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Hafidzah, F.[a] , Bijarimi, M.[a] , Alhadadi, W.[a] , Salleh, S.[a] , Norazmi, M.[b] , Normaya, E.[b]

Statistical study on the interaction factors of polypropylene-graft-maleic anhydride (PP-G-MA) with graphene nanoplatelet (GNP) at various poly(lactic acid)/polypropylene (PLA/PP) blends ratio

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[a] Faculty of Chemical and Natural Resources Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, Gambang, Pahang, 26300, Malaysia

[b] Experimental and Theoretical Research Laboratory, Department of Chemistry, Kulliyyah of Science, International Islamic University Malaysia, Kuantan, Malaysia

Abstract

This paper reports the effects of polypropylene-graft-maleic anhydride (PP-g-MA) and graphene nanoplatelet (GNP on tensile stress of various PLA/PP weight ratio. The PLA/PP blends prepared with the ratio 70/30, 80/20, and 90/10 with the addition of PP-g-MA (1 to 5 phr) and GNP (1 to 3 phr) by using an injection molding machine. The tensile stress (MPa) was analyzed based on 11 runs of full factorial design. The results showed that the tensile stress of PLA/PP blends gradually increased after the addition of PP-g-MA and GNP. There is a relationship between PP-g-MA and GNP which causes a positive impact on the mechanical properties of PLA/PP blends. The optimum tensile stress of 50.06 MPa achieved at the ratio of 90/10 blends with 5 phr of PP-g-MA and 3 phr of GNP.

Author Keywords

Graphene nanoplatelets (GNP); Poly(lactic acid)(PLA); Polypropylene (PP); Tensile stress

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Correspondence Address
Bijarimi M.; Faculty of Chemical and Natural Resources Engineering, Lebuhraya Tun Razak, Malaysia; email: bijarimi@ump.edu.my

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