

Polymer Electrolyte Membrane based on Nafion/Graphene Oxide Composite for Fuel Cells

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In this report, we suggested a new type of nanofiller, two-dimensional graphene oxide (GO) sheets that can influence the behavior of the Nafion polymer matrix with a creation of desirable ionic channels, and thus suppressing methanol permeability without sacrificing the proton conductivity. The insulating and defective nature of GOs along with 2D physical geometry, containing oxygen functional groups either on the basal plane or at the edges, are favorably suitable for modification of Nafion membrane in terms of mass transfer properties. Our percolating architecture of Nafion/GO composite membrane through a simple solvent casting shows optimized good transport, thermal, and mechanical properties as well as enhancement of DMFC performance.