# INTERNAL ROTATIONS OF METHYL PIVALATE BY ROTATIONAL SPECTROSCOPY

NOBUHIKO KUZE, YOSHIYUKI KAWASHIMA, *Department of Materials and Life Sciences, Sophia University, Tokyo, Japan*.

The rotational spectrum of methyl pivalate ($t$-BuC(O)OCH$_3$) in the ground vibrational state was observed by molecular beam-Fourier transform microwave spectroscopy. Observed spectral lines for normal species as well as five $^{13}$C-isotopomers were mainly assigned to the $b$-type rotational transitions. Some high-$K_a$ lines were found to be split and we have interpreted these splittings in terms of the internal rotation of the methyl group. Some forbidden transitions were also observed for normal species in case where $K_a = 2$ levels were involved in the internal rotation with $E$ state. The analysis of the observed spectra was carried out by using the XIAM program and thus determined potential barrier $V_3$ to CH$_3$ internal rotation was 5.1 kJ mol$^{-1}$. Since gas electron diffraction study for this molecule shows the large-amplitude motion of the $t$-Bu group, we are observing the further spectral splittings from the rotational spectra. We are also trying to observe the $^{18}$O-isotopomers.