## **Supporting Information for**

## Methods to form atomically thin carbon coatings on SnS and SnO<sub>2</sub> nanostructures

Shuankui Li<sup>a,b</sup>, Jiaxin Zheng<sup>a</sup>, Shiyong Zuo<sup>b</sup>, Zhiguo Wu<sup>b\*</sup>, Pengxun Yan<sup>b</sup>, Andrey L. Rogach<sup>c</sup>

and Feng Pan<sup>a\*</sup>

<sup>a</sup> School of Advanced Materials, Peking University Shenzhen Graduate School, Shenzhen,

518055, China.

<sup>b</sup> School of Physical Science and Technology, Lanzhou University, Lanzhou, Gansu, 730000,

China.

° Department of Physics and Materials Science and Centre for Functional Photonics, City

University of Hong Kong, Hong Kong S.A.R., China



Fig. S1. (a) Schematic view of the SnS crystal structure along the a, b, c axes. (b)The most energy stable configuration of the citric acid molecules absorbed on the SnS (100) surface (views along the a, b, c axes, respectively).



Fig. S2. EDX mapping of Sn, S, and C elements on a C@SnS@C microsphere .



**Fig. S3.** Cyclic performance of the porous  $C/SnO_2$  nanosheets (inset: their SEM image) at a current density of  $100mAg^{-1}$  for 50 cycles.



Fig. S4. SEM images of (a, b, c) the  $SnO_2@ATC$  electrode after 50 charge/discharge cycles at  $100mAg^{-1}$ .