Ethanol to Power the Future of Hydrogen Fuel Cells

Industrial Bioprocessing Alert - Technical Insights

(PRWEB) February 29, 2004 --Hydrogen fuel cell technology's potentially strong future as a fuel for automobiles and various other applications is likely to be weakened by issues regarding its availability and the expenses involved in storage. Bio-based products such as ethanol are expected to open up new areas for research.

Hydrogen fuel cells reduce pollution by emitting water vapour in place of carbon dioxide. However the prevalent method of producing hydrogen from hydrocarbons, though economical, creates pollutants at the manufacturing site.

"Biomass material-based fuel cells are a better solution than power fuel cells since hydrogen is expensive and dangerous to handle," notes Technical Insights Analyst Al Hester. "More research should be devoted to ethanol since it is environmentally friendly and based on renewable resources."

Conversion of biomass materials such as ethanol into hydrogen is a more cost-efficient method to power fuel cells. Researchers believe that inter-metallic compounds could be used beneficially in fuel cell electrodes to oxidize ethanol. These materials are not alloys but have ordered structures wherein atoms are very specifically arranged.

Electrolysis of water using hydroelectric or nuclear, wind, or solar power also produces hydrogen. However, in the present economic condition, these methods may not prove to be cost effective.

The need for cheaper and more efficient means to power fuel cells has resulted in investment in extensive research. The U.S. Department of Energy (DOE), for instance, awarded Cornell University $2.25 million over three years, to devote research efforts to cells based on other fuels, including ethanol.

Research should also be extended to resolve technical problems so that systems that can handle the explosive gas are developed. Safety is a non-issue while considering ethanol in fuel cells. The challenge will be to reduce the cost of producing ethanol from corn and increase tax advantages in order to enable it to compete with fossil fuels.

"Current production processes, such as partial combustion of natural gas or electrolysis of water require cheap fossil fuels or electrical power," notes Hester. "In such a scenario, light-induced biological hydrogen production is a potentially cost-effective system."

This process uses enzyme systems present in photosynthetic bacteria, cyanobacteria, and green algae such as Chlamydomonas reinhardt. However, there is a need to detect microorganisms that are immune to oxygen and that would prove to be good alternatives to produce hydrogen commercially.

Researchers at the National Renewable Energy Laboratory have developed a sensor that detects hydrogen-producing microorganisms through a screening process. The system uses a sensitive film that changes colour at a point where the organism being tested indicates hydrogen presence.

New analysis by Technical Insights, a business unit of Frost & Sullivan (http://www.Technical-Insights.frost.com), featured in the current Industrial Bioprocessing Alert, provides a detailed assessment of recent developments and the use of bio-based products in the fuel cell technology. Copies of the Alert and interviews are available to the press.

Technical Insights is an international technology analysis business that produces a variety of technical news alerts, newsletters, and reports.

Frost & Sullivan, an international growth consultancy, has been supporting clients' expansion for more than four decades. Our market expertise covers a broad spectrum of industries, while our portfolio of advisory competencies includes custom strategic consulting, market intelligence, and management training. Our mission is to forge partnerships with our clients' management teams to deliver market insights and to create value and drive growth through innovative approaches. Frost & Sullivan's network of consultants, industry experts, corporate trainers, and support staff spans the globe with offices in every major country.

Title: Industrial Bioprocessing Alert

Media Contact:

USA:
Julia Paulson
P: 210.247.3870
F: 210.348.1003
E: jpaulson@frost.com

Europe:
Katja Feick
P: +44 (0) 20 7915 7856
F: +44 (0) 20 7730 3343
E: kfeick@frost.com

Asia Pacific:
Pramila Gurtoo
DID: (603) 6204 5811
Gen: (603) 6204 5800
Fax: (603) 6201 7402
E: pgurtoo@frost.com

www.frost.com

Contact Information
Katja Feick
FROST & SULLIVAN
http://www.Technical-Insights.frost.com
0049697703312

Online Web 2.0 Version
You can read the online version of this press release here.