EXFOR News (November 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 $d/d\Omega$	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 $d/d\Omega$	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, $d/d\Omega$
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)

1 Hydrogen 1

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	^{7}Be,γ	^{8}B	?	2ITYFSN	3.7+05	8.1+05	Jour	PL/B,824,136819	22	R.Buompane+	O2564
*	^{29}Ne,n+p	^{28}Ne	?	2JPNIPC	7.0+09	7.0+09	Jour	PL/B,843,138038	23	H.Wang+	E2752
*	^{57}Sc,2p	^{56}Ca	?	2JPNIPC	1.2+10	1.2+10	Jour	PL/B,843,138025	23	S.Chen+	E2753
*	^{59}Sc,2p	^{58}Ca	?	2JPNIPC	1.2+10	1.2+10	Jour	PL/B,843,138025	23	S.Chen+	E2753

1 Hydrogen 2

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	^{7}Be,p	^{8}Be	?	2ZZZCER	7.8+06	7.8+06	Jour	PRL,128,252701	22	Skm.Ali+	O2577
*	^{7}Be,sct	^{2}H	?	2ZZZCER	7.8+06	7.8+06	Jour	PRL,128,252701	22	Skm.Ali+	O2577
*	^{206}Hg,p	^{207}Hg	?	2ZZZCER	1.5+09	1.5+09	Jour	PRL,124,062502	20	T.L.Tang+	O2568

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	d,n	^{7}Be	DAP	2GRCATH	9.9+05	2.2+06	Jour	NIM/B,539,162	23	E.Taimpiri+	O2570
*	d,p	^{7}Li	DAP	2GRCATH	9.9+05	2.2+06	Jour	NIM/B,539,162	23	E.Taimpiri+	O2570

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	^{7}Li	DAP	2GRCATH	1.0+06	4.0+06	Jour	NIM/B,539,113	23	A.Ziagkova+	O2573
*	p,inel	^{7}Li	TTD	2GRCATH	1.0+06	4.0+06	Jour	NIM/B,539,113	23	A.Ziagkova+	O2573
*	d,inel	^{7}Li	DAP	2GRCATH	9.9+05	2.2+06	Jour	NIM/B,539,162	23	E.Taimpiri+	O2570

4 Berylium 9

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,α	^{6}Li	CS	2JPNTOH	1.7+04	8.9+04	Jour	AJ,893,126	20	Q.Zhang+	E2754
*	p,α	^{6}Li	TT	2JPNTOH	1.8+04	1.0+05	Jour	AJ,893,126	20	Q.Zhang+	E2754
*	p,d	^{8}Be	CSP	2JPNTOH	1.9+04	8.9+04	Jour	AJ,893,126	20	Q.Zhang+	E2754
*	p,d	^{8}Be	TTP	2JPNTOH	2.0+04	1.0+05	Jour	AJ,893,126	20	Q.Zhang+	E2754
*	^{3}He,p	^{11}B	DAP	2PRTLIS	9.4+05	2.5+06	Jour	PS,98,035306	23	C.M.Vitor+	O2566

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2p	^{11}B	D3A	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
*	p,2p	^{11}B	POD	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
*	p,d	^{11}C	CS	2SPNSEU	1.6+07	1.6+07	Jour	RPC,190,109759	22	T.Rodriguez-Gonzalez+	O2576
	p,el	^{12}C	POD	1USAORL	4.0+07	4.0+07	Jour	PR,147,812	66	L.N.Blumberg+	O0208
*	p,γ	^{13}N	CS	2SPNSEU	6.5+06	1.6+07	Jour	RPC,190,109759	22	T.Rodriguez-Gonzalez+	O2576
*	^{18}C,n+X	^{16}C	CSP	2JPNIPC	4.4+09	4.4+09	Jour	PL/B,836,137629	23	S.Kim+	E2745
*	^{18}C,n+X	^{16}C	DE	2JPNIPC	4.4+09	4.4+09	Jour	PL/B,836,137629	23	S.Kim+	E2745
*	^{18}C,n+X	^{16}C	DEP	2JPNIPC	4.4+09	4.4+09	Jour	PL/B,836,137629	23	S.Kim+	E2745
*	^{18}C,x	^{17}C	DP	2JPNIPC	4.4+09	4.4+09	Jour	PL/B,836,137629	23	S.Kim+	E2745

7 Nitrogen 14

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,α	^{11}C	CS	2SPNSEU		1.0+06	Jour	RPC,190,109759	22	T.Rodriguez-Gonzalez+	O2576

8 Oxygen

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,el	^{nat}O	DA	2GRCATH	4.0+06	6.0+06	Jour	NIM/B,539,15	23	M.Kokkoris+	O2575

8 Oxygen 16

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2p	^{15}N	D3A	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
	p,2p	^{15}N	D3A	1CANUBC	5.0+08	5.0+08	Jour	NP/A,456,577	86	W.J.Mcdonald+	O0066
*	p,2p	^{15}N	POD	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
*	p,α	^{13}N	CS	2SPNSEU	6.5+06	1.6+07	Jour	RPC,190,109759	22	T.Rodriguez-Gonzalez+	O2576
*	p,x	^{11}C	CS	2SPNSEU	5.0+06	1.6+07	Jour	RPC,190,109759	22	T.Rodriguez-Gonzalez+	O2576

8 Oxygen 17

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,el	^{17}O	DA	2FR FR	6.0+05	1.3+06	Jour	NIM/B,516,15	22	M.Salimi+	O2567

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	DAP	2GRCATH	9.9+05	2.2+06	Jour	NIM/B,539,162	23	E.Taimpiri+	O2570

12 Magnesium

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	γ,x+p	inclusive	INT	4RUSMOS		3.2+07	Jour	BAS,30,383	67	B.S.Ishkhanov+	M0725

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,inel	^{27}Al	DAP	2PRTLIS	1.5+06	3.0+06	Jour	EPJ/A,58,209	22	R.Mateus+	O2571
*	d,α	^{25}Mg	DAP	2FR FR	1.5+06	2.0+06	Jour	SCR,11,18036	21	M.Salimi+	O2572
*	d,p	^{28}Al	DAP	2FR FR	5.0+05	2.0+06	Jour	SCR,11,18036	21	M.Salimi+	O2572

14 Silicon 28

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	p,el	^{28}Si	DA	1USAORL	4.0+07	4.0+07	Jour	PR,156,1207	67	M.P.Fricke+	O0328
	p,el	^{28}Si	POD	1USAORL	4.0+07	4.0+07	Jour	PR,156,1207	67	M.P.Fricke+	O0328

20 Calcium 40

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,2p	^{39}K	D3A	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
*	p,2p	^{39}K	POD	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
	p,el	^{40}Ca	POD	1USAORL	4.0+07	4.0+07	Jour	PR,147,812	66	L.N.Blumberg+	O0208

20 Calcium 48

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,2p	^{47}K	D3A	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
*	p,2p	^{47}K	POD	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757

22 Titanium 46

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	α,x	Many	CS	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716
	α,x	Many	DA	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716

	α,x	^{9}Be	DA	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716
	α,x	^{12}C	DA	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716
	α,x	^{14}N	DA	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716
	α,x	^{16}O	DA	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716
	α,x	^{19}F	DA	2GERKFK	1.0+08	1.0+08	Jour	RRP,37,121	92	M.Parlog+	O0716

26 Iron

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x+n	inclusive	TTD	2JPNKTO	1.1+08	1.1+08	Jour	NST,60,435	23	H.Iwamoto+	E2746

26 Iron 54

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{51}Cr	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514
p,el	^{54}Fe	DA	1USAORL	4.0+07	4.0+07	Jour	PR,156,1207	67	M.P.Fricke+	O0328
p,el	^{54}Fe	POD	1USAORL	4.0+07	4.0+07	Jour	PR,156,1207	67	M.P.Fricke+	O0328

26 Iron 56

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,2n	^{55}Fe	DAP	4UKRKGU	1.5+07	1.5+07	Rept	INDC(CCP)-118,(2),3	77	A.P.Degtyarev+	40575
n,α	^{53}Cr	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514
n,inel	^{56}Fe	DAP	4UKRKGU	1.5+07	1.5+07	Rept	INDC(CCP)-118,(2),3	77	A.P.Degtyarev+	40575

26 Iron 57

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{54}Cr	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514

26 Iron 58

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{55}Cr	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514

28 Nickel 58

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

n,α	^{55}Fe	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514
p,el	^{58}Ni	POD	1USAORL	4.0+07	4.0+07	Jour	PR,147,812	66	L.N.Blumberg+	O0208

28 Nickel 60

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{57}Fe	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514
p,el	^{60}Ni	DA	1USAORL	4.0+07	4.0+07	Jour	PR,156,1207	67	M.P.Fricke+	O0328
p,el	^{60}Ni	POD	1USAORL	4.0+07	4.0+07	Jour	PR,156,1207	67	M.P.Fricke+	O0328

28 Nickel 61

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,inel	^{61}Ni	?	4UZ UZB	Fiss		Conf	77TASHKENT,,19	77	S.Arynov+	41759

28 Nickel 62

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{59}Fe	CS	4UKRKFT	1.5+07	1.5+07	Rept	INDC(CCP)-099,(4),173	75	G.P.Dolya+	40514
n,inel	^{62}Ni	?	4UZ UZB	Fiss		Conf	77TASHKENT,,20	77	S.Arynov+	41760

28 Nickel 64

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,inel	^{64}Ni	?	4UZ UZB	Fiss		Conf	77TASHKENT,,20	77	S.Arynov+	41760

29 Copper 63

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,inel	^{63}Cu	?	4UZ UZB	Fiss		Conf	77TASHKENT,,22	77	S.Arynov+	41761

29 Copper 65

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,inel	^{65}Cu	?	4UZ UZB	Fiss		Conf	77TASHKENT,,22	77	S.Arynov+	41761

30 Zinc

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{66}Ga	CS	2SWTUBE	5.1+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565
*	p,x	^{67}Ga	CS	2SWTUBE	3.8+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565
*	p,x	^{68}Ga	CS	2SWTUBE	3.8+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565

30 Zinc 66

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{67}Ga	?	2SWTUBE	3.8+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565
*	p,n	^{66}Ga	CS	2SWTUBE	6.5+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565

30 Zinc 67

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,inel	^{67}Zn	?	4UZ UZB	Fiss		Conf	77TASHKENT,,24	77	L.N.Smirin+	41762
*	p,γ	^{68}Ga	?	2SWTUBE	3.8+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565
*	p,n	^{67}Ga	CS	2SWTUBE	3.8+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565

30 Zinc 68

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2n	^{67}Ga	CS	2SWTUBE	1.3+07	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565
*	p,n	^{68}Ga	CS	2SWTUBE	3.8+06	1.8+07	Jour	ARI,186,110252	22	S.Braccini+	O2565

31 Gallium 69

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,inel	^{69}Ga	?	4UZ UZB	Fiss		Conf	77TASHKENT,,26	77	L.N.Smirin+	41763

31 Gallium 71

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,inel	^{71}Ga	?	4UZ UZB	Fiss		Conf	77TASHKENT,,26	77	L.N.Smirin+	41763

34 Selenium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{71}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{72}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{73}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{74}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{76}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{77}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{78}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{79}As	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{73}Se	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{75}Se	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045
*	γ,x	^{81}Se	CS	4ZZZDUB		8.0+07	Jour	NIM/A,1054,168428	23	F.A.Rasulova+	M1045

38 Strontium 86

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2n	^{85}Y	CS	2GERJUL	1.6+07	4.4+07	Jour	EPJ/A,58,67	22	M.S.Uddin+	O2574
*	p,3n	^{84}Y	CS	2GERJUL	3.0+07	4.4+07	Jour	RCA,111,81	23	M.S.Uddin+	O2569
*	p,α	^{83}Rb	CS	2GERJUL	8.8+06	4.3+07	Jour	EPJ/A,58,67	22	M.S.Uddin+	O2574
*	p,γ	^{87}Y	CSP	2GERTHS	2.5+06	3.6+06	Jour	PR/C,104,025804	21	S.Harissopulos+	O0316
*	p,n	^{86}Y	CS	2GERJUL	6.5+06	4.4+07	Jour	EPJ/A,58,67	22	M.S.Uddin+	O2574
*	p,x	^{82}Rb	CS	2GERJUL	2.5+07	4.4+07	Jour	RCA,111,81	23	M.S.Uddin+	O2569
*	p,x	^{84}Rb	CS	2GERJUL	2.7+07	4.3+07	Jour	EPJ/A,58,67	22	M.S.Uddin+	O2574
*	p,x	^{85}Sr	CS	2GERJUL	1.3+07	4.3+07	Jour	RCA,111,81	23	M.S.Uddin+	O2569

38 Strontium 87

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{88}Y	CSP	2GERTHS	2.0+03	3.6+06	Jour	PR/C,104,025804	21	S.Harissopulos+	O0316

38 Strontium 88

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{89}Y	CSP	2GERTHS	1.4+03	4.9+03	Jour	PR/C,104,025804	21	S.Harissopulos+	O0316

40 Zirconium 90

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2p	^{89}Y	D3A	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
*	p,2p	^{89}Y	POD	2JPNOSA	2.0+08	2.0+08	Jour	PTEP,2023,093D01	23	T.Noro+	E2757
	p,el	^{90}Zr	POD	1USAORL	4.0+07	4.0+07	Jour	PR,147,812	66	L.N.Blumberg+	O0208

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{87}Y	CS	4RUSRUS		4.0+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044
*	γ,x	^{88}Y	CS	4RUSRUS		4.0+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044

42 Molybdenum

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{89}Zr	CS	4RUSRUS		5.5+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044

42 Molybdenum 92

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{86}Zr	CS	4RUSRUS		5.5+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044
*	γ,x	^{87}Zr	CS	4RUSRUS		5.5+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044
*	γ,x	^{88}Zr	CS	4RUSRUS		5.5+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044

42 Molybdenum 94

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{89}Zr	CS	4RUSRUS		2.0+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044

42 Molybdenum 100

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{95}Zr	CS	4RUSRUS		4.0+07	Jour	EPJ/A,59,141	23	P.D.Remizov+	M1044

50 Tin 115

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{116}Sn	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,43	78	E.A.Rudak+	41764

50 Tin 117

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{118}Sn	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,43	78	E.A.Rudak+	41764

50 Tin 119

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{120}Sn	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,43	78	E.A.Rudak+	41764

50 Tin 120

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{121}Sn	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,47	78	E.A.Rudak+	41765

50 Tin 122

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{123}Sn	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,47	78	E.A.Rudak+	41765

50 Tin 124

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{125}Sn	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,47	78	E.A.Rudak+	41765

52 Tellurium 124

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{125}Te	SPC	4UKRKGU	2.5-02	2.5-02	Conf	77TASHKENT,,60	77	E.A.Rudak+	41767

52 Tellurium 125

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{126}Te	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,51	78	E.A.Rudak+	41766

52 Tellurium 126

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{127}Te	SPC	4UKRKGU	2.5-02	2.5-02	Conf	78ALMAATA,,51	78	E.A.Rudak+	41766

52 Tellurium 128

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{129}Te	SPC	4UKRKGU	2.5-02	2.5-02	Conf	77TASHKENT,,60	77	E.A.Rudak+	41767

52 Tellurium 130

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{131}Te	SPC	4UKRKGU	2.5-02	2.5-02	Conf	77TASHKENT,,60	77	E.A.Rudak+	41767

62 Samarium 150

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,inel	^{150}Sm	CSP	4UKRKGU	2.8+06	2.8+06	Rept	INDC(CCP)-118,(2),17	77	E.A.Andreev+	40574

63 Europium 153

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,inel	^{153}Eu	SPC	4LATIFL	1.0+06	1.0+06	Conf	78ALMAATA,,81	78	V.A.Bondarenko+	41768

64 Gadolinium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{153}Tb	CS	2SWTUBE	1.2+07	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554
*	p,x	^{154}Tb	CS	2SWTUBE	5.8+06	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554
*	p,x	^{155}Tb	CS	2SWTUBE	5.1+06	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554
*	p,x	^{156}Tb	CS	2SWTUBE	5.1+06	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554

64 Gadolinium 154

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2n	^{153}Tb	CS	2SWTUBE	1.2+07	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554

*	p,γ	^{155}Tb	?	2SWTUBE	5.8+06	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554
*	p,n	^{154}Tb	CS	2SWTUBE	6.2+06	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554
*	p,n	^{154}Tb	?	2SWTUBE	1.2+07	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554

64 Gadolinium 155

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{156}Tb	?	2SWTUBE	5.1+06	1.8+07	Jour	ARI,184,110175	22	G.Dellepiane+	O2554

75 Rhenium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,x	^{183}Re	CS	2JPNIPC	2.1+07	2.3+07	Jour	NIM/B,543,165093	23	M.Aikawa+	E2756
*	d,x	^{184}Re	CS	2JPNIPC	4.0+06	2.3+07	Jour	NIM/B,543,165093	23	M.Aikawa+	E2756
*	d,x	^{186}Re	CS	2JPNIPC	7.0+05	2.3+07	Jour	NIM/B,543,165093	23	M.Aikawa+	E2756
*	d,x	^{188}Re	CS	2JPNIPC	7.0+05	2.3+07	Jour	NIM/B,543,165093	23	M.Aikawa+	E2756
*	d,x	^{183}Os	CS	2JPNIPC	2.1+07	2.3+07	Jour	NIM/B,543,165093	23	M.Aikawa+	E2756
*	d,x	^{185}Os	CS	2JPNIPC	6.4+06	2.3+07	Jour	NIM/B,543,165093	23	M.Aikawa+	E2756

82 Lead

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x+n	inclusive	TTD	2JPNKTO	1.1+08	1.1+08	Jour	NST,60,435	23	H.Iwamoto+	E2746

82 Lead 208

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{208}Pb	POD	1USAORL	4.0+07	4.0+07	Jour	PR,147,812	66	L.N.Blumberg+	O0208

83 Bismuth 209

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x+n	inclusive	TTD	2JPNKTO	1.1+08	1.1+08	Jour	NST,60,435	23	H.Iwamoto+	E2746

104 Rutherfordium 256

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,fis		NU	4ZZZDUB	Spont		Jour	PL/B,843,138008	23	A.V.Isaev+	41758