عنوان مقاله:

Enhancement of the Cooling System Performance of the Proton-exchange Membrane Fuel Cell By Baffle-restricted Coolant Flow Channels

محل انتشار:

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خلاصه مقاله:

The performance of proton-exchange membrane fuel cell cooling system using coolant flow channels enhanced with baffles was numerically investigated. To do this, the maximum temperature of the cooling plate, temperature uniformity and also pressure drop along the flow channels were compared for different cases associated with number of baffles and their dimensions inside the channels. The governing equations by the finite-volume approach in three dimensions were solved. Numerical results indicate that the baffle-restricted cooling flow channels, generally improved the performance of the fuel cell in such a way that a reduced maximum temperature of the cell and a better temperature uniformity in the cooling plates were determined. As the pressure drop increases by incorporating the baffles inside the coolant flow channels, one needs to compromise between the improvement of cooling system performance and the total pressure drop.

کلمات کلیدی:

Proton, exchange Membrane Fuel Cell, Cooling Flow Field, Baffle, Temperature Uniformity, SurfaceTemperature, Pressure drop