

Yotsawat Supavitipattana 2010: Energy Efficiency of Hexavalent Chromium Removal by Electrocoagulation. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Patcharaporn Suwanvitaya, M.App. Sc. 92 pages.

This study investigated the removal of hexavalent chromium [Cr(VI)] from electroplating wastewater by Electrocoagulation (EC) using two steel electrodes with surface area per volume (A/V ratio) of about  $162 \text{ cm}^2/\text{L}$ . The wastewater contained 600 mg/L of Cr(VI), pH value of 2.5 – 3.5. Parameters under study included distance between electrodes, electrodes voltages and volume of wastewater.

In the first phase of the study, Cr(VI) was removed by EC to find out the appropriate range of the parameters used. The appropriate condition was found to be at 6 volt supply and 2 cm. plate distance with the retention time of 70 minutes. Energy consumption in this condition was 6.11 kW – hr/kg Cr(VI) removal. The results indicated that the decrease in voltage and the increase in the distance between electrodes increased the energy efficiency.

The second phase investigated the effect of the parameters on the energy efficiency by EC. The results from the study indicated that the volume of wastewater and distance between electrodes did not significantly affect the energy efficiency. For the reduction of Cr(VI) from 350 mg/L to below 0.25 mg/L, the arrangement that consumed lowest energy was at 4 volt supply and 1 cm. plate distance, energy in the cases of 3 and 5 L treatment volume were 10.35 and 9.33 kW – hr/kg Cr(VI) removal. Retention time required was about 180 – 200 minutes.

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