

HIGH-RESOLUTION INFRARED SPECTROSCOPY OF ISOPRENE AND METHYL VINYL KETONE IN THE 10 μm REGION

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Isoprene (C_5H_8) is the most abundant biogenic volatile organic compound (BVOC) emitted by plants into Earth's atmosphere and plays a key role in the chemistry of the troposphere. Isoprene (and other BVOCs) play a role in the formation of secondary organic aerosols and production of tropospheric ozone, a pollutant that is a major part of photochemical smog. One attractive means of measuring isoprene levels in the atmosphere is the use of infrared spectroscopy to monitor strong absorption bands that lie in the "atmospheric window" between 8-14 μm . We have measured the high-resolution infrared spectrum of isoprene in the region of the strong ν_{26} vibrational band near 10 μm using a quantum cascade laser-based spectrometer. This work will support future efforts to use the ν_{26} band for sensing applications. We will discuss the assignment of several weaker bands we have observed near the main ν_{26} band and a rotational analysis based on the strong Q-branches. In addition, we have also observed the high-resolution spectrum of methyl vinyl ketone ($\text{C}_4\text{H}_6\text{O}$), an oxidation product of isoprene, in this same frequency region, and will present a preliminary analysis of our spectrum.