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Effect of nanoclay on thermal behavior of jute reinforced composite (Article)

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Abstract

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Due to enhanced mechanical strength, superior flame resistance, and decreased gas permeability, montmorillonite nanoclay has been introduced to the jute-polyester resin composite materials for structural application. Long-fiber Bangla tossa special jute is being used as reinforcement materials along with 1, 3, and 5% addition of nanoclay within the matrix-fiber mixture to find the optimum percentage of nanoclay. These doped hand lay-up-processed plates are used to made samples for dynamic mechanical analysis and thermogravimetry testing as per ASTM standards. Temperature-induced weight loss due to thermal decomposition was measured and char residue was calculated up to 1000 °C, where 5% added nanoclay samples showed better thermal stability. Viscoelastic properties through storage modulus and loss modulus showed better stability with 1% nanoclay-added composite in dynamic mechanical analysis. Moisture and temperature did not affect the tested samples significantly in diminutive exposure for 1% nanoclay-added samples even though there is a loss of storage modulus 12 to 30% for 3 and 5% nanoclay-added samples, respectively. © 2017, Springer-Verlag London Ltd.

Reaxys Database Information

View Compounds

Author keywords

Dynamic mechanical analysis Jute fiber Nanoclay Viscoelastic property

Indexed keywords

Engineering controlled terms: Decomposition Dynamic mechanical analysis Dynamics Elastic moduli Flame resistance Gas permeability Jute fibers Mechanical permeability Nanostructured materials Polyester resins Reinforcement Standards Thermogravimetric analysis Viscoelasticity

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