

SYSTEM ENGINEERING

质子交换膜燃料电池电堆的动态热模型及其温度控制

邵庆龙, 卫东, 曹广益, 朱新强

FuelCellInstitute, ShanghaiJiaoTongUniversity, Shanghai200030, China

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摘要 A dynamic thermal transfer model of a proton exchange membrane fuel cell (PEMFC) stack is developed based on energy conservation in order to reach better temperature control of PEMFC stack. Considering its uncertain parameters and disturbance, we propose a robust adaptive controller based on backstepping algorithm of Lyapunov function. Numerical simulations indicate the validity of the proposed controller.

关键词 动态热学模型, 鲁棒自适应控制, 质子交换膜燃料电池电堆, 温度控制

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Dynamic Thermal Model and Temperature Control of Proton Exchange Membrane Fuel Cell Stack

SHAO Qinglong, WEI Dong, CAO Guangyi, ZHU Xinjiang

FuelCellInstitute, ShanghaiJiaoTongUniversity, Shanghai200030, China

Abstract

A dynamic thermal transfer model of a proton exchange membrane fuel cell (PEMFC) stack is developed based on energy conservation in order to reach better temperature control of PEMFC stack. Considering its uncertain parameters and disturbance, we propose a robust adaptive controller based on backstepping algorithm of Lyapunov function. Numerical simulations indicate the validity of the proposed controller.

Key words proton exchange membrane fuel cell stack, dynamic thermal transfer model, temperature control.

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通讯作者: 邵庆龙 qll102@sjtu.edu.cn

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