STUDY OF ADSORPTION MECHANISM OF CATIONIC SURFACTANTS BY BENTONITE FROM ASKAN DEPOSIT

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Abstract. Adsorption of cationic surfactants - dodecylammonium chloride and hexadecylpyridinium perchlorate from aqueous solutions by the natural bentonite from Askan deposit of Georgia was studied. The microstructural parameters and surfactant loading and distribution, were determined by X-ray diffraction and analysis of FT-IR spectra. The objective was to improve the understanding of the behaviour of surfactants when adsorbed by bentonite for its possible use as antimicrobial preparations. The adsorption constants from the Langmuir, Freundlich and Dubinin-Radushkevich equations were used to compare the adsorption of surfactants by bentonite. The obtained high values of the Gibbs free energy of adsorption indicate a high affinity of cationic surfactants to bentonite. The kinetics of the adsorption process was analysed using the kinetic models of pseudo-first and pseudo-second order, intrafilm diffusion, intraparticle diffusion of Boyd and Weber-Morris. It was found that the degree of adsorption from the studied surfactants by bentonite reaches 70-80%.

Keywords: cationic surfactant, bentonite, adsorption, kinetics.