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Note

Re-Evaluation of Stopping Powers of Be, Al, Ti, V, Fe, Co, Ni, Cu, Mo, Rh, Ag, Ta, and Au for 28 MeV Alpha Particles

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In the previous paper,[1] stopping powers of various metallic elements for 28.8 MeV alpha particles have been measured. The results have been reduced to the velocity of 7.0 MeV protons by multiplying $(\ln v^2/v^2)_{7.0}/(\ln v^2/v^2)$.

However, the energies of protons, $\bar{E}'$, which have the same velocity as alpha

Table I. Results. $\bar{E}$ Denotes the Average Alpha-Energy in the Absorber Foil. $\bar{E}'$ Denotes the Proton Energy Which Has the Same Velocity as Alpha Particles of Energy $\bar{E}$.

Element	$\bar{E}$	$\bar{E}'$	$\Delta E/\Delta t$ (keV/mg cm^{-2})	$(\Delta E/\Delta t)_{7.0}$	$(1/4\Delta E/\Delta t)_{7.0}$
Be	28.5165 ±0.0177	7.1783	196.45 ±1.00	200.48 ±1.00	50.12 ±0.25
Al	28.3186 ±0.0178	7.1285	176.85 ±0.85	179.32 ±0.90	44.83 ±0.22
Ti	28.2833 ±0.0178	7.1196	153.35 ±0.74	155.29 ±0.78	38.82 ±0.19
V	28.1870 ±0.0178	7.0954	148.95 ±0.72	150.45 ±0.75	37.61 ±0.19
Fe	28.3040 ±0.0178	7.1248	147.25 ±0.71	149.15 ±0.74	37.29 ±0.19
Co	28.0884 ±0.0179	7.0705	145.14 ±0.70	146.19 ±0.73	36.55 ±0.18
Ni	28.2583 ±0.0178	7.1133	147.88 ±0.72	149.58 ±0.75	37.40 ±0.19
Cu	28.2384 ±0.0178	7.1083	139.35 ±0.67	140.90 ±0.70	35.22 ±0.18
Mo	28.3383 ±0.0177	7.1334	122.54 ±0.60	124.11 ±0.62	31.03 ±0.16
Rh	28.2983 ±0.0178	7.1234	117.95 ±0.57	119.35 ±0.60	29.84 ±0.15
Ag	28.2267 ±0.0178	7.1054	117.95 ±0.57	119.15 ±0.60	29.79 ±0.15
Ta	28.2737 ±0.0178	7.1172	93.10 ±0.49	94.09 ±0.47	23.52 ±0.12
Au	28.2763 ±0.0178	7.1178	91.18 ±0.45	92.14 ±0.46	23.03 ±0.12

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particle of the average energy in the absorber foil were higher than 7.0 MeV by more than 100 keV. Therefore, the reduction to 7.0 MeV by multiplying $(\ln v^2/v^2)_{7.0}/(\ln v^2/v^2)$ were too crude and the reduced stopping power values obtained in this way must be somewhat too high.

In the present paper, the stopping powers have been reduced to 7.0 MeV by the use of Risø proton data.[2~5] Stopping powers, $S_{\bar{E}}'$, for protons of energy $\bar{E}'$ have been obtained by interpolating Risø data. Then the raw data have been reduced to 7.0 MeV by multiplying $(S_{7.0}/S_{\bar{E}}')_{Risø}$. The results are shown in Table I.

For Mo and Rh, Risø Ag data have been used. The present results are lower than the previous results by about 0.5 percent.

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