

عنوان مقاله:

Performance of multi-wall carbon nanotubes modified by chitosan and EDTA in the removal of Direct Blue 15 dye from aqueous solutions

محل انتشار:

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خلاصه مقاله:

Dyes are considered to be important pollutants in different industries (e.g., textile) and contain various organic materials with complicated structures. These compounds are mainly carcinogenic and toxic and less biodegradable when discharged into the environment. The present study aimed to investigate the performance of multi-wall carbon nanotubes (MWCNTs) modified by chitosan and EDTA in the removal of Direct Blue 15 dye from aqueous solutions. MWCNT was synthesized and characterized using the BET, zeta potential, DLS, SEM, and FTIR techniques. The effects of key parameters including pH, adsorbent dose, initial dye concentration, and contact time were also evaluated. The experimental data of the adsorption process were analyzed using the Langmuir and Freundlich models. With the increased contact time, the removal efficiency of the dye improved, while the increased pH, initial dye concentration, and adsorbent dose led to the reduced dye removal efficiency. With the optimum values of pH (=7), contact time (60 min), adsorbent dose (0.5 g/L), and initial dye concentration (60 mg/L), the maximum adsorption capacity was determined to be 114.42 mg/g. According to the results, the adsorption process using the modified .MWCNT followed the Langmuir model and pseudo-second-order kinetics

کلمات کلیدی:

Parameter optimization, Adsorption, Modification, Chitosan, EDTA

