THE 235–500 GHZ ROTATIONAL SPECTRUM OF 1-CYANO-2-METHYLENECYCLOPROPANE (C_5H_5N)

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The gas-phase rotational spectrum of 1-cyano-2-methylencyclopropane (C_1, C_5H_5N), an isomer of pyridine first generated by the photoisomerization of (cyanomethylene)cyclopropane, has been synthesized by dehydration of its corresponding amide. Its rotational spectrum has been obtained from 235 GHz to 500 GHz and over 3600 a-, b-, and c-type transitions for the ground vibrational-state have been least-squares fit to partial octic, A- and S-reduced Hamiltonians with low statistical uncertainty (σ_{fit} = 42 kHz). Transitions for the two lowest-energy fundamentals (ν_{27} and ν_{26}) and the lowest energy overtone ($2\nu_{27}$) have been similarly least-squares fit to single state Hamiltonians. Many additional vibrationally excited states have been observed, which form a complex polyad of interacting states. The spectroscopic constants presented here form the foundation of future searches for 1-cyano-2-methylencyclopropane in the interstellar medium.