PHOSPHORUS CHEMISTRY IN CIRCUMSTELLAR ENVELOPES: PN IN IRC+10216, VY CMA, AND CRL2688

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Currently the role of phosphorus in circumstellar chemistry is uncertain. The only phosphorus bearing species detected to date is CP, which has been identified only in IRC+10216. Recent observations using the facilities of the Arizona Radio Observatory (ARO) have suggested that PN is a relevant circumstellar molecule as well. Using the ARO 12 meter and SMT telescopes to observe the J=2-1, 3-2, and 5-4 transitions, PN has now been identified in IRC+10216, VY CMa, and tentatively, CRL2688. Typical abundances in these sources are $1-4\times10^{-8}$, relative to H_2. Observations towards additional circumstellar envelopes are currently being conducted, including CIT6, CRL618, TX Cam and NGC7027.