Investigation of the Rovibrational Energy Pattern in Acetaldehyde in the Mid and Near Infrared Ranges

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Three ranges of the infrared and near infrared absorption spectrum of CH\textsubscript{3}CHO have been recorded using a Fourier transform interferometer, under various experimental conditions: between 1300 and 3100 cm\textsuperscript{-1} at a resolution of 0.01 cm\textsuperscript{-1} under jet cooled conditions, between 1400 and 3200 cm\textsuperscript{-1} at a resolution of 0.008 cm\textsuperscript{-1} at room temperature, and between 4000 and 8000 cm\textsuperscript{-1} at a resolution of 0.03 cm\textsuperscript{-1} at room temperature. We are investigating specific bands in those ranges, all presenting problems of different nature, severely limiting the analysis in each case. We are studying $\nu_8$ and $\nu_2$ respectively located at 1429.91 and 1435.83 cm\textsuperscript{-1}. They are two methyl bending fundamentals, with strong Coriolis interaction\textsuperscript{a}. We are also focusing on the aldehydic CH stretch fundamental band ($\nu_5$), located around 2716 cm\textsuperscript{-1} and known to be in Fermi-type interaction with $2\nu_8$\textsuperscript{b}. Eventually, we are considering the two first overtones of the aldehydic CH stretch, observed around 5320 and 7810 cm\textsuperscript{-1}, presenting a dense structure.