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"CHITOSAN/MONTMORILLONITE" NANOCOMPOSITES: ADSORPTION OF Cr(III)

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The interaction between Cr(III) and "chitosan/montmorillonite" nanocomposites has been studied. Also, the adsorption kinetic of chromium in prepared chromium solution and in tannery wastewater has been presented. The article confirmed the initial interest in using "chitosan/montmorillonite" nanocomposites as depolluting agent, especially MMTCTf2% nanocomposite exhibits the best adsorption capacity of Cr(III) as compared to MMTCTf1% and MMTCTf3%. According to ICP-OES analysis MMCTf2% can adsorb 45% of Cr(III) from this effluent.

Keywords: chitosan, montmorillonite, nanocomposite, chromium complexation, wastewater.

Introduction

Chitosan and clay exhibit a good adsorption capacity of metallic ions [1]. The free amine function gives to chitosan a better ability to chelate metallic ions [2].

Recently, polymer-clay nanocomposites have received significant attention because nanocomposites present an excellent nano-scale dispersion, which brings significant improvement in mechanical and physical properties as compared to micro-scale polymer composites. Different studies confirm the enhance of mechanical properties [3], thermal stability [4, 5], functional properties [6], barrier properties [6, 7] and water solubility [7] of chitosan nanocomposites by incorporation of nanoclay (1–5 wt %) into chitosan.

Montmorillonite is the most widely studied type of clay; it has an important atoms substitutions and disorganized piling of sheets. This disorder and the

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