SPECTROSCOPY OF NEW IMINE ASTROPHYSCICS TARGET: METHYLIMINO-ACETONITRILE ($CH_3N{=}CHCN$)

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There are to date about 200 molecules that have been detected in the interstellar medium or circumstellar shells. Among these molecules, several tens are the methylated derivatives of compounds previously detected. For several years, we have been studying molecules belonging to the imine family. Following the detection of the dimer of HCN, the cynaoethanimine, its methylated derivative, methylimino-acetonitrile $CH_3N{=}CHCN$ appears as a privileged target. Methylimino-acetonitrile has two isomers E and Z. According to quantum chemical calculations, the E isomer is more stable than Z by about 1.5 kJ/mol. There was no spectrosocpic data allowing detection without ambiguity of this molecule in the interstellar medium. We recorded and analyzed the spectra of methylimino-acetonitrile up to 660 GHz. This compound is not stable in laboratory conditions, it was produced in-situ by pyrolisis and introduced in a 1 m long pyrex cell in a flow mode. The E isomer represents an interesting case from spectroscopic point of view. Even if the barrier to internal rotation of the methyl top is quite high 714 cm^{-1}, some A-E tunneling splittings were observed. This is due to quite high ρ value: 0.274, just slightly smaller than the acetaldehyde value of 0.329. The analysis is performed using the RAM36 code[a]. The spectroscopic results will be presented.

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[a] Ilyushin, V.V. et al; *J. Mol. Spectrosc.* **259**, (2010) 26