



Preparation of starch sulfate resin and its adsorption performance for malachite green

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Received 26 June 2017; Accepted 15 November 2017

ABSTRACT

Starch sulfate resin (SSR) was prepared in the form of spherical beads by an emulsion crosslinking technique and used to adsorb malachite green (MG) from aqueous solution. The effects of time, concentration of MG, temperature, and pH were investigated via static adsorption experiments. The adsorption processes reach equilibrium in about 60 min, and the kinetic data conform to the pseudo-first-order model. The adsorption equilibrium data are well described by the Langmuir isotherm model with a maximum adsorption capacity of 173.92 mg/g at 288 K. The result of thermodynamic studies indicates that the adsorption process is spontaneous and endothermic. The adsorption capacities of MG on SSR first increase and then decrease with the pH increasing from 2.0 to 10.0, and the optimal adsorption performance is achieved at pH = 6.0. The dynamic adsorption performance of MG on SSR was also investigated. The adsorption capacity decreases after five cycles of adsorption and desorption process; however, the adsorbent still has a promising potential on the adsorption of MG.

Keywords: Starch sulfate resin; Malachite green; Column adsorption; Emulsion crosslinking

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