

SG23: Library of Cross Section Evaluations for Fission Products

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SG23 Membership, Goals

- SG23 established in May 2004
- Membership (5 projects, 14 members)
 - Chairman P. Oblozinsky, ENDF project
 - Monitor R. Jacqmin, JEFF project
 - ENDF C. Dunford, M. Herman and S. Mughabghab (all BNL), M. Dunn (ORNL)
 - JEFF C. Dean (Winfrith), A. Trkov (IAEA)
 - JENDL T. Nakagawa and K. Shibata (JAERI)
 - BROND A.V. Ignatyuk and V. Pronyaev (IPPE)
 - CENDL Ge Zhigang and Chen Guochang (CNDC)
- Goals
 - Create library based on SG21 recommendations for 218 FP materials
 - Perform partial validation of the library

Summary of SG21 Recommendations

Library (Data Source)	Full File	Resonance Region	Fast Region	Comment
ENDF/B-VI	1	18	13	
ENDF/B-VII	27	-	2	Includes 5 isotopes of Ge
JEFF-3.0	1	-	-	
JENDL-3.3	44	7	66	
CENDL-3	10	-	27	
BROND-2	1	1	1	
New BNL-325	-	109	-	Evaluations fully completed
EMPIRE	-	-	25	Preliminary calculations done
Total	84	134	134	211 existing + 7 new

SG23 Activities in June 2004 – March 2005

- SG21 final report
 - Submitted to NEA in March 2005
- SG23 preparatory work
 - SG23 meeting held, Santa Fe, October 2004
 - SG23 webpage created, www.nndc.bnl.gov/sg23
 - Evaluations for **Atlas of Neutron Resonances** completed
- SG23 library
 - Converted full files into SG23 style 84 materials
 - Created files by merging 80 materials
164 materials

 - Available in Preliminary ENDF/B-VII 29 materials
 - Evaluations to be done by Empire 25 materials
54 materials

S. Mughabghab: Atlas of Neutron Resonances

5-th issue of BNL-325
Neutron resonance parameters
Thermal cross-sections
Average resonance parameters
 $Z = 1 - 100$

Contract with Elsevier signed
Submit by June 15, 2005
Publish early 2006

FP region: 177 materials ok,
41 materials no resonance data

ENDF-6 files given to SG23
URR in selected cases only

Atlas of Neutron Resonances

Resonance Parameters and
Thermal Cross Sections
Part A: $Z=1-60$

Atlas of Neutron Resonances

Resonance Parameters and
Thermal Cross Sections
Part B: $Z=61-100$

S.F. Mughabghab

SG23 Fission Product Library: Procedure

- Convert files recommended for fast region into SG23 style
 - Marked as ENDF/B-VII, to be changed once NLIB for SG23 Library is provided
 - Standard SG23 text added
 - Comments on fixes added
- Insert resonance parameters
 - None – if full file was recommended
 - Take from specific file – if it was recommended
 - Take from Atlas of Neutron Resonances – if new BNL-325 was recommended
 - URR taken from the file recommended for the fast region
- Perform data verification
 - Correct all errors detected by CHEKCR and FIZCON, **all SG23 files (164) are clean!**
 - Run NJOY (ok for 136 materials), followed by simple MCNP run (underway)

SG23 Webpage: Documents, Library

www.nndc.bnl.gov/sg23



National Nuclear Data Center



NNDC Databases: ENDF | CSISRS | CINDA | NuDat | NSR | XUNDL | ENSDF | MIRD

SG23 Fission Product Library

Projectile	MAT	Nuclide	E _{max}	Date	Labs	Authors
n	3125	31-Ga-69	20.0	EVAL-JAN05	KHI,BNL	T.WATANABE, Mughabghab
n	3131	31-Ga-71	20.0	EVAL-OCT98	CNDC	SONG-BAI ZHANG, B.S. YU, Z.J. ZHANG
n	3425	34-Se-74	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3325	33-As-75	20.0	EVAL-JAN05	JNDC,BNL	JNDC FPND W.G., Mughabghab
n	3431	34-Se-76	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3434	34-Se-77	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3625	36-Kr-78	20.0	EVAL-FEB05	JNDC,BNL	JNDC FPND W.G., Mughabghab
n	3437	34-Se-78	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3525	35-Br-79	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3440	34-Se-79	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3631	36-Kr-80	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3443	34-Se-80	20.0	EVAL-MAR90	JNDC	JNDC FP NUCLEAR DATA W.G.
n	3531	35-Br-81	20.0	EVAL-JAN05	JNDC,BNL	JNDC FPND W.G., Mughabghab
n	3637	36-Kr-82	20.0	EVAL-FEB05	JNDC,BNL	JNDC FPND W.G., Mughabghab
n	3449	34-Se-82	20.0	EVAL-JAN05	JNDC,BNL	JNDC FPND W.G., Mughabghab
n	3640	36-Kr-83	20.0	EVAL-JUN99	CNDC	YOU-XIANG ZHUANG, CHONG-HAI CAI
n	3643	36-Kr-84	20.0	EVAL-JAN05	JNDC,BNL	JNDC FPND W.G., Mughabghab

SG23 Fission Product Library: 102Ru



National Nuclear Data Center



NNDc Databases: ENDF | CSISRS | CINDA | NuDat | NSR | XUNDL | ENSDF | MIRD

n-102Ru

SG23 fission product library

[SG23-file](#) [Description](#) [EXFOR-data](#)

Incident particle: n

Target: 102-Ru

MAT: 4443

Date: EVAL-FEB05

Authors: QI-CHANG LIANG+, Mughabghab

Lab: CNDC, BNL

Maximum incident energy: 20.0 MeV

Outputs of checking codes

[CHECKR](#) [FIZCON](#) [PSYCHE](#)

Log-outputs of pre-processing codes

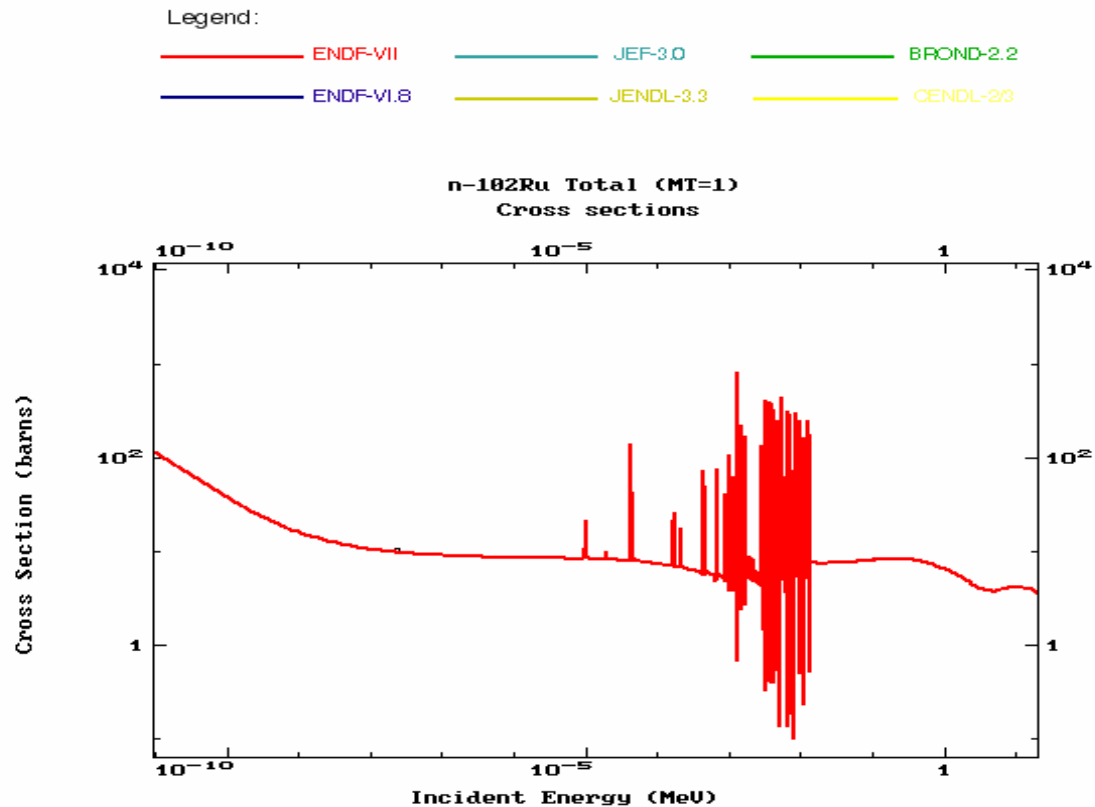
[LINEAR](#) => [RECENT](#) => [SIGMA1](#) => [FIXUP](#) => [LEGEND](#)

Comments



SG23 Fission Product Library: Plots for ^{102}Ru

Comparison of SG23 against experimental data and evaluations. This is a standard set of plots produced regardless of experimental data. Depending on availability of experimental data in EXFOR the PLOT4 set (see above) may contain more or fewer plots. Click on the pictures below to enter interactive ZVView plotting ([ZVView](#) package needs to be installed. Click [here](#) for a short ZVView manual.) NOTE: SG23 files are denoted ENDF/B-VII below.



SG23: Future work

- Complete SG23 library by adding remaining 54 materials
 - 29 materials from ENDF/B-VII (updates expected)
 - 25 materials to be done by Empire (preliminary calculations done)
- Perform data verification for a complete set of 218 materials
 - Run checking codes, run NJOY and simple MCNP
 - Perform graphical inspection of all files and identify deficiencies
- Solve problems
 - Address deficiencies identified above
 - Address complex merging (URR region)
- Compare with data for natural elements
- Perform data validation for selected materials