

PURE ROTATIONAL SPECTRUM OF CN^+

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The pure rotational spectrum of the elusive CN^+ cation has been observed for the first time using the cryogenic ion trap apparatus Coltrap by applying an action spectroscopy scheme. For the $^{12}\text{C}^{14}\text{N}^+$ species, the three lowest rotational transitions have been observed each of which exhibits hyperfine structure from the presence of the ^{14}N nucleus. The rare $^{12}\text{C}^{15}\text{N}^+$ isotopolog has been studied up to the $J = 4 - 3$ transition. The observations conclusively confirm CN^+ to occupy a $^1\Sigma^+$ electronic ground state. Given the ubiquity of the CN radical in space, CN^+ is an appealing candidate for future radio astronomical searches.