

Composite ion-exchange membrane for improving electrochemical LiOH production performance

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LiOH is one of the basic raw materials for the manufacture of Li-secondary batteries, and various technologies for the efficient production of LiOH have been recently developed. Among them, water-splitting electrodialysis (WSED) using ion-exchange membranes (IEMs) is known as an economical and eco-friendly LiOH production process. In this study, composite IEMs with optimal properties for electrochemical LiOH production have been developed through the preparation of a pore-filled type of base membranes and their surface modification. Polyphenylene oxide (PPO) was selected as a base polymer for effective surface modification, and the hydrophilicity and strength of electrostatic force were controlled by introducing zwitterionic groups of various structures into PPO. As a result, it was confirmed that the surface-modified composite IEMs showed excellent electrochemical properties and LiOH production efficiency compared to the commercial membranes. This work was supported in part by the MOTIE (No. 20010491) and the MSIT (No. 2019R1A2C1089286).