

Fast Hydrolysis for Hydrogen Bio-Oil

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- Green Technology

Keywords:

- Biofuels
- Chemical Engineering
- Clean Energy
- Energy
- Fuel Cells
- Green Technology
- Hydrogen Storage

The transportation sector currently relies almost exclusively on liquid hydrocarbons as its energy source for good reasons. The high energy density of gasoline far exceeds that of proposed replacements like hydrogen or batteries. In addition, the liquid hydrocarbon fuel distribution infrastructure is efficient and already in place. Production of liquid fuels from biomass can solve the problem of CO₂ emission from the transportation sector because it would be considered carbon neutral as CO₂ released from vehicle exhaust is captured during biomass growth.

Researchers from Purdue University have developed a process of fast pyrolysis to use on biomass. The process feeds H₂ from a carbon-free source to a fluidized bed reactor. The H₂ is mixed with a biomass in the reactor. The resulting mixture produces a biomass containing less oxygen atoms than normal due to the addition of the hydrogen. The mixture is then sent to a separator to remove the char, which is burned to create heat for the system, from the bio-oil. The bio-oil is further processed to create the hydrocarbon, which is then cooled to create the liquid hydrocarbon. The H₂ bio-oil has all the advantages of conventional bio-oil in addition to a remarkable increase in energy density while retaining compatibility with conventional hydrocarbon fuel distribution, a truly carbon neutral solution to the green transportation fuel concern.

Advantages:

- Dramatically lower fuel costs
- Increased bio-oil energy density

Potential Applications:

- Clean energy
- Green technology

People:

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