

고분자 전해질 연료전지 금속분리판 코팅 내구성 평가

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Development of high durable metallic bipolar plate for Polymer Electrolyte Membrane Fuel Cells

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Metallic bipolar plate is the one of the promising candidate material for PEMFC because of mechanical strength, low gas permeability, electrical and thermal conductivity. However, the corrosion is the main obstacle of metallic bipolar plate, and many investigations, especially coating on base metal, have been carried out to avoid corrosion. Gold is considered as the one of the best coating material because of its corrosion resistance and electrical conductivity.

In this study, gold coated metallic bipolar plate was developed and evaluated.

Due to our coating process, gold can be well-adhere to the base material, and hydrophobic material on its gold surface was coated by dipping method for better water management. To verify coating reliability, a single fuel cell(50cm²) was evaluated, and its durability over 4000hrs was demonstrated.

Key words : Polymer Electrolyte Membrane Fuel Cell(고분자전해질연료전지), 금속분리판(Metallic Bipolar plate)

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파라미터 보간법을 이용한 3MW급 MCFC 시스템의 정상 및 비정상 상태 설계

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Steady and Dynamic Modeling of 3MW MCFC System Conceptual Design Using Parameter Interpolation Method

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The steady and dynamic process model for an internal reforming molten carbonate fuel cell power plant is discussed in this paper. The dominant thermal and chemical dynamic processes are modeled for the stack module and balance-of-plant, including cathode gas preparation, heat recovery, heat loss (Each heat loss amount for the stack and MBOP is obtained from real plant data) and fuel processing. Based on dynamic model and control demand, PID controllers are designed in the whole system. By applying these controllers we can obtain temperature balance of stack and control system depending on changing steam to carbon ratio, air feed amount, and transient condition.

Key words : MCFC(용융탄산염연료전지), Interpolation Method(보간법)

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