

## **Facile fabrication of hierarchical ZnCo<sub>2</sub>O<sub>4</sub>/NiO core/shell nanowire arrays with improved lithium-ion battery performance**

Zhipeng Sun,<sup>a,b</sup> Wei Ai,<sup>a</sup> Jilei Liu,<sup>a</sup> Xiaoying Qi,<sup>c</sup> Yanlong Wang,<sup>a</sup>  
Jianhui Zhu,<sup>a</sup> Hua Zhang <sup>c</sup> and Ting Yu<sup>\*a,d,e</sup>

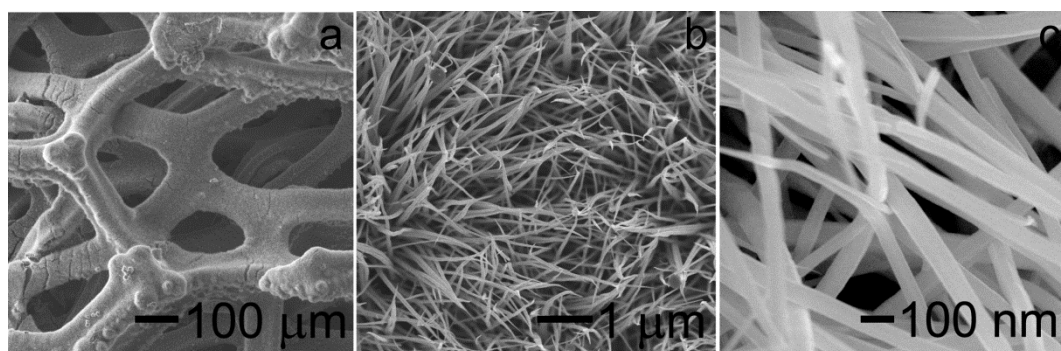
a Division of Physics and Applied Physics, School of Physical and Mathematical Sciences, Nanyang Technological University, 637371, Singapore. E-mail: yuting@ntu.edu.sg

b Xinjiang Uygur Autonomous Region Product Quality Supervision and Inspection Institute, 830011, China.

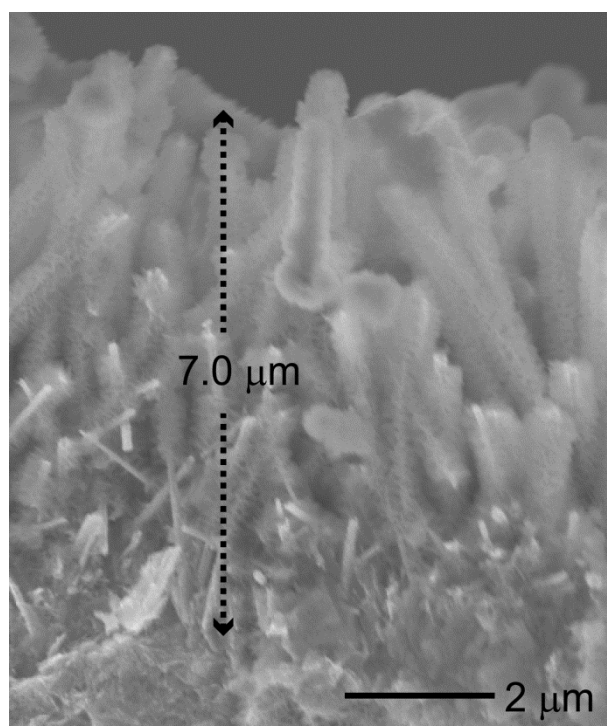
c School of Materials Science and Engineering, Nanyang Technological University, 63639798, Singapore.

d Department of Physics, Faculty of Science, National University of Singapore, 117542, Singapore.

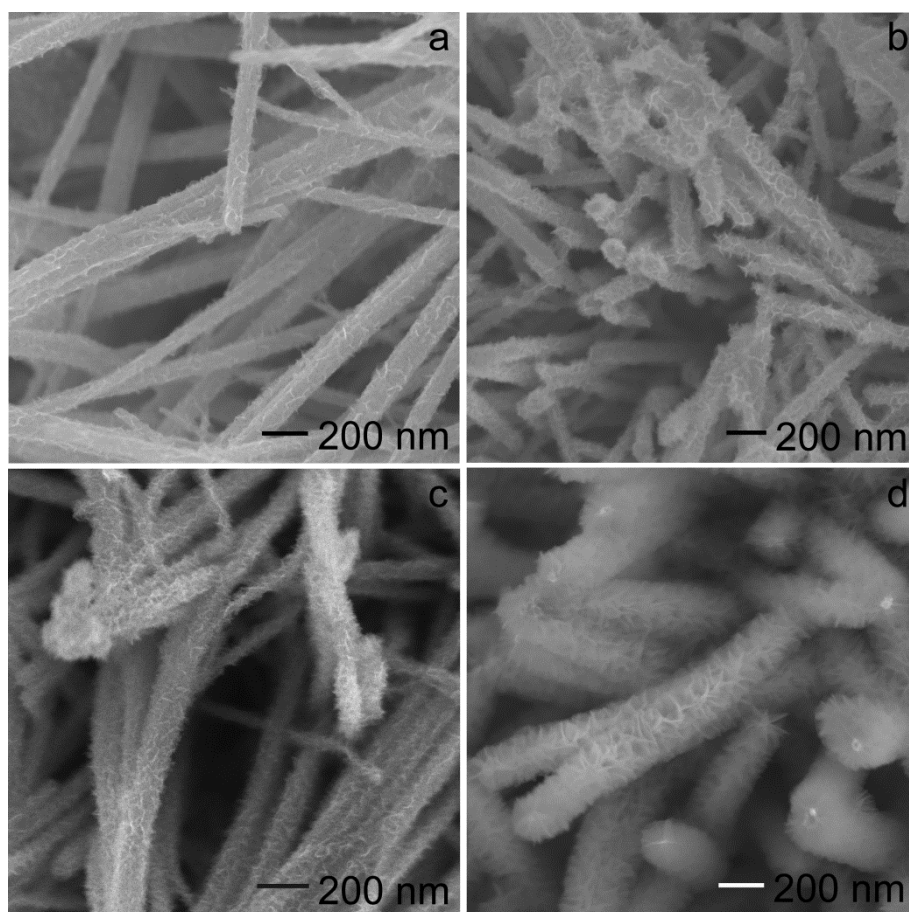
e Graphene Research Centre, National University of Singapore, 117546, Singapore.



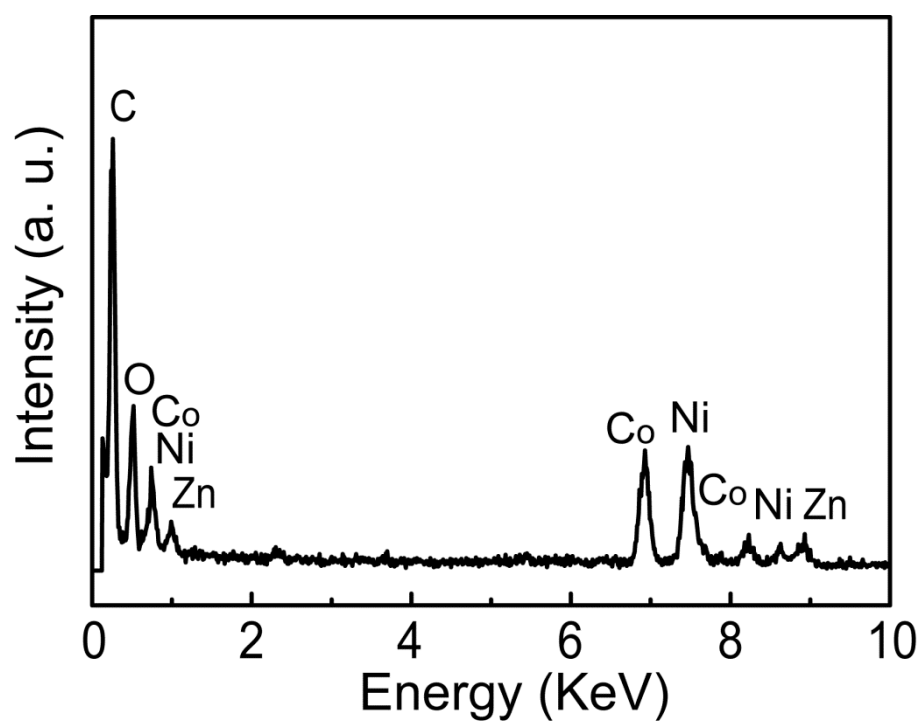
**Fig. S1** SEM images with low and high magnifications of the precursor ZCO NWs grown on the Ni foam before annealing treatment, demonstrating the uniform growth of the array on a large scale.



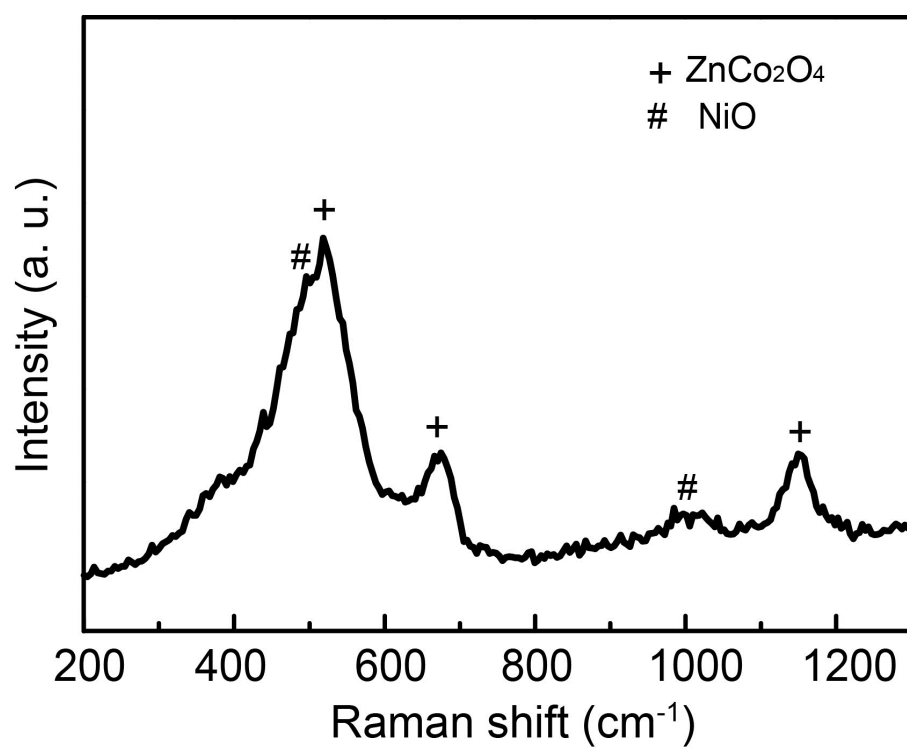
**Fig. S2** Side-view SEM image of the ZCO/NiO NWs. It is shown that the ZCO/NiO NWs are rigid and well separated, with inter-NWs spacing of micrometer scale, from which the length of NWs is about 7.0  $\mu\text{m}$ .



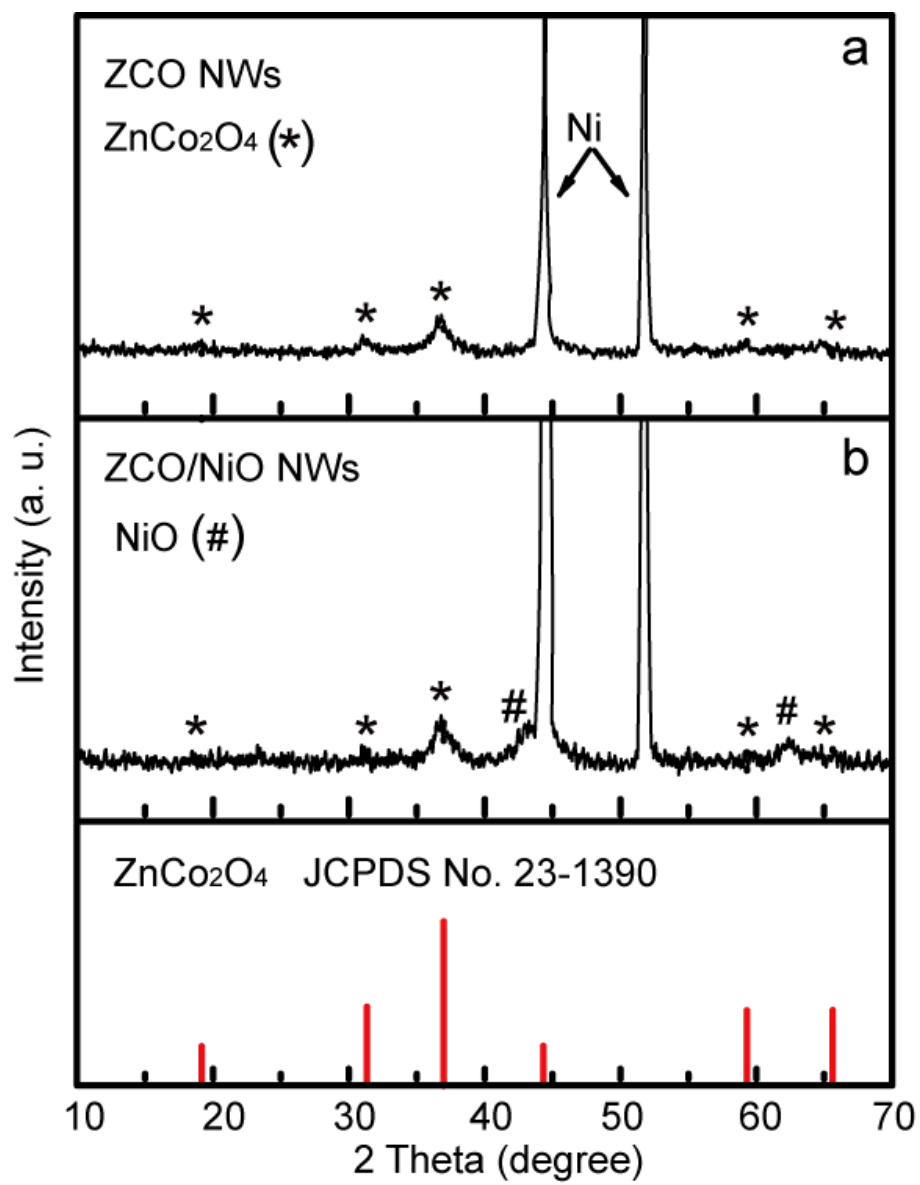
**Fig. S3** SEM images of the ZCO/NiO NWs obtained after CBD for different times, showing the morphology evolution of the core/shell nanowire arrays: (a) 10 min, (b) 20 min, (c) 35 min, and (d) 60 min.



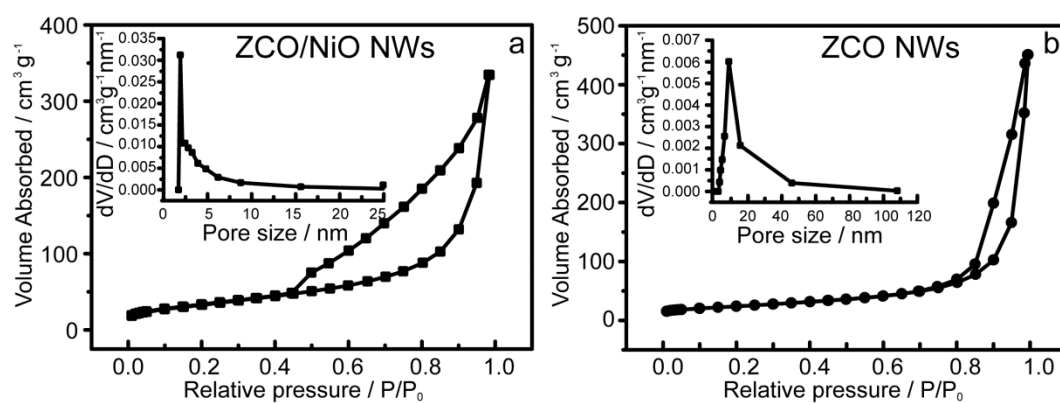
**Fig. S4** The EDX spectrum of ZCO/NiO NWs.



**Fig. S5** Raman spectrum of ZCO/NiO NWs.

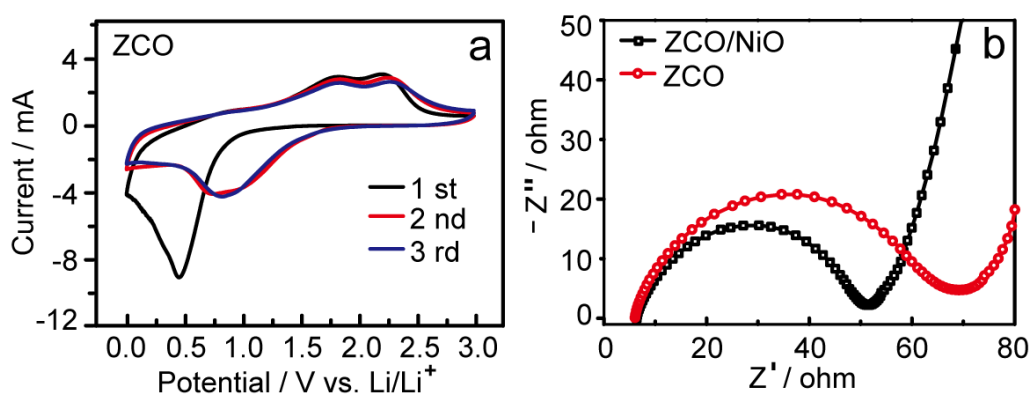


**Fig. S6** XRD patterns of the pristine ZCO NWs (a) and ZCO/NiO NWs (b) grown on the Ni foam substrate.



**Fig. S7** Nitrogen adsorption/desorption isotherm and pore-size distribution of the ZCO/NiO NWs (a) and ZCO NWs (b) electrodes which were scraped from the Ni foam.





**Fig. S8** (a) The first three CV curves of ZCO NWs electrode at a scanning rate of 0.5 mV s<sup>-1</sup>. (b) Nyquist plots of ZCO NWs and ZCO/NiO NWs after the first cycle.