

Can formic acid be removed from the electrolyte?

The development of new and efficient separation technologies to remove formic acid from the electrolyte can significantly improve the economics of CO₂ to formic acid.

Do electrolyzers affect the concentration of formic acid and formate in CO₂ RR?

It has been well documented in the literature that the concentration of formic acid and formate in CO₂ RR is influenced by the choice of electrolyzers.

Does CO₂ RR improve the performance of formic acid and formate-producing electrocatalysts?

In this review, some fundamentals of CO₂ RR to formic acid and formate (e.g., cell design and molecular mechanism) and the critical aspects that must be considered to improve the performance of formate-producing electrocatalysts (i.e., overpotential, selectivity, and stability) are first provided.

Can electrolyzers produce formic acid at high concentrations?

Designing the electrolyzer has been reported to be an effective strategy for producing formate, as well as other products, at high concentrations. For example, a three-compartment cell configuration by Yang et al. [40,41] can produce formic acid at high purity and high concentration (up to 15-18 wt%).

Do electrode electrocatalysts produce high-concentration products (formic acid/formate) in CO₂ RR?

Although few reports have been focused on the studies of high-concentration products (formic acid/formate) in electrode electrocatalysts of CO₂ RR, we will review especially electrode design strategies that produce high-concentration of formic acid/formate via increasing FE, current densities, and keeping stable long-term operation simultaneously.

Can electrolyte-less systems reduce the cost of downstream separation of formic acid/formate?

Designing electrolyte-less systems with suitable membranes (CEM or AEM) can effectively avoid the limited solubility of CO₂ and reduce the cost of downstream separation of formic acid/formate. It is a good strategy to gain high-concentration formic acid/formate.

Here, we propose a two-step pervaporation system with a high-silica CHA (chabazite) membrane, which has sufficient resistance to water and acid, to demonstrate the ...

This increases the concentration of formate/formic acid in the electrolyte resulting in a higher sensitivity in quantifying formic acid through the analysis technique. As can be ...

5 ???· A promising design to produce high-purity liquid products is using a solid-electrolyte layer in the reactor, which has been reported to achieve high formic acid purity of nearly 100 ...

Here we demonstrate continuous electrochemical CO₂ reduction for formic acid production at 2 M at an industrial-level current densities (i.e., 200 mA cm⁻²) for 300 h on ...

Climate change damage induced by growing carbon dioxide (CO₂) emissions has rapidly fostered research on capturing, utilizing, and converting CO₂ into valuable C₁ and C₂ chemicals. In ...

The pH of the electrolyte solution has not only a strong influence on the electrochemical reduction process of CO₂, but also on the downstream separation of (dilute) ...

With this mixture of organic compounds in the electrolyte, the product of its reduction may be methane, ethylene, ethanol, formic acid and other higher hydrocarbons or ...

Formic acid (FA) and potassium iodide-based electrolyte system have been synthesized for the fabrication of energy storage devices, supercapacitors. The diluted formic ...

SOLUTION: The electrolyte for an electrolytic capacitor uses water as a main solvent, formic acid or its salt, and adipic acid or its salt as a solute with aminopolycarboxylic being added. The ...

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A Novel High-performance All-liquid Formic Acid Redox Fuel Cell: ... electrolyte from 0.05 to 1.2 V vs. RHE at a scan rate of 50 mV s⁻¹. Supplementary Note 3 The calculation details of the Bi ...

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