The Office of Technology Management

UNIVERSITY OF TEXAS ARLINGTON

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Continuous Flow Reactor and Hybrid Electro-catalyst for CO_2 Reduction

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TECHNOLOGY NEED

Ever since the beginning of industrial revolution, the rising levels of carbon dioxide in the atmosphere has been a major concern for everyone. The amount of CO_2 in the atmosphere has exceeded 400 ppm and continues to rise causing global warming. This calls for conceptually new methods to capture and convert CO_2 into useful products. Currently available reactors are costly, inefficient, lack selectivity for one product and suffer from rapid reductions in electrolytic activity. Therefore, there is a need for an improved reactor which not only has high catalytic activity but also provides high CO_2 flux to the cathode/electrolyte interface.

INVENTION DESCRIPTION/SOLUTION

Researchers have developed a three phase (CO_2 gas/solid/liquid) system which is known to enhance and extend electrochemical performance. It consists of an electrochemical reactor with a liquid electrolyte that is capable of generating products and a hybrid electro-catalyst that is hydrophilic on one side and hydrophobic on the other. When a gas containing CO_2 is passed through the reactor, the hybrid catalyst provides high selectivity for ethylene and other hydrocarbons. Additionally, the arrangement of the system allows the reactor to automatically separate gaseous products from liquid electrolyte thus increasing production capacity.

APPLICATIONS

- Chemical industries
- Cement industries
- Oil and gas companies
- Lithium air batteries
- Spacecraft applications

KEY BENEFITS

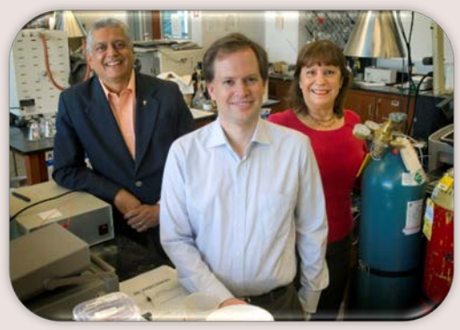
- Efficient CO_2 electrolysis
- High reaction rates
- Simple reactor design
- Gravity independent operation
- Greater wettability
- Reduces carbon dioxide concentration
- Prevents bubble attachment on the surface

STAGE OF DEVELOPMENT

Prototype

INTELLECTUAL PROPERTY STATUS

Provisional



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