BIOPLASTIK BERBASIS *POLYBLEND* PEKTIN DAN *POLY(VINYLPYRROLIDONE)* SEBAGAI BAHAN KEMASAN

SKRIPSI

diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains
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disusun oleh:

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ABSTRAK

Plastik yang sering digunakan sebagai kemasan umumnya berasal dari sumber bahan tidak terbarukan dan sulit terurai, sehingga dapat mencemari lingkungan. Oleh karena itu, perlu dikembangkan bioplastik sebagai bahan alternatif untuk mengurangi jumlah limbah plastik yang semakin meningkat. Pektin merupakan salah satu bahan yang dapat digunakan untuk pembuatan bioplastik. Namun, kelemahan pektin yang bersifat rapuh sebagai bioplastik perlu dimodifikasi agar sifatnya lebih baik. Salah satu caranya adalah mencampurkannya dengan polimer lain, seperti *poly(vinylpyrrolidone)* (PVP). Penelitian ini bertujuan untuk mengetahui komposisi optimum dan karakteristik bioplastik berbasis *polyblend* pektin dengan penambahan PVP pada berbagai komposisi (8:0, 7:1, 6:2, dan 5:3 (w/w)) yang disintesis menggunakan metode *solution casting*. Morfologi permukaan film bioplastik berbasis *polyblend* pektin/PVP berdasarkan foto SEM menunjukkan ketercampuran yang cukup baik dengan komposisi optimum *polyblend* pektin/PVP adalah 7:1, yang ditandai dengan peningkatan sifat mekanik dibandingkan dengan film pektin tanpa penambahan PVP. Analisis sifat termal menggunakan DSC menunjukkan kenaikan titik leleh setelah penambahan PVP pada film pektin. Analisis struktur kimia film bioplastik berbasis *polyblend* pektin/PVP menggunakan FTIR menunjukkan puncak khas dari pektin dan PVP, serta terjadinya pergeseran bilangan gelombang yang menunjukkan adanya interaksi antara pektin dan PVP dalam *polyblend.* Peningkatan nilai laju transmisi uap air dan penurunan sudut kontak pada film bioplastik menunjukkan bahwa penambahan PVP terhadap pektin menurunkan sifat hidrofobisitas film. Analisis menggunakan spektrofotometer UV-Vis menunjukkan peningkatan transparansi film pada komposisi *polyblend* pektin/PVP optimum. Hasil analisis karakteristik film bioplastik berbasis *polyblend* pektin/PVP menunjukkan bahwa penambahan PVP dapat memperbaiki kelemahan film pektin dan berpotensi untuk digunakan sebagai bahan kemasan.

Kata kunci: *bioplastik, pektin, poly(vinylpyrrolidone), polyblend.*

ABSTRACT

Plastics that are often used as food packaging generally come from non-renewable sources and difficult to degrade, which can cause environmental pollution. Therefore, it is necessary to develop bioplastics as an alternative material to reduce the increasing amount of plastic waste. Pectin is one of the materials that can be used to make bioplastics. However, the weakness of pectin is brittle as bioplastic, it needs to be modified so that its properties are better. One way is to mix it with other polymers, such as poly(vinylpyrrolidone) (PVP). This study aims to determine the optimum composition and characteristics of polyblend pectin/PVP based bioplastic with the addition of PVP in various composition (8:0, 7:1, 6:2, and 5:3 (w/w)), which were synthesized using the solution casting method. The surface morphology of bioplastic film based on a polyblend of pectin/PVP based on SEM photos showed good miscibility with the optimum composition of pectin/PVP polyblend is 7:1, which showed improved mechanical properties compared to pectin film without the addition of PVP. Thermal properties analysis using DSC shows an increase in melting point after addition of PVP to the pectin film. Analysis of the chemical structure of bioplastic film based on a polyblend of pectin/PVP using FTIR showed a typical peaks of pectin and PVP, as well as a wavenumber shift which indicates the interaction between pectin and PVP in the polyblends. Increased water vapour transmission rate and decreased contact angle of the bioplastic film indicate that the addition of PVP to pectin reduces the hydrophobicity of the film. Analysis using UV–Vis spectrophotometer showed an increase in film transparency on optimum pectin/PVP polyblend composition. The results of analysis of the characteristics of polyblend pectin/PVP based bioplastic films show that the addition of PVP can improve the weaknesses of pectin films and has the potential to be used as packaging material.

Keywords: *bioplastic, pectin, poly(vinylpyrrolidone), polyblend.*

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