

Nanocomposites and nanomaterials

Study of adsorption of the interaction of polimetakrilovoï acid with the surface modified titanium dioxide

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To adjust the properties of aqueous suspensions of oxides metals widely used polyelectrolytes, such as polymethacrylic acid.

The primary Act, which determines the effect of macromolecules on the inter phase interaction in disperse systems is their adsorption from solutions on a solid surface. Adsorption of polymethacrylic acid on dispersible particles of titanium dioxide and its significant influence on the properties of aqueous suspensions have been studied earlier. But the mechanism of adsorption is not studied before. We used the method of x-ray photoelectron spectroscopy for the study of adsorption of interaction on the verge of phase separation.

The study used a powder of titanium dioxide rutile type whose surface modified by inorganic oxides and organic compounds grafted to provide required properties and regulation of hydrophobic and hydrophilic balance polymethacrylic acid synthesized by free radical polymerization.

To detect changes in surface layers of particles of TiO_2 after their contact with the dispersed environment used "AXIS ULTRA" Kratos Analytical, England. The dry original titanium dioxide powder and samples from its water suspensions after adsorption polymethacrylic acid with different pH were analyzed.

From the area of the peaks of spectra with the relative factors of sensitivity and energy-dependent spectrometer-transmission functions, the composition of the surface area of the particles of titanium dioxide powder was defined.

It is established that during the adsorption of macromolecules the desorption from the surface of TiO_2 organic compounds adsorbed (nonspecifically) takes place. We determined that an increase in the pH of the environment leads to a decrease in the adsorption of macromolecules polymethacrylic acid.