EXFOR News (March 2014)

New experimental data available from Nuclear Reaction Data Centres

EXFOR is a world-wide data library for experimental neutron induced, charged-particle induced and photonuclear reaction data compiled by the International Network of the Nuclear Reaction Data Centres (NRDC)[a] coordinated by the IAEA Nuclear Data Section. Regularly updated retrieval database is available at NNDC, NEADB, IAEA-NDS, JAEA, JCPRG and CDFE. Please send an email to n.otsuka@iaea.org if you would prefer to be advised electronically when EXFOR News is released.

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 $\mathrm{d}\Omega_1/\mathrm{d}\Omega_2/\mathrm{d}E'$	NUD	Delayed fission neutron multiplicity $\bar{\nu}_d$
D3E	Triple differential $\mathrm{d}\Omega/\mathrm{d}E'_1/\mathrm{d}E'_2$	NUF	Fragment neutrons
D4A	Quadruple diff. $\mathrm{d}\Omega_1/\mathrm{d}\Omega_2/\mathrm{d}E'_1/\mathrm{d}E'_2$	POL	Polarization
DA	Differential $\mathrm{d}/\mathrm{d}\Omega$	POD	Differential polarization
DAA	Double differential $\mathrm{d}\Omega_1/\mathrm{d}\Omega_2$	PY	Product yield (other than fission)
DAE	Double differential $\mathrm{d}\Omega/\mathrm{d}E'$	RI	Resonance integral
DAP	Partial differential $\mathrm{d}/\mathrm{d}\Omega$	RP	Resonance parameter
DAT	Temperature-dependent Legendre coefficient	RR	Reaction rate
DE	Differential $\mathrm{d}/\mathrm{d}E'$	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, $\mathrm{d}/\mathrm{d}\Omega$
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), CAJaD (Russia), 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 #
γ,π^+	n	DA	1CANSAS	1.9+08	1.9+08	Jour	KPS,29,(5),581	96	H.T.Chung+	L0184
n,ths	^{1}H	CS	1USALAS	8.0-08	8.0-08	Jour	PR/C,88,037601	13	E.I.Sharapov+	14373
^{17}C,n+X	^{15}C	DE	2JPNIPC	1.2+09	1.2+09	Jour	PL/B,728,462	14	Y.Satou+	E2448
^{17}C,n+X	^{15}C	DEP	2JPNIPC	1.2+09	1.2+09	Jour	PL/B,728,462	14	Y.Satou+	E2448
^{17}C,x	^{16}C	CSP	2JPNIPC	1.2+09	1.2+09	Jour	PL/B,728,462	14	Y.Satou+	E2448
^{17}C,x	^{16}C	DP	2JPNIPC	1.2+09	1.2+09	Jour	PL/B,728,462	14	Y.Satou+	E2448

2 Helium 4

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,d	^{3}He	CS	2JPNTOK	5.5+07	5.5+07	Jour	PL,8,330	64	S.Hayakawa+	E2354
p,d	^{3}He	DA	2JPNTOK	5.5+07	5.5+07	Jour	PL,8,330	64	S.Hayakawa+	E2354
p,el	^{4}He	DA	2JPNTOK	5.5+07	5.5+07	Jour	PL,8,330	64	S.Hayakawa+	E2354

6 Carbon 12

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x	^{11}C	CS	2JPNJPN	3.2+07	7.0+07	Jour	RM,59,262	13	T.Akagi+	E2449

7 Nitrogen 15

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,π^-	^{15}O	DAP	1CANSAS	1.8+08	1.9+08	Jour	KPS,29,(5),581	96	H.T.Chung+	L0184

8 Oxygen 16

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
p,x	^{11}C	CS	2JPNJPN	7.2+06	6.9+07	Jour	RM,59,262	13	T.Akagi+	E2449
p,x	^{13}N	CS	2JPNJPN	7.2+06	6.9+07	Jour	RM,59,262	13	T.Akagi+	E2449
p,x	^{15}O	CS	2JPNJPN	7.2+06	6.9+07	Jour	RM,59,262	13	T.Akagi+	E2449

16 Sulphur 32

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

α,el	^{32}S	DA	2JPNOSA	3.9+08	3.9+08	Jour	PR/C,88,064313	13	M.Itoh+	E2447
α,inel	^{32}S	DAP	2JPNOSA	3.9+08	3.9+08	Jour	PR/C,88,064313	13	M.Itoh+	E2447
α,inel	^{32}S	?	2JPNOSA	3.9+08	3.9+08	Jour	PR/C,88,064313	13	M.Itoh+	E2447

22 Titanium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,x+n	inclusive	PY	2JPNKYU	5.0+06	5.0+06	Jour	KPS,59,1725	11	N.Shigyo+	E2367

23 Vanadium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,ths	^{nat}V	CS	1USALAS	8.0-08	8.0-08	Jour	PR/C,88,037601	13	E.I.Sharapov+	14373

26 Iron

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,tot		CS	1USAWIS	9.0+03	4.9+05	Jour	PR,73,659	48	H.H.Barschall+	12227

28 Nickel

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,tot		CS	1USAWIS	9.4+03	4.9+05	Jour	PR,73,659	48	H.H.Barschall+	12227

29 Copper

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,x+n	inclusive	PY	2JPNKYU	5.0+06	5.0+06	Jour	KPS,59,1725	11	N.Shigyo+	E2367

41 Niobium

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
d,x+n	inclusive	PY	2JPNKYU	9.0+06	9.0+06	Jour	KPS,59,1725	11	N.Shigyo+	E2367

78 Platinum 192

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{193}Pt	CS	1USAORL	Maxwl	5.0+05	Jour	PR/C,88,035802	13	P.E.Koehler+	14372

78 Platinum 194

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{195}Pt	CS	1USAORL	Maxwl	5.0+05	Jour	PR/C,88,035802	13	P.E.Koehler+	14372

78 Platinum 195

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{196}Pt	CS	1USAORL	Maxwl	5.0+05	Jour	PR/C,88,035802	13	P.E.Koehler+	14372

78 Platinum 196

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{197}Pt	CS	1USAORL	Maxwl	5.0+05	Jour	PR/C,88,035802	13	P.E.Koehler+	14372

82 Lead 204

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{34}S,fis		CS	2JPNJAE	1.4+08	1.7+08	Jour	PR/C,86,064602	12	J.Khuyagbaatar+	E2413
^{36}S,fis		CS	2JPNJAE	1.4+08	1.7+08	Jour	PR/C,86,064602	12	J.Khuyagbaatar+	E2413

82 Lead 206

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{34}S,fis		CS	2JPNJAE	1.4+08	1.7+08	Jour	PR/C,86,064602	12	J.Khuyagbaatar+	E2413
^{36}S,fis		CS	2JPNJAE	1.4+08	1.7+08	Jour	PR/C,86,064602	12	J.Khuyagbaatar+	E2413

82 Lead 208

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{34}S,fis		CS	2JPNJAE	1.4+08	1.7+08	Jour	PR/C,86,064602	12	J.Khuyagbaatar+	E2413
^{36}S,fis		CS	2JPNJAE	1.4+08	1.7+08	Jour	PR/C,86,064602	12	J.Khuyagbaatar+	E2413

83 Bismuth 209

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,tot		CS	1USAWIS	9.2+03	5.0+05	Jour	PR,73,659	48	H.H.Barschall+	12227

92 Uranium 233

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,fis		NU	1USALRL	8.2+06	1.8+07	Jour	PR/C,34,2201	Dec 86	B.L.Berman+	L0058

92 Uranium 234

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,fis		NU	1USALRL	7.9+06	1.8+07	Jour	PR/C,34,2201	Dec 86	B.L.Berman+	L0058

92 Uranium 235

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,fis	Many	KE	1USABNL	Maxwl		Jour	PRL,44,1200	80	C.A.Fontenla+	10937

92 Uranium 236

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
0,fis	Many	FY	1USABNL	Spont		Jour	PRL,44,1200	80	C.A.Fontenla+	10937
0,fis	Many	KE	1USABNL	Spont		Jour	PRL,44,1200	80	C.A.Fontenla+	10937

92 Uranium 238

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
^{40}Ca,fis		CS	2JPNJAE	1.8+08	2.3+08	Jour	PR/C,86,034608	12	K.Nishio+	E2411
^{40}Ca,fis	Many	FY	2JPNJAE	1.8+08	2.3+08	Jour	PR/C,86,034608	12	K.Nishio+	E2411
^{40}Ca,fis	Many	KE	2JPNJAE	1.8+08	2.3+08	Jour	PR/C,86,034608	12	K.Nishio+	E2411
^{48}Ca,fis		CS	2JPNJAE	1.8+08	2.5+08	Jour	PR/C,86,034608	12	K.Nishio+	E2411
^{48}Ca,fis	Many	FY	2JPNJAE	1.8+08	2.5+08	Jour	PR/C,86,034608	12	K.Nishio+	E2411
^{48}Ca,fis	Many	KE	2JPNJAE	1.8+08	2.5+08	Jour	PR/C,86,034608	12	K.Nishio+	E2411

93 Neptunium 237

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,fis		NU	1USALRL	7.5+06	1.8+07	Jour	PR/C,34,2201	Dec 86	B.L.Berman+	L0058

94 Plutonium 238

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
n,γ	^{239}Pu	CS	1USALAS	2.5-02	9.0+05	Jour	PR/C,88,044607	13	A.Chyzh+	14364

94 Plutonium 239

Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
γ,fis		NU	1USALRL	7.1+06	1.6+07	Jour	PR/C,34,2201	Dec 86	B.L.Berman+	L0058