Fuel Cell Research Advancing on Many Fronts

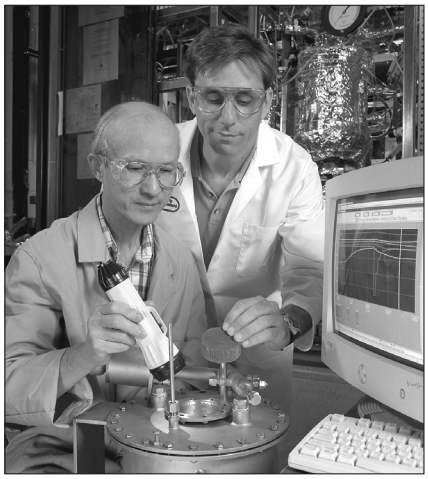
Commercially viable fuel cells are critical to reducing our nation's dependence on petroleum for transportation fuel. Long a leader in the field of fuel cell research, Argonne National Laboratory has produced several award-winning and patented advances in the areas of materials, methods, and concepts for fuel cells and fuel processing. From state-of-the-art testing and analysis capabilities to development of sophisticated fuel reformers and catalysts, Argonne is well-represented at the leading edge of fuel cell development.

Fuel Processors and Catalysts for Polymer Electrolyte Fuel Cells

Polymer electrolyte fuel cells (PEFCs) are a preferred fuel cell technology for many transportation applications. Until a widespread hydrogen refueling infrastructure exists, though, methods are needed to convert today's readily available fuels into hydrogen for PEFCs. Argonne's compact, fuel-flexible processor meets that need in a compact, efficient package.

Using Argonne's award-winning autothermal reforming catalyst, the Argonne fuel processor operates at lower temperatures than any other fuel processor capable of converting gasoline. Unlike most conventional catalysts, the Argonne autothermal reforming catalyst can tolerate the sulfur present in most petroleum-based fuels.

The Argonne flexible-fuel processor is currently undergoing engineering tests; the Argonne autothermal reforming catalyst has been licensed by Süd-Chemie Inc.



Researchers examine the Argonne fuel-flexible processor during testing

For more information please visit www.transportation.anl.gov/ttrdc/fuelcell/reformer.html or contact Romesh Kumar (630-252-4342, kumar@cmt.anl.gov).

Fuel Cell Testing Facility

The Fuel Cell Testing Facility (FCTF) provides fuel cell developers with reliable, standardized, and unbiased performance evaluations. It is equipped to test fuel cell stacks and systems up to 80 kW, the size needed for a passenger car. The brain of the facility is a computer-controlled electronic load system that can simulate the power demands of a vehicle. The heart of the facility is a sophisticated gas management system that supplies air and fuel to the fuel cell with precise control of flow rate, pressure, temperature, and humidity. The fuel can be hydrogen, gasoline, or simulated reformate. In automated test laboratories, researchers conduct experimental evaluations to identify existing and potential failure mechanisms and assess component reliability. Equipped with extensive and specialized hardware and computing power, the FCTF is ideally suited to the complex task of testing fuel cell systems, including how well fuel cell stacks and supporting components interact.

Argonne researchers test a fuel cell stack at the Fuel Cell Testing Facility.

For more information, please visit www.cmt.anl.gov/facilities/fctf.shtml or contact Ira Bloom (630-252-4516, bloom@cmt.anl.gov).

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