INFRARED AND MICROWAVE-INFRARED DOUBLE RESONANCE SPECTROSCOPY OF METHANOL EMBEDDED IN SUPERFLUID HELIUM NANODROPLETS

PAUL L. RASTON AND WOLFGANG JÄGER, *Department of Chemistry, University of Alberta, Edmonton, Alberta T6G-2G2, Canada*.

Methanol is one of the simplest torsional oscillators, and has been extensively studied in the gas phase by various spectroscopic techniques. At 300 K, a large number of rotational, torsional, and vibrational energy levels are populated, and this makes for a rather complicated infrared spectrum which is still not fully understood. It is expected that in going from 300 K to 0.4 K (the temperature of helium nanodroplets) that the population distribution of methanol will collapse into one of two states; the J,K = 0,0 level for the A symmetry species, and the J,K = 1,-1 level for the E symmetry species. This results in a simplified spectrum that consists of narrow a-type lines and broader b-type lines in the OH stretching region. Microwave-infrared double resonance spectroscopy is used to help assign the a-type infrared lines.