

EXFOR News (November 2015)

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 coordinated 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 published 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.Otsuka et al., [Nucl.Data.Sheets](#) **120**(2014)272.

Quantity codes

ALF	α -value ($\sigma_{\text{capt}}/\sigma_{\text{fis}}$)	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 $d\Omega_1/d\Omega_2/dE'$	NUD	Delayed fission neutron multiplicity $\bar{\nu}_d$
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	η -value $\bar{\nu}\sigma_{\text{fis}}/(\sigma_{\text{capt}} + \sigma_{\text{fis}})$	TTD	Differential thick target yield, $d/d\Omega$
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	tex	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 3

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
p,n	^3He	CS	1USALAS	2.5+06	4.0+06	Rept	LA-8215-MS	80	M.Drosg	D0013
p,n	^3He	DA	1USALAS	2.0+06	4.0+06	Rept	LA-8215-MS	80	M.Drosg	D0013
* $d,x+t$	inclusive	DA	4UKRIJD	3.7+07	3.7+07	Jour	YFE,15,(3),240	15	O.O.Beljuskina+	D5108
* $d,x+t$	inclusive	DAE	4UKRIJD	3.7+07	3.7+07	Jour	YFE,15,(3),240	15	O.O.Beljuskina+	D5108

3 Lithium 6

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α,el	^6Li	DA	4KASKAZ	5.0+07	5.0+07	Jour	PAN,59,29	96	N.Burtebaev+	D0771
α,inel	^6Li	DAP	4KASKAZ	5.0+07	5.0+07	Jour	PAN,59,29	96	N.Burtebaev+	D0771

3 Lithium 7

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α,el	^7Li	DA	4KASKAZ	5.0+07	5.0+07	Jour	PAN,59,29	96	N.Burtebaev+	D0771
α,inel	^7Li	DAP	4KASKAZ	5.0+07	5.0+07	Jour	PAN,59,29	96	N.Burtebaev+	D0771

4 Beryllium 9

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* $^{18}\text{O},^{10}\text{Be}$	^{17}O	?	2ITYLNS	8.4+07	8.4+07	Jour	PR/C,90,064621	14	D.Carbone+	D0775

5 Boron 11

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* $^{16}\text{N},^{11}\text{B}$	^{16}N	DAP	3POLWWA	8.4+07	8.4+07	Jour	NP/A,939,1	15	A.T.Rudchik+	D5109
* $^{16}\text{N},\text{el}$	^{11}B	DA	3POLWWA	8.4+07	8.4+07	Jour	NP/A,939,1	15	A.T.Rudchik+	D5109
* $^{16}\text{O},\text{el}$	^{11}B	DA	4KASATN	2.2+07	2.2+07	Jour	IMP/E,24,1550047	15	Sh.Hamada+	D0778

6 Carbon 12

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,α	^9Be	CSP	2JPNTOH	1.2+07	1.3+07	Jour	NIM/A,440,403	00	T.Sanami+	23005
p,el	^{12}C	DA	1CANTMF	2.5+08	2.5+08	Jour	PR/C,37,544	88	H.O.Meyer+	C1420

<i>p</i> ,inel	¹² C	DAP	1CANTMF	2.5+08	2.5+08	Jour	PR/C,37,544	88	H.O.Meyer+	C1420
<i>p</i> ,inel	¹² C	POD	1CANTMF	2.5+08	2.5+08	Jour	PR/C,37,544	88	H.O.Meyer+	C1420

8 Oxygen 16

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n</i> , α	¹³ C	CSP	2JPNTOH	1.3+07	1.5+07	Jour	NIM/A,440,403	00	T.Sanami+	23005
<i>n</i> , $x+\alpha$	inclusive	CS	2JPNTOH	1.4+07	1.5+07	Jour	NIM/A,440,403	00	T.Sanami+	23005

9 Fluorine 19

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>d</i> , <i>t</i>	¹⁸ F	CS	1USAMIT	5.7+06	1.5+07	Jour	PR,127,1698	62	L.H.Bowen+	C2171

11 Sodium 23

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>d</i> , <i>p</i>	²⁴ Na	CS	1USAMIT	1.2+06	1.3+07	Jour	PR,66,231	44	E.T.Clarke+	C2170
<i>d</i> , <i>p</i>	²⁴ Na	CS	1USAMIT	1.7+06	1.5+07	Jour	PR,127,1698	62	L.H.Bowen+	C2171
<i>d</i> , <i>t</i>	²² Na	CS	1USAMIT	7.8+06	1.5+07	Jour	PR,127,1698	62	L.H.Bowen+	C2171

13 Aluminium 27

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #	
				Min	Max						
*	<i>d</i> , <i>x</i>	²⁴ Na	CS	3CZRUF	3.0+06	2.0+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	<i>d</i> , <i>x</i>	²⁷ Mg	CS	3CZRUF	6.6+06	2.0+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777

14 Silicon 28

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
*	²⁸ Si,fus	CS	2ITYPAD	3.0+07	3.9+07	Jour	PL/B,746,300	15	G.Montagnoli+	D0772

22 Titanium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #	
				Min	Max						
*	<i>d</i> , <i>x</i>	⁴³ Sc	CS	3CZRUF	1.2+07	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	<i>d</i> , <i>x</i>	⁴⁴ Sc	CS	3CZRUF	4.5+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	<i>d</i> , <i>x</i>	⁴⁶ Sc	CS	3CZRUF	4.5+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777

*	<i>d,x</i>	⁴⁷ Sc	CS	3CZRUF	4.5+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	<i>d,x</i>	⁴⁸ Sc	CS	3CZRUF	4.5+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777

22 Titanium 48

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,inel</i>	⁴⁸ Ti	DAP	4KASKAZ	1.0+06	1.0+06	Jour	IZV,57,(9),144	93	Yu.G.Kosyak+	41140
<i>p,el</i>	⁴⁸ Ti	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁴⁸ Ti	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

22 Titanium 50

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,inel</i>	⁵⁰ Ti	DAP	1USAPTN	1.7+07	1.7+07	Jour	PR,134,B117	64	H.O.Funsten+	C1326

23 Vanadium 51

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁵¹ V	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵¹ V	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵¹ V	DAP	1USAPTN	1.7+07	1.7+07	Jour	PR,134,B117	64	H.O.Funsten+	C1326

24 Chromium 52

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁵² Cr	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵² Cr	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵² Cr	DAP	1USAPTN	1.7+07	1.7+07	Jour	PR,134,B117	64	H.O.Funsten+	C1326

26 Iron 54

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁵⁴ Fe	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵⁴ Fe	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵⁴ Fe	DAP	1USAPTN	1.7+07	1.7+07	Jour	PR,134,B117	64	H.O.Funsten+	C1326

26 Iron 56

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁵⁶ Fe	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵⁶ Fe	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

27 Cobalt 59

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁵⁹ Co	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁵⁹ Co	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

28 Nickel 58

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,p</i>	⁵⁸ Co	CS	2BLGMOL	Fiss		Conf	84GEESTH,867	84	D.M.Gilliam+	23096

28 Nickel 60

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶⁰ Ni	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶⁰ Ni	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>d,el</i>	⁶⁰ Ni	DA	1USAORL	4.9+06	1.4+07	Jour	PR,138,B1083	65	J.K.Dickens+	C2173
<i>d,inel</i>	⁶⁰ Ni	DAP	1USAORL	9.9+06	1.4+07	Jour	PR,138,B1083	65	J.K.Dickens+	C2173

28 Nickel 62

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶² Ni	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶² Ni	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

28 Nickel 64

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶⁴ Ni	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶⁴ Ni	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

29 Copper 63

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,α</i>	⁶⁰ Co	CS	2JPNTOK	Fiss		Jour	CZJ,49,(S1),839	99	M.Imamura+	23272
<i>n,p</i>	⁶³ Ni	CS	2JPNTOK	Fiss		Jour	CZJ,49,(S1),839	99	M.Imamura+	23272
<i>p,el</i>	⁶³ Cu	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶³ Cu	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

29 Copper 65

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶⁵ Cu	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶⁵ Cu	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

30 Zinc 64

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶⁴ Zn	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶⁴ Zn	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

30 Zinc 66

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶⁶ Zn	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶⁶ Zn	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

30 Zinc 68

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>p,el</i>	⁶⁸ Zn	DA	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165
<i>p,inel</i>	⁶⁸ Zn	DAP	1USAORL	1.1+07	1.1+07	Jour	PR,175,1460	68	C.M.Perey+	C2165

31 Gallium 69

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,0</i>		RP	2JPNJAE			Rept	JAERI-M-90-213	90	M.Ohkubo	21861

31 Gallium 71

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$n,0$		RP	2JPNJAE			Rept	JAERI-M-90-213	90	M.Ohkubo	21861

33 Arsenic 75

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
d,p	^{76}As	CS	1USAMIT	2.1+05	1.5+07	Jour	PR,127,1698	62	L.H.Bowen+	C2171
d,t	^{74}As	CS	1USAMIT	7.8+06	1.5+07	Jour	PR,127,1698	62	L.H.Bowen+	C2171

35 Bromine 79

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$d,2n$	^{79}Kr	CS	1USAMIT	5.6+06	1.3+07	Jour	PR,66,231	44	E.T.Clarke+	C2170

35 Bromine 81

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
d,p	^{82}Br	CS	1USAMIT	3.5+06	1.3+07	Jour	PR,66,231	44	E.T.Clarke+	C2170

39 Yttrium 89

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #	
				Min	Max						
*	$d,2n$	^{89}Zr	CS	3CZRUJF	5.0+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	$d,3n$	^{88}Zr	CS	3CZRUJF	1.5+07	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	d,p	^{90}Y	CS	3CZRUJF	3.9+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	d,x	^{87}Sr	CS	3CZRUJF	3.9+06	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777
*	d,x	^{88}Y	CS	3CZRUJF	1.0+07	1.9+07	Jour	NIM/B,360,118	15	O.Lebeda+	D0777

40 Zirconium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #	
				Min	Max						
*	p,x	^{95}Nb	CS	3KORKRM	1.9+07	4.5+07	Jour	JRN,300,1121	14	H.Naik+	D7012

40 Zirconium 90

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>d,el</i>	⁹⁰ Zr	DA	1USAORL	1.2+07	1.4+07	Conf	66GATLNBG,,99	66	J.K.Dickens+	C2172
<i>d,p</i>	⁹¹ Zr	DAP	1USAORL	1.2+07	1.4+07	Conf	66GATLNBG,,99	66	J.K.Dickens+	C2172

42 Molybdenum

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,0</i>		CS	4RUSKUR	6.9+00	4.0+04	Jour	JET,17,803	63	M.I.Pevzner+	40091

47 Silver 107

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>α,2n</i>	¹⁰⁹ In	CS	3INDVEC	1.8+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218
<i>α,n</i>	¹¹⁰ In	CS	3INDVEC	1.0+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218
<i>α,x</i>	¹⁰⁵ Ag	CS	3INDVEC	3.3+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218
<i>α,x</i>	¹⁰⁶ Ag	CS	3INDVEC	2.4+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218

47 Silver 109

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>α,2n</i>	¹¹¹ In	CS	3INDVEC	1.4+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218
<i>α,3n</i>	¹¹⁰ In	CS	3INDVEC	2.6+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218
<i>α,3n+α</i>	¹⁰⁶ Ag	CS	3INDVEC	4.0+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218
<i>α,4n</i>	¹⁰⁹ In	CS	3INDVEC	3.6+07	4.7+07	Jour	NIM/B,24-25,480	87	N.L.Singh+	D6218

48 Cadmium 114

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* <i>n,γ</i>	¹¹⁵ Cd	CS	2JPNJAE	2.5-02	2.5-02	Jour	AJ,707,859	09	T.Hayakawa+	23113
* <i>n,γ</i>	¹¹⁵ Cd	RI	2JPNJAE		5.0-01	Jour	AJ,707,859	09	T.Hayakawa+	23113
<i>d,el</i>	¹¹⁴ Cd	DA	1USAORL	8.0+06	1.5+07	Jour	PR,138,B1083	65	J.K.Dickens+	C2173
<i>d,inel</i>	¹¹⁴ Cd	DAP	1USAORL	8.0+06	1.5+07	Jour	PR,138,B1083	65	J.K.Dickens+	C2173

49 Indium 115

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
<i>n,inel</i>	¹¹⁵ In	CS	4RUSKUR	1.4+06	1.4+06	Jour	AE,25,(5),437	68	F.Nasyrov+	40216
<i>n,inel</i>	¹¹⁵ In	CS	2BLGMOL	Fiss		Conf	84GEESTH,867	84	D.M.Gilliam+	23096

50 Tin 124

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
* $^{58}\text{Ni, fus}$		CS	2ITYPAD	1.4+08	1.6+08	Jour	PR/C,91,044602			15	C.L.Jiang+	D0774
* $^{64}\text{Ni, fus}$		CS	2ITYPAD	1.4+08	1.6+08	Jour	PR/C,91,044602			15	C.L.Jiang+	D0774

60 Neodymium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
* p, x	^{148}Pm	CS	3KORKRM	5.1+06	4.5+07	Jour	JRN,302,467			14	S.C.Yang+	D7013

68 Erbium 166

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
$n, inel$	^{166}Er	?	4RUSKUR	Fiss		Jour	IZV,56,(1),23			92	S.A.Berendakov+	41131

73 Tantalum 181

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
α, fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45			72	K.G.Kuvatov+	D0773
α, fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45			72	K.G.Kuvatov+	D0773

75 Rhenium 185

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
* n, γ	^{186}Re	CS	2JPNJAE	2.5-02	2.5-02	Jour	AJ,628,533			05	T.Hayakawa+	22777
n, tot		CS	4UKRIFU	2.5-02	2.5-02	Jour	SJA,19,1162			65	V.P.Vertebnyi+	40060
α, fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45			72	K.G.Kuvatov+	D0773
α, fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45			72	K.G.Kuvatov+	D0773

75 Rhenium 187

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n, tot		CS	4UKRIFU	2.5-02	2.5-02	Jour	SJA,19,1162			65	V.P.Vertebnyi+	40060
α, fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45			72	K.G.Kuvatov+	D0773
α, fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45			72	K.G.Kuvatov+	D0773

76 Osmium 188

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

76 Osmium 189

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

76 Osmium 190

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

76 Osmium 192

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

78 Platinum 194

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

78 Platinum 195

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

78 Platinum 196

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

78 Platinum 198

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

79 Gold 197

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

80 Mercury

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

81 Thallium 203

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

81 Thallium 205

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

82 Lead 204

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45	72	K.G.Kuvatov+	D0773

α ,fis DA 4KASKAZ 3.8+07 3.8+07 Jour SNP,14,45 72 K.G.Kuvatov+ [D0773](#)

82 Lead 206

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

82 Lead 207

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

82 Lead 208

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

83 Bismuth 209

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
α ,fis		CS	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773
α ,fis		DA	4KASKAZ	3.8+07	3.8+07	Jour	SNP,14,45		72	K.G.Kuvatov+	D0773

90 Thorium 232

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
n ,fis		CS	2BLGMOL	Fiss		Conf	84GEESTH,867		84	D.M.Gilliam+	23096

92 Uranium 233

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
				Min	Max		Ref	Vol Page			
* n ,fis		CS	2ZZZCER	3.4-02	1.1+06	Jour	PR/C,80,044604		09	M.Calviani+	23072
n ,fis		CS	2BLGMOL	Fiss		Conf	84GEESTH,867		84	D.M.Gilliam+	23096

92 Uranium 234

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
*	<i>n,0</i>	RP	2ZZZCER	1.0+00	1.5+03	Jour	PR/C,82,034601	10	C.Paradela+	23126
*	<i>n,fis</i>	CS	2ZZZCER	6.6-01	1.0+04	Jour	PR/C,82,034601	10	C.Paradela+	23126
*	<i>n,fis</i>	?	2ZZZCER	1.4+06	1.9+08	Jour	PR/C,89,044606	14	D.Karadimos+	23231

92 Uranium 235

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
	<i>n,fis</i>	CS	2BLGMOL	Fiss		Conf	84GEESTH,867	84	D.M.Gilliam+	23096
	<i>n,fis</i>	<i>n</i>	4RUSFEI	1.5+06	1.5+06	Jour	AE,69,(1),28	90	H.Maerten+	41144
	<i>n,x+n</i>	inclusive	4RUSFEI	1.5+06	1.5+06	Jour	AE,69,(1),28	90	H.Maerten+	41144

92 Uranium 238

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
	<i>n,fis</i>	CS	4RUSKUR	1.4+06	1.4+06	Jour	AE,25,(5),437	68	F.Nasyrov+	40216
	<i>n,fis</i>	CS	4RUSRI	1.4+07	1.4+07	Jour	SJA,30,64	71	I.M.Kuks+	40081
	<i>n,fis</i>	CS	2BLGMOL	Fiss		Conf	84GEESTH,867	84	D.M.Gilliam+	23096
*	<i>n,fis</i>	?	2ZZZCER	6.6+05	9.5+08	Jour	PR/C,91,024602	15	C.Paradela+	23269

93 Neptunium 237

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
	<i>n,fis</i>	CS	4RUSKUR	1.4+06	1.4+06	Jour	AE,25,(5),437	68	F.Nasyrov+	40216
	<i>n,fis</i>	CS	2BLGMOL	Fiss		Conf	84GEESTH,867	84	D.M.Gilliam+	23096
	<i>n,fis</i>	NUF	4RUSFEI	6.0+06	6.0+06	Jour	YF,55,(2),298	92	A.M.Trufanov+	41132
	<i>n,fis</i>	NUF	2JPNTOH	6.2+05	6.2+05	Jour	NST,36,486	99	Thanwin+	22481

94 Plutonium 238

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
	0,fis	FY	2BLGMOL	Spont		Jour	NP/A,545,623	92	P.Schillebeeckx+	22273

94 Plutonium 240

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
	0,fis	FY	2BLGMOL	Spont		Jour	NP/A,545,623	92	P.Schillebeeckx+	22273

n,fis CS 2BLGMOL Fiss Conf 84GEESTH,867 84 D.M.Gilliam+ [23096](#)

94 Plutonium 242

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
0,fis		FY	2BLGMOL	Spont		Jour	NP/A,545,623	92	P.Schillebeeckx+	22273