PROPERTIES OF PAPER SLUDGE FILLED POLYPROPYLENE (PP)/ETHYLENE PROPYLENE DIENE TERPOLYMER (EPDM) COMPOSITES: THE EFFECT OF SILANE-BASED COUPLING AGENT

Abstract:

Paper sludge was used as a filler in PP/EPDM composites and 3-aminopropyl triethoxysilane (3-APE) was used in this study as a coupling agent. The effects of filler loading and 3-APE on the mechanical properties, water absorption, morphology, and thermal properties of the composites were investigated. It was found that incorporation of a silane coupling agent (3-APE) increased the stabilization (equilibrium) torque, tensile strength, and Young's modulus but decreased the elongation at break and water absorption. Scanning electron microscopy (SEM) study of the tensile fracture surface of the composites indicated that the presence of 3-APE increased the interfacial interaction between paper sludge and PP/EPDM matrix. The addition of a silane coupling agent also increased the crystallinity of PP and thermal stability of PP/EPDM/PS composites.