



A Method for Preparation of Butanol from Ethanol over Acid Catalyst

UW ID: 16-088

Inventors: Maohong Fan
Yueli Wen
Bin Wang
Patent Status: Patent Pending

Description of Technology

Researchers at the University of Wyoming have been investigating alternative energy sources such as biofuels from renewable biomass sources. Renewable biofuels such as ethanol or n-butanol can be made from the fermentation of sugar-containing crops and can be used as suitable options to conventional gasoline. In comparison to ethanol, butanol is a more ideal fuel replacement for gasoline due to its non-corrosivity, its immiscibility with water, and its closer energy density to gasoline. As such, butanol can be blended with gasoline at twice the concentration of ethanol. In addition, butanol is an important chemical raw material and intermediate and is extensively used as a solvent in organic synthesis. Butanol is widely used in chemical and textile processes.

There are three traditional methods used to synthesize butanol: bacterial fermentation, hydroformylation and hydrogenation of propylene, and condensation of acetaldehyde and hydrogenation of the aldehyde (in the Guerbet reaction). All these methods have drawbacks.

Investigators at the University of Wyoming have recently invented a new way to prepare butanol from renewable biomasses. In the new method, acid catalysts are used to prepare butanol from ethanol resulting in a high yield of butanol obtained. **Preliminary research shows that highly effective results are obtained: conversion of ethanol can reach 65% and the yield of butanol is 40% over the acid catalysts.**

Applications

Butanol can be made from sugar-containing crops and can be used as a suitable environmentally-friendly alternative or additive to conventional gasoline. Butanol is an important raw material and intermediate material used in chemical processes and is an important solvent used in organic synthesis. Butanol is also widely used in the textile industry.

Features & Benefits

- Can be prepared from renewable biofuels
- The method only requires mild temperatures (80 °C to 300 °C) and pressures (0 PSI to 500 PSI)
- High butanol yield: conversion of ethanol can reach 65% with 40% yield of butanol

Marketing Opportunities

Alternative energy, renewable energy, catalysts, acids, ethanol conversion, biofuel from biomass, gasoline replacement/alternative, chemical processes, chemical raw materials, chemical intermediates, synthesis, solvents, organic synthesis, textiles, others

Contact Us:

**Research Products
Center**
1000 E University Ave
Laramie, WY 82071

Phone: 307-766-2520
Fax: 307-766-2530
Email: WyomingInvents@uwyo.edu

