

**EFFECT OF CROSSLINKER COMPOSITION ON STRENGTH AND  
THERMAL PROPERTIES OF POLYVINYL ALCOHOL /SAGO STARCH  
FILM**

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## **ABSTRACT**

### **EFFECT OF CROSSLINKER COMPOSITION ON STRENGTH AND THERMAL PROPERTIES OF POLYVINYL ALCOHOL/SAGO STARCH FILM.**

Biodegradable film and plastic from starch and polyvinyl alcohol have many applications including mulch film, drug delivery systems and medicinal use. The aim of this study was to investigate whether starch and polyvinyl alcohol could be a compatible system with and without crosslinker. Free films of these polymers were produced by casting and investigated with respect to their mechanical properties and moisture uptake. The moisture uptake was found to be substantially higher when higher polyvinyl alcohol was incorporated. The films had a lower failure stress under tension than the corresponding glycerol-free films. In this research, Sago starch is physically mixed with different amount of polyvinyl alcohol to modify the mechanical properties and thermal properties of sago starch. Improvement of tensile strength and elongation properties of sago starch / polyvinyl film were obtained with use of Cross linking agent such as Malonic Acid and Glyoxal. Characterisation made using Differential Scanning Calorimetric( DSC) showed significant difference between their melting or gelation transition. Spectra for scanned sample from Fourier Transform Infra Red (FTIR) showed strong absorption of carbonyl aldehyde group with crosslinked system. Improve strength and thermal gelation temperature of Sago starch/Polyvinyl Alcohol film were found for crosslinked system. 20% of glyoxal content was found to give optimum strength for sago starch/polyvinyl alcohol film. All the experiment were conducted at Laboratory Polymer 211, 410, 411 at Applied Science Faculty, UiTM Shah Alam, Selangor.