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 polyesters 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.

The oligo- and polyesters produced by the method can be used as binders and compatibility improvers 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:

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

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