Abstract of Presentation

Sustainable utility of wood biomass – current trends at VTT

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Abstract :

The key challenges facing today´s forest-based sector renewing efforts include securing the availability of renewable raw materials, obtaining an economic and environmental balance in using forest biomass for products and energy and substantially improving the industry's ability to develop and design products.　There is also a growing need to a significant decrease in capital intensity and increased production flexibility through process innovations.

Recently, the research on novel, high performance wood-based products has been introduced. VTT has special expertise on generation of competitive, high quality, added-value wood based products by intelligent wood material selection and advanced tailoring of material properties. The aim of novel wood based product research area is to generate improved wood products and biocomposites with e.g. high biological durability, controlled moisture behaviour and UV-resistance and functional surface properties.

The converting and high-value fibre-based products have been studied intensively. For example, VTT is expertized in converting technologies of fibre-based raw material to added value paper, board, packaging products. VTT provides research activities and services in field of printed communication, bioactive fibre-based applications, biodegradable speciality products and advanced packaging. Special attention is paid on to material functionalization in order to obtain improved formability, transparency, barrier properties, activity and intelligence to different packaging materials. Nanotechnology has applications across most economic sectors and allows the development of new enabling technologies with broad commercial potential. Due to the fact the cellulose appears to have great potential as nanomaterial, it has suggested to be exploited in many potential applications. The potential application area includes high quality paper products, novel active coatings, mouldable and light weight, high strength materials and components, composites for different end-uses, components for food and cosmetics, new materials for electronics and pharmaceutical applications.

Fibre functionalization technologies have shown potential method to develop new innovative products.　At VTT the knowledge on chemistry and processing of renewable fibre-based materials is profound. The fibre functionalization technologies used are based on enzymatic and chemical surface activation combined with chemo-enzymatic bonding of groups giving functional properties such as charge, hydrophobicity and conductivity. The functionalization technologies have been exploited in tailoring of

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surface properties of paper, development bio-based pigments, barriers and plastics from renewable resources.

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