# EXFOR News (June 2023)

## 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 | $\alpha$-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/d$E'$ | 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 | $\eta$-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 2

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,el | $^{2}$H | ? | 3CPRIHP | 1.4+07 | 5.2+07 | Jour | EPJ/A,57,310 | 21 | Zengqi Cui+ | 32862 |
| * | $p,\gamma$ | $^{3}$He | CS | 2GERZFK | 2.6+05 | 1.1+06 | Jour | PR/C,103,045805 | 21 | S.Turkat+ | O2556 |
| | $^{24}$Ne,$p$ | $^{25}$Ne | DAP | 2FR GAN | 2.5+08 | 2.5+08 | Jour | PRL,104,192501 | 10 | W.N.Catford+ | O1294 |
| | $^{46}$Ar,$p$ | $^{47}$Ar | ? | 2FR GAN | 4.7+08 | 4.7+08 | Jour | PRL,97,092501 | 06 | L.Gaudefroy+ | O0693 |
| * | $^{72}$Zn,$^{3}$He | $^{71}$Cu | ? | 2FR GAN | 2.7+09 | 2.7+09 | Jour | JP/CS,580,012012 | 15 | S.Franchoo+ | O0702 |

## 2 Helium 4

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $d,\gamma$ | $^{6}$Li | CS | 2GERGSI | 4.5+04 | 1.9+06 | Conf | 2006CERN,,(013) | 06 | F.Hammache+ | O0692 |
| | $d,\gamma$ | $^{6}$Li | CS | 2GERKFK | 9.9+04 | 3.8+05 | Jour | PR/C,44,2195 | 91 | J.Kiener+ | O2209 |
| * | $^{13}$N,$p$ | $^{16}$O | ? | 1USAANL | 3.3+06 | 6.0+06 | Jour | PR/C,105,L042802 | 22 | H.Jayatissa+ | C2747 |
| * | $^{18}$Ne,$p$ | $^{21}$Na | ? | 1USAFSU | 2.5+06 | 4.0+06 | Jour | PR/C,105,055806 | 22 | M.Anastasiou+ | C2770 |
| * | $^{100}$Mo,$n$ | $^{103}$Ru | ? | 1USAANL | 9.1+06 | 1.3+07 | Jour | PR/C,105,055803 | 22 | W.-J.Ong+ | C2768 |

## 2 Helium 5

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{3}$He,$\alpha$ | $^{4}$He | CS | 3CRORBZ | 3.8+04 | 6.1+05 | Jour | EPJ/A,57,20 | 21 | C.Spitaleri+ | D1037 |

## 3 Lithium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,tot | | CS | 3CPRIHP | 4.2-01 | 2.0+07 | Jour | ASI,71,052901 | 22 | Zhang Jiang-Lin+ | 32868 |

## 4 Berylium 9

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{6}$Li,el | $^{9}$Be | DA | 3BZLUSP | 1.1+07 | 2.6+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{7}$Li,el | $^{9}$Be | DA | 3BZLUSP | 1.8+07 | 2.2+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{8}$Li,el | $^{9}$Be | DA | 3BZLUSP | 1.5+07 | 1.9+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{7}$Be,el | $^{9}$Be | DA | 3BZLUSP | 1.7+07 | 1.7+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{9}$Be,el | $^{9}$Be | DA | 3BZLUSP | 2.4+07 | 3.0+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{10}$Be,el | $^{9}$Be | DA | 3BZLUSP | 2.2+07 | 2.7+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{8}$B,el | $^{9}$Be | DA | 3BZLUSP | 2.4+07 | 2.4+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{11}$B,el | $^{9}$Be | DA | 3BZLUSP | 3.1+07 | 3.1+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |
| * | $^{12}$B,el | $^{9}$Be | DA | 3BZLUSP | 2.8+07 | 3.4+07 | Jour | PR/C,106,054602 | 22 | U.Umbelino+ | D1034 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $^{208}$Pb,x | $^{142}$Sm | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{143}$Eu | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{144}$Eu | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{145}$Eu | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{144}$Gd | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{147}$Gd | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{148}$Tb | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{152}$Ho | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |
| | $^{208}$Pb,x | $^{153}$Ho | CS | 2GERGSI | 2.1+11 | 2.1+11 | Jour | APP/B,43,253 | 12 | S.Myalski+ | O0557 |

## 6 Carbon

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| | $\gamma$,x | $^{11}$C | CS | 2GERGER | | 7.3+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| * | $p$,x | $^{11}$C | CS | 2GERUDE | 9.7+07 | 9.7+07 | Jour | EPJ/A,57,248 | 21 | C.M.Baecker+ | O2552 |
| * | $\alpha$,x+$\gamma$ | inclusive | CSP | 2GERBER | 6.0+07 | 9.0+07 | Jour | PR/C,104,024621 | 21 | J.Kiener+ | O2563 |
| * | $^{16}$O,tcc | | CS | 2GERGSI | 1.4+10 | 1.4+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{18}$O,tcc | | CS | 2GERGSI | 1.6+10 | 1.6+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{19}$O,tcc | | CS | 2GERGSI | 1.8+10 | 1.8+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{20}$O,tcc | | CS | 2GERGSI | 1.8+10 | 1.8+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{21}$O,tcc | | CS | 2GERGSI | 2.0+10 | 2.0+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{22}$O,tcc | | CS | 2GERGSI | 2.1+10 | 2.1+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{23}$O,tcc | | CS | 2GERGSI | 2.0+10 | 2.0+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |
| * | $^{24}$O,tcc | | CS | 2GERGSI | 2.1+10 | 2.1+10 | Jour | PRL,129,142502 | 22 | S.Kaur+ | D8052 |

## 6 Carbon 12

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| * | $p$,x | $^{10}$C | CS | 2GERGER | 4.1+07 | 2.2+08 | Jour | PMB,64,205012 | 19 | F.Horst+ | O2553 |
| * | $p$,x | $^{11}$C | CS | 2GERGER | 4.1+07 | 2.2+08 | Jour | PMB,64,205012 | 19 | F.Horst+ | O2553 |
| | $\alpha$,$^{8}$Be | $^{8}$Be | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PRL,31,607 | 73 | G.J.Wozniak+ | C2758 |
| | $\alpha$,$\gamma$ | $^{16}$O | DAP | 1USABNL | 3.4+07 | 4.2+07 | Jour | PRL,46,884 | 81 | A.M.Sandorfi+ | C2750 |
| | $\alpha$,inel | $^{12}$C | DAP | 1USABNL | 3.5+07 | 4.2+07 | Jour | PRL,46,884 | 81 | A.M.Sandorfi+ | C2750 |
| * | $^{12}$C,x | $^{10}$C | CS | 2GERGER | 7.9+08 | 5.0+09 | Jour | PMB,64,205012 | 19 | F.Horst+ | O2553 |
| * | $^{12}$C,x | $^{11}$C | CS | 2GERGER | 7.9+08 | 5.0+09 | Jour | PMB,64,205012 | 19 | F.Horst+ | O2553 |
| * | $^{24}$Mg,fus | | CS | 2ITYPAD | 8.4+06 | 1.7+07 | Jour | JP/G,49,095101 | 22 | G.Montagnoli+ | D8051 |

## 6 Carbon 13

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| * | $\alpha$,$n$ | $^{16}$O | TTP | 2UK HAR | 5.6+06 | 6.0+06 | Jour | NIM/A,1013,165636 | 21 | S.Croft+ | O2557 |

## 6 Carbon 14

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{11}$B,$^{13}$B | $^{12}$C | DAP | 3POLWWA | 4.5+07 | 4.5+07 | Jour | YFE,23,12 | 22 | S.Yu.Mezhevych+ | D5195 |

## 7 Nitrogen 16

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $d$,$^{3}$He | $^{15}$C | DAP | 1USAANL | 2.4+07 | 2.4+07 | Jour | PR/C,105,064307 | 22 | T.L.Tang+ | C2772 |

## 8 Oxygen

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,el | $^{\rm nat}$O | DA | 1USACST | 4.1+05 | 1.6+06 | Jour | NP/A,241,460 | 75 | C.Rolfs+ | C0626 |

## 8 Oxygen 16

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,$\alpha$ | $^{13}$N | CS | 1USAANL | 3.3+06 | 6.0+06 | Jour | PR/C,105,L042802 | 22 | H.Jayatissa+ | C2747 |
| * | $p$,x | $^{15}$O | CS | 2GERGER | 3.9+07 | 2.2+08 | Jour | PMB,64,205012 | 19 | F.Horst+ | O2553 |
| | $\alpha$,$^{8}$Be | $^{12}$C | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PRL,31,607 | 73 | G.J.Wozniak+ | C2758 |
| * | $^{10}$B,$^{9}$Be | $^{17}$F | DAP | 3POLWWA | 4.1+07 | 4.1+07 | Jour | APP/B,53,9-A5 | 22 | F.Kh.Ergashev+ | D8053 |
| * | $^{10}$B,el | $^{16}$O | DA | 3POLWWA | 4.1+07 | 4.1+07 | Jour | APP/B,53,9-A5 | 22 | F.Kh.Ergashev+ | D8053 |
| * | $^{12}$C,x | $^{15}$O | CS | 2GERGER | 7.9+08 | 5.1+09 | Jour | PMB,64,205012 | 19 | F.Horst+ | O2553 |

## 8 Oxygen 17

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\alpha$,0 | | RP | 1CANTMF | 6.1+05 | 1.3+06 | Jour | PR/C,105,065805 | 22 | M.Williams+ | C2774 |
| * | $\alpha$,$\gamma$ | $^{21}$Ne | RR | 1CANTMF | | | Jour | PR/C,105,065805 | 22 | M.Williams+ | C2774 |

## 8 Oxygen 18

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,0 | | RP | 1USAORL | | | Jour | PR,134,B1237 | 64 | D.Powers+ | C0750 |
| * | $\alpha$,$\gamma$ | | RP | 1USASRF | 4.7+05 | 7.7+05 | Jour | PRL,128,162701 | 22 | A.C.Dombos+ | C2764 |

## 10 Neon

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $^{3}$He,x | $^{24}$Na | CS | 2GERJUL | 1.5+06 | 3.3+07 | Jour | RCA,79,207 | 97 | A.Fenyvesi+ | D4134 |
| | $\alpha$,x | $^{24}$Na | CS | 2GERJUL | 2.6+06 | 2.2+07 | Jour | RCA,79,207 | 97 | A.Fenyvesi+ | D4134 |

## 10 Neon 20

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,$\gamma$ | | RP | 1USACST | | | Jour | NP/A,241,460 | 75 | C.Rolfs+ | C0626 |

## 10 Neon 22

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,$\gamma$ | $^{23}$Na | CS | 1USACST | 5.4+05 | 1.7+06 | Jour | NP/A,241,460 | 75 | C.Rolfs+ | C0626 |
| | $p$,$\gamma$ | $^{23}$Na | CSP | 1USACST | 5.4+05 | 1.7+06 | Jour | NP/A,241,460 | 75 | C.Rolfs+ | C0626 |

## 12 Magnesium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,el | $^{\mathrm{nat}}$Mg | DA | 2GRCATH | 2.7+06 | 4.2+06 | Jour | NIM/B,536,45 | 23 | F.Maragkos+ | O2562 |
| * | $\alpha$,x+$\gamma$ | inclusive | CSP | 2GERBER | 5.0+07 | 9.0+07 | Jour | PR/C,104,024621 | 21 | J.Kiener+ | O2563 |

## 12 Magnesium 24

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{3}$He,el | $^{24}$Mg | DA | 4KASKAZ | 6.0+07 | 6.0+07 | Jour | EPJ/A,57,130 | 21 | B.M.Sadykov+ | D8059 |
| * | $^{3}$He,inel | $^{24}$Mg | DAP | 4KASKAZ | 6.0+07 | 6.0+07 | Jour | EPJ/A,57,130 | 21 | B.M.Sadykov+ | D8059 |
| * | $\alpha$,el | $^{24}$Mg | DA | 4KASKAZ | 5.0+07 | 5.0+07 | Jour | EPJ/A,57,130 | 21 | B.M.Sadykov+ | D8059 |
| * | $\alpha$,inel | $^{24}$Mg | DAP | 4KASKAZ | 5.0+07 | 5.0+07 | Jour | EPJ/A,57,130 | 21 | B.M.Sadykov+ | D8059 |
| * | $^{16}$O,X+$^{16}$O | $^{16}$O | ? | 3INDTRM | 1.2+08 | 1.3+08 | Jour | NP/A,1016,122320 | 21 | B.N.Joshi+ | D6410 |

## 12 Magnesium 25

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,inel | $^{25}$Mg | DAP | 2PRTLIS | 8.7+05 | 4.0+06 | Jour | EPJ/A,58,128 | 22 | J.Cruz+ | O2551 |

## 12 Magnesium 26

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $d$,el | $^{26}$Mg | DA | 3CZRUJF | 1.9+07 | 1.9+07 | Jour | PR/C,103,015806 | 21 | G.D'Agata+ | D1035 |
| * | $d$,$p$ | $^{27}$Mg | DAP | 3CZRUJF | 1.9+07 | 1.9+07 | Jour | PR/C,103,015806 | 21 | G.D'Agata+ | D1035 |

## 13 Aluminium 27

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\gamma$,x | $^{24}$Na | CS | 2GERGER | | 7.7+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| * | $\gamma$,x | $^{24}$Na | CS | 4UKRKFT | | 8.5+07 | Jour | VAT/I,,(5/141),11 | 22 | O.S.Deiev+ | G4101 |
| | $\gamma$,x | $^{27}$Mg | CS | 2GERGER | | 7.3+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $n$,$p$ | $^{27}$Mg | DA | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $n$,x+$p$ | inclusive | DE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $\alpha$,el | $^{27}$Al | DA | 1USAUAZ | 2.0+06 | 4.7+06 | Jour | NIM/B,15,296 | 86 | J.A.Leavitt+ | C0742 |

## 14 Silicon

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,el | $^{nat}$Si | DA | 2GRCATH | 3.0+06 | 5.0+06 | Jour | NIM/B,507,20 | 21 | F.Maragkos+ | O2559 |
| * | $\alpha$,x+$\gamma$ | inclusive | CSP | 2GERBER | 6.0+07 | 9.0+07 | Jour | PR/C,104,024621 | 21 | J.Kiener+ | O2563 |

## 14 Silicon 28

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,x+$p$ | inclusive | DAE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |

## 16 Sulphur 32

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,$d$ | $^{31}$S | DAP | 1USATAM | 3.3+07 | 3.3+07 | Jour | PR/C,105,045805 | 22 | S.Burcher+ | C2746 |

## 20 Calcium 40

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,el | $^{40}$Ca | DA | 1USABRK | 2.2+07 | 7.2+07 | Jour | PR/C,6,1226 | 72 | R.Stock+ | C2757 |
| * | $^{18}$O,$^{17}$O | $^{41}$Ca | DAP | 2ITYLNS | 2.8+08 | 2.8+08 | Jour | PR/C,104,064609 | 21 | S.Calabrese+ | D8042 |
| * | $^{18}$O,$^{19}$F | $^{39}$K | DAP | 2ITYLNS | 2.8+08 | 2.8+08 | Jour | PR/C,104,064609 | 21 | S.Calabrese+ | D8042 |

## 20 Calcium 42

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,el | $^{42}$Ca | DA | 1USABRK | 4.1+07 | 6.6+07 | Jour | PR/C,6,1226 | 72 | R.Stock+ | C2757 |

## 20 Calcium 44

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,el | $^{44}$Ca | DA | 1USABRK | 4.1+07 | 7.2+07 | Jour | PR/C,6,1226 | 72 | R.Stock+ | C2757 |

## 20 Calcium 48

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,el | $^{48}$Ca | DA | 1USABRK | 4.1+07 | 6.6+07 | Jour | PR/C,6,1226 | 72 | R.Stock+ | C2757 |

## 21 Scandium 45

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,2$n$ | $^{47}$V | CS | 1USABNL | 1.5+07 | 4.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |
| | $\alpha$,2$p$ | $^{47}$Sc | CS | 1USABNL | 2.1+07 | 4.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |
| | $\alpha$,$n$ | $^{48}$V | CS | 1USABNL | 1.4+07 | 4.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |

## 22 Titanium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{24}$Na | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{34}$Cl | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{38}$Cl | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{39}$Cl | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{41}$Ar | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{42}$K | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{43}$K | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{44}$K | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{47}$Ca | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{43}$Sc | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{44}$Sc | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{46}$Sc | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{47}$Sc | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{48}$Sc | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{47}$V | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{48}$V | CS | 2GERUDE | 1.0+08 | 1.3+08 | Jour | NIM/B,492,56 | 21 | C.M.Baecker+ | O2560 |
| * | $p$,x | $^{48}$V | CS | 3PAKQAU | 5.4+06 | 5.8+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\alpha$,x | $^{49}$Cr | CS | 3PAKQAU | 5.6+06 | 7.9+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{51}$Cr | CS | 3PAKQAU | 7.9+06 | 7.9+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |

## 22 Titanium 46

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $d$,$n$ | $^{47}$V | CS | 1USABNL | 7.4+06 | 2.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |
| $\alpha$,el | $^{46}$Ti | DA | 2GERKFK | 1.0+08 | 1.0+08 | Jour | NP/A,218,13 | 74 | H.Rebel+ | O0714 |
| $\alpha$,inel | $^{46}$Ti | DAP | 2GERKFK | 1.0+08 | 1.0+08 | Jour | NP/A,218,13 | 74 | H.Rebel+ | O0714 |

## 22 Titanium 47

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $d$,2$n$ | $^{47}$V | CS | 1USABNL | 5.5+06 | 2.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |
| $d$,2$p$ | $^{47}$Sc | CS | 1USABNL | 4.2+06 | 2.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |

## 22 Titanium 48

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $d$,2$n$ | $^{48}$V | CS | 1USABNL | 8.8+06 | 2.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |
| $\alpha$,el | $^{48}$Ti | DA | 2GERKFK | 1.0+08 | 1.0+08 | Jour | NP/A,218,13 | 74 | H.Rebel+ | O0714 |
| $\alpha$,inel | $^{48}$Ti | DAP | 2GERKFK | 1.0+08 | 1.0+08 | Jour | NP/A,218,13 | 74 | H.Rebel+ | O0714 |

## 22 Titanium 49

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $d$,$n$+$\alpha$ | $^{46}$Sc | CS | 1USABNL | 1.2+07 | 2.0+07 | Jour | PR,134,B1269 | 64 | K.L.Chen+ | D4105 |

## 23 Vanadium 51

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| * $\gamma$,3$n$ | $^{48}$V | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * $\gamma$,x | $^{46}$Sc | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * $\gamma$,x | $^{47}$Sc | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * $\gamma$,x | $^{48}$Sc | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| $p$,x | $^{7}$Be | CS | 2FR SAT | 2.8+08 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| $p$,x | $^{22}$Na | CS | 2FR SAT | 1.3+08 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| $p$,x | $^{24}$Na | CS | 2FR SAT | 1.4+08 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| $p$,x | $^{28}$Mg | CS | 2FR SAT | 2.8+08 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| $p$,x | $^{42}$K | CS | 2FR SAT | 5.8+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| $p$,x | $^{43}$K | CS | 2FR SAT | 4.5+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,x | $^{47}$Ca | CS | 2FR SAT | 8.0+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{44}$Sc | CS | 2FR SAT | 3.2+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{46}$Sc | CS | 2FR SAT | 3.2+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{47}$Sc | CS | 2FR SAT | 8.0+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{48}$Sc | CS | 2FR SAT | 4.5+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{44}$Ti | CS | 2FR SAT | 1.2+08 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{48}$V | CS | 2FR SAT | 3.2+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{48}$Cr | CS | 2FR SAT | 3.2+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |
| | $p$,x | $^{51}$Cr | CS | 2FR SAT | 3.2+07 | 2.6+09 | Thes | PROTOSCHILL | 97 | J.Protoschill | O0703 |

## 24 Chromium 50

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,$p$ | $^{50}$V | DA | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $n$,x+$p$ | inclusive | DAE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $n$,x+$p$ | inclusive | DE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |

## 26 Iron

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\alpha$,x+$\gamma$ | inclusive | CSP | 2GERBER | 5.0+04 | 9.0+04 | Jour | PR/C,104,024621 | 21 | J.Kiener+ | O2563 |

## 26 Iron 54

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,$p$ | $^{54}$Mn | DA | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $n$,x+$p$ | inclusive | DAE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $n$,x+$p$ | inclusive | DE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| * | $p$,$\alpha$ | $^{51}$Mn | CS | 1USANOT | 9.4+06 | 1.8+07 | Jour | NP/A,1021,122424 | 22 | W.Lin+ | C2765 |
| | $\alpha$,$\gamma$ | $^{58}$Ni | DAP | 1USAANL | 7.6+06 | 1.4+07 | Jour | PR/C,17,56 | 78 | L.Meyer-Schutzmeister+ | C2748 |

## 26 Iron 56

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,$p$ | $^{56}$Mn | DA | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $n$,x+$p$ | inclusive | DE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |

## 26 Iron 59

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,$\gamma$ | $^{60}$Fe | CS | 2JPNJAE | 1.0+04 | 7.8+06 | Jour | AJ,919,84 | 21 | S.Q.Yan+ | 32857 |

## 27 Cobalt 57

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,x+$p$ | inclusive | CS | 3INDTRM | | | Jour | PR/C,106,034609 | 22 | R.Gandhi+ | 33184 |

## 28 Nickel

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,x+$p$ | inclusive | DAE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |
| | $p$,x | $^{55}$Co | CS | 3POLIPJ | 2.3+07 | 2.3+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |
| * | $p$,x | $^{55}$Co | CS | 3PAKQAU | 4.8+06 | 5.6+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| | $p$,x | $^{60}$Cu | CS | 3POLIPJ | 2.3+07 | 2.3+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |
| * | $p$,x | $^{61}$Cu | CS | 3PAKQAU | 4.8+06 | 5.6+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{61}$Cu | CS | 3PAKQAU | 3.0+06 | 9.0+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{62}$Zn | CS | 3PAKQAU | | 9.0+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{63}$Zn | CS | 3PAKQAU | 9.0+06 | 9.0+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{65}$Zn | CS | 3PAKQAU | | 9.0+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |

## 28 Nickel 58

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,x+$p$ | inclusive | DAE | 4RUSTIL | 1.4+07 | 1.4+07 | Rept | INDC(CCP)-376 | 94 | L.I.Klochkova+ | 41118 |

## 28 Nickel 62

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,inel | $^{62}$Ni | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | NP,70,305 | 65 | B.G.Harvey+ | C2751 |

## 29 Copper

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,x | $^{60}$Co | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * | $\gamma$,x | $^{61}$Co | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * | $\gamma$,x | $^{61}$Cu | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * | $\gamma$,x | $^{64}$Cu | CS | 4ARMJER | | 7.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| | $n$,el | $^{nat}$Cu | CS | 1USAANL | 1.5+06 | 3.9+06 | Jour | NP/A,448,280 | 86 | P.T.Guenther+ | 12869 |
| * | $p$,x | $^{63}$Zn | CS | 3PAKQAU | 4.9+06 | 5.6+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $p$,x | $^{65}$Zn | CS | 3PAKQAU | 4.9+06 | 5.6+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{66}$Ga | CS | 3PAKQAU | 8.8+06 | 8.8+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |
| * | $\alpha$,x | $^{67}$Ga | CS | 3PAKQAU | | 9.0+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\alpha$,x | $^{68}$Ga | CS | 3PAKQAU | 7.9+06 | 7.9+06 | Jour | RCA,110,799 | 22 | M.Anwer+ | D1033 |

## 29 Copper 63

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,inel | $^{63}$Cu | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | NP,70,305 | 65 | B.G.Harvey+ | C2751 |

## 30 Zinc 64

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{19}$F,fus | | CS | 3INDNSD | 3.0+07 | 4.6+07 | Jour | EPJ/A,58,129 | 22 | S.Noor+ | D6438 |

## 30 Zinc 68

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{19}$F,fus | | CS | 3INDNSD | 3.1+07 | 4.6+07 | Jour | EPJ/A,58,129 | 22 | S.Noor+ | D6438 |

## 32 Germanium 70

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n,\gamma$ | $^{71}$Ge | CS | 1USALAS | 1.0+01 | 9.1+05 | Jour | PR/C,106,025802 | 22 | A.Laminack+ | 14791 |

## 32 Germanium 72

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n,\gamma$ | $^{73}$Ge | CS | 1USALAS | Maxwl | 9.1+05 | Jour | PR/C,106,025802 | 22 | A.Laminack+ | 14791 |

## 34 Selenium 82

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma,n$ | $^{81}$Se | CS | 4UKRIEP | | 1.8+07 | Jour | VAT/I,,(5/141),7 | 22 | V.M.Mazur+ | G4100 |

## 35 Bromine 81

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,$n$ | $^{80}$Br | CS | 4UZ NUU | | 3.5+07 | Jour | PPN/L,18,672 | 21 | S.R.Palvanov+ | G0083 |
| * | $n$,2$n$ | $^{80}$Br | CS | 4UZ UZB | 1.4+07 | 1.4+07 | Jour | PPN/L,18,672 | 21 | S.R.Palvanov+ | 31848 |

## 36 Krypton 84

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,$\gamma$ | $^{85}$Rb | CS | 1USAMSU | 2.1+06 | 3.0+06 | Jour | PR/C,105,065804 | 22 | A.Palmisano-Kyle+ | C2773 |

## 38 Strontium 86

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,$\gamma$ | $^{87}$Y | CS | 2GERTHS | 2.5+06 | 3.6+06 | Jour | PR/C,104,025804 | 21 | S.Harissopulos+ | O0316 |

## 38 Strontium 87

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,$\gamma$ | $^{88}$Y | CS | 2GERTHS | 2.0+06 | 4.9+06 | Jour | PR/C,104,025804 | 21 | S.Harissopulos+ | O0316 |

## 38 Strontium 88

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,$\gamma$ | $^{89}$Y | CS | 2GERTHS | 1.4+06 | 4.9+06 | Jour | PR/C,104,025804 | 21 | S.Harissopulos+ | O0316 |

## 40 Zirconium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{95}$Zr | CS | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,56,194 | 20 | V.D.Nguyen+ | D7039 |
| * | $p$,x | $^{90}$Nb | CS | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,57,324 | 21 | V.D.Nguyen+ | D7041 |
| * | $p$,x | $^{90}$Nb | TT | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,57,324 | 21 | V.D.Nguyen+ | D7041 |
| * | $p$,x | $^{91}$Nb | CS | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,57,324 | 21 | V.D.Nguyen+ | D7041 |
| * | $p$,x | $^{91}$Nb | TT | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,57,324 | 21 | V.D.Nguyen+ | D7041 |
| * | $p$,x | $^{92}$Nb | CS | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,57,324 | 21 | V.D.Nguyen+ | D7041 |
| * | $p$,x | $^{92}$Nb | TT | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,57,324 | 21 | V.D.Nguyen+ | D7041 |
| * | $p$,x | $^{95}$Nb | CS | 3KORKRM | 1.1+07 | 4.4+07 | Jour | EPJ/A,56,194 | 20 | V.D.Nguyen+ | D7039 |

## 40 Zirconium 90

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,$d$ | $^{92}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |
| | $\alpha$,$t$ | $^{91}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,4,1809 | 71 | M.S.Zisman+ | C2754 |

## 40 Zirconium 91

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,$d$ | $^{93}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |
| | $\alpha$,$t$ | $^{92}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |

## 40 Zirconium 92

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,$d$ | $^{94}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |
| | $\alpha$,$t$ | $^{93}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |

## 40 Zirconium 94

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,$d$ | $^{96}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |
| | $\alpha$,$t$ | $^{95}$Nb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |

## 41 Niobium 93

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,3$n$ | $^{90}$Nb | CS | 4UKRKFT | | 8.0+07 | Jour | VAT/I,,(5/141),11 | 22 | O.S.Deiev+ | G4101 |
| * | $\gamma$,$n$ | $^{92}$Nb | CS | 4UKRKFT | | 4.2+07 | Jour | VAT/I,,(5/141),11 | 22 | O.S.Deiev+ | G4101 |
| * | $p$,4$n$ | $^{90}$Mo | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{87}$Y | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{88}$Y | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{86}$Zr | CS | 3KORKAE | 7.0+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{88}$Zr | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{89}$Zr | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{89}$Nb | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{90}$Nb | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $p$,x | $^{92}$Nb | CS | 3KORKAE | 5.8+07 | 9.9+07 | Jour | PR/C,103,064617 | 21 | M.Bakhtiari+ | D7040 |
| * | $^{7}$Li,$\alpha$ | $^{96}$Mo | DA | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |
| * | $^{7}$Li,$\alpha$ | $^{96}$Mo | DAE | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |
| * | $^{7}$Li,el | $^{93}$Nb | DA | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |
| * | $^{7}$Li,X+$\alpha$ | $^{94}$Mo | DAE | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |
| * | $^{7}$Li,X+$\alpha$ | $^{95}$Mo | DAE | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{7}$Li,x+$\alpha$ | inclusive | DA | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |
| * | $^{7}$Li,x+$\alpha$ | inclusive | DAE | 3INDTRM | 2.4+07 | 2.4+07 | Jour | PL/B,820,136570 | 21 | S.K.Pandit+ | D6409 |

## 42 Molybdenum

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,x | $^{88}$Zr | CS | 4ARMJER | | 4.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * | $\gamma$,x | $^{99}$Mo | CS | 4ARMJER | | 4.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |

## 42 Molybdenum 92

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,$d$ | $^{94}$Tc | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,5,1031 | 72 | M.S.Zisman+ | C2756 |
| | $\alpha$,$t$ | $^{93}$Tc | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PR/C,4,1809 | 71 | M.S.Zisman+ | C2754 |

## 42 Molybdenum 100

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\alpha$,2$n$ | $^{102}$Ru | CS | 1USAANL | 1.2+07 | 1.3+07 | Jour | PR/C,105,055803 | 22 | W.-J.Ong+ | C2768 |

## 49 Indium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,x | $^{111}$Ag | CS | 4ARMJER | | 4.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| * | $\gamma$,x | $^{111}$In | CS | 3KORPUE | | 6.3+07 | Rept | INDC(JPN)-0208,201 | 22 | A.Makinaga+ | G0089 |

## 49 Indium 115

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,inel | $^{115}$In | CS | 3INDTRM | 7.9+06 | 1.9+07 | Jour | RPC,199,110270 | 22 | A.Hingu+ | 33182 |

## 50 Tin 112

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,2$n$ | $^{111}$Sb | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |
| | $p$,$n$ | $^{112}$Sb | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |
| | $p$,x | $^{111}$Sn | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |

## 50 Tin 114

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,$2n$ | $^{113}$Sb | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |

## 50 Tin 115

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,$2p$ | $^{114}$In | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |

## 50 Tin 116

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{12}$C,x+$\alpha$ | inclusive | DAE | 3INDTRM | 4.7+07 | 6.3+07 | Jour | PR/C,105,034607 | 22 | G.Mohanto+ | D6426 |

## 50 Tin 117

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $p$,inel | $^{117}$Sn | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |
| | $p$,$n$ | $^{117}$Sb | CS | 3POLIPJ | 2.4+07 | 2.4+07 | Jour | NKA,52,17 | 07 | E.Betak+ | D1036 |

## 50 Tin 120

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{11}$B,el | $^{120}$Sn | DA | 3BZLUSP | 3.1+07 | 3.7+07 | Jour | PR/C,106,044606 | 22 | V.Scarduelli+ | D1031 |
| * | $^{11}$B,inel | $^{120}$Sn | DAP | 3BZLUSP | 3.5+07 | 3.7+07 | Jour | PR/C,106,044606 | 22 | V.Scarduelli+ | D1031 |
| * | $^{11}$B,x | $^{7}$Li | DA | 3BZLUSP | 3.7+07 | 3.7+07 | Jour | PR/C,106,044606 | 22 | V.Scarduelli+ | D1031 |
| * | $^{11}$B,x | $^{10}$Be | DA | 3BZLUSP | 3.5+07 | 3.7+07 | Jour | PR/C,106,044606 | 22 | V.Scarduelli+ | D1031 |
| * | $^{11}$B,x | $^{12}$C | DA | 3BZLUSP | 3.5+07 | 3.7+07 | Jour | PR/C,106,044606 | 22 | V.Scarduelli+ | D1031 |

## 51 Antimony 121

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,$2n$ | $^{120}$Sb | CS | 3INDTRM | 1.2+07 | 1.9+07 | Jour | CHP,46,054002 | 22 | R.K.Singh+ | 33181 |

## 51 Antimony 123

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,2$n$ | $^{122}$Sb | CS | 3INDTRM | 1.2+07 | 1.9+07 | Jour | CHP,46,054002 | 22 | R.K.Singh+ | 33181 |

## 52 Tellurium 128

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $^{12}$C,3$n$ | $^{137}$Ce | CS | 1USABRK | 4.4+07 | 5.4+07 | Jour | PR,173,1202 | 68 | R.L.Kiefer+ | C2753 |

## 53 Iodine 127

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $\gamma$,$n$ | $^{126}$I | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{101}$Rh | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{103}$Ag | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{104}$Ag | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{108}$In | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{109}$In | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{111}$In | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{115}$Sb | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{116}$Sb | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{118}$Sb | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{120}$Sb | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{122}$Sb | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{117}$Te | CS | 2GERGER | | 7.6+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{119}$Te | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{121}$Te | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{118}$I | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{119}$I | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{120}$I | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{121}$I | CS | 2GERGER | | 7.3+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| $\gamma$,x | $^{124}$I | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |

## 55 Cesium 133

| Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|
| $^{7}$Li,3$n$ | $^{137}$Ce | CS | 1USABRK | 2.3+07 | 3.7+07 | Jour | PR,173,1202 | 68 | R.L.Kiefer+ | C2753 |

## 56 Barium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{135}$Ba | CS | 3EGYCAI | 6.7+06 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{132}$La | CS | 3EGYCAI | 6.7+06 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |
| * | $p$,x | $^{135}$La | CS | 3EGYCAI | 6.7+06 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |

## 56 Barium 136

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,3$n$ | $^{137}$Ce | CS | 1USABRK | 2.7+07 | 4.8+07 | Jour | PR,173,1202 | 68 | R.L.Kiefer+ | C2753 |

## 56 Barium 137

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $^{3}$He,3$n$ | $^{137}$Ce | CS | 1USABRK | 1.7+07 | 3.1+07 | Jour | PR,173,1202 | 68 | R.L.Kiefer+ | C2753 |

## 56 Barium 138

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,el | $^{138}$Ba | DA | 2GERLMU | 2.3+07 | 2.3+07 | Jour | PR/C,104,034309 | 21 | B.M.Rebeiro+ | O2532 |
| * | $p$,$t$ | $^{136}$Ba | DAP | 2GERLMU | 2.3+07 | 2.3+07 | Jour | PR/C,104,034309 | 21 | B.M.Rebeiro+ | O2532 |

## 58 Cerium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{137}$Ce | CS | 3EGYCAI | 1.4+07 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |
| * | $p$,x | $^{139}$Ce | CS | 3EGYCAI | 1.1+07 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |
| * | $p$,x | $^{141}$Ce | CS | 3EGYCAI | 1.4+07 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |
| * | $p$,x | $^{138}$Pr | CS | 3EGYCAI | 9.3+06 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |
| * | $p$,x | $^{139}$Pr | CS | 3EGYCAI | 1.4+07 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |
| * | $p$,x | $^{142}$Pr | CS | 3EGYCAI | 5.8+06 | 1.4+07 | Jour | RCA,110,891 | 22 | M.S.Abdelshafy+ | D1032 |

## 62 Samarium 154

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,inel | $^{154}$Sm | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PL/B,26,127 | 68 | D.L.Hendrie+ | C2752 |
| * | $^{19}$F,4$n$ | $^{169}$Lu | CS | 3INDNSD | 7.9+07 | 1.0+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,5$n$ | $^{168}$Lu | CS | 3INDNSD | 7.9+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,6$n$ | $^{167}$Lu | CS | 3INDNSD | 8.5+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,x | $^{161}$Ho | CS | 3INDNSD | 9.6+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,x | $^{162}$Ho | CS | 3INDNSD | 9.1+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,x | $^{164}$Tm | CS | 3INDNSD | 9.1+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,x | $^{165}$Tm | CS | 3INDNSD | 7.9+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |
| * | $^{19}$F,x | $^{166}$Tm | CS | 3INDNSD | 7.9+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{19}$F,x | $^{167}$Yb | CS | 3INDNSD | 9.1+07 | 1.1+08 | Jour | PR/C,106,014613 | 22 | A.Mahato+ | D6439 |

## 64 Gadolinium 156

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{16}$O,4$n$ | $^{168}$Hf | CS | 3INDNSD | 6.9+07 | 9.8+07 | Jour | IPA,59,103 | 21 | R.Ali+ | D6407 |
| * | $^{16}$O,6$n$ | $^{166}$Hf | CS | 3INDNSD | 8.9+07 | 9.8+07 | Jour | IPA,59,103 | 21 | R.Ali+ | D6407 |
| * | $^{16}$O,x | $^{161}$Er | CS | 3INDNSD | 7.9+07 | 9.8+07 | Jour | IPA,59,103 | 21 | R.Ali+ | D6407 |
| * | $^{16}$O,x | $^{166}$Tm | CS | 3INDNSD | 7.4+07 | 9.8+07 | Jour | IPA,59,103 | 21 | R.Ali+ | D6407 |

## 65 Terbium 159

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{12}$C,x+$\alpha$ | inclusive | DAE | 3INDTRM | 4.7+07 | 6.3+07 | Jour | PR/C,105,034607 | 22 | G.Mohanto+ | D6426 |

## 67 Holmium 165

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{16}$O,3$n$ | $^{178}$Re | CS | 3INDTRM | 5.5+07 | 7.6+07 | Jour | PR/C,104,054607 | 21 | S.Bhattacharjee+ | D6413 |
| * | $^{16}$O,4$n$ | $^{177}$Re | CS | 3INDTRM | 6.1+07 | 7.6+07 | Jour | PR/C,104,054607 | 21 | S.Bhattacharjee+ | D6413 |
| * | $^{16}$O,5$n$ | $^{176}$Re | CS | 3INDTRM | 7.4+07 | 7.6+07 | Jour | PR/C,104,054607 | 21 | S.Bhattacharjee+ | D6413 |
| * | $^{16}$O,fus | | CS | 3INDTRM | 5.5+07 | 7.6+07 | Jour | PR/C,104,054607 | 21 | S.Bhattacharjee+ | D6413 |
| * | $^{16}$O,x | $^{174}$Ta | CS | 3INDTRM | 6.6+07 | 7.6+07 | Jour | PR/C,104,054607 | 21 | S.Bhattacharjee+ | D6413 |

## 68 Erbium 166

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,inel | $^{166}$Er | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PL/B,26,127 | 68 | D.L.Hendrie+ | C2752 |

## 69 Thulium 169

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,$\gamma$ | $^{170}$Tm | CS | 3CPRIHP | 2.8+04 | 3.2+05 | Jour | CPH/C,46,044002 | 22 | Jie Ren+ | 32870 |
| * | $^{14}$N,4$n$ | $^{179}$Os | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |
| * | $^{14}$N,x | $^{174}$W | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |
| * | $^{14}$N,x | $^{175}$W | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |
| * | $^{14}$N,x | $^{176}$W | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |
| * | $^{14}$N,x | $^{177}$W | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |
| * | $^{14}$N,x | $^{178}$Re | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |
| * | $^{14}$N,x | $^{179}$Re | CS | 3INDNSD | 8.3+07 | 8.3+07 | Jour | JP/G,49,105103 | 22 | S.Kumar+ | D6441 |

## 70 Ytterbium 176

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,inel | $^{176}$Yb | DAP | 1USABRK | 5.0+07 | 5.0+07 | Jour | PL/B,26,127 | 68 | D.L.Hendrie+ | C2752 |

## 71 Lutetium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,$\gamma$ | | CS | 3CPRIHP | 6.0-01 | 1.0+02 | Jour | ASI,71,072901 | 22 | Wang De-Xin+ | 32869 |

## 72 Hafnium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,x | $^{179}$Hf | CS | 3INDIND | | 1.5+07 | Jour | ARI,174,109739 | 21 | G.T.Bholane+ | G0514 |

## 72 Hafnium 179

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,inel | $^{179}$Hf | CS | 3INDIND | | 8.0+06 | Jour | ARI,174,109739 | 21 | G.T.Bholane+ | G0514 |

## 73 Tantalum

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{110}$In | CS | 2GERJUL | 1.3+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{111}$In | CS | 2GERJUL | 1.7+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{115}$Sb | CS | 2GERJUL | 1.0+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{118}$Sb | CS | 2GERJUL | 1.3+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{116}$Te | CS | 2GERJUL | 1.1+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{117}$Te | CS | 2GERJUL | 1.1+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{119}$Te | CS | 2GERJUL | 1.3+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{123}$I | CS | 2GERJUL | 9.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{123}$Xe | CS | 2GERJUL | 1.0+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{127}$Xe | CS | 2GERJUL | 9.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{127}$Cs | CS | 2GERJUL | 7.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{129}$Cs | CS | 2GERJUL | 6.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{126}$Ba | CS | 2GERJUL | 1.3+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{128}$Ba | CS | 2GERJUL | 1.7+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{131}$Ba | CS | 2GERJUL | 7.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{132}$La | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{132}$Ce | CS | 2GERJUL | 9.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{133}$Ce | CS | 2GERJUL | 1.1+09 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{135}$Ce | CS | 2GERJUL | 9.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{139}$Ce | CS | 2GERJUL | 6.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{138}$Pr | CS | 2GERJUL | 7.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{136}$Nd | CS | 2GERJUL | 1.0+09 | 1.3+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{139}$Nd | CS | 2GERJUL | 9.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{145}$Eu | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{147}$Eu | CS | 2GERJUL | 6.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{146}$Gd | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{147}$Gd | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{149}$Gd | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{153}$Gd | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{147}$Tb | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{148}$Tb | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{149}$Tb | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{151}$Tb | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{152}$Tb | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{153}$Tb | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{155}$Tb | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{152}$Dy | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{153}$Dy | CS | 2GERJUL | 5.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{155}$Dy | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{157}$Dy | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{156}$Ho | CS | 2GERJUL | 6.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{157}$Er | CS | 2GERJUL | 1.1+09 | 1.1+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{158}$Er | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{159}$Er | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{161}$Er | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{163}$Tm | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{165}$Tm | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{167}$Tm | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{162}$Yb | CS | 2GERJUL | 1.1+09 | 1.1+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{169}$Yb | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{167}$Lu | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{169}$Lu | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{170}$Lu | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{171}$Lu | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{172}$Lu | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{173}$Lu | CS | 2GERJUL | 3.0+08 | 1.1+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{170}$Hf | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{172}$Hf | CS | 2GERJUL | 3.0+08 | 9.0+08 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{173}$Hf | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{175}$Hf | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{180}$Hf | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{172}$Ta | CS | 2GERJUL | 3.0+08 | 1.1+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{173}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{174}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{175}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{176}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{177}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{178}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{180}$Ta | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{175}$W | CS | 2GERJUL | 3.0+08 | 3.0+08 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |
| * | $p$,x | $^{177}$W | CS | 2GERJUL | 3.0+08 | 1.7+09 | Jour | ARI,178,109983 | 21 | C.Duchemin+ | O2561 |

## 73 Tantalum 181

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $\gamma$,$n$ | $^{180}$Ta | CS | 4UKRKFT | | 8.0+07 | Jour | VAT/I,,(5/141),11 | 22 | O.S.Deiev+ | G4101 |
| * | $n$,4$n$ | $^{178}$Ta | CS | 3CZRUJF | 3.0+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,5$n$ | $^{177}$Ta | CS | 3CZRUJF | 3.6+07 | 4.7+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,6$n$ | $^{176}$Ta | CS | 3CZRUJF | 4.7+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,7$n$ | $^{175}$Ta | CS | 3CZRUJF | 5.9+07 | 8.9+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,8$n$ | $^{174}$Ta | CS | 3CZRUJF | 6.6+07 | 8.9+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |

## 74 Tungsten

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $p$,x | $^{181}$Re | CS | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{181}$Re | TT | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{182}$Re | CS | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{182}$Re | TT | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{183}$Re | CS | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{183}$Re | TT | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{184}$Re | CS | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{184}$Re | TT | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{186}$Re | CS | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |
| * | $p$,x | $^{186}$Re | TT | 3KORKRM | 1.2+07 | 4.4+07 | Jour | RPC,196,110145 | 22 | T.H.Nguyen+ | D7042 |

## 74 Tungsten 182

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{12}$C,fus | | CS | 3INDNSD | 4.9+07 | 7.9+07 | Jour | PR/C,106,024614 | 22 | S.Sanila+ | D6440 |

## 74 Tungsten 184

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{12}$C,fus | | CS | 3INDNSD | 4.9+07 | 7.9+07 | Jour | PR/C,106,024614 | 22 | S.Sanila+ | D6440 |

## 74 Tungsten 186

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{12}$C,fus | | CS | 3INDNSD | 4.9+07 | 7.9+07 | Jour | PR/C,106,024614 | 22 | S.Sanila+ | D6440 |

## 78 Platinum 194

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{19}$F,fis | | CS | 3INDNSD | 8.8+07 | 1.1+08 | Jour | JP/G,48,075104 | 21 | V.Singh+ | D6408 |

## 78 Platinum 196

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{19}$F,fis | | CS | 3INDNSD | 8.1+07 | 1.1+08 | Jour | JP/G,48,075104 | 21 | V.Singh+ | D6408 |
| * | $^{19}$F,fis | | DA | 3INDNSD | 8.9+07 | 1.2+08 | Jour | JP/G,48,075104 | 21 | V.Singh+ | D6408 |

## 78 Platinum 198

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $^{19}$F,fis | | CS | 3INDNSD | 9.8+07 | 1.1+08 | Jour | JP/G,48,075104 | 21 | V.Singh+ | D6408 |

## 79 Gold 197

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\gamma$,fis | | CS | 2GERGER | | 7.3+06 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $\gamma$,x | $^{186}$Au | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $\gamma$,x | $^{188}$Au | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $\gamma$,x | $^{190}$Au | CS | 2GERGER | | 7.4+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $\gamma$,x | $^{194}$Au | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $\gamma$,x | $^{196}$Au | CS | 2GERGER | | 7.5+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| * | $n$,2$n$ | $^{196}$Au | CS | 3CZRUJF | 3.0+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,4$n$ | $^{194}$Au | CS | 3CZRUJF | 3.0+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,5$n$ | $^{193}$Au | CS | 3CZRUJF | 4.7+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,6$n$ | $^{192}$Au | CS | 3CZRUJF | 4.7+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,7$n$ | $^{191}$Au | CS | 3CZRUJF | 5.9+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,8$n$ | $^{190}$Au | CS | 3CZRUJF | 6.6+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $d$,el | $^{197}$Au | DA | 3ARGCNE | 5.0+06 | 1.6+07 | Jour | JP/G,50,045103 | 23 | T.Giudice+ | D1038 |

## 82 Lead

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\gamma$,fis | | CS | 2GERGER | | 7.1+06 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| * | $\gamma$,x | $^{203}$Hg | CS | 4ARMJER | | 4.0+07 | Jour | RPC,204,110651 | 23 | A.R.Balabekyan+ | M1041 |
| | $^{6}$Li,X+$d$ | $^{4}$He | DE | 2GERGSI | 9.0+08 | 9.0+08 | Conf | 2006CERN,,(013) | 06 | F.Hammache+ | O0692 |

## 82 Lead 208

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha$,x+$\alpha$ | inclusive | DAE | 1USABRK | 6.5+07 | 6.5+07 | Jour | PRL,27,434 | 71 | G.Chenevert+ | C2755 |
| * | $^{7}$Li,el | $^{208}$Pb | DA | 2ITYPAD | 2.5+07 | 3.9+07 | Jour | EPJ/A,57,95 | 21 | E.Vardaci+ | O2558 |
| * | $^{7}$Li,non | | CS | 2ITYPAD | 2.5+07 | 3.9+07 | Jour | EPJ/A,57,95 | 21 | E.Vardaci+ | O2558 |
| * | $^{48}$Ca,2$n$ | $^{254}$No | CS | 2GERGSI | 2.1+08 | 2.2+08 | Jour | PR/C,106,014602 | 22 | A.Bronis+ | D8054 |
| * | $^{48}$Ca,$n$ | $^{255}$No | CS | 2GERGSI | 2.1+08 | 2.2+08 | Jour | PR/C,106,014602 | 22 | A.Bronis+ | D8054 |

## 83 Bismuth 209

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,10$n$ | $^{200}$Bi | CS | 3CZRUJF | 9.4+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,4$n$ | $^{206}$Bi | CS | 3CZRUJF | 3.0+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,5$n$ | $^{205}$Bi | CS | 3CZRUJF | 4.7+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,6$n$ | $^{204}$Bi | CS | 3CZRUJF | 4.7+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,7$n$ | $^{203}$Bi | CS | 3CZRUJF | 5.9+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,8$n$ | $^{202}$Bi | CS | 3CZRUJF | 6.6+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |
| * | $n$,9$n$ | $^{201}$Bi | CS | 3CZRUJF | 8.9+07 | 9.4+07 | Jour | NP/A,1031,122593 | 23 | J.Vrzalova+ | 31857 |

## 90 Thorium 232

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| * | $n$,fis | | KE | 1USALAS | 1.1+06 | 3.7+07 | Jour | PR/C,101,014601 | 20 | D.Higgins+ | 14600 |
| | $n$,fis | | ? | 1USALRL | 1.8+06 | 4.0+06 | Jour | NSE,81,512 | 82 | J.W.Behrens+ | 10658 |
| * | $n$,fis | | ? | 3CPRBJG | 4.2+06 | 1.2+07 | Jour | EPJ/A,58,86 | 22 | Yu.M.Gledenov+ | 32873 |

## 92 Uranium

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\gamma$,fis | Many | CS | 2GERGER | | 6.0+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |
| | $\gamma$,fis | $^{132}$I | CS | 2GERGER | | 6.0+09 | Jour | NP/A,197,44 | 72 | G.Andersson+ | G0088 |

## 92 Uranium 235

| | Reaction | Product | Quant. | Lab. | Energy (eV) Min | Energy (eV) Max | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\gamma$,fis | $^{129}$Sn | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{131}$Sn | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{130}$Sb | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{132}$Sb | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{133}$Te | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{136}$I | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| * | $n$,fis | | MFQ | 2ZZZGEL | 2.5-02 | 2.5-02 | Jour | PR/C,102,064610 | 20 | A.Al-Adili+ | 23764 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,fis | $n$ | MFQ | 2FR BRC | 6.0+05 | 7.0+06 | Rept | CEA-R-4913 | 78 | A.Bertin+ | 21546 |

## 92 Uranium 236

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| * | $n$,fis | | ? | 3CPRIHP | 4.1+05 | 1.8+08 | Jour | EPJ/A,59,5 | 23 | Zhizhou Ren+ | 32886 |

## 92 Uranium 238

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| | $\gamma$,fis | $^{129}$Sn | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{131}$Sn | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{126}$Sb | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{130}$Sb | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{132}$Sb | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{133}$Te | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| | $\gamma$,fis | $^{136}$I | FY | 2BLGGHT | | 3.0+07 | Jour | PR/C,29,1777 | 84 | D.Defrenne+ | G0082 |
| * | $n$,fis | Many | FY | 3CPRNPC | 1.4+07 | 1.5+07 | Jour | ANE,165,108780 | 22 | Luocheng Yang+ | 32860 |
| * | $n$,fis | | ? | 3CPRIHP | 5.1+05 | 1.8+08 | Jour | EPJ/A,59,5 | 23 | Zhizhou Ren+ | 32886 |
| | $n$,fis | $n$ | MFQ | 2FR BRC | 7.0+06 | 7.0+06 | Rept | CEA-R-4913 | 78 | A.Bertin+ | 21546 |
| * | $n$,fis | $^{131}$Sb | CS | 3CPRNPC | 1.4+07 | 1.5+07 | Jour | ANE,165,108780 | 22 | Luocheng Yang+ | 32860 |
| * | $n$,fis | $^{131}$Sb | FY | 3CPRNPC | 1.4+07 | 1.5+07 | Jour | ANE,165,108780 | 22 | Luocheng Yang+ | 32860 |
| * | $n$,fis | $^{131}$Te | CS | 3CPRNPC | 1.4+07 | 1.5+07 | Jour | ANE,165,108780 | 22 | Luocheng Yang+ | 32860 |
| * | $n$,fis | $^{131}$Te | FY | 3CPRNPC | 1.4+07 | 1.5+07 | Jour | ANE,165,108780 | 22 | Luocheng Yang+ | 32860 |
| | $n$,inel | $^{238}$U | DAP | 2UK ALD | 2.0+06 | 2.0+06 | Jour | NP,65,236 | 65 | R.Batchelor+ | 21019 |
| | $d$,$\gamma$ | $^{240}$Np | CS | 1USADAV | 5.7+06 | 2.3+07 | Jour | NP,81,401 | 66 | R.M.Lessler+ | C0719 |

## 94 Plutonium 240

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| * | $d$,$p$+fis | $\gamma$ | FY | 2NOROSL | | 1.4+07 | Jour | PR/C,103,034609 | 21 | D.Gjestvang+ | O2555 |
| * | $d$,$p$+fis | $\gamma$ | KE | 2NOROSL | | | Jour | PR/C,103,034609 | 21 | D.Gjestvang+ | O2555 |

## 94 Plutonium 244

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| | $n$,fis | | ? | 1USALRL | 1.0+05 | 3.3+07 | Jour | NSE,66,433 | 78 | J.W.Behrens+ | 10597 |

## 95 Americium 241

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

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $n$,fis | | NU | 2JPNKTO | 2.5-02 | 2.5-02 | Jour | JIN,33,3239 | 71 | H.Nakahara+ | 22064 |

## 96 Curium 244

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| * | $n$,fis | Many | FY | 3INDTRM | 2.5-02 | 2.5-02 | Jour | NSE,197,25 | 23 | H.Naik+ | 33185 |
| * | $n$,fis | | MAS | 3INDTRM | 2.5-02 | 2.5-02 | Jour | NSE,197,25 | 23 | H.Naik+ | 33185 |

## 96 Curium 246

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| | $\alpha$,$t$ | $^{247}$Bk | DAP | 1USAANL | 2.8+07 | 2.8+07 | Jour | PR/C,20,290 | 79 | I.Ahmad+ | C2749 |

## 98 Californium 252

| | Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation | Date | Author | Data # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | | Ref Vol Page | | | |
| * | 0,fis | Many | FY | 2ZZZGEL | Spont | | Jour | PR/C,102,064610 | 20 | A.Al-Adili+ | 23764 |
| * | 0,fis | | FY | 2ZZZGEL | Spont | | Jour | PR/C,102,064610 | 20 | A.Al-Adili+ | 23764 |
| * | 0,fis | $\gamma$ | FY | 3INDTRM | Spont | | Conf | 2016KOLKAT,,314 | 16 | R.P.Vind+ | 33165 |
| * | 0,fis | | MFQ | 2ZZZGEL | Spont | | Jour | PR/C,102,064610 | 20 | A.Al-Adili+ | 23764 |
| * | 0,fis | Many | NU | 2ZZZGEL | Spont | | Jour | PR/C,102,064610 | 20 | A.Al-Adili+ | 23764 |
| * | 0,fis | | NU | 2ZZZGEL | Spont | | Jour | PR/C,102,064610 | 20 | A.Al-Adili+ | 23764 |