

Modeling of Molten Carbonate Fuel Cell Systems

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Current Molten Carbonate Fuel Cells (MCFC) operate at temperatures as high as 650 °C. With information on the stress distribution evolved during heating and running of the stack, information can be realized about its optimum design. Finite element computer modeling can be used to analyze this stress distribution for a range of variables, including heating rates, running characteristics (such as output power, electrical and thermal effects, and gas flow rates and distribution), and material property values. The finite element-modeling environment can be used for generating the model, with a batch interface feature employed for generating results. Modeling will also be used to understand the electrochemical processes in the MCFC to obtain results that lead to a better understanding of the electrochemistry within the MCFC, particularly for the cathode reaction.