

OPTICAL ZEEMAN SPECTROSCOPY OF YTTERBIUM MONOFLUORIDE; YbF^a

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The heavy polar molecular monofluoride, YbF, has been used to set an upper limit on the electric-dipole moment of the electron, d_e ^a. These measurements are dependent upon precise knowledge of the magnetic field which can be readily ascertained from the analysis of the optical Zeeman spectrum. Here we report on the analysis of Zeeman effect on the $A^2\Pi_{1/2}-X^2\Sigma^+(0,0)$ band of ytterbium monofluoride, ¹⁷¹YbF, recorded at near-natural linewidth limit. A molecular beam was generated by skimming the output of a laser ablation/supersonic expansion. The Zeeman tuning of the $X^2\Sigma^+(v=0)$ state could be modeled and the determined g-factors differ slightly from those derived from the matrix isolated ESR results.^b The Zeeman tuning of the $A^2\Pi_{1/2}(v=0)$ state is unusually strong due to significant Born-Oppenheimer breakdown.

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^bR.J. Van Zee, M.L. Seely, T.C. DeVore and W. Weltner, Jr., *J. Phys. Chem.*, 82, 1192 (1978)