TEKSTIL JOURNAL VOL. XX1 No. XX

Xxxxxxx, 201X

Application of Chitosan for heavy metals removal in batch processes

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Abstract:

In this paper, the effects of various parameters such as pH, contact time and temperature on the adsorption of Cu (II) and pb(II) by chitosan (CS) and its nano form witch prepared based on ionic gelation was investigated in batch experiment. Chitosan and Nanochitosan (NCS) have been characterized by means of Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM) analysis . Maximum uptake of Cu and Pb were recorded at pH=6. Equilibrium data for Cu and Pb were fitted well by Langmuir adsorption model with maximum adsorption capacity of 33.33 mg/g at 25◦C. The obtained data showed that adsorption kinetically proceeded according to pseudo second-order model. It was also concluded that NCS had great potential to remove Cu and Pb ions from the aqueous solutions at various concentrations of metal ions.

Keywords: Chitosan, Nanochitosan, Langmuir adsorption model, pseudo second-order model