

SELF-DIFFUSION PROCESSES IN DILUTED WATER-ALCOHOL SOLUTIONS

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S u m m a r y

The concentration and temperature dependences of both the self-diffusion coefficient of water molecules in diluted water-ethanol solutions and its collective part have been discussed. The cluster model of the solution structure is used to explain nontrivial features in the behavior of the self-diffusion coefficient which is considered as a sum of contributions given by water molecules located inside and outside the clusters. The law describing the dependence of the total self-diffusion coefficient on the ethanol concentration has been found. The collective part of the self-diffusion coefficient and the residence time of water molecules are demonstrated to increase with the ethanol concentration. A model of elementary water-ethanol cluster has been proposed and physically substantiated. A careful comparison of theoretical results with experimental ones on the molecular light scattering (MLS) and the incoherent scattering of thermal neutrons has been carried out.