ABSTRACT

Kali Tengah Water Treatment (Industrial Wastewater Come From) By Chitosan-Alum Combination With Aquatic Plant

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Chitosan-alum coagulant is able to bind colloidal particles in wastewater, forming large and strong flocks. The combination of the flocks with water hyacinth (*Eichhornia crassipes*) functions as biofiltration that absorbs ions in water, which are the elemental nutrients for the plant. The objective of this study is to determine the compositions of chitosan-alum coagulant materials, which could reduce pollutant substances in wastewater effectively. The methods applied were (1) Chitosan-alum coagulation process through mixing and blending techniques with respective ratios of 25%:75%, 50%:50% and 75%:25%. (2) Biofiltration-coagulation process. Water hyacinth was used in biofiltration with absorption times of 3 x 24 hours and 6 x 24 hours, while chitosan-alum coagulations had the compositions of 10%:90%, 25%:75% and 50%:50%. The observed parameters were pH, turbidity (NTU), total residue (mg/L), COD and BOD (mg/L) as well as metal ions (Fe, Mn, Cd and Pb) contents (mg/L). The results of the study were statistically analyzed using ANOVA and HSD tests. The percentage of pollutant decreases as pH change, turbidity and metal ion (Cd, mg/L) lowering, was optimally obtained with chitosan-alum composition of 10%:90% in biofiltration time of 3 x 24 hours. With biofiltration time of 6 x 24 hours, the same composition optimally lowered total residue (mg/L), COD and metal ions (Fe. Mn and Pb) contents (mg/L). The coagulant composition of 50%:50% obtained with coagulant process through blending technique lowered BOD (mg/L). The optimal treatment in this study was 6 x 24 hours biofiltration with 10%:90% chitosan-alum coagulation.

Key words: Industrial wastewater, biofiltration-coagulation, chitosan-alum, water hyacinth