, see IAEA-NDS-39, Rev. 8, Nuclear Data Section, International Atomic Energy Agency, Vienna, Austria),

- 1) Linearly interpolable, tabulated cross sections (LINEAR)
- 2) Including the resonance contribution (RECENT)
- 3) Doppler broaden all cross sections to room temperature (SIGMA1)
- 4) Check data, define redundant cross sections by summation (FIXUP)

The result is linearly interpolable, tabulated, room temperature cross sections, in the ENDF/B-VI format, ready to be used in applications.

Contents of the Library

This library contains all of the evaluations in the ENDF/B-VI general purpose library. The following page summarizes the contents of the ENDF/B-VI general purpose library. This library contains evaluations for 321 materials (isotopes or naturally occurring elemental mixtures of isotopes).

This library does not contain data from special purpose ENDF/B-VI libraries, such as fission products, thermal scattering, photon interaction data. To obtain any of these special purpose libraries contact the National Nuclear Data Center, Brookhaven National Laboratory.

Each evaluation is stored as a separate file. The following table defines each material and the corresponding filename. The entire library is in the computer independent ENDF/B-VI character format, which allows the data to be easily transported between computers. The entire library requires approximately 132 mega-bytes of storage.

This library contains data for some metastable materials, which are indicated by an "m" at the end of their descriptions. The library also contains two evaluations for ²⁶Fe-56; a standard evaluation

extending up to an incident neutron energy of 20 MeV, and a second high energy evaluation extending up to 1 GeV; the latter is identified in the following table as 26-Fe-56x.

The majority of these evaluations are complete, in the sense that they include all cross sections over the energy range 10^{-5} eV to at least 20 MeV. However, the following are only partial evaluations that either only contain single reactions and no total cross section (12-Mg-24, 19-K-41, 22-Ti-46, 22-Ti-47, 22-Ti-48, 22-Ti-50 and 28-Ni-59), or do not include cross sections above the resonance region (18-Ar-40, 42-Mo-92, 42-Mo-98, 42-Mo-100, 49-In-115, 50-Sn-120, 50-Sn-112 and 50-Sn-124).

Summary of September 1993 Update

The library was updated to include the effects of a convention regarding the definition of resolved resonance parameters used by evaluators that was not clearly described in the ENDF/B-VI Formats and Procedures manual. These changes only effect the elastic scattering cross section of the following materials: Fe-54, Fe-56 and Ni-58.

Summary of July 1994 Update

The 74 evaluations modified between the original (Mod. 0) and Mod. 2 libraries were included in the distribution; Mod. 2 results replaced the older results. For details see the following table of materials modified between the original and Mod. 2 libraries.

Summary of March 1996 Update

The 18 evaluations modified between Mod. 2 and 3 libraries are included in the current distribution; Mod. 3 results replaced the older results. For details see the following table of materials modified between Mod. 2 and 3.

Acknowledgments

I thank the Nuclear Data Section of the International Nuclear Energy Agency, Vienna, Austria, for providing the computer time and programmer support to process all of the Mod. 3 data, as they have processed all earlier versions of this library.

ENDF/B-VI Mod. 3 Library (Z = 1 through 51)

Material	Filename	Material	Filename	Material	Filename
1-H -1	za001001	29-Cu-65	za029065	43-Tc-99	za043099
1-H -2	za001002	31-Ga-Nat	za031000	44-Ru-96	za044096
1-H -3	za001003	32-Ge-72	za032072	44-Ru-98	za044098
2-He-3	za002003	32-Ge-73	za032073	44-Ru-99	za044099
2-He-4	za002004	32-Ge-74	za032074	44-Ru-100	za044100
3-Li-6	za003006	32-Ge-76	za032076	44-Ru-101	za044101
3-Li-7	za003007	33-As-75	za033075	44-Ru-102	za044102
4-Be-9	za004009	34-Se-74	za034074	44-Ru-103	za044103
5-B -10	za005010	34-Se-76	za034076	44-Ru-104	za044104
5-B -11	za005011	34-Se-77	za034077	44-Ru-105	za044105
6-C -Nat	za006000	34-Se-78	za034078	44-Ru-106	za044106
7-N -14	za007014	34-Se-80	za034080	45-Rh-103	za045103
7-N -15	za007015	34-Se-82	za034082	45-Rh-105	za045105
8-O -16	za008016	35-Br-79	za035079	46-Pd-102	za046102
8-O -17	za008017	35-Br-81	za035081	46-Pd-104	za046104
9-F -19	za009019	36-Kr-78	za036078	46-Pd-105	za046105
11-Na-23	za011023	36-Kr-80	za036080	46-Pd-106	za046106
12-Mg-Nat	za012000	36-Kr-82	za036082	46-Pd-107	za046107
12-Mg-24	za012024	36-Kr-83	za036083	46-Pd-108	za046108
13-Al-27	za013027	36-Kr-84	za036084	46-Pd-110	za046110
14-Si-Nat	za014000	36-Kr-85	za036085	47-Ag-107	za047107
15-P -31	za015031	36-Kr-86	za036086	47-Ag-109	za047109
16-S -Nat	za016000	37-Rb-85	za037085	47-Ag-111	za047111
16-S -32	za016032	37-Rb-86	za037086	48-Cd-Nat	za048000
17-Cl-Nat	za017000	37-Rb-87	za037087	48-Cd-106	za048106
18-Ar-40	za018040	38-Sr-84	za038084	48-Cd-108	za048108
19-K -Nat	za019000	38-Sr-86	za038086	48-Cd-110	za048110
19-K -41	za019041	38-Sr-87	za038087	48-Cd-111	za048111
20-Ca-Nat	za020000	38-Sr-88	za038088	48-Cd-112	za048112
21-Sc-45	za021045	38-Sr-89	za038089	48-Cd-113	za048113
22-Ti-Nat	za022000	38-Sr-90	za038090	48-Cd-114	za048114
22-Ti-46	za022046	39-Y -89	za039089	48-Cd-115m	za048115m
22-Ti-47	za022047	39-Y -90	za039090	48-Cd-116	za048116
22-Ti-48	za022048	39-Y -91	za039091	49-In-Nat	za049000
22-Ti-50	za022050	40-Zr-Nat	za040000	49-In-113	za049113
23-V -Nat	za023000	40-Zr-90	za040090	49-In-115	za049115
24-Cr-50	za024050	40-Zr-91	za040091	50-Sn-112	za050112
24-Cr-52	za024052	40-Zr-92	za040092	50-Sn-114	za050114
24-Cr-53	za024053	40-Zr-93	za040093	50-Sn-115	za050115
24-Cr-54	za024054	40-Zr-94	za040094	50-Sn-116	za050116
25-Mn-55	za025055	40-Zr-95	za040095	50-Sn-117	za050117
26-Fe-54	za026054	40-Zr-96	za040096	50-Sn-118	za050118
26-Fe-56	za026056	41-Nb-93	za041093	50-Sn-119	za050119
26-Fe-56x	za026056x	41-Nb-94	za041094	50-Sn-120	za050120
26-Fe-57	za026057	41-Nb-95	za041095	50-Sn-122	za050122
26-Fe-58	za026058	42-Mo-Nat	za042000	50-Sn-123	za050123
27-Co-59	za027059	42-Mo-92	za042092	50-Sn-124	za050124
28-Ni-58	za028058	42-Mo-94	za042094	50-Sn-125	za050125
28-Ni-59	za028059	42-Mo-95	za042095	50-Sn-126	za050126
28-Ni-60	za028060	42-Mo-96	za042096	51-Sb-121	za051121
28-Ni-61	za028061	42-Mo-97	za042097	51-Sb-123	za051123
28-Ni-62	za028062	42-Mo-98	za042098	51-Sb-124	za051124
28-Ni-64	za028064	42-Mo-99	za042099	51-Sb-125	za051125
29-Cu-63	za029063	42-Mo-100	za042100	51-Sb-126	za051126

ENDF/B-VI Mod. 3 Library (Z = 52 through 99)

Material	Filename	Material	Filename	Material	Filename
52-Te-120	za052120	60-Nd-147	za060147	74-W -182	za074182
52-Te-122	za052122	60-Nd-148	za060148	74-W -183	za074183
52-Te-123	za052123	60-Nd-150	za060150	74-W -184	za074184
52-Te-124	za052124	61-Pm-147	za061147	74-W -186	za074186
52-Te-125	za052125	61-Pm-148	za061148	75-Re-185	za075185
52-Te-126	za052126	61-Pm-148m	za061148m	75-Re-187	za075187
52-Te-127m	za052127m	61-Pm-149	za061149	79-Au-197	za079197
52-Te-128	za052128	61-Pm-151	za061151	82-Pb-206	za082206
52-Te-129m	za052129m	62-Sm-144	za062144	82-Pb-207	za082207
52-Te-130	za052130	62-Sm-147	za062147	82-Pb-208	za082208
52-Te-132	za052132	62-Sm-148	za062148	83-Bi-209	za083209
53-I -127	za053127	62-Sm-149	za062149	90-Th-230	za090230
53-I -129	za053129	62-Sm-150	za062150	90-Th-232	za090232
53-I -130	za053130	62-Sm-151	za062151	91-Pa-231	za091231
53-I -131	za053131	62-Sm-152	za062152	91-Pa-233	za091233
53-I -135	za053135	62-Sm-153	za062153	92-U -232	za092232
54-Xe-124	za054124	62-Sm-154	za062154	92-U -233	za092233
54-Xe-126	za054126	63-Eu-151	za063151	92-U -234	za092234
54-Xe-128	za054128	63-Eu-152	za063152	92-U -235	za092235
54-Xe-129	za054129	63-Eu-153	za063153	92-U -236	za092236
54-Xe-130	za054130	63-Eu-154	za063154	92-U -237	za092237
54-Xe-131	za054131	63-Eu-155	za063155	92-U -238	za092238
54-Xe-132	za054132	63-Eu-156	za063156	93-Np-237	za093237
54-Xe-133	za054133	63-Eu-157	za063157	93-Np-238	za093238
54-Xe-134	za054134	64-Gd-152	za064152	93-Np-239	za093239
54-Xe-135	za054135	64-Gd-154	za064154	94-Pu-236	za094236
54-Xe-136	za054136	64-Gd-155	za064155	94-Pu-237	za094237
55-Cs-133	za055133	64-Gd-156	za064156	94-Pu-238	za094238
55-Cs-134	za055134	64-Gd-157	za064157	94-Pu-239	za094239
55-Cs-135	za055135	64-Gd-158	za064158	94-Pu-240	za094240
55-Cs-136	za055136	64-Gd-160	za064160	94-Pu-241	za094241
55-Cs-137	za055137	65-Tb-159	za065159	94-Pu-242	za094242
56-Ba-134	za056134	65-Tb-160	za065160	94-Pu-243	za094243
56-Ba-135	za056135	66-Dy-160	za066160	94-Pu-244	za094244
56-Ba-136	za056136	66-Dy-161	za066161	95-Am-241	za095241
56-Ba-137	za056137	66-Dy-162	za066162	95-Am-242	za095242
56-Ba-138	za056138	66-Dy-163	za066163	95-Am-242m	za095242m
56-Ba-140	za056140	66-Dy-164	za066164	95-Am-243	za095243
57-La-139	za057139	67-Ho-165	za067165	96-Cm-241	za096241
57-La-140	za057140	68-Er-166	za068166	96-Cm-242	za096242
58-Ce-140	za058140	68-Er-167	za068167	96-Cm-243	za096243
58-Ce-141	za058141	71-Lu-175	za071175	96-Cm-244	za096244
58-Ce-142	za058142	71-Lu-176	za071176	96-Cm-245	za096245
58-Ce-143	za058143	72-Hf-Nat	za072000	96-Cm-246	za096246
58-Ce-144	za058144	72-Hf-174	za072174	96-Cm-247	za096247
59-Pr-141	za059141	72-Hf-176	za072176	96-Cm-248	za096248
59-Pr-142	za059142	72-Hf-177	za072177	97-Bk-249	za097249
59-Pr-143	za059143	72-Hf-178	za072178	98-Cf-249	za098249
60-Nd-142	za060142	72-Hf-179	za072179	98-Cf-250	za098250
60-Nd-143	za060143	72-Hf-180	za072180	98-Cf-251	za098251
60-Nd-144	za060144	73-Ta-181	za073181	98-Cf-252	za098252
60-Nd-145	za060145	73-Ta-182	za073182	98-Cf-253	za098253
60-Nd-146	za060146	74-W -Nat	za074000	99-Es-253	za099253

Materials Modified for Mod. 2 Library

Material	Filename	Material	Filename	Material	Filename
1-H -1	za001001	40-Zr-Nat	za040000	72-Hf-178	za072178
2-He-3	za002003	41-Nb-93	za041093	72-Hf-179	za072179
3-Li-6	za003006	44-Ru-101	za044101	72-Hf-180	za072180
5-B -10	za005010	44-Ru-102	za044102	74-W -Nat	za074000
6-C -Nat	za006000	48-Cd-106	za048106	79-Au-197	za079197
7-N -14	za007014	48-Cd-108	za048108	82-Pb-207	za082207
11-Na-23	za011023	48-Cd-110	za048110	92-U -235	za092235
21-Sc-45	za021045	48-Cd-112	za048112	92-U -237	za092237
24-Cr-50	za024050	48-Cd-114	za048114	92-U -238	za092238
24-Cr-52	za024052	48-Cd-116	za048116	93-Np-237	za093237
24-Cr-53	za024053	50-Sn-112	za050112	93-Np-238	za093238
24-Cr-54	za024054	50-Sn-114	za050114	94-Pu-239	za094239
26-Fe-54	za026054	53-I -127	za053127	94-Pu-240	za094240
26-Fe-56	za026056	57-La-139	za057139	94-Pu-241	za094241
26-Fe-57	za026057	60-Nd-143	za060143	94-Pu-243	za094243
26-Fe-58	za026058	60-Nd-145	za060145	95-Am-241	za095241
27-Co-59	za027059	60-Nd-147	za060147	95-Am-242	za095242
28-Ni-58	za028058	61-Pm-147	za061147	96-Cm-245	za096245
28-Ni-60	za028060	62-Sm-150	za062150	96-Cm-246	za096246
28-Ni-61	za028061	62-Sm-151	za062151	96-Cm-247	za096247
28-Ni-62	za028062	62-Sm-152	za062152	98-Cf-250	za098250
28-Ni-64	za028064	63-Eu-155	za063155	98-Cf-251	za098251
29-Cu-63	za029063	72-Hf-174	za072174	98-Cf-252	za098252
29-Cu-65	za029065	72-Hf-176	za072176	98-Cf-253	za098253
32-Ge-73	za032073	72-Hf-177	za072177		

Materials Modified for Mod. 3 Library

Material	Filename
1-H -2	za001002
7-N -14	za007014
13-Al-27	za013027
48-Cd-106	za048106
48-Cd-108	za048108
48-Cd-110	za048110
48-Cd-111	za048111
48-Cd-112	za048112
48-Cd-113	za048113
48-Cd-114	za048114
48-Cd-116	za048116
56-Ba-138	za056138
56-Ba-140	za056140
62-Sm-144	za062144
83-Bi-209	za083209
92-U -235	za092235
94-Pu-241	za094241
95-Am-241	za095241