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EQUILIBRIUM, KINETIC AND THERMODYNAMIC STUDIES OF CATIONIC RED X-GRL ADSORPTION ON GRAPHENE OXIDE

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Abstract

Graphene oxide (GO) was prepared from expandable graphite by a modified Hummers' method and characterized by TEM, XRD, FTIR, and Raman spectroscopy. The batch adsorption experiments were carried out to study the effect of various parameters, such as the initial concentration, adsorbent dosage, initial pH, contact time and temperature on adsorption properties of cationic red X-GRL onto GO. The Langmuir and Freundlich models were used to fit the experimental data of adsorption isotherms. The kinetic studies showed that the adsorption data followed the pseudo-second order model. Thermodynamic studies indicated the reaction of cationic red X-GRL adsorbed by GO was a spontaneous and endothermic process. The results indicated that GO could be considered a promising adsorbent for the removal of dyes from aqueous solutions.

Key words: adsorption, cationic red X-GRL, graphene oxide (GO), kinetics, thermodynamics

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