

Enhancement using hydrogen for pre-treatment on nano Aluminum-reinforced α -LiAlO₂ for MCFC

김형석, 송신애, 윤성필, 남석우, 최대기, 김성현¹, 한종희*
한국과학기술연구원; ¹고려대학교
(hyungsae@naver.com*)

Molten Carbonate Fuel cell (MCFC) entered the stage of commercialization. The important things for the commercialization are long term operation and cost reduction.

During long term operations, Cracks which are main problems to lead low performances occurs. To prohibit from occurring Cracks, enhancements of Mechanical strength are significant issues.

In this study, we used Aluminum nano powder (100nm) for reinforced-matrix that can cover LiAlO₂ Powers. We also added Li₂CO₃ to prevent consumption of lithium ion. We changed the pretreatment schedule that we put hydrogen Instead of putting air during pretreatment. Hydrogen makes nano aluminum particles to form neck formation easier, and to be sintered. Reinforced- α -LiAlO₂(0.631Kgf/mm²) increased mechanical strength dramatically, which is three times compared with using pure α -LiAlO₂ (0.214Kgf/mm²).

As a result, performances and analyses will be presented in single cell test with hydrogen pretreatment and nano Aluminum-reinforced α -LiAlO₂ added Li₂CO₃.