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Theory of the adsorption of polymers onto chemically non-uniform surfaces with applications to the polymer adsorption onto the mixed brushes.[1] ALEXANDER CHERVANYOV, GERT HEINRICH, Institute for Polymer Research Dresden, Hohe Str. 6, 01069 Dresden, Germany — By developing the self-consistent perturbation expansion we theoretically study the adsorption of polymers onto the chemically non-uniform planar surfaces. The present theory deals with both regularly and randomly patterned surfaces having the position-dependent affinity for polymers. We predict that chemical non-uniformity of the surface dramatically enhances the overall affinity of this surface for polymers. The corresponding effective adsorption potential is calculated as a function of the periodicity of the surface-to- the size of polymer ratio and the excluded volume parameter. The obtained results are applied to the study of the adsorption of polymers onto the selective binary brushes that assume different morphologies. As a main result of the study, we demonstrate that the reversible switching from random to 'ripple' microphase of the binary brush results in the significant enhancement of the adsorption ability of this brush.

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