World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:9, No:05, 2015

Effects of Coupling Agent on the Properties of Henequen Microfiber (NF) Filled High Density Polyethylene (HDPE) Composites

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Abstract : The main objective of incorporating natural fibers such as Henequen microfibers (NF) into the High-Density Polyethylene (HDPE) polymer matrix is to reduce the cost and to enhance the mechanical as well as other properties. The Henequen microfibers were chopped manually to 5-7mm in length and added into the polymer matrix at the optimized concentration of 8 wt %. In order to facilitate the link between Henequen microfibers (NF) and HDPE matrix, coupling agent such as Glycidoxy (Epoxy) Functional Methoxy Silane (GPTS) at various concentrations from 0.1%, 0.3%, 0.5%, 0.7%, 0.9%, and 1% by weight to the total fibers were added. The tensile strength of the composite increased marginally while % elongation at break of the composites decreased with increase in silane loading by wt %. Tensile modulus and stiffness observed increased at 0.9 wt % GPTS loading. Flexural as well as impact strength of the composite decreased with increase in GPTS loading by weight %. Dielectric strength of the composite also found increased marginally upto 0.5wt % silane loading and thereafter remained constant.

Keywords : Henequen microfibers (NF), polymer composites, HDPE, coupling agent, GPTS
Conference Title : ICFMPCA 2015 : International Conference on Fracture Mechanics, Polymers, Composites and Adhesives
Conference Location : Paris, France
Conference Dates : May 18-19, 2015