

Bio-nanokomposit poly vinyl alcohol organoclay Tapanuli terinterkalasi surfaktan HDTMA-Br: sintesis, uji tarik dan uji degradasi = Bio nanocomposite of poly vinyl alcohol Tapanuli organoclay intercalated surfactant HDTMA-br: synthesis tensile test degradation test

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Abstrak

**ABSTRAK**

Pengembangan plastik yang mudah terdekomposisi saat ini sudah banyak dilakukan, terutama dengan menggunakan bahan dasar polimer seperti poly(vinyl alcohol) yang dimodifikasi menjadi komposit. Bio-nanokomposit dibuat dengan metoda solvent casting dari poly(vinyl alcohol) sebagai matriks dan organoclay sebagai nanofiller. Penelitian ini bertujuan mempelajari karakteristik dan sifat mekanik material nanokomposit poly(vinyl alcohol) / organoclay terinterkalasi heksadesiltrimetilamonium bromida (C16). Penelitian ini dilakukan melalui dua tahap yaitu pembuatan organoclay dengan C16; serta sintesis dan karakterisasi nanokomposit poly(vinyl alcohol) / organoclay ? C16. Proses interkalasi terlihat dari pergeseran puncak bentonite dan organoclay yaitu dari  $2\theta = 6^\circ$  ke  $2\theta = 4,9^\circ$ , dengan nilai basal spacing dari 15,1 Å menjadi 19,7 Å. Kuat tarik tertinggi dimiliki oleh poly(vinyl alcohol) murni dengan nilai 58,02 MPa dan terendah pada nanokomposit poly(vinyl alcohol) / organoclay ? C16 7% dengan nilai 41,33 MPa. Laju transmisi uap air tertinggi dimiliki oleh nanokomposit poly(vinyl alcohol) / organoclay ? C16 7% dengan nilai 0,35 gr/m<sup>2</sup>/jam dan terendah pada poly(vinyl alcohol) murni dengan nilai 0,62 gr/m<sup>2</sup>/jam. Nanokomposit poly(vinyl alcohol) / organoclay ? C16 3% memiliki sifat dekomposisi paling baik dan sifat dekomposisi yang paling rendah yaitu pada poly(vinyl alcohol) murni.

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**ABSTRACT**

Easy decomposed plastic development is now being popular, especially with polymer based material such as modified poly(vinyl alcohol) into composites. The bio-nanocomposite made by solvent casting method of poly(vinyl alcohol) as matrix and organoclay as nanofilter. This research aims to study the characteristics and mechanical properties of nanocomposite poly(vinyl alcohol) / hexadecyltrimethylammonium bromide (C16) intercalated organoclay. This study was conducted in two stages, the process of organoclay with C16; as well as the synthesis and characterization of nanocomposite poly(vinyl alcohol) / organoclay - C16. Intercalation process can be seen from the peak shift of bentonite and organoclay that  $2\theta = 6^\circ$  to  $2\theta = 4.9^\circ$ , with a basal spacing of 15.1 Å to 19.7 Å. The highest tensile strength possessed by pure poly(vinyl alcohol) with a value of 58.02 MPa and the lowest is in the nanocomposite poly(vinyl alcohol) / organoclay - C16 7% by value 41.33 MPa. The highest water vapor transmission rate is owned by nanocomposite poly(vinyl alcohol) / organoclay - C16 7% with a value of 0.35 g/m<sup>2</sup>/h and the lowest is in the pure poly(vinyl alcohol) with a value of 0.62 g/m<sup>2</sup>/hr. Nanocomposite poly(vinyl alcohol) / organoclay - C16 3% has the nicest also the most low decomposition propertie, and the nature decomposition is on pure poly(vinylalcohol).