

DISPERSED FLUORESCENCE SPECTRA OF SIMPLE CARBENES

BOR-CHEN CHANG, *Department of Chemistry, National Central University, Chung-Li 32054, Taiwan*; ANDREW J. BEZANT and TERRY A. MILLER, *Laser Spectroscopy Facility, Department of Chemistry, The Ohio State University, 120 W. 18th Avenue, Columbus, Ohio 43210*.

The electronic excitation spectra of simple carbenes such as CCl₂, HCCl, and HCB_r were found to be complicated due to Renner-Teller effects, spin-orbit couplings, and Fermi resonances.^a Information on the ground electronic state structure is crucial to unravel the interplay between these interactions, as well as being valuable in its own right. We have adopted the combination of a DC electrical discharge free jet source and laser-induced fluorescence (LIF) to record the dispersed fluorescence spectra of these simple carbenes. The dispersed fluorescence spectra of CCl₂ reveal the vibrational structure of the \tilde{X} state. Comparison with previous data from cryogenic matrix work^b and recent theoretical calculations^c will be discussed. Progress on the dispersed fluorescence experiments of other carbenes, such as HCB_r and HCCl, will also be presented.

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^aD. J. Clouthier and J. Karolczak, *J. Chem. Phys.* **94**, 1 (1991).

^bV. E. Bondybey, *J. Mol. Spectrosc.* **64**, 180 (1977).

^cK. Sendt and G. B. Bacskay, *J. Chem. Phys.* **112**, 2227 (2000).