Physico-chemical nanomaterials science

Adsorption and electrokinetic properties of the system containing the mixed oxide Cu_xO_y/SiO_2 and polyvinyl alcohol

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Mineral mixed oxides can be used in many industries due to their unique surface properties. So far, they were used as catalysts, fillers or dyes [1]. Surface oxides can be further modified by adsorption of a particular polymer. The knowledge of the adsorption and electrokinetic properties of the mixed oxide suspension in the presence of specific macromolecular compound is necessary to broaden the application possibilities of the mixed solids.

In this paper electrokinetic and adsorption properties of the system containing the mixed oxide Cu_xO_y/SiO_2 and polyvinyl alcohol (PVA) were examined. The surface charge density of the adsorbent in the absence and presence of polymer was determined by the potentiometric titration method. Zeta potential of the mixed oxide particles was measured using the microelectrophoresis phenomena. The PVA adsorption amount on the solid surface was determined by the difference of the polymer concentration in the solution before and after the adsorption process. Adsorption measurements were carried out as a function of the solution pH value.

The obtained results showed that the PVA adsorption level increase with the growth of copper content of the adsorbent. Moreover, the higher pH value, the more macromolecules adsorb on the solid surface. It is worth mentioned that the polymer adsorption affect the particle zeta potential values.

1. *Hadjiivanov I., Klissurski D.G.* Surface chemistry of titania (anatase) and titania-supported catalysts // Chem. Soc. Rev.-1996-**61**

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