

عنوان مقاله:

(Preparation of Magnetic Multi-Walled Carbon Nanotubes to Adsorb Sodium Dodecyl Sulfate (SDS)

محل انتشار:

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خلاصه مقاله:

Surfactants are one of the main groups of pollutants released into aqueous solutions due to human activities and their harmful effects have been proven on human. In this study, first, magnetic multi-walled carbon nanotubes (MMWCNTs) were synthesized and then, the effects of operating parameters such as surfactant concentration, adsorbent dosage, and pH values were analyzed on the adsorption process. MMWCNTs were characterized by means of X-ray diffraction (XRD) analysis and fourier transform infrared spectroscopy (FTIR). The optimal adsorption conditions were achieved at initial pH = ۴.۶, adsorbent concentration = ۰.۵ g/L, and initial SDS concentration = ۱۵ mg/L. In addition, the equilibrium of sorption reached after ۱۲۰ min and the maximum capacity of SDS for monolayer coverage was found to be ۶۱ mg/g at ۲۵°C. Kinetic studies were performed under optimal conditions and the sorption kinetics was described using the pseudo-second-order kinetic model. The experimental data were studied using Freundlich, Langmuir, and Sips models. Finally, the experimental data were fitted reasonably by Langmuir isotherm. The results demonstrated that MMWCNTs with respect to their high adsorption capacity, relatively low equilibrium time, and capability to be separated from aqueous solutions (after adsorption) could be applied to wastewater treatment.

کلمات کلیدی:

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