LASER-INDUCED FLUORESCENCE SPECTROSCOPY OF THE $\widetilde{A}\ ^2\Pi - \widetilde{X}\ ^2\Sigma^+$ TRANSITION OF SrCCH AND SrCCD

A. FARIDIAN, D. W. TOKARYK, *Department of Physics and Centre for Laser, Atomic, and Molecular Sciences, University of New Brunswick, Fredericton, NB, Canada E3B 5A3*; A. G. ADAM, *Chemistry Department, and Centre for Lasers, and Atomic, and Molecular Sciences, University of New Brunswick, Fredericton, NB, Canada E3B 6E2*.

The family of molecules consisting of an alkaline earth metal atom bonded to an organic ligand has been under intensive investigation recently, since these molecules play a significant role in synthesis of organic compounds, and since some members like MgNC and MgCN have been detected in stellar atmospheres. Our group has previously studied CaCCH, MgCCH, $CaOCH_3$, and $SrOCH_3$, and in this work we consider the $\widetilde{A}\ ^2\Pi - \widetilde{X}\ ^2\Sigma^+$ transition of SrCCH and SrCCD. The molecules were created in a pulsed-jet laser ablation source through reaction of strontium atoms ablated from a solid rod with methane gas entrained in helium. High-resolution spectra were collected through laser-induced fluorescence following excitation of the molecules formed in the jet with a cw ring dye laser. Results of the analysis are compared to those of a previous high-resolution study of SrCCH.[a] The data provide information on the C-H bond length via the isotopic substitution, and the lambda-doubling parameter p allows for an estimate of the position of the $\widetilde{B}\ ^2\Sigma^+$ state for both isotopes.

[a] M. J. Dick, P. M. Sheridan, J.-G. Wang, and P. F. Bernath , *J. Mol. Spectrosc.* **233**, pp. 197-202 (2005)