THE ROVIBRATIONAL SPECTRUM OF THE RING PUCKERING AND NH BENDING MODES OF AZETIDINE

T. ZAPOROZAN and J. A. VAN WIJNGAARDEN, *Department of Chemistry, University of Manitoba, Winnipeg, MB, Canada R3T 2N2*.

High quality infared spectra of the two lowest frequency modes of azetidine (c-C_3H_6NH) have been recorded between 100 and 700 cm^{-1} using the far infrared beamline at the Candian Light Source in Saskatoon. The far infrared endstation couples highly spatially confined synchrotron light into a Bruker IFS125HR Fourier transform spectrometer and can achieve spectral resolution up to 0.000959 cm^{-1}. The observed modes correspond to the ring puckering mode (ν_{16}) at 207.2 cm^{-1} and the N-H bending mode (ν_{15}) at 648.2 cm^{-1}. Rotational analysis of the ring puckering mode confirmed our $ab\ initio$ prediction that the band structure is governed by $a-$type selection rules rather than $c-$type transitions as reported for oxetane.[a] The results of the rovibrational analysis of both bands will be presented and comparisons will be made between the synchrotron spectra and those collected using a conventional globar source.

[a] M. Winnewisser, M. Kunzmann, M. Lock, and B. P. Winnewisser, J. Mol. Struct. 561, 1 (2001).