OVERTONE AND COMBINATION BAND SPECTROSCOPY OF JET COOLED METHANOL


Overtone spectra of jet-cooled methanol have been recorded from 5,000 to 14,000 cm\(^{-1}\) using Infrared Laser Assisted Photofragment Spectroscopy (IRLAPS) for the detection of the vibrationally excited molecules. In addition to the OH stretch overtones (\(\nu_a\)), the major components of the spectra are the overtones of the CH stretch (up to \(5\nu_{CH}\)) as well as combinations of the OH stretch with the CO stretch (\(\nu_a + \nu_C\)), the COH bend (\(\nu_a + \nu_B\)), and both (\(\nu_a + \nu_C + \nu_B\)). These data, together with photoacoustic data [1] up to 18,250 cm\(^{-1}\) and previously reported IRLAPS data [2] up to 22,166 cm\(^{-1}\), have been fit to an anharmonic Hamiltonian. In this Hamiltonian, the CH stretch vibrations are treated as a pair of local modes, \(\nu_a\) and \(\nu_b\), for \(\nu_{CH} = 3\) and higher. The other modes are treated as the usual normal vibrations.