

FINAL YEAR PROJECT REPORT
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ESTABLISHING HALF SATURATION CONSTANT
FOR NITRITE (K_{NO_2})

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ABSTRACT

The sewer is an integral part of the urban wastewater system that comprises of the sewer, the wastewater treatment plant and the local receiving waters. The sewer is a reactor for microbial changes of the wastewater during transport, affecting the quality of the wastewater and thereby the successive treatment processes or receiving water impacts during combined sewer overflow.

This report presents the methodology and results of studies on anoxic processes, namely denitrification, in the bulk water phase of wastewater as it occurs in sewers. Since anoxic conditions do not normally exist in sewer, sodium nitrite is added to the sample to induce the anoxic condition.

Tests were conducted on 7 different wastewater samples taken from two locations, namely, the wastewater treatment plant (WWTP) at Section 23, Shah Alam and WWTP located at Jalan Ilmu, UiTM, Shah Alam. Tests were performed using batch reactors to measure denitrification rate under conditions of excess electron donor and limited electron acceptor. Concentrations of electron acceptors *i.e.*, nitrate and nitrite were determined using Ion Chromatography 790 COM.

This report also presents the results of studies on half saturation constants for nitrite, K_{NO_2} , in raw wastewater. The average value of K_{NO_2} , determined from experiments conducted on 7 different wastewater samples were found to be 0.640 units.

NO_3-N / m^3

KEYWORDS: In-sewer processes, anoxic condition, denitrification, half saturation constant.

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CHAPTER 1: INTRODUCTION

1.0 GENERAL

Every community produces both liquid and solid wastes. The liquid portion is essentially the water supply of the community after it has been fouled by a variety of uses. From the standpoint of sources of generation, wastewater may be defined as a combination of the liquid or water carried wastes removed from residences, institutions, commercial and industrial establishments, together with such groundwater, surface water, and storm water as may be present (Metcalf and Eddy, 1991).

Sewage comprises of various pollutants that enter the sewerage system from domestic, commercial and industrial premises. It is more than just what goes down a toilet as it also includes wastewater from kitchens, bathroom and laundries. Many of our activities at home generate pollutants, which find their way into the sewerage system. Unless treated at a wastewater treatment plant, raw sewage and pollutants can end up in our drains, rivers and coastal waters risking public health, contaminating water resources and polluting the environment.

In Malaysia, sewerage systems range from simple bucket latrines providing little or no treatment to sewage to modern sewage treatment plants that employ mechanical and biological means to treat large volumes of sewage to acceptable environmental standards.