

EXFOR News (February 2014)

New experimental data available from Nuclear Reaction Data Centres

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Quantity codes

| | | | |
|-----|---|-----|--|
| ALF | α -value ($\sigma_{\text{capt}}/\sigma_{\text{fis}}$) | FY | Fission product yield |
| AMP | Length or amplitude | INT | Cross section integral over incident energy |
| CHG | Fragment charge | KE | Kinetic energy |
| CS | Cross section | KER | Kerma factor |
| CSN | Differential with respect to number of particles | MLT | Multiplicity |
| CSP | Partial cross section | NQ | Nuclear quantity |
| CST | Temperature dependent cross section | NU | Fission neutron multiplicity $\bar{\nu}$ |
| D3A | Triple differential $d\Omega_1/d\Omega_2/dE'$ | NUD | Delayed fission neutron multiplicity $\bar{\nu}_d$ |
| D3E | Triple differential $d\Omega/dE'_1/dE'_2$ | NUF | Fragment neutrons |
| D4A | Quadruple diff. $d\Omega_1/d\Omega_2/dE'_1/dE'_2$ | POL | Polarization |
| DA | Differential $d/d\Omega$ | POD | Differential polarization |
| DAA | Double differential $d\Omega_1/d\Omega_2$ | PY | Product yield (other than fission) |
| DAE | Double differential $d\Omega/dE'$ | RI | Resonance integral |
| DAP | Partial differential $d/d\Omega$ | RP | Resonance parameter |
| DAT | Temperature-dependent Legendre coefficient | RR | Reaction rate |
| DE | Differential d/dE' | SIF | Self indication |
| DEP | Energy spectrum for specific group | SPC | Gamma spectrum |
| DP | Diff. by linear momentum of outgoing part. | TSL | Thermal scattering |
| DT | Diff. by 4-momentum transfer squared | TT | Thick target yield |
| ETA | η -value $\bar{\nu}\sigma_{\text{fis}}/(\sigma_{\text{capt}} + \sigma_{\text{fis}})$ | TTD | Differential thick target yield, $d/d\Omega$ |
| EVL | Evaluation | TTP | Partial thick target yield |

Special codes in outgoing particle field

| | | | | | | | |
|-----|------------|------|------------|-----|-----------------------|-----|-------|
| abs | Absorption | fus | Fusion | sc | 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), [CAJaD](#) (Russia), [CDFE](#) (Russia), [CNPD](#) (Russia), [UkrNDC](#) (Ukraine)

1 Hydrogen 1

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|--------------|--------|---------|-------------|--------|------|--------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,el | ^1H | DA | 4ZZZDUB | 5.0+08 | 8.8+08 | Jour | PPN/L,10,243 | 13 | Yu.V.Gurchin+ | A0952 |
| $^{104}\text{Sn},x$ | Many | CS | 2JPNIPC | 1.5+10 | 1.5+10 | Jour | PR/C,88,041602 | 13 | L.Audirac+ | E2444 |
| $^{112}\text{Sn},x$ | Many | CS | 2JPNIPC | 1.8+10 | 1.8+10 | Jour | PR/C,88,041602 | 13 | L.Audirac+ | E2444 |

1 Hydrogen 2

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|--------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------------|-----------------------|
| | | | | Min | Max | | | | | |
| $p,n+p$ | ^1H | DAE | 2JPNTOK | 1.0+07 | 1.4+07 | Jour | JPJ,15,749 | 60 | S.Kikuchi+ | E2217 |
| $p,n+p$ | ^1H | DAP | 2JPNTOK | 1.0+07 | 1.4+07 | Jour | JPJ,15,749 | 60 | S.Kikuchi+ | E2217 |
| $d,x+d$ | inclusive | DA | 4UKRIJD | 3.7+07 | 3.7+07 | Jour | IZV,77,(7),981 | 13 | O.O.Beliuskina+ | D5101 |
| $d,x+d$ | inclusive | DAE | 4UKRIJD | 3.7+07 | 3.7+07 | Jour | IZV,77,(7),981 | 13 | O.O.Beliuskina+ | D5101 |

3 Lithium 7

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| p,n | ^7Be | POD | 1USAANL | 2.0+06 | 2.6+06 | Jour | NP,31,78 | 62 | A.J.Elwyn+ | C2061 |

4 Beryllium 7

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,p | ^7Li | CS | 4ZZZDUB | 2.5-02 | 4.2+02 | Conf | 87KIEV,2,232 | 87 | Yu.M.Gledenov+ | 41596 |
| n,p | ^7Li | CSP | 4ZZZDUB | 2.5-02 | 2.5-02 | Conf | 87KIEV,2,232 | 87 | Yu.M.Gledenov+ | 41596 |
| n,p | ^7Li | ? | 4ZZZDUB | 2.5-02 | 2.5-02 | Conf | 87KIEV,2,232 | 87 | Yu.M.Gledenov+ | 41596 |

5 Boron 10

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| p,α | ^7Be | CSP | 1USATNL | 2.1+06 | 6.0+06 | Jour | NIM/B,316,48 | 13 | A.Kafkarkou+ | C2072 |
| p,α | ^7Be | DAP | 1USATNL | 2.1+06 | 6.0+06 | Jour | NIM/B,316,48 | 13 | A.Kafkarkou+ | C2072 |
| p,α | ^7Be | DAP | 3AULCBR | 2.2+06 | 5.9+06 | Jour | NP,33,198 | 62 | T.R.Ophel+ | F1194 |
| p,el | ^{10}B | DA | 4UKRUFT | 1.0+04 | 3.6+06 | Jour | ZET,43,2038 | 62 | A.K.Valter+ | D5100 |
| p,el | ^{10}B | DA | 4UKRUFT | 1.0+06 | 3.5+06 | Jour | IZV,26,1134 | 62 | G.B.Andreev+ | D5099 |
| p,el | ^{10}B | DA | 4UKRUFT | 1.3+04 | 3.6+06 | Jour | ZET,43,2038 | 62 | A.K.Valter+ | D5100 |
| p,γ | ^{11}C | DAP | 3AULCBR | 2.6+06 | 4.7+06 | Jour | NP,33,198 | 62 | T.R.Ophel+ | F1194 |
| $p,inel$ | ^{10}B | DAP | 3AULCBR | 2.2+06 | 6.9+06 | Jour | NP,33,198 | 62 | T.R.Ophel+ | F1194 |

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Fluorine

19

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,0</i> | | RP | 1USACAL | | | Jour | PR,97,1226 | 55 | C.A.Barnes | C2068 |
| <i>p,el</i> | | RP | 1USACAL | 3.4+05 | 9.4+05 | Jour | PR,97,1226 | 55 | C.A.Barnes | C2068 |
| <i>p,inel</i> | | RP | 1USACAL | 3.4+05 | 1.3+06 | Jour | PR,97,1226 | 55 | C.A.Barnes | C2068 |
| <i>p,inel</i> | ¹⁹ F | CSP | 1USACAL | 6.7+05 | 1.7+06 | Jour | PR,97,1226 | 55 | C.A.Barnes | C2068 |
| <i>p,tot</i> | | RP | 1USACAL | 7.8+05 | 8.4+05 | Jour | PR,97,1226 | 55 | C.A.Barnes | C2068 |
| <i>α,n</i> | ²² Na | CS | 4KASKAZ | 1.5+06 | 5.0+07 | Jour | IZK,1980,(4),82 | 80 | V.T.Gladun+ | D0723 |
| <i>α,p</i> | ²² Ne | DAP | 2NEDUTR | 1.2+06 | 3.3+06 | Jour | PHY,31,1603 | 65 | J.Kuperus | F1190 |
| <i>α,tot</i> | | RP | 2NEDUTR | 1.3+06 | 2.5+06 | Jour | PHY,31,1603 | 65 | J.Kuperus | F1190 |

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Neon

20

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------------------------------|------------------|--------|---------|-------------|--------|------|----------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,γ</i> | | RP | 1CANTMF | 1.2+06 | 1.2+06 | Jour | PR/C,88,038801 | 13 | G.Christian+ | C2062 |
| <i>p,γ</i> | ²¹ Na | PY | 1CANTMF | 1.1+06 | 1.1+06 | Jour | PR/C,88,038801 | 13 | G.Christian+ | C2062 |
| ²⁸ Si, ²⁴ Mg | ²⁴ Mg | DAP | 3POLWWA | 5.2+07 | 5.2+07 | Jour | IMP/E,22,1350073 | 13 | O.Sgouros+ | D0724 |

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Sodium

23

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|-----|------|--------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,0</i> | | RP | 1USATNL | | | Jour | PR/C,70,045802 | 04 | S.E.Hale+ | C1135 |
| <i>p,α</i> | ²⁰ Ne | RR | 1USATNL | | | Jour | PR/C,70,045802 | 04 | S.E.Hale+ | C1135 |
| <i>p,γ</i> | ²⁴ Mg | RR | 1USATNL | | | Jour | PR/C,70,045802 | 04 | S.E.Hale+ | C1135 |

12

Magnesium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,x</i> | ²⁴ Na | CS | 3CZRUJF | 1.8+07 | 1.8+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

12

Magnesium

24

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,el</i> | ²⁴ Mg | DA | 4RUSMOS | 1.5+07 | 1.5+07 | Jour | IZV,77,492 | 13 | L.I.Galanina+ | A0949 |
| <i>d,el</i> | ²⁴ Mg | DA | 1USALRL | 8.0+06 | 8.0+06 | Jour | NP,88,(3),513 | 66 | H.F.Lutz+ | C2080 |
| <i>d,inel</i> | ²⁴ Mg | DAP | 4RUSMOS | 1.5+07 | 1.5+07 | Jour | IZV,77,492 | 13 | L.I.Galanina+ | A0949 |
| <i>d,p</i> | ²⁵ Mg | DAP | 2FR STR | 2.8+06 | 6.1+06 | Jour | NP,88,675 | 66 | A.Gallmann+ | F1191 |

12 Magnesium

25

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|------------------|--------|---------|-------------|--------|------|--------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p</i> ,el | ²⁵ Mg | DA | 2FR STR | 4.5+06 | 6.1+06 | Jour | NP,88,675 | 66 | A.Gallmann+ | F1191 |
| <i>p</i> ,inel | ²⁵ Mg | DAP | 2FR STR | 4.5+06 | 6.1+06 | Jour | NP,88,675 | 66 | A.Gallmann+ | F1191 |
| <i>d</i> ,el | ²⁵ Mg | DA | 1USALRL | 8.0+06 | 8.0+06 | Jour | NP,88,(3),513 | 66 | H.F.Lutz+ | C2080 |
| <i>d</i> , <i>p</i> | ²⁶ Mg | CSP | 1USALRL | 8.0+06 | 8.0+06 | Jour | NP,88,(3),513 | 66 | H.F.Lutz+ | C2080 |
| <i>d</i> , <i>p</i> | ²⁶ Mg | DAP | 1USALRL | 8.0+06 | 8.0+06 | Jour | NP,88,(3),513 | 66 | H.F.Lutz+ | C2080 |
| α ,inel | ²⁵ Mg | CSP | 3RUMBUC | 5.4+06 | 1.5+07 | Jour | PR/C,88,034604 | 13 | A.Negret+ | D0720 |
| α , <i>n</i> | ²⁸ Si | CSP | 3RUMBUC | 5.4+06 | 1.5+07 | Jour | PR/C,88,034604 | 13 | A.Negret+ | D0720 |
| α , <i>p</i> | ²⁸ Al | CSP | 3RUMBUC | 5.4+06 | 1.5+07 | Jour | PR/C,88,034604 | 13 | A.Negret+ | D0720 |

13 Aluminium

27

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> , α | ²⁴ Na | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |
| α ,el | ²⁷ Al | DA | 4KASAFU | 5.5+06 | 5.5+06 | Jour | IET,56,521 | 13 | V.V.Dyachkov+ | D0728 |

14 Silicon

28

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-----------------------------------|------------------|--------|---------|-------------|--------|------|----------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| ²⁰ Ne, ¹² C | ³⁶ Ar | DAP | 3POLWWA | 5.2+07 | 5.2+07 | Jour | IMP/E,22,1350073 | 13 | O.Sgouros+ | D0724 |
| ²⁰ Ne, ¹⁶ O | ³² S | DAP | 3POLWWA | 5.2+07 | 5.2+07 | Jour | IMP/E,22,1350073 | 13 | O.Sgouros+ | D0724 |
| ²⁰ Ne,sct | ²⁸ Si | DAP | 3POLWWA | 4.2+07 | 5.2+07 | Jour | IMP/E,22,1350073 | 13 | O.Sgouros+ | D0724 |

16 Sulphur

32

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|---------|--------|---------|-------------|--------|------|--------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p</i> ,0 | | RP | 1CANTMF | | | Jour | PR/C,88,045801 | 13 | J.Fallis+ | C2064 |
| <i>p</i> , γ | | RP | 1CANTMF | 1.8+05 | 4.0+05 | Jour | PR/C,88,045801 | 13 | J.Fallis+ | C2064 |

17 Chlorine

35

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d</i> , ³ He | ³⁴ S | DAP | 1USAANL | 2.3+07 | 2.3+07 | Jour | PR,177,1624 | 69 | N.G.Puttaswamy+ | C2057 |

17 Chlorine

36

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,el | | RP | 4ZZZDUB | 1.3+03 | 8.2+03 | Conf | 87KIEV,2,232 | 87 | Yu.M.Gledenov+ | 41596 |

n,p RP 4ZZZDUB 1.3+03 8.2+03 Conf 87KIEV,2,232 87 Yu.M.Gledenov+ 41596

17 Chlorine 37

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,³He</i> | ³⁶ S | DAP | 1USAANL | 2.3+07 | 2.3+07 | Jour | PR,177,1624 | 69 | N.G.Puttaswamy+ | C2057 |

20 Calcium 40

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>α,el</i> | ⁴⁰ Ca | DA | 2BLGLVN | 2.3+07 | 2.3+07 | Jour | NP/A,135,145 | 69 | E.Labie+ | F1196 |

22 Titanium 46

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------------------|------------------|--------|---------|-------------|--------|------|----------------------------------|------|-----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,p</i> | ⁴⁶ Sc | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |
| <i>³He,d</i> | ⁴⁷ V | DAP | 1USAMIT | 1.2+07 | 1.2+07 | Jour | NP/A,102,(3),681 | 67 | W.E.Dorenbusch+ | C2078 |
| <i>³He,el</i> | ⁴⁶ Ti | DA | 1USAMIT | 1.2+07 | 1.2+07 | Jour | NP/A,102,(3),681 | 67 | W.E.Dorenbusch+ | C2078 |

22 Titanium 47

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,p</i> | ⁴⁷ Sc | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |

22 Titanium 48

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,p</i> | ⁴⁸ Sc | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |

23 Vanadium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|------------------|--------|---------|-------------|--------|------|----------------------------------|------|---------|-----------------------|
| | | | | Min | Max | | | | | |
| ²³⁰ U,el | ^{nat} V | DA | 2GERGSI | 3.2+09 | 3.2+09 | Jour | IMP/E,22,1350045 | 13 | G.Sher+ | D0722 |

| | | | | | | | | | | |
|-----------------|------------------|-----|---------|--------|--------|------|----------------------------------|----|----------------|-----------------------|
| $p,inel$ | ^{56}Fe | DAP | 1USATNL | 3.1+06 | 4.0+06 | Jour | PR/C,24,(5),1992 | 81 | W.A.Watsoniii+ | C2049 |
| d,n | ^{57}Co | POD | 4RUSITE | 1.1+07 | 1.1+07 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |
| $^3\text{He},t$ | ^{56}Co | DAP | 2JPNOSA | 4.2+08 | 4.2+08 | Jour | PR/C,88,054329 | 13 | H.Fujita+ | E2445 |

27 Cobalt 59

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | ^{60}Ni | POD | 4RUSITE | 1.2+07 | 1.2+07 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

28 Nickel

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,x | ^{56}Ni | CS | 3CZRUJF | 3.0+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| n,x | ^{57}Ni | CS | 3CZRUJF | 1.8+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

28 Nickel 58

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{57}Ni | CS | 3CZRUJF | 1.8+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| $n,3n$ | ^{56}Ni | CS | 3CZRUJF | 3.0+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

28 Nickel 60

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | ^{61}Cu | POD | 4RUSITE | 9.6+06 | 9.6+06 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

28 Nickel 62

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | ^{63}Cu | POD | 4RUSITE | 9.7+06 | 9.7+06 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

28 Nickel 64

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | ^{65}Cu | POD | 4RUSITE | 7.6+06 | 7.6+06 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

29 Copper

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,x | ^{64}Cu | CS | 3CZRUJF | 3.0+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| $d,x+n$ | inclusive | PY | 2JPNTOK | 3.3+07 | 3.3+07 | Jour | PR/C,29,1307 | 84 | K.Shin+ | E2343 |
| $^3\text{He},x+n$ | inclusive | PY | 2JPNTOK | 6.5+07 | 6.5+07 | Jour | PR/C,29,1307 | 84 | K.Shin+ | E2343 |
| $\alpha,x+n$ | inclusive | PY | 2JPNTOK | 6.5+07 | 6.5+07 | Jour | PR/C,29,1307 | 84 | K.Shin+ | E2343 |

29 Copper 65

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{64}Cu | CS | 3CZRUJF | 3.0+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

30 Zinc

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,x | ^{62}Zn | CS | 3CZRUJF | 3.0+07 | 3.0+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| n,x | ^{63}Zn | CS | 3CZRUJF | 1.8+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| n,x | ^{65}Zn | CS | 3CZRUJF | 3.0+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

30 Zinc 64

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{63}Zn | CS | 3CZRUJF | 1.8+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| $n,3n$ | ^{62}Zn | CS | 3CZRUJF | 3.0+07 | 3.0+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| d,n | ^{65}Ga | POD | 4RUSITE | 9.5+06 | 9.5+06 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

30 Zinc 66

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{65}Zn | CS | 3CZRUJF | 3.0+07 | 3.6+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| d,n | ^{67}Ga | POD | 4RUSITE | 9.5+06 | 9.5+06 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

30 Zinc 68

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | ^{69}Ga | POD | 4RUSITE | 7.6+06 | 7.6+06 | Jour | YF,8,14 | 68 | I.I.Levintov+ | A0946 |

33

Arsenic

75

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|-----|------|-------------------------------|------|----------|-----------------------|
| | | | | Min | Max | | | | | |
| n,γ | ^{76}As | CS | 3HUNKOS | Fiss | | Conf | 77KIEV,3,32 | 77 | Z.Dezso+ | 30400 |

39

Yttrium

88

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,p | | RP | 4ZZZDUB | 3.0+01 | 8.0+02 | Conf | 87KIEV,2,232 | 87 | Yu.M.Gledenov+ | 41596 |
| n,p | ^{88}Sr | CS | 4ZZZDUB | 3.0+01 | 8.0+02 | Conf | 87KIEV,2,232 | 87 | Yu.M.Gledenov+ | 41596 |

39

Yttrium

89

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------------|------------------|--------|---------|-------------|--------|------|--------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{88}Y | CS | 2SWDUPP | 5.9+07 | 5.9+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| $n,3n$ | ^{87}Y | CS | 2SWDUPP | 5.9+07 | 8.9+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| $n,4n$ | ^{86}Y | CS | 2SWDUPP | 5.9+07 | 8.9+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| p,γ | ^{90}Zr | DAP | 2UK ALD | 2.7+06 | 1.9+07 | Jour | NP/A,135,193 | 69 | W.M.Mason+ | F1207 |
| α,el | ^{89}Y | DA | 3HUNDEB | 1.6+07 | 1.9+07 | Jour | PR/C,80,045807 | 09 | G.G.Kiss+ | D4196 |

40

Zirconium

90

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------------|------------------|--------|---------|-------------|--------|------|----------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| p,γ | ^{91}Nb | CS | 1USANOT | 2.7+06 | 4.9+06 | Jour | PR/C,88,045802 | 13 | A.Spyrou+ | C2065 |
| $^6\text{Li},\text{el}$ | ^{90}Zr | DA | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |
| $^6\text{Li},\text{inel}$ | ^{90}Zr | DAP | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |
| $^7\text{Li},^6\text{He}$ | ^{91}Nb | DAP | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |
| $^7\text{Li},^6\text{Li}$ | ^{91}Zr | DAP | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |
| $^7\text{Li},\text{el}$ | ^{90}Zr | DA | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |
| $^7\text{Li},\text{inel}$ | ^{90}Zr | DAP | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |

40

Zirconium

91

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------------|------------------|--------|---------|-------------|--------|------|----------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| $^6\text{Li},\text{el}$ | ^{91}Zr | DA | 1USAFSU | 3.4+07 | 3.4+07 | Jour | NP/A,313,(3),363 | 79 | R.J.Puigh+ | C2070 |

40

Zirconium

92

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|--------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| p,γ | ^{93}Nb | CS | 1USANOT | 1.9+06 | 4.9+06 | Jour | PR/C,88,045802 | 13 | A.Spyrou+ | C2065 |

41 Niobium 93

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{92}Nb | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |

42 Molybdenum 92

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,p | ^{92}Nb | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |
| α,el | ^{92}Mo | DA | 3HUNDEB | 1.3+07 | 1.9+07 | Jour | PR/C,64,065805 | 01 | Zs.Fulop+ | D0375 |

42 Molybdenum 95

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,p | ^{95}Nb | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |

42 Molybdenum 98

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,α | ^{95}Zr | CS | 3BANSAV | 1.5+06 | 1.5+06 | Jour | RCA,101,613 | 13 | M.S.Uddin+ | 31733 |

48 Cadmium 106

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| α,el | ^{106}Cd | DA | 3HUNDEB | 1.6+07 | 1.9+07 | Jour | EPJ/AS,27,197 | 06 | G.G.Kiss+ | D4136 |

48 Cadmium 110

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| $d,2n$ | ^{110}In | CS | 4UZ UZB | 7.7+06 | 1.2+07 | Jour | IZU,1985,(5),81 | 85 | S.Mukhammedov+ | D0727 |
| α,el | ^{110}Cd | DA | 3HUNDEB | 1.6+07 | 1.9+07 | Jour | PR/C,83,065807 | 11 | G.G.Kiss+ | D4251 |

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|-----------------|--------|
| | | | | Min | Max | | | | | |
| <i>p,x</i> | ⁴⁴ Sc | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁸⁷ Y | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁹⁵ Tc | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁹⁹ Rh | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ¹⁰⁸ In | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ⁴⁴ Sc | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ⁹⁹ Rh | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ¹¹⁰ In | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| α ,el | ¹¹² Sn | DA | 3HUNDEB | 1.4+07 | 1.9+07 | Jour | PR/C,71,065802 | 05 | D.Galaviz+ | D4162 |
| ¹² C,x | ⁴⁴ Sc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁵ Y | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁷ Y | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁵ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁹ Rh | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------------|--------|
| | | | | Min | Max | | | | | |
| <i>p,x</i> | ⁴⁴ Sc | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁸⁷ Y | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁹⁵ Nb | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁹⁵ Tc | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ⁹⁹ Rh | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ¹⁰¹ Rh | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ¹⁰⁸ In | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ¹¹⁰ In | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>p,x</i> | ¹¹⁷ In | CS | 4ZZZDUB | 3.6+09 | 3.6+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ⁴⁴ Sc | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ⁹⁵ Tc | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ⁹⁹ Rh | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ¹⁰¹ Rh | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ¹⁰⁸ In | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ¹¹⁰ In | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| <i>d,x</i> | ¹¹⁷ In | CS | 4ZZZDUB | 7.3+09 | 7.3+09 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁴⁴ Sc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁴ Rb | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁵ Y | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁷ Y | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹³ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁴ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁵ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁷ Rh | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁹ Rh | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹⁰⁴ Ag | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹⁰⁸ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁰ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹¹ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁷ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁶ Sb | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁹ Te | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |

| | | | | | | | | | | |
|-------------------|-------------------|-----|---------|--------|--------|------|--------------------------------|----|------------------|-----------------------|
| α ,el | ¹²⁴ Sn | DA | 3BZLUSP | 1.3+07 | 2.1+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| α ,el | ¹²⁴ Sn | DA | 3HUNDEB | 1.9+07 | 1.9+07 | Jour | PR/C,71,065802 | 05 | D.Galaviz+ | D4162 |
| α ,el | ¹²⁴ Sn | DA | 3BZLUSP | 2.0+07 | 2.0+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| α ,inel | ¹²⁴ Sn | DAP | 3BZLUSP | 2.0+07 | 2.0+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| ¹² C,x | ⁴⁴ Sc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁴ Rb | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁵ Y | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁸⁷ Y | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹³ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁴ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁵ Tc | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁷ Rh | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ⁹⁹ Rh | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁷ Cd | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹⁰⁸ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁰ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁷ In | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹²³ Sn | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹²⁵ Sn | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁶ Sb | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹²⁴ Sb | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹¹⁹ Te | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |
| ¹² C,x | ¹²¹ Te | CS | 4ZZZDUB | 2.6+10 | 2.6+10 | Jour | YF,76,381 | 13 | A.S.Danagulyan+ | A0950 |

52 Tellurium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| p ,x | Many | CS | 1USALAS | 8.0+08 | 2.3+10 | Jour | NIM/B,295,16 | 13 | A.F.Barghouty+ | C1977 |

52 Tellurium

122

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| ³ He,el | ¹²² Te | DA | 3BZLUSP | 2.0+07 | 2.0+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| α ,inel | ¹²² Te | DAP | 3BZLUSP | 2.0+07 | 2.0+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |

52 Tellurium

124

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| ³ He,el | ¹²⁴ Te | DA | 3BZLUSP | 2.0+07 | 2.0+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| ³ He,inel | ¹²⁴ Te | DAP | 3BZLUSP | 2.0+07 | 2.0+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| α ,el | ¹²⁴ Te | DA | 3BZLUSP | 1.9+07 | 1.9+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |
| α ,inel | ¹²⁴ Te | DAP | 3BZLUSP | 1.9+07 | 1.9+07 | Jour | NP/A,313,333 | 79 | S.S.Vasconcelos+ | F1200 |

52 Tellurium 128

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ¹²⁸ I | CS | 4UZ UZB | 4.4+06 | 1.6+07 | Jour | IZU,1981,(3),93 | 81 | A.Vasidov+ | D0726 |

52 Tellurium 130

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ¹³⁰ I | CS | 4UZ UZB | 4.2+06 | 1.7+07 | Jour | IZU,1981,(3),93 | 81 | A.Vasidov+ | D0726 |

53 Iodine 127

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|--------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,2n</i> | ¹²⁶ I | CS | 3CZRUF | 3.0+07 | 8.9+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

55 Caesium 133

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ¹³³ Ba | CS | 4UZ UZB | 6.4+06 | 1.6+07 | Jour | IZU,1981,(3),93 | 81 | A.Vasidov+ | D0726 |

56 Barium 134

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ¹³⁴ La | CS | 4UZ UZB | 7.0+06 | 1.3+07 | Jour | IZU,1981,(3),93 | 81 | A.Vasidov+ | D0726 |

56 Barium 136

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ¹³⁶ La | ? | 4UZ UZB | 4.6+06 | 1.7+07 | Jour | IZU,1981,(3),93 | 81 | A.Vasidov+ | D0726 |

58 Cerium 141

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,0</i> | | RP | 4RUSNIR | | | Conf | 80KIEV,2,136 | 80 | V.A.Anufriev+ | 41594 |
| <i>n,tot</i> | | CS | 4RUSNIR | 2.5-02 | 2.5-02 | Conf | 80KIEV,2,136 | 80 | V.A.Anufriev+ | 41594 |

60 Neodymium 142

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,el</i> | ¹⁴² Nd | DA | 2DENNBI | 1.2+07 | 1.2+07 | Jour | NP/A,102,481 | 67 | P.R.Christensen+ | F1204 |
| <i>d,p</i> | ¹⁴³ Nd | DAP | 2DENNBI | 1.2+07 | 1.2+07 | Jour | NP/A,102,481 | 67 | P.R.Christensen+ | F1204 |

60 Neodymium 143

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,inel</i> | ¹⁴³ Nd | DAP | 2DENNBI | 1.2+07 | 1.2+07 | Jour | NP/A,102,481 | 67 | P.R.Christensen+ | F1204 |

62 Samarium 144

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,el</i> | ¹⁴⁴ Sm | DA | 2DENNBI | 1.2+07 | 1.2+07 | Jour | NP/A,102,481 | 67 | P.R.Christensen+ | F1204 |
| <i>d,p</i> | ¹⁴⁵ Sm | DAP | 2DENNBI | 1.2+07 | 1.2+07 | Jour | NP/A,102,481 | 67 | P.R.Christensen+ | F1204 |
| <i>α,el</i> | ¹⁴⁴ Sm | DA | 3HUNDEB | 1.9+07 | 1.9+07 | Jour | PR/C,55,1523 | 97 | P.Mohr+ | D0525 |

64 Gadolinium 154

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,d</i> | ¹⁵³ Gd | DAP | 1USABRK | 2.5+07 | 2.5+07 | Jour | PR/C,88,031301 | 13 | T.J.Ross+ | C2067 |
| <i>p,d</i> | ¹⁵³ Gd | DAP | 1USABRK | 2.5+07 | 2.5+07 | Jour | PR/C,85,051304 | 12 | T.J.Ross+ | C2071 |

64 Gadolinium 156

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,d</i> | ¹⁵⁵ Gd | DAP | 1USABRK | 2.5+07 | 2.5+07 | Jour | PR/C,81,064316 | 10 | J.M.Allmond+ | C2063 |

64 Gadolinium 158

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,d</i> | ¹⁵⁷ Gd | DAP | 1USABRK | 2.5+07 | 2.5+07 | Jour | PR/C,85,051304 | 12 | T.J.Ross+ | C2071 |
| <i>p,t</i> | ¹⁵⁶ Gd | DAP | 1USABRK | 2.5+07 | 2.5+07 | Jour | PR/C,85,051304 | 12 | T.J.Ross+ | C2071 |

68 Erbium 167

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,p</i> | ¹⁶⁷ Ho | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |

68 Erbium 168

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,α</i> | ¹⁶⁵ Dy | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |
| <i>n,p</i> | ¹⁶⁸ Ho | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |

68 Erbium 170

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,α</i> | ¹⁶⁷ Dy | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |
| <i>n,γ</i> | ¹⁷¹ Er | CS | 3KORPUE | 2.5-02 | 2.5-02 | Jour | NIM/B,310,10 | 13 | V.D.Nguyen+ | 30833 |
| <i>n,γ</i> | ¹⁷¹ Er | RI | 3KORPUE | | 5.5-01 | Jour | NIM/B,310,10 | 13 | V.D.Nguyen+ | 30833 |

70 Ytterbium 170

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,2n</i> | ¹⁶⁹ Yb | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |

70 Ytterbium 172

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,p</i> | ¹⁷² Tm | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |

70 Ytterbium 173

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,p</i> | ¹⁷³ Tm | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |

70 Ytterbium 174

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,γ</i> | ¹⁷⁵ Yb | CS | 3ALGRNB | 2.5-02 | 3.7-02 | Jour | ANE,64,264 | 14 | N.Belouadah+ | 31730 |

70 Ytterbium 176

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,2n$ | ^{175}Yb | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |
| n,p | ^{176}Tm | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Jour | PR/C,86,034609 | 12 | N.Dzysiuk+ | 32233 |

71 Lutetium 175

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,α | ^{172}Tm | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Conf | 2012KYIV,,444 | 13 | A.O.Kadenko+ | 32236 |

71 Lutetium 176

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,α | ^{173}Tm | CS | 4UKRKGU | 1.5+07 | 1.5+07 | Conf | 2012KYIV,,444 | 13 | A.O.Kadenko+ | 32236 |

73 Tantalum 181

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,6n$ | ^{176}Ta | CS | 2SWDUPP | 4.7+07 | 9.4+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |

74 Tungsten 186

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,0$ | | RP | 4ZZZDUB | | | Conf | 80KIEV,2,168 | 80 | Yu.A.Aleksandrov+ | 41592 |
| n,abs | | CS | 4ZZZDUB | 2.5-02 | 2.5-02 | Conf | 80KIEV,2,168 | 80 | Yu.A.Aleksandrov+ | 41592 |
| n,el | ^{186}W | AMP | 4ZZZDUB | 2.5-02 | 1.0+01 | Conf | 80KIEV,2,168 | 80 | Yu.A.Aleksandrov+ | 41592 |
| n,γ | | RP | 4ZZZDUB | 1.9+01 | 1.9+01 | Conf | 80KIEV,2,168 | 80 | Yu.A.Aleksandrov+ | 41592 |
| n,tot | | CS | 4ZZZDUB | 1.9-02 | 9.8+00 | Conf | 80KIEV,2,168 | 80 | Yu.A.Aleksandrov+ | 41592 |

79 Gold 197

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-----------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| $n,3n$ | ^{195}Au | CS | 2SWDUPP | 4.7+07 | 4.7+07 | Jour | NIM/A,726,84 | 13 | J.Vrzalova+ | 31714 |
| $^6\text{He},x$ | ^{192}Hg | CS | 4ZZZDUB | 5.6+07 | 1.1+08 | Jour | IZV,77,404 | 13 | N.K.Skobelev+ | A0953 |
| $^6\text{He},x$ | ^{193}Hg | CS | 4ZZZDUB | 6.8+07 | 1.1+08 | Jour | IZV,77,404 | 13 | N.K.Skobelev+ | A0953 |
| $^6\text{He},x$ | ^{195}Hg | CS | 4ZZZDUB | 5.6+07 | 1.1+08 | Jour | IZV,77,404 | 13 | N.K.Skobelev+ | A0953 |

${}^6\text{He},x$ ${}^{197}\text{Hg}$ CS 4ZZZDUB 4.1+07 1.1+08 Jour IZV,77,404 13 N.K.Skobelev+ [A0953](#)

81 **Thallium** 203

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------------|---------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| ${}^3\text{He},4n$ | ${}^{202}\text{Bi}$ | CS | 4KASKAZ | 2.4+07 | 5.6+07 | Jour | IZK,1990,(2),3 | 90 | I.N.Khaustov+ | D0725 |
| ${}^3\text{He},5n$ | ${}^{201}\text{Bi}$ | CS | 4KASKAZ | 3.3+07 | 5.7+07 | Jour | IZK,1990,(2),3 | 90 | I.N.Khaustov+ | D0725 |
| ${}^3\text{He},6n$ | ${}^{200}\text{Bi}$ | CS | 4KASKAZ | 4.6+07 | 5.8+07 | Jour | IZK,1990,(2),3 | 90 | I.N.Khaustov+ | D0725 |

82 **Lead**

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|-----------|--------|---------|-------------|--------|------|--------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| p,fis | | CS | 4ZZZDUB | 2.0+09 | 2.0+09 | Jour | PR/C,87,067602 | 13 | M.Zamani+ | A0951 |
| $d,x+n$ | inclusive | PY | 2JPNTOK | 3.3+07 | 3.3+07 | Jour | PR/C,29,1307 | 84 | K.Shin+ | E2343 |
| ${}^3\text{He},x+n$ | inclusive | PY | 2JPNTOK | 6.5+07 | 6.5+07 | Jour | PR/C,29,1307 | 84 | K.Shin+ | E2343 |
| $\alpha,x+n$ | inclusive | PY | 2JPNTOK | 6.5+07 | 6.5+07 | Jour | PR/C,29,1307 | 84 | K.Shin+ | E2343 |

82 **Lead** 204

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| $d,2n$ | ${}^{204}\text{Bi}$ | CS | 4UZ UZB | 1.0+07 | 1.6+07 | Jour | IZU,1985,(5),81 | 85 | S.Mukhammedov+ | D0727 |

82 **Lead** 206

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|---------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,γ | ${}^{207}\text{Pb}$ | CS | 3HUNHUN | 2.5-02 | 2.5-02 | Jour | EPJ/A,49,143 | 13 | P.Schillebeeckx+ | 31732 |
| n,γ | ${}^{207}\text{Pb}$ | CSP | 3HUNHUN | 2.5-02 | 2.5-02 | Jour | EPJ/A,49,143 | 13 | P.Schillebeeckx+ | 31732 |
| $d,2n$ | ${}^{206}\text{Bi}$ | CS | 4UZ UZB | 8.1+06 | 1.6+07 | Jour | IZU,1985,(5),81 | 85 | S.Mukhammedov+ | D0727 |

82 **Lead** 207

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|---------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| n,γ | ${}^{208}\text{Pb}$ | CS | 3HUNHUN | 2.5-02 | 2.5-02 | Jour | EPJ/A,49,143 | 13 | P.Schillebeeckx+ | 31732 |
| n,γ | ${}^{208}\text{Pb}$ | CSP | 3HUNHUN | 2.5-02 | 2.5-02 | Jour | EPJ/A,49,143 | 13 | P.Schillebeeckx+ | 31732 |

82 **Lead** 208

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

| | | | | | | | | | | |
|------------|-------------------|----|---------|--------|--------|------|---------------|----|----------------|-----------------------|
| <i>d,p</i> | ²⁰⁹ Pb | DA | 4UKRIJD | 7.3+06 | 7.3+06 | Conf | 2012KYIV,,206 | 13 | Yu.N.Pavlenko+ | D5102 |
|------------|-------------------|----|---------|--------|--------|------|---------------|----|----------------|-----------------------|

88 Radium 226

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|-------------------|--------|---------|-------------|--------|------|--------------------------------|------|-------------------|-----------------------|
| | | | | Min | Max | | | | | |
| ⁴⁸ Ca,4n | ²⁷⁰ Hs | CS | 4ZZZDUB | 2.3+08 | 2.3+08 | Jour | PR/C,87,034605 | 13 | Yu.Ts.Oganessian+ | A0947 |

90 Thorium 232

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|--------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,fis</i> | | CS | 3HUNKOS | Fiss | | Conf | 76PARIS,,IV-19 | 76 | M.Buczko+ | 31731 |
| <i>n,fis</i> | | DA | 3HUNKOS | Fiss | | Conf | 76PARIS,,IV-19 | 76 | M.Buczko+ | 31731 |
| <i>n,fis</i> | | ? | 4RUSRI | 2.9+06 | 2.9+06 | Jour | YF,53,(3),628 | 91 | G.S.Boikov+ | 41110 |
| <i>n,fis</i> | | ? | 4RUSFEI | 3.2+06 | 5.1+06 | Jour | AE,112,(6),350 | 12 | V.M.Piksaikin+ | 41566 |
| <i>d,fis</i> | | CS | 4ZZZDUB | 1.6+09 | 2.5+09 | Jour | PR/C,87,067602 | 13 | M.Zamani+ | A0951 |

92 Uranium 233

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|--------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,fis</i> | Many | FY | 4RUSMIF | 2.5-02 | 2.5-02 | Jour | YF,57,(12),2137 | Dec 94 | A.A.Aleksandrov+ | 41496 |
| <i>n,fis</i> | Many | NU | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |
| <i>n,fis</i> | | NU | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |
| <i>n,fis</i> | | ? | 4RUSFEI | 2.9+00 | 2.9+00 | Jour | AE,92,(2),135 | Feb 02 | V.M.Piksaykin+ | 41439 |
| <i>n,fis</i> | | ? | 4RUSFEI | 3.4+05 | 4.7+06 | Rept | JINR-E3-2004-169,342 | 04 | V.M.Piksaykin+ | 41528 |
| <i>n,fis</i> | Many | ? | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |

92 Uranium 235

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|----------|--------|---------|-------------|--------|------|-------------------------------|--------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n,fis</i> | | NU | 4RUSRI | 1.5+07 | 1.5+07 | Jour | YF,53,(3),628 | 91 | G.S.Boikov+ | 41110 |
| <i>n,fis</i> | Many | NU | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |
| <i>n,fis</i> | | NU | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |
| <i>n,fis</i> | | ? | 4RUSKUR | 1.1-01 | 3.0+04 | Rept | JINR-E3-97-213,348 | May 97 | V.F.Gerasimov+ | 41369 |
| <i>n,fis</i> | Many | ? | 4RUSMIF | 2.5-02 | 2.5-02 | Jour | YF,57,(12),2137 | Dec 94 | A.A.Aleksandrov+ | 41496 |
| <i>n,fis</i> | | ? | 4RUSRI | 2.9+06 | 2.9+06 | Jour | YF,53,(3),628 | 91 | G.S.Boikov+ | 41110 |
| <i>n,fis</i> | Many | ? | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |
| <i>n,fis</i> | <i>n</i> | KE | 4RUSRI | 1.5+07 | 1.5+07 | Jour | YF,53,(3),628 | 91 | G.S.Boikov+ | 41110 |

92 Uranium 236

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|--------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | | ? | 4RUSFEI | 1.0+06 | 4.7+06 | Rept | ISINN-14,144 | May 06 | V.A.Roschenko+ | 41512 |

92 Uranium 238

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | CS | | 3HUNKOS | Fiss | | Conf | 76PARIS,,IV-19 | 76 | M.Buczko+ | 31731 |
| <i>n</i> ,fis | DA | | 3HUNKOS | Fiss | | Conf | 76PARIS,,IV-19 | 76 | M.Buczko+ | 31731 |
| <i>n</i> ,fis | | ? | 4RUSRI | 2.9+06 | 2.9+06 | Jour | YF,53,(3),628 | 91 | G.S.Boikov+ | 41110 |

93 Neptunium 236

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|--------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | | ? | 4RUSKUR | 5.2-02 | 1.8+04 | Rept | JINR-E3-97-213,348 | May 97 | V.F.Gerasimov+ | 41369 |

93 Neptunium 237

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|-----|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | CS | | 3HUNKOS | Fiss | | Conf | 76PARIS,,IV-19 | 76 | M.Buczko+ | 31731 |
| <i>n</i> ,fis | DA | | 3HUNKOS | Fiss | | Conf | 76PARIS,,IV-19 | 76 | M.Buczko+ | 31731 |

94 Plutonium 238

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|--------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | | ? | 4RUSKUR | 1.1-01 | 4.3+04 | Rept | JINR-E3-97-213,348 | May 97 | V.F.Gerasimov+ | 41369 |

94 Plutonium 239

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|-----|------|-------------------------------|--------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | | NU | 4RUSKUR | Maxwl | | Jour | NP,71,(3),553 | Sep 65 | V.F.Apalin+ | 41397 |

95 Americium 241

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,el | | RP | 4RUSJIA | 3.0-01 | 1.5+01 | Prog | JIA-1358 | 13 | A.A.Alekseev+ | 41573 |

| | | | | | | | | | |
|---------------|-----|---------|---------|--------|------|----------------|----|----------------|-----------------------|
| <i>n</i> ,fis | NUD | 4RUSFEI | 8.6+05 | 4.8+06 | Rept | INDC(NDS)-0646 | 13 | V.M.Piksaykin+ | 41590 |
| <i>n</i> ,fis | RI | 4RUSJIA | 1.0+04 | 8.2-01 | Prog | JIA-1358 | 13 | A.A.Alekseev+ | 41573 |
| <i>n</i> ,fis | RP | 4RUSJIA | -5.0-01 | 1.6+01 | Prog | JIA-1358 | 13 | A.A.Alekseev+ | 41573 |
| <i>n</i> ,fis | ? | 4RUSFEI | 6.2+05 | 5.0+06 | Rept | INDC(NDS)-0646 | 13 | V.M.Piksaykin+ | 41590 |
| <i>n</i> ,fis | ? | 4RUSJIA | 6.5-02 | 8.7+03 | Prog | JIA-1358 | 13 | A.A.Alekseev+ | 41573 |

96 Curium 244

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------|--------|--------|-------------|-----|------|-------------------------------|--------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| 0,fis | | KE | 4RUSRI | Spont | | Jour | YF,15,(1),22 | Jan 72 | I.D.Alkhazov+ | 40176 |

97 Berkelium 249

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---|------------------|--------|---------|-------------|--------|------|--------------------------------|------|-------------------|-----------------------|
| | | | | Min | Max | | | | | |
| ⁴⁸ Ca, ₃ <i>n</i> | ²⁹⁴ * | CS | 4ZZZDUB | 2.4+08 | 2.6+08 | Jour | PR/C,87,054621 | 13 | Yu.Ts.Oganessian+ | A0948 |
| ⁴⁸ Ca, ₄ <i>n</i> | ²⁹³ * | CS | 4ZZZDUB | 2.4+08 | 2.6+08 | Jour | PR/C,87,054621 | 13 | Yu.Ts.Oganessian+ | A0948 |
| ⁴⁸ Ca, ₅ <i>n</i> | ²⁹² * | CS | 4ZZZDUB | 2.6+08 | 2.6+08 | Jour | PR/C,87,054621 | 13 | Yu.Ts.Oganessian+ | A0948 |

98 Californium 249

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|--------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>n</i> ,fis | | ? | 4RUSKUR | 1.0+01 | 2.2+01 | Rept | JINR-E3-97-213,348 | May 97 | V.F.Gerasimov+ | 41369 |
| <i>n</i> ,fis | Many | ? | 4RUSMIF | 2.5-02 | 2.5-02 | Jour | YF,57,(12),2137 | Dec 94 | A.A.Aleksandrov+ | 41496 |

98 Californium 252

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------|--------|--------|-------------|-----|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| 0,fis | | NU | 4RUSRI | Spont | | Conf | 80KIEV,4,119 | 80 | B.M.Aleksandrov+ | 41595 |