PENGEMBANGAN FILM BIOPLASTIK BERBASIS *POLYBLEND* ASAM HIALURONAT DAN HIDROKSIETIL SELULOSA

SKRIPSI

Diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains Program Studi Kimia

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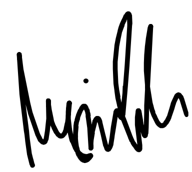
Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Sains Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

PERNYATAAN KEASLIAN SKRIPSI

Dengan ini saya menyatakan bahwa skripsi dengan judul "**Pengembangan Film Bioplastik Berbasis *Polyblend* Asam Hialuronat Dan Hidroksietil Selulosa**" beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan pengutipan atau penjiplakan dengan cara-cara yang tidak sesuai dengan etika keilmuan yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menerima risiko atau sanksi apabila kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya.

Bandung, 12 September 2024



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ABSTRAK

Plastik berbasis petrokimia menyebabkan penumpukan limbah yang sulit terurai di alam. Pada penelitian ini dikembangkan suatu film bioplastik berbasis polisakarida Asam Hialuronat (HA) dan Hidroksietil Selulosa (HEC). Pengaruh penggabungan HEC ke dalam HA dengan berbagai komposisi terhadap struktur dan sifat campurannya diselidiki. Analisis FTIR menunjukkan bahwa penggabungan HEC menurunkan ikatan hidrogen antarmolekul yang terjadi. Analisis XRD menunjukkan adanya peningkatan kristalinitas bioplastik seiring bertambahnya komposisi HEC. Penambahan HEC menyebabkan sifat mekanik menjadi turun, tetapi masih dalam jangkauan sifat mekanik plastik konvensional. Sifat mekanik HA:HEC 1:3 memiliki kekuatan tarik 55,53 ± 7,9 MPa; elongasi 42,17 ± 8,6%; dan modulus young 6,85 ± 1,7 MPa. Sifat penghalang terhadap uap air tidak menunjukkan perubahan yang signifikan. Analisis UV-Vis menunjukkan bahwa penambahan HEC menurunkan transparansi film bioplastik. Selanjutnya bioplastik ini dapat digunakan sebagai plastik kemasan dan berbagai aplikasi lainnya.

Kata kunci: bioplastik; polyblend; polisakarida; plastik ramah lingkungan; campuran HA/HEC.

ABSTRACT

Petrochemical-based plastics cause the accumulation of waste that is difficult to decompose in nature. In this study, a bioplastic film based on the polysaccharides Hyaluronic Acid (HA) and Hydroxyethyl Cellulose (HEC) was developed. The effect of incorporating HEC into HA with various compositions on the structure and properties of the blends was investigated. FTIR analysis showed that incorporation of HEC decreased the intermolecular hydrogen bonding that occurred. XRD analysis showed an increase in the crystallinity of the bioplastic as the HEC composition increased. The addition of HEC caused the mechanical properties to decrease, but still within the range of mechanical properties of conventional plastics. The mechanical properties of HA:HEC 1:3 had a tensile strength of 55.53 ± 7.9 MPa; elongation of 42.17 ± 8.6%; and young modulus of 6.85 ± 1.7 MPa. The barrier properties against water vapour showed no significant change. UV-Vis analysis showed that the addition of HEC decreased the transparency of the bioplastic film. Furthermore, this bioplastic can be used as plastic packaging and various other applications.

Keywords: bioplastic; polyblend; polysaccharide; eco-friendly plastic; HA/HEC blend

DAFTAR ISI

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DAFTAR LAMPIRAN

KATA PENGANTAR

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