

Environmental friendly method for the extraction of coir fibre and isolation of nanofibre

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ABSTRACT

The objective of this work was to develop an environmental friendly method for the effective utilization of coir fibre by adopting steam pre-treatment. The retting of the coconut bunch makes strong environmental problems which can be avoided by this method. Chemical characterization of the fibre during each processing stages confirmed the increase of cellulose content from raw (40%) to final steam treated fibres (93%). Morphological and dynamic light scattering analyses of the fibres at different processing stages revealed that the isolation of cellulose nano fibres occur in the final step of the process as an aqueous suspension. FT-IR and XRD analysis demonstrated that the treatments lead to the gradual removal of lignin and hemicelluloses from the fibres. The existence of strong lignin–cellulose complex in the raw coir fibre is proved by its enhanced thermal stability. Steam explosion has been proved to be a green method to expand the application areas of coir fibre.