

## Accepted Manuscript

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PII: S1572-6657(17)30740-3  
DOI: [doi:10.1016/j.jelechem.2017.10.032](https://doi.org/10.1016/j.jelechem.2017.10.032)  
Reference: JEAC 3592

To appear in: *Journal of Electroanalytical Chemistry*

Received date: 18 June 2017  
Revised date: 5 October 2017  
Accepted date: 15 October 2017

Please cite this article as: Yuran Tang, Qin Liu, Xue Yang, Min Wei, Mingxiao Zhang, Copper oxide coated gold Nanorods like a film: A facile route to nanocomposites for electrochemical application. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Jeac*(2017), doi:[10.1016/j.jelechem.2017.10.032](https://doi.org/10.1016/j.jelechem.2017.10.032)

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# Copper oxide Coated Gold Nanorods like a Film: A Facile Route to Nanocomposites for Electrochemical Application

Yuran Tang, Qin Liu, Xue Yang, Min Wei, Mingxiao Zhang\*

\*Corresponding author. E-mail address: pclab@wsu.edu.cn (M. Zhang)

\* School of Chemistry and Chemical Engineering, Southwest University, Chongqing 400715, China

**Abstract:** In this work, the gold nanorods - copper oxide nanocomposites (Au NRs-CuO nanocomposites) is fabricated via a facile seed mediated followed by copper oxide nanoparticles (CuO NPs) in situ deposition, in which the CuO NPs coating Au NRs like a film. The synthesized nanocomposites was characterized by advanced microscopic and spectroscopic techniques. The biosensing properties of Au NRs-CuO nanocomposites toward glucose were studied based on electrochemical methods. Electrochemical studies indicated that the obtained Au NRs-CuO nanocomposites showed excellent electrocatalytic activity toward the oxidation of glucose compared with CuO NPs. The enhanced performance was related to the synergetic catalytic effect of Au NRs and CuO NPs. At an oxidation potential of +0.43 V, the current response of the Au NRs-CuO nanocomposites modified glassy carbon electrode (Au NRs-CuO /GCE) presented a good linear relation with the glucose concentration in the range of 0.01 mmol/L (mM) to 9.35 mM. Furthermore, it also showed fast response (<2s), a low detection limit of 2.57  $\mu\text{mol/L}$  ( $\mu\text{M}$ ), good anti-toxicity,

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\* Corresponding author.

E-mail address: [pclab@swu.edu.cn](mailto:pclab@swu.edu.cn)

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