

Accurate Abundances Determination of Planetary Nebulae

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Abstract. Accurate chemical abundances for the following planetary nebulae (PNe); NGC 6537, He 2-111, NGC 6302, NGC 6445, NGC 6741, NGC 7027, NGC 7662, NGC 2440 and NGC 5315 have been derived using data from the Infrared Space Observatory (ISO) and the International Ultraviolet Explorer (IUE). Optical data from the literature has also been used. These work has been published by Pottasch et al. (2001), Bernard Salas et al. (2001 and 2002). In particular, the use of the ISO data has reduced the need for ionization correction factors. Furthermore, infrared data avoid or reduce many problems when deriving these abundances, namely: temperature fluctuations in the nebula, and extinction corrections. The electron temperature (T_e) and density of the PNe has been derived. For those PNe in which the T_e has been derived for several ions a trend with the ionization potential is present. Ions with high stages of ionization give higher T_e , probably because they are formed close to the central star. The chemical abundances measured in these PNe give some hint of the nucleosynthesis and mixing processes experienced by their progenitor stars. In this view, a preliminary comparison with synthetic TP-AGB models is made (Bernard Salas et al. (in prep.)). NGC 7027, NGC 6741, NGC 2440, and NGC 6445 are consistent with the occurrence of the 3rd dredge-up due to both C¹² and He⁴ enrichment. NGC 6537, NGC 6302, and He 2-111 are likely to have stellar progenitors experiencing hot bottom burning due to the low C¹² and high N¹⁴ abundances.

References

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