EXFOR News (January 2023)

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	Scattering length	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 $d\Omega_1/d\Omega_2/dE'$	NQ	Nuclear quantity
D3E	Triple differential $d\Omega/dE'_1/dE'_2$	NU	Fission neutron multiplicity $\bar{\nu}$
D4A	Quadruple diff. $d\Omega_1/d\Omega_2/dE'_1/dE'_2$	NUD	Delayed fission neutron multiplicity $\bar{\nu_d}$
DA	Differential d/dΩ	POL	Polarization
DAA	Double differential $d\Omega_1/d\Omega_2$	POD	Differential polarization
DAE	Double differential $d\Omega/dE'$	PY	Product yield (other than fission)
DAP	Partial differential d/dΩ	RI	Resonance integral
DAT	Temperature-dependent Legendre coefficient	RP	Resonance parameter
DE	Differential d/dE'	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, d/dΩ
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)

2 Helium 3

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,2p	^{4}He	CS	2GERBOC	4.9+04	1.7+05	Jour	NP/A,467,273	87	A.Krauss+	A0469
	^{3}He,2p	^{4}He	DA	2GERBOC	1.0+05	3.5+05	Jour	NP/A,467,273	87	A.Krauss+	A0469
*	α,γ	^{7}Be	CS	3HUNDEB	2.5+06	4.4+06	Jour	PR/C,99,055804	19	T.Szucs+	D4400

2 Helium 4

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{15}N,el	^{4}He	?	4KASKAZ	5.2+06	7.2+06	Jour	PR/C,105,014614	22	A.Volya+	D8044

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{10}B,^{7}Be	^{9}Be	DAP	3POLWWA	5.1+07	5.1+07	Jour	YFE,22,230	21	A.T.Rudchik+	D5194

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{8}Be	CSP	2GERBOC	4.4+05	4.4+05	Jour	ZP/A,351,229	95	D.Zahnow+	A0639
*	p,n	^{7}Be	CS	3CZRUJF	1.2+07	1.4+07	Jour	NIM/A,1040,167075	22	Z.Matej+	D1028
*	p,n	^{7}Be	?	3CZRUJF	1.2+07	1.4+07	Jour	NIM/A,1040,167075	22	Z.Matej+	D1028
*	p,x+n	inclusive	DA	3CZRUJF	1.2+07	1.4+07	Jour	NIM/A,1040,167075	22	Z.Matej+	D1028
*	p,x+n	inclusive	TTD	3CZRUJF	1.2+07	1.4+07	Jour	NIM/A,1040,167075	22	Z.Matej+	D1028

5 Boron 11

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{12}C	DAP	1USASTF	2.1+06	3.0+06	Jour	PR/C,25,1179	82	S.S.Hanna+	T0048
	α,n	^{14}N	CSP	2UK HAR	1.4+07	1.4+07	Jour	AF,21,543	62	J.Kjellman	F0469

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{6}Li,α	^{14}N	DAP	3ARGCNE	2.0+07	2.0+07	Jour	PR/C,106,014603	22	J.C.Zamora+	D1025
*	^{6}Li,el	^{12}C	DA	3ARGCNE	2.0+07	2.0+07	Jour	PR/C,106,014603	22	J.C.Zamora+	D1025

6 Carbon 13

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,n	^{16}O	CS	1USAWIS	1.1+06	3.4+06	Jour	PR,107,1065	57	R.B.Walton+	C2806
	α,n	^{16}O	DA	1USAWIS	8.2+05	3.5+06	Jour	PR,107,1065	57	R.B.Walton+	C2806

7 Nitrogen 14

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n+p+2α	^{4}He	CS	4UKRKFT	2.7+07	1.5+08	Jour	EEJP,,(1),5	22	S.N.Afanasiev	G4099
*	p,γ	^{15}O	CS	3HUNDEB	5.5+05	1.4+06	Jour	PR/C,105,L022801	22	Gy.Gyurky+	D4423

8 Oxygen 16

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,el	^{16}O	DA	3EGYCAI	1.2+06	2.5+06	Jour	ADP,21,1	68	F.Machali+	D1018

8 Oxygen 18

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,0		RP	1USAORL			Jour	PR,128,299	62	J.K.Bair+	P0120
	α,el		RP	1USAORL			Jour	PR,128,299	62	J.K.Bair+	P0120

9 Fluorine 19

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{6}Li,α	^{21}Ne	DAP	3ARGCNE	2.0+07	2.0+07	Jour	PR/C,106,014603	22	J.C.Zamora+	D1025
*	^{6}Li,el	^{19}F	DA	3ARGCNE	2.0+07	2.0+07	Jour	PR/C,106,014603	22	J.C.Zamora+	D1025

12 Magnesium 26

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,0		RP	1USAORL			Jour	PR,128,299	62	J.K.Bair+	P0120
	α,el		RP	1USAORL			Jour	PR,128,299	62	J.K.Bair+	P0120

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	^{22}Na	CS	1USADAV	2.8+07	6.7+07	Jour	ARI,39,41	88	M.C.Lagunas-Solar+	A0445
	α,3p	^{28}Mg	CS	4ZZZDUB	3.6+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,x	^{22}Na	CS	4ZZZDUB	3.6+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,x	^{24}Na	CS	4ZZZDUB	3.6+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027

20 Calcium 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,inel	^{40}Ca	DAE	3SAFITH	2.0+08	2.0+08	Jour	PR/C,105,054319	22	S.D.Olorunfunmi+	D1023
*	^{78}Kr,el	^{40}Ca	DA	2ITYLNS	7.8+08	7.8+08	Jour	EPJ/A,55,22	19	S.Pirrone+	D8046
*	^{78}Kr,x	Many	CS	2ITYLNS	7.8+08	7.8+08	Jour	EPJ/A,55,22	19	S.Pirrone+	D8046
*	^{78}Kr,x	Many	DA	2ITYLNS	7.8+08	7.8+08	Jour	EPJ/A,55,22	19	S.Pirrone+	D8046

20 Calcium 42

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,γ	^{46}Ti	RR	3AULAML			Jour	NP/A,443,487	85	L.W.Mitchell+	A0310
*	α,inel	^{42}Ca	DAE	3SAFITH	2.0+08	2.0+08	Jour	PR/C,105,054319	22	S.D.Olorunfunmi+	D1023
	α,p	^{45}Sc	RR	3AULAML			Jour	NP/A,443,487	85	L.W.Mitchell+	A0310

20 Calcium 44

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,inel	^{44}Ca	DAE	3SAFITH	2.0+08	2.0+08	Jour	PR/C,105,054319	22	S.D.Olorunfunmi+	D1023

20 Calcium 48

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,inel	^{48}Ca	DAE	3SAFITH	2.0+08	2.0+08	Jour	PR/C,105,054319	22	S.D.Olorunfunmi+	D1023
*	^{86}Kr,el	^{48}Ca	DA	2ITYLNS	8.6+08	8.6+08	Jour	EPJ/A,55,22	19	S.Pirrone+	D8046
*	^{86}Kr,x	Many	CS	2ITYLNS	8.6+08	8.6+08	Jour	EPJ/A,55,22	19	S.Pirrone+	D8046

23 Vanadium 51

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{51}Cr	RR	3INDTRM			Jour	PRM,24,629	85	S.Kailas+	A0332

26 Iron

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	^{54}Mn	CS	2ZZZCER	6.0+08	6.0+08	Rept	INDC(GER)-32,33	88	B.Dittrich+	A0408
	p,x	^{57}Co	CS	2ZZZCER	6.0+08	6.0+08	Rept	INDC(GER)-32,33	88	B.Dittrich+	A0408

26 Iron 54

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{28}Si,x	Many	MLT	1USAROC	7.5+07	1.2+08	Jour	PL/B,178,339	86	N.G.Nicolis+	A0359

27 Cobalt 59

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,3n	^{57}Ni	CS	3KORKRM	2.3+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
*	p,4n	^{56}Ni	CS	3KORKRM	3.6+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
	p,x	^{22}Na	CS	2ZZZCER	6.0+08	6.0+08	Rept	INDC(GER)-32,33	88	B.Dittrich+	A0408
*	p,x	^{51}Cr	CS	3KORKRM	3.6+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
*	p,x	^{54}Mn	CS	3KORKRM	2.6+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
	p,x	^{54}Mn	CS	2ZZZCER	6.0+08	6.0+08	Rept	INDC(GER)-32,33	88	B.Dittrich+	A0408
*	p,x	^{56}Mn	CS	3KORKRM	2.7+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
*	p,x	^{55}Co	CS	3KORKRM	4.0+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
*	p,x	^{56}Co	CS	3KORKRM	2.7+07	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
*	p,x	^{57}Co	CS	3KORKRM	9.0+06	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038
*	p,x	^{58}Co	CS	3KORKRM	5.5+06	4.4+07	Jour	NIM/B,466,102	20	M.Shahid+	D7038

28 Nickel

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	^{54}Mn	CS	2ZZZCER	6.0+08	6.0+08	Rept	INDC(GER)-32,33	88	B.Dittrich+	A0408
	p,x	^{60}Co	CS	2ZZZCER	6.0+08	6.0+08	Rept	INDC(GER)-32,33	88	B.Dittrich+	A0408
	d,x	^{61}Cu	?	2BLGLEU			Jour	NP/A,99,686	67	M.Cogneau+	D0076
	d,x	^{62}Cu	?	2BLGLEU			Jour	NP/A,99,686	67	M.Cogneau+	D0076

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{59}Cu	RR	3AULAML			Jour	NP/A,439,371	85	C.I.W.Tingwell+	A0311
*	p,inel	^{58}Ni	CSP	3RUMBUC	4.0+06	1.7+07	Jour	PR/C,106,024609	22	A.Olacel+	D1029
	d,n	^{59}Cu	CS	2BLGLEU	4.0+06	1.2+07	Jour	NP/A,99,686	67	M.Cogneau+	D0076
	d,n	^{59}Cu	?	2BLGLEU			Jour	NP/A,99,686	67	M.Cogneau+	D0076

	d,t	^{57}Ni	?	2BLGLEU			Jour	NP/A,99,686	67	M.Cogneau+	D0076

28 Nickel 61

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{14}N,x	^{60}Co	CS	2JPNIPC	7.0+07	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
*	^{16}O,fus		CS	3INDNSD	2.7+07	3.9+07	Jour	PR/C,105,054608	22	N.K.Deb+	D6433
*	^{18}O,fus		CS	3INDNSD	2.6+07	4.1+07	Jour	PR/C,105,054608	22	N.K.Deb+	D6433

28 Nickel 62

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{14}N,x	^{44}Sc	CS	2JPNIPC	9.8+07	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
	^{14}N,x	^{46}Sc	CS	2JPNIPC	1.1+08	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
	^{14}N,x	^{47}Sc	CS	2JPNIPC	9.8+07	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
	^{14}N,x	^{55}Co	CS	2JPNIPC	8.6+07	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
	^{14}N,x	^{56}Co	CS	2JPNIPC	7.0+07	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
	^{14}N,x	^{57}Co	CS	2JPNIPC	7.0+07	1.2+08	Jour	RCA,38,117	85	K.Sueki+	A0355
	^{14}N,x	^{58}Co	CS	2JPNIPC	7.0+07	1.1+08	Jour	RCA,38,117	85	K.Sueki+	A0355
*	^{18}O,fus		CS	3INDNSD	2.6+07	4.1+07	Jour	PR/C,105,054608	22	N.K.Deb+	D6433

29 Copper

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x+p	inclusive	DAE	4KASKAZ	7.0+06	7.0+06	Jour	EPJ/A,58,97	22	Y.Kucuk+	D8049
*	p,x+p	inclusive	DE	4KASKAZ	7.0+06	7.0+06	Jour	EPJ/A,58,97	22	Y.Kucuk+	D8049

29 Copper 63

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,2n	^{64}Ga	CS	2GERHAM	1.3+07	3.5+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,2n	^{64}Ga	CS	2GERBON	1.4+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,x	^{58}Co	CS	2GERBON	1.4+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,x	^{61}Cu	CS	2GERBON	1.4+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,x	^{63}Zn	CS	2GERBON	1.4+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,x	^{63}Zn	CS	2GERHAM	1.8+07	4.2+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,x	^{65}Zn	CS	2GERBON	1.4+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347

29 Copper 65

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

	^{3}He,2n	^{66}Ga	CS	2GERHAM	1.2+07	4.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,2n	^{66}Ga	CS	2GERBON	1.4+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,3n	^{65}Ga	CS	2GERHAM	1.7+07	4.1+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,3n	^{65}Ga	CS	2GERBON	2.0+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,4n	^{64}Ga	CS	2GERHAM	3.8+07	4.2+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,x	^{65}Zn	CS	2GERBON	9.4+06	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347

30 Zinc

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{67}Cu	CS	3KORKAE	4.8+07	9.9+07	Jour	NIM/B,449,35	19	J.K.Park+	D7034
	p,x	^{66}Ga	CS	3SAFNAC	8.4+06	1.0+08	Jour	ARI,42,353	91	F.M.Nortier+	A0498
*	p,x	^{67}Ga	CS	3KORKAE	4.8+07	9.9+07	Jour	NIM/B,449,35	19	J.K.Park+	D7034
	p,x	^{67}Ga	CS	3SAFNAC	8.4+06	1.0+08	Jour	ARI,42,353	91	F.M.Nortier+	A0498
	p,x	^{68}Ga	CS	3SAFNAC	8.4+06	4.5+07	Jour	ARI,42,353	91	F.M.Nortier+	A0498

30 Zinc 64

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,2n	^{64}Ga	CS	2GERBON	1.2+07	2.4+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{58}Co	CS	2GERBON	1.5+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{61}Cu	CS	2GERBON	1.2+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{63}Zn	CS	2GERBON	1.2+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{65}Zn	CS	2GERBON	1.1+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347

30 Zinc 66

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,2n	^{66}Ga	CS	2GERBON	2.0+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,3n	^{65}Ga	CS	2GERBON	2.2+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{65}Zn	CS	2GERBON	2.0+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347

32 Germanium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x	^{66}Ga	CS	3SAFNAC	1.8+07	9.8+07	Jour	ARI,42,353	91	F.M.Nortier+	A0498
p,x	^{67}Ga	CS	3SAFNAC	4.9+06	9.8+07	Jour	ARI,42,353	91	F.M.Nortier+	A0498
p,x	^{68}Ga	CS	3SAFNAC	1.8+07	9.8+07	Jour	ARI,42,353	91	F.M.Nortier+	A0498
p,x	^{72}Ga	CS	3SAFNAC	2.2+07	9.8+07	Jour	ARI,42,353	91	F.M.Nortier+	A0498
p,x	^{73}Ga	CS	3SAFNAC	1.5+07	9.8+07	Jour	ARI,42,353	91	F.M.Nortier+	A0498

32 Germanium 76

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,0		RP	2GERZFK			Jour	PR/C,105,024303	22	R.Schwengner+	G0084
*	γ,sct	^{76}Ge	CS	2GERZFK	5.0+06	1.0+07	Jour	PR/C,105,024303	22	R.Schwengner+	G0084

34 Selenium 76

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,^{17}O	^{77}Se	DAE	2ITYLNS	2.8+08	2.8+08	Jour	PR/C,105,044607	22	I.Ciraldo+	D8048
*	^{18}O,^{17}O	^{77}Se	DAP	2ITYLNS	2.8+08	2.8+08	Jour	PR/C,105,044607	22	I.Ciraldo+	D8048

36 Krypton

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	^{77}Br	CS	3SAFNAC	1.2+07	9.8+07	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{82}Br	CS	3SAFNAC	2.2+07	9.8+07	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{79}Kr	CS	3SAFNAC	1.5+07	9.8+07	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{85}Kr	CS	3SAFNAC	1.5+07	9.8+07	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{81}Rb	CS	3SAFNAC	1.4+07	1.2+08	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{82}Rb	CS	3SAFNAC	5.2+06	1.2+08	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{83}Rb	CS	3SAFNAC	5.2+06	1.2+08	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{84}Rb	CS	3SAFNAC	5.2+06	1.2+08	Jour	ARI,42,361	91	G.F.Steyn+	A0499
	p,x	^{86}Rb	CS	3SAFNAC	5.2+06	3.7+07	Jour	ARI,42,361	91	G.F.Steyn+	A0499

38 Strontium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{82}Rb	CS	2BLGVUB	2.7+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{83}Rb	CS	2BLGVUB	1.7+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{84}Rb	CS	2BLGVUB	1.9+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{83}Sr	CS	2BLGVUB	1.8+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{85}Sr	CS	2BLGVUB	1.4+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{87}Sr	CS	2BLGVUB	1.4+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{84}Y	CS	2BLGVUB	3.0+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{85}Y	CS	2BLGVUB	1.6+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{86}Y	CS	2BLGVUB	1.4+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{87}Y	CS	2BLGVUB	1.4+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420
*	p,x	^{88}Y	CS	2BLGVUB	1.4+07	3.3+07	Jour	NIM/B,511,91	22	A.Hermanne+	D4420

38 Strontium 86

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

*	γ,n	^{85}Sr	CS	3INDIND		1.5+07	Jour	NP/A,1023,122445	22	T.S.Ganesapandy+	G0517

38 Strontium 87

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,d	^{86}Sr	DAP	1USAINU	9.4+07	9.4+07	Jour	PR/C,40,1603	89	M.C.Radhakrishna+	T0049
p,d	^{86}Sr	POD	1USAINU	9.2+07	9.4+07	Jour	PR/C,40,1603	89	M.C.Radhakrishna+	T0049

38 Strontium 88

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
*	γ,n	^{87}Sr	CS	3INDIND		1.5+07	Jour	NP/A,1023,122445	22	T.S.Ganesapandy+	G0517

39 Yttrium 89

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
d,2n	^{89}Zr	CS	2GERBON	6.8+06	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,3n	^{88}Zr	CS	2GERBON	1.9+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{87}Sr	CS	2GERBON	1.0+07	2.6+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
d,x	^{88}Y	CS	2GERBON	1.9+07	2.5+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347

40 Zirconium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,x	^{83}Rb	CS	4UKRIJD	3.5+07	6.8+07	Conf	88BAKU,,310	88	O.K.Gorpinich+	A0376
p,x	^{84}Rb	CS	4UKRIJD	4.8+07	6.8+07	Conf	88BAKU,,310	88	O.K.Gorpinich+	A0376

40 Zirconium 91

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
*	p,γ	^{92}Nb	CS	3HUNDEB	1.4+06	2.8+06	Jour	JP/G,48,105202	21	Gy.Gyurky+	D4417

40 Zirconium 96

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
*	p,n	^{96}Nb	CS	3HUNDEB	1.5+06	2.8+06	Jour	JP/G,48,105202	21	Gy.Gyurky+	D4417

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,2n	^{94}Tc	CS	2GERHAM	1.1+07	4.3+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,3n	^{93}Tc	CS	2GERHAM	1.6+07	4.3+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,4n	^{92}Tc	CS	2GERHAM	3.2+07	4.3+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
	^{3}He,n	^{95}Tc	CS	2GERBON	8.9+06	2.7+07	Jour	PR/C,22,1468	80	H.H.Bissem+	A0347
*	^{13}C,4n	^{102}Ag	CS	3INDNSD	6.4+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,5n	^{101}Ag	CS	3INDNSD	6.4+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{94}Tc	CS	3INDNSD	7.8+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{95}Tc	CS	3INDNSD	6.8+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{96}Tc	CS	3INDNSD	6.4+07	8.3+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{97}Ru	CS	3INDNSD	7.6+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{96}Rh	CS	3INDNSD	7.4+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{97}Rh	CS	3INDNSD	7.8+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{98}Rh	CS	3INDNSD	6.8+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{99}Rh	CS	3INDNSD	6.4+07	8.3+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{100}Rh	CS	3INDNSD	6.4+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{100}Pd	CS	3INDNSD	7.4+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425
*	^{13}C,x	^{101}Pd	CS	3INDNSD	6.4+07	8.7+07	Jour	PR/C,105,034609	22	A.Agarwal+	D6425

42 Molybdenum

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,x	^{99}Mo	CS	3HUNDEB	3.0+06	9.2+06	Jour	EPJ/A,57,312	21	A.Elbinawi+	D4416
*	d,x	^{93}Tc	CS	3HUNDEB	3.0+06	9.2+06	Jour	EPJ/A,57,312	21	A.Elbinawi+	D4416
*	d,x	^{95}Tc	CS	3HUNDEB	3.0+06	9.2+06	Jour	EPJ/A,57,312	21	A.Elbinawi+	D4416
*	d,x	^{96}Tc	CS	3HUNDEB	3.0+06	9.2+06	Jour	EPJ/A,57,312	21	A.Elbinawi+	D4416
*	d,x	^{99}Tc	CS	3HUNDEB	3.0+06	9.2+06	Jour	EPJ/A,57,312	21	A.Elbinawi+	D4416
*	α,x	^{94}Tc	CS	3INDVEC	1.9+07	3.1+07	Jour	EPJ/A,58,95	22	M.Choudhary+	D6431
*	α,x	^{95}Tc	CS	3INDVEC	9.9+06	3.1+07	Jour	EPJ/A,58,95	22	M.Choudhary+	D6431
*	α,x	^{96}Tc	CS	3INDVEC	1.9+07	3.1+07	Jour	EPJ/A,58,95	22	M.Choudhary+	D6431
*	α,x	^{95}Ru	CS	3INDVEC	9.9+06	3.1+07	Jour	EPJ/A,58,95	22	M.Choudhary+	D6431
*	α,x	^{97}Ru	CS	3INDVEC	9.9+06	3.1+07	Jour	EPJ/A,58,95	22	M.Choudhary+	D6431
*	α,x	^{103}Ru	CS	3INDVEC	9.9+06	3.1+07	Jour	EPJ/A,58,95	22	M.Choudhary+	D6431

42 Molybdenum 100

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{100}Tc	CS	1USACAL	1.9+06	1.1+07	Jour	NP/A,250,285	75	D.W.Kneff+	T0013
*	α,n	^{103}Ru	CS	3HUNDEB	6.9+06	1.2+07	Jour	PR/C,104,035804	21	T.N.Szegedi+	D4422
*	α,n	^{103}Ru	TT	3HUNDEB	6.7+06	1.2+07	Jour	PR/C,104,035804	21	T.N.Szegedi+	D4422

44 Ruthenium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{94}Tc	CS	2BLGVUB	3.0+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{95}Tc	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{96}Tc	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{99}Tc	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{95}Ru	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{97}Ru	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{103}Ru	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{99}Rh	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{100}Rh	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{101}Rh	CS	2BLGVUB	1.5+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418
*	p,x	^{102}Rh	CS	2BLGVUB	1.6+07	3.3+07	Jour	NIM/B,502,205	21	A.Hermanne+	D4418

45 Rhodium 103

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x+α	inclusive	DAE	4KASKAZ	2.2+07	2.2+07	Jour	APP/B,14,821	21	T.K.Zholdybayev+	D8045
*	p,x+α	inclusive	DE	4KASKAZ	2.2+07	2.2+07	Jour	APP/B,14,821	21	T.K.Zholdybayev+	D8045
*	p,x+p	inclusive	DAE	4KASKAZ	2.2+07	2.2+07	Jour	APP/B,14,821	21	T.K.Zholdybayev+	D8045
*	p,x+p	inclusive	DE	4KASKAZ	2.2+07	2.2+07	Jour	APP/B,14,821	21	T.K.Zholdybayev+	D8045

46 Palladium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{100}Rh	CS	3KORKRM	2.1+07	4.3+07	Jour	JRN,321,117	19	V.D.Nguyen+	D7036
*	p,x	^{100}Pd	CS	3KORKRM	2.6+07	4.3+07	Jour	JRN,321,117	19	V.D.Nguyen+	D7036

48 Cadmium 114

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{115}In	CS	3INDTRM	4.9+06	1.4+07	Jour	PR/C,105,044613	22	V.Vashi+	D6428
*	p,n	^{114}In	CS	3INDTRM	4.9+06	1.4+07	Jour	PR/C,105,044613	22	V.Vashi+	D6428

48 Cadmium 116

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{20}Ne,^{19}F	^{117}In	DAP	2ITYLNS	3.1+08	3.1+08	Jour	PR/C,105,024616	22	S.Burrello+	D8047
*	^{20}Ne,^{20}F	^{116}In	CSP	2ITYLNS	3.1+08	3.1+08	Jour	PR/C,105,024616	22	S.Burrello+	D8047
*	^{20}Ne,^{20}F	^{116}In	DAE	2ITYLNS	3.1+08	3.1+08	Jour	PR/C,105,024616	22	S.Burrello+	D8047
*	^{20}Ne,el	^{116}Cd	DA	2ITYLNS	3.1+08	3.1+08	Jour	PR/C,105,024616	22	S.Burrello+	D8047
*	^{20}Ne,inel	^{116}Cd	DAP	2ITYLNS	3.1+08	3.1+08	Jour	PR/C,105,024616	22	S.Burrello+	D8047

49 Indium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	^{109}In	CS	3SAFNAC	4.7+07	2.0+08	Jour	ARI,42,1105	91	F.M.Nortier+	A0506
	p,x	^{109}Sn	CS	3SAFNAC	5.7+07	2.0+08	Jour	ARI,42,1105	91	F.M.Nortier+	A0506

50 Tin 120

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{6}Li,^{7}Li	^{119}Sn	DAP	3BZLUSP	1.9+07	2.7+07	Jour	PR/C,106,014622	22	V.A.B.Zagatto+	D1026
*	^{6}Li,el	^{120}Sn	DA	3BZLUSP	1.9+07	2.7+07	Jour	PR/C,106,014622	22	V.A.B.Zagatto+	D1026
*	^{6}Li,inel	^{120}Sn	DAP	3BZLUSP	1.9+07	2.7+07	Jour	PR/C,106,014622	22	V.A.B.Zagatto+	D1026

51 Antimony

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,x	^{118}Sb	CS	2JPNIPC	4.3+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{120}Sb	CS	2JPNIPC	1.7+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{122}Sb	CS	2JPNIPC	2.1+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{121}Te	CS	2JPNIPC	3.4+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{123}Te	CS	2JPNIPC	2.1+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{125}Te	CS	2JPNIPC	1.7+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{121}I	CS	2JPNIPC	3.8+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{123}I	CS	2JPNIPC	1.7+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{124}I	CS	2JPNIPC	1.1+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{125}I	CS	2JPNIPC	1.7+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419
*	α,x	^{126}I	CS	2JPNIPC	1.1+07	5.0+07	Jour	NIM/B,505,24	21	S.Takacs+	D4419

52 Tellurium 130

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,2p	^{132}Te	CS	4ZZZDUB	3.6+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,n	^{133}Xe	CS	4ZZZDUB	1.5+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,p	^{133}I	CS	4ZZZDUB	1.5+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,x	^{129}Te	CS	4ZZZDUB	2.9+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,x	^{131}Te	CS	4ZZZDUB	3.6+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027
	α,x	^{132}I	CS	4ZZZDUB	2.1+07	3.6+07	Jour	ZP/A,341,443	92	A.Kirov+	D1027

54 Xenon 124

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	^{123}Xe	CS	4RUSKUR	1.7+07	3.3+07	Jour	JRN/L,135,39	89	N.V.Kurenkov+	A0436

55 Cesium 133

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{14}N,x	^{129}Cs	DA	1USAYAL	1.4+08	1.4+08	Jour	PR,156,1332	67	R.I.Morse+	P0146
	^{14}N,x	^{130}Cs	DA	1USAYAL	1.4+08	1.4+08	Jour	PR,156,1332	67	R.I.Morse+	P0146

60 Neodymium 142

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{141}Nd	CS	3INDIND		1.5+07	Jour	NP/A,1020,122399	22	G.T.Bholane+	G0515

60 Neodymium 148

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{147}Nd	CS	3INDIND		1.5+07	Jour	NP/A,1020,122399	22	G.T.Bholane+	G0515

60 Neodymium 150

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{149}Nd	CS	3INDIND		1.5+07	Jour	NP/A,1020,122399	22	G.T.Bholane+	G0515

64 Gadolinium 156

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{30}Si,fus		CS	3INDNSD	9.2+07	1.1+08	Jour	PR/C,105,064612	22	R.Prajapat+	D6436

65 Terbium 159

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{12}C,x	^{167}Yb	CS	3INDNSD	6.9+07	7.8+07	Jour	PR/C,105,054607	22	I.M.Bhat+	D6434
*	^{13}C,x	^{167}Yb	CS	3INDNSD	7.8+07	8.5+07	Jour	PR/C,105,054607	22	I.M.Bhat+	D6434

66 Dysprosium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{159}Gd	CS	3CZRUJF	1.6+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{155}Tb	CS	3KORKRM	1.3+07	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{155}Tb	CS	3CZRUJF	1.4+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{156}Tb	CS	3KORKRM	1.6+07	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{156}Tb	CS	3CZRUJF	1.9+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{160}Tb	CS	3KORKRM	1.3+07	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{160}Tb	CS	3CZRUJF	1.5+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{161}Tb	CS	3CZRUJF	1.4+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{161}Tb	CS	3KORKRM	6.0+06	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{155}Dy	CS	3CZRUJF	1.5+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{155}Dy	CS	3KORKRM	1.9+07	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{157}Dy	CS	3CZRUJF	7.4+06	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{157}Dy	CS	3KORKRM	9.2+06	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{159}Dy	CS	3KORKRM	1.6+07	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{159}Dy	CS	3CZRUJF	8.7+06	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{159}Ho	CS	3CZRUJF	1.1+07	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{159}Ho	CS	3KORKRM	6.0+06	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{161}Ho	CS	3KORKRM	6.0+06	4.4+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{161}Ho	CS	3CZRUJF	7.4+06	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022
*	p,x	^{162}Ho	CS	3KORKRM	3.9+06	3.6+07	Jour	NIM/B,464,74	20	M.Shahid+	D7035
*	p,x	^{162}Ho	CS	3CZRUJF	7.4+06	3.6+07	Jour	NIM/B,522,1	22	J.Cervenak+	D1022

70 Ytterbium 168

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{167}Yb	CS	3INDIND		1.5+07	Jour	RPC,195,110066	22	G.T.Bholane+	G0516

70 Ytterbium 170

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{169}Yb	CS	3INDIND		1.5+07	Jour	RPC,195,110066	22	G.T.Bholane+	G0516

70 Ytterbium 176

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{175}Yb	CS	3INDIND		1.5+07	Jour	RPC,195,110066	22	G.T.Bholane+	G0516

71 Lutetium 175

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{14}N,3n	^{186}Pt	CS	3INDNSD	6.6+07	8.3+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,4n	^{185}Pt	CS	3INDNSD	6.6+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,5n	^{184}Pt	CS	3INDNSD	6.6+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{178}Ta	CS	3INDNSD	7.0+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{177}W	CS	3INDNSD	7.0+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{181}Re	CS	3INDNSD	7.4+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{182}Os	CS	3INDNSD	6.7+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{183}Os	CS	3INDNSD	6.6+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{183}Ir	CS	3INDNSD	8.2+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{184}Ir	CS	3INDNSD	6.7+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422
*	^{14}N,x	^{184}Ir	CS	3INDNSD	8.0+07	8.7+07	Jour	PR/C,105,054607	22	I.M.Bhat+	D6434
*	^{14}N,x	^{185}Ir	CS	3INDNSD	6.6+07	8.7+07	Jour	NP/A,1021,122421	22	I.M.Bhat+	D6422

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{3}He,2n	^{182}Re	CS	3HUNDEB	1.5+07	2.6+07	Jour	PR/C,102,064608	20	B.M.Ali+	D4421
*	^{3}He,3n	^{181}Re	CS	3HUNDEB	1.5+07	2.6+07	Jour	PR/C,102,064608	20	B.M.Ali+	D4421
*	^{3}He,x	^{178}Ta	CS	3HUNDEB	2.0+07	2.6+07	Jour	PR/C,102,064608	20	B.M.Ali+	D4421
*	^{3}He,x	^{180}Ta	CS	3HUNDEB	1.8+07	2.6+07	Jour	PR/C,102,064608	20	B.M.Ali+	D4421

74 Tungsten 182

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,fus		CS	3INDNSD	6.2+07	9.5+07	Jour	PR/C,105,054614	22	P.Jisha+	D6432

74 Tungsten 184

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,fus		CS	3INDNSD	6.2+07	9.4+07	Jour	PR/C,105,054614	22	P.Jisha+	D6432

74 Tungsten 186

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,fus		CS	3INDNSD	6.4+07	9.5+07	Jour	PR/C,105,054614	22	P.Jisha+	D6432

79 Gold 197

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	Many	CS	4RUSLIN	1.0+09	1.0+09	Conf	88BAKU,,544	88	Yu.V.Aleksandrov+	A0380
	d,x	^{121}Te	CS	4ZZZDUB	7.3+09	7.3+09	Conf	90LENING,,346	90	C.Damdinsuren+	A0461
	d,x	^{196}Au	CS	4ZZZDUB	7.3+09	7.3+09	Conf	90LENING,,346	90	C.Damdinsuren+	A0461
	d,x	^{196}Tl	CS	4ZZZDUB	7.3+09	7.3+09	Conf	90LENING,,346	90	C.Damdinsuren+	A0461

82 Lead

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,x	^{121}Te	CS	4ZZZDUB	7.3+09	7.3+09	Conf	90LENING,,346	90	C.Damdinsuren+	A0461
	d,x	^{196}Tl	CS	4ZZZDUB	7.3+09	7.3+09	Conf	90LENING,,346	90	C.Damdinsuren+	A0461
	d,x	^{198}Tl	CS	4ZZZDUB	7.3+09	7.3+09	Conf	90LENING,,346	90	C.Damdinsuren+	A0461

82 Lead 204

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{48}Ca,2n	^{250}No	CS	2GERGSI	2.2+08	2.2+08	Jour	PR/C,106,024309	22	J.Khuyagbaatar+	D8050

83 Bismuth 209

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,3n	^{207}Po	CS	3KORKAE	4.3+07	6.7+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,4n	^{206}Po	CS	3KORKAE	4.3+07	6.8+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,5n	^{205}Po	CS	3KORKAE	4.3+07	6.7+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,6n	^{204}Po	CS	3KORKAE	4.4+07	6.7+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,x	^{203}Bi	CS	3KORKAE	6.3+07	6.8+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,x	^{204}Bi	CS	3KORKAE	5.1+07	6.7+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,x	^{205}Bi	CS	3KORKAE	4.4+07	6.7+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,x	^{206}Bi	CS	3KORKAE	4.4+07	6.8+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	p,x	^{207}Bi	CS	3KORKAE	4.3+07	6.7+07	Jour	PR/C,101,014602	20	L.Mokhtarioranj+	D7037
*	d,4n	^{207}Po	CS	2BLGLVN	2.6+07	5.0+07	Jour	EPJ/A,57,233	21	F.Tarkanyi+	D4415
*	d,5n	^{206}Po	CS	2BLGLVN	3.5+07	5.0+07	Jour	EPJ/A,57,233	21	F.Tarkanyi+	D4415
*	d,6n	^{205}Po	CS	2BLGLVN	4.5+07	5.0+07	Jour	EPJ/A,57,233	21	F.Tarkanyi+	D4415
*	d,x	^{203}Pb	CS	2BLGLVN	4.2+07	5.0+07	Jour	EPJ/A,57,233	21	F.Tarkanyi+	D4415
*	d,x	^{205}Bi	CS	2BLGLVN	4.2+07	5.0+07	Jour	EPJ/A,57,233	21	F.Tarkanyi+	D4415
*	d,x	^{207}Bi	CS	2BLGLVN	2.4+07	5.0+07	Jour	EPJ/A,57,233	21	F.Tarkanyi+	D4415
	^{12}C,fis	Many	CHG	2UK MAN			Jour	JIN,39,921	77	C.L.Branquinho+	B0153
	^{12}C,fis	Many	FY	2UK MAN			Jour	JIN,39,921	77	C.L.Branquinho+	B0153

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,fis	Many	FY	2FR CAD		1.6+07	Jour	NIM/A,1011,165598	21	M.Delarue+	G0085
*	γ,fis	Many	FY	2FR CAD		1.8+07	Jour	NIM/A,1040,167259	22	M.Delarue+	G0086

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,fis	Many	FY	2FR CAD		1.6+07	Jour	NIM/A,1011,165598	21	M.Delarue+	G0085
*	γ,fis	Many	FY	2FR CAD		1.8+07	Jour	NIM/A,1040,167259	22	M.Delarue+	G0086

94 Plutonium 239

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,fis	Many	FY	2FR CAD		1.8+07	Jour	NIM/A,1040,167259	22	M.Delarue+	G0086

98 Californium 249

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{16}O,x	^{245}Bk	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{246}Bk	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{248}Bk	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{248}Cf	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{249}Es	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{250}Es	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{251}Es	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{253}Es	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{251}Fm	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{252}Fm	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{253}Fm	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{254}Fm	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410
^{16}O,x	^{256}Fm	CS	1USABRK	9.0+07	1.5+08	Jour	PR/C,36,1820	87	R.M.Chasteler+	A0410