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The World's Fuel Cell Solutions Provider

NexTech's business strategy is to expand its manufacturing and materials technologies to meet the needs of the emerging commercial fuel cell market. NexTech sees the immediate role of fuel cell technology as a means to use hydrocarbon based fuels efficiently and in an environmentally responsible manner. We focus our product development on the critical issues faced by all organizations that are commercializing hydrocarbon fuel cell systems for military, stationary, portable, and transportation applications. These issues include obtaining high efficiency and reliability at a competitive cost, and fuel cell compatibility with sulfur containing fuels including diesel, natural gas, and propane. Our solutions range from materials to components to stack designs that meet real application requirements.



Founded in 1994, NexTech has established a reputation for innovation and performance through its development of ceramic materials and components. Specifically, our team of scientists and engineers has developed proprietary, high volume processes to manufacture the active components of solid oxide fuel cells (SOFCs) utilizing our unique electrolyte and electrode materials. NexTech has recently moved its operations into a 56,000 square foot facility and has begun offering SOFC components commercially. In addition we are developing catalysts and sensors for fuel processing applications, with non-pyrophoric water-gas shift catalyst materials available for purchase. NexTech's advanced fuel cell and catalyst materials can be purchased in quantities from 50 g to 20 kg directly from our Fuel Cell Materials division via its website: www.fuelcellmaterials.com. We welcome inquiries for quantity contracts.

NexTech also offers custom materials and component fabrication services. We have successfully helped our clients fashion new components and redesign prototype products for improved manufacturability. Our core strengths in ceramic processing science and structure/property relationships, combined with diverse and state-of-the-art synthesis and fabrication technologies, provide a unique capability for designing and producing planar and tubular components for solid oxide fuel cells and other applications.

What can we do for you?



The Technology

NexTech's reputation has been built by delivering materials solutions to its clients. These solutions begin with the intimate understanding of the importance of controlling the physical and chemical properties of ceramic materials. Small changes to chemical composition, surface area particle size, and surface chemistry, among other factors, can significantly impact downstream processing and the performance of the fabricated component. NexTech has invested millions of dollars in establishing world-class processes and facilities for synthesizing ceramic powders by wet-chemical and conventional calcination methods, and for regulating particle morphology during milling and drying. The breadth of powder characterization and materials testing tools available to NexTech augments our materials development work.

Component fabrication requires mastery of processing techniques and methods specific to each material, component geometry and application. For tubular components, such as those used in solid oxide fuel cells and electrochemical ceramic oxygen generators, NexTech has developed extrusion processes for fabricating ceramic tubes with specialized porosity and geometry. NexTech utilizes a patented ultrasonic-spray deposition method to apply electrolyte films and functional coating layers onto these tubular components. For planar components, NexTech has established tape casting, lamination and screen printing processes to produce multi-layer cells with controlled density and microstructure within individual layers. These planar components can be fabricated in circular, square, or rectangular shapes, to accommodate any of the planar SOFC designs being pursued today. The availability of a diverse set of ceramic fabrication techniques, along with the experience in adapting these techniques for a range of component geometries, makes NexTech a complete solutions provider for your SOFC component development needs.

NexTech scientists have generated improved catalysts for fuel processing. Our initial research into water-gas-shift catalysts is being extended to hydrocarbon reforming catalysts, with a primary focus on working with sulfur containing fuels. The core to NexTech's catalyst work is the use of innovative synthesis methods to achieve highly dispersed metallic catalysts onto oxide supports, with the primary benefits of high catalytic activity and exceptional long-term stability. We also have defined scalable processes for coating the materials onto ceramic and metallic monoliths, which provide a robust platform for incorporating these advanced catalysts into reactors. Our research is being extended into combining catalysts with membrane separation technology. In parallel, NexTech has been developing inexpensive, ceramic-based sensors for monitoring gaseous impurities (such as carbon monoxide and hydrogen sulfide) in reformed hydrocarbons. These sensors will be critically important to any fuel cell systems that operate using existing fuels (e.g., natural gas, propane, gasoline or diesel).

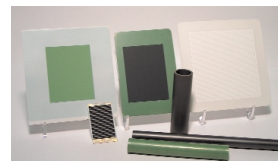
Cooperative Development

Through cooperative development arrangements, clients are leveraging the materials and processing expertise of NexTech to fashion materials, components and processes in order to accelerate their individual programs. The scientists and engineers at NexTech are responsive to the clients before, during, and after the project, making certain that progress, communications and results meet or exceed expectations. NexTech understands the importance of intellectual property in our industry and our agreements are designed to maximize the benefit for all the parties.



Fuel Cell Components

NexTech has brought many of its ideas and inventions from R&D to commercial availability. NexTech has undergone significant expansion in component production, with a larger clean room, more and larger furnaces, and greater capacity for component fabrication and testing. Available components include high-performance electrolyte-supported planar solid oxide fuel cells for benchmarking, prototyping, research and demonstrations. NexTech also offers water-gas-shift catalysts in powdered form or supported on ceramic monoliths. Several gas sensors are in testing and initial products should be available in 2005.



Advanced Materials

NexTech produces nanoscale and micron-scale zirconia- and ceria-based materials for SOFC and catalyst applications. These materials are available in aqueous suspension and powder forms. A wide range of high performance perovskite cathode materials (manganite, ferrite and cobaltite), including patent-pending composite cathodes, and specialized anode materials (NiO/YSZ and NiO/GDC) are available in powder form and as screen-printing inks. Standard materials usually ship within a day. NexTech welcomes your requests for materials with custom specifications and prides itself on being able to deliver custom formulations usually within three weeks.



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