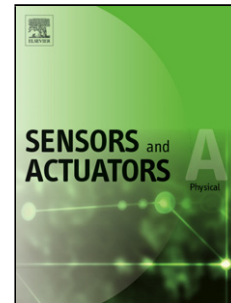


## Accepted Manuscript

Title: Electropolymerized Polythiophene Photoelectrodes for Photocatalytic Water Splitting and Hydrogen Production

Authors: Emmeline Kao, Qiaohao Liang, Goran Rez-Kallah Bertholet, Xining Zang, Hyun Sung Park, Jinwoo Bae, Jianan Lu, Liwei Lin



PII: S0924-4247(17)31833-2  
DOI: <https://doi.org/10.1016/j.sna.2018.04.037>  
Reference: SNA 10750

To appear in: *Sensors and Actuators A*

Received date: 13-10-2017  
Revised date: 27-2-2018  
Accepted date: 23-4-2018

Please cite this article as: Kao E, Liang Q, Bertholet GR-Kallah, Zang X, Park HS, Bae J, Lu J, Lin L, Electropolymerized Polythiophene Photoelectrodes for Photocatalytic Water Splitting and Hydrogen Production, *Sensors and Actuators: A. Physical* (2010), <https://doi.org/10.1016/j.sna.2018.04.037>

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.

# ELECTROPOLYMERIZED POLYTHIOPHENE PHOTOELECTRODES FOR PHOTOCATALYTIC WATER SPLITTING AND HYDROGEN PRODUCTION

Emmeline Kao, Qiaohao Liang, Goran Rez-Kallah Bertholet, Xining Zang, Hyun Sung Park, Jinwoo Bae, Jianan Lu, and Liwei Lin

Department of Mechanical Engineering,

Berkeley Sensor and Actuator Center

University of California, Berkeley, CA 94720

Corresponding author

Liwei Lin

lwlin@berkeley.edu

(510) 643-5495

## HIGHLIGHTS

- □ develop and demonstrate electropolymerized thiophene onto conductive metallic substrates
- □ electrochemically analyze photoelectrochemical devices for water splitting, showing appreciable photocurrent for organic devices
- □ electropolymerized thiophene shows more than 0.5 V improvement in onset voltage as compared to spin-coated poly-3hexylthiophene

## ABSTRACT

We present thiophene-based devices fabricated via spin-coating and electropolymerization (EP) for usage in solar-powered, photocatalytic hydrogen gas (H<sub>2</sub>) harvesting. Two innovative claims are achieved in this work: (1) demonstration of electropolymerized photoelectrochemical (PEC) devices for water splitting, and (2) drastically improved performance of EP-PEC devices over spin-coated PEC hydrogen harvesters, achieving >0.5V improvement in onset voltage ( $V_{on}$ , bias voltage needed to produce photocurrent), with  $V_{on}$  of 0 V vs. Ag/AgCl. As such, this work points to new opportunities for material and device fabrication for cheaper and efficient PEC hydrogen harvesting systems.\

Download English Version:

<https://daneshyari.com/en/article/7133245>

Download Persian Version:

<https://daneshyari.com/article/7133245>

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