

Computational Fuel Cell Dynamics of Solid Oxide Fuel Cells

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In this paper, a two-dimensional solid oxide fuel cell (SOFC) model was formulated to analyze combined effect of mass-, charge-, and energy transport. To deal with flow-field design issue, seven-layered domain, e.g. anode/cathode flow channels, backing layer, catalyst layer, and separator, was considered. The presented model was validated with cell polarization data taken from the literatures, representing good agreements. Various parameters were investigated to analyze the influence on cell polarizations and summarized as follows: i) various porosity of the backing layer, ii) various relative humidity.