

Chemical modification of chitosan-filled polypropylene (PP) composites: The effect of 3-aminopropyltriethoxysilane on mechanical and thermal properties

Abstract

Chitosan was used as filler in polypropylene (PP) polymer. In order to improve compatibility between chitosan and PP, chitosan was chemically modified with 3-aminopropyltriethoxysilane (3-APE). The results show that the increasing of filler content decreased tensile strength and elongation at break, but increased Young's modulus of composites. The treated composites exhibit higher tensile strength and Young's modulus, but lower elongation at break compared untreated composites. The addition of 3-APE has improved thermal properties such as thermal stability and crystallinity of treated composites. SEM study of the tensile fracture surface of treated composites shows better interfacial interaction and adhesion between the chitosan-PP matrix.