MULTIFUNCTIONAL MATERIALS FROM HEMP FIBERS TREATED WITH STEAM EXPLOSION TECHNOLOGY

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Multifunctional materials include properties of smart material systems (e.g. smart textiles) as well as biologically synthesized materials (case of biomimetic). Natural wood, flax and hemp fibres are examples of such multifunctional materials – polymer composite systems. In current research attempt has been made to analyse hemp fibres treated with steam explosion (SE) technology. During the SE process, fibres are chemically modified and mechanically defibrillated. At the end of the steaming process, the instantaneous release of pressure stops the reaction and separates the fibres. Disintegration of hemp fibres separated from non-retted, dew-retted and dried stems of hemp plants grown in the Agricultural Science Centre of Latgale (Kraslava) at 2010 vegetation season of Latvian local genotype 'Purini'[1] by alkali treatment and steam explosion (SE) were investigated.

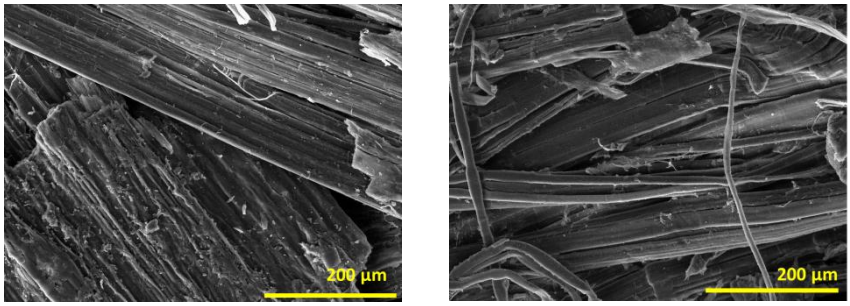

Fig. 1. SEM micrograph of bundles of the hemp fibres before and after SE

An average intensive SE in combination with the hydro-thermal and alkali after-treatment allows decreasing the diameter of hemp fibres and reduce the concentration of non-celluloses components, among them hemicelluloses, lignin, pectin, waxes and water [1;2].

References

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2. Kukle S., Gravitis J., Putnina A. Processing Parameters Influence on Disintegration Intensity of Technical Hemp Fibres. *Journal of Biobased Materials and Bioenergy*. Vol.6, No.4, 2012, 440-448.