

Application of Hydrogen Peroxide and Polialuminum Chloride to Treat Palm Oil Mill Wastewater by Electrocoagulation

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Abstract : The purposes of this study were to investigate the effects of polyaluminum chloride (PAC) and hydrogen peroxide on COD removal by electrocoagulation. The current density was varied between 30-80 mA cm⁻², polyaluminum chloride (1-3 g L⁻¹) as coagulant aid and 1 and 2 percent of hydrogen peroxide as an oxidizing agent. It has been shown that 86.67% of COD was removed by the iron electrode in 180 min while 81.11% of COD was removed by the aluminum electrode in 210 min which indicate that iron was more effective than aluminum. As much as 88.25% COD was removed by using 80 mA cm⁻² as compared to 72.86% by using 30 mA cm⁻² in 240 min. When PAC and H₂O₂ increased, the percent of COD removal was increasing as well. The highest removal efficiency of 95.08% was achieved by adding 2% of H₂O₂ in addition of 3 g L⁻¹ PAC. The general results demonstrate that electrocoagulation is very efficient and able to achieve more than 70% COD removal in 180 min at current density 30-80 mAcm⁻² depending on the concentration of H₂O₂ and coagulant aid.

Keywords : electrocaogulation, palm oil mill effluent, hydrogen peroxide, polialuminum chloride, chemical oxygen demand

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