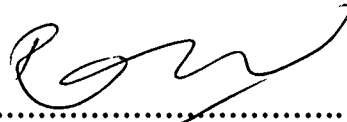


**EFFECT OF DIFFERENT COMPOSITION OF PLASTICISER AND
OTHER ADDITIVES ON STRENGTH AND THERMAL
PROPERTIES OF SAGO STARCH FILM**

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ABSTRACT

EFFECT OF DIFFERENT COMPOSITION OF PLASTICISER AND OTHER ADDITIVES ON STRENGTH AND THERMAL PROPERTIES OF SAGO STARCH FILM

The use of plastic materials in agriculture causes the serious drawback of huge quantities of waste. The introduction of biodegradable materials, which can be disposed directly into the soil, can be one possible solution to this problem. Biodegradable materials are actually innovative materials; therefore, their physical properties must be evaluated in relation to their functionality during the use in field. In this research, Sago starch is physically mixed with different composition of Glycerol to produce Strength Sago Starch Film. Glycerol was added to the sago starch gel as a plasticizer to modify the mechanical properties and thermal properties of sago starch film. Deterioration in properties for Tensile strength (TS) but improvement on elongation properties of sago starch film with increasing amount of Glycerol was found. Additives such as Aldehyde and microcrystalline cellulose (MCC) were added to improve strength of Sago starch/Glycerol film. Characterisation made using Differential Scanning Calorimetric (DSC) showed significant differences between their melting or gelation transition while scanned with a Fourier Transform Infra Red (FTIR) Spectra showed strong absorption of carbonyl Aldehyde group. 40% to 60% Glycerol content were found to give optimum strength for sago starch film. All the experiments and tests were conducted at Lab Polymer 411, 410 and 112 and Lab Applied Chemistry 307 at Applied Science Faculty, UiTM Shah Alam, Selangor.

CHAPTER 1

INTRODUCTION

Synthetic plastics such as polystyrene, polypropylene and polyethylene are important materials that widely used in daily life, in food industry, biomedical field and agriculture but they are difficult to be recycled or naturally decomposed. Over the last few years, there has been a widespread interest in films made from renewable and natural polymers that can degrade naturally and more rapidly than petroleum-based plastics. For mulch and agricultural film, there are important things to find material that can be decomposed easily without suffering any dangerous effects either for plants or human being. German plantation field had been using Starch as their mulch film to replace the conventional PE film where starch is to decompose upon seedling growth (after germination and plant growth) (Prof. Dr. Claudia Kummerlöwe & Prof. Dr. Dieter Trautz,).