ANALYSIS OF THE SPECTRUM OF ETHYLENE IN THE 800–1500 CM^{-1} REGION USING TENSORIAL FORMALISM: FREQUENCIES AND INTENSITIES

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Recently, we have presented a tensorial formalism[a,b] adapted to the spectroscopy of X_2Y_4 molecules. It is based on formalisms already developed in Dijon for spherical-top molecules[c] as well as on the work of Sartakov[d]. This approach has the advantages to allow a systematic development of rovibrational interactions and to make global analyses easier to perform. We have used this tool to perform a re-analysis of the $\nu_{10}/\nu_7/\nu_4/\nu_{12}$ tetrad both in frequencies and intensities in the 800–1500 cm^{-1} region. We have used 8943 infrared data in the $\nu_{10}/\nu_7/\nu_4$ region from W. E. Blass' atlas[e] completed by 5420 more recent data in the same range[f] (207 of these having a precision of a few 10^{-6} cm^{-1}) and by 1138 data in the ν_{12} region from a spectrum recorded in Brussels. We obtain a global reduced RMS of 0.54 for line positions, which is comparable to the result of Ref. *f*. Concerning line intensities, we used 10657 data from Blass' atlas and 25 high-precision diode laser data[g]. We obtain a 11.6 % RMS in this case.

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