

General Profile

Title:
Professor

Name:
Stefan Willför

Tasks:
Chair of the Action, Grant Holder representative

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Curriculum Vitae

Education/professional career:

Professor in Renewable Materials Chemistry	Åbo Akademi	2010-
Professor in Forest Products Chemistry	Åbo Akademi	2009
Docent in Biomaterials' Chemistry	University of Helsinki	2008-
Academy Research Fellow	Academy of Finland	2005-2008
Docent in Wood Chemistry	Åbo Akademi	2004-2009
Dr.Tech. (Chem. Eng.)	Åbo Akademi	2002

Others:

- Head of the Department of Chemical Engineering at Åbo Akademi University, 2010-
- Responsible for the "Joint analysis effort" (wood and pulp sampling and distribution) within the COST E41 action, 2005-2008
- Member of the Management Committee and Steering Group and Working Group leader (WG 3, Extractives) of the COST action E41 (Analytical tools with applications for wood and pulping chemistry), 2004-2008
- Organizer of the international seminar "Towards Understanding Wood, Fibre, and Paper - deeper knowledge through modern analytical tools" of the COST E41 Action (joint with a COST E50 workshop), 2008, Turku, Finland
- Deputy representative of the steering group (2009-) and active partner within the European Polysaccharide Network of Excellence (EPNOE), 2005-
- Member of Groupe Polyphenols, 2003-

- Member of the Scientific Committee for the international conference “Italic 5, Science and Technology of Biomasses: Advances and Challenges”, Varenna, Italy, 2009
- Member of the Task Force in “Biorefinery Hemicelluloses; hydroxyacids and functional materials” for the Finnish Forest Cluster research area “A biorefinery that utilises wood diversely”, involved also in other task forces in the biorefinery area
- Member of the board and co-responsible for international contacts and business co-operation in the biotechnology company Oy ArboNova Ab (www.arbonova.com), 2004-2008

Selected research projects relevant to the Action:

- New value-added natural chemicals from wood
- A sustainable process for production of green chemicals from softwood bark
- Bioactive and wood-associated stilbenes as multifunctional antimicrobial and health-promoting agents
- Biomass derived novel functional foamy materials
- Lignin valorization
- Future Biorefinery
- Chemistry in Forest Biorefineries
- Upgrading forest industry waste to bioactive chemicals for crop stimulation and biocontrol

Five recent publications relevant to the Action:

Willför, S.M., Smeds, A.I., Holmbom, B.R. (2006) Chromatographic analysis of lignans. *J. Chromatogr. A*, 1112:1-2, 64-77 (review)

Smeds, A.I., Eklund, P.C., Sjöholm, R.E., Willför, S.M., Nishibe, S., Deyama, T., Holmbom, B.R. (2007) Quantification of a broad spectrum of lignans in cereals, oilseeds, and nuts. *J. Agr. Food Chem.*, 55:4, 1337-1346

Willför, S., Sundberg, K., Tenkanen, M., Holmbom, B. (2008) Spruce-derived mannans – A potential raw material for hydrocolloids and novel advanced natural materials. *Carbohydr. Polym.*, 72:2, 197-210 (review)

Willför, S., Pranovich, A., Tamminen, T., Puls, J., Laine, C., Suurnakki, A., Saake, B., Sirén, H., Uotila, K., Simolin, H., Rovio, S., Hemming, J., Holmbom, B. (2009) Carbohydrate analysis of plant materials with uronic acid-containing polysaccharides – A comparison between different hydrolysis and subsequent chromatographic analytical techniques. *Ind. Crops Prod.*, 29:2-3, 571-580

Doliška, A., Strnad, S., Ribitsch, V., Stana Kleinschek, K., Willför, S., Saake, B. (2009) Analysis of galactoglucomannans from spruce wood by capillary electrophoresis. *Cellulose*, online first: DOI: 10.1007/s10570-009-9328-7

Organisation

Åbo Akademi comprises a large number of subjects to secure the higher education in Swedish for Finland's Swedish-speaking population. Research has a strong role at Åbo Akademi, and the Faculty of Technology has been rated as one of the best in Finland in several investigations. Åbo Akademi has also several Centres of Excellence in Research appointed by the Academy of Finland. One of these Centres is the Åbo Akademi Process Chemistry Centre (PCC). At PCC we study detailed physico-chemical processes in complex environments of industrial importance, in order to meet the needs of tomorrow's process and product development. This approach, with the focus on detailed understanding of the process chemistry, we have called Molecular Process Technology.

The ultimate goal of the research performed at my own laboratory, the Laboratory of Wood and Paper Chemistry, is to promote sustainable and multipurpose use of wood for fibre products and for high-value specialty biochemicals (biorefinery). Our research area extends from wood to paper, including process waters and effluents. Specialty biochemicals and biomaterials from wood and other biomasses are also of great interest for our laboratory.