European Institute
for Energy Research
by EDF and KIT

CREATE

Critical raw materials elimination by a top-down approach to hydrogen and electricity generation

Key Facts

Funding Agency
HORIZON 2020

Project Call
NMBP-03-2016

Duration
01/2017 – 06/2020

Coordinator
Institut Charles Gerhardt Montpellier, Equipe AIME, CNRS - Université de Montpellier

Partners

- Institute of Chemical Research of Catalonia (ICIQ)
- Aalto University Finland
- FUMATECH BWT GmbH
- The Technion-Israel Institute of Technology
- ITM Power
- University of Rome Tor Vergata
- Forschungszentrum Jülich GmbH
- PRETEXO
- Northeastern University, USA

Website
http://www.create-energy-h2020.eu/

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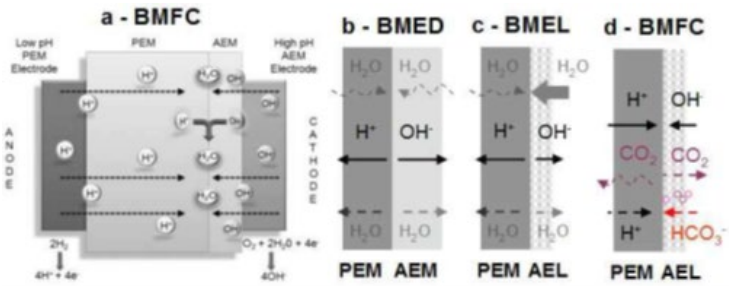
Project Objectives

CREATE aims at developing innovative membrane electrode assemblies (MEAs) for low-temperature fuel cells / electrolysis cells at much reduced cost. This will be achieved via elimination or drastic reduction of critical raw materials in their catalysts, enabling cost-efficient solutions to reversibly store electricity in the form of H2. To overcome the limitations of actual technologies, a dual strategy is considered:

1. Shifting from PEM-based cells to pure anion-conducting polymer electrolytes: highly active PGM-free or ultralow-PGM catalysts at high pH

2. Shifting from PEM-based cells to bipolar-membrane polymer electrolytes: bipolar membranes with low-pH electrode (fuel side) and high-pH electrode (oxygen side)



a) Bipolar-Membrane Fuel Cell (BMFC) with low-pH anode & high-pH cathode;

b) Bipolar-Membrane design currently applied,

c) Expected advantage of a porous anion-exchange layer (AEL) for the design of BM with improved water transport to the junction, or

d) Improved CO2 removal from the junction in BMFC.

EIFER's Contribution

- Project Management
- Definition of test protocols, cost analysis and Life Cycle Analysis of CREATE cells
- Cell assembly and cell testing
- Evaluation of different membrane assemblies under fuel cell, electrolysis and reversible profiles
- Dissemination and exploitation

Contact

Dr. Julian Dailly
+49 (0) 721 6105 1352
julian.dailly@eifer.org

EIFER - Europäisches Institut für Energieforschung EDF-KIT EWIV
Emmy-Noether-Straße 11
76131 Karlsruhe, Germany
www.eifer.org

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