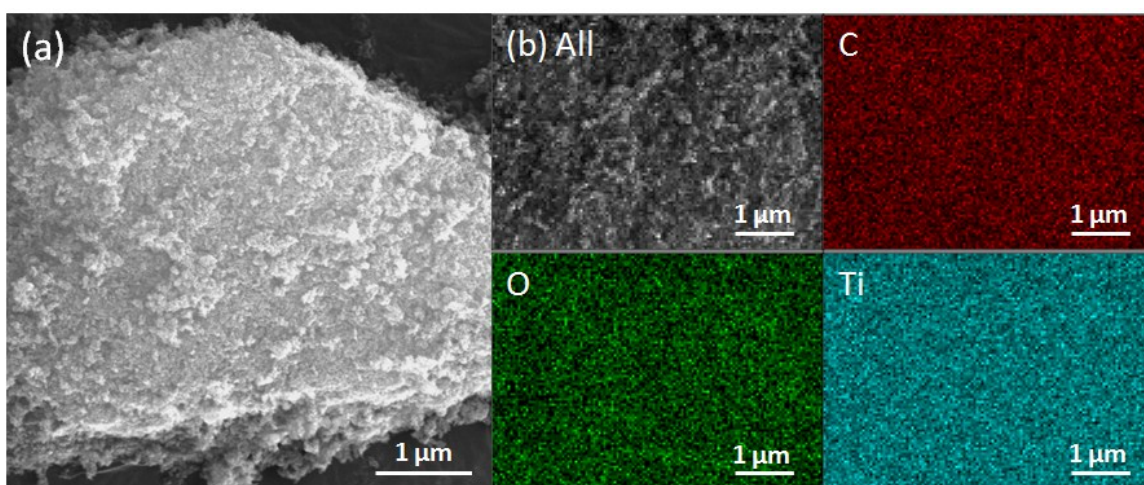


Supporting Information for

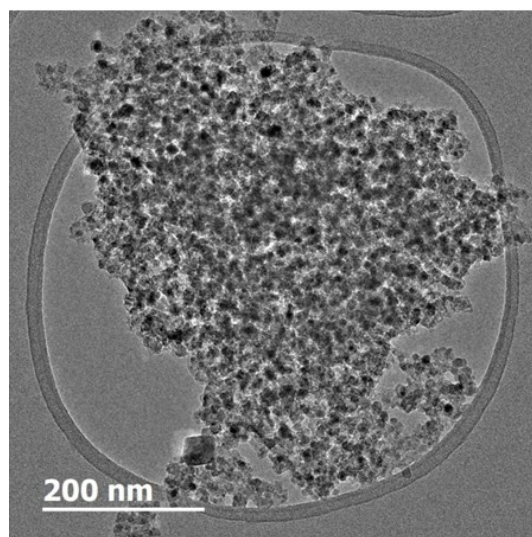
**Facile synthesis of mesostructured TiO<sub>2</sub>-graphitized carbon (TiO<sub>2</sub>-gC)  
composite through the hydrothermal process and its application to the anode  
of lithium ion battery**

Hiesang Sohn,<sup>a</sup> Daeun Kim,<sup>b</sup> Jinwoo Lee,<sup>c</sup> and Songhun Yoon\*<sup>b</sup>

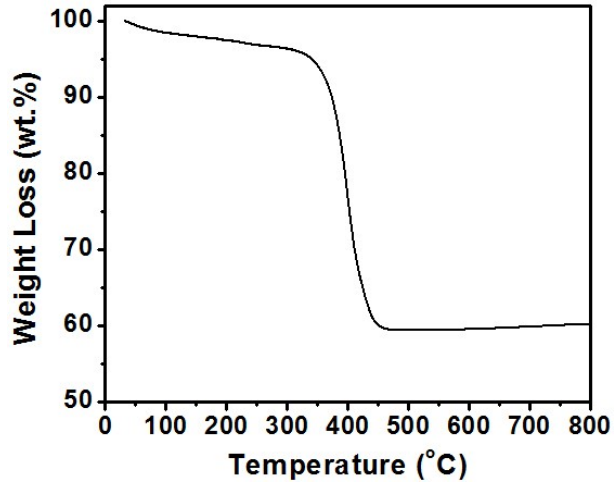
<sup>a</sup> *The Pennsylvania State University, Department of Mechanical and Nuclear Engineering, University Park, PA, 16802, USA;* <sup>b</sup> *Chung-Ang University, Department of Integrative Engineering, Seoul, 156-756, Korea. E-mail: [yoonsahun@cau.ac.kr](mailto:yoonsahun@cau.ac.kr)*



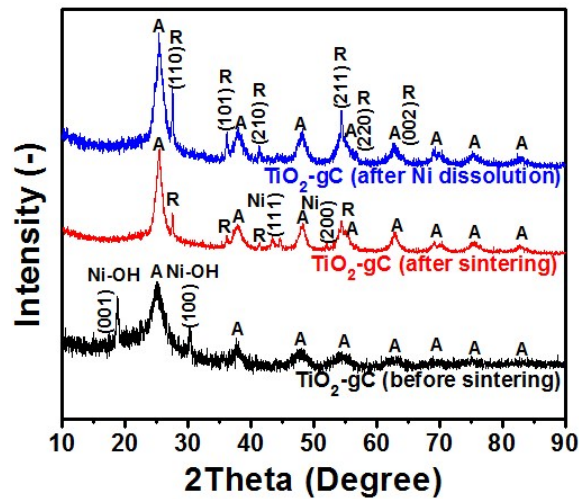
**Figure S1.** Morphology of TiO<sub>2</sub>-gC composite by scanning electron microscope (SEM) (a) SEM image and (b) Elemental mapping images of TiO<sub>2</sub>-gC composite (C: red, O: green, Ti: blue).



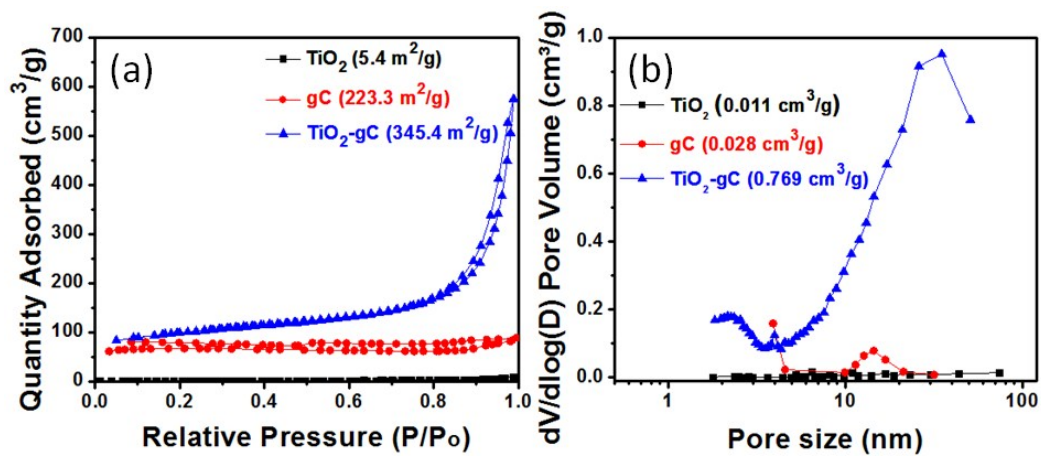
**Figure S2.** Morphology of TiO<sub>2</sub>-gC composite by transmission electron microscopy (TEM).



**Figure S3.** Thermogravimetric analysis (TGA) for  $\text{TiO}_2$ -gC to analyze the composition of  $\text{TiO}_2$  and graphitic carbon (gC).



**Figure S4.** Crystalline structural of  $\text{TiO}_2$ -gC composite obtained at different preparation stages (as-prepared, after sintering, after Ni dissolution).



**Figure S5.** (a)  $\text{N}_2$  sorption isotherms (inset: BET surface area) and (b) pore size distributions (inset: pore volume) of  $\text{TiO}_2$ , gC and  $\text{TiO}_2$ -gC composite.

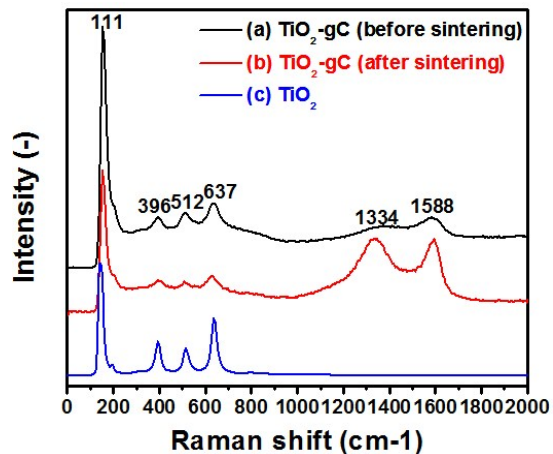


Figure S6. Raman spectra of (a) TiO<sub>2</sub>-C (before sintering) (b) TiO<sub>2</sub>-gC (after sintering) (c) TiO<sub>2</sub>.

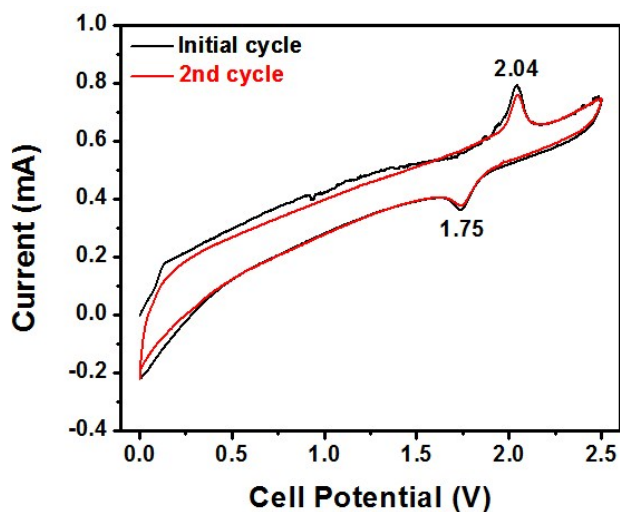


Figure S7. Cyclic voltammogram curves of TiO<sub>2</sub>-gC measured at 0.1 mV/s in a voltage range of 0.0-2.5 V vs. Li/Li<sup>+</sup>.

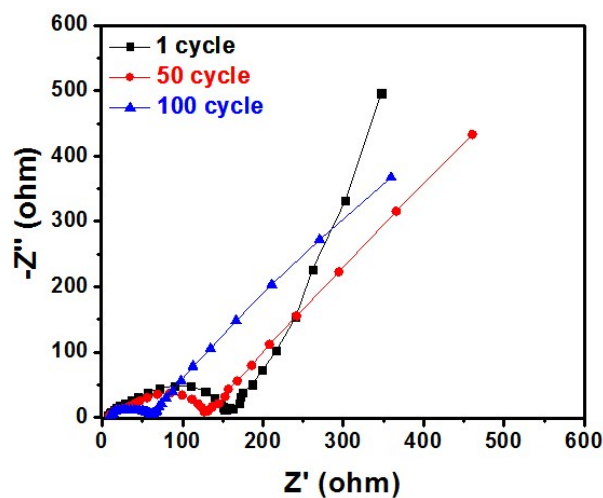
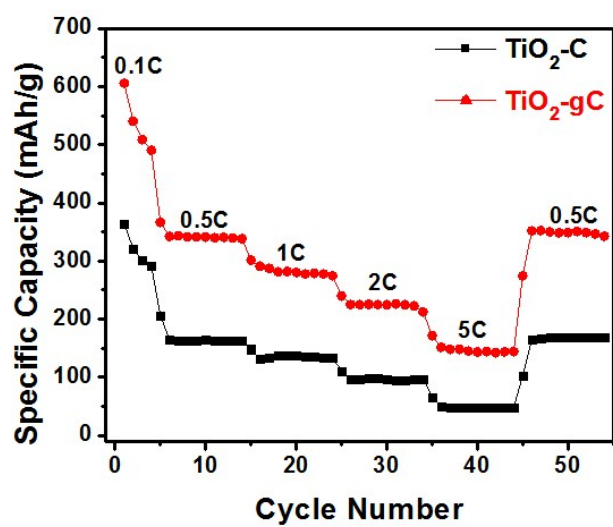


Figure S8. EIS curves for TiO<sub>2</sub>-gC composite at different cycles (1<sup>st</sup> cycle, 50 cycle, 100 cycle).



**Figure S9.** Comparative rate capability test for TiO<sub>2</sub>-gC and TiO<sub>2</sub>-C at various current densities (0.1C-5C).