

Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)

EXFOR : Recent Compilation List (Added in Sep 2005)

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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)

<i>p,x</i>	²² Na	CS	2JPNTOH	3.1+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	²⁴ Na	CS	2JPNTOH	3.1+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894

14 Silicon

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,abs		CS	2GERMPM	1.0+07	1.4+08	Conf	72SENDAI,213	72	J.Ahrens+	L0083
<i>n,x</i>	Many	CS	1USALAS	7.0+05	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010

14 Silicon 28

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
⁷ Li, ⁷ Be	²⁸ Al	DAE	2JPNOSA	4.6+08		Jour	PR/C,60,(4),047303	Oct 99	S.Nakayama+	E1891

19 Potassium 39

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,x</i>	⁷ Be	CS	4ZZZDUB	2.6+07	2.9+07	Jour	YK,2004,(1),42	04	V.S.Butcev+	41448

20 Calcium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,abs		CS	2GERMPM	1.0+07	1.4+08	Conf	72SENDAI,213	72	J.Ahrens+	L0083

22 Titanium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,x</i>	Many	CS	1USALAS	2.5+06	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010

26 Iron

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,f		CS	2ITYSIC	5.1+08		Jour	NP/A,257,438	76	V.Emma+	L0077
γ ,n		DA	1USAIRT	1.0+03	7.7+04	Jour	PR/C,8,1002	73	V.V.Verbinski+	L0104
<i>n,x</i>	Many	CS	1USALAS	2.5+06	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010

28 Nickel

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ, f		CS	2ITYSIC	5.1+08		Jour	NP/A,257,438	76	V.Emma+	L0077
n, x	Many	CS	1USALAS	7.0+05	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010

28 Nickel 60

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ, n	^{59}Ni	DA	1USAIRT	4.2+01	7.8+04	Jour	PR/C,8,1002	73	V.V.Verbinski+	L0104

29 Copper

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ, f		CS	2ITYSIC	5.2+08		Jour	NP/A,257,438	76	V.Emma+	L0077
n, x	Many	CS	1USALAS	7.0+05	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010
p, x	^{56}Co	CS	2JPNTOH	5.3+07	6.9+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
p, x	^{62}Zn	CS	2JPNTOH	2.7+07	6.9+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
p, x	^{65}Zn	CS	2JPNTOH	2.7+07	6.9+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894

30 Zinc

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ, f		CS	2ITYSIC	5.2+08		Jour	NP/A,257,438	76	V.Emma+	L0077

40 Zirconium 90

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α, inel	^{90}Zr	DAE	2JPNOSA	3.9+08		Jour	PR/C,69,(5),051301	May 04	M.Uchida+	E1899

40 Zirconium 92

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n, inel	^{92}Zr	CSP	1USAKTY	3.4+06	4.0+06	Jour	PR/C,71,054304	05	C.Fransen+	14013

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Niobium

93

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,x</i>	Many	CS	2JPNLEP	1.2+10		Jour	NP/A,414,(3),385	Feb 84	T.Tominaka+	E1882

42

Molybdenum

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,x</i>	⁸⁶ Y	CS	2JPNTOH	4.1+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁸⁷ Y	CS	2JPNTOH	3.6+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁸⁸ Y	CS	2JPNTOH	3.0+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁸⁶ Zr	CS	2JPNTOH	5.1+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁸⁸ Zr	CS	2JPNTOH	3.0+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁸⁹ Zr	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹⁰ Nb	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹² Nb	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹⁵ Nb	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹⁶ Nb	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹³ Mo	CS	2JPNTOH	3.0+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹⁴ Tc	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹⁵ Tc	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894
<i>p,x</i>	⁹⁶ Tc	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894

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Molybdenum

100

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,x</i>	⁹⁹ Mo	CS	2JPNTOH	2.2+07	6.7+07	Jour	ARI,60,(6),911	Jun 04	M.S.Uddin+	E1894

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Ruthenium

96

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>d,p</i>	⁹⁷ Ru	CS	2JPNKTO	4.4+06	1.4+07	Jour	NP/A,129,(1),165	May 69	A.Mito+	E1879

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Ruthenium

102

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>d,p</i>	¹⁰³ Ru	CS	2JPNKTO	4.4+06	1.4+07	Jour	NP/A,129,(1),165	May 69	A.Mito+	E1879

44 Ruthenium 104

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>d,p</i>	¹⁰⁵ Ru	CS	2JPNKTO	4.4+06	1.4+07	Jour	NP/A,129,(1),165	May 69	A.Mito+	E1879

46 Palladium 102

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,γ</i>	¹⁰³ Pd	CS	1USAORU	Maxwl		Jour	PR/C,71,054322	05	C.L.Duncan+	14012
<i>n,γ</i>	¹⁰³ Pd	RI	1USAORU	0.0+00		Jour	PR/C,71,054322	05	C.L.Duncan+	14012

46 Palladium 108

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,γ</i>	¹⁰⁹ Pd	CS	1USAORU	Maxwl		Jour	PR/C,71,054322	05	C.L.Duncan+	14012
<i>n,γ</i>	¹⁰⁹ Pd	RI	1USAORU	0.0+00		Jour	PR/C,71,054322	05	C.L.Duncan+	14012

47 Silver

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>γ,f</i>		CS	2ITYSIC	4.7+08		Jour	NP/A,257,438	76	V.Emma+	L0077

47 Silver 109

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>α,2n</i>	¹¹¹ In	CS	2JPNOK	1.4+07	3.8+07	Jour	NP,69,(2),273	Jul 65	S.Fukushima+	E1876
<i>α,3n</i>	¹¹⁰ In	CS	2JPNOK	2.7+07	3.8+07	Jour	NP,69,(2),273	Jul 65	S.Fukushima+	E1876
<i>α,n</i>	¹¹² In	CS	2JPNOSA	9.7+06	2.0+07	Jour	NP,69,(2),273	Jul 65	S.Fukushima+	E1876

48 Cadmium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>γ,f</i>		CS	2ITYSIC	4.7+08		Jour	NP/A,257,438	76	V.Emma+	L0077

49 Indium 115

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

n,γ	^{116}In	CS	4RUSFEI	5.5+03	3.3+05	Rept	YK-22,29	77	V.N.Kononov+	40520
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50 Tin

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	2ITYSIC	4.6+08		Jour	NP/A,257,438	76	V.Emma+	L0077

50 Tin 116

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α,inel	^{116}Sn	DAE	2JPNOSA	3.9+08		Jour	PR/C,69,(5),051301	May 04	M.Uchida+	E1899

58 Cerium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	2ITYSIC	4.2+08	4.6+08	Jour	NP/A,257,438	76	V.Emma+	L0077

58 Cerium 140

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$p,2n$	^{139}Pr	CS	2JPN TOK	1.3+07	1.5+07	Jour	NP/A,90,(2),253	Jan 67	M.Furukawa	E1877
p,n	^{140}Pr	CS	2JPN TOK	5.6+06	1.5+07	Jour	NP/A,90,(2),253	Jan 67	M.Furukawa	E1877

58 Cerium 142

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
p,n	^{142}Pr	CS	2JPN TOK	5.8+06	1.5+07	Jour	NP/A,90,(2),253	Jan 67	M.Furukawa	E1877
$d,2n$	^{142}Pr	CS	2JPNOSA	5.5+06	1.4+07	Jour	NP,81,(2),322	Jun 66	K.Otozai+	E1881
d,α	^{140}La	CS	2JPNOSA	7.0+06	1.4+07	Jour	NP,81,(2),322	Jun 66	K.Otozai+	E1881
d,n	^{143}Pr	CS	2JPNOSA	5.5+06	1.4+07	Jour	NP,81,(2),322	Jun 66	K.Otozai+	E1881
d,p	^{143}Ce	CS	2JPNOSA	3.9+06	1.4+07	Jour	NP,81,(2),322	Jun 66	K.Otozai+	E1881

62 Samarium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	2ITYSIC	3.9+08	4.0+08	Jour	NP/A,257,438	76	V.Emma+	L0077

62 Samarium 144

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,el	¹⁴⁴ Sm	DA	2JPNOSA	3.9+08		Jour	PR/C,68,(6),064602	Dec 03	M.Itoh+	E1886
α ,inel	¹⁴⁴ Sm	DAE	2JPNOSA	3.9+08		Jour	PR/C,68,(6),064602	Dec 03	M.Itoh+	E1886

62 Samarium 148

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,inel	¹⁴⁸ Sm	DAE	2JPNOSA	3.9+08		Jour	PR/C,68,(6),064602	Dec 03	M.Itoh+	E1886

62 Samarium 150

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,inel	¹⁵⁰ Sm	DAE	2JPNOSA	3.9+08		Jour	PR/C,68,(6),064602	Dec 03	M.Itoh+	E1886

62 Samarium 152

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,inel	¹⁵² Sm	DAE	2JPNOSA	3.9+08		Jour	PR/C,68,(6),064602	Dec 03	M.Itoh+	E1886

62 Samarium 154

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,f		CS	1USASTF	8.2+07	4.2+08	Jour	PR,179,1176	69	L.G.Moretto+	L0090
α ,inel	¹⁵⁴ Sm	DAE	2JPNOSA	3.9+08		Jour	PR/C,68,(6),064602	Dec 03	M.Itoh+	E1886

64 Gadolinium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,f		CS	2ITYSIC	3.8+08		Jour	NP/A,257,438	76	V.Emma+	L0077

64 Gadolinium 158

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n , γ		?	4ZZZDUB	2.2+01	1.1+03	Jour	NP/A,724,14	Aug 03	C.Granja+	41443

<i>n,tot</i>	CS	1USAPPO	1.7+03	8.3-03	Priv	YOUNG	68	T.E.Young	14018
<i>n,tot</i>	CS	1USAINL	2.5-02		Prog	NCSAC-33,89	70	T.E.Young	14026

71 Lutetium 176

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,γ</i>	¹⁷⁷ Lu	CS	1USAINL	2.5-02		Prog	NCSAC-33,89	70	T.E.Young	14026
<i>n,tot</i>	CS	1USAINL	1USAINL	2.5-02		Prog	NCSAC-33,89	70	T.E.Young	14026
<i>n,tot</i>	CS	1USAPPO	1USAPPO	3.2+00	2.6-02	Priv	YOUNG	68	T.E.Young	14018

72 Hafnium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>γ,f</i>		CS	2ITYSIC	3.1+08		Jour	NP/A,257,438	76	V.Emma+	L0077

73 Tantalum 181

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>γ,el</i>	¹⁸¹ Ta	DA	1USAANL	1.1+07		Jour	PR/C,9,1153	74	H.E.Jackson+	L0080
<i>γ,f</i>		CS	2ITYSIC	3.0+08		Jour	NP/A,257,438	76	V.Emma+	L0077
<i>γ,inel</i>	¹⁸¹ Ta	DAP	1USAANL	1.1+07		Jour	PR/C,9,1153	74	H.E.Jackson+	L0080

74 Tungsten

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>γ,f</i>		CS	2ITYSIC	2.9+08		Jour	NP/A,257,438	76	V.Emma+	L0077
<i>n,f</i>		CS	4RUSLIN	2.2+07	3.6+08	Rept	RI-262	04	A.V.Fomichev+	41444

75 Rhenium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>γ,f</i>		CS	2ITYSIC	2.8+08		Jour	NP/A,257,438	76	V.Emma+	L0077

75 Rhenium 185

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,2n</i>	¹⁸⁴ Re	CS	4ZZZDUB	1.5+13		Jour	YF,67,(7),1251	04	Yu.P.Gangrskiy+	41440

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Gold

197

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,f		CS	2ITYSIC	2.4+08		Jour	NP/A,257,438	76	V.Emma+	L0077
γ ,f	Many	FY	4UKRUFT	0.0+00	1.0+09	Jour	SNP,10,30	70	A.P.Komar+	L0101
γ ,f	Many	KE	4UKRUFT	0.0+00	1.0+09	Jour	SNP,10,30	70	A.P.Komar+	L0101
$n,2n$	¹⁹⁶ Au	CS	4ZZZDUB	1.5+13		Jour	YF,67,(7),1251	04	Yu.P.Gangrskiy+	41440
$n,4n$	¹⁹⁴ Au	CS	1USALAS	7.0+05	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010
n,γ	¹⁹⁸ Au	CS	1USALAS	7.0+05	7.5+08	Jour	NIM/B,234,419	05	J.M.Sisterson+	14010
$n,inel$	¹⁹⁷ Au	CSP	1USALAS	1.1+06	1.1+07	Jour	PR/C,71,064314	05	N.Fotiades+	14021
$n,inel$	¹⁹⁷ Au	SPC	1USALAS	1.0+06	7.0+07	Jour	PR/C,71,064314	05	N.Fotiades+	14021

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Thallium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,f		CS	2ITYSIC	2.3+08		Jour	NP/A,257,438	76	V.Emma+	L0077

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Lead

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ ,el	^{nat} Pb	DA	1USAANL	1.1+07		Jour	PR/C,9,1153	74	H.E.Jackson+	L0080
γ ,f		CS	2ITYSIC	2.2+08		Jour	NP/A,257,438	76	V.Emma+	L0077
n,el	^{nat} Pb	CS	1USAORL	1.6-01	4.5+02	Conf	91JUELIC,,163	91	J.Schmiedmayer+	14025

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Lead

207

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,γ	²⁰⁸ Pb	?	4ZZZDUB	8.0-03	3.0+00	Jour	YF,67,(7),1257	Jul 04	J.Andrzejewski+	41445

82

Lead

208

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
p,x	²⁰⁶ Pb	CSP	2JPNTOK	2.4+07	5.2+07	Jour	NP/A,262,(1),52	May 76	H.Kawakami+	E1878
p,x	²⁰⁷ Pb	CS	2JPNTOK	2.4+07	5.2+07	Jour	NP/A,262,(1),52	May 76	H.Kawakami+	E1878
p,x	²⁰⁷ Pb	CSP	2JPNTOK	4.4+07		Jour	NP/A,262,(1),52	May 76	H.Kawakami+	E1878
$\alpha,inel$	²⁰⁸ Pb	DAE	2JPNOSA	3.9+08		Jour	PR/C,69,(5),051301	May 04	M.Uchida+	E1899

83

Bismuth

209

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

γ ,el	²⁰⁹ Bi	DA	1USAANL	1.1+07		Jour	PR/C,9,1153	74	H.E.Jackson+	L0080
γ ,f		CS	2ITYSIC	2.0+08		Jour	NP/A,257,438	76	V.Emma+	L0077
γ ,f		CS	1USASTF	5.0+07	4.2+08	Jour	PR,179,1176	69	L.G.Moretto+	L0090
γ ,f	Many	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	Many	FY	4UKRUFT	0.0+00	1.0+09	Jour	SNP,10,30	70	A.P.Komar+	L0101
γ ,f	Many	FY	2SWDLND	0.0+00	7.0+08	Jour	NP/A,143,449	70	B.Schroder+	L0097
γ ,f	Many	KE	4UKRUFT	0.0+00	1.0+09	Jour	SNP,10,30	70	A.P.Komar+	L0101
γ ,f	Many	KE	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	⁸⁷ Y	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	⁹⁰ Y	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	¹⁰¹ Rh	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	¹⁰⁶ Ag	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	¹¹⁰ Ag	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	¹¹⁴ In	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	¹²⁰ Sb	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,f	¹²¹ Te	CS	2SWDLND	0.0+00	6.0+08	Jour	NP/A,251,418	75	M.Areskoug+	L0078
γ ,n	²⁰⁸ Bi	?	1USASUI	8.3+06	3.2+07	Conf	73PACIFI,2,1059	73	S.M.Kocimski+	L0076
n,f		CS	4RUSLIN	3.0+07	4.1+08	Rept	RI-262	04	A.V.Fomichev+	41444
¹⁰ Be,3n	²¹⁶ Fr	CS	2JPNIPC	3.8+07	5.4+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹⁰ Be,4n	²¹⁵ Fr	CS	2JPNIPC	3.9+07	5.5+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹⁰ Be,f		CS	2JPNIPC	3.1+07	5.5+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹⁰ Be,fus		CS	2JPNIPC	3.4+07	5.5+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹¹ Be,4n	²¹⁶ Fr	CS	2JPNIPC	3.8+07	5.4+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹¹ Be,5n	²¹⁵ Fr	CS	2JPNIPC	4.1+07	5.5+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹¹ Be,f		CS	2JPNIPC	3.6+07	5.5+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895
¹¹ Be,fus		CS	2JPNIPC	3.6+07	5.5+07	Jour	NP/A,735,(3-4),329	May 04	C.Signorini+	E1895

90

Thorium

232

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max					
γ ,2n	²³⁰ Th	CS	2FR SAC	9.2+06	1.6+07	Conf	72SENDAI,273	72	R.Bergere+	L0082
γ ,el	²³² Th	DA	1USAANL	1.1+07		Jour	PR/C,9,1153	74	H.E.Jackson+	L0080
γ ,el	²³² Th	DA	3ISLISL	7.9+06	1.1+07	Jour	NP/A,229,417	74	T.Bar-Noy+	L0079
γ ,f		CS	1CANCRC	0.0+00	2.1+07	Conf	58GENEVA,15,188	55	L.Katz+	L0085
γ ,f		CS	2JPNTOK	2.9+08	9.1+08	Jour	JPJ,26,851	69	Y.Wakuta+	L0099
γ ,f		CS	1USAAUI	5.1+06	7.9+06	Jour	PRL,35,501	75	P.A.Dickey+	L0081
γ ,f		CS	3BZLIEA	5.4+06	9.0+06	Jour	AAB,43,571	71	O.Y.Mafra+	L0074
γ ,f		CS	1CANCRC	6.2+06	1.9+07	Conf	58GENEVA,15,188	55	L.Katz+	L0085
γ ,f		CS	2FR SAC	9.2+06	1.6+07	Conf	72SENDAI,273	72	R.Bergere+	L0082
γ ,f		DA	1CANSAS	0.0+00	2.0+07	Jour	CJP,37,1418	59	A.P.Baerg+	L0094
γ ,f		NU	1USAGRT	0.0+00	9.7+06	Jour	NT,13,33	72	R.L.Bramblett+	L0087
γ ,f		NUD	1USAGRT	0.0+00	9.4+06	Jour	NT,13,33	72	R.L.Bramblett+	L0087
γ ,f	Many	FY	2SWDLND	0.0+00	1.1+09	Jour	NP/A,143,449	70	B.Schroder+	L0097
γ ,f	¹¹¹ Pd	FY	1USAANL	1.4+07	1.7+07	Jour	JIN,32,731	70	D.C.Aumann+	L0086
γ ,inel	²³² Th	DAP	1USAANL	1.1+07		Jour	PR/C,9,1153	74	H.E.Jackson+	L0080
γ ,n	²³¹ Th	CS	1CANCRC	6.2+06	2.2+07	Jour	CJP,35,470	57	L.Katz+	L0091
γ ,n	²³¹ Th	CS	1USAAUI	6.8+06	7.9+06	Jour	PRL,35,501	75	P.A.Dickey+	L0081
γ ,n	²³¹ Th	CS	2FR SAC	9.2+06	1.6+07	Conf	72SENDAI,273	72	R.Bergere+	L0082
n,f		CS	4RUSFEI	1.6+06	2.2+06	Jour	YF,67,(7),1263	Jul 04	V.A.Khryachkov+	41442
n,f		DA	4RUSFEI	1.6+06		Jour	YF,67,(7),1263	Jul 04	V.A.Khryachkov+	41442
n,f		KE	4RUSFEI	1.5+07	1.8+07	Jour	YF,67,(5),914	May 04	G.N.Lovchikova+	41446
n,f		NU	4RUSFEI	1.5+07	1.8+07	Jour	YF,67,(5),914	May 04	G.N.Lovchikova+	41446
n, γ	²³³ Th	CS	1CANCRC	Maxwl		Conf	85SANTA,1,537	85	R.T.Jones+	14029

n,sct ^{232}Th DA 1USAANL 4.5+06 1.0+07 Jour ANE,23,459 96 A.B.Smith+ 14030

92 Uranium

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	3BZLIEA	5.4+06	9.0+06	Jour	AAB,43,571	71	O.Y.Mafra+	L0074
n,f	Many	FY	4RUSLIN	2.0+07		Jour	EPJ/A,19,341	Jan 04	A.Andrighetto+	41441
n,f	Many	?	4RUSLIN	2.0+07		Jour	EPJ/A,19,341	Jan 04	A.Andrighetto+	41441
n,sct	^{nat}U	DA	1USAANL	4.5+06	1.0+07	Jour	ANE,23,459	96	A.B.Smith+	14030

92 Uranium 233

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	1CANCRC	0.0+00	2.1+07	Conf	58GENEVA,15,188	55	L.Katz+	L0085
γ,f	^{111}Pd	FY	1USAANL	1.4+07	1.7+07	Jour	JIN,32,731	70	D.C.Aumann+	L0086
γ,n	^{232}U	CS	1CANCRC	6.9+06	2.2+07	Jour	CJP,35,470	57	L.Katz+	L0091
n,f		?	4RUSFEI	2.9+00		Jour	AE,92,(2),135	Feb 02	V.M.Piksaykin+	41439
n,f		?	1USALAS	5.8+05	4.0+08	Conf	91JUELIC,,732	91	P.W.Lisowski+	14011
$^6\text{Li},4n$	^{235}Am	CS	2JPNJAE	3.4+07	4.2+07	Jour	PR/C,69,(1),014308	Jan 04	M.Sakama+	E1888
$^6\text{Li},5n$	^{234}Am	CS	2JPNJAE	3.9+07	4.8+07	Jour	PR/C,69,(1),014308	Jan 04	M.Sakama+	E1888
$^6\text{Li},6n$	^{233}Am	CS	2JPNJAE	5.2+07	6.0+07	Jour	PR/C,69,(1),014308	Jan 04	M.Sakama+	E1888

92 Uranium 234

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		DA	1CANSAS	0.0+00	1.5+07	Jour	CJP,37,1418	59	A.P.Baerg+	L0094
γ,f	^{111}Pd	FY	1USAANL	1.4+07	1.7+07	Jour	JIN,32,731	70	D.C.Aumann+	L0086
n,f		?	1USALAS	6.2+05	4.0+08	Conf	91JUELIC,,732	91	P.W.Lisowski+	14011

92 Uranium 235

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		NU	1USAGRT	0.0+00	9.7+06	Jour	NT,13,33	72	R.L.Bramblett+	L0087
γ,f		NUD	1USAGGA	0.0+00	1.0+07	Jour	NSE,39,163	70	L.A.Kull+	L0098
γ,f		NUD	1USAGRT	0.0+00	9.7+06	Jour	NT,13,33	72	R.L.Bramblett+	L0087
γ,f	^{111}Pd	FY	1USAANL	1.4+07	1.7+07	Jour	JIN,32,731	70	D.C.Aumann+	L0086
n,f		CS	1USALAS	2.1+06	3.0+07	Conf	91JUELIC,,518	91	A.D.Carlson+	14015
n,f		CS	1USALAS	3.0+07	2.6+08	Conf	91UPPSAL,,177	91	P.W.Lisowski+	14016
n,f		?	4RUSFEI	2.9+00		Jour	AE,92,(2),135	Feb 02	V.M.Piksaykin+	41439
n,f	Many	FY	1USALAS	5.1+06	8.4+07	Conf	2001BERKEL,,673	01	W.Younes+	14014
$^6\text{Li},5n$	^{236}Am	CS	2JPNJAE	3.9+07	4.8+07	Jour	PR/C,69,(1),014308	Jan 04	M.Sakama+	E1888
$^6\text{Li},5n$	^{236}Am	CS	2JPNJAE	4.6+07	5.0+07	Jour	PR/C,57,(4),2057	Apr 98	K.Tsukada+	E1887

93 Neptunium 237

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\gamma,2n$	²³⁵ Np	CS	2FR SAC	1.3+07	1.6+07	Conf	72SENDAI,273	72	R.Bergere+	L0082
γ,el	²³⁷ Np	DA	3ISLISL	8.5+06	1.1+07	Jour	NP/A,275,151	77	T.Bar-Noy+	L0102
γ,f		CS	1CANCRC	0.0+00	1.9+07	Conf	58GENEVA,15,188	55	L.Katz+	L0085
γ,f		CS	2FR SAC	9.2+06	1.6+07	Conf	72SENDAI,273	72	R.Bergere+	L0082
$\gamma,inel$	²³⁷ Np	DAP	3ISLISL	8.5+06	1.1+07	Jour	NP/A,275,151	77	T.Bar-Noy+	L0102
γ,n	²³⁶ Np	CS	2FR SAC	9.2+06	1.6+07	Conf	72SENDAI,273	72	R.Bergere+	L0082

94 Plutonium 238

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	1USAUCN	7.5+06	1.1+07	Jour	NSE,45,47	71	A.Shapiro+	L0084

94 Plutonium 239

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	1CANCRC	0.0+00	2.0+07	Conf	58GENEVA,15,188	55	L.Katz+	L0085
γ,f		CS	1USAUCN	7.5+06	1.1+07	Jour	NSE,45,47	71	A.Shapiro+	L0084
γ,f		NU	1USAGRT	0.0+00	9.7+06	Jour	NT,13,33	72	R.L.Bramblett+	L0087
γ,f		NUD	1USAGRT	0.0+00	9.6+06	Jour	NT,13,33	72	R.L.Bramblett+	L0087
γ,n	²³⁸ Pu	CS	1CANCRC	6.3+06	2.1+07	Jour	CJP,35,470	57	L.Katz+	L0091
n,f		DEP	1USALTI	2.5-02		Conf	88MITO,,853	88	W.A.Schier+	14022
n,f		?	4RUSFEI	2.9+00		Jour	AE,92,(2),135	Feb 02	V.M.Piksaykin+	41439
n,f		?	4RUSFEI	3.7+05	5.0+06	Jour	AE,92,(3),233	Mar 02	V.M.Piksaykin+	41438

94 Plutonium 240

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		DA	1CANSAS	0.0+00	1.5+07	Jour	CJP,37,1418	59	A.P.Baerg+	L0094
n,f		?	4RUSLIN	5.9+05	3.6+08	Rept	RI-262	04	A.V.Fomichev+	41444

95 Americium 241

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
γ,f		CS	1CANCRC	0.0+00	2.1+07	Conf	58GENEVA,15,188	55	L.Katz+	L0085

95 Americium 243

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,f		?	4RUSLIN	5.9+05	3.6+08	Rept	RI-262	04	A.V.Fomichev+	41444

98 Californium 252

Reaction	Product	Quantity	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
0,f		DE	4RUSFEI	Spont		Jour	YF,67,(7),1263	Jul 04	V.A.Khryachkov+	41442
0,f		?	4RUSFEI	Spont		Jour	YF,67,(7),1263	Jul 04	V.A.Khryachkov+	41442
0,f	Many	FY	1USAORL	Spont		Prog	ORNL-3692,	64	W.F.Kiker	14020