Adsorption kinetics and thermodynamics of hazardous dye Tropaeoline 000 unto Aeroxide Alu C (Nano alumina): a non-carbon adsorbent

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\textbf{ABSTRACT}

The present paper is aimed to investigate and develop adsorption methods for colour removal from wastewater using waste material a non-carbon adsorbent Nano alumina (NA). The unique properties of Nano materials have promisingly exhibited in solving many environmental issues. The high surface area and unique adsorption capacity of NA were successfully utilized in removing water-soluble azo dye, Tropaeoline 000 from wastewater. Equilibrium isotherms for the adsorption of the dye were measured experimentally. Results were analysed by the Freundlich and Langmuir equation at different temperatures and determined characteristic parameters for each adsorption isotherm. Specific rate constants of the processes were calculated by kinetic measurements and pseudo-second-order adsorption kinetics was observed in each case. Thermodynamic parameters like free energy ($\Delta G$), enthalpy ($\Delta H$) and entropy ($\Delta S$) of the systems were calculated by using Langmuir constant. The adsorption process followed pseudo-second-order model.

\textit{Keywords:} Tropaeoline 000; Adsorption; Kinetics; Nano alumina; Thermodynamics

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