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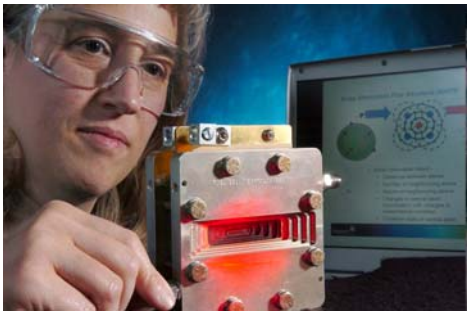

Professional Experience at Argonne National Laboratory

- **January 2003–Present.** Leader, Hydrogen and Fuel Cell Materials Group in the Catalysis and Energy Conversion Theme of the Chemical Sciences and Engineering Division. Research activities include high-temperature polymer electrolytes and non-platinum electrocatalysts for polymer electrolyte fuel cells; fundamental studies of electrocatalyst degradation mechanisms; high-temperature steam electrolyzer materials, designs, and degradation analyses; materials development for thermochemical hydrogen production cycles; and *in situ* X-ray studies of solid oxide fuel cell and electrolysis cell electrodes.
- **January 2003–June 2008.** Operating Agent for the International Energy Agency's "Polymer Electrolyte Fuel Cell**"** Annex. Responsible for coordinating and chairing semi-annual international workshops on various aspects of polymer electrolyte fuel cell development.
- **April 2002–December 2002.** Leader, Solid Oxide Fuel Cell Group. Supervised four staff scientists/engineers in developing cathodes, metallic bi-polar plates, and sulfur-tolerant anodes for intermediate-temperature solid oxide fuel cells.
- **December 2001–April 2002.** Leader, Shift Catalysis Group. Supervised a staff scientist and a staff engineer in developing water-gas shift catalysts for automotive fuel processors.
- **April 1992–December 2001.** Chemist, Advanced Fuel Cell Materials, Monolithic Solid Oxide Fuel Cell Technology Advancement, and Fuel Cell Technology Transportation Applications groups. Development and electrochemical testing of intermediate temperature solid state fuel cells, and of monolithic solid oxide fuel cells. Her major accomplishments in this program were determination of the viability of aluminates as fuel cell electrolytes, and elucidation of the steps in the cell reaction mechanism that limit the performance of the thin-electrolyte solid oxide fuel cells. She conducted research on polymer electrolyte and direct methanol fuel cells and on fuel processing catalysts for on-board reformers for automotive fuel cell systems. Her technical accomplishments include developing an anode catalyst more resistant to fuel impurities than the state-of-the-art platinum catalyst, and demonstrating that one of the performance-limiting processes in direct methanol fuel cells, methanol crossover, can be dramatically reduced by using an anion-conducting polymer membrane electrolyte rather than the conventional proton-conducting electrolyte. A notable achievement of her technical work in the area of water-gas shift catalysis for fuel processors was the development of a water-gas shift catalyst that is more durable, yet as active as commercial catalysts.
- **October 1989–April 1992.** Postdoctoral Appointee, Aqueous Corrosion Group. Developed a method for obtaining reproducible kinetic data for the copper deposition reaction that allowed determination of the rate constants for the individual reaction steps in this corrosion-related process. Determined the threshold oxide coverage and the oxidation potential for roughening of platinum in an electrochemical environment using in situ X-ray reflectivity.

Education

- Ph.D., Chemistry, University of Illinois, Urbana-Champaign, IL, 1989
- B.A., Chemistry, Knox College, Galesburg, IL, 1984

Awards

- Pacesetter Award, Argonne National Laboratory (2004)
- DOE Hydrogen Program R&D Award for solid oxide fuel cell and water-gas shift catalysis development (2004)
- DOE National Laboratory Fuel Cell R&D Award for Autothermal Fuel Processing Technology for Automotive Fuel Cells (2000)
- Phi Lambda Upsilon (1989)
- Phi Beta Kappa Honor Society (1984)

Career Activities & Highlights

- Materials development and characterization to improve the durability, lower the cost, and reduce the size and weight of fuel cell power and hydrogen production systems, including the following projects: non-Pt cathode electrocatalysts for polymer electrolyte fuel cells, ethanol electro-oxidation catalysts, cathode electrocatalyst degradation mechanisms, in situ X-ray studies of polymer electrolyte fuel cell cathode electrocatalysts, and studies of polymer electrolyte fuel cell stacks and membrane-electrode assemblies for transportation applications.
- Development and characterization of materials for fuel processors, direct methanol fuel cells, and solid oxide fuel cells, and characterization of electrochemical systems, including projects in the following areas: high-temperature low-humidity polymer electrolyte materials, in situ X-ray of solid oxide fuel cell cathode electrocatalysts, bipolar plate-supported solid oxide fuel cells, high performance electrodes for high-temperature steam electrolysis, SO_3 electrolysis for the thermo-chemical production of hydrogen, sulfur-tolerant solid oxide fuel cell anodes, water-gas shift catalysis, X-ray absorption spectroscopy of direct methanol fuel cells, anion-conducting membranes for direct methanol fuel cells, effect of underpotentially-deposited layers on outer sphere electron transfer reactions, heterogeneous electron transfer kinetics at high temperatures and pressures, X-ray reflectivity studies of the electrochemical interface, electrochemical and electron spectroscopic study of mixed adlattices on polycrystalline and single crystal platinum electrodes, the electrochemical synthesis of high temperature superconductors, and surface science studies of corrosion inhibition by phosphonates.

Publications and Patents

- Patents: 3
- Journal Publications & Book Chapters: 24
- Reports: 20
- Conference Proceedings: 30
- Conference Presentations: 90+