INTERNATIONAL ATOMIC ENERGY AGENCY

NUCLEAR DATA SERVICES

DOCUMENTATION SERIES OF THE IAEA NUCLEAR DATA SECTION

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JENDL-3.3

The Japanese Evaluated Nuclear Data Library

by the JAERI Nuclear Data Center
and the Japanese Nuclear Data Committee

Summary of contents

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Abstract: This document summarizes the contents of JENDL-3.3, the Japanese evaluated data library for neutron nuclear data, released in 2002 and supercedes JENDL-3.2. The present version also includes fission-products cross-section data which were previously contained in a separate library. The entire library or retrievals of selected materials are available online or on CD-ROM from the IAEA Nuclear Data Section free of charge.

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Online: TELNET or FTP: iaeand.iaea.org
username: IAEANDS for interactive Nuclear Data Information System
usernames: ANONYMOUS for FTP file transfer;
FENDL2 for FTP file transfer of FENDL-2.0;
RIPL for FTP file transfer of RIPL;
NDSONL for FTP access to files sent to NDIS "open" area.
Web: http://www-nds.iaea.org

Note:

The IAEA-NDS-reports should not be considered as formal publications. When a nuclear data library is sent out by the IAEA Nuclear Data Section, it will be accompanied by an IAEA-NDS-report which should give the data user all necessary documentation on contents, format and origin of the data library.

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.

Neither the originator of the data libraries nor the IAEA assume any liability for their correctness or for any damages resulting from their use.

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Citation guidelines:

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Japanese Evaluated Nuclear Data Library Version 3 Revision-3: JENDL-3.3
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November 2002

JENDL-3

The Japanese Evaluated Nuclear Data Library

Introduction

JENDL-3 was released in December 1989. The data library was compiled and tested by the Nuclear Data Centre of the Japanese Atomic Energy Research Institute (JAERI) and made available to the IAEA Nuclear Data Section. The second update, JENDL-3.2, was released in June 1994. The third update JENDL-3.3 was released in October 2002. The purpose of which is to provide a Japanese standard library for fast breeder reactors, thermal reactors, fusion neutronics and shielding calculations, and other applications

The original version of this library is documented in the report "Japanese Evaluated Nuclear Data Library, Version 3 - JENDL-3" by K. Shibata, T. Nakagawa, T. Asami, T. Fukahori, T. Narita, S. Chiba, M. Mizumoto, A. Hasegawa, Y. Kikuchi, Y. Nakajima, S. Igarasi, JAERI-1319 (1990).

It superseded the earlier library JENDL-2 and superseded also a temporary version of JENDL-3 which has been known as JENDL-3T and reported at the 1988 Nuclear Data Conference in Mito, Japan (proceedings, page 533).

The library contains evaluations of neutron reaction data for 337 elements or isotopes from 1-H-1 to 100-Fm-255 in the energy range from 10^{-5} eV to 20 MeV.

Compared to JENDL-2 the size of the library has been increased significantly. The accuracy of the data has increased. Gamma-ray production data have been added. Special emphasis has been given to the higher energy regions. For fission-neutron spectra the Madland-Nix formula is used.

Users will notice that some important activation reactions such as 79-Au-197(n,γ) were not included in JENDL-3. For this reaction users are referred to the ENDF/B-6 standards library or to the specialized libraries for neutron-dosimetry reactions.

Revision 1: A modified version, i.e. JENDL-3.1 was released in December 1990.

Revision 2: A second update, i.e. JENDL-3.2, was released in June 1994. Modifications have been made to most of the materials. The JENDL library of fission-product cross-sections, which was previously a separate library, has been incorporated, and several new evaluations for additional nuclides have been added.

Revision 3: A third update, i.e. JENDL-3.3, was released in Oct. 2002. Data were improved for medium -heavy and actinide nuclides. Double-differential cross sections (DDXs) and covariance matrices of uncertainties were given to part of nuclides. Pointwise files have been prepared at 0K and 300K temperatures with computer codes
RECENT and SIGMA1.

The entire library of JENDL-3 Rev**.** 3 has a size of 1.02 GigaBytes. The original file is 11 Mbytes, the 0K file is 550 Mbytes and the 300K file is 387 Mbytes. The complete library with comment and graphic files is available free on a CD-ROM.

part	nuclides	# of MAT's
1	1-H to 21 Sc light elements	40
2	22-Ti to 29-Cu structural materials	23
3	31-Ga to 68-Er medium elements and fission products	185
4	72-Hf to 83-Bi medium elements	23
5	88-Ra to 100-Fm actinides	66
		337

Release conditions

The data library JENDL-3 has been released freely with the understanding

- that reprints of publications in which JENDL-3 data have been used, and
- that comments on data accuracies or deficiencies encountered in the data files

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Documentation

The library is well documented in the text section of each material (MF/MT = 1/451). The CD-ROM with JENDL-3.3, Data and Figures, 2002, distributed by the Nuclear Data Centre of the JAERI contains:

- descriptions (text sections)
- original files and files with cross sections given for two temperatures (0°K and 300°K)
- figures of major cross sections
- tables of 0.0253 eV, 14 Mev, Maxwellian average and fission spectrum average cross sections and resonance integrals

JENDL-3.2, the earlier version of the JENDL-3 library, is superseded. However it's documentation may still be of interest for comparison purposes.

"Curves and Tables of Neutron Cross-Sections" of JENDL-3.2 were contained in the report JAERI-M-90-099 edited by T. Nakagawa, T. Asami, T. Yoshida (July 1990). It contains

- cross-section curves
- curves of $\overline{\nu}$ and $\overline{\nu}*\sigma_f$
- tables of average cross-sections
- tables of 2200 m/s, 14 MeV, Maxwellian average, fission average cross-sections, of resonance integrals, and/or of threshold energies.

Detailed reports on individual evaluations are being published as JAERI reports which, however, have so far been issued only for a limited number of nuclides.

JENDL-2 is the earlier version of the JENDL-3 library, published as:

JAERI-M-84-103 (June 1984), T. Nakagawa: Summary of the JENDL-2 General Purpose File

JAERI-M-84-052 (March 1984), Japanese Nuclear Data Committee: Graphs of Evaluated Neutron Cross-Sections in JENDL-2.

Format

The format of JENDL-3.3 is ENDF-6 which is described in detail in the report IAEA-NDS-76 Rev. 6**.**

Users of JENDL-2 will remember that the format did not fully agree with ENDF so that the resonances had to be treated with the code RESENDD instead of the ENDF code RECENT. For JENDL-3.2 and JENDL-3.3 the ENDF-6 format is strictly followed so that the normal ENDF processing codes can be applied.

Data processing computer codes

The following ENDF-6 processing codes are available from the IAEA Nuclear Data Section, free of charge:

ENDF Pre-Processing Codes, 2000 version, by D.E. Cullen.
See document IAEA-NDS-39 Rev. 10.

ENDF Utility Codes from NNDC, version 6.13, by NNDC.
See document IAEA-NDS-29 Rev. 6.13.

PLOTC4: plots experimental EXFOR data together with ENDF formatted data.
See document IAEA-NDS-79 Rev. 1.

ENDVER: The ENDF File Verification Support Package.
See document IAEA-NDS-77 Rev. 0.

Not available from IAEA:

NJOY: This must be requested from the Radiation Safety Information Computational Center (RSICC), Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN, USA-37831.

Selected literature

K. Shibata, S. Igarasi, T. Asami
Evaluated gamma-ray production data for 66 nuclides in JENDL-3.2.
Report INDC(NDS)-334 (May 1995) p. 127.

F. Maekawa, Y. Oyama
Benchmark tests of gamma-ray production data in JENDL-3.2 and FENDL-1.
Report INDC(NDS)-334 (May 1995) p. 139.

K.Shibata, T.Kawano et al.
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History of JENDL-3

1989 Dec. Release of JENDL-3. Data were given to 171 nuclei /1/.

1990 Dec. The first revision (JENDL-3.1) was released. Minor errors in compilation were modified. The data for fission product nuclei /2/ were added. The data for 324 nuclei in total are given in JENDL-3.1.

1994 Jun. The JENDL-3 revision 2 (JENDL-3.2) was released. In JENDL-3.2, new evaluated data were given to 16 nuclei, and modification was carried out to the data of about 180 nuclides. This version contains the data of 340 nuclides which are listed below.

Modifications after June 1994

1994.07

1) Zr-92: resonance parameters, cross sections of mt=2, 52, 54 and 57. Angular distributions of mt=52, 54 and
2) Order of isotopes in Pb-Nat resonance parameters.
3) An LWF flag was set to 1 for the following nuclei.

U-236, PU-240, PU-242, AM-241, CM-242, CM-243, CM-244, CM-245, CM-248, BK-249, BK-250, CF-249, CF-250, CF-251, CF-252

The LFW flag was set to 0 for Th-229.

Note: corrections of the items 2 and 3 have no effects on the reconstructed resonance cross sections. Therefore, mod numbers were not changed, and 'revised' flag is not given in the following content table.

1994.08 Comment part of Eu-153 and Pu-241 was modified.

2002.05 JENDL-3.3 released

Contents of JENDL-3.3

JENDL-3.3 contains the evaluated data for 337 nuclides.

Please note that the compactness of the present summary does not permit for the description of the status of the evaluations in depth. For further details see the documentation contained in the beginning of each data set, or select the link below in the "STATUS" column to view the detail.

NUCLIDE	MAT	STATUS
1-H-1	125	REVISED
1-H-2	128	REVISED
2-HE-3	225	REVISED
2-HE-4	228	REVISED
3-LI-6	325	REVISED
3-LI-7	328	REVISED
4-BE-9	425	REVISED
5-B-10	525	REVISED
5-B-11	528	REVISED
6-C- 0	600	REVISED
7-N-14	725	REVISED
7-N-15	728	REVISED
8-O-16	825	REVISED
9-F-19	925	REVISED
11-NA-23	1125	REVISED
12-MG-24	1225	REVISED
12-MG-25	1228	REVISED
12-MG-26	1231	REVISED
13-AL-27	1325	REVISED

NUCLIDE	MAT	STATUS
14-SI-28	1425	REVISED
14-SI-29	1428	REVISED
14-SI-30	1431	REVISED
15-P-31	1525	REVISED
16-S-32	1625	REVISED
16-S-33	1628	REVISED
16-S-34	1631	REVISED
16-S-36	1637	REVISED
17-CL-35	1725	REVISED
17-CL-37	1731	REVISED
18-AR-40	1837	REVISED
19-K-39	1925	REVISED
19-K-40	1928	REVISED
19-K-41	1931	REVISED

NUCLIDE	MAT	STATUS
20-CA-40	2025	REVISED
20-CA-42	2031	REVISED
20-CA-43	2034	REVISED
20-CA-44	2037	REVISED
20-CA-46	2043	REVISED
20-CA-48	2049	REVISED
21-SC-45	2125	REVISED
22-TI-46	2225	REVISED
22-TI-47	2228	REVISED
22-TI-48	2231	REVISED
22-TI-49	2234	REVISED
22-TI-50	2237	REVISED
23-V - 0	2300	REVISED
24-CR-50	2425	REVISED
24-CR-52	2431	REVISED
24-CR-53	2434	REVISED
24-CR-54	2437	REVISED
25-MN-55	2525	REVISED

NUCLIDE	MAT	STATUS
26-FE-54	2625	REVISED
26-FE-56	2631	REVISED
26-FE-57	2634	REVISED
26-FE-58	2637	REVISED
27-CO-59	2725	REVISED
28-NI-58	2825	REVISED
28-NI-60	2831	REVISED
28-NI-61	2834	REVISED
28-NI-62	2837	REVISED
28-NI-64	2843	REVISED
29-CU-63	2925	REVISED
29-CU-65	2931	REVISED

NUCLIDE	MAT	STATUS
31-GA-69	3125	REVISED
31-GA-71	3131	REVISED
32-GE-70	3225	REVISED
32-GE-72	3231	REVISED
32-GE-73	3234	REVISED
32-GE-74	3237	REVISED
32-GE-76	3243	REVISED
33-AS-75	3325	REVISED
34-SE-74	3425	REVISED
34-SE-76	3431	REVISED
34-SE-77	3434	REVISED
34-SE-78	3437	REVISED
34-SE-79	3440	REVISED
34-SE-80	3443	REVISED
34-SE-82	3449	REVISED

NUCLIDE	MAT	STATUS
35-BR-79	3525	REVISED
35-BR-81	3531	REVISED
36-KR-78	3625	REVISED
36-KR-80	3631	REVISED
36-KR-82	3637	REVISED
36-KR-83	3640	REVISED
36-KR-84	3643	REVISED
36-KR-85	3646	REVISED
36-KR-86	3649	REVISED
37-RB-85	3725	REVISED
37-RB-87	3731	REVISED
38-SR-86	3831	REVISED
38-SR-87	3834	REVISED
38-SR-88	3837	REVISED
38-SR-89	3840	REVISED
38-SR-90	3843	REVISED
39-Y-89	3925	REVISED
39-Y-91	3931	REVISED
40-ZR-90	4025	REVISED
40-ZR-91	4028	REVISED
40-ZR-92	4031	REVISED
40-ZR-93	4034	REVISED
40-ZR-94	4037	REVISED
40-ZR-95	4040	REVISED
40-ZR-96	4043	REVISED

NUCLIDE	MAT	STATUS
41-NB-93	4125	REVISED
41-NB-94	4128	REVISED
41-NB-95	4131	REVISED
42-MO-92	4225	REVISED
42-MO-94	4231	REVISED
42-MO-95	4234	REVISED
42-MO-96	4237	REVISED
42-MO-97	4240	REVISED
42-MO-98	4243	REVISED
42-MO-99	4246	REVISED
42-MO-100	4249	REVISED
43-TC-99	4331	REVISED
44-RU-96	4425	REVISED
44-RU-98	4431	REVISED
44-RU-99	4434	REVISED
44-RU-100	4437	REVISED
44-RU-101	4440	REVISED
44-RU-102	4443	REVISED
44-RU-103	4446	REVISED
44-RU-104	4449	REVISED
44-RU-106	4455	REVISED

NUCLIDE	MAT	STATUS
45-RH-103	4525	REVISED
45-RH-105	4531	REVISED
46-PD-102	4625	REVISED
46-PD-104	4631	REVISED
46-PD-105	4634	REVISED
46-PD-106	4637	REVISED
46-PD-107	4640	REVISED
46-PD-108	4643	REVISED
46-PD-110	4649	REVISED
47-AG-107	4725	REVISED
47-AG-109	4731	REVISED
47-AG-110M	4735	REVISED
48-CD-106	4825	REVISED
48-CD-108	4831	REVISED
48-CD-110	4837	REVISED
48-CD-111	4840	REVISED
48-CD-112	4843	REVISED
48-CD-113	4846	REVISED
48-CD-114	4849	REVISED
48-CD-116	4855	REVISED
49-IN-113	4925	REVISED
49-IN-115	4931	REVISED

NUCLIDE	MAT	STATUS
50-SN-112	5025	REVISED
50-SN-114	5031	REVISED
50-SN-115	5034	REVISED
50-SN-116	5037	REVISED
50-SN-117	5040	REVISED
50-SN-118	5043	REVISED
50-SN-119	5046	REVISED
50-SN-120	5049	REVISED
50-SN-122	5055	REVISED
50-SN-123	5058	REVISED
50-SN-124	5061	REVISED
50-SN-126	5067	REVISED
51-SB-121	5125	REVISED
51-SB-123	5131	REVISED
51-SB-124	5134	REVISED
51-SB-125	5137	REVISED
52-TE-120	5225	REVISED
52-TE-122	5231	REVISED
52-TE-123	5234	REVISED
52-TE-124	5237	REVISED
52-TE-125	5240	REVISED
52-TE-126	5243	REVISED
52-TE-127M	5247	REVISED
52-TE-128	5249	REVISED
52-TE-129M	5253	REVISED
52-TE-130	5255	REVISED
53-I-127	5325	REVISED
53-I-129	5331	REVISED
53-I-131	5337	REVISED
54-XE-124	5425	REVISED
54-XE-126	5431	REVISED
54-XE-128	5437	REVISED
54-XE-129	5440	REVISED
54-XE-130	5443	REVISED
54-XE-131	5446	REVISED
54-XE-132	5449	REVISED
54-XE-133	5452	REVISED
54-XE-134	5455	REVISED
54-XE-135	5458	REVISED
54-XE-136	5461	REVISED

NUCLIDE	MAT	STATUS
55-CS-133	5525	REVISED
55-CS-134	5528	REVISED
55-CS-135	5531	REVISED
55-CS-136	5534	REVISED
55-CS-137	5537	REVISED
56-BA-130	5625	REIVSED
56-BA-132	5631	REIVSED
56-BA-134	5637	REIVSED
56-BA-135	5640	REVISED
56-BA-136	5643	REIVSED
56-BA-137	5646	REVISED
56-BA-138	5649	REVISED
56-BA-140	5655	REVISED
57-LA-138	5725	REVISED
57-LA-139	5728	REVISED
58-CE-140	5837	REVISED
58-CE-141	5840	REVISED
58-CE-142	5843	REVISED
58-CE-144	5849	REVISED
59-PR-141	5925	REVISED
59-PR-143	5931	REVISED
60-ND-142	6025	REVISED
60-ND-143	6028	REVISED
60-ND-144	6031	REVISED
60-ND-145	6034	REVISED
60-ND-146	6037	REVISED
60-ND-147	6040	REVISED
60-ND-148	6043	REVISED
60-ND-150	6049	REVISED

NUCLIDE	MAT	STATUS
61-PM-147	6149	REVISED
61-PM-148	6152	REVISED
61-PM-148M	6153	REVISED
61-PM-149	6155	REVISED
62-SM-144	6225	REVISED
62-SM-147	6234	REVISED
62-SM-148	6237	REVISED
62-SM-149	6240	REVISED
62-SM-150	6243	REVISED
62-SM-151	6246	REVISED
62-SM-152	6249	REVISED
62-SM-153	6252	REVISED
62-SM-154	6255	REVISED
63-EU-151	6325	REVISED
63-EU-152	6328	REVISED
63-EU-153	6331	REVISED
63-EU-154	6334	REVISED
63-EU-155	6337	REVISED
63-EU-156	6340	REVISED
64-GD-152	6425	REVISED
64-GD-154	6431	REVISED
64-GD-155	6434	REVISED
64-GD-156	6437	REVISED
64-GD-157	6440	REVISED
64-GD-158	6443	REVISED
64-GD-160	6449	REVISED
65-TB-159	6525	REVISED

NUCLIDE	MAT	STATUS
68-ER-162	**6825**	NEW EVALUATION
68-ER-164	**6831**	NEW EVALUATION
68-ER-166	**6837**	NEW EVALUATION
68-ER-167	**6840**	NEW EVALUATION
68-ER-168	**6843**	NEW EVALUATION
68-ER-170	**6849**	NEW EVALUATION
72-HF-174	7225	REVISED
72-HF-176	7231	REVISED
72-HF-177	7234	REVISED
72-HF-178	7237	REVISED
72-HF-179	7240	REVISED
72-HF-180	7243	REVISED
73-TA-181	7328	REVISED
74-W-182	7431	REVISED
74-W-183	7434	REVISED
74-W-184	7437	REVISED
74-W-186	7443	REVISED
80-HG-196	**8025**	NEW EVALUATION
80-HG-198	**8031**	NEW EVALUATION
80-HG-199	**8034**	NEW EVALUATION
80-HG-200	**8037**	NEW EVALUATION
80-HG-201	**8040**	NEW EVALUATION
80-HG-202	**8043**	NEW EVALUATION
80-HG-204	**8049**	NEW EVALUATION
82-PB-204	8225	REVISED
82-PB-206	8231	REVISED
82-PB-207	8234	REVISED
82-PB-208	8237	REVISED
83-BI-209	8325	REVISED

NUCLIDE	MAT	STATUS
88-RA-223	8825	REVISED
88-RA-224	8828	REVISED
88-RA-225	8831	REVISED
88-RA-226	8834	REVISED
89-AC-225	8925	REVISED
89-AC-226	8928	REVISED
89-AC-227	8931	REVISED
90-TH-227	9025	REVISED
90-TH-228	9028	REVISED
90-TH-229	9031	REVISED
90-TH-230	9034	REVISED
90-TH-232	9040	REVISED
90-TH-233	9043	REVISED
90-TH-234	9046	REVISED
91-PA-231	9131	REVISED
91-PA-232	9134	REVISED
91-PA-233	9137	REVISED
92-U-232	9219	REVISED
92-U-233	9222	REVISED
92-U-234	9225	REVISED
92-U-235	9228	REVISED
92-U-236	9231	REVISED
92-U-237	9234	REVISED
92-U-238	9237	REVISED
93-NP-235	**9340**	NEW EVALUATION
93-NP-236	9343	REVISED
93-NP-237	9346	REVISED
93-NP-238	9349	REVISED
93-NP-239	9352	REVISED

NUCLIDE	MAT	STATUS
94-PU-236	9428	REVISED
94-PU-237	**9431**	NEW EVALUATION
94-PU-238	9434	REVISED
94-PU-239	9437	REVISED
94-PU-240	9440	REVISED
94-PU-241	9443	REVISED
94-PU-242	9446	REVISED
94-PU-244	**9452**	NEW EVALUATION
94-PU-246	**9458**	NEW EVALUATION
95-AM-241	9543	REVISED
95-AM-242	9546	REVISED
95-AM-242M	9547	REVISED
95-AM-243	9549	REVISED
95-AM-244	9552	REVISED
95-AM-244M	9553	REVISED
96-CM-240	**9625**	NEW EVALUATION
96-CM-241	9628	REVISED
96-CM-242	9631	REVISED
96-CM-243	9634	REVISED
96-CM-244	9637	REVISED
96-CM-245	9640	REVISED
96-CM-246	9643	REVISED
96-CM-247	9646	REVISED
96-CM-248	9649	REVISED
96-CM-249	9652	REVISED
96-CM-250	9655	REVISED
97-BK-247	**9746**	NEW EVALUATION
97-BK-249	9752	REVISED
97-BK-250	9755	REVISED
98-CF-249	9852	REVISED
98-CF-250	9855	REVISED
98-CF-251	9858	REVISED
98-CF-252	9861	REVISED
98-CF-254	9867	REVISED
99-ES-254	9914	REVISED
99-ES-255	9915	REVISED
100-FM-255	9936	REVISED

Total Nuclides = 337
Revised = 318
New = 19

Total storage = 111 Mbytes

Relationship with JENDL special purpose files

JENDL-3 is supplemented by the following special purpose files**.**

1) JENDL FUSION FILE/3/
JENDL fusion file is made to improve the double-differential cross sections in the 14-mev region to provide precise data for fusion neutronics. The data that had been completed by the end of May 1994 were adopted to jendl-3.2. The data are given in mf=6 representation in JENDL fusion file. They were transformed into mf=4 and mf=5 representation. Therefore, the ddx data in jendl-3.2 are not perfectly precise, but enough for usual applications. For fusion neutronics study, the use of JENDL fusion file is recommended instead of JENDL-3.2.

2) JENDL ACITINIDE FILE/4/
This file is made to provide a good database storing minor actinide data for fuel cycle study. This file will store the data for about 90 nuclides. New evaluations for U-237, Np-236 and Np-238 were adopted from JENDL Actinide file to JENDL-3.2. After release of JENDL-3.2, JENDL Actinide file will be updated independently of JENDL-3.2. For example, new evaluation will be done to many nuclides, and re-evaluation to important minor actinides.

3) JENDL DOSIMETRY FILE/5/
JENDL Dosimetry file was constructed by adopting the cross section data from JENDL-3.1. After benchmark testing of the cross sections, drawbacks of several reaction cross sections were indicated. Updated data for the capture cross sections were adopted to JENDL-3.2. however, the revision work was just under way at the time of compilation of JENDL-3.2. Therefore, JENDL dosimetry file will be updated independently of JENDL-3.2.
(See document IAEA-NDS-140)

4) The JENDL Dosimetry File 99 (JENDL/D-99)/6/
The JENDL Dosimetry File 99 (JENDL/D-99), which is a revised version of the JENDL Dosimetry File 91 (JENDL/D-91), has been compiled and released for the determination of neutron flux and energy spectra. This work was undertaken to remove the inconsistency between the cross sections and their co-variances in JENDL/D-91 since the co-variances were mainly taken from IRDF-85 although the cross sections were based on JENDL-3. Dosimetry cross sections has been evaluated for 67 reactions on 47 nuclides together with co-variances. The cross sections for 34 major reactions and their co-variances were simultaneously generated, and the remaining 33 reaction data were mainly taken from JENDL/D-91. Latest measurements were taken into account in the evaluation. The resultant evaluated data are given in the neutron energy region below 20 MeV in both of point- wise and group-wise files in the ENDF-6 format. In order to confirm the reliability of the evaluated data, several integral tests have been carried out: comparisons with average cross sections measured in fission neutron fields, fast/thermal reactor spectra, DT neutron fields and Li(d,n) neutron fields. It was found from the comparisons that the cross sections calculated from JENDL/D-99 are generally in good agreement with the measured data. The contents of JENDL/D- 99 and the results of the integral tests are described in this report. All of the dosimetry cross section are shown in a graphical form in the Appendix.

5) JENDL FP Decay Data File 2000/7/
A decay data file of fission product (FP) nuclides has been developed for the use in Nuclear technology fields as one of special purpose files of JENDL (Japanese Evaluated Nuclear Data Library) in the format of ENDF/B and it is called JENDL FP Decay Data File 2000. The file includes the decay data for 1229 fission product nuclides: 142 stable and 1087 unstable nuclides. The data included for a nuclide are decay modes, their Q values and branching ratios, average decay energy values of beta-rays, gamma-rays and alpha-particles and their spectral data. The primary source of decay data is ENSDF (Evaluated Nuclear Structure Data File), which is the internationally recognized data file of nuclear structure properties. The data in ENSDF, however, cover only measured ones. The data of the short-lived nuclides needed for the application fields such as decay heat prediction are often incomplete or not measured because of their short half-lives. For such nuclides a theoretical model calculation is applied to derive the needed data such as average decay energies and spectral data. The data in JENDL FP Decay Data File 2000 have been tested by summation calculation comparing its results with measured data of decay heat values and aggregate fission product spectra of various fissioning nuclei. The comparison showed good agreement between the calculated results and measured values.

6) JENDL-3 Sub-library for gas production reactions,
The cross section data of gas production reactions such as (n,p) and (n,alpha) of reactor material induced by neutrons.
(see document IAEA-NDS-139).

7) JENDL-3 Fission-Product Yield Sub-library,
(see document IAEA-NDS-138).

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4) Nakagawa, T. et al.: Proc. of Global'93, P. 467 (1993).
5) Nakazawa, M. et al.: JAERI 1325 (1992).
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7) J. Katakura et al. JAERI 1343 [#] (July 2001)

Name	Release year	Characteristics
JENDL Dosimetry File 91	1991	The data of 61 reactions for reactor dosimetry and their covariance. Numerical data
JENDL Dosimetry File 99	1999	The revised version of Dosimetry File 91. The data of 67 reactions for reactor dosimetry and their covariance data. Numerical data
JENDL Gas-Production Cross Section File 91	1991	The cross section data of gas production reactions such as (n,p) and (n,alpha) of reactor material induced by neutrons. Numerical data
JENDL Activation Cross Section File 96	1996	For activity estimation of reactor material. The data of 233 nuclides and 1246 reactions. Numerical data
JENDL Fusion File 99	1999	For fusion neutronics. The data for 92 nuclides are stored Numerical data
JENDL FP Decay Data File 2000	2000	Decay data for 1229 fission product nuclides. Numerical data

Name	Release year	Characteristics
JENDL-3 Fission-Product Yield Sub-library	2002	Fission yield data are given to 12 nuclides. They are the same as JENDL-3.2. Numerical data

JENDL document

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