

Effect of sodium dodecyl sulfate on mechanical and thermal properties of polypropylene/chitosan composites

Abstract

The effect of sodium dodecyl sulfate (SDS) on mechanical and thermal properties of chitosan-filled polypropylene (PP) composites was investigated. Mechanical and thermal properties of PP/chitosan composites were analyzed according to ASTM D 638-91, thermogravimetry analysis and differential scanning calorimetry, respectively. Results showed that the treated PP/chitosan composites had higher tensile strength and Young's modulus when compared with untreated PP/chitosan composites, but lower in elongation at break in the same filler loading. Thermal analysis results showed that the thermal stability and degree of crystallinity of treated PP/chitosan composites were higher than untreated ones. Scanning electron microscopy and Fourier transform infrared studies revealed less detachment of filler from matrix on the tensile surface of treated PP/chitosan composites as an evidence of enhanced interfacial adhesion between filler and matrix due to the formation of covalent bonding between chitosan and SDS.

Keywords

Chitosan; Composites; Polypropylene; Properties; Sodium dodecyl sulfate