EXFOR News (September 2017)

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)

8 Oxygen 16

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,n	^{17}F	DAP	1USAORE	2.0+06	4.5+06	Jour	NIM,79,245	70	W.R.Wylie+	C0350

13 Aluminium 27

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,x+α	inclusive	CS	1USADAV	5.0+06	3.4+07	Rept	INDC(USA)-84,113	80	D.W.Kneff+	14281
p,x+n	inclusive	PY	1USAANL	1.1+08	2.6+08	Rept	ANL/NPBTSTR-023	89	L.R.Greenwood+	C0746

26 Iron

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,x	^{52}Mn	CS	1USAANL	1.9+07	2.5+08	Conf	99OSAKA,,409	99	L.R.Greenwood	14280
n,x+α	inclusive	CS	1USADAV	5.0+06	3.4+07	Rept	INDC(USA)-84,113	80	D.W.Kneff+	14281

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	1USAANL	3.7+06	2.5+08	Conf	99OSAKA,,409	99	L.R.Greenwood	14280
n,p	^{54}Mn	CS	1USAANL	2.1+05	2.5+08	Conf	99OSAKA,,409	99	L.R.Greenwood	14280

27 Cobalt 59

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,x+n	inclusive	CS	1USALRL	1.0+07	3.7+07	Jour	PR/C,20,128	Jul 79	R.A.Alvarez+	L0028
γ,x+n	inclusive	CS	1USALRL	9.6+06	2.8+07	Jour	PR,128,2345	62	S.C.Fultz+	L0001

28 Nickel

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,x+α	inclusive	CS	1USADAV	5.0+06	3.4+07	Rept	INDC(USA)-84,113	80	D.W.Kneff+	14281

29 Copper

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,x+α	inclusive	CS	1USADAV	5.0+06	3.4+07	Rept	INDC(USA)-84,113	80	D.W.Kneff+	14281

36 Krypton 86

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{85}Kr	CS	1USATNL	1.1+07	1.3+07	Jour	PRL,111,112501	13	R.Raut+	L0174

42 Molybdenum 92

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{91}Mo	CS	4ZZZDUB		2.4+07	Jour	PPN/L,14,(1),102	17	Tranducthiep+	M0935

42 Molybdenum 96

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,p	^{95}Nb	CS	4ZZZDUB		2.4+07	Jour	PPN/L,14,(1),102	17	Tranducthiep+	M0935

42 Molybdenum 98

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,p	^{97}Nb	CS	4ZZZDUB		2.4+07	Jour	PPN/L,14,(1),102	17	Tranducthiep+	M0935

50 Tin 116

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{40}Ar,fis		CS	1USABRK	1.8+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fis		DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fus		CS	1USABRK	1.8+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	Many	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	^{9}Be	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+α	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+p	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358

62 Samarium 154

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{40}Ar,fis		CS	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fis		DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fus		CS	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	Many	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	^{9}Be	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+α	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+α	inclusive	DAE	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+p	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+p	inclusive	DAE	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358

65 Terbium 159

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,3n	^{156}Tb	CS	4RUSMOS	2.4+07	2.8+07	Jour	PR/C,95,054607	17	V.V.Varlamov+	M0937

66 Dysprosium 164

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	^{40}Ar,fis		CS	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fis		DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fus		CS	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	Many	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	^{9}Be	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+α	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+p	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358

73 Tantalum 180

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	γ,2n	^{178}Ta	CS	4ZZZDUB		2.4+07	Jour	ZP/A,356,23	96	S.A.Karamian+	M0936

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,el	^{181}Ta	CS	1USATNL	2.2+06	2.8+06	Jour	PRL,117,142501	16	C.T.Angell+	L0220

79 Gold 197

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,x+α	inclusive	CS	1USADAV	5.0+06	3.4+07	Rept	INDC(USA)-84,113	80	D.W.Kneff+	14281
	^{40}Ar,fis		CS	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,fis		DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	Many	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x	^{9}Be	DA	1USABRK	3.4+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+α	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358
	^{40}Ar,x+p	inclusive	DA	1USABRK	2.2+08	3.4+08	Jour	PR/C,22,1080	80	D.Logan+	C0358

82 Lead 208

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{48}Ti,2n	^{254}Rf	CS	1USABRK	2.2+08	2.4+08	Jour	PR/C,78,024605	08	I.Dragojevic+	C1738
*	^{48}Ti,n	^{255}Rf	CS	1USABRK	2.2+08	2.4+08	Jour	PR/C,78,024605	08	I.Dragojevic+	C1738
*	^{50}Ti,2n	^{256}Rf	CS	1USABRK	2.3+08	2.4+08	Jour	PR/C,78,024605	08	I.Dragojevic+	C1738
*	^{50}Ti,n	^{257}Rf	CS	1USABRK	2.3+08	2.4+08	Jour	PR/C,78,024605	08	I.Dragojevic+	C1738
*	^{51}V,2n	^{257}Db	CS	1USABRK	2.4+08	2.6+08	Jour	PR/C,78,034604	08	J.M.Gates+	C1703
*	^{51}V,n	^{258}Db	CS	1USABRK	2.4+08	2.6+08	Jour	PR/C,78,034604	08	J.M.Gates+	C1703
	^{55}Mn,2n	^{261}Bh	CS	1USABRK	2.6+08	2.7+08	Jour	PR/C,73,014611	06	C.M.Foldeniii+	C1735
	^{55}Mn,n	^{262}Bh	CS	1USABRK	2.6+08	2.7+08	Jour	PR/C,73,014611	06	C.M.Foldeniii+	C1735

83 Bismuth 209

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{50}Ti,2n	^{257}Db	CS	1USABRK	2.3+08	2.4+08	Jour	PR/C,78,034604	08	J.M.Gates+	C1703
*	^{50}Ti,n	^{258}Db	CS	1USABRK	2.3+08	2.4+08	Jour	PR/C,78,034604	08	J.M.Gates+	C1703

92 Uranium 235

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	n,fis		CS	1USAORL	1.4+00	1.1+05	Jour	NSE,88,567	84	L.W.Weston+	12877

92 Uranium 238

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,x	Many	CS	1USABNL	2.8+10	2.8+10	Jour	NP/B,40,428	72	Y.Y.Chu+	C0378
	p,x+n	inclusive	PY	1USAANL	1.1+08	2.6+08	Rept	ANL/NPBTSTR-023	89	L.R.Greenwood+	C0746
	α,2n	^{240}Pu	CS	1USASTB	2.0+07	3.7+07	Jour	PR/C,7,(3),1222	73	M.N.Namboodiri+	C1797
	α,3n	^{239}Pu	CS	1USASTB	2.4+07	4.5+07	Jour	PR/C,7,(3),1222	73	M.N.Namboodiri+	C1797
	α,4n	^{238}Pu	CS	1USASTB	3.3+07	3.7+07	Jour	PR/C,7,(3),1222	73	M.N.Namboodiri+	C1797

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	1USATNL	1.1+07	1.1+07	Jour	PR/C,95,024608	17	Meghabhike+	L0221
	n,fis		CS	1USAORL	1.4+00	1.1+05	Jour	NSE,88,567	84	L.W.Weston+	12877

94 Plutonium 240

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis		CS	1USAORL	1.4+00	1.1+05	Jour	NSE,88,567	84	L.W.Weston+	12877

100 Fermium 255

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{256}Fm	CS	1USAGEV	Maxwl		Jour	NP/A,115,225	68	R.W.Hoff+	14279

100 Fermium 257

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{258}Fm	CS	1USAGEV	Maxwl		Jour	NP/A,115,225	68	R.W.Hoff+	14279