Accepted Manuscript

Title: A 3-D binder-free nanoporous anode for a safe and stable charging of lithium ion batteries

Authors: Yijun Chen, Yunsong Wang, Muhammad Yousaf, Zhimin Ma, Mingchu Zou, Anyuan Cao, Ray P.S. Han

PII: S0025-5408(16)31191-6
DOI: http://dx.doi.org/doi:10.1016/j.materresbull.2017.02.041
Reference: MRB 9188

To appear in: *MRB*

Received date: 27-9-2016
Revised date: 25-2-2017
Accepted date: 28-2-2017

Please cite this article as: Yijun Chen, Yunsong Wang, Muhammad Yousaf, Zhimin Ma, Mingchu Zou, Anyuan Cao, Ray P.S.Han, A 3-D binder-free nanoporous anode for a safe and stable charging of lithium ion batteries, Materials Research Bulletin http://dx.doi.org/10.1016/j.materresbull.2017.02.041

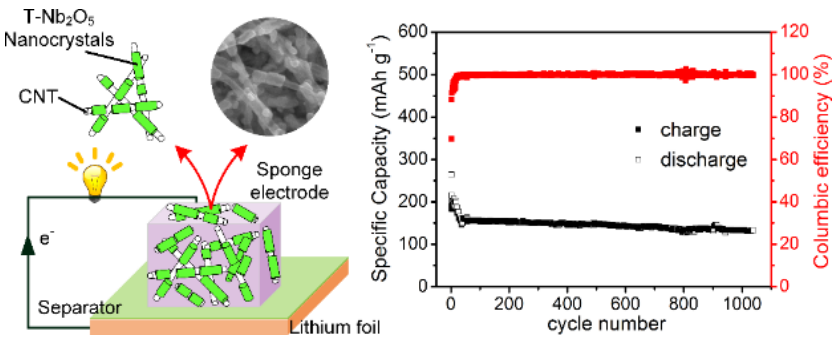
A 3-D binder-free nanoporous anode for a safe and stable charging of lithium ion batteries

Yijun Chen, Yunsong Wang, Muhammad Yousaf, Zhimin Ma, Mingchu Zou, Anyuan Cao* and Ray P.S. Han*

Department of Materials Science and Engineering, College of Engineering, Peking University, Beijing 100871, China

* Corresponding authors
Email Address: anyuan@pku.edu.cn (A. Cao); ray-han@pku.edu.cn (R. Han)

GRAPHICAL ABSTRACT



T-Nb_2O_5 nanocrystals are *in situ* grown in CNT sponges and serve as binder-free, safe and stable lithium ion battery anodes.

HIGHLIGHTS

- *In situ* growth of T-Nb_2O_5 nanocrystals in CNT sponge for a safe binder-free anode.
- 3-D nanoporous structural network enhances rate capability and cycling stability.
- Voltage window of hybrid anode varies from 1-3 V to prevent SEI formation.
- Binder-free anode has high retention rates after 1000 cycles