

## CHAPTER V

### CONCLUSIONS

The SEM micrographs of uncompatibilized PA6/HDPE blend showed the coarse phase morphology of dispersed phase in the continuous phase over a wide range of composition. This was probable due to the weak interfacial adhesion between two phases; this resulted in poor mechanical properties of the uncompatibilized blend. In addition, the DSC endotherm and exotherm thermograms of uncompatibilized PA6/HDPE blends reported that  $T_c$  and  $T_m$  peaks of each component in the blends had occurred separately. This result also indicated that the PA6/HDPE blend was incompatible blend.

The addition of Fusabond<sup>®</sup> as a compatibilizer in the PA6/HDPE blend improved the compatibility in PA6/HDPE blend due to the interaction between the terminal amine groups of PA6 and the anhydride groups of compatibilizer. These interactions were confirmed by the FTIR result. The improvement of compatibility of the PA6/HDPE blends had resulted in reduction of size of dispersed phase to less than 1  $\mu\text{m}$ . Maximum reduction of disperse phase size was found at 1% wt. Fusabond<sup>®</sup>. The enhancement of mechanical properties of the PA6/HDPE blends was observed. The maximum improvement of the tensile properties was found at compatibilized blend with 10 wt.% of Fusabond<sup>®</sup>, which the tensile modulus and the tensile strength of the compatibilized PA6/HDPE blend (80/20) were 1.43, 1.35 times higher than that of the uncompatibilized blend. Impact strength of the compatibilized PA6/HDPE (80/20) blend was 1-3 times that of the uncompatibilized PA6/HDPE blend. At the small amount of the compatibilizer (0.1-2.5 wt.%), the hardness of the compatibilized PA6/HDPE (80/20) blend was also 1.05-1.09 times higher than the uncompatibilized blend. Moreover, the decrease in the crystallization temperatures, the melting temperatures and crystallinity of each component in the blends as compared with pure PA6 and HDPE also supported that the compatibility of the PA6/HDPE blend was improved by adding compatibilizer.