Diploma thesis abstract

The effect of solvent on molecular oscillations in terahertz region

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The problem of the low-frequency (LF) oscillations (< 200 cm^{-1}) is of great importance in a context of the relation between these oscillations and functions of macromolecules. In particular, the mechanisms of these oscillations in a water environment are of great interest. The damping of LF resonances in aqueous media is considered as a result of hydrogen bonding. It is difficult to describe hydrogen-bond interactions using simple theoretical models. Thus, there is a reason to experimentally observe hydrogen-bonding between simple molecules, convenient for theoretical descriptions.

In this work Raman spectra of model substances (1,1,2,2-tetrachloroethane and 1,1,2,2-tetrabromoethane) in two different solvents: making hydrogen bonds with substances (dimethylsulfoxide) and non-hydrogen bonded (carbon tetrachloride) in the were recorded in the LF region. Raman spectra of acetamide aqueos solutions were measured.

The observed spectral changes, corresponding to different relative concentrations of components. are discussed. Theoretical estimation of the effect of solvent on LF parameters of model substance is proposed.