THE INVERSION SPLITTING OF $^{15}NH_2D$ AND $^{15}ND_2H$ AS OBTAINED FROM THEIR FIR SPECTRA

M. ELKEURTI, *Laboratoire d'Etudes Physico Chimiques, 20000 Saïda, Algérie*; L. H. COUDERT, J. ORPHAL, *LISA, CNRS/Universités Paris 12 et 7, 61 Avenue du Général de Gaulle, 94010 Créteil, France*; C. E. FELLOWS, *Laboratório de Espectroscopia e Laser, Universidade Federal Fluminense, Campus da Boa Viagem, Niterói, RJ, 24210-340, Brazil*; AND S. TOUMI, *Institut d'Electronique, Université Mokhtar Badji, 23000 Annaba, Algérie*.

The far infrared absorption spectra of the partially deuterated species $^{15}NH_2D$ and $^{15}ND_2H$ have been recorded in the 20 to 105 cm^{-1} region using a Brucker IFS 120 Fourier transform spectrometer. A 25 cm long absorption cell with teflon windows was filled with different mixtures of $^{15}NH_3$ and $^{15}ND_3$ at total pressures ranging from 0.8 to 2 mbar. Several spectra with different $^{15}NH_2D$ to $^{15}ND_2H$ ratio were thus recorded. For all spectra the maximum path length was used resulting in a 2×10^{-3} cm^{-1} resolution.

Prior to the line assignment, rotational constants for $^{15}NH_2D$ and $^{15}ND_2H$ where calculated from those of $^{14}NH_2D$ and $^{14}ND_2H$. The IAM-type theoretical approach developed by Cohen and Pickett,[a] which accounts for the large amplitude inversion motion and its coupling with the overall rotation, was afterwards used to obtain rovibrational energies and predicted spectra. In the case of $^{15}NH_2D$, observed line positions for low-J lines were sometimes within 0.050 cm^{-1} from their predicted values.

The line position analyzes are still in progress. For both species, they are carried out with the help of the IAM-type theoretical approach.[a] For $^{15}NH_2D$ more than 300 a- and c-type lines have already been assigned and the observed wavenumbers are reproduced with an RMS deviation of 0.4×10^{-3} cm^{-1}. This will be discussed in the paper and the values obtained for the spectroscopic constants will be reported and compared to those obtained by Fusina *et al.*[b] for the ^{14}N-species. The decrease of the tunneling inversion splitting which goes from 0.406 cm^{-1} in $^{14}NH_2D$[b] to 0.383 cm^{-1} in $^{15}NH_2D$ will also be discussed.

[a] E. A. Cohen and H. M. Pickett, *J. Molec. Spectrosc.* **93,** 83 (1982).

[b] L. Fusina, G. Di Lonardo, J. W. C. Johns and L. Halonen, *J. Molec. Spectrosc.* **127,** 240 (1988).