Adsorption capacity of NH₄Cl-induced activated carbon for removing sodium dodecyl sulfate from water

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ABSTRACT

Surfactants are a very important group of compounds that are used extensively in modern life and have adverse effects on human health and aquatic life. The aim of this study was to evaluate the adsorption characteristics of sodium dodecyl sulfate (SDS) on standard activated carbon (SAC) and NH₄Cl-induced activated carbon (NAC). It was found that, in the batch experiment conducted at 50 mg/L initial concentration of SDS, pH of neutral, and adsorbent dose of 1 g/L, SAC and NAC could remove up to 81 and 99% of SDS from the solution. The removal of SDS by both adsorbent followed the pseudo-second-order reaction kinetics. Results of the equilibrium experiments revealed that the adsorption of SDS onto SAC and NAC was better fitted by the Langmuir model. The maximum adsorption capacity of SDS onto SAC and NAC was 117.2 and 178.6 mg/g, respectively. The results suggested that NAC is suitable as a sorbent for the adsorption of SDS from aqueous solutions in view of its effectiveness and high capacity.

Keywords: Activated carbon; Adsorption capacity; Anionic surfactant; Kinetic coefficients

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