

## Current Status of SOFC Stack Technology Developed at KIST in the viewpoint of Ceramic Science and Technology

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Despite very high power density of planar type solid oxide fuel cells (SOFC) stacks, they require a reliable high temperature sealing materials during fabrication and operation. Despite extensive R&D efforts, their engineering reliability has long been remained as a major challenge in developing the planar SOFCs. If there is gas leakage during operation, a stack can experience severe degradation of its performance. Especially local sealing failure can contribute to temperature rise to form so-called hot spot due to exothermic reaction between fuel and oxidant, causing a catastrophic stack failure.

Particularly in the viewpoint of ceramic materials, the scale-up of SOFC stacks is likely to suffer from the statistical nature of component reliability such that all the SOFC components should be developed based on engineering reliability as well as processing reliability. In this presentation, recent efforts to improve stack reliability will be introduced in terms of microstructural design of the critical components and their relevant fabrication processes. Current status of planar SOFC stacks developed at KIST will be discussed in the viewpoint of structural reliability and stack scale-up.