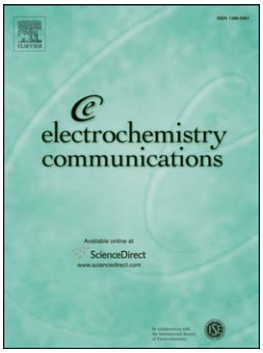

Electrochemistry-assisted microstructuring of reduced graphene oxide-based microarrays with adjustable electrical behavior

Ming Zhao, Aiping Liu, Huaping Wu, Bingbing Wu, Chaorong Li, Weihua Tang

PII: S1388-2481(14)00285-9
DOI: doi: 10.1016/j.elecom.2014.08.030
Reference: ELECOM 5264

To appear in: *Electrochemistry Communications*

Received date: 21 July 2014
Revised date: 17 August 2014
Accepted date: 28 August 2014

Please cite this article as: Ming Zhao, Aiping Liu, Huaping Wu, Bingbing Wu, Chaorong Li, Weihua Tang, Electrochemistry-assisted microstructuring of reduced graphene oxide-based microarrays with adjustable electrical behavior, *Electrochemistry Communications* (2014), doi: 10.1016/j.elecom.2014.08.030

Electrochemistry-assisted microstructuring of reduced graphene oxide-based microarrays with adjustable electrical behavior

Ming Zhao [a], Aiping Liu [a,b,*], Huaping Wu [c,*], Bingbing Wu [c], Chaorong Li [a], Weihua Tang [d]

[a] *Center for Optoelectronics Materials and Devices, Zhejiang Sci-Tech University, Hangzhou 310018, China*

[b] *State Key Lab of Silicon Materials, Zhejiang University, Hangzhou 310027, China*

[c] *Key Laboratory of E&M (Zhejiang University of Technology), Ministry of Education & Zhejiang Province, Hangzhou 310014, China*

[d] *State Key Laboratory of Information Photonics and Optical Communication, Beijing University Posts and Telecommunications, Beijing 100876, China*

Abstract

An electrochemistry-assisted microstructuring process is developed for fabricating well-aligned reduced graphene oxide (rGO)-based micropatterns on arbitrary substrates using a combined method of photolithography, electrochemical reduction and wet etching techniques. The dimension of special-shaped rGO microarrays localized in an insulating GO matrix is effectively adjusted by changing GO reduction time without multi-mask patterning. The increased conductivity of rGO micropatterns by several orders of magnitude is achieved by controlling GO thickness and reduction time. The electrochemical activity of rGO micropatterns as microarray