VIBRATIONAL RELAXATION AND CONTROL IN THE CYCLOHEXADIENE REACTIVE SYSTEM

ADAM D. DUNKELBERGER, RYAN D. KIEDA, F. FLEMING CRIM, *Department of Chemistry, University of Wisconsin-Madison, Madison, WI 53706.*

We have shown previously that reactions in molecular beams can be effectively controlled through vibrational excitation of reactant species. We have demonstrated that the short timescale for vibrational relaxation makes such vibrational control difficult in the solution phase. In this work, we apply our recently developed vibrational mediation techniques to the cyclohexadiene reactive system. The ring-opening photoreaction of cyclohexadiene is a simple model for more complicated photochromic systems. The electronic excited state of cyclohexadiene decays on a faster timescale than is typical for vibrational relaxation in solution, making it an attractive target for vibrational control. We present preliminary results of experiments probing the timescale of vibrational relaxation in cyclohexadiene, the first step toward attempting vibrational control of the reactive system.