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

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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 $R_{21}(0.5)$, $Q_{21}(1.5)$, and $R_2(0.5)$ lines. The obtained values were $\mu(\tilde{X}^2\Sigma^+)$= 1.426(38)D and $\mu(\tilde{A}^2\Pi)$= 0.477(7) D. The results are compared with predicted values from semi-empirical models and those for CaOH and SrOH[c].

[a] J. G. Wang, J. D. Tandy and P. F. Bernath *J. Mol. Spectrosc.* **252**, 31 (2008)
[b] M. A. Anderson, M. D. Allen, W. L. Barclay, Jr, and L. M. Ziurys *Chem. Phys. Lett* **205**, 415 (1993)
[c] T. C. Steimle, D. A. Fletcher, K. Y. Jung and C. T. Scurlock *J. Chem. Phys.* **96**, 2556 (1992)