

The thesis describes investigation of two selected supramolecular systems by means of NMR spectroscopy and hydrodynamic calculations. The first system studied was inclusion complex of cryptophane-C with chloroform. Initially, the kinetics of complexation was determined. The measurements of longitudinal relaxation and heteronuclear Overhauser enhancement on carbon-13 nuclei revealed very large motional coupling between the host and the molecular guest bound inside the cavity. Hydrogen bonded clusters of ethanol in a non-polar solvent were the second system addressed. The diffusion coefficients of ethanol were measured in a broad temperature range (180 - 330 K) by means of NMR spectroscopy. The average cluster sizes dependent upon experimental conditions were determined. At low temperature (around 180 K), the cluster sizes vary from hexamer (0.16 M sample) to octamer or larger structures (1.4 M sample). On the other hand, the average cluster size at ambient temperature corresponds to trimer (1.4 M), pure monomer occurs in the less concentrated sample above 308 K. Experimental results for monomer are in excellent agreement with the calculated values.