Effects of the different Supported Structures on Tubular Solid Oxide Fuel Cell Performance

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A comprehensive two-dimensional model has been developed to investigate the performance of tubular solid oxide fuel cell (T-SOFC) stack with different supported structures. The discrepancy between the anode-supported tubular SOFC (AST-SOFC) stack and the cathode-supported tubular SOFC (CST-SOFC) stack are examined by varying temperature, electrical conductivity, porosity, contact resistance and output voltage. The results illustrate that the different supported structures have an significant influence on the performance of stack. The performance of CST-SOFC stack is much better than AST-SOFC stack for any aforementioned working parameters. Especially in lower temperature, smaller cathode conductivity, larger cathode porosity and lower output voltage, the advantage is more outstanding.

Keywords: Tubular solid oxide fuel cell; Electrode support; Structure comparison

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