

## Muons in calcium carbonate (CaCO<sub>3</sub>)

	$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
	0.49955	2.800	136.4	0.08301	3.4120	0.0492	3.0549	3.7738	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
10.0 MeV	$4.704 \times 10^1$	6.613				6.613	$8.408 \times 10^{-1}$		
14.0 MeV	$5.616 \times 10^1$	5.175				5.175	$1.532 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	4.053				4.054	$2.857 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	3.154				3.154	$5.692 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	2.699				2.699	$9.141 \times 10^0$		
80.0 MeV	$1.527 \times 10^2$	2.027				2.027	$2.677 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.903				1.903	$3.698 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.778				1.778	$5.883 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.708				1.708	$9.339 \times 10^1$		
297. MeV	$3.884 \times 10^2$	1.686			0.000	1.686	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.686			0.000	1.686	$1.525 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.697			0.000	1.697	$2.116 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.773	0.000		0.000	1.773	$4.422 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.806	0.000		0.000	1.807	$5.539 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.859	0.001	0.000	0.001	1.861	$7.719 \times 10^2$		
2.00 GeV	$2.103 \times 10^3$	1.918	0.001	0.000	0.001	1.920	$1.089 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.985	0.002	0.001	0.001	1.989	$1.600 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	2.031	0.002	0.002	0.002	2.037	$2.097 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	2.136	0.006	0.006	0.004	2.151	$4.001 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	2.168	0.008	0.008	0.005	2.188	$4.923 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	2.213	0.012	0.013	0.006	2.244	$6.727 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	2.259	0.018	0.021	0.009	2.308	$9.361 \times 10^3$		
30.0 GeV	$3.011 \times 10^4$	2.309	0.030	0.036	0.013	2.388	$1.362 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	2.342	0.042	0.053	0.017	2.455	$1.775 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	2.418	0.095	0.129	0.033	2.675	$3.333 \times 10^4$		
100. GeV	$1.001 \times 10^5$	2.442	0.123	0.169	0.041	2.775	$4.067 \times 10^4$		
140. GeV	$1.401 \times 10^5$	2.476	0.181	0.253	0.057	2.968	$5.460 \times 10^4$		
200. GeV	$2.001 \times 10^5$	2.513	0.272	0.387	0.081	3.253	$7.390 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.555	0.428	0.612	0.121	3.716	$1.026 \times 10^5$		
400. GeV	$4.001 \times 10^5$	2.584	0.589	0.846	0.161	4.181	$1.280 \times 10^5$		
631. GeV	$6.316 \times 10^5$	2.631	0.973	1.402	0.256	5.262	<i>Muon critical energy</i>		
800. GeV	$8.001 \times 10^5$	2.656	1.259	1.813	0.326	6.054	$2.071 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.679	1.604	2.311	0.410	7.004	$2.378 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.714	2.298	3.302	0.581	8.895	$2.883 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.752	3.362	4.819	0.841	11.774	$3.468 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.796	5.142	7.342	1.287	16.567	$4.181 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.827	6.949	9.896	1.742	21.415	$4.710 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.905	14.255	20.176	3.631	40.968	$6.038 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.930	17.944	25.349	4.603	50.828	$6.475 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.969	25.307	35.664	6.605	70.545	$7.140 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	3.011	36.434	51.213	9.678	100.336	$7.850 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	3.060	54.944	77.086	15.005	150.094	$8.660 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	3.095	73.535	103.033	20.468	200.132	$9.235 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	3.181	148.069	206.906	43.362	401.518	$1.062 \times 10^6$		
100. TeV	$1.000 \times 10^8$	3.209	185.424	258.899	55.217	502.749	$1.106 \times 10^6$		