

THE SPECTRAL STUDY OF THE OH (ν_1) + CH (ν_3) STRETCH COMBINATION BAND OF JET-COOLED METHANOL

SHUCHENG XU and DAVID S. PERRY, *Department of Chemistry, University of Akron, Akron, OH 44325.*

The rotationally resolved overtone spectrum of the OH (ν_1) + CH (ν_3) stretch combination band of methanol between 6510 and 6550 cm^{-1} has been recorded at sub-Doppler resolution by continuous-wave cavity ringdown spectroscopy (CW-CRDS). Of 572 recorded lines, 358 lines have been assigned by ground state combination differences, including the 21 subbands with $J' = 0-8$ and $K' = 0-3$. The perturbations of $E K' = -1, -2,$ and -3 levels have been observed and deperturbations have been carried out. The torsion-rotational constants in the upper state, obtained by fitting the observed spectrum to the Herbst Hamiltonian, are in a reasonable agreement with the predicted values based on the constants of the fundamental bands, ν_1 and ν_3 . This combination band has fewer perturbations than the fundamental ν_1 , and the coupling matrix elements are smaller, 0.02 to 0.66 cm^{-1} as compared to 0.35 to 1.6 cm^{-1} .