HZS P 2

Ispitivanje adsorpcionih performansi i antimikrobnog potencijala nanočesticama srebra modifikovane montmorilonitne gline

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U ovom istraživanju ispitivan je adsorpcioni potencijal nanočesticama srebra (nčAg) modifikovane sirove montmorilonitne gline (Gl) izvađene iz depozita u okolini Pirota. U cilju dobijanja visokih adsorpcionih performansi adsorbenta Gl-nčAg, izvršena je optimizacija procedure sinteze koja uključuje varijacije vremena, temperature i količine nanetog nanočestičnog srebra (nčAg), korišćenjem metodologije odzivnih površina (response surface methodology - RSM). Najefikasniji adsorbent, dobijen hemijskom redukcijom srebra korišćenjem natrijum borohidrida - Gl-nčAgh detaljno je okarakterisan korišćenjem BET, SEM, FTIR, XRD tehnika i određivanjem tačke nultog naelektrisanja (pHPZC). Dobijeni rezultati su pokazali da u procesu prečišćavanja vode mogu da učestvuju dva sinergistička efekta korišćenjem Gl-nčAgh, uklanjanje zagađivača uz istovremeno smanjenje mikrobiološke kontaminacije koja doprinosi ukupnom poboljšanju kvaliteta vode.

Adsorption performance and antimicrobial potential of nanoparticles of silver modified montmorillonite clay

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In this study, the adsorption potential of raw montmorillonite clay (MC) modified by nanoparticles of silver (npAg) was tested. The clay was extracted from deposits in the vicinity of Pirot. In order to obtain high adsorption performance of the adsorbent MCnpAg, optimization of the synthesis procedure involving variations of the time, temperature and amount of applied nanoparticle silver (npAg) was performed, using the surface surface methodology (RSM). The most efficient adsorbent, obtained by chemical reduction of silver using sodium borohydride – MC-npAgh, was characterized in detail by using BET, SEM, FTIR, XRD techniques and determining the zero-charge point (pHPZC). The obtained results show that two synergistic effects can be involved in the water purification process using MC-npAgh, for the removal of pollutants while minimizing microbiological contamination, which contributes to overall improvement in water quality.