

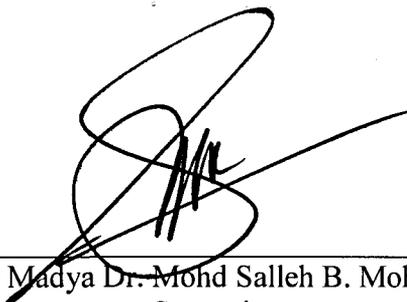
**ROOM TEMPERATURE ELASTIC PROPERTIES OF  
TERNARY ZINC MAGNESIUM CHLORO PHOSPHATE BY  
PULSE ECHO ULTRASONIC TECHNIQUE**

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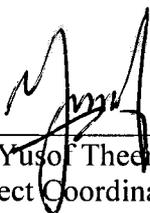
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This Final Year Project Report entitled “Room Temperature Elastic Properties of Ternary Zinc Magnesium Chloro Phosphate- $(\text{MgCl})_x(\text{ZnO})_{0.2}(\text{P}_2\text{O}_5)_{0.8-x}$  by Pulse Echo Ultrasonic Technique” was submitted by Siti Nurulaien Binti Abd Samat, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by

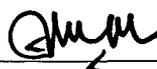


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## TABLE OF CONTENTS

	Page
<b>ACKNOWLEDGEMENT</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>ABSTRACT</b>	ix
<b>ABSTRAK</b>	x
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Background	1
1.2 Problem statement	4
1.3 Significance of study	4
1.4 Objectives of study	5
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Mysteries of metallic glass	6
2.2 Elastic properties and structural studies on some zinc borate glasses	7
2.3 Effect of zinc on the physical properties	8
2.4 Ultrasonic and infrared measurements of copper-doped sodium phosphate glasses	8
2.5 Ultrasonic study and physical properties	9
2.6 Pulse echo-overlap (PEO)	10
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Materials	11
3.1.1 Flowchart	11
3.1.2 Chemicals	12
3.1.3 Apparatus	12
3.1.4 Instrumentation	13

## ABSTRACT

### ROOM TEMPERATURE ELASTIC PROPERTIES OF TERNARY ZINC MAGNESIUM CHLORO PHOSPHATE- $(\text{MgCl})_x(\text{ZnO})_{0.2}(\text{P}_2\text{O}_5)_{0.8-x}$ BY PULSE ECHO ULTRASONIC TECHNIQUE

The study of glasses in ternary zinc magnesium chloro phosphate- $(\text{MgCl})_x(\text{ZnO})_{0.2}(\text{P}_2\text{O}_5)_{0.8-x}$  system will be carried out at room temperature. In the addition of magnesium chloride (MgCl) to the system it will modified the glass properties in his work the ion magnesium chloride for  $x=0.1, 0.2$  and  $0.3$  will be doped to the glass system and this will be synthesized by melt quenching technique. The structure of non-crystalline glass will be determined by XRD. Ultrasonic velocity measurements for longitudinal wave velocity and shear wave velocity will be carried out at room temperature with 4Mhz frequency. Then, trough this elastic property it can be used to determine Longitudinal Modulus, Shear Modulus, Bulk Modulus, Young's Modulus, Debye Temperature, micro hardness and Poisson's ratio of the glass sample. Results from the study show that the density of all glass was decrease from 2822 to 2685  $\text{kg/m}^3$  and molar volumes decrease from 0.004331 to 0.003917  $\text{m}^3/\text{mol}$ . Both the longitudinal and shear wave velocity decreased with increase of MgCl composition. The experimental results indicated that the elastic constant was depending upon the composition of the glass.