Catalytic Conversion of Bioethanol to Hydrocarbons

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Technology Summary

A method for catalytically converting an alcohol to a hydrocarbon without requiring purified or concentrated alcohol was invented by ORNL researchers. This approach can be used for relatively dilute bio-mass produced alcohols, such as those found in a biomass fermentation reactor.

Conventional biomass to hydrocarbon conversion is generally not commercially feasible, due to costs of the conversion process. This invention offers a method for catalytic conversion of biomass-derived alcohols or mixtures of alcohols to olefins or paraffins at relatively low temperatures. These hydrocarbons can then be added to a variety of transportation fuels without the need to make expensive changes to vehicles. Another critical advantage of this method is that the conversion can occur in the presence of water, even at dilute conditions.

Advantages

- Direct catalytic conversion of an aqueous product stream of biomass to hydrocarbons
- Reduction or elimination of distillation energy costs associated with hydrocarbon production
- Expansion of traditional ethanol fermentation into fungible fuel applications

Potential Applications

- Hydrocarbon products as transportation fuel
- Alternate renewable source of raw materials for the chemical industry

Patent

Chaitanya K. Narula, Brian H. Davison, and Martin Keller. *Zeolitic Catalitic Conversion of Alcohols to Hydrocarbons*, U.S. Provisional Patent Application No. 61/497,256, filed June 15, 2011.

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