## Table 242: Muons in Rubber butyl $(C_4H8)_n$

| $\langle Z/A \rangle$ | $\rho$ [g/cm$^3$] | $I$ [eV] | $a$ | $k = m_s$ | $x_0$ | $x_1$ | $\overline{C}$ | $\delta_0$ |
|---|---|---|---|---|---|---|---|---|
| 0.57034 | 0.920 | 56.5 | 0.12108 | 3.4296 | 0.1347 | 2.5154 | 2.9915 | 0.00 |

| $T$ | $p$ [MeV/$c$] | Ionization | Brems | Pair prod | Photonucl | Total | CSDA range [g/cm$^2$] |
|---|---|---|---|---|---|---|---|
| | | [MeV cm$^2$/g] | | | | | |
| 10.0 MeV | $4.704 \times 10^1$ | 8.483 | | | | 8.483 | $6.498 \times 10^{-1}$ |
| 14.0 MeV | $5.616 \times 10^1$ | 6.609 | | | | 6.609 | $1.190 \times 10^0$ |
| 20.0 MeV | $6.802 \times 10^1$ | 5.155 | | | | 5.155 | $2.230 \times 10^0$ |
| 30.0 MeV | $8.509 \times 10^1$ | 3.994 | | | | 3.994 | $4.465 \times 10^0$ |
| 40.0 MeV | $1.003 \times 10^2$ | 3.407 | | | | 3.407 | $7.193 \times 10^0$ |
| 80.0 MeV | $1.527 \times 10^2$ | 2.549 | | | | 2.549 | $2.119 \times 10^1$ |
| 100. MeV | $1.764 \times 10^2$ | 2.385 | | | | 2.386 | $2.932 \times 10^1$ |
| 140. MeV | $2.218 \times 10^2$ | 2.218 | | | | 2.218 | $4.680 \times 10^1$ |
| 200. MeV | $2.868 \times 10^2$ | 2.120 | | | | 2.120 | $7.458 \times 10^1$ |
| 300. MeV | $3.917 \times 10^2$ | 2.080 | | | 0.000 | 2.080 | $1.223 \times 10^2$ |
| 328. MeV | $4.211 \times 10^2$ | 2.079 | | | 0.000 | 2.079 | *Minimum ionization* |
| 400. MeV | $4.945 \times 10^2$ | 2.084 | | | 0.000 | 2.084 | $1.704 \times 10^2$ |
| 800. MeV | $8.995 \times 10^2$ | 2.155 | 0.000 | | 0.000 | 2.156 | $3.592 \times 10^2$ |
| 1.00 GeV | $1.101 \times 10^3$ | 2.189 | 0.000 | | 0.000 | 2.190 | $4.513 \times 10^2$ |
| 1.40 GeV | $1.502 \times 10^3$ | 2.244 | 0.000 | | 0.001 | 2.245 | $6.316 \times 10^2$ |
| 2.00 GeV | $2.103 \times 10^3$ | 2.305 | 0.000 | 0.000 | 0.001 | 2.307 | $8.950 \times 10^2$ |
| 3.00 GeV | $3.104 \times 10^3$ | 2.375 | 0.001 | 0.000 | 0.001 | 2.377 | $1.322 \times 10^3$ |
| 4.00 GeV | $4.104 \times 10^3$ | 2.423 | 0.001 | 0.001 | 0.002 | 2.427 | $1.738 \times 10^3$ |
| 8.00 GeV | $8.105 \times 10^3$ | 2.535 | 0.003 | 0.003 | 0.004 | 2.544 | $3.343 \times 10^3$ |
| 10.0 GeV | $1.011 \times 10^4$ | 2.569 | 0.004 | 0.004 | 0.005 | 2.581 | $4.123 \times 10^3$ |
| 14.0 GeV | $1.411 \times 10^4$ | 2.618 | 0.006 | 0.006 | 0.007 | 2.637 | $5.655 \times 10^3$ |
| 20.0 GeV | $2.011 \times 10^4$ | 2.669 | 0.009 | 0.010 | 0.009 | 2.697 | $7.904 \times 10^3$ |
| 30.0 GeV | $3.011 \times 10^4$ | 2.723 | 0.015 | 0.018 | 0.014 | 2.769 | $1.156 \times 10^4$ |
| 40.0 GeV | $4.011 \times 10^4$ | 2.760 | 0.021 | 0.026 | 0.018 | 2.825 | $1.513 \times 10^4$ |
| 80.0 GeV | $8.011 \times 10^4$ | 2.847 | 0.047 | 0.063 | 0.035 | 2.992 | $2.887 \times 10^4$ |
| 100. GeV | $1.001 \times 10^5$ | 2.873 | 0.061 | 0.084 | 0.043 | 3.062 | $3.547 \times 10^4$ |
| 140. GeV | $1.401 \times 10^5$ | 2.913 | 0.091 | 0.126 | 0.060 | 3.190 | $4.827 \times 10^4$ |
| 200. GeV | $2.001 \times 10^5$ | 2.955 | 0.137 | 0.193 | 0.085 | 3.370 | $6.656 \times 10^4$ |
| 300. GeV | $3.001 \times 10^5$ | 3.002 | 0.216 | 0.307 | 0.127 | 3.654 | $9.505 \times 10^4$ |
| 400. GeV | $4.001 \times 10^5$ | 3.036 | 0.299 | 0.427 | 0.170 | 3.931 | $1.214 \times 10^5$ |
| 800. GeV | $8.001 \times 10^5$ | 3.118 | 0.644 | 0.925 | 0.343 | 5.029 | $2.111 \times 10^5$ |
| 1.00 TeV | $1.000 \times 10^6$ | 3.144 | 0.822 | 1.183 | 0.430 | 5.580 | $2.489 \times 10^5$ |
| 1.28 TeV | $1.281 \times 10^6$ | 3.174 | 1.074 | 1.543 | 0.557 | 6.348 | *Muon critical energy* |
| 1.40 TeV | $1.400 \times 10^6$ | 3.185 | 1.182 | 1.697 | 0.611 | 6.675 | $3.143 \times 10^5$ |
| 2.00 TeV | $2.000 \times 10^6$ | 3.228 | 1.736 | 2.485 | 0.884 | 8.334 | $3.946 \times 10^5$ |
| 3.00 TeV | $3.000 \times 10^6$ | 3.278 | 2.665 | 3.799 | 1.355 | 11.098 | $4.983 \times 10^5$ |
| 4.00 TeV | $4.000 \times 10^6$ | 3.314 | 3.612 | 5.132 | 1.834 | 13.892 | $5.787 \times 10^5$ |
| 8.00 TeV | $8.000 \times 10^6$ | 3.402 | 7.450 | 10.502 | 3.831 | 25.186 | $7.895 \times 10^5$ |
| 10.0 TeV | $1.000 \times 10^7$ | 3.432 | 9.393 | 13.208 | 4.860 | 30.894 | $8.611 \times 10^5$ |
| 14.0 TeV | $1.400 \times 10^7$ | 3.476 | 13.272 | 18.599 | 6.982 | 42.329 | $9.713 \times 10^5$ |
| 20.0 TeV | $2.000 \times 10^7$ | 3.524 | 19.144 | 26.732 | 10.243 | 59.643 | $1.090 \times 10^6$ |
| 30.0 TeV | $3.000 \times 10^7$ | 3.579 | 28.924 | 40.262 | 15.907 | 88.672 | $1.227 \times 10^6$ |
| 40.0 TeV | $4.000 \times 10^7$ | 3.619 | 38.762 | 53.838 | 21.722 | 117.941 | $1.324 \times 10^6$ |
| 80.0 TeV | $8.000 \times 10^7$ | 3.717 | 78.203 | 108.188 | 46.153 | 236.262 | $1.559 \times 10^6$ |
| 100. TeV | $1.000 \times 10^8$ | 3.750 | 97.977 | 135.397 | 58.825 | 295.949 | $1.635 \times 10^6$ |