EXFOR News (December 2019)

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 (Naohiko Otsuka 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 et al., Nucl.Data.Sheets **120**(2014)272.

Quantity codes

ALF	α-value ($\sigma_{\rm capt}/\sigma_{\rm fis}$)	KE	Kinetic energy
AMP	Length or amplitude	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) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,tot		CST	1USAORL	4.3-04	1.6-02	Jour	PR/B,91,180301	15	K.B.Grammer+	14566

1 Hydrogen 2

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{1}H	CS	4RUSLEB	5.4+07	1.5+08	Jour	ZET,33,614	57	A.Aleksandrov+	M1001
	γ,n	^{1}H	DA	4RUSLEB		1.5+08	Jour	ZET,33,614	57	A.Aleksandrov+	M1001
	γ,n	^{1}H	DAP	4RUSLEB		2.6+08	Jour	ZET,33,1123	57	P.S.Baranov+	M1002
*	^{7}Li,el	^{2}H	?	2ITYLNS	3.8+07	3.8+07	Jour	EPJ/A,53,167	17	A.Pakou+	O2376
*	^{7}Li,p	^{8}Li	?	2ITYLNS	3.8+07	3.8+07	Jour	EPJ/A,53,167	17	A.Pakou+	O2376
*	^{95}Sr,p	^{96}Sr	?	1CANTMF	5.2+08	5.2+08	Jour	PL/B,786,94	18	S.Cruz+	C2382
*	^{132}Sn,t	^{131}Sn	?	1USAORL	5.8+08	5.8+08	Jour	PL/B,785,615	18	R.Orlandi+	C2383

2 Helium 4

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,abs		CS	4RUSLEB	2.0+07	1.7+08	Jour	ZET,34,866	57	A.N.Gorbunov+	M0999
	γ,abs		INT	4RUSLEB		1.7+08	Jour	ZET,34,866	57	A.N.Gorbunov+	M0999
	γ,n	^{3}He	CS	4RUSLEB	2.5+07	1.7+08	Jour	ZET,34,862	58	A.N.Gorbunov+	M0998
	γ,n	^{3}He	DA	4RUSLEB	2.1+07	1.7+08	Jour	ZET,34,862	58	A.N.Gorbunov+	M0998
	γ,n	^{3}He	INT	4RUSLEB		1.7+08	Jour	ZET,34,862	58	A.N.Gorbunov+	M0998
	γ,n+p	^{2}H	CS	4RUSLEB	2.7+07	1.5+08	Jour	ZET,34,866	57	A.N.Gorbunov+	M0999
	γ,n+p	^{2}H	INT	4RUSLEB		1.7+08	Jour	ZET,34,866	57	A.N.Gorbunov+	M0999
	γ,p	^{3}H	CS	4RUSLEB	2.0+07	1.7+08	Jour	ZET,33,21	57	A.N.Gorbunov+	M0997
	γ,p	^{3}H	DA	4RUSLEB	2.1+07	1.7+08	Jour	ZET,33,21	57	A.N.Gorbunov+	M0997
	γ,p	^{3}H	INT	4RUSLEB		1.7+08	Jour	ZET,33,21	57	A.N.Gorbunov+	M0997
	α,el	^{4}He	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
*	^{19}F,p	^{22}Ne	?	1USAORL	1.9+06	2.1+06	Jour	NIM/A,900,60	18	K.Y.Chae+	C2395

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,inel	^{6}Li	DAP	4KASKAZ	5.0+07	6.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,inel	^{6}Li	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

3 Lithium 7

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,el	^{7}Li	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,inel	^{7}Li	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

4 Beryllium 9

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{3}He,el	^{9}Be	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	^{3}He,inel	^{9}Be	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,el	^{9}Be	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,inel	^{9}Be	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
*	^{238}U,fis	Many	CS	2GERGSI	2.3+11	2.3+11	Jour	PR/C,99,054606	19	D.Perez-Loureiro+	D0955

5 Boron 11

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{12}C	CS	3CPRIMP	1.3+05	2.6+05	Jour	PR/C,93,055804	16	J.J.He+	S0183

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,2α	^{4}He	CS	4RUSLEB	1.1+07	4.2+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
	γ,n	^{11}C	DAP	4RUSLEB		2.6+08	Jour	ZET,33,1123	57	P.S.Baranov+	M1002
	γ,p	^{11}B	CSP	4RUSLEB	1.6+07	1.0+08	Jour	ZET,46,1492	64	G.F.Taran+	M0987
	γ,p	^{11}B	INT	4RUSLEB		1.7+08	Jour	ZET,46,1492	64	G.F.Taran+	M0987
	γ,p	^{11}B	?	4RUSLEB	1.6+07	1.0+08	Jour	ZET,46,1492	64	G.F.Taran+	M0987
	γ,p+α	^{7}Li	CS	4RUSLEB	2.6+07	8.4+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
	γ,p+α	^{7}Li	INT	4RUSLEB	2.5+07	8.5+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
	γ,p+t+α	^{4}He	INT	4RUSLEB	3.0+07	8.5+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
	γ,x+p	inclusive	DAE	4RUSLEB	8.2+07	8.9+07	Jour	ZET,37,374	59	E.B.Bazhanov	M1003
	γ,x+p	inclusive	DAP	4RUSLEB		8.9+07	Jour	ZET,37,374	59	E.B.Bazhanov	M1003
	^{3}He,el	^{12}C	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	^{3}He,inel	^{12}C	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,el	^{12}C	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,inel	^{12}C	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

6 Carbon 13

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,p	^{12}B	CS	4RUSFTI	1.7+07	3.1+07	Jour	ZET,46,1488	64	V.P.Denisov+	M0988
	γ,p	^{12}B	INT	4RUSFTI		5.0+07	Jour	ZET,46,1488	64	V.P.Denisov+	M0988

^{3}He,el	^{13}C	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
^{3}He,inel	^{13}C	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
α,el	^{13}C	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
α,inel	^{13}C	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
α,p	^{16}N	DAP	1USAINU	1.2+08	1.2+08	Jour	NP/A,459,317	86	P.R.Andrews+	C2371

7 Nitrogen 14

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
γ,p+α	^{9}Be	INT	4RUSLEB	3.0+07	8.0+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
α,el	^{14}N	DA	4KASKAZ	4.8+07	4.8+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
α,inel	^{14}N	DAP	4KASKAZ	4.8+07	4.8+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

8 Oxygen 16

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
γ,3α	^{4}He	CS	4RUSLEB	1.6+07	4.4+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
γ,n	^{15}O	CSP	4RUSLEB	1.6+07	8.5+07	Jour	ZET,43,40	62	A.N.Gorbunov+	M0996
γ,n	^{15}O	DAP	4RUSLEB		1.7+08	Jour	ZET,43,40	62	A.N.Gorbunov+	M0996
γ,p	^{15}N	CSP	4RUSLEB	1.3+07	7.5+07	Jour	ZET,43,40	62	A.N.Gorbunov+	M0996
γ,p	^{15}N	DAP	4RUSLEB		1.7+08	Jour	ZET,43,40	62	A.N.Gorbunov+	M0996
γ,p+α	^{11}B	CS	4RUSLEB	2.7+07	8.1+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
γ,p+α	^{11}B	INT	4RUSLEB	2.5+07	8.5+07	Jour	ZET,34,1406	58	V.N.Maikov	M1000
α,el	^{16}O	DA	4KASKAZ	4.8+07	4.8+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
α,inel	^{16}O	DAP	4KASKAZ	4.8+07	4.8+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

10 Neon 20

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
n,γ	^{21}Ne	CS	2GERKFK	Maxwl		Jour	AJ,265,417	83	J.Almeida+	21808
α,el	^{20}Ne	DA	4KASKAZ	4.9+07	4.9+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
α,inel	^{20}Ne	DAP	4KASKAZ	4.9+07	4.9+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

10 Neon 21

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
n,γ	^{22}Ne	CS	2GERKFK	Maxwl		Jour	AJ,265,417	83	J.Almeida+	21808

10 Neon 22

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

	n,0		RP	2GERKFK			Jour	AJ,265,417	83	J.Almeida+	21808
	n,γ	^{23}Ne	CS	2GERKFK	Maxwl		Jour	AJ,265,417	83	J.Almeida+	21808

12 Magnesium 24

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	α,el	^{24}Mg	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,inel	^{24}Mg	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

12 Magnesium 25

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
*	n,α	^{22}Ne	CS	3CPRBJG	4.0+06	6.0+06	Jour	PR/C,98,034605	18	Yu.M.Gledenov+	32783
*	n,α	^{22}Ne	CSP	3CPRBJG	4.0+06	6.0+06	Jour	PR/C,98,034605	18	Yu.M.Gledenov+	32783

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	γ,x	^{24}Na	CS	4RUSLEB	3.0+07	2.3+08	Jour	ZET,38,1084	60	A.N.Gorbunov+	M0995
	γ,x+p	inclusive	DAE	4RUSLEB	8.2+07	8.9+07	Jour	ZET,37,374	59	E.B.Bazhanov	M1003
	γ,x+p	inclusive	DAP	4RUSLEB		8.9+07	Jour	ZET,37,374	59	E.B.Bazhanov	M1003
*	^{16}O,el	^{27}Al	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{6}Li	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{7}Li	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{7}Be	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{9}Be	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{10}B	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{11}B	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{12}C	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{13}C	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{14}N	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338
*	^{16}O,x	^{15}N	DA	3INDTRM	1.3+08	1.3+08	Jour	PR/C,97,034603	18	B.J.Roy+	D6338

14 Silicon 28

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
					Min	Max		Ref Vol Page			
	p,inel	^{28}Si	DAP	1USAOSU	3.0+06	5.2+06	Jour	PR/C,13,510	76	N.Tsoupas+	C2403
	α,el	^{28}Si	DA	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925
	α,inel	^{28}Si	DAP	4KASKAZ	5.0+07	5.0+07	Rept	IYFK-P-88-01	88	N.T.Burtebaev+	D0925

15 Phosphorus 31

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,x	^{24}Na	CS	4RUSLEB	6.3+07	2.3+08	Jour	ZET,38,1084	60	A.N.Gorbunov+	M0995

18 Argon 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{41}Ar	CS	1USALAS	1.5-02	1.4-01	Jour	PR/D,99,103021	19	V.Fischer+	14568

19 Potassium 38

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	1USATNL	3.8+05	7.0+05	Jour	PR/C,98,055804	18	K.Setoodehnia+	C2386

20 Calcium 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,p	^{39}K	CSP	4RUSMOS	1.4+07	3.2+07	Jour	ZET,46,1484	64	B.S.Ishkhanov+	M1005
	γ,p	^{39}K	INT	4RUSMOS		3.3+07	Jour	ZET,46,1484	64	B.S.Ishkhanov+	M1005
	γ,x+p	inclusive	CSP	4RUSJIA	1.4+07	2.4+07	Jour	ZET,46,1480	64	B.S.Ratner	M0990
*	^{3}He,α	^{39}Ca	DAP	1USATNL	2.1+07	2.1+07	Jour	PR/C,98,055804	18	K.Setoodehnia+	C2386

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	3CPRBJG	5.5+06	1.0+07	Jour	PR/C,99,024619	19	Huaiyong Bai+	32786
*	n,γ	^{55}Fe	CS	2GERKFK	Maxwl		Jour	PR/C,96,025808	17	A.Wallner+	23047

26 Iron 56

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{53}Cr	CS	3CPRBJG	5.5+06	1.0+07	Jour	PR/C,99,024619	19	Huaiyong Bai+	32786

27 Cobalt 59

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

γ,x	^{56}Mn	CS	4RUSLEB	3.0+07	2.3+08	Jour	ZET,38,1084	60	A.N.Gorbunov+	M0995

29 Copper

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
γ,x+p	inclusive	CSP	4RUSJIA	1.1+07	2.6+07	Jour	ZET,46,1157	64	B.S.Ratner	M0989
α,x	^{66}Ga	CS	1USABRK	8.0+06	1.1+07	Jour	PR,52,405	37	W.B.Mann	C2402
α,x	^{68}Ga	CS	1USABRK	7.0+06	1.1+07	Jour	PR,52,405	37	W.B.Mann	C2402

38 Strontium 88

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,el	^{88}Sr	DA	2GERUEN	5.0+06	5.2+06	Jour	PRL,27,1294	71	W.Kretschmer+	O2380

39 Yttrium 89

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,x	^{87}Y	CS	2SWDUPP	2.8+07	4.9+07	Jour	NIM/B,129,153	97	R.Michel+	O0276

40 Zirconium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
p,x	^{95}Zr	CS	2BLGLVN	5.9+07	2.4+10	Jour	PR/C,26,931	82	S.Regnier+	O0204

40 Zirconium 90

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
n,γ	^{91}Zr	CS	1CANCRC	2.5-02	2.5-02	Conf	78BNL,,675	78	M.A.Lone+	14567
p,el	^{90}Zr	DA	2GERUEN	4.5+06	4.9+06	Jour	PRL,27,1294	71	W.Kretschmer+	O2380

45 Rhodium 103

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
γ,inel	^{103}Rh	CS	4RUSLEB	4.0+06	2.4+07	Jour	ZET,39,1224	60	O.V.Bogdankevich+	M0994

46 Palladium 110

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{109}Pd	CS	3CPRNPC		1.5+07	Jour	JRN,316,733	18	Junhua Luo+	32776

47 Silver 107

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,inel	^{107}Ag	CS	4RUSJIA	4.5+06	2.6+07	Jour	ZET,45,882	63	O.V.Bogdankevich+	M0991

48 Cadmium 113

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{114}Cd	CS	3HUNKFI	2.5-02	2.5-02	Jour	EPJ/CS,146,05009	17	T.Belgya+	31808
*	n,γ	^{114}Cd	DE	3HUNKFI	2.5-02	2.5-02	Jour	EPJ/CS,146,05009	17	T.Belgya+	31808

49 Indium 115

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,2n	^{113}In	CS	4RUSLEB	1.6+07	2.8+07	Jour	ZET,31,405	56	O.V.Bogdankevich+	M1004
	γ,inel	^{115}In	CS	4RUSLEB	5.0+06	2.6+07	Jour	ZET,31,405	56	O.V.Bogdankevich+	M1004
	γ,x+n	inclusive	CS	4RUSLEB	1.0+07	2.7+07	Jour	ZET,31,405	56	O.V.Bogdankevich+	M1004
*	n,inel	^{115}In	CS	3CPRSIU	3.0+06	5.2+06	Jour	RPC,127,177	16	Chao Wang+	32731

50 Tin 112

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,n	^{111}Sn	CS	4RUSJIA	1.0+07	2.0+07	Jour	ZET,40,85	61	Kuoch'I-Ti+	M0993
	γ,n	^{111}Sn	INT	4RUSJIA		3.0+07	Jour	ZET,40,85	61	Kuoch'I-Ti+	M0993
*	^{7}Li,p+X	^{6}He	CS	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,p+X	^{6}He	DA	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,t+X	^{4}He	DA	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{6}He	CSP	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{5}Li	CS	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{5}Li	DA	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{6}Li	CSP	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{6}Li	DAP	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{7}Li	CSP	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x	^{7}Li	DAP	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340
*	^{7}Li,x+α	inclusive	CS	3INDTRM	3.0+07	3.0+07	Jour	PR/C,97,051601	18	D.Chattopadhyay+	D6340

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	4RUSJIA	8.5+06	2.0+07	Jour	ZET,40,85	61	Kuoch'I-Ti+	M0993
	γ,n	^{123}Sn	INT	4RUSJIA		3.0+07	Jour	ZET,40,85	61	Kuoch'I-Ti+	M0993

50 Tin 126

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,p	^{127}Sn	DAP	1USAORL	6.3+08	6.3+08	Jour	PR/C,99,041302	19	B.Manning+	C2396

50 Tin 128

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	d,p	^{129}Sn	DAP	1USAORL	6.3+08	6.3+08	Jour	PR/C,99,041302	19	B.Manning+	C2396

51 Antimony

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,el		RP	2JPNJAE	3.8+01	2.5+02	Conf	68WASH,2,789	68	A.Asami+	21326

51 Antimony 121

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,0		RP	2JPNJAE		6.0+02	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,el		RP	2JPNJAE		5.3+03	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,tot		CS	2JPNJAE	4.6+02	1.1+04	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819

51 Antimony 123

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,0		RP	2JPNJAE		1.3+03	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,el		RP	2JPNJAE		5.3+03	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,tot		CS	2JPNJAE	8.0+01	1.1+04	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819

53 Iodine 127

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{125}I	CS	4RUSMOS	1.7+07	3.1+07	Jour	MPM,3,1930413	19	A.I.Davydov+	M0984
*	γ,3n	^{124}I	CS	4RUSMOS	2.7+07	3.1+07	Jour	MPM,3,1930413	19	A.I.Davydov+	M0984
*	γ,n	^{126}I	CS	4RUSMOS	8.9+06	3.1+07	Jour	MPM,3,1930413	19	A.I.Davydov+	M0984
*	γ,x+n	inclusive	CS	4RUSMOS	8.9+06	3.1+07	Jour	MPM,3,1930413	19	A.I.Davydov+	M0984

58 Cerium 140

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,0		RP	2JPNJAE			Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,el		RP	2JPNJAE		5.0+04	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,tot		CS	2JPNJAE	7.1+02	1.8+05	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	p,inel	^{140}Ce	DAP	2GERUEN	1.0+07	1.2+07	Jour	PRL,27,526	71	H.Clement+	O2381

58 Cerium 142

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,0		RP	2JPNJAE		1.0+04	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,el		RP	2JPNJAE		5.0+04	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819
	n,tot		CS	2JPNJAE	7.1+02	1.8+05	Rept	JAERI-M-93-012	93	M.Ohkubo+	20819

63 Europium 151

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,0		RP	1USABNL			Jour	BAP,1,347(X9)	56	H.H.Landon	14559
*	n,2n	^{150}Eu	CS	3CPRNPC			Jour	RPC,148,43	18	Junhua Luo+	32779

63 Europium 153

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ		RP	1USABNL	2.5+00	3.9+00	Jour	BAP,1,347(X9)	56	H.H.Landon	14559

65 Terbium 159

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{160}Tb	CS	3INDTRM	5.1+06	1.7+07	Jour	ARI,141,10	18	B.K.Soni+	33113

74 Tungsten

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{177}Re	CS	3KORKAE	7.8+07	9.3+07	Jour	KPS,70,47	17	J.R.Yoon+	D7025
*	p,x	^{178}Re	CS	3KORKAE	7.8+07	9.3+07	Jour	KPS,70,47	17	J.R.Yoon+	D7025
*	p,x	^{179}Re	CS	3KORKAE	7.8+07	9.3+07	Jour	KPS,70,47	17	J.R.Yoon+	D7025

74 Tungsten 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,p	^{180}Ta	CSP	4RUSMOS	1.4+07	3.4+07	Jour	ZET,44,808	63	V.G.Shevchenco+	M0992

75 Rhenium 185

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,$2n$	^{184}Re	CS	3CPRNPC		1.5+07	Jour	EPJ/A,55,27	19	Junhua Luo+	32785

79 Gold 197

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,$3n$	^{195}Hg	CS	2ITYMIL	2.7+07	2.8+07	Rept	INFN/TC-80/17	80	C.Birattari+	O2100
*	α,n	^{200}Tl	CS	3INDVEC	3.2+07	4.2+07	Jour	EPJ/A,54,205	18	M.K.Sharma+	D6329

80 Mercury 196

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{195}Hg	CS	4ZZZDUB		2.4+07	Jour	NIM/B,457,4	19	Tranducthiep+	M0979
*	γ,n	^{195}Hg	CS	4ZZZDUB		2.4+07	Jour	NIM/B,457,4	19	Tranducthiep+	M0986

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		2.4+07	Jour	NIM/B,457,4	19	Tranducthiep+	M0979
*	γ,n	^{197}Hg	CS	4ZZZDUB		2.4+07	Jour	NIM/B,457,4	19	Tranducthiep+	M0986

81 Thallium 205

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{48}Ca,2n	^{251}Md	CS	2SF JYV	2.1+08	2.2+08	Jour	PRL,98,132503	07	A.Chatillon+	D0943

82 Lead

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{238}U,fis	Many	CS	2GERGSI	2.3+11	2.3+11	Jour	PR/C,99,054606	19	D.Perez-Loureiro+	D0955

82 Lead 206

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ		RP	1USAORL		6.5+05	Prog	AAEC/PR-46,16	80	A.R.Musgrove+	30386

90 Thorium 232

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,fis	^{134}I	FY	4ZZZDUB		2.5+07	Jour	JRN,155,299	91	A.P.Tonchev+	M0983
*	^{12}C,fis	Many	DA	3INDTRM	7.4+07	7.4+07	Jour	PR/C,98,041601	18	Y.K.Gupta+	D6347
*	^{12}C,fis	^{4}He	?	3INDTRM	7.4+07	7.4+07	Jour	PR/C,98,041601	18	Y.K.Gupta+	D6347
*	^{13}C,fis	^{4}He	?	3INDTRM	7.4+07	7.4+07	Jour	PR/C,98,041601	18	Y.K.Gupta+	D6347

91 Protactinium 231

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,fis		CS	4RUSFEI	5.3+06	8.9+06	Jour	AE/T,78,386	95	A.S.Soldatov+	M0980
	γ,fis		?	4RUSFEI		8.9+06	Jour	AE/T,78,386	95	A.S.Soldatov+	M0980

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,fis	Many	FY	4RUSSIB		2.0+09	Jour	YF,55,2623	92	D.I.Ivanov+	M0985
	γ,fis	^{134}I	FY	4ZZZDUB		2.5+07	Jour	JRN,155,299	91	A.P.Tonchev+	M0983
	n,fis	Many	FY	3CPRAEP	1.9+07	1.9+07	Prog	INDC(CPR)-053,10	01	Yang Yi+	32792
*	n,fis	Many	?	1USATNL	4.6+06	4.6+06	Jour	PR/C,91,064604	15	C.Bhatia+	14423
	n,fis	^{84}Br	FY	3CHFTHU	2.5-02	2.5-02	Jour	JRN,119,101	87	C.H.Lee+	32790
	n,fis	^{146}La	FY	3CHFTHU	2.5-02	2.5-02	Jour	JRN,119,101	87	C.H.Lee+	32790

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,fis	Many	CS	4ARMJER		3.5+09	Jour	YF,71,28	08	N.A.Demekhina+	M0982
	γ,fis	Many	FY	4RUSSIB		2.0+09	Jour	YF,55,2623	92	D.I.Ivanov+	M0985
*	n,fis	Many	?	1USATNL	4.6+06	4.6+06	Jour	PR/C,91,064604	15	C.Bhatia+	14423
*	n,fis	^{134}Te	CS	3CPRNPC	1.4+07	1.5+07	Jour	RPC,158,175	19	Niu Deqing+	32787
	n,inel	^{238}U	DAP	2UK HAR	8.4+05	1.0+06	Jour	NP,80,46	66	E.Barnard+	21320

93 Neptunium 239

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{240}Np	CS	1USARL	2.5-02	2.5-02	Jour	BAP,1,62(UA6)	56	H.W.Lefevre+	14569

94 Plutonium 239

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,fis	Many	FY	4RUSTIL		2.8+07	Jour	AE,50,34	81	M.Ya.Kondrat'Ko+	M0076
	n,fis	Many	FY	1USAINL	2.5-02	2.5-02	Conf	58GENEVA,15,444	58	L.R.Bunney+	14564
*	n,fis	Many	?	1USATNL	4.6+06	4.6+06	Jour	PR/C,91,064604	15	C.Bhatia+	14423

96 Curium 244

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	0,fis	Many	FY	1USAINL	Spont		Jour	JRN,264,243	05	E.L.Reber+	14547

98 Californium 252

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	0,fis	Many	CHG	1USAASU	Spont		Jour	NSE,61,366	76	C.A.Boligjr+	14540
	0,fis	Many	FY	4ZZZDUB	Spont		Conf	2006SMOLEN,,295	06	A.V.Daniel+	14331
	0,fis	Many	FY	1USAVBT	Spont		Jour	PR/C,74,017309	06	D.Fong+	14546
	0,fis	Many	FY	1USAINL	Spont		Jour	JRN,264,243	05	E.L.Reber+	14547
	0,fis	Many	FY	1USAVBT	Spont		Jour	PR/C,78,014313	08	J.G.Wang+	14548
	0,fis	Many	?	4ZZZDUB	Spont		Conf	2006SMOLEN,,295	06	A.V.Daniel+	14331
	0,fis	Many	?	1USAASU	Spont		Jour	NSE,61,366	76	C.A.Boligjr+	14540
*	0,fis	Many	?	3CPRBHN	Spont		Jour	PR/C,93,014606	16	Taofeng Wang+	32788
*	0,fis	γ	?	3CPRBHN	Spont		Jour	PR/C,93,014606	16	Taofeng Wang+	32788
	0,fis	^{4}He	KE	1USAVBT	Spont		Conf	99ST.AND,,246	99	A.V.Ramayya+	14545
	0,fis	^{4}He	?	1USAVBT	Spont		Conf	99ST.AND,,246	99	A.V.Ramayya+	14545
	0,fis	^{5}He	KE	1USAVBT	Spont		Conf	99ST.AND,,246	99	A.V.Ramayya+	14545
	0,fis	^{5}He	?	1USAVBT	Spont		Conf	99ST.AND,,246	99	A.V.Ramayya+	14545

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
0,fis	Many	FY	3ISLWZI	Spont		Conf	79GRENOB,,316	79	H.A.Selic+	31802
0,fis	Many	MAS	3ISLWZI	Spont		Conf	79GRENOB,,316	79	H.A.Selic+	31802