

Supporting Information

for

Highly porous coral-like silicon particles synthesized by an ultra-simple thermal-reduction method

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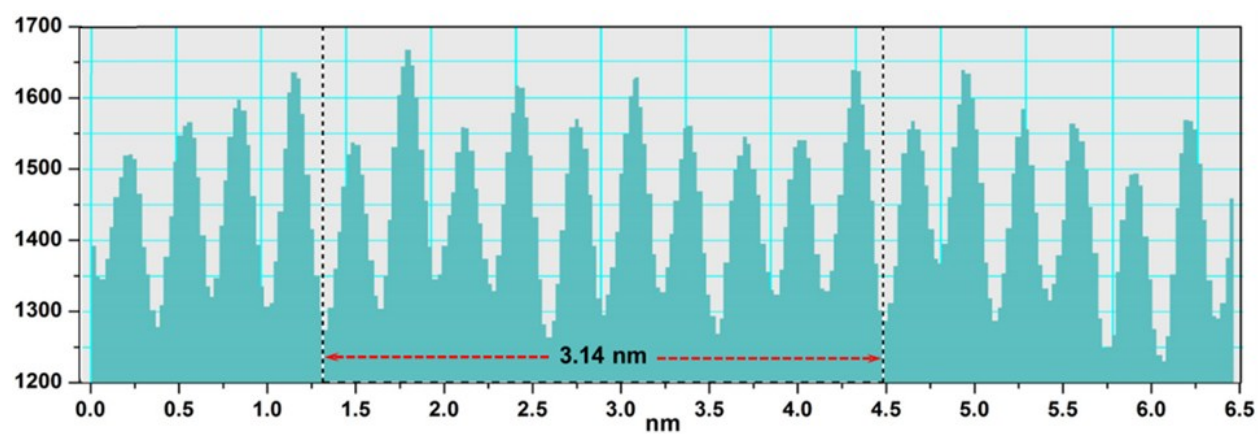


Fig. S1- d-spacing of the nanoporous Si, which corresponds to the position selected in **Fig. 2e**.

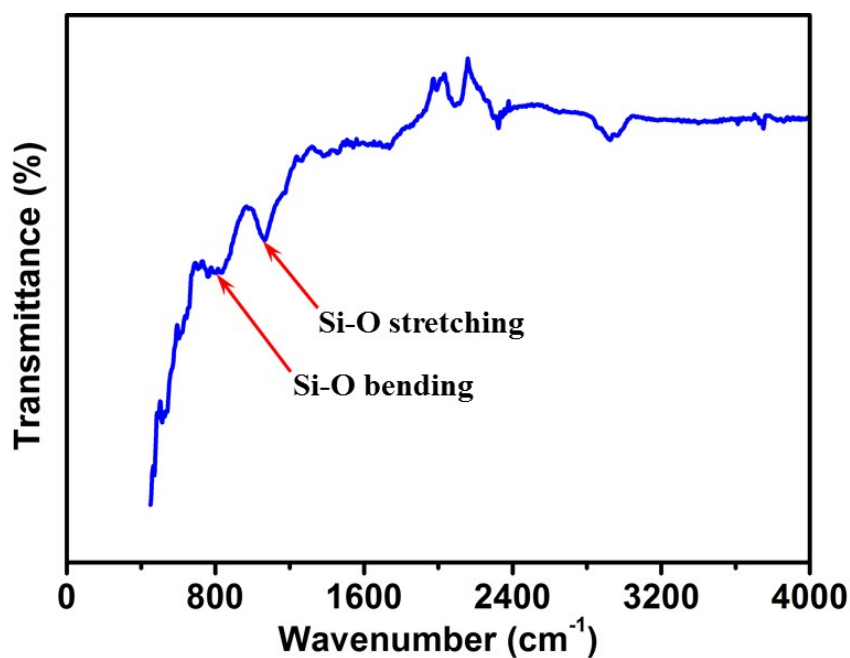


Fig. S2. FTIR spectrum of the nanoporous Si.

Fig. S2 shows the FTIR transmission spectrum of the nanoporous Si, measured at 500–4000 cm⁻¹. As shown in **Fig. S2**, two typical absorption peaks, corresponding to Si-O bonding, were observed at 814 and 1064 cm⁻¹. The first peak corresponds to Si-O stretching vibration, and the second peak corresponds to Si-O bending vibration.^[1] This demonstrates that the synthesized nanoporous Si sample contains a certain amount of silica.

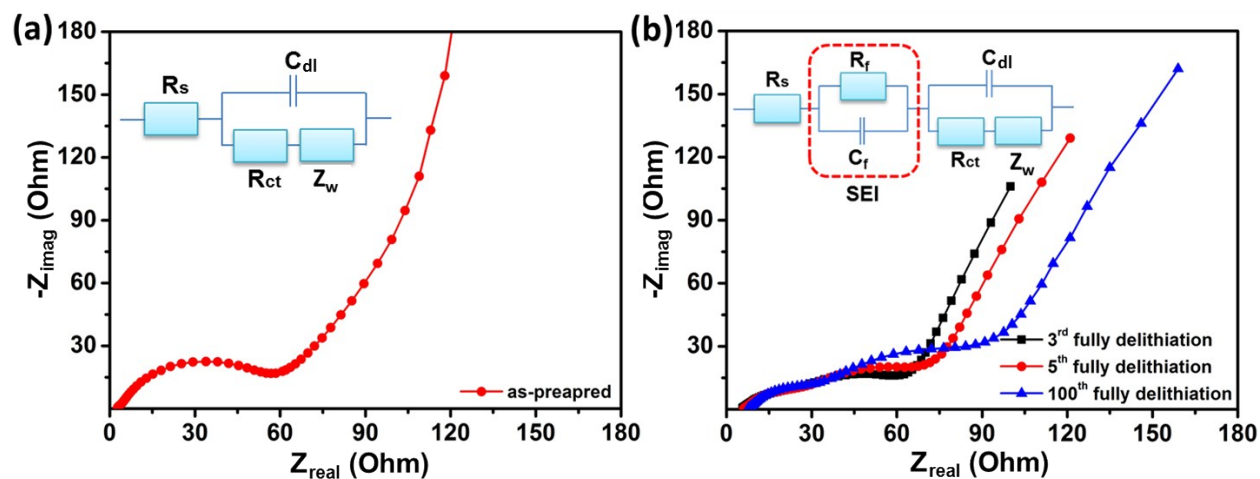


Fig. S3. Electrochemical impedance spectra of the nanoporous Si electrodes: (a) spectra of the as-prepared electrode; (b) spectra of the fully-charged (dealloyed) electrode following 3, 5, and 100 cycles. Insets of Fig. S3 (a) and (b) show the equivalent circuit prior to, and following cycling, respectively.

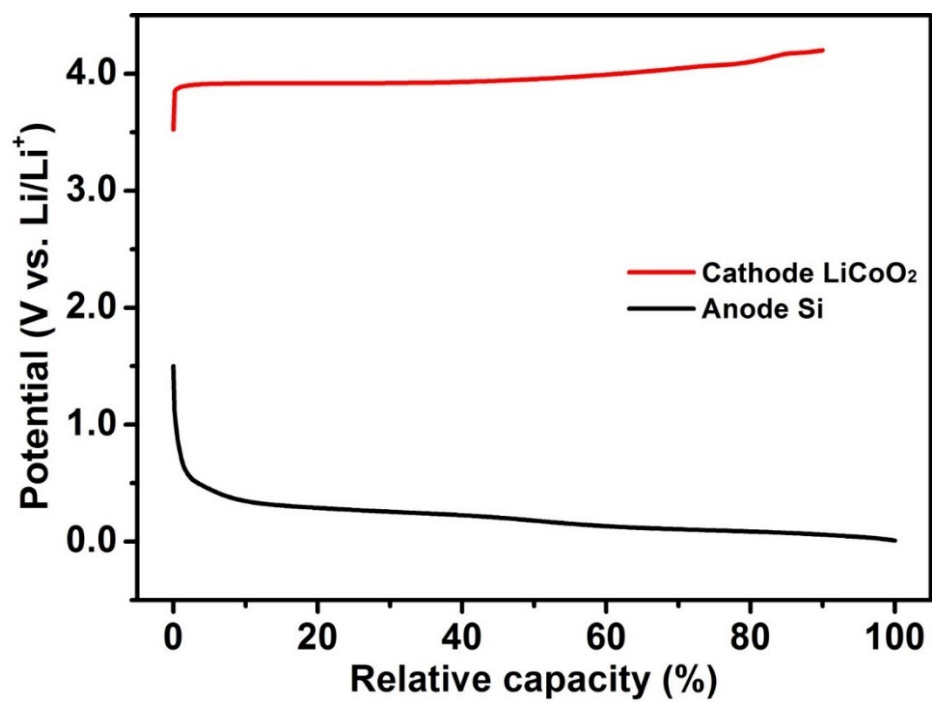


Fig. S4. Capacity of the cathode relative to that of the anode of the full cell of Si-LiCoO₂.

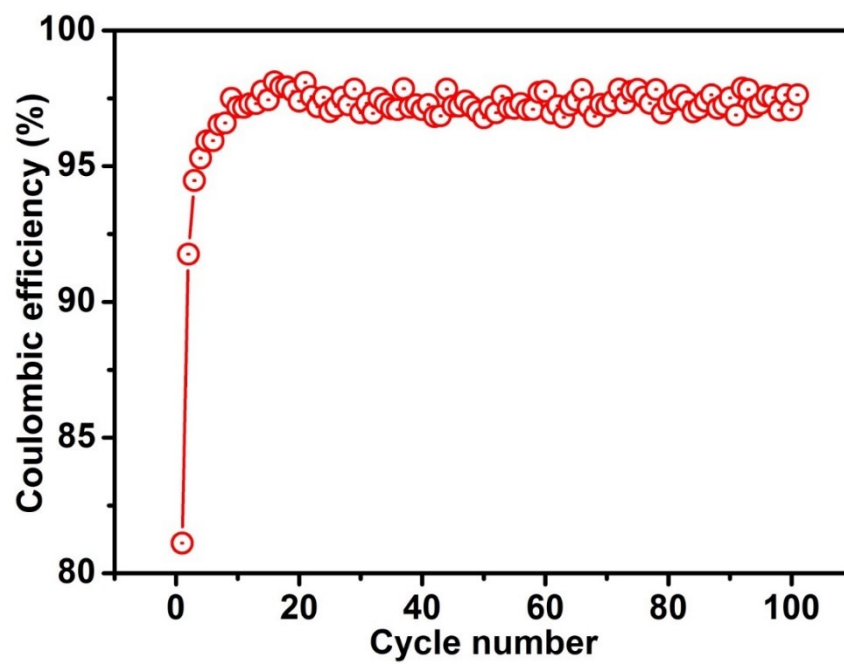


Fig. S5. Coulombic efficiency of the Si-LiCoO₂ full cell, corresponding to Fig. 7(a), tested under a rate of C/10.

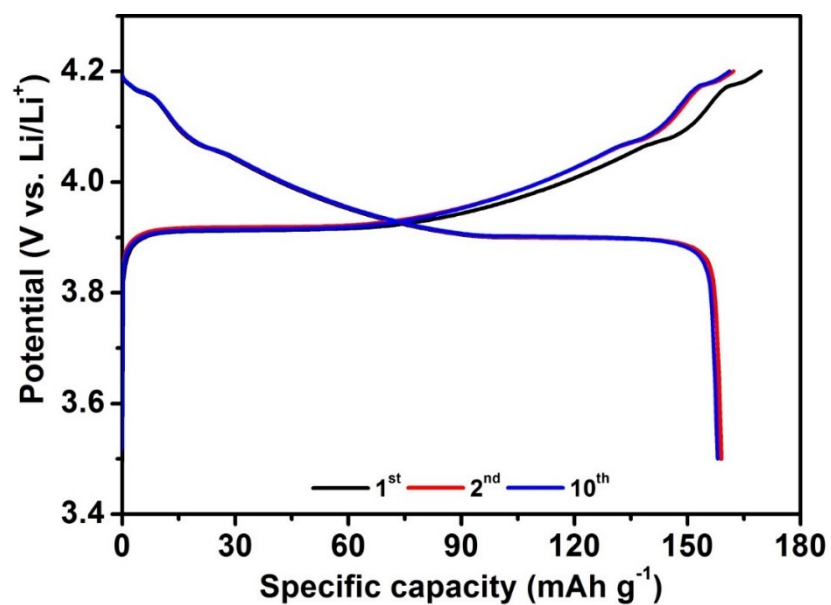


Fig. S6. Potential profile of the LiCoO₂ electrode, tested under a rate of C/10.

References

- 1) S.-K. Lee, S.-M. Oh, E. Park, B. Scrosati, J. Hassoun, M.-S. Park, Y.-J. Kim, H. Kim, I. Belharouak, Y.-K. Sun, Nano Lett. 2015, 15, 2863.