

LARGE AMPLITUDE MOTIONS IN THE S_1 STATE OF ACETALDEHYDE

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Acetaldehyde is of great interest because of its two large amplitude motions, CH_3 internal rotation and pyramidal deformation (mainly C-H wagging), and there have been extensive spectroscopic studies so far ^{a b c d e f}. In order to accurately investigate the vibrational and rotational levels in the $S_1(n, \pi^*)$ state, rotationally-resolved high-resolution fluorescence excitation spectra were measured by crossing a cw single-mode UV laser beam perpendicular to a collimated molecular beam. The absolute wavenumber was calibrated with accuracy 0.0002 cm^{-1} by measurement of the Doppler-free saturation spectrum of iodine molecule and fringe pattern of the stabilized etalon. The acetaldehyde molecule is pyramidal in the $S_1(n, \pi^*)$ state, and interactions between the vibrational modes are significant. Our final goal is to perform a global fit of observed rotational transitions and to accurately analyze each interaction.

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