

Khwanchanok Nithichotdechakon 2007: Development of Water Soluble Film for Chemical Packaging from Cassava Starch or Modified Cassava Starch Blended with Polyvinyl Alcohol (PVOH). Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging Technology. Thesis Advisor: Associate Professor Ngamtip Poovarodom, Ph.D. 115 pages.

Starch is a natural biopolymer that is low cost, renewable and formable into films. Starch films are usually sensitive to moisture, poor mechanical properties and brittle. This research was aimed to improve cassava starch film properties by blending with polyvinyl alcohol (PVOH) and plasticizer. FTIR spectrum of starch/PVOH films plasticized with glycerol revealed no evidence of new bond formation among the components. It was found that the suitable amount of PVOH homogeneously blended into cassava starch, propionate starch and oxidized starch was 10 % (by dry weight of starch) and 5, 10 and 5% of glycerol (by weight of starch) respectively. The obtained films were transparent, smooth surface and the thickness ranging from 0.04 to 0.06 mm. Their properties were as follows; the oxidized starch/PVOH films had the highest tensile strength (7.54 kg/mm^2), followed by cassava starch/PVOH films (4.02 kg/mm^2) and propionate starch/PVOH films (3.93 kg/mm^2) respectively. All films possess high oxygen barrier property (OTR was ranging from 13 to 20 $\text{cc/m}^2 \cdot \text{day} \cdot \text{atm}$) but low barrier to water vapor (WVTR was ranging from 9 to 12 $\text{g/m}^2 \cdot \text{hour}$). They were heat sealable with relatively high seal strength ranging from 0.7 to 1.0 kg/ 25 mm. The preliminary trial to apply the films as water soluble packaging for powder soluble fertilizer and chemical coated seed, it showed promising results. All films could be dissolve and delivered the test chemicals within 3 minutes. Also, the germination of tested seeds was not significantly different from the control ($p < 0.05$).

Student's signature

Thesis Advisor's signature

