



Properties of polyelectrolyte–surfactant complexes obtained by polymerization of an ionic monomer in a solution of an oppositely charged surfactant

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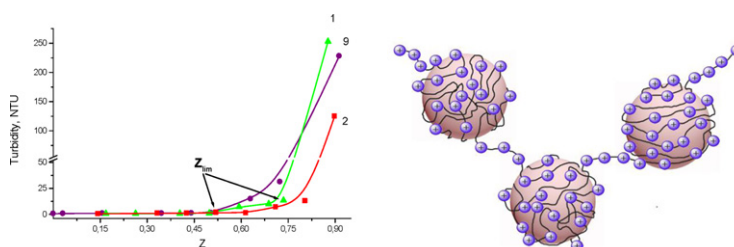
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HIGHLIGHTS

- ▶ A new way of synthesis of polyelectrolyte–surfactant complexes is described.
- ▶ The properties of resultant polyelectrolyte–surfactant complexes were studied.
- ▶ The resultant polyelectrolyte–surfactant complexes are enriched with surfactant ions.
- ▶ The resultant polyelectrolyte–surfactant complexes are very stable.
- ▶ Their structures differ from complexes structure obtained by mixing.

GRAPHICAL ABSTRACT



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ABSTRACT

Properties of polyelectrolyte–surfactant complexes obtained by template polymerization of an ionic monomer in a micellar solution of an oppositely charged surfactant were studied using nephelometric turbidity measurement, polyelectrolyte titration and dynamic light scattering. It was shown that their properties differ from properties of polyelectrolyte–surfactant complexes obtained by mixing of solutions of a polyelectrolyte and a surfactant. A template polymerization as a synthesis way of polyelectrolyte–surfactant complexes makes it possible to obtain water-soluble complexes noticeably enriched with surfactant ions, as compared to the complexes formed by mixing due to the difference in complex structures.

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1. Introduction

Complexes of polyelectrolytes with oppositely charged surfactants are spontaneously formed by mixing aqueous solutions of the components through an electrostatic interaction of oppositely charged groups of polyelectrolytes and surfactants and

hydrophobic interactions of aliphatic moieties of surfactant ions, which leads to their segregation and formation of a micellar phase in complex species [1,2]. The formation of a micellar phase into a macromolecule coil is a necessary condition of complex existence [3,4]. A characteristic feature of polyelectrolyte–surfactant complexes is the possession of a substantial solubilizing capacity for organic compounds of various classes, and just this detail enables their application in the fields of ecology [5–7], medicine [8] and technology [9]. Polymer complexes are commonly obtained through mixing of aqueous solutions of polyelectrolytes with

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