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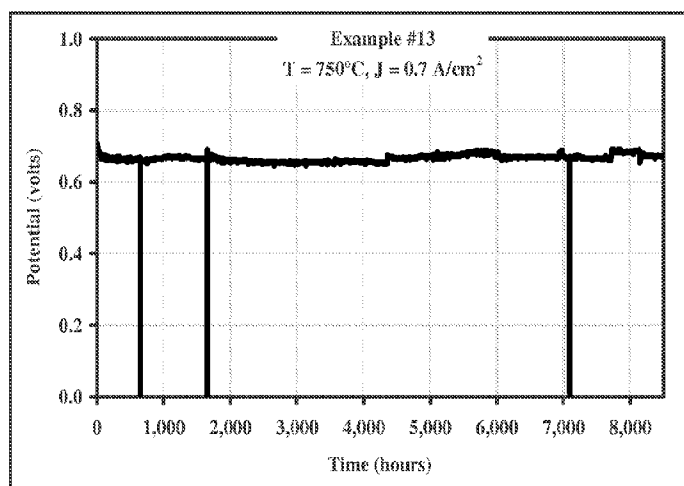


FIG. 13

(57) Abstract: Electrode materials systems for planar solid oxide fuel cells with high electrochemical performance including anode materials that provide exceptional long-term durability when used in reducing gases and cathode materials that provide exceptional long-term durability when used in oxygen-containing gases. The cathode materials comprise zinc-doped lanthanum strontium ferrite (LSZF) or an alternative ferrite, cobaltite or nickelate ceramic electrode material. The cathode material also may comprise a mixed-conducting ceria-based electrolyte material, a palladium dopant, or a combination of these. The cathode may have a bi-layer structure. A ceramic-based interfacial layer may be provided at the electrolyte/cathode interface. The multilayer cathode system and its palladium doped cathode material exhibit a high degree of tolerance to chromium contamination during operation with metallic interconnect materials.

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