Modeling and Control of a Fuel Cell Power System for Automotive Applications

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Abstract
In this paper, the primary components of an automotive fuel processor are analyzed. Basic chemical engineering principles are utilized to assess the role of thermodynamics, heat transport, and reaction kinetics. The amount of methane required is calculated as function of hydrogen produced as well as the power produced. The heat duty for thermal control of the system is computed. A switching control is proposed to switch between the battery backup and the power generation subsystem.

Keywords: Fuel Cell modeling, fuel cell power system, control system design