COUPLING OF NON-SYMMETRIC BENDING MODES TO METASTABLE STATES OF ACETYLENE

KYLE L. BITTINGER, WILTON L. VIRGO, and ROBERT W. FIELD, *Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA 02139.*

Several bands of acetylene involving the near degenerate non-symmetric bending modes $\nu_4$ and $\nu_6$ of $S_1$ have been recorded by simultaneous laser induced fluorescence and gold surface electron ejection by laser-excited metastables (Au:SEELEM). The Au:SEELEM spectra indicate pronounced differences in coupling to long-lived states between the torsion ($\nu_4$) and in-plane bend ($\nu_6$). These results will be examined in light of the fact that ab initio calculations predict a nonplanar equilibrium geometry for the third triplet state, which mediates coupling between $S_1$ and the triplet manifold.