

Nanomaterial's for intermediate temperature solid oxide fuel cell

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Abstract

Nanomaterials were prepared using solution combustion method. These materials were further used as different parts of solid oxide fuel cell. In this report I have included synthesis and characterization of anode, cathode and electrolyte materials and also fuel cell testing report (open circuit voltage). Anode materials: NiO-GDC, CuO-NiO-GDC, NiO-Al₂O₃, and AFL/NiO-GDC, cathode material: La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O₃ (LSCF), and electrolyte material:

Gd_{0.1}Ce_{0.9}O_{1.95} (GDC). The conductivity of anode functional

layer (NiO-Al₂O₃) in biogas is 160×10^{-3} S/cm and of CuO-NiO-GDC in biogas is 35×10^{-3} S/cm. The SOFC formed with CuO-NiO-GDC anode exhibits OCV of 0.92 V at 500 oC and the OCV of the cell with NiO-GDC as anode is 0.7 V at 500 oC. The single cell (CuO-NiO-GDC/GDC/LSCF) can achieve highest power density 11.38 mW/cm² and highest current density 31.68 mA/cm² at 800 oC.

Biography

Sarika Patil studied Sharad Institute of Technology College of Engineering, Yadrav, Kolhapur, India