

Supporting Information

Hierarchical Zigzag $\text{Na}_{1.25}\text{V}_3\text{O}_8$ Nanowires with Topotactically-Encoded Superior Performance for Sodium-Ion Battery Cathode

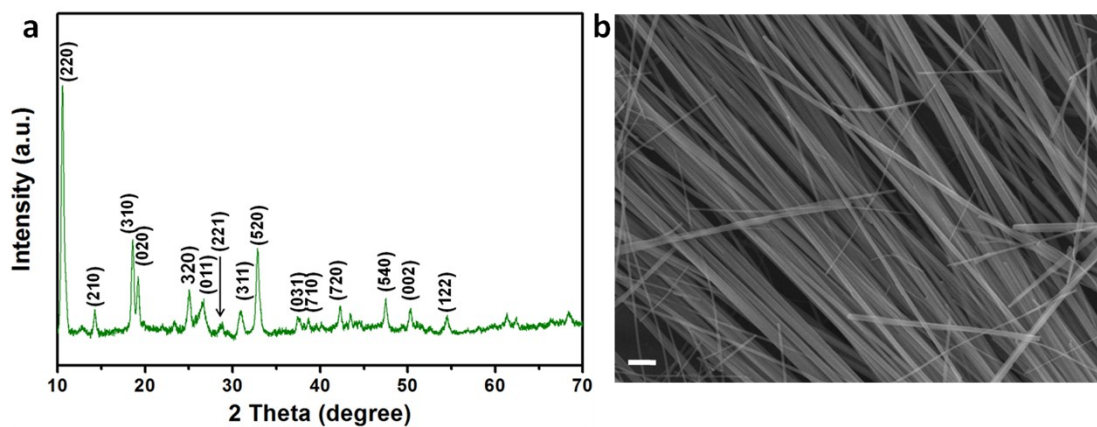


Figure S1. XRD patterns and SEM image (scale bar: 1 μm) of $\text{H}_2\text{V}_3\text{O}_8$ nanowire precursor.

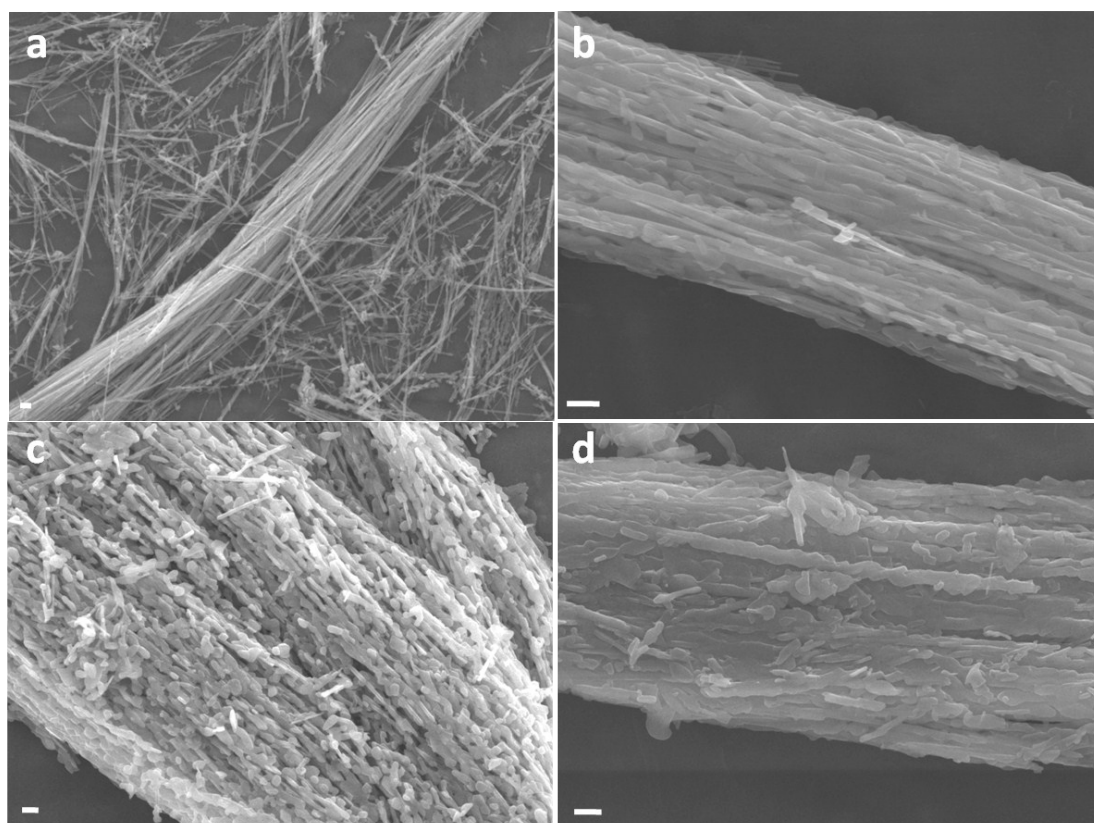


Figure S2. SEM images of simple NVO (a), NVO-C1 (b), NVO-C2 (c) and NVO-C3 (d), respectively. Scale bar: 1 μm .

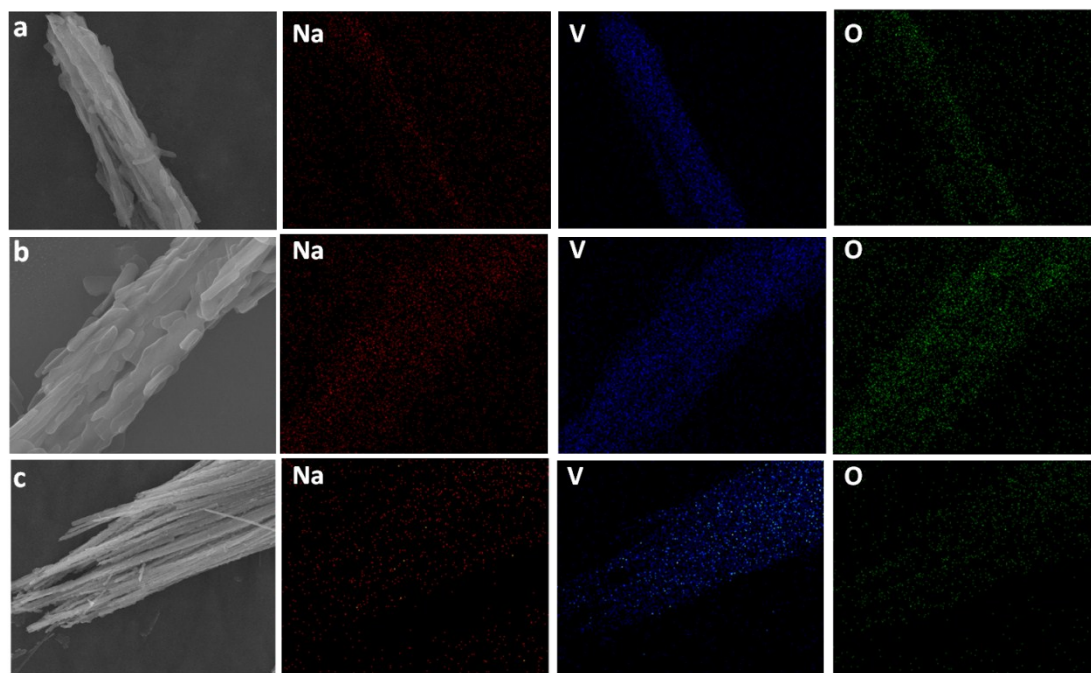


Figure S3. EDS mappings of Na, V and O element from NVO-C1 (a), NVO-C2 (b) and NVO-C3 (c), respectively.

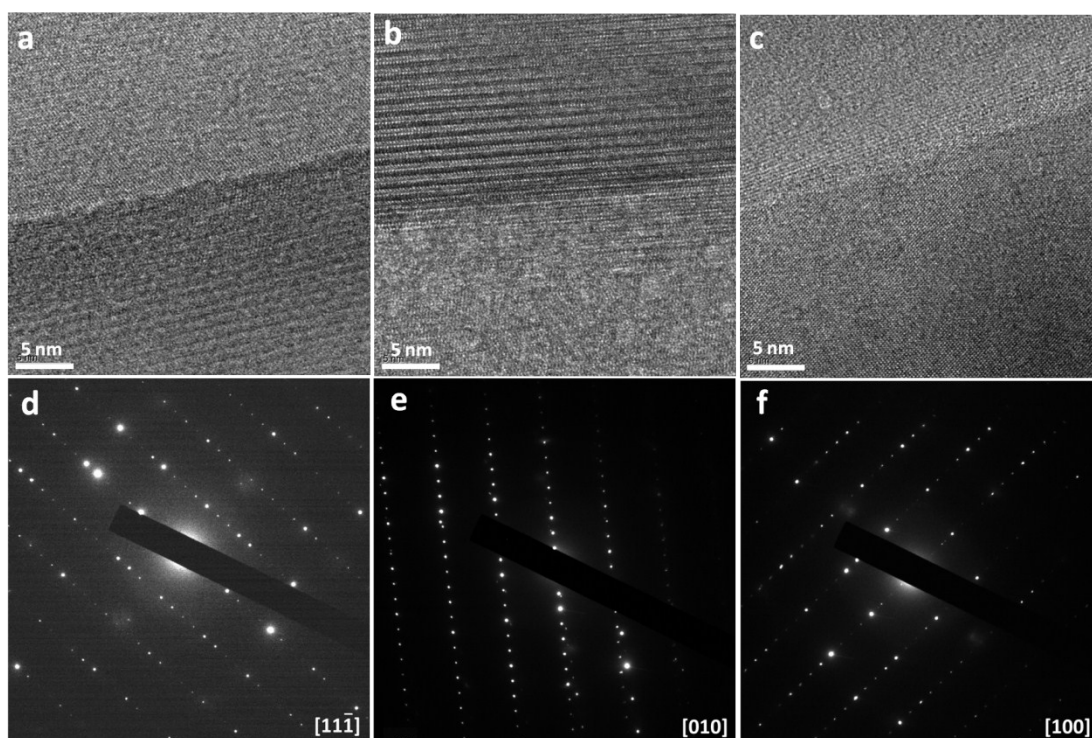


Figure S4. The HRTEM images of NVO-C1 (a), NVO-C2 (b) and NVO-C3 (c) at the junction position and the corresponding SAED patterns of NVO-C1 (d), NVO-C2 (e) and NVO-C3 (f).

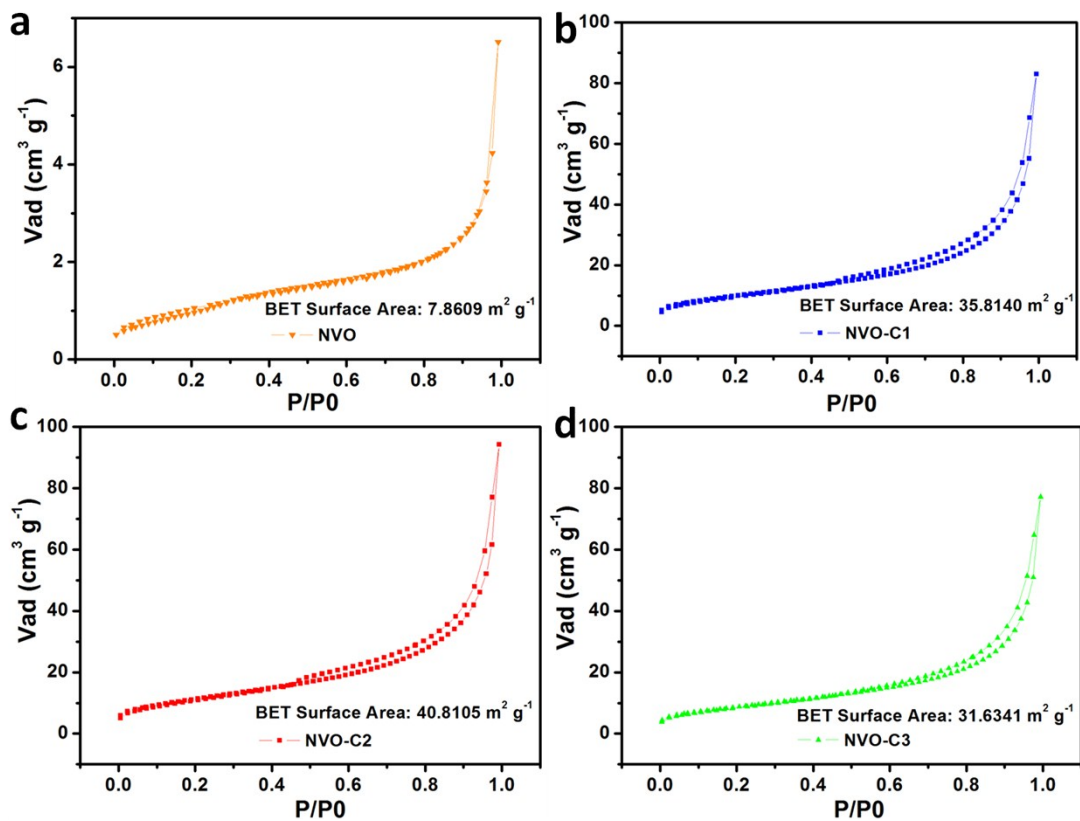


Figure S5. Nitrogen adsorption-desorption isotherms of simple NVO (a), NVO-C1 (b), NVO-C2 (c) and NVO-C3 (d).

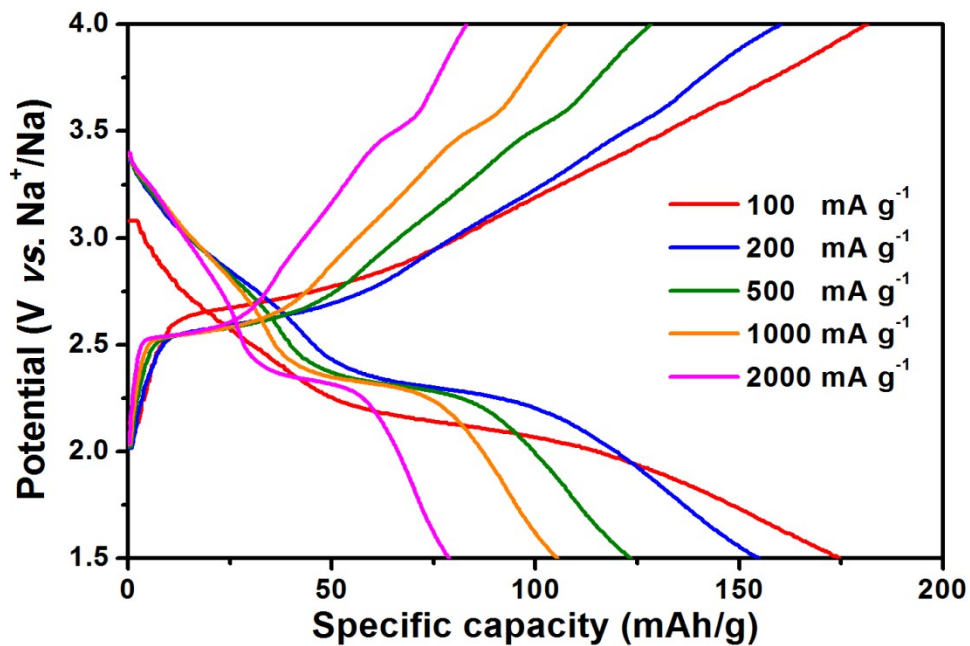


Figure S6. The charge/discharge curves of NVO-C2 at different current densities from 100 mA g^{-1} to 2000 mA g^{-1} , respectively.

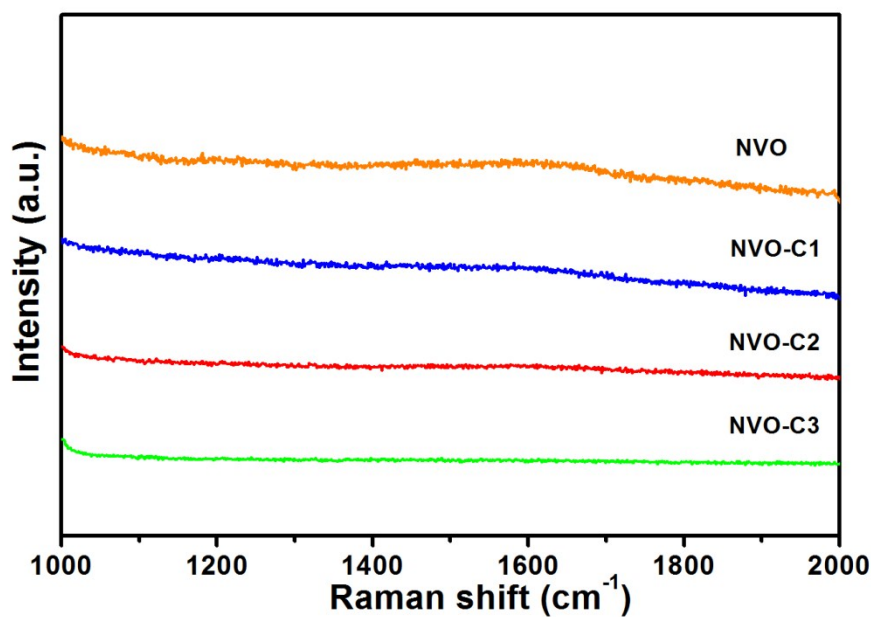


Figure S7. The Raman spectra of NVO, NVO-C1, NVO-C2 and NVO-C3, respectively.

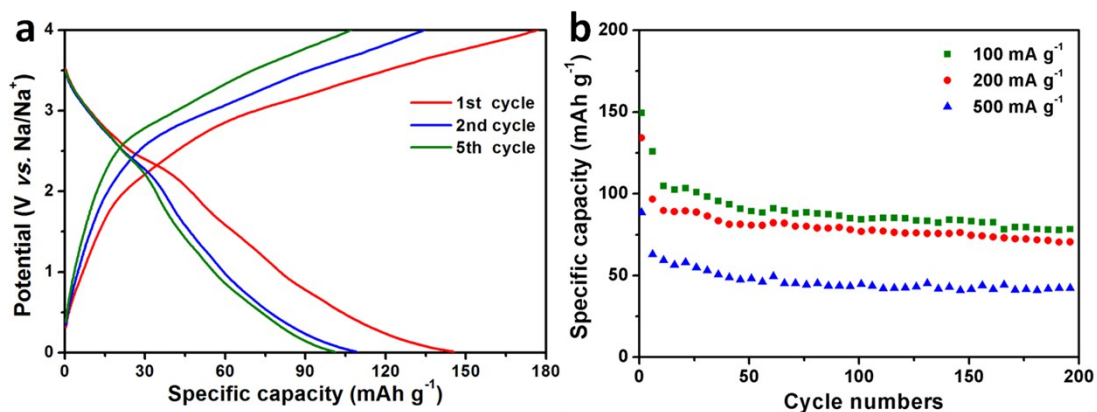


Figure S8. Electrochemical performance of the NVO-C2/CNF full Na-ion battery: the galvanostatic charge-discharge profiles of NVO-C2/CNF full cell at current density of 200 mA g^{-1} (a) and the cycling performance of the NVO-C2/CNF full cell at current density of 100, 200 and 500 mA g^{-1} (b).

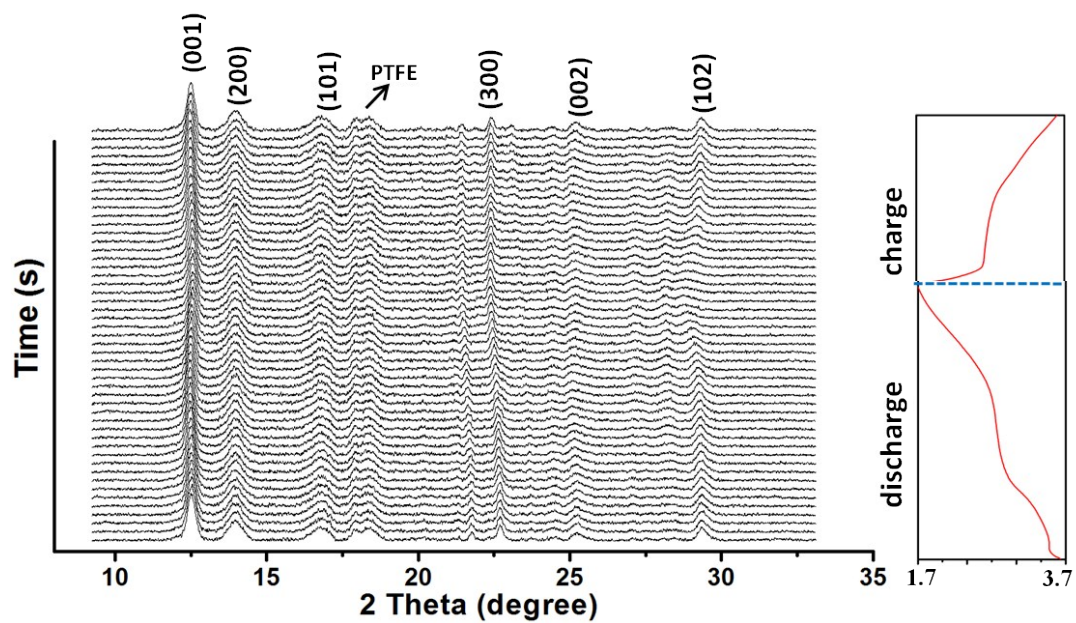


Figure S9. The *in situ* XRD patterns of NVO-C2 for a full charge-discharge process.

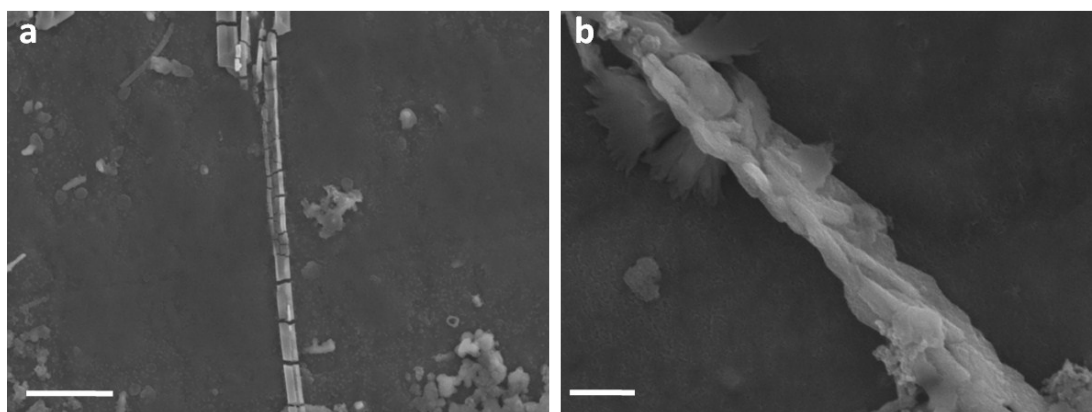


Figure S10. The morphologies of simple NVO and NVO-C2 after 100 cycles at the current density of 100 mA g^{-1} . Scale bar: $1 \mu\text{m}$.

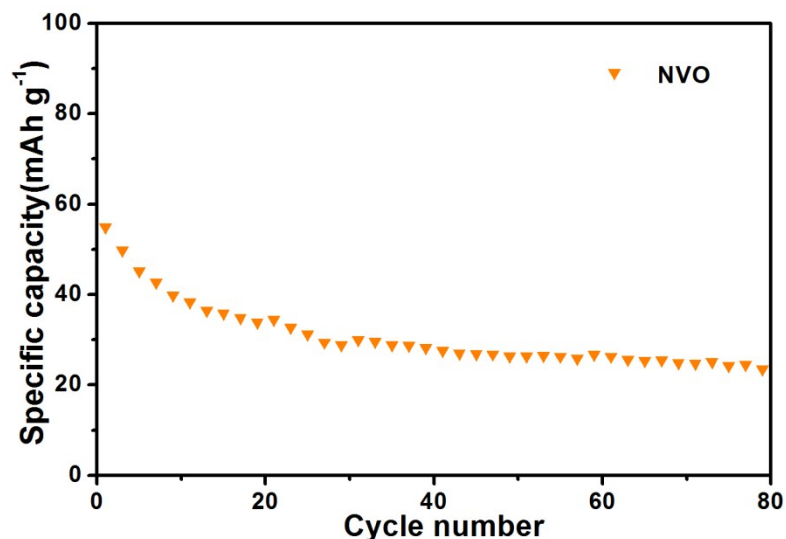


Figure S11. Charge–discharge cycling test of the simple NVO nanowire cathode at high current density of 1000 mA g⁻¹ for 80 cycles.

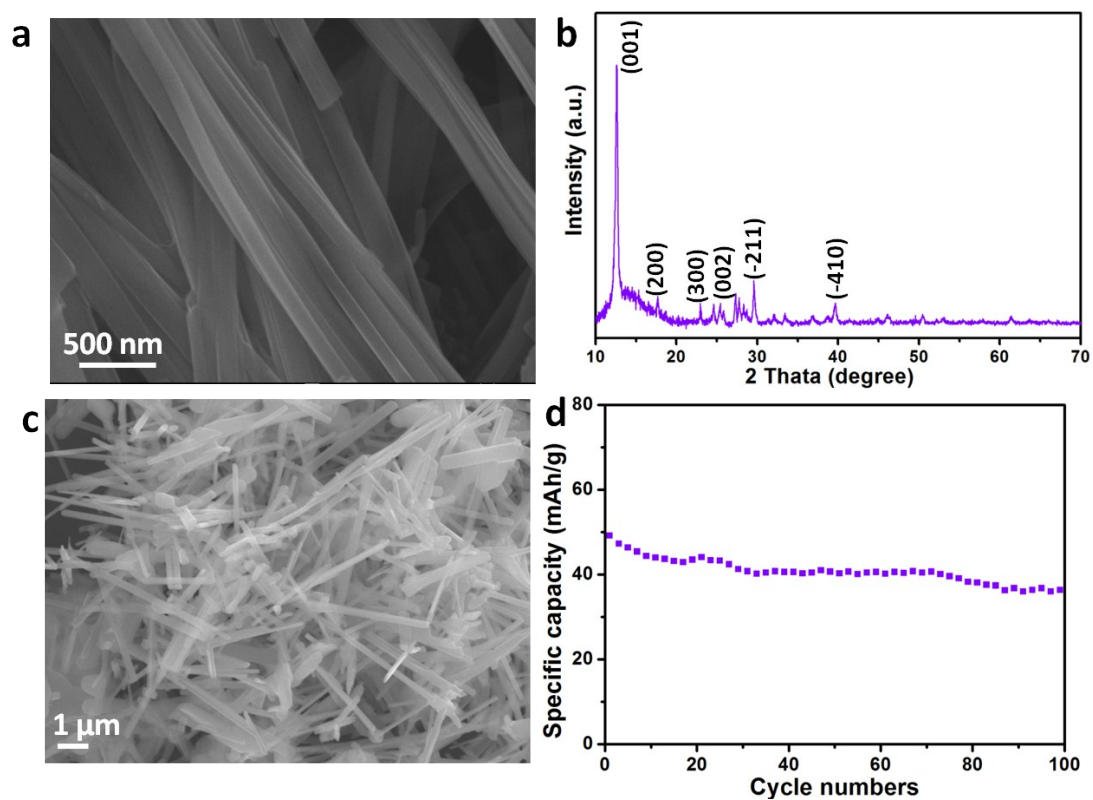


Figure S12. The SEM image of V₂O₅ nanowire precursor (a), the XRD patterns (b) and the SEM image (c) of Na_{1.25}V₃O₈ nanobelts prepared with V₂O₅ nanowire precursor, and the corresponding cycling performance at 200 mA g⁻¹ current density for 100 cycles. The synthesis of V₂O₅ nanowires is the same synthetic method as our previous work¹.

References

1. L. Mai, F. Dong, X. Xu, Y. Luo, Q. An, Y. Zhao, J. Pan and J. Yang, *Nano Lett.*, 2013, **13**, 740-745.