MICROWAVE SPECTROSCOPY OF *TRANS*-ETHYL METHYL ETHER IN THE GROUND STATE

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The *trans*-ethyl methyl ether molecule ($CH_3CH_2OCH_3$) has two inequivalent methyl group internal rotors which corresponds to the two vibrational motions, ν_{28} and ν_{29}. Due to these internal rotations, a rotational transition could be split into maximum five components. The skeletal torsion (ν_{30}) is another low-lying state (ν_{30}) that interacts with the ν_{28} and ν_{29} modes. The microwave spectra of the *trans*-ethyl methyl ether molecule in the ν_{28} = 1 [a], ν_{29} = 1[b] , and ν_{30} = 1[c] , 2 and 3[d] have been extensively studied by using Hougen's tunneling matrix formalism. The microwave spectroscopy in the ground state was studied by several groups [e, f, g, h]. The splitting due to the ν_{28} mode (C-CH_3 internal rotation) is small in the ground state and was not fully resolved in most of the previous studied rotational transitions.

In this paper, we report the results of the pulsed nozzle-jet Fourier transform microwave spectroscopy so as to measure the fully resolved spectra. The submillmeter wave spectroscopy was also carried out. Our analysis including the previously reported transitions would be useful for astronomical observations.

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