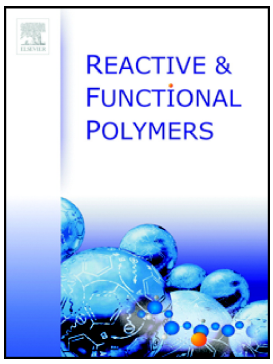

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Ashish Kumar, T. Venkatappa Rao, S. Ray Chowdhury, S.V.S. RamanaReddy

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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[a], T.Venkatappa Rao[a,*], S. Ray Chowdhury[b], S.V.S RamanaReddy[a]

[a]Department of Physics, National Institute of Technology, Warangal-506004, Telangana, India.

[b]Bhabha Atomic Research Centre, RTDD, Trombay-400085, Mumbai,India.

*Corresponding Author:

E-mail: 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 ^{1}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