

## Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)

### EXFOR : Recent Compilation List (Added in Jun 2006)

EXFOR is a world-wide database for experimental neutron induced, charged-particle induced and photonuclear reaction compiled by Nuclear Reaction Data Centres Network coordinated by IAEA Nuclear Data Section. This list gives newly compiled data to EXFOR. *List consists of tables titled by target nuclide.*

Retrieval service is available at:

<http://www.jcprg.org/exfor/>

#### Quantity code

ALF	Alpha	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	Nu
D3A	Triple differential $d\Omega_1/d\Omega_2/dE'$	NUD	Nu delayed
D3E	Triple differential $d\Omega/dE'_1/dE'_2$	NUF	Fragment neutrons
D4A	Quadruple diff. $d\Omega_1/d\Omega_2/dE'_1/dE'_2$	POL	Polarization
DA	Differential $d/d\Omega$	POD	Differential polarization
DAA	Double differential $d\Omega_1/d\Omega_2$	PY	Product yield (other than fission)
DAE	Double differential $d\Omega/dE'$	RI	Resonance integral
DAP	Partial differential $d/d\Omega$	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	Eta	TTD	Differential thick target yield, $d/d\Omega$
EVL	Evaluation	TT	Partial thick target yield

#### Special codes in outgoing particle field

abs	Absorption	fus	Fusion	non	Nonelastic	ths	Thermal scattering
el	Elastic	inel	Inelastic	sct	Scattering	tot	Total
f	Fission	incl	Inclusive	tcc	Total charge changing		

#### Special codes in incident energy field

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



**11 Sodium 23**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,el</i>	<sup>23</sup> Na	DA	2UK CAV	4.3+05	9.6+05	Jour	PM,1,821		56	G.Dearnaley	D0319

**12 Magnesium**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,γ</i>	incl	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115		80	M.J.Kenny+	D0384

**12 Magnesium 24**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,incl</i>	<sup>24</sup> Mg	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115		80	M.J.Kenny+	D0384

**12 Magnesium 25**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,incl</i>	<sup>25</sup> Mg	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115		80	M.J.Kenny+	D0384

**12 Magnesium 26**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,γ</i>	<sup>27</sup> Al	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115		80	M.J.Kenny+	D0384

**13 Aluminium 27**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,γ</i>	incl	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115		80	M.J.Kenny+	D0384
<i>α,el</i>	<sup>27</sup> Al	DA	3INDVEC	5.0+07		Jour	NC/A,105,517		92	R.N.Mukherjee+	D0382

**14 Silicon**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
<i>p,γ</i>	incl	TTD	3AULAUA	2.5+06		Jour	NIM,168,115		80	M.J.Kenny+	D0384

14

Silicon

28

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
$\alpha$ ,el	$^{28}\text{Si}$	DA	3INDVEC	4.0+07	4.5+07	Jour	PR/C,45,2904		92	S.Roy+	D0220
$\alpha$ ,el	$^{28}\text{Si}$	DA	3INDVEC	4.0+07	5.0+07	Conf	89BANGLO,,497		89	T.K.De+	D0379
$\alpha$ ,inel	$^{28}\text{Si}$	DAP	3INDVEC	4.0+07	4.5+07	Jour	PR/C,45,2904		92	S.Roy+	D0220
$\alpha$ ,inel	$^{28}\text{Si}$	DAP	3INDVEC	4.0+07	5.0+07	Conf	89BANGLO,,497		89	T.K.De+	D0379

20

Calcium

40

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
$\alpha$ ,el	$^{40}\text{Ca}$	DA	2GERKFK	1.0+08		Jour	PR/C,21,1239		80	H.J.Gils+	D0332
$\alpha$ ,el	$^{40}\text{Ca}$	DA	2UK HAR	2.4+07	8.6+07	Jour	NP/A,270,413		76	H.H.Chang+	D0307
$\alpha$ ,el	$^{40}\text{Ca}$	DA	1USADAV	8.2+07		Jour	NP/A,270,413		76	H.H.Chang+	D0307

20

Calcium

42

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
$\alpha$ ,el	$^{42}\text{Ca}$	DA	2GERKFK	1.0+08		Jour	PR/C,21,1239		80	H.J.Gils+	D0332

20

Calcium

44

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
$\alpha$ ,el	$^{44}\text{Ca}$	DA	2GERKFK	1.0+08		Jour	PR/C,21,1239		80	H.J.Gils+	D0332

20

Calcium

48

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
$\alpha$ ,el	$^{48}\text{Ca}$	DA	2GERKFK	1.0+08		Jour	PR/C,21,1239		80	H.J.Gils+	D0332

28

Nickel

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
$p,\gamma$	incl	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115		80	M.J.Kenny+	D0384

**28                      Nickel                      58**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\alpha$ ,el	<sup>58</sup> Ni	DA	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,el	<sup>58</sup> Ni	DA	3SAFNLP	2.4+07	3.2+07	Jour	NP/A,229,256	74	A.A.Cowley+	D0374
$\alpha$ ,el	<sup>58</sup> Ni	DA	2UK HAR	2.5+07	4.0+07	Jour	NP/A,270,413	76	H.H.Chang+	D0307
$\alpha$ ,el	<sup>58</sup> Ni	DA	2SWTBAS	2.7+07	4.2+07	Jour	HPA,51,726	78	U.Kiebele+	D0373
$\alpha$ ,el	<sup>58</sup> Ni	DA	3SAFNLP	3.2+07		Jour	NP/A,229,256	74	A.A.Cowley+	D0374
$\alpha$ ,el	<sup>58</sup> Ni	DA	2SWTBAS	3.7+07	4.9+07	Jour	HPA,51,726	78	U.Kiebele+	D0373
$\alpha$ ,el	<sup>58</sup> Ni	DA	2UK HAR	5.2+07	8.6+07	Jour	NP/A,270,413	76	H.H.Chang+	D0307
$\alpha$ ,el	<sup>58</sup> Ni	DA	1USADAV	8.2+07		Jour	NP/A,270,413	76	H.H.Chang+	D0307
$\alpha$ ,inel	<sup>58</sup> Ni	DAP	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,inel	<sup>58</sup> Ni	DAP	3SAFNLP	3.2+07		Jour	NP/A,229,256	74	A.A.Cowley+	D0374

**28                      Nickel                      60**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\alpha$ ,el	<sup>60</sup> Ni	DA	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,el	<sup>60</sup> Ni	DA	3SAFNLP	2.4+07	3.2+07	Jour	NP/A,229,256	74	A.A.Cowley+	D0374
$\alpha$ ,inel	<sup>60</sup> Ni	DAP	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,inel	<sup>60</sup> Ni	DAP	3SAFNLP	3.2+07		Jour	NP/A,229,256	74	A.A.Cowley+	D0374

**28                      Nickel                      62**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\alpha$ ,el	<sup>62</sup> Ni	DA	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,el	<sup>62</sup> Ni	DA	3SAFNLP	2.4+07	3.2+07	Jour	NP/A,229,256	74	A.A.Cowley+	D0374
$\alpha$ ,inel	<sup>62</sup> Ni	DAP	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,inel	<sup>62</sup> Ni	DAP	3SAFNLP	3.2+07		Jour	NP/A,229,256	74	A.A.Cowley+	D0374

**28                      Nickel                      64**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\alpha$ ,el	<sup>64</sup> Ni	DA	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,el	<sup>64</sup> Ni	DA	3SAFNLP	2.4+07	3.2+07	Jour	NP/A,229,256	74	A.A.Cowley+	D0374
$\alpha$ ,inel	<sup>64</sup> Ni	DAP	2GERMUU	1.8+07	2.7+07	Jour	PR/C,9,1813	74	W.Trombik+	D0372
$\alpha$ ,inel	<sup>64</sup> Ni	DAP	3SAFNLP	3.2+07		Jour	NP/A,229,256	74	A.A.Cowley+	D0374

**47                      Silver**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$p,\gamma$	incl	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115	80	M.J.Kenny+	D0384

**52                      Tellurium                      124**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$d,p$	$^{125}\text{Te}$	DAP	2GERMUU	1.7+07		Jour	NP/A,717,149	03	J.Honzatko+	D0298

**52                      Tellurium                      126**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He},\alpha$	$^{125}\text{Te}$	DAP	2GERMUU	3.2+07		Jour	NP/A,717,149	03	J.Honzatko+	D0298

**79                      Gold                      197**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$p,\gamma$	incl	TTD	3AULAUA	2.0+06	2.5+06	Jour	NIM,168,115	80	M.J.Kenny+	D0384

**83                      Bismuth                      209**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\alpha,2n$	$^{211}\text{At}$	TT	2NOROSL	2.8+07	3.0+07	Jour	ARI,54,839	01	G.Henriksen+	D0167
$\alpha,3n$	$^{210}\text{At}$	TT	2NOROSL	2.9+07	3.0+07	Jour	ARI,54,839	01	G.Henriksen+	D0167

**93                      Neptunium                      237**

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He},2p$	$^{238}\text{Np}$	CS	2SF ABA	2.0+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},3n$	$^{237}\text{Am}$	CS	2SF ABA	2.5+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},n$	$^{239}\text{Am}$	CS	2SF ABA	2.0+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},x$	$^{236}\text{Np}$	CS	2SF ABA	2.0+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},x$	$^{236}\text{Pu}$	CS	2SF ABA	2.0+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},x$	$^{237}\text{Pu}$	CS	2SF ABA	2.0+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},x$	$^{237}\text{Pu}$	TT	2SF ABA	2.6+07		Jour	JRN,203,67	96	J.Aaltonen+	D0371
$^3\text{He},x$	$^{238}\text{Pu}$	CS	2SF ABA	2.0+07	2.6+07	Jour	JRN,203,67	96	J.Aaltonen+	D0371