

**Table 323: Muons in Astatine**

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
85 (At)	[209.98715 (6)]	??	825.0	0.31184	3.0000	0.7833	3.0000	7.0039	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	$4.704 \times 10^1$	3.913				3.913	$1.488 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.126				3.126	$2.642 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.494				2.494	$4.813 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	1.974				1.974	$9.377 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.707				1.707	$1.486 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.316				1.317	$4.233 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.249				1.249	$5.797 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.186				1.186	$9.098 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.161				1.161	$1.423 \times 10^2$		
216. MeV	$3.039 \times 10^2$	1.160	0.000			1.161	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.173	0.000		0.000	1.173	$2.281 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.201	0.000		0.000	1.201	$3.124 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.307	0.001		0.000	1.309	$6.305 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.347	0.002		0.000	1.349	$7.810 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.407	0.003		0.001	1.411	$1.071 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.471	0.004	0.001	0.001	1.477	$1.486 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.540	0.007	0.003	0.001	1.553	$2.145 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.587	0.011	0.007	0.002	1.606	$2.777 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.690	0.026	0.023	0.003	1.743	$5.158 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.719	0.035	0.033	0.004	1.792	$6.290 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.762	0.054	0.053	0.005	1.875	$8.471 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.803	0.084	0.088	0.007	1.982	$1.158 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.846	0.137	0.155	0.011	2.149	$1.642 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.874	0.194	0.229	0.014	2.311	$2.091 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.936	0.438	0.554	0.028	2.957	$3.617 \times 10^4$		
100. GeV	$1.001 \times 10^5$	1.955	0.567	0.730	0.034	3.288	$4.258 \times 10^4$		
140. GeV	$1.401 \times 10^5$	1.984	0.833	1.091	0.048	3.957	$5.366 \times 10^4$		
141. GeV	$1.409 \times 10^5$	1.984	0.838	1.098	0.048	3.970	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	2.013	1.247	1.664	0.068	4.994	$6.714 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.047	1.955	2.620	0.102	6.726	$8.434 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.071	2.687	3.611	0.136	8.507	$9.754 \times 10^4$		
800. GeV	$8.001 \times 10^5$	2.129	5.703	7.673	0.275	15.782	$1.315 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.148	7.252	9.751	0.346	19.498	$1.429 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.176	10.353	13.894	0.490	26.915	$1.603 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.207	15.094	20.215	0.709	38.227	$1.789 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.243	23.004	30.718	1.083	57.050	$2.002 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.268	31.016	41.331	1.463	76.080	$2.154 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.331	63.297	83.988	3.037	152.655	$2.517 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.352	79.555	105.427	3.845	191.181	$2.634 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.383	111.984	148.207	5.502	268.078	$2.810 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.417	160.896	212.646	8.040	384.001	$2.996 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.456	242.322	319.853	12.424	577.058	$3.207 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.485	324.022	427.307	16.909	770.725	$3.357 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.554	651.248	857.409	35.621	1546.835	$3.716 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.577	815.110	1072.650	45.280	1935.619	$3.831 \times 10^5$		