Supporting Information

Ultrafine TiO_2 Confined in Porous Nitrogen Doped Carbon from Metal-Organic Frameworks for High Performance Lithium Sulfur Batteries

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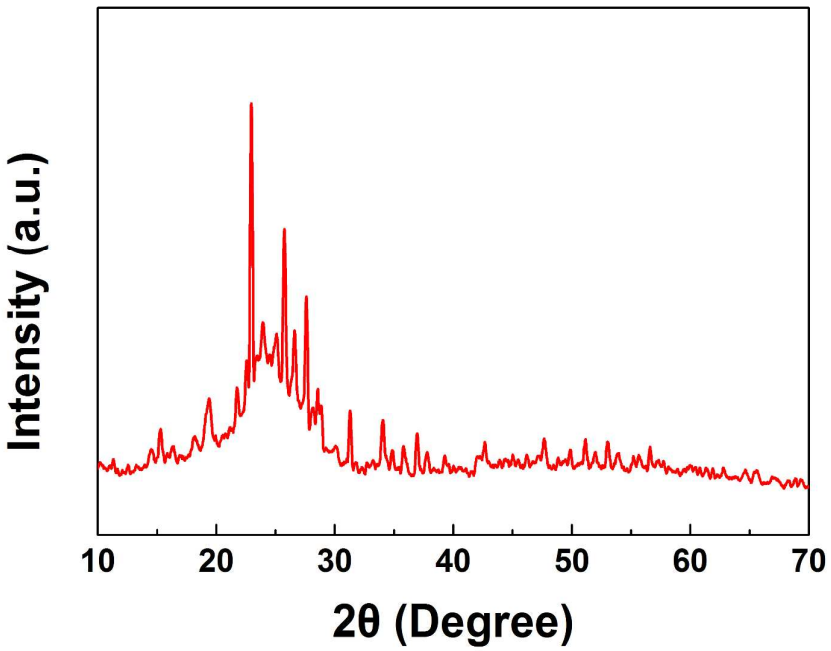

Fig. S1 XRD patterns of the sulfur-activated carbon composites.

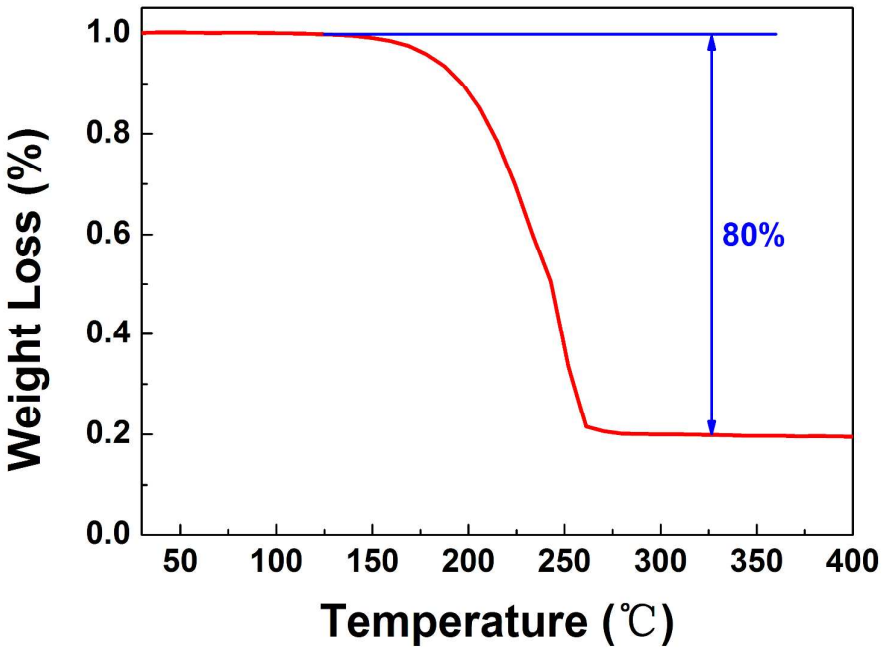

Fig. S2 Thermal gravity analysis (TGA) curve of the sulfur-activated carbon composites.

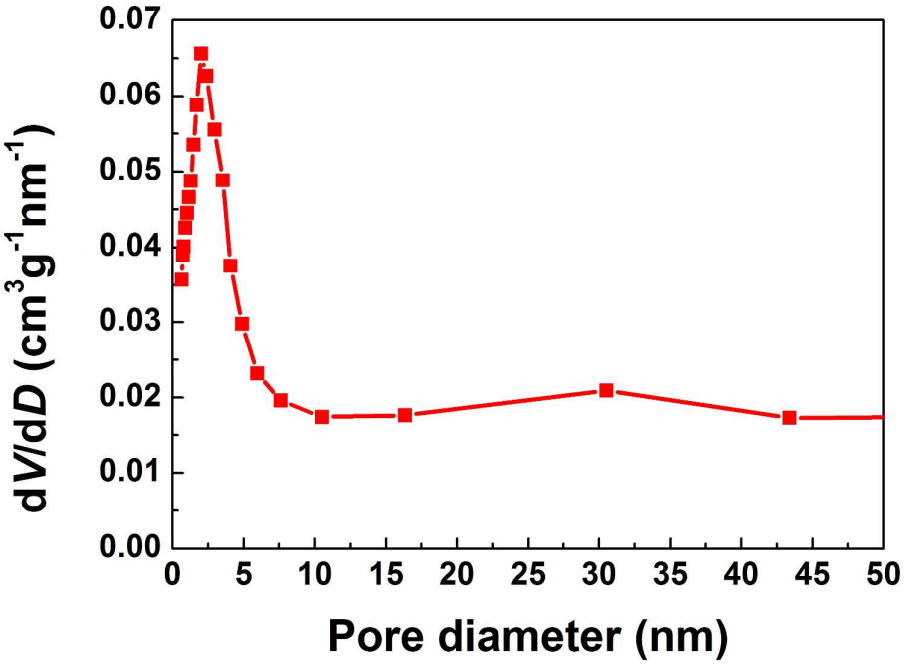

Fig. S3 Pore-size distributions of the TiO_2@NC.

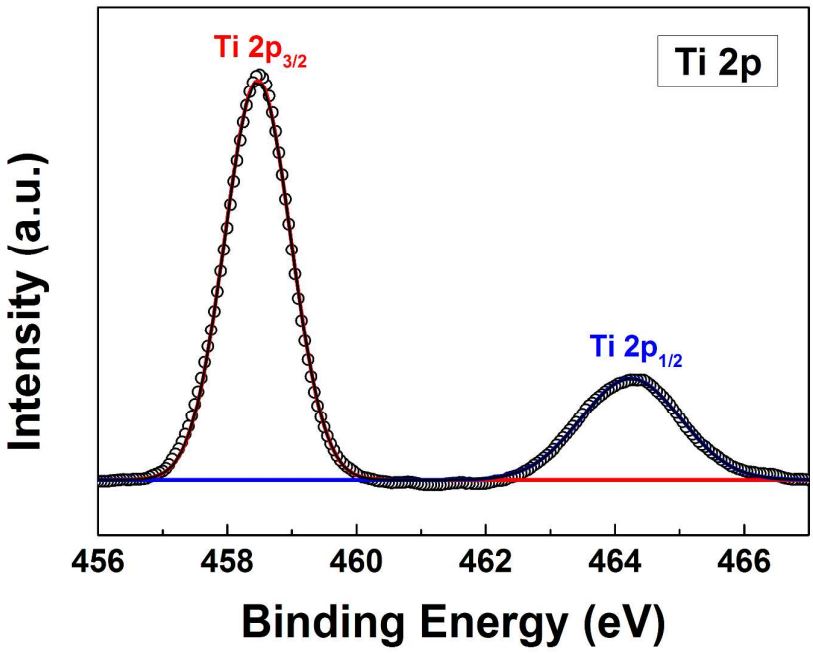

Fig. S4 High-resolution Ti 2p XPS spectrum of the TiO_2@NC.

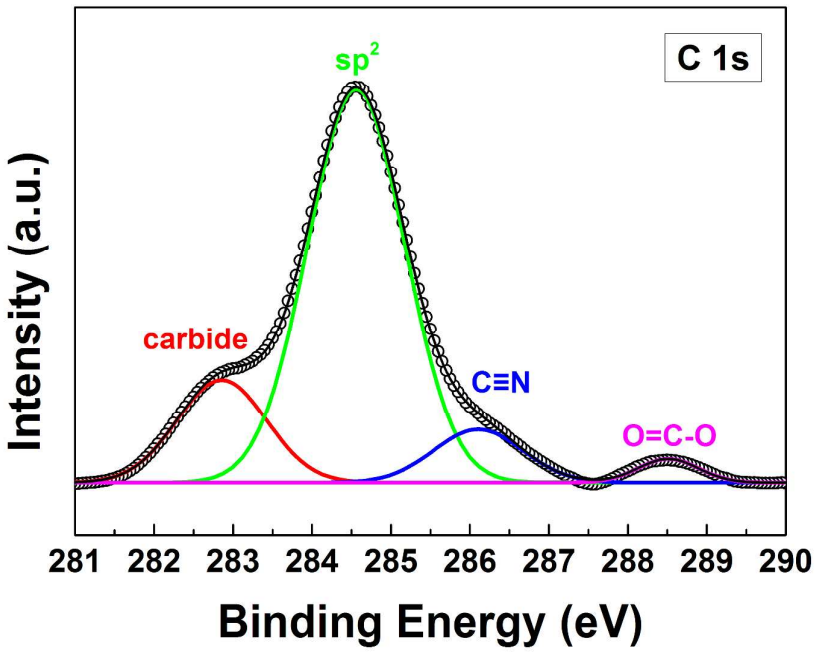

Fig. S5 High-resolution C 1s XPS spectrum of the TiO_2@NC.

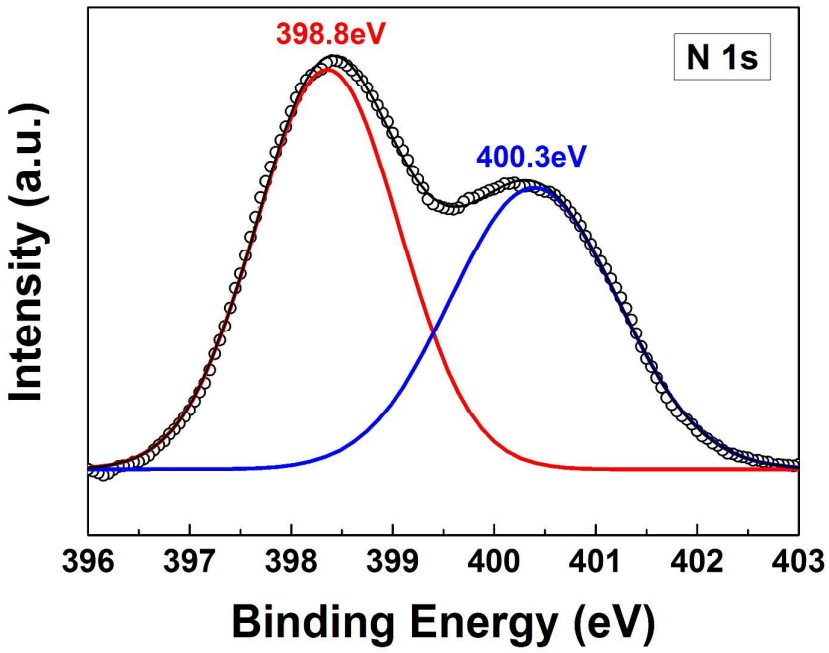

Fig. S6 High-resolution N 1s XPS spectrum of the TiO_2@NC.

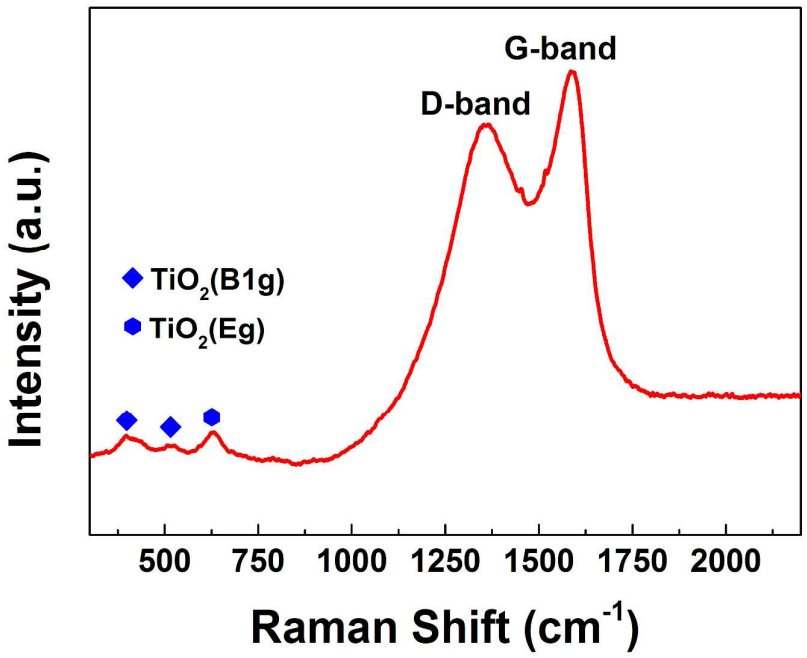

Fig. S7 Raman spectra of the TiO_2@NC.

The Raman spectra of TiO_2@NC reveals the characteristic peaks of the anatase TiO_2 and the graphite carbon (G band) and the disordered carbon (D band) of carbon. Three peaks at 397cm^{-1}, 512cm^{-1} and 642 cm^{-1} correspond to the states of B_{1g}, B_{1g}, E_g of the anatase TiO_2, respectively. The peaks at 1340cm^{-1} and 1528 cm^{-1} are the D band and the G band, respectively. The Raman spectra demonstrates that the samples are composed of the anatase TiO_2 and the carbon.

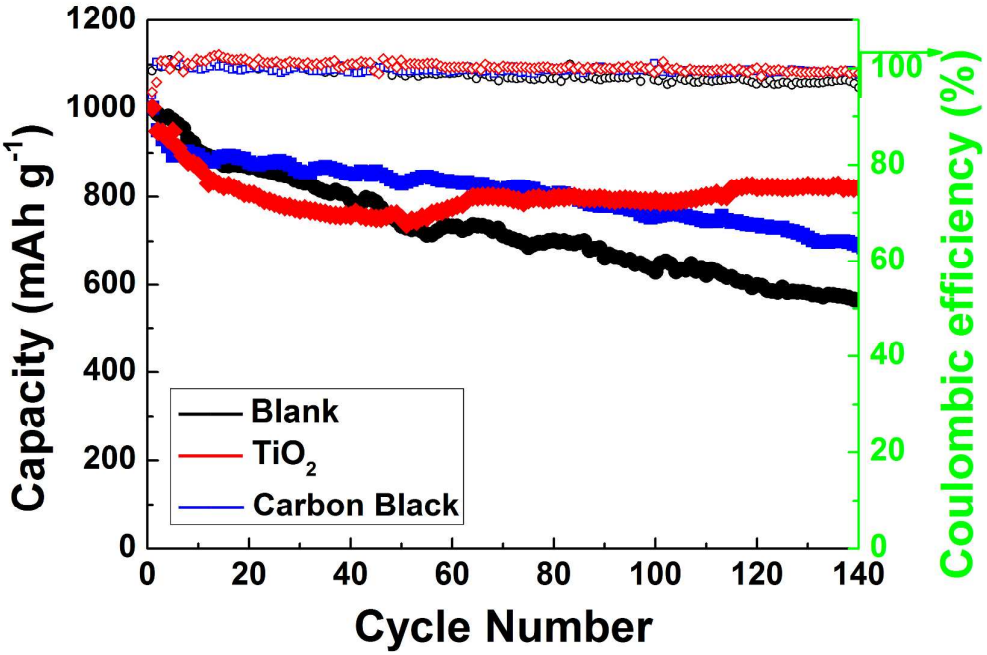

Fig. S8 Cycling performance of the lithium sulfur battery without interlayer and TiO_2@NC and carbon black as the interlayer at a current density of 1 C.

Reference

1. Yan, L. T.; Xu, Y.; Zhou, M.; Chen, G.; Deng, S. G.; Smirnov, S.; Luo, H. M.; Zou, G. F. Porous TiO_2 Conformal Coating on Carbon Nanotubes as Energy Storage Materials, *Electrochim. Acta* **2015**, *169*, 73-81.