

**THE FABRICATION AND CHARACTERIZATION OF Nd DOPED
SiO₂P₂O₅ GLASS BY THE SOL GEL ROUTE**

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All the praises and thanks to Allah

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF APPENDICES	vii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
ABSTRAK	xi
CHAPTER 1 INTRODUCTION	
1.0 Introduction	1
1.1 Background Studies	3
1.2 Problem Statement	4
1.3 Significance of Study	4
1.4 Objective of Study	5
1.5 Scope of Study	5
CHAPTER 2 LITERATURE REVIEW	6
CHAPTER 3 METHODOLOGY	
3.0 Materials	11
3.1 Methods	12
3.1.1 Preparation of the Sample	12
3.1.2 Flowchart of Sample Preparation	15
3.2 Characterization of the Sample	16
3.2.1 Thermal Gravimetric Analysis (TGA)	16
3.2.2 Scanning Electron Microscope (SEM)	18
3.2.3 Fourier-Transform Infrared (FTIR) Analysis	19

CHAPTER 4 RESULT AND DISCUSSION	
4.0 Introduction	21
4.1 Thermal Gravimetric Analysis (TGA)	21
4.2 Scanning Electron Microscope (SEM)	25
4.3 Fourier-Transform Infrared (FTIR) Analysis	26
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	
5.1 Conclusion	29
5.2 Recommendation	30
CITED REFERENCES	31
APPENDICES	34
CURRICULUM VITAE	47

ABSTRACT

THE FABRICATION AND CHARACTERIZATION OF Nd DOPED $\text{SiO}_2\text{P}_2\text{O}_5$ GLASS BY THE SOL GEL ROUTE

The sol-gel process involves the sol (or solution) that evolves gradually towards the formation of a gel-like network containing both a liquid phase and a solid phase. In this research work, a fabrication of neodymium doped silica phosphate glass using sol gel technique had been carried out. The samples were fabricated by using with different content of raw material such as SiO_2 , P_2O_5 and Nd_2O_3 in different weight percentages. Five samples with Nd content ranging from 0 mol % to 4 mol % were prepared by using sol gel technique. Then, the samples were characterized by using Thermal Gravimetric Analysis (TGA), Fourier Transform Infrared (FTIR) analysis and Scanning Electron Analysis (SEM) respectively. From the results, it is obviously been seen that the TGA results show a decrement trend of result ranging from 10 % to 60% for all samples. Meanwhile, the FTIR spectra show the vibrational peak around 843 cm^{-1} corresponding to Si-O-Si functional group that resulted the formation of the glass through the sol gel method. Meanwhile, SEM also proves that the morphology of surface shows the great crystallization process of the glass matrix after it has been heat-treated.