

LIST OF FIGURES

<u>Fig.No.</u>	<u>Description</u>	<u>Page No.</u>
1.1	Crystal structure of completely inverse ferrite.	- 5
1.2a	Fe ion on an A-site	- 9
1.2b	Fe ion or M ion on B-site	- 9
1.3	The spinel lattice	- 10
1.4	The variation of resistivity with firing temperature and iron stoichiometry.	- 22
1.5	The resistivities of samples before and after surface grinding.	- 23
2.1a,b	The application of Bragg's Law	- 39
2.2a	Ewald's sphere	- 43
2.2b	Principle of the powder method (photo)	- 44
2.3a	Experimental set up for X-ray diffractometer ( Photo )	- 46
2.3b	X-ray Diffractometer (Schematic) (Photo)	- 46
2.4	Diffractometric record of $\text{CuFe}_2\text{O}_4$	- 51
2.5	Diffractometric record of $\text{Cu}_{0.8}\text{Fe}_{2.2}\text{O}_4$	- 52
2.6	Diffractometric Record of $\text{Cu}_{0.6}\text{Fe}_{2.4}\text{O}_4$	- 53
2.7	Diffractometric Record of $\text{Cu}_{0.4}\text{Fe}_{2.6}\text{O}_4$	- 54
2.8	Diffractometric Record of $\text{Cu}_{0.2}\text{Fe}_{2.8}\text{O}_4$	- 55
2.9	The variation of Lattice parameters (a or c) with the percentage decrease of $\text{Cu}^{2+}$	- 61
3.1a	A schematic circuit diagram for I-V characteristic measurements.	- 67
3.1b	A block diagram of the Pellet holder	- 67
3.2	Schematic diagrams of three types of high field instability.	- 70
3.3	General nature of switching behaviour	- 74
3.4	A graph of first switching currents with switching temperatures.	- 75
3.5	I-V characteristics of slow cooled $\text{CuFe}_2\text{O}_4$	- 78
3.6	I-V characteristics of $\text{CuFe}_2\text{O}_4$ quenched at $400^\circ\text{C}$ .	- 79
3.7, 3.8	I-V characteristics of $\text{CuFe}_2\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 80 81

...

List of Figures (contd.)

<u>Fig.No.</u>	<u>Description</u>	<u>Page No.</u>
3.9	I-V characteristics of $\text{CuFe}_2\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 82
3.10	I-V characteristics of slow cooled $\text{Cu}_{0.8}\text{Fe}_{2.2}\text{O}_4$ .	- 88
3.11	I-V characteristics of $\text{Cu}_{0.8}\text{Fe}_{2.2}\text{O}_4$ quenched at $400^\circ\text{C}$ .	- 89
3.12	I-V characteristics of $\text{Cu}_{0.8}\text{Fe}_{2.2}\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 90
3.13	I-V characteristics of $\text{Cu}_{0.8}\text{Fe}_{2.2}\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 91
3.14, 3.15'	I-V characteristics of slow cooled $\text{Cu}_{0.6}\text{Fe}_{2.4}\text{O}_4$	- 93, 94
3.16	I-V characteristics of $\text{Cu}_{0.6}\text{Fe}_{2.4}\text{O}_4$ quenched at $400^\circ\text{C}$ .	- 95
3.17	I-V characteristics of $\text{Cu}_{0.6}\text{Fe}_{2.4}\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 96
3.18	I-V characteristics of $\text{Cu}_{0.6}\text{Fe}_{2.4}\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 97
3.19, 3.20	I-V characteristics of slow cooled $\text{Cu}_{0.4}\text{Fe}_{2.6}\text{O}_4$	- 101, 102
3.21	I-V characteristics of $\text{Cu}_{0.4}\text{Fe}_{2.6}\text{O}_4$ quenched at $400^\circ\text{C}$ .	- 103
3.22	I-V characteristics of $\text{Cu}_{0.4}\text{Fe}_{2.6}\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 104
3.23	I-V characteristics of $\text{Cu}_{0.4}\text{Fe}_{2.6}\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 105
3.24, 3.25	I-V characteristics of slow cooled $\text{Cu}_{0.2}\text{Fe}_{2.8}\text{O}_4$	- 107, 108
3.26, 3.27	I-V characteristics of $\text{Cu}_{0.2}\text{Fe}_{2.8}\text{O}_4$ quenched at $400^\circ\text{C}$	- 109, 110
3.28, 3.29	I-V characteristics of $\text{Cu}_{0.2}\text{Fe}_{2.8}\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 111, 112
3.30, 3.31	I-V characteristics of $\text{Cu}_{0.2}\text{Fe}_{2.8}\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 113, 114.
3.32	Graph of $\log I/\log V$ of slow cooled $\text{CuFe}_2\text{O}_4$	- 116

...

List of Figures (contd.)

<u>Fig.No.</u>	<u>Description</u>	<u>Page No.</u>
3.33	Graph of $\log I/\log V$ of $\text{CuFe}_2\text{O}_4$ quenched at $400^\circ\text{C}$ .	- 127
3.34	Graph of $\log I/\log V$ of $\text{CuFe}_2\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 128
3.35	Graph of $\log I/\log V$ of $\text{CuFe}_2\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 129
3.36	Graph of $\log (I/V)$ versus voltage(v) of $\text{CuFe}_2\text{O}_4$ , slow cooled, quenched at $400^\circ\text{C}$ , $600^\circ\text{C}$ and $800^\circ\text{C}$ .	- 130
3.37	Graph of $\log (I/V)$ versus voltage(v) of slow cooled $\text{CuFe}_2\text{O}_4$	- 131
3.38	Graph of $\log (I/V)$ versus voltage(v) of $\text{CuFe}_2\text{O}_4$ quenched at $400^\circ\text{C}$ .	- 132
3.39	Graph of $\log (I/V)$ versus voltage(v) of $\text{CuFe}_2\text{O}_4$ quenched at $600^\circ\text{C}$ .	- 133
3.40	Graph of $\log (I/V)$ versus voltage(v) of $\text{CuFe}_2\text{O}_4$ quenched at $800^\circ\text{C}$ .	- 134
3.41	Diffraction record of $\text{CuFe}_2\text{O}_4$ after switching	- 118
3.42	Diffraction record of $\text{Cu}_{0.4}\text{Fe}_{2.6}\text{O}_4$ after switching	- 119

...