rocket-fuel-from-co2

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Rocket Fuel from CO2

This webpage QR code

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The purpose of this platform is to make rocket fuel from CO2 by providing experimentation and development of novel gas to liquids GTL technologies for the utilization and mitigation of carbon dioxide.

PDF Version of the webpage (first pages)

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Rocket Fuel GTL Module $150,000 Experimenters Platform

Inputs: CO2, H20, DC electricity, and Nafion or other membrane catalysts.

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CO2 to Fuels Experimental Developer Platform Processor

The purpose of this platform is to provide experimentation and development of novel gas to liquids (GTL) technologies for the utilization and mitigation of carbon dioxide.

Infinity is now providing experimental platforms for developing modular cart mounted GTL (gas to liquids) fuel processing from CO2. Using Nafion or similar catalysts (available in sheets, tubes, pellets, and more), the inputs are CO2, water, and electricity to make alcohol (ethanol, methanol, and butanol). The selectivity of the output will depend on your formula for the inputs and catalyst.

The Infinity GTL Processor allows you to adjust the flow of CO2, water, and electricity. The platform also allows you to incorporate and modulate in-situ power production, static electricity generation (SEG), and other unique functions.

The processor platform is available in a completed cart or parts in kit form for developers who want to configure their own system.

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CO2 to Rocket Fuel Experimental Developer Platform Processor

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Concept

The concept of a modular GTL processor is to provide a rapid configurable platform to perform experiments and development to advance gas to liquids processing.

This is accomplished by providing a standard catalyst module which can be easily adjusted (mechanically and flow).

The functionality is further enhanced by optional add-ons to incorporate in-situ power production and catalyst tuning using static electricity.

The platform is bolted together with standardized fasteners and can easily be modified.

Parameters

Catalyst: Nafion and other catalysts can be tested or developed for best output.

Electricity: Volts, amps, and frequency can be adjusted for production tuning.

CO2 and Water: Flow, pressure, and temperature can be adjusted.

Rotational Device: Cavitation and other devices can be incorporated into the system.

Instrumentation: Sensors allow real-time processor monitoring and data capture.

Advantages

The biggest advantage of a modular processor platform is time savings from a standardized configuration which allows the user to implement rapid changes on the fly.

Components are accessible and the stainless steel tubing can easily be cleaned.

Instumentation can be extended to wireless monitoring using a smartphone or tablet.

Supercritical CO2 to treat Nafion for Direct Methanol Fuel Cells

Supercritical carbon dioxide treatment was used to enhance performance of NR212. The microstructure of NR212 membranes was reorganized after the Sc-CO2 treatment. The treated NR212 membranes showed higher proton conductivity than Nafion 117. The treated NR212 membranes showed lower methanol permeability than Nafion 117. Direct Methanol Fuel Cell (DMFC) performance of the treated NR212 membranes was better than Nafion 117 (2012). The Nafion-grafted-polystyrene sulfonic acid (N-g-pssa) exhibits higher ion conductivity and lower methanol permeability than that of Nafion 115. The N-g-pssa membranes are tested as electrolytes in a direct methanol fuel cell. Compared with the as-received NR212 membranes, all the Sc-CO2 treated NR212 membranes show higher proton conductivity and better capacity of barrier to methanol crossover. From Fenton test, it can be found that the Sc-CO2 treated NR212 membranes have better chemical stability than that of NR212 membranes. Therefore, NR212 membranes treated by the Sc-CO2 method may be promising candidate electrolytes for DMFC applications (2020).

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