FOURIER TRANSFORM MICROWAVE SPECTRUM OF THE YC_2 (X^2A_1) RADICAL

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The pure rotational spectrum of YC_2 (X^2A_1) in the range 4 - 40 GHz has been measured using Fourier transform microwave (FTMW) techniques. The species was produced using Discharge Assisted Laser Ablation Spectroscopy (DALAS) in a supersonic jet expansion of yttrium vapor and HCCH or CH_4, diluted in argon carrier gas. Three rotational transitions (N = 1 $\rightarrow$ 0, 2 $\rightarrow$ 1, and 3 $\rightarrow$ 2) have been recorded each exhibiting fine structure and hyperfine splittings due to the yttrium nuclear spin of I(^{89}Y) = 1/2. The data have been analyzed wtih a case (b) asymmetric top Hamiltonian, and rotational, fine, and hyperfine constants have been determined. The spectrum of this species was previously measured by PPMODR methods, and our data have refined the spectroscopic constants. Measurements of the ^{13}C isotopologues are currently underway to establish a precise structure for YC_2.