

## Muons in carbon dioxide gas (CO<sub>2</sub>)

$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
0.49989	$1.842 \times 10^{-3}$	85.0	0.11768	3.3227	1.6294	4.1825	10.1537	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod [MeV cm <sup>2</sup> /g]	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]	
10.0 MeV	$4.704 \times 10^1$	7.057				7.057	$7.842 \times 10^{-1}$	
14.0 MeV	$5.616 \times 10^1$	5.508				5.508	$1.433 \times 10^0$	
20.0 MeV	$6.802 \times 10^1$	4.304				4.304	$2.679 \times 10^0$	
30.0 MeV	$8.509 \times 10^1$	3.341				3.341	$5.353 \times 10^0$	
40.0 MeV	$1.003 \times 10^2$	2.854				2.854	$8.612 \times 10^0$	
80.0 MeV	$1.527 \times 10^2$	2.145				2.145	$2.529 \times 10^1$	
100. MeV	$1.764 \times 10^2$	2.018				2.018	$3.493 \times 10^1$	
140. MeV	$2.218 \times 10^2$	1.894				1.894	$5.549 \times 10^1$	
200. MeV	$2.868 \times 10^2$	1.831				1.831	$8.783 \times 10^1$	
257. MeV	$3.471 \times 10^2$	1.819			0.000	1.820	<i>Minimum ionization</i>	
300. MeV	$3.917 \times 10^2$	1.823			0.000	1.823	$1.427 \times 10^2$	
400. MeV	$4.945 \times 10^2$	1.848			0.000	1.848	$1.972 \times 10^2$	
800. MeV	$8.995 \times 10^2$	1.972	0.000		0.000	1.972	$4.066 \times 10^2$	
1.00 GeV	$1.101 \times 10^3$	2.024	0.000		0.000	2.025	$5.066 \times 10^2$	
1.40 GeV	$1.502 \times 10^3$	2.109	0.000		0.001	2.111	$6.999 \times 10^2$	
2.00 GeV	$2.103 \times 10^3$	2.206	0.001	0.000	0.001	2.208	$9.776 \times 10^2$	
3.00 GeV	$3.104 \times 10^3$	2.319	0.001	0.001	0.001	2.322	$1.418 \times 10^3$	
4.00 GeV	$4.104 \times 10^3$	2.401	0.002	0.001	0.002	2.405	$1.841 \times 10^3$	
8.00 GeV	$8.105 \times 10^3$	2.567	0.004	0.003	0.004	2.578	$3.439 \times 10^3$	
10.0 GeV	$1.011 \times 10^4$	2.615	0.005	0.005	0.005	2.630	$4.207 \times 10^3$	
14.0 GeV	$1.411 \times 10^4$	2.683	0.007	0.008	0.007	2.705	$5.705 \times 10^3$	
20.0 GeV	$2.011 \times 10^4$	2.749	0.011	0.013	0.009	2.783	$7.890 \times 10^3$	
30.0 GeV	$3.011 \times 10^4$	2.818	0.019	0.023	0.013	2.874	$1.142 \times 10^4$	
40.0 GeV	$4.011 \times 10^4$	2.863	0.027	0.034	0.017	2.941	$1.486 \times 10^4$	
80.0 GeV	$8.011 \times 10^4$	2.960	0.061	0.081	0.034	3.136	$2.800 \times 10^4$	
100. GeV	$1.001 \times 10^5$	2.989	0.079	0.107	0.042	3.217	$3.430 \times 10^4$	
140. GeV	$1.401 \times 10^5$	3.029	0.116	0.161	0.058	3.365	$4.645 \times 10^4$	
200. GeV	$2.001 \times 10^5$	3.071	0.174	0.247	0.083	3.575	$6.374 \times 10^4$	
300. GeV	$3.001 \times 10^5$	3.115	0.275	0.392	0.124	3.907	$9.049 \times 10^4$	
400. GeV	$4.001 \times 10^5$	3.146	0.379	0.543	0.165	4.234	$1.151 \times 10^5$	
800. GeV	$8.001 \times 10^5$	3.219	0.813	1.172	0.334	5.539	$1.974 \times 10^5$	
1.00 TeV	$1.000 \times 10^6$	3.243	1.037	1.497	0.420	6.197	$2.315 \times 10^5$	
1.09 TeV	$1.095 \times 10^6$	3.252	1.143	1.648	0.461	6.505	<i>Muon critical energy</i>	
1.40 TeV	$1.400 \times 10^6$	3.278	1.489	2.143	0.595	7.505	$2.901 \times 10^5$	
2.00 TeV	$2.000 \times 10^6$	3.316	2.181	3.133	0.862	9.493	$3.611 \times 10^5$	
3.00 TeV	$3.000 \times 10^6$	3.360	3.342	4.781	1.320	12.804	$4.515 \times 10^5$	
4.00 TeV	$4.000 \times 10^6$	3.392	4.523	6.451	1.786	16.152	$5.208 \times 10^5$	
8.00 TeV	$8.000 \times 10^6$	3.469	9.300	13.178	3.728	29.675	$7.008 \times 10^5$	
10.0 TeV	$1.000 \times 10^7$	3.495	11.714	16.565	4.728	36.502	$7.615 \times 10^5$	
14.0 TeV	$1.400 \times 10^7$	3.534	16.532	23.316	6.787	50.168	$8.546 \times 10^5$	
20.0 TeV	$2.000 \times 10^7$	3.575	23.817	33.496	9.949	70.838	$9.548 \times 10^5$	
30.0 TeV	$3.000 \times 10^7$	3.624	35.946	50.437	15.437	105.444	$1.070 \times 10^6$	
40.0 TeV	$4.000 \times 10^7$	3.659	48.136	67.432	21.069	140.295	$1.152 \times 10^6$	
80.0 TeV	$8.000 \times 10^7$	3.745	97.010	135.468	44.687	280.911	$1.349 \times 10^6$	
100. TeV	$1.000 \times 10^8$	3.773	121.509	169.526	56.926	351.734	$1.413 \times 10^6$	