EXFOR News (November 2011)

New experimental data available from Nuclear Reaction Data Centres

EXFOR is a world-wide data library for experimental neutron induced, charged-particle induced and photonuclear reaction data compiled by the International Network of the Nuclear Reaction Data Centres (NRDC)[a] coordinated by the IAEA Nuclear Data Section. Regularly updated retrieval database is available at NNDC, NEADB, IAEA-NDS, JAEA, JCPRG and CDFE.

Quantity codes

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

1 Hydrogen 1

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{14}Be,n	^{14}B	?	2JPNIPC	9.7+08	9.7+08	Jour	PL/B,697,(5),459	Mar 11	Y.Satou+	E2325
^{14}Be,n+X	^{13}B	DAE	2JPNIPC	9.7+08	9.7+08	Jour	PL/B,697,(5),459	Mar 11	Y.Satou+	E2325
^{68}Zn,0		RP	2JPNJAE			Jour	EPJ/A,46,157	Oct 10	N.Imai+	E2292
^{68}Zn,el	^{1}H	DA	2JPNJAE	4.7+06	5.4+06	Jour	EPJ/A,46,157	Oct 10	N.Imai+	E2292

1 Hydrogen 2

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,n	^{3}He	CS	3CZRUJF	2.0+03	1.5+06	Jour	PL/B,700,111	11	A.Tumino+	D0651
d,p	^{3}H	CS	3CZRUJF	2.0+03	1.5+06	Jour	PL/B,700,111	11	A.Tumino+	D0651
^{14}C,p	^{15}C	DAP	1USATAM	1.6+08	1.6+08	Jour	NIM/A,634,71	11	B.T.Roeder+	C1826
^{14}C,p	^{15}C	?	1USATAM	1.6+08	1.6+08	Jour	NIM/A,634,71	11	B.T.Roeder+	C1826

1 Hydrogen

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,tot		CST	1USAINU	3.1-04	1.7-01	Jour	NIM/B,269,425	11	H.Yan+	14289

2 Helium 4

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,el	^{4}He	CS	1USALAS	1.8+07	2.4+07	Jour	PR/C,4,36	71	A.Niiler+	10190
n,el	^{4}He	DA	1USALAS	1.8+07	2.4+07	Jour	PR/C,4,36	71	A.Niiler+	10190
d,x+n	inclusive	TTD	3CZRUJF	1.7+07	1.7+07	Jour	NIM/A,466,509	01	P.Bem+	D0278

3 Lithium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x+n	inclusive	DAE	4RUSFEI	2.2+07	2.2+07	Jour	AE,24,56	68	V.K.Daruga+	A0897
p,x+n	inclusive	TTD	2JPNOSA	2.5+08	3.9+08	Jour	NIM/A,629,(1),43	Feb 11	Y.Iwamoto+	E2297
p,x+n	inclusive	TTD	1USADAV	3.5+07	6.5+07	Jour	MED,4,486	77	H.I.Amols+	C1835
d,x+n	inclusive	DAE	4RUSFEI	2.1+07	2.1+07	Jour	AE,24,56	68	V.K.Daruga+	A0897
d,x+n	inclusive	TTD	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898
d,x+n	inclusive	TTD	1USADAV	3.5+07	3.5+07	Jour	MED,4,486	77	H.I.Amols+	C1835
d,x+n	inclusive	?	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898
α,x+n	inclusive	DAE	4RUSFEI	4.2+07	4.2+07	Jour	AE,24,56	68	V.K.Daruga+	A0897

3 Lithium 6

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,α	^{4}He	CS	3CZRUJF	4.3+05	5.0+06	Jour	PR/C,83,045801	11	R.G.Pizzone+	D0649

3 Lithium 7

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,α	^{4}He	CS	3CZRUJF	1.0+05	1.0+07	Jour	PR/C,83,045801	11	R.G.Pizzone+	D0649
p,n	^{7}Be	DAP	2JPNOSA	2.5+08	3.9+08	Jour	NIM/A,629,(1),43	Feb 11	Y.Iwamoto+	E2297
p,n	^{7}Be	TTD	2JPNOSA	2.5+08	3.9+08	Jour	NIM/A,629,(1),43	Feb 11	Y.Iwamoto+	E2297
p,x+n	inclusive	TTD	1CANCRC	1.5+07	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
p,x+n	inclusive	TTD	2JPNJAE	4.3+07	8.7+07	Jour	NIM/A,428,(2-3),454	Jun 99	M.Baba+	E1808
p,x+n	inclusive	TTD	1CANCRC	8.0+06	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
d,x+n	inclusive	TTD	1CANCRC	1.5+07	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
d,x+n	inclusive	TTD	1USAORL	4.0+07	4.0+07	Jour	NIM,145,81	77	M.J.Saltmarsh+	C1832
d,x+n	inclusive	TTD	1CANCRC	8.0+06	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837

4 Beryllium 9

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x+n	inclusive	TTD	1USAMRY	1.0+08	1.0+08	Jour	MED,4,322	77	R.Madey+	C1833
p,x+n	inclusive	TTD	1CANCRC	1.5+07	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
p,x+n	inclusive	TTD	2JPNTOK	2.0+07	3.2+07	Jour	NIM/A,271,546	Sep 88	Y.Uwamino+	E2296
p,x+n	inclusive	TTD	1USADAV	3.5+07	3.5+07	Jour	MED,8,396	81	J.L.Ullmann+	C1834
p,x+n	inclusive	TTD	2JPNTOK	3.5+07	3.5+07	Jour	NIM/A,271,546	Sep 88	Y.Uwamino+	E2296
p,x+n	inclusive	TTD	1USADAV	3.5+07	6.5+07	Jour	MED,4,486	77	H.I.Amols+	C1835
p,x+n	inclusive	TTD	2JPNTOK	3.8+07	4.0+07	Jour	NIM/A,271,546	Sep 88	Y.Uwamino+	E2296
p,x+n	inclusive	TTD	1CANCRC	8.0+06	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
d,x+n	inclusive	TTD	1USABRK	1.5+06	1.5+06	Jour	MED,26,793	99	N.Colonna+	C1836
d,x+n	inclusive	TTD	1CANCRC	1.5+07	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
d,x+n	inclusive	TTD	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898
d,x+n	inclusive	TTD	1USADAV	3.5+07	3.5+07	Jour	MED,4,486	77	H.I.Amols+	C1835
d,x+n	inclusive	TTD	1USAORL	4.0+07	4.0+07	Jour	NIM,145,81	77	M.J.Saltmarsh+	C1832
d,x+n	inclusive	TTD	1CANCRC	8.0+06	2.3+07	Jour	NIM,143,331	77	M.A.Lone+	C1837
d,x+n	inclusive	TTD	1USAMRY	8.4+07	8.4+07	Jour	MED,4,322	77	R.Madey+	C1833
d,x+n	inclusive	?	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898
^{3}He,t	^{9}B	CS	2JPNTOH	6.7+06	6.7+06	Jour	JPJ,40,(6),1537	Jun 76	H.Ueno+	E2329
^{3}He,t	^{9}B	DAE	2JPNTOH	5.5+06	7.8+06	Jour	JPJ,40,(6),1537	Jun 76	H.Ueno+	E2329
^{6}He,el	^{9}Be	DA	3BZLUSP	1.6+07	2.1+07	Jour	PR/C,83,064603	11	K.C.C.Pires+	D0650
^{10}Be,x	^{9}Be	CS	1USAMSU	8.0+08	1.2+09	Jour	PRL,106,162502	11	G.F.Grinyer+	C1830
^{10}Be,x	^{9}Be	DP	1USAMSU	1.2+09	1.2+09	Jour	PRL,106,162502	11	G.F.Grinyer+	C1830
^{10}C,x	^{9}C	CS	1USAMSU	1.2+09	1.2+09	Jour	PRL,106,162502	11	G.F.Grinyer+	C1830
^{12}N,abs		CS	2JPNIPC	4.6+07	6.9+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290
^{12}N,non		CS	2JPNIPC	4.6+07	6.9+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290
^{13}O,abs		CS	2JPNIPC	5.2+07	7.6+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290
^{13}O,non		CS	2JPNIPC	5.2+07	7.6+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290

^{17}Ne,abs		CS	2JPNIPC	4.2+07	6.4+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290
^{17}Ne,non		CS	2JPNIPC	4.2+07	6.4+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,^{3}He	^{9}Be	DAP	4KASKAZ	2.5+07	2.5+07	Jour	IZV,75,976	11	S.V.Artemov+	A0899
d,t	^{9}B	DAP	4KASKAZ	2.5+07	2.5+07	Jour	IZV,75,976	11	S.V.Artemov+	A0899

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{11}B	DA	2JPNKTO	6.0+06	7.4+06	Jour	JPJ,17,(1),9	Aug 62	K.Kimura+	E2232

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{12}C	DA	3PAKPAK	1.0+06	2.0+06	Jour	NIM/B,269,2032	11	K.Gul+	D0655
p,inel	^{12}C	CSP	3PAKPAK	8.0+06	8.0+06	Jour	NIM/B,269,2032	11	K.Gul+	D0655
p,inel	^{12}C	DAP	3PAKPAK	8.0+06	8.0+06	Jour	NIM/B,269,2032	11	K.Gul+	D0655
d,p	^{13}C	DAP	3HUNKFI	9.0+05	2.0+06	Jour	AHP,26,269	69	I.Borbely+	D0659
d,x+n	inclusive	TTD	1USABRK	1.5+06	1.5+06	Jour	MED,26,793	99	N.Colonna+	C1836
^{3}He,d	^{13}N	DAP	2JPNTOK	8.1+07	8.1+07	Jour	JPJ,41,(5),1445	76	K.Koyama	E2331
^{3}He,n	^{14}O	CS	3CZRUJF	7.2+06	3.5+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{3}He,x	^{10}C	CS	3CZRUJF	1.8+07	3.5+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{6}He,sct	^{12}C	DAP	2JPNIPC	4.9+08	4.9+08	Jour	PR/C,83,(3),034612	Mar 11	J.L.Lou+	E2327
^{9}Be,el	^{12}C	DA	3BZLUSP	1.3+07	2.1+07	Jour	NP/A,856,46	11	R.A.N.Oliveira+	D0648
^{10}C,x	^{9}C	CS	1USAMSU	1.2+09	1.2+09	Jour	PRL,106,162502	11	G.F.Grinyer+	C1830
^{10}C,x	^{9}C	DP	1USAMSU	1.2+09	1.2+09	Jour	PRL,106,162502	11	G.F.Grinyer+	C1830
^{12}C,x+p	inclusive	DAE	2JPNIRS	3.5+09	3.5+09	Jour	NSTP,1,102	Feb 11	Y.Fukuda+	E2338
^{17}Ne,abs		CS	2JPNIPC	4.2+07	6.4+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290
^{17}Ne,non		CS	2JPNIPC	4.2+07	6.4+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,x+n	inclusive	TTD	1USABRK	1.5+06	1.5+06	Jour	MED,26,793	99	N.Colonna+	C1836

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #

α,el	^{16}O	DA	1USAFSU	5.2+06	9.8+06	Jour	PR,181,1455	May 69	J.John+	C0751

9 Fluorine 18

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,α	^{15}O	CS	1CANTMF	2.5+05	6.7+05	Jour	PR/C,83,042801	11	C.E.Beer+	C1828

11 Sodium 22

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ		RP	1USAWAU	2.0+05	8.0+05	Jour	PR/C,83,034611	11	A.L.Sallaska+	C1827
p,γ	^{23}Mg	RR	1USAWAU	Maxwl		Jour	PR/C,83,034611	11	A.L.Sallaska+	C1827
p,γ	^{23}Mg	TT	1USAWAU	2.0+05	6.3+05	Jour	PR/C,83,034611	11	A.L.Sallaska+	C1827

12 Magnesium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{nat}Mg	DA	2JPNKTO	7.0+06	7.4+06	Jour	JPJ,17,(1),9	Aug 62	K.Kimura+	E2232

13 Aluminium 27

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{24}Na	CS	3CZRUJF	1.8+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,p	^{27}Mg	CS	3CZRUJF	1.8+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
p,el	^{27}Al	DA	2JPNKTO	6.5+06	7.3+06	Jour	JPJ,17,(1),9	Aug 62	K.Kimura+	E2232
p,x	^{22}Na	CS	3KORKRM	3.3+07	3.8+07	Jour	KPS,59,1821	11	M.U.Khandaker+	D7003
p,x	^{24}Na	CS	3KORKRM	3.1+07	3.8+07	Jour	KPS,59,1821	11	M.U.Khandaker+	D7003
^{3}He,2p	^{28}Al	CS	3CZRUJF	4.2+06	3.5+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{17}Ne,abs		CS	2JPNIPC	4.2+07	6.4+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290
^{17}Ne,non		CS	2JPNIPC	4.3+07	6.4+07	Jour	PR/C,82,(4),044309	Oct 10	K.Tanaka+	E2290

14 Silicon 28

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,p	^{29}Si	DAP	2JPNTOH	2.0+06	4.2+06	Jour	PR/C,7,(4),1425	Jul 73	C.C.Hsu+	E2177
α,inel	^{28}Si	DAP	2FR PAR	1.7+08	1.7+08	Jour	NP/A,155,89	70	B.Tatischeff+	D0217

15 Phosphorus 31

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{31}P	DA	2JPNKTO	6.5+06	7.3+06	Jour	JPJ,17,(1),9	Aug 62	K.Kimura+	E2232

21 Scandium 45

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{27}Al,fus		CS	1USAANL	3.2+07	5.0+07	Jour	PR/C,81,024611	10	C.L.Jiang+	C1781

27 Cobalt 59

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{59}Co	DA	2JPNKTO	6.5+06	7.4+06	Jour	JPJ,17,(1),9	Aug 62	K.Kimura+	E2232
p,γ	^{60}Ni	?	1USAOHO	1.8+06	1.8+06	Jour	PR/C,81,024319	10	A.Voinov+	C1783
^{3}He,2n	^{60}Cu	CS	3CZRUJF	2.1+07	2.1+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{3}He,n	^{61}Cu	CS	3CZRUJF	2.1+07	2.1+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{3}He,x	^{56}Co	CS	3CZRUJF	2.1+07	3.6+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{3}He,x	^{57}Co	CS	3CZRUJF	2.1+07	3.6+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654
^{3}He,x	^{58}Co	CS	3CZRUJF	2.1+07	3.6+07	Jour	EPJ/A,47,72	11	A.Pichard+	D0654

28 Nickel 58

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{58}Ni	DA	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291
p,el	^{58}Ni	POD	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291

28 Nickel 60

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{16}O,sct	^{60}Ni	DAP	3BZLUSP	2.4+07	3.8+07	Jour	PR/C,84,024601	11	E.Crema+	D0658
^{18}O,sct	^{60}Ni	DAP	3BZLUSP	2.5+07	3.7+07	Jour	PR/C,84,024601	11	E.Crema+	D0658

29 Copper

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{nat}Cu	DA	2JPNKTO	6.5+06	7.4+06	Jour	JPJ,17,(1),9	Aug 62	K.Kimura+	E2232
d,x	^{64}Cu	CS	3CZRUJF	1.5+06	2.0+07	Jour	PR/C,84,014605	11	E.Simeckova+	D0653

29 Copper 63

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,2n	^{63}Zn	CS	3CZRUJF	4.6+06	1.9+07	Jour	PR/C,84,014605	11	E.Simeckova+	D0653
d,3n	^{62}Zn	CS	3CZRUJF	1.6+07	2.0+07	Jour	PR/C,84,014605	11	E.Simeckova+	D0653

29 Copper 65

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,2n	^{65}Zn	CS	3CZRUJF	4.2+06	2.0+07	Jour	PR/C,84,014605	11	E.Simeckova+	D0653
d,2p	^{65}Ni	CS	3CZRUJF	1.1+07	2.0+07	Jour	PR/C,84,014605	11	E.Simeckova+	D0653
d,p	^{66}Cu	CS	3CZRUJF	4.6+06	1.9+07	Jour	PR/C,84,014605	11	E.Simeckova+	D0653
^{7}Li,^{6}Li	^{66}Cu	CSP	3INDTRM	2.5+07	2.5+07	Jour	PL/B,633,463	06	A.Shrivastava+	D0378

31 Gallium 69

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{68}Ga	CS	1USATNL	1.1+07	1.5+07	Jour	PR/C,83,044621	11	R.Raut+	14291
n,p	^{69}Zn	CS	1USATNL	7.5+06	1.5+07	Jour	PR/C,83,044621	11	R.Raut+	14291

31 Gallium 71

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,p	^{71}Zn	CS	1USATNL	7.5+06	1.5+07	Jour	PR/C,83,044621	11	R.Raut+	14291

33 Arsenic 75

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{74}As	CS	1USATNL	1.2+07	1.5+07	Jour	PR/C,83,044621	11	R.Raut+	14291
n,p	^{75}Ge	CS	1USATNL	7.5+06	1.5+07	Jour	PR/C,83,044621	11	R.Raut+	14291

41 Niobium 93

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,x+n	inclusive	TTD	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898
d,x+n	inclusive	?	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898

45 Rhodium 103

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{100}Tc	DAE	3CRORBZ	1.5+07	1.5+07	Jour	NP,73,548	Nov 65	P.Kulisic+	30127
n,α	^{100}Tc	DAP	3CRORBZ	1.5+07	1.5+07	Jour	NP,73,548	Nov 65	P.Kulisic+	30127
p,3n	^{101}Pd	TT	3IRNKRJ	2.5+07	2.9+07	Jour	KT,76,2	11	M.Enferadi+	D0656

49 Indium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,x	^{114}In	CS	3CZRUJF	1.8+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714

50 Tin

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,inel	^{nat}Sn	DAP	2FR PAR	1.7+08	1.7+08	Jour	NP/A,155,89	70	B.Tatischeff+	D0217

50 Tin 115

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,γ	^{119}Te	CS	3RUMBUC	9.6+06	1.5+07	Jour	PR/C,83,064609	11	D.Filipescu+	D0652
α,γ	^{119}Te	?	3RUMBUC	9.6+06	1.5+07	Jour	PR/C,83,064609	11	D.Filipescu+	D0652
α,n	^{118}Te	CS	3RUMBUC	1.1+07	1.5+07	Jour	PR/C,83,064609	11	D.Filipescu+	D0652

50 Tin 116

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,n	^{119}Te	CS	3RUMBUC	1.0+07	1.5+07	Jour	PR/C,83,064609	11	D.Filipescu+	D0652

52 Tellurium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x	^{120}I	CS	3EGYCAI	6.9+06	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{121}I	CS	3EGYCAI	1.4+07	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{123}I	CS	3EGYCAI	5.5+06	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{124}I	CS	3EGYCAI	6.9+06	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{125}I	CS	3EGYCAI	1.0+07	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{126}I	CS	3EGYCAI	4.3+06	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{128}I	CS	3EGYCAI	5.3+06	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647
p,x	^{130}I	CS	3EGYCAI	4.3+06	1.4+07	Jour	RCA,99,317	11	A.M.Ahmed+	D0647

53 Iodine 127

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,4n	^{124}I	CS	3CZRUJF	3.0+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714

66 Dysprosium 164

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{16}O,x+α	inclusive	DAE	3INDTRM	8.6+07	8.6+07	Jour	PR/C,80,054611	09	Y.K.Gupta+	C1772

67 Holmium 165

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{166}Ho	CS	3KORPUE	2.5-02	2.5-02	Jour	NIM/B,269,159	11	V.D.Nguyen+	30827
n,γ	^{166}Ho	RI	3KORPUE		5.5-01	Jour	NIM/B,269,159	11	V.D.Nguyen+	30827

69 Thulium 169

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,n	^{169}Yb	TT	3IRNKRJ	8.0+06	1.5+07	Jour	JRN,289,361	11	H.Nadi+	D0657

73 Tantalum 181

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{180}Ta	CS	3CZRUJF	1.8+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
^{12}C,x+α	inclusive	DAE	3INDTRM	7.7+07	7.7+07	Jour	PR/C,80,054611	09	Y.K.Gupta+	C1772

74 Tungsten 186

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{160}Gd,x	Many	FY	1USAANL	8.6+08	8.6+08	Jour	PR/C,83,044610	11	W.Loveland+	C1829

79 Gold 197

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{196}Au	CS	3CZRUJF	1.8+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,4n	^{194}Au	CS	3CZRUJF	2.2+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,5n	^{193}Au	CS	3CZRUJF	3.6+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,6n	^{192}Au	CS	2SWDUPP	4.7+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714

82 Lead 204

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{204}Pb	DA	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291
p,el	^{204}Pb	POD	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291

82 Lead 206

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{206}Pb	DA	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291
p,el	^{206}Pb	POD	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291

82 Lead 207

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{64}Ni,n	^{270}Ds	CS	2GERGSI	3.2+08	3.2+08	Jour	EPJ/A,10,5	01	S.Hofmann+	A0896

82 Lead 208

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,el	^{208}Pb	DA	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291
p,el	^{208}Pb	POD	2JPNOSA	3.0+08	3.0+08	Jour	PR/C,82,044611	Oct 10	J.Zenihiro+	E2291
^{70}Zn,n	^{277}Cn	CS	2GERGSI	3.4+08	3.4+08	Jour	ZP/A,354,229	96	S.Hofmann+	A0893
^{70}Zn,n	^{277}Cn	CS	2GERGSI	3.4+08	3.5+08	Jour	EPJ/A,14,147	02	S.Hofmann+	A0894

83 Bismuth 209

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,10n	^{200}Bi	CS	2SWDUPP	9.4+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,3n	^{207}Bi	CS	3CZRUJF	1.8+07	3.6+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,4n	^{206}Bi	CS	3CZRUJF	2.2+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,5n	^{205}Bi	CS	3CZRUJF	3.6+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714

n,6n	^{204}Bi	CS	2SWDUPP	4.7+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,7n	^{203}Bi	CS	2SWDUPP	9.4+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
n,8n	^{202}Bi	CS	2SWDUPP	9.4+07	9.4+07	Jour	KPS,59,1709	11	O.Svoboda+	31714
^{64}Ni,n	^{272}Rg	CS	2GERGSI	3.2+08	3.2+08	Jour	EPJ/A,14,147	02	S.Hofmann+	A0894

90 Thorium 232

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
^{13}C,fis		CS	1USAANL	5.6+07	7.0+07	Jour	PRL,106,172701	11	M.Alcorta+	C1831
^{14}C,fis		CS	1USAANL	5.5+07	6.8+07	Jour	PRL,106,172701	11	M.Alcorta+	C1831
^{15}C,fis		CS	1USAANL	5.4+07	7.0+07	Jour	PRL,106,172701	11	M.Alcorta+	C1831

92 Uranium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
d,x+n	inclusive	TTD	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898
d,x+n	inclusive	?	4RUSFEI	2.2+07	2.2+07	Jour	AE,30,399	71	V.K.Daruga+	A0898

92 Uranium 233

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,fis	Many	FY	2JPNJAE	1.2+07	1.2+07	Jour	EPJ/A,47,(1),9	11	I.Nishinaka+	E2337
p,fis	Many	KE	2JPNJAE	1.2+07	1.2+07	Jour	EPJ/A,47,(1),9	11	I.Nishinaka+	E2337

92 Uranium 235

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
n,2n	^{234}U	CSP	1USALAS	4.1+06	1.9+07	Rept	UCRL-ID-140313	00	W.Younes+	14144
n,3n	^{233}U	CSP	1USALAS		4.1+06	Rept	UCRL-ID-140313	00	W.Younes+	14144
n,fis		NUF	1USALAS	1.0+06	8.0+06	Jour	PR/C,83,034604	11	S.Noda+	14290
n,fis	^{1}n	KE	1USALAS	1.0+06	8.0+06	Jour	PR/C,83,034604	11	S.Noda+	14290
n,inel	^{235}U	CSP	1USALAS		1.9+07	Rept	UCRL-ID-140313	00	W.Younes+	14144

92 Uranium 238

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{238}U	DA	1USABRK	5.0+07	5.0+07	Jour	PRL,30,571	73	D.L.Hendrie+	C1838
α,inel	^{238}U	DAP	1USABRK	5.0+07	5.0+07	Jour	PRL,30,571	73	D.L.Hendrie+	C1838
^{48}Ca,3n	^{283}Cn	CS	4ZZZDUB	2.3+08	2.4+08	Jour	PR/C,70,064609	04	Yu.Ts.Oganessian+	A0889
^{48}Ca,3n	^{283}Cn	CS	2GERGSI	2.4+08	2.4+08	Jour	EPJ/A,32,251	07	S.Hofmann+	A0895

93 Neptunium 237

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{48}Ca,3n	^{282}*	CS	4ZZZDUB	2.4+08	2.4+08	Jour	PR/C,76,011601	07	Yu.Ts.Oganessian+	A0892

94 Plutonium 238

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		CS	1USABRK	1.0+06	2.0+07	Jour	PR/C,83,054610	11	J.J.Ressler+	14292

94 Plutonium 239

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		NUF	1USALAS	1.0+06	8.0+06	Jour	PR/C,83,034604	11	S.Noda+	14290
n,fis		?	1USALAS	1.0+06	8.0+06	Jour	PR/C,83,034604	11	S.Noda+	14290
n,fis	^{1}n	KE	1USALAS	1.0+06	8.0+06	Jour	PR/C,83,034604	11	S.Noda+	14290

94 Plutonium 242

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{48}Ca,4n	^{286}*	CS	4ZZZDUB	2.4+08	2.4+08	Jour	PR/C,70,064609	04	Yu.Ts.Oganessian+	A0889

94 Plutonium 244

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{48}Ca,3n	^{289}*	CS	4ZZZDUB	2.4+08	2.6+08	Jour	PR/C,69,054607	04	Yu.Ts.Oganessian+	A0891

95 Americium 243

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{48}Ca,3n	^{288}*	CS	4ZZZDUB	2.5+08	2.5+08	Jour	PR/C,72,034611	05	Yu.Ts.Oganessian+	A0890
^{48}Ca,4n	^{287}*	CS	4ZZZDUB	2.5+08	2.5+08	Jour	PR/C,72,034611	05	Yu.Ts.Oganessian+	A0890

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{48}Ca,2n	^{291}*	CS	4ZZZDUB	2.4+08	2.4+08	Jour	PR/C,69,054607	04	Yu.Ts.Oganessian+	A0891

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{18}O,5n	^{261}Rf	CS	2JPNIPC	9.5+07	9.5+07	Jour	PR/C,83,(3),034602	Mar 11	H.Haba+	E2324
^{48}Ca,4n	^{292}*	CS	4ZZZDUB	2.5+08	2.5+08	Jour	PR/C,70,064609	04	Yu.Ts.Oganessian+	A0889