

SUBMILLIMETER WAVE INVESTIGATION OF TWO FORMAMIDE ISOMERS: FORMALDOXIME (CH<sub>2</sub>NOH) AND NITROSOMETHANE (CH<sub>3</sub>NO)

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The knowledge of synthetic routes of complex organic molecules is still far to be fully understood. The creation of reliable models is particularly challenging. Hollis et al.<sup>a</sup> pointed out that the observations of molecular isomers provides an excellent tool to evaluate the hypothesis of the synthetic pathways. Formamide (HC(O)NH<sub>2</sub>) is an abundant molecule in ISM detected in 1971 in SgrB2<sup>b</sup>. Since formaldoxime and nitrosomethane are two isomers of formamide, they are interesting ISM targets. Up to now the spectroscopic studies are only available up to 40 GHz<sup>c</sup>. We reinvestigated the spectra of both isomers in the submillimeterwave domain in order to provide more accurate prediction to permit their possible detection in ISM. These two molecules are not commercially available and should be synthesized. The spectra were recorded in Lille from 150 to 660 GHz. In the region below 500 GHz we used the new Fourier transform millimeter-wave (FTmmW) spectrometer system based on DDS particularly suitable for unstable species<sup>e</sup>. Both analysis are not obvious, formaldoxime has a small dipole moment value: 0.2 Debye, giving weak transitions in the observed spectra. Concerning nitrosomethane, the methyl top internal rotation should be taken into account, therefore the analysis is performed using the version of RAM36 coded which includes the treatment of the nuclear quadrupole hyperfine structure<sup>f</sup>. The first spectroscopic results will be presented. *This work was supported by the CNES and the Action sur Projets de l'INSU, PCMI.*

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<sup>a</sup>Hollis, J. M.; *et al.*, 2006, *ApJ* **642**, 933

<sup>b</sup>Rubin, R. H. ; *et al.*, 1971, *ApJ* **169**, L39

<sup>c</sup>Kaushik V. K. ; *et al.*, 1978, *J. Phys. Soc. Jap.* **45**, 1975

<sup>d</sup>Turner P. H. *et al.*, 1978, *J. Chem. Soc., Faraday Trans. 2* **74**, 533

<sup>e</sup>Zou L.; *et al.*, 2019, 74<sup>th</sup> ISMS, Champaign USA **FB04**

<sup>f</sup>Ilyushin, V.V. *et al*, 2010, *J. Mol. Spectrosc.* **259**, 26