

EXFOR News (May 2025)

New experimental data available from Nuclear Reaction Data Centres

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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 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 ($\sigma_{\text{capt}}/\sigma_{\text{fis}}$)	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 = $\bar{\nu}\sigma_{\text{fis}}/(\sigma_{\text{capt}} + \sigma_{\text{fis}})$	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	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 2

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* d,n	^3He	DA	4RUSFEI	1.0+06	5.0+06	Jour	ANE,211,110904	25	D.E.Gremyachkin+	F1525
* d,n	^3He	TTD	4RUSFEI	1.0+06	5.0+06	Jour	ANE,211,110904	25	D.E.Gremyachkin+	F1525

3 Lithium 6

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* d,α	^4He	CS	4RUSSIB	3.3+05	2.2+06	Jour	NIM/B,554,165460	24	S.Taskaev+	F1513
* d,α	^4He	DA	4RUSSIB	3.3+05	2.2+06	Jour	NIM/B,554,165460	24	S.Taskaev+	F1513
* d,p	^7Li	DAP	4RUSSIB	3.3+05	2.2+06	Jour	NIM/B,554,165460	24	S.Taskaev+	F1513
$d,x+t$	inclusive	CS	4RUSEPA	1.7+06	7.3+06	Conf	97TRIEST,1,632	97	S.N.Abramovich+	F0526

3 Lithium 7

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* p,inel	^7Li	CSP	4RUSEPA	7.0+06	1.0+07	Jour	BAS,88,1342	24	L.N.Generalov+	F1516
* p,n	^7Be	TTD	4RUSFEI	2.0+06	4.0+06	Jour	ANE,211,110904	25	D.E.Gremyachkin+	F1525
* $p,x+t$	inclusive	CS	4RUSEPA	4.5+06	1.0+07	Jour	BAS,88,1342	24	L.N.Generalov+	F1516
* d,α	^5He	DA	4RUSSIB	3.3+05	2.2+06	Jour	NIM/B,554,165460	24	S.Taskaev+	F1513
* d,n	^8Be	CSP	4RUSSIB	3.3+05	2.1+06	Jour	PAN,87,769	24	S.A.Meshchaninov+	F1514
* d,n	^8Be	DAP	4RUSSIB	3.3+05	2.1+06	Jour	PAN,87,769	24	S.A.Meshchaninov+	F1514
* $d,n+\alpha$	^4He	DA	4RUSSIB	3.3+05	2.2+06	Jour	NIM/B,554,165460	24	S.Taskaev+	F1513
$d,x+t$	inclusive	CS	4RUSEPA	1.7+06	7.3+06	Conf	97TRIEST,1,632	97	S.N.Abramovich+	F0526

4 Beryllium 9

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* $d,x+t$	inclusive	CS	4RUSEPA	1.5+06	1.2+07	Jour	BAS,88,1332	24	L.N.Generalov+	F1515
* $d,x+t$	inclusive	DA	4RUSEPA	2.0+06	1.0+07	Jour	BAS,88,1332	24	L.N.Generalov+	F1515
* $^6\text{Li}, ^7\text{Li}$	^8Be	DAP	4ZZZDUB	6.8+07	6.8+07	Jour	CPH/C,48,114101	24	A.K.Azhibekov+	F1527
* $^6\text{Li}, ^8\text{Li}$	^7Be	DAP	4ZZZDUB	6.8+07	6.8+07	Jour	CPH/C,48,114101	24	A.K.Azhibekov+	F1527
* $^6\text{Li}, \text{el}$	^9Be	DA	4ZZZDUB	6.8+07	6.8+07	Jour	CPH/C,48,114101	24	A.K.Azhibekov+	F1527

5 Boron 10

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* d,α	^8Be	DAP	4RUSSIB	3.7+05	2.2+06	Jour	NIM/B,557,165527	24	S.Taskaev+	F1518
* d,p	^{11}B	DAP	4RUSSIB	5.7+05	2.2+06	Jour	NIM/B,557,165527	24	S.Taskaev+	F1518

α, x ^{12}C DAP 1USAWAU 1.9+07 2.7+07 Jour [NP/A,248,276](#) 75 J.Spuller+ [C3031](#)

5 Boron 11

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
					Min	Max		Ref	Vol Page			
*	p, α	^8Be	CSP	4RUSSIB	7.5+04	2.2+06	Jour	NIM/B,555,165490		24	S.Taskaev+	F1517
*	p, α	^8Be	DAP	4RUSSIB	7.5+04	2.2+06	Jour	NIM/B,555,165490		24	S.Taskaev+	F1517
*	d, α	^9Be	DAP	4RUSSIB	3.7+05	2.2+06	Jour	NIM/B,557,165527		24	S.Taskaev+	F1518

6 Carbon

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
					Min	Max		Ref	Vol Page			
	$^3\text{He}, x + \gamma$	inclusive	DAP	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759		96	J.A.Behr+	C3033
	$^3\text{He}, x + \gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759		96	J.A.Behr+	C3033

6 Carbon 12

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
					Min	Max		Ref	Vol Page			
	$^3\text{He}, x + \gamma$	inclusive	CS	1USAWAU	1.0+07	2.7+07	Jour	PR/C,53,1759		96	J.A.Behr+	C3033
	α, inel	^{12}C	DAP	1USAWAU	2.3+05	2.7+07	Jour	NP/A,248,276		75	J.Spuller+	C3031
	α, inel	^{12}C	DAP	1USABRK	6.5+07	6.5+07	Jour	PL/B,65,339		76	R.Jahn+	C3025
	α, p	^{15}N	DAP	1USAWAU	2.3+07	2.7+07	Jour	NP/A,248,276		75	J.Spuller+	C3031
	α, x	^5He	DAP	1USAWAU	9.0+07	9.0+07	Jour	PR/C,14,896		76	D.R.Brown+	C3027

6 Carbon 13

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
					Min	Max		Ref	Vol Page			
	α, inel	^{13}C	DAP	1USABRK	6.5+07	6.5+07	Jour	PL/B,65,339		76	R.Jahn+	C3025

7 Nitrogen 14

	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation		Date	Author	Data #
					Min	Max		Ref	Vol Page			
	α, n	^{17}F	?	1USAVIR	7.0+06	1.2+07	Jour	PR,181,1371		69	W.A.Schier+	C3028
	α, p	^{17}O	DAP	1USAWIS	1.3+07	1.8+07	Jour	NP/A,124,305		69	F.A.Rose	C3034
	α, p	^{17}O	DAP	1USAVIR	8.1+06	1.2+07	Jour	PR,181,1371		69	W.A.Schier+	C3028

8 Oxygen

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He},x+\gamma$	inclusive	DAP	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$^3\text{He},x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

8 Oxygen 16

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* d,el	^{16}O	DA	4RUSEPA	3.0+06	1.1+07	Jour	BAS,88,1825	24	L.N.Generalov+	F1522
α,inel	^{16}O	DAP	1USABRK	6.5+07	6.5+07	Jour	PL/B,65,339	76	R.Jahn+	C3025

9 Fluorine 19

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* d,t	^{18}F	CSP	4RUSEPA	7.0+06	8.0+06	Jour	BAS,88,1342	24	L.N.Generalov+	F1516
* d,t	^{18}F	DAP	4RUSEPA	7.0+06	8.0+06	Jour	BAS,88,1342	24	L.N.Generalov+	F1516
* d,x	^{18}F	CS	4RUSEPA	6.0+06	6.7+06	Jour	BAS,88,1342	24	L.N.Generalov+	F1516

13 Aluminium 27

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He},\text{el}$	^{27}Al	DA	1USAWAS	1.4+07	3.1+07	Jour	PR/C,13,937	76	C.B.Fulmer+	C3026
α,el	^{27}Al	DA	1USAWAS	1.3+07	4.0+07	Jour	PR/C,13,937	76	C.B.Fulmer+	C3026
$\alpha,x+d$	inclusive	DAE	1USABRK	1.6+09	1.6+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$\alpha,x+p$	inclusive	DAE	1USABRK	1.6+09	1.6+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$\alpha,x+t$	inclusive	DAE	1USABRK	1.6+09	1.6+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{19}\text{F},x+\gamma$	inclusive	DAP	1USAWAU	6.0+07	6.0+07	Jour	PR/C,47,1436	93	G.Feldman+	C3032
$^{19}\text{F},x+\gamma$	inclusive	DE	1USAWAU	3.0+07	6.0+07	Jour	PR/C,47,1436	93	G.Feldman+	C3032
$^{20}\text{Ne},x+d$	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{20}\text{Ne},x+p$	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{20}\text{Ne},x+t$	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024

20 Calcium 40

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^{40}\text{Ar},x+d$	inclusive	DAE	1USABRK	1.6+10	4.2+10	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{40}\text{Ar},x+p$	inclusive	DAE	1USABRK	1.6+10	4.2+10	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{40}\text{Ar},x+t$	inclusive	DAE	1USABRK	1.6+10	4.2+10	Jour	PR/C,21,1321	80	A.Sandoval+	C3024

22 **Titanium** 48

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,el	^{48}Ti	DA	1USAWAS	2.2+06	2.9+06	Jour	PR/C,7,690	73	P.T.Sewell+	C3029
α ,x+ γ	inclusive	DAP	1USAWAU	1.7+07	2.4+07	Jour	PR/C,47,1436	93	G.Feldman+	C3032
α ,x+ γ	inclusive	DE	1USAWAU	1.2+07	2.8+07	Jour	PR/C,47,1436	93	G.Feldman+	C3032

24 **Chromium** 52

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,el	^{52}Cr	DA	1USAWAS	2.1+06	2.9+06	Jour	PR/C,7,690	73	P.T.Sewell+	C3029

24 **Chromium** 53

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,el	^{53}Cr	DA	1USAWAS	2.1+06	2.7+06	Jour	PR/C,7,690	73	P.T.Sewell+	C3029

27 **Cobalt** 59

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* γ ,x	^{49}Cr	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{51}Cr	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{52}Mn	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{54}Mn	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{56}Mn	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{52}Fe	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{53}Fe	?	4ZZZDUB		1.0+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{55}Co	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{56}Co	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054
* γ ,x	^{57}Co	?	4ZZZDUB		1.3+08	Jour	CPH/C,48,114002	24	F.A.Rasulova+	M1054

28 **Nickel** 58

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α ,el	^{58}Ni	DA	1USAWAS	1.3+07	2.8+07	Jour	PR/C,7,690	73	P.T.Sewell+	C3029
α ,inel	^{58}Ni	DAP	1USAWAS	1.3+07	2.8+07	Jour	PR/C,7,690	73	P.T.Sewell+	C3029
α ,x	^{60}Ni	CSP	1USAWAS	2.0+07	2.0+07	Jour	PR/C,9,607	74	J.H.Barker+	C3030
α ,x	^{61}Cu	CSP	1USAWAS	2.0+07	2.0+07	Jour	PR/C,9,607	74	J.H.Barker+	C3030
α ,x+p	inclusive	DAE	1USAWAS	2.0+07	2.0+07	Jour	PR/C,9,607	74	J.H.Barker+	C3030
α ,x+p	inclusive	DE	1USAWAS	2.0+07	2.0+07	Jour	PR/C,9,607	74	J.H.Barker+	C3030

28 Nickel 61

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He}, x + \gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$\alpha, x + \gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

28 Nickel 62

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He}, x + \gamma$	inclusive	DE	1USAWAU	1.1+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

29 Copper

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* $d, n + p$		DA	4RUSFEI	1.0+06	5.0+06	Jour	ANE,211,110904	25	D.E.Gremyachkin+	F1525

40 Zirconium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* α, x	^{88}Zr	CS	4RUSKUR	4.2+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{89}Zr	CS	4RUSKUR	2.2+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{90}Nb	CS	4RUSKUR	3.7+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{92}Nb	CS	4RUSKUR	2.2+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{95}Nb	CS	4RUSKUR	2.2+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{96}Nb	CS	4RUSKUR	2.7+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{90}Mo	CS	4RUSKUR	4.6+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520
* α, x	^{93}Mo	CS	4RUSKUR	1.7+07	6.0+07	Jour	ARI,214,111544	24	R.A.Aliev+	F1520

40 Zirconium 90

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α, el	^{90}Zr	DA	1USATAM	2.4+08	2.4+08	Jour	NP/A,687,80	01	H.L.Clark+	C3018
α, inel	^{90}Zr	DAP	1USATAM	2.4+08	2.4+08	Jour	NP/A,687,80	01	H.L.Clark+	C3018

42 Molybdenum 95

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He}, x + \gamma$	inclusive	DAP	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$^3\text{He}, x + \gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$\alpha, x + \gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

42 Molybdenum 96

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
$^3\text{He},x+\gamma$	inclusive	DE	1USAWAU	1.5+07	1.5+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

45 Rhodium 103

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
n,el	^{103}Rh	RP	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,el		AMP	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,γ		RP	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,γ	^{104}Rh	CS	4RUSFEI	Maxwl	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,tot		CS	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
α,x	^5He	DAP	1USAWAU	9.0+07	9.0+07	Jour	PR/C,14,896	76	D.R.Brown+	C3027

47 Silver 108

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
$^{20}\text{Ne},x+d$	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{20}\text{Ne},x+p$	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
$^{20}\text{Ne},x+t$	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024

50 Tin 119

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
$\alpha,x+\gamma$	inclusive	DE	1USAWAU	2.8+07	2.8+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

50 Tin 120

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
$^3\text{He},x+\gamma$	inclusive	DE	1USAWAU	1.6+07	1.6+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

50 Tin 124

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max		Ref Vol Page			
$^3\text{He},x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$\alpha,x+\gamma$	inclusive	DE	1USAWAU	1.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

55 Cesium 133

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,el		RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177
n,γ		RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177
n,γ	^{134}Cs	CS	4RUSFEI	Maxwl	4.0+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

56 Barium 135

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$p,3n$	^{133}La	CS	4RUSKUR	2.0+07	3.0+07	Jour	BLI,51,515		24	I.A.Khomenko+	F1526
*	$p,3n$	^{133}La	TT	4RUSKUR	2.0+07	3.0+07	Jour	BLI,51,515		24	I.A.Khomenko+	F1526
*	$p,inel$	^{135}Ba	CS	4RUSKUR	3.5+06	3.0+07	Jour	BLI,51,515		24	I.A.Khomenko+	F1526
*	p,n	^{135}La	CS	4RUSKUR	3.5+06	3.0+07	Jour	BLI,51,515		24	I.A.Khomenko+	F1526
*	p,n	^{135}La	TT	4RUSKUR	3.5+06	3.0+07	Jour	BLI,51,515		24	I.A.Khomenko+	F1526
*	p,x	^{133}Ba	CS	4RUSKUR	2.0+07	3.0+07	Jour	BLI,51,515		24	I.A.Khomenko+	F1526

56 Barium 136

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
*	$p,2n$	^{135}La	CS	4RUSKUR	1.4+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	$p,2n$	^{135}La	TT	4RUSKUR	1.4+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	p,x	^{132}Cs	CS	4RUSKUR	2.3+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	p,x	^{132}Cs	TT	4RUSKUR	2.3+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	p,x	^{135}Ba	CS	4RUSKUR	1.7+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	p,x	^{135}Ba	TT	4RUSKUR	1.7+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	p,x	^{133}La	CS	4RUSKUR	2.6+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524
*	p,x	^{133}La	TT	4RUSKUR	2.6+07	2.9+07	Jour	EPJ/P,139,1121		24	I.A.Khomenko+	F1524

62 Samarium 144

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
α,el	^{144}Sm	DA	1USATAM	2.4+08	2.4+08	Jour	NP/A,687,80			01	H.L.Clark+	C3018
$\alpha,inel$	^{144}Sm	DAP	1USATAM	2.4+08	2.4+08	Jour	NP/A,687,80			01	H.L.Clark+	C3018

62 Samarium 147

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,el		RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177
n,γ		RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

n,γ	^{148}Sm	CS	4RUSFEI	Maxwl	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
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62Samarium148

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$^3\text{He},x+\gamma$	inclusive	DAP	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$^3\text{He},x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$\alpha,x+\gamma$	inclusive	DAP	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$\alpha,x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

62Samarium152

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,el	^{153}Sm	RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,γ		RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,γ		CS	4RUSFEI	Maxwl	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177

62Samarium154

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
$\alpha,x+\gamma$	inclusive	DAP	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033
$\alpha,x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759	96	J.A.Behr+	C3033

63Europium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,γ		CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177

63Europium151

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,el	^{152}Eu	RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,γ		RP	4RUSFEI	5.0+03	4.5+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
n,γ		CS	4RUSFEI	Maxwl	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177

63Europium153

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

<i>n</i> ,el	¹⁵³ Eu	RP	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
<i>n</i> ,el		AMP	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
<i>n</i> , γ		RP	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
<i>n</i> , γ	¹⁵⁴ Eu	CS	4RUSFEI	Maxw1	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
<i>n</i> ,tot		CS	4RUSFEI	5.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177

64 Gadolinium 158

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
<i>n</i> , γ	¹⁵⁹ Gd	CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177
<i>n</i> ,tot		CS	4RUSFEI	4.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177

64 Gadolinium 160

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
<i>n</i> , γ	¹⁶¹ Gd	CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177
<i>n</i> ,tot		CS	4RUSFEI	4.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177

65 Terbium 159

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
<i>n</i> , γ	¹⁶⁰ Tb	CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177
<i>n</i> ,tot		CS	4RUSFEI	4.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177

66 Dysprosium

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
<i>n</i> , γ		CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177

66 Dysprosium 160

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
<i>n</i> , γ	¹⁶¹ Dy	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177

66 Dysprosium 161

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
<i>n</i> , γ	¹⁶² Dy	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	91	M.V.Bokhovko+	41177

66 Dysprosium 162

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{163}Dy	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

66 Dysprosium 163

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{164}Dy	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

66 Dysprosium 164

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{165}Dy	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

67 Holmium 165

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{166}Ho	CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177
n,tot		CS	4RUSFEI	4.0+03	1.0+06	Rept	FEI-2169			91	M.V.Bokhovko+	41177

70 Ytterbium 170

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{171}Yb	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

70 Ytterbium 171

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{172}Yb	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

70 Ytterbium 172

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

<i>n,γ</i>	¹⁷³ Yb	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
			70	Ytterbium			173			
Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max			Ref Vol Page		
<i>n,γ</i>	¹⁷⁴ Yb	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
			70	Ytterbium			174			
Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max			Ref Vol Page		
<i>n,γ</i>	¹⁷⁵ Yb	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
			70	Ytterbium			176			
Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max			Ref Vol Page		
<i>n,γ</i>	¹⁷⁷ Yb	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
			71	Lutetium			175			
Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max			Ref Vol Page		
<i>n,γ</i>	¹⁷⁶ Lu	CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
<i>n,tot</i>		CS	4RUSFEI	4.0+03	1.0+06	Rept	FEI-2169	91	M.V.Bokhovko+	41177
			72	Hafnium			176			
Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max			Ref Vol Page		
<i>n,γ</i>	¹⁷⁷ Hf	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177
			72	Hafnium			177			
Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation	Date	Author	Data #
				Min	Max			Ref Vol Page		
<i>n,γ</i>	¹⁷⁸ Hf	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169	91	M.V.Bokhovko+	41177

72 **Hafnium** 178

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{179}Hf	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

72 **Hafnium** 179

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{180}Hf	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

72 **Hafnium** 180

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{181}Hf	CS	4RUSFEI	1.6+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

73 **Tantalum** 181

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{182}Ta	CS	4RUSFEI	2.0+04	4.6+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177
$^3\text{He},x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759			96	J.A.Behr+	C3033
$\alpha,x+\gamma$	inclusive	DE	1USAWAU	2.7+07	2.7+07	Jour	PR/C,53,1759			96	J.A.Behr+	C3033
* $^{48}\text{Ca},x+\alpha$	inclusive	DAE	4ZZZDUB	2.8+08	2.8+08	Jour	PAN,85,307			22	Yu.E.Penionzhkevich+	F1519

76 **Osmium** 187

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
n,γ	^{188}Os	CS	4RUSFEI	5.0+03	4.0+05	Rept	FEI-2169			91	M.V.Bokhovko+	41177

77 **Iridium**

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
				Min	Max		Ref	Vol	Page			
* γ,x	^{185}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057
* γ,x	^{186}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057
* γ,x	^{187}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057
* γ,x	^{188}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057
* γ,x	^{189}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057
* γ,x	^{190}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057
* γ,x	^{192}Ir	CS	4RUSMOS		5.5+07	Jour	PAN,87,S386			24	M.V.Zheltonozhskaya+	M1057

79 Gold 197

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
²⁰ Ne,x+d	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
²⁰ Ne,x+p	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
²⁰ Ne,x+t	inclusive	DAE	1USABRK	7.9+09	7.9+09	Jour	PR/C,21,1321	80	A.Sandoval+	C3024
* ⁴⁸ Ca,x+α	inclusive	DAE	4ZZZDUB	2.8+08	2.8+08	Jour	PAN,85,307	22	Yu.E.Penionzhkevich+	F1519

82 Lead

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* p,x	¹⁰² Rh	CS	4RUSITE	4.0+08	4.0+08	Jour	ARI,214,111533	24	Q.Liu+	F1523
* p,x	¹⁰⁸ Ag	CS	4RUSITE	4.0+08	4.0+08	Jour	ARI,214,111533	24	Q.Liu+	F1523

82 Lead 204

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* ⁵⁰ Ti,n	²⁵³ Rf	CS	4ZZZDUB	2.4+08	2.4+08	Jour	PR/C,105,L021306	22	A.Lopez-Martens+	F1512

82 Lead 208

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
α,el	²⁰⁸ Pb	DA	1USATAM	2.4+08	2.4+08	Jour	NP/A,687,80	01	H.L.Clark+	C3018
α,inel	²⁰⁸ Pb	DAP	1USATAM	2.4+08	2.4+08	Jour	NP/A,687,80	01	H.L.Clark+	C3018
α,x	⁵ He	DAP	1USAWAU	4.2+07	9.0+07	Jour	PR/C,14,896	76	D.R.Brown+	C3027

83 Bismuth 209

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
* γ,3n	²⁰⁶ Bi	CS	4ARMJER		6.0+07	Jour	EPJ/A,61,20	25	M.Krmar+	M1055
* γ,4n	²⁰⁵ Bi	CS	4ARMJER		6.0+07	Jour	EPJ/A,61,20	25	M.Krmar+	M1055

90 Thorium 232

Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation Ref Vol Page	Date	Author	Data #
				Min	Max					
n,fis		KE	4RUSFEI	1.4+06	5.6+06	Jour	SNP,7,475	68	A.I.Sergachev+	40173
* p,3n	²³⁰ Pa	CS	4ARMJER	1.4+07	1.6+07	Jour	PR/C,109,065802	24	T.V.Kotanjyan+	F1521
* p,n	²³² Pa	CS	4ARMJER	1.3+07	1.6+07	Jour	PR/C,109,065802	24	T.V.Kotanjyan+	F1521

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	Reaction	Product	Quant.	Lab.	Energy (eV)		Type	Documentation			Date	Author	Data #
					Min	Max		Ref	Vol	Page			
*	$p,3n$	^{236}Np	CS	4ARMJER	1.5+07	1.7+07	Jour	PR/C,109,065802	24		24	T.V.Kotanjyan+	F1521
*	p,n	^{238}Np	CS	4ARMJER	1.2+07	1.7+07	Jour	PR/C,109,065802	24		24	T.V.Kotanjyan+	F1521
*	p,x	^{237}U	CS	4ARMJER	1.2+07	1.7+07	Jour	PR/C,109,065802	24		24	T.V.Kotanjyan+	F1521
	$p,x+d$	inclusive	DAE	1USABRK	3.9+08	3.9+08	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$p,x+p$	inclusive	DAE	1USABRK	3.9+08	3.9+08	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$p,x+t$	inclusive	DAE	1USABRK	3.9+08	3.9+08	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	α,x	^5He	DAP	1USAWAU	9.0+07	9.0+07	Jour	PR/C,14,896	76		76	D.R.Brown+	C3027
	$\alpha,x+d$	inclusive	DAE	1USABRK	1.6+09	4.2+09	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$\alpha,x+p$	inclusive	DAE	1USABRK	1.6+09	4.2+09	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$\alpha,x+t$	inclusive	DAE	1USABRK	1.6+09	4.2+09	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{20}\text{Ne},x+\alpha$	inclusive	DAE	1USABRK	4.8+09	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{20}\text{Ne},x+d$	inclusive	DAE	1USABRK	4.8+09	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{20}\text{Ne},x+^3\text{He}$	inclusive	DAE	1USABRK	4.8+09	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{20}\text{Ne},x+p$	inclusive	DAE	1USABRK	4.8+09	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{20}\text{Ne},x+t$	inclusive	DAE	1USABRK	4.8+09	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{40}\text{Ar},x+d$	inclusive	DAE	1USABRK	1.6+10	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{40}\text{Ar},x+p$	inclusive	DAE	1USABRK	1.6+10	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
	$^{40}\text{Ar},x+t$	inclusive	DAE	1USABRK	1.6+10	4.2+10	Jour	PR/C,21,1321	80		80	A.Sandoval+	C3024
*	$^{48}\text{Ca},x+\alpha$	inclusive	DAE	4ZZZDUB	2.8+08	2.8+08	Jour	PAN,85,307	22		22	Yu.E.Penionzhkevich+	F1519