

The effect of silane treatment on processing characteristic and swelling behavior of polypropylene/recycled acrylonitrile butadiene rubber/rice husk powder composites

Abstract

The effect of silane treatment on processing characteristic and swelling behavior of recycled acrylonitrile butadiene rubber (NBRr)/polypropylene (PP)/rice husk powder (RHP) composites has been studied. Polypropylene/recycled acrylonitrile butadiene rubber/rice husk powder (PP/NBRr/RHP) composite were prepared by melt mixing technique at 180° C for 9 minutes and 50rpm rotor speed using an internal mixer. Five different composites compositions (70/30/0, 70/30/5, 70/30/10, 70/30/15 and 70/30/30), with silane treated RHP (treated) and without silane treatment RHP (untreated) was studied. The specimens were analyzed for swelling behavior with ASTM oil No.3 and processing torque of composites was obtained during composite preparation. The results showed that swelling percentage for both composites increased with NBRr content. However the treated composites exhibited lower swelling characteristics. Processing torque of both composites also showed higher torque reading with increasing NBRr content. However the treated composite with silane exhibited much higher torque value for similar composition composites. Better interaction between RHP filler and PP/NBRr matrix was obtained with treated composites.