Erratum: Rotational temperature dependences of gas phase ion-molecule reactions [J. Chem. Phys. 89, 4848 (1988)]

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FIG. 2. Same as Fig. 1 in gaseous Ar $(N = 0.240 \times 10^{22} \text{ atom cm}^{-3}, T = 296 \text{ K})$. The plotted lines are theoretical results $(-\sigma_0 = 0.60 \text{ Å}^2; -\sigma_0 = 1.0 \text{ Å}^2; \cdots \sigma_0 = 2.0 \text{ Å}^2)$. The dots (\bullet) are experimental results [Ref. 2(a)].

where $\tilde{\gamma}$ is defined as

$$\tilde{\gamma} \equiv \frac{eE\sqrt{l_0l_1}}{T} \left(\frac{M}{m}\right)^{1/2}, \quad l_1 \equiv \frac{1}{N\sigma_1}$$

Accordingly, in captions for Figs. 1, 3, 4, 6, 7, and 9 of our paper, two parameters, both σ_0 and σ_1 should be introduced instead of the single parameter σ : $\sigma_0 = \sigma \times 10.0$ and $\sigma_1 = \sigma/10.0$.

Figures 5 and 8, and statements in the text with respect to these figures should be discarded from our paper and Fig. 2 of our paper should be replaced by the following figure.

In Sec. IV of our paper, the paragraph in which Cohen-Lekner's theory is mentioned should be removed.

The caption for Fig. 7 contains a typing error. "T = 296 K" should be replaced by "T = 87 K" in this caption.

Erratum: Rotational temperature dependences of gas phase ion-molecule reactions [J. Chem. Phys. 89, 4848 (1988)]

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FIG. 1. Rate constants for the reaction of $O^- + N_2 O$ vs center of mass kinetic energy at several temperatures.



FIG. 2. Rate constants for the reaction of $O^- + CH_4$ vs center of mass kinetic energy at several temperatures.

We have found that the neutral inlet design used in our drift tube in these measurements caused the measured rate constants to be in error, especially at low temperatures. The old inlet is a single tube in which the gas is injected upstream. The new inlet is a ring with eight small holes pointing upstream. The technique reported for determining rotational temperature dependences remains valid. The data from Figs. 1 and 2 are replaced by Figs. 1 and 2 below. In contrast to the original data, the corrected data show no rotational temperature dependence within experimental uncertainty for both reactions. Consequently much of the discussion is rendered invalid. We are uncertain why the finger inlet affected the CH_4 data more than the N₂O data. Future papers will deal with the inlet effect and each of these reactions individually.

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