EXFOR News (February 2015)

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 1

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{27}Al,γ	^{28}Si	?	1USANOT	9.4+08	1.1+09	Jour	NIM/A,757,62	14	S.J.Quinn+	C2123
*	^{48}Ca,inel	^{1}H	?	1USAMSU	4.7+09	4.7+09	Jour	PR/C,90,011305	14	L.A.Riley+	C2128
*	^{50}Ca,inel	^{1}H	?	1USAMSU	4.5+09	4.5+09	Jour	PR/C,90,011305	14	L.A.Riley+	C2128
*	^{58}Ni,γ	^{59}Cu	?	1USANOT	1.4+09	1.5+09	Jour	NIM/A,757,62	14	S.J.Quinn+	C2123

1 Hydrogen 2

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,π^0	^{2}H	POD	4RUSSIB	1.6+08	4.0+08	Jour	IZV,78,(7),826	14	S.A.Zevakov+	M0883

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,d	^{4}He	DAP	2SWDLND	5.9+07	7.5+07	Jour	PR/C,55,942	97	J.F.Dias+	M0877
	γ,t	^{3}He	DAP	2SWDLND	5.9+07	7.5+07	Jour	PR/C,55,942	97	J.F.Dias+	M0877

3 Lithium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{40}Ar,x+n	inclusive	PY	4KASATN	4.0+07	4.0+07	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{80}Kr,x+n	inclusive	PY	4KASATN	5.8+07	1.4+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{132}Xe,x+n	inclusive	PY	4KASATN	1.3+08	2.0+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745

4 Beryllium 9

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{40}Ar,x+n	inclusive	PY	4KASATN	4.0+07	4.0+07	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{80}Kr,x+n	inclusive	PY	4KASATN	5.8+07	1.4+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{132}Xe,x+n	inclusive	PY	4KASATN	1.3+08	2.0+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745

6 Carbon

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+n	inclusive	PY	1USAMSU	2.2+07	4.0+07	Jour	NSE,147,73	04	T.M.Amos+	C1038

*	^{40}Ar,x+n	inclusive	PY	4KASATN	4.0+07	4.0+07	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{80}Kr,x+n	inclusive	PY	4KASATN	1.1+08	1.4+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{132}Xe,x+n	inclusive	PY	4KASATN	1.3+08	2.0+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,p	^{11}B	DAP	2SWDLND	5.9+07	8.0+07	Jour	PS,49,397	94	D.Nilsson+	M0882
*	^{10}B,tcc		CS	2GERGSI	9.2+09	9.2+09	Jour	PRL,113,132501	14	A.Estrade+	D0749
*	^{11}B,tcc		CS	2GERGSI	1.0+10	1.0+10	Jour	PRL,113,132501	14	A.Estrade+	D0749
*	^{12}B,tcc		CS	2GERGSI	1.2+10	1.2+10	Jour	PRL,113,132501	14	A.Estrade+	D0749
*	^{13}B,tcc		CS	2GERGSI	1.2+10	1.2+10	Jour	PRL,113,132501	14	A.Estrade+	D0749
*	^{14}B,tcc		CS	2GERGSI	1.3+10	1.3+10	Jour	PRL,113,132501	14	A.Estrade+	D0749
*	^{15}B,tcc		CS	2GERGSI	1.4+10	1.4+10	Jour	PRL,113,132501	14	A.Estrade+	D0749
*	^{17}B,tcc		CS	2GERGSI	1.5+10	1.5+10	Jour	PRL,113,132501	14	A.Estrade+	D0749

8 Oxygen 16

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{16}O,el	^{16}O	DA	4KASATN	2.0+07	2.8+07	Jour	IMP/E,22,1350058	13	Sh.Hamada+	D0751

11 Sodium 23

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,α	^{20}F	CS	3INDSAH	1.4+07	1.4+07	Jour	NP,33,177	62	O.N.Kaul	33074
	n,α	^{20}F	DA	3INDSAH	1.4+07	1.4+07	Jour	NP,33,177	62	O.N.Kaul	33074

13 Aluminium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{40}Ar,x+n	inclusive	PY	4KASATN	4.0+07	4.0+07	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{80}Kr,x+n	inclusive	PY	4KASATN	5.8+07	1.4+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{132}Xe,x+n	inclusive	PY	4KASATN	1.3+08	2.0+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	1USANOT	9.6+05	9.6+05	Jour	NIM/A,757,62	14	S.J.Quinn+	C2123
	p,x+n	inclusive	PY	1USAMSU	2.2+07	4.0+07	Jour	NSE,147,73	04	T.M.Amos+	C1038
*	^{16}O,el	^{27}Al	DA	2ITYLNS	2.8+08	2.8+08	Jour	NIM/A,763,314	14	F.Cappuzzello+	D0747
*	^{16}O,inel	^{27}Al	DAP	2ITYLNS	2.8+08	2.8+08	Jour	NIM/A,763,314	14	F.Cappuzzello+	D0747

*	^{80}Kr,x+n	inclusive	PY	4KASATN	1.1+08	1.4+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745
*	^{132}Xe,x+n	inclusive	PY	4KASATN	1.3+08	2.0+08	Jour	PPN/L,11,462	14	B.N.Gikal+	D0745

18 Argon 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	4UKRKFT	1.1+06	3.0+06	Jour	IZV,78,(7),805	14	A.S.Kachan+	D5105

22 Titanium 46

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	t,^{3}He	^{46}Sc	?	1USAMSU	3.4+08	3.4+08	Jour	PRL,112,252501	14	S.Noji+	C2120

26 Iron

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{51}Cr	CS	3KORKRM	3.2+07	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
*	p,x	^{52}Mn	CS	3KORKRM	2.3+07	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
*	p,x	^{54}Mn	CS	3KORKRM	1.2+07	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
*	p,x	^{52}Fe	CS	3KORKRM	3.3+07	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
*	p,x	^{55}Co	CS	3KORKRM	1.7+07	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
*	p,x	^{56}Co	CS	3KORKRM	3.4+06	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
*	p,x	^{57}Co	CS	3KORKRM	4.3+05	4.0+07	Jour	NIM/B,322,63	14	K.S.Kim+	D7007
	p,x+d	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021

26 Iron 54

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+d	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021
	p,x+p	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021

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	CSP	3CPRAEP	1.5+07	1.5+07	Jour	CST,47,2177	13	Wangzhaohui+	32720
*	n,inel	^{56}Fe	CSP	3CPRAEP	1.5+07	1.5+07	Jour	CST,47,2177	13	Wangzhaohui+	32720
	p,x+d	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021
	p,x+p	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021
*	t,^{3}He	^{56}Mn	DAP	1USAMSU	3.4+08	3.4+08	Jour	PR/C,90,025801	14	M.Scott+	C2130
*	t,^{3}He	^{56}Mn	?	1USAMSU	3.4+08	3.4+08	Jour	PR/C,90,025801	14	M.Scott+	C2130

26 Iron 57

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+d	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021
	p,x+p	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021

26 Iron 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+d	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021
	p,x+p	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021

27 Cobalt 59

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+d	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021
	p,x+p	inclusive	DAE	1USAORL	2.2+07	2.2+07	Jour	PR,127,574	Jul 62	C.D.Goodman+	C1021

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	1USANOT	1.4+06	1.4+06	Jour	NIM/A,757,62	14	S.J.Quinn+	C2123
*	^{7}Be,fus	^{1}H	CS	1USANOT	1.6+07	2.1+07	Jour	PR/C,90,014616	14	E.Martinez-Quiroz+	C2129
*	^{7}Be,x+p	inclusive	CS	1USANOT	1.6+07	2.1+07	Jour	PR/C,90,014616	14	E.Martinez-Quiroz+	C2129
*	^{40}Ca,fus		CS	2ITYPAD	6.7+07	9.0+07	Jour	PR/C,90,044610	14	D.Bourgin+	D0746
*	^{40}Ca,fus		DA	2ITYPAD	1.2+08	1.4+08	Jour	PR/C,90,044610	14	D.Bourgin+	D0746

28 Nickel 64

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{64}Ni	DA	1USAORL	9.5+06	1.6+07	Jour	PR,125,631	Jan 62	C.B.Fulmer	C1019
*	^{40}Ca,fus		CS	2ITYPAD	6.4+07	9.4+07	Jour	PR/C,90,044610	14	D.Bourgin+	D0746
*	^{40}Ca,fus		DA	2ITYPAD	1.2+08	1.4+08	Jour	PR/C,90,044610	14	D.Bourgin+	D0746

29 Copper

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+n	inclusive	PY	1USAMSU	2.2+07	4.0+07	Jour	NSE,147,73	04	T.M.Amos+	C1038

*	d,x	^{65}Zn	CS	3ISLSOR	2.8+06	5.6+06	Jour	NIM/B,342,7	15	L.Weissman+	D0753

29 Copper 63

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,p	^{64}Cu	CS	3ISLSOR	2.8+06	5.6+06	Jour	NIM/B,342,7	15	L.Weissman+	D0753

30 Zinc

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{61}Cu	CS	2BLGLVN	5.7+06	1.7+07	Jour	ARI,94,67	14	A.H.Asad+	D0734
*	p,x	^{65}Zn	CS	2BLGLVN	1.4+07	1.7+07	Jour	ARI,94,67	14	A.H.Asad+	D0734
*	p,x	^{66}Ga	CS	2BLGLVN	4.0+06	1.7+07	Jour	ARI,94,67	14	A.H.Asad+	D0734
*	p,x	^{67}Ga	CS	2BLGLVN	3.2+06	1.7+07	Jour	ARI,94,67	14	A.H.Asad+	D0734

30 Zinc 64

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{64}Zn	DA	1USAORL	9.5+06	1.6+07	Jour	PR,125,631	Jan 62	C.B.Fulmer	C1019

32 Germanium 76

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{75}Ge	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

33 Arsenic 75

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,α	^{72}Ga	CS	3INDSAH	1.4+07	1.4+07	Jour	NP,29,522	62	O.N.Koul	33073
	n,α	^{72}Ga	DA	3INDSAH	1.4+07	1.4+07	Jour	NP,29,522	62	O.N.Koul	33073
	n,α	^{72}Ga	DE	3INDSAH	1.4+07	1.4+07	Jour	NP,29,522	62	O.N.Koul	33073

34 Selenium 82

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{81}Se	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

38 Strontium 86

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{85}Sr	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,el	^{93}Nb	DA	1USAORL	1.0+07	1.6+07	Jour	PR,125,631	Jan 62	C.B.Fulmer	C1019
*	p,x+α	inclusive	DAE	3SAFITH	1.0+08	1.0+08	Jour	PR/C,90,054604	14	S.S.Dimitrova+	D0752
*	p,x+α	inclusive	POD	3SAFITH	1.0+08	1.0+08	Jour	PR/C,90,054604	14	S.S.Dimitrova+	D0752

46 Palladium 110

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{109}Pd	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

47 Silver

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x+n	inclusive	PY	1USAMSU	2.2+07	4.0+07	Jour	NSE,147,73	04	T.M.Amos+	C1038

48 Cadmium 106

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,2n	^{108}Sn	CS	1USABNL	2.1+07	3.8+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,γ	^{110}Sn	CS	1USABNL	6.3+06	2.0+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,n	^{109}Sn	CS	1USABNL	1.6+07	3.1+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,n+2α	^{101}Pd	CS	1USABNL	3.6+07	3.9+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,n+α	^{105}Cd	CS	1USABNL	2.4+07	3.7+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,p	^{109}In	CS	1USABNL	1.8+07	3.1+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,x	^{107}In	CS	1USABNL	3.0+07	3.9+07	Jour	PR,137,1491	65	R.L.Hahn	C2121
	α,x	^{108}In	CS	1USABNL	2.8+07	3.8+07	Jour	PR,137,1491	65	R.L.Hahn	C2121

48 Cadmium 116

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{115}Cd	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

50 Tin 114

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{113}Sn	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

50 Tin 124

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{123}Sn	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

52 Tellurium 122

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{121}Te	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

52 Tellurium 128

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{127}Te	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

52 Tellurium 130

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{129}Te	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

56 Barium 132

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{131}Ba	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

56 Barium 134

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{133}Ba	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

58 Cerium 138

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{137}Ce	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

58 Cerium 140

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{139}Ce	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

62 Samarium 147

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{148}Eu	CS	3RUMBUC	4.4+06	8.5+06	Jour	NDS,119,245	14	I.Gheorghe+	D0742
*	p,n	^{147}Eu	CS	3RUMBUC	4.4+06	8.5+06	Jour	NDS,119,245	14	I.Gheorghe+	D0742

62 Samarium 149

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{150}Eu	CS	3RUMBUC	3.6+06	8.6+06	Jour	NDS,119,245	14	I.Gheorghe+	D0742
*	p,n	^{149}Eu	CS	3RUMBUC	3.6+06	8.6+06	Jour	NDS,119,245	14	I.Gheorghe+	D0742

62 Samarium 152

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{153}Sm	CS	3BANSAV	3.3-02	3.3-02	Jour	RCA,102,583	14	Md.S.Uddin+	31739

62 Samarium 154

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,inel	^{154}Sm	DAP	1USAMSU	3.5+07	3.5+07	Jour	PR/C,20,2084	Dec 79	C.H.King+	T0153

64 Gadolinium 154

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

*	^{48}Ca,3n	^{199}Po	CS	1USATAM	1.8+08	2.0+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,4n	^{198}Po	CS	1USATAM	1.8+08	2.0+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,5n	^{197}Po	CS	1USATAM	2.0+08	2.0+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127

65 Terbium 159

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{48}Ca,3n	^{204}At	CS	1USATAM	1.9+08	1.9+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,4n	^{203}At	CS	1USATAM	1.9+08	2.1+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,5n	^{202}At	CS	1USATAM	1.9+08	2.1+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,6n	^{201}At	CS	1USATAM	2.0+08	2.0+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127

66 Dysprosium 162

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{48}Ca,3n	^{207}Rn	CS	1USATAM	1.8+08	2.0+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,4n	^{206}Rn	?	1USATAM	1.8+08	2.1+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,6n	^{204}Rn	CS	1USATAM	2.0+08	2.1+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127

67 Holmium 165

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,n	^{168}Tm	CS	1USANOT	1.1+07	1.5+07	Jour	PR/C,89,065808	14	J.Glorius+	C2119
*	^{48}Ca,3n	^{210}Fr	CS	1USATAM	1.9+08	2.0+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,4n	^{209}Fr	?	1USATAM	1.9+08	2.1+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127
*	^{48}Ca,6n	^{207}Fr	CS	1USATAM	2.1+08	2.1+08	Jour	PR/C,90,024602	14	D.A.Mayorov+	C2127

68 Erbium 166

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,n	^{169}Yb	CS	1USANOT	1.1+07	1.5+07	Jour	PR/C,89,065808	14	J.Glorius+	C2119

70 Ytterbium 176

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,inel	^{176}Yb	DAP	1USAMSU	3.5+07	3.5+07	Jour	PR/C,20,2084	Dec 79	C.H.King+	T0153

73 Tantalum

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x+n	inclusive	PY	1USAMSU	2.2+07	4.0+07	Jour	NSE,147,73	04	T.M.Amos+	C1038

73 Tantalum 181

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,α	^{178}Lu	?	3INDTRM	2.5-02	2.5-02	Jour	NP/A,235,307	74	J.Alam+	33070

78 Platinum 198

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{197}Pt	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

80 Mercury 198

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,n	^{197}Hg	CS	4ZZZDUB		2.5+07	Jour	IZV,65,(1),111	01	Yu.P.Gangrskiy+	M0885

82 Lead

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x+n	inclusive	PY	1USAMSU	2.2+07	4.0+07	Jour	NSE,147,73	04	T.M.Amos+	C1038

82 Lead 204

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,0		RP	2GERTHD			Jour	NP/A,724,243	03	J.Enders+	M0884

82 Lead 206

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,0		RP	2GERTHD			Jour	NP/A,724,243	03	J.Enders+	M0884
α,3n	^{207}Po	CS	1USAUCX	4.0+07	4.0+07	Jour	PR,72,758	47	D.H.Templeton+	C2124

82 Lead 207

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,0		RP	2GERTHD			Jour	NP/A,724,243	03	J.Enders+	M0884

82 Lead 208

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,0		RP	2GERTHD			Jour	NP/A,724,243	03	J.Enders+	M0884
α,2n	^{210}Po	CS	1USAUCX	4.0+07	4.0+07	Jour	PR,72,758	47	D.H.Templeton+	C2124
α,x	^{210}Bi	CS	1USAUCX	4.0+07	4.0+07	Jour	PR,72,766	47	D.H.Templeton+	C2125

83 Bismuth 209

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,3n	^{208}Po	CS	1USAUCX	2.0+07	2.0+07	Jour	PR,72,758	47	D.H.Templeton+	C2124
d,n	^{210}Po	CS	1USAUCX	2.0+07	2.0+07	Jour	PR,72,758	47	D.H.Templeton+	C2124
d,p	^{210}Bi	CS	1USAUCX	2.0+07	2.0+07	Jour	PR,72,758	47	D.H.Templeton+	C2124
d,p	^{210}Bi	CS	1USAUCX	2.0+07	2.0+07	Jour	PR,72,766	47	D.H.Templeton+	C2125

90 Thorium 232

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,inel	^{232}Th	DAP	1USAMSU	3.5+07	3.5+07	Jour	PR/C,20,2084	Dec 79	C.H.King+	T0153

92 Uranium 233

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	n	KE	1USAANL	5.2+05	5.2+05	Jour	NSE,76,357	80	A.Smith+	10911
p,fis		DA	1USAANL	5.0+06	1.2+07	Jour	PR,133,B1471	Mar 64	G.L.Bate+	T0044
p,fis		?	1USAANL	6.0+06	1.2+07	Jour	PR,133,B1471	Mar 64	G.L.Bate+	T0044

92 Uranium 235

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		CS	1USALRL	1.0+05	3.5+05	Conf	71KNOX,2,584	Mar 71	C.D.Bowman+	10419
n,fis		NUF	1USALAS	2.5-02	2.5-02	Jour	PR,85,(4),600	52	N.Nereson	14134
n,fis		NUF	1USALAS	2.5-02	2.5-02	Jour	PR,87,(6),1032	52	T.W.Bonner+	14400
n,fis	Many	NUF	3AULAUA	Maxwl		Jour	AUJ,24,821	71	J.W.Boldeman+	30909

n,fis		NUF	3AULAUA	Maxwl		Jour	AUJ,24,821	71	J.W.Boldeman+	30909
n,fis	Many	NUF	3AULAUA	Maxwl		Jour	AUJ,24,821	71	J.W.Boldeman+	30909
n,fis	n	KE	1USAANL	5.2+05	5.2+05	Jour	NSE,76,357	80	A.Smith+	10911
n,fis	n	NUF	1USALAS	2.5-02	2.5-02	Jour	PR,87,1037	52	B.E.Watt	14099

92 Uranium 238

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,fis		DA	1USAANL	6.0+06	1.2+07	Jour	PR,133,B1471	Mar 64	G.L.Bate+	T0044
p,inel	^{238}U	DAP	1USAMSU	3.5+07	3.5+07	Jour	PR/C,20,2084	Dec 79	C.H.King+	T0153

93 Neptunium 237

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		CS	1USANBS	1.1+06	1.9+07	Conf	79KNOX,,971	Oct 79	A.D.Carlson+	10951

94 Plutonium 239

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		NUF	1USALAS	2.5-02	2.5-02	Jour	PR,88,(4),823	52	N.Nereson	14399
n,fis	n	KE	1USAANL	5.2+05	5.2+05	Jour	NSE,76,357	80	A.Smith+	10911

94 Plutonium 240

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	n	KE	1USAANL	8.5+05	8.5+05	Jour	NSE,76,357	80	A.Smith+	10911

96 Curium 248

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis		?	3CPRBJG	Spont		Jour	PHE,25,304	01	Baoshanglian+	32726
0,fis	n	KE	3CPRBJG	Spont		Jour	PHE,25,304	01	Baoshanglian+	32726