EXFOR News (September 2021)

New experimental data available from Nuclear Reaction Data Centres

EXFOR [1] is a world-wide data library for experimental neutron, charged-particle and photon induced reaction data compiled by the International Network of the Nuclear Reaction Data Centres (NRDC)[a] co-ordinated by the IAEA Nuclear Data Section. Regularly updated web retrieval databases are available at IAEA-NDS as well as NNDC, NEADB, JCPRG and CDFE.

This News lists newly created EXFOR entries as well as revised EXFOR entries where new data subentries are added. Entries from articles pubslished in past 10 years are flagged by asterisks (*). Please send an email to the NRDC Coordinator (n.otsuka@iaea.org) for inclusion in the EXFOR News distribution list as well as any question on EXFOR.

[1] N. Otuka, E. Dupont, V. Semkova, B. Pritychenko et al., Nucl.Data.Sheets **120**(2014)272.

Quantity codes

ALF	α-value ($\sigma_{\rm capt}/\sigma_{\rm fis}$)	KE	Kinetic energy
AMP	Scattering length	INT	Cross section integral over incident energy
CHG	Fragment charge	KER	Kerma factor
CS	Cross section	MAS	Fragment mass
CSP	Partial cross section	MFQ	Differential fission neutron multiplicity
CST	Temperature dependent cross section	MLT	Multiplicity
D3A	Triple differential $d\Omega_1/d\Omega_2/dE'$	NQ	Nuclear quantity
D3E	Triple differential $d\Omega/dE'_1/dE'_2$	NU	Fission neutron multiplicity $\bar{\nu}$
D4A	Quadruple diff. $d\Omega_1/d\Omega_2/dE'_1/dE'_2$	NUD	Delayed fission neutron multiplicity $\bar{\nu_d}$
DA	Differential d/dΩ	POL	Polarization
DAA	Double differential $d\Omega_1/d\Omega_2$	POD	Differential polarization
DAE	Double differential $d\Omega/dE'$	PY	Product yield (other than fission)
DAP	Partial differential d/dΩ	RI	Resonance integral
DAT	Temperature-dependent Legendre coefficient	RP	Resonance parameter
DE	Differential d/dE'	RR	Reaction rate
DEP	Energy spectrum for specific group	SIF	Self indication
DP	Diff. by linear momentum of outgoing part.	SPC	Gamma spectrum
DT	Diff. by 4-momentum transfer squared	TSL	Thermal scattering
ETA	η-value = $\bar{\nu}\sigma_{\rm fis}/(\sigma_{\rm capt}+\sigma_{\rm fis})$	TT	Thick target yield
EVL	Evaluation	TTD	Differential thick target yield, d/dΩ
FY	Fission product yield	TTP	Partial thick target yield

Special codes in outgoing particle field

abs	Absorption	fus	Fusion	sct	Scattering	tot	Total
el	Elastic	inel	Inelastic	tcx	Total charge changing		
fis	Fission	non	Nonelastic	ths	Thermal scattering		

Special codes in incident energy field

Fast	Fast reactor spectrum average	Maxw	Maxwellian spectrum average
Fiss	Fission spectrum average	Spont	Spontaneous (for fission)

[a] NNDC (USA), NEADB (France), NDS (Austria), CJD (Russia), CNDC (China), ATOMKI (Hungary), NDPCI (India), JAEA (Japan), JCPRG (Japan), KAERI (Korea), CDFE (Russia), CNPD (Russia), UkrNDC (Ukraine)

1 Hydrogen 1

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{6}Li,^{3}He	^{4}He	?	2GERMST	1.1+04	5.2+04	Jour	ZP/A,342,471	92	S.Engstler+	A0632
	^{7}Li,α	^{4}He	?	2GERMST	1.3+04	4.5+04	Jour	ZP/A,342,471	92	S.Engstler+	A0632

1 Hydrogen 2

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{1}H	DAE	1USAOHO	1.5+07	1.5+07	Jour	PR/C,102,064005	20	A.V.Voinov+	14681
	^{6}Li,α	^{4}He	?	2GERMST	1.6+04	9.0+04	Jour	ZP/A,342,471	92	S.Engstler+	A0632

2 Helium 4

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,el	^{4}He	DA	1USAMSU	1.1+07	1.1+07	Jour	NIM/A,880,166	18	Y.Ayyad+	C2591

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,^{3}He	^{4}He	CS	2GERMST	1.1+04	8.3+04	Jour	ZP/A,342,471	92	S.Engstler+	A0632
	d,α	^{4}He	CS	2GERMST	1.4+04	7.3+04	Jour	ZP/A,342,471	92	S.Engstler+	A0632

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,α	^{4}He	CS	2GERMST	1.3+04	8.5+04	Jour	ZP/A,342,471	92	S.Engstler+	A0632

4 Berylium 9

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{7}Be	CS	4UKRKFT		5.5+07	Jour	YFE,21,302	20	V.O.Zheltonozhsky+	G4090

5 Boron

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{7}Be	CS	4UKRKFT		5.5+07	Jour	YFE,21,302	20	V.O.Zheltonozhsky+	G4090

5 Boron 10

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,t	^{7}Be	CS	4UKRKFT		2.0+07	Jour	YFE,21,302	20	V.O.Zheltonozhsky+	G4090

11 Sodium 23

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{24}Na	CS	3INDTRM	6.1+05	3.1+06	Jour	EPJ/A,57,1	21	A.Gandhi+	33154

12 Magnesium 24

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,α	^{21}Na	DAP	1USAORL	3.1+07	3.1+07	Jour	PR/C,96,025810	17	S.M.Cha+	C2590

17 Chlorine 35

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{32}P	CSP	1USALAS	2.8+06	5.8+06	Jour	PR/C,102,024623	20	S.A.Kuvin+	14683
*	n,p	^{35}S	CSP	1USALAS	6.0+05	5.8+06	Jour	PR/C,102,024623	20	S.A.Kuvin+	14683

20 Calcium 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,^{20}Ne	^{38}Ar	DAP	2ITYLNS	2.7+08	2.7+08	Jour	PR/C,103,054604	21	J.L.Ferreira+	D8035

22 Titanium 48

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{49}V	CSP	4UKRKFT	1.5+06	3.5+06	Jour	YF,55,123	92	B.A.Nemashkalo+	D5187

22 Titanium 50

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,γ	^{51}V	CSP	4UKRKFT	1.6+06	3.3+06	Jour	YF,55,123	92	B.A.Nemashkalo+	D5187

26 Iron

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,x	^{52}Mn	CS	3KORPUE		7.0+07	Jour	EPJ/CS,106,04008	16	Md.S.Rahman+	G3137

26 Iron 57

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	0,0		NQ	1USAOHO			Jour	PR/C,76,044602	07	A.V.Voinov+	C2597

26 Iron 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,x+α	inclusive	DA	1USAOHO	1.0+07	1.0+07	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597
	^{3}He,x+α	inclusive	DAE	1USAOHO	1.0+07	1.0+07	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597
	^{3}He,x+n	inclusive	DAE	1USAOHO	1.0+07	1.0+07	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597
	^{3}He,x+p	inclusive	DA	1USAOHO	1.0+07	1.0+07	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597
	^{3}He,x+p	inclusive	DAE	1USAOHO	1.0+07	1.0+07	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597

27 Cobalt 59

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	d,x+α	inclusive	DAE	1USAOHO	7.5+06	7.5+06	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597
	d,x+n	inclusive	DAE	1USAOHO	7.5+06	7.5+06	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597
	d,x+p	inclusive	DAE	1USAOHO	7.5+06	7.5+06	Jour	PR/C,76,044602	07	A.V.Voinov+	C2597

39 Yttrium 89

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{87}Y	CS	3KORPUE		7.5+07	Jour	RCA,105,789	17	M.Tatari+	G3136
*	γ,3n	^{86}Y	CS	3KORPUE		7.5+07	Jour	RCA,105,789	17	M.Tatari+	G3136
*	γ,4n	^{85}Y	CS	3KORPUE		7.5+07	Jour	RCA,105,789	17	M.Tatari+	G3136
*	γ,n	^{88}Y	CS	3KORPUE		7.5+07	Jour	RCA,105,789	17	M.Tatari+	G3136
*	^{6}Li,x	^{87}Sr	CS	3INDTAT	2.4+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399

*	^{6}Li,x	^{87}Y	CS	3INDTAT	3.2+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{90}Y	CS	3INDTAT	2.4+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{88}Zr	CS	3INDTAT	3.6+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{89}Zr	CS	3INDTAT	2.4+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{90}Nb	CS	3INDTAT	3.4+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{92}Nb	CS	3INDTAT	2.4+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{90}Mo	CS	3INDTAT	4.0+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{91}Mo	CS	3INDTAT	3.0+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399
*	^{6}Li,x	^{93}Mo	CS	3INDTAT	2.4+07	4.3+07	Jour	PR/C,103,034620	21	R.Prajapat+	D6399

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	^{18}O,3n	^{108}In	CS	3INDNSD	6.2+07	8.5+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,4n	^{107}In	CS	3INDNSD	6.2+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,5n	^{106}In	CS	3INDNSD	7.7+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{95}Tc	CS	3INDNSD	6.8+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{96}Tc	CS	3INDNSD	7.7+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{101}Tc	CS	3INDNSD	8.5+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{99}Rh	CS	3INDNSD	8.5+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{100}Rh	CS	3INDNSD	8.2+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{100}Pd	CS	3INDNSD	6.2+07	9.2+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{101}Ag	CS	3INDNSD	8.5+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{102}Ag	CS	3INDNSD	8.9+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{103}Ag	CS	3INDNSD	7.2+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{104}Ag	CS	3INDNSD	6.2+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{105}Ag	CS	3INDNSD	8.9+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{105}Cd	CS	3INDNSD	8.9+07	9.9+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397
*	^{18}O,x	^{107}Cd	CS	3INDNSD	6.8+07	9.2+07	Jour	PR/C,103,034602	21	A.Agarwal+	D6397

47 Silver

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	n,x	^{104}Ag	CS	3KORKRM	2.6+07	3.7+07	Jour	JRN,313,47	17	M.Nadeem+	30847
*	n,x	^{105}Ag	CS	3KORKRM	1.4+07	3.7+07	Jour	JRN,313,47	17	M.Nadeem+	30847
*	n,x	^{106}Ag	CS	3KORKRM	1.4+07	3.7+07	Jour	JRN,313,47	17	M.Nadeem+	30847

49 Indium 115

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	p,x+n	inclusive	DAP	3INDVEC	1.2+07	1.2+07	Jour	EPJ/A,57,48	21	P.Roy+	D6395
*	p,x+n	inclusive	DE	3INDVEC	9.0+06	1.2+07	Jour	EPJ/A,57,48	21	P.Roy+	D6395

50 Tin 116

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{18}O,fus		CS	3INDNSD	4.5+07	7.4+07	Jour	PR/C,102,034603	20	N.K.Deb+	D6391

51 Antimony 135

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,β^-	^{135}Te	NUD	1USALRL	Decay		Jour	PR/C,101,025806	20	B.S.Wang+	14685

51 Antimony 136

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,β^-	^{136}Te	NUD	1USALRL	Decay		Jour	PR/C,101,025806	20	B.S.Wang+	14685

52 Tellurium 120

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{119}Te	CS	4UKRIEP	1.0+07	2.0+07	Jour	YFE,20,228	19	V.M.Mazur+	G4089
*	γ,n	^{119}Te	?	4UKRIEP		1.8+07	Jour	YFE,20,228	19	V.M.Mazur+	G4089

53 Iodine 140

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,β^-	^{140}Xe	NUD	1USALRL	Decay		Jour	PR/C,101,025806	20	B.S.Wang+	14685

58 Cerium 136

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{135}Ce	CS	4UKRIEP	1.0+07	1.8+07	Jour	YFE,20,228	19	V.M.Mazur+	G4089
*	γ,n	^{135}Ce	?	4UKRIEP		1.8+07	Jour	YFE,20,228	19	V.M.Mazur+	G4089

60 Neodymium 146

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{147}Nd	CS	1USAORL	Maxwl	2.5-02	Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{147}Nd	RI	1USAORL		5.0-01	Jour	ARI,144,54	19	K.Broderick+	14680

60 Neodymium 148

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{16}O,5n	^{159}Er	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,5n	^{159}Er	DA	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,6n	^{158}Er	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,6n	^{158}Er	DA	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{155}Tb	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{155}Tb	DA	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{155}Dy	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{155}Dy	DA	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{157}Dy	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{157}Dy	DA	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{159}Ho	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{159}Ho	DA	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374
*	^{16}O,x	^{160}Ho	CS	3INDNSD	9.6+07	9.6+07	Jour	PR/C,100,054604	19	P.K.Giri+	D6374

61 Promethium 147

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{146}Pm	CS	1USAORL	Fiss		Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{148}Pm	CS	1USAORL	Maxwl	2.5-02	Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{148}Pm	RI	1USAORL		5.0-01	Jour	ARI,144,54	19	K.Broderick+	14680

61 Promethium 148

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{149}Pm	CS	1USAORL	2.5-02	2.5-02	Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{149}Pm	CS	1USAORL	2.5-02	2.5-02	Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{149}Pm	CS	1USAORL	Maxwl		Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{149}Pm	CS	1USAORL	Maxwl		Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{149}Pm	RI	1USAORL	2.5-02	2.5-02	Jour	ARI,144,54	19	K.Broderick+	14680
*	n,γ	^{149}Pm	RI	1USAORL	2.5-02	2.5-02	Jour	ARI,144,54	19	K.Broderick+	14680

63 Europium 153

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{154}Eu	CS	4UKRIJD	Fiss		Jour	YF,51,621	90	V.A.Pshenichnyi+	41038

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{35}Cl,fus		CS	3INDNSD	1.4+08	2.0+08	Jour	PR/C,102,034613	20	P.V.Laveen+	D6392
*	^{37}Cl,fus		CS	3INDNSD	1.4+08	2.0+08	Jour	PR/C,102,034613	20	P.V.Laveen+	D6392

74 Tungsten 180

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{181}W	CS	1USAORU	Maxwl		Jour	ARI,146,115	19	K.S.Krane	14679
*	n,γ	^{181}W	RI	1USAORU		5.0-01	Jour	ARI,146,115	19	K.S.Krane	14679

74 Tungsten 184

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{185}W	CS	1USAORU	Maxwl		Jour	ARI,146,115	19	K.S.Krane	14679
*	n,γ	^{185}W	RI	1USAORU		5.0-01	Jour	ARI,146,115	19	K.S.Krane	14679

74 Tungsten 186

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{187}W	CS	1USAORL	Maxwl		Jour	ARI,148,191	19	O.A.Ersoz+	14678
*	n,γ	^{187}W	RI	1USAORL		5.0-01	Jour	ARI,148,191	19	O.A.Ersoz+	14678

74 Tungsten 187

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{188}W	CS	1USAORL	Maxwl		Jour	ARI,148,191	19	O.A.Ersoz+	14678

79 Gold 197

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,x	^{196}Au	CS	3HUNDEB	6.1+06	6.5+06	Jour	EUL,131,52001	20	I.M.Kadenko+	32251

82 Lead 207

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

*	^{50}Ti,n	^{256}Rf	CS	2GERGSI	2.4+05	2.4+05	Jour	PR/C,103,064303	21	J.Khuyagbaatar+	D8037

82 Lead 208

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{50}Ti,2n	^{256}Rf	CS	2GERGSI	2.4+05	2.4+05	Jour	PR/C,103,064303	21	J.Khuyagbaatar+	D8037

90 Thorium 232

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,fis	Many	FY	3CPRAEP	7.6+06	7.6+06	Jour	CNP,10,244	88	Jing Kexing+	G0500
*	p,5n	^{228}Pa	CS	1USAORL	2.5+07	4.0+07	Rept	AIP-1525,520	13	J.R.Griswold+	C2048
*	p,n	^{232}Pa	CS	1USAORL	1.3+07	4.0+07	Rept	AIP-1525,520	13	J.R.Griswold+	C2048
	d,fis	^{131}Te	FY	1USABNL	1.8+07	1.8+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
	d,fis	^{133}Te	FY	1USABNL	1.8+07	1.8+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
	α,fis	Many	FY	1USADAV			Rept	UCRL-10673	63	J.A.Mchughjr	C2505
	α,fis	Many	?	1USADAV			Rept	UCRL-10673	63	J.A.Mchughjr	C2505
*	α,fis	^{72}Zn	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
	α,fis	^{90}Sr	?	1USADAV			Rept	UCRL-10673	63	J.A.Mchughjr	C2505
*	α,fis	^{91}Sr	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{93}Y	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{95}Zr	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{96}Nb	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{99}Mo	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{103}Ru	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{105}Ru	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{106}Ru	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{111}Pd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{112}Pd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{111}Ag	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{113}Ag	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{115}Cd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{117}Cd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{125}Sn	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{124}Sb	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{126}Sb	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{127}Sb	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{128}Sb	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{129}Te	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
	α,fis	^{131}Te	FY	1USABNL	3.3+07	3.3+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
*	α,fis	^{131}Te	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{132}Te	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
	α,fis	^{133}Te	FY	1USABNL	3.3+07	3.3+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
*	α,fis	^{131}I	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{133}I	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{133}Xe	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{134}Cs	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{136}Cs	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
	α,fis	^{137}Cs	?	1USADAV			Rept	UCRL-10673	63	J.A.Mchughjr	C2505
*	α,fis	^{137}Cs	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596

	α,fis	^{138}Ba	?	1USADAV			Rept	UCRL-10673	63	J.A.Mchughjr	C2505
*	α,fis	^{140}Ba	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{140}La	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{142}La	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{141}Ce	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{143}Ce	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
	α,fis	^{144}Ce	?	1USADAV			Rept	UCRL-10673	63	J.A.Mchughjr	C2505
*	α,fis	^{144}Ce	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{145}Pr	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{147}Nd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{149}Nd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{149}Pm	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{151}Pm	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{153}Sm	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{156}Sm	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{155}Eu	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{156}Eu	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{157}Eu	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{159}Gd	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596
*	α,fis	^{161}Tb	?	1USALRL	2.6+07	2.6+07	Jour	RCA,106,627	18	N.Gharibyan+	C2596

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	n,fis	Many	FY	4ZZZDUB	2.5-02	2.5-02	Jour	EPJ/CS,211,04003	19	Sh.Zeynalov+	41738
*	n,fis		NU	4ZZZDUB	2.5-02	2.5-02	Jour	EPJ/CS,211,04003	19	Sh.Zeynalov+	41738
*	n,fis	Many	?	4ZZZDUB	2.5-02	2.5-02	Jour	EPJ/CS,211,04003	19	Sh.Zeynalov+	41738
	α,fis	Many	FY	1USADAV	2.8+07	4.4+07	Rept	UCRL-10673	63	J.A.Mchughjr	C2505
	α,fis	Many	?	1USADAV	2.8+07	4.4+07	Rept	UCRL-10673	63	J.A.Mchughjr	C2505

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	d,fis	^{131}Te	FY	1USABNL	1.8+07	1.8+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
	d,fis	^{133}Te	FY	1USABNL	1.8+07	1.8+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
	^{3}He,fis	Many	FY	1USALAS	2.5+07	2.5+07	Jour	PR,145,911	66	W.R.Daniels+	C2504
	α,fis	Many	FY	1USALAS	2.8+01	2.9+01	Jour	PR,145,911	66	W.R.Daniels+	C2504
	α,fis	^{131}Te	FY	1USABNL	3.3+07	3.3+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503
	α,fis	^{133}Te	FY	1USABNL	3.3+07	3.3+07	Jour	PR,138,B353	65	D.G.Sarantites+	C2503

93 Neptunium 237

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	n,fis	Many	FY	1USALAS	3.0+06	8.4+07	Jour	PR/C,102,064612	20	A.Pica+	14677
*	n,fis		KE	1USALAS	2.6+06	1.0+08	Jour	PR/C,102,064612	20	A.Pica+	14677

94 Plutonium 239

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis		MFQ	1USALAS	7.0+05	8.0+08	Jour	PR/C,101,044614	20	P.Marini+	14684
*	n,fis	n	KE	1USALAS	7.0+05	8.0+08	Jour	PR/C,101,044614	20	P.Marini+	14684

94 Plutonium 240

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis	Many	FY	3INDTRM	5.0-01		Jour	EPJ/A,57,112	21	H.Naik+	33155
*	n,fis		MAS	3INDTRM	5.0-01		Jour	EPJ/A,57,112	21	H.Naik+	33155

97 Berkelium 249

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{50}Ti,3n	^{296}*	CS	2GERGSI	2.8+08	2.8+08	Jour	PR/C,102,064602	20	J.Khuyagbaatar+	D8036

98 Californium 249

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{50}Ti,3n	^{296}*	CS	2GERGSI	2.8+08	2.8+08	Jour	PR/C,102,064602	20	J.Khuyagbaatar+	D8036

98 Californium 252

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,fis		NU	2ZZZGEL	Spont		Jour	EPJ/CS,211,04003	19	Sh.Zeynalov+	41739
*	0,fis	Many	?	2ZZZGEL	Spont		Jour	EPJ/CS,211,04003	19	Sh.Zeynalov+	41739