

PROMOTING HYDROLYTIC DEGRADATION OF PLA/NATURAL WAX COMPOSITES WITH ZNO NANO-ADDITIVES FOR SUSTAINABLE SINGLE-USE PACKAGING

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The present research investigates the hydrolytic degradation of poly(lactic acid) (PLA) plasticized with a natural wax and mixed with Zinc Oxide (ZnO) nanoparticles, functionalized and non-functionalized with Triethoxysilane. Different ZnO concentrations of 0, 0.1, and 1 wt% functionalized and non-functionalized were added to an 85/15 PLA/Natural Wax (NWX) matrix using a Brabender internal mixing at 180 °C. For the study of hydrolytic degradation of the composites, type V probes (ASTM D638) were obtained by hot melt compression. Probes of each formulation were vertically positioned inside acrylic boxes. Hydrolytic degradation was carried out in tridistilled water at a temperature of 50 °C and initial pH 7.1, covering 1 cm above the sample. Degradation in probes was monitored for 2 months, extracting one specimen from the boxes at different intervals. Changes in weight, morphology and the rheological behavior of the blends were evaluated at different periods during degradation.

Keywords: PLA, Natural Wax, Zinc Oxide nanoparticles

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