

Fuel cell and electrolyser trials

Polarisation curve tests. Electrochemical profiling tests, such as cyclic voltammetrics, chronoamperometry and linear sweep voltammetry, and impedance frequency response analysis. Crossover tests.

GRUPO DE INVESTIGACIÓN



UNIVERSIDAD POLITÉCNICA DE MADRID

Contact information

Address: Escuela Técnica Superior de Ingenieros Navales; Avenida de la Memoria, 4; 28040, Madrid; España

Phone number: 910676267

Website: blogs.upm.es

Email: teresa.leo.mena@upm.es

Technological Offers type

Technological scientific services

Research and innovation areas

- [Climate, Energy and Mobility](#)

ODS



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Where?

Fuel Cells, Hydrogen Technology and Alternative Engines

Keywords: | Chronoamperometry | Cyclovoltammetry | DMFC | Electrochemical characterization | fuel cell | Hydrogen | methanol | PEMFC | polarization curve | trial | voltammetry

Fuel cell and electrolyser development trials

Description of the services offered

PiCoHiMa offers a wide range of trials applicable to the development of fuel cells and electrolysers, as well as their main components (electrodes, membranes and bipolar panels). Polarisation curve tests. Electrochemical profiling tests, such as cyclic voltammetrics, chronoamperometry and linear sweep voltammetry, and impedance frequency response analysis. Crossover determination.

Needs requested and applications

The development and manufacture of fuel cells and electrolysers is a complex, constantly evolving field. The need to reduce catalyser load or increase performance are just two targets that research centres and businesses in the industry spend a large part of their research and development efforts on. All these developments need to be tested at various levels, from laboratory level for each one of the components up to prototype level for the final arrays. These tests need specialist equipment and knowledge in order to interpret the results correctly and propose improvements, if necessary. PiCoHiMa has all the equipment and knowledge needed to do these tests. Therefore, PiCoHiMa offers its experience in the field to research centres and businesses, enabling significant time saving.

Sector or area of application

- Development and manufacture of electrodes for fuel cells and electrolysers
 - Development and manufacture of bipolar panels for fuel cells and electrolysers
 - Development and manufacture of PEMFC and DMFC fuel cells
 - Development and manufacture of AE and PEME alkaline electrolysers
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Differential skills

PiCoHiMa Group's economical/financial structure means it can do profiling and testing work on fuel cells and electrolysers at a highly competitive cost. Constant research work in the field means that it has extensive experience and fully up-to-date know-how.

Previous references for provision of services

PiCoHiMa, along with the Universidad Politécnica de Valencia, CSIC e INTA and the Universidad Rovira i Virgili de Tarragona, has taken part in projects in the State Plan for knowledge generation and in the Community of Madrid (ENE2007-67584-C03-03ALT, ENE2011-28735-C02-02, S2013MAE-2975, ENE2014-53734-C2-2-R and ENE2017-86711-C3-2-R). Amongst other activities, PiCoHiMa was responsible for the study and development of electrodes, materials for fuel cell components, and testing and profiling electrodes and membranes for direct methanol fuel cells developed in those projects.

Equipment description

PiCoHiMa has the following equipment:

- Laboratories:
 - HTSEN Fuel Cell Laboratory
 - HTSEN Fuel Cell and Alternative Fuels Laboratory
 - HTSEAS Alternative Engines Laboratory
 - Equipment:
 - Fuel Cell single cells for MEA testing
 - Testing benches for fuel cells and direct alcohol electrolyser with the ability to simulate environmental conditions
 - Equipment for manufacturing parts and preparing samples: lathes, CNC milling machines, thermostatic presses, 3D printers and other tools
 - Equipment for manufacturing and preparing electrodes, with electrodeposit, chemical deposit, electronic evaporation and sputtering
 - Equipment for profiling electrodes, MEAs and stacks: frequency response and potentiostat/galvanostat analysers, ultramicroscales and optical microscopes
 - Software:
 - Design and simulation: Rhinoceros, AutoCAD, SolidWorks, CATIA, ANSYS
 - Naval architecture: MAXSURF, MARS
 - CFD: OpenFOAM
 - Engineering: MATLAB, SIMULINK
 - Thermodynamics: REFPROP
 - Fuel cells: Aero-Marine DMFC Designer®, MedPEM®
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Request for service

To request the service, contact the Group's Head Researcher, Professor Teresa J. Leo via her e-mail (teresa.leo.mena@upm.es) or use the contact form on the PiCoHiMa web site(<https://blogs.upm.es/picohima/>).