

## GROUND AND EXCITED STATE ALKYL CH STRETCH IR SPECTRA OF STRAIGHT-CHAIN ALKYL BENZENES

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Vibrational spectra of alkanes in the CH stretch region are often complicated by Fermi resonance with the overtone of the CH bends. This complication has made the CH stretch region difficult to use as a spectroscopic tool for assigning structures to experimental infrared spectra. A first-principles model accounting for Fermi resonance has been developed by Sibert and co-workers, and has been successfully implemented to predict the CH stretch region of alkyl groups in a variety of settings (both -CH<sub>2</sub>- and -CH<sub>3</sub>). We have recorded jet-cooled, single-conformation infrared spectra of a series of straight chain alkylbenzenes having chain lengths of two carbons and longer, serving as a foundation for further tests and refinement of the theoretical model. Ground and excited state IR spectra of these alkylbenzenes were acquired using fluorescence dip infrared spectroscopy. A novel approach for taking the excited state spectra that utilizes the gain of a second, infrared-induced fluorescence peak will be discussed and compared to the typical depletion spectra, using ethylbenzene as a prototypical system.