HYBRID NATURAL FIBER THERMOPLASTIC BIOCOMPOSITES: EFFECT OF MODIFICATION OF FIBER AND POLYMER ON MATERIAL PROPERTIES.

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ABSTRACT

In the present work, borax (BX)- treated oil palm mesocarp fiber (OPMF) and kenaf core fiber (KCF) were hybridized manually and reinforced into maleic anhydride (MA)-modified poly(lactic acid) (PLA) through melt-blending and compression-molding techniques, aiming at a synergistically improved mechanical, physical, morphological, thermogravimetric and dynamic mechanical properties of their resulting hybrid biocomposites. The BX-treated fibers showed considerable increase in cellulose and decrease in hemicellulose, while lignin partially decreased as confirmed by chemical analysis, Fourier transformed infrared spectroscopy, X-ray diffraction analysis, bulk density and scanning electron microscopy. The best material performances were exhibited by the hybrid system *i.e.* BX(OPMF-KCF)-MAPLA, which involved BX-treated hybrid fiber reinforced MA-modified PLA, consequent of the synergistically enhanced interface adhesion provided by the BX treatment of the fibers and the compatibilization potential of MA-modified PLA. The optimum hybrid system exhibited promising application performances to be employed as an alternative to medium density fiberboard.