

PENGARUH *PLASTICIZER* POLI(BUTILEN ITAKONAT) DAN POLI(BUTILEN ITAKONAT) IKAT SILANG GLISEROL TERHADAP KARAKTER *FILM* Ca-ALGINAT/ASAM PALMITAT

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INTISARI

Pada penelitian ini telah dipelajari pembuatan *film* Ca-alginat/asam palmitat, yang difokuskan pada pengaruh penambahan asam palmitat dan *plasticizer* poli(butilen itakonat) maupun poli(butilen itakonat) ikat silang gliserol terhadap sifat mekanik *film* serta mempelajari biodegradasi *film* Ca-alginat/asam palmitat.

Pembuatan *film* dilakukan dengan metode *casting*, yang diawali dengan pembuatan larutan Ca-alginat. Selanjutnya penambahan asam palmitat dengan konsentrasi yang bervariasi 0, 5, 10, dan 15%(b/b) dan *plasticizer* poli(butilen itakonat) maupun poli(butilen itakonat) ikat silang gliserol dengan konsentrasi yang bervariasi 3, 6, 9, 12, 15, dan 18%(b/b) ke dalam larutan. Campuran tersebut dicetak dan dikeringkan dalam oven selama 24 jam pada suhu 60 °C. Film yang terbentuk dilakukan uji kuat tarik, elongasi, WVTR dan biodegradasi.

Hasil penelitian menunjukkan bahwa *film* Ca-alginat/asam palmitat dengan *plasticizer* poli(butilen itakonat) 15% dan asam palmitat 5% memiliki sifat mekanik *film* paling baik dengan nilai kuat tarik 15,72 MPa, nilai elongasi 4,98%, dan nilai WVTR 1,81 g mm m⁻² jam⁻¹. Pada film dengan *plasticizer* poli(butilen itakonat) ikat silang gliserol 15% dan asam palmitat 10% memiliki sifat mekanik *film* paling baik dengan nilai kuat tarik 18,97 MPa, nilai elongasi 6,23%, dan nilai WVTR 1,29 g mm m⁻² jam⁻¹. Berdasarkan data kuat tarik, elongasi, dan WVTR menandakan bahwa *film* Ca-alginat/asam palmitat dengan *plasticizer* poli(butilen itakonat) ikat silang gliserol lebih elastis dibandingkan poli(butilen itakonat). *Film* Ca-alginat/asam palmitat dengan *plasticizer* poli(butilen itakonat) maupun poli(butilen itakonat) ikat silang gliserol dapat terdegradasi sempurna oleh bakteri EM4 dalam waktu 8 hari.

Kata kunci: *Film*, alginat, asam palmitat, poli(butilen itakonat), gliserol

**THE EFFECT OF POLY(BUTYLEN ITACONIC) AND POLY(BUTYLEN ITACONIC)
CROSSLINKING GLYCEROL TO THE CHARACTERISTIC OF
Ca-ALGINATE/PALMITIC ACID FILM**

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ABSTRACT

Syntheses of Ca-alginate/palmitic acid film has been studied, which was focused on the effect of addition of palmitic acid and plasticizers of poly (butylen itaconic) and poly (butylen itaconic) crosslinking glycerol on mechanical properties film, and to investigate the biodegradation of film.

The film was made by casting method that was started with the manufacture of Ca-alginate solution. Then palmitic acid was concentrations of 0, 5, 10, and 15% (w/w), plasticizers of poly(butylen itaconic) and poly(butylen itaconic) crosslinking glycerol was concentrations of 3, 6, 9, 12, 15, and 18% (w/w) were added. The mixture was formed and dried in an oven for 24 hours at 60 °C. The film was characterized for tensile strength, elongation, WVTR and biodegradation tests.

The research results showed that the addition of poly(butylen itaconic) plasticizer 15% and palmitic acid 5% reach maximal value on the mechanical properties of film with tensile strength of 15,72 MPa, elongation of 4,98%, and WVTR of 1,81 g mm m⁻² hour⁻¹. The addition of poly(butylen itaconic) crosslinked glycerol as plasticizer 15% and palmitic acid 10% reach maximal value on the mechanical properties of film with tensile strength of 18,97 MPa, elongation of 6,23%, and WVTR of 1,29 g mm m⁻² hour⁻¹. Based on Tensile Strength, elongation, and WVTR, it is shown that film of Ca-alginate/palmitic acid with poly(butylen itaconic) crosslinking glycerol more elastic than poly(butylen itaconic). Film of Ca-alginate/palmitic acid with poly(butylen itaconic) and poly(butylen itaconic) crosslinked glycerol can be biodegraded by EM4 in 8 days.

Key words: Film, alginate, palmitic acid, poly(butylen itaconic), glycerol