HIGH-RESOLUTION INFRARED SPECTROSCOPY OF JET-COOLED VINYL RADICAL: SYMMETRIC CH$_2$ STRETCHING VIBRATIONS

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Vinyl radical, C$_2$H$_3$, is a transient but fundamental hydrocarbon species which plays important roles in a number of combustion processes. Previous high resolution spectroscopic studies of this species have been very limited; only the CH$_2$ wagging mode in the electronic ground state has been $^a$ studied with IR diode laser absorption methods. Guided by both recent time-resolved FTIR emission $^b$ and high level density functional predictions, we have recently used the slit jet discharge IR laser spectrometer to observe and assign high-resolution infrared spectra of jet-cooled vinyl radical in the symmetric CH$_2$ stretch region. In addition to structural information, the tunneling dynamics due to in-plane rocking of the $\alpha$-C-H will be discussed.