Preface

Despite the very large number of monomeric compounds that have been synthesised and converted to the corresponding homopolymers, the needs and desires of an ever-expanding technology have continually sought to prepare novel polymer modifications having unique and useful properties.

Block copolymers are an important class of modified polymers which have received widespread attention, since their successful commercial development in the mid 60's. Much of the interest in these polymers has risen because of their remarkable multiphase morphology and hence, they have been the subject of extensive microstructural examinations. These materials offer an almost unique opportunity for the application of fundamental structural and property data to the interpretation of the excellent performance of generally processed artefacts.

Accordingly, in this work attempt has been made with the specific intention of highlighting those aspects of science and technology of block copolymers that are potentially important for further advances in material formulation or utilisation. Special consideration is given to the relationship between the properties of block copolymers and their microstructure. With this view a few series of block copolymers from liquid natural rubber and different polyethers have been synthesised and investigated.

This thesis has an organisational format as follows. It consists of four chapters. Chapter 1 is meant as an introductory part and comprises an overview of block copolymers and a critical survey of the many block copolymer systems reported in literature. Chapter 2 discusses in detail the materials and experimental procedure employed for the synthesis and characterisation of the block copolymer samples. Chapter 3 deals with results and discussion. This chapter is divided into four sections. The first section deals with the block copolymers formed from hydroxyl terminated liquid natural rubber and polyethylene oxide. Attempt has been made to characterise the block copolymer samples and to interpret the structure-property relationship based on the analytical results. In a similar manner the second section deals with the block copolymers formed from hydroxyl terminated liquid natural rubber and polypropylene oxide. In the third section, the results obtained for block copolymers from hydroxyl terminated liquid natural rubber and polytetramethylene oxide are presented and discussed. In the fourth section, a review and rationalisation of the results discussed in the three sections is presented. The conclusions derived from the above studies are given in Chapter 4. List of references is provided at the end of each chapter.