EXFOR News (December 2016)

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 dΩ_1/dΩ_2/dE'	NUD	Delayed fission neutron multiplicity $\bar{\nu}_d$
D3E	Triple differential dΩ/dE'_1/dE'_2	NUF	Fragment neutrons
D4A	Quadruple diff. dΩ_1/dΩ_2/dE'_1/dE'_2	POL	Polarization
DA	Differential d/dΩ	POD	Differential polarization
DAA	Double differential dΩ_1/dΩ_2	PY	Product yield (other than fission)
DAE	Double differential dΩ/dE'	RI	Resonance integral
DAP	Partial differential d/dΩ	RP	Resonance parameter
DAT	Temperature-dependent Legendre coefficient	RR	Reaction rate
DE	Differential d/dE'	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, d/dΩ
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 2

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{3}He	CS	1CANUBC	5.4+04	1.1+06	Jour	CJP,48,3059	70	G.M.Bailey+	C1637

2 Helium 3

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,p	^{4}He	CS	1USATEX	Maxwl	4.8+04	Jour	PRL,111,082502	13	M.Barbui+	C2231
*	α,γ	^{7}Be	CS	2GERZFK		2.3+04	Jour	PR/D,91,123526	15	M.P.Takacs+	D4331
*	α,γ	^{7}Be	RR	2GERZFK			Jour	PR/D,91,123526	15	M.P.Takacs+	D4331
*	^{24}Mg,α	^{23}Mg	?	1CANTMF	7.5+07	7.5+07	Jour	PR/C,93,025802	16	O.S.Kirsebom+	C2219

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{7}Be	DA	1CANUBC	7.5+05	7.5+05	Jour	PR,101,242	56	J.B.Warren+	C1639

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,el	^{7}Li	DA	4KASKAZ	6.0+07	6.0+07	Conf	2000IZMIR,,822	00	N.Burtebayev+	D0809
	^{3}He,inel	^{7}Li	DAP	4KASKAZ	6.0+07	6.0+07	Conf	2000IZMIR,,822	00	N.Burtebayev+	D0809
	α,γ		RP	1USAANL			Jour	PR/C,29,1199	84	G.Hardie+	C1642

4 Beryllium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,γ		RP	1USAANL			Jour	PR/C,29,1199	84	G.Hardie+	C1642

4 Beryllium 9

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,el	^{9}Be	DA	4KASKAZ	5.0+07	6.0+07	Conf	2000IZMIR,,822	00	N.Burtebayev+	D0809
	^{3}He,inel	^{9}Be	DAP	4KASKAZ	6.0+07	6.0+07	Conf	2000IZMIR,,822	00	N.Burtebayev+	D0809
	α,el	^{9}Be	DA	4KASKAZ	5.0+07	5.0+07	Conf	2000IZMIR,,822	00	N.Burtebayev+	D0809
	α,inel	^{9}Be	DAP	4KASKAZ	5.0+07	5.0+07	Conf	2000IZMIR,,822	00	N.Burtebayev+	D0809

^{32}S,x	^{31}S	CS	1USAMSU	2.0+09	2.0+09	Jour	PR/C,69,034311	04	A.Gade+	C2228
^{32}S,x	^{31}S	CSP	1USAMSU	2.0+09	2.0+09	Jour	PR/C,69,034311	04	A.Gade+	C2228
^{33}Cl,x	^{32}Cl	CS	1USAMSU	2.2+09	2.2+09	Jour	PR/C,69,034311	04	A.Gade+	C2228
^{33}Cl,x	^{32}Cl	CSP	1USAMSU	2.2+09	2.2+09	Jour	PR/C,69,034311	04	A.Gade+	C2228
^{34}Ar,x	^{33}Ar	CS	1USAMSU	2.4+09	2.4+09	Jour	PR/C,69,034311	04	A.Gade+	C2228
^{34}Ar,x	^{33}Ar	CSP	1USAMSU	2.4+09	2.4+09	Jour	PR/C,69,034311	04	A.Gade+	C2228

5 Boron 11

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,α		RP	1USAUSA	1.6+05	1.6+05	Jour	PR,124,814	61	R.E.Segel+	C1643
p,el		RP	1USAUSA	1.6+05	1.6+05	Jour	PR,124,814	61	R.E.Segel+	C1643
p,γ		RP	1USAUSA	1.6+05	1.6+05	Jour	PR,124,814	61	R.E.Segel+	C1643
α,n	^{14}N	DAP	1CANOTC	2.0+06	7.9+06	Jour	NP/A,246,(1),93	75	L.Vanderzwan+	C1630
α,tot		RP	1CANOTC	2.1+06	7.8+06	Jour	NP/A,246,(1),93	75	L.Vanderzwan+	C1630

6 Carbon 12

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,0		RP	1USACAL			Jour	PR,85,197	52	J.D.Seagrave	C1645
p,γ	^{13}N	CS	1USACAL	4.5+05	1.7+06	Jour	PR,85,197	52	J.D.Seagrave	C1645
α,γ	^{16}O	CSP	1USACAL	1.3+06	2.9+06	Jour	PRL,60,1475	88	R.M.Kremer+	C1629

6 Carbon 13

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,0		RP	1USACAL			Jour	PR,85,197	52	J.D.Seagrave	C1645
p,0		RP	1USACAL			Jour	PR,92,1199	53	H.H.Woodbury+	C1647
p,0		RP	1USAMRY			Jour	NP,72,(3),552	65	R.W.Detenbeck+	C1651
p,γ		RP	1USAMRY	1.0+06	1.7+06	Jour	NP,72,(3),552	65	R.W.Detenbeck+	C1651
p,γ	^{14}N	CS	1USACAL	1.3+05	1.3+05	Jour	PR,85,51	52	E.J.Woodbury+	C1633
p,γ	^{14}N	CS	1USACAL	1.5+06	1.6+06	Jour	PR,92,1199	53	H.H.Woodbury+	C1647
p,γ	^{14}N	CS	1USACAL	5.5+05	2.1+06	Jour	PR,85,197	52	J.D.Seagrave	C1645
p,γ	^{14}N	DAP	1USAMRY	1.0+06	1.0+06	Jour	NP,72,(3),552	65	R.W.Detenbeck+	C1651

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	7.1+04	2.6+05	Jour	PRL,115,252501	15	F.Cavanna+	D4330

11 Sodium 23

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	5.1+05	5.1+05	Jour	PR/C,17,1550	78	B.M.Paine+	D0819
	p,γ		?	3AULAML			Jour	PR/C,17,1550	78	B.M.Paine+	D0819

12 Magnesium 26

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	2.0+06	2.0+06	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		?	3AULAML			Jour	NP/A,331,389	79	B.M.Paine+	D0820

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	6.3+05	9.9+05	Jour	NP/A,331,389	79	B.M.Paine+	D0820
*	^{16}O,inel	^{27}Al	DAP	2ITYLNS	2.8+08	2.8+08	Jour	EPJ/A,52,169	16	F.Cappuzzello+	D0747

14 Silicon 30

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	6.2+05	6.2+05	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		?	3AULAML			Jour	NP/A,331,389	79	B.M.Paine+	D0820

15 Phosphorus 31

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	6.4+05	6.4+05	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		RP	3AULAML	8.1+05	8.1+05	Jour	PR/C,17,1550	78	B.M.Paine+	D0819
	p,γ		?	3AULAML			Jour	PR/C,17,1550	78	B.M.Paine+	D0819
*	p,inel	^{31}P	DAP	3IRNNRT	1.9+06	3.0+06	Jour	NIM/B,383,152	16	A.Jokar+	D0817
*	p,inel	^{31}P	MLT	3IRNNRT	1.7+06	3.0+06	Jour	NIM/B,383,152	16	A.Jokar+	D0817

16 Sulphur 34

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	1.2+06	1.2+06	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		?	3AULAML			Jour	NP/A,331,389	79	B.M.Paine+	D0820

17 Chlorine 35

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	8.5+05	8.6+05	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		RP	3AULAML	8.6+05	8.6+05	Jour	PR/C,17,1550	78	B.M.Paine+	D0819
	p,γ		?	3AULAML			Jour	PR/C,17,1550	78	B.M.Paine+	D0819
	p,γ		?	3AULAML			Jour	NP/A,331,389	79	B.M.Paine+	D0820

19 Potassium 39

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	2.0+06	2.0+06	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		?	3AULAML			Jour	NP/A,331,389	79	B.M.Paine+	D0820

20 Calcium 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ		RP	3AULAML	1.8+06	1.8+06	Jour	NP/A,331,389	79	B.M.Paine+	D0820
	p,γ		?	3AULAML			Jour	NP/A,331,389	79	B.M.Paine+	D0820

22 Titanium 46

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{46}Ti,fus		CS	2ITYPAD	5.8+07	7.1+07	Jour	PR/C,65,034609	02	A.M.Stefanini+	D0814

23 Vanadium 51

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,4n	^{48}Cr	CS	2BLGLVN	3.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,n	^{51}Cr	CS	2BLGLVN	3.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,n	^{51}Cr	TT	3IRNKRJ	3.0+06	1.1+07	Jour	JRN,309,1321	16	T.Kakavand+	D0824
*	p,x	^{42}K	CS	2BLGLVN	5.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{43}K	CS	2BLGLVN	4.2+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{43}Sc	CS	2BLGLVN	3.8+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{44}Sc	CS	2BLGLVN	4.7+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{46}Sc	CS	2BLGLVN	3.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{47}Sc	CS	2BLGLVN	3.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{48}Sc	CS	2BLGLVN	3.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356
*	p,x	^{48}V	CS	2BLGLVN	3.6+07	6.4+07	Jour	NIM/B,381,16	16	F.Ditroi+	D4356

28 Nickel

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{51}Cr	CS	2BLGVUB	5.7+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{52}Mn	CS	2BLGVUB	4.5+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{54}Mn	CS	2BLGVUB	4.8+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{52}Fe	CS	2BLGVUB	5.6+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{55}Co	CS	2BLGVUB	3.1+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{56}Ni	CS	2BLGVUB	3.1+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{57}Ni	CS	2BLGVUB	3.1+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	d,x	^{55}Co	CS	3CZRUJF	7.8+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{56}Co	CS	3CZRUJF	1.5+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{57}Co	CS	3CZRUJF	7.8+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{58}Co	CS	3CZRUJF	1.5+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{60}Co	CS	3CZRUJF	1.3+07	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{57}Ni	CS	3CZRUJF	9.8+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{65}Ni	CS	3CZRUJF	1.5+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{60}Cu	CS	3CZRUJF	7.8+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{61}Cu	CS	3CZRUJF	1.5+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818
*	d,x	^{64}Cu	CS	3CZRUJF	7.8+06	2.0+07	Jour	PR/C,94,014606	16	M.Avrigeanu+	D0818

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{20}Ne,x	Many	DA	3POLWWA	5.1+07	5.1+07	Jour	PR/C,93,054604	16	A.Trzcinska+	D0815

28 Nickel 60

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{20}Ne,x	Many	DA	3POLWWA	5.1+07	5.1+07	Jour	PR/C,93,054604	16	A.Trzcinska+	D0815

28 Nickel 61

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{20}Ne,x	Many	DA	3POLWWA	5.1+07	5.1+07	Jour	PR/C,93,054604	16	A.Trzcinska+	D0815

30 Zinc 64

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,2n	^{62}Zn	INT	2SWTETH		3.2+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921

30 Zinc 66

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,x	^{64}Cu	CS	2SWTETH	2.3+07	2.9+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921
	γ,x	^{64}Cu	INT	2SWTETH		3.2+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921

30 Zinc 68

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,p	^{67}Cu	CS	2SWTETH	1.5+07	2.7+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921
	γ,p	^{67}Cu	INT	2SWTETH		3.2+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921

31 Gallium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{65}Zn	CS	2BLGVUB	2.2+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{69}Zn	CS	2BLGVUB	2.6+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{66}Ga	CS	2BLGVUB	3.0+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{67}Ga	CS	2BLGVUB	1.6+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{68}Ga	CS	2BLGVUB	1.5+07	3.7+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{68}Ge	CS	2BLGVUB	3.1+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	p,x	^{69}Ge	CS	2BLGVUB	3.1+07	6.4+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	d,x	^{65}Zn	CS	2BLGVUB	1.8+07	5.0+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	d,x	^{69}Zn	CS	2BLGVUB	5.1+06	5.0+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	d,x	^{66}Ga	CS	2BLGVUB	4.2+07	5.0+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	d,x	^{67}Ga	CS	2BLGVUB	2.5+07	5.0+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343
*	d,x	^{72}Ga	CS	2BLGVUB	5.1+06	5.0+07	Jour	NIM/B,359,145	15	A.Hermanne+	D4343

32 Germanium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,x	^{69}Ge	CS	2JPNIPC	1.3+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{71}As	CS	2JPNIPC	2.5+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{72}As	CS	2JPNIPC	1.3+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{74}As	CS	2JPNIPC	1.7+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{76}As	CS	2JPNIPC	1.3+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{78}As	CS	2JPNIPC	2.0+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{72}Se	CS	2JPNIPC	1.9+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{73}Se	CS	2JPNIPC	1.1+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352
*	α,x	^{75}Se	CS	2JPNIPC	1.1+07	5.1+07	Jour	NIM/B,383,213	16	S.Takacs+	D4352

42 Molybdenum

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,x	^{92}Nb	TT	3CZRUJV	1.2+07	1.2+07	Jour	IP,5,247	69	K.Svoboda+	D0822
	d,x	^{95}Nb	TT	3CZRUJV	1.2+07	1.2+07	Jour	IP,5,247	69	K.Svoboda+	D0822
	d,x	^{99}Mo	?	3CZRUJV	1.2+07	1.2+07	Jour	IP,5,247	69	K.Svoboda+	D0822
	d,x	^{95}Tc	?	3CZRUJV	1.2+07	1.2+07	Jour	IP,5,247	69	K.Svoboda+	D0822
	d,x	^{96}Tc	TT	3CZRUJV	1.2+07	1.2+07	Jour	IP,5,247	69	K.Svoboda+	D0822

42 Molybdenum 92

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,x	^{90}Nb	INT	2SWTETH		3.2+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921

42 Molybdenum 98

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,p	^{97}Nb	INT	2SWTETH		3.2+07	Jour	HPA,30,264	57	A.Elsioufi+	M0921

46 Palladium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{97}Ru	CS	2JPNTOH	3.0+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{103}Ru	CS	2JPNTOH	4.2+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{99}Rh	CS	2JPNTOH	2.8+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{100}Rh	CS	2JPNTOH	1.8+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{101}Rh	CS	2JPNTOH	6.7+06	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{102}Rh	CS	2JPNTOH	3.6+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{105}Rh	CS	2JPNTOH	6.7+06	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{100}Pd	CS	2JPNTOH	1.8+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{101}Pd	CS	2JPNTOH	1.5+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{103}Ag	CS	2JPNTOH	3.4+07	6.8+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{104}Ag	CS	2JPNTOH	6.7+06	6.8+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{105}Ag	CS	2JPNTOH	3.6+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{106}Ag	CS	2JPNTOH	3.6+07	7.9+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357
*	p,x	^{110}Ag	CS	2JPNTOH	8.2+06	3.7+07	Jour	ARI,114,128	16	F.Tarkanyi+	D4357

48 Cadmium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,x	^{105}Ag	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{106}Ag	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{110}Ag	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354

*	d,x	^{111}Ag	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{107}Cd	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{109}Cd	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{115}Cd	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{109}In	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{110}In	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{111}In	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{113}In	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{114}In	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	d,x	^{115}In	CS	2BLGLVN	3.3+07	4.9+07	Jour	NIM/B,385,19	16	A.Hermanne+	D4354
*	α,x	^{115}Cd	CS	2JPNIPC	2.8+07	5.0+07	Jour	NIM/B,385,1	16	F.Ditroi+	D4353
*	α,x	^{115}In	CS	2JPNIPC	2.8+07	5.0+07	Jour	NIM/B,385,1	16	F.Ditroi+	D4353
*	α,x	^{116}In	CS	2JPNIPC	2.8+07	5.0+07	Jour	NIM/B,385,1	16	F.Ditroi+	D4353
*	α,x	^{117}In	CS	2JPNIPC	2.8+07	5.0+07	Jour	NIM/B,385,1	16	F.Ditroi+	D4353
*	α,x	^{117}Sn	CS	2JPNIPC	2.8+07	5.0+07	Jour	NIM/B,385,1	16	F.Ditroi+	D4353

48 Cadmium 110

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{111}Cd	CS	3INDTRM	1.1+06	4.1+06	Jour	JRN,307,1481	16	R.Ghosh+	33086

48 Cadmium 111

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,inel	^{111}Cd	CS	3INDTRM	1.1+06	4.1+06	Jour	JRN,307,1481	16	R.Ghosh+	33086

52 Tellurium 128

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,t	^{126}Te	DAP	1USAYAL	1.5+07	1.5+07	Jour	PR/C,82,027308	10	T.Bloxham+	C2229
*	p,t	^{126}Te	?	1USAYAL	1.5+07	1.5+07	Jour	PR/C,82,027308	10	T.Bloxham+	C2229

52 Tellurium 130

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,t	^{128}Te	DAP	1USAYAL	1.5+07	1.5+07	Jour	PR/C,82,027308	10	T.Bloxham+	C2229
*	p,t	^{128}Te	?	1USAYAL	1.5+07	1.5+07	Jour	PR/C,82,027308	10	T.Bloxham+	C2229

55 Caesium 133

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

*	γ,2n	^{131}Cs	CS	4RUSMOS	1.6+07	2.9+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,2n	^{131}Cs	INT	4RUSMOS		3.0+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,3n	^{130}Cs	CS	4RUSMOS	2.5+07	2.9+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,3n	^{130}Cs	INT	4RUSMOS		3.0+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,n	^{132}Cs	CS	4RUSMOS	9.0+06	2.9+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,n	^{132}Cs	INT	4RUSMOS		3.0+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,x+n	inclusive	CS	4RUSMOS	9.0+06	2.9+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,x+n	inclusive	INT	4RUSMOS		3.0+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922

56 Barium 138

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{136}Ba	CS	4RUSMOS	1.5+07	2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,2n	^{136}Ba	INT	4RUSMOS		2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,3n	^{135}Ba	CS	4RUSMOS	2.5+07	2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,3n	^{135}Ba	INT	4RUSMOS		2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,n	^{137}Ba	CS	4RUSMOS	8.5+06	2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,n	^{137}Ba	INT	4RUSMOS		2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,x+n	inclusive	CS	4RUSMOS	8.5+06	2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,x+n	inclusive	INT	4RUSMOS		2.7+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922

59 Praseodymium 141

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,2p	^{141}Ce	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,3n	^{140}Nd	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,4n	^{139}Nd	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,5n	^{138}Nd	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{135}Ce	CS	2BLGLVN	4.2+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{137}Ce	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{139}Ce	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{138}Pr	CS	2BLGLVN	3.6+07	4.9+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355

63 Europium 151

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{152}Eu	CS	3INDTRM	1.1+06	4.1+06	Jour	JRN,307,1385	16	S.Badwar+	33085

65 Terbium 159

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{20}Ne,fis		CS	2BLGLVN			Jour	PR/C,68,034613	03	J.Cabrera+	C2227
	^{20}Ne,fis		DA	2BLGLVN	2.6+08	2.6+08	Jour	PR/C,68,034613	03	J.Cabrera+	C2227
	^{20}Ne,fus		CS	2BLGLVN			Jour	PR/C,68,034613	03	J.Cabrera+	C2227

	^{20}Ne,fus		?	2BLGLVN			Jour	PR/C,68,034613	03	J.Cabrera+	C2227

67 Holmium 165

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,5n	^{161}Er	CS	2JPNTOH	3.6+07	6.4+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358
*	p,6n	^{160}Er	CS	2JPNTOH	4.7+07	6.4+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358
*	p,x	^{157}Dy	CS	2JPNTOH	5.3+07	6.4+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358
*	p,x	^{159}Dy	CS	2JPNTOH	4.7+07	6.4+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358

68 Erbium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{160}Er	CS	2JPNTOH	6.0+07	6.6+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358

68 Erbium 162

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{160}Er	CS	2JPNTOH	2.8+07	3.6+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358
*	p,x	^{161}Er	CS	2JPNTOH	1.6+07	3.6+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358
*	d,x	^{160}Er	CS	2JPNTOH	3.6+07	4.0+07	Jour	ARI,115,262	16	F.Tarkanyi+	D4358

69 Thulium 169

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,2n	^{169}Yb	CS	2BLGLVN	3.5+07	5.0+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,5n	^{166}Yb	CS	2BLGLVN	3.5+07	5.0+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{166}Tm	CS	2BLGLVN	4.6+07	5.0+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{167}Tm	CS	2BLGLVN	3.5+07	5.0+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
*	d,x	^{168}Tm	CS	2BLGLVN	3.5+07	5.0+07	Jour	NIM/B,383,81	16	A.Hermanne+	D4355
	^{20}Ne,fis		CS	2BLGLVN			Jour	PR/C,68,034613	03	J.Cabrera+	C2227
	^{20}Ne,fus		CS	2BLGLVN			Jour	PR/C,68,034613	03	J.Cabrera+	C2227
	^{20}Ne,fus		?	2BLGLVN			Jour	PR/C,68,034613	03	J.Cabrera+	C2227

82 Lead 208

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{64}Ni,n	^{271}Ds	CS	1USABRK	3.1+08	3.1+08	Jour	PR/C,67,064609	03	T.N.Ginter+	C2225

83 Bismuth 209

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{207}Bi	CS	4RUSMOS	1.4+07	2.8+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,2n	^{207}Bi	INT	4RUSMOS		2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,3n	^{206}Bi	CS	4RUSMOS	2.3+07	2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,3n	^{206}Bi	INT	4RUSMOS		2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,n	^{208}Bi	CS	4RUSMOS	8.0+06	2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,n	^{208}Bi	INT	4RUSMOS		2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,x+n	inclusive	CS	4RUSMOS	8.0+06	2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922
*	γ,x+n	inclusive	INT	4RUSMOS		2.6+07	Jour	YF,79,(4),315	16	V.V.Varlamov+	M0922

90 Thorium 232

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,fis	^{135}Xe	CS	4ZZZDUB		2.5+07	Jour	PPN/L,13,(4),471	16	Tranducthiep+	M0924

92 Uranium 233

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,fis	^{135}Xe	CS	4ZZZDUB		2.5+07	Jour	PPN/L,13,(4),471	16	Tranducthiep+	M0924

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,fis	^{4}He	FY	3INDITK	2.5-02	4.8+05	Jour	PRM,18,205	82	S.C.L.Sharma+	33088
	n,fis	^{4}He	KE	3INDITK	2.5-02	4.8+05	Jour	PRM,18,205	82	S.C.L.Sharma+	33088

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis		NU	3INDTRM	2.0+06	3.0+06	Jour	PR/C,92,014609	15	V.V.Desai+	33084
*	n,fis		NUF	3INDTRM	2.0+06	3.0+06	Jour	PR/C,92,014609	15	V.V.Desai+	33084

93 Neptunium 237

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,fis	^{135}Xe	CS	4ZZZDUB		2.5+07	Jour	PPN/L,13,(4),471	16	Tranducthiep+	M0924

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis		NU	3AULAUA	Spont		Conf	77NBS,,182	77	J.W.Boldeman	31761