



A Bimetallic Catalyst and Fuel for Use in a **Direct Dimethyl Ether Fuel Cell**



The Problem

At the current rate of global energy demands, new, alternative energy technologies must be developed to accommodate our needs. For more than a decade, it was strongly believed that hydrogen can help address the growing demand for energy and slow down global climate change. Hydrogen fuel is used together with oxygen in an electrochemical cell, which converts their chemical energy into electricity. This technology is called fuel cell. While hydrogen conversion is already technologically feasible, its delivery and storage face serious challenges. The cost of hydrogen storage and delivery is too high for many energy applications, thus impeding the introduction of the hydrogen as a major energy carrier.



The Solution

Our forefront solution replaces the use of hydrogen with Dimethyl Ether (DME). DME can be liquefied under low pressure and produce relatively high energy density. **DME-based fuel cells may become one of the most promising alternative energy technologies due to its high energy density, low cost and physical properties which make it very easy to handle.**



The Commercial Benefit

DME can easily help address the growing demand for energy and tackle the two top hurdles in fuel cells technology: Durability and Cost.

- The cost of DME storage and delivery is low as it can be liquefied under low pressure much like the gas in plastic lighters.
 - DME can harness high energy density, much higher than compressed hydrogen.
- The Commercial Benefit



Market Potential

The Fuel Cells market size is projected to exceed USD 6 billion by 2024, as reported in the latest study by Global Market Insights, Inc. Favorable government policies pertaining to sustainable energy technologies along with increasing demand for fuel cell vehicles will drive up the fuel cell market size.



Target Markets/Industries

Fuel Cells today categorizes the use of fuel cells into three broad areas:

- Portable power generation
- Stationary power generation
- Power for transportation



Intellectual Property

Patent pending



Team: Primary Inventor

Dr. Lior Elbaz

- Has a PhD in chemical engineering, from the Ben-Gurion University, worked at the Los Alamos National Lab, NM, USA for four years and joined BIU in 2013.
- An expert in electrochemistry and electrocatalysis.
- Has been focusing his efforts on fuel cells technology for more than 15 years.
- Head of the Israeli fuel cells consortium (IFCC), composed of 12 leading Israeli labs from across Israel

Team: Ronit Sharabi, Bar Gavriel



Future Research

The alternative energy group, headed by Lior Elbaz is focusing on different aspects of fuel cells and their application in the automotive industry, backup power and drones/UAVs. We would like to continue this work in order to further improve the activity of our catalysts in parallel to the development of a standalone fuel cell unit which works on DME, to be used for various applications.



The Opportunity

We invite Industrial companies to license our patent through a licensing agreement with sponsored research



Keywords

Fuel Cell, Catalyst, Dimethyl Ether, Hydrogen, Electrochemical Cell, Hydrogen Conversion, Dimethyl Ether Oxidation, Polymer Electrolyte, Electrocatalysis