FOURIER TRANSFORM EMISSION SPECTRA OF THE 4051 Å BAND OF C_3

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C_3 is an important molecule in astrophysics. Its spectra serves as probes into physical conditions (e.g. density, temperature) of astronomical objects such as carbon stars, interstellar clouds and comets. The (000)-(000) band of the 4051 Å band ($A\ ^1\Pi_u - X\ ^1\Sigma_g^+$) of C_3 was recorded in emission with a Bruker IFS 120HR Fourier transform spectrometer at University of Waterloo. The band was excited by a microwave discharge in iso-propanol diluted in helium. This band was also re-examined by recent cavity ring down spectroscopy by McCall et al.[a] They observed low temperature spectrum of this band using a supersonic expansion source and showed the R(0) transition was incorrectly assigned in the previous laboratory work. Analysis of our new spectrum combined with the data by McCall et al. confirmed the lower J levels in the A state were perturbed as reported by Gausset et al.[b] The unidentified lines observed by McCall et al. can be identified to be extra transitions due to the perturbing state. Investigation into nature of the perturbation will be presented.

[a] B.J. McCall, R.N. Casaes, M. Ádámkovics and R.J. Saykally, *Chem. Phys. Lett.* **374**, 583-586 (2003)
[b] L. Gausset, G. Herzberg, A. Lagerqvist and B. Rosen, *Astrophys. J.* **142**. 45-76 (1965)