LASER SPECTROSCOPIC STUDIES OF CARBON MOLECULES

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Recent experiments to measure the electronic spectra of reactive carbon molecules of astrophysical interest will be presented. The molecules are generated using an electrical discharge through a precursor gas in the throat of a supersonic nozzle. Optical transitions are detected by one of three complementary methods: (1) Cavity Ring-down Spectroscopy (CRDS), (2) Laser Induced Fluorescence (LIF), and most recently (3) Resonant Two Color Two Photon Ionization (R2C2PI) with Time of Flight Mass Spectrometry (TOF-MS). Several small carbon chains and silicon-carbon rings have now been detected by these methods, allowing systematic comparisons of detection sensitivity and these results will be summarized. Finally, further results concerning the carrier of a strong laboratory band at λ4430 will be presented.