

Abstract Submitted  
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**Photodissociation of Methyl Iodide at 193 NM** HONG XU, STEPHEN PRATT, Argonne National Laboratory — A new measurement of the photodissociation of CH<sub>3</sub>I at 193 nm is reported in which we use a combination of vacuum ultraviolet photoionization and velocity map ion imaging. The iodine photofragments are probed by single-photon ionization at photon energies above and below the photoionization threshold of I(<sup>2</sup>P<sub>3/2</sub>). The relative I(<sup>2</sup>P<sub>3/2</sub>) and I\*(<sup>2</sup>P<sub>1/2</sub>) photoionization cross sections are determined at these wavelengths by using the known branching fractions for the photodissociation at 266 nm. Velocity map ion images indicate that the branching fraction for I(<sup>2</sup>P<sub>3/2</sub>) atoms is non-zero, and yield a value of 0.07 ± 0.01. Interestingly, the translational energy distribution extracted from the image shows that the translational energy of the I(<sup>2</sup>P<sub>3/2</sub>) fragments is significantly smaller than that of the I\*(<sup>2</sup>P<sub>1/2</sub>) atoms. This observation indicates the internal rotational/vibrational energy of the CH<sub>3</sub> co-fragment is very high in the I(<sup>2</sup>P<sub>3/2</sub>) channel. The results can be interpreted in a manner consistent with the previous measurements, and provide a more complete picture of the dissociation dynamics of this prototypical molecule. This work was supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, Division of Chemical Sciences, Geosciences, and Biosciences under contract No. DE-AC02-06CH11357.

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