

Pengaruh penambahan organoclay terhadap sifat mekanis dan thermal pada high density polyethylene - organoclay nanokomposit = Effect of organoclay on the mechanical and thermal properties of HDPE-organoclay nanocomposite

Agung Retno, author

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Abstrak

Berbagai penelitian mengenai polimer-clay nanokomposit telah memberikan indikasi adanya peningkatan pada sifat mekanis dan kestabilan panas. Penelitian ini bertujuan untuk mempelajari efek penambahan organoclay pada sifat mekanis dan sifat thermal pada polimer high density polyethylene (HDPE). Pembuatan HDPE-organoclay nanokomposit menggunakan metoda melt compounding dan menggunakan variasi konsentrasi organoclay 2,5 % hingga 7,5 % dari massa nanokomposit. Compatibilizer yang digunakan dalam pembuatan nanokomposit ini adalah HDPE-g-MA. Pendispersian lapisan silikat pada matriks HDPE dianalisa menggunakan XRD. Sifat mekanis dianalisa berdasarkan pada hasil pengujian tarik. Sifat thermal dianalisa berdasarkan hasil pengujian heat deflection temperature (HDT).

The result presented by number of researchers indicate that the introduction of montmorillonite into polymer matrix results in an increase of thermal stability and mechanical properties of polymer-clay nanocomposite. The main purpose of this study was to elevate the effect of the organoclay on the thermal stability and mechanical properties of high density polyethylene (HDPE). HDPE-organoclay nanocomposites were prepared by melt compounding with 2.5% wt to 7.5% wt of organoclay. HDPE-organoclay nanocomposites used HDPE-g-MA as compatibilizer. Changes in the surface of montmorillonite and the dispersion of organoclay in the polymer matrix were evaluated using X-ray diffraction (XRD). The mechanical properties were analysed by using tensile test. The thermal stability of nanocomposites were analysed by heat deflection temperature (HDT).