

Nanostructured surfaces

Formation and properties of the novel surface-grafted polymer brushes based on the poly(pentaerythrityl monomethacrylate)

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In the last years a trend of modification of surfaces by stimuli-responsive polymers has been developed [1]. These polymers change their surface properties under the action of environmental factors, for example, temperature, light, pH etc. This work is devoted to the forming of the novel temperature-responsive polymer nanolayers based on poly(pentaerythrityl monomethacrylate), onto glass surfaces.

Usage of thermo responsive polymers with functional hydroxyl groups offers two advantages. Firstly, they have, as a rule, a low toxicity. Secondly, these polymers can be partly modified after polymerization process to change their lower critical solution temperature point, as well as can give new properties for polymer systems.

The structure, morphology and properties of the grafted nanolayers at different temperatures were investigated by a number of physic-chemical methods: TOF-SIMS, AFM, ellipsometry and measuring of contact angles of moistening. Protein adsorption onto modified surfaces was investigated.

The obtained surfaces are promising for creation of “smart” implants, systems of controlled interaction with proteins and biosensor systems.

1. *Zhai L. Stimuli-responsive polymer films // Chem. Soc. Rev. -2013. -42.- P. 7148–7160.*