

Physico-mechanical and degradation properties of biodegradable photografted coir fiber with acrylic monomers

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Abstract

Coir fibers were modified with 2-hydroxyethyl methacrylate (HEMA), methyl methacrylate (MMA) and 2-hydroxyethyl acrylate (2-HEA) solutions under UV radiation. Monomer concentration and radiation dose were optimized in terms of grafting and tensile properties. It was found that 20 % HEMA at 20th UV pass, 30 % MMA at 15th UV pass and 25 % 2-HEA at 20th UV pass of radiation produced higher tensile properties over untreated sample. Urea of different concentrations (0.5–2 %) were incorporated into optimized solutions and 1 % urea showed the best properties of the fiber. Water uptake behavior and simulating weathering degradation properties were also performed.

Keywords Coir fiber, Acrylic monomers, Additive, Grafting, UV radiation, Mechanical properties