

Wajussakorn Kanjana 2006: Application of Submerged Filter Bioreactor for Paper Mill Wastewater Treatment. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Mr.Monthon Thanuttamawong, Ph.D. 135 pages. ISBN 974-16-1871-9

This research studied the kinetic coefficients and suitable operating conditions of filamentous bacteria in submerged filter bioreactor. The research was operated in laboratory scale of sequencing batch reactor (SBR) which was fed with wastewater from kimberly-clark thailand limited.

The results showed that kinetic coefficients of wastewater degradation by filamentous bacteria was determined as maximum rate of substrate utilization per unit weight of micro organism ($k = 1.21 \text{ (kg-COD/kg-MLVSS}\cdot\text{d)}$), half velocity coefficient ($K_s = 5.45 \text{ (mg-BOD/l)}$), Yield coefficient ($Y = 0.38 \text{ (mg-MLVSS/mg-BOD)}$), maximum specific growth rate ($\mu_m = 0.46 \text{ (mg-MLVSS/mg-MLVSS}\cdot\text{d)}$) and decay coefficient ($k_d = 0.17 \text{ (mg-MLVSS/mg-MLVSS}\cdot\text{d)}$). In BOD removal efficiency term, If efficiency reached to maximum, 95%, should operated with F/M ratio = 0.1 (kg-BOD/kg-MLVSS.d) sludge age = 3.38 (d.) and hydraulic retention time = 16 (hrs.). Sludge bulking trend decreased by observed when system was operated with hydraulic retention time = 16 (hour) and F/M ratio more than 0.5 (kg-BOD/kgMLVSS.d). In results of filtration part revealed that no microorganism broke out from filter which was made from nylon pore size 20 micron and less than 10 (mg/l) of suspended solid can broke out from the filter. At constant tranfilter pressure (-7 kPa) actual flux dropped when concentration of mix-liquor suspended solid increased until concentration reached to 12000 (mg/l) that made actual flux constant even though concentration increased more than this. The specific flux was 431 ($\text{L/m}^2\cdot\text{hr}\cdot\text{bar}$)

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Thesis Advisor's signature

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