

Accepted Manuscript

Title: Facet-specific heterojunction in gold-decorated pyramidal silicon for electrochemical hydrogen peroxide sensing

Authors: Chia-Wei Huang, Joey Andrew A. Valinton, Yung-Jr Hung, Chun-Hu Chen



PII: S0925-4005(18)30627-0
DOI: <https://doi.org/10.1016/j.snb.2018.03.131>
Reference: SNB 24416

To appear in: *Sensors and Actuators B*

Received date: 11-1-2018
Revised date: 16-3-2018
Accepted date: 21-3-2018

Please cite this article as: Chia-Wei Huang, Joey Andrew A.Valinton, Yung-Jr Hung, Chun-Hu Chen, Facet-specific heterojunction in gold-decorated pyramidal silicon for electrochemical hydrogen peroxide sensing, *Sensors and Actuators B: Chemical* <https://doi.org/10.1016/j.snb.2018.03.131>

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.

Facet-specific Heterojunction in Gold-decorated Pyramidal Silicon for Electrochemical Hydrogen Peroxide Sensing

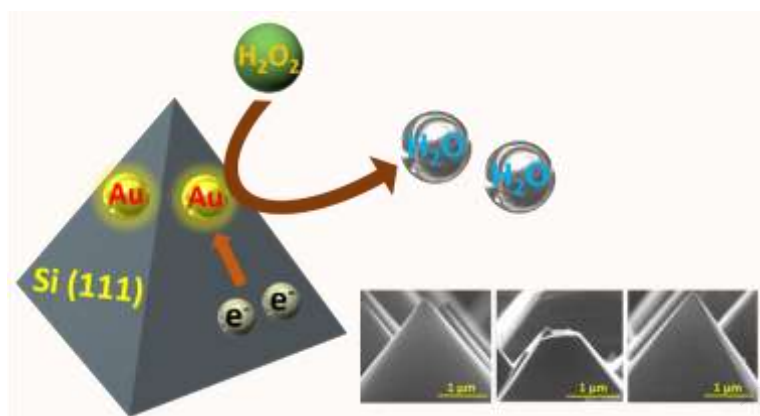
Chia-Wei Huang¹, Joey Andrew A. Valinton², Yung-Jr Hung¹ and Chun-Hu Chen^{*2}

Department of Photonics, National Sun Yat-sen University, Kaohsiung, Taiwan 80424.

Department of Chemistry, National Sun Yat-sen University, Kaohsiung, Taiwan 80424.

E-mail: chunhu.chen@mail.nsysu.edu.tw; Tel: +886-7-525-2000

Graphical Abstract



Highlight:

Large scale Si pyramidal electrodes with monolithic exposure of Si (111) can be prepared by selective alkaline etching.

The success fabrication of Au/Si (111) heterojunction exhibits the facet-dependent electrochemical activities superior to Au/Si (100), and synergistically enhances the electrochemical sensing performance.

The H₂O₂ sensing performance of Au/Si (111) achieves 194 times greater sensitivity than the Au/Si (100) with a wide linear range (0.01 to 55.55 mM), high sensitivity (171 $\mu\text{A mM}^{-1} \text{cm}^{-2}$), and low detection limit of 1.24 μM .

ABSTRACT

Nanoscale heterojunction of asymmetrical band structures and electron distributions at the

Download English Version:

<https://daneshyari.com/en/article/7139896>

Download Persian Version:

<https://daneshyari.com/article/7139896>

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