Adsorption of anionic azo dye Congo Red from aqueous solution onto NaOH-modified jute fibre

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\textbf{ABSTRACT}

Adsorption of Congo red onto NaOH-modified jute fibre was studied for different concentrations of dye solutions (50, 100, 150 and 200 mg/L). Experiments were carried out as function of contact time, initial solution pH (3–9), adsorbent dose (10–20 g/L) and temperature (293, 303 and 313 K). Adsorption data fit better to Langmuir model in comparison with the Freundlich model. This indicates the mono-layer adsorption on the homogeneous surface of the adsorbent with identical binding sites of the adsorbent. The adsorption process followed the pseudo-second-order kinetic model. The maximum sorption capacity ($q_{\text{max}}$) was found to be 32.24 mg/g. The maximum adsorption occurred at pH 7.0. The effect of adsorption dose was studied and optimum adsorption was obtained at a jute dose of 16 g/L.

\textit{Keywords:} Adsorption; NaOH-modified jute fibre; Congo Red; Isotherm; Equilibrium studies; Pseudo-first-order; Pseudo-second-order

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