



Treatment of sugar industry wastewater by electrocoagulation using Fe and Al electrodes: a comparative study

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ABSTRACT

It was aimed in the present study to investigate the treatability of wastewater from sugar industry (WSI) using electrocoagulation method (EM) and the effects of system parameters (SPs) on removal yield (RY). SPs were chosen to be electrode material (EIM), initial pH (pH_i) of the solution, current density (CD), stirring speed (SS), type and concentration of support electrolyte. WSI collected from equalization pond of sugar production process in Erzurum Sugar Plant was used in the study. Aluminium and iron plate electrodes functioned as electrodes in the experiments, where additional supportive electrolyte in the solution increased the yield of COD removal and reduced the energy consumption. COD removal was found in the experiments conducted using aluminium electrode to be 97.43% at 180 min when CD, SS and pH_i were 2.143 mA cm⁻², 150 rpm and 6, respectively and by adding 100 mM NaCl while it was 67.24% at 180 min when iron electrode was used in the experiments and CD, SS and pH_i were 4.286 mA cm⁻², 150 rpm and 8, respectively by adding 100 mM NaCl.

Keywords: Sugar industry; Electrocoagulation; Al-Fe plate electrode; pH; Current density

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