

OPTICAL STARK SPECTROSCOPY OF THE $\tilde{A}^2\Pi$ - $\tilde{X}^2\Sigma^+$ BAND OF BaOH

SARAH E. FREY AND TIMOTHY C. STEIMLE, *Department of Chemistry and Biochemistry, Arizona State University, Tempe, AZ 85287, USA.*

Transitions of the $\tilde{A}^2\Pi$ - $\tilde{X}^2\Sigma^+$ band system of barium monohydroxide, BaOH, were observed and recorded from 11483-11485 cm^{-1} and 12041-12044 cm^{-1} . The features were readily identified using the results of the Doppler-limited measurements^a. The laser induced fluorescence (LIF) spectrum was analyzed to give optimized field-free excited state parameters. The parameters for the $\tilde{X}^2\Sigma^+$ state were constrained to the previously determined values^b. The permanent electric dipole moments for the $\tilde{X}^2\Sigma^+$ and $\tilde{A}^2\Pi$ states have been determined from the analysis of the optical Stark spectra for the R₂₁(0.5), Q₂₁(1.5), and R₂(0.5) lines. The obtained values were $\mu(\tilde{X}^2\Sigma^+)= 1.426(38)\text{D}$ and $\mu(\tilde{A}^2\Pi)= 0.477(7)\text{D}$. The results are compared with predicted values from semi-empirical models and those for CaOH and SrOH^c.

^aJ. G. Wang, J. D. Tandy and P. F. Bernath *J. Mol. Spectrosc.* **252**, 31 (2008)

^bM. A. Anderson, M. D. Allen, W. L. Barclay, Jr, and L. M. Ziurys *Chem. Phys. Lett* **205**, 415 (1993)

^cT. C. Steimle, D. A. Fletcher, K. Y. Jung and C. T. Scurlock *J. Chem. Phys.* **96**, 2556 (1992)