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Ipomoea batatas vine-derived activated carbon: a utility and efficient adsorbent for removing Cr(VI) from aqueous solution

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ABSTRACT

In this work, an efficient activated carbon derived from *Ipomoea batatas* vine was used to remove hexavalent chromium (Cr(VI)) from wastewater. A series of characterization results of the activated carbon revealed that one of the prepared activated carbon (prepared at 800°C) had a high specific surface area (1,508.4 m^2/g), rich functional groups, etc. Batch adsorption experiments were carried out to explore the adsorption effect and mechanism of AC-800 on Cr(VI) in aqueous solution. The adsorption kinetic and isotherms experiment results fitted well with the pseudo-second-order kinetic model and the Langmuir isotherm model, respectively, which indicated that the adsorption of Cr(VI) by AC-800 was mainly by surface chemical complexation reaction, and the maximum adsorption capacity was 362.3 mg/g (in optimized condition). The efficiency of Cr(VI) removal was significantly affected by the initial pH of the solution. And, AC-800 showed good reusability, and the removal efficiency of Cr(VI) was still over 70% after four cycles. Overall, the activated carbon derived from discarded *Ipomoea batatas* vine could be considered an efficient adsorbent for Cr(VI) removal from aqueous solution.

Keywords: Activated carbon; *Ipomoea batatas* vine; Chromium; Removal; Mechanism

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