

RE-INVESTIGATION OF THE CYANOACETALDEHYDE (NCCH₂CHO) ROTATIONAL SPECTRUM

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Cyanoacetaldehyde could be present in interstellar space or in planetary atmospheres, because of the facile hydrolysis of cyanoacetylene, which is prevalent in the interstellar medium, and found in comets and in Titan's atmosphere. We already studied its rotation spectrum ten years ago^a. The two lowest energy rotamers were studied, Rotamer I was found to be 2.9(8) kJ/mol more stable than II by relative intensity measurements. There was no major difficulties with assignment of the conformer II for the ground and the two lowest energy vibrational states. On the other hand, the analysis of the most stable conformer is not satisfactory. This is due to the existence of tunnelling effect between two equivalent configurations, which makes the analysis of the spectra tricky. The assignment is actually limited to data up to 80 GHz and with $K_a < 3$. It should be noted that the synthesis of cyanoacetaldehyde is not straightforward, and non negligible amount of the precursor, isoxazole, is present in the final mixture. We re-examined the millimeter wave spectra (150-330 GHz) as our DDS spectrometer is now faster and particularly suitable for unstable species. We also have more experience with analyzing Coriolis interaction from tunnelling motion.^b. The new spectroscopic results will be presented. Its presence in ISM will also be discussed. *This work was supported by the CNES and the Action sur Projets de l'INSU, PCMI.*

^aMøllendal, H.; *et al.*, 2012, *J. Phys. Chem. A* **116**, 4047

^bMargulès, L.; *et al.*, 2017, *A&A* **601**, A50