

Rachit Sattapun 2010: Investigating an Optimization of Coagulation – Flocculation Process for Chemical Wastewater Treatment in Dyeing Textile Industry by Response Surface Statistical Methodology. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Assistant Professor Tunlawit Satapanajaru, Ph.D. 113 pages.

The objectives of this study was to investigate the optimum condition for treating synthesis wastewater containing dye by chemical precipitation process using response surface methodology (RSM). Four coagulants, $\text{Ca}(\text{OH})_2$, CaCO_3 , FeCl_3 and $\text{Al}_2(\text{SO}_4)_3$ were used to find the suitable coagulant in treating 250 mgL^{-1} of Reactive black 5 (RB5). The study indicated that $\text{Ca}(\text{OH})_2$ dosage of 40 gL^{-1} at pH 7 gave the highest result, dye removal efficiency was 98.15% and COD removal efficiency was 90.78%.

The optimum $\text{Ca}(\text{OH})_2$ dosages and pH in coagulation – flocculation process of synthesis wastewater containing 250 mgL^{-1} of Reactive black 5 (RB5), Reactive red 198 (RR198) and Reactive yellow 176 (RY176) were investigated by RSM. The removal efficiencies of RB5 and COD by $\text{Ca}(\text{OH})_2$ dosage of 53 gL^{-1} at pH 9.75 were 99.68% and 92.53% respectively. The removal efficiencies of RR198 and RY176 and COD by $\text{Ca}(\text{OH})_2$ dosage of 34 gL^{-1} at pH 10 were 99.47% and 91.74% for RR198 and 99.4% and 91.71% for RY176, respectively.

The optimal condition of mix dye solution for coagulant dosage and pH were 46 gL^{-1} $\text{Ca}(\text{OH})_2$ at pH 10, respectively, where more than 90.00% removal efficiency of dye and 88.46% removal efficiency of COD can be obtained.

Student's signature

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