

# **Alum Recovery from Alum Sludge Disposal from Water Treatment Plants**

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## **Summary**

The present study deals with the recovery of alum from alum sludge produced in a large amount from the conventional water treatment plants. The alum recovery process was applied to actual alum sludge were produced in Al- Wathba and Al-Karama water treatment plant to assess the suitability of the process. Recovery experiments were carried out on simulated alum sludges obtained from coagulation- flocculation of waters with different turbidities; normally; 150, 500 and 1000 NTU. Sulphuric acid was used as extraction agent of the alum.

The effect of acid amounts (0, 25, 50, 75, and 100 %), acidity of solution (1-3) and temperature (18-70°C) were investigated. It was found the adding 100% excess acid to 1000 NTU sludge, more than 90% of alum added during coagulation – flocculation process was recovered at pH of 2.9 and temperature of 40 °C. There are regarded as the best operating conditions of the process.

The other part of the present study was using the recovered alum obtained as a solution in the coagulation- flocculation process. Water with average turbidity of 78 NTU was used for this purpose. The alum dose (1.25-25 ppm), pH of solution (5-9) and time of mixing (5-25 min)

were taken as variables affected the coagulation process. The same runs were carried out with fresh alum at the same operation conditions. As expected, the recovered alum has lower coagulation efficiency compared with the fresh alum. A dose of 5 ppm of the recovered alum was used to reduce the turbidity from 78 NTU to 23.6 NTU and the recovered alum works more slowly than the fresh alum. The best dose, as well as, the best operating conditions were found to evaluate the feasibility of the process.