FREQUENCY ANALYSIS OF THE 10 μm REGION OF THE ETHYLENE SPECTRUM USING THE D_{2h} TOP DATA SYSTEM.

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New high resolution IR spectra of the $\nu_{10}/\nu_7/\nu_4$ region, lying from 600 cm^{-1} to 1200 cm^{-1} have been recorded in Brussels. They are used simultaneously with a previous spectrum of the ν_{12} band, also recorded in Brussels, to perform the analysis of the $\nu_{10}/\nu_7/\nu_4/\nu_{12}$ region, lying from 600 cm^{-1} to 1500 cm^{-1}. Following our work devoted to the ν_{12} band considered as isolated, we performed a frequency re-analysis of the $\nu_{10}/\nu_7/\nu_4/\nu_{12}$ infrared tetrad in the $600-1500$ cm^{-1} region, thanks to the tensorial formalism developed in Dijon for X_2Y_4 asymmetric-top molecules[a] and the XTDS software package[b]. Including the strong Coriolis interaction affecting the upper vibrational levels 10^1, 7^1, 4^1 and 12^1, a total of 11727 lines have been assigned and fitted as a tetrad with a global root mean square deviation of 0.338×10^{-3} cm^{-1}.

[a] W. Raballand, M. Rotger, V. Boudon and M. Loëte, *J. Mol. Spectrosc.*, **217** 239–248 (2003).

[b] Ch. Wenger, V. Boudon, M. Rotger, M. Sanzharov and J.-P. Champion, *J. Mol. Spectrosc.*, **251** 102–113 (2008).