

Parametric Analysis of Solid Oxide Fuel Cell Using Lattice Boltzmann Method

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Abstract : The present paper deals with a numerical simulation of temperature field inside a solid oxide fuel cell (SOFC) components. The temperature distribution is investigated using a co-flow planar SOFC comprising the air and fuel channel and two-ceramic electrodes, anode and cathode, separated by a dense ceramic electrolyte. The Lattice Boltzmann method (LBM) is used for the numerical simulation of the physical problem. The effects of inlet temperature, anode thermal conductivity and current density on temperature distribution are discussed. It was found that temperature distribution is very sensitive to the inlet temperature and the current density.

Keywords : heat sources, Lattice Boltzmann method, solid oxide fuel cell, temperature

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