PENGARUH KOMPOSISI ASAM HIALURONAT/HIDROKSIPROPILMETILSELULOSA TERHADAP SIFAT MEKANIK DAN PENGHALANG *POLYBLEND* HA/HPMC

SKRIPSI

diajukan untuk memenuhi sebagian syarat memperoleh gelar sarjana sains di bidang kimia

Oleh

Mutiara Erdiana Putri

2000814

KELOMPOK BIDANG KAJIAN MATERIAL

PROGRAM STUDI KIMIA FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM

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PENGARUH KOMPOSISI ASAM HIALURONAT/HIDROKSIPROPILMETILSELULOSA TERHADAP SIFAT MEKANIK DAN PENGHALANG *POLYBLEND* HA/HPMC

Oleh:
Mutiara Erdiana Putri

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

LEMBAR PENGESAHAN

PENGARUH KOMPOSISI ASAM HIALURONAT/HIDROKSIPROPILMETILSELULOSA TERHADAP SIFAT MEKANIK DAN PENGHALANG FILM POLYBLEND HA/HPMC

Oleh

Mutiara Erdiana Putri

2000814

Pembimbing I

Dr. H. Budiman Anwar, S.Si., M.Si.

NIP: 197003131997031004

Pembimbing II

Dr.Galuh Yuliani, M.Si., Ph.D.

NIP: 198007252001122001

Mengetahui,

Ketua Program Studi Kimia

Prof. Fitri Khoerunnisa, M.Si., Ph.D.

NIP: 197806282001122001

PERNYATAAN KEASLIAN SKRIPSI

Dengan ini saya menyatakan bahwa skripsi dengan judul "**PENGARUH KOMPOSISI ASAM HIALURONAT/ HIDROKSIPROPILMETILSELULOSA TERHADAP SIFAT MEKANIK DAN PENGHALANG FILM *POLYBLEND* HA/HPMC**" ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 20 Agustus 2023

Yang membuat pernyataan,

Mutiara Erdiana Putri

ABSTRAK

Plastik biodegradable merupakan inovasi plastik untuk menanggulangi pencemaran lingkungan akibat plastik konvensional. Penerapan plastik biodegradable tidak hanya untuk plastik kemasan, namun dapat diterapkan pada industri serat, *wound healing*, farmasi, dan tekstil. Tujuan dari penelitian ini mengetahui komposisi optimum, struktur, dan sifat film polyblend berbasis asam hialuronat (HA) dan hidroksipropilmetilselulosa (HPMC). Pada Penelitian ini variasi komposisi massa HA/HPMC yang digunakan adalah 4:0, 3:1, 1:1, 1:3, dan 0:4. Pengaruh penambahan HPMC dalam HA diselidiki terhadap sifat fisikokimia film campuran. Analisis FTIR menunjukkan ketercampuran antara keduanya dengan munculnya gugus fungsi yang mengkarakteristik keduanya. Pencampuran antara HA dan HPMC memunculkan ikatan hidrogen baru yang berasal dari gugus –NH. Analisis XRD menunjukkan bahwa seiring komposisi HPMC yang lebih banyak kristalinitas film semakin meningkat. Pengaruh penambahan komposisi HPMC lebih banyak meningkatkan sifat mekanik, dan komposisi HA/HPMC optimum pada perbandingan massa 1:3 dengan kekuatan tarik 29,20 ± 5,70 MPa; perpanjangan putus 16,88 ± 8,51%, dan modulus young 5,13 ± 0,97 MPa. Penambahan HPMC menurunkan transparansi film. Laju permeabilitas uap air meningkat seiring dengan peningkatan penambahan HPMC. Morfologi menunjukkan semakin teratur pori dengan adanya penambahan HPMC.

Kata Kunci: Asam Hialuronat, HPMC, Polyblend, Plastik Biodegradable, *Solvent Casting*

ABSTRACT

Biodegradable plastic is a plastic innovation to overcome environmental pollution caused by conventional plastics. The application of biodegradable plastics is not only for plastic packaging, but can be applied to the fiber, wound healing, pharmaceutical, and textile industries. The purpose of this study was to determine the optimum composition, structure, and properties of polyblend films based on hyaluronic acid (HA) and hydroxypropylmethylcellulose (HPMC). In this study, the variations of HA/HPMC mass composition used were 4:0, 3:1, 1:1, 1:3, and 0:4. The effect of HPMC addition in HA was investigated on the physicochemical properties of blended films. FTIR analysis showed the blending between the two with the appearance of functional groups characteristic of both. The blending between HA and HPMC gave rise to new hydrogen bonds derived from -NH groups. XRD analysis showed that as the composition of HPMC increased the crystallinity of the film increased. The effect of adding more HPMC composition improved the mechanical properties, and the optimum HA/HPMC composition at a mass ratio of 1:3 with a tensile strength of 29.20 ± 5.70 MPa; elongation at break of 16.88 ± 8.51%, and a young modulus of 5.13 ± 0.97 MPa. The addition of HPMC decreased the transparency of the film. The water vapor permeability rate increased with the increase of HPMC addition. Morphology shows that the pores are increasingly regular with the addition of HPMC.

Keywords: Hyaluronic Acid, HPMC, Polyblend, Biodegradable Plastic, Solvent Casting

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