

Preparation of Yttria Stabilized Zirconia Thin Film for SOFC Electrolyte by Electron Beam PVD

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Yttria stabilized zirconia (YSZ) thin film for the electrolyte of solid oxide fuel cell (SOFC) was prepared by electron beam physical vapor deposition (EB-PVD).

The film thickness of 5 ~ 10 μm was deposited on a porous electrode. The effects of parameters, such as deposition time, substrate temperature, oxygen flow rate, and electron-beam power, on the surface morphology and microstructure of YSZ electrolyte film have been analyzed. Conductivity and electrochemical properties of YSZ electrolyte film were evaluated.

In addition, Performance, such as power density and cathodic overpotential of SOFC single cell, which consists of Ni-YSZ anode, the YSZ film electrolyte and LSC cathode, have been characterized. The results of the application of new EB-PVD technology for the fabrication of SOFC electrolyte will be discussed.