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Improved thermal properties by controlling selective distribution of AlN and MWCNT in immiscible Polycarbonate (PC)/Polyamide 66 (PA66) composites

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Abstract

A stable co-continuous morphology was achieved in immiscible polycarbonate (PC)/ polyamide 66 (PA66) blend by controlling the selective distribution of multi-walled carbon nanotubes (MWCNT) and aluminum nitride (AlN) nanoparticles. SEM and TEM tests proved that hybrid fillers were both located in PA66 phase. Selective etching process was applied to confirm the gradual variation of morphologies. It indicated that the compatibilities between PC and PA66 were gradually enhanced since the phase size reduced significantly and the interface of two phases blurred after the fillers were incorporated. DMA confirmed that the glass transition temperature of PC and PA66 appeared a trend to merge, besides, the tensile properties were enhanced. TGA indicated that the in-situ generated PC-b-PA66 copolymer played an important role in the compatibilization effect. Besides, the raised interconnectivities were