Effect of Ca^{2+} on Adsorption and Desorption of Chromium (VI) by "Greener" Iron Nanoparticles

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Abstract

Cr (VI) compounds are utilized in a variety of industrial applications, and the hexavalent specie of Cr has been detected in many types of industrial wastewater. These ions are well known for their environmental hazards, and therefore their removal from water is essential. Iron nanomaterials has been reported by many researchers to be very effective in sequestration of Cr (VI) ions over a wide range of experimental studies. In this study, Fe NPs produced by reducing Fe^{2+} ions with green tea extract has been used in the removal of Cr (VI) ions. Adsorption and desorption studies were performed in the presence of Ca^{2+} ions at different concentrations and time periods. All measurements were obtained using direct UV-Vis spectrophotometric determination. The results showed that proper concentrations of Ca^{2+} ions can enhance the adsorption Cr(VI) ions and at the same time inhibit their desorption.