CHAPTER V

CONCLUSIONS

The experimental results can be summarized as the followings.

1. The presence of NBR in plasticized PVC can be characterized and verified by FTIR. The greater the amount of the NBR, the more the absorption peak of CN at 2238 cm^{-1}.

2. The TGA can be used to quantitatively detect the NBR. The weight change that occurs over the temperature range between 350°C and 550°C indicates the amount of NBR because degradation of PVC takes place at such temperature range .

3. The mechanical properties in terms of the tensile strength, the modulus at 50%, 100% and 200% elongation are decreased when more NBR is present in the plasticized PVC. However, the tensile elongation at break is found to increase with the NBR content. Compression set properties and the tear strength are improved with the addition of NBR to plasticized PVC.

4. Physical properties such as the hardness, the specific gravity and the abrasion resistance decrease when NBR is present. The color property

tends to deteriorate as the NBR content in plasticized PVC increases due to the inherent color of NBR itself.

5. Some aggressive petrol reagents do affect the properties of NBR-plasticized PVC. The addition of NBR to plasticized PVC gives a lower tensile strength and moduli at 50, 100 and 200% elongation but a higher elongation at break. As NBR content increases, the change in the mechanical properties after aging in unleaded gasoline and hexane are improved because of the less plasticizer extraction. In contrast, the change in the physical properties after aging in motor oil is not significant. Confirmation of these findings can be obtained by using FTIR to identify the DINP plasticizer in hexane after the immersion of the test samples.

6. The compatibility study by DSC thermal analysis shows that NBR and plasticized PVC are compatible as is evident by a single T_g between the T_g 's of the plasticized PVC and that of the original NBR.

7. The SEM fractography supports the miscibility between the plasticized PVC and NBR by showing that overall there is no phase separation. The NBR particles were rarely found in all of the NBR-plasticized PVC systems.

RECOMMENDATION FOR FURTHER STUDIES

This research can be expanded to study the effect of the quantity of NBR to the fabrication process. A curing agent can be used for crosslink between the PVC and the NBR. This is especially important if the PVC application is to be expanded, for example, to curl cord wire where dimensional and shape stability is primary concern.