



Treatment of winery wastewater by electrocoagulation process

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ABSTRACT

Winery wastewater treatment by electrocoagulation (EC) process using aluminum (Al) and iron (Fe) electrodes was investigated. The effects of operational parameters such as initial pH, current density and electrolysis time were investigated separately. Chemical oxygen demand (COD), turbidity and color were used to measure the treatment efficiency. Electrode consumptions were calculated per m³ of wastewater. Amount of sludge produced by EC was also reported per m³ of wastewater. The optimum operating conditions were defined due to the initial pH, applied current density and operating time for Fe and Al electrodes. Maximum removal efficiencies were found at pH 7 for Fe electrode and pH 5.2 for Al electrode with current density of 300 A/m² for both electrodes and with an operating time of 90 min and 120 min for Fe and Al electrodes, respectively. The removal efficiencies were found as 46.6% (COD), 80.3% (color) and 92.3% (turbidity) for Fe electrode while they were 48.5% for COD, 97.2% for color and 98.6% for turbidity when Al electrodes were used. Finally, the results were compared with various food and beverage industry wastewaters treated by EC process reported in the literature.

Keywords: Electrocoagulation; Aluminum electrodes; Iron electrodes; Winery wastewater; COD removal; Turbidity removal; Color removal

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