

CHAPTER V

CONCLUSIONS

Vinyl chloride/ vinylidene chloride copolymers were successfully synthesized at various comonomer composition. VCM/VDC copolymers were synthesized via radical polymerization. The reaction could occur at 30°C and 50°C. The copolymers with the highest molecular weight were obtained at 30°C polymerization temperature, and 0.2 mmol initiator, which provided good mechanical properties for the PVC and 75%VCM copolymers. For 50%VCM copolymer, The polymer obtained was quite sticky when processed by 2 roll mill. 30°C polymerization temperature shows acceptable mechanical properties when compared with 50°C polymerization temperature which required shorter polymerization time. The 65°C polymerization temperature, was too high for polymerization of copolymers using the selected initiators.

The copolymer structures were identified by FTIR and NMR. The higher the VDC content, the higher the intensities of NMR peak of VDC component at 91 ppm and also the broader the peak in the range of 1350-600 cm^{-1} in FTIR spectra. As for the DSC results, it can be concluded that the higher the VDC content, the lower the T_g value which means the more plasticization occurred. The molecular weight of the copolymer depends on copolymer composition and reactivity ratio of VCM and VDC, causing chain transfer reaction to occur. Tensile properties of these copolymers also depend on molecular weight. The higher the molecular weight, the better the tensile properties. The comparison of mechanical properties between commercial saran and the PVC and copolymers synthesized could give a conclusion that the commercial saran show better mechanical properties.