

Production of Hydrogen from Steam Using Solid Oxide Fuel Cell

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Steam electrolysis with solid oxide cells is one of the most promising methods for hydrogen production with high efficiency. Because operating at high temperature reduces the electrical energy requirement for steam electrolysis.

Recent development is focused on the decreasing operation temperature with high ionic conductivity ceramic materials. The system performs all electrochemical functions using a single stack assembly with single button cells. The cells used in this work were yttria-stabilized zirconia, gadolinium doped ceria and samarium doped ceria electrolyte supported cells, with nickel-zirconia cermet cathode anodes and strontium-doped lanthanum manganite cathodes. The system performance was tested in the intermediate temperature range (700 – 1000 °C) with different anode and cathode-side gas flow rate and composition.