

Dispersion Of Montmorillonite Nanoclays And Their Effects On The Thermomechanical, Structural And Drying Properties Of Palm Oil Based Coating

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ABSTRACT

Montmorillonite nanoclays (MNCs) were dispersed into palm oil based polyalkyds for improved thermomechanical and structural properties. Different percentages of MNCs such as 0.5, 1.0 and 1.5 wt.% were loaded into the liquid resin and cured thermally at 120 °C. Ultrasound technique was adopted for better dispersion into the polyalkyds. Dispersion was also carried out during esterification process under situ condition. The properties of nanoclays-loaded composites were characterized by various testing like tensile, pencil hardness, Fourier transform of infrared spectroscopy (FTIR), X-ray diffraction and field-emission scanning electron microscopy (FE-SEM). The hydrophobicity of the samples was analysed by the contact angle measurement. Additionally, the drying property was closely monitored by the FE-SEM observation during different stages of the curing process and discussed with the observed FTIR data. Results analysis revealed that 1.0 wt.% is sufficient to improve the mechanical and thermal properties of the nanocomposites. Additionally, the in situ condition of dispersion was found to be motivational to build better interfacial adhesion between the nanoclays and polymer chains.

KEYWORDS: Montmorillonite nanoclays (MNCs); In situ condition; Polyesterification; Polyalkyds;Palm oil

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