THE FOURIER TRANSFORM MICROWAVE SPECTRUM AND STRUCTURE OF OPF

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The pure rotational spectrum of free gas phase OPF has been observed in the frequency range 4-26 GHz, using a cavity pulsed jet Fourier transform microwave spectrometer. The samples were prepared in mixtures of PF_3 and O_2 in Ne, using a pulsed discharge nozzle. The transitions were analysed in terms of rotational, centrifugal distortion and nuclear spin-rotation coupling constants. The determined rotational constants have been used to evaluate r_0, r_s and approximate r_e geometries, which are compared to those of related molecules. The spin-rotation coupling constants have been used to calculate the nuclear shielding parameters of the P and F nuclei; however, because both nuclei have $I = \frac{1}{2}$, and because both sets of coupling constants have very similar values, assignment to a given nucleus was not possible, based on experimental data alone.