

عنوان مقاله:

Two Dimensional Two Phases Numerical Solution to the Cathode Side of Pem Fuel Cell

محل انتشار:

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خلاصه مقاله:

In this thesis, two-dimensional modeling of the electrode on the cathode side of the polymer membrane fuel cell with two-phase flow is presented. The equations governing the fuel cell of the polymer membrane that are solved in this modeling include consistency equations, survival, and the survival of chemical species along with the phase change of the vapor-liquid phase. In this thesis, the Butler-Wolmer relationship is used to model the electrochemical reaction in the catalyst layer. The numerical solution of this modeling is based on finite volume method. Simpel algorithm is used for coupling the velocity and pressure field and the displacement terms are dissected by the power law method and spreading terms by the central difference method. The computer program of this modeling is based on Fortran 95 language. By comparing the results of numerical modeling with numerical and experimental results presented in different references, a good agreement was found between them. This modeling is capable of examining various parameters affecting the fuel cell behavior in different input conditions to the cathode. The polarization curve obtained from the numerical solution corresponds well to experimental results.

کلمات کلیدی:

PEM Fuel Cell, Two-Phase Flow, Numerical Solution, Porous Media, Stefan-Maxwel Equation

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