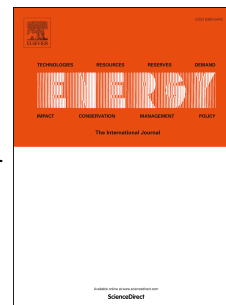


Accepted Manuscript

Assessment of silver nanowires infused with zinc oxide as a transparent electrode for dye-sensitized solar cell applications

Abdul Hai Alami, Bilal Rajab, Kamilia Aokal



PII: S0360-5442(17)30551-0

DOI: [10.1016/j.energy.2017.03.171](https://doi.org/10.1016/j.energy.2017.03.171)

Reference: EGY 10660

To appear in: *Energy*

Received Date: 18 November 2016

Revised Date: 26 March 2017

Accepted Date: 29 March 2017

Please cite this article as: Alami AH, Rajab B, Aokal K, Assessment of silver nanowires infused with zinc oxide as a transparent electrode for dye-sensitized solar cell applications, *Energy* (2017), doi: 10.1016/j.energy.2017.03.171.

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 **Assessment of silver nanowires infused with zinc oxide as a** 2 **transparent electrode for dye-sensitized solar cell applications**

3
4 **Abdul Hai Alami^{1,2,*}, Bilal Rajab¹ and Kamilia Aokal¹**

5
6 ¹Sustainable and Renewable Energy Engineering Department, University of Sharjah, POBox
7 27272, Sharjah, United Arab Emirates

8 ²Centre for Advanced Materials Research, University of Sharjah, POBox 27272, Sharjah,
9 United Arab Emirates

10 *Corresponding author, telephone: +971(56) 160-5355, email: aalalami@sharjah.ac.ae, fax:
11 +971(6) 505-3935

12 13 **Abstract**

14 This paper presents the results of growing silver nanowire (Ag NW) meshes for utilization as
15 photo-electrodes in dye-sensitized solar cells. These meshes have the advantage of high
16 spectral transmission (> 80%) in the visible-NIR range, and as electrodes, they provide better
17 flexibility compared with traditional glass-based photo-electrodes. Another important feature
18 is the high conductivity (low sheet resistance) compared with their indium-tin oxide (ITO)
19 counterparts. The produced Ag NWs are then filled with a ZnO to act as the electron
20 extraction layer of the solar cell. The evolution of the resulting nanomaterials is monitored by
21 microstructural techniques, such as atomic force microscopy (AFM) and scanning electron
22 microscopy (SEM) while the synthesis of the nanomeshes is done in-solution under
23 controlled conditions. The optical properties of the resulting nanomeshes are determined by
24 spectroscopic measurements within an integrating sphere, while the characteristics of the
25 produced cells are determined by potentiostatic methods and compared to ITO based cells
26 significant increase in performance was achieved.

27
28 **Keywords:** Silver nanowires; transparent photo-electrodes; dye-sensitized solar cells

Download English Version:

<https://daneshyari.com/en/article/8072732>

Download Persian Version:

<https://daneshyari.com/article/8072732>

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