

Study of Solidification Process in Melt-spinning of PET/CNT Fibers

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Carbon Nanotubes (CNTs) have been used extensively recently to improve the conductivity of different polymers. In this study, polymer melts containing CNT have been processed to produce fibers. An important aspect of fiber production from melt-spinning is the solidification stage which determines the structure and properties of the produced fibers. In this paper, solidification of polyethylene terephthalate (PET)/CNT monofilament is experimentally examined and compared with pure melt-spun PET. The effect of CNT addition at different concentrations on the solidification process was studied and its impact on the final size and mechanical properties of the fibers was examined. Alignment of the nanotubes and draw ratios (DRs) are reported as a measure of intensity of the elongational flow on the solidification process. We used different methods such as transmission electron microscopy (TEM), differential scanning calorimetry (DSC) and Raman spectroscopy to assess the results.