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# Influence of chain transfer agent on structure/property relation of polymer nanocomposites with functionalized carbon nanotubes

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## Abstract

Nanocomposites comprising polystyrene/ carbon nanotube (PS/CNT) were synthesized via *in-situ* emulsion polymerization, where the CNTs were functionalized by an unsaturated organic fatty acid. The effect of chain transfer agent (CTA) on nanocomposite synthesis and structure-property relationships were investigated. The presence of CTA affected the polymer molar mass and subsequently the structure of the nanocomposites was altered as a result of the chain length variation. The TEM images showed structural modification of the nanocomposite matrix, and in particular the effect on CNT orientation on using CTA. The composites without CTA (PS/CNT) and with CTA (PS/CNT@CTA) showed significant influence of CTA not only in terms of polymerization kinetics and monomer conversion, but also on the final thermomechanical properties. The mechanical and thermal properties of the PS/CNT nanocomposites were found to be substantially altered when CTA was used during the polymerization process, which were explained in the light of composite structural changes on using CTA.

**Keywords:** A. Nanocomposites; A. Nano-structures; B. Mechanical properties; B. Thermal properties;

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