FT MICROWAVE SPECTRUM OF SULFUR CHLORIDE FLUORIDE, ClSF

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The microwave spectrum of sulfur chloride fluoride, ClSF, has been measured for the first time, using a pulsed-jet cavity Fourier-transform microwave spectrometer. The samples were prepared from mixtures of SCl_2/SF_6 or Cl_2/SF_6 in Ne carrier gas, using an electric discharge nozzle. Spectra of three isotopomers ($^{35}Cl^{32}S^{19}F$, $^{37}Cl^{32}S^{19}F$, and $^{35}Cl^{34}S^{19}F$) have been observed in natural abundance, and have been analysed to produce rotational constants, centrifugal distortion constants, and hyperfine parameters of Cl and F. The molecular geometry has been derived. The harmonic force field has been refined, and used as part of the structure determination. The Cl quadrupole coupling constants and F spin-rotation constants have given information on the electronic structure. In particular, some rather unusual, negative, F spin-rotation constants will be discussed in terms of a potential electronic spectrum.