THE DECOLORIZATION OF PAINT WASTEWATER BY USING TITANIUM DIOXIDE AND UV RADIATION (PHOTOCATALYSIS)

MAIZATUL EKMALIA BINTI JASNI

Final Year Project Report Submitted in Partial Fulfillment of the Requirement for the Degree of Bachelor of Science (Hons.) Applied Chemistry in the Faculty of Applied Sciences Universiti Teknologi MARA

APRIL 2009

This Final Year Project entitled **"The Decolorization of Paint Wastewater by Using Titanium Dioxide and UV Radiation (Photocatalysis)"** was submitted by Maizatul Ekmalia binti Jasni,in partial fulfillment of the requirements for the Degree of Bachelor of 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 binti M.Yahaya
Project Coordinator
B.Sc. (Hons.) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA

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

Date: 22/5/2009

ACKNOWLEDGEMENTS

Alhamdulillah, praise be to Allah, Lord of the Universe, upon completion of this project, I would like to express my deepest appreciation and gratitude especially Assoc.Prof.Lee Kok Kheng, my supervisor, for her understanding, patience, invaluable guidance, suggestion and constant encouragement throughout the planning and execution of this project.

My grateful thanks also to le also Food Technology Department laboratory assistants,

The support, suggestion and insightful comments given by my senior, Ami and my friend, Ain are greatly acknowledged. To them and all others who have helped during this project, I wish to express my deepest appreciation.

Last but not least, I am greatly indebted to my parents,for their understanding, and encouragement throughout the course of this study. What would I do without all of you? This is as much your accomplishment as it is mine.

TABLE OF CONTENTS

ABSTRACT

DECOLORIZATION OF PAINT WASTEWATER BY USING TITANIUM DIOXIDE AND UV RADIATION (PHOTOCATALYSIS)

This study is to investigate the feasibility of using a combination of chemical coagulation and photocatalysis for decolourization and COD reduction of emulsion paint wastewater. The optimum pH, dosages of coagulant and flocculant in the jar test are 6.5, 0.024% of alum and 0.024% of $CaCO_3$.The resulting supernatant was subsequently treated with TiO_2 and UV radiation for a fixed duration of 24 hours. It was observed that the average reductions of color and COD achieved are 93.4% and 97.1% respectively for both samples. However, the quality of the final effluent still exceed the discharge limits of Department of Environment (DOE).Thus, further studies should be conducted in photocatalysis to improve the quality of the treated effluent.