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TREATMENT OF CORN STALK PULPING EFFLUENT BY ELECTRO-COAGULATION

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Abstract

In this work, the possibility of treatment corn stalk pulping wastewater by electro-coagulation process was investigated in relationship with efficiency of chemical oxygen demand removal. Diluted black liquor (resulted from laboratory soda pulping of corn stalks) was used to create a simulated effluent. The electrochemical treatments were performed by using two types of sacrificial anodes: aluminum (Al-SA) and stainless steel (FeC-SA). The results of the initial stage of investigation indicated that the efficiency of the process in terms of COD_{Cr} removal strongly depend on several factors including pH, current density and the material chosen as anode. The optimization study showed the best parameters for both of the chosen materials for the sacrificial anode and also the optimal parameter for operating towards maximum efficiency. From economical perspective a steel sacrificial anode is more suitable for performing the electro-coagulation treatment of corn stalks pulping effluent. Under the conditions of the study, the optimal parameters to achieve a 67% COD_{Cr} removal efficiency for the FeC-SA were: current density of 11.2 mA/cm², 92 minutes of electrocoagulation treatment at a COD_{Cr} load of 2415 g/L.

Key words: corn stalks, electrocoagulation, optimization, pulping effluent, sacrificial anode

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