

The Effect of Plasticizer on Mechanical Properties and Chemical Structure of Chitosan-Starch Film Composites

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ABSTRACT

Plasticizer is an additive for plastic to improve its elasticity and flexibility. In this experiment, the composites based on chitosan-starch were synthesized at different weight ratios (7/3; 8/2; 9/1; 10/0) by using 12.28 – 24.24% volume of glycerol as plasticizer. This paper studies the influence of plasticizer on mechanical and chemical properties of chitosan-starch plastic film. The films were observed on the aspect of mechanical characteristic (tensile strength, elongation at break), and % swelling. The mechanical characteristic of the film were characterized by autograph and swelling test. *The alteration of chemical structure was studied by FTIR.*

The results showed the higher of chitosan-starch ratio increased the tensile strength and the elasticity of film but decreased in % swelling. Otherwise, the addition of plasticizer increased the elasticity of film and % swelling. These results suggested that these two film forming components were an interaction existed, a greater intensity was observed and the amino group band of chitosan molecule in the FTIR spectrum shifted from 1601 cm⁻¹ in the chitosan film to 1590 cm⁻¹ in composite films.

Keywords: Chitosan-Starch ; Gliserol ; Tensile Strength; Elongation at Break