Development of thin reinforced ionomer membranes for energy conversion applications

강문성†
상명대학교
(solar@smu.ac.kr†)

Ionomer-based membranes that incorporate fixed charges in polymers have been widely used for the separation of ionic substances. Recently, they have also been applied as a separator in various processes for electrochemical energy storage and production. To further expand the application of these ionomer membranes, it is necessary to enhance the electrochemical performances, lower the membrane cost and improve the physical and chemical stabilities. In this study, therefore, we have developed thin reinforced ionomer membranes which have excellent mechanical properties by using porous substrate film and cross-linked polymer. In particular, the prepared ionomer membranes showed very low electrical resistance and at the same time excellent chemical and physical stabilities. In addition, it has been confirmed to be a successful application by applying them to various energy conversion technologies such as reverse electrodialysis and redox flow batteries. This work was supported by the Technology Innovation Program funded by the Ministry of Trade, Industry & Energy (MOTIE) (No. 10047796).