## Table 132: Muons in Calcium sulfate ($CaSO_4$)

| $\langle Z/A \rangle$ | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|
| 0.49950 | 2.960 | 152.3 | 0.07708 | 3.4495 | 0.0587 | 3.1229 | 3.9388 | 0.00 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 6.510 | | | | 6.510 | $8.551 \times 10^{-1}$ |
| 14.0 MeV | $5.616 \times 10^1$ | 5.098 | | | | 5.098 | $1.557 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 3.995 | | | | 3.995 | $2.901 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 3.111 | | | | 3.111 | $5.777 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 2.663 | | | | 2.663 | $9.273 \times 10^0$ |
| 80.0 MeV | $1.527 \times 10^2$ | 2.003 | | | | 2.004 | $2.712 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 1.882 | | | | 1.882 | $3.745 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 1.760 | | | | 1.760 | $5.953 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 1.693 | | | | 1.693 | $9.441 \times 10^1$ |
| 290. MeV | $3.813 \times 10^2$ | 1.673 | | | 0.000 | 1.673 | *Minimum ionization* |
| 300. MeV | $3.917 \times 10^2$ | 1.673 | | | 0.000 | 1.673 | $1.540 \times 10^2$ |
| 400. MeV | $4.945 \times 10^2$ | 1.685 | | | 0.000 | 1.685 | $2.136 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 1.763 | 0.000 | | 0.000 | 1.763 | $4.456 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 1.796 | 0.000 | | 0.000 | 1.797 | $5.579 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 1.851 | 0.001 | 0.000 | 0.001 | 1.852 | $7.770 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 1.910 | 0.001 | 0.000 | 0.001 | 1.913 | $1.095 \times 10^3$ |
| 3.00 GeV | $3.104 \times 10^3$ | 1.977 | 0.002 | 0.001 | 0.001 | 1.982 | $1.608 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 2.024 | 0.003 | 0.002 | 0.002 | 2.030 | $2.107 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 2.130 | 0.006 | 0.006 | 0.004 | 2.146 | $4.017 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 2.162 | 0.008 | 0.008 | 0.005 | 2.183 | $4.940 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 2.208 | 0.012 | 0.014 | 0.006 | 2.241 | $6.748 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 2.254 | 0.019 | 0.022 | 0.009 | 2.305 | $9.386 \times 10^3$ |
| 30.0 GeV | $3.011 \times 10^4$ | 2.304 | 0.032 | 0.039 | 0.013 | 2.387 | $1.365 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 2.337 | 0.045 | 0.057 | 0.017 | 2.456 | $1.777 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.413 | 0.101 | 0.137 | 0.033 | 2.684 | $3.333 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.437 | 0.131 | 0.180 | 0.041 | 2.788 | $4.064 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.472 | 0.192 | 0.269 | 0.057 | 2.990 | $5.449 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.509 | 0.289 | 0.410 | 0.080 | 3.288 | $7.361 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 2.550 | 0.454 | 0.649 | 0.120 | 3.774 | $1.020 \times 10^5$ |
| 400. GeV | $4.001 \times 10^5$ | 2.580 | 0.625 | 0.898 | 0.160 | 4.263 | $1.269 \times 10^5$ |
| 599. GeV | $5.993 \times 10^5$ | 2.621 | 0.975 | 1.405 | 0.241 | 5.243 | *Muon critical energy* |
| 800. GeV | $8.001 \times 10^5$ | 2.651 | 1.335 | 1.924 | 0.324 | 6.235 | $2.040 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 2.674 | 1.701 | 2.451 | 0.407 | 7.234 | $2.338 \times 10^5$ |
| 1.40 TeV | $1.400 \times 10^6$ | 2.710 | 2.436 | 3.502 | 0.577 | 9.226 | $2.826 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 2.748 | 3.564 | 5.110 | 0.836 | 12.258 | $3.389 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 2.791 | 5.450 | 7.783 | 1.280 | 17.305 | $4.072 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 2.823 | 7.366 | 10.490 | 1.731 | 22.410 | $4.579 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 2.900 | 15.106 | 21.382 | 3.608 | 42.998 | $5.845 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 2.926 | 19.014 | 26.863 | 4.575 | 53.378 | $6.262 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 2.965 | 26.815 | 37.791 | 6.563 | 74.134 | $6.895 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 3.007 | 38.603 | 54.263 | 9.614 | 105.488 | $7.570 \times 10^5$ |
| 30.0 TeV | $3.000 \times 10^7$ | 3.055 | 58.210 | 81.676 | 14.904 | 157.845 | $8.340 \times 10^5$ |
| 40.0 TeV | $4.000 \times 10^7$ | 3.090 | 77.902 | 109.168 | 20.328 | 210.488 | $8.887 \times 10^5$ |
| 80.0 TeV | $8.000 \times 10^7$ | 3.176 | 156.854 | 219.222 | 43.050 | 422.302 | $1.020 \times 10^6$ |
| 100. TeV | $1.000 \times 10^8$ | 3.204 | 196.424 | 274.308 | 54.814 | 528.750 | $1.062 \times 10^6$ |