EXTENDED ASSIGNMENTS, VIBRATIONAL COUPLING, AND MODELING FOR THE C-O STRETCH BAND OF CH_3OH

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The Fourier transform spectrum of the CO-stretching fundamental of CH_3OH has been re-examined at higher pressure and path length than heretofore in a study of the lower modes over the 930-1400 cm^{-1} region. With the increase in spectral sensitivity, it has been possible to assign a significant number of new subbands for torsionally excited ν_t = 1 and ν_t = 2 substates, plus some high-K subbands for the ν_t = 0 torsional ground state. Assignments have also been extended to higher J for most of the previously known subbands. We have observed a number of new J-localized resonances arising from level-crossings with other torsion-vibration modes. The partner levels have been identified and the interactions characterized for some of the resonances, while others remain mysterious. We are exploring the extent to which the unperturbed CO-stretching levels can be modelled by an effective Hamiltonian of the multi-parameter type used successfully to fit the ground state. So far, 1620 lines have been fitted with a weighted standard deviation of 100 corresponding to a mean residual of approximately 0.02 cm^{-1}, still some distance from experimental uncertainty.