

Batch Kinetic, Isotherm and Thermodynamic Studies of Copper (II) Removal from Wastewater Using HDL as Adsorbent

Authors : Nadjat Taoualit, Zoubida Chemat, Djamel-Eddine Hadj-Boussaad

Abstract : This study aims the removal of copper Cu (II) contained in wastewater by adsorption on a perfect synthesized mud. It is the materials Hydroxides Double Lamellar, HDL, prepared and synthesized by co-precipitation method at constant pH, which requires a simple titration assembly, with an inexpensive and available material in the laboratory, and also allows us better control of the composition of the reaction medium, and gives well crystallized products. A characterization of the adsorbent proved essential. Thus a range of physic-chemical analysis was performed including: FTIR spectroscopy, X-ray diffraction... The adsorption of copper ions was investigated in dispersed medium (batch). A systematic study of various parameters (amount of support, contact time, initial copper concentration, temperature, pH...) was performed. Adsorption kinetic data were tested using pseudo-first order, pseudo-second order, Bangham's equation and intra-particle diffusion models. The equilibrium data were analyzed using Langmuir, Freundlich, Tempkin and other isotherm models at different doses of HDL. The thermodynamics parameters were evaluated at different temperatures. The results have established good potentiality for the HDL to be used as a sorbent for the removal of Copper from wastewater.

Keywords : adsorption, copper, HDL, isotherm

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