## Table 323: Muons in Astatine

| Z | $A$ [g/mol] | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|---|
| 85 (At) | [209.98715 (6)] | ?? | 825.0 | 0.31184 | 3.0000 | 0.7833 | 3.0000 | 7.0039 | 0.00 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 3.913 | | | | 3.913 | $1.488 \times 10^0$ |
| 14.0 MeV | $5.616 \times 10^1$ | 3.126 | | | | 3.126 | $2.642 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 2.494 | | | | 2.494 | $4.813 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 1.974 | | | | 1.974 | $9.377 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 1.707 | | | | 1.707 | $1.486 \times 10^1$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.316 | | | | 1.317 | $4.233 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.249 | | | | 1.249 | $5.797 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.186 | | | | 1.186 | $9.098 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.161 | | | | 1.161 | $1.423 \times 10^2$ |
| 216. MeV | $3.039 \times 10^2$ | 1.160 | 0.000 | | | 1.161 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.173 | 0.000 | | 0.000 | 1.173 | $2.281 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.201 | 0.000 | | 0.000 | 1.201 | $3.124 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.307 | 0.001 | | 0.000 | 1.309 | $6.305 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.347 | 0.002 | | 0.000 | 1.349 | $7.810 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.407 | 0.003 | | 0.001 | 1.411 | $1.071 \times 10^3$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.471 | 0.004 | 0.001 | 0.001 | 1.477 | $1.486 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.540 | 0.007 | 0.003 | 0.001 | 1.553 | $2.145 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.587 | 0.011 | 0.007 | 0.002 | 1.606 | $2.777 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 1.690 | 0.026 | 0.023 | 0.003 | 1.743 | $5.158 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 1.719 | 0.035 | 0.033 | 0.004 | 1.792 | $6.290 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 1.762 | 0.054 | 0.053 | 0.005 | 1.875 | $8.471 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 1.803 | 0.084 | 0.088 | 0.007 | 1.982 | $1.158 \times 10^4$ |
| 30.0 GeV | $3.011 \times 10^4$ | 1.846 | 0.137 | 0.155 | 0.011 | 2.149 | $1.642 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 1.874 | 0.194 | 0.229 | 0.014 | 2.311 | $2.091 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 1.936 | 0.438 | 0.554 | 0.028 | 2.957 | $3.617 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 1.955 | 0.567 | 0.730 | 0.034 | 3.288 | $4.258 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 1.984 | 0.833 | 1.091 | 0.048 | 3.957 | $5.366 \times 10^4$ |
| 141. GeV | $1.409 \times 10^5$ | 1.984 | 0.838 | 1.098 | 0.048 | 3.970 | *Muon critical energy* |
| 200. GeV | $2.001 \times 10^5$ | 2.013 | 1.247 | 1.664 | 0.068 | 4.994 | $6.714 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.047 | 1.955 | 2.620 | 0.102 | 6.726 | $8.434 \times 10^4$ |
| 400. GeV | $4.001 \times 10^5$ | 2.071 | 2.687 | 3.611 | 0.136 | 8.507 | $9.754 \times 10^4$ |
| 800. GeV | $8.001 \times 10^5$ | 2.129 | 5.703 | 7.673 | 0.275 | 15.782 | $1.315 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.148 | 7.252 | 9.751 | 0.346 | 19.498 | $1.429 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.176 | 10.353 | 13.894 | 0.490 | 26.915 | $1.603 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.207 | 15.094 | 20.215 | 0.709 | 38.227 | $1.789 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.243 | 23.004 | 30.718 | 1.083 | 57.050 | $2.002 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.268 | 31.016 | 41.331 | 1.463 | 76.080 | $2.154 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.331 | 63.297 | 83.988 | 3.037 | 152.655 | $2.517 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.352 | 79.555 | 105.427 | 3.845 | 191.181 | $2.634 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.383 | 111.984 | 148.207 | 5.502 | 268.078 | $2.810 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.417 | 160.896 | 212.646 | 8.040 | 384.001 | $2.996 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.456 | 242.322 | 319.853 | 12.424 | 577.058 | $3.207 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.485 | 324.022 | 427.307 | 16.909 | 770.725 | $3.357 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 2.554 | 651.248 | 857.409 | 35.621 | 1546.835 | $3.716 \times 10^5$ |
| 100. TeV | $1.000 \times 10^8$ | 2.577 | 815.110 | 1072.650 | 45.280 | 1935.619 | $3.831 \times 10^5$ |