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Mechanical and Morphological Properties of PP/LLPDE/NR Blends—Effects of Polyoctenamer

Azman Hassan, Mat Uzir Wahit, and Ching Yern Chee
Faculty of Chemical and Natural Resources Engineering, UTM, Skudai,
Johor, Malaysia

Abstract: In this study, impact-modified polypropylene (PP) ternary blends based on PP/natural rubber (NR)/linear low-density polyethylene (LLDPE) with ratios of 72/10/18 and 64/20/16 were produced by a twin-screw extruder with polyoctenamer (TOR) as the compatibilizer. The mechanical properties of the blends were determined on injection-molded specimens in tensile, flexural, and impact testing. The impact strength and elongation at break of the blend increased significantly while the flexural modulus and tensile strength decreased slightly with increasing TOR content. The impact strength improved with the increasing TOR due the increase of interfacial adhesion resulting in finer dispersion of the rubbery minor phase in the PP matrix. The improvement in compatibility with the addition of TOR into PP/NR/LLDPE blends is being supported by both scanning electron microscopy (SEM) and dynamic mechanical analysis (DMA).

Keywords: PP/NR blends, polyoctenamer, mechanical properties, compatibility

Address correspondence to Azman Hassan, Faculty of Chemical and Natural Resources Engineering, UTM, 81310, Skudai, Johor, Malaysia; E-mail: azmanh@fkkksa.utm.my