Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Supporting Information for

High capacity and enhanced structural reversibility of β-$Li_xV_2O_5$ nanorods as the lithium battery cathode

Wang-Da Li, [a,b] Cheng-Yan Xu, [*,a,b,c] Xiao-Liang Pan, [a] Yu-Dong Huang [c] and Liang Zhen [*, a, b]

[a] *School of Materials Science and Engineering, Harbin Institute of Technology, Harbin 150001, China. Fax: 86 451 8641 3922; Tel: 86 451 8641 2133; E-mail: cy_xu@hit.edu.cn; lzhen@hit.edu.cn.*

[b] *MOE Key Laboratory of Micro-system and Micro-structures Manufacturing, Harbin Institute of Technology, Harbin 150080, China*

[c] *School of Chemical Engineering, Harbin Institute of Technology, Harbin 150001, China.*

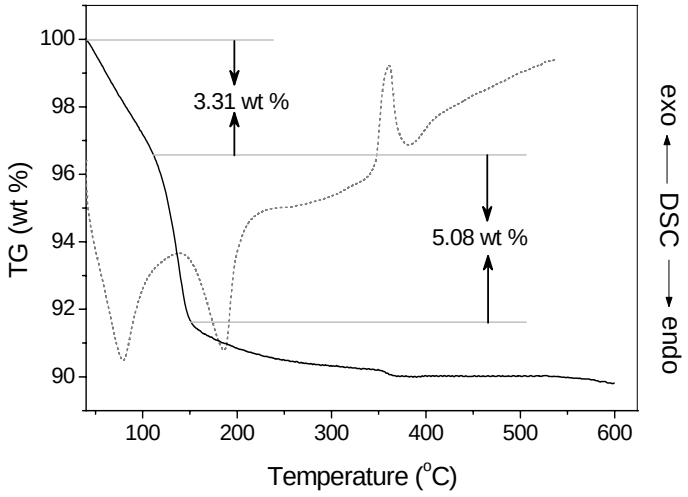

Fig. S1. TG/DSC curve of the as-prepared sample (ramping rate: 5 °C min^{-1}).

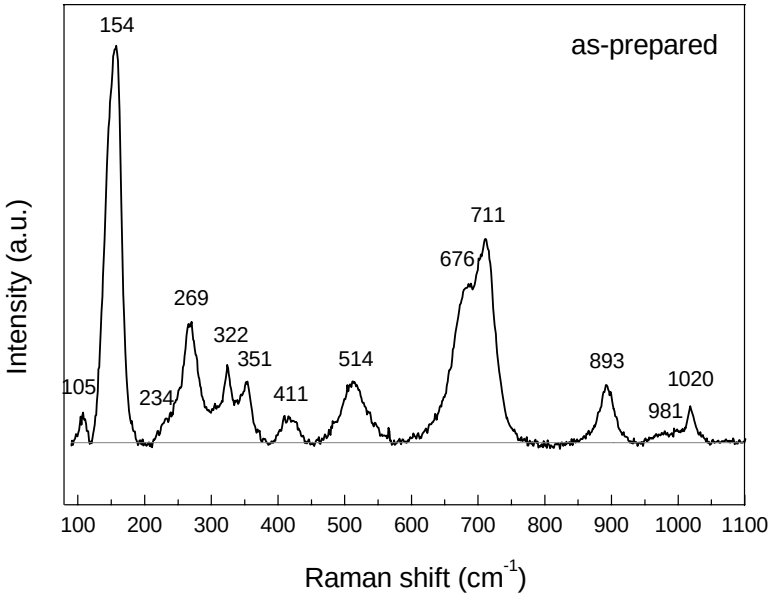

Fig. S2. Raman spectrum of the as-prepared lithium-doped V_2O_5-based hydrate with a double-layered δ-structure.

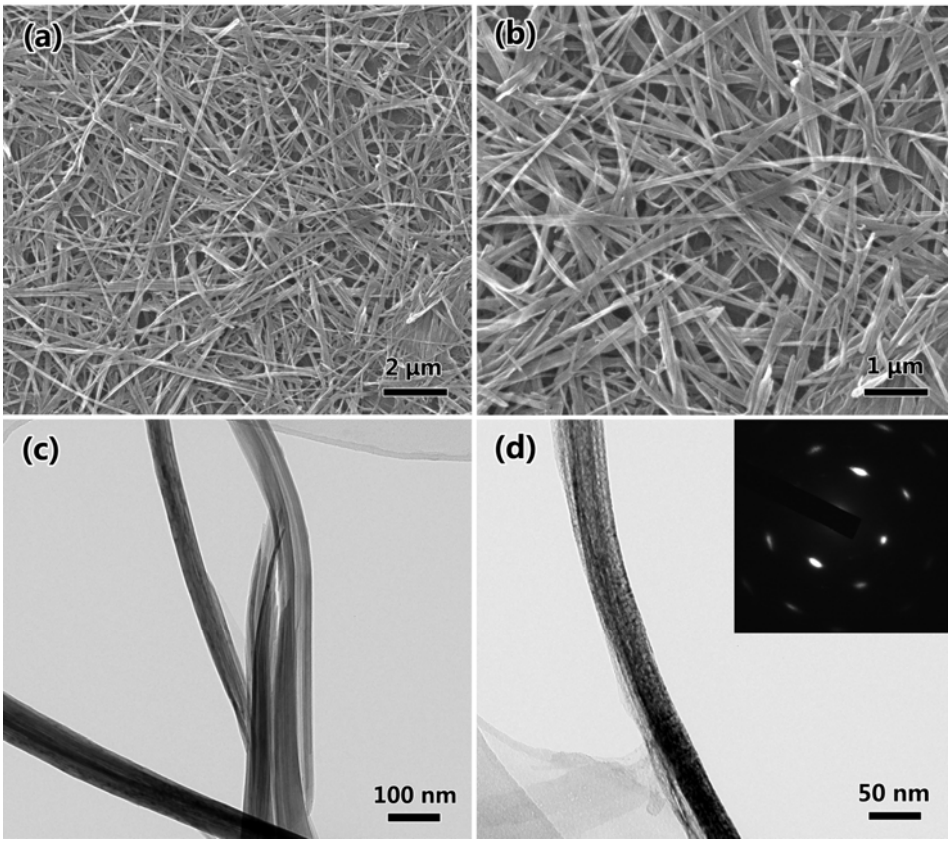

Fig. S3. Representitive morphology of the as-synthesized δ-$Li_xV_2O_5 \cdot nH_2O$ nanobelts: (a), (b) SEM, and (c), (d) TEM images; SAED pattern of the individual nanobelt in (d) are given as the inset.

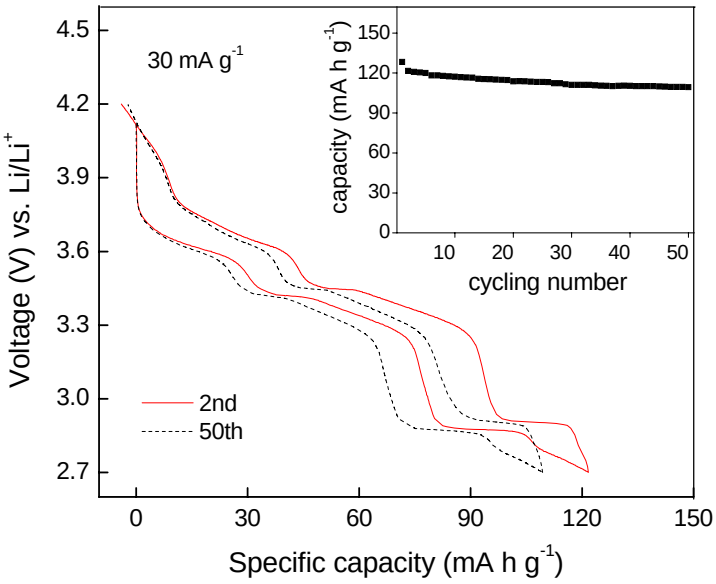

Fig. S4. Electrochemical performance of β-$Li_xV_2O_5$ nanorods with a cut-off voltage of 2.7 V: galvanostatic lithium insertion/extraction at 2nd and 50th cycles, with the evolution of the specific capacity upon cycling (inset, 30 mA g^{-1}).

References:

[S1] R. Baddour-Hadjean, S. Bach, N. Emery and J. P. Pereira-Ramos, *J. Mater. Chem.* 2011, **21**, 11296.

Table S1. Comparison of Raman modes of β-$Li_xV_2O_5$ nanorods with those of β-$Na_{0.33}V_2O_5$ powder [S1].

β-$Li_xNa_{0.33}V_2O_5$ (x = 0.1, ref. S1)	β-$Li_xV_2O_5$ (this work)
1004	1005
972	972
-	771
724	724
689	685
654	645
553	541
501	497
459	-
432	435
364	369
330	317
286	284
271	268
253	251
224	215
150	143
124	118