

ION IMAGING STUDIES OF CH₂I₂ PHOTODISSOCIATION AT 248 NM

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CH₂I₂ plays an important role in atmospheric chemistry as a significant natural source of organohalide compounds. The photodissociation dynamics of CH₂I₂ in the ultraviolet range of 277-305 nm via the two lowest B₁ excited states has been well studied using one-color velocity map ion imaging (VMI) and photofragment translational spectroscopy. In this two-color experimental study, CH₂I₂ is photodissociated by 248 nm via the B₂ or A₁ excited states to give rise to CH₂I 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 CH₂I 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 CH₂I fragment is of particular interest because of its subsequent reaction with O₂ in a near thermo-neutral reaction to produce the smallest Criegee intermediate, CH₂OO. We anticipate that the internal energy contained in CH₂I will likely be carried into CH₂OO.

^aS. L. Baughcum and S. R. Leone, *J. Chem. Phys.* **72**, 6531 (1980).