OPTICAL-OPTICAL DOUBLE RESONANCE SPECTROSCOPY OF CaOH: INVESTIGATING THE HIGH ENERGY STATES

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The $\widetilde{D}^2\Sigma^+$(000) state of CaOH has been investigated at high resolution using the technique of optical-optical double resonance spectroscopy. CaOH was synthesized in a Broida-type oven by the reaction of H_2O_2 and calcium vapor. A linear cavity dye laser ($\sim$1 cm^{-1} bandwidth) was used to excite the band heads of the $\widetilde{A}^2\Pi_{1/2} - \widetilde{X}^2\Sigma^+$ and $\widetilde{A}^2\Pi_{3/2}$-$\widetilde{X}^2\Sigma^+$transitions of CaOH. A Ti:Sapphire ring laser was then used to promote the molecules from the $\widetilde{A}^2\Pi$ state to the $\widetilde{D}^2\Sigma^+$ state. Assignment and analysis of the high resolution spectra is in progress and a discussion of the rotational and fine structure constants of the $\widetilde{D}^2\Sigma^+$(000) state of CaOH will be presented. In addition, high resolution studies of other higher-lying states of CaOH using optical-optical double resonance spectroscopy are in progress and preliminary results will be described.