

Oxidative induction and performance of oil palm fiber reinforced polypropylene composites - effects of coupling agent and UV stabilizer

John O.Akindoyo^{a,b,c}, Mohammad D.H. Beg^a, S. Ghazali^a, Hans P.Heim^b, Maik Feldmann^b, M. Mariatti^c

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

^b Institute of Materials Engineering, Mönchebergstr. - 3, 34125 Kassel, University of Kassel, Germany

^c School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, Engineering Campus, 14300 Nibong Tebal, Pulau Pinang, Malaysia

ABSTRACT

Reinforced polypropylene/empty fruit bunch (EFB) fiber composites were prepared through extrusion and injection moulding. Maleic anhydride grafted polypropylene (MAPP) and CESA-light PPADOL 12020 (PDOL) were used as compatibilizer and UV stabilizer respectively. The samples were subjected to accelerated UV irradiation and the simultaneous effects of compatibilization and PDOL were investigated. Results showed that PDOL slightly improved the adhesion between PP and EFB, but did not offer mechanical strength improvement. However, oxidative induction time analysis and discoloration analysis revealed that the incorporation of PDOL plays significant role in preventing the composites from discoloration as well as UV degradation. In addition, dynamic mechanical analysis indicated that compared with ternary composites, the quaternary composite containing PDOL and MAPP exhibits lower loss modulus, accrued to good interrelationship between PP, EFB, PDOL and MAPP. Generally, it is evident herein that PDOL may be used in applications requiring higher colour stability.

KEYWORDS

A. Polymer-matrix composites (PMCs); B. Mechanical properties; D. Mechanical testing; E. Injection moulding

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