INFRARED LINE INTENSITIES FOR FORMALDEHYDE FROM SIMULTANEOUS MEASUREMENTS IN THE INFRARED AND FAR INFRARED SPECTRAL RANGES

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Formaldehyde (H_2CO) is an important intermediate compound in the degradation of the volatile organic compounds (VOCs), including methane, in the terrestrial troposphere. Its observation using optical remote sensing in the infrared range relies on the 3.6 and 5.7 μm absorption bands. Band and individual line intensities have been reported in both ranges.[a]

With the present work, we aim to also derive infrared line intensities for formaldehyde, however relying on pure rotation line intensities and the known electric dipole moment to determine the particle density. Indeed, because formaldehyde polymerizes or degrades easily, the gas phase may contain polymerization or degradation products. Spectra of H_2CO diluted in 10 hPa of N_2 were therefore simultaneously recorded in the $20 - 60$ cm^{-1} and 3.6 μm ranges, respectively using a Bruker IFS125HR Fourier transform spectrometer and a tunable diode laser.

[a] see A. Perrin, D. Jacquemart, F. Kwabia Tchana, N. Lacome, J. Quant. Spectrosc. Radiat. Transfer 110 (2009) 700-716, and references therein