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/ COAGULATION/ RAW WATER

KULWARANG SUWANASRI : REMOVAL EFFICIENCY OF HUMIC ACID  
IN RAW WATER BY USING POTASSIUM PERMANGANATE AND ALUM IN  
COAGULATION. THESIS ADVISORS : SUTHEP SILAPANUNTAKUL, Ph.D.,  
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This study was conducted to remove humic acid from raw water by using potassium permanganate and alum in the coagulation process. The jar-test method was used to determine the effect of initial humic acid concentration, the optimum pH value, and the optimum dose of alum and potassium permanganate. The water samples were taken randomly from Klong Prapa Sam-Sen, Bangkok and the stock solution of humic acid (10 mg/L) was added. The pH levels were then adjusted to 5.5, 7.0, and 8.5. The study doses of alum were 15, 25, 35, and 45 mg/L, whereas those of potassium permanganate were 0.0, 0.2, 0.4, 0.6, 0.8, and 1.0 mg/L. The concentration of humic acid for determining the percentage removal efficiency was measured by the Spectrophotometric method with absorbance wavelength at 420 nm. Data analysis was performed by using the statistical Kruskal-Wallis test.

The results indicated that the percentage efficiency of humic acid removal from the water sample without the addition of the humic acid stock solution was  $78.32 \pm 10.82\%$ , which was significantly greater than the efficiency with the addition of the humic acid stock solution,  $76.75 \pm 20.99\%$ , ( $P$ -value $<0.05$ ). At a pH level of 5.5, the percentage efficiency of humic acid removal,  $83.83 \pm 9.84\%$ , was significantly greater than that at pH 7.0 and 8.5 ( $P$ -value $<0.05$ ). For the alum dose, the percentage efficiency of humic acid removal with the addition of alum at 35 mg/L,  $85.31 \pm 8.71\%$ , was significantly greater than that at 15, 25, and 45 mg/L ( $P$ -value $<0.05$ ). When adding different doses of potassium permanganate to raw water, the percentage of humic acid removal was not significantly different ( $P$ -value $>0.05$ ). However, at the neutral and alkaline pH, increasing potassium permanganate doses resulted in effectively greater percentage of humic acid removal. As a result, this study could be applied to the small or large-scale water supply system, but additional study for understanding the influence of potassium permanganate on the filter unit should be conducted.