



Adsorption Study of Congo red from Aqueous Solution onto Cadmium and Nickel Ferricyanides

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ABSTRACT

The adsorption behavior of Congo red from aqueous solution on cadmium ferricyanide and nickel ferricyanide were studied under various conditions of contact time, different pH and temperature by varying initial concentration of Congo red using batch technique. Prepared metal ferricyanides were characterized by FTIR, SEM, CHN analysis, TGA and XRD. Adsorption capacity of Congo red on cadmium ferricyanide and nickel ferricyanide were decreased with increasing the pH from 2 to 7 of aqueous solution and increased gradually from 7 to 11. Adsorption capacity also increased with increasing concentration of Congo red. Results were analyzed by Langmuir and Freundlich models of adsorption. Cadmium ferricyanide was found to be a better adsorbent than Nickel ferricyanide. Thermodynamic parameters like free energy (ΔG), enthalpy (ΔH) and entropy (ΔS) of the system suggested that adsorption process was spontaneous and physisorption. The positive value of ΔH for Congo red indicated that adsorption was endothermic in nature.

Keywords: Metal ferricyanide, Congo red, Adsorption, Langmuir isotherm, Freundlich isotherm.
