

CONTENTS

CHAPTER	TITLE	PAGE NO.
I	INTRODUCTION TO NANOCRYSTALLINE FERRITES	1 - 30
	INTRODUCTION	1
	1.1 Historical	2
	1.2 Classification	4
	1.3 Quantum Confinement	9
	1.4 Properties	9
	1.5 Application of Nanocrystalline materials	17
	1.6 Review of Work Done	19
	1.7 Orientation of Problem	22
	References	24
II	PREPARATION AND CHARACTERIZATION OF NANOCRYSTALLINE FERRITES	31 - 92
	PART A - SYNTHESIS	
	INTRODUCTION	
	Introduction	31
	2.A.1 Classification of Methods	33
	2.A.2 Advantages of Chemical Synthesis	36
	2.A.3 Fast Firing Method	37
	2.A.3.1 Role of sucrose and PVA	37
	2.A.4 Actual Preparation of Samples	40

CHAPTER	TITLE	PAGE NO.
	PART B – X-RAY DIFFRACTION STUDIES	
	INTRODUCTION	42
	2.B.1 Principle of X-ray Diffraction	43
	2.B.2 X-ray Diffraction Methods	45
	2.B.3 Experimental Techniques	46
	2.B.4 Results and Discussion	49
	PART C - SEM STUDIES	
	INTRODUCTION	66
	2.C.1 Literature Survey	67
	2.C.2 Experimental Techniques	71
	2.C.3 Results and Discussion	73
	PART D- INFRA-RED STUDIES	
	INTRODUCTION	74
	2.D.1 Experimental Techniques	76
	2.D.2 Results and Discussion	76
	References	82
III	ELECTRICAL PROPERTIES	93 - 123
	PART A – D. C. RESISTIVITY	
	INTRODUCTION	93
	3.A.1 Conduction in Ferrite	95
	3.A.2 Experimental Techniques	99
	3.A.3 Results and Discussions	101

CHAPTER	TITLE	PAGE NO.
	PART B – DIELECTRIC PROPERTIES	
	INTRODUCTION	108
	3.B.1 Dielectric Constant	109
	3.B.2 Polarisation and Dielectric Constant	110
	3.B.3 Experimental Techniques	112
	3.B.4 Results and Discussions	113
	References	119
IV	HYSTERESIS BEHAVIOUR	124– 139
	INTRODUCTION	124
	4.1. Magnetization in Ferrites	125
	4.2 Hysteresis	128
	4.3 Experimental	131
	4.4 Calculation of M_s and n_B	131
	4.5 Results and Discussion	133
	References	138
V	SUMMARY AND CONCLUSIONS	140-147
