



Liquid Hydrocarbon Fuels from Biomass via Single Reactor Process

IP Status: Issued US Patent; **Application #:** 12/871,187

Uses a Single Reactor to Produce Liquid Hydrocarbon Fuel

Researchers at the University of Minnesota have developed a method for the rapid creation of liquid hydrocarbon fuel from biomass that does not require the addition of expensive hydrogen. This process creates liquid hydrocarbon fuel directly from biomass and alcohol or alkane reactants using a single reactor.

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Low Pressure Process Converts Biomass to Liquid Hydrocarbon Fuel

The process involves three steps. The biomass is first fed through a metal-based catalyst with oxygen to produce bio-oil. The bio-oil is then mixed with methane and fed through a zeolite-based film to remove oxygen-containing functional groups from the bio-oil. In the third stage, the resulting hydrocarbons are mixed with alcohol and/or methane and sent through another zeolite-based film which spurs the formation of longer length hydrocarbons by promoting carbon to carbon bonding. Each stage operates at an optimum temperature. This low-pressure process lowers the production costs and is easier to implement. The process results in fast conversion times and is easily scaled.

FEATURES AND BENEFITS OF LIQUID HYDROCARBON FROM BIOMASS:

- Process does not require expensive hydrogen feedstock
- Creates liquid hydrocarbon fuel from biomass and alcohol or alkane co-reactants using a single reactor
- Low-pressure which makes the process lower cost and easily scaled
- Fast conversion times (millisecond contact times)

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Engineering & Physical
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