

**Table 226: Muons in Polystyrene ( $[\text{C}_6\text{H}_5\text{CHCH}_2]_n$ )**

| $\langle Z/A \rangle$ | $\rho$ [g/cm <sup>3</sup> ] | $I$ [eV]   | $a$     | $k = m_s$                             | $x_0$     | $x_1$   | $\bar{C}$                          | $\delta_0$ |
|-----------------------|-----------------------------|------------|---------|---------------------------------------|-----------|---------|------------------------------------|------------|
| 0.53768               | 1.060                       | 68.7       | 0.16454 | 3.2224                                | 0.1647    | 2.5031  | 3.2999                             | 0.00       |
| $T$                   | $p$<br>[MeV/c]              | Ionization | Brems   | Pair prod<br>[MeV cm <sup>2</sup> /g] | Photonucl | Total   | CSDA range<br>[g/cm <sup>2</sup> ] |            |
| 10.0 MeV              | $4.704 \times 10^1$         | 7.803      |         |                                       |           | 7.803   | $7.077 \times 10^{-1}$             |            |
| 14.0 MeV              | $5.616 \times 10^1$         | 6.084      |         |                                       |           | 6.084   | $1.294 \times 10^0$                |            |
| 20.0 MeV              | $6.802 \times 10^1$         | 4.749      |         |                                       |           | 4.749   | $2.424 \times 10^0$                |            |
| 30.0 MeV              | $8.509 \times 10^1$         | 3.683      |         |                                       |           | 3.683   | $4.848 \times 10^0$                |            |
| 40.0 MeV              | $1.003 \times 10^2$         | 3.144      |         |                                       |           | 3.144   | $7.806 \times 10^0$                |            |
| 80.0 MeV              | $1.527 \times 10^2$         | 2.359      |         |                                       |           | 2.359   | $2.296 \times 10^1$                |            |
| 100. MeV              | $1.764 \times 10^2$         | 2.210      |         |                                       |           | 2.211   | $3.174 \times 10^1$                |            |
| 140. MeV              | $2.218 \times 10^2$         | 2.058      |         |                                       |           | 2.058   | $5.059 \times 10^1$                |            |
| 200. MeV              | $2.868 \times 10^2$         | 1.970      |         |                                       |           | 1.971   | $8.049 \times 10^1$                |            |
| 300. MeV              | $3.917 \times 10^2$         | 1.937      |         |                                       | 0.000     | 1.937   | $1.318 \times 10^2$                |            |
| 318. MeV              | $4.105 \times 10^2$         | 1.936      |         |                                       | 0.000     | 1.936   | <i>Minimum ionization</i>          |            |
| 400. MeV              | $4.945 \times 10^2$         | 1.942      |         |                                       | 0.000     | 1.943   | $1.834 \times 10^2$                |            |
| 800. MeV              | $8.995 \times 10^2$         | 2.015      | 0.000   |                                       | 0.000     | 2.015   | $3.856 \times 10^2$                |            |
| 1.00 GeV              | $1.101 \times 10^3$         | 2.048      | 0.000   |                                       | 0.000     | 2.049   | $4.841 \times 10^2$                |            |
| 1.40 GeV              | $1.502 \times 10^3$         | 2.102      | 0.000   |                                       | 0.001     | 2.103   | $6.767 \times 10^2$                |            |
| 2.00 GeV              | $2.103 \times 10^3$         | 2.161      | 0.000   | 0.000                                 | 0.001     | 2.163   | $9.578 \times 10^2$                |            |
| 3.00 GeV              | $3.104 \times 10^3$         | 2.228      | 0.001   | 0.001                                 | 0.001     | 2.231   | $1.413 \times 10^3$                |            |
| 4.00 GeV              | $4.104 \times 10^3$         | 2.275      | 0.001   | 0.001                                 | 0.002     | 2.279   | $1.856 \times 10^3$                |            |
| 8.00 GeV              | $8.105 \times 10^3$         | 2.382      | 0.003   | 0.003                                 | 0.004     | 2.391   | $3.564 \times 10^3$                |            |
| 10.0 GeV              | $1.011 \times 10^4$         | 2.414      | 0.004   | 0.004                                 | 0.005     | 2.427   | $4.394 \times 10^3$                |            |
| 14.0 GeV              | $1.411 \times 10^4$         | 2.461      | 0.006   | 0.006                                 | 0.007     | 2.480   | $6.023 \times 10^3$                |            |
| 20.0 GeV              | $2.011 \times 10^4$         | 2.509      | 0.009   | 0.010                                 | 0.009     | 2.538   | $8.413 \times 10^3$                |            |
| 30.0 GeV              | $3.011 \times 10^4$         | 2.560      | 0.015   | 0.018                                 | 0.014     | 2.607   | $1.230 \times 10^4$                |            |
| 40.0 GeV              | $4.011 \times 10^4$         | 2.596      | 0.021   | 0.027                                 | 0.018     | 2.662   | $1.609 \times 10^4$                |            |
| 80.0 GeV              | $8.011 \times 10^4$         | 2.677      | 0.049   | 0.065                                 | 0.035     | 2.825   | $3.065 \times 10^4$                |            |
| 100. GeV              | $1.001 \times 10^5$         | 2.702      | 0.063   | 0.086                                 | 0.043     | 2.895   | $3.765 \times 10^4$                |            |
| 140. GeV              | $1.401 \times 10^5$         | 2.740      | 0.093   | 0.130                                 | 0.059     | 3.022   | $5.116 \times 10^4$                |            |
| 200. GeV              | $2.001 \times 10^5$         | 2.779      | 0.141   | 0.199                                 | 0.084     | 3.203   | $7.044 \times 10^4$                |            |
| 300. GeV              | $3.001 \times 10^5$         | 2.824      | 0.222   | 0.316                                 | 0.126     | 3.489   | $1.003 \times 10^5$                |            |
| 400. GeV              | $4.001 \times 10^5$         | 2.855      | 0.307   | 0.439                                 | 0.168     | 3.770   | $1.279 \times 10^5$                |            |
| 800. GeV              | $8.001 \times 10^5$         | 2.932      | 0.661   | 0.951                                 | 0.340     | 4.884   | $2.208 \times 10^5$                |            |
| 1.00 TeV              | $1.000 \times 10^6$         | 2.957      | 0.844   | 1.216                                 | 0.428     | 5.445   | $2.596 \times 10^5$                |            |
| 1.18 TeV              | $1.183 \times 10^6$         | 2.976      | 1.011   | 1.456                                 | 0.509     | 5.953   | <i>Muon critical energy</i>        |            |
| 1.40 TeV              | $1.400 \times 10^6$         | 2.995      | 1.212   | 1.743                                 | 0.606     | 6.558   | $3.265 \times 10^5$                |            |
| 2.00 TeV              | $2.000 \times 10^6$         | 3.036      | 1.779   | 2.552                                 | 0.878     | 8.246   | $4.079 \times 10^5$                |            |
| 3.00 TeV              | $3.000 \times 10^6$         | 3.083      | 2.730   | 3.899                                 | 1.346     | 11.059  | $5.123 \times 10^5$                |            |
| 4.00 TeV              | $4.000 \times 10^6$         | 3.117      | 3.698   | 5.266                                 | 1.822     | 13.903  | $5.928 \times 10^5$                |            |
| 8.00 TeV              | $8.000 \times 10^6$         | 3.201      | 7.621   | 10.772                                | 3.804     | 25.399  | $8.025 \times 10^5$                |            |
| 10.0 TeV              | $1.000 \times 10^7$         | 3.228      | 9.606   | 13.547                                | 4.825     | 31.207  | $8.734 \times 10^5$                |            |
| 14.0 TeV              | $1.400 \times 10^7$         | 3.270      | 13.568  | 19.074                                | 6.931     | 42.843  | $9.824 \times 10^5$                |            |
| 20.0 TeV              | $2.000 \times 10^7$         | 3.315      | 19.563  | 27.412                                | 10.166    | 60.456  | $1.100 \times 10^6$                |            |
| 30.0 TeV              | $3.000 \times 10^7$         | 3.367      | 29.546  | 41.284                                | 15.784    | 89.982  | $1.234 \times 10^6$                |            |
| 40.0 TeV              | $4.000 \times 10^7$         | 3.405      | 39.586  | 55.203                                | 21.551    | 119.744 | $1.331 \times 10^6$                |            |
| 80.0 TeV              | $8.000 \times 10^7$         | 3.498      | 79.826  | 110.926                               | 45.767    | 240.016 | $1.562 \times 10^6$                |            |
| 100. TeV              | $1.000 \times 10^8$         | 3.528      | 99.994  | 138.821                               | 58.325    | 300.668 | $1.636 \times 10^6$                |            |