สำนักงานวิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

CHAPTER V
CONCLUSIONS AND RECOMMENTDATIONS

Surlyn® compatibilizer, blend composition and the characteristics of the pure components can influence morphology, thermal stability, and crystallization behavior of PA6/LDPE blends.

TGA results of Surlyn®/LDPE blends showed thermal stabilities close to those predicted from the rule of mixing. SEM micrographs provided some evidence of interactions between phases. DSC results indicated that the ionomer acted as a nucleating agent for LDPE despite the absence of any co-crystallization of Surlyn® with LDPE. Surlyn®/LDPE morphology indicated compatibility; however, it was not found to occur in the crystalline phase. Compatibility must therefore have existed in either the amorphous phase or at interfaces.

PA6/Surlyn® blends showed thermal stabilities much higher than that predicted by the rule of mixing. SEM micrographs showed homogeneous morphologies. These results indicate that chemical reactions occurred between PA6 and Surlyn®, and that zinc ion complex species were formed. Surlyn® showed a higher affinity for PA6 than for LDPE. PA6 acted as a nucleating agent for the blends due to its high crystallization temperature, but chemical reactions between PA6 and Surlyn® interfered with the ability of PA6 to crystallize.

Noncompatibilized PA6/LDPE blends showed a complete absence of any interactions between PA6 and LDPE. However, the thermal stabilities of PA6/LDPE blends were improved by the addition of Surlyn®. There is a perturbation of the morphology of PA6 with Surlyn® compatibilizer due to the efficiency of the Surlyn® to chemically react with PA6 and to undergo interactions with LDPE in the amorphous phase, but it had little effect on the melting behavior of the blends. TGA results showed that for the 80/20 blend ratio of PA6/LDPE with 1.5 and 5.0 phr Surlyn® it is possible to obtain a material with similar thermal degradative properties to that of PA6, thus representing an economically viable way to obtain at low cost an alternative to PA6 having excellent thermal properties.

Recommendations for the future work

Many methods could be used to determine kinetic degradation parameters. However, in this work Flynn and Wall method was only employed. Therefore, different methods should be used to determine the kinetic degradation parameters of this blends, and their values should be compared to determine the most acculate results.

SEM analysis showed evidences of interactions between Surlyn® and LDPE, which supported the hypothesis of compatibility of PE segments of both components. However, results from this work concluded that there were some interactions in the amorphous or at the interface. Therefore, Dynamic mechanical analysis (DMA) should be use to confirm the compatibility in the amorphous phase of the blends.