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Thermal Annealing Induced Enhancement of Electrical Properties of a Co-Continuous Polymer Blend Filled with Carbon Nanotubes

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Abstract:

In the current study, it is found that the electrical properties of a co-continuous polystyrene (PS)/poly(methyl methacrylate) (PMMA) blend containing with conductive multi-wall carbon nanotubes (MWCNTs) can be remarkably improved via the thermal annealing treatment. Utilizing the on-line (rheometer and optical microscope) and off-line (transmission electron microscopy) instruments, the evolution of the morphology and microstructure of PS/PMMA/MWCNTs composites are visualized. It is observed that thermal annealing can induce the coalescence of small phases into the more perfect co-continuous phase structure, which can significantly improve the electrical properties of the composites. Moreover, the