

Synthesis and Characterisation of Different Blends of Virgin Polyethylene Modified by Naturel Fibres Alfa

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Abstract : The basic idea of this study is to promote a polyethylene recycle and local vegetable fiber (alfa) in the development and characterization of a new composite material. In this work, different sizes of fiber alfa (<63 microns, between 63 and 125 microns, 125 and 250 microns) were incorporated into the blends (HDPE / recycled HDPE) with different methods elaboration (extruder twin-screw and twin-cylinder mixer). The fiber was modified by sodium hydroxide in order to evaluate the effect of alkaline treatment on the interfacial adhesion and therefore the properties of composites prepared. These were characterized by various techniques: mechanical (tensile and Charpy impact test), Rheological (melt flow), morphological (SEM). The demonstration of the effect of alkali treatment on alfa fiber was examined by FTIR spectroscopy and morphological analysis. The introduction of alfa treated fiber in the (HDPE/recycled HDPE) increased stress, impact strength and Young's modulus on the contrary, the elongation at break decreased. The results of the mechanical properties showed an improvement is better in extrusion twin-screw mixer than two cylinders.

Keywords : naturel fiber, alfa, recycling, blends, polyethylene

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