PC GS I -6

PHOTODISSOCATION OF ICH_2CN : IMAGING STUDY

Jung Sik Lim, Kyoung-Seok Lee, Kyo Won Choi, Doo Sik Ahn, Ki Young Yeon, and Sang Kyu Kim

Department of Chemistry and School of Molecular Science (BK21) Korea Advanced Institute of Science and Technology (KAIST) Daejeon 305-701

The photodissociationdynamics of iodoacetonitrile, ICH_2CN, have been investigated at 266 and 304 nm using photofragment ion image velocity mapping technique. After the absorption of UV photon, C-I bond cleavage takes place leading to the formation of the spin-orbit ground, $I(^2P_{3/2})$, and excited, $I^*(^2P_{1/2})$, state iodine atoms, which have been detected by state-elective [2+1] resonance enhanced multiphoton ionization (REMPI) via $6p[3]_{5/2}$ and $6p[1]_{1/2}$ intermediate levels at 304.67 and 304.03 nm, respectively. Kinetic energy release and the angular distribution have been simultaneously extracted from the observed images. The obtained kinetic energy releases have been well fitted by a single Gaussian function implying that CI chromophore has been, only, responsible for 266 and 304 nm photolysis wavelengths. At 266 nm, the recoil anisotropy parameter, β, value of 1.07 and 1.60 for I and I* have been measured, respectively. Slightly higher values have been obtained at 304 nm, 1.67 and 1.93. With measured relative branching ratios, the detailed photodissociation dynamics, such as curve crossing phenomena, have been suggested.