

Continuous Segmented Flow Fractionation of Lignin

Lignin transformation from waste into a commodity thanks to a segmented flow fractionation system, fully automatable at an industrial scale



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IP Status

Patent application submitted

Seeking

Seeking investment

Background

Lignin is a polymer that constitutes 30% of the lignocellulosic materials and the residue of agricultural and forestry processes, such as pulp & paper and modern biorefinery processes. Currently disposed via combustion, or applied in low value applications, it can find increasingly innovative destinations of greater industrial interest as a commodity, thanks to methods of fractionation with high reproducibility. The patented system allows the first fractionation of lignin in continuous flow, fully automatable and scalable.

Tech Overview

Lignin has a high potential for industrial applications, thanks to the discovery of fractionation methods refining it in highly reproducible fractions. For example, it can be employed as a nanostructured material in coating, paints, resins with antimicrobial and sunscreen properties and in innovative packaging. Intrinsically biocompatible, this natural polymer can also be used in cosmetics, nutraceuticals or pharmaceuticals.

The existing fractionation methods, however, work in batch and are suitable only for laboratory processes. By keeping the same qualitative characteristics, the new-patented segmented flow fractionation system allows for the first time the automation of the process and its industrialization, giving also new value to an industrial waste.

Benefits

- Higher efficiency than “batch” fractionation methods
- Lignin fractions with constant and reproducible characteristics
- Automated fractionation system
- Scalable at industrial level
- Economic and environmental sustainability

Applications

- Composite materials, polymers and resins, additives for improving of the quality of materials / compounds in various industrial sectors
- Nanostructured materials for composites, cosmetics, nutraceutical products and formulations
- Reuse and enhancement of agricultural and forestry production waste

Opportunity

Industry partners or an ambitious entrepreneur to commercialize this technology (biorefineries, paper factories / other lignin producers), as well as to create a new service provider.

Patents

- PCT/EP2019/086784