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Formation of protein/surfactant adsorption layer as studied by dilational surface rheologyBoris A. Noskov^{*}, Michael M. Krycki

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Abstract

The review discusses the mechanism of formation of protein/surfactant adsorption layers at the liquid – gas interface. The complexes of globular proteins usually preserve their compact structure at low surfactant concentrations. Therefore a simple kinetic model of the adsorption of charged compact nanoparticles is discussed first and compared with experimental data. The increase of surfactant concentrations results in various conformational transitions in the surface layer. One can obtain information on the changes of the adsorption layer structure using the dilational surface rheology. The kinetic dependencies of the dynamic surface elasticity are strongly different for the adsorption of unfolded macromolecules and compact globules, and have local maxima in the former case corresponding to different steps of the adsorption. These distinctions allow tracing the changes of the tertiary structure of protein/surfactant complexes in the surface layer. The adsorption from mixed solutions of ionic surfactants with β -casein, β -lactoglobulin, bovine serum albumin and myoglobin is discussed with some details.

Keywords: globular proteins, protein/surfactant complexes, protein unfolding, adsorption kinetics, dilational surface rheology, dynamic surface elasticity, dynamic surface tension

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