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Acta Medica Iranica

2009;47(4) : 97-102

Removal of chromium (VI) from aqueous solution by Ulmus leaves

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Abstract:

The Cr (VI) adsorption characteristics of Ulmus leaves (UL) and their ash were examined as a function of contact time, initial pH, and initial metal ion concentration. Batch adsorption experiments were performed. The effects of Ca²⁺, Mg²⁺, Na⁺ and K⁺ on adsorption were studied. Maximum removal was achieved in the pH=7, contact time of 60 minutes and with initial Cr (VI) concentration of 2 mg/L. Because at pH ≥ 6.5 , precipitation of chromium may take place, optimum pH was selected at 6. Maximum adsorption rate values were found at the first 60 min at pH= 6. The effect of the adsorbent on COD removal from aqueous solution showed that 2g/L of adsorbent caused 130 and 75 mg /L increase in COD of deionized water in 60 min for UL and its ash, respectively. The chromium adsorption data obtained under the optimum condition were described by the Langmuir and Freundlich isotherms. Studies showed that the Langmuir adsorption model better fitted than Freundlich, with R² >0.99. Also UL ash was more efficient than living leaves in removing chromium from aqueous solution.

Keywords:

chromium removal , Ulmus leaves , aqueous solution

TUMS ID: 3272

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