MICROWAVE MEASUREMENTS OF CYCLOPROPANECARBOXYLIC ACID AND ITS DOUBLY HYDROGEN BONDED DIMER WITH FORMIC ACID*

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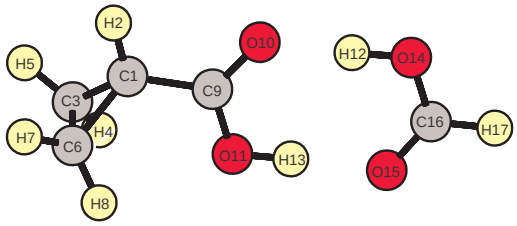

The microwave spectra were measured for cyclopropanecarboxylic acid (CPCA), an excited state conformer of CPCA and a doubly hydrogen bonded dimer formed with formic acid (FA) using a pulsed-beam Fourier transform microwave spectrometer. The rotational constants were determined from the spectra and were used to obtain a best fit gas phase structure of both CPCA and CPCA-FA using a nonlinear least squares fitting program. We obtained the C-C bond lengths in the cyclopropane ring for CPCA and the hydrogen bond distances for the CPCA-FA dimer. For CPCA-FA, there was no evidence of a concerted double proton tunneling motion as singlet b-type transitions were observed. The absence of the tunneling motion is most likely due to the asymmetry of the dimer. The excited stated conformer of the CPCA-FA dimer was also searched for, but was also not observed.

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