Sintesis bioplastik pati-g-PLA/PVA termodifikasi ikat silang dan pengisian selulosa yang diperkaya dengan aditif antioksidan dan antimikroba = Synthesis of modified starch-g-PLA/PVA bioplastics cross-linking and cellulose filling enriched by antioxidant and antimicrobial additives

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Abstrak

Peningkatan kebutuhan dan produksi plastik konvensional menimbulkan masalah lingkungan. Biodegradable plastic berbahan dasar pati dapat digunakan sebagai alternatif pengganti plastik konvensional, karena ramah lingkungan, mudah didapat dan mudah terdegradasi. Namun, penggunaan pati sebagai bahan dasar bioplastik diperlukan modifikasi fisika atau kimia untuk meningkatkan sifat fisik dan mekaniknya. Pada penelitian ini, peningkatan sifat fisik dan mekanik bioplastik berbahan dasar pati dilakukan dengan grafting asam laktat dan menambahkan polivinil alkohol, crosslinker asam sitrat (0-25%) serta filler selulosa tongkol jagung 2-8% (b/b pati-g-PLA dan PVA). Film bioplastik juga ditambahkan senyawa aktif antioksidan dan antimikroba daun sirih untuk meningkatkan keunggulan bioplastik. Hasil penelitian menunjukkan modifikasi film Pati-g-PLA/PVA-crosslinked asam sitrat dan penambahan filler selulosa dapat meningkatkan sifat fisik dan mekanik bioplastik, dengan konsentrasi optimum masing-masing variasi adalah 5% (b/b) dan 6% (b/b). Penambahan ekstrak metanol daun sirih juga terbukti dapat meningkatkan keunggulan bioplastik karena memiliki aktivitas antioksidan.
.....The increasing production of conventional plastics raises environmental problems. Starch-based biodegradable plastics can be used as an alternative to conventional plastics, because they are environmentally friendly, renewable and easily degraded. However, the use of starch as a bioplastic base material requires physical or chemical modifications to improve its physical and mechanical properties. In this study, the improvement of the physical and mechanical properties of starch-based bioplastics was carried out by grafting lactic acid and adding polyvinyl alcohol, citric acid crosslinker (0-25%) and corncob cellulose filler (2-8%, w/w starch-g-PLA and PVA). Bioplastic films are also added with active antioxidant and antimicrobial compounds of betel leaf to increase the advantages of bioplastics. The results showed that modification of the starch-g-PLA/PVA-crosslinked citric acid film and the addition of cellulose fillers could improve the physical and mechanical properties of the bioplastic, with the optimum concentrations of each variation being 5% (w/w) and 6% (w/w).). The addition of betel leaf methanol extract has also been shown to increase the advantages of bioplastics because it has antioxidant activity.