High Power Density Electrochemical Energy Conversion Devices

Tech ID: 33692 / UC Case 2024-935-0

BRIEF DESCRIPTION

This invention significantly enhances the power density of fuel cells through precise nanoscale control of the catalyst layer and the introduction of novel catalytic materials.

FULL DESCRIPTION

Researchers at UC Irvine have developed advanced nanofabrication techniques to produce electrochemical energy conversion devices with significantly higher power densities than current solutions. The technology focuses on precise control over the catalyst layer within the membrane electrode assembly (MEA) and the use of novel catalytic materials to improve performance drastically. The process leverages highly controlled templating techniques at nanoscale to produce high-efficiency fuel cells with enhanced active site placement and reduced mass transport losses.

SUGGESTED USES

- Transportation fuel cells for light and heavy-duty vehicles.
- Stationary power generation for zero-emission infrastructure.
- Portable power sources where high energy density is crucial.
- Potential applications in other electrochemical devices requiring high power density.

ADVANTAGES

- Significant improvement in power density over state-of-the-art (SoA) fuel cells.
- Precise nanoscale control of catalyst placement enhances reaction efficiency.
- Integration of novel catalytic materials for improved performance.
- Reduction in mass transport losses and higher catalyst utilization.
- Compatibility with existing membrane electrode assembly designs.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- **Energy**
  - Other

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