

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

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Raman spectra of C-H (C-D) and C-Cl vibrations band in chloroform and its mixtures with neutral and proton acceptor solvents were studied. There is the difference in bands' maximum positions for C-H (C-D) vibrations in parallel ($I_{\parallel}(\nu)$) and perpendicular ($I_{\perp}(\nu)$) polarized components in pure liquid $\Delta\nu \sim 1,5 \text{ cm}^{-1}$ ($\Delta\nu \sim 1,1 \text{ cm}^{-1}$). This difference is smaller in mixtures with neutral and proton acceptor solvents. This fact as well as the presence of band's asymmetry and peculiar trend of depolarization ratio within the band for CHCl_3 testifies about C-H (C-D) vibrations band complexity, which is conditioned by intermolecular hydrogen bond in pure liquid. This conclusion is confirmed by quantum-chemical calculations.

In strong proton acceptor solvents (pyridine, chinoline), the intermolecular hydrogen bond formation is displayed both on bands of proton acceptor and bands of C-H (C-D) vibrations, as well as on C-Cl vibrations band of chloroform.

The calculation of concentrational fluctuation function on a base of Rayleigh light scattering data for mixtures of CHCl_3 with acetonitrile and nitrobenzene shows that these solutions belong to the systems with negative deviation from ideality.