THE STUDY OF INTERMOLECULAR INTERACTIONS IN LIQUID BUTYRIC ACID AND ITS SOLUTIONS BY RAMAN SPECTRA

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Parallel and perpendicular polarized components of C=O vibrations Raman spectra for butyric acid differ from each other in some details. This difference as well as a complicated shape of bands in both polarizations are related to the availability of H-aggregates of different composition in liquid acid. Under strong dilution of acid in CCl_4, closed dimer formations are significantly preserved. Strong proton-acceptor solvents (dimethylsulfoxide, pyridine, acetonitrile) efficiently destroy the dimer and other aggregated formations from acid molecules and at the strong dilution, only the band corresponding to free vibrations of C=O group remains in the spectrum. At the dilution in aqueous solutions, at comparable concentrations of components the band shape is complicated, but at strong dilution of acid only one line with ν=1711 cm^{-1} and with halfwidth 63 cm^{-1} remains, which means that at these concentrations, the associations of only one type are mainly preserved in mixture. The structural changes in water at 0.05 mole fraction of acid assigned by us to Rayleigh scattering are not accompanied by the change in aggregation type of different molecules.