Action to unlock commercial fibre potential

Multi-stakeholder consultation in conjunction with the joint meeting of the intergovernmental group on hard fibres and the Intergovernmental group on jute, kenaf and allied fibres

Salvador, Bahia, Brazil, 15 November 2011

Summary

Many regions do not have wood available, turning its options to non-wood cellulose. For this reason Fibres from crops such as flax, hemp, sisal, and others, especially from by-products of these different plants, are likely to become of increasing interest for composites and new materials production. These non-wood plants generally contain less lignin than wood and therefore bleaching processes are less chemical demanding. The potential for significant improvements in mechanical properties already at very small volume fractions of the reinforcing phase attracted the interest of polymer nanocomposites recently. The major objective of the present study is to prepare true cellulose nanocomposites based on thermoset and thermoplastic and investigate the reinforcement potential of nanocrystalline cellulose developed from various plant. Mechanical properties of developed nanofiber reinforced composites were investigated. Biodegradation studies of the developed composites are also done. Due to its unique nanostructure and properties, nanocellulose is a natural candidate for numerous medical applications. The developed nanocellulose membranes have been successfully used in cosmetic treatments as an efficient protective coating against harmful Ultraviolet (UV) radiation and as a wound-healing device for severely damaged skin. These nanocellulose composites can be utilized for the construction of metal-free orthodontic retainers which strengthens the tooth after Root Canal Treatment and for the development of artificial heart valve, Ligaments, Hip Joints. If nanocellulose can be successfully mass produced, it will eventually become a vital biomaterial and will be used in the creation of a wide variety of medical devices and consumer products.