

عنوان مقاله:

Numerical Study on Heat and Mass Transfer in Cathode Layers of Proton Exchange Membrane Fuel Cells

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خلاصه مقاله:

In this paper, a two-dimensional, two-phase, non-isothermal model is presented to predict mass and heat transfer behaviors in cathode side of a proton exchange membrane fuel cell (PEMFC). The liquid-gas two-phase mass transport in the porous cathode is formulated based on multi-fluid model in porous media. The governing equations are solved over a single computational domain using COMSOL software with the finite volume method, which consists of gas diffusion layer, and catalyst layer for cathode side. A parametric study is performed to examine the effects of the current density on different variables such as oxygen concentration, cell temperature, and liquid saturation cathode layers of PEMFC. Numerical results elucidate that oxygen concentration in cathode layers decreases; cell temperature increases; and cathode liquid saturation increases by increment in the current density.

کلمات کلیدی:

PEMFC, modeling, two-phase

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