

MICROWAVE SPECTRA OF THE METHYLCYANOPOLYINES
 $\text{CH}_3(\text{C}\equiv\text{C})_n\text{CN}$, $n=2,3,4,5$

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The ground state rotational spectra of four methylcyanopolyynes, $\text{CH}_3(\text{C}\equiv\text{C})_2\text{CN}$, $\text{CH}_3(\text{C}\equiv\text{C})_3\text{CN}$, $\text{CH}_3(\text{C}\equiv\text{C})_4\text{CN}$, and $\text{CH}_3(\text{C}\equiv\text{C})_5\text{CN}$, were measured between 6 and 22 GHz by Fourier transform microwave spectroscopy. For $\text{CH}_3(\text{C}\equiv\text{C})_2\text{CN}$, 8 transitions, each with nitrogen nuclear quadrupole hyperfine structure (hfs), were observed and a value of $eqQ = -4.25(3)$ MHz was determined for the first time. Twenty-one rotational transitions of $\text{CH}_3(\text{C}\equiv\text{C})_3\text{CN}$, ten rotational transitions of $\text{CH}_3(\text{C}\equiv\text{C})_4\text{CN}$, and eleven rotational transitions of $\text{CH}_3(\text{C}\equiv\text{C})_5\text{CN}$ were detected for the first time and precise values for the rotational, leading centrifugal distortion constants of each molecule, and the nuclear quadrupole coupling constant of $\text{CH}_3(\text{C}\equiv\text{C})_3\text{CN}$ were determined.