



## CHAPTER V

### CONCLUSIONS

The Nylon/NR/[PS/NR/MA] blend showed the core-shell morphology where Nylon12 was encapsulated by NR phase in Nylon12 matrix. PSNRMA acted as adhesive functional group between amine group and maleic anhydride. More content of PS/NR/MA resulted in larger dispersed phase particle size. At low PS/NR/MA content, the Nylon12/NR blend showed improvement of tensile modulus, tensile strength and impact energy from the strength of Nylon12 core, flexibility of NR shell and proper particle distribution. Tensile modulus, tensile strength and impact energy lowering at higher PS/NR/MA content due to the coarser morphology and the lower Nylon12 composition. The Nylon12/NR/[PS/NR/MA] reactive blends showed improved properties compared to The Nylon12/NR/[PS/NR] presumably because of higher stress transfer via the amide linkage. Nylon12/NR/compatibilizer with variation of compatibilizer types showed the higher tensile modulus with increasing the molecular weight of compatibilizer, %wt PS hard segment content and maleic anhydride functional group of compatibilizer. The higher tensile strength, tensile modulus and impact energy of Nylon12/NR/[PS/NR/MA] blends than in Nylon12/NR/SEBS blends could be due to the PS hard segment and NR crosslinking in the PS/NR/MA blend.

#### Recommendations:

1. Limit of compatibilizer for properties improvement is rather low, 1-4 phr for melt blending process. Content greater than the limit values will lead to poorer properties. Thus it is postulated that increasing temperature or annealing may induce better diffusion of the copolymer to the interface. And thus more chance of properties improvement could be achieved and the limit of concentration may be wider.
2. Crystallization, crystalline size and phase formation may affect to the mechanical properties. Especially, the crystallization rate at or in the vicinity of the glass transition of PS. New species and the rate may be altered and relate to the mechanical properties.

3. Thermal expansion coefficient and viscosity of each component may be different and affect the morphology and physical properties.