FOURIER-TRANSFORM SPECTROSCOPY OF $^{14}NH_3$ AND $^{15}NH_3$ IN THE NEAR-INFRARED

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The near-infrared absorption spectrum of NH_3 is an interesting opportunity for atmospheric *in-situ* measurements of this species using tuneable diode-lasers. For this purpose, accurate line positions and intensities are indispensable.

In the past, several studies of the absorption spectrum of $^{14}NH_3$ in the near-infrared were carried out, using Fourier-transform[1] and tuneable diode-laser spectroscopy.[2−4] More recently, high-resolution diode-laser spectra of $^{15}NH_3$ were analyzed for the first time.[5] The lines of $^{14}NH_3$ in this region are also useful for wavenumber calibration of absorption spectra obtained with tuneable lasers.

In our group, we have recently investigated the possibility to detect atmospheric NH_3 using photoacoustic laser spectroscopy in the 1.5 μm region, and observed several discrepancies between individual line positions and intensities observed in our and previous studies[1,4], as already noticed by other groups.[2,5] In order to solve this problem we have measured new absorption spectra of $^{14}NH_3$ (and also of $^{15}NH_3$) in the 6300-7500 cm^{-1} region using a Bruker IFS 120-HR Fourier-transform spectrometer. The length of the absorption cell was 30 cm. The NH_3 pressures employed were around 30 mbar, and the spectral resolution used was 0.02 cm^{-1}, leading to linewidths (Full-Width at Half-Maximum) of about 0.03 cm^{-1}. Based on these spectra, we have produced a list of individual line positions and line intensities at 296 K. Comparisons with the previous studies[1−5] will be presented.

[1] L. Lundsberg-Nielsen et al., *J. Mol. Spectrosc.*, **162**, 230-245 (1993).
[2] M. Webber et al., *Appl. Opt.*, **40**, 2031-2042 (2004).
[3] L.-H. Xu et al., *Infrared Phys. Technol.*, **45**, 31-45 (2004).
[4] J. S. Gibb et al., *Eur. Phys. J. D.*, **28**, 59-66 (2004).
[5] R. M. Lees et al., *J. Mol. Struct.*, in press (2006).