

HIGH-RESOLUTION JET-COOLED INFRARED SPECTRUM OF THE ν_{26} BAND OF ISOPRENE

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Isoprene (C_5H_8) is an important hydrocarbon that is naturally produced by plants and is the most abundant nonmethane hydrocarbon in the atmosphere. Isoprene plays an important role in the formation of secondary organic aerosol particles and the production of ozone in the troposphere. Isoprene is also one of the simplest conjugated organic molecules, exhibiting interesting conformational properties with respect to rotation about the central C-C single bond. To better understand the spectral and structural properties of isoprene, we have measured the high-resolution rovibrational spectrum of the ν_{26} band of isoprene near 992 cm^{-1} . The isoprene was cooled in a supersonic expansion to better resolve and analyze the rotational structure of this band and measured with a quantum cascade laser (QCL)-based spectrometer. This work complements previous spectra our group has obtained of room-temperature isoprene. We will present our analysis of the rovibrational spectrum and the insights the cold spectrum provides in the context of the room-temperature spectrum, as well as a comparison to anharmonic quantum calculations previously done in our group.