

## Muons in valine (C<sub>5</sub>H<sub>11</sub>NOi<sub>2</sub>)

	$\langle Z/A \rangle$	$\rho$ [g/cm <sup>3</sup> ]	$I$ [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
	0.54632	1.230	67.7	0.11386	3.3774	0.1441	2.6227	3.1059	0.00
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
10.0 MeV	$4.704 \times 10^1$	7.943				7.943	$6.951 \times 10^{-1}$		
14.0 MeV	$5.616 \times 10^1$	6.193				6.193	$1.272 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	4.834				4.834	$2.381 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	3.748				3.748	$4.763 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	3.200				3.200	$7.669 \times 10^0$		
80.0 MeV	$1.527 \times 10^2$	2.398				2.398	$2.256 \times 10^1$		
100. MeV	$1.764 \times 10^2$	2.245				2.245	$3.121 \times 10^1$		
140. MeV	$2.218 \times 10^2$	2.088				2.088	$4.977 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.997				1.997	$7.927 \times 10^1$		
300. MeV	$3.917 \times 10^2$	1.961			0.000	1.961	$1.300 \times 10^2$		
324. MeV	$4.161 \times 10^2$	1.960			0.000	1.960	<i>Minimum ionization</i>		
400. MeV	$4.945 \times 10^2$	1.965			0.000	1.965	$1.809 \times 10^2$		
800. MeV	$8.995 \times 10^2$	2.036	0.000		0.000	2.037	$3.810 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	2.069	0.000		0.000	2.070	$4.783 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	2.123	0.000		0.001	2.124	$6.690 \times 10^2$		
2.00 GeV	$2.103 \times 10^3$	2.182	0.001	0.000	0.001	2.184	$9.474 \times 10^2$		
3.00 GeV	$3.104 \times 10^3$	2.250	0.001	0.001	0.001	2.253	$1.398 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	2.297	0.001	0.001	0.002	2.302	$1.837 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	2.406	0.003	0.003	0.004	2.416	$3.528 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	2.439	0.004	0.004	0.005	2.452	$4.349 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	2.487	0.006	0.007	0.007	2.507	$5.962 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	2.535	0.010	0.011	0.009	2.566	$8.326 \times 10^3$		
30.0 GeV	$3.011 \times 10^4$	2.588	0.016	0.020	0.014	2.638	$1.217 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	2.623	0.023	0.029	0.018	2.694	$1.592 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	2.706	0.053	0.071	0.034	2.865	$3.029 \times 10^4$		
100. GeV	$1.001 \times 10^5$	2.732	0.069	0.094	0.043	2.937	$3.718 \times 10^4$		
140. GeV	$1.401 \times 10^5$	2.770	0.102	0.141	0.059	3.072	$5.050 \times 10^4$		
200. GeV	$2.001 \times 10^5$	2.810	0.153	0.216	0.084	3.263	$6.944 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.855	0.242	0.344	0.126	3.567	$9.873 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.887	0.334	0.477	0.168	3.866	$1.257 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.966	0.717	1.032	0.339	5.054	$2.159 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.991	0.915	1.319	0.426	5.652	$2.533 \times 10^5$		
1.12 TeV	$1.121 \times 10^6$	3.004	1.035	1.490	0.480	6.009	<i>Muon critical energy</i>		
1.40 TeV	$1.400 \times 10^6$	3.030	1.315	1.890	0.604	6.839	$3.175 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	3.071	1.929	2.765	0.875	8.641	$3.954 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	3.119	2.959	4.223	1.341	11.643	$4.948 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	3.154	4.007	5.702	1.816	14.679	$5.711 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	3.238	8.254	11.660	3.790	26.943	$7.693 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	3.266	10.403	14.661	4.808	33.138	$8.361 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	3.309	14.691	20.640	6.905	45.545	$9.387 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	3.355	21.179	29.659	10.127	64.320	$1.049 \times 10^6$		
30.0 TeV	$3.000 \times 10^7$	3.408	31.984	44.665	15.722	95.779	$1.176 \times 10^6$		
40.0 TeV	$4.000 \times 10^7$	3.446	42.848	59.721	21.465	127.480	$1.266 \times 10^6$		
80.0 TeV	$8.000 \times 10^7$	3.540	86.412	119.994	45.576	255.523	$1.483 \times 10^6$		
100. TeV	$1.000 \times 10^8$	3.571	108.253	150.167	58.078	320.070	$1.553 \times 10^6$		