

Muons in liquid helium (He)

| Z | A [g/mol] | ρ [g/cm ³] | I [eV] | a | $k = m_s$ | x_0 | x_1 | \bar{C} | δ_0 |
|----------|---------------------|-----------------------------|--------|---------------------------------------|-----------|---------|------------------------------------|-----------|------------|
| 2 (He) | 4.002602(2) | 0.125 | 41.8 | 0.65713 | 3.0000 | 0.4729 | 2.0000 | 4.5180 | 0.00 |
| T | p [MeV/c] | Ionization | Brems | Pair prod [MeV cm ² /g] | Photonucl | Total | CSDA range [g/cm ²] | | |
| 10.0 MeV | 4.704×10^1 | 7.709 | | | | 7.709 | 7.138×10^{-1} | | |
| 14.0 MeV | 5.616×10^1 | 5.998 | | | | 5.998 | 1.308×10^0 | | |
| 20.0 MeV | 6.802×10^1 | 4.673 | | | | 4.673 | 2.455×10^0 | | |
| 30.0 MeV | 8.509×10^1 | 3.616 | | | | 3.616 | 4.922×10^0 | | |
| 40.0 MeV | 1.003×10^2 | 3.082 | | | | 3.083 | 7.937×10^0 | | |
| 80.0 MeV | 1.527×10^2 | 2.305 | | | | 2.305 | 2.343×10^1 | | |
| 100. MeV | 1.764×10^2 | 2.165 | | | | 2.165 | 3.240×10^1 | | |
| 140. MeV | 2.218×10^2 | 2.026 | | | | 2.026 | 5.159×10^1 | | |
| 200. MeV | 2.868×10^2 | 1.954 | | | 0.000 | 1.954 | 8.186×10^1 | | |
| 277. MeV | 3.683×10^2 | 1.936 | | | 0.000 | 1.936 | <i>Minimum ionization</i> | | |
| 300. MeV | 3.917×10^2 | 1.937 | | | 0.000 | 1.937 | 1.334×10^2 | | |
| 400. MeV | 4.945×10^2 | 1.952 | | | 0.000 | 1.952 | 1.849×10^2 | | |
| 800. MeV | 8.995×10^2 | 2.037 | | | 0.000 | 2.037 | 3.853×10^2 | | |
| 1.00 GeV | 1.101×10^3 | 2.072 | | | 0.001 | 2.072 | 4.826×10^2 | | |
| 1.40 GeV | 1.502×10^3 | 2.126 | 0.000 | | 0.001 | 2.127 | 6.730×10^2 | | |
| 2.00 GeV | 2.103×10^3 | 2.184 | 0.000 | | 0.001 | 2.185 | 9.511×10^2 | | |
| 3.00 GeV | 3.104×10^3 | 2.247 | 0.000 | 0.000 | 0.002 | 2.249 | 1.402×10^3 | | |
| 4.00 GeV | 4.104×10^3 | 2.290 | 0.000 | 0.000 | 0.002 | 2.293 | 1.842×10^3 | | |
| 8.00 GeV | 8.105×10^3 | 2.386 | 0.001 | 0.001 | 0.004 | 2.392 | 3.545×10^3 | | |
| 10.0 GeV | 1.011×10^4 | 2.415 | 0.002 | 0.002 | 0.005 | 2.423 | 4.375×10^3 | | |
| 14.0 GeV | 1.411×10^4 | 2.458 | 0.002 | 0.003 | 0.007 | 2.470 | 6.010×10^3 | | |
| 20.0 GeV | 2.011×10^4 | 2.501 | 0.004 | 0.004 | 0.010 | 2.519 | 8.414×10^3 | | |
| 30.0 GeV | 3.011×10^4 | 2.549 | 0.006 | 0.008 | 0.014 | 2.578 | 1.233×10^4 | | |
| 40.0 GeV | 4.011×10^4 | 2.582 | 0.009 | 0.012 | 0.019 | 2.622 | 1.618×10^4 | | |
| 80.0 GeV | 8.011×10^4 | 2.657 | 0.021 | 0.029 | 0.036 | 2.744 | 3.107×10^4 | | |
| 100. GeV | 1.001×10^5 | 2.681 | 0.028 | 0.039 | 0.045 | 2.792 | 3.829×10^4 | | |
| 140. GeV | 1.401×10^5 | 2.716 | 0.042 | 0.058 | 0.062 | 2.878 | 5.240×10^4 | | |
| 200. GeV | 2.001×10^5 | 2.752 | 0.063 | 0.090 | 0.088 | 2.993 | 7.284×10^4 | | |
| 300. GeV | 3.001×10^5 | 2.794 | 0.101 | 0.144 | 0.132 | 3.171 | 1.053×10^5 | | |
| 400. GeV | 4.001×10^5 | 2.823 | 0.140 | 0.201 | 0.175 | 3.340 | 1.360×10^5 | | |
| 800. GeV | 8.001×10^5 | 2.895 | 0.306 | 0.443 | 0.354 | 3.998 | 2.453×10^5 | | |
| 1.00 TeV | 1.000×10^6 | 2.918 | 0.392 | 0.569 | 0.445 | 4.324 | 2.934×10^5 | | |
| 1.40 TeV | 1.400×10^6 | 2.953 | 0.566 | 0.821 | 0.632 | 4.973 | 3.796×10^5 | | |
| 2.00 TeV | 2.000×10^6 | 2.991 | 0.836 | 1.210 | 0.916 | 5.953 | 4.897×10^5 | | |
| 2.02 TeV | 2.020×10^6 | 2.992 | 0.844 | 1.223 | 0.925 | 5.985 | <i>Muon critical energy</i> | | |
| 3.00 TeV | 3.000×10^6 | 3.035 | 1.289 | 1.861 | 1.404 | 7.589 | 6.382×10^5 | | |
| 4.00 TeV | 4.000×10^6 | 3.067 | 1.751 | 2.524 | 1.902 | 9.245 | 7.574×10^5 | | |
| 8.00 TeV | 8.000×10^6 | 3.144 | 3.634 | 5.207 | 3.979 | 15.964 | 1.083×10^6 | | |
| 10.0 TeV | 1.000×10^7 | 3.170 | 4.589 | 6.563 | 5.050 | 19.372 | 1.196×10^6 | | |
| 14.0 TeV | 1.400×10^7 | 3.209 | 6.497 | 9.260 | 7.260 | 26.226 | 1.373×10^6 | | |
| 20.0 TeV | 2.000×10^7 | 3.250 | 9.390 | 13.338 | 10.660 | 36.639 | 1.566×10^6 | | |
| 30.0 TeV | 3.000×10^7 | 3.299 | 14.206 | 20.112 | 16.578 | 54.195 | 1.789×10^6 | | |
| 40.0 TeV | 4.000×10^7 | 3.334 | 19.055 | 26.915 | 22.660 | 71.965 | 1.949×10^6 | | |
| 80.0 TeV | 8.000×10^7 | 3.420 | 38.527 | 54.158 | 48.256 | 144.361 | 2.334×10^6 | | |
| 100. TeV | 1.000×10^8 | 3.448 | 48.300 | 67.800 | 61.550 | 181.099 | 2.457×10^6 | | |