

Phosphonated Polystyrene Ionomer Proton Exchange Membrane
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This program will develop a new phosphonate-ionomer and determine its applicability as a proton exchange membrane, specifically for direct methanol fuel cells. Specifically, the research team will synthesize copolymers of styrene and vinylphosphonic acid by a simple free-radical polymerization and compare their properties with sulfonated polystyrene ionomers with similar ion-exchange capacities. It is expected that the phosphonate ionomers will have lower, but similar proton conductivity and lower methanol transport rates as the sulfonate ionomers.