

Intisari

SIFAT FISIK DAN KIMIA BIOPLASTIK BERBAHAN DASAR KITOSAN-KARAGENAN DENGAN PENAMBAHAN *BEESWAX*

Sampah plastik menyebabkan permasalahan lingkungan di tanah, udara serta perairan karena tidak dapat terdegradasi oleh alam. Penggunaan bioplastik dapat menjadi solusi dari permasalahan tersebut. Penambahan karagenan pada bioplastik kitosan mampu meningkatkan sifat fisik dan mekanik, namun menghasilkan nilai kelarutan dan WVTR yang tinggi sehingga diperlukan bahan tambahan untuk mereduksi keduanya yaitu salah satunya dengan *beeswax*. Tujuan penelitian ini adalah untuk mengetahui pengaruh penambahan *beeswax* terhadap karakteristik bioplastik berbahan dasar kitosan-karagenan. Konsentrasi bahan yang digunakan yaitu kitosan 2%, gliserol 0,5%, karagenan 0,5%, serta konsentrasi *beeswax* yaitu 0%, 1%, 2%, 3%, 4%, dan 5%. Pengujian karakteristik yang dilakukan adalah uji ketebalan film, densitas, kelarutan, kadar air, kuat tarik, elongasi, WVTR, dan analisis gugus fungsi. Hasil pengujian menunjukkan bahwa penambahan *beeswax* dapat mereduksi nilai kelarutan, WVTR, dan kadar air namun masih terdapat parameter yang belum memenuhi standar yaitu parameter kuat tarik, kelarutan, dan WVTR. Penambahan emulsifier diperkirakan dapat digunakan untuk memperbaiki karakteristik bioplastik namun masih perlu penelitian lebih lanjut.

Kata kunci: *beeswax*, bioplastik, karagenan, karakteristik, kitosan

Abstract

PHYSICAL AND CHEMICAL PROPERTIES BIOPLASTIC BASED ON CHITOSAN-CARRAGEENAN WITH BEESWAX ADDITION

Plastic waste causes environmental problems because it cannot be degraded by nature. Bioplastics can be an alternative solution to overcome this problem. The addition of carrageenan to chitosan bioplastics improves physical and mechanical properties, but also resulted high solubility and WVTR values so additional materials are needed to reduce both those properties, such as beeswax. The purpose of this study was to determine the effect of beeswax addition on the characteristics of chitosan-carrageenan-based bioplastics. The concentrations of the materials used were 2% chitosan, 0.5% glycerol, 0.5% carrageenan, and the beeswax concentrations were 0%, 1%, 2%, 3%, 4%, and 5%. The characteristic tests performed were film thickness, density, solubility, water content, tensile strength, elongation, WVTR, and functional group analysis. The result of this study show that the addition of beeswax can reduce the values of solubility, WVTR, and water content, but there are still some parameters that do not meet the standards, namely the parameters of tensile strength, solubility, and WVTR. Emulsifier addition predicted can improve the properties of bioplastic but still need further research.

Key words: beeswax, bioplastic, carrageenan, characteristic, chitosan.