



Tatjana Stevanovic

Université Laval, Canada

Biography

Tatjana Stevanovic has completed her undergraduate and graduate studies up to PhD at the University of Belgrade at which she was teaching Wood Chemistry and Chemical Transformation of Wood until 1997. Since then she is teaching these same courses at Laval University and performing research on bioactive polyphenols as well as on polymeric applications of lignins. She has published numerous scientific papers and book chapters as well as Wood chemistry textbook. She has deposited a international patent on new organosolv process leading to highly pure lignin along with cellulose pulp and bioactive extractives from pre-extraction.

Tatjana.Stevanovic@sbf.ulaval.ca

POLYPHENOLS FROM CATALYTIC ORGANOSOLV PROCESS: ANTIOXIDANTS AND CARBON FIBER APPLICATIONS

The complete transformation of forest biomass is at centre of our studies. The patented catalytic process was developed in order to remove the extractable polyphenols from forest biomass prior to pulp. The objective of the pre- extraction is dual: to remove the polyphenols soluble in ethanol-water, which could contaminate the catalyst used in delignification process, but also to get access to valuable antioxidant molecules with multiple bioactive properties. We have applied this process on trembling aspen wood. Components from pre-extraction step have revealed several polyphenols, some of which have been determined to have high antioxidant capacity. Organosolv lignin produced in this research was examined for use as carbon fiber precursor, as it can be spun both in molten form and from solution, by electrospinning. The stabilized lignin fiber obtained by spinning in molten form yielded a high carbon content carbon fiber. The mechanical properties of the carbon fiber spun from organosolv lignin alone, without any polymer blending, were determined to have mechanical properties which are better than those published on other carbon fibers based on lignins. The polyphenolic constituents of lignocelluloses which are actually defining their woody nature are offering the perspective of very valuable utilisations. All polyphenols isolated from aspen wood, were analyzed by FT-IR, NMR, HPLC, GPC, GC-MS, DSC, TGA and XPS.