

Adsorption and kinetic studies of methylene blue on zeolite synthesized from fly ash

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ABSTRACT

Batch sorption experiments were carried out to remove methylene blue from its aqueous solutions using zeolite synthesized from fly ash as an adsorbent. Nearly 10 min of contact time are found to be sufficient for the adsorption of dye to reach equilibrium. Equilibrium data have been analyzed using Langmuir and Freundlich isotherms and the results were found to be well represented by the Freundlich isotherm equation. Adsorption data were fitted to both Lagergren first-order and pseudo-second-order kinetic models and the data were found to follow pseudo-second-order kinetics. Thermodynamic calculations suggest that the adsorption of methylene blue on zeolite synthesized from fly ash is spontaneous and exothermic reaction.

Keywords: Zeolite; Methylene blue; Dye adsorption; Adsorption Kinetics; Thermodynamics

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