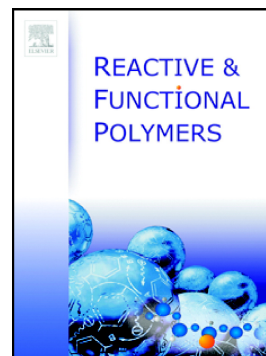


## Accepted Manuscript

Compatibility confirmation and refinement of thermal and mechanical properties of poly (lactic acid)/poly (ethylene-co-glycidyl methacrylate) blend reinforced by hexagonal boron nitride

Ashish Kumar, T. Venkatappa Rao, S. Ray Chowdhury, S.V.S. RamanaReddy



PII: S1381-5148(17)30097-4  
DOI: doi: [10.1016/j.reactfunctpolym.2017.05.005](https://doi.org/10.1016/j.reactfunctpolym.2017.05.005)  
Reference: REACT 3853  
To appear in: *Reactive and Functional Polymers*  
Received date: 16 November 2016  
Revised date: 8 May 2017  
Accepted date: 14 May 2017

Please cite this article as: Ashish Kumar, T. Venkatappa Rao, S. Ray Chowdhury, S.V.S. RamanaReddy , Compatibility confirmation and refinement of thermal and mechanical properties of poly (lactic acid)/poly (ethylene-co-glycidyl methacrylate) blend reinforced by hexagonal boron nitride, *Reactive and Functional Polymers* (2017), doi: [10.1016/j.reactfunctpolym.2017.05.005](https://doi.org/10.1016/j.reactfunctpolym.2017.05.005)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Compatibility confirmation and refinement of thermal and mechanical properties of Poly (lactic acid)/Poly (ethylene-co-glycidyl methacrylate) blend reinforced by hexagonal boron nitride.**

**Ashish Kumar<sup>a</sup>, T.Venkatappa Rao<sup>a,\*</sup>, S. Ray Chowdhury<sup>b</sup>, S.V.S RamanaReddy<sup>a</sup>**

<sup>a</sup>Department of Physics, National Institute of Technology, Warangal-506004, Telangana, India.

<sup>b</sup>Bhabha Atomic Research Centre, RTDD, Trombay-400085, Mumbai, India.

\*Corresponding Author:

E-mail: [tvraokmm@nitw.ac.in](mailto:tvraokmm@nitw.ac.in)

Phone: +919248667047

**ABSTRACT**

The formation of PLA/PEGM graft copolymers during the melt blending of poly (lactic acid) (PLA) and poly (ethylene-co-glycidyl methacrylate) (PEGM) act as an interface between two polymer matrices was illustrated by the epoxide ring-opening mechanism. There are two coupling reaction mechanisms of glycidyl methacrylate (GM) unit of PEGM with the terminal groups of PLA. The analysis of FTIR and <sup>1</sup>H NMR spectra elucidates the chemical reaction of GM unit of PEGM with carboxylic and hydroxyl terminal groups of PLA. FTIR analysis also confirms that the carboxylic terminal groups of PLA are more likely to react with GM group of PEGM. Hence, PLA grade having carboxyl terminal groups is more compatible with PEGM as compared to the PLA grade having hydroxyl and ester terminal groups. The hexagonal boron nitride(HBN) is incorporated with various labels such that 1 phr, 5 phr and 10 phr to prepare PLA/PEGM/HBN blend-composites. The blend-composite with low HBN content i.e. 1 phr shows better mechanical and thermal properties than neat

Download English Version:

<https://daneshyari.com/en/article/5209323>

Download Persian Version:

<https://daneshyari.com/article/5209323>

[Daneshyari.com](https://daneshyari.com)