

Pengaruh Asam Sitrat Sebagai Agen *Cross-Linking* terhadap Karakteristik Fisik dan Kimia *Edible Film* dari Pati Jagung

The Effect of Citric Acid as Cross-Linking Agent on the Physical and Chemical Properties of Corn Starch Edible Film

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ABSTRACT

Plastic is a practical, cheap, and lightweight packaging. The use of plastic is increasing, and can have a negative impact on the environment and living things. Therefore, there needs to be a new innovation that can minimize the use of plastic as a food packaging, namely, edible film. Edible films can be made with natural materials such as starch. Corn starch has high amylose which can play a role in compiling a dense film matrix. However, edible films from corn starch have disadvantages, namely poor mechanical properties and water vapor barrier. Therefore, in the process of making edible film from corn starch, cross-linking modification is carried out using citric acid as a cross-linking agent with different concentrations. This research aims to determine the effect of citric acid as cross-linking on the physical and chemical characteristics of edible film from corn starch and reasearch method used a 1-factor completely randomized design, namely variations in citric acid concentration. The concentration of citric acid used in this study was 0%; 0,10%; 0,15%; 0,20%; 0,25% of solution volume (v/v). The results showed that the higher concentration of citric acid significantly increased opacity, and significantly decreased water uptake, Water Vapor Transmission Rate (WVTR) and Water Vapor Permeability (WVP), tensile strength, elongation, and light transmittance. However, the use of citric acid has no significant effect on thickness and moisture content. In addition, testing using Fourier Transmission InfraRed (FTIR) showed the presence of new functional groups, namely ester bonds in the addition of citric acid as a cross-linking agent.

Keywords: *Edible film, corn starch, citric acid, cross-linking.*