DECOLORIZATION OF TREATED PALM OIL MILL EFFLUENT (TPOME) BY COAGULATION AND HYDROGEN PEROXIDE

DAINEE NOR FARDZILA BTE AHMAD TUGI

Final Year Project Report Submitted in Partial Fulfilment of the Requirements for the Degree of Bachelor of Science (Hons) Applied Chemistry In the Faculty of Applied Sciences Universiti Teknologi MARA

OCTOBER 2008

This Final Year Project Report entitled **"Decolorization of Treated Palm Oil Mill Effluent (TPOME) by Chemical Coagulation and Hydrogen Peroxide"** was submitted by Dainee Nor Fardzila Bte Ahmad Tugi, in partial fulfillment of the requirements for the Degree of Bachelor Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

Assoc. Prof. Lee Kok Kheng
Supervisor
B. Sc. (Hons.) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA

Miss Sabrina Bte M. Yahaya
Project Coordinator
B.Sc (Hons.) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA

Dr. Yusairie Bin Mohd
Head of Programme
B.Sc (Hons.) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA

Date: 1/12/08

ACKNOWLEDGEMENTS

Assalamualaikum..

Alhamdulillah with the consent of Allah s.w.t, finally I managed to complete my thesis successfully.

First and foremost, my sincere gratitude goes to my supervisor, Assoc. Prof. Lee Kok Kheng for his precious supervision, guidance and constructive comments in in helping me preparing and completing my thesis. I would like to express my thanks and appreciation to the Head of Programme of Applied Chemistry, Dr. Yusairie Bin Mohd, for giving me the opportunity to learn and gain new knowledge and experience while completing this study.

To all lab assistants in 305, 303, 407, 610 laboratories, thank you so much for your helps in guiding and conducting me to use the instruments during this study. My enormous gratitude also goes to those persons that partially or fully involved in completing my thesis.

THANK YOU....

TABLES OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 The production of palm oil mill effluent in Malaysia

Palm oil processing is carried out using large quantities of water in mills where oil is extracted from the palm fruits. During the extraction of crude palm oil from the fresh fruits, about 50% of water results in palm oil mill effluent (POME). It is estimated that for 1 tonne of crude palm oil produced, 5-7.5 tonnes of water ends up as POME (Ahmad et al., 2003). The solid waste products that result from the milling operation are empty fruit bunches, palm fiber, and palm kernel. In both traditional and modern milling settings, these solid waste products are all put to economically useful purposes such as fuel material and mulch in agriculture. It is the POME that is usually discharged into the environment, either raw or treated.

The various effluent treatment schemes which are currently used by the Malaysian palm oil industry are in the descending order: (a) anaerobic/ facultative ponds (Rahim and Raj et al., 1982; Wong et al., 1980; Chan and Choi et al., 1982), (b) tank digestion and mechanical aeration, (c) tank digestion and facultative ponds, (d) decanter and facultative ponds, and (e) physico-chemical and biological treatment (Andreasen et al., 1982).