

CONTENTS

<u>CHAPTER</u>	<u>SUMMARY</u>	<u>PAGE</u>
		i
I	INTRODUCTION	1
II	LUMINESCENCE	
2.1	Elementry Concepts	9
	a) Types of luminescence ..	10
	b) Fluorescence and Phosphorescence	12
	c) Traps and trapping mechanism	16
	d) Luminescence Centre ..	17
	e) Imperfections in crystals..	18
	f) Concentration quenching ..	19
2.2	Theoretical models for interpretation of luminescence phenomena	21
	a) Configuration Coordinate Model	21
	b) Continuous Dielectric Model	28
	c) Energy Band Model	29
2.3	Types of luminescent systems..	33
i)	Systems in which absorption and emission of energy take place in the same centres	34
ii)	Systems in which absorption and emission of energy take place in different centres	35

<u>CHAPTER</u>		<u>PAGE</u>
iii) Systems in which transfer of energy is predominantly by the movement of charge carriers.		38
III	SPECTRAL CHARACTERISTICS OF	
	PHOSPHORS	41
3.1	Phosphor	41
	i) Host matrix	41
	ii) Activator	42
	iii) Flux	43
3.2	Excitation spectrum	44
3.3	Emission spectrum	47
3.4	Historical Review	50
	a) Intrinsic luminescence of alkali halides	50
	b) Luminescence of thallium doped alkali halides .. .	54
	c) Single thallous ion (monomer) absorption	60
	d) Single thallous ion (monomer) emission	64
	e) Thallous ion pair (dimer) luminescence	70
3.5	Recent Information	72

<u>CHAPTER</u>		<u>PAGE</u>
IV	EXPERIMENTAL DETAILS	
4.1	Preparation of phosphors ..	74
4.2	Instrumentation	79
	A) Principles of operation ..	79
	B) Experimental system ..	80
	C) Procedure for obtaining excitation and emission spectra	85
V	RESULTS AND DISCUSSION	
5.1	Results	88
5.2	Discussion	112
	A) Undoped NaBr	113
	B) Thallium doped NaBr ..	117
	i) Ultraviolet emission ..	117
	ii) Near ultraviolet emission	121
	iii) Visible emission ..	128
	CONCLUSIONS	143
	REFERENCES	147

