

REEXAMINING THE CHEMISTRY IN PROTOPLANETARY NEBULAE: M1-92, COTTON CANDY NEBULA, AND IRAS22036

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Protoplanetary nebulae (PPNe) are an important step in stellar evolution as they bridge the asymptotic giant branch (AGB) and planetary nebulae phases. Observations have demonstrated that planetary nebulae are rich in molecular content which varies considerably from the AGB phase; therefore, significant chemical changes must occur in the PPNe stage. To examine this issue, we have conducted observations of M1-92, the Cotton Candy Nebula, and IRAS22036+5306, all PPN sources in which CO had previously been detected. Measurements were conducted with the 12-meter antenna and the Sub-millimeter Telescope (SMT) of the Arizona Radio Observatory at 3, 2, and 1 mm. Towards M1-92 we have thus far detected CN, HCO⁺, H¹³CO⁺, HCN, and HNC. Towards the Cotton Candy Nebula, we have identified CN, HCN, and HNC. In IRAS22036+5306, H₂S and SO have been observed. Abundances in these PPNe appear to vary from those in circumstellar AGB envelopes. The detailed chemistry in these sources will be discussed.