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Process for Utilizing Liquefied Lignocellulosic Biomass

A new technology simplifies the process flow for biomass liquefaction using a mimetic, reducing capital costs by 50% or more while improving efficiency for producing biofuels and value-added products.

A challenge in biomass processing is the difficulty in moving the biomass to, within, and through the equipment needed to physically and/or chemically treat the biomass. Processing at low biomass solids content enhances flowability and transport in some cases, but minimizes productivity for the downstream product, often fatal to the commercial viability of the process. Despite previous efforts related to processing lignocellulosic biomass feedstocks and their ultimate use in the production of ethanol and other products, the need remains for improved and alternative biomass utilization processes, including the production of ethanol or other useful substances from fermentation.

Researchers at Purdue University have developed a technology that simplifies the process flow diagram of using a mimetic for the liquefaction of biomass, decreasing capital costs by a factor of 50 percent or more. This is a major development in the field and applies to a number of different types of biomass processing schemes. These processes could be subsequently extended to facilitate production of various types of molecules through enzyme hydrolysis, fermentation, or chemical reaction. The generation of sugars or other soluble molecules using chemical catalysis, as well as bioprocessing in order to obtain both biofuels and value-added products, are added. Once the mash or pumpable slurry is obtained, standard chemical engineer unit operations may be used effectively and efficiently to achieve conditions required to obtain high yields and rapid processing.

Advantages:

-Simplifies the process of using a mimetic for the liquefaction of biomass

-Lower capital costs

Technology ID

65594

Category

Biotechnology & Life Sciences/Bioprocessing & Biomanufacturing

GreenTech/Carbon Management

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Potential Applications:

-Processing lignocellulosic biomass feedstock

-Alternative biomass utilization processes

-Production of ethanol or other substances from fermentation

TRL: 7

Intellectual Property:

Provisional-Patent, 2010-07-30, United States | PCT-Patent, 2011-07-29, WO | NATL-Patent, 2011-07-29, Canada | NATL-Patent, 2013-08-28, United States

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