HIGH RESOLUTION MICROWAVE SPECTROSCOPY OF THE ALLENE DERIVATIVES $H_2C_3HC_2H$, $H_2C_3HC_4H$, AND $H_2C_3HC_3N$

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Molecules of the form H_2C_3H–R (where R is a carbon chain) are of astrophysical interest in light of the recent centimeter-wave band detection of cyanoallene (H_2C_3HCN) towards TMC-1[a]. The carbon chain molecules $H_2C_3HC_2H$, $H_2C_3HC_4H$, and $H_2C_3HC_3N$ have been investigated between 5 and 41 GHz by Fourier transform microwave spectroscopy of a supersonic molecular beam. Accurate rotational and centrifugal distortion constants have been derived for all three molecules from their *a*- and *b*-type transitions, and owing to the high spectral resolution of this technique, nitrogen hyperfine structure has been resolved for $H_2C_3HC_3N$. Several ^{13}C isotopic species have now been observed in natural abundance, suggesting that accurate determinations of experimental structures may be feasible. Because these molecules are structurally similar to known astronomical molecules and possess large dipole moments, they are good candidates for astronomical detection.

[a]F.J. Lovas, Anthony J. Remijan, J.M. Hollis, P.R. Jewell, and L.E. Snyder *ApJ*, **637**: L37-L40, (2006).