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FIXED-BED COLUMN STUDY OF DIAZINON ADSORPTION ON THE CROSS-LINKED CHITOSAN/CARBON NANOTUBE

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Abstract

Adsorption of diazinon from aqueous solution was studied by using cross-linked Chitosan/Carbon Nanotube (CHN-CNT) in a fixed-bed column. The cross linked CHN-CNT with 2.5% of MWCNT was prepared with a protected crosslinking method. The effects of the initial concentration of diazinon, bed-height, and flow rate on the adsorption of diazinon onto the cross linked CHN-CNT were investigated. The highest bed capacity of 29.47 mg/g was obtained at the initial concentration of 50 mg/L, flow rate of 10.5 mL/min, and fixed bed-height of 4 cm. Three models, namely Bohart–Adams, Thomas, and Yoon–Nelson, were investigated to predict the breakthrough curves and to determine the characteristic parameters. The experimental data were well fitted with the Yoon–Nelson model, indicating that it was suitable for continuous adsorption of diazinon onto cross-linked CHN-CNT in a fixed-bed column. The findings of this study revealed that the cross-linked CHN-CNT not only has a simple synthesis method and good strength but also adsorbs the diazinon well.

Key words: adsorption, carbon nanotube, chitosan, diazinon, fixed-bed column

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