EXFOR News (March 2018)

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 #
*	^{15}N,α	^{12}C	?	4KASATN			Jour	NIM/A,847,125	17	A.K.Nurmukhanbetova+	D0876
*	^{15}N,el	^{1}H	?	4KASATN			Jour	NIM/A,847,125	17	A.K.Nurmukhanbetova+	D0876

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	DA	3INDLUL	6.5+05	6.5+05	Jour	IPA,10,567	72	M.L.Srivastava+	D6284

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	?	4KASATN	1.2+06	4.8+06	Jour	NIM/A,847,125	17	A.K.Nurmukhanbetova+	D0876
*	^{16}O,el		?	4KASATN			Jour	PR/C,96,014322	17	D.K.Nauruzbayev+	D0849
*	^{16}O,el	^{4}He	?	4KASATN	6.8+05	5.1+06	Jour	PR/C,96,014322	17	D.K.Nauruzbayev+	D0849

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,γ		RP	3AULAML	1.2+06	1.2+06	Jour	NP/A,318,21	79	R.H.Spear+	D0855

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{7}Be	DAP	1USAANL	2.6+06	7.0+06	Prog	ANL-7910,17	72	J.W.Meadows	D0031
	d,n	^{8}Be	DAP	3INDTAT	5.0+05	5.0+05	Jour	IPA,8,108	70	M.K.Saxena	D6283

5 Boron 10

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,^{6}Li	^{8}Be	DAP	4UKRIJD	2.7+07	2.7+07	Jour	JPJ,64,1141	95	G.Fazio+	D5138

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,0		RP	1USARIC			Jour	NP,51,518	64	Hsin-Minkuan+	C0482
	^{3}He,n	^{14}O	CS	1USARIC	1.7+06	5.3+06	Jour	NP,50,267	64	G.U.Din+	C1132
	^{3}He,n	^{14}O	DA	1USARIC	1.7+06	5.3+06	Jour	NP,50,267	64	G.U.Din+	C1132
	α,^{8}Be	^{8}Be	DA	3AULCBR	1.5+07	1.9+07	Jour	NP/A,194,491	72	Ph.Martin+	D0857
	α,el	^{12}C	DA	3SAFNLP	3.2+07	3.2+07	Jour	NP/A,185,509	72	G.F.Burdzik+	D0873
	α,inel	^{12}C	DAP	2GERKFK	1.0+08	1.0+08	Jour	NP/A,143,373	70	J.Specht+	D0885
	α,inel	^{12}C	DAP	3SAFNLP	3.2+07	3.2+07	Jour	NP/A,185,509	72	G.F.Burdzik+	D0873
	α,n	^{15}O	DAP	3RUMBUC	1.8+07	2.3+07	Jour	NP/A,202,377	73	V.Corcalciuc+	D0870

6 Carbon 13

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,el	^{13}C	DA	4KASKAZ	2.9+07	5.0+07	Jour	IMP/E,25,1650078	16	N.Burtebayev+	D0867
*	α,inel	^{13}C	DAP	4KASKAZ	2.9+07	5.0+07	Jour	IMP/E,25,1650078	16	N.Burtebayev+	D0867

7 Nitrogen 14

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,0		RP	1USARIC			Jour	NP,51,518	64	Hsin-Minkuan+	C0482
	α,^{6}Li	^{12}C	DAP	4UKRIJD	2.7+07	2.7+07	Jour	JPJ,64,1141	95	G.Fazio+	D5138

7 Nitrogen 15

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,^{6}Li	^{13}C	DAP	4UKRIJD	2.7+07	2.7+07	Jour	JPJ,64,1141	95	G.Fazio+	D5138

8 Oxygen 16

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,x	^{18}F	CS	1USABRK	2.3+06	3.0+07	Jour	AC,34,329	62	S.S.Markowitz+	C1759
	α,el	^{16}O	DA	3POLIFJ	2.3+07	2.8+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877
*	^{18}O,inel	^{16}O	DAP	2ITYLNS	8.4+07	8.4+07	Jour	PR/C,96,044603	17	M.J.Ermamatov+	D0851

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	CSP	3AULAML	4.2+06	6.5+06	Jour	PR/C,16,1264	77	Z.E.Switkowski+	D0856

9 Fluorine 19

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,p	^{20}F	CS	1USABAR	7.0+05	1.8+06	Jour	PR,78,299(2)	50	S.C.Snowdon	C1852
	α,^{6}Li	^{17}O	DAP	4UKRIJD	2.7+07	2.7+07	Jour	JPJ,64,1141	95	G.Fazio+	D5138

12 Magnesium 24

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,α	^{22}Na	CS	1USAMHG	7.8+06	7.8+06	Jour	JIN,9,193	59	K.L.Hall+	C1128
	α,el	^{24}Mg	DA	3POLIFJ	2.4+07	2.8+07	Rept	INP-740	72	A.Budzanowski+	D0878

12 Magnesium 25

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	4UKRKFT	1.4+06	2.0+06	Jour	VAT/I,3/109,16	17	A.S.Kachan+	D5137
*	p,γ	^{26}Al	DAP	4UKRKFT	9.5+05	1.7+06	Jour	VAT/I,3/109,16	17	A.S.Kachan+	D5137

12 Magnesium 26

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{26}Al	CS	1USAANL	5.0+06	6.7+06	Jour	PL/B,94,303	80	M.Paul+	C2281
	d,α	^{24}Na	CS	1USAMHG	7.8+06	7.8+06	Jour	JIN,9,193	59	K.L.Hall+	C1128

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,3p	^{28}Mg	CS	1USABNL	4.1+07	4.1+07	Jour	JIN,4,237	57	J.Hudis	C1127
	α,d	^{29}Si	DAP	3POLIFJ	2.7+07	2.7+07	Jour	NP/A,371,288	81	I.Skwirczynska+	D0868
	α,el	^{27}Al	DA	3POLIFJ	2.3+07	2.8+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877

16 Sulphur 34

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,α	^{32}P	CS	1USAMHG	7.7+06	7.7+06	Jour	JIN,9,193	59	K.L.Hall+	C1128

18 Argon 38

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,γ	^{42}Ca	DAP	3AULCBR	5.2+06	1.6+07	Jour	NP/A,263,349	76	G.S.Foote+	D0859

18 Argon 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,γ	^{44}Ca	DAP	3AULCBR	5.0+06	1.1+07	Jour	NP/A,263,349	76	G.S.Foote+	D0859

19 Potassium 41

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,α	^{38}Ar	CSP	3AULAML	1.2+06	2.5+06	Jour	NP/A,378,349	82	M.E.Sevior+	D0854
	p,γ	^{42}Ca	CS	3AULAML	7.1+05	2.5+06	Jour	NP/A,378,349	82	M.E.Sevior+	D0854
	p,n	^{41}Ca	CS	3AULAML	1.3+06	2.5+06	Jour	NP/A,378,349	82	M.E.Sevior+	D0854

20 Calcium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{nat}Ca	DA	3POLIFJ	2.3+07	2.6+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877
*	p,x	^{47}Ca	TT	3POLIFJ	5.3+06	5.6+07	Jour	JRN,313,429	17	R.Misiak+	D0852
*	p,x	^{46}Sc	TT	3POLIFJ	5.3+06	5.6+07	Jour	JRN,313,429	17	R.Misiak+	D0852
*	p,x	^{47}Sc	TT	3POLIFJ	5.3+06	5.6+07	Jour	JRN,313,429	17	R.Misiak+	D0852
*	p,x	^{48}Sc	TT	3POLIFJ	5.3+06	5.6+07	Jour	JRN,313,429	17	R.Misiak+	D0852

20 Calcium 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{40}Ca	DA	3POLIFJ	2.4+07	2.8+07	Rept	INP-740	72	A.Budzanowski+	D0878

22 Titanium 48

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,α	^{46}Sc	CS	1USAMHG	7.0+06	7.0+06	Jour	JIN,9,193	59	K.L.Hall+	C1128
	α,γ	^{52}Cr	DAP	3AULCBR	6.0+06	1.2+07	Jour	NP/A,263,349	76	G.S.Foote+	D0859

24 Chromium 50

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,el	^{50}Cr	DA	3AULCBR	2.6+07	2.6+07	Jour	NP/A,303,154	78	K.A.Aniol+	D0861
α,p	^{53}Mn	DAP	3AULCBR	1.8+07	2.6+07	Jour	NP/A,303,154	78	K.A.Aniol+	D0861

24 Chromium 52

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{3}He,3n	^{52}Fe	CS	1USAUSA	2.2+07	2.2+07	Jour	ARI,21,719	70	M.W.Greene+	C1766
^{3}He,3n	^{52}Fe	CS	1USABNL	3.0+07	4.2+07	Jour	ARI,21,719	70	M.W.Greene+	C1766
^{3}He,3n	^{52}Fe	TT	1USABNL	2.3+07	4.5+07	Jour	ARI,21,719	70	M.W.Greene+	C1766
^{3}He,x	^{52}Mn	CS	1USAUSA	1.7+07	2.2+07	Jour	ARI,21,719	70	M.W.Greene+	C1766
^{3}He,x	^{52}Mn	CS	1USABNL	2.0+07	4.1+07	Jour	ARI,21,719	70	M.W.Greene+	C1766
α,el	^{52}Cr	DA	3AULCBR	2.6+07	2.6+07	Jour	NP/A,303,154	78	K.A.Aniol+	D0861
α,p	^{55}Mn	DAP	3AULCBR	1.8+07	2.6+07	Jour	NP/A,303,154	78	K.A.Aniol+	D0861

24 Chromium 54

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,el	^{54}Cr	DA	3AULCBR	2.6+07	2.6+07	Jour	NP/A,303,154	78	K.A.Aniol+	D0861
α,p	^{57}Mn	DAP	3AULCBR	1.8+07	2.6+07	Jour	NP/A,303,154	78	K.A.Aniol+	D0861

26 Iron 54

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,x+p	inclusive	DAE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
α,x+p	inclusive	DE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871

26 Iron 56

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
α,γ	^{60}Ni	DAP	3AULCBR	8.0+06	1.8+07	Jour	NP/A,220,505	74	G.S.Foote+	D0858
α,x+p	inclusive	DAE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
α,x+p	inclusive	DE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871

27 Cobalt 59

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,γ	^{60}Ni	DAP	3AULCBR	7.2+06	7.6+06	Jour	NP/A,220,505	74	G.S.Foote+	D0858

α,el	^{59}Co	DA	3POLIFJ	2.3+07	2.8+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877
α,x+p	inclusive	DAE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
α,x+p	inclusive	DE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871

28 Nickel

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{nat}Ni	DA	3POLIFJ	2.4+07	2.8+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877

28 Nickel 58

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,inel	^{58}Ni	DAP	2GERKFK	1.0+08	1.0+08	Jour	NP/A,143,373	70	J.Specht+	D0885
α,p	^{61}Cu	DAP	3RUMBUC	1.9+07	1.9+07	Jour	NP/A,189,577	72	D.Bucurescu+	D0869
α,x+p	inclusive	DAE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
α,x+p	inclusive	DE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
^{28}Si,x+α	inclusive	DE	3INDTRM	1.0+08	1.2+08	Jour	NP/A,712,23	02	D.R.Chakrabarty+	D6282
^{28}Si,x+α	inclusive	?	3INDTRM	1.0+08	1.2+08	Jour	NP/A,712,23	02	D.R.Chakrabarty+	D6282
^{28}Si,x+p	inclusive	DE	3INDTRM	1.0+08	1.2+08	Jour	NP/A,712,23	02	D.R.Chakrabarty+	D6282
^{28}Si,x+p	inclusive	?	3INDTRM	1.0+08	1.2+08	Jour	NP/A,712,23	02	D.R.Chakrabarty+	D6282

28 Nickel 60

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,inel	^{60}Ni	DAP	2GERKFK	1.0+08	1.0+08	Jour	NP/A,143,373	70	J.Specht+	D0885
α,p	^{63}Cu	DAP	3RUMBUC	1.9+07	1.9+07	Jour	NP/A,189,577	72	D.Bucurescu+	D0869

28 Nickel 61

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,x+p	inclusive	DAE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
α,x+p	inclusive	DE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871

28 Nickel 62

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,inel	^{62}Ni	DAP	2GERKFK	1.0+08	1.0+08	Jour	NP/A,143,373	70	J.Specht+	D0885
α,p	^{65}Cu	DAP	3RUMBUC	1.9+07	1.9+07	Jour	NP/A,189,577	72	D.Bucurescu+	D0869

28 Nickel 64

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{64}Ni	DA	1USAMIT	3.0+07	3.0+07	Jour	PL/B,27,280	68	G.Heymann	D0874
	α,inel	^{64}Ni	DAP	2GERKFK	1.0+08	1.0+08	Jour	NP/A,143,373	70	J.Specht+	D0885
	α,inel	^{64}Ni	DAP	1USAMIT	3.0+07	3.0+07	Jour	PL/B,27,280	68	G.Heymann	D0874
	α,p	^{67}Cu	DAP	3RUMBUC	1.9+07	1.9+07	Jour	NP/A,189,577	72	D.Bucurescu+	D0869

29 Copper

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{65}Zn	TT	3IRNNRT	1.2+07	1.7+07	Jour	JRN,314,1759	17	M.Rostampour+	D0881
	d,x	^{61}Cu	CS	1CANMCG	3.1+07	5.0+07	Jour	NIM,159,171	79	M.Diksic+	C1131
	d,x	^{64}Cu	CS	1CANMCG	1.3+07	5.0+07	Jour	NIM,159,171	79	M.Diksic+	C1131
	d,x	^{64}Cu	CS	1CANCRC	5.8+06	2.4+07	Jour	NIM,159,171	79	M.Diksic+	C1131
	α,el	^{nat}Cu	DA	3POLIFJ	2.3+07	2.8+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877

29 Copper 63

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,x+p	inclusive	DAE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871
	α,x+p	inclusive	DE	3RUMBUC	2.3+07	2.3+07	Jour	NP/A,265,376	76	A.Alevra+	D0871

29 Copper 65

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	t,α	^{64}Ni	DAP	2UK ALD	1.2+07	1.2+07	Jour	PL/B,27,280	68	G.Heymann	D0874

30 Zinc

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{62}Zn	CS	3KORPUE		6.5+07	Jour	NP/A,960,22	17	M.Zaman+	G3126
*	γ,x	^{63}Zn	CS	3KORPUE		6.5+07	Jour	NP/A,960,22	17	M.Zaman+	G3126
*	γ,x	^{65}Zn	CS	3KORPUE		6.5+07	Jour	NP/A,960,22	17	M.Zaman+	G3126
*	γ,x	^{69}Zn	CS	3KORPUE		6.5+07	Jour	NP/A,960,22	17	M.Zaman+	G3126
*	^{3}He,x	^{62}Zn	CS	3HUNDEB	1.0+07	2.7+07	Jour	EPJ/A,53,107	17	M.Al-Abyad+	D4373
*	^{3}He,x	^{65}Zn	CS	3HUNDEB	6.6+06	2.7+07	Jour	EPJ/A,53,107	17	M.Al-Abyad+	D4373
*	^{3}He,x	^{66}Ga	CS	3HUNDEB	8.6+06	2.7+07	Jour	EPJ/A,53,107	17	M.Al-Abyad+	D4373
*	^{3}He,x	^{67}Ga	CS	3HUNDEB	8.6+06	2.7+07	Jour	EPJ/A,53,107	17	M.Al-Abyad+	D4373
*	^{3}He,x	^{68}Ga	CS	3HUNDEB	8.6+06	2.7+07	Jour	EPJ/A,53,107	17	M.Al-Abyad+	D4373
*	^{3}He,x	^{69}Ge	CS	3HUNDEB	8.6+06	2.7+07	Jour	EPJ/A,53,107	17	M.Al-Abyad+	D4373

37 Rubidium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,x	^{87}Y	?	1USABNL	3.5+07	3.5+07	Jour	ARI,17,9	66	M.Hillman+	C1762

38 Strontium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	Many	?	1USABRK	7.3+08	7.3+08	Jour	EPL,3,193	67	H.Funk+	C1130
	p,x	^{80}Kr	CS	1USABRK	7.3+08	7.3+08	Jour	EPL,3,193	67	H.Funk+	C1130

38 Strontium 88

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,p	^{90}Y	CS	1USAFSU	1.4+07	1.9+07	Jour	NP,83,364	66	C.Riley+	C1756

39 Yttrium 89

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,x	^{88}Y	CS	3CZRUJF	1.0+07	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777

40 Zirconium 90

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{90}Zr	?	3ISLWZI	6.0+06	1.7+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865
*	^{40}Ca,fus		CS	2ITYPAD	1.3+08	1.5+08	Jour	PR/C,96,014603	17	A.M.Stefanini+	D0848

40 Zirconium 91

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{91}Zr	?	3ISLWZI	7.1+06	1.6+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

40 Zirconium 92

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{40}Ca,fus		CS	2ITYPAD	1.3+08	1.5+08	Jour	PR/C,96,014603	17	A.M.Stefanini+	D0848

42 Molybdenum 92

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{92}Mo	?	3ISLWZI	6.0+06	1.6+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

42 Molybdenum 94

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{94}Mo	?	3ISLWZI	7.0+06	1.5+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

44 Ruthenium 100

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{100}Ru	DA	3BZLUSP	9.0+06	2.2+07	Jour	PR/C,54,2296	96	L.C.Gomes+	D0863
	α,inel	^{100}Ru	DAP	3BZLUSP	9.0+06	2.2+07	Jour	PR/C,54,2296	96	L.C.Gomes+	D0863

44 Ruthenium 102

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{102}Ru	DA	3BZLUSP	9.0+06	1.7+07	Jour	PR/C,54,2296	96	L.C.Gomes+	D0863
	α,inel	^{102}Ru	DAP	3BZLUSP	9.0+06	1.7+07	Jour	PR/C,54,2296	96	L.C.Gomes+	D0863

44 Ruthenium 104

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{104}Ru	DA	3BZLUSP	9.0+06	1.7+07	Jour	PR/C,54,2296	96	L.C.Gomes+	D0863
	α,inel	^{104}Ru	DAP	3BZLUSP	9.0+06	1.7+07	Jour	PR/C,54,2296	96	L.C.Gomes+	D0863

45 Rhodium 103

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,0		RP	3ISLHEB			Jour	NP/A,173,92	71	J.Zioni+	D0853
*	p,3n	^{101}Pd	CS	2JPNTOH	2.0+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377
*	p,4n	^{100}Pd	CS	2JPNTOH	2.7+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377
	p,el	^{103}Rh	DA	3ISLHEB	5.8+06	7.0+06	Jour	NP/A,173,92	71	J.Zioni+	D0853
	p,n	^{103}Pd	DA	3ISLHEB	5.8+06	6.8+06	Jour	NP/A,173,92	71	J.Zioni+	D0853
*	p,x	^{97}Ru	CS	2JPNTOH	3.6+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377

*	p,x	^{99}Rh	CS	2JPNTOH	4.3+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377
*	p,x	^{100}Rh	CS	2JPNTOH	3.6+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377
*	p,x	^{101}Rh	CS	2JPNTOH	2.0+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377
*	p,x	^{102}Rh	CS	2JPNTOH	2.0+07	7.0+07	Jour	NIM/B,412,190	17	F.Tarkanyi+	D4377

46 Palladium

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	d,x	^{97}Ru	CS	2BLGLVN	3.8+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{103}Ru	CS	2BLGLVN	4.0+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{99}Rh	CS	2BLGLVN	3.5+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{100}Rh	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{101}Rh	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{102}Rh	CS	2BLGLVN	3.1+07	4.7+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{105}Rh	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{100}Pd	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{101}Pd	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{109}Pd	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{111}Pd	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{103}Ag	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{104}Ag	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{105}Ag	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{106}Ag	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{110}Ag	CS	2BLGLVN	3.1+07	4.7+07	Jour	ARI,128,297	17	F.Ditroi+	D4372
*	d,x	^{111}Ag	CS	2BLGLVN	3.1+07	4.9+07	Jour	ARI,128,297	17	F.Ditroi+	D4372

48 Cadmium 106

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
d,α	^{104}Ag	CS	1USAMHG	7.8+06	7.8+06	Jour	JIN,9,193	59	K.L.Hall+	C1128

48 Cadmium 110

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
^{3}He,el	^{110}Cd	?	3ISLWZI	9.0+06	1.8+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865
α,el	^{110}Cd	?	3ISLWZI	9.0+06	1.6+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

48 Cadmium 111

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{111}Cd	?	3ISLWZI	1.0+07	1.6+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

48 Cadmium 112

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,el	^{112}Cd	?	3ISLWZI	7.1+06	1.7+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865
	α,el	^{112}Cd	?	3ISLWZI	7.1+06	1.6+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

48 Cadmium 113

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,α	^{111}Ag	CS	1USAMHG	7.8+06	7.8+06	Jour	JIN,9,193	59	K.L.Hall+	C1128
	^{3}He,el	^{113}Cd	?	3ISLWZI	6.0+06	1.7+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865
	α,el	^{113}Cd	?	3ISLWZI	6.1+06	1.6+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

48 Cadmium 114

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,α	^{112}Ag	CS	1USAMHG	7.8+06	7.8+06	Jour	JIN,9,193	59	K.L.Hall+	C1128
	α,el	^{114}Cd	?	3ISLWZI	9.0+06	1.7+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

52 Tellurium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{124}I	TT	3IRNNRT	2.7+07	3.0+07	Jour	JRN,314,1627	17	H.Azizakram+	D0880
*	p,x	^{126}I	TT	3IRNNRT	2.7+07	3.0+07	Jour	JRN,314,1627	17	H.Azizakram+	D0880

52 Tellurium 122

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{122}Te	?	3ISLWZI	8.0+06	1.8+07	Jour	NP/A,279,210	77	M.Samuel+	D0866

52 Tellurium 124

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{124}Te	?	3ISLWZI	1.1+07	1.7+07	Jour	NP/A,279,210	77	M.Samuel+	D0866

52 Tellurium 126

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{126}Te	?	3ISLWZI	1.1+07	1.7+07	Jour	NP/A,279,210	77	M.Samuel+	D0866

52 Tellurium 128

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,el	^{128}Te	?	3ISLWZI	1.1+07	1.8+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865
	α,el	^{128}Te	?	3ISLWZI	8.0+06	1.7+07	Jour	NP/A,236,327	74	Y.Eisen+	D0865

56 Barium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	Many	?	1USABRK	7.3+08	7.3+08	Jour	EPL,3,193	67	H.Funk+	C1130
	p,x	^{126}Xe	CS	1USABRK	7.3+08	7.3+08	Jour	EPL,3,193	67	H.Funk+	C1130
*	d,x	^{129}Cs	CS	2BLGVUB	3.9+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{132}Cs	CS	2BLGVUB	1.8+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{134}Cs	CS	2BLGVUB	2.6+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{136}Cs	CS	2BLGVUB	1.3+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{131}Ba	CS	2BLGVUB	1.9+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{133}Ba	CS	2BLGVUB	1.9+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{135}Ba	CS	2BLGVUB	2.1+06	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{132}La	CS	2BLGVUB	3.5+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{133}La	CS	2BLGVUB	2.4+07	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379
*	d,x	^{135}La	CS	2BLGVUB	9.0+06	4.9+07	Jour	NIM/B,414,18	18	F.Tarkanyi+	D4379

57 Lanthanum 139

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,3n	^{137}Ce	CS	2BLGLVN	3.4+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,5n	^{135}Ce	CS	2BLGLVN	3.4+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,6n	^{134}Ce	CS	2BLGLVN	5.4+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,7n	^{133}Ce	CS	2BLGLVN	6.2+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,n	^{139}Ce	CS	2BLGLVN	3.4+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,x	^{131}Ba	CS	2BLGLVN	5.6+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,x	^{133}Ba	CS	2BLGLVN	3.5+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,x	^{133}La	CS	2BLGLVN	6.2+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375
*	p,x	^{135}La	CS	2BLGLVN	4.1+07	6.4+07	Jour	JRN,312,691	17	F.Tarkanyi+	D4375

58 Cerium

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

*	p,x	^{133}La	CS	2BLGLVN	5.2+07	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{135}Ce	CS	2BLGLVN	1.9+07	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{137}Ce	CS	2BLGLVN	1.6+07	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{139}Ce	CS	2BLGLVN	8.4+06	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{141}Ce	CS	2BLGLVN	1.3+07	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{137}Pr	CS	2BLGLVN	3.3+07	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{138}Pr	CS	2BLGLVN	2.5+07	6.3+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{139}Pr	CS	2BLGLVN	1.6+07	4.0+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378
*	p,x	^{142}Pr	CS	2BLGLVN	8.4+06	2.9+07	Jour	NIM/B,412,46	17	F.Tarkanyi+	D4378

58 Cerium 140

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{139}Ce	CS	4UKRIEP		1.8+07	Jour	YFE,18,146	17	V.M.Mazur+	G4059

60 Neodymium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{139}Ce	CS	2BLGLVN	9.4+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{138}Pr	CS	2BLGLVN	3.0+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{142}Pr	CS	2BLGLVN	3.4+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{138}Nd	CS	2BLGLVN	3.7+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{139}Nd	CS	2BLGLVN	3.9+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{140}Nd	CS	2BLGLVN	3.0+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{141}Nd	CS	2BLGLVN	3.0+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{147}Nd	CS	2BLGLVN	2.9+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{149}Nd	CS	2BLGLVN	1.1+07	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{141}Pm	CS	2BLGLVN	1.3+07	1.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{143}Pm	CS	2BLGLVN	6.0+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{144}Pm	CS	2BLGLVN	6.0+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{146}Pm	CS	2BLGLVN	6.0+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{148}Pm	CS	2BLGLVN	6.0+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{149}Pm	CS	2BLGLVN	7.8+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376
*	p,x	^{150}Pm	CS	2BLGLVN	6.0+06	6.4+07	Jour	JRN,314,1425	17	F.Tarkanyi+	D4376

62 Samarium 144

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{7}Li,d+X	^{4}He	DA	3ARGCNE	3.0+07	3.0+07	Jour	NP/A,969,94	18	P.F.F.Carnelli+	D0850
*	^{7}Li,x+α	inclusive	DA	3ARGCNE	2.4+07	3.0+07	Jour	NP/A,969,94	18	P.F.F.Carnelli+	D0850
*	^{7}Li,x+α	inclusive	DAE	3ARGCNE	2.4+07	3.0+07	Jour	NP/A,969,94	18	P.F.F.Carnelli+	D0850

66 Dysprosium 162

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,2n	^{164}Er	?	3SAFNLP	1.9+07	3.2+07	Jour	NP/A,124,597	69	S.J.Mills+	D0872

70 Ytterbium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,x	^{167}Tm	CS	2BLGLVN	3.0+07	3.7+07	Jour	JRN,311,1825	17	F.Tarkanyi+	D4374
*	α,x	^{175}Yb	CS	2BLGLVN	2.0+07	3.8+07	Jour	JRN,311,1825	17	F.Tarkanyi+	D4374
*	α,x	^{173}Lu	CS	2BLGLVN	7.8+06	3.8+07	Jour	JRN,311,1825	17	F.Tarkanyi+	D4374
*	α,x	^{172}Hf	CS	2BLGLVN	2.0+07	3.8+07	Jour	JRN,311,1825	17	F.Tarkanyi+	D4374

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,x	^{133}Ba	CS	4UKRKFT	1.0+08	1.1+09	Jour	VAT/I,,(5/48),22	07	I.G.Goncharov+	G4015
	γ,x	^{150}Eu	CS	4UKRKFT	1.0+08	1.1+09	Jour	VAT/I,,(5/48),22	07	I.G.Goncharov+	G4015
	γ,x	^{172}Hf	CS	4UKRKFT	1.0+08	1.1+09	Jour	VAT/I,,(5/48),22	07	I.G.Goncharov+	G4015
	γ,x	^{178}Hf	CS	4UKRKFT	1.0+08	1.1+09	Jour	VAT/I,,(5/48),22	07	I.G.Goncharov+	G4015
	γ,x	^{178}Hf	CS	4UKRKFT	1.0+09	5.0+07	Jour	UJP,52,823	07	I.G.Goncharov+	G4014
	γ,x	^{178}Hf	INT	4UKRKFT	1.0+08	1.1+09	Jour	VAT/I,,(5/48),22	07	I.G.Goncharov+	G4015

79 Gold 197

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{197}Au	DA	3POLIFJ	2.3+07	2.8+07	Jour	NP/A,211,463	73	A.Budzanowski+	D0877
	α,el	^{197}Au	DA	3POLIFJ	2.4+07	2.8+07	Rept	INP-740	72	A.Budzanowski+	D0878

80 Mercury 198

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{198}Hg	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
	α,inel	^{198}Hg	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862

80 Mercury 200

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{200}Hg	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
	α,inel	^{200}Hg	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862

80 Mercury 202

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{202}Hg	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
α,inel	^{202}Hg	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862

80 Mercury 204

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{204}Hg	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
α,inel	^{204}Hg	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862

82 Lead 204

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{204}Pb	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
α,el	^{204}Pb	?	3ISLWZI	1.4+07	2.3+07	Jour	PL/B,32,465	70	G.Goldring+	D0864
α,inel	^{204}Pb	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862

82 Lead 206

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{206}Pb	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
α,inel	^{206}Pb	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862

82 Lead 208

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
α,el	^{208}Pb	DA	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
α,el	^{208}Pb	?	3ISLWZI	1.4+07	2.4+07	Jour	PL/B,32,465	70	G.Goldring+	D0864
α,inel	^{208}Pb	DAP	3AULCBR	2.7+07	2.7+07	Jour	NP/A,369,25	81	A.M.Baxter+	D0862
α,n	^{211}Po	CS	1USABRK	1.8+07	3.9+07	Jour	PR,94,1292	54	F.N.Spiess	C2280
α,p	^{211}Bi	CS	1USABRK	1.8+07	3.9+07	Jour	PR,94,1292	54	F.N.Spiess	C2280

83 Bismuth 209

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

	α,x	^{211}Po	CS	1USABRK	3.0+07	3.9+07	Jour	PR,94,1292	54	F.N.Spiess	C2280

90 Thorium 232

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	α,fis		CS	3INDVEC	7.7+06	6.5+07	Jour	PR/C,91,044620	15	A.Chaudhuri+	D6285

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	γ,fis	^{97}Nb	CS	4UKRIEP		1.8+07	Jour	UFZ,62,285	17	V.O.Zheltonozhskyi+	G4058

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	γ,fis	^{97}Nb	CS	4UKRIEP		1.8+07	Jour	UFZ,62,285	17	V.O.Zheltonozhskyi+	G4058
*	^{32}S,fis	Many	FY	3INDNSD	1.8+08	2.2+08	Jour	PRM,85,379	15	L.S.Danu+	D6281

98 Californium 252

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	α,2n	^{254}Fm	CS	1USADAV	2.3+07	4.0+07	Jour	JIN,11,261	59	T.Sikkeland+	C1129
	α,3n	^{253}Fm	CS	1USADAV	2.9+07	4.0+07	Jour	JIN,11,261	59	T.Sikkeland+	C1129
	α,n	^{255}Fm	?	1USADAV	2.3+07	4.0+07	Jour	JIN,11,261	59	T.Sikkeland+	C1129
	α,x	^{253}Es	CS	1USADAV	2.6+07	4.0+07	Jour	JIN,11,261	59	T.Sikkeland+	C1129
	α,x	^{254}Es	CS	1USADAV	2.9+07	4.0+07	Jour	JIN,11,261	59	T.Sikkeland+	C1129