PREFACE

Polymer blends are gaining technological importance due to their compromise set of properties, advantages in processing and reduction in cost. One polymer may possess a particular set of properties, while the other may have another set of properties. By blending two such polymers, a desired set of properties can be achieved. In the case of elastomers, blends are used in tires, belts, cables etc. For the successful applications of such blends, component elastomers must be miscible and compatible. The curing method adopted and the distribution of compounding ingredients has a vital role on the ultimate properties. The distribution depends mainly on the nature of the elastomers and the blending process. Therefore, knowledge of these parameters will facilitate in obtaining a successful elastomer blend.

In the present work, investigation has been carried out on the compatibility and mechanical properties of blends consisting of ethylene propylene diene rubber (EPDM) and chlorobutyl rubber (CIIR). This blend finds application in the manufacture of curing envelope and other high temperature performances.

This thesis is presented in seven chapters.

The various factors affecting the blend compatibility, the methods of blend preparation and the advantages of blends are explained in chapter I. A review of the earlier works in this field and the scope and objective of the present investigation is also presented.

The specifications of the materials used in the study and the different experimental techniques employed are described in the second chapter.

A detailed study of the compatibility behaviour of blends of EPDM with CIIR has been reported in the third chapter. The extent of compatibility has been evaluated
based on mechanical, thermal and morphological studies. The effect of compatibiliser on the blend properties is also studied.

The fourth chapter deals with extensive study on the physical properties of sulphur cured EPDM/CIIR blends with respect to blend ratio and ageing.

The effect of precuring on the physical properties of sulphur cured blends of EPDM with CIIR has been discussed in chapter five.

Chapter six explains the property studies of resin cured EPDM/CIIR blends with special reference to their ageing resistance.

Finally, more technical features of the blends such as thermal diffusivity, thermal degradation resistance, air permeability and rheological behaviour are presented in the seventh chapter.

A summary of the whole investigation results is presented as the last chapter.