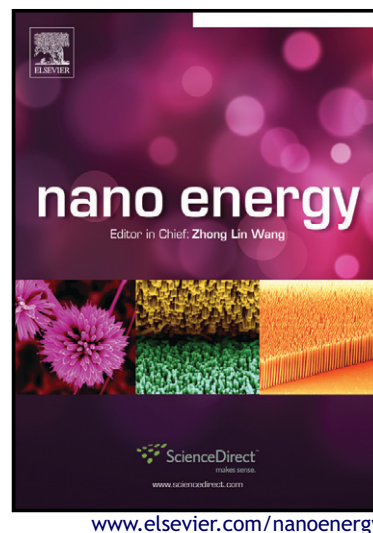


Effects of structural defects on the electrochemical activation of Li_2MnO_3

Liang Xiao, Jie Xiao, Xiqian Yu, Pengfei Yan, Jianming Zheng, Mark Engelhard, Priyanka Bhattacharya, Chongmin Wang, Xiao-Qing Yang, Ji-Guang Zhang



PII: S2211-2855(15)00265-7
DOI: <http://dx.doi.org/10.1016/j.nanoen.2015.06.011>
Reference: NANOEN881

To appear in: *Nano Energy*

Received date: 21 March 2015

Revised date: 7 June 2015

Accepted date: 17 June 2015

Cite this article as: Liang Xiao, Jie Xiao, Xiqian Yu, Pengfei Yan, Jianming Zheng, Mark Engelhard, Priyanka Bhattacharya, Chongmin Wang, Xiao-Qing Yang, Ji-Guang Zhang, Effects of structural defects on the electrochemical activation of Li_2MnO_3 , *Nano Energy*, <http://dx.doi.org/10.1016/j.nanoen.2015.06.011>

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 galley proof before it is published in its final citable 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.

Effects of structural defects on the electrochemical activation of Li_2MnO_3

Liang Xiao,^{1,4} Jie Xiao,^{1,*} Xiqian Yu,² Pengfei Yan,³ Jianming Zheng,¹ Mark Engelhard,³ Priyanka Bhattacharya,¹ Chongmin Wang,³ Xiao-Qing Yang,² and Ji-Guang Zhang^{1,*}

¹ Dr. L. Xiao, Dr. J. Xiao, Dr. J. Zheng, Dr. P. Bhattacharya, Dr. J.-G. Zhang
Energy and Environment Directorate, Pacific Northwest National Laboratory, 902 Battelle Blvd.,
Richland, Washington 99352 USA
E-mail: Jiguang.zhang@pnnl.gov

² Dr. X. Yu, Dr. X-Q. Yang
Chemistry Department, Brookhaven National Laboratory, Upton, NY, 11973 USA

³ Dr. P. Yan, Mr. M. Engelhard, Dr. C.M. Wang
Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, 902
Battelle Blvd., Richland, Washington 99352 USA

⁴ Dr. L. Xiao
Department of Chemistry, School of Chemistry, Chemical Engineering and Life Sciences,
Wuhan University of Technology, Wuhan, Hubei 430070 China

Keywords: Li_2MnO_3 , structural defect, Mn^{3+} , lithium-rich, lithium-ion batteries

Abstract

Structural defects, e.g. Mn^{3+} /oxygen non-stoichiometry, largely affect the electrochemical performance of both Li_2MnO_3 and Lithium-rich Manganese-rich (LMR) layered oxides with Li_2MnO_3 as one of the key components. Herein, Li_2MnO_3 samples with different amount of structural defects of Mn^{3+} /oxygen non-stoichiometry are prepared. The results clearly demonstrate that the annealed Li_2MnO_3 (ALMO), quenched Li_2MnO_3 (QLMO), and quenched Li_2MnO_3 milled with Super P (MLMO) all show pure C2/m monoclinic phase with stacking faults. MLMO shows the largest amount of Mn^{3+} , followed by the QLMO and then the ALMO. The increased amount of Mn^{3+} in Li_2MnO_3 (such as sample MLMO) facilitates the activation of Li_2MnO_3 and leads to the highest initial discharge specific capacity of 167.7 mAh g^{-1} among the

Download English Version:

<https://daneshyari.com/en/article/7953907>

Download Persian Version:

<https://daneshyari.com/article/7953907>

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