

Development of Semi-Empirical Cell Voltage Model For Proton Exchange Membrane Fuel Cell

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A new semi-empirical model is established to describe the cell voltage of a Proton exchange fuel cell (PEMFC) as a function of current density. The model equation is validated experimental data over a wide range of a gas feed pressure and temperatures. A number of existing models are semi-empirical. They, however, are inaccurate in low current density term. The proposed model focuses on very unfavorable conditions for the cell operation, i.e. low methanol solution concentrations. A newly developed semi-empirical equation, includes the methanol crossover effect that plays a major role in determining the cell voltage of PEMFC.