Preparation and characterization of SPEEK/boron phosphate nanocomposite membranes

조은경, 박진수*, 박석희, 김창수, 이원용
한국에너지기술연구원 신에너지연구부 고분자연료전지연구단
(park@kier.re.kr*)

Nanocomposite membranes based on sulfonated poly(ether ether ketone)(SPEEK) containing different sizes of boron phosphate(BPO_4) were prepared and characterized for proton exchange membrane fuel cells(PEMFC). BPO_4 were prepared via an in-situ sol-gel process in which tripropylborate $(C_3H_7O)_3B$ and phosphoric acid(H_3PO_4) were used as precursors. The sizes of BPO_4 were determined by reaction temperature and time. The nanocomposite membranes were characterized using scanning electron microscope (SEM) and differential scanning calorimetry (DSC)/thermogravimetric analysis (TGA). SEM cross-sectional features revealed that the domain size of the BPO_4 phase changed with temperature and time. As a result, the optimal sizes of BPO_4 in the nanocomposite membranes can be controlled by adjusting the reaction temperature and time for improvement of proton conduction.