Novel Synthesis of 2,5- Dimethylfuran from 5-(Chloromethyl)furfural

Tech ID: 25694 / UC Case 2013-821-0

ABSTRACT

Researchers at the University of California, Davis have developed an efficient synthesis of 2,5-dimethylfuran (DMF) from 5- (chloromethyl)furfural (CMF).

FULL DESCRIPTION

The conversion of biomass into fuels and chemicals continues to be a sought after alternative to petroleum. Consumer demand for carbon-neutral products is high, placing a "green premium" on prices and contributing to the green credentials of manufacturers due to the environmental impact of burning fossil fuels. 5- (Hydroxymethyl)furfural (HMF) has been cited as a promising renewable platform molecule with multiple applications for polymer, fine chemical, and biofuel production. The preparation, however, of HMF from feedstocks other than fructose is complicated by low yields and difficult isolation from reaction media, and significant challenges remain in scaling HMF production to an industrial level.

Researchers at the University of California, Davis have developed an efficient technology for the production of 2,5- dimethylfuran (DMF) directly from 5- (chloromethyl)furfural (CMF). CMF is a renewable platform chemical that is functionally equivalent to HMF and can be produced under mild conditions from sugars, cellulose, or directly from raw biomass. It can be made in high yields without any issues involving isolation or purification. Its production can be integrated with pulp mill, bioethanol, biodiesel or algae waste streams. DMF is a high energy density, high octane biofuel and fuel oxygenate. DMF can also be converted into para-xylene (PX), an octane-boosting fuel additive and high volume chemical intermediate used mainly in the production of terephthalic acid, a monomer of polyethylene terephthalate (PET).

APPLICATIONS

- Biofuels
- Bio-PX
- Bio-PET
- Renewable polymers
- Renewable solvents
- Renewable specialty chemicals

FEATURES/BENEFITS

- Starting material derived from biomass
- Simple, high yield synthesis of versatile furanic intermediate DMF
- Viable industrial method for production of bio-PX and bio-PET

PATENT STATUS

Country	Type	Number	Dated	Case

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OTHER INFORMATION

KEYWORDS

CMF, biomass conversion, biofuels, renewable polymers, sustainable chemistry, 5-(chloromethyl)furfural

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Chemicals
  - Other
- **Biotechnology**
  - Food
  - Industrial/ Energy
- **Energy**
  - Bioenergy
- **Materials & Chemicals**
  - Agricultural

United States Of America	Issued Patent	9,868,712	01/16/2018	2013-821	▶ Chemicals

RELATED CASES

2013-821-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Preparation of Furan Fatty Acids from 5-(Chloromethyl) Furfural
- ▶ Synthetic, Non-Scheduled, Cannabinoid for Reducing the Frequency and Severity of Seizure
- ▶ Cannabigerol (CBG) In The Treatment Of Seizures And Epilepsy
- ▶ Process for Converting Waste Biomass

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