DETERMINATION OF KINETIC PARAMETERS FOR OUR-MODEL FOR MUNICIPAL WASTEWATER IN HOT-CLIMATE COUNTRIES

By

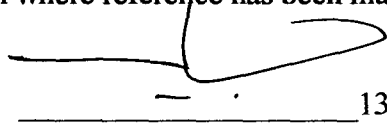## SHAFIENAZ BT ISMAIL

Report is submitted as
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DECLARATION BY THE CANDIDATE

I <u>Shafienaz Ismail, 2002238771</u> confirm that the work is my own and that appropriate credit has been given where reference has been made to the work of others.

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Generally, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Oxygen Carbon (TOC) are commonly used in wastewater characterization. These conventional methods assess the organic content of wastewater. However no information on the biomass can be obtained from these methods. With the advancement of technology, a new technique the Oxygen Utilization Rate (OUR) model, has been introduced by Volertsen and Hvitved-Jacobsen (1999) to overcome these problems. OUR is based on respirometry which allows COD-fractions in the wastewater to be evaluated. The COD-fractions include biomass (X_B), readily biodegradable substrate (S_S), fast hydrolysable substrate (X_{S1}) and slow hydrolysable substrate (X_{S2}). An OUR model based on the Activated Sludge model that has been developed to facilitate the calculation of COD-fractions from the OUR experiments (Henze *et al.*, 1985, Henze *et al.*, 1995, Henze *et al.*, 1999 and Henze, 2002). The use of OUR has the advantage to provide information about the biomass which is central to the transformation processes in wastewater. Vollertsen and Hvitved –Jacobsen, (2002) and Gudjonsson *et al.* (2002) described the use of OUR in characterizing wastewater under sewer conditions. It is expected that OUR will have a pronounce impact on design of processes involving wastewater treatment. Kinetic parameters for OUR model have been established by Kappelar and Gujer, (1992) and Hivtved-Jacobsen, (1999) for wastewater taken in temperate climate countries. The use of the OUR model, on wastewater in hot