

Thesis Title                      Study of Specific Resistance of Alum Sludge  
   of the Thonburi Water Treatment Plant by  
   using Polyelectrolytes as Conditioner

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#### ABSTRACT

This study was conducted to assess the specific resistance of alum sludge when anionic, cationic, and nonionic polyelectrolytes were applied for sludge concentration of 2, 4, and 6 % of total solid contents. Several tests were evaluated at pH 6.8 and 8.0 . Alum sludge was taken from Thonburi water treatment plant. Buchner Funnel test was employed in evaluation of specific resistance and total solid content by selecting lowest specific resistance and highest total solid content.

It was found that sludge concentration, pH, and type of poly electrolyte, each has statistically significant effect on specific resistance (P-value < 0.0001). The interaction effects between these parameters on specific resistance were also statistically

significant. From the test results, specific resistance was inversely associated with sludge concentration .

It was found that the lowest specific resistance was obtained when cationic polyelectrolyte was applied, whereas the use of nonionic polyelectrolyte and anionic polyelectrolyte yielded higher specific resistance . Interaction effect between sludge concentration and pH levels showed that specific resistance decreased as sludge concentration increased and pH levels decreased. Interaction effect between polyelectrolyte types and pH levels showed that anionic and nonionic polyelectrolyte at pH 6.8 exhibited lower specific resistance than at pH 8.0 ; cationic polyelectrolyte at pH 8.0 yielded lower specific resistance than at pH 6.8 . The lowest specific resistance was observed when cationic polyelectrolyte was applied at the highest sludge concentration. In similar patterns, lowest specific resistance was also observed at the highest sludge concentration for nonionic and anionic polyelectrolytes . Among the three polyelectrolyte, cationic polyelectrolyte yielded the lowest specific resistance under the same conditions.