

Thamonwan Chooprajong 2012: Recycle of Sludge from Water Supply Treatment System for Using as Coagulant Aid and Reducing of Alum Dose. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Mongkol Damrongsri, Dr.Ing. 135 pages.

Generally, water supply treatment process has used alum as coagulant in coagulation process. Water supply treatment process produces a large amount of sludge from process. The sludge from solid contact clarifier called wet sludge and sludge lagoon called dry sludge from water supply treatment process to be used again as a coagulant aid substance because of alum residual is composed in its characteristic. In this study uses Jar Test method. From this reason, recovered sludges will used as coagulant aid be for this concerning. In addition to water supply treatment process; alum doses are expected to decrease as well as the reduction of chemical cost. This sludge will increase mass of suspended solids and turbidity of raw water which increase efficiency of chemical coagulation in drought weather that have low turbidity.

In this study, showed that turbidity of raw water samples were 19.1, 46.1, 47.5, 53.0 and 87.9 NTU. The optimum alum doses were 35.5, 66.5, 70, 69 and 55 mg/l respectively when used only alum. The efficiency of removal turbidity were 92.04%, 97.59%, 98.16%, 98.06% and 98.10% respectively than using only alum as coagulant. Optimum alum doses were 23, 50, 64, 55 and 42.5 mg/l 5 mg/l respectively when used wet sludge as coagulant aid with alum. Optimum wet sludge dose were 292, 412, 429, 345 and 275 mg/l respectively. The efficiency of removal turbidity were 92.41%, 97.81%, 98.67%, 98.68 and 98.65% respectively. Optimum alum doses were 28, 54, 71, 62 and 50 mg/l respectively when used dry sludge as coagulant aid with alum. Optimum dry sludge dose were 408, 340, 340, 374 and 442 mg/l respectively. The efficiency of removal turbidity were 93.14%, 97.74%, 98.40%, 98.60% and 98.40% respectively. The usage of wet sludge and dry dry sludge can reduce the cost of alum. Water supply treatment plant at Bangkok have Solids contact clarifier 18 tanks with capacity 200,000 cubic meters/day for each tank. Rate of water production is 3.6 million cubic meters/day. Cost of alum when using only alum as coagulant were 972,000, 1,836,000, 1,944,000, 1,908,000, and 1,548,000 bath/day respectively. Cost of alum when using wet sludge as coagulant aid is decreasing 324,000, 432,000, 180,000, 396,000 and 360,000 bath/day respectively. Cost of alum when using dry sludge as coagulant aid is decreasing 180,000, 324,000, 72,000, 190,000 and 144,000 bath/day respectively.

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