

..... C O N T E N T S .....

CHAPTER No.	T I T L E	PAGE NO.
<b>CHAPTER- I</b>	<b>FERRITE - AN INTRODUCTION</b>	.....
1.1	Introduction	..... 1
1.2	Historical	..... 1
1.3	Crystal Structure	..... 4
	Spinel Structure	..... 5
	Normal Spinel Ferrite	..... 7
	Inverse Spinel Ferrite	..... 7
	Random Spinel Ferrite	..... 8
1.4	Magnetic Properties of Ferrites	..... 8
	Magnetisation in Ferrites	9
	Anisotropy	10
1.5	Neel's Theory For Ferrimagnetism	..... 12
1.6	Yafet-Kittle Theory	..... 17
1.7	Permeability	..... 18
1.8	Electrical Properties of Ferrites	..... 19
	Conductivity	..... 19
	Dielectric Properties	..... 20
1.9	Orientation of the Problem	..... 22
	<b>R E F E R E N C E S</b>	..... 25
<b>CHAPTER- II</b>	<b>PREPARATION AND CHARACTERISATION</b>	..... 25-
2.1	Introduction	..... 27
	Section- A	..... 28

CHAPTER No.	T I T L E	PAGE NO.
2.2	Preparation Of Ferrite	28
2.3	Methods Of Preparation Of Ferrites	28
	Oxide Method	28
	Decomposition Method	30
	Hydroxide Precipitation Method	31
	Oxalate Prrecipitation Method	31
2.4	Presintering and Sintering	31
2.5	Microstructure And Ferrite	32
	Normal Grain Growth	34
	Exaggerated Grain Growth	34
2.6	Hot Pressing	35
2.7	Sintering Atmosphere	36
2.8	Actual Preparation Of Ferrite Samples	36
2.9	Mixing And Presintering	37
2.10	Sintering	38
	Section-B	
	X-Ray Diffraction Study	
2.11	Introduction	39
2.12	Condition For X-ray Diffraction...	39
2.13	Experimental Diffraction Method	42
	Powder Method And Its Principle	42
	X-ray Diffractometer And Its Principle	43

<b>CHAPTER No.</b>	<b>T I T L E</b>	<b>PAGE NO.</b>
2.14	Experimental	47
	Indexing Of The Powder	
	Pattern	48
	Scanning Electron Microscopy	49
2.15	Results And Discussion	49
	X-ray Diffraction	49
	S.E.M.	59
	<b>R E F E R E N C E S</b>	63
<b>CHAPTER-III</b>	<b>STUDIES ON MAGNETISATION AND PERMEABILITY</b>	
3.1	Introduction	65
3.2	Theoretical Aspects	66
3.3	Magnetic Anisotropy	68
3.4	Magnetostriction	70
3.5	Hysteresis And Magnetic Domain	71
3.6	Magnetisation Curve And Hysteresis	71
3.7	Permeability	73
3.8	Losses	75
	Hysteresis Loss	75
	Eddy Current Loss	75
	Permeability Loss	76
	Residual Loss Factor	77
	Wall Resonance Loss	77
3.9	Disaccommodation Factor	78
3.10	Experiments	78
	Curie Temperature Measurements....	78

CHAPTER No.	T I T L E	PAGE NO.
	Saturation Magnetisation Study .....	82
	Permeability .....	85
	Variation With Temperature .....	85
	Variation With Frequency .....	87
3.11	Results And Discussion .....	87
	Magnetisation .....	87
	Curie Temperature .....	91
	Permeability .....	92
	R E F E R E N C E S	100
<b>CHAPTER-IV</b>	<b>STUDIES ON D.C. AND A.C. ELECTRICAL CONDUCTIVITY</b> .....	
4.1	Introduction .....	103
4.2	Conduction Mechanism .....	106
4.3	Conduction In Oxides .....	106
4.4	Conduction In Ferrites .....	107
4.5	Conductivity .....	109
4.6	Electron Hopping And Polarons .....	109
4.7	Thermoelectric Power .....	111
4.8	KOOP'S Theory .....	111
4.9	Experiments .....	115
	Conductivity Cell and Measurement of D.C. Resistivity .....	115
	A.C. Conductivity Measurement .....	116
4.10	Results And Discussion .....	118
	Resistivity .....	118
	Dielectric Constant .....	128
	R E F E R E N C E S	136
<b>CHAPTER-V</b>	<b>SUMMARY AND CONCLUSIONS</b> .....	139-
	REFERENCES	149