

The Characteristics of Liquid Water Flow in a PEFC

안은진*, 윤영기, 조중원, 박구곤, 이원용, 김창수
한국에너지기술연구원
(ejahn@kier.re.kr*)

Liquid water transport and removal from the gas diffusion layer and gas channel of a polymer electrolyte fuel cell (PEFC) is of paramount importance for improving performance and durability. The characteristics of liquid water flow in the cathode serpentine flow channels of an operating fuel cell was experimentally studied. The state of water in a cell is determined by operating conditions such as gas utilization, cell temperature, relative humidity. The water behaviors were observed with respect to the operating conditions and the performance of the fuel cell was evaluated by I-V curves. In this work a transparent fuel cell is set up for the observation of liquid water transport during the operation. Water droplet, water film and slug flow along the channel are respectively presented. for different gas velocity. The visualization of the liquid water flow characteristics in the cathode flow channel of an operating fuel cell helps understanding the two phase phenomena that take place inside the fuel cell.