

## Errata

1. Section 5.1, page 105, the Introduction to Chapter 5: there is no CD-ROM attached to the book nor is one available electronically.

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## *Simulink Implementation of Fuel Cell Models and Controllers\**

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### 5.1 Introduction

The dynamic fuel cell models and controllers were developed using MATLAB–Simulink environment. Simulink is a toolbox extension of the MATLAB program by Mathworks Inc. Simulink is a very powerful tool in modeling and mathematical representation. We can choose a suitable integration method and set up the run-time and initial conditions in the Simulink environment. Systems are drawn on-screen by block diagrams in Simulink. Elements of a block diagram are available, such as transfer functions, a summing junction, etc., as well as virtual input and output devices: function generators and oscilloscopes. Because Simulink provides a graphical user interface, it is easy to build block diagrams, perform simulations, and analyze results. In Simulink, models are hierarchical so that you can view a system at a high level, and details in each block can be viewed by a double click on blocks.

The Simulink simulations in the CD-ROM attached in this book were developed in MATLAB version 6.5. The details of Simulink implementation of the fuel cell model and controllers as well as related elements are described in this chapter.

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### 5.2 Simulink Implementation of the Fuel Cell Models

Two assumptions are made to develop a fuel cell model in Simulink:

- Owing to a slow response time for the stack temperature (about 102 s [1]), the operating stack temperature is assumed to be constant.

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\* This chapter was mainly prepared by Dr. Woonki Na, California State University, Fresno and Dr. Bei Gou, Smart Electric Grid LLC, USA.