High Yield Method to Produce LGO from Biomass

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a faster, easier and more economical method to produce the building block chemical levoglucosenone.

OVERVIEW

Levoglucosenone (LGO) is a highly dehydrated sugar typically derived from cellulose. It is an important, non-petroleum building block chemical with potential uses in a wide range of industrial processes. For example, it can be converted to 1,6-hexanediol to be utilized in the production of polyurethanes and polyesters.

Conventionally, LGO is derived from materials such as waste paper via high temperature pyrolysis. However, the process is hindered by low yield. Attempts to improve yield using expensive, toxic ionic liquids are undesirable.

THE INVENTION

UW–Madison researchers have developed a new method to produce LGO from cellulosic biomass under mild reaction conditions. The biomass material is reacted in a mixture comprising a polar aprotic solvent (e.g., tetrahydrofuran or THF) and an acid in the absence of water. The LGO can be separated out by routine downstream processes such as distillation and evaporation.

Glucose, levoglucosan, furfural and 5-hydroxymethylfurfural also are produced in small quantities.

APPLICATIONS

• Producing LGO from biomass

KEY BENEFITS

• High yields
• Low reaction temperature
• Outperforms harsher methods
• Easy to separate LGO from solvent and byproducts

STAGE OF DEVELOPMENT

High LGO yields from cellulose have been achieved using polar aprotic solvents.

ADDITIONAL INFORMATION

Related Portfolios
UW–Madison Technologies Developed Through the Great Lakes Bioenergy Research Center

Related Technologies
WARF reference number P140138US01 describes a similar method developed by the researchers to produce HMF (5-hydroxymethyl furfural) from biomass.

Publications

Tech Fields
Clean Technology - Bio-based & renewable chemicals
Clean Technology - Biofuels & renewable fuels

CONTACT INFORMATION

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854.