

IR POLARIZATION STUDY OF THE UV PHOTOLYSIS OF ACETYL CHLORIDE

BRAD ROWLAND, and WAYNE HESS, *Battelle Pacific Northwest National Laboratories, PO Box 999, Richland, WA. 99352, Mail Stop K2-14.*

Infrared polarization spectroscopy is used to determine the alignments of the photoreagent and photoproducts after the ultraviolet photolysis of acetyl chloride. Matrix-isolated (argon) and neat samples of acetyl chloride are irradiated with polarized 266 nm light, producing complexes of ketene ($\text{H}_2\text{C}=\text{C}=\text{O}$) and HCl through a concerted elimination reaction. The alignment of the vibrational dipoles of the HCl and ketene products, and the remaining acetyl chloride is measured. The \cos^2 angular distributions allow the orientation of the molecules to be calculated relative to a laboratory axis. Possible geometries for the reaction coordinate and the HCl-ketene complex are deduced from the determined orientations.