CARBON MOLECULE CHEMISTRY: GENERATION AND SPECTROSCOPIC CHARACTERIZATION OF TRIPLET HC_5H AND SUBSTITUTED ANALOGUES

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Triplet HC_5H,[a] along with several derivatives (RC_5R'; R, R$'$ = H-, CH_3-, $(CH_3)_3C$-), have been observed and characterized by IR, UV-vis, and ESR spectroscopy in cryogenic matrices. The structural similarity of RC_5R molecules to known interstellar molecules allows their consideration as plausible interstellar species. The electronic spectrum of HC_5H clarifies some ambiguities concerning earlier attempts to detect this species and provides a foundation for further gas-phase spectroscopic studies. The optical spectra of HC_5H and analogs also exhibit rich vibronic fine structure, and will be discussed in the context of the diffuse interstellar bands (DIBs). In addition, the photoisomerizations of RC_5R molecules will be briefly discussed.

[a] N. P. Bowling, R. J. Halter, J. A. Hodges, R. A. Seburg, P. S. Thomas, C. S. Simmons, J. F. Stanton, and R. J. McMahon. J. Am. Chem. Soc. (2006) ASAP.