CONTENTS

Chapter		Page No.		
	Declaration		(i)	
	Certificate Acknowledgement List of Tables Abbreviations		(ii)	
			(iii)	
			(iv)	
			(iv)	
	List	of Figures	(v)	
ONE	SOLID			
	1.1	Introduction	1	
	1.2	Definitions	2	
	1.2.1	Luminescence	. 2	
	1.2.2	Fluorescence and Phosphorescence	3	
	1.3	Phosphors and their Classifications	4	
	1.4	Localized Energy Levels in Forbidden Gap.	5	
	1.5	Mechanism of Luminescence	6	
	1.5.1	Excitation	6	
	1.5.2	Radiative Transitions	7	
	1.5.3	Non-Radiative Transitions	10	
	1.6	Photoluminescence	11	
	1.7	Theory of Electroluminescence	12	
	1.8	Statement of Problem	19	
		References	21	
TWO	PREPARATION OF PHOSPHORS AND EXPERIMENTAL ASPECTS			
•	2.1	Phosphors Preparation	31	
		A) Basic Ingredients of Phosphors	31	
		B) Preparative Parameters of Phosphors	34	
	2.2	Details of Method followed	35	
	2.2.1	First Stage	36	
	2 2 2	Second Stane	27	

CONTENTS (contd.)

Chapter		Title	Page No.	
	2.3	Prepared Phosphors	38	
	2.4	Experimental Aspects	38	
	2.4.1	Electroluminescence Measurements	38	
	2.4.2		41	
		References	42	
THREE	ELECTROLUMINESCENCE			
	3.1	Introduction	49	
	3.2	Theoretical Background	49	
	3.2.1	Relation between Brightness and Applied Voltage	49	
	3.2.2	Relation between Brightness and Applied Frequency	53	
	3.3	Result and Discussion	58	
	3.3.1	Voltage Dependence of EL Brightness	58	
	3.3.2	Frequency Dependence of EL Brightness	61	
	3.3.3	Spectral Energy Distribution of EL Emission	63	
	3.3.4	Electrical Characteristics of Phosphors	65	
	3.3.5	Effect of Activator on EL Behaviour	66	
	3.3.6	Mechanism of Electroluminescence	67	
	3.3.7	Kinetics involved EL Process	68	
	3.4	Summary	68	
		References	70	

Chapter		Title	Page No.	
FOUR	X-RAY DIFFRACTION AND SCANNING ELECTRON MICROSCOPY STUDIES			
	4.1	Introduction	95	
	4.2	X-ray Diffraction	96	
	4.3	X-ray Diffractometer	98	
	4.4	Indexing Diffraction Maxima and Calculation of Lattice Parameters	99	
	4.5	Result and Discussion	101	
	4.6	Scanning Electron Microscopy Studies	102	
	4.6.1	Design and Construction of Microscope	e 103	
	4.6.2	The Electron Gun	104	
	4.6.3	Electron Lenses	105	
	4.6.4	The Scanning System	105	
	4.6.5	The Specimen Stage	106	
	4.6.6	The Electron Collector	106	
	4.6.7	Result and Discussion	108	
		References	108	
FIVE	GENER	AL DISCUSSION AND CONCLUSIONS		
	5.1	Preparation of Phosphors : Firing Temperature & Duration of Firing	124	
	5.2	EL Brightness-Voltage Dependence	124	
	5.3	EL Brightness-Frequency Dependence	125	
	5.4	Electrical Characteristics of Phosphors	125	

CONTENTS (contd.)

Chapter		Title	Page No.
	5.5	EL Emission Characteristics	126
	5.6	Effect of Addition of Activitors on Electroluminescence Behaviour	127
	5.7	Mechanism of Electroluminensce	127
	5.8	X-ray Diffraction Studies	128
	5.9	Scanning Electron Microscopy Studies	129
	5.10	Conclusions.	129
		References	131
	Publication		