



High Temperature Ionic Conductivity Material For Fuel Cells

AzTE Case # M5-100

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Intellectual Property Status:

Patent pending

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Background

Polymer electrolyte membrane fuel cells (PEM-FCs) are becoming an increasingly important technology in both stationary and mobile applications. Problems impeding the development of fuel cell technology mainly involve electrocatalysts and electrolyte membranes. Commercially available membranes limit the operating temperature range to an approximate maximum of 80°C, and consequently, catalyst poisoning can result from overheating, creating serious problems.

Invention Description

To overcome these problems, researchers at ASU have developed membrane materials for PEM-FCs that can operate at temperatures up to 200°C. Operation at such high temperatures improves the CO tolerance of Pt electrodes, and allows for use of 'dirty hydrogen'. Furthermore, this technology does not require hydration nor use of other problematic materials such as phosphoric acids for operation.

Potential Applications

- Backup power generation
- Portable systems
- Automotive industries

Benefits and Advantages

- Material can function up to 200°C and requires no cooling
- Material can function with hydrocarbon fuels
- Material exhibits endurance to harsh physical conditions and overcomes 'catalyst poisoning'
- No hydration needed
- Multiple approaches to fabrication make the technology better suited to market fabrication.