

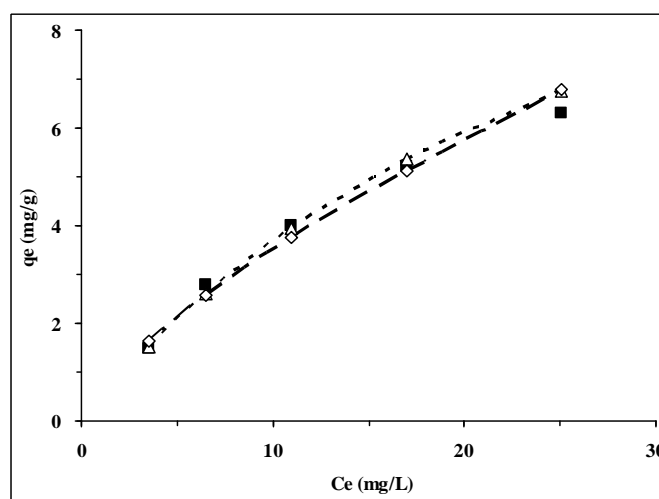
Equilibrium, kinetics and mechanism of adsorption basic red 2 dye onto modified chitosan with commercial detergent solution as adsorbent

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The modified chitosan with commercial detergent solution, Breeze excel liquid detergent, it is inexpensive chemical for forming resin, was used as adsorbent to adsorb the basic red 2 dye ($C_{20}H_{19}ClN_4$) from aqueous solution. The effect on the initial concentration, 20-100 mg/L, of the dye at pH 5 and 30°C was thoroughly investigated in the batch adsorption systems. The experiments were conducted duplicated. The adsorption capacity increased with increasing initial concentration of basic red 2 dye. The experimental results showed that adsorption capacity onto modified chitosan for basic red 2 dye 20-100 mg/L were 1.5-6.3 mg/g, respectively. The Langmuir and the Freundlich adsorption isotherms were applied to describe the basic red 2 dye uptake, which could be described by Langmuir adsorption isotherm onto adsorbent. Single-state batch adsorption design of basic red 2 dye onto adsorbent has been studied based on the Langmuir isotherm equation. The pseudo-second order was fit to describe the kinetics of adsorption. The mechanism of the adsorption occurred in 3 steps. The rate limiting step for mechanism of adsorption was film diffusion. The significant uptake of basic red 2 dye was demonstrated by FT-IR spectroscopy.



Keywords: Adsorption; Basic red 2 dye; Modified chitosan