

Supplementary Information

Interconnected TiO_x/carbon hybrid framework incorporated silicon for stable lithium ion battery anodes

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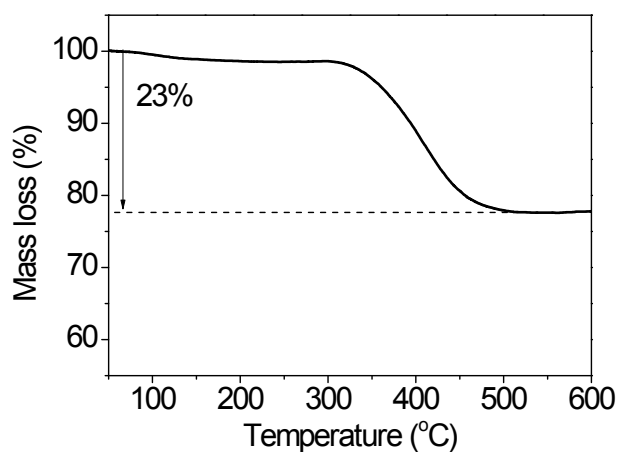


Figure S1 TGA curve of Si/TiO_x/C under air.

Table S1 The weight percentage of Si in Si/TiO_x/C.

Sample	W _c (%)	W _{Si/TiO_x} (%)	W _{Si} in Si/TiO _x (%)	W _{TiO_x} (%)	W _{Si} (%)
Si/TiO _x /C	23	77	45	43	34

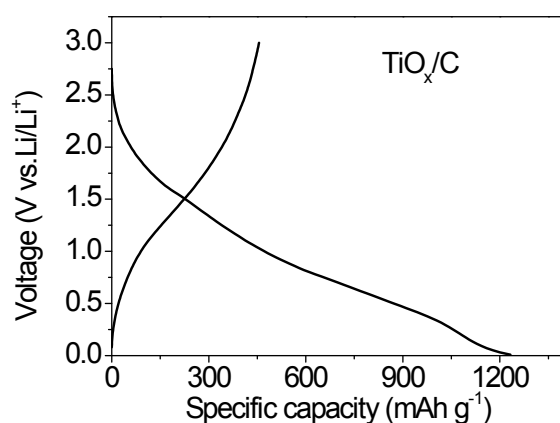


Figure S2. The initial charge-discharge potential profiles of TiO_x/C electrode in a voltage window of 0.01-3 V vs. Li/Li^+ at a current density of 100 mA g^{-1} .

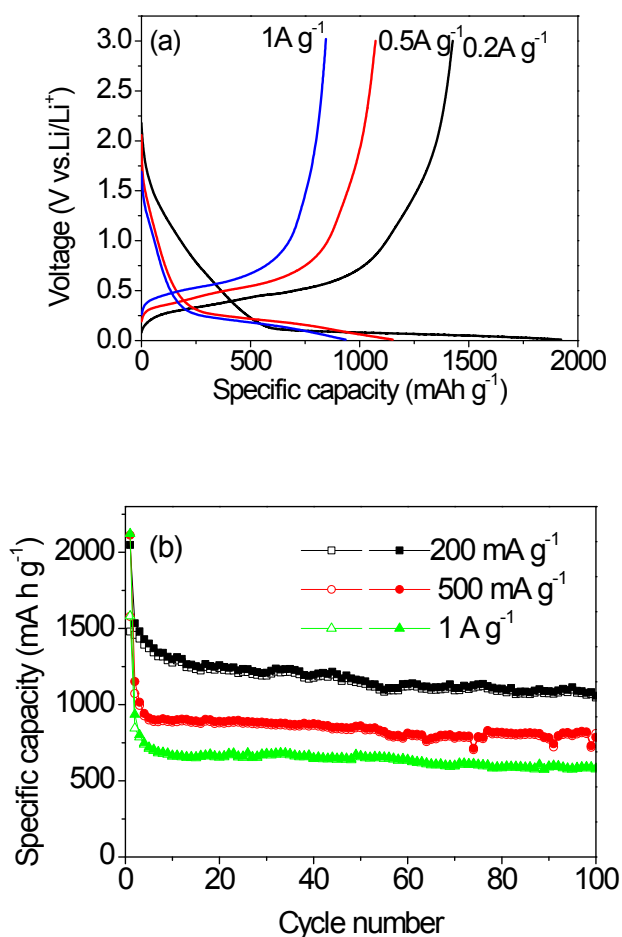


Figure S3(a) (a) charge-discharge potential profiles of $\text{Si}/\text{TiO}_x/\text{C}$ at different current density (0.01-3.0 V); (b) the cycling performance of pure $\text{Si}/\text{TiO}_x/\text{C}$ electrodes at different current density (0.01-3.0 V, open: Li insertion, solid: Li extraction).

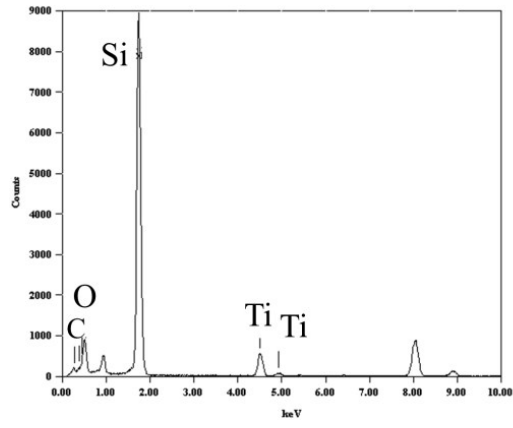


Figure S4. The EDX spectrum of Si/TiO_x/C before cycling.

Table S2 The electrochemical performance of similarly Si/TiO₂ composites

materials	Cycle numbers	Reversible capacity (mAh g ⁻¹)	Rate capability (mAh g ⁻¹)	Ref.
ALD TiO ₂ coated silicon nanowires	100	1600 (0.4A g ⁻¹)	1300 (4A g ⁻¹) 540 (12A g ⁻¹)	29
Si@TiO _{2-x} /C mesoporous microfiber	50	900 (0.2 A g ⁻¹)	1000 (4 A g ⁻¹) 939 (12A g ⁻¹)	28
Si@TiO ₂ Nanospheres	100	804 (0.42A g ⁻¹)	795(4.2A g ⁻¹)	31
Si-ATO-Si	100	1500 (1.4 A g ⁻¹)	1823 (0.7A g ⁻¹) 1480 (1.4A g ⁻¹)	34
TiO ₂ /Si composites	900	710 (3.4 A g ⁻¹)	1311 (8.7 A g ⁻¹) 1140 (10 A g ⁻¹)	38
Si/TiO ₂ nanowire	200	802 (0.1A g ⁻¹)	800 (0.8A g ⁻¹) 600(1.6A g ⁻¹)	35
silicon/graphite/TiO ₂	55	720 (0.048 Ag ⁻¹)	-	37
TiO ₂ /C/Si composite	50	861 (0.4Ag ⁻¹)	600 (4A g ⁻¹) 480 (8A g ⁻¹) 875 (5 A g ⁻¹)	39
This work	100	1696 (0.1 A g ⁻¹)	820(10 Ag ⁻¹) 754 (15 A g ⁻¹)	