CHAPTER V
CONCLUSIONS

Zinc-neutralized samples of maleic anhydride grafted HDPE were successfully prepared by melt neutralization with zinc acetate dihydrate using a twin-screw extruder. FTIR spectra confirmed the neutralization reaction via disappearance of maleic anhydride characteristic peaks and appearance of the zinc-carboxylate characteristic peaks. The shear viscosity increased upon neutralization as expected, although the highest viscosity was found for 75% neutralization rather than 100% neutralization. Dispersed phase sizes decreased with added compatibilizer; with 10 phr compatibilizer showing much smaller dispersed phase sizes than 1 phr compatibilizer. Compatibilization improved the mechanical properties, and the improvement at 10 phr compatibilizer for elongation at break was much more dramatic vs. 1 phr compatibilizer. A significant nucleation effect was found for the Nylon 6 upon blending. Melt viscosity results showed that increased compatibilizer level increased the melt viscosity significantly, consistent with the conclusion that covalent bonding between the Nylon 6 and the compatibilizer was occurring. The neutralization level behavior was unexpected, in the Nylon 6 rich blend the neutralization level did not affect the melt viscosity while in the HDPE rich blend, the viscosity decreased as the neutralization level increased even though pure compatibilizer showed the opposite trend. Overall, the addition of zinc did not have a large effect on the compatibilization capabilities of the maleic anhydride grafted material; which was the same conclusion reached when zinc oxide rather than zinc acetate dihydrate was used to neutralize the compatibilizer (Chatreenuwat, et al. 2007).