# EFFECT OF IONIC ORDERING IN CONDUCTIVITY EXPERIMENTS OF DNA AQUEOUS SOLUTIONS

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S u m m a r y

The effects of ionic ordering in DNA water solutions are studied by conductivity experiments. The conductivity measurements are performed for the solutions of DNA with KCl salt in the temperature interval from 28 to 70 °C. The salt concentration varied from 0 to 2 M. The measurements of the conductivity of solutions without DNA but with the same concentration of KCl salt are also performed. The results show that, in the case of a salt-free solution of DNA, the melting process of the double helix is observed, while, in the case of the DNA solution with added salt, the macromolecule denaturation is not featured. For salt concentrations lower than some critical one (0.4 M), the DNA solution conductivity is higher than the conductivity of a KCl water solution without DNA. Starting from the critical concentration, the conductivity of a KCl solution is higher than the conductivity of a DNA solution with added salt. For the description of the experimental data, a phenomenological model is elaborated basing on electrolyte theory. In the framework of the developed model, a mechanism of counterion ordering is introduced. According to this mechanism the electrical conductivity of the system at low salt concentrations is caused by counterions of the DNA ion-hydrate shell. At an increasing the amount of salt to the critical concentration, counterions condense on the DNA polyanion. A further increase of the salt concentration leads to the formation of DNA-salt complexes, which decreases the conductivity of the system.