

## **Refinement of Thermal and Mechanical Properties of Poly (Lactic Acid)/Poly (Ethylene-Co-Glycidyle Methacrylate)/ Hexagonal Boron Nitride Blend-Composites through Electron-Beam Irradiation**

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**Abstract :** The main objective of this work is to determine the influence of electron beam irradiation on thermal and mechanical properties of Poly (lactic acid) (PLA)/Poly (ethylene-co-glycidyle methacrylate) (PEGM)/Hexagonal boron nitride (HBN) blend-composites. To reduce the brittleness and improve the toughness of PLA, the PLA/PEGM blend is prepared by using twin-screw Micro compounder. However, the heat deflection temperature (HDT) and other tensile properties were reduced. The HBN has been incorporated into the PLA/PEGM blend as part per hundred i.e. 5 phr and 10phr to improve the HDT. The prepared specimens of blend and blend-composites were irradiated to high energy (4.5 MeV) electron beam (E-beam) at different radiation doses to introduce the cross linking among the polymer chains and uniform dispersion of HBN particles in the PLA/PEGM/HBN blend-composites. The further improvement in the notched impact strength and HDT have been achieved in the case of PLA/PEGM/HBN blend-composites. The irradiated PLA/PEGM/HBN 5phr blend composite shows high notched impact strength and HDT as compared to other unirradiated and E-beam irradiated blend and blend-composites. The improvements in the yield strength and tensile modulus have also been noticed in the case of E-beam irradiated PLA/PEGM/HBN blend-composites as compared to unirradiated blend-composites.

**Keywords :** blend-composite, e-beam, HDT, PEGM, PLA

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