

CONTENTS

<u>Chapter</u>	<u>Title</u>	<u>Page</u>
I	INTRODUCTION	
1.1	Introduction	1
1.2	Crystal structure of ferrites	2
1.2.1	Normal spinel ferrites	4
1.2.2	Inverse spinel ferrites	4
1.2.3	Random spinel ferrites	4
1.3	Substitutional ferrites	5
1.4	Magnetic properties of ferrites	6
1.4.1	Magnetisation in ferrites	6
1.4.2	Structural explanation of ferrites	6
1.4.3	Neel's theory of ferri-magnetism	10
1.4.4	Yafet Kittel theory	15
1.5	D.C. conductivity	17
1.6	Applications of ferrites	18
1.7	Orientation of the present work	18
	References	20
II	PREPARATION OF FERRITES AND X-RAY DIFFRACTION STUDIES	
	(A) Method of Preparation	22
2.1	Introduction	22
2.2	Mechanism of solid state reaction	22
2.3	The general formula	23
2.4	Raw materials	23
2.5	Weighing	24
2.6	Pre-sintering	24
2.7	Grinding	24
2.8	Sintering	24
2.9	Pellet formation	24
2.10	Final sintering	25

...

Contents

<u>Chapter</u>	<u>Title</u>	<u>Page</u>
	(B) X-ray Diffraction Studies	... 25
2.11	Introduction	... 25
2.12	Diffractionmeter	... 25
2.13	Preparation of the specimen	... 26
2.14	Indexing of the peaks in the diffractiongrams.	... 26
2.15	Results and discussion	... 45
	(C) Determination of Curie Temperature	
2.16	Apparatus and determination of Curie temperatures.	... 49
	References	... 53
 <b>III</b>	 <b>RESISTIVITY STUDIES</b>	
3.1	Introduction	... 55
3.2	Survey of conduction models	... 56
3.3	D.C.conductivity cell	... 61
3.4	D.C.Resistivity measurement	... 63
3.5	Results and discussion	... 63
	References	... 88
 <b>IV</b>	 <b>MAGNETISATION STUDIES</b>	
4.1	Introduction	... 92
4.2	Domains and wall formation	... 93
4.3	Irreversibility and hysteresis	... 98
4.4	Losses	... 100
4.4.1	Hysteresis loss	... 101
4.4.2	Eddy current loss	... 102
4.4.3	Spin resonance loss	... 102
4.4.4	Relaxation loss	... 102
4.4.5	Wall resonance loss	... 103

...

Contents

<u>Chapter</u>	<u>Title</u>	<u>Page</u>
IV contd.	4.5 Experimental	... 103
	4.5.1 Apparatus	... 103
	4.5.2 Measurement procedure	... 104
	4.6 Results and discussion	... 105
	References	... 113
V	SUMMARY AND CONCLUSIONS	... 116
	References	... 123

...