Triplet HC₃H, along with several derivatives (RC₃R'; R, R' = H-, CH₂-, (CH₃)₂C-), have been observed and characterized by IR, UV-vis, and ESR spectroscopy in cryogenic matrices. The structural similarity of RC₃R molecules to known interstellar molecules allows their consideration as plausible interstellar species. The electronic spectrum of HC₃H clarifies some ambiguities concerning earlier attempts to detect this species and provides a foundation for further gas-phase spectroscopic studies. The optical spectra of HC₃H 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 RC₃R molecules will be briefly discussed.