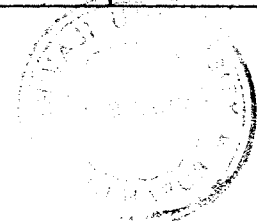


CONTENTS

Chapter	Title	Page No.
I	A BRIEF SURVEY OF FERRITES	1
	1.0 Introduction	2
	1.1 Historical background	2
	1.2 Crystal structure	4
	1.3 Spinel structure	4
	1.4 Classification of spinel ferrites	8
	a) Normal spinel ferrites	8
	b) Inverse spinel ferrites	9
	c) Random spinel ferrites	9
	1.5 Theories of ferrimagnetism	10
	a) Neel's theory of ferrimagnetism	10
	b) Yafet - Kittel theory	17
	1.6 Magnetic properties of ferrites	19
	1.7 Electrical properties of ferrites	21
	1.8 Applications of ferrites	22
	1.9 Orientation of work	24
	References	27
II	PREPARATION OF FERRITES	33
	2.0 Introduction	34
	2.1 Preparation of ferrites	35
	a) Oxide or ceramic method	36
	b) Decomposition method	36
	c) Precipitation technique	37
	i) Hydroxide precipitation	37
	ii) Oxalate precipitation	37
	2.2 Presintering or calcination	38
	2.3 Milling	38
	2.4 Sintering	38
	2.5 Mechanism of solid state reaction	39
	2.6 Hot pressing	41
	2.7 Preparation of ferrites under investigation	41
	2.8 Measurement of density	43
	References	47



III	CHARACTERIZATION OF FERRITES	50
	3.0 Introduction	51
	PART A : X RAY DIFFRACTION	53
	3.A.1 X-ray diffraction principle	53
	3.A.2 Powder method	54
	3.A.3 Experimental	56
	3.A.4 Results and discussion	58
	PART B : IR ABSORPTION	64
	3.B.1 Experimental	64
	3.B.2 Results and discussion	64
	References	70
IV	DC ELECTRICAL RESISTIVITY	72
	4.0 Introduction	73
	4.1 Conduction in oxides	75
	4.2 Conduction in ferrites	75
	4.3 Experimental	79
	4.4 Results and discussion	81
	References	86
V	MAGNETIC PROPERTIES	89
	5.0 Introduction	90
	5.1 Magnetostriction	91
	5.2 Weiss domain structure	93
	5.3 Bloach wall	93
	5.4 Domain wall thickness	94
	5.5 Domain state and hysteresis loop	95
	5.6 Temperature dependent initial susceptibility	98
	5.7 Magnetocrystalline anisotropy energy	99
	5.8 Magnetization process	101
	5.9 Losses in ferrites	103
	a) Hysteresis loss	103
	b) Eddy current loss	104
	c) Relaxation loss	105
	d) Spin resonance loss	105
	e) Wall resonance loss	106
	5.10 Curie temperature	106

	PART A : HYSTERESIS	109
	5.A.1 Experimental	109
	5.A.2 Results and discussion	111
	PART B : CURIE TEMPERATURE	121
	5.B.1 Experimental	121
	5.B.2 Results and discussion	123
	PART C : SUSCEPTIBILITY	124
	5.C.1 Experimental	124
	5.C.2 Results and discussion	127
	References	130
VI	SUMMARY AND CONCLUSIONS	136