Study of Electrocoagulation on the Elimination of Chromium in Waste Water From an Electroplating Bath Using Aluminium Electrodes

Authors : Salim Ahmed

Abstract : Electrocoagulation has proven its effectiveness in industrial effluent treatment by eliminating pollutants, particularly metallic ones. The electrochemical processes that occur at aluminium electrodes give excellent performance. In this work, electrocoagulation tests were carried out on an industrial effluent from an electroplating bath located in Casablanca (Morocco). The aim was to remove chromium and reuse the purified water for other purposes within the company. To this end, we have optimised the operating parameters that affect the efficiency of electrocoagulation, such as electrical voltage, electrode material, stirring speed and distance between electrodes. We also evaluated these parameters. The effect on pH, conductivity, turbidity and chromium concentration. The tests were carried out in a perfectly stirred reactor on an industrial solution rich in chromium. The effluent concentration was 1000 mg/L of Cr6+. Chromium removal efficiency was determined for the following operating conditions: aluminium electrodes, regulated voltage of 6 volts and 12 volts, optimum stirring speed of 600 rpm and distance between electrodes of 2 cm. The sludge produced by electrocoagulation was characterised by X-ray diffractometry, infrared spectroscopy (IR) and scanning electron microscopy (SEM).

Keywords : wastewater, chromium, electrocoagulation, aluminium, aluminium hydroxide

Conference Title : ICC 2023 : International Conference on Chemistry

Conference Location : San Francisco, United States

Conference Dates : November 06-07, 2023