

Supporting Information for Bi-continuous Si/C anode materials derived from silica aerogel for lithium-ion batteries

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Content

- S1. Actual photos of silica aerogels, mesoporous Si and Si/C.**
- S2. Electrochemical properties of pure Si.**
- S3. CV curves of the b-Si/C-12 electrode with a potential range of 0.01-3.00 V**
- S4. Fitting results of the EIS curves**
- S5. Previous works on Si-based anode in recent years**
- S6. Cycle performance of b-Si/C-12 at a current density of 300 mA g⁻¹ (500 cycles)**

S1. Actual photos of silica aerogels, mesoporous Si and Si/C.

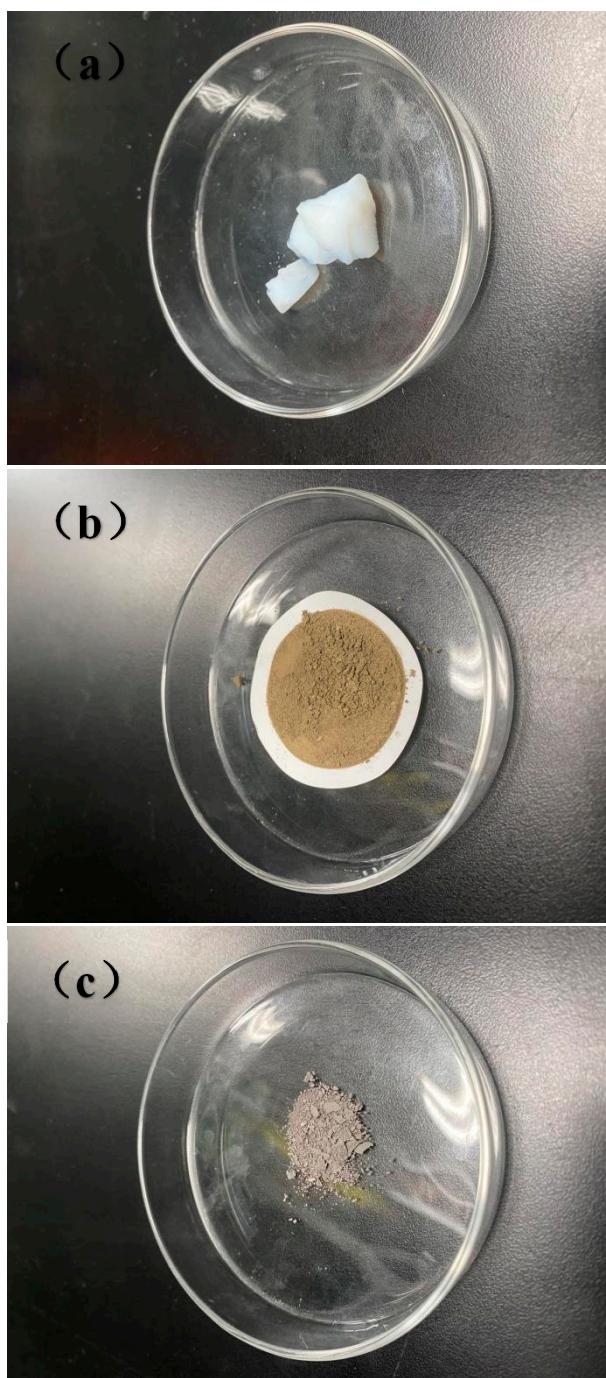


Figure S1. Actual photos of (a) silica aerogels, (b) mesoporous Si, (c) Si/C

S2. Electrochemical properties of pure Si.

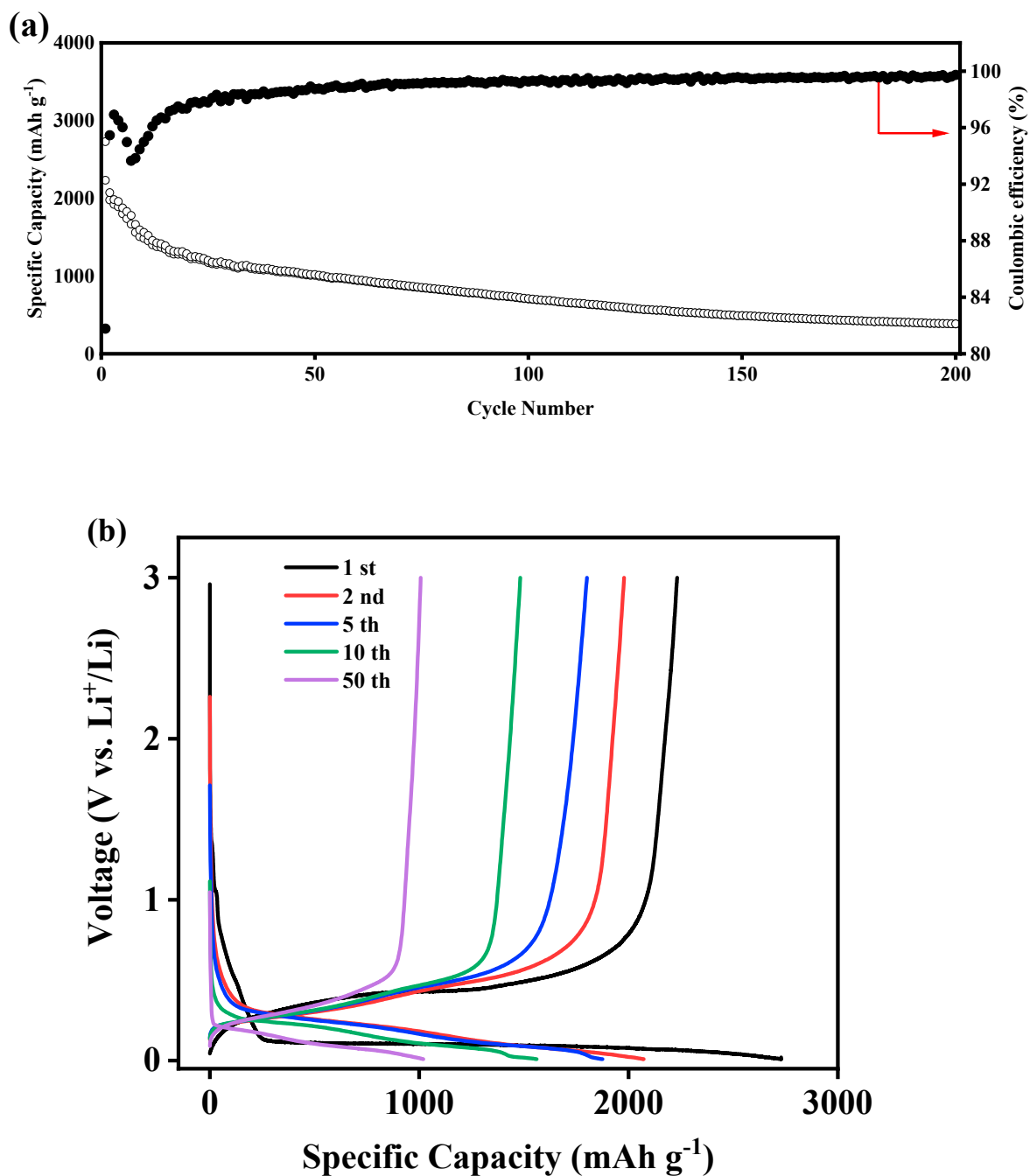


Figure S2. (a) Cycle performance of the pure Si at current density of 300 mAh g⁻¹. (b)

Charge/discharge curves of pure Si at current density of 300 mAh g⁻¹.

S3. CV curves of the b-Si/C-12 electrode with a potential range of 0.01-3.00 V.

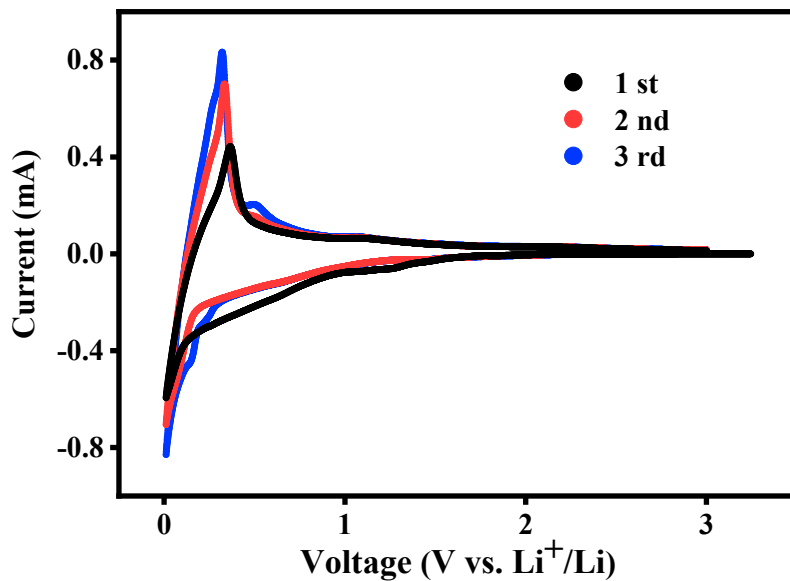


Figure S3. CV curves of the b-Si/C-12 electrode at a scan rate of 0.5 mV s^{-1} .

S4. Fitting results of the EIS curves

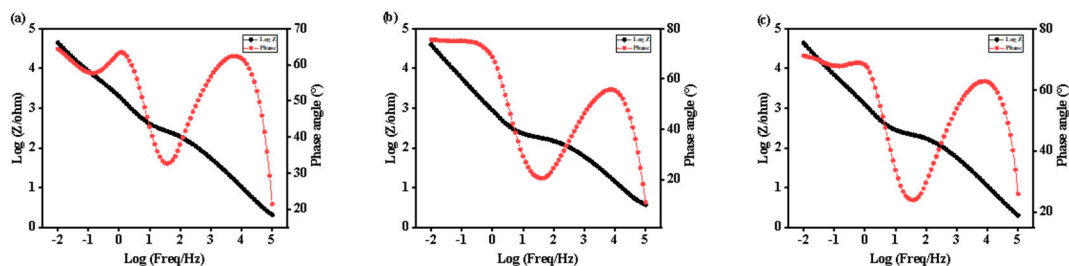


Figure S4. Bode impedance plots of (a) b-Si/C-6, (b) b-Si/C-12, and (c) b-Si/C-18.

Table S1 Fitting results of the EIS curves

Sample	R_s/Ω		R_{ct}/Ω		CPE				Z_w					
					CPE-T		CPE-P		W-R		W-T		W-P	
	value	error	value	error	value	error	value	error	value	error	value	error	value	error
m-Si/C-6	1.5	8%	211.2	7%	1.9×10^{-5}	12%	0.8	2%	4113	11%	0.5	15%	0.8	3%
m-Si/C-12	3.0	7%	161.1	5%	1.7×10^{-5}	14%	0.8	2%	1754	15%	0.5	17%	0.8	3%
m-Si/C-18	1.4	8%	191.7	4%	1.5×10^{-5}	10%	0.8	1%	2390	9%	0.5	10%	0.8	2%

S5. Previous works on Si-based anode in recent years

Table S2 Previous works on Si-based anode in recent years

Sample	Current density (mA g ⁻¹)	Initial capacity (mAh g ⁻¹)	Remaining capacity/Cycle number (mAh g ⁻¹)	Initial coulombic efficiency	Ref.
m-Si-12	300	1481.7	813.5/200	82 %	This work
Si/C hybrid	200	1552	1057/50	65.6 %	[1]
GSCC	200	1147	803.4/100	78 %	[2]
Si/C	100	902	678/50	57 %	[3]
Carbon coated Si	200	1818	633/30	73 %	[4]
C/Si/CNT	100	1338.2	698.8/50	54.1	[5]
Si@C@v@CNTs	100	1684.2	912.8/100	62.41	[6]

S6. Cycle performance of b-Si/C-12 at a current density of 300 mA g⁻¹ (500 cycles)

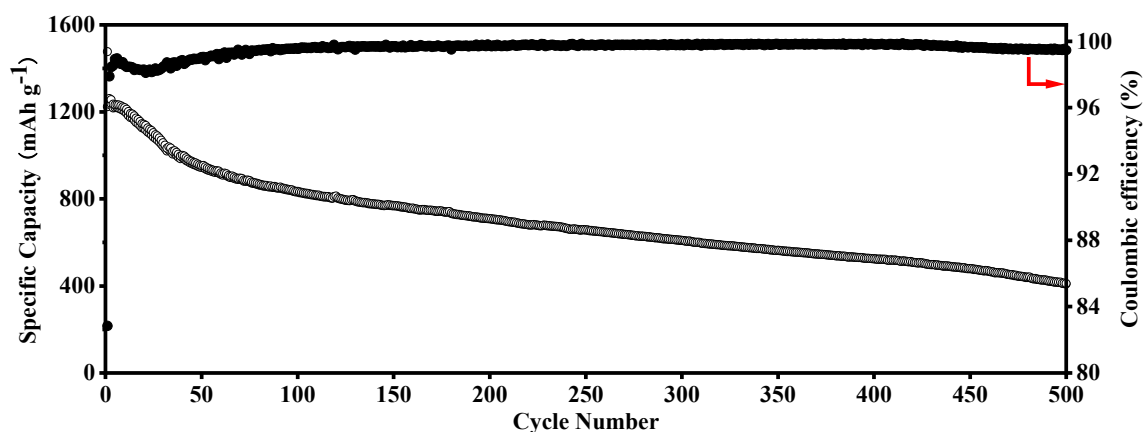


Figure S5. Cycle performance of b-Si/C-12 at a current density of 300 mA g⁻¹ (500 cycles)

References

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