

Nanocomposites and nanomaterials

***In situ* immobilization on the silica gel surface and adsorption capacity of polymer based azobenzene on toxic metals ions**

Ia. Polonskaya¹, E. Yanovska¹, I. Savchenko¹, D. Sternik², O. Kychkiruk³, L. Ol'khovik¹

¹ National Taras Shevchenko University of Kyiv,
60, Volodymyrska str., 01601 Kyiv, Ukraine
E-mail: iras@univ.kiev.ua

² Maria Curie-Skłodowska University, pl. Maria Curie-Skłodowskiej 3, 20-031
Lublin, Poland

³ Ivan Franko Zhytomyr State University, 40 Velyka Berdychivska St., 10008
Zhytomyr, Ukraine

In recent years, the preparation of organic/inorganic hybrid materials composed of organic polymers and silica nanoparticles has been widely investigated. The combination of organic polymer components with nanometer-sized silica fillers in a single material has extraordinary significance for the development of hybrid materials with unique properties [1-2].

However, by promising one-step synthesis of complex formative composite materials, which leads to even distribution of active complex formative groups in the polymer immobilized on the surface of the inorganic matrix is direct (in situ) formation of the polymer layer in the presence of particles of inorganic matrix.

In this paper, *in situ* immobilization of poly[4-methacroyloxy-(4'-carboxy)-azobenzene] has been performed on silica gel surface. Infrared (IR) and mass spectroscopies as well as termogravimetry (TG) analysis have been used to elucidate the structure of immobilized polymer. An adsorption capacity of the synthesized composite towards Cu(II), Pb(II), Mn(II), Fe(III), Co(II), Ni(II) ions has been estimated.

1. Tamaki R., Naka K., Chujo Y. Synthesis of polystyrene/silica gel polymer hybrids by in-situ polymerization method. // Pol Bull. -1997. -**39**.- P. 303-310.
2. Yang M., Gao Y., He J.P., Li H.M. Preparation of polyamide 6/silica nanocomposites from silica surface initiated ring-opening anionic polymerization. // eXPRESS Pol. Lett. – 2007. - **1**, 7. - p. 433–42.