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KEY WORD : SEQUENCING BATCH REACTOR/ ENZYME-ACTIVATOR

SUPANEE SAMRANKIJDAMRONG : INCREASING THE EFFICIENCY OF A SEQUENCING BATCH REACTOR BY ENZYME - ACTIVATOR. THESIS ADVISOR : SUVIT SHUMNUMSIRIVATH, M.S.(Env.&Water Resources Eng.), KRISANA TEANKAPRASITH, M.S. (Env.Health), UDOMSAK KONGMUANG, M.S.(Env.Eng.), KOMOL SIVABORVORN, Dr.P.H. (Env. Health Sc.). 124 p. ISBN 974 - 589-223-8

The objective of this research was to increase the efficiency of a sequencing batch reactor (SBR) by Enzyme - Activator. Enzyme - Activator has balanced mixture of high activity enzymes and dried bacterial cultures for digesting organic matter. The experiment was divided into 2 groups. Group I was controlled MLSS concentration in the range of 300 - 500 mg/l. Group II was controlled MLSS concentration in the range of 900 - 1,500 mg/l. Each group was divided into 2 sets, with Enzyme-Activator and control. The raw wastewater from Pathumthani Hospital was used. The models were operated on half an hour fill, 20-hours aerate, 3-hours settle, half an hour draw out and half an hour idle period, while the filling and aeration were started at the same time.

The results showed that in Group I, the control and the experimental set with Enzyme - Activator had efficiency of COD removals of 85.02 % and 88.10%; TKN removals were 93.79% and 95.32%, and SS removals were 97.43% and 97.84% respectively. For Group II, in the control and the experimental set the efficiency of COD removals were 91.59% and 93.72%, TKN removals were 96.91% and 98.23%, and SS removals were 98.33% and 98.66% respectively.

The statistical analysis showed that the efficiency of COD and TKN removals of the experimental sets were significantly higher than the controls in both two groups at $p\text{-value} < 0.05$. The efficiency of SS removals were not significantly different at $p\text{-value} > 0.05$ in both Groups. It can be concluded that the SBR system with MLSS concentration in range of 900 - 1,500 mg/l had efficiency of COD, TKN and SS removals statistically significantly higher than the MLSS concentration in range of 300 - 500 mg/l at $p\text{-value} < 0.05$. It was also found that the higher percentages of experimental groups were too small when compared with controls. It may be due to the very low MLSS in the experiments.