Process for Converting Waste Biomass

Tech ID: 18696 / UC Case 2008-516-0

ABSTRACT
A researcher at the University of California, Davis has developed a chemical approach for the total conversion of plant carbohydrates to biofuels and value-added products.

FULL DESCRIPTION
A researcher at the University of California, Davis has developed a process for converting waste biomass (agricultural, municipal forestry) into 5-chlorofurfural (CMF) in yields approaching 90% of the theoretical. Thus far no other method of biomass deconstruction gives such a high conversion to a simple organic product. The process is completely chemical in nature and inexpensive. Conditions are mild (T<100 °C) and reaction times are short (<4 h). By reaction with ethanol or hydrogen, the CMF product is converted into 5-ethoxymethyl furfural and 5-methylfurfural, respectively, both of which are promising biofuel candidates, and the former of which is currently being commercialized in Europe as a diesel additive. By reaction with water, the CMF product is converted into levulinic acid, an industrially important value-added chemical. A secondary product of this process is furfural itself, which derives from the hemicellulose content of plant biomass. Furfural is currently traded as a commercial commodity.

APPLICATIONS
- High yield process for the development and manufacture of renewable alternative fuels

FEATURES/BENEFITS
- More efficient than conventional ethanol production
- Direct utilization of cellulose, a prevalent and available source of carbon
- Derived biofuels are hydrophobic, non-toxic, non-volatile, non-corrosive, clean-burning, and biodegradable
- Method can be used to derive either biofuels or value added materials from biomass

RELATED MATERIALS

PATENT STATUS

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CATEGORIZED AS
- Biotechnology
- Industrial/ Energy
- Energy
- Bioenergy
- Other

RELATED CASES
2008-516-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS
- Preparation of Furan Fatty Acids from 5-(Chloromethyl) Furfural
- Novel Synthesis of 2,5- Dimethylfuran from 5- (Chloromethyl)furfural
- Cannabigerol (CBG) In The Treatment Of Seizures And Epilepsy

INVENTORS
- Mascal, Mark J.