ABSTRACT

PS is known for its various remarkable properties such as ; high chemical resistance, reasonably high tensile strength and good rigidity etc. But it suffers from low impact strength. In the present studies, the investigations have therefore been undertaken on the Elastomer Modified Thermoplastics. An attempt has been made to modify PS as to increase its impact strength. In brief, the present studies were undertaken keeping following objectives in view.

The objective of the present studies has been to develop effective modifiers for PS based on EPDM rubber The modifiers were prepared by grafting various monomer mixtures onto EPDM backbone by different polymerization processes. In the synthesis, the main criterion has been to develop such modifier by which a compromise in physical properties could be obtained. However, the compromise in the properties can only be attained when dispersed phase is semi-compatible with PS. It has been achieved by the proper selection of grafted components.

The prime factor contributing to the overall performance of the blends has been the compatibility behaviour of its constituents. Thus, to evaluate the compatibility behaviour of PS blends with EPDM and its graft polyblends at molecular level, ultrasonic and viscometric methods were applied in addition to other traditional methods.

The structurally different modifiers in PS matrix would behave quite differently according to their structure and properties. Another objective of the studies has been to evaluate the performances of various PS blends for their physical properties, such as ; impact strength and tensile strength. The fracture behaviour of different PS blends has also been investigated by the study of their fractured surfaces by scanning electron microscopy. The present thesis contains four chapters. The first chapter deals with the introduction to Elastomer Modified Thermoplastics. The synthesis and characterization of EPDM based graft copolymers have been described in chapter II. The third chapter covers the polymer-polymer compatibility studies on various PS blends. The chapter also deals with the introduction to the polymer-polymer compatibility. The fourth chapter describes the studies on mechanical properties of PS blends. In the present investigation, the performance of the blends of PS/EPDM- gp- styrene polyblends was found to be superior to other blends. The dissertation concludes with the suggestions for further investigations.