Preparation and Physical Properties of Biodegradable Films using Various Starches

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Synthetic plastics, such as polystyrene, polypropylene and polyethylene, are used widely in daily life, in food industry, biomedical field and agriculture. A heavy environmental pollution accompanies their uses, because they need hundreds of years to degrade, and the disposal of waste plastics has become a serious problem. Therefore, in the past two decades, biodegradable materials have been paid attention as alternatives to the petroleum-derived plastics.

In this study, films were prepared different starches, PVA and additives by using casting method. Glycerol(GL), sorbitol(SO), tartaric acid(TA), and citric acid(CA) were used as additives. Physical properties such as tensile strength(TS), elongation at break(%E), degree of swelling(DS) and solubility(S) with amylose contents of starches were investigated. Amylose content of starches was analyzed by the colourimetric method. The result of the measurements indicated that with increasing the amylose contents of starches, TS and DS of films increased. However, %E and S of films decreased. Thermal analysis of films was measured by using differential scanning calorimeter (DSC). Also, biodegradability of the films was evaluated by soil burial test.