ION IMAGING STUDIES OF CH_2I_2 PHOTODISSOCIATION AT 248 NM

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CH_2I_2 plays an important role in atmospheric chemistry as a significant natural source of organohalide compounds. The photodissociation dynamics of CH_2I_2 in the ultraviolet range of 277-305 nm via the two lowest B_1 excited states has been well studied using one-color velocity map ion imaging (VMI) and photofragment translational spectroscopy. In this two-color experimental study, CH_2I_2 is photodissociated by 248 nm via the B_2 or A_1 excited states to give rise to CH_2I and I ($^2P_{3/2}$) or I^* ($^2P_{1/2}$). The iodine atoms are then state selectively ionized using a (2+1) resonance-enhanced multiphoton ionization process near 310 nm and detected by VMI. Preliminary results show about 85% of the available energy is being funneled into the internal energy of the CH_2I fragment, consistent with prior infrared emission results of Baughcum and Leone.[a] The anisotropy parameter derived from the image indicates this is a fast dissociation process and reflects the character of the electronic transition. The internal energy distribution of the CH_2I fragment is of particular interest because of its subsequent reaction with O_2 in a near thermo-neutral reaction to produce the smallest Criegee intermediate, CH_2OO. We anticipate that the internal energy contained in CH_2I will likely be carried into CH_2OO.

[a] S. L. Baughcum and S. R. Leone, *J. Chem. Phys.* **72**, 6531 (1980).