REINVESTIGATION OF THE MICROWAVE SPECTRUM OF ACETAMIDE

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About 50 jet-cooled Fourier transform lines for acetamide have been recorded using a new version of our spectrometer, which has been upgraded with a heated nozzle and an expanded automatic scanning range. Nuclear quadrupole hyperfine structure arising from the nitrogen atom was removed theoretically to yield hyperfine-free center frequencies. In addition, about 30 submillimeter measurements were carried out. When hyperfine structure was observed for these lines, it was also removed theoretically. A set of 115 A-species and E-species rotational transitions in the torsional ground state, obtained by combining our new measurements with the literature data, have been fit to a model involving 28 torsion, rotation, and torsion-rotation interaction parameters to near experimental uncertainty (i.e., to a weighted unitless standard deviation of 1.5), significantly improving on previous fits. Various theoretical problems associated with K labels for E-species levels arise in this very low barrier molecule, requiring a variant of the signed K_a labels frequently used for internal-rotor E states.