

MCFC 배가스용 촉매연소기 연소특성에 관한 연구

**이 상민, 이 연화, 안 국영, 박 인욱

A Study on the Combustion Characteristics of MCFC Offgas Catalytic Combustors

**Sang Min Lee, Younhwa Lee, Kook Young Ahn, In-Wook Park

Anode off-gas of high temperature fuel cells such as MCFC still contain combustible components such as hydrogen, carbon monoxide and hydrocarbon. Thus, it's very important to fully burn anode off-gas and use the generated heat in order to increase system efficiency. In the present study, catalytic combustors have been applied to high temperature MCFC system so that the combustion of anode-off gas can be boosted up. Since the performance of catalytic combustor directly depends on the combustion catalyst, this study has been focused on the experimental investigation on the combustion characteristics of multiple commercial catalysts having different structures and compositions. In order to determine the design conditions of the catalytic combustor, parameters such as inlet temperature, space velocity and excess air ratio have been varied and optimized for combustor design. Results show that H₂ in off-gas assists CH₄ combustion in a way that it decreases minimum inlet temperature limit and increases maximum space velocity while keeping high fuel conversion efficiency.

Key words : MCFC(용융탄산염연료전지), Anode Offgas(연료극 배가스), Catalytic Combustion(촉매연소), Space Velocity(공간속도)

E-mail : ** victlee@kimm.re.kr

Li-ion battery용 음극재료인 SnO₂의 합성법의 차이에 따른 음극 성능비교

*심 영선, 박 수진

Comparing the methods of making SnO₂ nanomaterials with and without templates of anode material for Li-ion battery

*Young-Sun Shim, Soo-Jin Park

Mesoporous tin oxide (SnO₂) as anode materials for Li-ion battery were prepared by hydrothermal method and templating method using SBA-15 as template. And electrochemical properties of SnO₂ electrode were investigated with cyclic voltammogram (CV). The morphology and structures of SnO₂ were characterized by transmission electron microscopy (TEM) and X-ray diffractometer (XRD), respectively. The specific surface area was defined by N₂ adsorption with BET(Brunauer-Emmett-Teller) method. As a result, the surface area of mesoporous SnO₂ which was made from templating method is higher than the case of using hydrothermal method. In addition, in anodic performance, mesoporous SnO₂ which is prepared by templating method showed higher charge-discharge capacity compared to hydrothermal method and exhibited excellent stability over the entire cycle number. It was indicated that electrochemical performances of mesoporous SnO₂ mainly affected to the structural features, such as specific surface area and porosity.

Key words : Mesoporous SnO₂(메조포러스 이산화주석), Nanowire(나노와이어), Templating method(템플레이팅 방법), SBA-15, Anode material(음극 활물질), Li-ion battery(리튬 이온 배터리)

E-mail : * sim0sun@naver.com