FOURIER TRANSFORM MICROWAVE SPECTRUM OF THE AlC_2 ($\tilde{X}^2A_1$) RADICAL

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The pure rotational spectrum of the AlC_2 ($\tilde{X}^2A_1$) radical in the range 4 - 60 GHz has been measured using Fourier transform microwave (FTMW) methods. The species was produced using the Discharge Assisted Laser Ablation Source (DALAS) technique in a supersonic jet expansion of aluminum vapor and CH_4, diluted in argon carrier gas. The $N = 1 \rightarrow 0$ and $2 \rightarrow 1$ transitions have been measured near 22 and 44 GHz, each exhibiting fine structure and hyperfine splittings, arising from the nuclear spin of aluminum, $I(^{27}Al) = 5/2$. The higher frequency transition was recorded using a newly constructed U-band FTMW system operating at 40 - 60 GHz. The data have been analyzed with a case (b) asymmetric top Hamiltonian, and rotational, fine structure, and hyperfine constants have been determined. Measurements of the ^{13}C isotopologues are currently underway to establish a precise structure for AlC_2.