MICROWAVE SPECTRA OF THE 2,4-PENTADIYNE RADICAL, H_2C-C≡C-C≡C-H

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The H_2C-C≡C-C≡C-H radical was produced in a pulsed discharge supersonic jet and studied by Fourier transform microwave spectroscopy. Four rotational transitions of the radical from N_{upper} = 2 to 5 in the K_a = 0 ladder were observed between 8 and 21 GHz. A total of 36 hyperfine components were measured and assigned. Seven spectroscopic constants, including rotational and centrifugal distortion constants, the spin-rotation constant, and hyperfine coupling constants for the methylenic and acetylenic hydrogens, were determined. These spectroscopic constants of 2,4-pentadiyne will be compared with those of its isoelectronic analog, H_2C-C≡C-C≡N, and with those of the propargyl radical, H_2C-C≡C-H.