

LABORATORY DETECTION AND MICROWAVE SPECTRUM of ScC₂ RADICAL (X^2A_1)

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The pure rotational spectrum of ScC₂ (X^2A_1) has been measured using Fourier transform microwave (FTMW) spectroscopy. This is the first study of ScC₂ by any spectroscopic technique. In the FTMW system, the molecule was synthesized using the discharge assisted laser ablation source (DALAS) from a mixture of 0.25 % methane in argon and the ablation of a scandium rod. Spectra of the main isotopologue, ScC₂, as well as Sc¹³C¹³C and Sc¹³C¹²C, have been recorded in the frequency range of 4-60 GHz. Three rotational transitions have been measured, each exhibiting fine structure and hyperfine splittings due to scandium nuclear spin ($I=7/2$). The data have been analyzed with a 2A_1 Hamiltonian and rotational, spin-rotation constants and Sc and ¹³C hyperfine parameters have been determined. The spectra are consistent with a triangular structure and a 2A_1 ground electronic state as predicted by theory. A precise structure will be presented.