An inorganic-organic composite proton exchange membrane for high temperature Polymer Electrolyte Membrane fuel cells by using electrospinning

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An inorganic-organic composite membrane has been synthesized to improve thermal stability, hydrogen ion conductivity and polymer electrolyte membrane fuel cell(PEMFC) performance at high temperature.
inorganic-organic composite membranes were fabricated from in three main steps.
Frist, an inoranic-organic precursor solution were prepared from the mixed solution containing SiO_2 using the sol-gel process and SPEEK in DMF solvent.
Second, inorganic-organic(SPEEK-SiO_2) membrane is made from this precersor solution using an electrospinning method.
Third, electrospun inorganic-organic(SPEEK-SiO_2) membrane impregnated with Nafion solution.
PEMFC test results show that the Nafion impregnated electrospun inorganic-organic membrane improved thermal stabillity, proton conductivity and good performance at high temperature and low humidity.