THE ROVIBRATIONAL SPECTRUM OF PYRIDINE BETWEEN 600-1300 cm^{-1}

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One of the great challenges of modern high resolution infrared spectroscopy is the recording and the analysis of rotationally resolved spectra of relatively heavy molecules containing numerous vibrational modes. Here we present new results on the prototype heterocyclic molecule of pyridine. This molecule is of astrophysical interest and can be related to other nitrogen containing biological aromatic systems. Up to now only vibrationally resolved infrared spectra and rotational spectra exist, including recent FASSST spectra[a].

We have recorded the spectrum of pyridine in the region 600-1300 cm^{-1} with our Zürich Bruker 2001 prototype Fourier transform infrared spectrometer[b] with an instrumental resolution of 0.0007 cm^{-1}, essentially Doppler limited, with Doppler widths ranging from 0.0008 to 0.0018 cm^{-1}. The analysis of the bands located at $\tilde{\nu}_c = 700.2528$ cm^{-1} (ν_{11}), $\tilde{\nu}_c = 744.0046$ cm^{-1} (ν_4) and $\tilde{\nu}_c = 1031.6339$ cm^{-1} (ν_{12}) will be discussed. Perturbations of the ν_1 and ν_{18a} modes have been observed.

We will give an outlook how in the future the rovibrational spectra of larger molecules of biological relevance can be recorded and analysed using the combination of our highly resolving spectrometer with Synchrotron radiation and applying our spectral analysis tools to the complicated spectra.

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[b] S. Albert, K.K. Albert, and M. Quack, *Trends in Optics and Photonics*, **84** 177 (2003),
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