

**FABRICATION OF ZINC OXIDE THIN FILMS USING SOLUTION
IMMERSION METHOD**

AMIR HAFIZ BIN KHAIRUDIN

**Final Year Project Reported Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Physics
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

JULY 2014

ACKNOWLEDGEMENTS

Assalamualaikum wbt.

In the name of Allah, the Most Gracious and the Most Merciful, I thank Him for His faithfulness in giving me the strength, patience and determination to complete my Final Year Project. I would like to take this opportunity to express my gratitude to all people who helped to make final year project a reality.

Foremost, I am highly grateful my supervisor Dr Kamisah Bte Mohamed Mahbor and my ex supervisor Pn Ruziana Bte Mohamed for the guidance, advice, and comments in accomplishing this project. I would like express my appreciation to others physic lecturers in Universiti Teknologi Mara (UiTM) Pahang in providing support, inspiration and help throughout the research

This project would not have been completed without the assistance of the technical staff in NANO-SciTech Centre (NST), Faculty Applied Science, and Faculty Mechanical Engineering in Universiti Teknologi Mara (UiTM) Shah Alam Selangor as well as the encouragement from their coordinators. Warm gratitude for these staff and postgraduate student for their assistance: Miss Nurul Afaah Binti Abdullah for solution immersion method and UV-Vis spectroscopy, Miss Nur Amierah Binti Mohd Asib and Pn Nurul Wahida Binti Aziz for photoluminescence spectroscopy, Mr Azrol for XRD, Mr Mohd Husairi Bin Fadzillah Suhaimi for current voltage measurement and others for their kind advice.

My final and greatest debt is to my supportive family especially my parent and faithful friends for being my constant companions throughout all the stages of my work. Thank you very much everyone without your unlimited encouragement, this research could not have seen the light of day!

Amir Hafiz Bin Khairudin

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background and problem statements	1
1.2 Significance of study	4
1.3 Objective of study	4
CHAPTER 2 LITERATURE REVIEW	
2.1 Introduction	5
2.2 Thin film	5
2.3 Zinc oxide	6
2.4 Solution immersion method	6
2.5 Characteristic of zinc oxide thin film	7
2.5.1 Structural properties	7
2.5.2 Optical properties	8
CHAPTER 3 METHODOLOGY	
3.1 Preparation of glass substrate	9
3.2 Preparation of precursor solution	10
3.3 Deposition of zinc oxide nanostructures	11
3.4 XRD characterization	14
3.5 Photoluminescence study	15
3.6 Current-voltage measurement	15

3.7	UV-Visible study	16
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CHAPTER 4 RESULTS AND DISCUSSION

4.1	Current-Voltage measurement	17
4.2	X-Ray diffraction	18
4.3	Photoluminescence	19
4.4	Ultraviolet-visible spectrometry	20

CHAPTER 5 CONCLUSION

5.1	Conclusion	22
5.2	Recommendation	23

CITED REFERENCES	24
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APPENDICES	27
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CURRICULUM VITAE	28
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ABSTRACT

FABRICATION OF ZINC OXIDE THIN FILMS USING SOLUTION IMMERSION METHOD

Zinc oxide (ZnO) nanoparticles were successfully synthesized by solution immersion method. The zinc nitrate hexahydrate was used as a precursor, hexamethylenetetramine as a stabilizer and gold seeded was used as a function of catalyser. The zinc oxide thin films obtained were annealed at different temperatures (350 °C, 400 °C, 450 °C and 500 °C). The effect of annealing temperature on the crystal structure, optical and electrical properties of the ZnO nanoparticles were characterized using X-ray diffraction (XRD), UV-Vis spectrometry, photoluminescence spectrometry and I-V measurement. XRD results showed that all the peaks obtained were corresponding to the hexagonal wurtzite structure. Photoluminescence spectrometry showed two peaks which is high intensity at wavelength of range 375 nm- 425 nm and higher at 450 nm- 800 nm and this indicates clearly two emission bands corresponding to the band edge emission and defects related emission respectively. UV-Vis spectrometry graph obviously showed high absorbance at wavelength 280 nm- 350 nm which means that all the films are highly absorbance at ultraviolet region. Meanwhile, I-V measurement exhibits the highest slope at 500 °C and then followed room temperature (RT), 350 °C, 450 °C and 400 °C. The current at a given voltage for the films at 500 °C higher than other annealed temperature. This indicates that the annealing temperature at 500 °C increases the production of electron-hole pairs.