Electronic Supplementary Information

A sandwich structure of mesoporous anatase TiO_2 sheet and reduced graphene oxide and its application as lithium-ion battery electrodes

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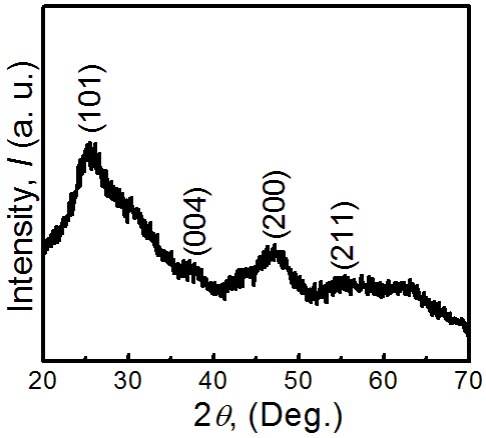

Fig. S1 XRD pattern of the white precipitation prepared through TBOT hydrolysis in the presence of GO.

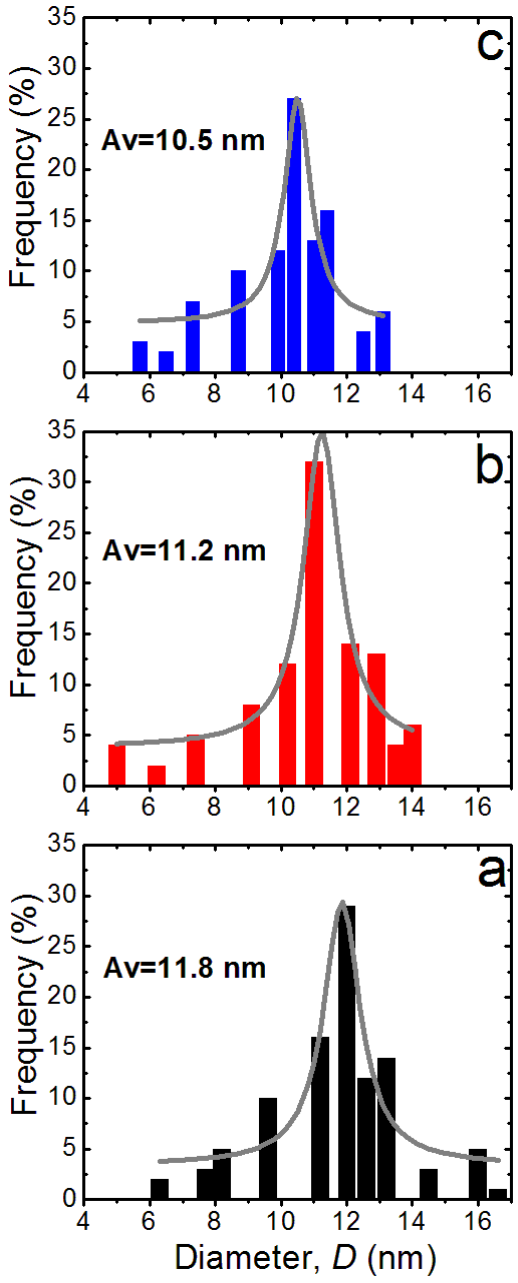

Fig. S2 Size distribution histograms of (a) TG1, (b) TG2, (3) TG3 samples as obtained from corresponding FESEM images as shown in the main text.

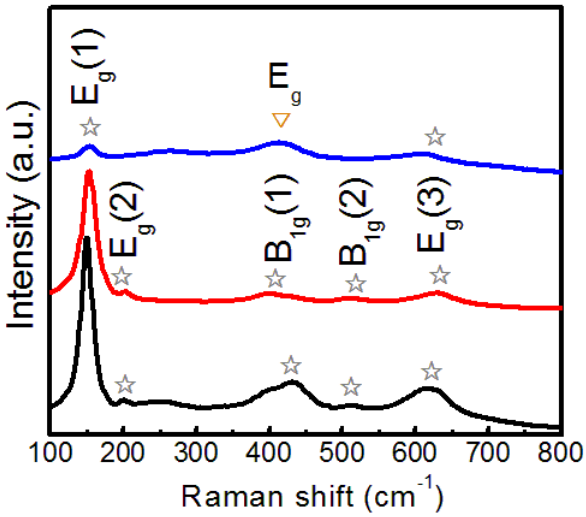

Fig. S3 Raman spectra for the mesoporous anatase TiO_2 sheets/rGO sandwich-like nanocomposites. TG1 (black line), TG2 (red line), and TG3 (blue line). For TG1 and TG2 samples, the Raman bands located at ~151 cm^{-1}, 200 cm^{-1}, 432 cm^{-1}, 511 cm^{-1}, and 620 cm^{-1} can be assigned as vibration modes of $E_g(1)$, $E_g(2)$, $B_{1g}(1)$, $B_{1g}(2)$, and $E_g(3)$ for anatase TiO_2 [1-5]. For TG3 sample, except $E_g(1)$ and $E_g(3)$ vibration modes for anatase TiO_2, another band located at ~417 can be attributed to Raman active mode E_g of rutile TiO_2 [3-5].

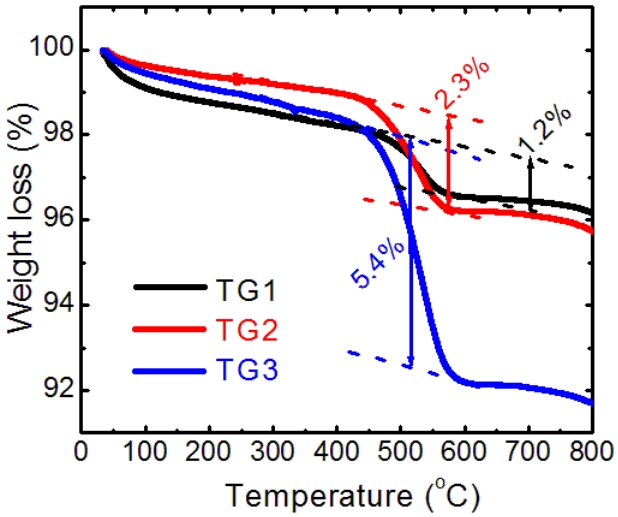

Fig. S4 TGA curves of the mesoporous anatase TiO_2 sheets/rGO sandwich-like nanocomposites measured by using TGA 2050 thermogravimetric analyzer under an air atmosphere at the temperature range of 25-800 ^{o}C with a heating rate of 10 ^{o}C min^{-1}. TG1 (black line), TG2 (red line), and TG3 (blue line). The weight loss before 400 ^{o}C could be ascribed to surface water adsorption, while the weight loss after ~400 °C could be ascribed to the oxidation of graphene in the nanocomposites, which yielding the weight fraction of graphene in the nanocomposites of about 1.2%, 2.3%, and 5.4% for TG1, TG2, and TG3 samples, respectively.

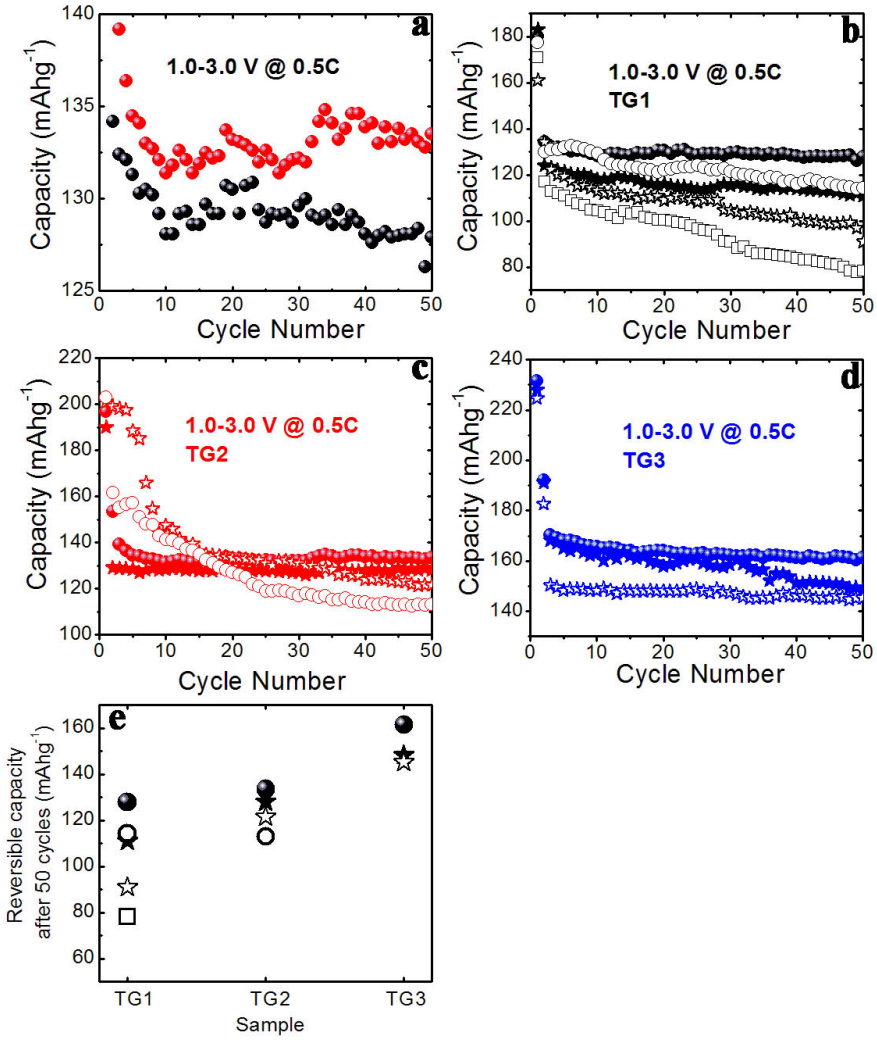

Fig. S5 (a) The enlargement of Fig. 5(c) in the main text; The cycling performance of the identical cells constructed by sandwich-like nanocomposite electrodes at a charge-discharge rate of 0.5 C in the voltage range of 1.0-3.0 V(vs. Li^+/Li) up to 50 cycles, (b) TG1, (c) TG2, (d) TG3; and (e) The reversible capacity after 50 cycles of the identical cells assembled by sandwich-like nanocomposite electrodes.

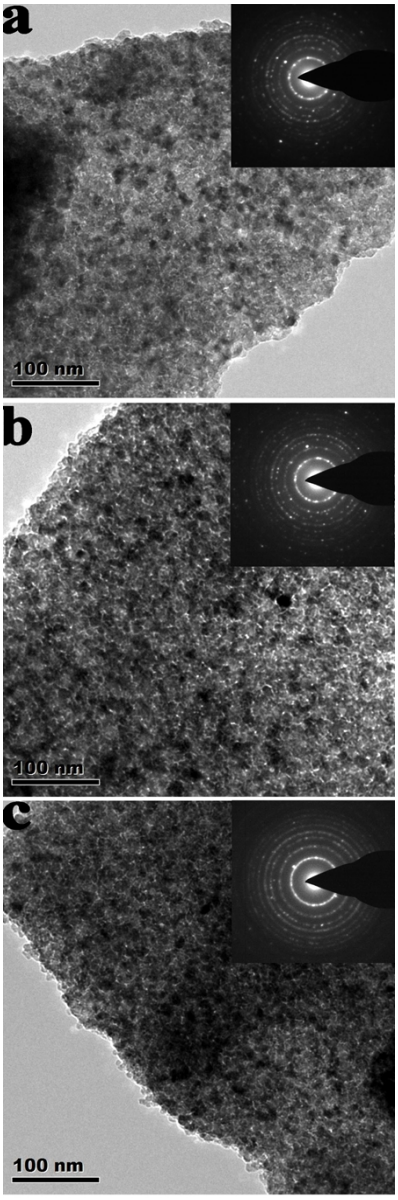

Fig. S6 TEM images and SAED patterns of the mesoporous anatase TiO_2 sheets/rGO sandwich-like nanocomposite electrodes after rate capability testing (50 cycles). (a) TG1, (b) TG2, (c) TG3.

References

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