

A LABORATORY SEARCH FOR THE CARRIER OF U-LINES ATTRIBUTED TO  $l\text{-C}_3\text{H}^+$  IN THE HORSEHEAD NEBULA PDR

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Recent radio observations of the Horsehead nebula PDR in the millimeter-wave band by Pety *et al.*<sup>a</sup> detected a series of unidentified lines which have been attributed to  $l\text{-C}_3\text{H}^+$ , a molecular cation for which no high-resolution laboratory data presently exist. We have detected a pair of rotational lines in the centimeter-wave band at frequencies predicted from their derived spectroscopic constants using Fourier transform microwave and microwave-microwave double resonance spectroscopies. Experimental evidence strongly suggests that the laboratory and astronomical lines arise from a common carrier, and that the carrier is a closed-shell, reactive hydrocarbon containing a linear or nearly-linear three carbon atom backbone.

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<sup>a</sup>Pety et al. *Astron. & Astrophys.* **548**, A68 (2012).