## Table 098: Muons in Carbon (compact)

| Z | $A$ [g/mol] | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|---|
| 6 (C) | [12.0107 (8)] | 2.265 | 78.0 | 0.26142 | 2.8697 | −0.0178 | 2.3415 | 2.8680 | 0.12 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 7.116 | | | | 7.116 | $7.772 \times 10^{-1}$ |
| 14.0 MeV | $5.616 \times 10^1$ | 5.549 | | | | 5.549 | $1.420 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 4.331 | | | | 4.331 | $2.658 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 3.355 | | | | 3.355 | $5.318 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 2.861 | | | | 2.861 | $8.567 \times 10^0$ |
| 80.0 MeV | $1.527 \times 10^2$ | 2.126 | | | | 2.127 | $2.531 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.991 | | | | 1.992 | $3.505 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.854 | | | | 1.854 | $5.597 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.775 | | | | 1.775 | $8.917 \times 10^1$ |
| 300. MeV | $3.917 \times 10^2$ | 1.745 | | | 0.000 | 1.745 | $1.462 \times 10^2$ |
| 317. MeV | $4.096 \times 10^2$ | 1.745 | | | 0.000 | 1.745 | *Minimum ionization* |
| 400. MeV | $4.945 \times 10^2$ | 1.751 | | | 0.000 | 1.751 | $2.034 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.819 | 0.000 | | 0.000 | 1.820 | $4.275 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.850 | 0.000 | | 0.000 | 1.851 | $5.365 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.900 | 0.000 | | 0.001 | 1.901 | $7.496 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.955 | 0.000 | 0.000 | 0.001 | 1.957 | $1.060 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 2.018 | 0.001 | 0.001 | 0.001 | 2.021 | $1.563 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 2.062 | 0.001 | 0.001 | 0.002 | 2.066 | $2.052 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 2.161 | 0.003 | 0.003 | 0.004 | 2.171 | $3.935 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 2.191 | 0.004 | 0.004 | 0.005 | 2.204 | $4.849 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 2.234 | 0.006 | 0.007 | 0.007 | 2.254 | $6.643 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 2.278 | 0.010 | 0.011 | 0.009 | 2.308 | $9.272 \times 10^3$ |
| 30.0 GeV | $3.011 \times 10^4$ | 2.326 | 0.016 | 0.019 | 0.013 | 2.374 | $1.354 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 2.359 | 0.022 | 0.028 | 0.018 | 2.427 | $1.770 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.434 | 0.050 | 0.068 | 0.034 | 2.587 | $3.364 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.458 | 0.065 | 0.089 | 0.042 | 2.655 | $4.127 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.493 | 0.097 | 0.134 | 0.059 | 2.783 | $5.598 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.529 | 0.145 | 0.206 | 0.084 | 2.964 | $7.687 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.571 | 0.230 | 0.327 | 0.125 | 3.253 | $1.091 \times 10^5$ |
| 400. GeV | $4.001 \times 10^5$ | 2.600 | 0.317 | 0.453 | 0.167 | 3.538 | $1.385 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.672 | 0.681 | 0.981 | 0.338 | 4.671 | $2.366 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.695 | 0.869 | 1.254 | 0.424 | 5.242 | $2.770 \times 10^5$ |
| 1.06 TeV | $1.057 \times 10^6$ | 2.701 | 0.922 | 1.330 | 0.449 | 5.402 | *Muon critical energy* |
| 1.40 TeV | $1.400 \times 10^6$ | 2.730 | 1.248 | 1.797 | 0.602 | 6.377 | $3.461 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.768 | 1.830 | 2.630 | 0.871 | 8.100 | $4.294 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.812 | 2.806 | 4.016 | 1.335 | 10.970 | $5.351 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.844 | 3.799 | 5.422 | 1.807 | 13.873 | $6.160 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.921 | 7.821 | 11.088 | 3.773 | 25.603 | $8.250 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.947 | 9.855 | 13.942 | 4.785 | 31.529 | $8.953 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.986 | 13.913 | 19.628 | 6.871 | 43.398 | $1.003 \times 10^6$ |
| 20.0 TeV | $2.000 \times 10^7$ | 3.027 | 20.052 | 28.206 | 10.076 | 61.362 | $1.119 \times 10^6$ |
| 30.0 TeV | $3.000 \times 10^7$ | 3.076 | 30.273 | 42.478 | 15.640 | 91.467 | $1.251 \times 10^6$ |
| 40.0 TeV | $4.000 \times 10^7$ | 3.111 | 40.549 | 56.796 | 21.350 | 121.806 | $1.346 \times 10^6$ |
| 80.0 TeV | $8.000 \times 10^7$ | 3.197 | 81.720 | 114.122 | 45.316 | 244.356 | $1.573 \times 10^6$ |
| 100. TeV | $1.000 \times 10^8$ | 3.225 | 102.350 | 142.820 | 57.740 | 306.136 | $1.646 \times 10^6$ |