

Study of the Influence of the Different Treatments in Almond Shell-Based Masterbatches

Authors : A. Ibáñez, A. Martínez, A. Sánchez, M. A. León

Abstract : This article is focused on the development of a series of biodegradable and eco-friendly masterbatches based on polylactic acid (PLA) filled with almond shell to study the influence of almond shell in the properties of injected biodegradable parts. These innovative masterbatches have 20 wt % of the almond shell. Different treatments were carried out with sodium hydroxide (NaOH) and maleic anhydride (MA) to obtain better interfacial bonding between fibre and matrix. The masterbatches were produced by varying the fibre treatments (type of treatment, concentration and temperature). The masterbatches have been injected to obtain standardised test samples in order to study mechanical properties. The results show that, the some of the treated fibres present slightly higher flexural modulus and impact strength than untreated fibres. This study is part of a LIFE project (MASTALMOND) aimed to create and test at preindustrial level new coloured masterbatches based on biodegradable polymers and containing in its formulation a high percentage of almond shell, a natural waste material, which firstly will permit to cover technical requirements of two traditional industrial sectors: toy and furniture, although the results achieved could be extended to other industrial sectors.

Keywords : additivation, almond shell, biodegradable, masterbatch, PLA, injection moulding

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