Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Sandwich-type porous carbon /sulfur /polyaniline composite as cathode material for high-performance lithium−sulfur batteries

Yakun Bu[a, b §], Jing Wu[a, b §], Xiaotao Zhao[a, b], Kui Ding[b], Qin Liu[b], Yiyin Huang[b], Jiangquan Lv[b], Yaobing Wang[b] *

[a]*College of Chemistry, Fuzhou University, Fuzhou, 350116, PR China*

[b]*Key Laboratory of Nanomaterials, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou, Fujian, 350002, PR China*

§ These authors contributed equally to this work.

Part I: Experimental section.

Part II: Morphology characterizations for SPC.

Part III: Characterization of SPC.

Part I: Experimental section.

Synthesis of Sandwich-type Porous Carbon (SPC)

Glucose (99.0%), ammonium hydroxide (25%-28%) and sublimed sulfur powder (99.5%) were purchased from Aldrich. The electrolyte was purchased from Fosai New Materials Co., Ltd. (Su Zhou, China). Graphene oxide (GO) was prepared by modified Hummer method from purified natural graphite powder. The prepared solid GO (70 mg) was dispersed in deionized water (70 ml) using an ultrasonic machine to prepare a GO aqueous dispersion (1 mg/ml). Then, 1 ml ammonium hydroxide ($NH_3 \cdot H_2O$) and a certain mass of glucose (GO: glucose = 1: 100) were added into the GO aqueous dispersion. After stirring for 30 min, the resulting solution was sealed in a 100 ml Teflon-lined stainless steel autoclave, followed by hydrothermal treatment at 180 ^oC for 18 h. After allowing it to cool naturally, the products were washed with deionized water and freeze-dried for 24 h. The obtained hydrothermal carbonized precursor was placed in open-type quartz tube furnace (Φ = 10 cm, OTF-1200X-100). The furnace was heated to 950 ^oC for 4 h; the furnace was naturally cooled down to room temperature. The resultant samples were designated as SPC.

Part II: Morphology characterizations for SPC.

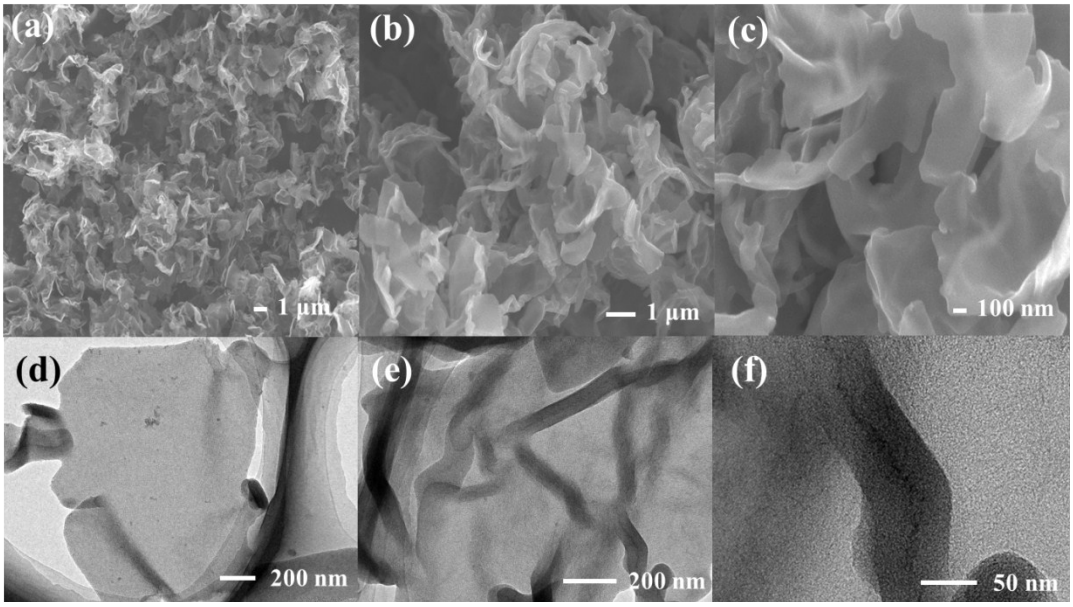

Fig. S1. (a)-(c) Scanning electron microscopy (SEM) image of SPC; (d)-(f) Transmission electron microscope (TEM) image of SPC;

Part III: More characterization of SPC.

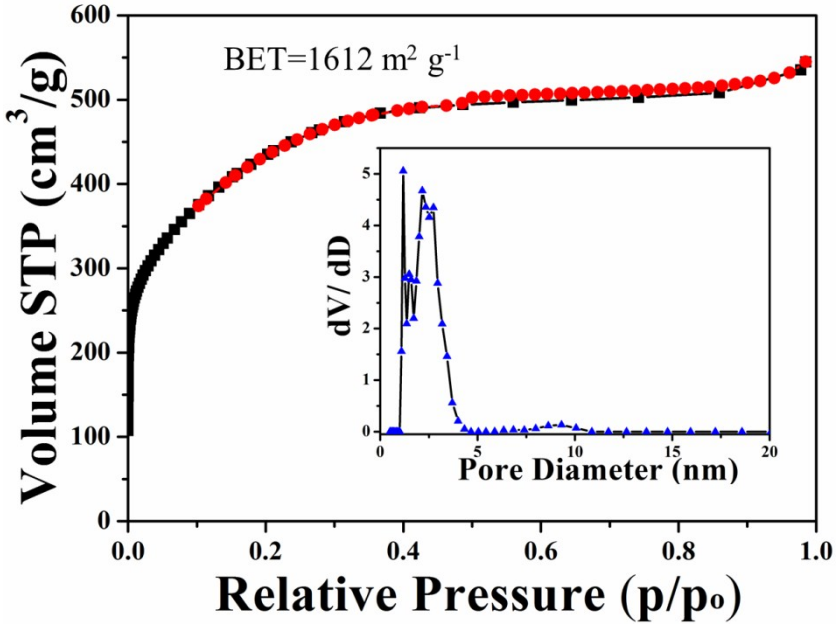

Fig. S2. Pore characterization of the SPC material

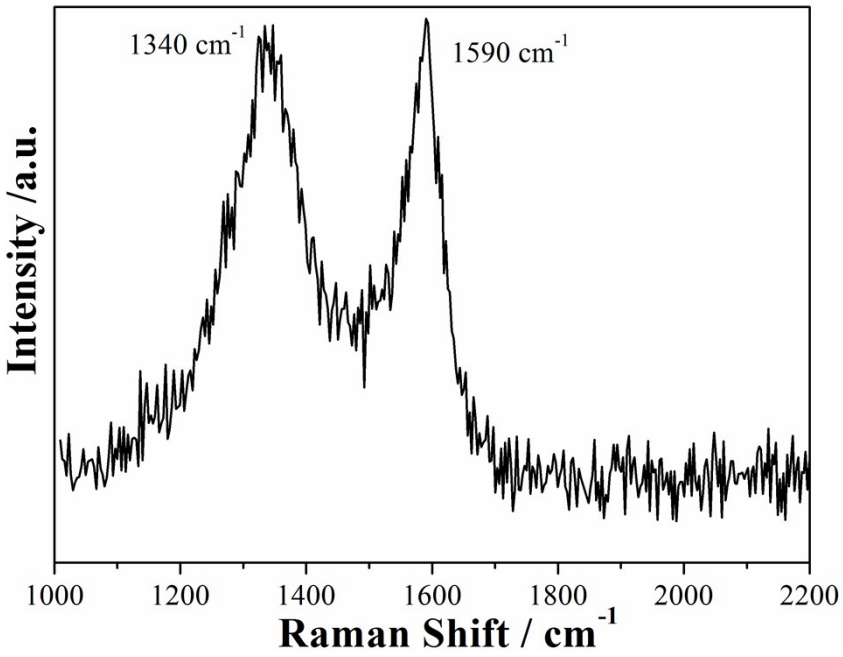

Fig. S3. Raman spectra of the SPC material