

## PREFACE

The ever increasing demand of ferrites in consumer electronics and in computer technology, has emphasized the need of synthesis and characterization of the new power ferrites. The ceramic method is the most versatile one for synthesis. The microstructure of the materials helps in tailor-making the properties and applications. Keeping this view in mind, the effect of tetravalent  $Mn^{4+}$  substitution in Ni-Zn ferrite on electric and magnetic properties is presented and it is discussed in the light of microstructure, obtained by electron microscopy.

In the First Chapter, important aspects like historical developments, spinel structure, properties, applications and theories of ferrimagnetism are discussed in brief. The orientation of the present work is included at the end.

Chapter II deals with the methods of preparation in which special attention is given to the actual preparation of ferrites in laboratory by oxide method. Characterization of the ferrites is discussed with the help of x-ray diffractograms. I.R. Spectra are discussed in addition, for the confirmation of the structure of the ferrite.

Magnetic properties and Microstructural Studies are included in Chapter III in which Magnetization, Curie temperature and

Permeability are presented with necessary theoretical background. The analysis of Micrographs is incorporated in Section-B of this Chapter.

Electrical properties are dealt with, in Chapter IV in which d.c. and a.c. electrical resistance and dielectric constant are discussed. Light is thrown on the experimental techniques and results are discussed with relevant theories in brief.

Summary and conclusions are given in the last Chapter. A list of references is incorporated at the end of each Chapter. In case of a few references, it was not possible to refer to the original papers.

  
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