

EXFOR News (June 2025)

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](#) and [JCPRG](#).

This News lists newly created EXFOR entries as well as revised EXFOR entries where new data subentries are added. Entries from articles published 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 ($\sigma_{\text{capt}}/\sigma_{\text{fis}}$)	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 = $\bar{\nu}\sigma_{\text{fis}}/(\sigma_{\text{capt}} + \sigma_{\text{fis}})$	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	tex	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)		Type	Documentation Ref Vol Page	Date	Author	Data #
					Min	Max					
*	d,n	^3He	DA	1USANOT	3.0+06	7.0+06	Jour	PR/C,110,044603	24	S.N.Paneru+	C3046
*	$^{10}\text{Be},\text{el}$	^2H	?	1USAMSU	9.6+07	9.6+07	Jour	PRL,134,012502	25	J.Chen+	C3040
*	$^{10}\text{Be},\text{inel}$	^2H	?	1USAMSU	9.6+07	9.6+07	Jour	PRL,134,012502	25	J.Chen+	C3040

2 Helium 4

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
					Min	Max					
*	$^{14}\text{N},\text{el}$	^4He	?	4KASATN	6.3+06	9.0+06	Jour	EPJ/A,60,217	24	A.K.Nurmukhanbetova+	D8106
*	$^{14}\text{N},p$	^{17}O	?	4KASATN	6.3+06	8.3+06	Jour	EPJ/A,60,217	24	A.K.Nurmukhanbetova+	D8106
*	$^{25}\text{Mg},n$	^{28}Si	CS	1USANOT	2.3+05	4.5+06	Jour	PR/C,110,045803	24	D.Blankstein+	C3047
*	$^{26}\text{Mg},n$	^{29}Si	CS	1USANOT	3.2+06	4.9+06	Jour	PR/C,110,045803	24	D.Blankstein+	C3047

3 Lithium

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
					Min	Max					
*	$p,x+n$	inclusive	TTD	3INDTAT	8.0+06	2.0+07	Jour	NIM/A,1061,169084	24	S.Paul+	D6464

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
					Min	Max					
*	d,α	^4He	DA	1USANOT	2.0+06	1.0+07	Jour	PR/C,110,044603	24	S.N.Paneru+	C3046
*	d,el	^6Li	DA	1USANOT	2.0+06	1.0+07	Jour	PR/C,110,044603	24	S.N.Paneru+	C3046
*	d,n	^7Be	CSP	1USANOT	2.0+06	1.0+07	Jour	PR/C,110,044603	24	S.N.Paneru+	C3046
*	d,n	^7Be	DAP	1USANOT	1.8+06	1.0+07	Jour	PR/C,110,044603	24	S.N.Paneru+	C3046
*	d,p	^7Li	DAP	1USANOT	3.7+06	1.0+07	Jour	PR/C,110,044603	24	S.N.Paneru+	C3046

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
					Min	Max					
*	$^3\text{He},d$	^8Be	DAP	1USAMIT	2.0+06	3.9+06	Jour	NIM/B,558,165564	25	C.Lopezperez+	C3043
*	$^3\text{He},p$	^9Be	DAP	1USAMIT	2.0+06	3.9+06	Jour	NIM/B,558,165564	25	C.Lopezperez+	C3043

5 Boron

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$^{35}\text{Cl},x$	Many	CS	1USANOT	6.0+07	9.1+07	Jour	ARI,215,111	560		25	A.M.Miller+	C3041

5 Boron 10

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	n,tot		CS	1USAORL	4.2+04	1.6+07	Conf	94GATLIN,1,50			94	O.A.Wasson+	14848
	d,p	^{11}B	DAP	1USAFSU	1.6+07	1.6+07	Jour	PR/C,110,054	319		24	A.N.Kuchera+	C3045

6 Carbon

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$p,x+n$	inclusive	TTD	3INDTAT	8.0+06	2.0+07	Jour	NIM/A,1061,169084			24	S.Paul+	D6464
*	n,tot		CS	1USALAS	1.0+08	7.4+08	Jour	PL/B,840,137	843		23	A.Agarwal+	14821

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	d,p	^{13}C	DAP	1USANOT	3.0+06	7.0+06	Jour	PR/C,110,044	603		24	S.N.Paneru+	C3046
*	$^{12}\text{C},\alpha$	^{20}Ne	CSP	1USANOT	2.7+06	5.0+06	Jour	PR/C,110,035	808		24	W.P.Tan+	C3048
*	$^{12}\text{C},\text{fus}$		CS	1USANOT	2.6+06	5.0+06	Jour	PR/C,110,035	808		24	W.P.Tan+	C3048
*	$^{12}\text{C},p$	^{23}Na	CSP	1USANOT	2.6+06	5.0+06	Jour	PR/C,110,035	808		24	W.P.Tan+	C3048
*	$^{12}\text{C},x$	^{24}Mg	CS	1USANOT	1.1+07	1.7+07	Jour	PR/C,110,045	803		24	D.Blankstein+	C3047

7 Nitrogen 13

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	d,x	^{12}C	DAP	1USAMSU	1.9+08	1.9+08	Jour	PR/C,110,024	313		24	Z.Rahman+	C3050
*	d,x	^{13}C	DAP	1USAMSU	1.9+08	1.9+08	Jour	PR/C,110,024	313		24	Z.Rahman+	C3050

7 Nitrogen 15

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	α,γ		RP	1USANOT			Jour	PR/C,110,025	806		24	R.Fang+	C3049
*	α,γ	^{19}F	MLT	1USANOT	1.3+06	1.5+06	Jour	PR/C,110,025	806		24	R.Fang+	C3049

8 Oxygen 14

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	d,x	^{10}B	DAP	IUSAMSU	2.1+08	2.1+08	Jour	PR/C,110,024313			24	Z.Rahman+	C3050
*	d,x	^{12}C	DAP	IUSAMSU	2.1+08	2.1+08	Jour	PR/C,110,024313			24	Z.Rahman+	C3050
*	d,x	^{13}C	DAP	IUSAMSU	2.1+08	2.1+08	Jour	PR/C,110,024313			24	Z.Rahman+	C3050
*	d,x	^{13}N	DAP	IUSAMSU	2.1+08	2.1+08	Jour	PR/C,110,024313			24	Z.Rahman+	C3050
*	d,x	^{14}N	DAP	IUSAMSU	2.1+08	2.1+08	Jour	PR/C,110,024313			24	Z.Rahman+	C3050

12 Magnesium 25

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	α,n	^{28}Si	CS	IUSANOT	3.2+06	4.5+06	Jour	PR/C,110,045803			24	D.Blankstein+	C3047

12 Magnesium 26

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	α,n	^{29}Si	CS	IUSANOT	3.2+06	4.9+06	Jour	PR/C,110,045803			24	D.Blankstein+	C3047

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$^{19}\text{F},x$	Many	CS	IUSANOT	3.5+07	6.0+07	Jour	ARI,215,111560			25	A.M.Miller+	C3041
*	$^{19}\text{F},x$	Many	TT	IUSANOT	5.2+07	6.0+07	Jour	ARI,215,111560			25	A.M.Miller+	C3041

20 Calcium 27

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$^3\text{He},x$	^{43}Sc	TT	IUSANOT	1.2+07	2.5+07	Jour	ARI,215,111580			25	A.D.Nelson+	C3042
*	$^3\text{He},x$	^{44}Sc	TT	IUSANOT	9.0+06	2.5+07	Jour	ARI,215,111580			25	A.D.Nelson+	C3042

21 Scandium 45

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$p,2n$	^{44}Ti	CS	2JPNIPC	1.3+07	3.0+07	Jour	RPC,218,111572			24	F.Ditroi+	D4434
*	p,n	^{45}Ti	CS	2JPNIPC	2.9+06	1.6+07	Jour	RPC,218,111572			24	F.Ditroi+	D4434
*	p,x	^{43}Sc	CS	2JPNIPC	2.3+07	3.0+07	Jour	RPC,218,111572			24	F.Ditroi+	D4434
*	p,x	^{44}Sc	CS	2JPNIPC	1.3+07	3.0+07	Jour	RPC,218,111572			24	F.Ditroi+	D4434

22 Titanium

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	γ, x	^{46}Sc	CS	4UKRKFT		3.7+07	Jour	RPC,216,111387			24	V.O.Zheltonozhsky+	G4115
*	p, x	Many	CS	1USABRK	1.5+07	2.5+07	Jour	RCA,113,89			25	S.B.Kholil+	C3054
*	p, x	Many	CS	2GERJUL	8.8+06	4.4+07	Jour	RCA,113,89			25	S.B.Kholil+	C3054

22 Titanium 48

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	γ, p	^{47}Sc	CS	4UKRKFT		3.7+07	Jour	RPC,216,111387			24	V.O.Zheltonozhsky+	G4115

24 Chromium 50

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	γ, x	^{48}V	CS	4UKRKFT		3.7+07	Jour	RPC,216,111387			24	V.O.Zheltonozhsky+	G4115

24 Chromium 52

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	γ, n	^{51}Cr	CS	4UKRKFT		3.7+07	Jour	RPC,216,111387			24	V.O.Zheltonozhsky+	G4115

26 Iron

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	d, x	^{51}Cr	CS	1USABRK	1.6+07	3.5+07	Jour	RCA,112,141			24	M.M.Hasan+	C3051
*	d, x	^{52}Mn	CS	1USABRK	1.6+07	3.5+07	Jour	RCA,112,141			24	M.M.Hasan+	C3051
*	d, x	^{54}Mn	CS	1USABRK	1.6+07	3.5+07	Jour	RCA,112,141			24	M.M.Hasan+	C3051

27 Cobalt 58

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$\gamma, x+p$	inclusive	CS	3INDTAT	2.3+07	3.2+07	Jour	EPJ/A,61,13			25	S.Akbar+	G0520

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	γ, n	^{57}Ni	CS	4UKRKFT		3.7+07	Jour	RPC,216,111387			24	V.O.Zheltonozhsky+	G4115
*	γ, p	^{57}Co	CS	4UKRKFT		3.7+07	Jour	RPC,216,111387			24	V.O.Zheltonozhsky+	G4115
*	n, p	^{58}Co	CS	3INDTRM	1.1+06	2.8+06	Jour	CPH/C,48,094104			24	M.Choudhary+	33212

29 Copper

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	α, x	^{65}Zn	CS	3INDVEC	4.0+07	5.0+07	Jour	JRN,333,5589			24	P.K.Giri+	D6474
*	α, x	^{66}Ga	CS	3INDVEC	4.0+07	5.0+07	Jour	JRN,333,5589			24	P.K.Giri+	D6474
*	α, x	^{67}Ga	CS	3INDVEC	4.0+07	5.0+07	Jour	JRN,333,5589			24	P.K.Giri+	D6474

30 Zinc 64

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$n, 2n$	^{63}Zn	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196

30 Zinc 66

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$n, 2n$	^{65}Zn	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196
*	n, p	^{66}Cu	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196

30 Zinc 67

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	n, p	^{67}Cu	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196

30 Zinc 68

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	n, α	^{65}Ni	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196
*	n, p	^{68}Cu	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196

30 Zinc 70

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

*	$n,2n$	^{69}Zn	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196
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32 Germanium 70

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

*	d,n	^{71}As	CS	1USANOT	2.1+06	1.0+07	Jour	ARI,217,111654			25	Y.-H.Lo+	C3039
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36 Krypton 86

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

*	α,n	^{89}Sr	CS	1CANTMF	9.0+06	1.0+07	Jour	PRL,134,112701			25	M.Williams+	C3052
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*	α,n	^{89}Sr	CSP	1CANTMF	9.0+06	1.0+07	Jour	PRL,134,112701			25	M.Williams+	C3052
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38 Strontium 86

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

*	d,x	^{82}Rb	CS	1USABRK	2.8+07	3.1+07	Jour	PR/C,110,064608			24	M.S.Uddin+	C3044
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*	d,x	^{82}Rb	CS	2BLGLVN	3.0+07	4.9+07	Jour	PR/C,110,064608			24	M.S.Uddin+	C3044
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*	d,x	^{83}Rb	CS	1USABRK	1.1+07	3.7+07	Jour	PR/C,110,064608			24	M.S.Uddin+	C3044
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*	d,x	^{83}Rb	CS	2BLGLVN	3.0+07	4.9+07	Jour	PR/C,110,064608			24	M.S.Uddin+	C3044
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*	d,x	^{84}Rb	CS	2BLGLVN	3.0+07	4.9+07	Jour	PR/C,110,064608			24	M.S.Uddin+	C3044
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*	d,x	^{84}Rb	CS	1USABRK	6.2+06	3.7+07	Jour	PR/C,110,064608			24	M.S.Uddin+	C3044
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38 Strontium 94

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

*	α,n	^{97}Zr	CSP	1CANTMF	9.9+06	9.9+06	Jour	PRL,134,112701			25	M.Williams+	C3052
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39 Yttrium 89

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

*	$n,2n$	^{88}Y	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196
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*	n,γ	^{90}Y	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002			23	T.S.Ganesapandy+	33196
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*	$^9\text{Be},\text{el}$	^{89}Y	DA	3INDTAT	2.9+07	2.9+07	Jour	NP/A,1046,122864			24	S.Kaur+	D6470
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*	$^9\text{Be},x+\alpha$	inclusive	CS	3INDTAT	2.9+07	2.9+07	Jour	NP/A,1046,122864			24	S.Kaur+	D6470
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*	$^9\text{Be},x+\alpha$	inclusive	DA	3INDTAT	2.9+07	2.9+07	Jour	NP/A,1046,122864			24	S.Kaur+	D6470
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*	$^9\text{Be},x+\alpha$	inclusive	DAE	3INDTAT	2.9+07	2.9+07	Jour	NP/A,1046,122864			24	S.Kaur+	D6470
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40 Zirconium 88

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* $n,0$		RP	1USALAS			Jour	PRL,134,112702	25	A.Stamatopoulos+	14847
* n,γ	^{89}Zr	CS	1USALAS	Maxw1	1.0+03	Jour	PRL,134,112702	25	A.Stamatopoulos+	14847
* n,γ	^{89}Zr	RI	1USALAS		5.0-01	Jour	PRL,134,112702	25	A.Stamatopoulos+	14847
* n,tot		CS	1USALAS	1.0-02	4.5+02	Jour	PRL,134,112702	25	A.Stamatopoulos+	14847

40 Zirconium 90

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* p,γ	^{91}Nb	CS	1USANOT	2.8+06	5.9+06	Jour	EPJ/A,61,57	25	A.Simon+	C3053
* p,γ	^{91}Nb	RR	1USANOT			Jour	EPJ/A,61,57	25	A.Simon+	C3053

41 Niobium 93

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* $^6\text{Li},2n$	^{97}Ru	CS	3INDTAT	2.4+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},4n$	^{95}Ru	CS	3INDTAT	2.6+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},5n$	^{94}Ru	CS	3INDTAT	3.8+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},x$	^{92}Nb	CS	3INDTAT	2.4+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},x$	^{93}Mo	CS	3INDTAT	2.4+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},x$	^{94}Tc	CS	3INDTAT	2.9+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},x$	^{95}Tc	CS	3INDTAT	2.4+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^6\text{Li},x$	^{96}Tc	CS	3INDTAT	2.4+07	4.3+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^7\text{Li},3n$	^{97}Ru	CS	3INDTAT	2.0+07	4.5+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^7\text{Li},5n$	^{95}Ru	CS	3INDTAT	3.8+07	4.5+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^7\text{Li},x$	^{93}Mo	CS	3INDTAT	2.8+07	4.5+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^7\text{Li},x$	^{95}Tc	CS	3INDTAT	2.3+07	4.5+07	Jour	ARI,208,111287	24	A.Singh+	D6475
* $^7\text{Li},x$	^{96}Tc	CS	3INDTAT	2.0+07	4.5+07	Jour	ARI,208,111287	24	A.Singh+	D6475

42 Molybdenum 92

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* n,α	^{89}Zr	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196
* n,p	^{92}Nb	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196

42 Molybdenum 94

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

*	$n,2n$	^{93}Mo	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196
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42 Molybdenum 95

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	n,γ	^{96}Mo	CS	1USATAM	5.8+03	5.9+06	Jour	PRL,122,052502	19	A.Ratkiewicz+	14846
*	d,p	^{96}Mo	SPC	1USATAM	1.2+07	1.2+07	Jour	PRL,122,052502	19	A.Ratkiewicz+	C3037

42 Molybdenum 96

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	n,p	^{96}Nb	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196

42 Molybdenum 97

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	n,p	^{97}Nb	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196

42 Molybdenum 98

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	n,γ	^{99}Mo	CS	3INDTRM	1.7+06	2.7+06	Jour	JP/G,50,125107	23	M.Upadhyay+	33197
*	n,p	^{98}Nb	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196

42 Molybdenum 100

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	$n,2n$	^{99}Mo	CS	3INDPOO	1.5+07	1.5+07	Jour	CPH,47,034002	23	T.S.Ganesapandy+	33196

47 Silver

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	α,x	^{105}Ag	CS	3INDVEC	3.2+07	3.8+07	Jour	NP/A,1050,122917	24	M.Choudhary+	D6476
*	α,x	^{106}Ag	CS	3INDVEC	2.4+07	3.8+07	Jour	NP/A,1050,122917	24	M.Choudhary+	D6476
*	α,x	^{108}In	CS	3INDVEC	3.6+07	4.0+07	Jour	ARI,214,111542	24	D.Banerjee+	D6478
*	α,x	^{109}In	CS	3INDVEC	2.0+07	4.0+07	Jour	ARI,214,111542	24	D.Banerjee+	D6478
*	α,x	^{110}In	CS	3INDVEC	3.0+07	4.0+07	Jour	ARI,214,111542	24	D.Banerjee+	D6478
*	α,x	^{111}In	CS	3INDVEC	2.0+07	4.0+07	Jour	ARI,214,111542	24	D.Banerjee+	D6478

*	α, x	^{111}In	CS	3INDVEC	2.4+07	3.8+07	Jour	NP/A,1050,122917	24	M.Choudhary+	D6476
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48 Cadmium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	α, x	^{111}Cd	CS	3INDVEC	2.1+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{115}Cd	CS	3INDVEC	2.7+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{108}In	CS	3INDVEC	2.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{109}In	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{110}In	CS	3INDVEC	2.2+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{111}In	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{113}In	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{114}In	CS	3INDVEC	2.2+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{115}In	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{116}In	CS	3INDVEC	2.1+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{117}In	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{110}Sn	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{113}Sn	CS	3INDVEC	1.5+07	3.9+07	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460
*	α, x	^{117}Sn	CS	3INDVEC	1.5+04	3.9+04	Jour	EPJ/A,59,214		23	S.W.Raja+	D6460

50 Tin 124

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$^9\text{Be}, \text{el}$	^{124}Sn	DA	3INDTAT	2.9+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be}, x+\alpha$	inclusive	CS	3INDTAT	2.9+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be}, x+\alpha$	inclusive	DA	3INDTAT	2.9+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be}, x+\alpha$	inclusive	DAE	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470

60 Neodymium 142

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$^{19}\text{F}, \text{fus}$		CS	3INDNSD	5.8+07	8.4+07	Jour	JP/G,52,015106		25	A.C.Visakh+	D6479

60 Neodymium 146

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$^{16}\text{O}, x$	^{155}Tb	CS	3INDNSD	8.1+07	1.0+08	Jour	JRN,333,1541		24	N.Sharma+	D6466

60 Neodymium 150

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

*	¹⁹ F,fus	CS	3INDNSD	5.5+07	8.5+07	Jour	JP/G,52,015106	25	A.C.Visakh+	D6479
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65 Terbium 159

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	⁹ Be,el	¹⁵⁹ Tb	DA	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864	24	S.Kaur+	D6470
*	⁹ Be,x+α	inclusive	CS	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864	24	S.Kaur+	D6470
*	⁹ Be,x+α	inclusive	DA	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864	24	S.Kaur+	D6470
*	⁹ Be,x+α	inclusive	DAE	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864	24	S.Kaur+	D6470

66 Dysprosium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	α,x	¹⁶⁰ Tb	CS	2JPNIPC	4.4+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁵⁷ Dy	CS	2JPNIPC	3.4+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁵⁹ Dy	CS	2JPNIPC	1.9+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁶⁶ Ho	CS	2JPNIPC	2.4+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁶⁷ Ho	CS	2JPNIPC	2.2+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁶⁰ Er	CS	2JPNIPC	2.2+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁶¹ Er	CS	2JPNIPC	1.9+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437
*	α,x	¹⁶³ Er	CS	2JPNIPC	1.9+07	5.0+07	Jour	NIM/B,563,165670	25	S.Takacs+	D4437

70 Ytterbium 174

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	¹⁶ O, _{3n}	¹⁸⁷ Pt	CS	3INDNSD	7.4+07	9.3+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O, _{4n}	¹⁸⁶ Pt	CS	3INDNSD	7.4+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O, _{5n}	¹⁸⁵ Pt	CS	3INDNSD	8.1+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O, _{6n}	¹⁸⁴ Pt	CS	3INDNSD	9.3+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁷⁸ Ta	CS	3INDNSD	9.3+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁷⁷ W	CS	3INDNSD	9.3+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁷⁹ Re	CS	3INDNSD	9.3+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸¹ Re	CS	3INDNSD	9.5+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸¹ Os	CS	3INDNSD	9.3+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸² Os	CS	3INDNSD	8.1+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸³ Os	CS	3INDNSD	7.7+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸⁴ Ir	CS	3INDNSD	9.3+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸⁵ Ir	CS	3INDNSD	8.1+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472
*	¹⁶ O,x	¹⁸⁶ Ir	CS	3INDNSD	7.4+07	9.9+07	Jour	PR/C,110,064605	24	A.Siddique+	D6472

72 Hafnium 178

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
*	¹² C,fis	Many	FY	3INDNSD		Jour	JP/G,51,035103		24	Vikas+	D6471

*	$^{12}\text{C},\text{fis}$		KE	3INDNSD		Jour	JP/G,51,035103	24	Vikas+	D6471
*	$^{12}\text{C},\text{fis}$	Many	KE	3INDNSD		Jour	JP/G,51,035103	24	Vikas+	D6471

73 Tantalum 181

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	n,tot		CS	1USARPI	1.5+02	1.1+05	Jour	NSE,198,1155		24	J.M.Brown+	14836
*	$^{19}\text{F},\text{x}$	Many	CS	3INDNSD	1.2+08	1.2+08	Jour	JRN,333,4773		24	S.Arora+	D6477

78 Platinum

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	p,x	Many	CS	1USALRL		Jour	ARI,217,111618			25	J.T.Wilkinson+	C3038
*	d,x	Many	CS	1USALRL		Jour	ARI,217,111618			25	J.T.Wilkinson+	C3038

78 Platinum 198

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$^9\text{Be},\text{el}$	^{198}Pt	DA	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be},\text{x}+\alpha$	inclusive	CS	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be},\text{x}+\alpha$	inclusive	DA	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be},\text{x}+\alpha$	inclusive	DAE	3INDTAT	3.5+07	3.5+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470

79 Gold 197

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$n,2n$	^{196}Au	CS	1USALRL	1.4+07	1.4+07	Jour	JP/G,47,045116		20	K.J.Moody+	14747
*	$^{48}\text{Ca},3n$	^{242}Es	CS	2GERGSI	2.2+08	2.2+08	Jour	PR/C,109,034311		24	J.Khuyagbaatar+	D8107

83 Bismuth 209

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$^9\text{Be},\text{el}$	^{209}Bi	DA	3INDTAT	3.6+07	3.6+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be},\text{x}+\alpha$	inclusive	CS	3INDTAT	3.6+07	3.6+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be},\text{x}+\alpha$	inclusive	DA	3INDTAT	3.6+07	3.6+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470
*	$^9\text{Be},\text{x}+\alpha$	inclusive	DAE	3INDTAT	3.6+07	3.6+07	Jour	NP/A,1046,122864		24	S.Kaur+	D6470

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	<i>n</i> ,fis	Many	CHG	3INDTRM	5.0-01		Jour	ARI,212,111445			24	H.Naik+	33211
*	<i>n</i> ,fis	Many	FY	3INDTRM	5.0-01		Jour	ARI,212,111445			24	H.Naik+	33211
*	<i>n</i> ,fis	Many	MAS	3INDTRM	5.0-01		Jour	ARI,212,111445			24	H.Naik+	33211

94 Plutonium 239

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	<i>n</i> ,fis	Many	FY	3INDTRM	5.0-01		Jour	NSE,198,2051			24	H.Naik+	33210
*	<i>n</i> ,fis		MAS	3INDTRM	5.0-01		Jour	NSE,198,2051			24	H.Naik+	33210

94 Plutonium 240

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	<i>n</i> ,fis		KE	1USALAS	5.5+05	1.0+08	Jour	PR/C,106,044603			22	A.Pica+	14795

94 Plutonium 242

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	<i>n</i> ,fis		KE	1USALAS	6.2+05	1.0+08	Jour	PR/C,106,044603			22	A.Pica+	14795