

Way of the proton exchange membrane fuel cell performance enhance under non-humidity via dual layered by Electrostatic Spray Deposition method

장은광, 홍채원, 이성철<sup>†</sup>  
한양대학교  
(scyi@hanyang.ac.kr<sup>†</sup>)

A proton exchange membrane fuel cell (PEMFC) is not only highly efficient device but also eco-friendly energy-conversion device, which is expected as one of the most promising alternatives to conventional fossil fuel. Providing sufficient hydration in PEMFC is important to obtain high fuel-cell performance. However, despite many research on PEMFC, the catalyst layer that achieve high performance under non-humidity is still insufficiently explored. In this study, Nano sized dense structure (NSDS) layer was prepared as the dual layer by electrostatic spray deposition to maintaining hydration in membrane electrode assembly (MEA). Both the anode and cathode of MEA were covered by NSDS layer and the NSDS layer enhanced the effect of maintaining hydration in MEA. As a result, a preparation of the NSDS layer is enhanced cell performance under non-humidity in PEMFC because the NSDS layer enables the self-humidification. In addition, the electrochemical impedance spectroscopy was further examined to investigate the relation between the NSDS layer and the charge transfer resistant.