

## PREFACE

The phenomenon known as ferroelectricity was thought to be a great rarity in nature and attempts to understand it, at least at the microscopic level, were formulated in terms of the very specific characteristics of each of the very few crystal structures which supported a ferroelectric instability. The microscopic breakthrough came in 1960 with the recognition of the fundamental relationship between lattice dynamics and ferroelectricity and most importantly, of the existence of a soft-mode instability at a ferroelectric transition. The enormous increase in the number of known ferroelectrics helped to focus on those microscopic characteristics which are common to all ferroelectrics and to grasp the relationship of ferroelectricity to the more general field of structural transitions and even to critical phenomena in general.

In the present dissertation, attempt has been made to present the work carried out on the subject consistent with the development of the topic concerned. General introduction and sufficient theoretical back-ground is given in the first chapter along with the orientation of the present work at the end. Chapter II deals with preparation of ferroelectric materials, x-ray diffraction and microstructure studies. Effects of impurity on ferroelectric properties namely, dielectric hysteresis, dielectric constant, d.c. conductivity have been presented in chapter III to V. The final chapter gives summary of the work.

Relevant references are cited at the end of each chapter. In case of a few references it was not possible to refer to the original work.