Short Communication

Numerical Analysis on the Effect of Stoichiometric Ratio on Fuel Utilization and Performance of High Temperature Proton Exchange Membrane Fuel Cells

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A three-dimensional mathematical model is developed and then employed to examine the effect of stoichiometric ratio on fuel utilization of high temperature proton exchange membrane fuel cells. The effect of stoichiometric ratio on cell performance and transport phenomena is also investigated. The performance of fuel cells at different stoichiometric ratios are obtained and compared. It is found that the cell performance can be improved by increasing the stoichiometric ratio, but it can not be continually increased. And the heat, mass and charge transport processes of fuel cells at different stoichiometric ratios are also presented and compared.

Keywords: High temperature proton exchange membrane fuel cells, Stoichiometric ratio, Fuel utilization, Cell performance, Transport characteristics

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