Modification sulfonation degree of poly(ether ether ketone)/silica hybrid membrane for redox flow battery

이지영, 전정환, 김성현*
고려대학교
(kimsh@korea.ac.kr*)

In this study, crosslinked organic-inorganic hybrid membranes based on sulfonated poly (ether ether ketone) and silica oxide was prepared using a sol-gel process. Using poly (ether ether ketone) exhibits exceptional chemical and mechanical stability. Introducing inorganic particles is a main idea of this study, this hybrid membranes with covalent bonds between organic and inorganic phases exhibit much reduced crossover and advanced dimensional stability. A series of Hydrocarbon membranes require a sulfonic groups to achieve high proton conductivity, therefore sulfonation with sulfonic acid was performed, and sulfonation degree was controlled by reaction time. The membranes which had 50, 60, 70 % of sulfonation degree were fabricated to investigated improved ion exchange capacity of hybrid membrane. Membrane morphology, chemical structure and thermal property was characterized by SEM (EDX), FT-IR, and TGA , respectively. Proton conductivity and vanadium ion crossover were measured to investigate the effect of introducing silica oxide on the performance of ion exchange membrane.