

Biodegradable Polymeric Composites of Polylactide and Epoxidized Natural Rubber

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Abstract : Polymeric materials have found their use almost in every branch of industry worldwide. Most of them constitute so-called "petropolymers" obtained from crude oil. However literature information sounds a warning that its global sources are running out. Thus, it seems that one should search for polymeric materials from renewable raw materials belonging to the group of green polymers. Therefore on account of environmental protection and the issue of sustainable technologies, nowadays greater and greater achievements have been observed in the field of green technology using engineering sciences to develop composite materials. The main aim of this study was to research what is the influence of biofillers on the properties. We used biofillers like : cellulose with different length of fiber, cellulose UFC100, silica and montmorillonite. In our research, we reported on biodegradable composites exhibiting specificity properties by melt blending of polylactide (PLA), one of the commercially available biodegradable material, and epoxidized natural rubber (ENR) containing 50 mol.%epoxy group. Blending hydrophilic natural polymers and aliphatic polyesters is of significant interest, since it could lead to the development of a new range of biodegradable polymeric materials. We research the degradation of composites on the basis epoxidized natural rubber and poly(lactide). The addition of biofillers caused far-reaching degradation processes. The greatest resistance to biodegradation showed a montmorillonite-based mixtures, the smallest inflated cellulose fibers of varying length. The final aim in the present study is to use ENR and poly(lactide) to design composite from renewable resources with controlled degradation.

Keywords : renewable resources, biopolymer, degradation, polylactide

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