

LIST OF FIGURES

FIGURE NO	TITLE	PAGE NO
1.1	The Spinel Structure	5
1.2(a)	Tetrahedral Site	6
1.2(b)	Octahedral Site	6
1.3	Predicted Susceptibility Curve of a Ferrimagnetic Material above Curie Temperature.	11
1.4	χ Vs T Curves Predicted by Neel's Theory	12
1.5	Triangular Spin Configuration	13
2.1	Principle of X-ray Diffractometer	29
2.2	Ewald's sphere	30
2.3(a)	X-ray Diffraction Pattern for the Sample $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Fe}_2\text{O}_4$	34
2.3(b)	X-ray Diffraction Pattern for the Sample $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_{0.2}\text{Fe}_{1.8}\text{O}_4$	34
2.3(c)	X-ray Diffraction Pattern for the Sample $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_{0.4}\text{Fe}_{1.6}\text{O}_4$	35
2.3(d)	X-ray Diffraction Pattern for the Sample $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_{0.6}\text{Fe}_{1.4}\text{O}_4$	35
2.3(e)	X-ray Diffraction Pattern for the Sample $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_{0.8}\text{Fe}_{1.2}\text{O}_4$	36
2.3(f)	X-ray Diffraction Pattern for the Sample $\text{Cu}_{0.5}\text{Co}_{0.5}\text{CrFeO}_4$	36
2.4	Compositional Variation of Lattice Constant with x.	38
3.1	Angles Between A-A, B-B and A-B Cations in a Spinel Structure	49
3.2	Circuit Diagram of Hysteresis Loop Tracer	52
3.3	Schematic Diagram of Initial Susceptibility Apparatus	55
3.4	Variation of Concentration of Cations on A and B Sites with x.	60

3.5(a) The Variation of susceptibility with Temperature for the Ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0,0.2$).	63
3.5(b) The Variation of susceptibility with Temperature for the Ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0.4,0.6,0.8,1.0$)	63
4.1(a) The conductivity Cell	74
4.1(b) Circuit Diagram for Electrical Resistivity	74
4.2 Schematic Diagram of Experimental Setup for the Measurement of Thermoelectric Power	76
4.3(a) The Variation of $\log \rho$ with $1/T$ for Ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0.0,0.2,0.4$)	81
4.3(b) The Variation of $\log \rho$ with $1/T$ for Ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0.6,0.8,1.0$)	82
4.4(a) The Variation of Seebeck Coefficient with Temperature For the ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0.0,0.2$)	85
4.4(b) The Variation of Seebeck Coefficient with Temperature For the ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$ ($x=0.6,0.8,1.0$)	86
4.5 The Variation of $\log \mu_d$ with $1/T$ for Ferrites of Composition $\text{Cu}_{0.5}\text{Co}_{0.5}\text{Cr}_x\text{Fe}_{2-x}\text{O}_4$	87
