



Investigation of antagonistic and synergistic interactions on simultaneous adsorption of crystal violet and Cu(II) using chitin and chitosan

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ABSTRACT

The simultaneous adsorption of crystal violet (CV), a cationic dye, and Cu(II) ions on chitin and chitosan from multi-component systems was investigated in batch stirred reactors and compared to single-component systems. Both components, Cu(II) ions and CV dye, have cationic properties, so that their dual adsorption systems by chitin and chitosan are competitive. CV was adsorbed selectively by chitin, while Cu(II) was retained preferentially by chitosan in the media containing equal quantities of the components (100 and 200 mg/L). For the multi-component adsorption equilibria, competitive adsorption isotherms were developed. The multi-component three-parameter Redlich Peterson model was used successfully to characterize competitive adsorption of CV and Cu(II) ions on chitin and chitosan.

Keywords: Wastewater treatment; Adsorption; Crystal violet; Cu(II); Chitin; Chitosan

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