

## Muons in promethium (Pm)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	a	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
61 (Pm)	[144.91275 (3)]	7.264	560.0	0.24280	2.6674	0.1614	3.3186	5.8163	0.14
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	$4.704 \times 10^1$	4.418				4.418	$1.295 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.501				3.501	$2.322 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.773				2.773	$4.268 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	2.180				2.180	$8.388 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.877				1.877	$1.336 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.431				1.431	$3.850 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.354				1.354	$5.291 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.279				1.279	$8.344 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.244				1.244	$1.312 \times 10^2$		
243. MeV	$3.325 \times 10^2$	1.240	0.000			1.240	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.245	0.000		0.000	1.246	$2.117 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.265	0.000		0.000	1.266	$2.914 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.351	0.001		0.000	1.353	$5.967 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.386	0.001		0.000	1.388	$7.426 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.440	0.002	0.000	0.001	1.443	$1.025 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.500	0.003	0.001	0.001	1.505	$1.432 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.567	0.006	0.003	0.001	1.577	$2.080 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.613	0.008	0.006	0.002	1.629	$2.703 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.717	0.020	0.019	0.003	1.760	$5.056 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.749	0.027	0.027	0.004	1.807	$6.177 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.794	0.041	0.043	0.005	1.884	$8.344 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.838	0.063	0.071	0.007	1.981	$1.145 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.885	0.104	0.124	0.011	2.125	$1.632 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.916	0.146	0.182	0.015	2.261	$2.088 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.985	0.331	0.438	0.029	2.784	$3.679 \times 10^4$		
100. GeV	$1.001 \times 10^5$	2.006	0.429	0.576	0.036	3.048	$4.365 \times 10^4$		
140. GeV	$1.401 \times 10^5$	2.036	0.629	0.861	0.049	3.577	$5.576 \times 10^4$		
180. GeV	$1.801 \times 10^5$	2.058	0.837	1.158	0.063	4.117	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	2.067	0.943	1.310	0.070	4.392	$7.088 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.102	1.479	2.062	0.105	5.750	$9.073 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.127	2.033	2.841	0.141	7.143	$1.063 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.187	4.320	6.033	0.284	12.826	$1.475 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.207	5.494	7.666	0.357	15.726	$1.616 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.237	7.848	10.923	0.506	21.515	$1.833 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.268	11.447	15.893	0.732	30.342	$2.066 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.305	17.455	24.152	1.119	45.032	$2.335 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.332	23.542	32.498	1.511	59.884	$2.527 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.397	48.079	66.045	3.139	119.662	$2.991 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.419	60.442	82.907	3.975	149.744	$3.140 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.451	85.101	116.552	5.690	209.797	$3.364 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.487	122.304	167.234	8.318	300.344	$3.602 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.528	184.238	251.560	12.857	451.184	$3.872 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.557	246.390	336.084	17.501	602.534	$4.063 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.630	495.360	674.412	36.889	1209.293	$4.522 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.653	620.050	843.730	46.900	1513.335	$4.670 \times 10^5$		