

CHAPTER V

CONCLUSIONS

- The binary blend of PET/HDPE and ternary blend of PET and HDPE and compatibilizer could not be reprocessed over 5 times. Each pass showed the different in the surface appearance and the viscosity.
- The melt strength of the binary blend was lower than melt strength of ternary blend in the same pass at particular ratio of PET/HDPE. The melt strength continued to decrease with the number of reprocessing pass. This decreasing was due to the degradation of the material during melt processing.
- The physical properties were determined as following

a. Tensile Strength

This property of ternary blend was not changed much after reprocessing. But the value of tensile strength (20-23 Mpa) was not as high as the value of tensile strength of pure HDPE (24.84 MPa). Also, the ductility was not changed much in the 1st-4th. The ductility of the 5th pass for ternary blend slightly decreased.

b. Flexural Strength

The binary blend showed the value of the flexural strength was nearly the same as the flexural strength of the ternary blend in every pass.

The stability of the value of flexural strength after reprocessing the blend may result from the orientation of the phase in the blend.

c. Impact Strength

The binary blend in every pass showed poor value of impact strength due to the immiscibility of the two components. In contrast, the ternary blend showed better value of impact strength in every pass of reprocessing the blend.

- Morphology of the blend

a. Binary Blend

Binary blend in the 1st pass showed dispersed PET in some areas of HDPE matrix. The adhesion at the interface was poor as seen by the holes in the HDPE matrix. With further reprocessing the PET components tended to aggregate, leading to poor mechanical properties.

b. Ternary Blend

In the 1st pass, the PET components were dispersed more. The size of PET component was about 2 μm . The surface of HDPE matrix was quite smooth and continuous. With further passes, there was no sign of the agglomeration of PET component, which was 2 μm in size. So the mechanical properties especially impact strength showed good value.

Suggestions for the Future Work

Take each pass of the pellet to molding to the product and determine that whether it can be molded or not.

Try to add other additives and study the effect of the additives and number of pass simultaneously.

Study the probability to make fiber from such blends