

EXFOR News (August 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 coordinated 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 published in past 10 years are flagged by asterisks (*). Please send an email to the NRDC Coordinator (n.otsuka@iaea.org) for inclusion in the EXFOR News distribution list as well as any question on EXFOR.

[1] N. Otuka, E. Dupont, V. Semkova, B. Pritychenko et al., [Nucl.Data.Sheets](#) **120**(2014)272.

Quantity codes

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

Special codes in outgoing particle field

| | | | | | | | |
|-----|------------|------|------------|-----|-----------------------|-----|-------|
| abs | Absorption | fus | Fusion | sct | Scattering | tot | Total |
| el | Elastic | inel | Inelastic | tex | Total charge changing | | |
| fis | Fission | non | Nonelastic | ths | Thermal scattering | | |

Special codes in incident energy field

| | | | |
|------|-------------------------------|-------|-----------------------------|
| Fast | Fast reactor spectrum average | Maxw | Maxwellian spectrum average |
| Fiss | Fission spectrum average | Spont | Spontaneous (for fission) |

^a [NNDC](#) (USA), [NEADB](#) (France), [NDS](#) (Austria), [CJD](#) (Russia), [CNDC](#) (China), [ATOMKI](#) (Hungary), [NDPCI](#) (India), [JAEA](#) (Japan), [JCPRG](#) (Japan), [KAERI](#) (Korea), [CDFE](#) (Russia), [CNPD](#) (Russia), [UkrNDC](#) (Ukraine)

1 Hydrogen 1

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------------------|--------------|--------|---------|-------------|--------|------|--------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| π^- ,non | | CS | 1USABNL | 2.6+08 | 4.5+08 | Jour | PR,93,917(F5) | 54 | L.C.L. Yuan+ | C2829 |
| π^+ ,non | | CS | 1USABNL | 3.4+08 | 4.5+08 | Jour | PR,93,917(F5) | 54 | L.C.L. Yuan+ | C2829 |
| p ,el | ^1H | DA | 1USACHI | 1.4+08 | 4.3+08 | Jour | PR,93,927(M1) | 54 | V.A.Nedzel+ | C2831 |
| p ,el | ^1H | DA | 1USACHI | 4.2+08 | 4.2+08 | Jour | PR,93,927(M2) | 54 | J.Marshall+ | C2832 |
| $p,x+\pi^+$ | inclusive | DA | 1USACHI | 4.2+08 | 4.2+08 | Jour | PR,93,927(M2) | 54 | J.Marshall+ | C2832 |
| * ^{10}Be ,el | ^1H | ? | 1USAMSU | 1.2+05 | 3.2+05 | Jour | PRL,129,012501 | 22 | Y.Ayyad+ | C2788 |

1 Hydrogen 2

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|--------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| π^- ,el | ^2H | DA | 1USACHI | 1.2+08 | 1.2+08 | Jour | PR,93,918(F10) | 54 | D.E.Nagle | C2830 |
| π^- ,x+p | inclusive | DA | 1USACHI | 1.2+08 | 1.2+08 | Jour | PR,93,918(F10) | 54 | D.E.Nagle | C2830 |
| $d,x+\gamma$ | inclusive | ? | 1USAMHG | 5.0+05 | 5.0+05 | Jour | PR,54,308(1) | 38 | A.J.Ruhlig | C2844 |
| $d,x+n$ | inclusive | KE | 1USAMHG | 5.0+05 | 5.0+05 | Jour | PR,54,308(1) | 38 | A.J.Ruhlig | C2844 |

2 Helium 4

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------|---------------|--------|---------|-------------|--------|------|---------------------------------|------|-----------------|-----------------------|
| | | | | Min | Max | | | | | |
| p ,el | ^4He | ? | 1USACAW | 1.2+06 | 3.0+06 | Jour | PR,60,42 | 41 | N.P.Heydenburg+ | C2878 |
| α ,el | ^4He | DT | 1USABRK | 6.5+08 | 8.5+08 | Jour | NP/A,262,365 | 76 | J.C.Fong+ | C2776 |
| * ^9Li ,el | ^4He | ? | 1CANTMF | | | Jour | PL/B,832,137256 | 22 | A.Dipietro+ | C2809 |

3 Lithium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $p,x+n$ | inclusive | TT | 1USAWES | 1.8+06 | 1.9+06 | Jour | PR,58,1035 | 40 | R.O.Haxby+ | C2881 |
| $d,x+\gamma$ | inclusive | CS | 1USARIC | 5.0+05 | 1.8+06 | Jour | PR,71,11 | 47 | W.E.Bennett+ | C2837 |
| $d,x+n$ | inclusive | DA | 1USARIC | 5.0+05 | 1.8+06 | Jour | PR,71,11 | 47 | W.E.Bennett+ | C2837 |

3 Lithium 6

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-----------------|---------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| $p,^3\text{He}$ | ^4He | PY | 1USACAW | 2.1+05 | 7.1+05 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| d,α | ^4He | PY | 1USACAW | 1.9+05 | 1.0+06 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| $d,x+n$ | inclusive | CS | 1USARIC | 2.6+05 | 2.2+06 | Jour | PR,75,688(1) | 49 | W.Whaling+ | C2838 |
| $d,x+n$ | inclusive | PY | 1USACAW | 1.7+05 | 1.0+06 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| $d,x+n$ | inclusive | ? | 1USARIC | 5.9+05 | 1.7+06 | Jour | PR,75,688(1) | 49 | W.Whaling+ | C2838 |

d,x+p inclusive PY 1USACAW 1.7+05 1.0+06 Jour [PR,54,657](#) 38 L.H.Rumbaugh+ [C2842](#)

3 Lithium 7

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,α</i> | ⁴ He | PY | 1USACAW | 3.4+05 | 1.0+06 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| <i>d,0</i> | | RP | 1USARIC | | | Jour | PR,71,11 | 47 | W.E.Bennett+ | C2837 |
| <i>d,p</i> | ⁸ Li | CS | 1USARIC | 5.5+05 | 1.4+06 | Jour | PR,71,11 | 47 | W.E.Bennett+ | C2837 |
| <i>d,p</i> | ⁸ Li | PY | 1USACAW | 3.8+05 | 1.1+06 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| <i>d,x+α</i> | inclusive | PY | 1USACAW | 4.0+05 | 1.0+06 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| <i>d,x+n</i> | inclusive | CS | 1USARIC | 2.6+05 | 2.1+06 | Jour | PR,75,688(1) | 49 | W.Whaling+ | C2838 |
| <i>d,x+n</i> | inclusive | PY | 1USACAW | 2.0+05 | 1.1+06 | Jour | PR,54,657 | 38 | L.H.Rumbaugh+ | C2842 |
| <i>d,x+n</i> | inclusive | ? | 1USARIC | 6.0+05 | 1.3+06 | Jour | PR,75,688(1) | 49 | W.Whaling+ | C2838 |

4 Beryllium 9

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,x+n</i> | inclusive | TT | 1USAWES | 2.0+06 | 2.5+06 | Jour | PR,58,1035 | 40 | R.O.Haxby+ | C2881 |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |
| <i>α,⁵He</i> | ⁸ Be | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |
| <i>α,el</i> | ⁹ Be | DA | 1USACAL | 6.0+06 | 6.5+06 | Jour | NIM/B,117,151 | 96 | Yuanxunqiu+ | C2780 |

4 Beryllium 10

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,α</i> | ⁸ Li | CS | 1USACAL | 6.6+05 | 3.0+06 | Jour | PR/C,1,1939 | 70 | D.R.Goosman+ | C2880 |
| <i>d,p</i> | ¹¹ Be | CS | 1USACAL | 1.9+06 | 1.0+07 | Jour | PR/C,1,1939 | 70 | D.R.Goosman+ | C2880 |
| <i>d,p</i> | ¹¹ Be | DAP | 1USACAL | 6.0+06 | 6.0+06 | Jour | PR/C,1,1939 | 70 | D.R.Goosman+ | C2880 |
| <i>d,x+p</i> | inclusive | DAE | 1USACAL | 6.0+06 | 6.0+06 | Jour | PR/C,1,1939 | 70 | D.R.Goosman+ | C2880 |

5 Boron

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,x+n</i> | inclusive | TT | 1USAWES | 3.0+06 | 3.0+06 | Jour | PR,58,1035 | 40 | R.O.Haxby+ | C2881 |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

5 Boron 10

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------------|--------|---------|-------------|--------|------|---------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| * <i>p,α</i> | ⁷ Be | DAP | 1USANOT | 2.0+06 | 2.0+06 | Jour | PR/C,105,055802 | 22 | B.Vandekolk+ | C2767 |
| * <i>p,α</i> | ⁷ Be | DAP | 1USAOHO | 8.0+05 | 1.9+06 | Jour | PR/C,105,055802 | 22 | B.Vandekolk+ | C2767 |

| | | | | | | | | | | | |
|---|----------------------|-----------------|-----|---------|--------|--------|------|---------------------------------|----|--------------|-----------------------|
| * | p,α | ^7Be | DAP | 1USANOT | 8.0+05 | 2.0+06 | Jour | PR/C,105,055802 | 22 | B.Vandekolk+ | C2767 |
| | d,n | ^{11}C | DA | 1USARIC | 3.2+05 | 4.6+06 | Jour | PR,100,847 | 55 | J.B.Marion+ | C2850 |
| | $\alpha,^6\text{Li}$ | ^8Be | DAP | 1USABRK | 7.2+07 | 7.2+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |

5 Boron 11

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | ^{12}C | DA | 1USARIC | 9.2+05 | 5.3+06 | Jour | PR,100,847 | 55 | J.B.Marion+ | C2850 |
| $\alpha,^7\text{Li}$ | ^8Be | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |

6 Carbon

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|-----------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| $p,x+n$ | inclusive | TT | 1USAWES | 3.2+06 | 3.5+06 | Jour | PR,58,1035 | 40 | R.O.Haxby+ | C2881 |
| $d,x+n$ | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

6 Carbon 12

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # | |
|----------------------|----------------------------|------------------|---------|-------------|--------|--------|-------------------------------|--------------------------------|--------------|-----------------------|-----------------------|
| | | | | Min | Max | | | | | | |
| $d,0$ | | RP | 1USARIC | | | Jour | PR,59,781 | 41 | W.E.Bennett+ | C2843 | |
| $d,x+\gamma$ | inclusive | PY | 1USARIC | 5.4+08 | 2.0+09 | Jour | PR,59,781 | 41 | W.E.Bennett+ | C2843 | |
| $\alpha,^2\text{He}$ | ^{14}C | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 | |
| $\alpha,2\alpha$ | ^8Be | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 | |
| $\alpha,2\alpha$ | ^8Be | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 | |
| $\alpha,2\alpha$ | ^8Be | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 | |
| $\alpha,^8\text{Be}$ | ^8Be | DAP | 1USABRK | 6.3+07 | 6.5+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 | |
| * | $^{16}\text{O},\alpha$ | ^{24}Mg | CS | 1USANOT | 3.9+06 | 4.8+06 | Jour | PR/C,96,045804 | 17 | X.Fang+ | C2812 |
| * | $^{16}\text{O},\text{fus}$ | | CS | 1USANOT | 3.6+06 | 5.0+06 | Jour | PR/C,96,045804 | 17 | X.Fang+ | C2812 |
| * | $^{16}\text{O},n$ | ^{27}Si | CS | 1USANOT | 4.0+06 | 4.8+06 | Jour | PR/C,96,045804 | 17 | X.Fang+ | C2812 |
| * | $^{16}\text{O},p$ | ^{27}Al | CS | 1USANOT | 3.6+06 | 5.0+06 | Jour | PR/C,96,045804 | 17 | X.Fang+ | C2812 |

6 Carbon 13

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $d,0$ | | RP | 1USARIC | | | Jour | PR,59,781 | 41 | W.E.Bennett+ | C2843 |
| $d,0$ | | RP | 1USARIC | | | Jour | PR,100,847 | 55 | J.B.Marion+ | C2850 |
| d,n | ^{14}N | DA | 1USARIC | 1.9+06 | 3.9+06 | Jour | PR,100,847 | 55 | J.B.Marion+ | C2850 |
| $d,x+\gamma$ | inclusive | PY | 1USARIC | 4.8+05 | 1.9+06 | Jour | PR,59,781 | 41 | W.E.Bennett+ | C2843 |
| $\alpha,^2\text{He}$ | ^{15}C | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| $\alpha,^8\text{Be}$ | ^9Be | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |

7 Nitrogen 14

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| $p,0$ | | RP | 1USASTF | | | Jour | PR,103,196 | 56 | G.W.Tautfest+ | C0847 |
| $p,e1$ | | RP | 1CANCR | | | Jour | PR,93,928(M4) | 54 | H.E.Gove+ | C2805 |
| $\alpha,^8\text{Be}$ | ^{10}B | DAP | 1USABRK | 7.2+07 | 7.2+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |
| α,γ | | RP | 1USACAL | 3.1+05 | 1.1+06 | Jour | NP/A,175,300 | 71 | R.G.Couch+ | C2779 |

7 Nitrogen 15

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,^8\text{Be}$ | ^{11}B | DAP | 1USABRK | 7.2+07 | 7.2+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |

8 Oxygen 16

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,^2\text{He}$ | ^{18}O | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| $\alpha,2\alpha$ | ^{12}C | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ^{12}C | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ^{12}C | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,^8\text{Be}$ | ^{12}C | DAP | 1USABRK | 5.5+07 | 6.5+07 | Jour | PR/C,14,815 | 76 | G.J.Wozniak+ | C2760 |

10 Neon 16

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|-----------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,n | | CS | 1USARIC | 1.1+06 | 2.1+06 | Jour | PR,103,676 | 56 | J.B.Marion+ | C2856 |
| $d,x+n$ | inclusive | DA | 1USARIC | 2.2+06 | 3.0+06 | Jour | PR,103,676 | 56 | J.B.Marion+ | C2856 |

10 Neon 22

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|------------------|--------|---------|-------------|--------|------|---------------------------------|------|----------|-----------------------|
| | | | | Min | Max | | | | | |
| * p,γ | | RP | 1USASRF | 8.5+05 | 8.5+05 | Jour | PR/C,106,025805 | 22 | Shahina+ | C2808 |
| $\alpha,^2\text{He}$ | ^{24}Ne | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| * α,γ | | RP | 1USASRF | 6.5+05 | 8.3+05 | Jour | PR/C,106,025805 | 22 | Shahina+ | C2808 |

10 Neon 23

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|---------------------------------|------|----------|-----------------------|
| | | | | Min | Max | | | | | |
| * d,p | ^{24}Ne | DAP | 1CANTMF | 1.6+07 | 1.6+07 | Jour | PL/B,833,137361 | 22 | G.Lotay+ | C2811 |

11 Sodium 23

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ²⁴ Na | DAP | 1USAWAS | 1.0+07 | 1.0+07 | Jour | PR,96,103 | 54 | M.M.Bretscher+ | C2848 |

12 Magnesium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,x</i> | ²⁴ Na | CS | 1USABRK | 1.6+06 | 3.6+06 | Jour | PR,48,855 | 35 | M.C.Henderson | C2841 |

12 Magnesium 24

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,α</i> | ²² Na | CS | 1USAMIT | 2.6+06 | 1.4+07 | Jour | JCP,16,686 | 48 | J.W.Irvinejr+ | C2836 |
| <i>α,²He</i> | ²⁶ Mg | DAP | 1USABRK | 5.5+07 | 5.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| <i>α,₂α</i> | ²⁰ Ne | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,₂α</i> | ²⁰ Ne | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,₂α</i> | ²⁰ Ne | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,el</i> | ²⁴ Mg | DA | 1USAWIS | 2.7+06 | 3.4+06 | Jour | PR,88,673 | 52 | S.G.Kaufmann+ | C0757 |

12 Magnesium 26

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,α</i> | ²⁴ Na | CS | 1USAMIT | 2.6+06 | 1.4+07 | Jour | JCP,16,686 | 48 | J.W.Irvinejr+ | C2836 |
| <i>d,x</i> | ²⁷ Mg | CS | 1USABRK | 3.0+06 | 3.0+06 | Jour | PR,48,855 | 35 | M.C.Henderson | C2841 |
| <i>d,x</i> | ²⁷ Mg | TT | 1USABRK | 3.0+06 | 3.0+06 | Jour | PR,48,855 | 35 | M.C.Henderson | C2841 |
| <i>α,²He</i> | ²⁸ Mg | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| <i>α,⁶He</i> | ²⁴ Mg | DAP | 1USACLU | 3.3+07 | 3.6+07 | Jour | PR/C,4,278 | 71 | R.J.Peterson+ | C2781 |
| <i>α,₂α</i> | ²² Ne | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,₂α</i> | ²² Ne | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,₂α</i> | ²² Ne | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |

13 Aluminium 23

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|---------------------------------|------|----------|-----------------------|
| | | | | Min | Max | | | | | |
| * <i>p,el</i> | | RP | 1CANTMF | 1.6+05 | 1.2+06 | Jour | PL/B,833,137361 | 22 | G.Lotay+ | C2811 |

13 Aluminium 27

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------------|-----------------------|
| | | | | Min | Max | | | | | |
| p,α | ^{24}Mg | DA | 1USAWIS | 1.1+06 | 1.8+06 | Jour | PR,83,1011 | 51 | F.C.Shoemaker+ | C2775 |
| p,eI | ^{27}Al | DA | 1USAWIS | 1.3+06 | 1.8+06 | Jour | PR,83,1011 | 51 | F.C.Shoemaker+ | C2775 |
| p,x | ^7Be | CS | 4RUSITE | 6.7+07 | 2.6+09 | Conf | 99PRAHA,,26 | 99 | Yu.E.Titarenko+ | O0985 |
| $p,x+\gamma$ | inclusive | DA | 1USAWIS | 1.4+06 | 4.1+06 | Jour | PR,83,1011 | 51 | F.C.Shoemaker+ | C2775 |
| d,p | ^{28}Al | DAP | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,79,241(X6) | 50 | H.K.Gove+ | C2845 |
| $d,x+n$ | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

14 Silicon 28

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,^2\text{He}$ | ^{30}Si | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| $\alpha,2\alpha$ | ^{24}Mg | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ^{24}Mg | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ^{24}Mg | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| α,x | Many | DAE | 1USAINU | 1.2+08 | 2.0+08 | Jour | PR/C,47,267 | 93 | L.W.Woo+ | C0928 |

14 Silicon 29

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|------------------|--------|---------|-------------|--------|------|---------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| * n,γ | | RP | 1USATNL | 2.1+05 | 3.1+05 | Jour | PR/C,105,055804 | 22 | L.N.Downen+ | C2769 |
| * n,γ | ^{30}Si | RR | 1USATNL | | | Jour | PR/C,105,055804 | 22 | L.N.Downen+ | C2769 |
| p,α | ^{26}Al | DAP | 1USAROC | 1.4+07 | 1.5+07 | Jour | NP/A,340,117 | 80 | M.Kildir | C0684 |

14 Silicon 30

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,2\alpha$ | ^{26}Mg | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ^{26}Mg | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ^{26}Mg | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |

15 Phosphorus 31

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| p,α | ^{28}Si | DAP | 1USAROC | 8.9+06 | 1.0+07 | Jour | PR/C,8,1965 | 73 | M.Kildir+ | C0769 |
| p,eI | ^{31}P | DA | 1USAROC | 8.5+06 | 1.0+07 | Jour | PR/C,8,1965 | 73 | M.Kildir+ | C0769 |
| d,p | ^{32}P | DAP | 1USAMHG | 7.2+06 | 7.2+06 | Jour | PR,87,387(2) | 52 | W.C.Parkinson+ | C2851 |
| $d,x+n$ | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

16 Sulphur

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,x+p</i> | inclusive | DAE | 1USAYAL | 3.2+06 | 3.2+06 | Jour | PR,75,757 | 49 | P.W.Davison | C2839 |

16 Sulphur 32

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ³³ S | CS | 1USAYAL | 2.5+06 | 3.5+06 | Jour | PR,75,757 | 49 | P.W.Davison | C2839 |
| <i>d,p</i> | ³³ S | CSP | 1USAYAL | 2.5+06 | 3.5+06 | Jour | PR,75,757 | 49 | P.W.Davison | C2839 |
| <i>d,p</i> | ³³ S | DAP | 1USAYAL | 2.6+06 | 3.4+06 | Jour | PR,75,757 | 49 | P.W.Davison | C2839 |
| $\alpha,^2\text{He}$ | ³⁴ S | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |

17 Chlorine 35

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ³⁶ Cl | DAP | 1USAMHG | 6.9+06 | 6.9+06 | Jour | PR,88,141 | 52 | J.S.King+ | C2852 |

18 Argon 36

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,^2\text{He}$ | ³⁸ Ar | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |

18 Argon 38

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,^2\text{He}$ | ⁴⁰ Ar | DAP | 1USABRK | 6.5+07 | 6.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |

18 Argon 40

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,α</i> | ³⁷ Cl | DA | 1USASUI | 1.8+06 | 3.5+06 | Jour | NP,28,428 | 61 | A.C.L.Barnard+ | C0859 |
| <i>p,el</i> | ⁴⁰ Ar | DA | 1USASUI | 1.8+06 | 3.5+06 | Jour | NP,28,428 | 61 | A.C.L.Barnard+ | C0859 |
| <i>p,inel</i> | ⁴⁰ Ar | DA | 1USASUI | 2.9+06 | 3.5+06 | Jour | NP,28,428 | 61 | A.C.L.Barnard+ | C0859 |

19 Potassium 39

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁴⁰ K | DAP | 1USAMIT | 6.0+06 | 6.0+06 | Jour | PR,115,949 | 59 | H.A.Engel+ | C2859 |

20 Calcium 40

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,0</i> | | RP | 1USAMIT | | 4.0+06 | Jour | PR,107,1366 | 57 | C.K.Bockelman+ | C2858 |
| <i>d,p</i> | ⁴¹ Ca | DA | 1USAANL | 2.0+06 | 4.2+06 | Jour | PR,107,1340 | 57 | L.L.Leejr+ | C2857 |
| <i>d,p</i> | ⁴¹ Ca | DAP | 1USAMIT | 7.0+06 | 7.0+06 | Jour | PR,107,1366 | 57 | C.K.Bockelman+ | C2858 |
| <i>d,p</i> | ⁴¹ Ca | ? | 1USAANL | 1.5+06 | 4.2+06 | Jour | PR,107,1340 | 57 | L.L.Leejr+ | C2857 |
| <i>α,0</i> | | RP | 1USACST | | | Jour | NP/A,284,163 | 77 | E.L.Cooperman+ | C0926 |
| <i>α,²He</i> | ⁴² Ca | DAP | 1USABRK | 5.5+07 | 5.5+07 | Jour | PR/C,18,9 | 78 | R.Jahn+ | C2777 |
| <i>α,2α</i> | ³⁶ Ar | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,2α</i> | ³⁶ Ar | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,2α</i> | ³⁶ Ar | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |

20 Calcium 42

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,0</i> | | RP | 1USAMIT | | 3.9+06 | Jour | PR,107,1366 | 57 | C.K.Bockelman+ | C2858 |
| <i>d,p</i> | ⁴³ Ca | ? | 1USAMIT | 7.0+06 | 7.0+06 | Jour | PR,107,1366 | 57 | C.K.Bockelman+ | C2858 |

20 Calcium 44

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,0</i> | | RP | 1USAMIT | | 3.4+06 | Jour | PR,107,1366 | 57 | C.K.Bockelman+ | C2858 |
| <i>d,p</i> | ⁴⁵ Ca | ? | 1USAMIT | 7.0+06 | 7.0+06 | Jour | PR,107,1366 | 57 | C.K.Bockelman+ | C2858 |
| <i>α,2α</i> | ⁴⁰ Ar | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,2α</i> | ⁴⁰ Ar | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| <i>α,2α</i> | ⁴⁰ Ar | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |

21 Scandium 45

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ⁴⁵ Ti | DA | 1USARIC | 2.9+06 | 5.8+06 | Jour | PR,100,84 | 55 | R.M.Brugger+ | C2877 |

22 Titanium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | | DAP | 1USAPUP | 1.5+07 | 1.5+07 | Jour | PR,126,698 | 62 | B.L.Cohen+ | C1020 |

22 Titanium 46

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁴⁷ Ti | DAP | 1USAYAL | 4.2+06 | 4.2+06 | Jour | PR,99,1384 | 55 | L.L.Leejr+ | C2849 |
| <i>d,p</i> | ⁴⁷ Ti | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
| ³ He, <i>t</i> | ⁴⁶ V | DAP | 1USAMIN | 2.5+07 | 2.5+07 | Jour | NP/A,190,437 | 72 | F.D.Becchetti+ | C0834 |

22 Titanium 47

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁴⁸ Ti | DAP | 1USAWAS | 1.0+07 | 1.0+07 | Jour | PR,96,103 | 54 | M.M.Bretscher+ | C2848 |
| <i>d,p</i> | ⁴⁸ Ti | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

22 Titanium 48

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|----------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁴⁹ Ti | DAP | 1USAWAS | 1.0+07 | 1.0+07 | Jour | PR,96,103 | 54 | M.M.Bretscher+ | C2848 |
| <i>d,p</i> | ⁴⁹ Ti | DAP | 1USAYAL | 4.2+06 | 4.2+06 | Jour | PR,99,1384 | 55 | L.L.Leejr+ | C2849 |
| <i>d,p</i> | ⁴⁹ Ti | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

23 Vanadium 51

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-----------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁵² V | DAP | 1USAMHG | 7.0+06 | 7.0+06 | Jour | PR,89,1080 | 53 | J.S.King+ | C2847 |
| <i>d,p</i> | ⁵² V | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

24 Chromium 50

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|---------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,el</i> | ⁵⁰ Cr | DA | 1USACLU | 2.3+07 | 2.3+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |
| <i>p,inel</i> | ⁵⁰ Cr | DAP | 1USACLU | 2.3+07 | 2.3+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |
| <i>d,el</i> | ⁵⁰ Cr | DA | 1USACLU | 1.6+07 | 1.6+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |
| <i>d,inel</i> | ⁵⁰ Cr | DAP | 1USACLU | 1.6+07 | 1.6+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |
| ³ He, <i>el</i> | ⁵⁰ Cr | DA | 1USACLU | 4.1+07 | 4.1+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |
| ³ He, <i>inel</i> | ⁵⁰ Cr | DAP | 1USACLU | 4.1+07 | 4.1+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |

| | | | | | | | | | | |
|---------------|------------------|-----|---------|--------|--------|------|----------------------------|----|---------------|-----------------------|
| α,el | ^{50}Cr | DA | 1USACLU | 3.6+07 | 3.6+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |
| $\alpha,inel$ | ^{50}Cr | DAP | 1USACLU | 3.6+07 | 3.6+07 | Jour | PR/C,6,829 | 72 | R.J.Peterson+ | C2782 |

25 Manganese 55

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|-----------|--------|--------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| $d,x+n$ | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

26 Iron

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|---------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,p | | DAP | 1USAPUP | 1.5+07 | 1.5+07 | Jour | PR,126,698 | 62 | B.L.Cohen+ | C1020 |

26 Iron 54

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,p | ^{55}Fe | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

26 Iron 56

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|----------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| d,p | ^{57}Fe | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

26 Iron 58

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| α,el | ^{58}Fe | DA | 1USABRK | 6.4+07 | 6.4+07 | Jour | PR,134,B42 | 64 | P.Darriulat+ | C1025 |

27 Cobalt 59

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| p,α | ^{56}Fe | DAE | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| d,p | ^{60}Co | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

28 Nickel

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|--------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

28 Nickel 58

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁵⁹ Ni | DAP | 1USAPUP | 1.5+07 | 1.5+07 | Jour | PR,126,698 | 62 | B.L.Cohen+ | C1020 |
| <i>d,p</i> | ⁵⁹ Ni | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
| <i>α,el</i> | ⁵⁸ Ni | ? | 1USABRK | 6.4+07 | 6.4+07 | Jour | PR,134,B42 | 64 | P.Darriulat+ | C1025 |

28 Nickel 60

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁶¹ Ni | DAP | 1USAPUP | 1.5+07 | 1.5+07 | Jour | PR,126,698 | 62 | B.L.Cohen+ | C1020 |

29 Copper

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|--------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

29 Copper 63

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ⁶³ Zn | DA | 1USARIC | 4.2+06 | 6.0+06 | Jour | PR,100,84 | 55 | R.M.Brugger+ | C2877 |
| <i>d,p</i> | ⁶⁴ Cu | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

29 Copper 65

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ⁶⁵ Zn | DA | 1USARIC | 2.2+06 | 4.3+06 | Jour | PR,100,84 | 55 | R.M.Brugger+ | C2877 |

30 Zinc

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | | DA | 1USARIC | 2.7+06 | 4.3+06 | Jour | PR,100,84 | 55 | R.M.Brugger+ | C2877 |

30 Zinc 64

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁶⁵ Zn | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

30 Zinc 66

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| $\alpha,2\alpha$ | ⁶² Ni | D3A | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ⁶² Ni | DAA | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |
| $\alpha,2\alpha$ | ⁶² Ni | ? | 1USABRK | 9.0+07 | 9.0+07 | Jour | PR/C,13,20 | 76 | J.D.Sherman+ | C2759 |

38 Strontium 86

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁸⁷ Sr | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

38 Strontium 88

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁸⁹ Sr | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

39 Yttrium 89

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ⁸⁹ Zr | CS | 1USALRL | 1.0+07 | 1.5+07 | Jour | PR/C,4,607 | 71 | S.M.Grimes+ | C0921 |

40 Zirconium 90

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁹¹ Zr | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

40 Zirconium 91

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,d</i> | ⁹⁰ Zr | CSP | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,d</i> | ⁹⁰ Zr | DA | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,d</i> | ⁹⁰ Zr | DAE | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>d,p</i> | ⁹² Zr | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

40 Zirconium 92

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,t</i> | ⁹⁰ Zr | CSP | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,t</i> | ⁹⁰ Zr | DA | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,t</i> | ⁹⁰ Zr | ? | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>d,p</i> | ⁹³ Zr | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

40 Zirconium 96

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # | |
|----------|------------|------------------|------|-------------|--------|--------|-------------------------------|---------------------------------|--------|----------|-----------------------|
| | | | | Min | Max | | | | | | |
| * | α,n | ⁹⁹ Mo | CS | 1USAHO | 7.8+06 | 1.3+07 | Jour | PR/C,106,025804 | 22 | G.Hamad+ | C2807 |
| * | α,n | ⁹⁹ Mo | RR | 1USAHO | | | Jour | PR/C,106,025804 | 22 | G.Hamad+ | C2807 |

41 Niobium 93

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-----------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,\alpha</i> | ⁹⁰ Zr | CSP | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,\alpha</i> | ⁹⁰ Zr | DA | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,\alpha</i> | ⁹⁰ Zr | DAE | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,\alpha</i> | ⁹⁰ Zr | DAP | 1USAORL | 2.2+07 | 2.2+07 | Jour | PR,130,2342 | 63 | J.B.Ball+ | C1034 |
| <i>p,n</i> | ⁹³ Mo | CS | 1USALRL | 8.7+06 | 1.4+07 | Jour | PR/C,4,607 | 71 | S.M.Grimes+ | C0921 |
| <i>d,p</i> | ⁹⁴ Nb | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
| $\alpha,e1$ | ⁹³ Nb | DA | 1USABRL | 2.2+07 | 2.2+07 | Jour | PR/C,7,445 | 73 | Y.S.Park+ | C2778 |

42 Molybdenum

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|--------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

42 Molybdenum 92

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ⁹³ Mo | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

42 Molybdenum 96

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|-------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,α</i> | ⁹³ Nb | DAP | 1USABRL | 1.5+07 | 1.5+07 | Jour | PR/C,7,445 | 73 | Y.S.Park+ | C2778 |
| <i>p,el</i> | ⁹⁶ Mo | DA | 1USABRL | 1.5+07 | 1.5+07 | Jour | PR/C,7,445 | 73 | Y.S.Park+ | C2778 |

45 Rhodium 103

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ¹⁰⁴ Rh | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

47 Silver

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | | CS | 1USAORL | 2.8+06 | 6.0+06 | Jour | PR,169,974 | 68 | C.H.Johnson+ | C0775 |
| <i>α,x</i> | ¹⁰⁹ In | CS | 1USABRK | 1.4+07 | 3.7+07 | Jour | PR,73,417 | 48 | S.N.Ghoshal | C2879 |
| <i>α,x</i> | ¹¹⁰ In | CS | 1USABRK | 1.2+07 | 3.7+07 | Jour | PR,73,417 | 48 | S.N.Ghoshal | C2879 |
| <i>α,x</i> | ¹¹¹ In | CS | 1USABRK | 1.5+07 | 3.7+07 | Jour | PR,73,417 | 48 | S.N.Ghoshal | C2879 |

47 Silver 107

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ¹⁰⁸ Ag | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

48 Cadmium 116

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,n</i> | ¹¹⁶ In | CS | 1USAORL | 2.5+06 | 6.0+06 | Jour | PR,169,974 | 68 | C.H.Johnson+ | C0775 |

49 Indium 115

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

| | | | | | | | | | | |
|------------|-------------------|---|---------|--------|--------|------|---------------------------|----|------------|-----------------------|
| <i>d,p</i> | ¹¹⁶ In | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
|------------|-------------------|---|---------|--------|--------|------|---------------------------|----|------------|-----------------------|

50 Tin 117

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

| | | | | | | | | | | |
|------------|-------------------|---|---------|--------|--------|------|---------------------------|----|------------|-----------------------|
| <i>d,p</i> | ¹¹⁸ Sn | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
|------------|-------------------|---|---------|--------|--------|------|---------------------------|----|------------|-----------------------|

50 Tin 120

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

| | | | | | | | | | | | |
|---|--------------------|-------------------|----|---------|--------|--------|------|---------------|----|---------|-----------------------|
| * | ⁸ B,eI | ¹²⁰ Sn | DA | 2JPNTOK | 3.9+07 | 4.6+07 | Jour | NAT/C,13,7193 | 22 | L.Yang+ | E2740 |
| * | ⁸ B,p+X | ⁷ Be | DA | 2JPNTOK | 3.9+07 | 4.6+07 | Jour | NAT/C,13,7193 | 22 | L.Yang+ | E2740 |
| * | ⁸ B,x | ⁷ Be | DA | 2JPNTOK | 3.9+07 | 4.6+07 | Jour | NAT/C,13,7193 | 22 | L.Yang+ | E2740 |

51 Antimony

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

| | | | | | | | | | | |
|--------------|-----------|----|--------|--------|--------|------|----------------------------|----|------------|-----------------------|
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |
|--------------|-----------|----|--------|--------|--------|------|----------------------------|----|------------|-----------------------|

51 Antimony 121

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

| | | | | | | | | | | |
|------------|-------------------|---|---------|--------|--------|------|---------------------------|----|------------|-----------------------|
| <i>d,p</i> | ¹²² Sb | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
|------------|-------------------|---|---------|--------|--------|------|---------------------------|----|------------|-----------------------|

73 Tantalum 181

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

| | | | | | | | | | | |
|--------------|-------------------|----|---------|--------|--------|------|-----------------------------|----|--------------|-----------------------|
| <i>p,fis</i> | | DA | 2FR PAR | 1.6+08 | 1.6+08 | Jour | PR,164,1528 | 67 | C.J.Stephan+ | O0618 |
| <i>p,n</i> | ¹⁸¹ W | CS | 1USALRL | 8.7+06 | 1.5+07 | Jour | PR/C,4,607 | 71 | S.M.Grimes+ | C0921 |
| <i>d,p</i> | ¹⁸² Ta | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

74 Tungsten

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

| | | | | | | | | | | | |
|--------------|------------|-------------------|---------|---------|--------|--------|----------------------------|------------------------------|----------------|-----------------------|-----------------------|
| <i>p,fis</i> | | DA | 4ZZZDUB | 6.6+08 | 6.6+08 | Jour | SNP,5,186 | 67 | V.S.Bychenkov+ | O0609 | |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 | |
| * | α,x | ¹⁸¹ Re | CS | 2JPNIPC | 3.4+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |

| | | | | | | | | | | | |
|---|------------|-------------------|----|---------|--------|--------|------|------------------------------|----|---------|-----------------------|
| * | α,x | ^{182}Re | CS | 2JPNIPC | 4.5+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{183}Re | CS | 2JPNIPC | 2.7+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{184}Re | CS | 2JPNIPC | 2.7+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{186}Re | CS | 2JPNIPC | 2.3+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{188}Re | CS | 2JPNIPC | 2.7+07 | 3.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{182}Os | CS | 2JPNIPC | 3.9+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{183}Os | CS | 2JPNIPC | 1.9+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |
| * | α,x | ^{185}Os | CS | 2JPNIPC | 1.4+07 | 5.0+07 | Jour | NIM/B,539,95 | 23 | N.Ukon+ | E2741 |

78 Platinum

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-----------|--------|---------|-------------|--------|------|-------------------------------|------|------------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,fis</i> | | CS | 2ZZZCER | 1.4+10 | 2.3+10 | Jour | ZP,269,385 | 74 | R.Antanasijevic+ | O0601 |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

78 Platinum 194

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ^{195}Pt | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

78 Platinum 195

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ^{196}Pt | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

79 Gold 197

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,fis</i> | | DA | 2FR PAR | 1.6+08 | 1.6+08 | Jour | JPR,24,901 | 63 | L.Kowalski+ | O0613 |
| <i>p,x</i> | ^{39}Ar | CS | 2FR SAC | 1.0+09 | 2.4+10 | Jour | PR/C,24,2667 | 81 | H.Sauvageon+ | O0050 |
| <i>d,p</i> | ^{198}Au | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |
| <i>d,x+n</i> | inclusive | TT | 1USAUI | 1.0+07 | 1.0+07 | Jour | PR,83,1137 | 51 | L.W.Smith+ | C2846 |

81 Thallium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,fis</i> | | DA | 1USAANL | 2.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

81 Thallium 203

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ²⁰⁴ Tl | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

81 Thallium 205

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ²⁰⁶ Tl | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

82 Lead 206

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,fis</i> | | CS | 1USAANL | 1.2+10 | 1.2+10 | Jour | ZP,261,329 | 73 | Z.Todorovic+ | O0602 |

82 Lead 206

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,fis</i> | | DA | 1USAANL | 2.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |
| <i>d,p</i> | ²⁰⁷ Pb | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

82 Lead 207

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,p</i> | ²⁰⁸ Pb | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

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 | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

83 Bismuth 209

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|-------------------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>p,fis</i> | | DA | 2FR PAR | 1.6+08 | 1.6+08 | Jour | JPR,24,901 | 63 | L.Kowalski+ | O0613 |
| <i>d,fis</i> | | DA | 1USAANL | 2.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |
| <i>d,p</i> | ²¹⁰ Bi | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

90 Thorium 232

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|--------------|--------|
| | | | | Min | Max | | | | | |
| <i>p</i> ,fis | ³⁹ Ar | CS | 2ZZZCER | 1.4+10 | 2.3+10 | Jour | ZP,266,29 | 74 | Z.Todorovic+ | O0603 |
| <i>p</i> ,x | | CS | 2FR SAC | 1.0+09 | 2.4+10 | Jour | PR/C,24,2667 | 81 | H.Sauvageon+ | O0050 |
| <i>d</i> ,fis | | CS | 1USAANL | 8.4+06 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |
| <i>d</i> ,fis | | DA | 1USAANL | 8.3+06 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

92 Uranium

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-------------|--------|
| | | | | Min | Max | | | | | |
| <i>p</i> ,fis | | DA | 2FR PAR | 1.6+08 | 1.6+08 | Jour | JPR,24,901 | 63 | L.Kowalski+ | O0613 |

92 Uranium 233

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|--------|
| | | | | Min | Max | | | | | |
| <i>d</i> ,fis | | CS | 1USAANL | 7.0+06 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |
| <i>d</i> ,fis | | DA | 1USAANL | 7.0+06 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

92 Uranium 234

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|--------|
| | | | | Min | Max | | | | | |
| <i>d</i> ,fis | | DA | 1USAANL | 1.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

92 Uranium 235

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|--------|
| | | | | Min | Max | | | | | |
| <i>d</i> ,fis | | DA | 1USAANL | 1.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

92 Uranium 236

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|---------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|--------|
| | | | | Min | Max | | | | | |
| <i>d</i> ,fis | | DA | 1USAANL | 1.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

92 Uranium 238

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|------------------|--------|---------|-------------|--------|------|-------------------------------|------|------------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,fis</i> | | CS | 1USAANL | 8.0+06 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |
| <i>d,fis</i> | | DA | 1USAANL | 7.9+06 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |
| <i>d,p</i> | ²³⁹ U | ? | 1USAMIT | 1.4+07 | 1.4+07 | Jour | PR,81,353 | 51 | J.A.Harvey | C2840 |

93 Neptunium 237

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,fis</i> | | DA | 1USAANL | 1.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |

94 Plutonium 239

| Reaction | Product | Quant. | Lab. | Energy (eV) | | Type | Documentation Ref Vol Page | Date | Author | Data # |
|--------------|---------|--------|---------|-------------|--------|------|-------------------------------|------|-----------|-----------------------|
| | | | | Min | Max | | | | | |
| <i>d,fis</i> | | DA | 1USAANL | 1.1+07 | 2.1+07 | Jour | PR,131,722 | 63 | G.L.Bate+ | C2860 |