

### Effect of metal dopants onto Ni-based anode on coke deposition for direct hydrocarbon SOFC

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The recent substrate-supported single cell of SOFC consists of thin films of three functional components (anode, electrolyte and cathode) laminated onto a porous substrate. In our work, thin layer of Ni-based anode was coated on a thick 3YSZ substrate in order to examine influence of dopant-levels on coke deposition happened in the anode when dry methane is directly used. The bilayer anode/substrate was subjected to sol-gel coating process to add several dopants with different levels to the anode. In this paper, the influence of adding Gadolinium, Copper, Samarium, and Cerium to a Ni-based anode has been examined. We demonstrated that the addition of all these metals could improve performance of the single cell on hydrogen and methane. The anode doped with these metals was stable in dry methane at 700oC for at least 18 hours.