

Supporting Information

SnO₂ Nanorods-Planted Graphite: an Effective Nanostructure Configuration for Reversible Lithium-Ion Storage

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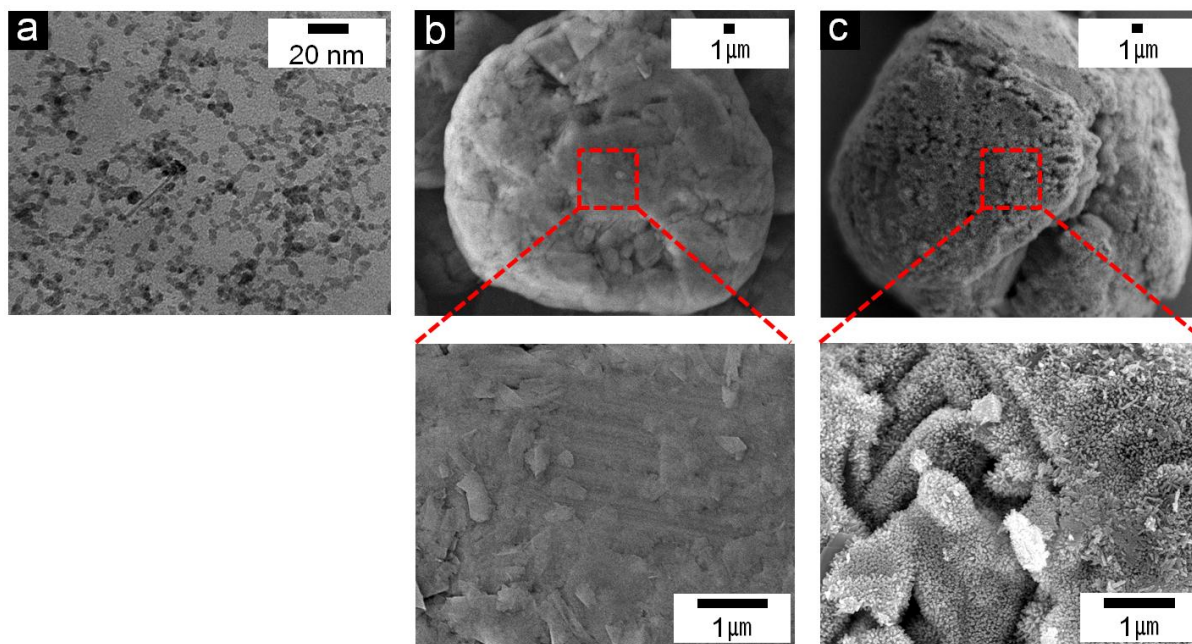


Figure S1. (a) HRTEM image of SnO₂-seeded graphite. SEM images of (b) original graphite particles and (c) SnO₂ nanorods-planted graphite (S1).

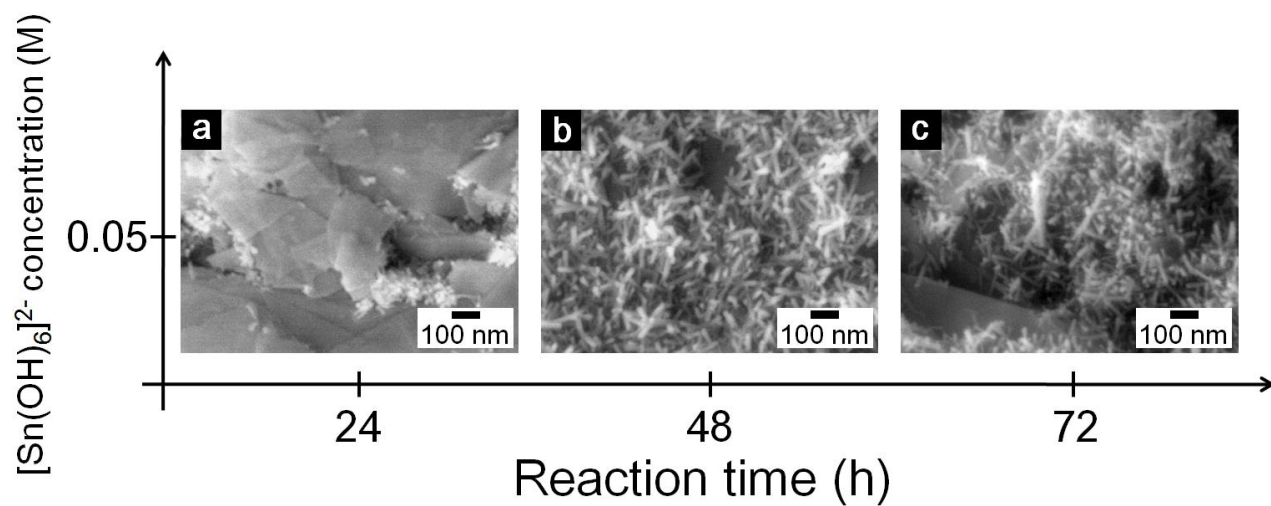


Figure S2. SEM images of the as-obtained SnO_2 nanorods-planted graphite at 0.05 M as a function of reaction time.

These samples were synthesized for different SnO_2 nanorod dimensions by changing the solution concentration to 50 mL of 0.05 M aqueous $\text{SnCl}_4 \cdot 5\text{H}_2\text{O}$ solution and 0.06 mol of NaOH. The solution also was hydrothermally heated to 200 °C and maintained for 24–72 h.

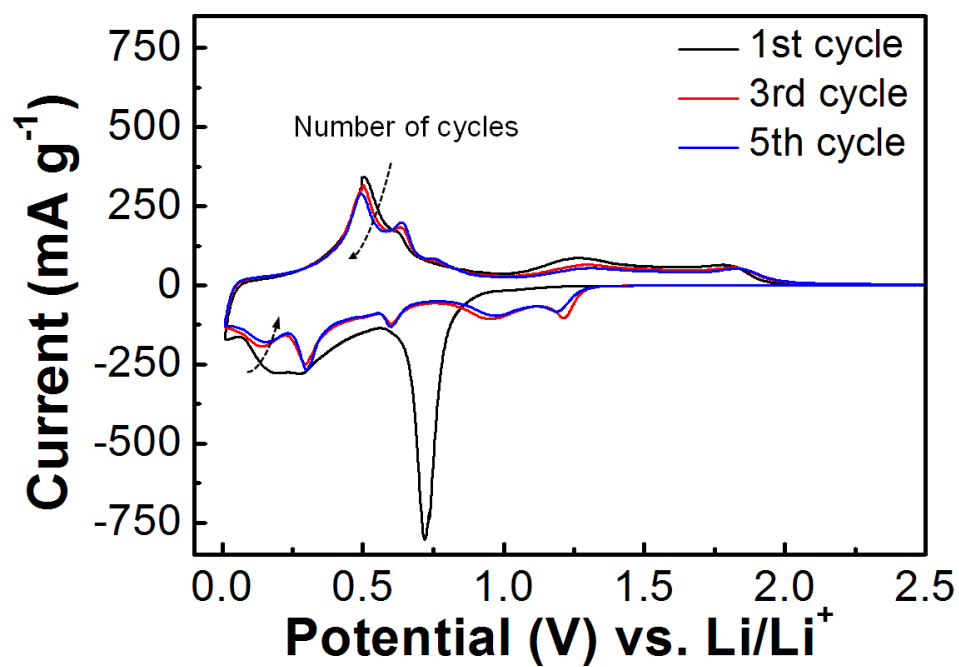


Figure S3. CVs of SnO₂ nanowires between 2.5 and 0.01 V at a scan rate of 0.05 mV s⁻¹.

In the CV-loops, the activation process is in competition with degradation of the electrode (44). Figure S3 shows that the degradation is more serious than the activation process for SnO₂ nanowires.

Table S1. The first discharge capacity and SnO₂ contents (wt.%) of SnO₂ nanorods-planted graphite synthesized under different conditions.

SnO ₂ nanorods-planted graphite sample	First discharge capacity (mAh g ⁻¹)	SnO ₂ contents (wt.%) – theoretical value ^a	SnO ₂ contents (wt.%) – TGA ^b
S1	1010.0	56.9	50.1
S2	1068.2	62.1	66.0
S3	1190.8	73.0	71.0
S4	1309.2	83.5	79.9
S5	1353.8	87.5	85.1
S6	1377.5	89.6	88.3

^aTheoretical values were calculated from the first discharge capacity of each sample. These values are very close to the measured values^b from the TGA.

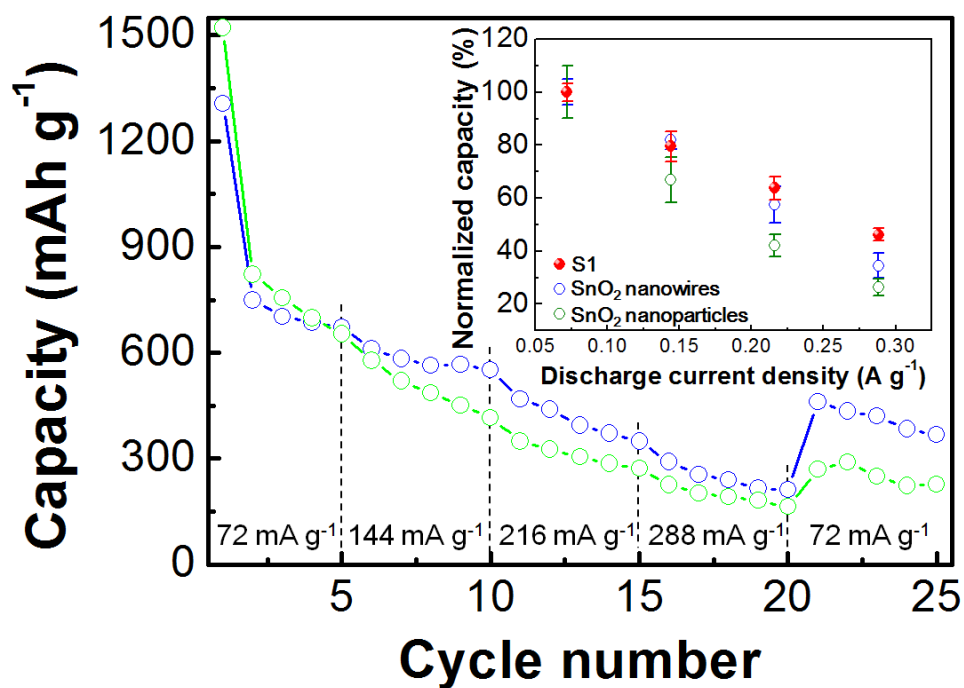


Figure S4. Cycling performance of SnO₂ nanorods-planted graphite composites, pure SnO₂ nanowires, and SnO₂ nanoparticles at various current densities between 0.01 and 1.5 V. The inset shows the normalized capacity at each step by the average capacity values under 0.72 mA g⁻¹ current density of the first step.

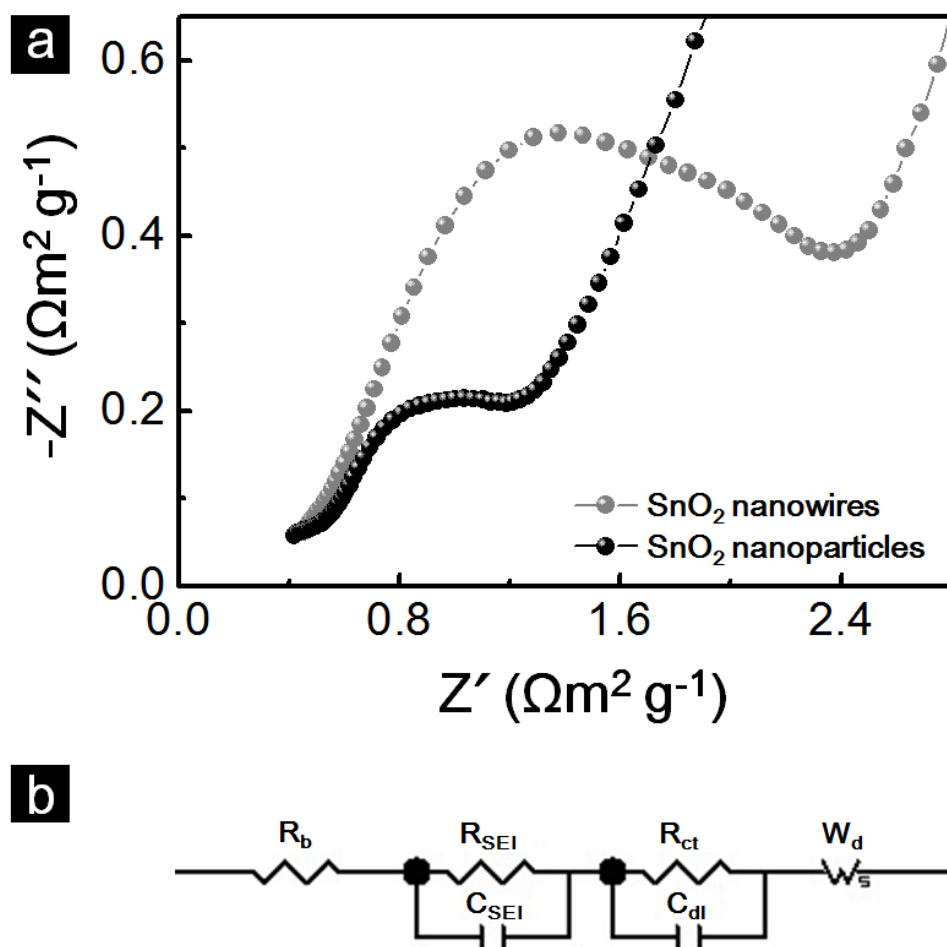


Figure S5. (a) Nyquist plots of SnO_2 nanowires and nanoparticles measured at the open circuit voltage of 1.5 V. (b) Equivalent circuit obtained from EIS measurements.