ROTATIONAL ANALYSIS OF THE MM-WAVE SPECTRUM OF THE LOWEST TWO TORSIONAL EXCITED STATES OF DIMETHYL ETHER, CH_3OCH_3

P. GRONER, *Department of Chemistry, University of Missouri - Kansas City, Kansas City, MO 64110*; S. ALBERT, E. HERBST and F. C. DE LUCIA, *Department of Physics, Ohio State University, Columbus, OH 43210*.

The rotational spectra of the two lowest torsional excited states of dimethyl ether were investigated between 262 and 323 GHz with the new fast scan submillimeter spectroscopic technique (FASSST). Initial assignments of R- and Q-transitions were based on the analysis of the microwave data[a] with an effective rotational Hamiltonian[b] and on the ρ and β parameters from the vibrational ground state. Further assignments were made as the analysis progressed. The splitting between the torsional sublevels is about 30 times larger than in the ground state. Transitions involving energy levels up to $J = 40$ and $K_a = 6$ were assigned. The frequencies could be fit to a dimensionless standard deviation of about 2.5.

[a] J. R. Durig, Y. S. Li and P. Groner, J. Mol. Spectrosc. (1976) 62, 159-174; H. Lutz and H. Dreizler, Z. Naturforsch., Part A (1978) 33, 1498-1510.
[b] P. Groner, submitted.