

Recycled polylactide blends as an alternative to polyolefins in disposable applications.

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Most of commodity polymers are made from petroleum resources, and it may take lots of years to be degraded after their service lives [1]. The current research focused on bio-based materials due to their features of coming from renewable resources and being biodegradable has brought new possibilities for potential application fields, such as the packaging and the agricultural sectors [2]. Poly (lactic acid) or polylactide (PLA) is an outstanding candidate to replace some commodity polymers, due to its good processability, mechanical properties, thermal stability and low environmental impact [3-4]. However, its introduction into the market would therefore represent an upcoming new main source of polymeric waste, which should be handled as a new commodity polymer. Among all recovery methods, material valorization by mechanical recycling is widely established for commodities. Recent studies have been focused on the study of the effects of reprocessing on PLA performance, but not on the blending of virgin PLA with recycled one. This is the aim of this work. Several blends were prepared varying their compositions. Virgin and PLA after one and two reprocessing cycles were blended. Three compositions were considered: (V/R₁₋₂) 80/20, 60/40, 40/60. Film probes, with thicknesses around 200 µm, were obtained by a hot plates press. Thermal properties of the resulting materials were evaluated by means of differential scanning calorimetry (DSC), thermogravimetry (TGA) and dynamic mechanical thermal analysis (DMTA). The evaluation of the virgin/reprocessed PLA blends carried out in this study, demonstrated the suitability behavior required for some commodity applications.

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