INTISARI

PENGARUH PENAMBAHAN *CELLULOSE NANOCRYSTALLINE* DARI LIMBAH RAMI PADA BAHAN BIOPLASTIK PVA-KITOSAN

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Telah dilakukan pembuatan bioplastik berbahan polivinil alkohol (PVA)-kitosan dengan penambahan *cellulosa nanocrystaline* (CNC) dari limbah rami sebagai *filler*. Limbah rami diproses alkalisasi, pengelantangan (*bleaching)*, dan hidrolisis asam untuk mendapatkan CNC. Pembuatan nanokomposit bioplastik dilakukan dengan metode *film casting* menggunakan larutan PVA 10% dan 1% kitosan dengan variasi penambahan CNC dari limbah rami 0%, 0,5%, 1%, 2%, 3%, dan 4%. Nanokomposit bioplastik kemudian dikarakterisasi menggunakan XRD, FTIR, UTM, Uji *Swelling*, dan Uji *Biodegradable.* Pengujian XRD menunjukkan derajat kristalinitas dari 60,34 % sampai 64,76 %. Pengujian FTIR menunjukkan gugus fungsi O-H *stretching,* C-H *stretching,* C-O *stretching,* dan C-O-C *stretching.* Nilai kuat tarik bioplastik berkisar antara (28 ± 1) MPa sampai (40 ± 2) MPa. Nilai *elongation at break* bioplastik bernilai antara (16 ± 4) % sampai (50 ± 12) %. Persentase *swelling* bioplastik antara 336,2007 % sampai 497,8693 %. Waktu degradasi rata-rata bioplastik berkisar antara (139 ± 43) hari sampai (302 ± 81) hari.

Kata kunci : rami, polivinil alkohol, kitosan, selulosa nanokristalin

ABSTRACT

PENGARUH PENAMBAHAN *CELLULOSE NANOCRYSTALLINE* DARI LIMBAH RAMI PADA BAHAN BIOPLASTIK PVA-KITOSAN

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A bioplastic from polyvinyl alcohol (PVA)-chitosan has been made with the addition of cellulose nanocrystalline (CNC) from ramie waste as a filler. Hemp waste is processed by alkalization, bleaching, and acid hydrolysis to obtain CNC. The manufacture of bioplastic nanocomposites was carried out by the film casting method using a 10% PVA solution and 1% chitosan solution with variations in the addition of CNC from hemp waste 0%, 0.5%, 1%, 2%, 3%, and 4%. The bioplastic nanocomposites were then characterized using XRD, FTIR, UTM, Swelling Test, and Biodegradable Test. XRD test showed the degree of crystallinity from 60.34 % to 64.76 %. FTIR test showed functional groups O-H stretching, C-H stretching, C-O stretching, and C-O-C stretching. The tensile strength of bioplastics ranged from (28 ± 1) MPa to (40 ± 2) MPa. The elongation at the break value of bioplastics is between (16 ± 4) % and (50 ± 12) %. The percentage of swelling of bioplastics is between 336,2007 % to 497,8693 %. The average degradation time of bioplastics ranged from (139 ± 43) days to (302 ± 81) days.

Keywords : ramie, polyvinyl alcohol, chitosan, cellulose nanocrystalline