Adsorption kinetic, equilibrium and thermodynamic studies of Eosin-B onto anion exchange membrane

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ABSTRACT

In this research, batch adsorption of anionic dye Eosin-B (EB) onto anion exchange membrane (AEM) (BI) from aqueous solution has been investigated at room temperature. The effect of some operating conditions such as contact time, membrane dosage, initial dye concentration and temperature on the percentage removal of EB from aqueous solution has been investigated in detail. Moreover, adsorption kinetics has been analyzed using different models such as pseudo-first-order, pseudo-second-order, Elovich, liquid film diffusion, modified Freundlich and Bangham models. Results show that adsorption data fits to the pseudo-second order kinetics very well. Non-linear isotherms containing two parameters and three parameters isotherms have been applied on experimental data. Different thermodynamic parameters such as Gibb's free energy ($\Delta G°$), enthalpy ($\Delta H°$), and entropy ($\Delta S°$) have been calculated, which shows that adsorption of EB onto anion exchange membrane (B1) is an exothermic process.

Keywords: Adsorption; Anion exchange membranes; Eosin-B; Kinetics; Isotherm; Thermodynamics

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