Applied Mechanics and Materials, vol.284 – 287, 2013, pages 87-93

# Effect of PE-g-MAH as compatibilizer on properties of LDPE/NR/WHF composites


## Abstract

In this work, the effect of PE-g-MAH as compatibilizer in polyethylene/ natural rubber/ water hyacinth fibers composites were prepared and characterized in terms of tensile properties, morphology properties, swelling behavior and FTIR characteristic. Water hyacinth fibers (WHF) was used as reinforced fiber in the composites incorporated into the LDPE/NR matrices with different fiber loading. LDPE/NR/WHF composites were prepared with Z-blade mixer at 180°C with rotor speed of 50 rpm for 10 minutes. The presence of PE-g-MAH increased the tensile strength and Young's modulus while reduced the elongation at break of LDPE/NR/WHF composites. The molar sorption of the composites decreased as the fiber loading increased. SEM morphology showed a better fiber dispersion and fiber distribution indicated PE-g-MAH improved the interfaces between water hyacinth fiber and LDPE/NR matrices. The absorption peak at 1741.52cm$^{-1}$ indicated ester carbonyl group in LDPE/NR/WHF$_{PE\text{-}g\text{-}MAH}$ composites.


**Keywords —** Low Density Polyethylene (LDPE), Natural Rubber (NR), Polyethylene-Grafted Maleic Anhydride, Water Hyacinth Fibers.