MICROWAVE INVESTIGATION OF THE GROUND AND FIRST EXCITED TORSIONAL STATES OF ACETIC ACID MONOHYDRATE.

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Rotational spectra of $CH_3COOH$-$H_2O$ and $^{13}CH_3COOH$-$H_2O$ have been observed by Fourier transform microwave spectroscopy. A total of 14 A state and 13 E state transitions have been analyzed. The resulting rotational constants are consistent with a structure similar to that of acetic acid dimer, where the water moiety forms a primary hydrogen bond with the carboxylic acid proton and a secondary hydrogen bond with the carbonyl oxygen. The barrier to internal rotation of the methyl group was determined to be 138.45(3) $cm^{-1}$, which represents a decrease of 18.7% when compared with that of the acetic acid monomer.