



Removal of chromium(VI) from aqueous solution by carbon waste from thermal power plant

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ABSTRACT

Carbon waste was used as an adsorbent for the removal of Cr(VI) from aqueous solution of $K_2Cr_2O_7$. The experiments were carried out at different doses of adsorbent (0.1–0.8 g), pH (1–7), and initial metal ion concentration (1–30 mg/L). Different adsorption isotherms such as Langmuir, Freundlich, Temkin, and Dubinin–Radushkevich were tested. Langmuir adsorption isotherm was found to have highest regression value and hence the best-fit. Pseudo-second-order fitted best the kinetic data. Further, it was found that 92% chromium (VI) removal is possible at pH 2.0, adsorbent dose 0.6 g/50 ml, metal ion concentration 20 mg/L, and time 120 min. Thermodynamic parameters showed that the sorption process is endothermic and spontaneous in nature.

Keywords: Chromium(VI); Carbon waste; FTIR; SEM; Isotherms; Kinetics

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