

## P R E F A C E

During the last few decades an awareness to study materials through the view point of their structures has given a way to the establishment of the field of materials science. Such an approach to materials has led to the tailormaking of properties of materials through microstructure control. The studies of ferrites from this angle are either new or rare.

In this dissertation, an effect of sintering time on the electrical resistivity, Curie temperature, energy of activation and infrared absorption has been reported and discussed in the light of ceramic microstructure observed by using the scanning electron microscope.

The subject matter of the dissertation has been presented in six chapters. Chapter I is devoted for the general aspects of ferrites. The historical developments, crystal structure and electrical and magnetic properties of spinel ferrites are discussed here. The applications of ferrites and the orientation of the problem are at the end of this chapter. A brief review regarding the manufacturing processes of ferrites forms the subject matter of Chapter II. The ceramic method used in the present case has been discussed in some what more detail. The discussion regarding characterization of ferrites by X-ray diffraction and the results are also put in this chapter. Chapter III is spared for the discussion of electrical conductivity, Curie temperature and activation energy of ferrites. The necessary theory for conduction in oxide magnetic materials is given at the

beginning. Chapter IV is divided in two parts. Part A consists of theoretical background and discussions of magnetization studies. The experimental setup used for hysteresis measurements has been fully explained. The results on far infrared absorption are in Part B. The aspects of ferrite microstructure developments and its effects on properties of ferrites make the topic of Chapter V. The results obtained from SEM studies are discussed here. The last chapter is on summary and conclusions.

The list of references is given separately at the end of each chapter. Except for a few cases, the original papers and reports were referred. In each chapter, the discussion is supported by figures and tables of contents.