

## **Study on parameters affecting microfibrillar morphology development in PP/PBT/Nanoclay blend nanocomposite fibers**

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The main objective of this work was to study the effect of presence of organically modified montmorillonite (organoclay) and the compatibilizer (iPPgMA) on microfibrillar morphology development in PP/PBT/Nanoclay nanocomposite fibers. The samples with the same blend ratio (80/20) but varying in organoclay content were prepared with and without the compatibilizer by using a melt intercalation process in a co-rotating twin screw extruder. All blend samples were melt spun by a single screw extruder equipped with a spinneret. The wide angle X-ray diffraction patterns (WAXD) and melt viscoelastic results suggested a great extent of intercalation for the samples in which organoclay were found to be mostly located inside the PBT droplets due to its greater affinity between organoclay and PBT. While compatibilizer could improve the melt spinnability of the blends by assisting the stress transformation between two phases, it reduced the extent of microfibril formation through reducing the PBT droplet size. This effect was changed in favor of microfibril formation when the organoclay was incorporated into the blend samples as indicated by SEM micrograph. This could be explained in terms of interfacial action and hence assisting the stress transformation to the droplets as well as improving the fibril formation of PBT droplets as a result of partitioning organoclay inside the PBT droplets.