



ABOUT FORMATION OF THE “BOUND” WATER ON THE SURFACE OF FRACTAL CLUSTERS FROM NANOPARTICLES

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The problem of formation of the "bound" (nonfreezing) water in various materials is very important for a nanotechnology, a science of polymer, a membrane science etc. However, the theory of this phenomenon still at a development stage.

The model of formation of the "bound" water in fractal clusters consisting from nanoparticles has been offered. The connection between the degree of "bounded" hydration and concentration of nanoparticles in aqueous solution has been studied theoretically. Degree of "bounded" hydration has been defined as $m_{bw} / m_{np} = \theta$, where m_{np} - mass of nanoparticles in aqueous solution,

m_{bw} - amount of bound water. It has been established that degree of the “bound” hydration decreases as the power function (scaling law) with increasing of concentration the nanoparticles in aqueous solution. It is shown that the exponent of the power function is defined by a surface and morphology of fractal clusters and also by kinetic mechanisms of aggregation and disintegration of nanoparticles.