Facile Synthesis of Ti_4O_7 on Hollow Carbon Spheres with Enhanced Polysulfide Binding for High Performance Lithium-Sulfur Batteries

Fang Wang[a], Xian Ding[a], Ruyue Shi[a], Yimin Lei[b,c], Zhibin Lei[a,*], Guangshen Jiang[c], Fei Xu[c], Hongqiang Wang[c], Lichao Jia[a], Ruibin Jiang[a], Zonghuai Liu[a] and Jie Sun[a,*]

a. Key Laboratory of Applied Surface and Colloid Chemistry (MOE), Shaanxi Engineering Lab for Advanced Energy Technology, Shaanxi Engineering Laboratory for Advanced Energy Technology, School of Materials Science and Engineering, Shaanxi Normal University, 620 West Chang'an Street, Xi'an, Shaanxi 710119, China.

b. School of Advanced Materials and Nanotechnology, Xidian University, 266# Xifeng Road, Xi'an, Shaanxi, 710126, China.

c. State Key Laboratory of Solidification Processing, School of Materials Science and Engineering, Northwestern Polytechnical University, Xi'an 710072, P. R. China

Supplementary Materials

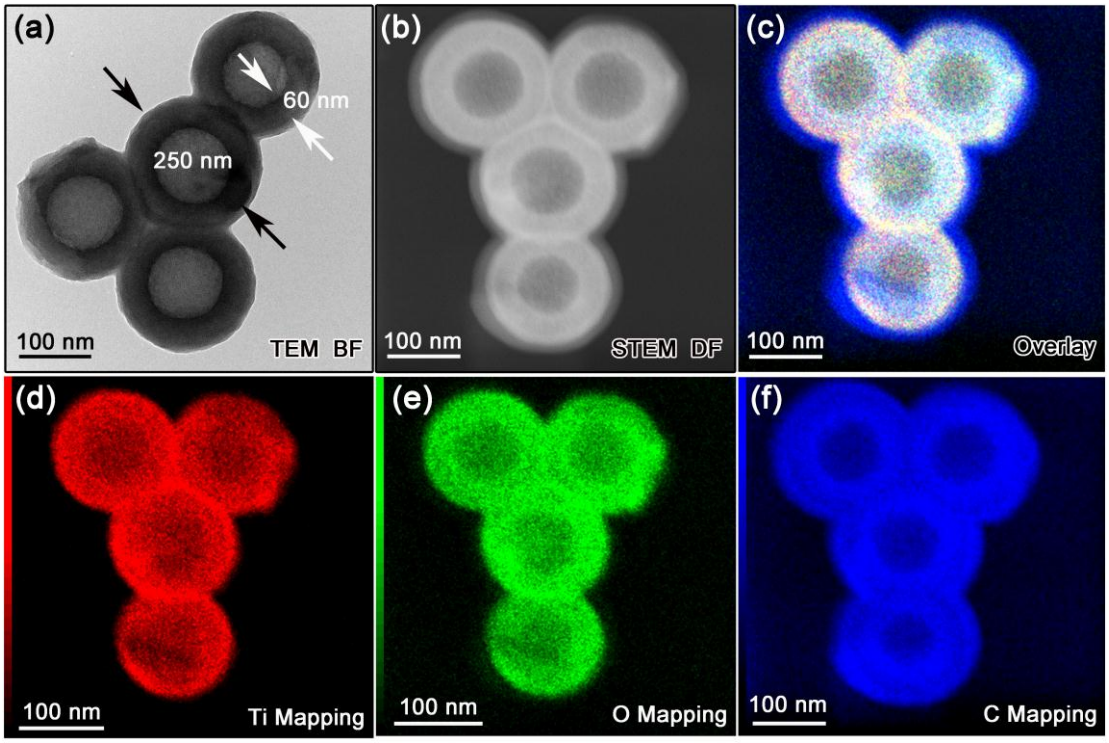

Fig. S1 The TEM BF (a), STEM DF (b) images and EDX mapping (c-f) of HCS@PDA@TiO_2 precursor. The uniform spherical and hollow morphology retains during the whole coating process.

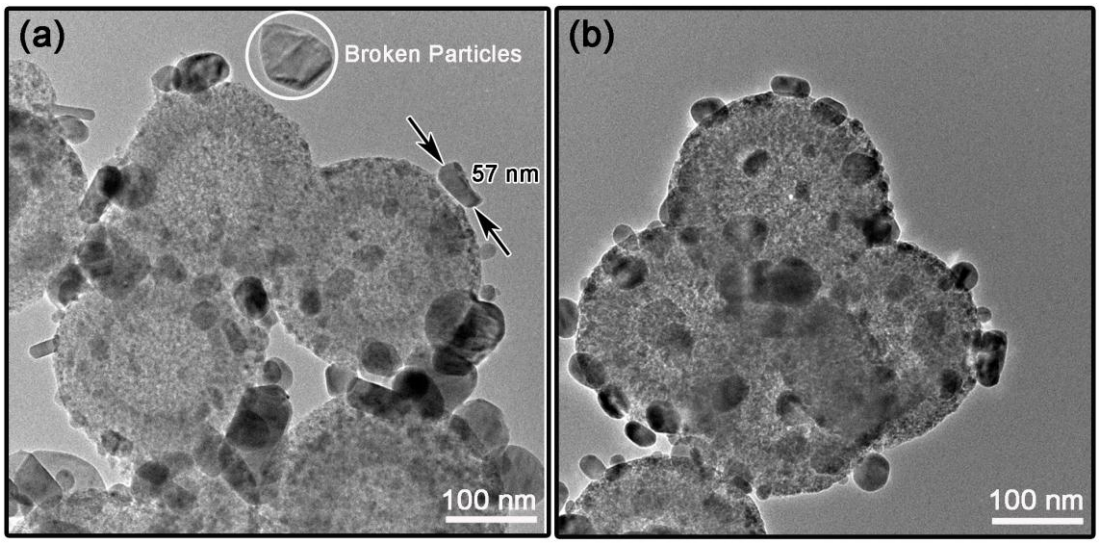

Fig. S2 TEM BF images of HCS@Ti_nO_{2n-1} without the coating of PDA.

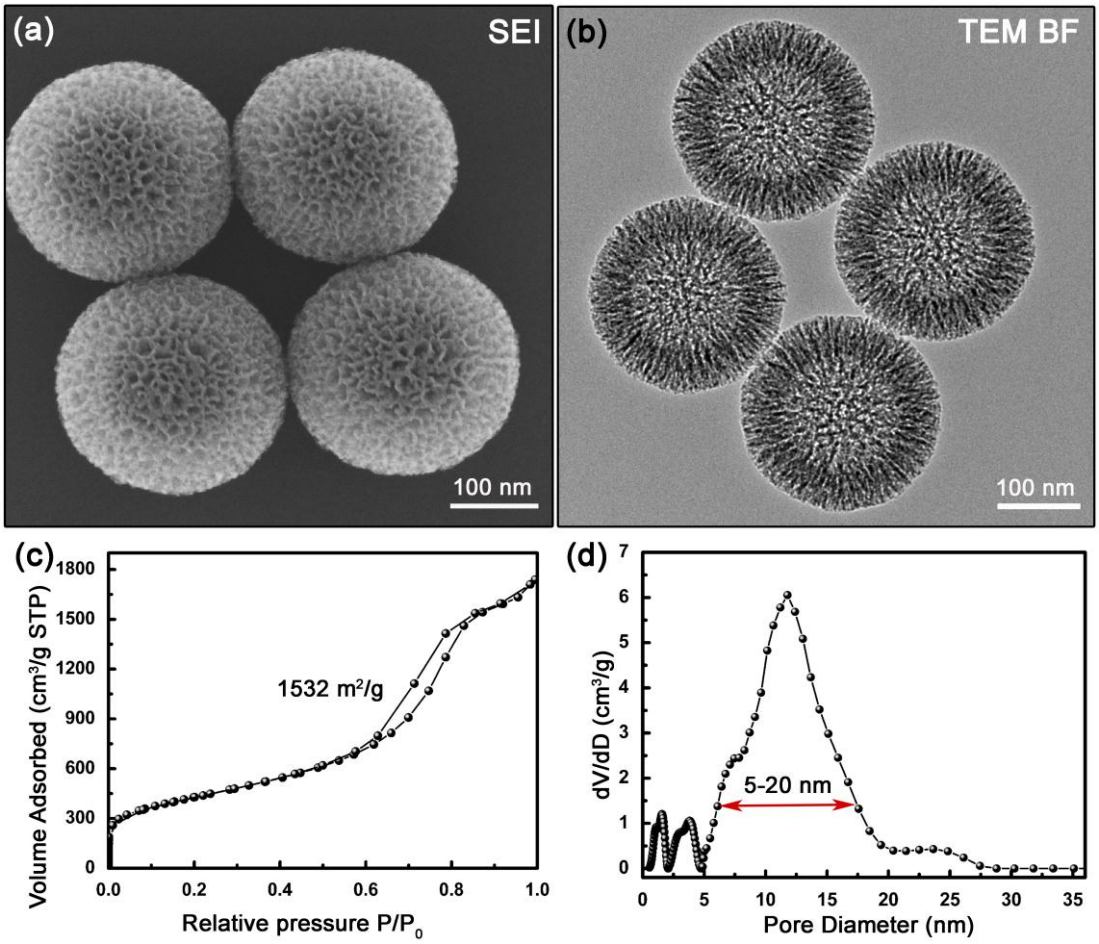

Fig. S3 The SEI (a), TEM BF images (b) of pure HCS indicate the uniform pore structure at the surface. The nitrogen adsorption/desorption isotherm and pore distribution curve illustrate the specific surface area of 1532 m^2 g^{-1} and pore volume of 2.69 cm^3 g^{-1} for HCS (c, d).

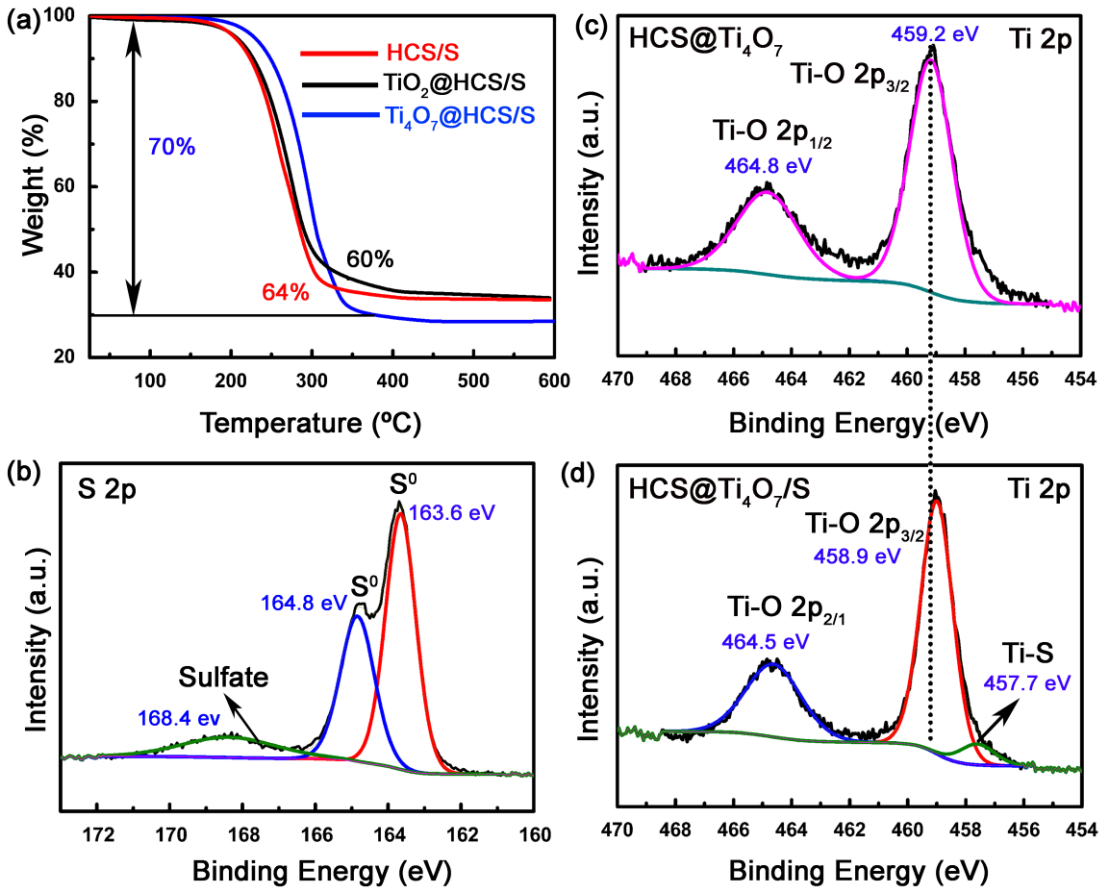

Fig. S4 The TG (a), XPS S 2p spectra (b) of HCS@Ti_4O_7/S electrodes prepared by the melt-diffusion method. The Ti 2p spectra before (c) and after sulfur loading (d) illustrates the shift of binding energy toward lower energy direction.

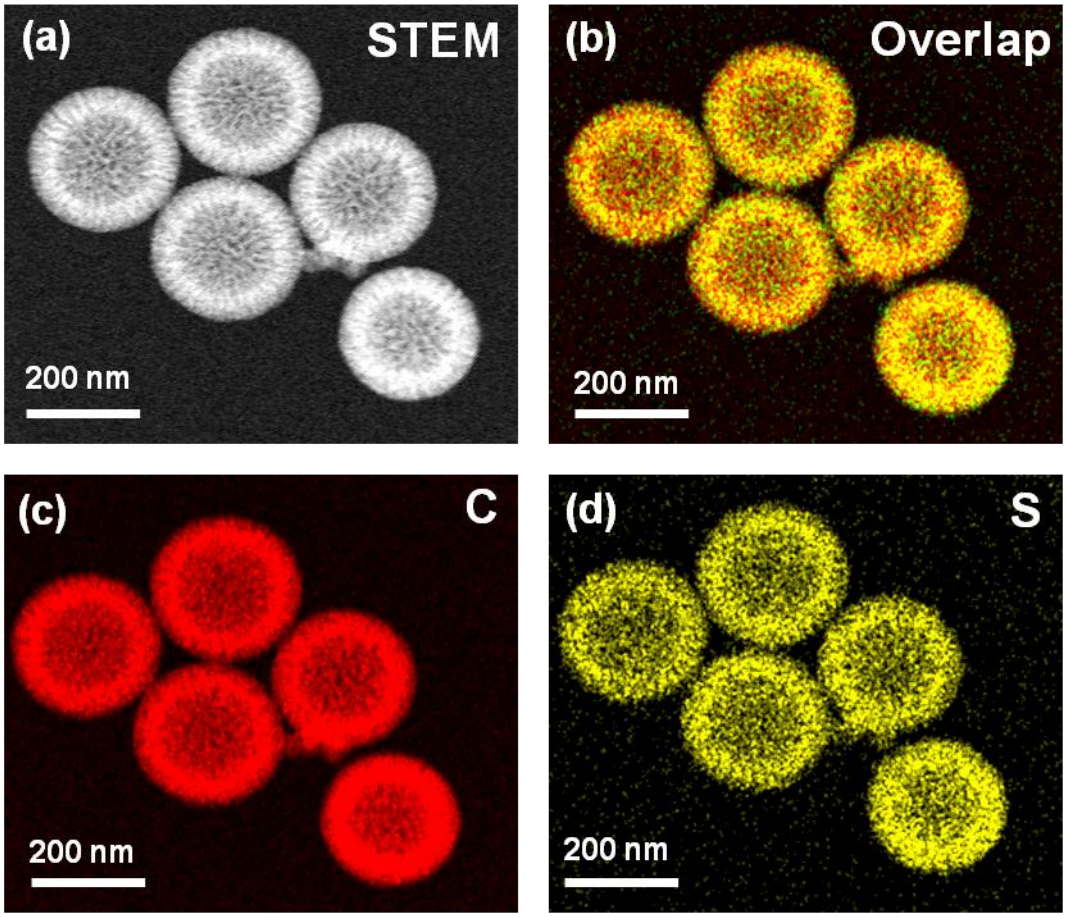

Fig. S5 The EDX mapping results of the HCS/S electrode.