TABLE 12a.—*Sporadic small-camera meteors: basic results.*

	no.	log $v\pm$p.e.	log $\tau_v/\rho_m^2\pm$p.e.	$\epsilon_\infty\pm$p.e.	w
All together	44	6. 389±0. 019	−11. 630±0. 084	1. 43±0. 08	3. 66
Meteors with $Q<7$ a. u.	30	6. 324±0. 017	−11. 779±0. 096	1. 47±0. 09	4. 03
Meteors with $Q>7$ a. u.	13	6. 584±0. 034	−11. 264±0. 140	1. 32±0. 16	2. 88
Meteors with $\epsilon_\infty>1$	26	6. 378±0. 028	−11. 868±0. 101	1. 82±0. 08	4. 18
Meteors with $\epsilon_\infty<1$	18	6. 413±0. 022	−11. 132±0. 115	0. 63±0. 07	2. 90

Least-squares solution for all meteors: $n=1.15\pm0.5$ (no correction applied for the difference of density between short-period and long-period meteors).

Least-squares solution for all meteors, after reduction of all data to the density of short-period meteors: $n=0.90\pm0.5$.

Although the quality of meteor no. 1242 is very good, it is obviously unsafe to rely on a value obtained from only one meteor. Fortunately, the recent experiences with artificial meteors have led to other estimates of τ_{op}. Let us examine briefly the results of these works. McCrosky (1961) reports the results of the firing of two shaped charges from an Aerobee rocket at a height of 80 km. The liners inserted in the explosive were made of aluminum. From laboratory evidence McCrosky assumed that 2 percent (0.11 g) of the mass was ejected with an initial speed of 14.2 kms^{-1}. From the observed light curve, assuming the linear dependence of τ on v given by Öpik for bright meteors, he found

$$\tau_{ov\ \mathrm{aluminum}}=9\times10^{-10}\ \mathrm{scm}^{-1}, \qquad (35)$$

which seems in perfect agreement with Öpik's earlier value (8.5×10^{-10} scm^{-1}). Of course these two values cannot be compared directly, since aluminum is not a major constituent of meteors. Although the correction cannot be accurately computed, McCrosky was able to work out a lower limit for τ_{ov}. He figured out that a maximum of 83 percent of the radiation could be produced by the oxidation of aluminum. Moreover, he assumed that iron and aluminum had equal efficiency per atom and that all the meteor radiation is caused by the iron, which, following Öpik (1958), he estimated to be 15 percent of the meteor material. The final result was

$$\tau_{ov}=1\times10^{-11}\ \mathrm{scm}^{-1}, \qquad (36)$$

85 times less than Öpik's value and about three times larger than Cook's value estimated on the basis of the motion of meteoric trains. Since McCrosky used a color-index correction −1.8 for passing from photographic to visual magnitude, we can go back to τ_{op}, which in Jacchia's units turns out to be

$$\log \tau_{op}=-20.0. \qquad (37)$$

Since this value is considered an extreme lower limit, McCrosky warns that a value 100 times larger (−18.0) is not precluded by the results of his experiment.

More recently McCrosky and Soberman (1962) have produced an iron meteor at a height of about 70 km by accelerating to a velocity of about 10 kms^{-1} a stainless-steel pellet ($m\simeq 2.2$ g) by an air-cavity charge attached to the nose of a 7-stage Trailblazer rocket. The primary purpose of the experiment was to determine the meteor luminous efficiency. The result is

$$(\tau_{op})_{\mathrm{stainless\ steel}}=8\times10^{-19}\ 0\ \mathrm{mag\ g^{-1}cm^{-3}s^{4}}. \qquad (38)$$

The estimated error involved is such that we may write, in logarithmic form,

$$(\log \tau_{op})_{\mathrm{stainless\ steel}}=-18.10\pm0.1, \qquad (39)$$

which represents a very accurate result. Three corrections are necessary, however, to convert the value of equation (38) to a luminosity coefficient valid for meteoric material. The first of these is caused by the presence in the pellet of about 20 percent chromium. Mc-