

## Steam exploded hemp nano-cellulose and –lignin influence on poly(vinyl alcohol) electrospun nanofibers structure and properties

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Hemp is a local and world-wide renewable natural fibres source. Steam explosion (SE) technology have been applied for hemp treatment without using environmentally harmful chemical agents (SE using only high temperature saturated water steam) and to solve problems for futher environmentally friendly nano-level disintegration of hemp supermacromolecular components and with consecutive integration of hemp nano-components into the structure of advanced and smart composite materials. Poly(vinyl alcohol) (PVA) was used as electrospun fiber mats. PVA is synthetic environmentally friendly polymer, biocompatible with natural nano-components and non-toxic for living organisms.

PVA nano-fiber mats with hemp nano-cellulose and –lignin as reinforcing elements morphology and structure were studied by using FTIR-ATR, X-ray diffraction, differential scanning calorimetry (DSC), SEM, AFM, mechanical testing, electric conductivity, viscosity and sorption methods. The analysis of hemp nano components influence on PVA mat structure and properties were carried out. To continue cellulose research the lignin influence was firstly emphasized.

The studies demonstrated that nano-additives from hemp dramatically increase PVA composite stability in water environment and mechanical properties of mat

### References

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