Electronic Supplementary Material (ESI) for RSC Advances.
This journal is © The Royal Society of Chemistry 2016

Electronic Supporting Information

Hollow Porous SiO_2 Nanobelts Containing Sulfur for Long-Life Lithium-Sulfur Batteries

Manli Xue, [a†] Yunyun Zhou, [a†] Jiarun Geng [a], Pan Zeng [a], Yan Xu [a], Yuguo Wang [a], Wangzhong Tang [a], Ping Wu, [a*] Shaohua Wei [a], Yiming Zhou [a*]

Jiangsu Key Laboratory of New Power Batteries, Jiangsu Collaborative Innovation Center of Biomedical Functional Materials, School of Chemistry and Materials Science, Nanjing Normal University, Nanjing 210023, P. R. China

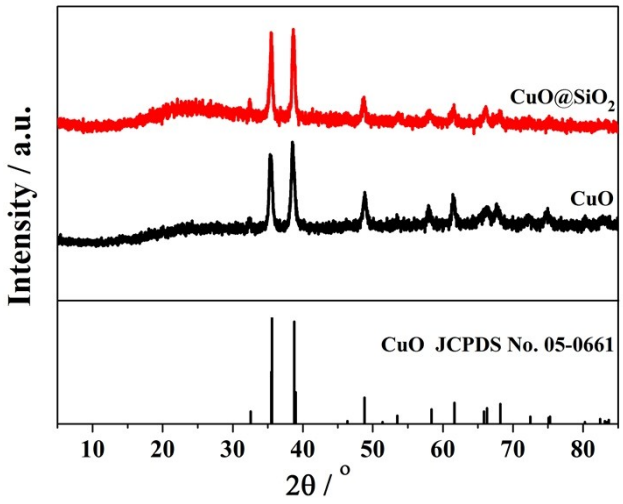

Fig. S1 XRD patterns of CuO nanobelts and $CuO@SiO_2$ nanobelts.

Just as observed from Fig. S1, the diffraction patterns of the CuO nanobelts and $CuO@SiO_2$ nanobelts fit reasonably well with the monoclinic CuO (JCPDS No. 05-0661).

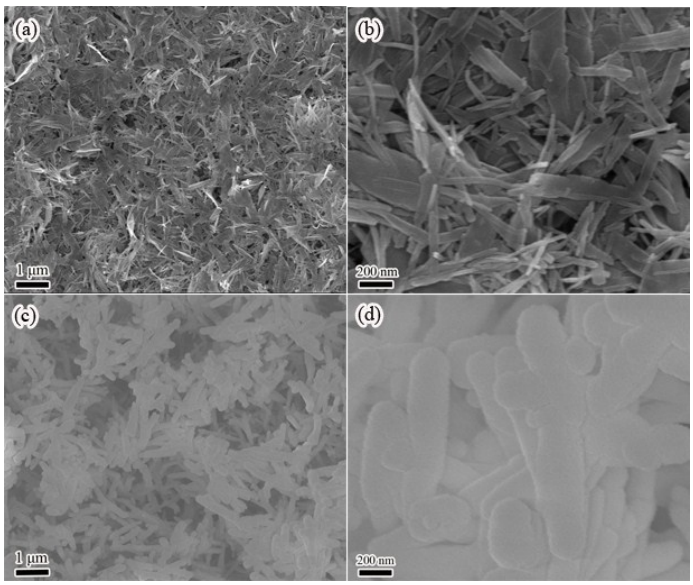

Fig. S2 SEM images of CuO nanobelts (a, b), CuO@SiO_2 nanobelts (c, d) with two different magnifications.

As can be seen from Fig. S2a-d, the one-dimensional belt-like morphology of CuO templates is well retained in core-sheath CuO@SiO_2 intermediates.

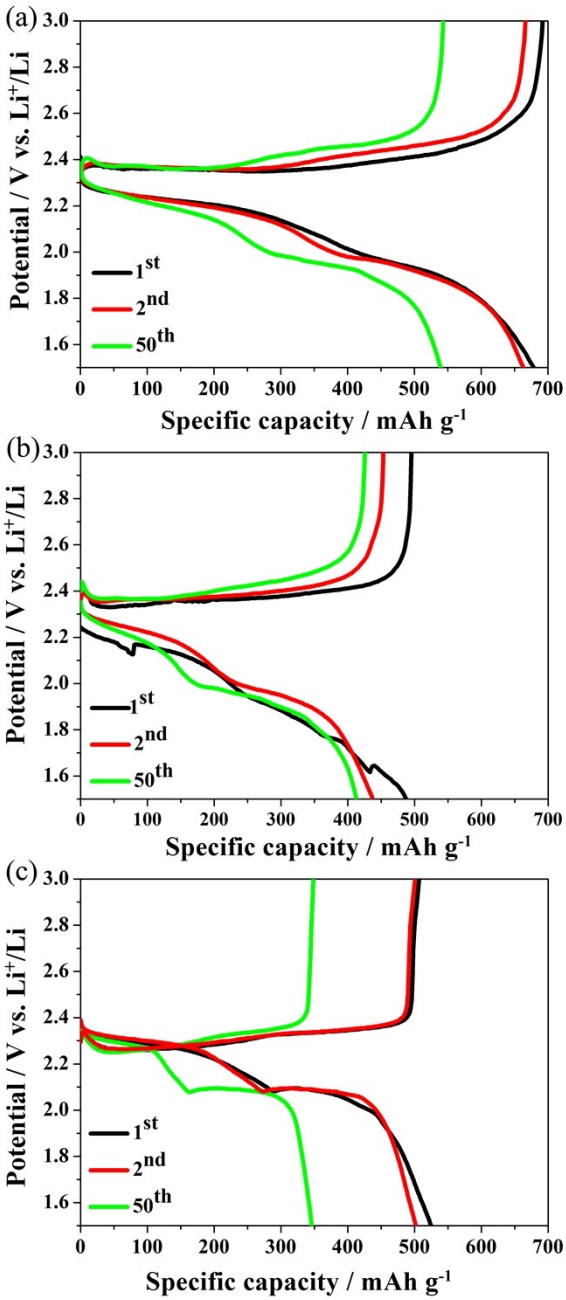

Fig. S3 The charge-discharge cycle capacity comparison of (a)the SiO_2-S-50 composite, (b) SiO_2-S-80 composite and (c) pure pristine S for 1st, 2nd and 50th cycles at a discharge/discharge current density of 0.1 C.

Fig. S3 displays the galvanostatic discharge profiles of SiO_2-S-50 composite, SiO_2-S-80 composite and pristine S at a discharge/discharge current density of 0.1 C, which show the characteristic two-plateau behavior of LSBs. The first shorter

discharge plateau is derived from the reduction of elemental sulfur to long-chain polysulfide species (S_n^{2-}, $4 \leq n \leq 8$). The second longer horizontal discharge stages is associated with the further reduction of long-chain polysulfide species to insoluble Li_2S_2 and Li_2S.