

Poland

September 2013



COST FP1205: Innovative applications of regenerated wood cellulose fibres

Poland

Faculty of Wood Technology, WULS

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Division of Wood-based Composites

Faculty of Wood Technology

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Experience in:

- modification of wood-based composites (raw materials, technology, properties etc.) in semi-industrial scale
- application of new raw materials in wood-based comp. technology
- development of wood-based materials with special features

Ongoing work:

- reinforcing of core structure of furniture/structural composites by regenerated cellulose fibers

Potential contribution to COST FP1205 WG3:

- testing the possibilities of application of regenerated cellulose fibers to wood-based composites



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Department of Innovative Biomaterials and Nanotechnologies

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The scope of research:

- Designing and producing advanced lignocellulosic and polymer-lignocellulosic composites based on renewable raw materials, thermoplastic and thermoset polymers, biopolymers and fillers
- Polymeric and biopolymeric nanocomposites, including those with natural fibres of specific properties, e.g. characterized with improved resistance to fire and flame and improved electro-conductive properties
- Methods of obtaining nano- and micro-fibres by electrospinning method, based on fibre-forming polymers
- Modification of nano- and micro-fibres with active compounds (e.g. antibiotics and enzymes) and nano-particles

Courtesy of Institute of Natural Fibres & Medicinal Plants, <http://iwnirz.pl/>



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Fibres from Natural Polymers

Team Leader: Dariusz Wawro, Ph.D., D.Sc., Eng.

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Main research fields :

- wet-spinning of fibres from solutions of natural polymers like alkaline solutions of cellulose, chitosan solutions, aqueous solutions of alginates, alkaline solutions of starch and solutions of cellulose derivatives (e.g. cellulose carbamate), chitin (dibutylchitin) and PLA
- preparation of film by wet-forming from solutions of natural polymers like: alkaline solutions of cellulose, acidic chitosan solutions, aqueous solutions of alginates, alkaline solutions of starch and solutions of cellulose derivatives (e.g. cellulose carbamate) and chitin (dibutylchitin)
- spinning of polysaccharide - and protein - modified cellulose fibres
- spinning of non-flammable cellulosic fibres.
- spinning of polysaccharide - or protein modified chitosan fibres
- hydrothermal modification of cellulose pulp
- forming of microfibrils – so called microfibrils from natural polymers and their blends
- preparation of edible film from starch and other polysaccharides

Courtesy of Institute of Biopolymers and Chemical Fibres , <http://www.ibwch.lodz.pl>



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Equipment

Equipment suitable for the modification of polymers, preparation of spinning solutions in various solvents and big laboratory spinning lines for continuous yarns and staple inclusive:

- wet spinning line for the preparation of multifilament yarn from polymer solutions,
- laboratory line for wet - forming of microfibrils from polymer solutions
- tanks and auxiliary equipment for the preparation of spinning solutions,
- pilot plant for the preparation of film/casings from polysaccharides.



Courtesy of Institute of Biopolymers and Chemical Fibres , <http://www.ibwch.lodz.pl>