



## Method to produce environmentally friendly products from renewable fatty acids

### Opportunity

Industrial use of natural, renewable biopolymers Suberin and cutin are plant biopolymers. They are particularly abundant in the bark of some tree species, for example, cork oak bark contains around 45% and birch outer bark around 35% of suberin. Industrial use of renewable suberin and cutin raw material offers a possibility to develop new products and replace materials obtained from non-renewable feedstocks.

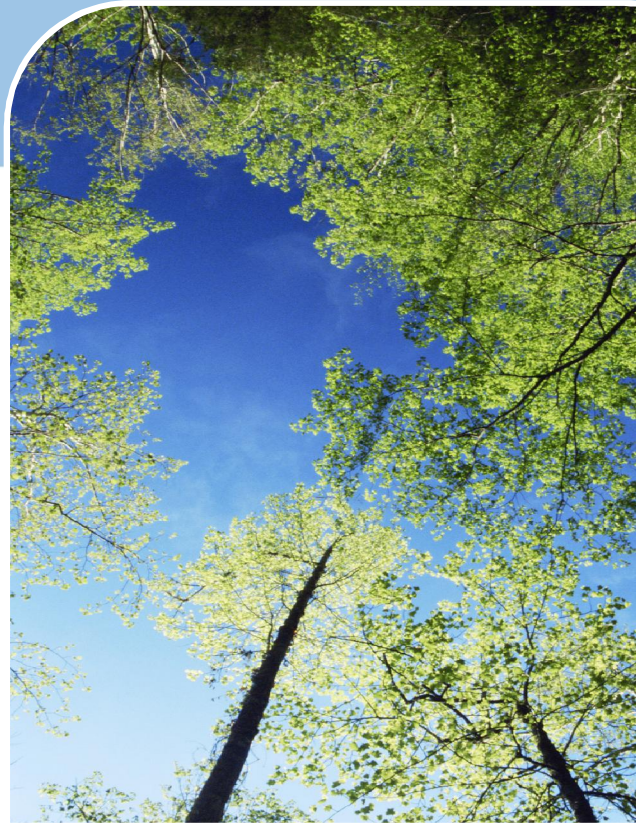
### Solution

Processing method to industrially utilize renewable natural suberin and cutin. With the developed method it is simple to produce oligo- and polyesters from a mixture of carboxylic acids that are derived from suberin and/or cutin. The oligo- and poly-esters obtained by the method can be used as renewable raw materials in a number of products, for example, in lubricants, fuel components, binders in coatings and composites.

The carboxylic acids obtained as hydrolysis products of suberin and cutin are typically mixtures of fatty acids. The chemical hydrolysis of suberin includes fatty acid fraction (oligo/polyol esters > coatings, lubricants) and phenolics (antioxidants, resins).

### Solution benefits

Low-cost products can be produced in a simple way from mixtures of fatty acids obtained from suberin and/or cutin by hydrolysis. Furthermore, these products can be tailored as desired by modifying with a monoacid and/or alcohol, and so for instance the viscosity of the product may be adjusted e.g. by means of monoacid. Moreover, controlling the reactions is easy.



### Why partner with VTT?

#### 10 reasons for technology partnering with VTT

1. Key factor in Finland's success story with a track record to prove it
2. Licensing and co-venturing opportunities
3. Portfolio of more than 1,000 patents and inventions
4. New business and product concepts based on strong IP and world class research
5. Combined experience of more than 2,000 motivated researchers in eight focused areas of technology
6. Active member in hundreds of scientific & business communities
7. Excellent track record as coordinator and partner in EU projects
8. Collaboration with TOP 50 R&D companies in Finland
9. Global R&D partnership with 50 Fortune 500 companies
10. Market driven multi-disciplinary solutions

The oligo- and polyesters produced by the method can be used as binders and compatibility improves for producing composites from natural materials such as from cellulose, wood, linen, hemp, starch, and other native fibers.

Products of the invention may be used to substitute prior art products based on formaldehyde. Products generated according to the method can also serve as natural alternatives for goods that currently use petrochemical and raw oil as starting materials.

### References

- Wood Material Science and Engineering Final Report, Finnish - Swedish Research Programme 2003-2007. [http://www.formas.se/upload/EPiStorePDF/Wood\\_Material\\_Science\\_final\\_report\\_2007/Formas%20wood.pdf](http://www.formas.se/upload/EPiStorePDF/Wood_Material_Science_final_report_2007/Formas%20wood.pdf)

### Competitive advantage

- new feasible products from renewable raw materials
- attractive alternative for replacing materials obtained from non-renewable feedstocks
- simple and industrially feasible production method

### Available for licensing

VTT offers exclusive and non-exclusive license depending on the technology partner.

### Additional information

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