

Treatment of textile wastewater by electrocoagulation process assisted with biocoagulant obtained from the pitahaya peels

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ABSTRACT

This study proposes the treatment of textile wastewater by electrocoagulation process (EC) assisted with biocoagulant obtained from the pitahaya peels. The Box–Behnken design (BBD) was used to evaluate and optimize the parameters of EC (pH, current density and time), using Al and Fe electrodes, from the response surface methodology and desirability function for the response, turbidity removal. Then, optimized EC processes were assisted with different biocoagulant doses (30, 35, 40, 45 and 50 mg/L) for the treatment of textile wastewater, evaluating the turbidity, color and chemical oxygen demand. The results of BBD showed that for EC process using the Fe electrodes the variables pH, current density and time were significant, while for Al electrodes were significant the variables current density and time. Optimized EC processes assisted with biocoagulant improved significantly the treatment efficiencies of the wastewater, obtaining removal values of turbidity, color, and chemical oxygen demand of 98.05%, 95.11% and 86.21%, respectively, for Al electrodes; and 96.89%, 95.10% and 81.78% for Fe electrodes. Additionally, it was observed significant removals of inorganic elements presents in the textile wastewater as P, Mg and Si.

Keywords: Electrocoagulation; Biocoagulant; Chemical oxygen demand; Turbidity; Pitahaya peels

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