

Equilibrium studies of Pb(II) adsorption from aqueous solution using polythiophene nanocomposite

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Abstract

This study was carried out on the sorption of Pb²⁺ under ambient conditions from single component aqueous solution by polythiophene/clay nanocomposite (PTC) on using batch technique. In the work, the polythiophene/clay nanocomposite were synthesized by chemical oxidative polymerization method in the presence of anionic surfactant sodium dodecylbenzenesulfonate (DBSNa) and non-ionic surfactant Polyvinylpyrrolidone (PVP) as additive and hydrogen peroxide and ferric chloride as oxidant. Polythiophene/clay nanocomposite was characterized by technique Fourier Transform spectroscopy. The results of FTIR spectroscopy indicate that the surfactants interact with PTC. the adsorption of Pb²⁺ ions performed in batch system and langmuir and freundlich equations were used for studying sorption equations and the experimental datas fit to this equations. The sorption results fit well to the Langmuir and the Freundlich models. The results suggested that PTC is suitable as a sorbent material for recovery and adsorption of Pb²⁺ ions from aqueous solutions.

Keywords: adsorption, lead, polythiophene, clay, Langmuir, equilibrium, nanocomposite

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