

Electrospun $\text{SiO}_2/\text{TiO}_2/\text{ZrO}_2$ membrane with functional group for proton exchange membrane fuel cells(PEMFC) at operating high temperature

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There are several fascinating reasons for operating PEMFC at high temperature and low related humidity. Electrochemical kinetics for both electrode reactions are improved, CO poisoning of Pt/C catalyst is decreased, and water management device is simplified. For these reasons, studies of proton exchange membrane with high proton conductivity and good thermal stability have been conducted. Recently, there has been an intense research interest in the development of organic-inorganic composite membrane due to inorganic-oxide such as SiO_2 , TiO_2 , ZrO_2 can increase moisture content of membranes. The $\text{SiO}_2/\text{TiO}_2/\text{ZrO}_2$ membranes for proton exchange membrane fuel cell (PEMFC) are prepared by electrospinning method. The electrospun $\text{SiO}_2/\text{TiO}_2/\text{ZrO}_2$ membranes have high porosity and surface area. The electrospun membrane was preparing by impergnating ionomer after functionalized functional groups. The characterization of the membranes were confirmed by field emission scanning electron microscope (FE-SEM), thermogravimetry analysis (TGA). Fourier transform infrared spectroscopy (FT-IR). The performance for HT-PEMFC was performed proton conductivity test and single cell test.