

AN ANALYSIS OF THE ROTATIONAL SPECTRUM OF ACETONITRILE (CH_3CN) IN EXCITED VIBRATIONAL STATES

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Acetonitrile (CH_3CN) is a well-known interstellar molecule whose vibrationally excited states need to be accounted for in searches for new molecules in the interstellar medium. To help catalog such 'weed' molecules, we have developed a technique that involves recording complete spectra over a range of astrophysically significant temperatures. With such a data set, we can experimentally measure the line strengths and lower state energies of unassigned lines in the spectrum.

In this talk we will present the ongoing analysis of complete temperature resolved spectra in the 215–265 GHz and 570–650 GHz regions. We have been able to assign many vibrationally hot lines from this data and a room temperature data set spanning 165–700 GHz. To date, we have assigned lines from most of the vibrational states below ν_6 at 1448 cm^{-1} .