

PHOTODISSOCIATION DYNAMICS OF CHLORINE DIOXIDE

THOMAS J. DOWD, LEANNE M. MILLER, and JAMES S. KELLER, *Department of Chemistry and Biochemistry, University of Notre Dame, Notre Dame IN, 46556.*

A ground state population depletion grating was used to elucidate the effects of initial nuclear motion on the photodissociation dynamics of chlorine dioxide. The ultraviolet absorption of OClO occurs via the $A^2A_2 \leftarrow X^2B_1$ transition, but dissociation of OClO* proceeds on several different excited state surfaces leading to two distinct product channels. Since several excited bending states (ν_2) are populated at room temperature, a depletion grating can be formed involving these vibrational states by the interference of two degenerate pump beams tuned to transitions which lie below the predissociation threshold. A probe beam was tuned through the dissociation region to record the $A \leftarrow X$ absorption spectra of specific vibrational states.