Elaboration and characterization of the thermo-mechanical properties of MWCNTs/PP composites by twin-screw mixer

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This study presents first the fabrication of a nano-composite material based on Multi-Walled Carbon Nanotubes, and on a thermoplastic polymer matrix. First, a twin-screw mixer had been employed for preparing polypropylene nano-composites loaded at 1, 2, and 5wt% of MWCNT. Second, a characterization of rheological behaviour for polypropylene as well as polypropylene/multi-walled carbon nanotube mixtures, at three temperatures (180, 200, and 220 °C,) has been carried out using cone and plate rheometer. And then, its thermo-mechanical properties have been also studied. The work demonstrates how the addition of functionalized CNTs to a polypropylene will allow it to act as thermal conductor rather than as insulator.

Keywords: Micro-structures, nano-composite material, rheology, multiwalled carbon nanotubes