

O 64. DEVELOPMENT OF A WATER MANAGEMENT FOR AN AUTOMOTIVE PEM FUEL CELL SYSTEM

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ABSTRACT: There are several factors, such as lack of fossil fuel reservoir and global warming phenomena which lead to the search alternative ways to replacement the internal combustion engine (ICE) for vehicles. PEM Fuel cells are one of the most promising technologies for automotive applications because they operate at low temperature, environmentally friendly, have a high-power density, and can be fueled by the hydrogen fuel which produces from different renewable sources. Consequently, investigation on a proper an automotive PEM fuel cell system design is necessary in order to perfect vehicle performance, increase efficiency, and reduce costs. Water management is one of the most important problems in PEM fuel cell, and this study makes a contribution to the improvement of the performance of an automotive fuel cell system. The effect of some operation parameters such as vehicle speed, air stoichiometry, and operation pressure on the water management issue, and the performance of an automotive fuel cell system was studied. The results showed that the operating pressure and the air stoichiometry ratio are two significant criteria in the water management of PEM fuel cell. System pressure has an important effect on water management and the performance of the PEM fuel cell. The decrease of air stoichiometry at high operation pressure enhances the water management of the system.

Keywords: PEM fuel cell, operating pressure, air stoichiometry