DENITRIFICATION PATH AND NITRATE UTILIZATION RATES

IN BULKWATER AND BIOFILM PHASES OF MUNICIPAL

SEWER NETWORKS USING NATURAL WASTEWATER

By

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ABSTRACT

Design of sewers incorporating sewer processes is now being accepted. The sewer acts as a reactor where the quality of the wastewater is affected by microbial changes during the transportation of the wastewater in the sewer. But, due to the lack of fundamental knowledge on kinetics of microbial transformation in the biofilm phase under anoxic condition, the efforts towards modeling and design of sewer network incorporating the process dimension is being restrained.
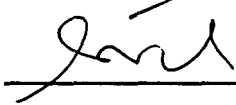
Hence, the main goal of this project is to study the microbial transformations under anoxic conditions particularly to determine the denitrification path and establish the nitrate utilizing rate (NUR) in bulkwater and biofilm phases of municipal sewer networks using natural wastewater.

This project is based on laboratory studies using biofilm grown under sewer condition in batch reactor that was subjected to anoxic condition. Experiments conducted on 7 different wastewater taken from a manhole located next to the Environmental Research Laboratory and WWTP at Jalan Ilmu, UiTM Shah Alam.

Results have shown that the nitrate utilization rate in the bulkwater and biofilm phases is higher than NUR bulkwater that had been established in the literature. NURs in biofilm and bulkwater phases for this study were found to be in the range of 1.57-4.90 g NO_3-N/(m^{3}h) while NUR bulkwater phase is in the range of 0.6-3.2 g NO_3-N/m^{3}h.

DECLARATION BY THE CANDIDATE

I Salmaliza Salleh, 2001304525 confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

(April 26, 2004)

ACKNOWLEDGEMENT

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