THE MILLIMETER SPECTRUM OF METHYL ACETATE

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The millimeter rotational spectra of methyl acetate, CH_3COOCH_3, has been acquired and assigned over the 225 - 360 GHz region. The presence of two internal rotors, one of relatively low barrier ($\sim$100 cm^{-1}) and one of higher barrier ($\sim$425 cm^{-1}), make fitting difficult, though assignments have been made using a program written by Peter Groner[a]. Methyl acetate is possibly synthesized through multiple reaction pathways from molecules previously detected in hot cores, most notably from acetic acid and methanol via esterification. Esterification beyond the formation of methyl formate has not yet been observed in the interstellar medium. Consequently, we have begun searches for methyl acetate in cores where acetic acid has been found, using the results of the laboratory studies presented here. If detected, methyl acetate, consisting of 11 atoms, would be one of the larger complex organic molecules discovered in the interstellar medium and could point to previously unconsidered reaction mechanisms.

[a]Groner, P., "Effective rotational Hamiltonian for molecules with two periodic large-amplitude motions," *J. Chem. Phys.* **1997**, 107, 4483-4498.