



IN SITU REACTIVE COMPATIBILIZATION OF PE/ PP/ PS TERNARY BLENDS

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The main objective of the present work was to study the reactive compatibilization process of PE/PP/PS ternary blends. For this purpose, all the PE/PP/PS ternary blends with PE as a major phase were reactively compatibilized via a one-step in situ method. Rheology, morphology and mechanical properties of different compatibilized and un-compatibilized ternary blends as well as reference samples were studied. The results of linear viscoelastic measurements showed that the reactive compatibilization could decrease the interfacial tension between different phases leading to increment in interfacial interactions. Based on these findings it was predicted that the reactive compatibilization can enhance the mechanical properties of the PE/PP/PS ternary blends. Using different rheological measurements, it was shown that although the PE/PS interface had more capability to reactive modification than that of PP/PS interface, but due to the special morphology of the ternary blends the major modified interface was PP/PS interface. The results of SEM analysis applied on fractured surfaces confirmed the obtained results from linear viscoelastic measurements. The results of tensile tests in agreement with the predicted results using rheological measurements showed that the used reactive compatibilization method appreciably increases the mechanical properties in particular elongation at break of the ternary blends. It was demonstrated that the linear viscoelastic studies can provide reliable information for evolution of the occurred reactions between different phases during reactive compatibilization process of ternary PE/PP/PS blends. Key words: Reactive Compatibilization, Ternary Blend, Rheology, morphology.