Memoirs of the Osaka Institute
of Technology, Series A
Vol. 44, No. 1 (1999) pp.59～74

スラリーキャスト法による燃料電池用固体電解質の薄膜化とその特性評価*

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(1999年5月29日受理)

Properties of Solid Oxide Fuel Cell Using Yttria Stabilized Zirconia Films Prepared by Slurry Casting Method

by

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(Manuscript received May 29, 1999)

Abstract

Thin films of yttria stabilized zirconia (YSZ) electrolytes for solid oxide fuel cell (SOFC) were prepared by the slurry casting method using alumina as the additive material into 3YSZ and 8YSZ doped 3mol% and 8mol% Y_2O_3. The electrical properties of these YSZ thin films were studied mainly under the various conditions of the additive alumina. It was found that 8YSZ film of 350μm was able to be prepared by an optimum quantity of 15mol% alumina additive, and it had a higher conductivity than that of 3YSZ film. Furthermore, the SOFC using this film indicated a stable generation property with high current density of 0.16A/cm^2. Then, the cell voltage at the high current density operation was found to be degraded mainly by the resistance polarization in the fuel electrode as compared with that in the electrolyte.

＊　電気学会全国大会および電気関係学会関西支部連合大会にて口頭発表
(1998年3月26日，慶應大学および1998年11月7日，大阪府立大学)

＊＊　現勤務先：㈱日立製作所（'99年3月電気電子工学専攻博士前期課程修了）