SPECTROSCOPY OF A MAJOR COMPLEX ORGANIC MOLECULE: MONO-DEUTERATED DIMETHYL ETHER

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Dimethyl ether is one of the most abundant molecule in star-forming regions. Like other complex organic molecules, its formation process is not yet clearly established. The study of deuteration may provide crucial hints.[a]

The mono-deuterated species (CH_2DOCH3) is still a relatively light molecule; its spectrum is the most intense in the THz domain even at ISM temperatures (100–150 K). Therefore, it is is necessary to measure and assign its transitions in this range in order to be able to compute accurate predictions which should allow us to detect it with ALMA, expected to be a powerful tool to observe such isotopic species. In this context, spectra between 50 and 950 GHz were recorded in Lille with a solid-state submillimeter-wave spectrometer.

The starting point of the analysis was the centimeter-wave measurements carried out in 2003 for almost all isotopic species.[b] Results concerning the symmetric conformer of the mono-deuterated species will be presented in the paper. The fits performed with the ERHAM code[c] will be discussed. Theoretical development are in progress in order to treat the case of the asymmetric conformer.

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[a] Ceccarelli, Caselli, Herbst, *et al.,* (eds.), University of Arizona Press, Tucson, **951** (2007) 47

[b] Niide *et al., J. Mol. Spectrosc.* **220** (2003) 65

[c] Groner, *J. Chem. Phys.* **107** (1997) 4483