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VS_2@N-doped carbon hybrid with strong interfacial interaction for high-performance rechargeable aqueous Zn-ion batteries

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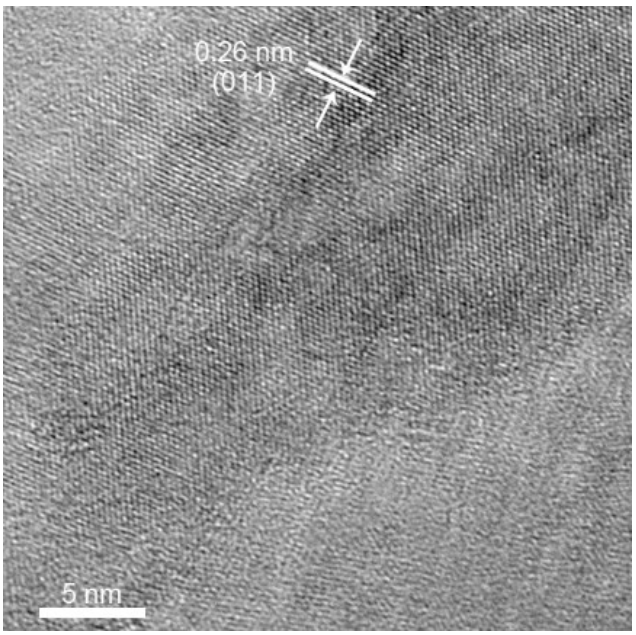

Figure S1. Representative high-resolution TEM of the VS_2@N-C hybrid.

Table S1. The comparison of aqueous Zn-ion batteries performance for VS_2@N-C hybrid with other vanadium sulfide based materials.

Materials	Specific capacity (Current density; A g^{-1})	Capacity retention (cycles numbers)	Ref
VS_2@N-C hybrid	203 (0.05)	97% (600)	This work
VS_2 nanosheets	143.3 (0.1)	83.6% (350)	1
Rose-like VS_2	190.3 (0.05)	98% (200)	2
VS_2 Nanosheet	150 (0.05)	83% (100)	3
Defective VS_2	220 (0.5)	96% (100)	4
VS_2@VOOH	184.2 (0.05)	86% (200)	2
VS_2@SS	187 (0.1)	90% (200)	5
VS_4 powder	210 (1)	85% (500)	6
Rice kernel like VS_4	135 (1)	67.4% (100)	7
VS_4@rGO	180 (1)	93.3% (165)	7

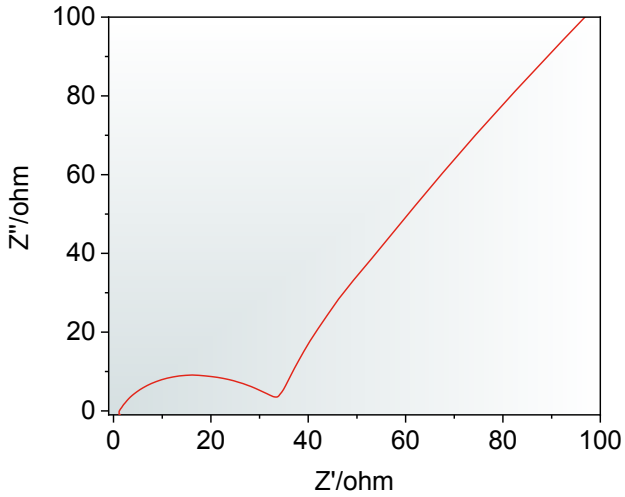

Figure S2. Electrochemical impedance spectroscopy of VS_2@N-C hybrid.

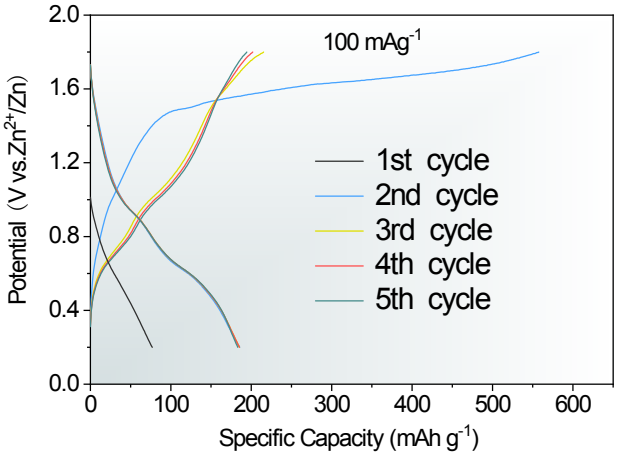

Figure S3. Galvanostatic charge/discharge curves of the initial five cycles at 100 mA g^{-1}.

Rferences

1. J. Zhu, T. Jian, Y. Wu, W. Ma, Y. Lu, L. Sun, F. Meng, B. Wang, F. Cai, J. Gao, G. Li, L. Yang, X. Yan and C. Xu, *Appl. Surf. Sci.*, 2021, **544**, 148882.
2. X. Pu, T. Song, L. Tang, Y. Tao, T. Cao, Q. Xu, H. Liu, Y. Wang and Y. Xia, *J. Power Sources*, 2019, **437**, 226917.
3. P. He, M. Yan, G. Zhang, R. Sun, L. Chen, Q. An and L. Mai, *Adv. Energy Mater.*, 2017, **7**, 1601920.
4. B.-S. Yin, S.-W. Zhang, T. Xiong, W. Shi, K. Ke, W. S. V. Lee, J. Xue and Z.-B. Wang, *New J. Chem.*, 2020, **44**, 15951-15957.
5. T. Jiao, Q. Yang, S. Wu, Z. Wang, D. Chen, D. Shen, B. Liu, J. Cheng, H. Li, L. Ma, C. Zhi and W. Zhang, *J. Mater. Chem. A*, 2019, **7**, 16330-16338.
6. Q. Zhu, Q. Xiao, B. Zhang, Z. Yan, X. Liu, S. Chen, Z. Ren and Y. Yu, *J. Mater.*

Chem. A, 2020, **8**, 10761-10766.
7. H. Qin, Z. Yang, L. Chen, X. Chen and L. Wang, *J. Mater. Chem. A*, 2018, **6**, 23757-23765.