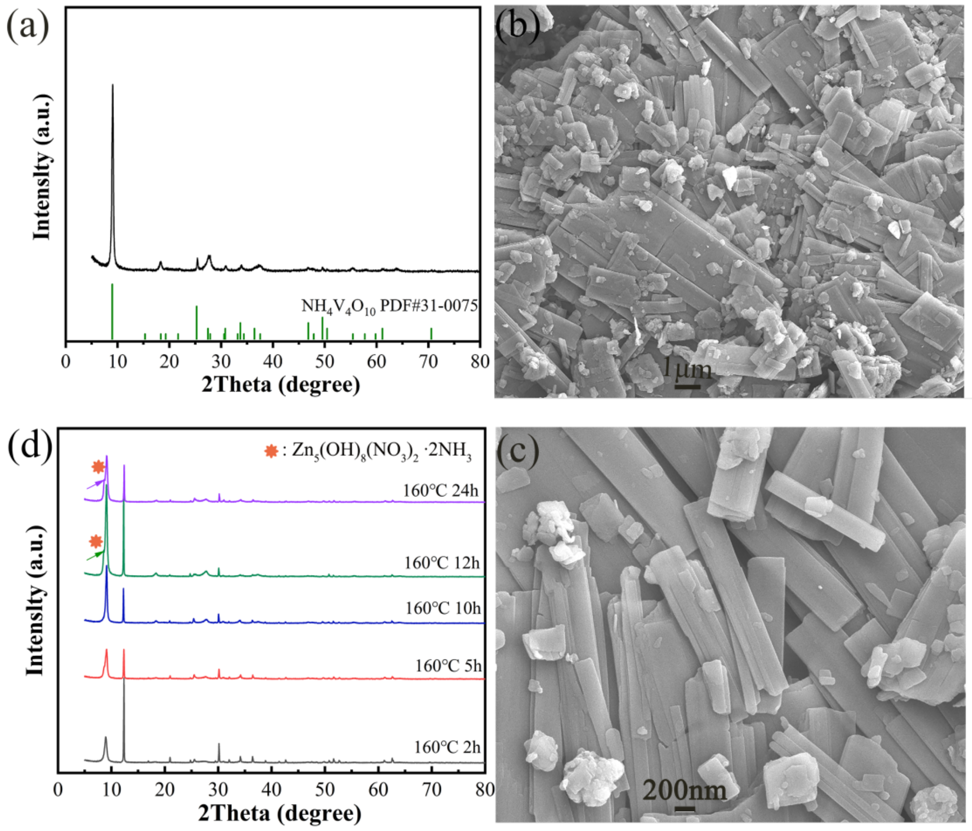

Fig.S1. XRD pattern (a) and SEM images (b-c) of NVO nanobelts without adding zinc source, (d) the XRD patterns of the ZnVO/NVO prepared by different reaction times.

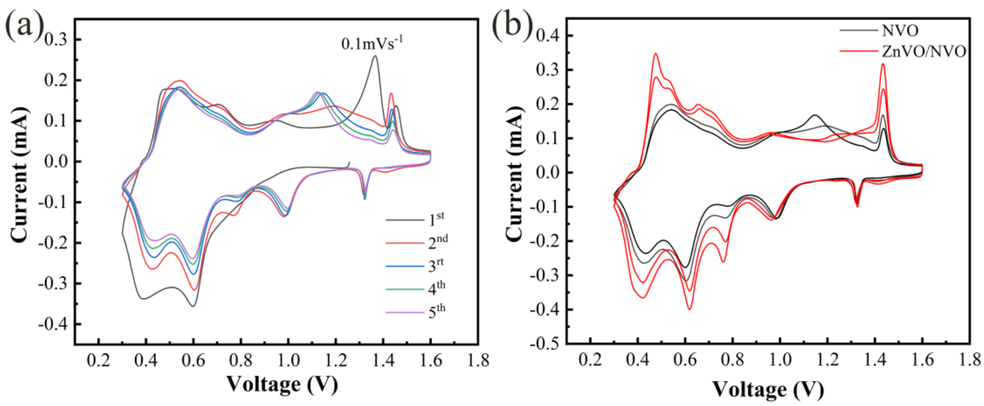

Fig. S2. The first five CV curves of NVO sample (a), the second and third CV curves (b) of the ZnVO/NVO and NVO samples at the scan rate of 0.1 mV s^{-1}.

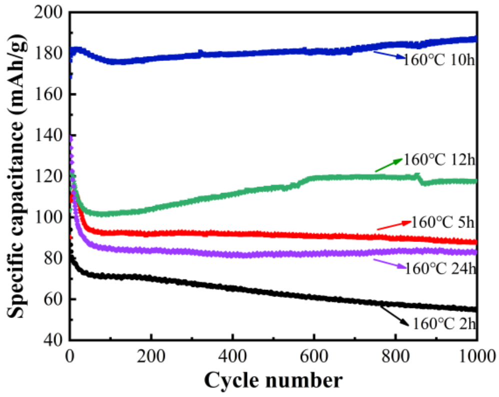

Fig. S3. The corresponding long-term cycling performance at the current density of 10.0 A g^{-1} of the ZnVO/NVO prepared by different reaction times.

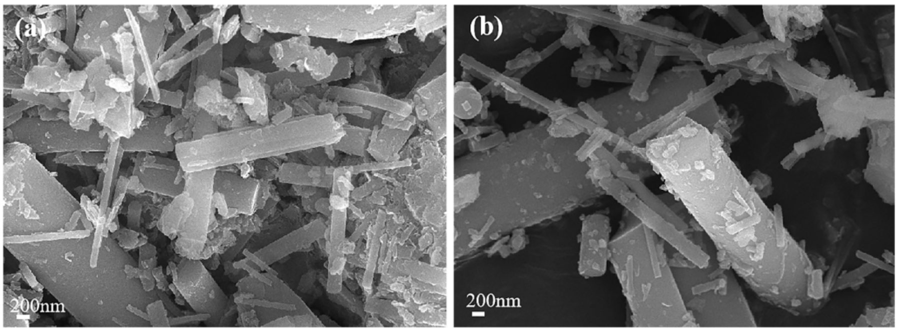

Fig. S4. The SEM images of the ZnVO/NVO electrodes after the 5 (a) and 1000 (b) cycles.

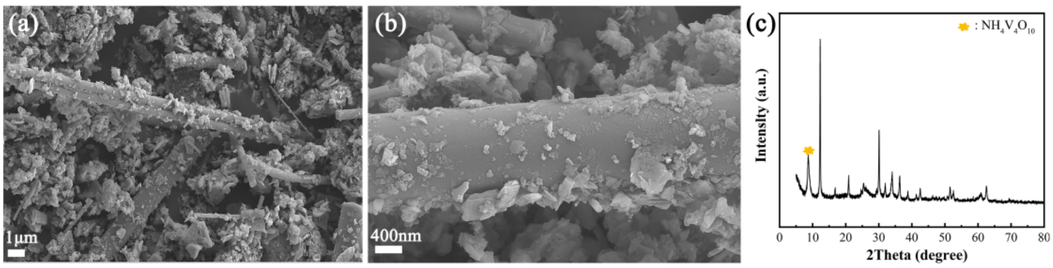

Fig. S5. The SEM images (a-b) and XRD pattern (c) of the NVO electrode after the 5 cycles.

Table S1. Comparison of electrochemical properties of ZnVO/NVO with previously reported V-based cathode materials.

Materials	High discharge capacity	Capacity retention

$Zn_3(OH)_2V_2O_7\cdot 2H_2O/NH_4V_4O_{10}$ (this work)	329 and 187 mAh g^{-1} at 5 and 10.0 A g^{-1}, respectively	94% after 2000 cycles at 10.0 A g^{-1}
$(NH_4)_2V_6O_{16}\cdot 1.5H_2O$ [1]	284.6 and 172 mAh g^{-1} at 3.0 and 5.0 A g^{-1}, respectively	100% after 3000 cycles at 5.0 A g^{-1}
$(NH_4)_xV_2O_5\cdot nH_2O$ [2]	372 and 219 mAh g^{-1} at 0.1 and 5.0 A g^{-1}, respectively	80% after 2000 cycles at 5.0 A g^{-1}
$(NH_4)_2V_4O_9\cdot 0.5H_2O$ [3]	200 and 177 mAh g^{-1} at 0.5 and 5.0A g^{-1}, respectively	93% after 1000 cycles at 1.0 A g^{-1}
$(NH_4)_{0.58}V_2O_5\cdot 0.98H_2O$ [4]	391 and 258 mAh g^{-1} at 0.5 and 2.0 A g^{-1}, respectively	53% after 400 cycles at 2.0 A g^{-1}
$NH_4V_4O_{10}\cdot 0.28H_2O$ [5]	385 and 319 mAh g^{-1} at 0.5 and 2.0 A g^{-1}, respectively	76% after 500 cycles at 2.0 A g^{-1}
$(NH_4)_2V_6O_{16}$ [6]	323.5 and 238.7 mAh g^{-1} at 0.1 and 5.0 A g^{-1}, respectively	78.3% after 2000 cycles at 5.0 A g^{-1}
$(NH_4)_{0.37}V_2O_5\cdot 0.15H_2O$ [7]	398 and 168 mAh g^{-1} at 0.5 and 10.0 A g^{-1}, respectively	84% after 1000 cycles at 10.0 A g^{-1}
$Zn_3V_2O_7(OH)_2\cdot 2H_2O$ [8]	150 and 76 mAh g^{-1} at 0.2 and 3.0 A g^{-1}, respectively	68% after 300 cycles at 0.2 A g^{-1}

Reference:

[1] X. Wang, B. Xi, Z. Feng, W. Chen, H. Li, Y. Jia, J. Feng, Y. Qian, S. Xiong, *J. Mater. Chem. A* , 2019, **7**, 19130–19139.

[2] L. Xu, Y. Zhang, J. Zheng, H. Jiang, T. Hu, C. Meng, Mater. *Today Energy*, 2020, **18**, 100509.

[3] R. Wei, X. Wang, B. Xi, Z. Feng, H. Li, W. Chen, Y. Jia, J. Feng, S. Xiong, *ACS Appl. Energy Mater.*, 2020, **3**, 5343–5352.

[4] H. Zhao, Q. Fu, D. Yang, A. Sarapulova, Q. Pang, Y. Meng, L. Wei, H. Ehrenberg, Y. Wei, C. Wang, G. Chen, ACS Nano, 2020, **14**, 11809–11820.

[5] T. Zhu, B. Mai, P. Hu, Z. Liu, C. Cai, X. Wang, L. Zhou, Chin. J. Chem., 2021， **39** 1885–1890.

[6] L. Xu, Y. Zhang, H. Jiang, J. Zheng, X. Dong, T. Hu, C. Meng, *Colloids Surf. A: Physicochem. Eng. Aspects*, 2020，**593,** 124621.

[7] M. Tamilselvan, T.V.M. Sreekanth, K. Yoo, J. Kim, *J. Ind. Eng. Chem.*, 2021， **93**， 176–185.

[8] C. Xia, J. Guo, Y. Lei, H. Liang, C. Zhao, H.N. Alshareef, *Adv. Mater.*, 2018, **30,** 1705580.