

TechBriefs

Savannah River National Laboratory

U.S. DEPARTMENT OF ENERGY • SAVANNAH RIVER SITE • AIKEN • SC

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Benefits

- > Low cost production of efficient catalysts
- > Precious metal free catalysts
- > Single step formulation
- > Tailored porosity, surface groups, and metal doping
- > Electrically conductive materials

Applications

- > Fuel cells
- > Electrolysis
- > Heterogeneous catalysis
- > Catalyst support
- > Gas separation

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Non-Platinum Group Oxygen Reduction Reaction Catalysts

Technology Overview

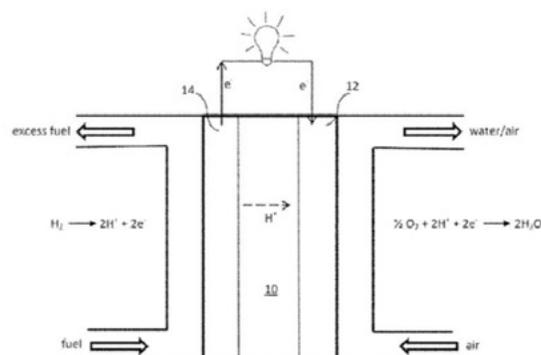
Savannah River National Laboratory (SRNL) has developed novel methods for producing non-platinum group metal electrocatalysts effective for the reduction of oxygen in fuel cells and other electrochemical reactions.

Description

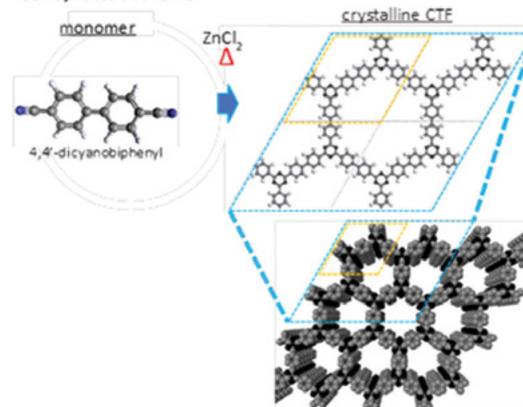
SRNL has developed state of the art methods for forming oxygen reduction reaction catalysts. This method can include reacting monomers in a melt in the presence of a Lewis acid catalyst to form a three-dimensional polymeric framework. Linkages formed between the monomers upon reaction can include at least one heteraryl group that contain at least one nitrogen hetero atom, which is available to form a coordinate bond with a metal ion. The electrocatalyst may optionally include additional chelates to modulate the electrocatalytic activity. These materials can be used in membrane electrode assemblies can be designed for use in low temperature fuels cells.

Intellectual Property

This technology and methods for its use have been granted U.S. Patent No. 10,409,852 B2 (November 26, 2019), "Non-Platinum Group Oxygen Reduction Reaction Catalysts" and is available for licensing.



COF synthesis scheme



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Technology transfer

The Savannah River National Laboratory (SRNL) is the U.S. Department of Energy's (DOE) applied research and development laboratory at the Savannah River Site (SRS).

With its wide spectrum of expertise in areas such as homeland security, hydrogen technology, materials, sensors, and environmental science, SRNL's cutting edge technology delivers high dividends to its customers.

The management and operating contractor for SRS and SRNL is Savannah River Nuclear Solutions, LLC. SRNS is responsible for transferring its technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

Partnering opportunities

SRNS invites interested companies with proven capabilities in this area of expertise to develop commercial applications for this process under a cooperative research and development agreement (CRADA) or licensing agreement. Interested companies will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention. Qualifications should include past experience at bringing similar products to market, reasonable schedule for product launch, sufficient manufacturing capacity, established distribution networks, and evidence of sufficient financial resources for product development and launch.

SRNL-L1100-2020-00XXX



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