ABSOLUTE LINE INTENSITIES MEASUREMENTS IN THE ν_2 BAND OF HOCl

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We have measured absolute line intensities in the ν_2 fundamental band at $1238\ \mathrm{cm}^{-1}$ of both isotopomers of hypochlorous acid. To obtain the partial pressure of the species in the sample mixture, unavailable through direct measurement since HOCl exists only in equilibrium with H_2O and Cl_2O and may decay by secondary reactions, we relied on known line intensities in the pure rotational far infrared (FIR) spectrum determined from Stark effect measurements. We have thus recorded SIMULTANEOUSLY the FIR pure rotation spectrum of HOCl using a Bruker IFS120HR interferometer and the spectrum of a few vibration-rotation lines in the infrared (IR) ν_2 band using a tunable diode laser spectrometer. The absolute intensities of these IR lines thus determined allowed to "calibrate" the intensites of vibration-rotation lines in the whole band, measured previously using Fourier transform spectroscopy. The treatment of the data took into account the blackbody emission contribution in the FIR and the evolution of the HOCl amount during the recording of the spectra. The square of the transition dipole moment and a linear Herman-Wallis factor were determined for both isotopomers. The line intensities were also least squares fitted using a full model that calculates explicitly the transition moment matrix elements. This allowed us to account for a weak resonance between the (010) and (002) levels, which leads to the observation of a few $2\nu_3$ resonating lines. The experimental work, results and comparison with previous measurements will be presented.