

Effects of Silane Coupling Agent on Mechanical Properties and Swelling Behaviour of Coconut Fiber Filled Polypropylene Composite

Abstract

Silane treatment used to improve mechanical properties and swelling behaviour of polypropylene/coconut fiber (PP/CF) composites by creating more adherent bonding between CF filler and PP Matrix. 3-Aminopropyltriethoxysilane (3-APE) treated and untreated composites were prepared in formulation of 10 wt%, 20 wt%, 30 wt%, and 40 wt%. The mechanical testing indicates that composite with 10 wt% has the optimum value of tensile strength, and the 3-APE treated composites shows the tensile strength was increased. By increasing of filler loading, elastic modulus was increased while the elongation at brake was decreased. Meanwhile, the swelling test discerned that the increase of filler loading increased the water absorption of composites and the presence of 3-APE reduced the equilibrium water absorption percentage.

Keywords: Coconut Fiber, Composite, Polypropylene (PP), Silane Coupling Agent