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Adsorption of natural organic matter onto a composite adsorbent prepared with chitosan and powdered activated carbon

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ABSTRACT

In this study a composite adsorbent was prepared with chitosan and powdered activated carbon (PAC). Jar tests were carried out to investigate effects of pH, adsorption time, temperature and initial concentration of natural organic matter (NOM) on the adsorbent's removal efficiency of NOM. UV absorbance at 254 nm wavelength (UV_{254}) was used as a surrogate parameter of NOM concentration. It is shown that the removal of NOM by chitosan-PAC composite adsorbent could be as high as 69% under optimal conditions. Pseudo-first-order rate expression and pseudo-second-order rate expression were fitted to the experimental results, and the latter was found to fit the experimental results quite well. The adsorption isotherm of NOM onto the adsorbent under various initial NOM concentrations was also experimentally determined. Freundlich isotherm was found to fit the adsorption data well.

Keywords: Adsorption; Natural organic matter; Composite adsorbent; Chitosan; Powdered activated carbon

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