Supporting Information

Layered-Spinel Capped Nanotubes Assembled 3D Li-Rich Hierarchitectures for High Performance Li-Ion Battery Cathode

Fuda Yu, Lanfang Que, Zhenbo Wang,* Yin Zhang, Yuan Xue, Baosheng Liu and Daming Gu

MIIT Key Laboratory of Critical Materials Technology for New Energy Conversion and Storage, School of Chemistry and Chemical Engineering, Harbin Institute of Technology, No. 92 West-Da Zhi Street, Harbin, 150001, China

* Corresponding author. E-mail: wangzhb@hit.edu.cn; Tel.: +86-451-86417853.

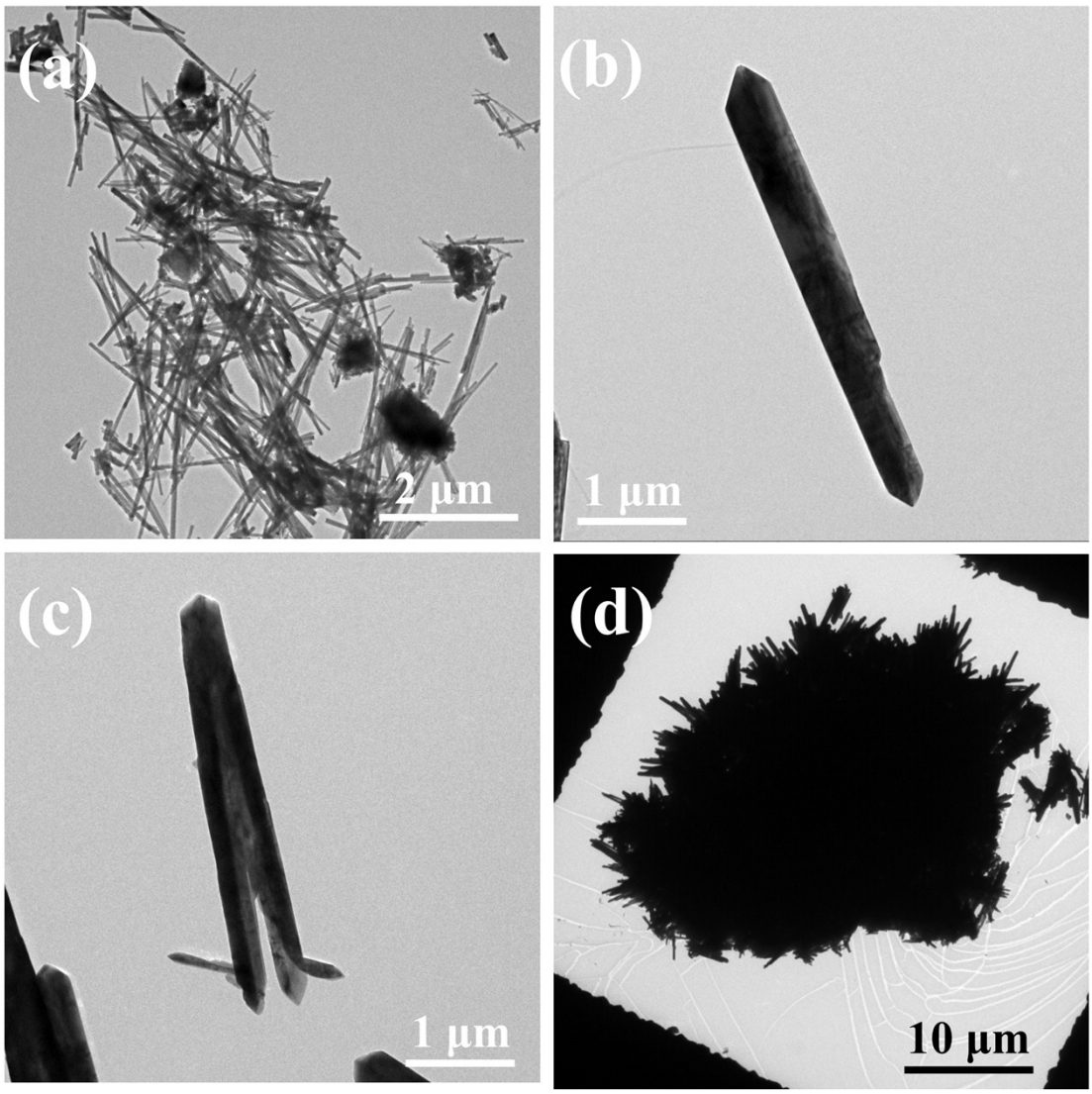

Figure S1. TEM images of β-MnO_2 precursors obtained via hydrothermal reaction at 160 ^oC for different times: (a) 1 h, (b) 5 h and (c,d) 10 h.

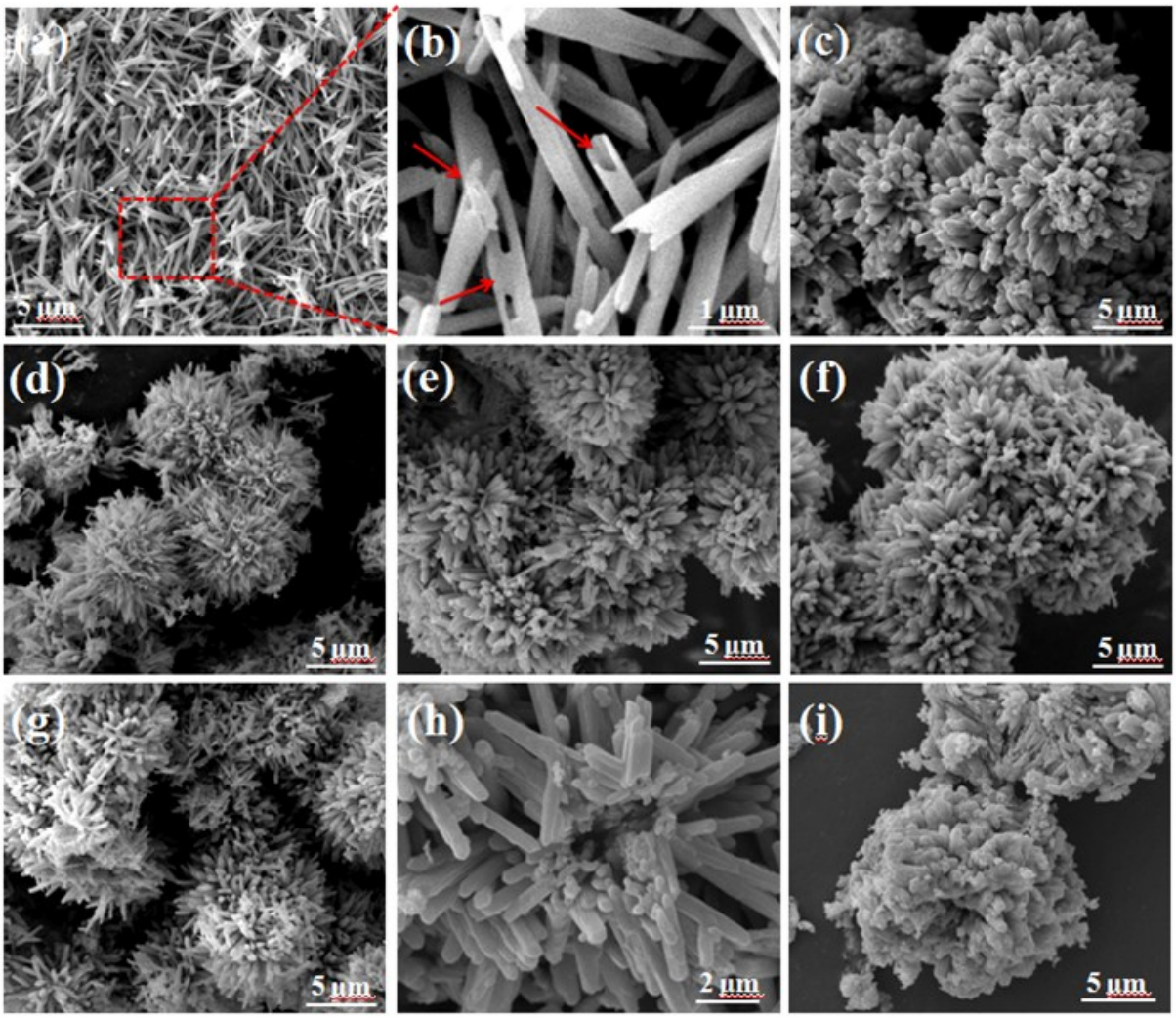

Figure S2. SEM images of β-MnO_2 precursors: (a) 1D tubular structured β-MnO_2 is obtained when the molar ratio of $MnSO_4$ and $NaClO_3$ is 1:2, at 160 ^oC for 10 h. (b) the red arrows highlight the hollow interior structure of 1D tubular structured β-MnO_2 at high magnification. β-MnO_2 precursors obtained via (c) 140 ^oC for 10 h, and (d) 180 ^oC for 10 h of hydrothermal reaction. SEM images of the as-prepared (e) HS1, (f) HS2, (g) HS3. (h) SEM image of the as-prepared HS0 sample magnified 10000 times. (i) SEM image of the as-prepared HS0 sample obtained at calcination temperature of 850 °C for 10h.

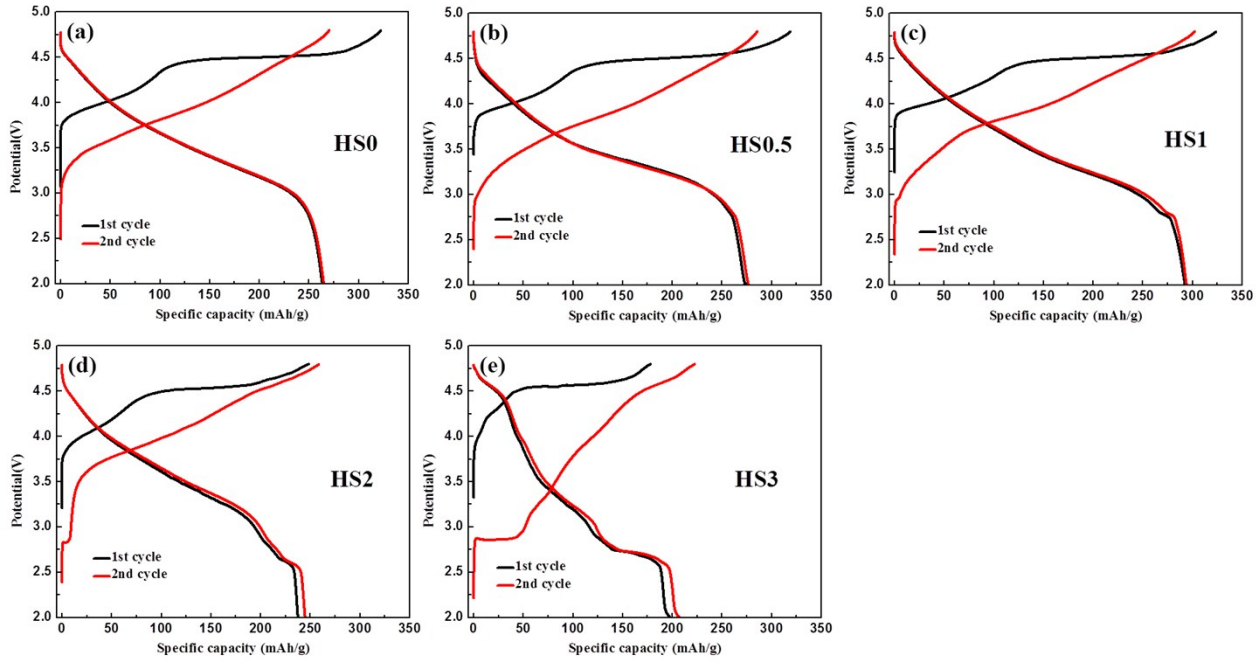

Figure S3. The charge-discharge profiles of the HS0, HS0.5, HS1, HS2 and HS3 samples during first and second charge/discharge processes.

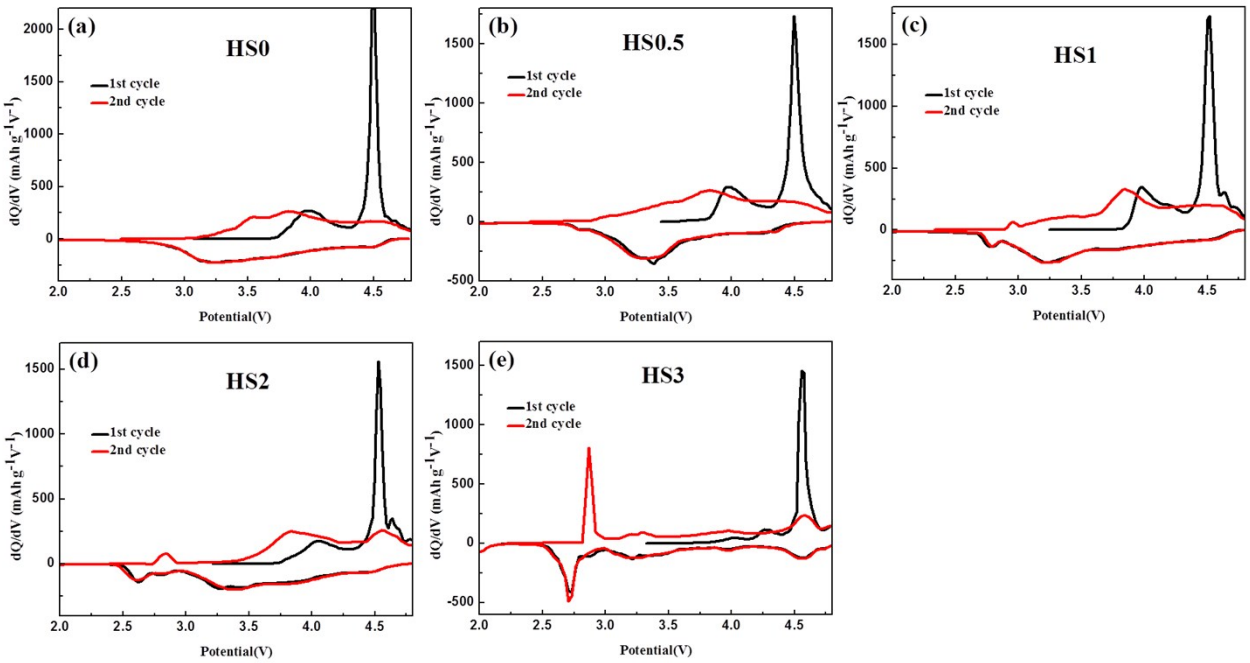

Figure S4. The dQ/dV curves of the HS0, HS0.5, HS1, HS2 and HS3 samples during first and second charge/discharge processes.

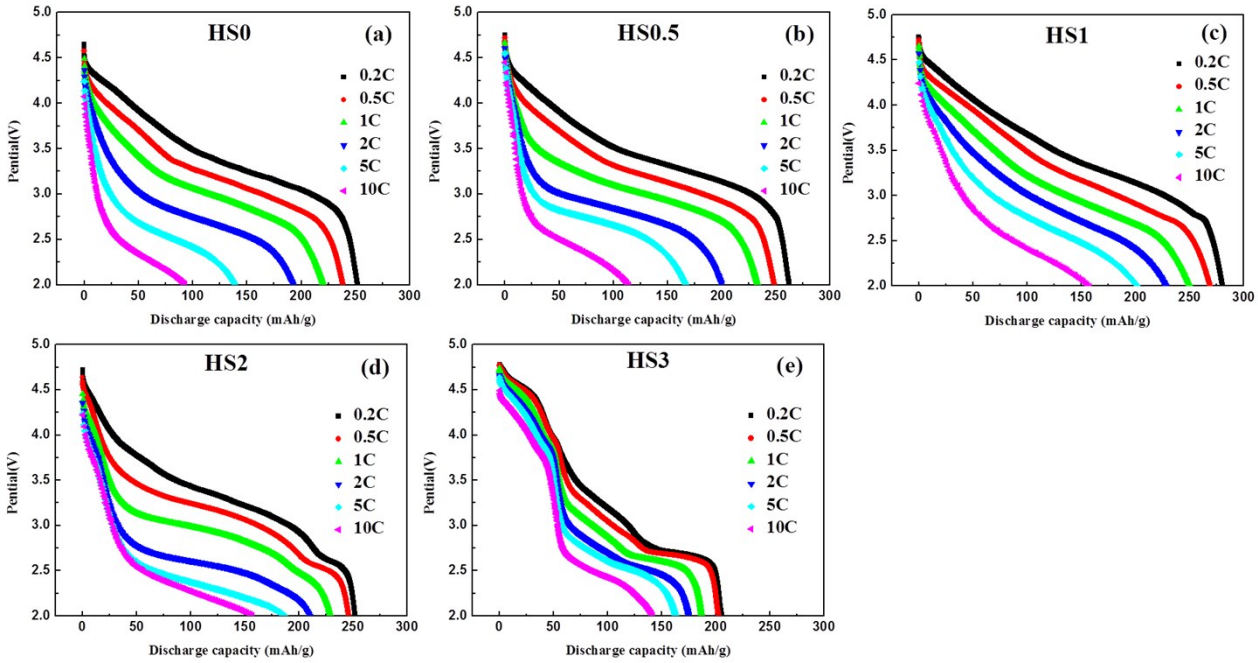

Figure S5. Discharge profiles of (a) HS0, (b) HS0.5, (c) HS1, (d) HS2 and (e) HS3 samples corresponding to the rate capabilities between 4.8-2 V verus Li/Li^{+}. Every third cycle conducted in each rate is shown.