EXFOR News (October 2021)

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 #
*	^{8}Li,el	^{1}H	?	1USAFSU			Jour	PR/C,102,014615	20	C.Hunt+	C2600

1 Hydrogen 2

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{7}Be,α	^{5}Li	?	1USAFSU	1.3+05	1.7+06	Jour	PRL,122,182701	19	N.Rijal+	C2459
*	^{7}Be,p	^{8}Be	?	1USAFSU	2.2+05	1.7+06	Jour	PRL,122,182701	19	N.Rijal+	C2459
*	^{7}Be,x+α	inclusive	?	1USAFSU	2.2+05	1.7+06	Jour	PRL,122,182701	19	N.Rijal+	C2459
*	^{12}B,^{3}He	^{11}Be	?	1USAANL	1.4+08	1.4+08	Jour	PR/C,100,064314	19	J.Chen+	C2438
*	^{26}Si,p	^{27}Si	?	1USAMSU	7.8+08	7.8+08	Jour	PRL,126,042701	21	S.Hallam+	C2594

3 Lithium 6

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	α,γ		RP	1CANTMF	1.5+06	1.5+06	Jour	NIM/A,987,164828	21	A.Psaltis+	C2592

4 Berylium 9

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{38}Ca,x	^{40}Sc	CS	1USAMSU	2.3+09	2.3+09	Jour	PL/B,808,135637	20	A.Gade+	C2585

5 Boron 10

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	p,α	^{7}Be	CS	2UK HAR	5.3+05	5.3+05	Jour	PM,40,807	49	W.E.Burcham+	F0346
	p,α	^{7}Be	CSP	2UK ALD	1.5+06	1.5+06	Jour	PR,106,1012	57	S.E.Hunt+	F0342
	p,γ	^{11}C	CSP	2UK ALD	1.1+06	1.1+06	Jour	PR,106,1012	57	S.E.Hunt+	F0342
	p,inel	^{10}B	CSP	2UK ALD	2.7+06	2.7+06	Jour	PR,106,1012	57	S.E.Hunt+	F0342

6 Carbon 14

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
	α,0		RP	1USAWIS			Jour	PR,104,1434	56	R.M.Sanders	C1880

14 Silicon 30

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	1USATNL	4.2+05	4.9+05	Jour	PR/C,102,014609	20	J.Dermigny+	C2578
*	p,γ	^{31}P	RR	1USATNL			Jour	PR/C,102,014609	20	J.Dermigny+	C2578

19 Potassium 38

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ		RP	1USAANL	3.9+05	7.0+05	Jour	PR/C,101,015804	20	M.R.Hall+	C2454

23 Vanadium 51

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	$\gamma,2n$	^{49}V	INT	4RUSMOS		2.7+07	Jour	YF,84,278	21	V.V.Varlamov+	M1028
*	γ,n	^{50}V	INT	4RUSMOS		2.7+07	Jour	YF,84,278	21	V.V.Varlamov+	M1028
*	γ,x+n	inclusive	INT	4RUSMOS		2.7+07	Jour	YF,84,278	21	V.V.Varlamov+	M1028

24 Chromium

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,x	^{51}Cr	CS	1USAUAL	1.4+07	2.0+07	Jour	ARI,147,165	19	R.Elsayed+	C2604
*	p,x	^{52}Mn	CS	1USAUAL	1.1+07	2.0+07	Jour	ARI,147,165	19	R.Elsayed+	C2604
*	p,x	^{54}Mn	CS	1USAUAL	1.1+07	2.0+07	Jour	ARI,147,165	19	R.Elsayed+	C2604

28 Nickel 58

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	^{3}He,n	^{60}Zn	DE	1USAOHO	9.9+06	9.9+06	Jour	PR/C,103,015802	21	D.Soltesz+	C2593

29 Copper 65

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{64}Cu	CS	4ARMJER		4.0+07	Jour	YF,84,194	21	A.E.Avetisyan+	M1030

30 Zinc 60

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,0		NQ	1USAOHO			Jour	PR/C,103,015802	21	D.Soltesz+	C2593

30 Zinc 64

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{62}Zn	CS	4ARMJER		4.0+07	Jour	NIM/B,498,48	21	G.H.Hovhannisyan+	M1029
*	γ,n	^{63}Zn	CS	4ARMJER		4.0+07	Jour	NIM/B,498,48	21	G.H.Hovhannisyan+	M1029

30 Zinc 66

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{65}Zn	CS	4ARMJER		4.0+07	Jour	NIM/B,498,48	21	G.H.Hovhannisyan+	M1029
*	γ,x	^{64}Cu	CS	4ARMJER		4.0+07	Jour	NIM/B,498,48	21	G.H.Hovhannisyan+	M1029

30 Zinc 68

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,p	^{67}Cu	CS	4ARMJER		4.0+07	Jour	NIM/B,498,48	21	G.H.Hovhannisyan+	M1029

30 Zinc 70

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,n	^{69}Zn	CS	4ARMJER		4.0+07	Jour	NIM/B,498,48	21	G.H.Hovhannisyan+	M1029

41 Niobium 93

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Energy (eV) Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,2n	^{91}Nb	CS	4ARMJER		4.0+07	Jour	YF,84,194	21	A.E.Avetisyan+	M1030
*	γ,3n	^{90}Nb	CS	4ARMJER		4.0+07	Jour	YF,84,194	21	A.E.Avetisyan+	M1030
*	γ,n	^{92}Nb	CS	4ARMJER		4.0+07	Jour	YF,84,194	21	A.E.Avetisyan+	M1030

46 Palladium 102

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

*	p,γ	^{103}Ag	CS	1USANOT	3.9+06	7.9+06	Jour	PR/C,102,055806	20	O.Olivas-Gomez+	C2602

48 Cadmium 108

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{109}In	CS	1USANOT	3.7+06	6.9+06	Jour	PR/C,102,055806	20	O.Olivas-Gomez+	C2602

48 Cadmium 110

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,γ	^{111}In	CS	1USANOT	2.9+06	5.9+06	Jour	PR/C,102,055806	20	O.Olivas-Gomez+	C2602

73 Tantalum 181

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	γ,p	^{180}Hf	CS	4RUSRUS		2.0+07	Jour	EPJ/A,57,121	21	V.A.Zheltonozhsky+	M1027
*	γ,p	^{180}Hf	CS	4ZZZDUB		4.0+07	Jour	EPJ/A,57,121	21	V.A.Zheltonozhsky+	M1027
*	γ,p	^{180}Hf	CS	4RUSMOS		5.5+07	Jour	EPJ/A,57,121	21	V.A.Zheltonozhsky+	M1027

90 Thorium 230

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,2n	^{229}Pa	CS	1USALRL	1.4+07	1.7+07	Jour	PR/C,103,034610	21	K.N.Kmak+	C2603
*	p,3n	^{228}Pa	CS	1USALRL	1.6+07	1.7+07	Jour	PR/C,103,034610	21	K.N.Kmak+	C2603

90 Thorium 232

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	p,n	^{232}Pa	CS	1USALRL	1.4+07	1.7+07	Jour	PR/C,103,034610	21	K.N.Kmak+	C2603
*	p,x	Many	CS	1CANTMF	4.4+08	4.4+08	Jour	PR/C,102,044613	20	A.K.H.Robertson+	C2601

98 Californium 252

	Reaction	Product	Quant.	Lab.	Energy (eV) Min	Max	Type	Documentation Ref Vol Page	Date	Author	Data #
*	0,fis	γ	FY	4RUSMOS	Spont		Jour	IZV,75,580	11	N.V.Eremin+	41551