

ABSTRAK

PENGARUH CROSSLINKER CaCl_2 TERHADAP KARAKTERISTIK BIOPLASTIK BERBASIS PATI KULIT SINGKONG

Saat ini bioplastik telah banyak dikembangkan. Salah satunya bioplastik berbasis pati kulit singkong yang dijadikan sebagai alternatif plastik sintetis karena sifatnya yang mudah terurai di dalam tanah dan ramah lingkungan. Namun, bioplastik berbasis pati kulit singkong ini memiliki kelemahan seperti mudah rusak dan sobek. Untuk memperbaiki sifatnya, dilakukan inovasi dengan penambahan kitosan dan gliserol sebagai plasticizer. Meskipun demikian, sifat bioplastik yang dihasilkan masih belum optimal. Oleh karena itu, diperlukan modifikasi lanjutan. Penelitian ini menganalisis pengaruh penambahan crosslinker CaCl_2 terhadap sifat fisik, mekanik, dan biodegradabilitas bioplastik yang dihasilkan. Selain itu dilakukan juga evaluasi kesesuaian sifat bioplastik yang dihasilkan dengan standar SNI Nomor. 7188.7:2016 tentang Kriteria Ekolabel. Adapun variasi CaCl_2 yang digunakan adalah 0%, 5%, 10% dan 15%. Hasil menunjukkan penambahan CaCl_2 berpengaruh terhadap sifat fisik, mekanik dan biodegradabilitas bioplastik. Pada sifat fisik kadar air meningkat hingga 39,79%, daya serap air meningkat hingga 95,41%, ketahanan air menurun hingga 4,59%, dan ketebalan meningkat hingga 0,09 mm. Pada sifat mekanik kuat tarik menurun hingga 3,85 Mpa, pemanjangan meningkat hingga 40,70% dan modulus elastisitas menurun hingga 0,09 Mpa. Sedangkan sifat biodegradabilitas meningkat hingga 84,64%. Hasil evaluasi kesesuaian sifat bioplastik dengan standar SNI menunjukkan belum semua formulasi bioplastik memenuhi standar.

Kata Kunci : Bioplastik; CaCl_2 ; Gliserol; Kitosan kulit udang; Pati kulit singkong.

ABSTRACT

INFLUENCE OF CaCl_2 CROSSLINKER ON CHARACTERISTICS OF BIOPLASTICS BASED ON CASSAVA PEEL STARCH

Currently, bioplastics have been widely developed. One of them is cassava peel starch-based bioplastics which are used as an alternative to synthetic plastics because they are easily decomposed in the soil and are environmentally friendly. However, cassava peel starch-based bioplastics have weaknesses such as being easily damaged and torn. To improve its properties, innovation is carried out by adding chitosan and glycerol as plasticisers. However, the resulting bioplastic properties are still not optimal. Therefore, further modification is required. This study analyses the effect of the addition of CaCl_2 crosslinker on the physical, mechanical, and biodegradability properties of bioplastics produced. In addition, it also evaluates the suitability of the bioplastic properties produced with SNI standard No. 7188.7: 2016 concerning bioplastics. 7188.7:2016 on Ecolabelling Criteria. The CaCl_2 variations used were 0%, 5%, 10% and 15%. The results show the addition of CaCl_2 affects the physical, mechanical and biodegradability properties of bioplastics. In physical properties, water content increased to 39.79%, water absorption increased to 95.41%, water resistance decreased to 4.59%, and thickness increased to 0.09 mm. In mechanical properties, tensile strength decreased to 3.85 Mpa, elongation increased to 40.70% and modulus of elasticity decreased to 0.09 Mpa. While the biodegradability increased to 84.64%. The results of the evaluation of the suitability of bioplastic properties with SNI standards show that not all bioplastic formulations fulfil SNI standards.

Keywords: Bioplastics; CaCl_2 ; Cassava peel starch; Glycerol; Shrimp skin chitosan.