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Influence of Acetic Acid Treatment on Crystallization Kinetics and Thermal Stability of Oil Palm Fiber Reinforced Phenol-Formaldehyde Composites

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Abstract: *Lignocellulosic Oil-palm fibers, an industrial waste of oil mills have been utilized for the fabrication of the composites. Oil palm fibers, obtained from oil palm empty fruit bunches have been treated with acetic acid and reinforced in a thermosetting phenol formaldehyde matrix. Untreated as well as acetic acid treated composites were having 40% fiber reinforcement by weight. Composites were heated at a rate of 10 K/min in a Rigaku 8230 B model, differential scanning calorimeter (DSC) attached to a thermal analysis station (TAS 100) to understand the crystallization kinetics of the fabricated composites. Activation energies of the composites have been evaluated, employing Kissinger's equation and Matusita peak shift method. Crystallization process has also been explained in terms of important kinetic parameters like the activation energy of crystallization, nucleation process and dimensionality of growth.*

Keywords: Lignocellulosic fiber, phenol formaldehyde resin, DSC, Chemical treatment, Activation energy, thermal stability

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