CHAPTER VI

CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

In this research, the synthesis method of polypropylene-*b*-poly(ethylene-propylene) copolymer and polypropylene/polypropylene-b-poly(ethylene-propylene) copolymer blends properties were investigated.

6.1.1. Synthesis of copolymer

The propylene/ethylene-propylene copolymers, synthesized using the simple method and Ziegler-Natta catalytic system were studied. A number of conclusions may be summarized as follows:

1. From ^{13}C-NMR spectrum, it indicated the incorporation of ethylene in synthesized polypropylene chains. The copolymer obtained has block copolymer microstructure.

2. From DSC and SEM, they showed properties of rubbery material of block copolymers and T_g of the copolymer were lower than T_g of PP.

3. The convenient condition from this work for synthesis PP-*b*-EP diblock copolymer was 30 psi of propylene feeding and 70 psi of ethylene feeding pressure at 10 °C copolymerization temperature. Duration of propylene fed was 10 minutes and duration of ethylene fed was 30 minutes.

6.1.2. Polymer blend

The relationship between PP-*b*-EP content with toughness, T_g, and crystallinity were verified. The conclusion of this research can be summarized as follows,

1. At ambient temperature, the blend of PP-*b*-EP/PP exhibit poor mechanical properties than pure PP according to tensile results. When compared only the blend PP/PP-*b*-EP, the more PP-*b*-EP content, the higher toughness.

2. From DSC and DMA result, it was found that the PP/PP-*b*-EP contribute to amorphous region of PP. The polymer blends have lower T_g, and crystallinity compared to pure PP and more deteriorate when added more PP-b-EP diblock copolymer.

3. From DMA, the addition of PP-*b*-EP in PP can be reinforced PP in temperature below 0°C.

6.2 Recommendations

From experiment, we had suspicion to ethylene chain was occurred in copolymerization system. To solve this problem, ethylene-propylene mixed gas should be continuously feed in the second stage polymerization after stop pure propylene feed.