중온 고체산화물 연료전지를 위한 Bi_2O_3 doped SDC($Ce_{0.8}Sm_{0.2}O_{1.9}$) 전해질의 특성에 관한 연구

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Due to a good ionic conductivity, SDC(Samarium-doped ceria) can be used as an electrolyte of solid oxide fuel cells (SOFCs). However, to obtain the electrolyte with fully densification, SDC is required for high sintering temperature(1600℃).
In this study, (25wt% and 30wt%) Bi_2O_3-doped SDCs are examined to lower densification temperature of SDC. Bi_2O_3-doped SDCs were sintered at 1000℃ and their porosities were measured by using ASTM method. (25wt% and 30wt%) Bi_2O_3-doped SDCs show low porosity of 3% and 0.9% respectively, which is sufficient to use an electrolyte for SOFCs. The conductivity of Bi_2O_3-doped SDC pellet was also examined by 4-point probe method(At 800℃, (25wt% and 30wt%)Bi2O3-doped SDC's conductivities were 0.3959 S/cm and 0.2535 S/cm, respectively).
Unlike 20wt% of the Bi_2O_3-doped SDC, (25wt% and 30wt%) Bi_2O_3-doped SDCs show single cubic phase and higher conductivity.