Removal of chromium(VI) from aqueous solutions using rubber leaf powder: batch and column studies

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\textbf{ABSTRACT}

Chromium metal is found in industrial wastewater at a much higher concentration than the prescribed limit set by different regulatory authorities. Since chromium(VI) is very toxic and carcinogenic, it requires removal at source, that is, before its discharge to the water bodies. The present study is carried out for removal of Cr(VI) from aqueous solution by using locally available rubber leaf as a low-cost adsorbent in batch and continuous column mode. The effects of pH, adsorbent dose, contact time, initial metal ion concentration, and temperature on removal of Cr(VI) were studied in batch process. Different kinetic and isotherm models were examined and the model parameters were determined. The column studies were conducted to investigate the effects of flow rate, bed height, and initial metal ion concentration on removal efficiencies. The experimental data reflects reasonably with Thomas and Yoon–Nelson models in continuous mode.

\textit{Keywords:} Rubber leaf; Isotherm; Breakthrough curve; Langmuir model; Freundlich model; Thomas model; Yoon–Nelson model

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