ROTATIONAL SPECTRA AND INTERNAL ROTATION OF 1,1,1,2,2-PENTAFLUOROPROPRANE AND 2,2,2-TRIFLUOROETHYLMETHYLETHER

N. SAKAKIBARA, K. FUCHIGAMI, Y. TATAMITANI, T. OGATA, *Department of Chemistry, Faculty of Science, Shizuoka University, Shizuoka, Japan 422-8529*.

The rotational spectra of $CF_3CF_2CH_3$ and *trans*- and *gauche*-$CF_3CH_2OCH_3$, constitute alternative compounds to the CFCs, have been studied by microwave spectroscopy. The spectra were measured using Stark modulation and Fourier-transform microwave spectrometers at Shizuoka University. Both molecules exhibited the spectrum due to many excited states of the CF_3 torsion. Accurate rotational constants and quartic centrifugal distortion constants have been obtained for the ground and torsional excited states up to v = 3. The barrier heights to internal rotation of the CF_3 top have been determined for these molecules. Reasonable molecular structures have been derived from the observed rotational constants and were compared with those of *ab initio* calculations of GAUSSIAN MP2/6-311G** level.