



Experimental Investigation of Mechanical Properties of Water Hyacinth Fiber Reinforced Polymer Composite

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Abstract:

Natural fiber has received wide attention from researchers all over the world because of their advantages, which are environmentally friendly and cost-effectiveness. Among various natural fibers, water hyacinth is one of the cheapest fibers and the resource used only for animal feed, organic fertilizer, for making paper, bag, basket, and tablecloth. The water hyacinth has not been used so far as reinforcing materials for composites. The goal of this research work is to fabricate water hyacinth fiber reinforced polyester composites with a view to characterized the mechanical properties of water hyacinth fiber reinforced polyester composite material. The fiber extract manually after collecting the water hyacinth plant from Lake Koka in the Oromia Region, Ethiopia. Once the extraction was done, the fiber treated by a chemical in different sodium hydroxide concentration, used for the improvement of bond & interfacial strength of the water hyacinth fiber and the fiber density were performed using Pycnometer method by ASTM standard. The composite of water hyacinth fiber are fabricated with polyester resin, using hand lay-up methods in different fiber/matrix ratio and mechanical properties of tensile, flexural, compression and hardness specimen measured according to ASTM standard and the prepared composite material experimentally analyzed. The result showed that water hyacinth fiber have a lower density comparing with common natural fiber and all the mechanical properties satisfactorily improved for chemically treated water hyacinth fiber polyester composites in comparison with those of raw water hyacinth fiber polyester composite. Therefore using water hyacinth fibers as reinforcement in a polymer matrix successfully develops a composite material.



Biography:

Samrawit Alemayehu has completed her BSc. In 2016 from Dire Dawa University in Mechanical Engineering and Assisant Lecturer in Dire Dawa University for 1 year and now she just study her Mastser degree in Addis Ababa Scinece and Technology, in Mechnaical Engineering, Mechanical Design

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Webinar on Materials Science and Nanotechnology | August 27, 2020 | London, UK

Citation: Samrawit Alemayehu Tewelde; Experimental Investigation of Mechanical Properties of Water Hyacinth Fiber Reinforced Polymer Composite; Euro Materials 2020; August 27, 2020; London, UK