

1 of 1 DOCUMENT

Chemical Industry Digest

November 29, 2012

Making fuel from biomass

LENGTH: 299 words

Reversing the fuel-cell

A fuel-cell is a device that generates electricity by catalytically splitting fuel compounds to release electrons and protons. The electrons and protons are then used to generate electricity.

A team of researchers from the University of Wisconsin-Madison, University of Massachusetts- Amherst, and Gwangju Institute of Science and Technology of South Korea have reversed this process. They were able to obtain fuel molecules by using fuel-cell running on electricity.

The research team has demonstrated that they can use a proton-exchange-membrane fuel-cell to convert biomass derived compound acetone into a fuel compound isopropanol. Isopropanol has wide applications in chemical industry and is an important feedstock for various downstream molecules. It is used largely in pharmaceutical industry and is an important gasoline additive. Researchers are also working on process to convert the biomolecule Glucose into a feedstock chemical Hexane.

While other technologies require huge amounts of hydrogen, this new technology uses electricity for biomass conversion. Researchers see this new technology as a way to store electrical energy in the form of chemical energy.

To chemically reduce biomass molecules into fuel compounds, researchers feed water into the anode side of the fuel-cell and pass an electric current through the water to generate protons and electrons. The electrons run through a circuit and the protons pass through the proton-exchange membrane to the cathode side, where they generate hydrogen. The hydrogen reacts with the biomass molecule and reduces it to fuel, while oxygen generated in the process exits the system. The reaction can be carried out in continuous flow mode. The process yields 50% more liquid fuel over ethanol fermentation processes.

LOAD-DATE: November 29, 2012**LANGUAGE:** ENGLISH**PUBLICATION-TYPE:** Magazine