

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

**VOLUME I**

Editors:

Suleyman Aremu Muyibi  
Mohammed Saedi Jami  
Zaki Zainudin



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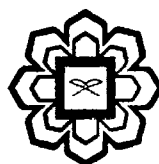
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## CHAPTER 6

### PROCESS DEVELOPMENT OF REMOVING LOW TURBIDITY WATER USING CHITOSAN AS A BIOCOAGULANT

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#### ABSTRACT

The availability of turbidity in water supply could be a deathful threat towards human if it is not treated properly. Treatment of turbidity from water is important to ensure the healthiness of the water from harmful particles and microorganisms. Therefore, in this study, we have evaluated the performance of *chitosan* used in removal of low turbidity from water and optimize the operating conditions of *chitosan* using conventional jar test method for removal of low turbidity from synthetic water. This research project is focused on the efficiency of Chitosan in removing low turbidity from water. The optimal conditions for *chitosan* to react with turbidity with water have been studied. The effect of contact time, *chitosan* dosage, agitation speed and pH will be observed for optimal flocculation of turbidity by *chitosan*. Thus, the application of conventional jar test method is used. Run 39 show the optimal result. Then, 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, chitosan, optimal condition, pH

#### 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 (Binner, 2006). 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). Turbidity is a cloudiness or haziness of water (or