

Abstract:

In this article, the effect of water glass on the mechanical and thermooxidative properties of kenaf and sisal fibres has been investigated. Single fibres were manually separated from the bundles and immersed in liquid water glass that produced a thick polysilicate coating. The water glass treatment significantly improved the tensile strength and the Young's modulus of the kenaf and sisal fibres, in relation to the untreated fibres. The improved failure strain of sisal fibre could have occurred because the axial splitting is promoted and the transverse cracking is delayed by the water glass treatment. The reduced thermal resistance of the water glass treated sisal is even more interesting when considering that NaOH treatment (major constituent of water glass) of sisal caused an opposite effect. The thermogravimetric analysis results showed that the water glass treatment strongly affected the chemical composition of the kenaf and sisal fibres. The water glass based thick polysilicate coating was about 40 wt%, which was unusually high.