

THE MILLIMETERWAVE SPECTRUM OF SUCCINONITRILE

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Only two dinitriles, the protonated cyanogen NCCNH^+ and one isocyanonitrile, NCNC have been detected in the interstellar medium (ISM) among about 200 other compounds, despite nitriles constitute almost 20% of the molecules observed in the interstellar medium. The lack of detections of dinitriles may be explained by the lack of accurate spectroscopic data on their rotational spectra since most of them do not present permanent dipole moment. Succinonitrile, $\text{NCCH}_2\text{CH}_2\text{CN}$ is one of the simplest dinitriles and it could be a candidate molecule to be observed in the ISM. The rotational spectrum for succinonitrile has been previously observed in the 2-78 GHz frequency region by Jahn *et al.*,^a but these measurements were limited to the ground state. In this talk we report the study of succinonitrile and its low lying excited vibrational states using a newly built broadband Fourier transform millimeter wave spectrometer^b equipped with Q-band (31.5-50 GHz) and W-band (72-116 GHz) receivers, similar to those used in the radio-telescopes. The spectrometer is well suited for high resolution emission spectroscopy of molecules of astrophysical importance.

^aM. K. Jahn, J.-U. Grabow, P. D. Godfrey and D. McNaughton, *Phys.Chem.Chem.Phys.*, **2014**, *16*, 2100.

^bJ. Cernicharo *et al.*, *A&A*, **2019**.