



The investigation of COD treatment and energy consumption from urban wastewater by batch electrocoagulation system for small settlements

Murat Tolga Yilmaz, Alper Erdem Yilmaz*, Yeşim Dede

Department of Environmental Engineering, Atatürk University, Erzurum, Turkey, email: mtyilmaz@atauni.edu.tr (M.T. Yilmaz), Tel. +90 4422314799, email: aerdemy@atauni.edu.tr (A.E. Yilmaz), yesim.dede25@gmail.com (Y. Dede)

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ABSTRACT

In this study, electrochemical treatment of urban wastewater with electrical conductivity of 1000 $\mu\text{S}/\text{cm}$, chemical oxygen demand of 250 mg/L was investigated using variables of circulation rate, initial pH value, constant pH value, current intensity and supporting electrolyte type and concentration. Electrocoagulation was used in which aluminum and stainless steel were selected as the electrochemical treatment process. The data obtained in experimental studies show that the COD removal efficiency increases in experiments where the circulation rate is 100 mL/min and the initial pH value is 7. Although the increase in current intensity from 5 A–20 A increases the recovery efficiency from 46%–80%, the COD removal efficiency at a current intensity of 25 A is significantly decreased. While the use of support electrolyte did not contribute to the efficiency of COD removal, it significantly reduced the value of energy consumption. The best removal efficiency according to optimum results was obtained as about 90%, which is 10 A current intensity, 100 mL/min circulation rate, constant pH 7 and no support electrolyte experiments.

Keywords: Urban wastewater; Electrocoagulation; Current intensity; Circulation rate

*Corresponding author.