The increasing importance and interest in polymers initiated investigation on better and more efficient methods for their modifications. This is a topic of world wide concern and the focus of a great deal of research interest. The criterion of performance which must be satisfied for the technological applications of polymers have become increasingly more stringent with the rapid advances in many areas of technology. The chemical structures of polymers suitable for advanced application have therefore increased in complexity. Consequently the studies on microstructure of macromolecules for predicting structure-property relationship is of great importance.

Modifying natural rubber is an interesting topic due to its ecofriendly characteristics and its availability from natural sources. Several ways of modification of natural rubber has been practised so far. Block copolymerization is one among them, which modifies the rubber chemically. They unite, in a single discipline, the major advantages of both the homopolymer blocks.

The present investigation focussed on the synthesis and characterisation of block copolymers from natural rubber (NR) and polyurethanes (PU). The polyurethanes are derived from diphenyl methane diisocyanate and a number of diols. The first level of the investigation is the critical survey of literature and the second level is the synthesis of block copolymers from NR and the PU. In the third level the results obtained from the testing and analysis of the products were discussed. All these are presented in the following chapters.
Chapter-1 is the introductory part of the thesis. This includes an overview of block copolymers in general and polyhydrocarbon-based block copolymers in particular. Chapter 2 is the experimental part of the work. The materials used for the synthesis, characterisation methods and the procedure adopted for the preparations were described in this chapter. The discussion of the results obtained by various characterisation methods and the rationalisation of the results are presented in Chapter 3. The various observations and conclusions arrived at from the result and discussion are summarised in Chapter 4. A list of references has been given at the end of each chapter. The scope for further studies and a list of papers under publication are presented at the end of the thesis.