

Chaiwat Chomsuwan 2009: Improvement Turbidity Removal Efficiency of Clarifier in Water Treatment Process. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Associate Professor Lertchai Ratana-arporn, M.Eng. 145 pages.

This study was conducted to find out the statistical method to improve turbidity removal efficiency of sludge blanket clarifier in water treatment process. In first part, to calculate the quantity of alum dose used in coagulation – flocculation process by mathematic model of relation between optimum alum dose and water quality parameters as turbidity(Tur), pH(pH), alkalinity(Alk) and hardness(Har) by regression analysis equation in 3 models. It was found that relation of model had only 2 parameters as turbidity and alkalinity and can be predicted the optimum alum dose better than jar test. In second part, to study the suitable condition for turbidity removal. It was found in the first experiment by Taguchi method that factors effects to turbidity of water from clarified tank were alum dose, production rate, drain frequency, suction height, flush time, respectively.

Then next experiment was investigated the optimum condition by central composite design. In case of raw water turbidity were 25 – 40 NTU and 45 – 60 NTU. It was found that, at low production rate, the optimum value were alum dose 24 and 25 mg/l, suction height 0.40 and 0.50 meter, flush time 11 and 12 second, drain frequency 400 and 400 second, respectively. And at high production rate, it was found that the optimum value were alum dose 27 and 28 mg/l, suction height 0.25 and 0.38 meter, flush time 10 and 11 second, drain frequency 320 and 320 second, respectively. These values can be used in actual water treatment process.

Student's signature

Thesis Advisor's signature

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