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Removal in batch mode experiment of Methylene Blue onto trimming wood of orange tree – Equilibrium and kinetics studies –

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ABSTRACT/RESUME

Abstract:*In the present study, adsorption of Methylene Blue (MB) from aqueous solution was investigated using an adsorbent derived from Trimming Wood of Orange Tree (WOT). The used adsorbent was analyzed using FT-IR and SEM techniques.The adsorption of MB was carried out using a batch system and the effects of adsorbent dose, initial pH, ionic strength, contact time, initial concentration and temperature on the adsorption capacity of adsorbent were investigated.Kinetic parameters, rate constants, equilibrium adsorption capacities and determination coefficients, for each kinetic equation were calculated and discussed. It was shown that the adsorption of MB onto WOT could be described by the pseudo-second order kinetic. The experimental isotherm data were analyzed using the Langmuir, Freundlich and Temkinmodels. Adsorption of MB onto WOT followed the Langmuir isotherm for all temperatures studied and the maximum MBuptake was observed as 48.78 mg/g at 293 K. The evaluation of thermodynamics parameters such as the negative Gibbs free energy and negative enthalpy change indicated respectively the spontaneous and exothermic nature of the sorption process.*