Palladium Based Catalyst For Co2 Reduction With High Co Tolerance

Tech ID: 33892 / UC Case 2022-727-0

BRIEF DESCRIPTION

An innovative Palladium hydride catalyst that significantly enhances the electroreduction of carbon dioxide (CO2) to formate with exceptional tolerance for carbon monoxide (CO).

FULL DESCRIPTION

This technology introduces a hydrogen-rich Palladium (Pd) hydride catalyst, synthesized through a one-step solvothermal process for the electrocatalytic reduction of carbon dioxide (CO2). This catalyst surpasses commercial Pd catalysts in its efficiency and lifetime, setting a new benchmark for Pd-based catalysts in CO2 capture and conversion. The superior performance of this catalyst is attributed to its high carbon monoxide (CO) tolerance, which is crucial for maintaining long-term activity and selectivity.

SUGGESTED USES

- Environmental technology for CO2 capture and conversion.
- Manufacture of formic acid, acetate, oxalate, and other valuable chemicals.
- Renewable chemical synthesis and green energy storage solutions.
- Industrial processes requiring high-efficiency CO2 conversion technologies.

ADVANTAGES

- Exceptional faradaic efficiency of 93.1% towards formate production.
- Record-setting working lifetime of 4 hours, surpassing current commercial catalysts.
- High tolerance to CO, overcoming a common limitation of Pd-based catalysts.
- Derived from a straightforward one-step solvothermal synthesis.
- Applicable for a wide range of CO2 electroreduction products beyond formate.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20230099785	03/30/2023	2022-727

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OTHER INFORMATION

CATEGORIZED AS

- **Energy**
  - Other
- **Materials & Chemicals**
  - Chemicals
  - Nanomaterials
- **Research Tools**
  - Reagents

RELATED CASES

2022-727-0

RELATED MATERIALS

» Guo, S., Liu, Y., et al. Atanassov, P. (2022). Robust palladium hydride catalyst for electrocatalytic formate formation with high CO tolerance. Appl. Catal., B. 316.

STATE OF DEVELOPMENT

Catalysts synthesized and tested on a select scope of substrates.

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