EXFOR News (June 2017)

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, JAEA, 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 N.Otsuka (NRDC Coordinator n.otsuka@iaea.org) for inclusion in the EXFOR News distribution list as well as any question on EXFOR.

[1] N.Otuka et al., Nucl.Data.Sheets **120**(2014)272.

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), NDPCI (India), JAEA (Japan), JCPRG (Japan), KAERI (Korea), 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 #
	n,ths	^{1}H	CS	1USAGGA	1.1-03	2.2-02	Rept	GA-4490	64	W.L.Whittemore	14174
*	p,el	^{1}H	DA	2GERJUL	1.0+09	2.8+09	Jour	PL/B,755,92	16	G.Macharashvili+	O2325
*	α,el	^{1}H	DA	3CPRFUD	1.8+06	6.0+06	Jour	NIM/B,335,85	14	H.L.Zhang+	S0204
*	^{7}Li,el	^{1}H	?	2ITYLNS	1.6+07	3.8+07	Jour	PR/C,94,014604	16	A.Pakou+	O2310
*	^{7}Li,inel	^{1}H	?	2ITYLNS	1.6+07	3.8+07	Jour	PR/C,94,014604	16	A.Pakou+	O2310
*	^{12}C,el	^{1}H	DA	3CPRFUD	4.0+06	8.0+06	Jour	NIM/B,346,17	15	Yangzhang+	S0196
*	^{18}F,α	^{15}O	CS	2JPNIPC	3.2+03	8.5+05	Jour	PR/C,92,015805	15	S.Cherubini+	E2506
*	^{107}Pd,x	Many	?	2JPNIPC	1.3+10	2.1+10	Jour	PTEP,2017,021D01	17	H.Wang+	E2518

1 Hydrogen 2

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{1}H	CS	2FR BRC	7.4+06	1.5+07	Conf	85SANTA,2,1561	85	J.Frehaut+	21971
*	^{3}He,p	^{4}He	DA	2GERGAR	1.8+05	5.6+06	Jour	NIM/B,371,41	16	B.Wielunska+	O1258
*	α,el	^{2}H	DA	3CPRFUD	2.6+06	7.4+06	Jour	NIM/B,375,13	16	Zhibinhan+	S0184
*	^{7}Li,el	^{2}H	?	2ITYLNS	3.8+07	3.8+07	Jour	PR/C,94,014604	16	A.Pakou+	O2310
*	^{7}Li,inel	^{2}H	?	2ITYLNS	5.4+06	5.4+06	Jour	PR/C,94,014604	16	A.Pakou+	O2310
*	^{107}Pd,x	Many	?	2JPNIPC	1.3+10	2.1+10	Jour	PTEP,2017,021D01	17	H.Wang+	E2518
*	^{208}Pb,fis		?	2GERGSI	1.0+11	1.0+11	Jour	NDS,119,277	14	J.Benlliure+	O2294

1 Hydrogen

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,ths	1-H-WTR	DAE	1USARPI	1.5-01	1.5-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	DAE	1USABNW	1.5-01	1.5-01	Jour	JCP,50,5279	69	O.K.Harling	14226
	n,ths	1-H-WTR	DAE	1USARPI	2.3-01	2.3-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	DAE	1USABNW	3.0-01	3.0-01	Jour	JCP,50,5279	69	O.K.Harling	14226
	n,ths	1-H-WTR	DAE	1USARPI	4.0-02	5.0-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	DAE	1USABNW	6.1-01	6.1-01	Jour	JCP,50,5279	69	O.K.Harling	14226
	n,ths	1-H-WTR	DAE	1USARPI	6.3-01	6.3-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	?	1USARPI	1.5-01	1.5-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	?	1USABNW	1.5-01	1.5-01	Jour	JCP,50,5279	69	O.K.Harling	14226
	n,ths	1-H-WTR	?	1USARPI	2.3-01	2.3-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	?	1USABNW	3.0-01	3.0-01	Jour	JCP,50,5279	69	O.K.Harling	14226
	n,ths	1-H-WTR	?	1USARPI	4.0-02	5.0-01	Rept	KAPL-3908	70	L.J.Esch+	14199
	n,ths	1-H-WTR	?	1USABNW	6.2-01	6.2-01	Jour	JCP,50,5279	69	O.K.Harling	14226
	n,ths	1-H-WTR	?	1USARPI	6.3-01	6.3-01	Rept	KAPL-3908	70	L.J.Esch+	14199

2 Helium 3

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n+p	^{1}H	DA	4RUSLEB	8.0+06	1.7+08	Jour	NP,71,305	65	V.N.Fetisov+	M0934
	γ,p	^{2}H	DA	4RUSLEB	6.0+06	2.2+07	Jour	NP,71,305	65	V.N.Fetisov+	M0934

2 Helium 4

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,el	^{4}He	DA	2SPNSEU	6.0+05	3.0+06	Jour	ACSOM,1,1229	16	V.Godinho+	O2322
*	^{56}Ni,inel	^{4}He	?	2FR GAN	2.8+09	2.8+09	Jour	PL/B,751,371	15	S.Bagchi+	O2320

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,el	^{6}Li	CS	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,el	^{6}Li	DA	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,inel	^{6}Li	CSP	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,inel	^{6}Li	DAP	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,x+n	inclusive	DAE	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,inel	^{7}Li	CSP	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,inel	^{7}Li	DAP	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,sct	^{7}Li	CSP	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,sct	^{7}Li	DAP	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711
*	n,x+n	inclusive	DAE	3CPRAEP	8.2+06	1.0+07	Jour	NSE,163,272	09	G.C.Chen+	32711

3 Lithium 11

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	0,B-	^{11}Be	NUD	1CANTMF	Spont		Jour	NP/A,738,201	04	Y.Hirayama+	14267

4 Beryllium 9

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,α	^{6}Li	DAP	2PRTLIS	5.1+05	2.3+06	Jour	NIM/B,371,50	16	N.Catarino+	O2302
*	p,d	^{8}Be	DAP	2PRTLIS	5.1+05	2.3+06	Jour	NIM/B,371,50	16	N.Catarino+	O2302

*	p,inel	^{9}Be	DAP	2PRTLIS	5.1+05	2.3+06	Jour	NIM/B,371,50	16	N.Catarino+	O2302
*	^{3}He,^{5}He	^{7}Be	DA	2SF JYV	3.0+07	3.0+07	Jour	JP/CS,724,012031	16	S.M.Lukyanov+	O2319
*	^{3}He,^{6}He	^{6}Be	DAP	2SF JYV	3.0+07	3.0+07	Jour	JP/CS,724,012031	16	S.M.Lukyanov+	O2319
*	^{3}He,^{5}Li	^{7}Li	DAP	2SF JYV	3.0+07	3.0+07	Jour	JP/CS,724,012031	16	S.M.Lukyanov+	O2319
*	^{3}He,^{6}Li	^{6}Li	DAP	2SF JYV	3.0+07	3.0+07	Jour	JP/CS,724,012031	16	S.M.Lukyanov+	O2319
*	^{3}He,α	^{8}Be	DAP	2SF JYV	3.0+07	3.0+07	Jour	JP/CS,724,012031	16	S.M.Lukyanov+	O2319
*	^{3}He,el	^{9}Be	DA	2SF JYV	3.0+07	3.0+07	Jour	JP/CS,724,012031	16	S.M.Lukyanov+	O2319

5 Boron

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,α		MLT	2ITYFIR	2.5+06	4.1+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306
*	p,α		MLT	2SF HLS	4.0+06	6.5+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303
*	p,inel	5-B-CMP	MLT	2ITYFIR	2.5+06	4.1+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306
*	p,inel	5-B-CMP	MLT	2SF HLS	4.0+06	6.5+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303

5 Boron 10

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,α	^{7}Be	CSP	2ITYNAP	5.7+05	9.3+05	Jour	JP/G,43,045109	16	I.Lombardo+	O2317
*	p,α	^{7}Be	DAP	2ITYNAP	6.3+05	1.0+06	Jour	JP/G,43,045109	16	I.Lombardo+	O2317

5 Boron 11

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	^{11}B	DAP	2GRCATH	2.6+06	5.0+06	Jour	NIM/B,368,71	16	K.Preketes-Sigalas+	O2305

6 Carbon

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	n,tot		CS	1USAGA	1.3-03	8.1-01	Rept	GA-6753	65	J.M.Neill	14181
*	^{10}B,x	Many	CS	2GERGSI	4.9+09	4.9+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{11}B,x	Many	CS	2GERGSI	5.4+09	5.4+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{12}B,x	Many	CS	2GERGSI	5.9+09	5.9+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{13}B,x	Many	CS	2GERGSI	6.4+09	6.4+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{14}B,x	Many	CS	2GERGSI	6.9+09	6.9+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{15}B,x	Many	CS	2GERGSI	7.4+09	7.4+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{10}C,x	Many	CS	2GERGSI	4.9+09	4.9+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{12}C,tcc		CS	2GERGSI	1.1+10	1.1+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{12}C,x	Many	CS	2GERGSI	5.9+09	5.9+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{13}C,tcc		CS	2GERGSI	1.1+10	1.1+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{13}C,x	Many	CS	2GERGSI	6.4+09	6.4+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{14}C,tcc		CS	2GERGSI	1.3+10	1.3+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{14}C,x	Many	CS	2GERGSI	6.9+09	6.9+09	Jour	PR/C,93,054601	16	R.Thies+	O2297

*	^{15}C,tcc		CS	2GERGSI	1.4+10	1.4+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{15}C,x	Many	CS	2GERGSI	7.4+09	7.4+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{16}C,tcc		CS	2GERGSI	1.5+10	1.5+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{16}C,x	Many	CS	2GERGSI	7.8+09	7.8+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{17}C,tcc		CS	2GERGSI	1.7+10	1.7+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{17}C,x	Many	CS	2GERGSI	8.3+09	8.3+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{18}C,tcc		CS	2GERGSI	1.6+10	1.6+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311
*	^{18}C,x	Many	CS	2GERGSI	8.8+09	8.8+09	Jour	PR/C,93,054601	16	R.Thies+	O2297
*	^{19}C,tcc		CS	2GERGSI	1.7+10	1.7+10	Jour	PRL,117,102501	16	R.Kanungo+	O2311

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	γ,p	^{11}B	CSP	2BLGGHT	2.0+07	3.0+07	Jour	PR/C,14,(2),456	76	R.Carchon+	M0933
	γ,p	^{11}B	DA	2BLGGHT	1.9+07	3.0+07	Jour	PR/C,14,(2),456	76	R.Carchon+	M0933
*	d,x+n	inclusive	PY	2SF JYV	2.0+07	3.0+07	Jour	EPJ/A,52,364	16	G.Lhersonneau+	O2327
*	^{3}He,p	^{14}N	DAP	2GERJUL	1.6+06	4.5+06	Jour	NIM/B,394,134	17	S.Moeller	O2321
*	^{12}C,x	^{6}Li	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{7}Li	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{7}Be	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{9}Be	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x+α	inclusive	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	n,2n	^{12}C	CS	2FR BRC	7.4+06	1.5+07	Prog	NEANDC(E)-194,66	78	J.Frehaut	21669
*	d,x+n	inclusive	PY	2SF JYV	2.0+07	3.0+07	Jour	EPJ/A,52,364	16	G.Lhersonneau+	O2327
*	^{3}He,α	^{12}C	DAP	2GERJUL	2.3+06	4.5+06	Jour	NIM/B,394,134	17	S.Moeller	O2321
*	^{3}He,p	^{15}N	DAP	2GERJUL	2.2+06	4.5+06	Jour	NIM/B,394,134	17	S.Moeller	O2321
*	α,inel	^{13}C	DAP	2SF JYV	6.5+07	9.0+07	Jour	JEL,102,199	15	A.A.Ogloblin+	O2296

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	7-N-CMP	MLT	2ITYFIR	3.5+06	4.1+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306
*	p,inel	7-N-CMP	MLT	2SF HLS	4.0+06	6.5+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	^{14}N	CSP	2SF HLS	3.6+06	6.9+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303

8 Oxygen 14

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,el	^{14}O	DA	2FR GAN	4.6+05	5.5+06	Jour	PL/B,758,26	16	F.Degrancey+	O2323

8 Oxygen 17

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	2ITYLNS			Jour	PR/C,95,025807	17	G.L.Guardo+	23332
*	p,α		RP	2ITYLGS	6.4+04	6.4+04	Jour	PRL,117,142502	16	C.G.Bruno+	O2313
*	p,γ		RP	2ITYLGS	6.4+04	6.4+04	Jour	PRL,117,142502	16	C.G.Bruno+	O2313
	α,n	^{20}Ne	CS	2GERIFS	6.4+05	2.0+06	Conf	94CRETE,,38	94	R.Kunz+	O2293

8 Oxygen 18

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,n	^{21}Ne	CS	2GERIFS	8.5+05	2.0+06	Conf	94CRETE,,38	94	R.Kunz+	O2293

9 Fluorine 19

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,α	^{16}O	DA	2PRTLIS	1.5+06	4.0+06	Jour	NIM/B,381,110	16	P.Cabanelas+	O2301
*	p,inel	^{19}F	DAP	2SPNAUT	3.0+06	7.2+06	Jour	NIM/B,384,37	16	M.Chiari+	O2312
*	d,α		RP	2GERMUN	2.2+07	2.2+07	Jour	PR/C,92,052802	15	T.Faestermann+	O2286
*	^{3}He,t	^{19}Ne	DAP	2GERMUU	2.5+07	2.5+07	Jour	PR/C,92,055806	15	A.Parikh+	O2285
	α,inel	^{19}F	CSP	2FR SAC	2.0+06	4.9+06	Jour	NP,51,593	64	R.M.Freeman+	O2290
	α,n	^{22}Na	CSP	2FR SAC	3.1+06	4.9+06	Jour	NP,51,593	64	R.M.Freeman+	O2290
	α,n	^{22}Na	DAP	2UK ALD	3.4+06	5.3+06	Jour	PPS,73,307	59	R.Batchelor+	O2291
	α,p	^{22}Ne	CSP	2FR SAC	2.0+06	4.9+06	Jour	NP,51,593	64	R.M.Freeman+	O2290

10 Neon 21

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,n	^{24}Mg	CS	2GERIFS	5.6+05	2.7+06	Conf	94CRETE,,38	94	R.Kunz+	O2293

10 Neon 22

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	2ITYLGS	1.6+05	2.6+05	Jour	PR/C,94,055804	16	R.Depalo+	O2324

*	p,γ		RP	2GERZFK	4.4+05	1.3+06	Jour	PR/C,92,045807	15	R.Depalo+	O2284
*	p,γ	^{23}Na	?	2ITYLGS	1.6+05	2.6+05	Jour	PR/C,94,055804	16	R.Depalo+	O2324
*	p,γ	^{23}Na	?	2GERZFK	4.4+05	6.4+05	Jour	PR/C,92,045807	15	R.Depalo+	O2284

11 Sodium

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	11-NA-CMP	MLT	2ITYFIR	2.5+06	4.1+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306
*	p,inel	11-NA-CMP	?	2ITYFIR	2.5+06	4.1+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306

11 Sodium 23

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	n,2n	^{22}Na	CS	2ZZZGEL	1.9+07	1.9+07	Conf	91JUELIC,,663	91	B.Strohmaier+	23328
*	n,γ		RP	2GERKFK	2.8+03	2.8+03	Jour	PR/C,95,025803	17	E.Uberseder+	23337
*	n,γ	^{24}Na	CS	2GERKFK			Jour	PR/C,95,025803	17	E.Uberseder+	23337

12 Magnesium 25

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	n,0		RP	2ITYUBO			Jour	PL/B,768,1	17	C.Massimi+	23327
*	n,γ	^{26}Mg	CS	2ZZZCER	1.0+01	1.0+06	Jour	PL/B,768,1	17	C.Massimi+	23327
*	n,γ	^{26}Mg	CS	2ITYUBO	Maxwl		Jour	PL/B,768,1	17	C.Massimi+	23327
*	p,inel	^{25}Mg	DAP	2GRCATH	2.4+06	4.5+06	Jour	NIM/B,386,4	16	K.Preketes-Sigalas+	O2316

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	n,α	^{24}Na	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171
*	p,α	^{24}Mg	MLT	2ITYFIR	2.5+06	4.0+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306
*	p,inel	^{27}Al	MLT	2ITYFIR	2.5+06	4.0+06	Jour	NIM/B,366,77	16	M.Chiari+	O2306
	α,n	^{30}P	DAP	2UK ALD	5.4+06	5.4+06	Jour	PPS,73,307	59	R.Batchelor+	O2291

14 Silicon

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	14-SI-CMP	MLT	2SF HLS	4.0+06	6.5+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303

14 Silicon 28

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,inel	^{28}Si	CSP	2SF HLS	3.6+06	6.7+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303

14 Silicon 29

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,inel	^{29}Si	CSP	2SF HLS	3.6+06	6.7+06	Jour	NIM/B,378,25	16	B.Marchand+	O2303

21 Scandium 45

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{44}Sc	CS	2FR BRC	1.2+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

22 Titanium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n		CS	2FR BRC	1.0+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	p,x	^{42}K	CS	2FR NTE	4.6+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{43}K	CS	2FR NTE	4.1+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{43}Sc	CS	2FR NTE	1.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{44}Sc	CS	2FR NTE	1.4+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{46}Sc	CS	2FR NTE	1.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{47}Sc	CS	2FR NTE	1.4+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{48}Sc	CS	2FR NTE	2.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{48}V	CS	2FR NTE	2.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	α,x	^{46}Sc	CS	2BLGVUB	2.2+07	3.9+07	Jour	NIM/B,380,15	16	M.S.Uddin+	O2304
*	α,x	^{48}Sc	CS	2BLGVUB	2.7+07	3.9+07	Jour	NIM/B,380,15	16	M.S.Uddin+	O2304
*	α,x	^{48}V	CS	2BLGVUB	1.6+07	3.9+07	Jour	NIM/B,380,15	16	M.S.Uddin+	O2304
*	α,x	^{48}Cr	CS	2BLGVUB	1.6+07	3.9+07	Jour	NIM/B,380,15	16	M.S.Uddin+	O2304
*	α,x	^{51}Cr	CS	2BLGVUB	1.6+07	3.9+07	Jour	NIM/B,380,15	16	M.S.Uddin+	O2304

22 Titanium 46

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,p	^{46}Sc	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171

22 Titanium 47

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,p	^{47}Sc	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171

22 Titanium 48

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,p	^{48}Sc	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171

23 Vanadium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$		CS	2FR BRC	1.1+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

24 Chromium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$		CS	2FR BRC	1.0+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

24 Chromium 52

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,t	^{50}Cr	DAP	2GERLMU	2.4+07	2.4+07	Jour	PR/C,94,011304	16	K.G.Leach+	O2309

26 Iron

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$		CS	2FR BRC	1.2+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

26 Iron 54

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,α	^{51}Cr	CS	2GERJUL	1.5+07	1.5+07	Jour	NP/A,283,269	Jun 77	N.I.Molla+	20721
*	n,α	^{51}Cr	CS	3CPRBJG	4.0+06	6.5+06	Jour	PR/C,92,044601	15	Zhiminwang+	32737
	n,p	^{54}Mn	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171

26 Iron 56

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{53}Cr	CS	3CPRBJG	5.5+06	6.5+06	Jour	PR/C,92,044601	15	Zhiminwang+	32737
*	n,γ	^{57}Fe	CS	3HUNKFI	2.5-02	2.5-02	Jour	PR/C,95,014328	17	R.B.Firestone+	31772
*	n,γ	^{57}Fe	CSP	3HUNKFI	2.5-02	2.5-02	Jour	PR/C,95,014328	17	R.B.Firestone+	31772
*	n,γ	^{57}Fe	SPC	3HUNKFI	2.5-02	2.5-02	Jour	PR/C,95,014328	17	R.B.Firestone+	31772

26 Iron 57

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{54}Cr	CSP	3CPRBJG	5.0+06	6.5+06	Jour	PR/C,89,064607	14	Yu.M.Gledenov+	32748

27 Cobalt 59

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$	^{58}Co	CS	2FR BRC	1.1+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

28 Nickel

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{52}Mn	CS	2FR NTE	4.1+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{54}Mn	CS	2FR NTE	1.8+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{55}Co	CS	2FR NTE	1.0+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{56}Co	CS	2FR NTE	1.8+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{57}Co	CS	2FR NTE	1.0+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{58}Co	CS	2FR NTE	1.0+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{56}Ni	CS	2FR NTE	2.0+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{57}Ni	CS	2FR NTE	1.4+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{62}Zn	CS	2FR NTE	1.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{59}Ni	CS	2GERKFK			Jour	NIM/B,259,683	07	G.Rugel+	22971
	n,p	^{58}Co	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171
	n,p	^{58}Co	?	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),953	79	R.Fleming+	14167

28 Nickel 60

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,0		RP	1USAORL			Conf	91JUELIC,41	May 91	C.M.Perey+	13511
*	n,2n	^{59}Ni	CS	3CPRAEP	1.5+07	1.5+07	Jour	NIM/B,361,517	15	Minghe+	32736

29 Copper

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n		CS	2FR BRC	1.0+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	p,x	^{54}Mn	CS	2FR NTE	5.7+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{56}Co	CS	2FR NTE	5.7+07	5.8+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{57}Co	CS	2FR NTE	2.9+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{58}Co	CS	2FR NTE	2.9+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{60}Co	CS	2FR NTE	3.6+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{57}Ni	CS	2FR NTE	4.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{61}Cu	CS	2FR NTE	2.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{64}Cu	CS	2FR NTE	1.5+07	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315
*	p,x	^{65}Zn	CS	2FR NTE	9.6+06	7.0+07	Jour	NIM/B,383,191	16	E.Garrido+	O2315

29 Copper 63

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x+n	inclusive	CS	4RUSMOS	1.1+07	2.7+07	Jour	IZV,81,(6),738	17	V.V.Varlamov+	M0931
	n,2n	^{62}Cu	CS	2FR BRC	1.2+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	n,α	^{60}Co	CS	3CPRBJG	5.0+06	6.5+06	Jour	PR/C,89,064607	14	Yu.M.Gledenov+	32748
*	n,γ	^{64}Cu	CS	2ZZZGEL			Jour	PR/C,95,015808	17	M.Weigand+	23326

29 Copper 65

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{64}Cu	CS	2FR BRC	1.1+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

30 Zinc 64

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{7}Li,el	^{64}Zn	DA	2ITYLNS	1.2+07	1.8+07	Jour	PR/C,92,054602	15	J.P.Fernandez-Garcia+	O2331

30 Zinc 70

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,el	^{70}Zn	DA	2FR PAR	2.7+07	2.7+07	Jour	PR/C,93,064308	16	P.Morfouace+	O2308
*	d,^{3}He	^{69}Cu	DAP	2FR PAR	2.7+07	2.7+07	Jour	PR/C,93,064308	16	P.Morfouace+	O2308

31 Gallium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$		CS	2FR BRC	9.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

32 Germanium 74

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,fus		CS	3CPRAEP	3.0+07	4.9+07	Jour	PR/C,86,044621	12	H.M.Jia+	S0077
*	^{18}O,fus		DA	3CPRAEP	4.0+07	4.5+07	Jour	PR/C,86,044621	12	H.M.Jia+	S0077

32 Germanium 76

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{16}O,fus		CS	3CPRAEP	3.1+07	5.0+07	Jour	PR/C,86,044621	12	H.M.Jia+	S0077
*	^{16}O,fus		DA	3CPRAEP	4.4+07	4.4+07	Jour	PR/C,86,044621	12	H.M.Jia+	S0077

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	2FR BRC	1.1+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

34 Selenium 76

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$	^{75}Se	CS	2FR BRC	1.2+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

34 Selenium 78

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$	^{77}Se	CS	2FR BRC	1.1+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

34 Selenium 80

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{79}Se	CS	2FR BRC	1.0+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

34 Selenium 82

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{81}Se	CS	2FR BRC	9.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

39 Yttrium 89

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{87}Y	CS	4RUSMOS	2.1+07	2.7+07	Jour	IZV,81,(6),738	17	V.V.Varlamov+	M0931
*	γ,2n	^{87}Y	INT	4RUSMOS		2.7+07	Jour	IZV,81,(6),738	17	V.V.Varlamov+	M0931
*	γ,n	^{88}Y	CS	4RUSMOS	1.1+07	2.4+07	Jour	IZV,81,(6),738	17	V.V.Varlamov+	M0931
*	γ,n	^{88}Y	INT	4RUSMOS		2.7+07	Jour	IZV,81,(6),738	17	V.V.Varlamov+	M0931
	γ,p	^{88}Sr	CSP	2BLGGHT	1.4+07	2.4+07	Jour	PR/C,24,(6),2499	81	E.Vancamp+	M0932
	γ,p	^{88}Sr	INT	2BLGGHT	1.4+07	2.5+07	Jour	PR/C,24,(6),2499	81	E.Vancamp+	M0932
*	γ,x+n	inclusive	INT	4RUSMOS		2.7+07	Jour	IZV,81,(6),738	17	V.V.Varlamov+	M0931
	n,2n	^{88}Y	CS	2FR BRC	1.2+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	n,2n	^{88}Y	CS	3CPRNPC	1.4+07	1.5+07	Jour	NSE,184,254	16	Luojunhua+	32729
*	n,α	^{86}Rb	CS	3CPRNPC	1.4+07	1.5+07	Jour	NSE,184,254	16	Luojunhua+	32729
*	n,p	^{89}Sr	CS	3CPRNPC	1.4+07	1.5+07	Jour	NSE,184,254	16	Luojunhua+	32729
*	n,t	^{87}Sr	CS	3CPRNPC	1.5+07	1.5+07	Jour	NSE,184,254	16	Luojunhua+	32729

40 Zirconium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n		CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,ths	40-ZR-HYD	DAE	1USARPI	2.3-01	5.7-01	Conf	67ANNARB,1,407	67	S.N.Purohit+	14157

40 Zirconium 90

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	2ZZZCER			Jour	PR/C,77,035802	08	G.Tagliente+	23329
*	n,γ	^{91}Zr	CS	2ZZZCER	Maxwl	5.0+05	Jour	PR/C,77,035802	08	G.Tagliente+	23329
*	^{32}S,fus		CS	3CPRAEP	7.3+07	9.5+07	Jour	PR/C,82,054609	10	H.Q.Zhang+	S0208

40 Zirconium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{94}Zr	CS	2JPNJAE	5.0+05	7.5+06	Jour	PR/C,94,015804	16	S.Q.Yan+	32732

40 Zirconium 94

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	2ZZZCER			Jour	PR/C,84,015801	11	G.Tagliente+	23330
*	n,γ	^{95}Zr	CS	2ZZZCER	Maxwl	5.0+05	Jour	PR/C,84,015801	11	G.Tagliente+	23330
*	^{32}S,fus		CS	3CPRAEP	7.0+07	9.6+07	Jour	PR/C,89,064605	14	H.M.Jia+	S0205

40 Zirconium 96

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	2ZZZCER			Jour	PR/C,84,055802	11	G.Tagliente+	23331
*	n,γ	^{97}Zr	CS	2ZZZCER	Maxwl	6.2+04	Jour	PR/C,84,055802	11	G.Tagliente+	23331
*	^{6}Li,2n	^{100}Tc	?	3CPRAEP	1.6+07	2.8+07	Jour	PR/C,91,044619	15	S.P.Hu+	S0193
*	^{6}Li,x	^{97}Zr	CS	3CPRAEP	1.4+07	2.8+07	Jour	PR/C,93,014621	16	S.P.Hu+	S0186
*	^{6}Li,x	^{97}Zr	CSP	3CPRAEP	1.4+07	2.8+07	Jour	PR/C,93,014621	16	S.P.Hu+	S0186
*	^{6}Li,x	^{96}Nb	CS	3CPRAEP	1.6+07	2.8+07	Jour	PR/C,91,044619	15	S.P.Hu+	S0193
*	^{6}Li,x	^{98}Mo	CS	3CPRAEP	1.6+07	2.8+07	Jour	PR/C,91,044619	15	S.P.Hu+	S0193
*	^{6}Li,x	^{99}Mo	CS	3CPRAEP	1.6+07	2.8+07	Jour	PR/C,91,044619	15	S.P.Hu+	S0193
*	^{6}Li,x	^{100}Mo	CS	3CPRAEP	1.6+07	2.8+07	Jour	PR/C,91,044619	15	S.P.Hu+	S0193
*	^{32}S,fus		CS	3CPRAEP	7.0+07	9.7+07	Jour	PR/C,82,054609	10	H.Q.Zhang+	S0208

41 Niobium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,ths	41-NB-CMP	DAE	1USARPI	2.4-01	2.4-01	Conf	67ANNARB,1,407	67	S.N.Purohit+	14157

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{92}Nb	CS	2FR BRC	9.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

42 Molybdenum

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

	n,2n		CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

45 Rhodium 103

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{102}Rh	CS	2FR BRC	9.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	p,γ	^{104}Pd	CS	2GERTHS	2.0+06	3.5+06	Jour	PR/C,93,025804	16	S.Harissopulos+	O2330

46 Palladium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,tot		CS	3KORPUE	2.1-01	2.0+02	Jour	NSE,183,286	16	T.F.Wang+	30838

46 Palladium 104

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	3KORPUE			Jour	NSE,183,286	16	T.F.Wang+	30838

46 Palladium 105

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	3KORPUE			Jour	NSE,183,286	16	T.F.Wang+	30838

46 Palladium 106

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	3KORPUE			Jour	NSE,183,286	16	T.F.Wang+	30838

46 Palladium 108

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	3KORPUE			Jour	NSE,183,286	16	T.F.Wang+	30838

46 Palladium 110

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	3KORPUE			Jour	NSE,183,286	16	T.F.Wang+	30838

48 Cadmium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,x	^{115}Cd	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{109}In	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{110}In	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{111}In	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{114}In	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{110}Sn	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{113}Sn	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314
*	α,x	^{117}Sn	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314

48 Cadmium 108

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,γ	^{112}Sn	CS	2GERKLN	1.2+07	1.3+07	Jour	PL/B,761,247	16	P.Scholz+	O2318
*	α,n	^{111}Sn	CS	2GERKLN	1.0+07	1.3+07	Jour	PL/B,761,247	16	P.Scholz+	O2318

48 Cadmium 116

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,x	^{117}Sn	CS	2FR NTE	2.5+07	6.5+07	Jour	ARI,115,113	16	C.Duchemin+	O2314

49 Indium 113

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{114}Sn	CS	2GERTHS	2.0+06	3.5+06	Jour	PR/C,93,025804	16	S.Harissopulos+	O2330

49 Indium 115

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{116}Sn	CS	2GERTHS	2.0+06	3.5+06	Jour	PR/C,93,025804	16	S.Harissopulos+	O2330

50 Tin 120

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{9}Li,fus		CS	2ITYLNS	1.7+07	2.5+07	Jour	PR/C,92,064611	15	M.Fisichella+	O2289

58 Cerium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n		CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

58 Cerium 136

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{137}Ce	CS	3KORKAE	Maxwl		Jour	NDS,119,154	14	J.Y.Lee+	30839

60 Neodymium 142

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{141}Nd	CS	2FR BRC	1.0+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

60 Neodymium 144

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{143}Nd	CS	2FR BRC	8.2+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
^{12}C,el	^{144}Nd	DA	2UK HAR	1.2+08	1.2+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292
^{16}O,el	^{144}Nd	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

60 Neodymium 146

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{145}Nd	CS	2FR BRC	8.0+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
n,3n	^{144}Nd	CS	2FR BRC	1.5+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
^{12}C,el	^{146}Nd	DA	2UK HAR	1.2+08	1.2+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292
^{16}O,el	^{146}Nd	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

60 Neodymium 148

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{147}Nd	CS	2FR BRC	8.0+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,3n	^{146}Nd	CS	2FR BRC	1.4+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	^{16}O,el	^{148}Nd	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

60 Neodymium 150

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{149}Nd	CS	2FR BRC	8.0+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,3n	^{148}Nd	CS	2FR BRC	1.3+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

62 Samarium 148

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{147}Sm	CS	2FR BRC	8.6+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

62 Samarium 150

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{149}Sm	CS	2FR BRC	8.6+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

62 Samarium 152

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{151}Sm	CS	2FR BRC	8.6+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	^{12}C,el	^{152}Sm	DA	2UK HAR	1.2+08	1.2+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292
	^{16}O,el	^{152}Sm	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

62 Samarium 154

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{153}Sm	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,3n	^{152}Sm	CS	2FR BRC	1.5+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	^{6}Li,3n	^{157}Tb	?	3CPRAEP	2.6+07	3.6+07	Jour	PR/C,92,014615	15	C.L.Guo+	S0190
*	^{6}Li,x	^{154}Eu	CS	3CPRAEP	2.6+07	3.6+07	Jour	PR/C,92,014615	15	C.L.Guo+	S0190
*	^{6}Li,x	^{156}Gd	CS	3CPRAEP	2.8+07	3.6+07	Jour	PR/C,92,014615	15	C.L.Guo+	S0190
	^{12}C,el	^{154}Sm	DA	2UK HAR	1.2+08	1.2+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292
	^{16}O,el	^{154}Sm	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

63 Europium 151

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{150}Eu	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

64 Gadolinium 155

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{154}Gd	CS	2FR BRC	6.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

64 Gadolinium 156

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{155}Gd	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

64 Gadolinium 157

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{156}Gd	CS	2FR BRC	6.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

64 Gadolinium 158

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{157}Gd	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

64 Gadolinium 160

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{159}Gd	CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
n,3n	^{158}Gd	CS	2FR BRC	1.4+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

66 Dysprosium 156

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

*	n,γ	^{157}Dy	CS	3KORKAE	Maxwl		Jour	NDS,119,154	14	J.Y.Lee+	30839

69 Thulium 169

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$	^{168}Tm	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	^{9}Be,3n	^{175}Ta	CS	3CPRIMP	3.4+07	4.8+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,3n+α	^{171}Lu	CS	3CPRIMP	3.8+07	4.8+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,4n	^{174}Ta	CS	3CPRIMP	3.6+07	4.8+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,5n	^{173}Ta	CS	3CPRIMP	4.6+07	4.8+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,x	^{170}Tm	CS	3CPRIMP	3.2+07	4.8+07	Jour	PR/C,93,034615	16	Y.D.Fang+	S0185
*	^{9}Be,x	^{172}Lu	CS	3CPRIMP	3.2+07	4.8+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197

70 Ytterbium 168

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{169}Yb	CS	3KORKAE	Maxwl		Jour	NDS,119,154	14	J.Y.Lee+	30839

71 Lutetium 175

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$	^{174}Lu	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$	^{180}Ta	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	^{9}Be,3n	^{187}Ir	CS	3CPRIMP	3.5+07	5.0+07	Jour	PR/C,90,024621	14	N.T.Zhang+	S0201
*	^{9}Be,3n+α	^{183}Re	CS	3CPRIMP	3.5+07	5.0+07	Jour	PR/C,90,024621	14	N.T.Zhang+	S0201
*	^{9}Be,4n	^{186}Ir	CS	3CPRIMP	3.6+07	5.0+07	Jour	PR/C,90,024621	14	N.T.Zhang+	S0201
*	^{9}Be,5n	^{185}Ir	CS	3CPRIMP	4.4+07	5.0+07	Jour	PR/C,90,024621	14	N.T.Zhang+	S0201
*	^{9}Be,x	^{182}Ta	CS	3CPRIMP	3.2+07	5.0+07	Jour	PR/C,93,034615	16	Y.D.Fang+	S0185
*	^{9}Be,x	^{184}Re	CS	3CPRIMP	3.5+07	5.0+07	Jour	PR/C,90,024621	14	N.T.Zhang+	S0201

74 Tungsten

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	$n,2n$		CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

74 Tungsten 182

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$	^{181}W	CS	2FR BRC	8.2+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

74 Tungsten 183

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$	^{182}W	CS	2FR BRC	7.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

74 Tungsten 184

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$	^{183}W	CS	2FR BRC	7.7+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,$3n$	^{182}W	CS	2FR BRC	1.5+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

74 Tungsten 186

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$	^{185}W	CS	2FR BRC	7.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,$3n$	^{184}W	CS	2FR BRC	1.4+07	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

75 Rhenium 187

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{9}Be,$3n$	^{193}Au	CS	3CPRIMP	3.6+07	4.9+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,$3n+\alpha$	^{189}Ir	CS	3CPRIMP	3.9+07	4.9+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,$4n$	^{192}Au	CS	3CPRIMP	3.6+07	4.9+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,$5n$	^{191}Au	CS	3CPRIMP	4.5+07	4.9+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197
*	^{9}Be,x	^{188}Re	CS	3CPRIMP	3.3+07	4.9+07	Jour	PR/C,93,034615	16	Y.D.Fang+	S0185
*	^{9}Be,x	^{190}Ir	CS	3CPRIMP	3.4+07	4.9+07	Jour	PR/C,91,014608	15	Y.D.Fang+	S0197

78 Platinum

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,$2n$		CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

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	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	^{12}C,x	^{6}Li	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{6}Li	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{6}Li	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{7}Li	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{7}Li	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{7}Li	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{7}Be	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{7}Be	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{7}Be	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{9}Be	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x	^{9}Be	?	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{10}Be	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{10}Be	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{11}Be	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x	^{11}Be	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+α	inclusive	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+α	inclusive	DAE	2ITYLNS	7.4+08	7.4+08	Jour	NDS,119,273	14	M.Denapoli+	O2299
*	^{12}C,x+α	inclusive	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+d	inclusive	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+d	inclusive	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+^{3}He	inclusive	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+^{3}He	inclusive	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+p	inclusive	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+p	inclusive	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+t	inclusive	DA	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307
*	^{12}C,x+t	inclusive	DE	2GERGSI	4.8+09	4.8+09	Jour	PR/C,93,064601	16	M.Toppi+	O2307

81 Thallium 203

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{202}Tl	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

81 Thallium 205

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{204}Tl	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

82 Lead

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n		CS	2FR BRC	7.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	^{10}B,el	^{nat}Pb	DA	3CPRIMP	1.7+08	1.7+08	Jour	PR/C,90,014606	14	Y.Y.Yang+	S0203

*	^{10}B,non		CS	3CPRIMP	1.7+08	1.7+08	Jour	PR/C,90,014606	14	Y.Y.Yang+	S0203
*	^{0}C,x	Many	CS	3CPRIMP			Jour	NIM/B,337,34	14	H.L.Ge+	S0200
*	^{10}C,el	^{nat}Pb	DA	3CPRIMP	2.3+08	2.6+08	Jour	PR/C,90,014606	14	Y.Y.Yang+	S0203
*	^{10}C,non		CS	3CPRIMP	2.3+08	2.6+08	Jour	PR/C,90,014606	14	Y.Y.Yang+	S0203
*	^{11}C,el	^{nat}Pb	DA	3CPRIMP	2.2+08	2.3+08	Jour	PR/C,90,014606	14	Y.Y.Yang+	S0203
*	^{11}C,non		CS	3CPRIMP	2.2+08	2.3+08	Jour	PR/C,90,014606	14	Y.Y.Yang+	S0203

82 Lead 206

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{205}Pb	CS	2FR BRC	8.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	n,α	^{203}Hg	CS	3CPRLNZ	1.4+07	1.5+07	Jour	NIM/B,349,130	15	Shuqingyuan+	32740
	^{16}O,el	^{206}Pb	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

82 Lead 207

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{206}Pb	CS	2FR BRC	7.4+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416

82 Lead 208

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{207}Pb	CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
*	α,el	^{208}Pb	DA	2FR GAN	1.6+07	2.2+07	Jour	APP/B,43,239	12	G.Marquinez-Duran+	O1980
*	^{8}He,el	^{208}Pb	DA	2FR GAN	2.2+07	2.2+07	Jour	PR/C,94,064618	16	G.Marquinez-Duran+	O2326
	^{12}C,el	^{208}Pb	DA	2UK HAR	1.2+08	1.2+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292
	^{16}O,el	^{208}Pb	DA	2UK HAR	1.3+08	1.3+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

83 Bismuth 209

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{208}Bi	CS	2FR BRC	7.9+06	1.5+07	Rept	BNL-NCS-51245,(1),399	80	J.Frehaut+	20416
	n,γ	^{210}Bi	CS	2ZZZCER	1.0+02	8.6+04	Jour	PR/C,74,025807	06	C.Domingo-Pardo+	22944
	^{12}C,el	^{209}Bi	DA	2UK HAR	1.2+08	1.2+08	Jour	PR/C,6,2219	72	A.M.Friedman+	O2292

90 Thorium 232

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,fis	Many	CS	2SF JYV	2.5+07	2.5+07	Jour	EPJ/CS,21,08008	12	V.A.Rubchenya+	O1982
*	d,2n	^{232}Pa	CS	2FR NTE	2.0+07	3.0+07	Jour	NDS,119,267	14	C.Duchemin+	O2300
*	d,4n	^{230}Pa	CS	2FR NTE	2.0+07	3.0+07	Jour	NDS,119,267	14	C.Duchemin+	O2300

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,x	^{233}Pa	CS	2FR NTE	1.9+07	3.0+07	Jour	NDS,119,267	14	C.Duchemin+	O2300

91 Protactinium 231

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		CS	2FR CSN	2.2+05	5.5+06	Jour	NP/A,735,345	04	M.Petit+	22952

91 Protactinium 233

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		CS	2FR CSN	1.0+06	5.5+06	Jour	NP/A,735,345	04	M.Petit+	22952

92 Uranium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,ths	92-U-CMP	DAE	1USARPI	1.3-01	1.3-01	Conf	67ANNARB,1,407	67	S.N.Purohit+	14157
n,ths	92-U-OXI	DAE	1USARPI	1.3-01	3.4-01	Conf	67ANNARB,1,407	67	S.N.Purohit+	14157

92 Uranium 233

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,abs		ALF	1USAMTR	2.5-02	2.5-02	Prog	GEAP-5270,2	Sep 66	B.F.Rider+	13322

92 Uranium 234

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
* p,t	^{232}U	DAP	2GERLMU	2.5+07	2.5+07	Jour	PR/C,92,064319	15	A.I.Levon+	O2287

92 Uranium 235

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{234}U	CS	2FR BRC	5.7+06	1.3+07	Jour	NSE,74,29	Apr 80	J.Frehaut+	21568
n,abs		ALF	1USABET		5.1-01	Jour	NSE,22,20	65	D.E.Conway+	13924
n,abs		ALF	1USAMTR	2.5-02	2.5-02	Prog	GEAP-5060	Dec 65	B.F.Rider+	13205
n,abs		ALF	1USAMTR	2.5-02	2.5-02	Rept	IN-1178	68	F.L.Lisman+	14182
n,fis	Many	FY	1USAMTR	2.5-02	2.5-02	Rept	IN-1178	68	F.L.Lisman+	14182
n,fis	Many	KE	3INDTRM	2.5-02	2.5-02	Jour	NP/A,346,473	80	R.K.Choudhury+	33089
n,fis	^{1}H	FY	3INDITK	2.5-02	5.5+05	Jour	NP/A,355,13	81	S.C.L.Sharma+	33090

n,fis	^{1}H	KE	3INDITK	1.5+05	5.5+05	Jour	NP/A,355,13	81	S.C.L.Sharma+	33090
n,fis	^{3}H	FY	3INDITK	2.5-02	5.5+05	Jour	NP/A,355,13	81	S.C.L.Sharma+	33090
n,fis	^{3}H	KE	3INDITK	1.5+05	5.5+05	Jour	NP/A,355,13	81	S.C.L.Sharma+	33090
n,fis	^{4}He	FY	3INDITK	2.5-02	5.5+05	Jour	NP/A,355,13	81	S.C.L.Sharma+	33090
n,fis	^{4}He	KE	3INDITK	1.5+05	5.5+05	Jour	NP/A,355,13	81	S.C.L.Sharma+	33090
n,fis	^{140}Ba	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,2n	^{237}U	CS	2FR BRC	6.5+06	1.5+07	Jour	NSE,74,29	Apr 80	J.Frehaut+	21568
	n,3n	^{236}U	CS	2FR BRC	1.2+07	1.5+07	Jour	NSE,74,29	Apr 80	J.Frehaut+	21568
	n,fis	^{140}Ba	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171
*	p,x	Many	CS	2SF JYV	2.5+07	5.0+07	Jour	EPJ/A,44,147	10	H.Penttila+	O1428
*	p,x	Many	?	2SF JYV	2.5+07	2.5+07	Jour	EPJ/A,44,147	10	H.Penttila+	O1428

93 Neptunium 237

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	^{140}Ba	CS	1USANBS	Fiss		Rept	NUREG/CP-0004,(3),959	79	V.Spiegel+	14171

94 Plutonium 239

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,abs		RI	1CANCRC		8.0-01	Rept	AECL-510	57	F.W.Cornish+	12367
n,γ	^{240}Pu	RI	1CANCRC		8.0-01	Rept	AECL-510	57	F.W.Cornish+	12367

94 Plutonium 241

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		FY	2BLGMOL	Maxwl		Jour	PR/C,29,498	84	H.Thierens+	21915
n,fis	Many	FY	2BLGMOL	Maxwl		Jour	PR/C,29,498	84	H.Thierens+	21915
n,fis		FY	2BLGMOL	Maxwl		Jour	PR/C,29,498	84	H.Thierens+	21915
n,fis	Many	FY	2BLGMOL	Maxwl		Jour	PR/C,29,498	84	H.Thierens+	21915
n,fis	Many	KE	2BLGMOL	Maxwl		Jour	PR/C,29,498	84	H.Thierens+	21915

94 Plutonium 242

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis		FY	2BLGGHT	Spont		Jour	PR/C,29,498	84	H.Thierens+	21915
0,fis	Many	FY	2BLGGHT	Spont		Jour	PR/C,29,498	84	H.Thierens+	21915

	0,fis		FY	2BLGGHT	Spont		Jour	PR/C,29,498	84	H.Thierens+	21915
	0,fis	Many	FY	2BLGGHT	Spont		Jour	PR/C,29,498	84	H.Thierens+	21915
	0,fis	Many	KE	2BLGGHT	Spont		Jour	PR/C,29,498	84	H.Thierens+	21915
*	n,fis		CS	2UK NPL	1.0+06	2.5+06	Jour	PR/C,95,024606	17	C.Matei+	23334