HIGH PRECISION MEASUREMENT OF C-O STRETCHING BAND OF CH_3OH USING CO_2 LASER SIDEBANDS

Z. D. SUN, F. MATSUSHIMA, S. TSUNEKAWA, and K. TAKAGI, *Department of Physics, Toyama University, Toyama 930-8555, Japan.*.

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_3OH in the C-O stretching band precisely. More than one hundred frequencies of CH_3OH 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 (v_{co} = 0) term values given in literature[b], many term valves of CH_3OH in the v_{co} = 1 stretching states have been refined. For A species in v_{co} = 1, 22 asymmetry splittings for various K in v_t = 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_3OH.

[a]Z. D. Sun, S. Ogura, F. Matsushima, S. Tsunekawa and K. Takagi, paper RA08 at the "53rd Ohio State University International Symposium on Molecular Spectroscopy", Columbus, Ohio (1998).

[b]G. Moruzzi, B. P. Winnewisser, M. Winnewisser, I. Mukhopadhyay, and F. Strumia, *Microwave, infrared and laser transitions of methanol*, (CRC Press, Inc. 1995).