DISPERSION OF CARBON NANOTUBES IN POLY(LACTIC ACID)

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Carbon nanotubes (CNT) grow as entangled bundles that are difficult to disperse in polymer matrices, or even in solvents. However, their dispersion level in the polymer matrix strongly affects the final nanocomposite properties[1]. Previous studies have shown that filler dispersion can be assisted by the functionalization of the CNTs[2].

In the present work, CNTs were chemically functionalized to bond pyrrolidine groups at the CNT surface[3]. Reaction of the functionalized CNTs with PLA took place upon melt blending, as shown by X-ray photoelectron spectroscopy.

The PLA modified CNT composites presented an average area of surviving agglomerates similar to that of composites with non-functionalized CNTs, and a larger number of agglomerates. In addition, those composites showed improved tensile properties at low CNT concentration, but a higher electrical resistivity relative to PLA/CNT composites, as illustrated in Figure 1.

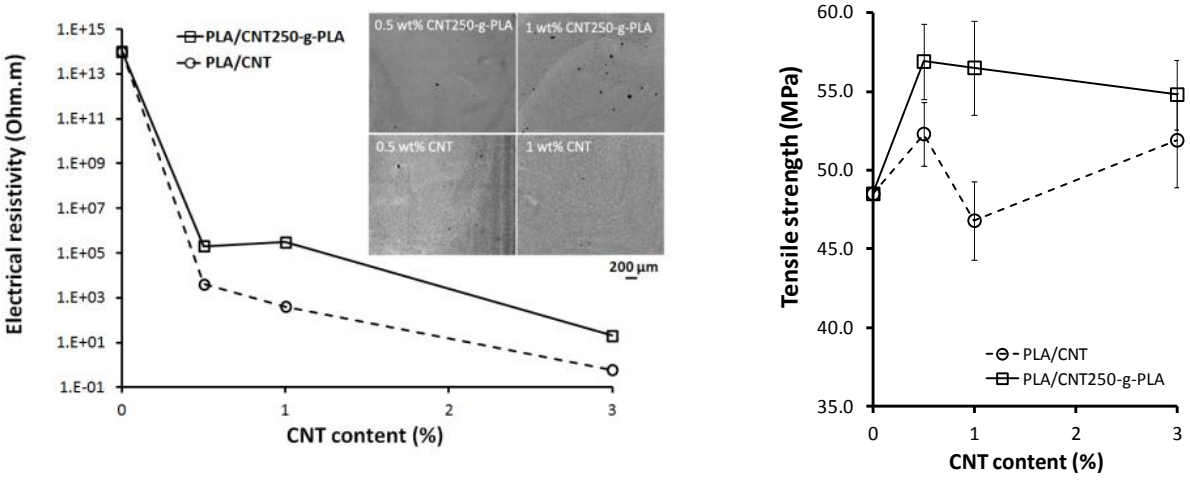

Figure 1: Electrical resistivity and tensile strength of PLA/CNT and PLA/PLA modified CNT composites (PLA/CNT250-g-PLA).

References

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