

# CONTENTS

## CHAPTER I

### INTRODUCTION

--- 1

- 1.1 Definition and classification
- 1.2 Need and advantages of composites
- 1.3 Magnetolectric composites
- 1.4 Literature survey
- 1.5 Applications
- 1.6 Orientation of the problem

### REFERENCES

## CHAPTER II

### FERRITES AND FERROELECTRICS

#### SECTION - A : Ferrite materials

---10

- 2A.1 Introduction
- 2A.2 Historical Development
- 2A.3 Crystal structure of spinel ferrites
- 2A.4 Classification of ferrites
- 2A.5 Theories on Ferrimagnetism
- 2A.6 Applications of ferrites

#### SECTION - B : Ferroelectric materials

---19

- 2B.1 Introduction
- 2B.2 Crystallographic considerations and definition
- 2B.3 Classification of ferroelectrics
- 2B.4 Crystal structure of  $\text{BaTiO}_3$
- 2B.5 Dielectric properties of ferroelectrics
- 2B.6 Ferroelectric theory

2B.7 Applications of ferroelectrics

REFERENCES

### **CHAPTER III**

#### **PREPARATION AND CHARACTERIZATION**

##### **SECTION - A : Preparation** --- 29

3A.1 Introduction

3A.2 Ceramic method

3A.3 Flow-chart for preparation

3A.4 Actual method of preparation

##### **SECTION - B : X-ray diffraction** --- 36

3B.1 Introduction

3B.2 X-ray diffractometer

3B.3 Experimental Techniques

3B.4 Results and Discussion

REFERENCES

### **CHAPTER IV**

#### **'SUM' PROPERTIES OF COMPOSITES** --- 56

4.1 Introduction

4.2 Dielectric dispersion and ac conductivity

4.2.1 Polarization and dielectric constant

4.2.2 Frequency dependence of dielectric constant

4.2.3 Temperature dependence of dielectric constant

4.2.4 Experimental techniques

4.2.5 Results and Discussion

4.3 DC electrical resistivity ---78

4.3.1	Experimental techniques	
4.3.2	Results and Discussion	
4.4	Thermoelectric power	--- 82
4.4.1	Experimental techniques	
4.4.2	Results and Discussion	
	REFERENCES	

## **CHAPTER V**

### **'PRODUCT' PROPERTY OF COMPOSITES** --- 90

5.1	Introduction	
5.2	Magnetoelectric effect	
5.3	Experimental technique	
5.4	Results and Discussion	
	REFERENCES	

## **CHAPTER VI**

### **SUMMARY AND CONCLUSIONS** -- -97