

CHAPTER V

CONCLUSIONS

In summary, MMA-grafted HDPE can be prepared in the melt by radical grafting of MMA. The product is demonstrated to be a graft rather than a mixture of PMMA. The maximum efficiency of grafting is obtained at 10% initial MMA concentration and at higher levels of DCP. However, chain degradation and cross-linking occur in all cases and the extent increases with increase of DCP concentration and increase of initial MMA concentration.

The presence of MMA grafted HDPE enhances the mechanical properties of the blends and changes the morphology to a finer disperse phase particle size, compared to HDPE/PVC blends without grafting. The improvement in properties depends on the initial concentration of MMA in the HDPE, and on the PVC content in the blend. Our results indicate that optimal compatibilization occurs when the initial concentration of MMA is not too large (5-10%) to avoid excessive degradation, and when the PVC content is also low (~10%).

The improvement in mechanical properties was shown to correlate with the presence of specific hydrogen bonding interactions between the HDPE-bound MMA groups and the PVC presumable at the interface between the PVC and HDPE phases.