

CONTENTS

Chapter	Title	Page
I	INTRODUCTION	
	1.1 Introduction	1
	1.2 Crystal Structure of ferrites	2
	1.2.1 Normal spinel ferrites	2
	1.2.2 Inverse spinel ferrites	4
	1.2.3 Random spinel structure	4
	1.3 Substitutional Ferrites	5
	1.4 Magnetic Properties of ferrites	5
	1.4.1 Magnetisation in ferrites	5
	1.4.2 Structural Explanation of ferrimagnetism	6
	1.4.3 Neel's theory of ferrimagnetism	9
	1.4.4 Yafet-Kittle theory	15
	1.5 Electrical Properties	15
	1.5.1 D.C. conductivity	16
	1.6 Applications of ferrites	17
	1.7 Orientation of present work	17
	References	20
II	PREPARATION OF FERRITES AND X-RAY DIFFRACTION STUDIES	
	2.1 Introduction	22
	2.2 Mechanism of Solid State reaction	22
	2.3 The general formula of system	23
	2.4 Raw Material	23
	2.5 Weighing	23
	2.6 Flow Chart	24
	2.7 Presintering	25
	2.8 Grinding	25

....

Contents (contd..)

Chapter	Title	Page
	2.9 Sintering	25
	2.10 Pelet Formation	25
	2.12 Final Sintering	26
	B X-Ray Diffraction Study	
	2.13 The Diffractometer	27
	2.14 Preparation of the Specimen	27
	2.15 Indexing the Peaks in diffraction pattern	27
	2.16 Curie Temperature	28
	2.17 Apparatus and Determination of Curie Temperature	28
	2.18 Results and Discussion	30
	References	59
III	ELECTRICAL RESISTIVITY	
	3.1 Introduction	61
	3.2.1 Survey of Conduction models	64
	3.2.2 Electron hopping and polarons	65
	3.3 Results and Discussion	82
	References	91
IV	MAGNETISATION STUDIES	
	4.1 Introduction	93
	4.2 Classification of Magnetic Materials and Spin Ordering	94
	4.3 Origin of Domains and Energy Considerations	96
	4.3.1 Exchange Energy	97
	4.3.2 Magnetic Energy	98
	4.3.3 Anisotropy Energy	98
	4.3.4 Magnetoelastic Energy	98
	4.3.5 Domain Wall Energy	99

....

Contents (contd..)

Chapter	Title		Page	
	4.4	Wall Formation	...	99
	4.5	Domain Wall and Irriversibility	...	100
	4.6	Hysteresis and Coercivity	...	102
	4.7	Losses in Magnetic Materials	...	103
	4.8	Experimental	...	105
	4.9	Results and Discussion	...	113
		References	...	119
V		SUMMARY AND CONCLUSION	...	120
		References	...	128
