

Microwave spectroscopy characterization of small organic rings

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Laboratory characterization of the molecular spectroscopic features is one of the necessary steps in the way of the identification of new species in extra-terrestrial environments.

The free jet millimeter wave Stark modulated absorption spectrometer, located in the Chemistry Department of the University of Bologna, allows for the observation of the rotational spectra of systems with molecular weight up to about 200 a.m.u. in the 52-74.4 GHz frequency region.

The experimental work is strongly supported and complemented by the theoretical modeling and calculations with the aim of assigning the observed spectra and to obtain information on the molecular dynamics which involve, for example, conformational rearrangements, large amplitude motions, vibro-rotational coupling and the prediction of vibrational spectra.

We will illustrate some experimental studies on flexible five membered ring organic molecules and their 1:1 molecular complexes with water.

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