

ABSTRAK

PEMBUATAN WATER-SOLUBLE FILM BERBASIS PATI SINGKONG (*Manihot esculenta*) DAN PVA SEBAGAI KEMASAN DETERGEN

Nadia Darmawan, 2026, 40 Halaman, 5 Tabel, 14 Gambar, 4 Lampiran

Penggunaan plastik konvensional yang sulit terurai secara alami menimbulkan dampak negatif yang signifikan terhadap lingkungan. Sebagai alternatif, dikembangkan Water-Soluble Film berbasis Pati Singkong dan Polyvinyl Alcohol (PVA) yang bersifat ramah lingkungan dan mudah larut dalam air. Penelitian ini bertujuan untuk menentukan pengaruh penambahan gliserol terhadap karakteristik film, menganalisis kecepatan kelarutan film dalam air, serta menentukan formulasi optimal rasio pati, PVA, dan gliserol berdasarkan SNI 7818:2016. Penelitian ini dilakukan dengan variasi rasio pati singkong dan PVA sebesar 4:6, 5:5, 6:4, 7:3, 8:2, dan 9:1 dengan total berat polimer 10 gram, serta variasi konsentrasi gliserol sebesar 3% dan 5%. Film dibuat menggunakan metode *solution casting* dengan pelarutan pada suhu 80°C dan pengeringan pada suhu 50°C selama 12 jam. Karakteristik yang diuji meliputi kuat tarik (tensile strength), elongasi (elongation at break), daya serap, dan waktu kelarutan. Hasil penelitian menunjukkan bahwa penambahan gliserol dari 3% menjadi 5% meningkatkan fleksibilitas film secara nyata hingga mencapai nilai elongasi tertinggi sebesar 27%, namun menurunkan nilai kuat tarik. Formulasi terbaik yang memenuhi standar SNI 7818:2016 diperoleh pada rasio pati singkong dan PVA 7:3 dengan konsentrasi gliserol 5%, menghasilkan nilai kuat tarik sebesar 4,653 Mpa, elongasi 27%, daya serap air 77,78% dan waktu kelarutan 1 menit 22 detik. Water-Soluble Film yang dihasilkan terbukti memiliki kemampuan larut dengan baik dalam air dengan rentang waktu kelarutan antara 1 menit 10 detik hingga 7 menit 22 detik, sehingga berpotensi dikembangkan sebagai kemasan detergen yang ramah lingkungan.

Kata Kunci: Pati singkong, water-soluble film, PVA, gliserol, kemasan detergen

ABSTRACT

MANUFACTURE OF WATER-SOLUBLE CASSAVA STARCH-BASED FILM (*Manihot esculenta*) AND PVA AS DETERGENT PACKAGING

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The use of conventional plastics that are difficult to decompose naturally has a significant negative impact on the environment. As an alternative, a Water-Soluble Film based on Cassava Starch and Polyvinyl Alcohol (PVA) was developed which is environmentally friendly and easily soluble in water. This study aims to determine the effect of glycerol addition on the mechanical properties of the film, analyze the solubility speed of the film in water, and determine the optimal formulation of the ratio of starch, PVA, and glycerol based on SNI 7818:2016. This study was conducted with variations in the ratio of cassava starch and PVA of 4:6, 5:5, 6:4, 7:3, 8:2, and 9:1 with a total polymer weight of 10 grams, as well as variations in glycerol concentration of 3% and 5%. The film is made using the solution casting method with dissolution at 80°C and drying at 50°C for 12 hours. The characteristics tested include tensile strength, elongation at break, absorbency, and solubility time. The results showed that the addition of glycerol from 3% to 5% significantly increased the flexibility of the film until it reached the highest elongation value of 27%, but decreased the tensile strength value. The best formulation that meets the SNI 7818:2016 standard is obtained at a ratio of cassava starch and PVA 7:3 with a glycerol concentration of 5%, resulting in a tensile strength value of 4.653 Mpa, 27% of solubility, 77.78% water absorption and a solubility time of 1 minute 22 seconds. The resulting Water-Soluble Film has been proven to have the ability to dissolve well in water with a solubility time range between 1 minute 10 seconds to 7 minutes 22 seconds, so it has the potential to be developed as an environmentally friendly detergent packaging.

Keywords: Cassava starch, water-soluble film, PVA, glycerol, detergent packaging