THE FOURIER TRANSFORM MICROWAVE/MILLIMETER SPECTRUM OF ScO ($X^2\Sigma^+$)

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The pure rotational spectra of ScO ($X^2\Sigma^+$) have been recorded in the 4 - 90 GHz range using Fourier transform microwave/millimeter (FTM/mmW) techniques. This species was created in a supersonic jet expansion of laser-ablated scandium vapor and N_2O gas, diluted in argon. The N = 1 $\rightarrow$ 0 and 2 $\rightarrow$ 1 rotational transitions in both v = 0 and 1 have been measured near 30 and 61 GHz, respectively. The data over 60 GHz were obtained using a new E-band (60 - 90 GHz) FTmmW spectrometer system. The data have been analyzed, and rotational, fine, and hyperfine constants have been determined, which are in good agreement with those from past optical studies. ScO is a potential circumstellar molecule in giant/supergiant stars, where it is produced in oxygen-burning nucleosynthesis.