



High Temperature PEM

POTENTIAL MARKET APPLICATIONS

Chemical Applications

Transportation and Automotive

Fuel Cells

Dialysis Equipment

Ultrafiltration

BENEFITS

Crosslinking allow for the density of the ionic functional groups to be increased, which means tougher membranes with higher IECs

Design prevents membranes from changing at higher temperatures

New material has enhanced water management

Membranes have high conductivity and efficiency

INTELLECTUAL PROPERTY

US PATENT #7,816,482
SD# 11210

TECHNOLOGY SUMMARY

Polymer electrolyte fuel cells (PEFCs) have been identified as an attractive electrical power source due to it having a higher efficiency level and being an environmental friendly energy source. In comparison with other types of fuel cells, PEFCs have a high power density, low weight to power ration, and utilize a proton exchange membrane (PEM) as its electrolyte. Some types of membranes that are in use have displayed issues such as reduced conductivity and membranes dehydration at high temperatures.

Sandia National Laboratories has created an improved composition for producing proton exchange membranes for use in fuel cells, electrode casting solutions, and in sulfur dioxide electrolyzers. This invention features an innovative crosslinked sulfonated poly (phenylene) copolymer composition. The crosslinked feature will remove the issues that previous types of membranes had and will result in membranes that are tougher, have high temperature capabilities, and have lower SO₂ crossover rates.



TECHNOLOGY READINESS LEVEL

Sandia estimates this technology at approximately TRL 6. Deliverable prototype testing has been conducted.

Bianca Thayer | 505.284.7766 | bkthaye@sandia.gov