



Evaluating the efficiency of cellulose nanofibers in DEHP removal from water

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ABSTRACT

The removal of di(2-ethylhexyl)phthalate (DEHP) from aqueous solutions by cellulose nanofibers (CNFs), derived from softwood, was studied. The optimum conditions of four factors at four levels including the DEHP concentration (1–10 mg/L), adsorbent dose (0.5–3 g/L), contact time (30–180 min), and pH (3–9) in a batch system was investigated by the design of experiment software. The Isotherm Fitting Tool software was used to fit isotherm parameters to experimental data. The maximum removal efficiency, (74.1%), was obtained at a DEHP concentration of 10 mg/L, an adsorbent dose of 0.5 g/L, a contact time of 30 min, and a pH of 7. The amount of DEHP adsorbed per unit weight of adsorbent (q_e) in the optimum conditions was 14.8 mg/g. The system was well corresponded by the generalized Langmuir–Freundlich model. The results showed that extracted CNF from softwood has a good potential for treatment of polluted aqueous solutions by DEHP.

Keywords: Cellulose nanofiber; Adsorption; Di(2-ethylhexyl)phthalate; Aqueous solutions

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