CHAPTER V

CONCLUSIONS

The reactive blending of NR and LLDPE are prepared at different content of NR. When small NR is mixed with LLDPE, 10 %wt, reactive blends with DCP and MA show more LLDPE microgel and small incorporation of MA in the blend. Although temperature and rotor speed can induce more MA reaction to polymers but since NR and MA is small so the grafting reaction of MA onto LLDPE and NR are harder than crosslinking reaction of LLDPE resulting in poor mechanical properties. The optimum condition for 90/10/3/0.5 LLDPE/NR/MA/DCP compound is found at 150°C and 50 rpm. Therefore, increasing DCP to this blend induces more crosslinking reaction in LLDPE phases than grafting reaction of MA and poorer mechanical properties while increasing MA is more effective to enhance more MA grafting reaction in both NR and LLDPE phases and suppress gel formation so that mechanical properties are improved.

For 50/50/7/0.5 compound, temperature and rotor speed effectively enhance MA reaction and NR crosslinking reaction in the blend. However, NR crosslinking occurred largely than MA reaction. Increasing rotor speed also promotes mechanical degradation of NR chains. Optimum condition to process this compound is at 150°C and 30 rpm. Increasing DCP content, induces more NR crosslinking and MA tends to react with NR rather than LLDPE. Increasing MA content produces more reaction to LLDPE phase and grafted copolymer with less gel and thus mechanical properties are improved. Thus DCP role is less effective to enhance grafting reaction of MA but to promote crosslinking in this LLDPE/NR system and enhance mechanical properties through dynamic vulcanization of rubber. It is better to obtain in situ compatibilizer by increasing MA content and limit content of DCP.