DETERMINATION OF WASTEWATER QUALITY CHANGES UNDER ANOXIC CONDITIONS

By

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ABSTRACT

Sewer systems in Malaysia have been design solely to perform mass transport function, while wastewater treatment plants (WWTPs) are considered stand-alone treatment units. However, microbial transformation processes in sewers have been neglected in design of sewers.

Microbial processes and model concepts describing transformations under aerobic and anaerobic conditions have been established. Under aerobic conditions, readily biodegradable substrate is removed, while under anaerobic conditions readily biodegradable substrate is preserved. However, studies under anoxic conditions to date have not established the wastewater quality changes that occur, though a general concept on the utilization rate of nitrate and nitrite has been established.

The purpose of this project is to investigate the amount of substrate (electron donor) and nitrate/nitrite (electron acceptor) utilized during anoxic transformations of municipal wastewater.

Tests on different municipal wastewater samples taken from the wastewater treatment plant located at Jalan Ilmu, UiTM Shah Alam and a man-hole, near the Civil Engineering Laboratory were conducted. Two types of reactors were used in this study. The first reactor, subjected to aerobic conditions was used to determine the amount of substrate utilized by analyzing the OUR curve. The second reactor, subjected to anoxic conditions was used to determine the amount of nitrate/nitrite used during the anoxic transformation processes.

KEYWORDS

Anoxic transformation, COD-fractions, dentrification, in-sewer processes, microbial transformation, nitrate utilization rate, oxygen utilization rate, wastewater characterization.

DECLARATION BY THE CANDIDATE

I Salinda Haji Mohd. Appandi, 2001471843 confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

(October 6, 2003)

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