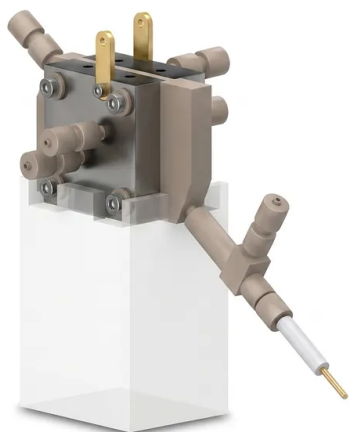


Multifunctional Gas Diffusion Membrane Electrode Assembly Electrochemical Cell For Carbon Dioxide Reduction And Solid State Electrolysis

Item Number: PL-DJ38



Introduction

Optimize carbon dioxide reduction research using this multifunctional gas diffusion membrane electrode assembly electrochemical cell featuring high purity titanium and PEEK modular components designed for highly versatile three in one laboratory catalytic testing configurations

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Application	Description	Key Benefit
CO2 Reduction to Gas Products	Utilizing the gas diffusion electrode (GDE) configuration to reduce carbon dioxide into carbon monoxide or ethylene at high current densities.	Minimizes mass-transport limitations, allowing direct gas-phase feed to the catalyst surface for high reaction rates.
Direct Liquid Product Synthesis	Using the solid-state electrolyte configuration to directly synthesize pure liquid fuels (e.g., formic acid, acetic acid) without liquid electrolyte dilution.	Eliminates complex downstream separation processes, yielding high-purity liquid chemical streams directly from the cell.
Zero-Gap MEA Performance Testing	Operating in the membrane electrode assembly (MEA) mode to evaluate the performance of zero-gap electrolyzer cells under varied humidity and pressure.	Maximizes electrical conductivity and minimizes ohmic resistance, reflecting commercial-scale electrolyzer performance.
Electrocatalyst Durability Profiling	Conducting long-term constant-current or constant-voltage degradation tests on novel precious and non-precious metal catalysts.	Outstanding mechanical and chemical stability of PEEK and Titanium ensures zero material degradation or contamination over hundreds of hours.
Alkaline Water Electrolysis	Employing the optional high-purity nickel component to study oxygen and hydrogen evolution reactions in alkaline media.	Provides an optimized electrochemical environment specifically tailored for industrial-relevant alkaline electrolysis conditions.
Acidic Membrane Testing	Evaluating proton exchange membranes (PEM) and acidic catalysts for carbon dioxide and water electrolysis systems.	High-purity titanium flow plates offer exceptional resistance to acid corrosion and prevent metal ion poisoning of the membranes.

Parameter	Specifications & Details (Model: PL-DJ38)
Model Number	PL-DJ38
Active Flow Area	10 mm × 10 mm
External Dimensions	50 mm × 50 mm
Standard Structural Material	Medical-Grade Polyetheretherketone (PEEK)
Flow Plate Material (Components A & C)	High-Purity Titanium (Nickel optional for Component C)
Chamber B Geometry	I-shaped (□□□) structural chamber
Chamber B Center Thickness	1.2 mm
Electrode Distance (Gas Diffusion Mode)	1.6 mm (Anode to Cathode distance)
Flow Field Design	Serpentine flow channels (Components A and C)
Sealing System	Stacked compression sealing with fluoropolymer gaskets

Parameter	Specifications & Details (Model: PL-DJ38)
Reference Electrode Integration	Component D pipeline and tubing assembly included
Operating Configurations	<ol style="list-style-type: none">1. Gas Diffusion Mode (Components A + B + C + D)2. Solid-State Electrolyte Mode (Components A + B + C)3. Membrane Electrode Assembly Mode (Components A + C)
Max Operating Temperature	120°C (limited by sealing materials and membranes)
Gas/Liquid Port Connections	Threaded fittings compatible with standard laboratory tubing