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Surface modification of bamboo filler by acid treatment on flexural and morphology rHDPE/BF composites

Abstract

This study main objective is to compare the effect of different concentration on surface treatments of natural fibrous material, bamboo filler (BF) by using acetic acid (CH_3COOH). The application of surface treatment on natural fibrous material can improve the compatibility with polymer matrix material. Different concentration on surface treatment by using CH_3COOH were applied at 0 wt.%, 2.5 wt.%, 5.0 wt.% and 7.5 wt.%. After the application of surface treatments, the fibrous materials were combined with polymer matrix material, particularly recycled high density polyethylene (rHDPE), by twin screw extruder and injection moulding. The mechanical test was performed to evaluate the influence of different concentration of surface treatments on rHDPE/BF composites. The experimental results shows that the surface treatment by using CH_3COOH on BF strongly affect the mechanical properties of the final composite materials by increasing the flexural strength ultimately at 5.0 wt.% concentration CH_3COOH with the highest flexural strength. The morphology of treated BF by using Field Emission Scanning Electron Microscope (FESEM) show that the lignin, wax and other impurities was removed from BF.