

Removal of chromium(VI) from aqueous solutions by electrochemical reduction–precipitation

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In this work, we investigated the reduction and removal of aqueous Cr(VI) via electrotreatment in a stirred batch reactor using a low-carbon steel electrode. In addition, the capacity to remove chromium from natural seawater, synthetic seawater and wastewater was also studied. The removal of Cr(VI) was primarily based on the simultaneous reduction of Cr(VI) to Cr(III), which then precipitated and formed a Fe(OH)₃/Cr(OH)₃ sludge to adsorb Cr(VI). The amount of Cr(VI) that was adsorbed in the sludge increased to a maximum value of 10% but decreased to a negligible level as the Cr(VI) concentration in the solution gradually decreased. The Cr(VI) concentration was reduced to the discharge limit (0.5 mg/L) in a single process without the addition of other precipitation agents.

Keywords: Cr(VI); Adsorption; Precipitation; Electrochemical; Pollution

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