

PREFACE

Material Science today assumes various manifestations. The study of the science of different types of materials has led to the development of a variety of devices which have found place in man's everyday life. Ferrite materials are known for a long time now and have been exploited for a number of communication and defence applications. In spite of the present developments in the technology of ferrite materials, the scientists still prefer to examine the structure and transport properties of these materials in a systematic manner to evolve correlation between them.

The results on the effect of concentration on the electrical and magnetic properties of some samarium doped magnesium-cadmium ferrites has been systematically presented in this dissertation.

The subject matter of the dissertation has been divided into five chapters. A comprehensive list of references following each chapter takes account of literature published. Chapter I deals with the preliminary aspects of ferrites, the historical development, crystal structure, electrical and magnetic properties, theory of magnetization etc. along with applications

of ferrites and the orientation of the problem. In Chapter II methods of ferrite preparation, their structural characterization by X-ray diffraction is discussed along with the results on IR absorption and Curie temperature measurements. Chapter III is devoted to the explanation of the results on electrical conductivity. The theory of conduction in ferrites is also presented here. The magnetization and hysteresis results are dealt with in Chapter IV. The detailed explanation of experimental set up is given. The summary of results, discussion and conclusions is the subject matter of the last chapter.

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