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Sulfonated poly(arylene ether) Copolymer/Zirconium phenylphosphonate (ZrPP) composite membranes

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Methanol permeability of the proton exchange membrane is one of the significant factor lowering the performance in direct methanol fuel cell (DMFC). Introduction of an inorganic component into proton exchange membranes can further improve the properties by potentially decreasing the methanol permeability and water uptake, while increasing the modulus and mechanical strength of the membrane. In this study, we introduce zirconium phenylphosphonate (ZrPP) to proton exchange membranes by using an in situ method. The methanol permeability, proton conductivity, ion exchange capacity (IEC), water uptake, swelling ratio, thermal properties of the membranes which include various amount of ZrPP were observed.

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