DISPERSED FLUORESCENCE SPECTRUM OF $^{13}C_2H_2$ FROM THE $\tilde{A}^1A_u$ STATE

MICHELLE L. SILVA, MATTHEW P. JACOBSON, ZICHENG DUAN, and ROBERT W. FIELD, *Department of Chemistry and George R. Harrison Spectroscopy Laboratory, Massachusetts Institute of Technology, Cambridge, MA 02139*.

The dispersed fluorescence (DF) spectrum of the $\tilde{A}^1A_u \rightarrow \tilde{X}^1\Sigma_g^+$ transition in $^{13}C_2H_2$ has been recorded utilizing the $2\nu_3, \nu_2 + \nu_3$, and $\nu_2 + 2\nu_3$ vibrational levels of the $\tilde{A}^1A_u, S_1$ electronically excited state. Polyad quantum number assignments have been made using a numerical pattern recognition technique, Extended Cross Correlation (XCC). The data has been fit to an effective Hamiltonian, which successfully predicts the transitions into vibrational levels that will have detectable intensity in our DF spectra at energies higher than those of the vibrational levels included in the fit. Interestingly, the IVR patterns in $^{13}C_2H_2$ are simpler than those of $^{12}C_2H_2$ and the fractionation sets in later even though similar anharmonic resonances are sampled.