

HIGH RESOLUTION JET-COOLED INFRARED ABSORPTION SPECTRA OF FORMIC ACID DIMER: A REINVESTIGATION OF THE FERMI-TRIAD SYSTEM IN THE C-O STRETCHING REGION

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High resolution jet-cooled absorption spectra of the formic acid dimer (HCOOH)₂ have been measured in the C-O stretching region at 1215-1240 cm⁻¹ using a rapid-scan tunable diode laser spectrometer. Three vibrational bands of (HCOOH)₂ have been assigned unambiguously. They were interpreted as the Fermi-triad system consisting of the ν_{22} fundamental band and two combination bands in a previous low-resolution study [F. Ito, Chem. Phys. Lett. 447, 202(2007)]. The spectral coverage in the high-resolution study of the middle band [M. Ortlieb and M. Havenith, J. Phys. Chem. A. 111, 7355(2007)] were extended. These three vibrational bands were analyzed together using a standard rigid rotor Watson A-reduced Hamiltonian without explicit consideration of the perturbation among three vibrationally excited states. The perturbed energies for three vibrationally excited states are 1219.71637(20), 1225.34666(15), and 1233.95863(17) cm⁻¹, respectively.