

COLOR CENTERS

IN

ALKALI HALIDES DOPED WITH CADMIUM AND ZINC

Thesis Submitted to

THE INDIAN INSTITUTE OF TECHNOLOGY, DELHI

for the Degree of
DOCTOR OF PHILOSOPHY
(Physics)

By

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ACKNOWLEDGEMENTS

The author expresses his grateful thanks to Professor S.C. Jain, Head, Department of Physics, Indian Institute of Technology, New Delhi for suggesting the problem and for helpful guidance throughout the progress of this work.

The author is thankful to his colleagues, Dr. P.C. Mehendru, Dr. G.D. Sootha, Dr. D.C. Parashar and Dr. V.K. Jain for many helpful discussions on several issues related to the work presented in this thesis. He would also like to particularly thank Mr. R.K. Jain for considerable help in discussions with regard to EPR spectra.

Most of the work reported in this thesis was done at the National Physical Laboratory and the author is extremely grateful to the Director, NPL, Dr. A.R. Verma, for giving the necessary facilities to work at NPL.

Thanks are due to Mr. S. Krishnamurthy who has typed the manuscript of the thesis with great care.

P R E F A C E

Considerable advance has been made in our understanding of the models of F-aggregate centers in the recent years. However, the models for the Z centers in alkali halides doped with alkaline earth impurities are still not clear. The work described in the thesis is mainly concerned with the optical and EPR absorption and other properties of alkali halides doped with elements of group 2b and other impurities.

The thesis is divided into five chapters. A brief review of the properties associated with defects in alkali halides is given in the first chapter. No attempt has been made to make the review exhaustive as several excellent review articles and books have appeared on the subject in recent years. The author has emphasised those aspects of the defect properties of alkali halides which are necessary for the appreciation of the work reported in the following chapters. The experimental techniques and equipments used are described in the second chapter.

The main experimental results on several alkali halides doped with group 2b impurities are discussed in chapter III. Experiments have been performed with uncolored crystals, X-irradiated and γ -irradiated crystals and

additively and electrolytically colored crystals. Optical absorption associated with the impurity centers and the metallic colloidal particles is also discussed in this chapter. Results of EPR absorption and electrical conductivity of the crystals are described in chapter IV. The last chapter is devoted to the study of optical, electrical and EPR studies of LiF crystals doped with uranium and Mn.

A detailed table of contents and an abstract are given in the beginning of each chapter. A consolidated list of references is given at the end of the thesis. The author has also done theoretical work on Application of Group Theory to physical properties of crystals. A list of author's publications in this field is given at the end of the thesis. This work does not however form part of the thesis.

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