USING VIBRATIONAL SPECTROSCOPY TO STUDY CHEMICAL DYNAMICS IN GASES AND LIQUIDS

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Vibrational spectroscopy is a powerful tool for studying the chemical dynamics of vibrationally excited molecules. It provides insights into the couplings within a molecule and a description of the initial states prepared by excitation of fundamental or overtone vibrational transitions. The rovibrational structure of electronic transitions is often a means of determining populations of individual states of products and, hence, of inferring the detailed reaction dynamics. Experiments using ultrafast lasers are a means of probing chemical dynamics directly in the time domain, a particularly useful approach in solutions, and analysis of such experiments often rests on insights from frequency domain measurements.