ISSN 0511-5728
The West Indian Journal of Engineering
Vol.38, No.2, January 2016, pp.4-12

Influence of Chemical Treatment on the Constituents and Tensile Properties of Selected Agro-Fibres

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Abstract: *The effect of chemical treatment on the tensile properties of Banana (Musa acuminata), Plantain (Musa parasidica), Coconut (Cocos nucifera) and Sisal (Agave sisilana) fibers was investigated. These fibres were obtained from plants in Akure, Ondo State, South-West, Nigeria and were treated with four different chemical solutions at 60 °C for 4 hours. The percentages of the fibre constituents were characterised and the tensile properties were determined using the Instron digital universal tensile testing machine. The results showed that the chemical treatment procedures had different effects on the fibers: the cellulose, hemicelluloses and lignin contents were all affected. All the chemical treatment procedures had great influence on the constituents of the fibres and their eventual tensile properties. Alkaline treatment with sodium hydroxide (NaOH) gave the best result for improved tensile strength in sisal fibre with a value of 0.81 MPa, followed by coconut fibre treated with the mixture of hydrochloric acid (HCl) and NaOH with a value of 0.69 MPa. These treatments were best for the constituents and surface modification of these selected fibres. The optimum advantage from these treatments was that, these fibers will perform better as reinforcement in composite development due to increased strength and roughed surfaces which aid binding between fibre and matrix.*

Keywords: *Chemical treatment, constituents, tensile properties, Agro fibres*