

TREATMENT OF WASTEWATER PRINTING INK BY PROCESS COAGULATION USING CHITOSAN NANOPARTICLES

YUSMANIAR

Department of Chemistry, State University of Jakarta, Jalan Pemuda, Jakarta Timur, Indonesia

ABSTRACT

In the present study, chitosan nanoparticles were used for the treatment of colored solutions by coagulation–flocculation (as an alternative to more conventional processes such as sorption). Effluent discharge of printing ink waste water contains high colour, suspended solid and dissolved organic pollutants was selected as a model waste water treatment for verifying chitosan nano particles. Study on the wastewater characteristics, effluent flow measurement, wastewater treatments to determine the process system of wastewater treatment has been carried out. Batch coagulation experiments were conducted to evaluate the influence of initial pH (4.0-7.0) and coagulant dosage 10-50 mg on colour removal from solution. Residual colour, total suspended solid(TSS), COD and system pH were observed as function of time. Optimum pH was found to be 5.0 for the coagulants. Optimum dosage chitosan nanoparticles was found to be 28 mg respectively, giving 99.8 % colour removal efficiency in 25 min. Reduction efficiency of Total Suspended Solid (TSS) of 95% with the TSS concentration of 106 mg/L, COD of 94% with the COD concentration of 500 mg/L. The flocs were recovered and the dye was efficiently removed using alkaline solutions (0.001–1 M NaOH solutions) and the biopolymer, re-dissolved in acetic acid solution, was reused in a further treatment cycle.

KEYWORDS: Coagulation, Dissolved Organic, Suspended Solid, Colour, Chitosan Nanoparticles