EXFOR News (March 2022)

New experimental data available from Nuclear Reaction Data Centres

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

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

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

Quantity codes

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

Special codes in outgoing particle field

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

Special codes in incident energy field

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

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

1 Hydrogen 1

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,el	^{1}H	?	3CPRIHP	6.1+06	5.2+07	Jour	EPJ/A,57,6	21	Haoyu Jiang+	32858

2 Helium 3

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{3}H	CS	1USANOT	5.0+03	3.6+05	Jour	EPJ/A,56,199	20	R.G.Pizzone+	14716

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	DAP	1USAINU	7.6+06	6.0+07	Jour	PR/C,25,2921	82	H.R.Weller+	C2625

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{9}Be	CSP	1USALAS	7.2+06	2.2+07	Jour	PR/C,104,014603	21	S.A.Kuvin+	14711
*	n,d	^{11}B	?	1USALAS	1.6+07	2.2+07	Jour	PR/C,104,014603	21	S.A.Kuvin+	14711
*	n,inel	^{12}C	CSP	1USAOHO	1.5+07	1.5+07	Jour	PR/C,103,064607	21	A.M.Mcevoy+	14710
*	n,inel	^{12}C	DAP	1USAOHO	1.5+07	1.5+07	Jour	PR/C,103,064607	21	A.M.Mcevoy+	14710
*	n,p	^{12}B	CSP	1USALAS	1.6+07	2.2+07	Jour	PR/C,104,014603	21	S.A.Kuvin+	14711
	p,^{6}Li	^{7}Be	DAP	1USACLA	3.5+07	5.7+07	Jour	NP/A,174,161	71	A.B.Holman+	C2619

6 Carbon 13

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{12}C	CSP	1USAOHO	1.5+07	1.5+07	Jour	PR/C,103,064607	21	A.M.Mcevoy+	14710
*	n,2n	^{12}C	DAP	1USAOHO	1.5+07	1.5+07	Jour	PR/C,103,064607	21	A.M.Mcevoy+	14710
*	n,α	^{10}Be	CSP	1USALAS	6.7+06	1.1+07	Jour	PR/C,104,014603	21	S.A.Kuvin+	14711

6 Carbon 14

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,n	^{14}N	DAP	1USALRL	7.2+06	1.8+07	Jour	PR/C,3,1904	71	C.Wong+	C2615
	p,n	^{14}N	POD	1USALRL	7.2+06	1.3+07	Jour	PR/C,3,1904	71	C.Wong+	C2615

9 Fluorine 19

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,$2n$	^{18}F	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	n,$2n$	^{18}F	CS	3CZRUJF	1.8+07	1.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842

11 Sodium 23

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,$2n$	^{22}Na	CS	3CZRUJF	1.8+07	1.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842

12 Magnesium 24

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{24}Na	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

13 Aluminium 27

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{24}Na	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	n,α	^{24}Na	CS	3CZRUJF	1.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	n,p	^{27}Mg	CS	3CZRUJF	1.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842

14 Silicon 28

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,inel	^{28}Si	DAP	1USAFSU	1.6+07	1.8+07	Jour	PR/C,5,1257	72	K.W.Kemper+	C2623

18 Argon 40

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,0		RP	1USADKE			Jour	NP,89,590	66	G.A.Keyworth+	C2620

22 Titanium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	Many	CS	1USABNL	4.9+07	1.9+08	Jour	ARI,49,285	98	L.F.Mausner+	C2614

22 Titanium 46

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{46}Sc	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

22 Titanium 47

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{47}Sc	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

22 Titanium 48

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{48}Sc	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
	p,x	Many	?	1USABNL	4.8+07	1.5+08	Jour	ARI,49,285	98	L.F.Mausner+	C2614

23 Vanadium 51

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	Many	CS	1USABNL	1.9+08	1.9+08	Jour	ARI,49,285	98	L.F.Mausner+	C2614

25 Manganese 55

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,$2n$	^{54}Mn	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

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	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	n,p	^{54}Mn	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

26 Iron 56

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{56}Mn	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

27 Cobalt 59

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{58}Co	CS	3CZRUJF	1.8+07	1.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	n,α	^{56}Mn	CS	3CZRUJF	1.8+07	1.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	n,p	^{59}Fe	CS	3CZRUJF	1.8+07	1.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{57}Ni	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	n,α	^{55}Fe	CS	3CPRBJG	4.5+06	5.5+06	Jour	CPH/C,44,114102	20	Haoyu Jiang+	32813
*	n,p	^{58}Co	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	n,x	^{57}Co	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

28 Nickel 60

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{57}Fe	CS	3CPRBJG	5.0+06	5.5+06	Jour	CPH/C,44,114102	20	Haoyu Jiang+	32813
*	n,p	^{60}Co	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

28 Nickel 61

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{58}Fe	CS	3CPRBJG	5.0+06	5.5+06	Jour	CPH/C,44,114102	20	Haoyu Jiang+	32813

29 Copper 63

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,α	^{60}Co	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838

33 Arsenic 75

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,γ	^{76}As	CS	3CPRSIU	2.9+04	1.1+06	Jour	CNPR,24,29	07	Shi Shu-Ting+	32846

36 Krypton 78

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{79}Kr	CS	3ISLSOR			Jour	PR/C,104,015806	21	M.Tessler+	31837

36 Krypton 80

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{81}Kr	CS	3ISLSOR			Jour	PR/C,104,015806	21	M.Tessler+	31837

36 Krypton 84

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{85}Kr	CS	3ISLSOR			Jour	PR/C,104,015806	21	M.Tessler+	31837

36 Krypton 86

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{87}Kr	CS	3ISLSOR			Jour	PR/C,104,015806	21	M.Tessler+	31837

37 Rubidium 85

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{86}Rb	CS	1USAORU	2.5-02	2.5-02	Jour	EPJ/A,57,19	21	K.S.Krane	14714
*	n,γ	^{86}Rb	RI	1USAORU	2.5-02		Jour	EPJ/A,57,19	21	K.S.Krane	14714

37 Rubidium 87

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{88}Rb	RI	1USAORU	2.5-02		Jour	EPJ/A,57,19	21	K.S.Krane	14714

38 Strontium 84

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{85}Sr	CS	1USAORU	2.5-02	2.5-02	Jour	EPJ/A,57,19	21	K.S.Krane	14714
*	n,γ	^{85}Sr	RI	1USAORU	2.5-02		Jour	EPJ/A,57,19	21	K.S.Krane	14714

38 Strontium 86

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{87}Sr	CS	1USAORU	2.5-02	2.5-02	Jour	EPJ/A,57,19	21	K.S.Krane	14714
*	n,γ	^{87}Sr	RI	1USAORU	2.5-02	2.5-02	Jour	EPJ/A,57,19	21	K.S.Krane	14714

38 Strontium 88

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{89}Sr	CS	1USAORU	2.5-02	2.5-02	Jour	EPJ/A,57,19	21	K.S.Krane	14714
*	n,γ	^{89}Sr	RI	1USAORU	2.5-02		Jour	EPJ/A,57,19	21	K.S.Krane	14714

39 Yttrium 88

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{89}Y	CS	1USADAV	2.5-02	2.5-02	Jour	PR/C,103,024614	21	J.A.Shusterman+	14697

39 Yttrium 89

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	$n,2n$	^{88}Y	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	$n,2n$	^{88}Y	CS	3CZRUJF	1.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	$n,3n$	^{87}Y	CS	3KORKRM	2.3+07	3.1+07	Jour	NP/A,970,411	18	M.Nadeem+	30850
*	$n,3n$	^{87}Y	CS	3CZRUJF	2.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	$n,4n$	^{86}Y	CS	3KORKRM	3.4+07	3.6+07	Jour	NP/A,970,411	18	M.Nadeem+	30850

40 Zirconium 88

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,γ	^{89}Zr	CS	1USADAV	2.5-02	2.5-02	Jour	PR/C,103,024614	21	J.A.Shusterman+	14697
*	n,γ	^{89}Zr	RI	1USADAV		2.5-02	Jour	PR/C,103,024614	21	J.A.Shusterman+	14697

40 Zirconium 90

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{89}Zr	CS	3CPRNPC	1.4+07	1.5+07	Jour	ARI,170,109588	21	Xinyi Chang+	32851
	p,0		RP	1USAFSU			Jour	NP/A,174,273	71	P.Richard+	C2621
	p,el	^{90}Zr	DA	1USAFSU	5.8+06	6.1+06	Jour	NP/A,174,273	71	P.Richard+	C2621

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{92}Nb	CS	3KORKRM	1.4+07	2.6+07	Jour	NP/A,970,156	18	H.Naik+	30849
*	n,2n	^{92}Nb	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	n,3n	^{91}Nb	CS	3KORKRM	2.3+07	3.0+07	Jour	NP/A,970,156	18	H.Naik+	30849
*	n,4n	^{90}Nb	CS	3KORKRM	3.4+07	3.4+07	Jour	NP/A,970,156	18	H.Naik+	30849

42 Molybdenum 92

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{92}Nb	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
	p,0		RP	1USAFSU			Jour	NP/A,174,273	71	P.Richard+	C2621
	p,el	^{92}Mo	DA	1USAFSU	5.2+06	5.4+06	Jour	NP/A,174,273	71	P.Richard+	C2621

48 Cadmium 111

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,inel	^{111}Cd	CS	3EGYCAI	4.0+06	4.0+06	Jour	IJP,95,1491	21	M.Tohamy+	31836

55 Cesium 133

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,0		RP	1USARPI			Jour	NSE,195,679	21	R.C.Block+	14709
*	n,γ	^{134}Cs	CS	1USARPI	6.0+02	2.0+03	Jour	NSE,195,679	21	R.C.Block+	14709
*	n,tot		CS	1USARPI	6.0+02	2.0+03	Jour	NSE,195,679	21	R.C.Block+	14709

60 Neodymium 143

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,α	^{140}Ce	CSP	3POLIBJ	1.2+07	1.8+07	Jour	BAS,45,(11),131	81	W.Augustyniak+	30477
	n,α	^{140}Ce	DAE	3POLIBJ	1.2+07	1.8+07	Jour	BAS,45,(11),131	81	W.Augustyniak+	30477

	n,α	^{140}Ce	DAP	3POLIBJ	1.2+07	1.8+07	Jour	BAS,45,(11),131	81	W.Augustyniak+	30477
	n,α	^{140}Ce	DE	3POLIBJ	1.2+07	1.8+07	Jour	BAS,45,(11),131	81	W.Augustyniak+	30477

62 Samarium 149

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,α	^{146}Nd	DAP	3POLIBJ	1.2+07	1.2+07	Prog	INDC(POL)-9,10	78	W.Augustyniak+	30478

69 Thulium 169

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	$n,2n$	^{168}Tm	CS	1USATNL	1.5+07	2.1+07	Jour	PR/C,103,044609	21	S.W.Finch+	14708
*	$n,3n$	^{167}Tm	CS	1USATNL	1.6+07	2.1+07	Jour	PR/C,103,044609	21	S.W.Finch+	14708

72 Hafnium 180

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,p	^{180}Lu	CS	3CPRNPC	1.4+07	1.5+07	Jour	ARI,170,109588	21	Xinyi Chang+	32851

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,tot		CS	1USARPI	1.7+02	2.5+05	Jour	NSE,194,221	20	J.M.Brown+	14686

79 Gold 197

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	$n,2n$	^{196}Au	CS	3CZRCTI	1.5+06	1.5+06	Jour	ANE,158,108268	21	M.Kostal+	31838
*	$n,2n$	^{196}Au	CS	3CZRUJF	1.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	$n,3n$	^{195}Au	CS	3CZRUJF	1.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	$n,4n$	^{194}Au	CS	3CZRUJF	2.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
	p,x	^{196}Au	CS	1USACAR	4.0+08	4.0+08	Jour	JIN,33,909	71	L.B.Church	C2617
	^{12}C,fis		CS	1USABRK	6.9+07	1.2+08	Jour	PR,120,1341	60	G.E.Gordon+	C2653
	^{12}C,fis		DA	1USABRK	7.2+07	1.2+08	Jour	PR,120,1341	60	G.E.Gordon+	C2653
	^{12}C,fis		KE	1USABRK	7.0+07	1.2+08	Jour	PR,120,1341	60	G.E.Gordon+	C2653
	^{12}C,fis		?	1USABRK	7.0+07	1.2+08	Jour	PR,120,1341	60	G.E.Gordon+	C2653

83 Bismuth 209

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,3n	^{207}Bi	CS	3CZRUJF	1.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842
*	n,4n	^{206}Bi	CS	3CZRUJF	2.8+07	2.8+07	Jour	NIM/B,511,64	22	J.Jarosik+	31842

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,fis	Many	FY	1USAMHG	2.5-02	2.5-02	Thes	TSOUKATOS	67	M.P.Tsoukatos	14088

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis	Many	FY	3INDTRM	1.9+06		Jour	RPC,189,109755	21	H.Naik+	33166
*	n,γ	^{239}U	CS	3CPRNPC	1.4+07	1.5+07	Jour	RPC,152,125	18	Qiang Wang+	32784
	n,γ	^{239}U	CS	1USARPI	1.5+02	1.0+05	Rept	NASA-TM-X-69565	73	T.Y.Byoun+	10577
	n,tot		CS	1USARPI	1.5+02	1.0+05	Rept	NASA-TM-X-69565	73	T.Y.Byoun+	10577

94 Plutonium 239

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,2n	^{238}Pu	CS	3CPRAEP	5.9+06	2.0+07	Jour	EPJ/CS,239,01007	20	Nanru Ma+	32815
*	n,fis		CS	3CPRAEP	5.9+06	2.4+07	Jour	EPJ/CS,239,01007	20	Nanru Ma+	32815
*	n,fis	Many	FY	1USALAS	2.9+06	8.3+07	Jour	EPJ/A,56,297	20	A.Chemey+	14715
*	n,fis		KE	1USALAS	2.4+06	1.0+08	Jour	EPJ/A,56,297	20	A.Chemey+	14715
*	n,fis		MFQ	1USALAS	1.0+06	2.0+07	Jour	PR/C,102,034615	20	K.J.Kelly+	14682
*	n,fis	n	KE	1USALAS	1.0+06	2.0+07	Jour	PR/C,102,034615	20	K.J.Kelly+	14682

94 Plutonium 241

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	n,fis		NU	1USATAM		2.0+07	Jour	PR/C,99,054601	19	O.A.Akindele+	14570

98 Californium 252

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,fis		DAP	1USAISU	Spont		Jour	PR/C,102,014612	20	J.Burggraf+	14698
	0,fis	γ	FY	1USALRL	Spont		Jour	PR/C,10,795	74	F.S.Dietrich+	14642
	0,fis	Many	FY	3ISLSOR	Spont		Jour	PR/C,1,2101	70	Y.Gazit+	31843

0,fis		KE	3ISLSOR	Spont	Jour	PR,182,1244	69	E.Nardi+	31844
0,fis	Many	MAS	3ISLSOR	Spont	Jour	PR,182,1244	69	E.Nardi+	31844
0,fis		MAS	3ISLSOR	Spont	Jour	PR,182,1244	69	E.Nardi+	31844
0,fis	Many	MAS	3ISLSOR	Spont	Jour	PR,182,1244	69	E.Nardi+	31844
0,fis		MAS	3ISLSOR	Spont	Jour	PR,182,1244	69	E.Nardi+	31844
0,fis	Many	?	3ISLSOR	Spont	Jour	PR,182,1244	69	E.Nardi+	31844
0,fis	Many	?	3ISLSOR	Spont	Jour	PRL,20,1248	68	E.Nardi+	31845
0,fis	^{4}He	NU	3ISLSOR	Spont	Jour	PRL,20,1248	68	E.Nardi+	31845
0,fis	^{136}Cs	FY	4RUSRI	Spont	Jour	AE,34,365	73	N.V.Skovorodkin+	40205