

CHAPTER V

CONCLUSION

5.1 Conclusion

1. The mechanical property in terms of PA 6/HiPS blend system without a compatibilizer is lower than those predicted by Reuss' and Voigt's model. This is believed to be due to the coarse dispersion and the poor distribution of the blend as is supported by the morphology study.
2. The morphology of the 40% PA6 shows a fibril domain with various aspect ratio. This explains why some mechanical properties of the 40/60 PA6/HiPS blend composition as inconsistent when compared with the other blend compositions.
3. By adding SEBS-g-MA to each parent polymer, the toughness is increased especially in PA6. This implies that SEBS-g-MA is partially compatible with the parent polymers.
4. By adding SEBS-g-MA to the PA6/HiPS blend system, it increases the toughness property of the PA6/HiPS blend system. However, the enhanced toughness is still lower than those estimated by using Reuss' and Voigt's models.

5. By adding SEBS-g-MA to the PA6/HiPS blend system, the dispersion and the distribution of the polymer is improved. This is evident in the micrographs of the blends with SEBS-g-MA compatibilizer. As a result, the mechanical properties of the system is also improved.
6. At 40% PA 6, the mechanical property is reduced when SEBS-g-MA was added. It was expected the SEBS-g-MA will improve the dispersion and the distribution and hence a reduce in fibril domain.
7. With 7.5 phr of SEBS-g-MA in the 80/20 PA6/HiPS blend, the Izod impact strength is close to that estimated by Reuss' model.
8. From the study of the Dynamic Mechanical Thermal Analysis (DMTA), at 2.5 phr of SEBS-g-MA, the glass transition temperatures of PA6 and PS in HiPS are close to 82 °C and 112 °C respectively.
9. The glass transition temperature as measured by the DSC method yields consistent measurement in close agreement with those obtained by the DMTA method.
10. From the study of the Dynamic Mechanical Thermal Analysis (DMTA), at 7.5 phr of SEBS-g-MA, the fourth $\tan \delta$ peak appeared. This suggests that SEBS-g-MA not only lays at the interface but also disperses itself in the metrix of blends.

5.2 Recommendation for Further Studies

1. Blends can be etched to allow for microscopic study of each phase.
2. The research can be extended to investigate the effect of various blending conditions, especially how temperature and mixing speed influence the blend morphology.