Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Electrospun $VSe_{1.5}$/CNFs composite with excellent performance for alkali metal ion batteries

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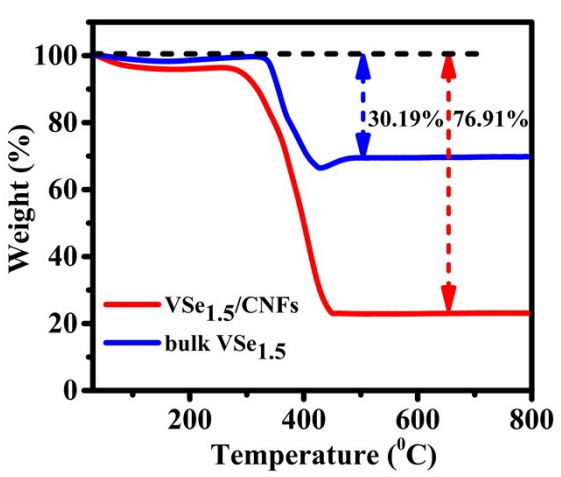

Fig. S1 TG cures of the bulk $VSe_{1.5}$ and $VSe_{1.5}$/CNFs composite.

Table S1 Electrochemical performance comparison of the as-prepared $VSe_{1.5}$/CNFs with other V-based anode materials for LIBs/SIBs/KIBs.

Electrode materials	Fields	Cycling capacity (mA h g^{-1})	Rate capability (mA h g^{-1})	Year/Ref.
VSe_2 NSA/C	LIBs	768 (50cycles /0.1 A/g)	571 (2 A/g)	2018/[S1]
	SIBs	571 (50 cycles /0.1 A/g)	450 (0.5 A/g)	
VSe_2 ultrathin nanosheets	PIBs	366 (200 cycles /0.1A/g)	169 (500 cycles /2 A/g)	2018/[S2]
V_2O_3@PNCNFs	PIBs	~230 (500 cycles /0.05A/g)	134 (1.0 A/g)	2018/[S3]
V_2O_3/carbon	LIBs	587 (200 cycles /0.1 A/g)	219 (2 A/g)	2017/[S4]
	SIBs	270 (150 cycles /0.1 A/g)	~150 (1000 cycles /1 A/g)	
V_5S_8-graphite	SIBs	496 (500 cycles /1 A/g)	344 (10 A/g)	2017/[S5]
VS_2 nanosheets	SIBs	620 (50 cycles /0.1 A/g)	277 (20 A/g)	2018/[S6]
c-VS_2@VOOH	SIB	330 (150 cycles /0.2 A/g)	356 (0.5 A/g) 224 (1 A/g)	2017/[S7]
VS_2	SIB	403 (200 cycles /0.2 A/g)	193 (0.5 A/g) 172 (1 A/g)	2018[S8]
$VSe_{1.5}$/CNFs	LIBs	821 200 cycles /0.5 A/g)	932 (400 cycles /1 A/g)	This work
	SIBs	668 (50 cycles /0.05 A/g)	265 (6000 cycles /2 A/g)	
	PIBs	313 (40 cycles /0.1 A/g)	177 (100 cycles /1 A/g)	

Ref.

S1 F. Ming, H. Liang, Y. Lei, W. Zhang and H. N. Alshareef, *Nano Energy,* 2018, **53**, 11-16.

S2 C. Yang, J. Feng, F. L, J. Zhou, C. Lin, K. Wang, Y. Zhang, Y. Yang, W. Wang, J. Li and S. Guo, *Adv. Mater.,* 2018, **30**, 1800036.

S3 T. Jin, H. Li, Y. Li, L. Jiao and J. Chen, *Nano Energy*, 2018, **50**, 462-467.

S4 X. An, H. Yang, Y. Wang, Y. Tang, S. Liang, A. Pan and G. Cao, *Sci. China Mater.*, 2017, **60**, 717-727.

S5 C. Yang, X. Ou, X. Xiong, F. Zheng, R. Hu, Y. Chen, M. Liu and K. Huang, *Energy Environ. Sci.*, 2017, **10**, 107-113..

S6 D. Yu, Q. Pang, Y. Gao, Y. Wei, C. Wang, G. Chen and F. Du, *Energy Storage Mater.,* 2018, **11**, 1-7.

S7 W. Li, J. Huang, L. Feng, L. Cao, Y. Feng, H. Wang, J. Li and C. Yao, *J. Mater. Chem. A*, 2017, **5**, 20217-20227.

S8 W. Li, J. Huang, L. Feng, L. Cao, Y. Liu and L. Pan, *Electrochim. Acta*, 2018, **286**, 131-138.

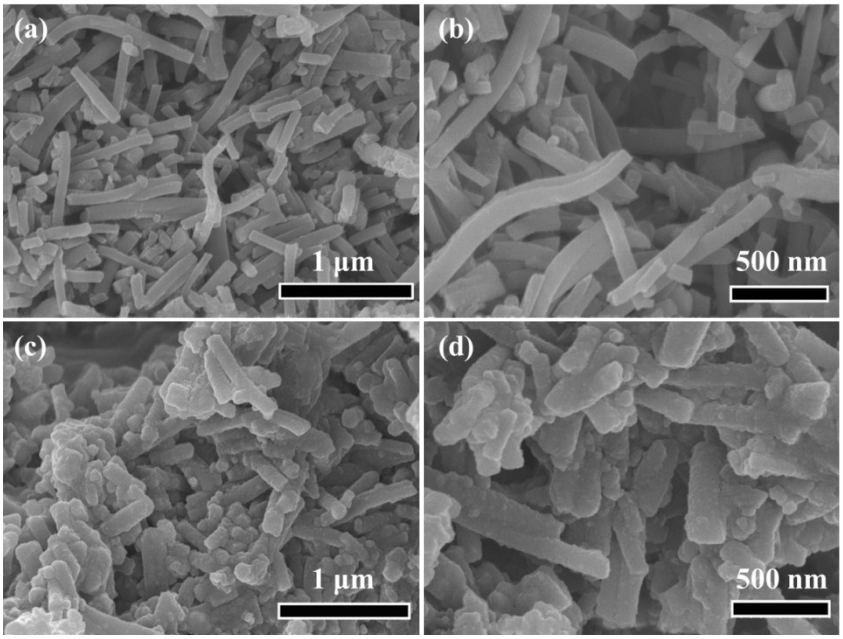

Fig. S2 SEM images of $VSe_{1.5}$/CNFs electrode (a-b) before cycling and (c-d) after 100 cycles at 200 mA g^{-1} for sodium storage.

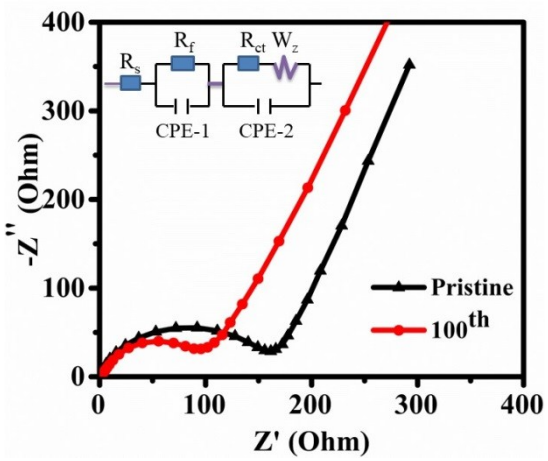

Fig. S3 Nyquist plots of $VSe_{1.5}$/CNFs electrode after different cycles for SIBs.

Table S2 Impedance parameters calculated from an equivalent circuit model.

Sample	Rs (Ω)	Rf (Ω)	Rct (Ω)
Pristine	19.5	746.9	303.8
100th	19.6	298.2	252.4

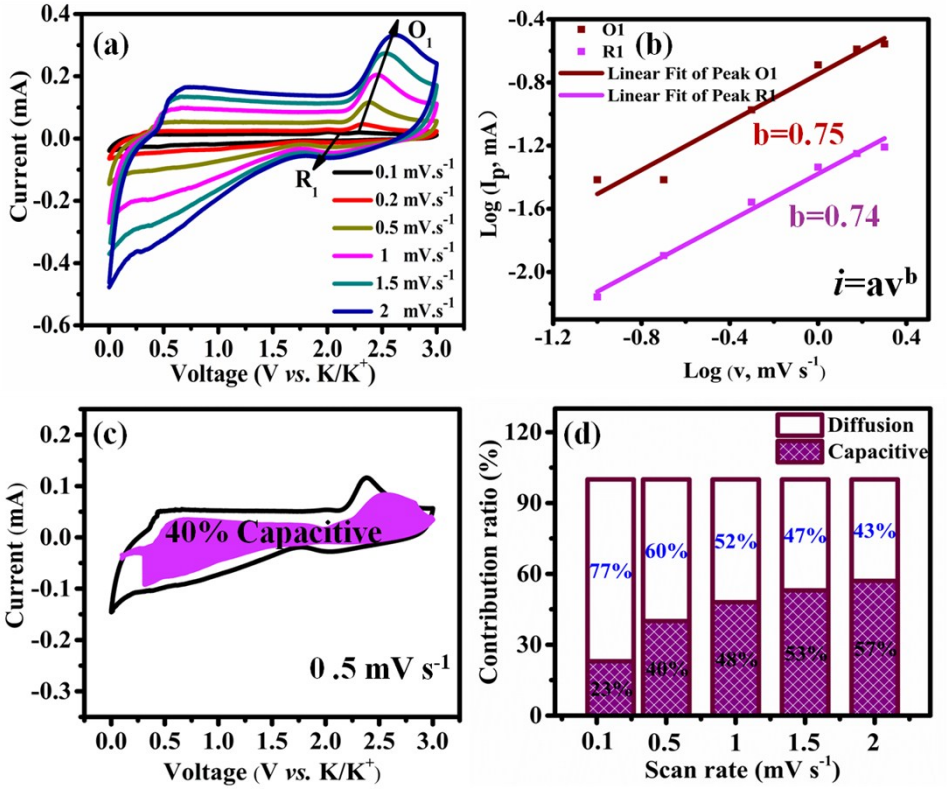

Fig. S4 (a) Cyclic voltammentry curves of $VSe_{1.5}$/CNFs electrode for PIBs at different scan rates of 0.1, 0.2, 0.5, 1, 1.5 and 2.0 mVs^{-1}. (b) log (*i*) vs. log (v) plots at different oxidation and reduction peaks. (c) Capacitive contribution (purple area) of $VSe_{1.5}$/CNFs at 0.5 mV s^{-1}. (d) The diffusion controlled (white) and capacitive (purple) capacities of $VSe_{1.5}$/CNFs at different scan rates.