

Sontaya Kongpetch 2014: Decolorization of Palm Oil Mill Wastewater by Electrocoagulation Process. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Technology and Management. Thesis Advisor: Associate Professor Bongotrat Pitiyont, Ph.D. 110 pages.

This study investigated the performance of electrocoagulation process in decolorization of palm oil mill wastewater using a 10 – Liter batch reactor. Iron was used as electrodes with a distance 2 cm. The effect of operating parameters including current voltage (6, 12 and 18 volts), reaction time (5, 10, 15, 30, 45 and 60 min) and initial pH 4 and 9 on removal efficiencies were examined to evaluate the optimum condition. The results showed that treatment efficiencies increased with increasing current voltage and reaction time. The optimum conditions at initial pH 4 and 9 were achieved at current voltage of 12 volts, reaction time 30 min. The efficiencies of decolorization in term of absorbance were 90.4% and 88.9%, respectively, where as the removal efficiencies for COD were 90.2% and 87.6%, and for TSS were 94.2% and 92.3%, respectively. The total sludge production were 1,000 mg/l and 1,130 mg/l at initial pH 4 and 9, respectively. Furthermore, in these conditions negligible residual iron concentrations were measured from electrocoagulated water. Sodium chloride addition as electrolyte did not enhance removal efficiencies. In addition, the effect of initial pH (4, 5, 6, 7, 8 and 9) on color and COD removal was further studied at optimum condition. From the results, the maximum removal efficiencies could be obtained at initial pH 7. The energy consumption at the optimum condition was 6.16 baht/m³. According to the results, the electrocoagulation process effectively treated palm oil mill wastewater. Therefore, electrocoagulation process can be used as a post - treatment step to improve the quality of final discharge in term of color and COD removal.

Student's signature

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