List of Figures

Figure No.	Title	Page No.
2A.1	The spinel structure	16
2A.2 (a)	The magnetic ion occupies "tetrahedral lattice site" where it is surrounded by four near neighbour oxygen ions	17
2A.2.(b)	The magnetic ion is said to occupy an "Octahedral lattice site" where it is surrounded by size near neighbour oxygen ions	17
2.3	Angle between A-A, B-B and A-B cations in a spinel structure	19
3B	Principle of the X-ray diffractometer	43
3B.1	XRD of $BaTiO_3$ (Ferroelectric)	47
3B.2	XRD of $MnFe_{1.8}Cr_{0.2}O_4$ (Ferrite)	48
3B.3	XRD of 85% $BaTiO_4$ 15% $MnFe_{1.8}Cr_{0.2}O_4$	49
3B.4	XRD of 70% $BaTiO_3$ - 30% $MnFe_{1.8}Cr_{0.2}O_4$	50
3B.5	XRD of 55% $BaTiO_3$ - 45% $MnFe_{1.8}Cr_{0.2}O_4$	51
4.1	HP Make - 4284 A Model	64
4.2.a	Variation of dielectric constant with frequency	67
4.2.b	Variation of tanδ with frequency	67
4.3	Variation of log (σ_ω- σ_{dc}) with log ω^2	68
4.4	Variation of dielectric constant with temperature for x = 1 i.e. $BaTiO_3$	74
4.5	Variation of dielectric constant with temperature for x = 0 i.e. $MnFe_{1.8}Cr_{0.2}O_4$	74

4.6	Variation of dielectric constant with temperature for x = 0.85 composite	75
4.7	Variation of dielectric constant with temperature for x = 0.70 composite	75
4.8	Variation of dielectric constant with temperature fox x = 0.70 composite	76
4.8.A	Variation of tanδ with temperature (^{0}C)	76
4.9	Measurement of DC electrical resistivity	81
4.9.a	Conductivity cell	82
4.9.b	Circuit diagram for electrical resistivity	82
4.10	Variation of log Vs 1000 T(K)	83
4.11	Variation of α (mv/^{0}C) ν_5 temperature (^{0}C)	87
4.12	Measurement of thermoelectrical power	89
5.1	Magnetic poling and ME output	97
5.2	Variation of dE/dH with the magnetic field	97