DENITRIFICATION PATH AND NUR BIOFILM PHASE OF MUNICIPAL SEWER NETWORKS USING ARTIFICIAL WASTEWATER

By

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DECLARATION BY THE CANDIDATE

I'm Salwani bt Jaffar, UiTM no. 2001305123, confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

Yours truly,
.....Salwani.....
(SALWANI BT JAFFAR)
15 APRIL 2004

ABSTRACT

Extensive study on denitrification rates in the biofilm phase under sewer condition had been done. This paper will propose a study on denitrification path in the biofilm phases of municipal wastewater using of artificial wastewater under anoxic condition of excess electron acceptor and excess electron donor. In this study, experiment will conducted to establish the Nitrate Utilizing Rate (NUR) in biofilm phase of municipal wastewater using of artificial wastewater that represent by distilled water. The result is solely due only to biofilm as this study condition is using of artificial wastewater (distilled water) that not contain any organic compounds instead of the bulkwater that contain various of organic compounds which can utilized the nitrate rapidly until it depleted.. So, this study is a project based only on laboratory work. Result from this study can be used as a comparison to study done by Abdul-Talib (2002) and Johari and Abdul-Talib (2004) which gets the NUR from the differentiation of NUR in bulkwater and biofilm and NUR in bulkwater only.

Gas sample result from experiments conducted on 2 from 7 artificial wastewater samples have shown that the denitrification path in biofilm can be simplified by the reduction of nitrate to nitrogen with significant accumulation of nitrite. This is because the results have shown the insignificant of nitric oxide and nitrous oxide accumulations'. While, all of 7 liquid samples result, have shown two distinct stages during the denitrification processes.

The Nitrate Utilizing Rate (NUR) in the biofilm phase establish in this study ranges from 0.035 – 0.173 $gNO_3^-N/(m^2h)$ with an average rate of 0.121 $gNO_3^-N/(m^2h)$.

Keywords: Biofilm, artificial wastewater, denitrification path, Nitrate Utilizing Rate (NUR)

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