NEW HIGH RESOLUTION SPECTROSCOPY STUDIES OF METHYL NITRITE CH_3ONO

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Methyl nitrite CH_3ONO is an important species in atmospheric chemistry involved in photochemical oxidation of volatile organic compounds. The *cis* conformer (more stable by about 298 cm^{-1}) has a high internal rotation potential barrier for the methyl group (731 cm^{-1})[a] whereas for the trans conformer the barrier to internal rotation is extremely low (10 cm^{-1})[b], leading to large internal rotation splittings. Only one high resolution infrared study was performed prior to this study[c]. For the first time, high-resolution spectrum of CH_3ONO was recorded in the far infrared region (30-500 cm^{-1}) using the synchrotron SOLEIL far-infrared beamline (AILES) and a Fourier transform (FT) spectrometer. Some 987 lines were assigned for the *cis* isomer up to J=65 and combined with 66 previously recorded microwave lines. In addition, high-resolution spectrum of the ν_9 band of the *cis* isomer around 627.9 cm^{-1} was also recorded using the FT spectrometer at LISA. New microwave data is currently recorded to improve the knowledge of both the *cis* and *trans* ground state parameters.

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[c]L. M. Goss, C. D. Mortensen and T. A. Blake,J. Mol. Spectrosc., 225, 182-188 (2004)