



## High Yield Method to Produce LGO from Biomass

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**WARF: P150101US01**

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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.

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#### For More Information About the Inventors

- [George Huber](#)

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### Related Technologies

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

### Publications

- Cao F., Schwartz T.J., McClelland D.J., Krishna S.H., Dumesic, J.A. and Huber G. W. 2015. Dehydration of Cellulose to Levoglucosenone Using Polar Aprotic Solvents. Energy Environ. Sci. 8, 1808-1815.

### Tech Fields

- [Clean Technology.: Biobased & renewable chemicals & fuels](#)

For current licensing status, please contact Jennifer Gottwald at [jennifer@warf.org](mailto:jennifer@warf.org) or 608-960-9854

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