INFRARED SPECTROSCOPY OF CARBON- AND CARBON-SILICON CLUSTERS

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Many of the molecules found in space are carbonaceous, that is, they have a carbon backbone in their structure. In addition, many of these molecules carry heteroatoms such as nitrogen and oxygen and also second row elements such as silicon. To date, four silicon-carbon molecules SiC_n ($n = 1-4$) have been detected in space and several more by high-resolution spectroscopic techniques in the laboratory. Owing to their symmetry, many clusters of the form SiC_nSi (and linear C_n chains) are non-polar and hence have no pure rotational spectrum. In an effort to obtain the gas-phase spectra of these clusters in the infrared, we have started a dedicated laboratory program employing diode laser techniques and more recently an optical parametric oscillator-based spectrometer operating at 5 microns, where many carbon- and carbon-silicon chains are expected to exhibit strong infrared-active vibrational modes. Results from new observations of the previously studied Si_2C_3 and C_6 clusters [a,b] will be reported.

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[b] H. J. Hwang, A. van Orden, K. Tanaka, E. W. Kuo, J. R. Heath, and R. J. Saykally, *Mol. Phys.* **79**, 769 (1993).