

A new HCl 2-0 band analysis: A two temperature study

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The HCl molecule has a significant role in a variety of applications occurring both in space and on Earth, being present in the atmospheres of Earth [1] and Venus [2,3] for example. Gaseous HCl has been the subject of several studies since the past [4,5]. In the present work a new study of the 2-0 band of HCl molecule is performed by high resolution Fourier-transform absorption spectroscopy in the near infrared region. The spectra were measured at two different temperatures, 293 K and 315 K, for different pressures at each temperature. The spectral linewidths were analysed in a two-step procedure, being the first performed by directly measuring the linewidth and the second by fitting each spectral line to a model line profile, where it was used the Gaussian, Lorentzian and Voigt profiles. A study of the profiles that best adapt to the spectral line fits is carried out in this work. The behavior of the spectral lines self-broadening and their corresponding self-induced shifts were studied for different values of rotational quantum numbers. The analysis are performed for both isotopes of the molecule and the self-broadening and self-shift coefficients are presented.

Referências

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