Supporting information for

Hierarchical porous porous $Ti_2Nb_{10}O_{29}$ Nanospheres as a Superior Anode Material for Li-ion storage

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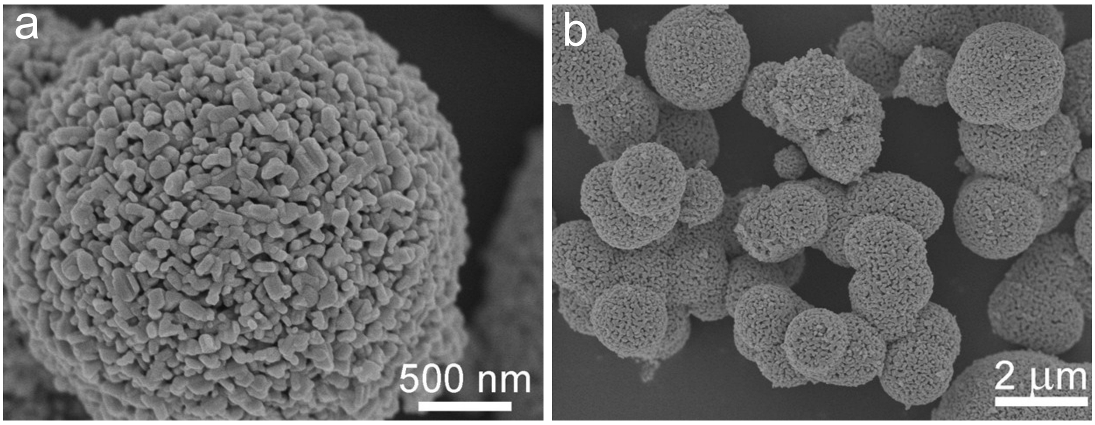

Figure S1. (a-b) SEM images of TNO microspheres prepared without P123.

Table S1. Comparison of electrochemical performance for different samples

Active materials	Rate capability	Cyclability	Ref.
Mo-doped $TiNb_2O_7$	50 C (~128 mAh g^{-1})	/	1
titanium niobium oxides	10 C (190 mAh g^{-1})	150 cycles (10 C)	2
$Ti_2Nb_{10}O_{27.1}$	5 C (180 mAh g^{-1})	100 cycles (5C, 164 mAh g^{-1})	3
V-$Ti_2N_{10}O_{29}$	10 mA cm^{-2} (150 mAh g^{-1})	/	4
$Ti_2N_{10}O_{29}$	10C (130 mAh g^{-1})	/	5
$TiNb_2O_7$	2C (150 mAh g^{-1})	/	6
$Ru_{0.01}Ti_{0.99}Nb_2O_7$	5 C (181 mAh g^{-1})	100 cycles (5C, 162 mAh g^{-1})	7
$Ti_2N_{10}O_{29}$/C	10 C (194 mAh g^{-1})	100 cycles (5C, 214 mAh g^{-1})	8
$TiNb_6O_{17}$/C	10 C (199 mAh g^{-1})	500 cycles (10C, 165 mAh g^{-1})	9
Porous $TiNb_{24}O_{62}$	20 C (181 mAh g^{-1})	500 cycles (10, 183 mAh g^{-1})	10
Ti2Nb10O29-x	10 C (270 mAh g^{-1})	100 cycles (10C, 240 mAh g^{-1})	11
macroporous $TiNb_2O_7$	20C 135mAh g^{-1}	1000cycles (10C 87mAh g^{-1})	12
$TiNb_2O_7$ nanotubes	10 C (250 mAh g^{-1})	700cycles (0.1 C 210 mAh g^{-1})	13
$TiNb_2O_7$ hollow nanofiber	/	900cycles (10 C 158.4 mAh g^{-1})	14
Ag-coated $TiNb_2O_7$	10 C (150 mAh g^{-1})	100 cycles (1C, 250 mAh g^{-1})	15
TNO nanospheres	**20 C (208** mAh g^{-1}**)**	**500** cycles **(10C, 215** mAh g^{-1}**)**	**This work**

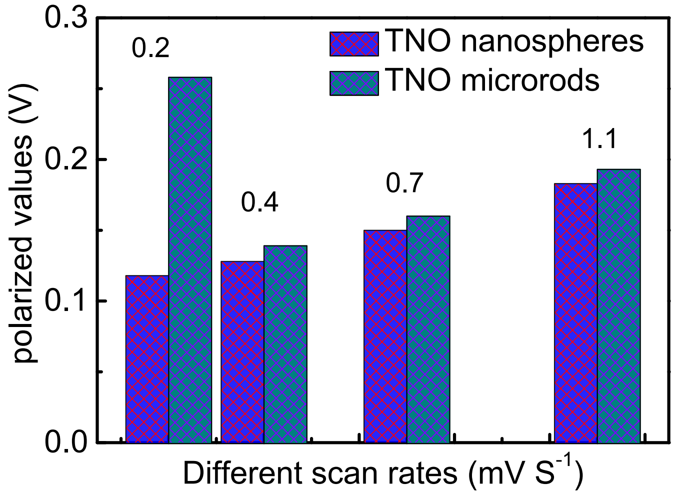

Figure S2. Polarization comparison of CV curves of TNO nanospheres and TNO microrods at different scan rates.

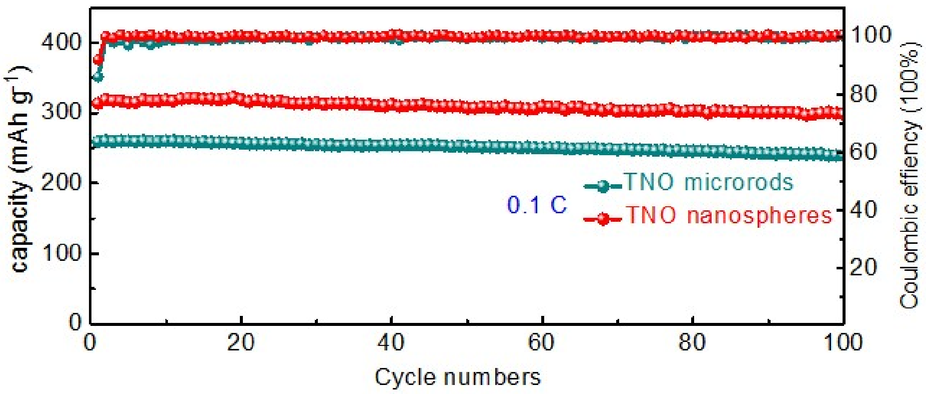

Figure S3. Cycling stability of two electrodes at 0.1 C for 100 cycles.

References

1. H. Song and Y.-T. Kim, *Chem. Commun.* , 2015, **51**, 9849-9852.
2. L. Buannic, J.-F. Colin, M. Chapuis, M. Chakir and S. Patoux, *J. Mater. Chem.A*, 2016, **4**, 11531-11541.

3. C. Lin, S. Yu, H. Zhao, S. Wu, G. Wang, L. Yu, Y. Li, Z. Z. Zhu, J. Li and S. Lin, *Sci. Rep.*, 2015, **5**, 17836.
4. T. Takashima, T. Tojo, R. Inada and Y. Sakurai, *J. Power Sources*, 2015, **276**, 113-119.
5. X. Wu, J. Miao, W. Han, Y.-S. Hu, D. Chen, J.-S. Lee, J. Kim and L. Chen, *Electrochem. Commun.*, 2012, **25**, 39-42.
6. J.-T. Han, Y.-H. Huang and J. B. Goodenough, *Chem. Mater.*, 2011, **23**, 2027-2029.
7. C. Lin, S. Yu, S. Wu, S. Lin, Z.-Z. Zhu, J. Li and L. Lu, *J. Mater. Chem.A*, 2015, **3**, 8627-8635.
8. G. Liu, B. Jin, R. Zhang, K. Bao, H. Xie, J. Guo, M. Wei and Q. Jiang, *Int. J. Hydrogen Energy*, 2016, **41**, 14807-14812.
9. W. Mao, K. Bao, L. Wang, G. Liu, H. Xie, R. Zhang, S. Zheng, J. Guo, B. Li and W. Wang, *Ceram. Int.*, 2016, **42**, 16935-16940.
10. C. Yang, S. Deng, C. Lin, S. Lin, Y. Chen, J. Li and H. Wu, *Nanoscale*, 2016, **8**, 18792-18799.
11. S. Deng, Z. Luo, Y. Liu, X. Lou, C. Lin, C. Yang, H. Zhao, P. Zheng, Z. Sun and J. Li, *J. Power Sources*, 2017, **362**, 250-257.
12. S. Lou, X. Cheng, Y. Zhao, A. Lushington, J. Gao, Q. Li, P. Zuo, B. Wang, Y. Gao and Y. Ma, *Nano Energy*, 2017, **34**, 15-25.
13. H. Park, D. H. Shin, T. Song, W. I. Park and U. Paik, *J. Mater. Chem.A*, 2017, **5**, 6958-6965.
14. H. Yu, H. Lan, L. Yan, S. Qian, X. Cheng, H. Zhu, N. Long, M. Shui and J. Shu, *Nano Energy*, 2017, **38**, 109-117.
15. G. Liu, X. Liu, Y. Zhao, X. Ji and J. Guo, *Mater. Lett.*, 2017, **197**, 38-40.