

FOURIER TRANSFORM MICROWAVE SPECTROSCOPY OF CuCCH ($X^1\Sigma^+$)

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The rotational spectrum of CuCCH ($X^1\Sigma^+$) has been measured using Fourier transform microwave (FTMW) spectroscopy. This work is the first gas-phase spectroscopic study of this molecule. The species was produced using Discharge Assisted Laser Ablation Spectroscopy (DALAS) in a supersonic jet expansion with HCCH as the precursor molecule. Four rotational transitions ($J = 1 \rightarrow 0$, $2 \rightarrow 1$, $3 \rightarrow 2$, and $4 \rightarrow 3$) have been measured for the $^{63}\text{CuCCH}$ and $^{65}\text{CuCCH}$ isotopologues in the range 8-33 GHz. Copper quadrupole splittings have been resolved in both species. The data have been analyzed, and rotational and hyperfine constants determined. Measurements of the carbon-13 and deuterium isotopologues are currently being conducted to establish a precise structure for CuCCH. Compounds of the form CuCCR play an important role in organic synthesis.