

## Supporting Information

for *Adv. Mater. Interfaces*, DOI: 10.1002/admi.201800848

### Ultrathin Surface Coating Enables Stabilized Zinc Metal Anode

*Kangning Zhao, Chenxu Wang, Yanhao Yu, Mengyu Yan, Qiulong Wei, Pan He, Yifan Dong, Ziyi Zhang, Xudong Wang, and Liqiang Mai\**

## Supporting Information

### **Ultrathin Surface Coating Enables Stabilized Zinc Metal Anode**

Kangning Zhao<sup>a,b</sup>, Chenxu Wang<sup>a</sup>, Yanhao Yu<sup>b</sup>, Mengyu Yan<sup>a,c</sup>, Qiulong Wei<sup>a,d</sup>, Pan He<sup>a</sup>,  
Yifan Dong<sup>a</sup>, Ziyi Zhang<sup>b</sup>, Xudong Wang<sup>b</sup>, Liqiang Mai<sup>a,\*</sup>

K.N. Zhao, C.X. W., M.Y. Yan, Q.L. Wei, P. He, Y.F. Dong, L.Q. Mai

State Key Laboratory of Advanced Technology for Materials Synthesis and Processing,  
Wuhan University of Technology, Wuhan 430070, China

E-mail: [mlq518@whut.edu.cn](mailto:mlq518@whut.edu.cn) (L. Q. Mai)

K.N. Zhao, Y.H. Yu, Z.Y. Zhang, X.D. Wang

Department of Materials Science and Engineering, University of Wisconsin-Madison,  
Madison, WI, USA



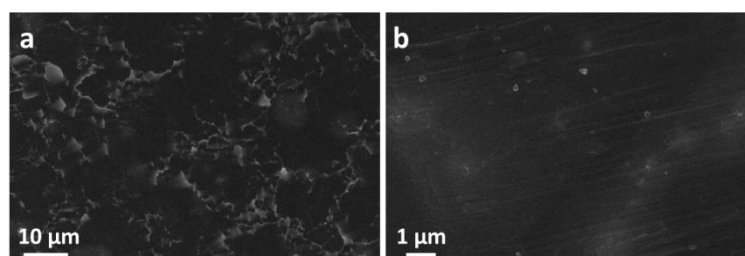


Fig. S4. SEM image of 500TiO<sub>2</sub>@Zn-MnO<sub>2</sub>.

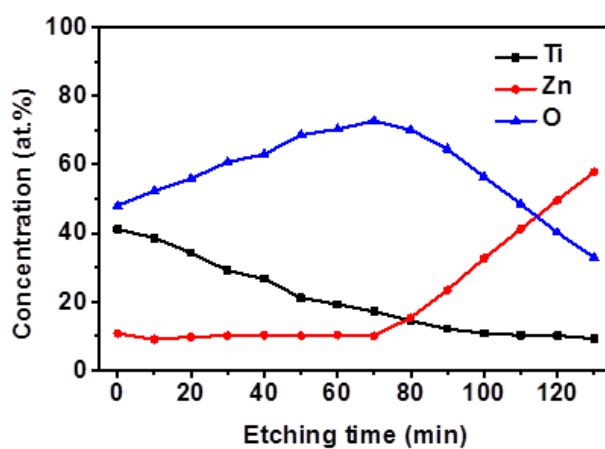


Fig. S5. XPS depth profile of 100TiO<sub>2</sub>@Zn.

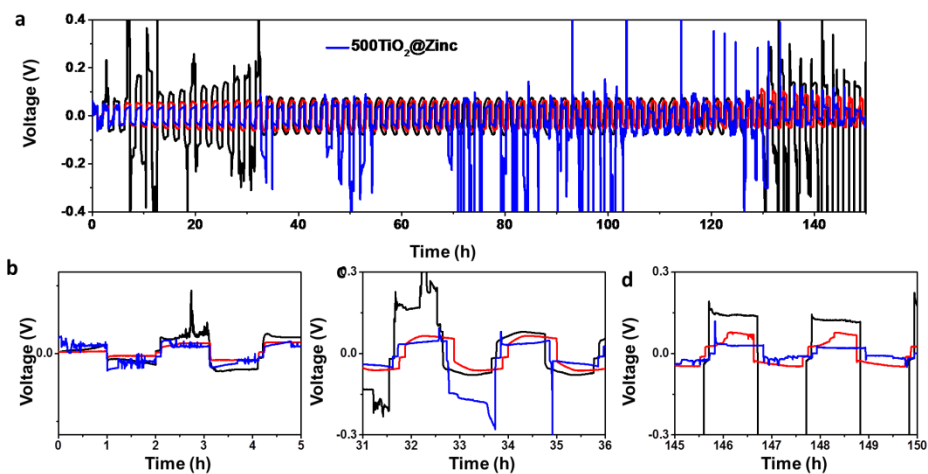
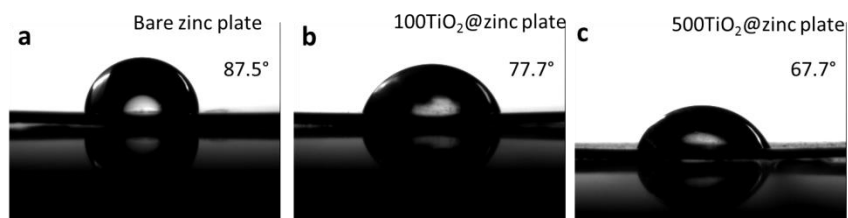
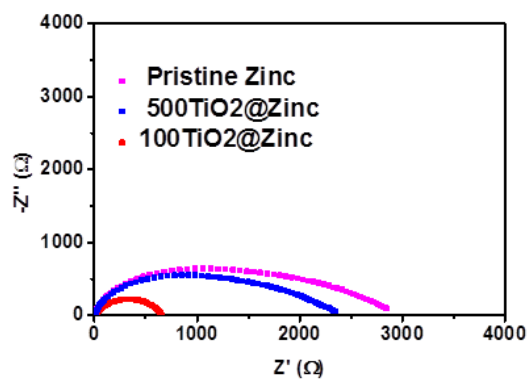


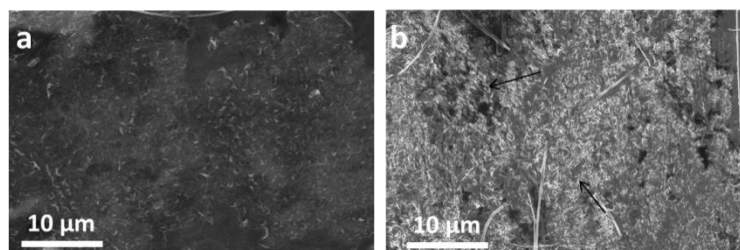
Fig. S6. Cyclic deposition/stripping process of symmetric cells using 500TiO<sub>2</sub>@Zn and pristine Zn at a constant current density of 1 mA cm<sup>-2</sup>. Each cycle is set to be 1 h.



**Fig. S7.** Experimental images of a droplet of the electrolyte on **a**, pristine zinc plate, **b**, 100TiO<sub>2</sub>@Zn, and **c**, 500TiO<sub>2</sub>@Zn.



**Fig. S8.** EIS spectrum of symmetrical Zn/Zn battery implementing different thickness of TiO<sub>2</sub> layer.



**Fig. S9.** Ex-situ SEM images of **a**, 100TiO<sub>2</sub>@Zn and **b**, pristine Zn anode, respectively.

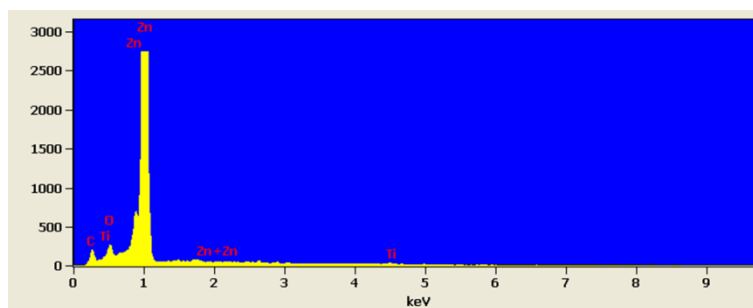


Fig. S10. EDS spectrum of 100TiO<sub>2</sub>@Zn after cycling.

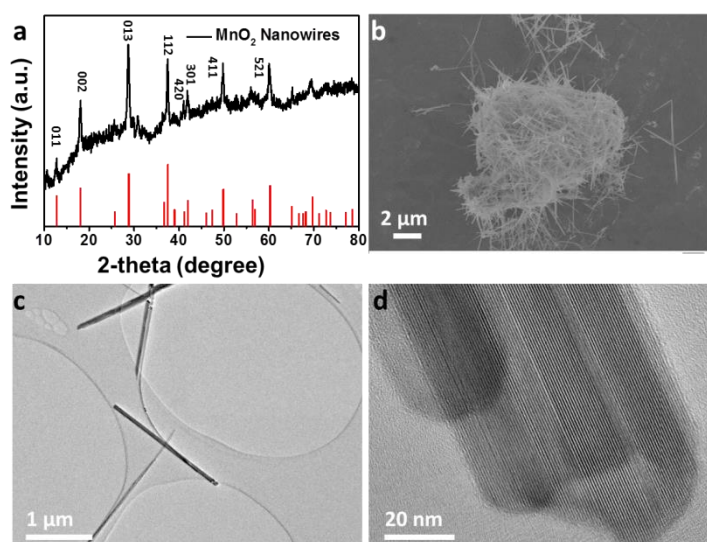
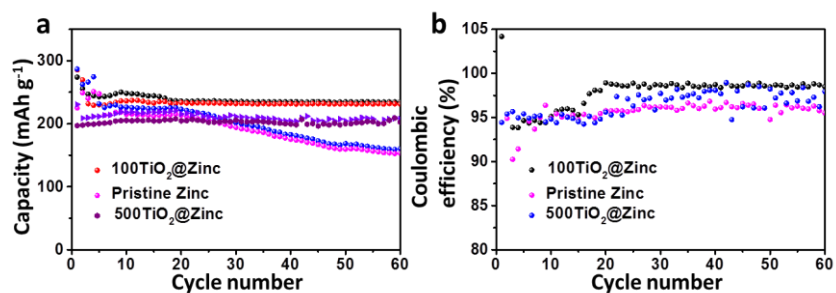
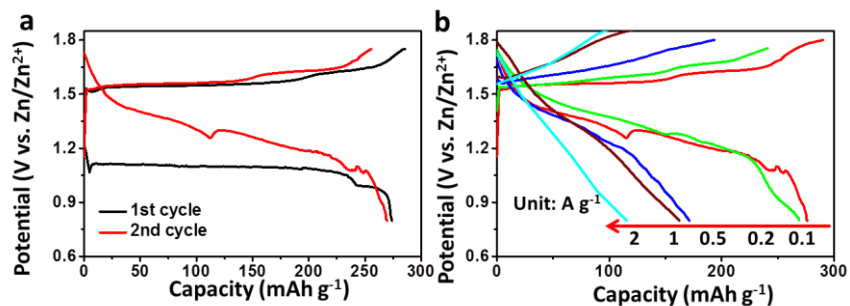


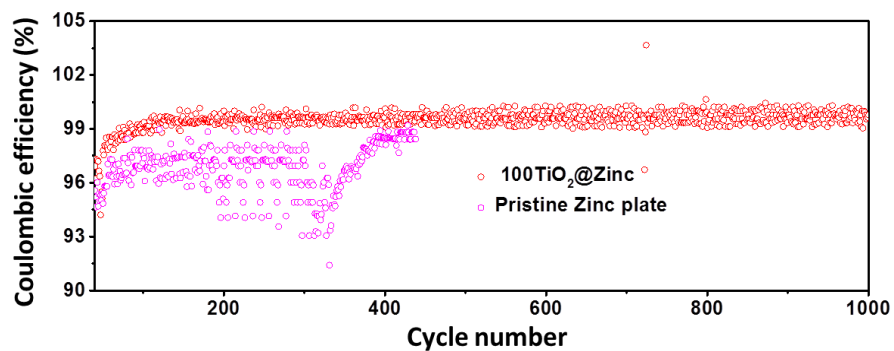
Fig. S11. XRD pattern, SEM image and TEM images of MnO<sub>2</sub> Nanowires.



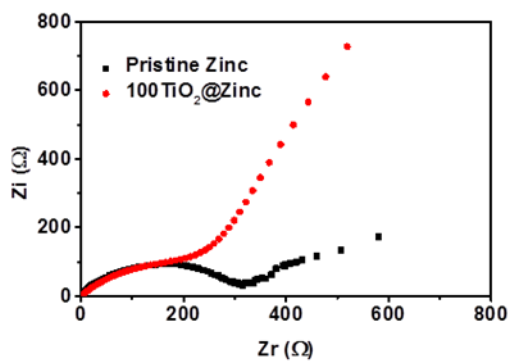
**Fig. S12.** Cycling performance of 500TiO<sub>2</sub>@Zn-MnO<sub>2</sub> cell at 100 mA g<sup>-1</sup> and b) the corresponding coulombic efficiencies of 100TiO<sub>2</sub>@Zn-MnO<sub>2</sub> cell and Zn-MnO<sub>2</sub> cell at 100 mA g<sup>-1</sup>.



**Fig. S13.** The charge-discharge curves of Zn-MnO<sub>2</sub> battery of a. the initial two cycles at 100 mA g<sup>-1</sup> and b. at different current density.



**Fig. S14.** Coulombic efficiencies of 100TiO<sub>2</sub>@Zn-MnO<sub>2</sub> cell and Zn-MnO<sub>2</sub> cell at 1 A g<sup>-1</sup>.



**Fig. S15.** EIS spectrum of 100TiO<sub>2</sub>@Zn-MnO<sub>2</sub> cell and Zn-MnO<sub>2</sub> cell at open circuit voltage.