

**CURRENT RESEARCH
AND DEVELOPMENT IN
BIOTECHNOLOGY
ENGINEERING
AT IIUM**

VOLUME I

Editors:

Suleyman Aremu Muyibi
Mohammed Saedi Jami
Zaki Zainudin



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(VOLUME I)

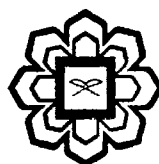
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CHAPTER 5

SETTLING COLUMN ANALYSIS FOR WATER TURBIDITY REMOVAL USING CHITOSAN

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ABSTRACT

Settling Column analysis is used to recommend the process parameters for the sedimentation tank and the results revealed that the sedimentation tank can reduce turbidity most effectively at the detention time of 1.75 hour and overflow rate of 16.5 m/d. It is hoped that the project would be able to offer a cheaper solution to remove turbidity from water through the use of *chitosan* as the flocculating agent. If the flocculation process is successful, it would provide more environmental-friendly and economical solution compared to previous method that have been practiced nowadays.

Keywords: turbidity, column analysis, settling column, chitosan

INTRODUCTION

One of the problems with treatment of surface water is the large seasonal variation in turbidity. Current operational procedures at many treatment works in developing countries are based on arbitrary guidelines, particularly in relation to the dosage of chemicals. There is the problem of inadequate number of skilled workers and inadequate laboratory facilities to monitor process performances required to operate the plants. There is also the problem of malfunctioning of these plants attributable to shortage of treatment chemicals, frequent breakdown of equipment like chlorinators and pumps and poor operational and maintenance schedule (Mackenzie, 2007). Water supply companies in developing countries utilize alum for coagulation in water treatment. Its usage constitutes a high percentage of the annual running expenditure of water treatment companies and the cost has been increasing at an alarming rate. In Kano, Nigeria for example, the Kano State Water Board spends about 65% of its annual running cost of about RM4 million on chemicals to provide 175,000 m³/d of potable water to Kano City and its environs (Muyibi, 1998). Moreover, aluminum salts used as primary coagulant in potable water may lead to an increase in the concentrations of aluminum ions, which is indicated to be a causative agent in neurological diseases like Alzheimer's disease and pre-senile dementia.