

Chemical Modification of Jute Fibers with Oxidative Agents for Usability as Reinforcement in Polymeric Composites

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Abstract : The goal of this research is to modify the surface characterization of jute yarns with different chemical agents to improve the compatibility with a non-polar polymer, polypropylene, when used as reinforcement. A literature review provided no knowledge on surface treatment of jute fibers with sodium perborate trihydrate. This study also aims to compare the efficiency of sodium perborate trihydrate on jute fiber treatment with other commonly used chemical agents. Accordingly, jute yarns were treated with 0.02% potassium dichromate (PD), potassium permanganate (PM) and sodium perborate trihydrate (SP) aqueous solutions in order to enhance interfacial compatibility with polypropylene in this study. The effect of treatments on surface topography, surface chemistry and interfacial shear strength of jute yarns with polypropylene were investigated. XPS results revealed that surface treatments enhanced surface hydrophobicity by increasing C/O ratios of fiber surface. Surface roughness values increased with the treatments. The highest interfacial adhesion with polypropylene was achieved after SP treatment by providing the highest surface roughness values and hydrophobic character of jute fiber.

Keywords : jute, chemical modification, sodium perborate, polypropylene

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