

Effect of particle morphology on the properties of polypropylene/nanometric zinc oxide (PP/nanoZnO) composites

Abstract

Polypropylene/nanometric zinc oxide (PP/nanoZnO) composites at 1 wt% nanoZnO content were prepared using melt blending method using a thermo Haake internal mixer. Three different types of zinc oxide (ZnO) with different morphologies were used as fillers. Each composite was subjected to characterization analyses including tensile testing, UV-vis spectroscopy and electron microscopy. The tensile strength, tensile modulus and elongation at break of the PP/nanoZnO composites were observed to be greatly enhanced despite the low filler content (1 wt%). All ZnO-reinforced composites exhibited superior UV absorption characteristic especially for composite specimens reinforced with ZnO morphology rich in nanorods.

Keywords — Mechanical properties, nano zinc oxide, polymer matrix composites