

## Effect of short carbon fiber surface treatment on composite properties

### ABSTRACT

The effects of whiskerized carbon fibers (WCF) embedded as filler into polymer matrix were investigated. In this respect, composites consisting of pure polypropylene and also carbon fiber (CF)/polypropylene (PP) was fabricated and compared. Polypropylene matrix was reinforced with 2% concentration of WCF and prepared by a melt-mixing method. The tensile test indicated that the addition of 2% WCF enhanced the tensile strength and Young's modulus by 38.1% and 28.2%, respectively. Besides that, the elongation was decreased for that sample. Dynamic mechanical analysis showed an increase of 39.2% in the stiffness of the WCF/PP composite and an improvement in the storage modulus. The  $\tan \delta$  for the sample was also smaller than unfilled PP and CF/PP composites. Furthermore, thermogravimetric analyses in an inert atmosphere showed a shift of temperature to the higher temperature with the addition of fillers.

**Keyword:** Whiskerization; Carbon fibers; Surface treatment; Carbon nanoparticles; Composite