A State-Of-The-Art on Sisal Natural Fibres: Material, Properties and Durability

Abstract

The advancement in research and engineering has shifted the interest from traditional monolithic materials to modern materials such as fibre-reinforced composites. This paradigm shift can be attributed to the unique mechanical characteristics of the fibre-reinforced composites such as high strength-to-weight ratio, good flexural strength, and fracture toughness. However, despite their widespread applications, they have some serious drawbacks such as costly raw materials, high manufacturing costs, non-recyclability, toxicity, and non-biodegradation. To address these issues, naturally occurring plant fibres are being increasingly researched as potential reinforcements for biodegradable or non-biodegradable polymer matrices to produce environmentally friendly composites. These green composites possess attractive properties such as low production cost, sustainable materials, recyclability, and biodegradation. However, natural fibres are sensitive to hydrothermal ageing and composites made from these fibres possess low strength as compared to synthetic fibre composites. This paper overviews the details of the sisal natural fibres as an alternative to the synthetic fibres in terms of materials, mechanical properties and durability. The future prospects concerning these composites are also discussed at the end of the paper.

Keywords: materials; composites; properties; durability; natural fibres; synthetic fibres

Biography

Abdalrahman Alajmi is a graduated master's student from the Queensland University of Technology, Faculty School of Chemistry Physics and Mechanical Engineering. Abdalrahman has experience in teaching which are mainly Engineering Materials, Advanced Welding Technology, Manufacturing Process, Industrial Management and Welding Metallurgy at the Public Authority for Applied Education and Training of Kuwait as a part-time. Regarding research, Abdalrahman has a big interest in the mechanical behaviour of fibre-reinforced polymer composites (Natural fibres). He also has lately published a paper and recently he is about to publish another paper in the same area . He is also working full-time as an Operation Engineer at the power station of Al-zour south Kuwait since he graduated with a master's degree in 2018.

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