Multilayered Iridium Oxide Catalyst For Oxygen Evolution Reaction

Tech ID: 34076 / UC Case 2025-826-0

BRIEF DESCRIPTION

This technology introduces a novel electrocatalyst design that significantly improves stability and activity for oxygen evolution reaction (OER) in acidic environments.

FULL DESCRIPTION

The invention presents a layered electrocatalyst structure designed for proton exchange membrane fuel cells (PEMFCs), comprising a titanium dioxide core, an intermediate iridium dioxide layer, and an outer amorphous iridium oxide layer. This structure leverages the high activity of amorphous iridium oxide and the stability of crystalline iridium dioxide, achieving superior performance through controlled thermal and electrochemical processing.

SUGGESTED USES

- Proton exchange membrane fuel cells (PEMFCs).
- Water electrolysis systems for hydrogen production.
- Energy conversion and storage devices requiring high-efficiency electrocatalysts.

ADVANTAGES

- Enhanced mass activity compared to conventional iridium oxide catalysts.
- Increased stability through the innovative layer design.
- Optimized iridium utilization, reducing the required loading of expensive material.
- Improved in-plane conductivity and coverage without increasing iridium loading.
- Compatibility with harsh acidic conditions of PEMFCs.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

iridium oxide, catalyst, supported catalyst, multi-layer catalyst

CATEGORIZED AS

- **Energy**
  - Bioenergy
  - Other

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