HIGH PRECISION MEASUREMENT OF C-O STRETCHING BAND OF CH$_3$OH USING CO$_2$ LASER SIDEBANDS

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Microwave sidebands of CO$_2$ laser lines have been used as an infrared power source to measure the sub-Doppler vibration-rotation frequencies of CH$_3$OH in the C-O stretching band precisely. More than one hundred frequencies of CH$_3$OH have been measured. Over thirty groups of unresolved lines in the Fourier-transform spectrum have been resolved. Combined with our previous infrared-microwave double resonance results$^a$ and the ground state ($t_{100} = 0$) term values given in literature$^b$, many term values of CH$_3$OH in the $t_{100} = 1$ stretching states have been refined. For A species in $t_{100} = 1$, 22 asymmetry splittings for various $K$ in $t_{00} = 0$ and 1 have been observed for the first time. The present results provide precision data to refine the molecular constants in the first excited C-O stretching state of CH$_3$OH.
