THE PECULIAR PLANETARY NEBULA M1-78

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ABSTRACT. The question of whether M1-78 is a PN or a compact H II region is discussed. We have obtained new high resolution radio continuum maps, optical spectra and CO maps. Arguments for it being a PN include spectral information, far infrared continuum emission, and radio morphology. It is the strongest CO emitting PN known. Its abundances are peculiar: high helium and very low oxygen and nitrogen abundances. If it is a PN it must be within 4 kpc, but 21-cm absorption measurements indicate that it may be further away.

OXYGEN DEPLETION VARIATIONS IN PLANETARY NEBULAE AND SHELLS EJECTED FROM LUMINOUS POPULATION I STARS

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ABSTRACT. Recent studies by the Peimberts have noted an anticorrelation between O and N abundances in the Type I He- and N-rich PN, such that N^+) is approximately constant. We report observations of the spectra and composition of several "planetary nebula-like" shells surrounding more luminous population I O- and WR-stars, which indicate that this O-N anticorrelation extends upwards in the HR diagram to among the most luminous stars known, with O/H values in the shells ranging down to -2 dex below Solar. We report optical and UV spectrophotometry of the shell nebulae NGC 2359, NGC 6164-5, NGC 6888, NGC 7635, AG Carinae, and the condensations around Eta Carinae, which generally support this anticorrelation trend. We also discuss variations in other elements such as He, C, S, and Ar in these shell nebulae, and compare the compositional variations to the expectations from stellar evolution and nucleosynthesis models of intermediate and massive stars.

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