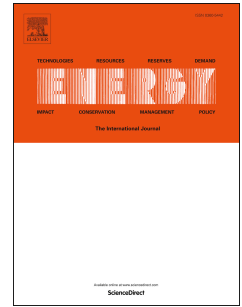


Accepted Manuscript

Design of an innovative distributor to improve flow uniformity using cylindrical obstacles in header of a fuel cell

Soroush Dabiri, Mohammadreza Hashemi, Mohammadfazel Rahimi, Mehdi Bahiraei, Erfan Khodabandeh



PII: S0360-5442(18)30595-4

DOI: [10.1016/j.energy.2018.04.005](https://doi.org/10.1016/j.energy.2018.04.005)

Reference: EGY 12644

To appear in: *Energy*

Received Date: 19 December 2017

Revised Date: 31 March 2018

Accepted Date: 2 April 2018

Please cite this article as: Dabiri S, Hashemi M, Rahimi M, Bahiraei M, Khodabandeh E, Design of an innovative distributor to improve flow uniformity using cylindrical obstacles in header of a fuel cell, *Energy* (2018), doi: 10.1016/j.energy.2018.04.005.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1 **Design of an innovative distributor to improve flow uniformity**

2 **using cylindrical obstacles in header of a fuel cell**

3

4 Soroush Dabiri^a, Mohammadreza Hashemi^b, Mohammadfazel Rahimi^b, Mehdi Bahiraei^{c,*}, Erfan
5 Khodabandeh^b

6 ^aEnvironmental Engineering Dept., University of Tehran, Tehran, Iran

7 ^bMechanical Engineering Department, Amirkabir University of Technology (Tehran Polytechnic), 424 Hafez
8 Avenue, P.O. Box 15875-4413, Tehran, Iran

9 ^cDepartment of Mechanical Engineering, Kermanshah University of Technology, Kermanshah, Iran

10

11 **Corresponding author:** Mehdi Bahiraei

12 * E-mail: m.bahiraei@kut.ac.ir

13 Tel: +988337259980

14

15

16 **Abstract**

17 Since the greenhouse gas effect results in global warming, many attempts are made for
18 substitution of renewable resources. In this regard, fuel cells are employed as important devices
19 in the clean energy applications. Therefore, it is essential to implement efficient techniques to
20 enhance the efficiency of fuel cells. In a parallel channel fuel cell, the efficiency of the device
21 increases by passing the reactants through the reacting channels uniformly. As a result, the
22 present research attempts to design a new distributor capable to be utilized in proton exchange
23 membrane fuel cells, while embedding small cylindrical obstacles to improve uniformity of the
24 flow distribution among the channels. The trial-and-error method is utilized to design the two-
25 dimensional model with a specific uniformity level. Subsequently, the distributor scheme is
26 modeled three-dimensionally integrated to the channels and collector. The modeled geometry is

Download English Version:

<https://daneshyari.com/en/article/8071696>

Download Persian Version:

<https://daneshyari.com/article/8071696>

[Daneshyari.com](https://daneshyari.com)