

Characteristics of Li_2CO_3 - Ceria doped with Samaria composite electrolytes for Intermediate Temperature Solid Oxide Fuel Cells

오창훈, 윤성필, 송신애, 김희수, 남석우, 한종희*, 권용재¹
한국과학기술연구원; ¹서울과학기술대학교
(jhan@kist.re.kr*)

Solid oxide fuel cells (SOFCs) have received much attention because of their high energy conversion efficiency and fuel flexibility. Especially, ceria based materials has been studied extensively due to its high ionic conductivity at relatively low temperatures. However, since ceria based material has high densification temperature near 1500°C, it is difficult to densify below 1500°C by the conventional ceramic techniques. This high sintering temperature of ceria based materials causes some problems such as the increase of fabrication cost and the difficulties of co-firing with electrode materials. In order to lower sintering temperature of SDC or GDC, sintering aids such as Mn_2O_3 , CoO , etc. has been used. however, to lower sintering temperature below 1000 oC is still hard.

In this study, New sintering aid, Li_2CO_3 is introduced for lowering densification temperature of SDC. Li_2CO_3 added SDC was sintered at 800~1000 oC and their porosities was measured using ASTM method. Li_2CO_3 added SDC sintered at 800 oC shows low porosity of 2.3%(?) which is sufficient value to use electrolyte for SOFCs. The conductivity of Li_2CO_3 added SDC pellet was also examined using 4-point probe method.