

CHAPTER V

CONCLUSION AND SUGGESTIONS

5.1 Conclusion

The mechanical properties and rheological properties of RTR/PP blends were studied as a function of blend ratio, compatibilizer and virgin rubber concentration. RTR comprised of the rubber 63.25%, carbon black 22.53%, calcium carbonate 4.66%, and residue 7.52%. The NMR results obviously revealed that RTR was the mixture of NR and BR, but not SBR. The swelling percentage of vulcanized RTR was considerably lower than the unvulcanized RTR, indicating numerous double bonds in the structure of unvulcanized RTR were available. RTR/PP blend with a ratio of 30:70 was found to show the optimum properties. The results of RTR/PP blend with additives showed that POE could lead to a better interaction between RTR and PP which resulted in a POE-encapsulated structure in a few RTR particles. The effect of MA-g-PP on mechanical properties was lower than POE. This was probably because there was a higher degree of a phase separation in the blends added with MA-g-PP compared to those containing POE. For the case of adding virgin rubber into the blends, the highest impact strength was observed at the EPDM content of 30 phr while a maximum elongation was found with the NR content of 30 phr. The effect of NR on elongation was more significant than that of blends without NR. This was probably because NR had structure that was similar to those in RTR. The impact strength of RTR/PP with EPDM was higher than with NR because it could transfer energy of break to EPDM more readily than NR. The energy absorbed firstly sent to plastic and then transferred to rubber. Mechanical properties of the blends were unchanged after three cycles of reprocessing. This indicates that the blends have good reprocessing ability up to three cycles. The results indicated that the blends showed fairly properties. The blends had slight rubber-like properties but can be melt-processed like thermoplastic polymers.

5.2 Suggestion for Further Work.

Future improvement on mechanical properties of reclaimed tire rubber/polypropylene blends should be made on the following aspects.

- To prepare reclaimed tire rubber using different method of devulcanization ground tire rubber (GTR).
- To investigate the preparation of thermoplastics vulcanized from reclaimed tire rubber and commodity plastics.