

A STUDY OF THE FO RADICAL BY FAR-IR LMR

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The fine-structure transition ${}^2\Pi_{1/2} \leftarrow {}^2\Pi_{3/2}$ of the free radical FO has been detected by far-infrared Laser Magnetic Resonance. The spectrum is entirely magnetic dipole and several pure rotational transitions ranging between $J = \frac{1}{2}$ and $J = 20 \frac{1}{2}$ have been recorded in both perpendicular and parallel polarization. These data form the most accurate spectroscopic information available for FO. A set of 272 transitions have been analyzed using a linear least-squares fit. The Hamiltonian, which contains rotational, centrifugal distortion, spin-orbit, Λ -doubling, magnetic hyperfine and Zeeman terms, was set up in a decoupled basis set. The spin-orbit coupling constant A_0 , the magnetic hyperfine parameters a , b_F , c , d and a number of g -factors have been derived experimentally for the first time. The value of A_0 obtained from the fit is:

$$A_0 = -196.108690(50) \text{ cm}^{-1}.$$