FOURIER TRANSFORM MICROWAVE SPECTROSCOPY OF VINYLDIACETYLENE, VINYLTRIACETYLENE, AND VINYLCYANODIACETYLENE

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The prolate asymmetric top carbon chain molecules vinyldiacetylene (hex-1-ene-3,5-diyne), vinyltriacetylene (oct-1-ene-3,5,7-triyne) and vinylcyanodiacetylene (1-cyanohex-5-ene-1,3-diyne) have been produced *in situ* through discharges of selected precursor gases and have been investigated by Fourier transform microwave spectroscopy of molecular beams in the centimeter wave range. Initial searches were guided by results obtained from high-level quantum chemical calculations. Because the molecules are similar in structure and composition to known astronomical molecules and because of their significant polarity, these species are plausible candidates for radioastronomical detection.