CHAPTER 5

CONCLUSION AND SUGGESTIONS

5.1 Conclusion

By comparison with LDPE/corn starch blend, the results indicated that tapioca starch has a good potential to develop as a biodegradable plastics. This conclusion has been derived from the tensile strength and elongation at break of LDPE/tapioca starch blends at all composition which shows that their mechanical properties are as good as or, perhaps, slightly better than those of LDPE/corn starch blends. In this study the compatibilizer is certainly needed. It was found that both glycerol monostearate and zinc stearate can be used as the appropriate compatibilizers for both types of blends, i.e., LDPE/tapioca starch and LDPE/corn starch. However, zinc stearate may be a better compatibilizer as the films of LDPE/tapioca starch blends with zinc stearate seem smoother than the one with glycerol monostearate.

5.2 Further suggestions

In this experiment, glycerol monostearate and zinc stearate can improve the mechanical strength of blends although its mechanical properties were not same as LDPE . The further researches ought to find out the another compatibilizer to enhance greater mechanical properties or develop the blending of starting materials homogeneously. However, the moisture content was the one serious problem. Because

high moisture content caused to weakness on tensile strength and elongation and caused to air bubble during films blowing. Decreasing the moisture content of blends which the one aspect is interesting. The attempt to solve this aspect by using modified starch instead of native starch. However biodegradation of modified starch blends must be confirm absolutely . This research were not investigated in term of degradation but the resulting of degradation confirmed by other researchers as follows : Miss Thanida (1995) examined biodegradability of LDPE/tapioca starch films by enzyme degradation from *Aspergillus niger* and *Penicillium pinophilum* fungi . The biodegradability of starch films increased as the quantity of starch increased. At high starch content, the degradation rate was high and tensile strength was very low after 6 month exposure. Sung,W.and Nikolov, Z.L. (1992) were investigated the accelerated starch biodegradation of LDPE-corn starch films by using a buffered *Bacillus sp.* ∝- amylase solution . The amount of starch hydrolyzed by ∝- amylase was directly related to physical properties of polyethylene films. The level of starch degradation range between 10 and 50 wt % of initial starch, depending on the extent of polyethylene degradation. Goheen S. M. and Wool R.P.(1991) studied degradation of LDPE-corn starch film in soil . They reported that starch removal was found to proceed rapidly during the first 40 days and near completion in very high starch blend (52% and 67% by weight). Starch removal was slower, consisting of mostly surface removal in 29% starch blend . Degradation rate in different soil containing different amount of organic matter were approximately the same alter a period of few week . Infrared spectroscopy analysis did not show significant chemical change in polyethylene matrix after 240 days .