## Muons in cerium fluoride ($CeF_3$)

| $\langle Z/A \rangle$ | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|
| 0.43123 | 6.160 | 348.4 | 0.18617 | 3.0000 | 0.2000 | 3.0000 | 5.0079 | 0.00 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 4.958 | | | | 4.958 | $1.135 \times 10^0$ |
| 14.0 MeV | $5.616 \times 10^1$ | 3.903 | | | | 3.904 | $2.054 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 3.075 | | | | 3.075 | $3.804 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 2.407 | | | | 2.407 | $7.529 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 2.068 | | | | 2.068 | $1.204 \times 10^1$ |
| 80.0 MeV | $1.527 \times 10^2$ | 1.574 | | | | 1.574 | $3.489 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.486 | | | | 1.487 | $4.800 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.400 | | | | 1.400 | $7.585 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.357 | | | | 1.357 | $1.195 \times 10^2$ |
| 257. MeV | $3.471 \times 10^2$ | 1.349 | | | 0.000 | 1.350 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.352 | 0.000 | | 0.000 | 1.352 | $1.935 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.369 | 0.000 | | 0.000 | 1.369 | $2.671 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.449 | 0.001 | | 0.000 | 1.450 | $5.507 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.482 | 0.001 | | 0.000 | 1.483 | $6.870 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.534 | 0.001 | 0.000 | 0.001 | 1.536 | $9.517 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.590 | 0.002 | 0.001 | 0.001 | 1.594 | $1.335 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.653 | 0.004 | 0.003 | 0.001 | 1.661 | $1.948 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 1.696 | 0.006 | 0.004 | 0.002 | 1.709 | $2.541 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 1.794 | 0.015 | 0.014 | 0.003 | 1.826 | $4.798 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 1.823 | 0.020 | 0.020 | 0.004 | 1.867 | $5.881 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 1.864 | 0.030 | 0.032 | 0.006 | 1.933 | $7.985 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 1.906 | 0.047 | 0.053 | 0.008 | 2.013 | $1.102 \times 10^4$ |
| 30.0 GeV | $3.011 \times 10^4$ | 1.950 | 0.076 | 0.092 | 0.012 | 2.130 | $1.585 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 1.979 | 0.108 | 0.135 | 0.015 | 2.238 | $2.043 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.045 | 0.244 | 0.325 | 0.030 | 2.644 | $3.684 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.065 | 0.316 | 0.427 | 0.037 | 2.846 | $4.414 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.095 | 0.463 | 0.637 | 0.052 | 3.249 | $5.728 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.127 | 0.695 | 0.971 | 0.074 | 3.867 | $7.420 \times 10^4$ |
| 241. GeV | $2.415 \times 10^5$ | 2.144 | 0.856 | 1.199 | 0.089 | 4.288 | *Muon critical energy* |
| 300. GeV | $3.001 \times 10^5$ | 2.163 | 1.090 | 1.528 | 0.111 | 4.892 | $9.715 \times 10^4$ |
| 400. GeV | $4.001 \times 10^5$ | 2.188 | 1.498 | 2.106 | 0.147 | 5.941 | $1.157 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 2.250 | 3.185 | 4.479 | 0.298 | 10.213 | $1.664 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.270 | 4.052 | 5.693 | 0.375 | 12.391 | $1.842 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.300 | 5.790 | 8.115 | 0.531 | 16.738 | $2.119 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.333 | 8.450 | 11.811 | 0.768 | 23.363 | $2.421 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.371 | 12.890 | 17.955 | 1.175 | 34.391 | $2.772 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.398 | 17.390 | 24.164 | 1.588 | 45.542 | $3.024 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.465 | 35.537 | 49.129 | 3.303 | 90.435 | $3.635 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.487 | 44.683 | 61.679 | 4.184 | 113.035 | $3.832 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.521 | 62.926 | 86.718 | 5.994 | 158.160 | $4.130 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 2.557 | 90.454 | 124.439 | 8.770 | 226.221 | $4.446 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 2.599 | 136.283 | 187.201 | 13.572 | 339.656 | $4.804 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 2.629 | 182.280 | 250.115 | 18.490 | 453.515 | $5.058 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 2.703 | 366.552 | 501.948 | 39.046 | 910.251 | $5.668 \times 10^5$ |
| 100. TeV | $1.000 \times 10^8$ | 2.728 | 458.848 | 627.982 | 49.670 | 1139.230 | $5.864 \times 10^5$ |