EXFOR News (March 2020)

New experimental data available from Nuclear Reaction Data Centres

EXFOR [1] is a world-wide data library for experimental neutron, charged-particle and photon induced reaction data compiled by the International Network of the Nuclear Reaction Data Centres (NRDC)[a] co-ordinated by the IAEA Nuclear Data Section. Regularly updated web retrieval databases are available at IAEA-NDS as well as NNDC, NEADB, JCPRG and CDFE.

This News lists newly created EXFOR entries as well as revised EXFOR entries where new data subentries are added. Entries from articles pubslished in past 10 years are flagged by asterisks (*). Please send an email to the NRDC Coordinator (n.otsuka@iaea.org) for inclusion in the EXFOR News distribution list as well as any question on EXFOR.

[1] N. Otuka, E. Dupont, V. Semkova, B. Pritychenko et al., Nucl.Data.Sheets **120**(2014)272.

Quantity codes

ALF	α-value ($\sigma_{\rm capt}/\sigma_{\rm fis}$)	KE	Kinetic energy
AMP	Length or amplitude	INT	Cross section integral over incident energy
CHG	Fragment charge	KER	Kerma factor
CS	Cross section	MAS	Fragment mass
CSP	Partial cross section	MFQ	Differential fission neutron multiplicity
CST	Temperature dependent cross section	MLT	Multiplicity
D3A	Triple differential $\mathrm{d}\Omega_1/\mathrm{d}\Omega_2/\mathrm{d}E'$	NQ	Nuclear quantity
D3E	Triple differential $\mathrm{d}\Omega/\mathrm{d}E'_1/\mathrm{d}E'_2$	NU	Fission neutron multiplicity $\bar{\nu}$
D4A	Quadruple diff. $\mathrm{d}\Omega_1/\mathrm{d}\Omega_2/\mathrm{d}E'_1/\mathrm{d}E'_2$	NUD	Delayed fission neutron multiplicity $\bar{\nu}_d$
DA	Differential $\mathrm{d}/\mathrm{d}\Omega$	POL	Polarization
DAA	Double differential $\mathrm{d}\Omega_1/\mathrm{d}\Omega_2$	POD	Differential polarization
DAE	Double differential $\mathrm{d}\Omega/\mathrm{d}E'$	PY	Product yield (other than fission)
DAP	Partial differential $\mathrm{d}/\mathrm{d}\Omega$	RI	Resonance integral
DAT	Temperature-dependent Legendre coefficient	RP	Resonance parameter
DE	Differential $\mathrm{d}/\mathrm{d}E'$	RR	Reaction rate
DEP	Energy spectrum for specific group	SIF	Self indication
DP	Diff. by linear momentum of outgoing part.	SPC	Gamma spectrum
DT	Diff. by 4-momentum transfer squared	TSL	Thermal scattering
ETA	η-value = $\bar{\nu}\sigma_{\rm fis}/(\sigma_{\rm capt}+\sigma_{\rm fis})$	TT	Thick target yield
EVL	Evaluation	TTD	Differential thick target yield, $\mathrm{d}/\mathrm{d}\Omega$
FY	Fission product yield	TTP	Partial thick target yield

Special codes in outgoing particle field

abs	Absorption	fus	Fusion	sct	Scattering	tot	Total
el	Elastic	inel	Inelastic	tcx	Total charge changing		
fis	Fission	non	Nonelastic	ths	Thermal scattering		

Special codes in incident energy field

Fast	Fast reactor spectrum average	Maxw	Maxwellian spectrum average
Fiss	Fission spectrum average	Spont	Spontaneous (for fission)

[a] NNDC (USA), NEADB (France), NDS (Austria), CJD (Russia), CNDC (China), ATOMKI (Hungary), NDPCI (India), JAEA (Japan), JCPRG (Japan), KAERI (Korea), CDFE (Russia), CNPD (Russia), UkrNDC (Ukraine)

1 Hydrogen 2

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
n,2n	^{1}H	DAE	1USAOHO	2.5+07	2.5+07	Jour	NP/A,367,157	81	V.Kulkarni+	10952
n,el	^{2}H	TSL	2GERMUN	2.5-02	2.5-02	Jour	ZK,118,149	63	W.Gissler	21433
p,el	^{2}H	POD	2SWTPSI	4.3+07	4.3+07	Jour	PL/B,219,58	89	S.Kistryn+	O2392
p,el	^{2}H	POL	2SWTPSI	4.3+07	4.3+07	Jour	PL/B,219,58	89	S.Kistryn+	O2392
p,γ	^{3}He	CSP	2ITYMIL	1.8+07	4.3+07	Jour	NP/A,410,173	83	M.Anghinolfi+	O2388
p,γ	^{3}He	DAP	2ITYMIL	1.8+07	4.3+07	Jour	NP/A,410,173	83	M.Anghinolfi+	O2388

2 Helium 4

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,2p	^{3}H	CS	2FR CSN	1.4+08	1.6+08	Jour	PR/C,7,2209	73	M.Jung+	O2382
p,d	^{3}He	CS	2FR CSN	1.4+08	1.6+08	Jour	PR/C,7,2209	73	M.Jung+	O2382
p,n+2p	^{2}H	CS	2FR CSN	1.4+08	1.6+08	Jour	PR/C,7,2209	73	M.Jung+	O2382
p,n+p	^{3}He	CS	2FR CSN	1.4+08	1.6+08	Jour	PR/C,7,2209	73	M.Jung+	O2382
p,p+d	^{2}H	CS	2FR CSN	1.4+08	1.6+08	Jour	PR/C,7,2209	73	M.Jung+	O2382

3 Lithium 6

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
d,n	^{7}Be	?	2GERTUB	9.4+04	1.7+05	Jour	PL/B,307,20	93	K.Czerski+	F0054
d,p	^{7}Li	DAP	1USAPUP	1.4+07	1.4+07	Jour	PR,97,1249	55	S.H.Levine+	F0040

3 Lithium 7

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
d,^{3}He	^{6}He	DAP	1USAPUP	1.4+07	1.4+07	Jour	PR,97,1249	55	S.H.Levine+	F0040
d,inel	^{7}Li	DAP	1USAPUP	1.4+07	1.4+07	Jour	PR,97,1249	55	S.H.Levine+	F0040
d,p	^{8}Li	DAP	1USAPUP	1.4+07	1.4+07	Jour	PR,97,1249	55	S.H.Levine+	F0040
d,t	^{6}Li	DAP	1USAPUP	1.4+07	1.4+07	Jour	PR,97,1249	55	S.H.Levine+	F0040
^{3}He,p	^{9}Be	POD	2UK BIR	1.4+07	3.3+07	Jour	NP/A,404,205	83	P.M.Lewis+	F0048

4 Beryllium 9

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
^{3}He,p	^{11}B	POD	2UK BIR	1.4+07	3.3+07	Jour	NP/A,404,205	83	P.M.Lewis+	F0048

6 Carbon

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,tot		CS	2JPNJAE	2.1-04	9.5+00	Jour	NIM/A,929,113	19	M.Teshigawara+	23532

6 Carbon 12

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{3}He,p	^{14}N	POD	2UK BIR	3.3+07	3.3+07	Jour	NP/A,404,205	83	P.M.Lewis+	F0048

6 Carbon 13

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,α	^{10}B	CSP	2ITYPAD	3.1+07	3.1+07	Jour	PR/C,38,517	88	A.Barbadoro+	O2390
p,α	^{10}B	DAP	2ITYPAD	3.1+07	3.1+07	Jour	PR/C,38,517	88	A.Barbadoro+	O2390
p,el	^{13}C	DA	2ITYPAD	3.1+07	3.1+07	Jour	PR/C,38,517	88	A.Barbadoro+	O2390
^{3}He,γ	^{16}O	DAP	2UK OXF	3.8+06	8.7+06	Jour	NP/A,229,241	74	S.H.Chew+	O2383

7 Nitrogen 15

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ	^{16}O	CSP	2ITYMIL	2.0+07	4.0+07	Jour	PR/C,28,1005	83	M.Anghinolfi+	O2389
p,γ	^{16}O	DAP	2UK OXF	1.0+07	2.0+07	Jour	NP/A,229,241	74	S.H.Chew+	O2383
p,γ	^{16}O	DAP	2ITYMIL	1.8+07	4.0+07	Jour	PR/C,28,1005	83	M.Anghinolfi+	O2389

14 Silicon 28

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ		RP	2ITYPAD	1.6+06	2.9+06	Jour	NP/A,324,1	79	F.Terrasi+	O2384
p,γ	^{29}P	DAP	2ITYPAD	1.4+06	2.3+06	Jour	NP/A,324,1	79	F.Terrasi+	O2384

14 Silicon 30

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ		RP	2NEDUTR	8.4+05	2.2+06	Jour	NP/A,124,273	69	A.C.Wolff+	O2379
p,γ	^{31}P	DAP	2NEDUTR	9.6+05	1.8+06	Jour	NP/A,124,273	69	A.C.Wolff+	O2379

20 Calcium 40

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ		RP	2GERBOC	2.4+06	3.0+06	Jour	NP/A,394,405	83	F.Terrasi+	O2387
p,γ	^{41}Sc	DAP	2GERBOC	2.6+06	3.1+06	Jour	NP/A,394,405	83	F.Terrasi+	O2387

24 Chromium 52

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,el	^{52}Cr	DA	2UK HAR	1.5+07	1.8+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333
α,inel	^{52}Cr	DAP	2UK HAR	1.1+07	2.0+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333

26 Iron 56

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,el	^{56}Fe	DA	2UK HAR	1.5+07	1.8+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333
α,inel	^{56}Fe	DAP	2UK HAR	1.5+07	1.8+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333

28 Nickel 60

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,el	^{60}Ni	DA	2UK HAR	1.5+07	1.8+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333
α,inel	^{60}Ni	DAP	2UK HAR	1.1+07	1.9+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333

30 Zinc

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,x	^{61}Cu	CS	2ZZZISP	1.0+07	1.9+07	Jour	NIM/B,213,373	04	F.Groppi+	O0778
d,x	^{64}Cu	CS	2ZZZISP	3.6+06	1.9+07	Jour	NIM/B,213,373	04	F.Groppi+	O0778
d,x	^{65}Zn	CS	2ZZZISP	3.6+06	1.9+07	Jour	NIM/B,213,373	04	F.Groppi+	O0778
d,x	^{69}Zn	CS	2ZZZISP	3.6+06	1.9+07	Jour	NIM/B,213,373	04	F.Groppi+	O0778
d,x	^{66}Ga	CS	2ZZZISP	8.8+06	1.9+07	Jour	NIM/B,213,373	04	F.Groppi+	O0778
d,x	^{67}Ga	CS	2ZZZISP	3.6+06	1.9+07	Jour	NIM/B,213,373	04	F.Groppi+	O0778

30 Zinc 64

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,el	^{64}Zn	DA	2UK HAR	1.5+07	1.9+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333
α,inel	^{64}Zn	DAP	2UK HAR	1.5+07	1.9+07	Jour	NP/A,301,36	78	T.B.Robinson+	O2333

30 Zinc 66

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{66}Zn	DA	2DENNBI	2.8+06	4.0+06	Jour	PL,22,466	66	C.Gaarde+	O2378
	p,inel	^{66}Zn	DAP	2DENNBI	3.8+06	3.9+06	Jour	PL,22,466	66	C.Gaarde+	O2378

32 Germanium 70

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	2ZZZCER		2.5+01	Jour	PR/C,100,045804	19	A.Gawlik+	23454
*	n,γ		RP	2ZZZCER		2.5+01	Jour	PR/C,100,045804	19	A.Gawlik+	23454
*	n,γ	^{71}Ge	CS	2ZZZCER	Maxwl	3.0+05	Jour	PR/C,100,045804	19	A.Gawlik+	23454

32 Germanium 74

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,α	^{71}Ga	CSP	2ITYMIP	3.6+07	3.6+07	Jour	PR/C,26,441	82	F.Pellegrini+	O2386
	p,α	^{71}Ga	DAP	2ITYMIP	3.6+07	3.6+07	Jour	PR/C,26,441	82	F.Pellegrini+	O2386
	p,el	^{74}Ge	DA	2ITYMIP	3.6+07	3.6+07	Jour	PR/C,26,441	82	F.Pellegrini+	O2386

46 Palladium 104

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{104}Ag	CSP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393
	p,n	^{104}Ag	DAP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393

46 Palladium 106

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{106}Ag	CSP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393
	p,n	^{106}Ag	DAP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393

46 Palladium 108

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{108}Ag	CSP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393
	p,n	^{108}Ag	DAP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393

46 Palladium 110

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{110}Ag	CSP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393
	p,n	^{110}Ag	DAP	2GERHAM	2.6+07	2.6+07	Jour	PR/C,41,1993	90	J.D.Anderson+	O2393

49 Indium 115

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{115}In	DA	2UK LVP	6.5+06	7.9+06	Jour	NP,89,209	66	J.C.Thompson+	O2377
	p,n	^{115}Sn	DA	2UK LVP	6.8+06	7.5+06	Jour	NP,89,209	66	J.C.Thompson+	O2377

52 Tellurium 126

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{127}Te	CS	1USATNL	5.7+05	7.3+06	Jour	EPJ/CS,146,09013	17	W.Tornow+	14583

52 Tellurium 128

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{129}Te	CS	1USATNL	5.7+05	7.3+06	Jour	EPJ/CS,146,09013	17	W.Tornow+	14583

52 Tellurium 130

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{131}Te	CS	1USATNL	5.7+05	1.5+07	Jour	EPJ/CS,146,09013	17	W.Tornow+	14583

56 Barium 138

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{138}Ba	DA	2GERKLN	9.4+06	1.2+07	Jour	NP/A,501,513	89	K.R.Nyga+	O2391
	p,el	^{138}Ba	POD	2GERKLN	9.5+06	1.2+07	Jour	NP/A,501,513	89	K.R.Nyga+	O2391
	p,inel	^{138}Ba	DAP	2GERKLN	9.8+06	1.2+07	Jour	NP/A,501,513	89	K.R.Nyga+	O2391

70 Ytterbium 176

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ	^{177}Lu	CS	2SWDUPP	6.1+06	2.4+07	Jour	NP/A,345,221	80	B.Palsson+	O2385

79 Gold 197

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{12}C,3n	^{206}At	CS	2ITYLNS	5.7+07	7.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,4n	^{205}At	CS	2ITYLNS	6.2+07	8.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,5n	^{204}At	CS	2ITYLNS	7.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,6n	^{203}At	CS	2ITYLNS	8.7+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{198}Tl	CS	2ITYLNS	7.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{199}Tl	CS	2ITYLNS	6.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{199}Pb	CS	2ITYLNS	8.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{200}Pb	CS	2ITYLNS	7.7+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{201}Pb	CS	2ITYLNS	6.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{199}Bi	CS	2ITYLNS	8.7+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{200}Bi	CS	2ITYLNS	7.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{201}Bi	CS	2ITYLNS	6.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{202}Bi	CS	2ITYLNS	6.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{203}Bi	CS	2ITYLNS	8.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{202}Po	CS	2ITYLNS	9.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{203}Po	CS	2ITYLNS	8.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{204}Po	CS	2ITYLNS	7.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447
^{12}C,x	^{205}Po	CS	2ITYLNS	6.2+07	9.7+07	Jour	PR/C,48,1815	93	P.Vergani+	O2447

92 Uranium 233

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	γ	KE	1USAORL	Maxwl		Prog	ORNL-4844,109	72	F.Pleasonton+	14214
n,fis	^{4}He	FY	1USALAS	2.5-02	2.5-02	Jour	PR,126,1508	62	R.A.Nobles	14550
p,2n	^{232}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,p	^{234}U	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328

92 Uranium 234

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	^{4}He	FY	1USALAS	1.0+06	1.0+06	Jour	PR,126,1508	62	R.A.Nobles	14550
p,2n	^{233}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,p	^{235}U	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis	Many	FY	1USATNL			Jour	NDS,131,319	16	M.E.Gooden+	14555
	n,fis	γ	KE	1USAORL	Maxwl		Prog	ORNL-4844,109	72	F.Pleasonton+	14214
	n,fis	^{3}H	FY	1USASRL	2.5-02	2.5-02	Jour	NUC,18,100	60	E.L.Albenesius+	14553
	n,fis	^{3}H	FY	1USAANL	Maxwl		Jour	JIN,24,337	62	E.N.Sloth+	14552
	n,fis	^{4}He	FY	1USALAS	2.5-02	1.0+06	Jour	PR,126,1508	62	R.A.Nobles	14550
	p,2n	^{234}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
	d,p	^{236}U	CS	2DENNBI	1.1+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328

92 Uranium 236

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,2n	^{235}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,2n	^{236}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,p	^{237}U	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis	Many	FY	1USATNL			Jour	NDS,131,319	16	M.E.Gooden+	14555
	p,2n	^{237}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
	d,n	^{239}Np	CS	2DENNBI	1.1+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
	d,p	^{239}U	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
	d,x	^{238}U	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

93 Neptunium 237

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,2n	^{236}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,2n	^{237}Pu	CS	2DENNBI	1.1+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,2n	^{237}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329
d,p	^{238}Np	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328

94 Plutonium 238

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,2n	^{237}Am	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329
d,p	^{239}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

94 Plutonium 239

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis	Many	FY	1USATNL			Jour	NDS,131,319	16	M.E.Gooden+	14555
	n,fis	γ	KE	1USAORL	Maxwl		Prog	ORNL-4844,109	72	F.Pleasonton+	14214
	n,fis	^{4}He	FY	1USALAS	2.5-02	1.0+06	Jour	PR,126,1508	62	R.A.Nobles	14550
*	n,fis	^{136}Cs	FY	1USATNL	5.8+05	1.5+07	Jour	NDS,131,319	16	M.E.Gooden+	14555
	d,2n	^{239}Am	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
	d,p	^{240}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
	d,x	^{239}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

94 Plutonium 240

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis	^{4}He	FY	1USALAS	Spont		Jour	PR,126,1508	62	R.A.Nobles	14550
d,p	^{241}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,p	^{241}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

94 Plutonium 241

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	^{4}He	FY	1USALAS	2.5-02	2.5-02	Jour	PR,126,1508	62	R.A.Nobles	14550
d,2n	^{241}Am	CS	2DENNBI	1.1+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,p	^{242}Pu	CS	2DENNBI	1.1+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,x	^{241}Pu	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

94 Plutonium 242

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis	^{4}He	FY	1USALAS	Spont		Jour	PR,126,1508	62	R.A.Nobles	14550
p,2n	^{241}Am	CS	2DENNBI	1.2+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328
d,p	^{243}Pu	CS	2DENNBI	1.2+07	1.3+07	Jour	NP/A,139,481	69	N.L.Lark+	O2328

94 Plutonium 244

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,2n	^{243}Am	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

95 Americium 241

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,2n	^{241}Cm	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

95 Americium 243

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,2n	^{243}Cm	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329
d,x	^{243}Am	CS	2DENNBI	1.3+07	1.3+07	Jour	NP/A,151,656	70	S.M.Polikanov+	O2329

96 Curium 242

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis	^{4}He	FY	1USALAS	Spont		Jour	PR,126,1508	62	R.A.Nobles	14550

96 Curium 244

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis	^{4}He	FY	1USALAS	Spont		Jour	PR,126,1508	62	R.A.Nobles	14550

98 Californium 252

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis	Many	CHG	1USABRK	Spont		Jour	PR/C,4,1913	71	E.Cheifetz+	12691
0,fis	Many	FY	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	Many	FY	1USAYAL	Spont		Jour	PR,121,230	61	J.C.Watson	14551
0,fis	γ	KE	1USAORL	Maxwl		Prog	ORNL-4844,109	72	F.Pleasonton+	14214
0,fis	Many	KE	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	Many	MAS	1USABRK	Spont		Jour	PR/C,4,1913	71	E.Cheifetz+	12691
0,fis	Many	?	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{1}H	FY	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{1}H	KE	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{2}H	FY	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{2}H	KE	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{3}H	FY	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{3}H	FY	1USAYAL	Spont		Jour	PR,121,230	61	J.C.Watson	14551
0,fis	^{3}H	FY	1USAANL	Spont		Jour	PR,134,B1219	64	D.L.Horrocks	14554
0,fis	^{3}H	KE	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{4}He	FY	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{4}He	FY	1USALAS	Spont		Jour	PR,126,1508	62	R.A.Nobles	14550
0,fis	^{4}He	FY	1USAYAL	Spont		Jour	PR,121,230	61	J.C.Watson	14551
0,fis	^{4}He	KE	1USAUCX	Spont		Jour	PR,154,1193	67	S.W.Cosper+	14549

0,fis	^{6}He	FY	1USAUCX	Spont	Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{6}He	KE	1USAUCX	Spont	Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{8}He	FY	1USAUCX	Spont	Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{8}He	KE	1USAUCX	Spont	Jour	PR,154,1193	67	S.W.Cosper+	14549
0,fis	^{7}Li	FY	1USAUCX	Spont	Jour	PR,154,1193	67	S.W.Cosper+	14549

98 Californium 254

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
0,fis	^{98}Sr	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{100}Zr	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{102}Zr	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{104}Zr	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{104}Mo	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{106}Mo	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{108}Mo	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{108}Ru	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{110}Ru	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{112}Ru	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{140}Xe	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{142}Xe	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{142}Ba	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{144}Ba	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{146}Ba	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{148}Ba	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{146}Ce	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{148}Ce	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582
0,fis	^{150}Ce	SPC	1USAORL	Spont		Prog	JUEL-SPEZ-99,69	81	H.A.Selic+	14582