

Khanh Minh Dang 2014: Effect of Chitosan on Properties of Thermoplastic Starch Blown Film. Master of Science (Packaging Technology), Major Field: Packaging Technology, Department of Packaging and Materials Technology. Thesis Advisor: Assistant Professor Rangrong Yoksan, Ph.D. 68 pages.

The objective of the present thesis is to improve blown film extrusion processability and properties of thermoplastic starch (TPS) film by incorporating chitosan (CTS) with 0.5-2 part(s) per hundred parts of starch (phs). TPS/CTS compounds were prepared using a twin-screw extruder followed by blowing into a film via blown film extrusion. The effect of chitosan on blown film extrusion processability, optical properties, morphology, thermal properties, tensile properties as well as water vapor and oxygen permeability of the films was investigated. The possible interactions between starch and chitosan molecules were evaluated by FTIR and XRD techniques. Starch and chitosan molecules could interact via hydrogen bonds as confirmed from the blue shift of OH bands and the reduction of V-type starch crystal formation. Glass-transition temperature evaluated by DSC and DMTA tended to increase as a function of chitosan content. Although the incorporation of chitosan caused decreased extensibility as well as increased yellowness and opacity, the films exhibited increased tensile strength, rigidity, thermal stability and UV absorption, improved water vapor and oxygen barrier properties, as well as reduced water absorption and surface stickiness. The obtained TPS/CTS films offer great potential applications in food industry as edible films.

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Student's signature

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Thesis Advisor's signature