

## P R E F A C E

The increasing demands of materials with specific properties has emphasized the need to understand how the microstructure of such materials dictates their properties. This has obviously led to the adoption of materials science and technology with the impression that such an approach to materials may help in improving their properties through microstructure control.

In the present dissertation the effect of sintering conditions on electrical and magnetic properties of copper-cobalt ferrites is presented and discussed in the light of microstructure obtained by electron microscopy.

Chapter I deals with an introduction to ferrites. Some important aspects of ferrites like historical developments, types of spinel structures and general properties are discussed here. The applications of ferrites and orientation of the present work are added at the end.

The II Chapter contains brief description of the methods of preparation of ferrites. The ceramic method is discussed in somewhat more details. The flow chart representing the various stages involved in the preparation of ferrite compositions is also incorporated here. The single phase

nature and crystallography of the samples under study is explained with the help of X-ray diffractograms.

The phenomenon of conduction through ferrites forms the subject of III Chapter. The experimental set up for measurement of d.c. resistivity is explained here along with the results.

Chapter IV is divided into two parts. Part A is devoted to magnetization studies. Necessary theoretical background and experimental set up are discussed here. Part B is spared for IR studies.

The V Chapter is meant for aspects of ferrite microstructure viz., sintering, grain growth and porosity. The effect of these elements on electrical and magnetic properties of ferrites is reviewed here in brief.

Summary and conclusions are given in the last chapter. A list of references is incorporated at the end of each chapter and the list of figures and tables at the beginning of the dissertation.