

HIGHLY EFFICIENT LOW PGM CATHODE CATALYST FOR AEM WATER ELECTROLYSIS

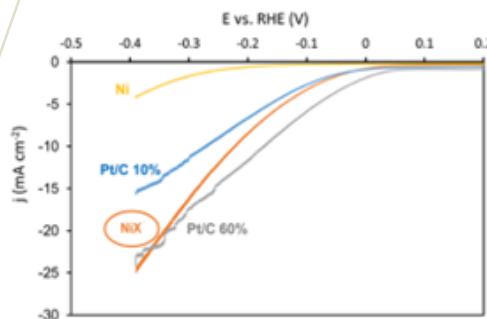
Single-step fabricated cathode catalyst, optimized with minimal precious metals, achieving high efficiency for hydrogen production in AEM water electrolysis.

PRESENTATION

Electricity cost is one of the main expenses in water electrolysis, so improving conversion efficiency in electrolyzers is crucial.

Our innovative Anion Exchange Membrane (AEM) water electrolysis cathode catalyst rivals the efficiency of Carbon-Platinum (Pt/C) at a much lower cost. It combines nickel with a small amount of a Platinum Group Metal (PGM) through a unique one-step synthesis.

In a three-electrode setup at 20°C and 0.1 mol/L KOH with a 10 mA/cm² current density, pure Ni stands at -280 mV overpotential, while our catalyst shows -110 mV, close to Pt/C 60%'s -105 mV, thus enhancing both affordability and performance in hydrogen production. At 1 mol/L KOH, our catalyst's overpotential even drops to -65 mV, versus -50 mV for Pt/C 60%.



Current-voltage curve measured at 10 mV/s in
0.1 M KOH

APPLICATIONS

Hydrogen production

INTELLECTUAL PROPERTY

Patent

CONTACT

+33 (0)1 44 23 21 50

industriels@erganeo.com

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Anion exchange membrane water electrolysis - Hydrogen evolution
Hydrogen production - Ultra-low PGM content
Nickel-based catalyst - One-pot synthesis

COMPETITIVE ADVANTAGES

- One-step material synthesis
- Cost-efficient catalyst
- Higher production efficiency

DEVELOPMENT PHASE

TRL 3

Experimental Proof of Concept - Researchers have validated the cathode's effectiveness in lab experiments, testing different compositions and synthesis methods to optimize the material for hydrogen production.

LABORATORIES

Université Paris Cité - CNRS - Ecole Polytechnique