

POLYATOMIC MOLECULES IN PLANETARY NEBULAE: SEARCHES FOR C-C₃H₂, H₂CO, CCH, AND HNC IN M1-59, NA2, HU1-1, AND M4-17

KATHERINE R. GOLD, *Department of Chemistry and Biochemistry, The University of Arizona, Tucson, AZ, USA*; DEBORAH SCHMIDT, *Department of Physics and Astronomy, Franklin and Marshall College, Lancaster, PA, USA*; LUCY M. ZIURYS, *Dept. of Astronomy, Dept. of Chemistry, Arizona Radio Observatory, The University of Arizona, Tucson, AZ, USA*.

Observations from the past decade show that a variety of polyatomic species such as HCN and HCO⁺ are present in over 30 planetary nebulae. Contrary to chemical models, which predict rapid photodissociation, molecular abundances appear to remain relatively constant with evolutionary age. To further explore molecular content of PNe, four planetary nebula containing HCO⁺ and/or HCN have been further investigated: Hu 1-1, M4-17, M1-59, and Na2. These nebulae were chosen on the basis of their varied morphologies (e.g., Hu 1-1 is elliptical, M1-59 is multipolar) or age (Na2 is 28,000 years old). Observations of these PNe were conducted using the ARO Submillimeter Telescope (1mm) and the IRAM 30m telescope (2mm). Current results include the detection of CS, c-C₃H₂, H₂CO, CCH, HNC and CN towards at least one of Hu1-1, M1-59, and M4-17, as well as various isotopologues of these species. These new identifications expand the known molecular species contained in these PNe. Molecular abundances and isotope ratios will be presented and compared with other PNe that foster similar chemistries.