World Academy of Science, Engineering and Technology International Journal of Mathematical and Computational Sciences Vol:14, No:12, 2020

Biodegradable Polymeric Composites of Polylactide and Epoxidized Natural Rubber

Authors: Masek A., Diakowska K., Zaborski M.

Abstract: Polymeric materials have found their use almost in every branch of industry worldwide. Most of them constitute socalled "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 exhibitingspecificity 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

Conference Title: ICSRD 2020: International Conference on Scientific Research and Development

Conference Location : Chicago, United States **Conference Dates :** December 12-13, 2020