

Mechanical, morphological and thermal properties of chitosan filled polypropylene composites: The effect of binary modifying agents

Abstract

This work investigates the effects of the binary modifying agents-organosolv lignin and acrylic acid, on the mechanical and thermal properties of chitosan-filled polypropylene (PP) composites. We analyse the mechanical and the thermal properties of the composites by means of ASTM D 638-91, ASTM D 256, thermogravimetry analysis (TGA) and differential scanning calorimetry (DSC). Tensile strength of the composites decreases upon the addition of chitosan, but Young's modulus improves. Impact strength is found to increase with the maximum value at 30 php. The chemical modifications do not alter the stress-strain character or the thermal degradation mechanism of the composites considerably; however the results of this study show that the treated composites are found to have better mechanical and thermal properties than untreated composites. Furthermore, the obtained results are comparable to results from previous work. This outcome implies that organosolv lignin could be a potential reagent to partially replace its synthetic counterpart.