

**GLAUCONITE/POLYANILINE - PHOSPHORIC ACID COMPOSITES  
AND THEIR SORPTION PROPERTIES OF Cr(VI)***Nesterivs'ka S., Makogon V., Yatsyshyn M., Saldan I., Reshetnyak O.*

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In recent years, the high number of hybrid composite materials (HCMs) has been created by combination of the properties of electrically conductive polymers and various inorganic substances. A considerable group of these composites consist the materials based on polyaniline (PAn) and natural minerals (NMs), namely montmorillonite, kaolinite, zeolite, glauconite (Gl) etc. [1]. Such HCMs can be used in the electronics industry as fillers of protection screens for electromagnetic radiation, pigment additives for anti-corrosion coatings of metals and alloys, sensitive elements of chemo- and biosensors, moisture sensors, components of rheological fluids etc.

One important direction of the study of polyaniline composites with NMs, in particular Gl/PAn, is their ability to remove Cr(VI) ions from waters of different nature in the results of its sorption with polyaniline chains. Cr(VI) ions is 500 times more toxic comparatively to Cr(III) and easily go to the aqueous environment in the form of  $\text{Cr}_2\text{O}_7^{2-}$ ,  $\text{HCrO}_4^-$  or  $\text{CrO}_4^{2-}$  oxyanions in the results of electrostatic repulsion between these anions and the negatively charged soil particles. The main sources of environmental pollution by chromium are the mining and processing of chromium ores, productions of wood preservatives, galvanic coatings industry, leather processing, paint production and more.

Studies on the sorption properties of individual polyaniline and glauconite/polyaniline-phosphoric acid composites (Gl/PAn-PhA) in relation to Cr(VI) were carried out for the samples synthesized by oxidative polycondensation of aniline by ammonium peroxydisulfate in the 0.1–2.0 M phosphoric acid aqueous solutions respectively in the absence or presence of fine dispersed glauconite [2]. The PAn : Gl mass ratio was 1 : 1. An important condition for efficiency of sorption is the formation of Gl/PAn-PhA composites with an amorphous structure of PAn. There is determined that such PAn under the used experimental conditions is precipitated on the glauconite particles (matrice) in the form of the emeraldine salt of phosphoric acid and is H-bonded to the glauconite surface. Thermogravimetical studies of the samples of individual PAn and Gl/PAn-PhA composites confirmed their stability within 20–200 °C temperature interval, which widens greatly the enhances of the scopes of their use.

It is shown that the synthesized samples of PAn and Gl/PAn composites, doped by phosphoric acid during their synthesis, are effective sorbents of Cr(VI) ions without special PhA addition to solution for increasing of its acidity.

[1]. Yatsyshyn M, Makogon V., Tsiko U., Reshetnyak O. Composite materials based on polyaniline and natural minerals: short review. 1. Features of synthesis, properties and applications // Proc. Shevchenko Sci. Soc. Chem. Sci. 2018. 53. 92–131.

[2]. Nesterivska S., Makogon V., Yatsyshyn M. et al. Properties of the composites made of glauconite and polyaniline in aqueous solutions of phosphoric acid // Chemistry & Chemical Technology. 2019. No 4. (In press).