

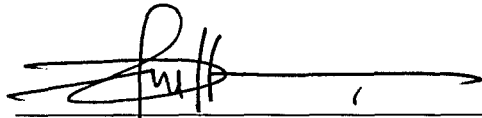
**PREPARATION AND OPTICAL CHARACTERIZATION OF
LATEX NANOPARTICLES**

MOHD HAFIZ BIN HASSAN

**BACHELOR OF SCIENCE (Hons.) PHYSICS
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

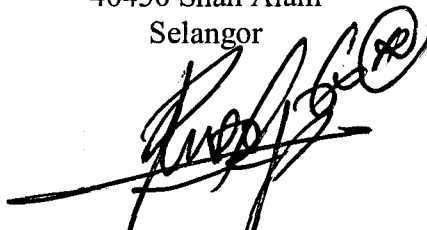
MAY 2011

This Final Year Project Report entitled “**Preparation and Optical Characterization of Latex Nanoparticles**” was submitted by Mohd Hafiz bin Hassan, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Physics in the Faculty of Applied Sciences, and was approved by



Prof. Dr. Saifollah bin Abdullah
Supervisor

~~B.Sc. (Hons.) Physics~~
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor



Assoc. Prof. Dr. Mohamad Rusop bin Mahmood
Co-supervisor

~~B.Sc. (Hons.) Physics~~
Faculty of Electrical Engineering
Universiti Teknologi MARA
40450 Shah Alam
Selangor

Assoc. Prof. Md Yusoff bin Theeran
Project Coordinator
B.Sc.(Hons.) Physics
Faculty of Applied Sciences
University Teknologi MARA
40450 Shah Alam
Selangor



Dr. Ab Malik Marwan bin Ali
Head of Programme
B.Sc.(Hons.) Physics
Faculty of Applied Sciences
University Teknologi MARA .
40450 Shah Alam
Selangor

Date: _____

ACKNOWLEDGEMENT

Firstly, I am very grateful to Allah S.W.T because of His consent, I finally finished my Final Year Project on time.

Foremost, I would like to express my sincere gratitude to my advisor, Prof. Dr. Saifollah bin Abdullah and my Co-supervisor, Assoc. Prof Dr Mohamad Rusop bin Mahmood for the continuous support of my study and research, for his patience, motivation, enthusiasm, and immense knowledge. Their guidance helped me in all the time of research and writing of this thesis. I could not have imagined having a better advisor and mentor for my study. Special dedications to my beloved parents, Hassan b. Mohammed and Halimah bte Hashim, who have always supported me and are always there to listen and understand me whether emotionally and/or financially. To Nur Farahin Hassmoro, thank you for helping me to synthesis latex nanoparticles. I would also like to express my special thanks to my friends for their big support, help and understanding throughout the completion of this thesis. Lastly, my gratitude goes to the lab assistants for all their help and support throughout the project lab works.

Once again, thanks to all who has contribute in the making of this report either directly or indirectly. I am truly grateful to know all of you.

Thank you.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	xi
ABSTRACT	xii
ABSTRAK	xiii
CHAPTER 1 INTRODUCTION	
1.1 General Information	1
1.2 Significance of Study	3
1.3 Problem Statements	4
1.4 Objectives of Study	4
CHAPTER 2 LITERATURE REVIEW	
2.1 Latex Synthesis	5
2.2 Optimum Temperature	6
2.3 Latex Film Formation	7
2.4 Preparation of Latex with High (T _g)	8
2.5 Crosslinkable Latexes	9
2.6 Emulsion polymerization	10
2.7 FTIR Spectra	11
2.8 UV-Vis Spectroscopy	15
CHAPTER 3 METHODOLOGY	
3.1 Methodology	18
3.2 Preparation of Latex Nanoparticles	19
3.3 Characterizations Method	22

ABSTRACT

PREPARATION AND OPTICAL PROPERTIES OF LATEX NANOPARTICLES

Latex is a stable dispersion of polymeric material in an essentially natural or synthetic colloidal suspension. Latex nanoparticle is latex in nano (10^{-9} m) size and used for coating or emitter. In this research, three types of latex nanoparticles samples with different amounts of n-BMA were prepared. The parameter used are drying process which is blow process, fast drying process and slow drying process. The chemical components of the latex nanoparticles were investigated by Fourier transform infrared (FTIR) spectrometer and the FTIR spectra exhibited the characteristic stretching peaks of C-H (CH_2) at 2928 cm^{-1} , the stretching vibration of C=O was observed at 1739 cm^{-1} , and the absorption at 970 cm^{-1} was the characteristic peak of n-BMA. UV-Vis absorption spectra show peaks characteristic of the surface of latex nanoparticles and the film absorption to UV light reached its maximum at range 256- 273 nm.