

JET-COOLED INFRARED LASER SPECTROSCOPY OF DIMETHYL SULFIDE: HIGH RESOLUTION ANALYSIS OF THE ν_{14} CH₃-BENDING MODE

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The rovibrational spectrum of the ν_{14} CH₃-bending mode of dimethyl sulfide (CH₃)₂S was recorded in the 963-987 cm⁻¹ spectral region using our sensitive tunable quantum cascade laser spectrometer coupled to a pulsed slit jet^{a b}. The combined use of a high dilution (CH₃)₂S/Ar gas mixture expanded at high backing pressure through a slit nozzle enabled to obtain an efficient rovibrational cooling which narrows the rotational distribution and eliminates hot bands arising from three low frequency modes below 300 cm⁻¹^c. The characteristic PQR band contour of a b₁ symmetry mode centered at 975.29 cm⁻¹ was observed and will be compared with theoretical calculations at the CCSD(T)/VTZ level^c (ν_{14} mode at 986 cm⁻¹) and room temperature experiments at low resolution (974 cm⁻¹)^d. Starting from the accurate set of ground state parameters derived from microwave, millimeter and far-infrared measurements, the rovibrational analysis will be presented and discussed.

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