Comparing the Air Flow Distribution Qualities Among Three Different Air Flow Path Configurations for Tubular Solid Oxide Fuel Cell Stacks

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In this paper, the air flow distribution quality within a conventional tubular solid oxide fuel cell (T-SOFC) stack air flow path structure was analyzed by 3D calculating fluid dynamics (CFD) simulating. The air flow field within the T-SOFC stack was of a typically turbulence characteristic. Both air flow distribution qualities among 36 T-SOFC units in stack level and over each T-SOFCs unit surface within the T-SOFC stacks with different air flow manifold configuration designs, such as 1in1out-line, 1in1out-Z, and 2in2out-Z type, were carefully compared through 3D simulation. 2in2out-Z type air flow path structure was concluded to be a more suitable chooses for T-SOFC stack, because its smaller variation of x-velocity at each main plane than that in other type air flow path structures.

Keywords: Tubular SOFC stack, air flow distributing path optimization, turbulence flow characteristic.

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