Optimizing Bipolar Membrane Interfaces to Catalyze Water Dissociation

Tech ID: 32348 / UC Case 2019-680-0

BRIEF DESCRIPTION

Researchers at UCI have modified current commercial membranes to enhance efficiency of water dissociation at varying conditions for electrochemical technologies geared towards renewable fuel generation.

SUGGESTED USES

·Fuel cells

·Electrolyzers

·Renewable fuel generation

FEATURES/BENEFITS

Energy efficient

Perform well at non-extreme pH conditions

Membrane modifications are tunable based on needs (e.g. pH conditions)

TECHNOLOGY DESCRIPTION

The researchers at the University of California, Irvine, designed a bipolar membrane for electrochemical applications, which promotes water dissociation at non-extreme acidic and basic conditions.The bipolar membrane consists of an anion exchange layer in contact with a cation-exchange layer admixed with a catalyst that promotes water dissociation.The system is flexible to permits bipolar membranes to be tailor to accommodate any materials.

In addition to finding utility in electrolyzers, these designer bipolar membrane are useful in fuel cells. generation of renewable fuels, most notably reduction of carbon dioxide which is most effectively performed at weak basic conditions.

STATE OF DEVELOPMENT

Numerical models and simulations were performed as proof of concept.Optimization of the membrane is on-going.

PATENT STATUS

Patent Pending

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INVENTORS

» Ardo, Shane

OTHER INFORMATION

CATEGORIZED AS

» **Energy**
» Other
» **Environment**
» Other
» **Materials & Chemicals**
» Chemicals
» Polymers

RELATED CASES

2019-680-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Electric Ratchet Based Ion Pumps

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