THE SUBMILLIMETER-WAVE SPECTRUM OF TRANS- AND CIS-CROTONONITRILE (CH$_3$CH=CHCN)

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The ground state rotational spectrum and ground state rotational torsional spectrum of trans- and cis-crotononitrile are further characterized in the 270-480 GHz frequency range. The A-E splittings due to methyl internal rotation in trans-crotononitrile are not observed in the sub-millimeter spectrum which has been assigned and fit to a semi-rigid rotor Hamiltonian in agreement with previous work. For cis-crotononitrile over 380 transitions are now assigned to this conformation, twice the number previously reported. Internal rotation splittings are observed throughout the $^3$$R$-branches and have been assigned for $J > 30$. The A-E spectrum fits reasonably well in an internal axis system, but strong correlation between $D_{ab}$ and the rotational constants indicates that a rotated internal axis system may suit the data better.