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# Electrochemical Characterization Laboratory

The research focus at the Electrochemical Characterization Laboratory at NREL's Energy Systems Integration Facility (ESIF) is evaluating the electrochemical properties of novel materials synthesized by various techniques and understanding and delineating the reaction mechanisms to provide practical solutions to PEMFCs commercialization issues of cost, performance and durability. It is also involved in the development of new tools and techniques for electrochemical characterization.

## Laboratory Specifications

The laboratory is equipped with state-of-the-art instrumentation that permits the synthesis, electrode preparation and comprehensive electrochemical characterization of novel electrocatalysts and supports for PEMFCs. Gas manifolding to specific workstations allows different reactions to be probed.

The laboratory is also equipped with potentiostats, electrochemical half-cells, wet-chemical synthesis set-ups and electrode preparation capabilities that provides a comprehensive characterization of materials and interfaces especially those related to fuel cell technology.

Chemical hoods and HEPA filters are present in the lab to allow work with nanoparticles.

- Determination of fundamental electrochemical parameters
- Estimation of electrocatalyst utilization

## Partner with Us

Work with NREL experts and take advantage of the state-of-the-art capabilities at the ESIF to make progress on your projects, which may range from fundamental research to applications engineering. Partners at the ESIF's Electrochemical Characterization Laboratory may include:

- PEMFC industry
- Certification laboratories
- Automotive fuel cell industry
- Fuel cell component suppliers
- U.S. and foreign Universities
- Other National laboratories

## Major Laboratory Equipment

- Conductivity measurement station
- Ovens
- Explosion proof refrigerators

## Application Scenarios

The laboratory concentrates on the development and characterization of new materials for PEMFCs such as electrocatalysts, catalyst supports in terms of electrochemical activity, electrochemical surface area and corrosion/durability. The impact of impurities and/or contaminants on the catalyst activity is also under study.

### Experiments that can be performed include:

- Determination and benchmarking of novel electrocatalyst activity
- Determination of electrochemical surface area
- Determination of electrocatalyst and support corrosion resistance and durability
- Synthesis and characterization of novel electrocatalyst

## Contact Us

If you are interested in working with NREL's Electrochemical Characterization Laboratory, please contact:

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