CHAPTER V

CONCLUSION

Conclusion

The research work described in this thesis can be summarized below.

1. The preparation of graft natural rubber

The preparation of graft natural rubber was performed by emulsion polymerization process, $K_2S_2O_8$ was used as an initiator. The rubber macroradical reacted with styrene and acrylonitrile monomers to form graft copolymer. The particle structure of graft natural rubber is the core shell type. The optimum condition of graft copolymerization was found. The graft products were characterized.

From this work, the graft products formed the complete closed shell at above 100 parts by weight of monomers per 100 parts of natural rubber. The maximum value of grafting efficiency was 85.7 % at 1.5 parts by weight of emulsifier per 100 parts of natural rubber at 65 °C for 8 hours. The change of emulsifiers concentration did not affect the degree of monomers conversion.

The graft natural rubber properties were strongly influenced by the reaction temperature. The maximum degree of monomers conversion and graft ratio were 58.7 and 0.64 respectively, at the reaction temperature of 50 °C. But the maximum of grafting efficiency and graft frequency were 85.7 and 2,079 respectively, at reaction temperature of 65 °C. The copolymer

composition of graft natural rubber was determined by FTIR method and CHN\O analyzer. At reaction temperature of 50 °C, the ratio of acrylonitrile, isoprene and styrene in the graft natural rubber was 11.8 : 72.9 : 15.2. (by FTIR method)

2. The production of thermoplastic blends.

Thermoplastic blends were produced by melt blending and injection molding. The effect of graft natural rubber and SAN ratio on impact strength, flexural strength, hardness, melt flow index and heat distortion temperature was studied. The good mechanical properties of blends was obtained at the graft natural rubber and SAN ratio of 20 : 80.

Suggestions

In this work, the graft natural rubber/SAN blend (Acrylonitrile/Isoprene /Styrene) were produced, these thermoplastic blends could be possibly subsituted for the thermoplastic ABS (Acrylonitrile/Butadiene/Styrene). However, the properties of the graft natural rubber/SAN blends must be improved, it should be further studied in the following aspects ;

1. Graft Copolymerization of styrene and acrylonitrile on the natural rubber at higher temperature and pressure in the medium pressure reactor.
2. The effect of the additives on the mechanical properties of the graft natural rubber/SAN blends.
3. The effect of different processing methods.