

Supplementary material

Achieving Cycling Stability in Anode of Lithium-Ion Batteries with Silicon-Embedded Titanium Oxynitride Microsphere

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Table S1. Electrochemical performances of various Si composites applied as anodes for LIBs reported in the previous works.

Electrode material	Preparation method	Voltage window (V vs Li/Li ⁺)	Initial discharge/charge capacities (mA h g ⁻¹)	Reversible capacity (mA h g ⁻¹)	Rate capability (mA h g ⁻¹)	Ref.
Porous Si microsphere@C	Hydrothermal reaction	0.01-1.5	2367/1652 [0.2 A g ⁻¹]	1665 (100) [0.2 A g ⁻¹]	499 [4 A g ⁻¹]	[16]
SiO _x -TiO ₂ @C	Sol-gel	0.01-2.5	1618/1011 [0.1 A g ⁻¹]	900 (200) [1 A g ⁻¹]	542 [3.2 A g ⁻¹]	[20]
Nitrogen-rich carbon/Si	Hydrothermal reaction	0.05-2.0	2394/1712 [0.1 A g ⁻¹]	950 (100) [0.1 A g ⁻¹]	579 [2 A g ⁻¹]	[49]
Si@graphitized carbon	Magnesiothermic co-reduction	0.005-1.5	1306/534 [0.1 A g ⁻¹]	681 (100) [0.2 A g ⁻¹]	294 [2 A g ⁻¹]	[50]
Al ₂ O ₃ coated G/Si	Sol-gel	0.01-1.5	747/659 [0.05 C]	530 (100) [0.1 C]	-	[51]
Si-TiON (1:1)	Spray drying	0.01-1.5	2076/1663 [0.1 A g ⁻¹]	1140 (100) [1 A g ⁻¹]	603 [5 A g ⁻¹]	This work

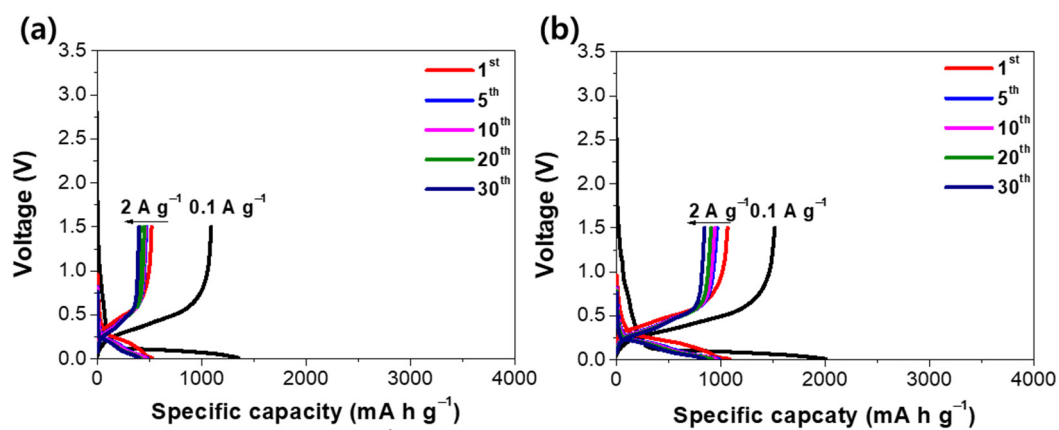


Figure S1. Voltage profiles for first and selected subsequent cycles at 0.1 A g^{-1} and 2 A g^{-1} , respectively: (a) Si-TiON (1:2) and (b) Si-TiO₂ (1:1).

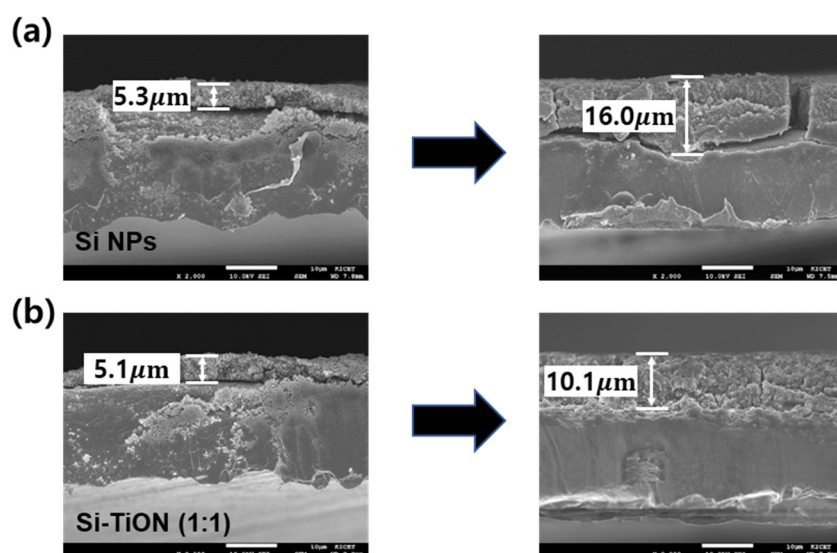


Figure S2. Cross-sectional FE-SEM images of (a) Si NPs and (b) Si-TiON (1:1) electrodes before and after 30 cycles at 2 A g^{-1} .

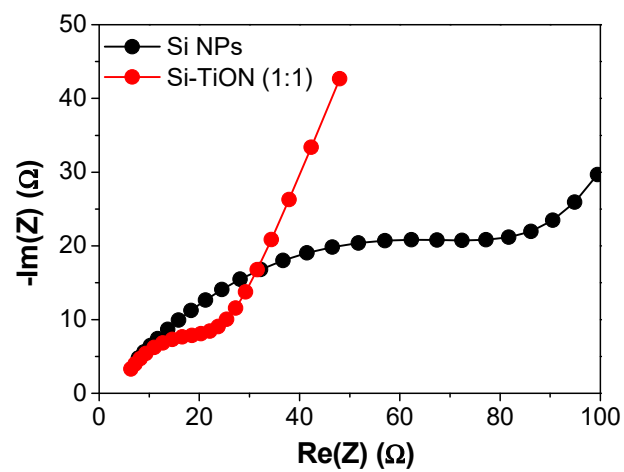


Figure S3. EIS profiles of Si NPs and Si-TiON (1:1) electrodes after 100 cycles at 1 A g^{-1} .