

Supporting information

**Anchoring Tungsten oxide nanorods on TiO₂ Nanowires
Coupled with Carbon for Efficient Lithium-Ion Storage**

Teng Wang,^{a,b} Yifan Qin,^{a,b} Renquan Hu,^{a,b} Zehui Wei^{a,b} and Yong Yang^{*a,b}

^a State Key Laboratory of Solidification Processing, Center of Advanced Lubrication and Seal Materials, Northwestern Polytechnical University, Xi'an, Shaanxi 710072, P. R. China.

^b Research & Development Institute of Northwestern Polytechnical University in Shenzhen, Shenzhen, Guangdong, 518057, P. R. China.

*Corresponding author: yongyangfj@nwpu.edu.cn

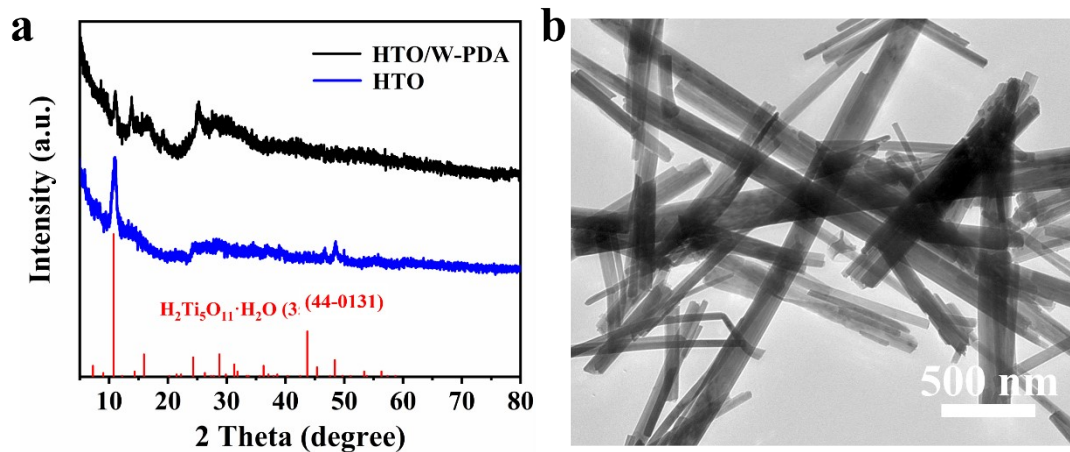


Figure S1. (a) XRD patterns of HTO nanowires and HTO/W-PDA precursor; (b) TEM image of HTO nanowires.

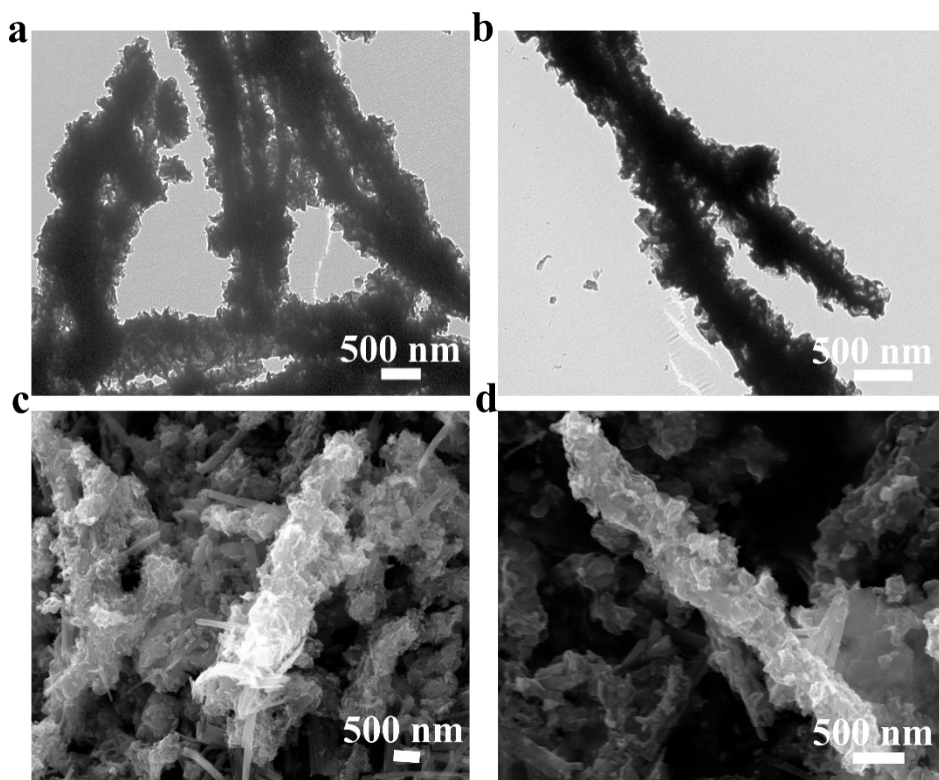


Figure S2. (a-b) TEM images and (c-d) SEM images of HTO/W-PDA precursor.

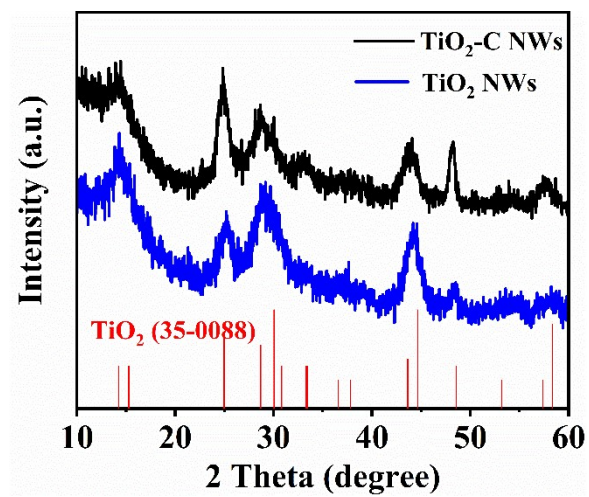


Figure S3. XRD patterns of TiO₂ nanowires and TiO₂-C nanowires.

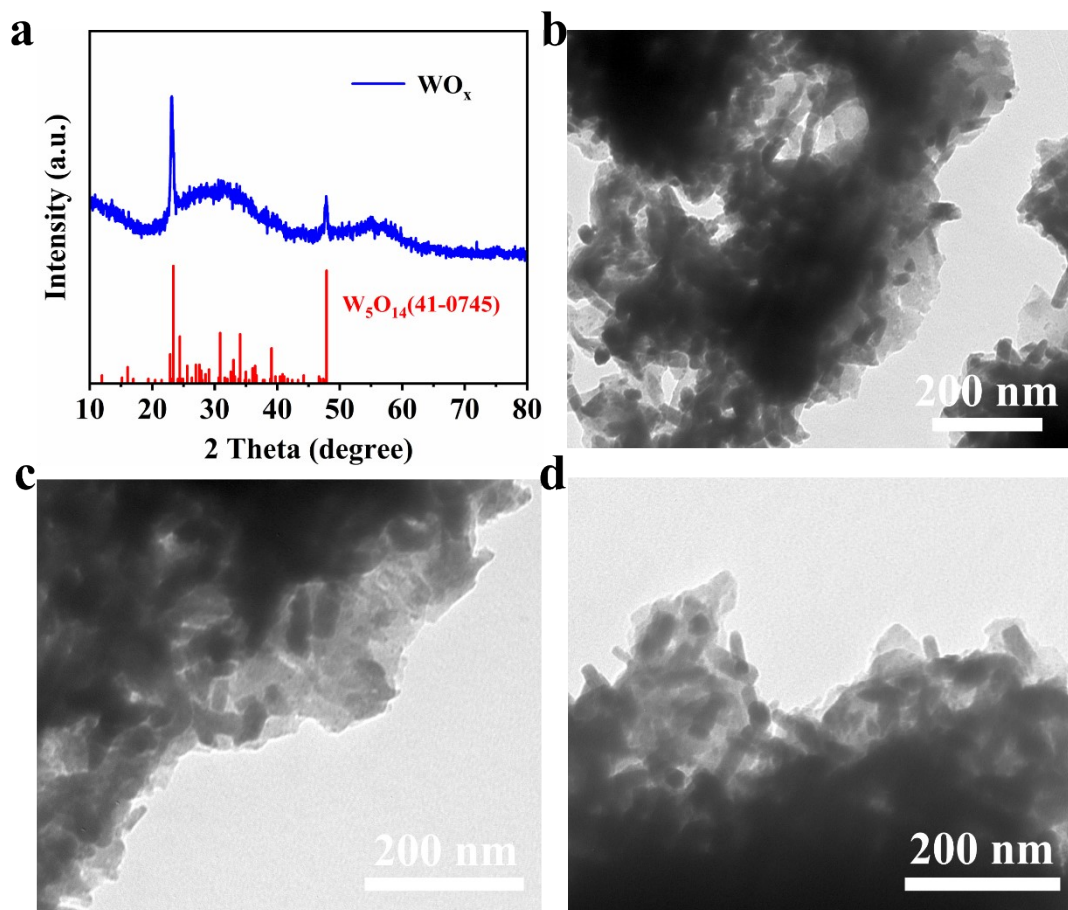


Figure S4. (a) XRD pattern and (b-d) TEM images of sample without HTO.

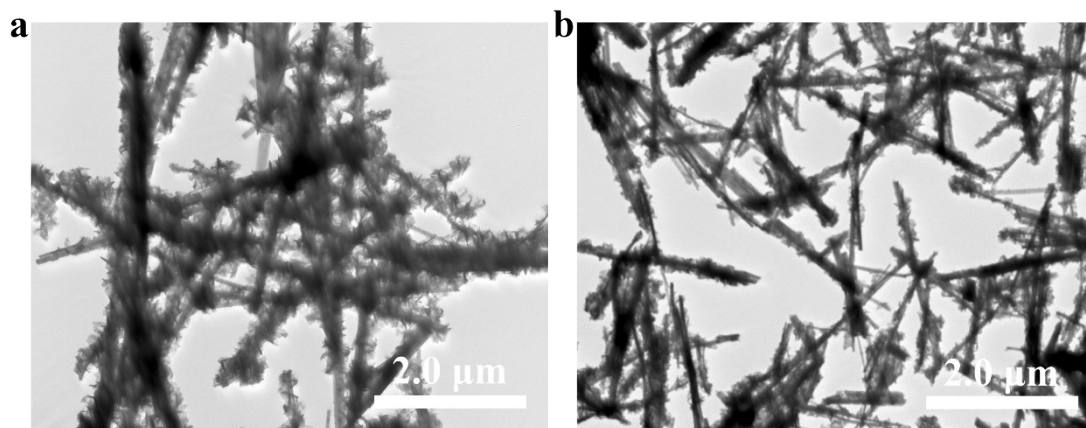


Figure S5. TEM images of tungsten-dopamine chelate precursor with (a) 20 mg HTO nanowires and (b) 30 mg HTO nanowires.

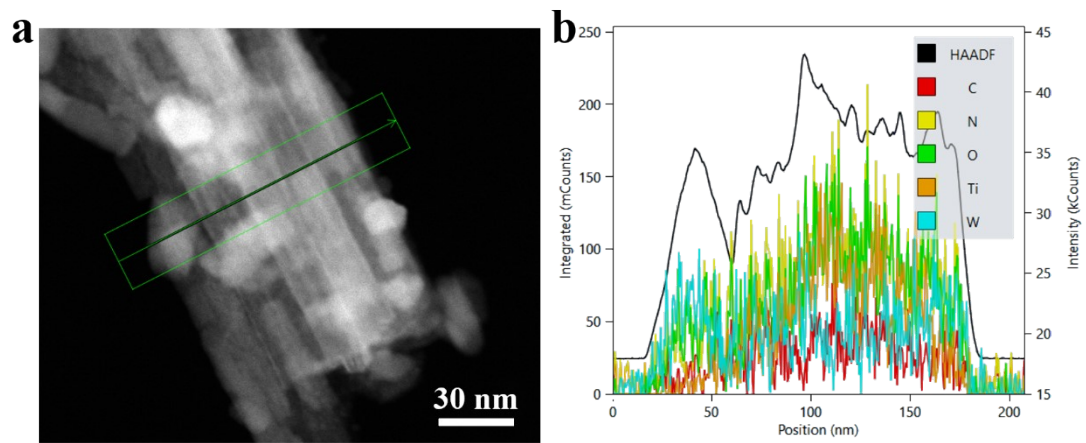


Figure S6. Linear scanning analysis of TiO₂@WO_x-C NWs.

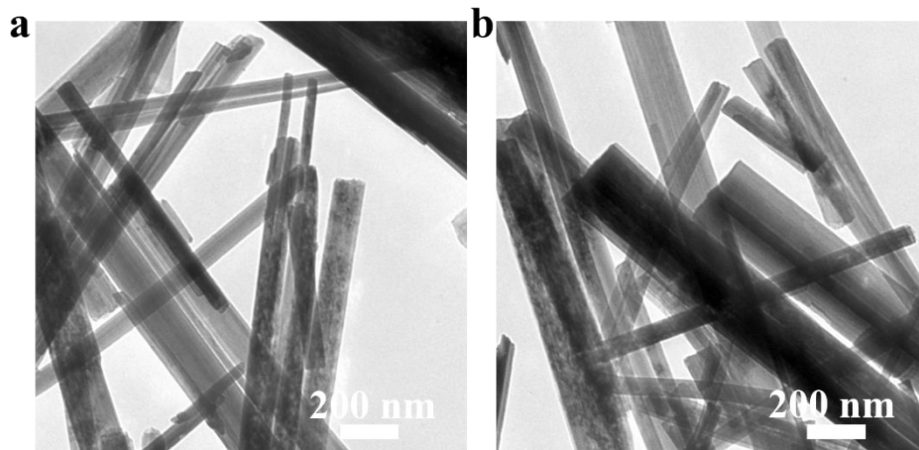


Figure S7. TEM images of TiO₂ nanowires.

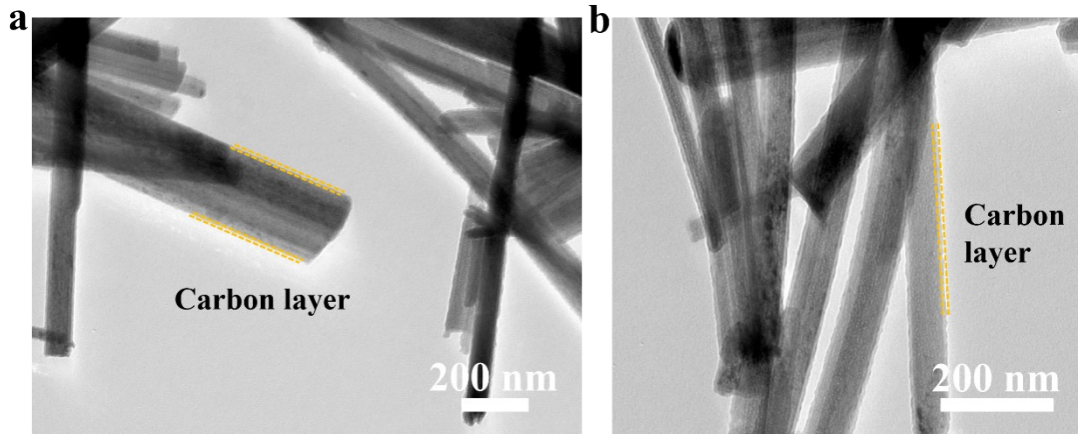


Figure S8. TEM images of TiO₂-C nanowires.

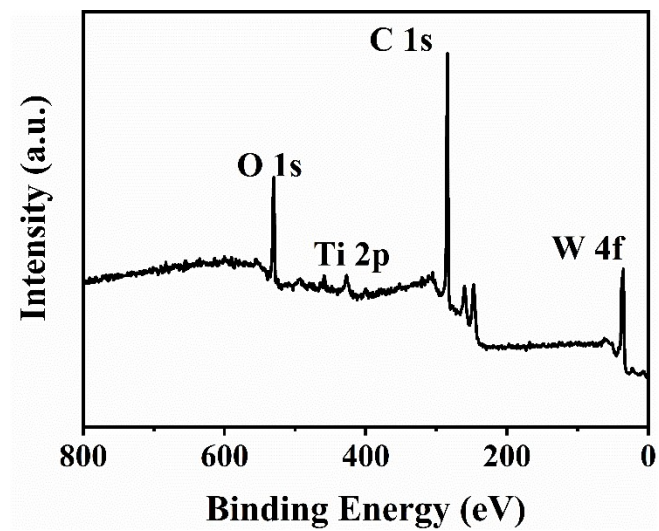


Figure S9. XPS spectra of TiO₂/WO_x-C NWs composites.

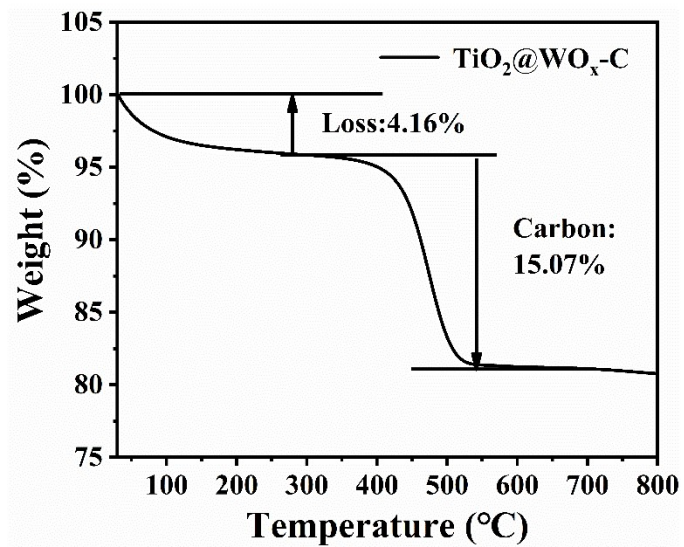


Figure S10. TGA curve of TiO₂/WO_x-C NWs composites.

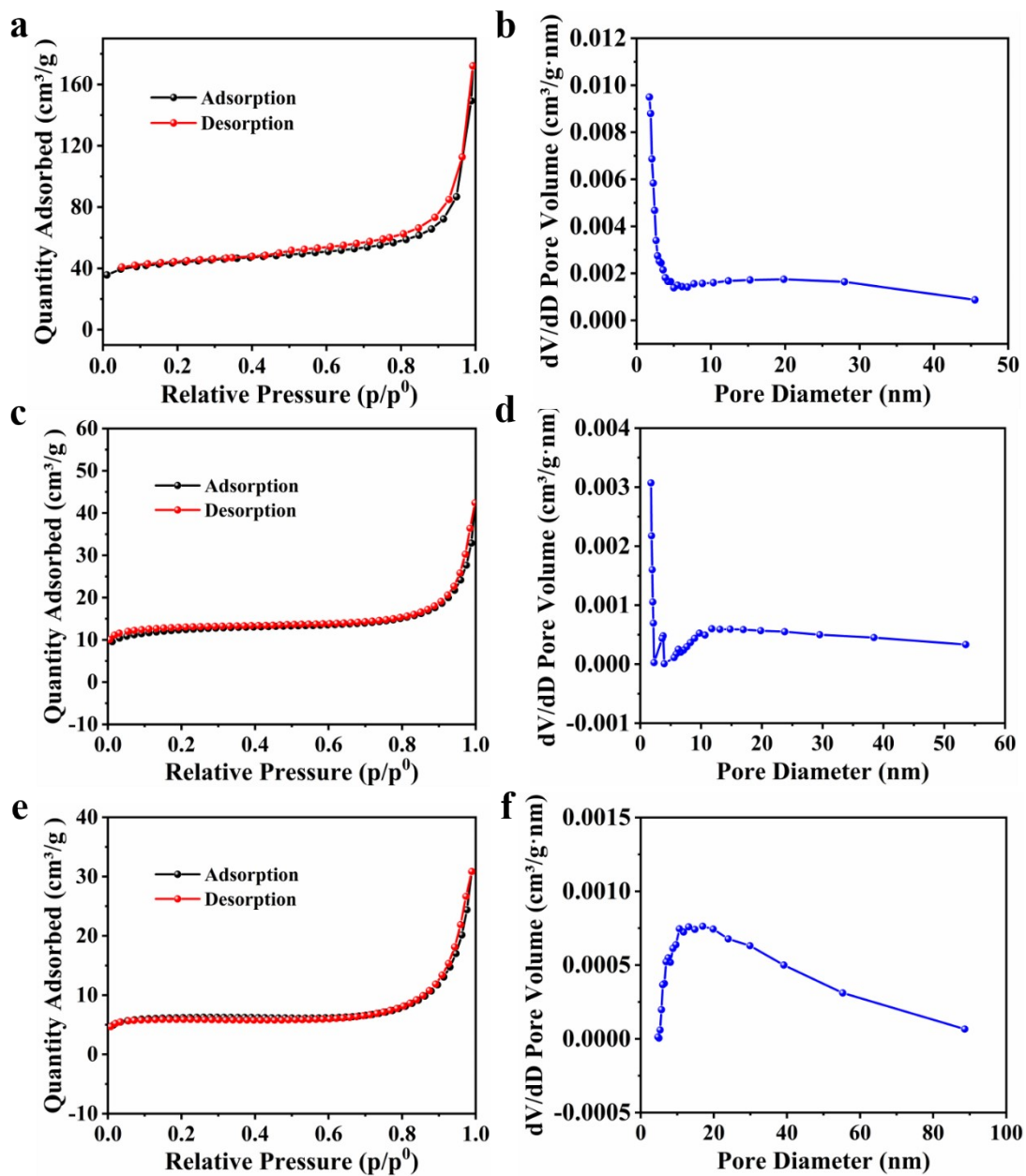


Figure S11. Nitrogen adsorption-desorption isotherms and the pore size distribution curves: (a-b) TiO₂@WO_x-C NWs; (c-d) TiO₂-C nanowires; (e-f) TiO₂ nanowires.

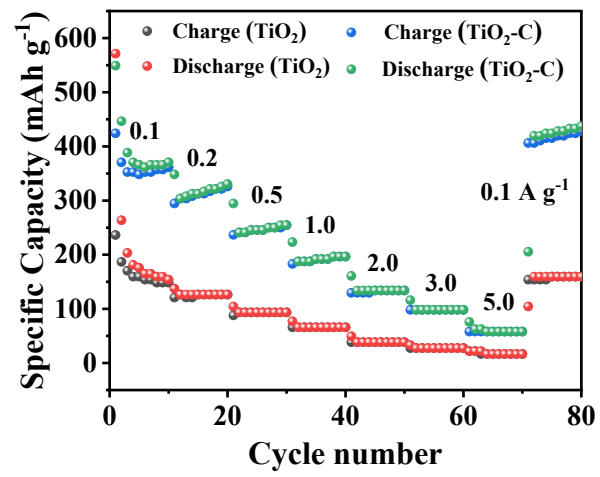


Figure S12. The rate performances of TiO₂-C NWs and TiO₂ NWs

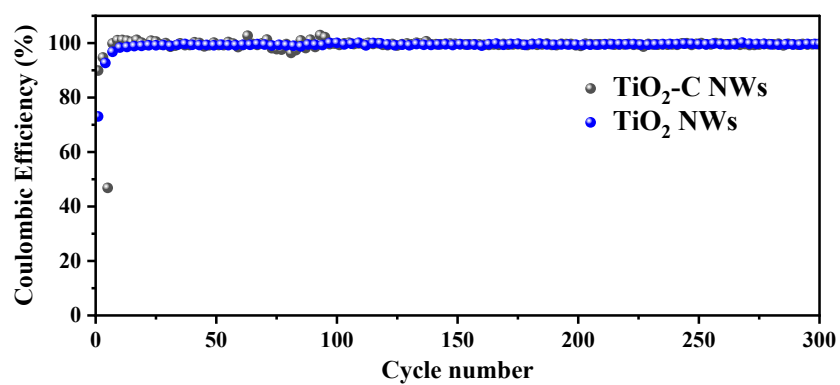


Figure S13. The coulombic efficiency of TiO₂-C NWs and TiO₂ NWs.

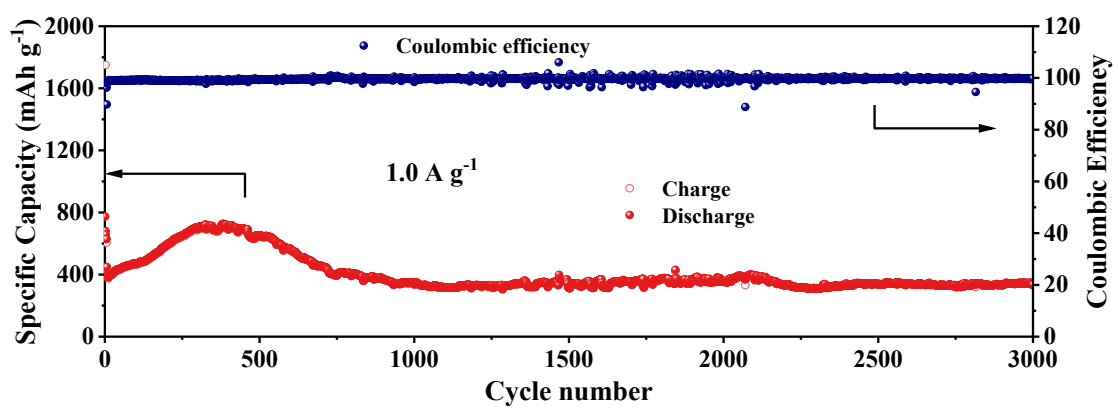


Figure S14. Long-term performance at 1.0 A g^{-1} after 3000 cycles.

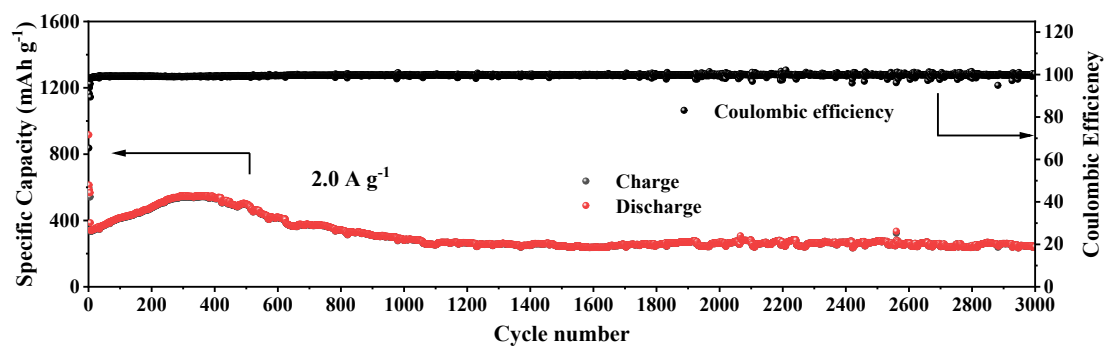


Figure S15. Long-term performance at 2.0 A g^{-1} after 3000 cycles.

Table S1. Comparison of the electrochemical performance of TiO₂@WO_x-C electrodes with related literature in lithium-ion batteries.

Samples	Current density (A g ⁻¹)	Specific capacitance (mAh g ⁻¹)	Cycle numbers	References
SDD TiO ₂	1.0	254	1000	<i>Nano Res.</i> 2021, 14 , 992-997
TiO ₂ /rGO	1.0	245	1000	<i>Small</i> , 2020, 16 , 2000030
TiO ₂ @graphdiyne	1.0	432.4	300	<i>J. Mater. Chem. A</i> 2018, 6 , 22655-22661
Macroporous titania	1.0	225	100	<i>Chem. Mater.</i> 2020, 32 , 4716-4723
TiO _{2-x} @C	0.1	432	100	<i>ACS Appl. Mater. Interfaces</i> , 2019, 11 , 48039-48053
TiO ₂ /NC-MoS ₂	0.1	629.9	200	<i>Int. J. Electrochem. Sci.</i> , 2020, 15 , 8171-8180
CMT-0.2	1.0	528.5	1000	<i>Chem. Eng. J.</i> , 2021, 406 , 126873
Sb ₂ S ₃ /Sb@TiO ₂ @C	0.5	495.8	500	<i>ACS Appl. Mater. Interfaces</i> , 2022, 14 , 33064-33075
TiO₂@WO_x-C	1.0	651.4	500	This work