INVESTIGATION ON MECHANICAL PROPERTIES OF BANANA FIBER REINFORCED POLYPROPYLENE COMPOSITES

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ABSTRACT

Natural fiber-reinforced polymer composites are widely used in various engineering applications. The present work aims to investigate the mechanical properties of banana fiber (with 10 and 20 wt % alkali treated and 10 wt % without alkali treated) reinforced polypropylene (PP) composites fabricated via injection molding technique. The fabricated PP composites are referred as PP-10W, PP-20W and PP-10WT composites. Mechanical properties like tensile strength, flexural strength and impact strength carried out as per ASTM standards. It has been found that there is a significant increase in tensile strength and elongation in allPP composites when compared to PP. The maximum tensile strength and elongation of 27.81MPa and 13.11% was obtained for PP-20W composite. Similarly, the flexural strength and flexural modulus were found to be increased drastically for all PP composites. The maximum flexural strength and flexural modulus of 42.4 MPa and 4048.06 MPa was found for PP-20W composite. It is observed that there is a light decrease in impact strength with increase in fiber content. The maximum impact strength of 221 MPa was achieved for PP-10WT composite. The pull out of fibers from PP matrix fracture surface shows the poor bonding between the interfaces.

Keywords: Banana Fibers, Composite Materials, Mechanical properties, Polypropylene (PP)