

# Accepted Manuscript

Full Length Article

Tangerine peel-derived carbon supported manganese oxides catalyst for oxygen reduction reaction

Guang-Lan Li, Li-Fang Yuan, Guang-Chun Cheng, Si-Mei Chen, Cai-Di Liu, Wen-Wen Chen, Bei-Bei Yang, Xiao-Cun Xu, Ce Hao

PII: S0169-4332(18)31103-6  
DOI: <https://doi.org/10.1016/j.apsusc.2018.04.143>  
Reference: APSUSC 39142

To appear in: *Applied Surface Science*

Received Date: 27 December 2017  
Revised Date: 31 March 2018  
Accepted Date: 14 April 2018

Please cite this article as: G-L. Li, L-F. Yuan, G-C. Cheng, S-M. Chen, C-D. Liu, W-W. Chen, B-B. Yang, X-C. Xu, C. Hao, Tangerine peel-derived carbon supported manganese oxides catalyst for oxygen reduction reaction, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.04.143>

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.



## Title Page

**Title:**

Tangerine peel-derived carbon supported manganese oxides catalyst for oxygen reduction reaction

**Abstract:**

Controllable growth of uniform nanoparticles with specific morphology to obtain high active electrocatalyst is a key common problem in developing efficient energy conversion and storage devices. In this work, a tangerine peel-derived carbon (TPC) supported mixed manganese oxides ( $\text{MnO}_x/\text{TPC}$ ) was synthesized for oxygen reduction reaction (ORR) through a facile pyrolysis procedure. By making full use of the confinement effect of tangerine peel cells, the  $\text{MnO}_x$  nanoparticles of  $\text{MnO}_x/\text{TPC}-800$  are obtained with a components of Mn(II), Mn(III) and Mn(IV) with cubic morphology of about 15 nm and evenly dispersed on the TPC surface. Electrochemistry measurements show that  $\text{MnO}_x/\text{TPC}-800$  demonstrates excellent ORR performance with a comparable half-wave potential to commercial Pt/C and a high onset potential with a dominant  $4e^-$  catalytic process, superior stability, and remarkable immunity to methanol crossover effect in alkaline media. The synergy effect between multi-oxidation states  $\text{MnO}_x$  and TPC of  $\text{MnO}_x/\text{TPC}-800$  is proved to play significant factor for its high ORR performance. This study provides a valuable and rational strategy to construct morphology-controlled metal nanoparticles with unique carbon materials in developing cost-effective catalysts for fuel cells and metal air batteries.

**Author names and affiliations:**

Guang-Lan Li\*, *State Key Laboratory of Fine Chemicals, Dalian University of Technology, Panjin, 124221, Liaoning, China.* Telephone: 15566800825. E-mail: guanglanli@dlut.edu.cn

Li-Fang Yuan, *State Key Laboratory of Fine Chemicals, Dalian University of Technology, Panjin, 124221, Liaoning, China.* Telephone: 18342781915. E-mail:

Download English Version:

<https://daneshyari.com/en/article/7833551>

Download Persian Version:

<https://daneshyari.com/article/7833551>

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