

New Concept and Fabrication of an Anode-Side, Ceramic-Supported, Planar-Type SOFC Stack

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Here we report our recent results on design and fabrication of a novel planar SOFC stack consisting of 9 single cells connected in series onto a ceramic substrate. The ceramic substrate is fabricated by pressing mixture of 3YSZ and pore-former into a mold followed by heat treatment to sinter the substrate to have a desired porosity. Then the single cells will be constructed by depositing anode, electrolyte and cathode from slurries onto nine particular positions on one side of the substrate. The other side of the substrate is left un-coated. The cathode of one single cell is connected to the anode of the adjacent cell by a dual-function sealant-interconnect material developed in our group. For operation, the stack is fixed in a system to allow passage of fuel through the uncoated side of the substrate and diffuse into it to reach the anode zones, while air is passed through the coated side of the substrate, where only cathodes and interconnects are exposed.