FAR-INFRARED LASER STARK SPECTROSCOPY OF METHANOL ISOTOPOMERS

M. JACKSON, G. R. SUDHAKARAN, *Department of Physics, University of Wisconsin, La Crosse, WI 54601*; A. SILVEIRA Jr., *Department of Chemistry, SUNY at Oswego, Oswego, NY 13126*; I. MUKHOPADHYAY, *Laser Programme, Centre for Advanced Technology, Indore, India, 452 013*; and R. M. LEES, *Department of Physics, University of New Brunswick, Fredericton, N.B., Canada E3B 5A3*.

The Stark spectra of several methanol isotopomers (CH_3OD, $^{13}CD_3OH$, CD_3OH, and CD_3OD) have been investigated in the far-infrared region using the HCN and DCN lasers. The spectra were recorded at room temperature for both parallel and perpendicular polarizations using electric fields up to 60 000 V/cm. Numerous transitions have been observed with these laser lines for all isotopomers. The following transitions will be presented: for CH_3OD, $J_K = 6_4 \leftarrow 5_3\ E_2\ v_t = 0$, $J_K = 18_1 \leftarrow 18_0\ E_2\ v_t = 1$, $J_K = 14_6 \leftarrow 13_5\ A\ v_t = 1$; for $^{13}CD_3OH$, $J_K = 18_2 \leftarrow 17_1\ A^-\ v_t = 0$; and for CD_3OH, $J_K = 14_1 \leftarrow 15_0\ E_2\ v_t = 1$.

Analysis of the recently recorded FTFIR spectra for CD_3OD has yielded accurate zero-field frequencies belonging to the Q-branch multiplet for $K = 11 \leftarrow 10\ E_2\ v_t = 0$. By combining these results with the previously reported Stark fields for the $J = 11$ through 19 members, we have determined the electric dipole moment of this important molecular species for the first time.