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Electronic Supplementary Information

**A hierarchical porous of silicon@TiO<sub>2</sub>@carbon composite novel  
anode materials for high performance li-ion battery**

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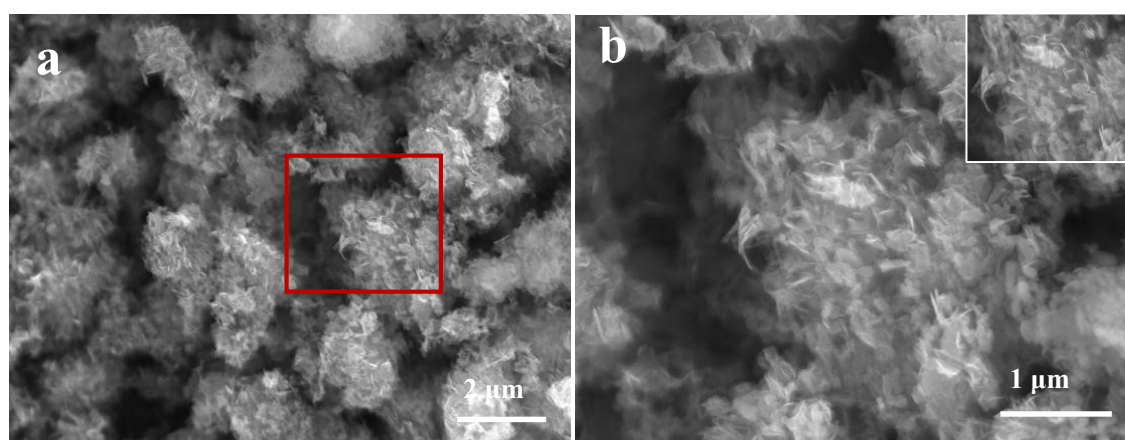


Fig. S1 SEM images of the Si@TiO<sub>2</sub> composite

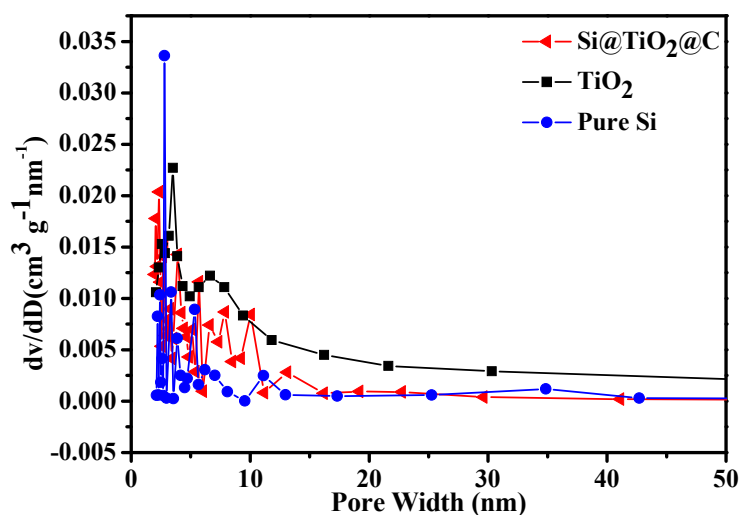


Fig. S2. The relevant pore diameter scatter diagrams of TiO<sub>2</sub>, pure Si and Si@TiO<sub>2</sub>@C composite

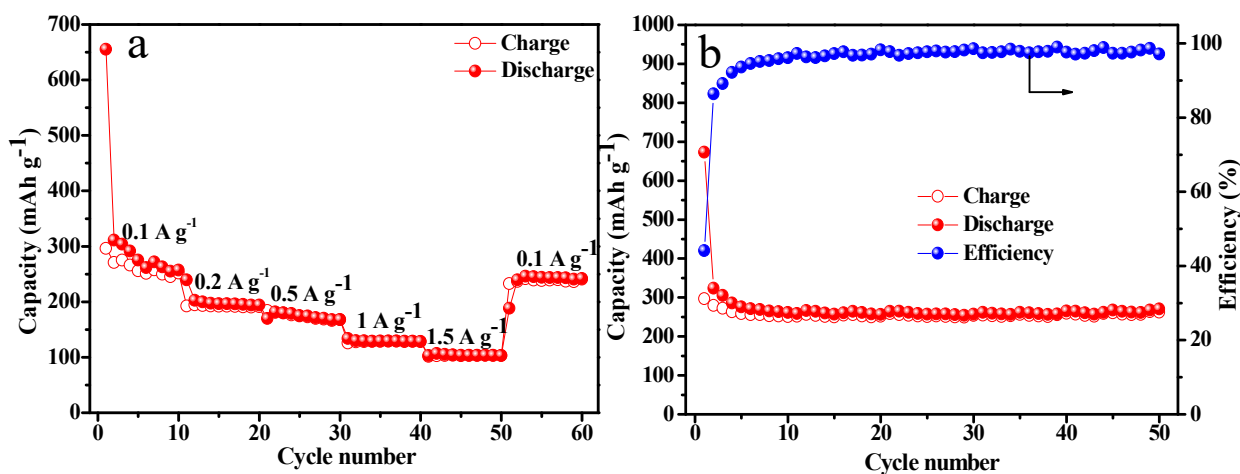


Fig. S3 (a) Rate performance of  $\text{TiO}_2$  electrodes at various current density. (b) The cycle performance and CE of  $\text{TiO}_2$ .

The specific capacity of pure  $\text{TiO}_2$  electrodes is  $296.4$  and  $655.5 \text{mAh g}^{-1}$  in initial charge and discharge at  $100 \text{mA g}^{-1}$ , respectively. The CE value of the pure  $\text{TiO}_2$  is  $45.2\%$ . The specific capacity of the pure  $\text{TiO}_2$  maintains  $262.4$  and  $270.2 \text{mAh g}^{-1}$  after 50 cycles at  $100 \text{mA g}^{-1}$ , respectively. The CE value is  $97.1\%$ . Compared with pure  $\text{TiO}_2$ , the properties of the  $\text{Si@TiO}_2@\text{C}$  composite materials are obviously superior.

Table S1 Equivalent circuit parameters derived using equivalent circuit model

Electrodes	Pure Si	$\text{Si@TiO}_2$	$\text{Si@TiO}_2@\text{C}$
$R_e$	6.98	4.695	2.535
$R_{ct}$	122.6	99.69	27.96