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WONTANA WUTTIYINGYONG : REMOVAL OF PHOSPHORUS IN SYNTHETIC WASTEWATER USING IRON SLAG. THESIS ADVISORS : SHALASAI HUNGPRASERT M.P.H. (Env.H.), SUTHEP SILAPANUNTAKUL Ph.D. (MED. & VET. Entomology), PATTANA MULPHRUK M.Eng (Sanitary) 81 p. ISBN 974-662-457-1

The objectives of this study were to determine the phosphorus removal capacity in synthetic wastewater using iron slag and to determine the phosphorus removal efficiency of iron slag when the phosphorus concentrations in synthetic wastewater and bed depths were varied. Batch experiment and column test were carried out. Three concentrations of synthetic wastewater containing phosphorus, namely 5 ±1, 10 ±1 and 15 ±1 mg/L were tested. In addition, two heights of iron slag packing column, 30 and 45 cm, were tested with the wastewater flow rate of 0.6 m^3/m^2.hr The effluent samples were collected at 1-hour intervals for 8 consecutive hours and analyzed for the phosphorus concentration.

The results showed that phosphorus removal capacity of iron slag ranged 0.05 to 0.1 mg/L at the initial phosphorus concentrations of wastewater of 5-15 mg/L. In column tests, the mean percentages of phosphorus removal efficiency at the depth of slag of 30 and 45 cm were 58.93 and 67.54, respectively. In addition, the mean percentages of phosphorus removal efficiency in wastewater when the phosphorus concentrations were 5 ±1, 10 ±1 and 15 ±1 mg/L were 83.33, 65.67 and 40.71, respectively. In addition, there was a significant increase in phosphorus removal efficiency when the depth of slag in column increased ($p = 0.05$). However, the significant decrease of phosphorus removal efficiency was observed when the initial phosphorus concentration in wastewater increased ($p < 0.05$). The highest phosphorus removal efficiency was observed when the height of slag was 45 cm and the initial phosphorus concentration was at 5 ±1 mg/L.