

Modified nanoadditives for food packaging applications

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Polymers are frequently mixed with other compounds to improve specific features such as mechanical, thermal or barrier properties. When these fillers added to the polymeric matrix are on a nanometric scale, the behaviour of the nanocomposite present an enhancement of the properties mentioned.

In the last few decades, clays have attracted a lot of attention as fillers for a wide range of polymeric matrix and for many applications such as automotive components, packaging materials or medical devices. [1]

In the field of food packaging, clays are promising additives due to the low price and especially due to safety reasons, since clays are innocuous compounds.

Due to the polar nature of the clays, the use of organic compounds as compatibilizers are needed to overcome the immiscibility with non-polar polymers, such as polylactic acid (PLA), Polyethylene terephthalate (PET) and polyolefins. One of the most common procedures to improve miscibility is to substitute the cations between the clay layers, replacing them by organophilic cations such as alkylammoniums. Intercalating non-polar organic compounds may also improve the interactions between the clay and the polymer [2,3,4].

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Figures

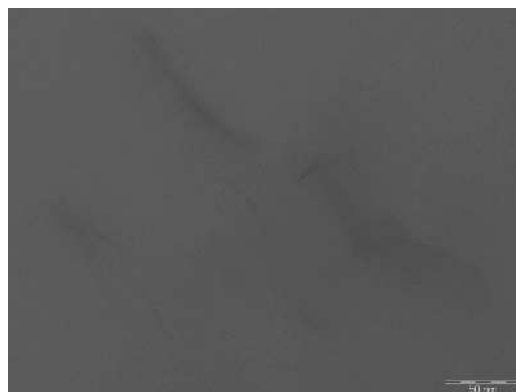


Figure 1: TEM micrographs of nanoclays in PLA matrix

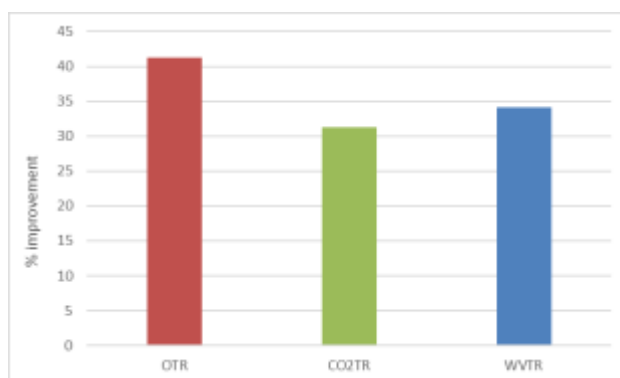


Figure 2: Improvement barrier properties PLA+Nanoclay bottle