Electrolyte-electrode-assembly modeling for solid oxide fuel cells

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A two-dimensional (2D), gas-phase, electronic(ionic) charge electrolyte-electrode-assembly (EEA) model has been developed, which is valid different designs of solid oxide fuel cells (SOFCs).
Experimental data for development and validation of the model was taken from the published literatures. Developed model shows good agreement on cell performance with experimental data.
Employing present model, various operating parameters are investigated to evaluate the effect of these parameters on SOFCs performance. Local current density distribution, and species concentration variation along EEA were numerically computed inder various operating conditions. The performance of SOFCs affected by porosity, tortuosity, and electron-conducting particle volume fraction is investigated in this paper.