

THE MM-WAVE ROTATIONAL SPECTRUM OF GLYCOLIC ACID

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Glycolic acid, HOCH₂COOH is the simplest α -hydroxy acid. It is as yet undetected in the interstellar medium, but is known to be present in carbonaceous meteorites and in residues from UV-photolysed interstellar ice analogue mixtures. Prior rotational spectroscopy has been carried out up to 40 GHz for the main, *SSC* conformer, ^{a,b} and up to 72 GHz for the weaker, *AAT*, conformer.^c

Presently we report the analysis of the rotational spectrum of glycolic acid on the basis of broadband measurements performed up to 318 GHz, and updated spectroscopic constants for the ground state and the first two excited states of the low-frequency ν_{21} torsional mode. We have used the AABS package to assign multiple further excited vibrational states of the *SSC* conformer. In particular, we have been able to assign the highly perturbed triad of ν_{14} , ν_{20} and $3\nu_{21}$ states. The triad has been fitted down to experimental accuracy with a coupled fit, which allowed us to pin down the hitherto elusive frequency of the ν_{21} mode. The experimental results make an interesting comparison with those of anharmonic force field calculations. We have also been able to extend the measurements for the *AAT* conformer.

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