Adsorption of polymers onto selective mixed brushes. A.I CHERVANYOV, G. HEINRICH, Leibniz-Institut fur Polymerforschung Dresden, Hohe Str. 6, 01069 Dresden, Germany — Reversible adsorption of polymers onto selective mixed brushes is studied theoretically. Mixed brushes are recently developed self-adoptive materials that reversibly change their morphology in response to altering external factors (e.g. quality of the solvent). The above changes in the morphology result in the formation of different patterns on the outer surface of the brush. It is shown that thus achieved patterning of the adsorbing surface of the mixed brush drastically enhances the adsorption of polymers, as compared to the adsorption onto the homogeneous brush surface. The density profiles and absorbances of the selected homo- and co-polymers are calculated for the three different morphologies ('ripple', 'dimple' and random) of the binary brush. The interplay between conformational entropy and binding energy of the adsorbed polymer leads to the reach adsorption-desorption behavior that is described by the developed theory. The calculated isotherms are compared with the experimental data and Monte-Carlo simulation results. In addition, the developed theory is applied to the study of the polymer adsorption onto the non-uniform binary brush in the presence of the gradient of chemical composition.

Alexander Chervanyov

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