DETECTION OF THE ROTATIONAL SPECTRUM OF CH+

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The A-X electronic band of the CH^+ ion has been used as a probe of the physical and dynamical conditions of the interstellar medium for 65 years. In spite of being one of the first molecular species observed in the interstellar medium and the very large number of subsequent observations with large derived column densities, the pure rotational spectra of CH^+ has remained elusive in both the laboratory and in the ISM as well. We report the first laboratory measurement of the pure rotation of the CH^+ ion and discuss the detection of $^{13}CH^+$ in the ISM. We also report the somewhat unexpected chemical conditions that resulted in laboratory production.