

Supporting information

Improvement of the Sodiation/De-sodiation Stability of Sn(C) by
Electrochemically Inactive Na₂Se

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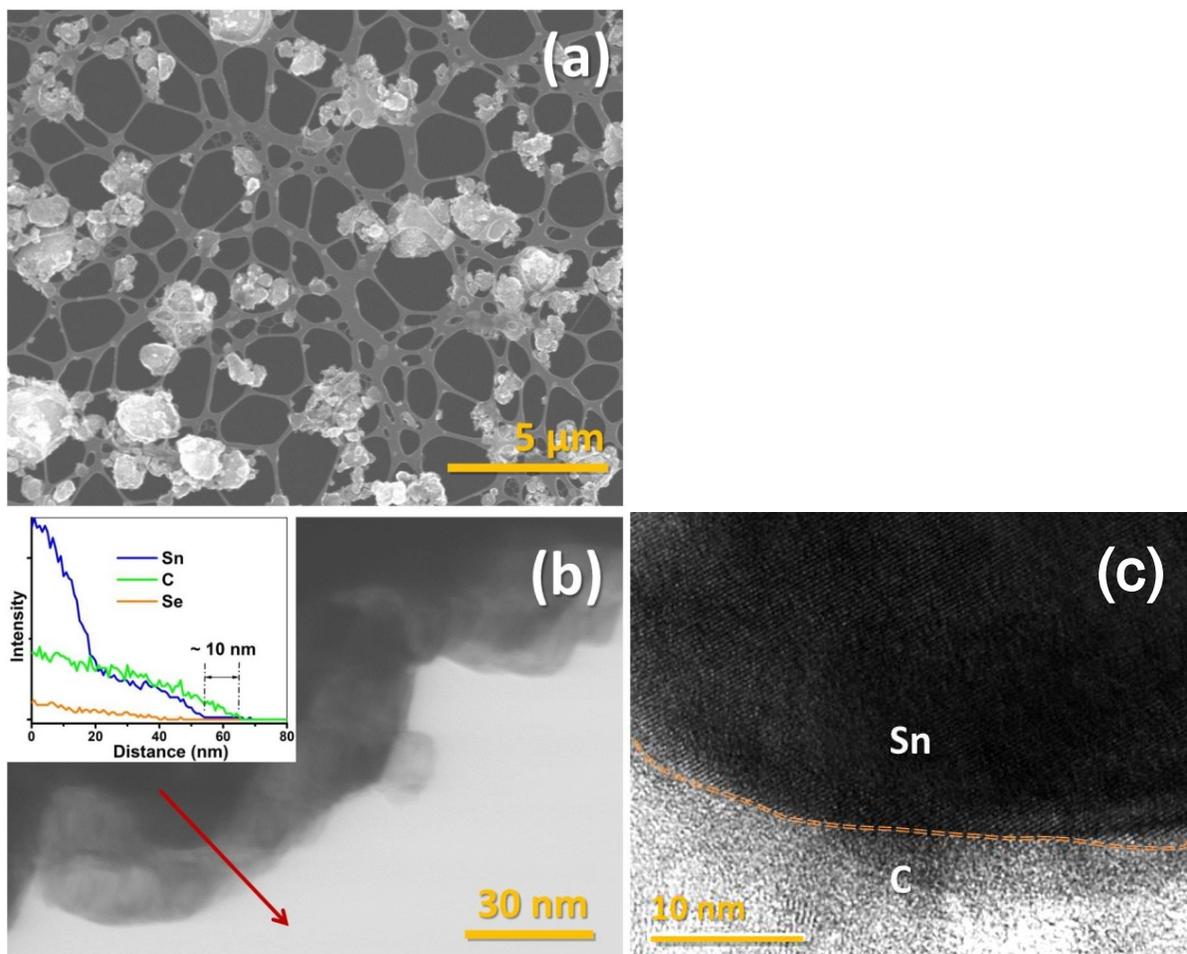


Figure S1. (a) SEM image of a typical as-synthesized Sn/Se/C powder on a carbon grid. (b) STEM of a Sn/Se/C (9/2) sample with a cross-sectional line scan (red arrow) (inset). (c) HRTEM image shows the interface between Sn and C domains.

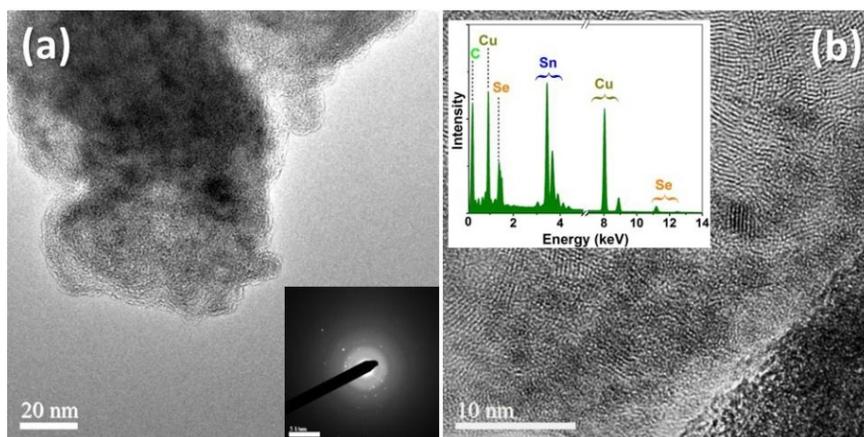


Figure S2. TEM of Sn/Se/C (9/2) sample (a) low resolution with the selected angle diffraction (inset), (b) with EDS: There are crystallized areas, EDS shows the presence of Sn, Se, and C.

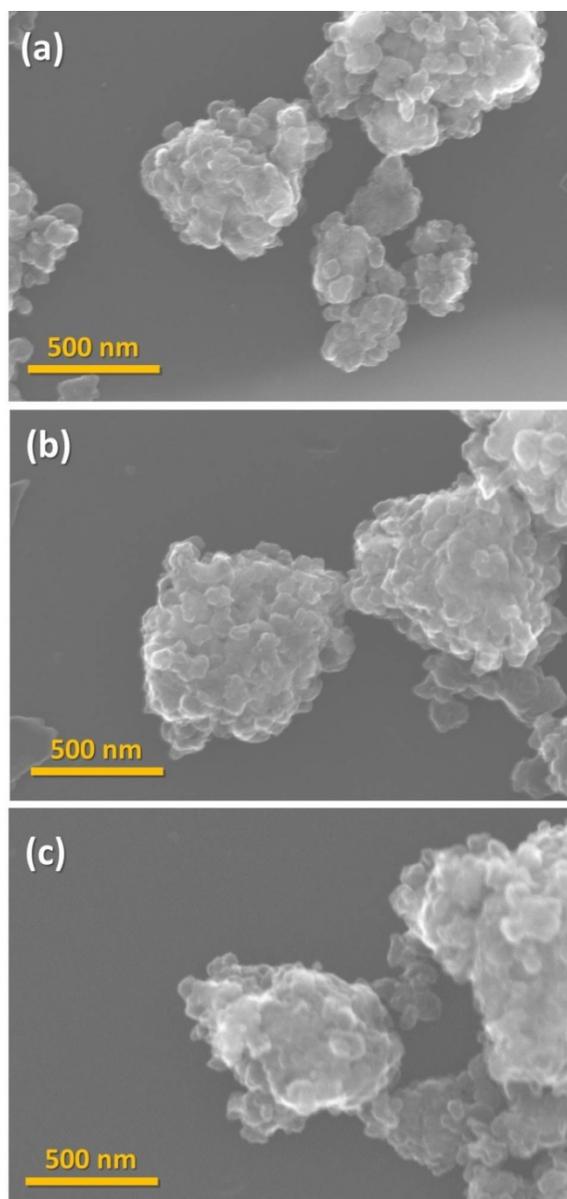


Figure S3. SEM images of as-synthesized powders of (a) Sn/C; (b) Sn/Se/C (9/1); and (c) Sn/Se/C (9/1) composites.

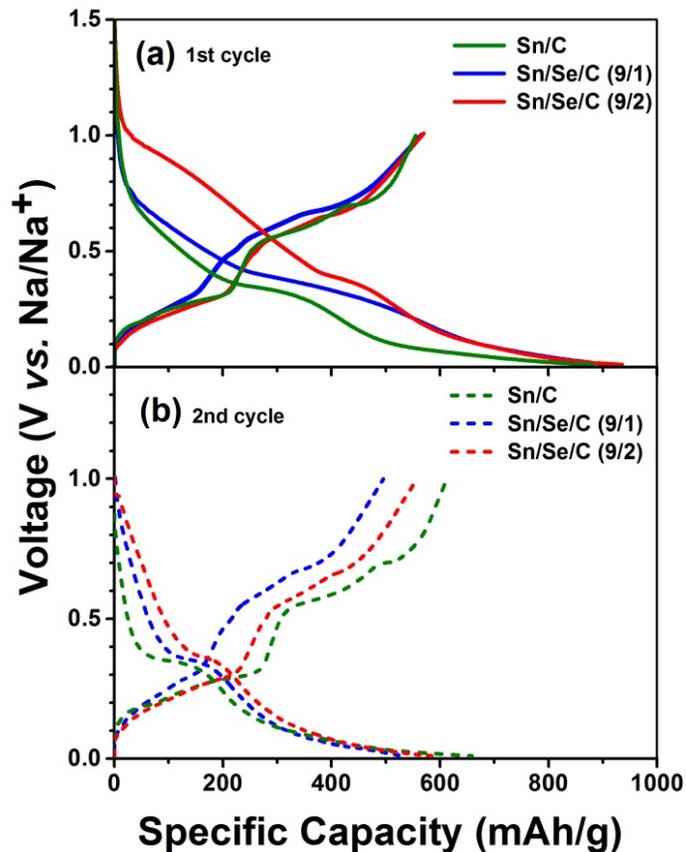


Figure S4: Voltage profile for electrodes in the first 2 conditioning cycles at 0.05 C rate (1 C = 847 mA/g).

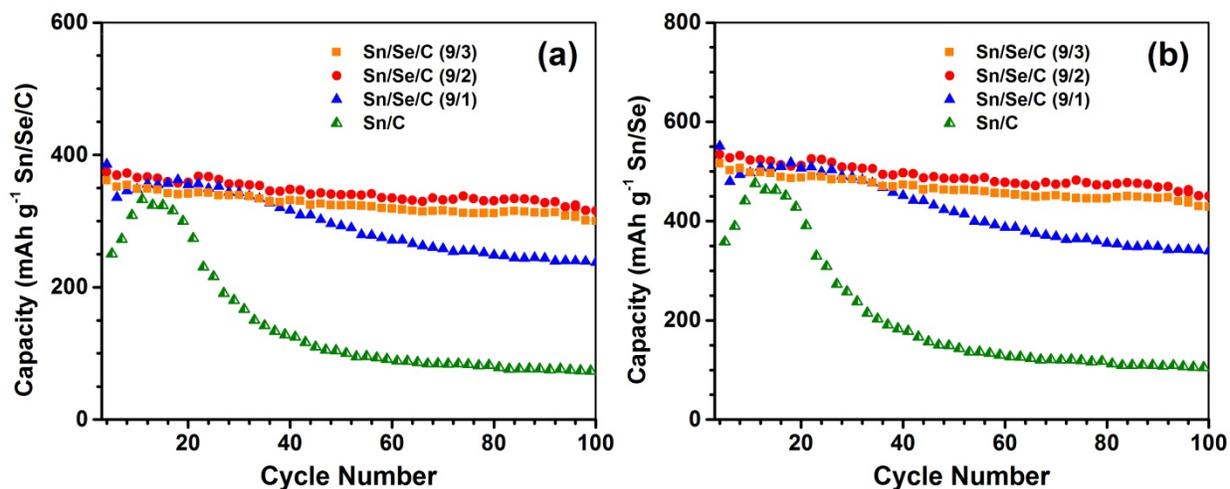


Figure S5: Dependence of the reversible gravimetric capacity of Sn/C and Sn/Se/C electrodes on the cycle number. The additional Sn/Se/C (9/3) electrode was prepared similar to other electrodes except the feed composition was Sn/Se = 9/3 (atomic ratio). Specific capacity with regard to Sn/Se/C mass loading (a) and to Sn/Se mass loading (b).

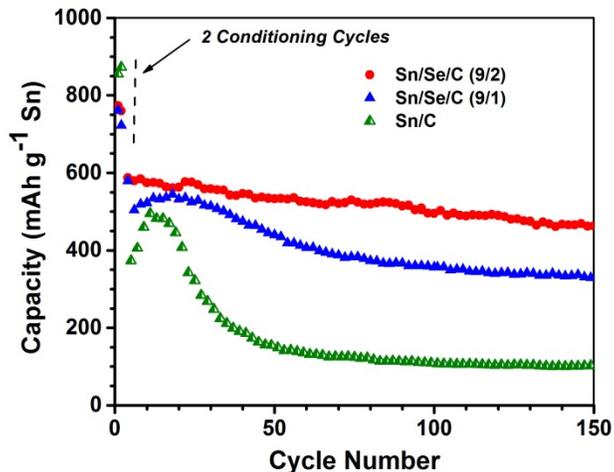


Figure S6. Dependence of the Sn-weight based reversible capacity of Sn/C and Sn/Se/C electrodes on the cycle number.

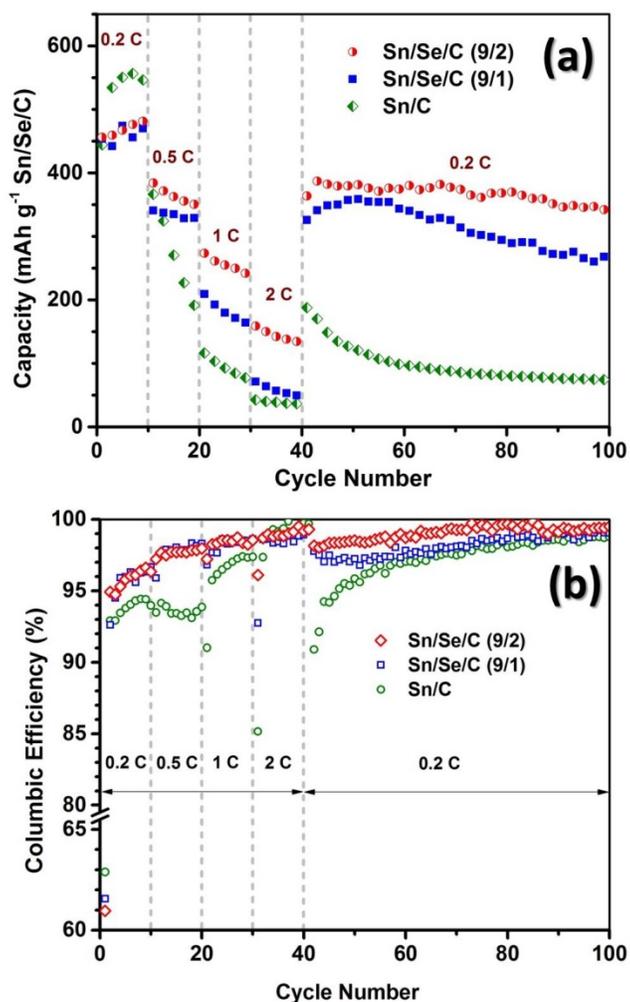


Figure S7: Specific reversible capacities and coulombic efficiencies of the electrodes cycled between 10 mV and 1.0 V vs. Na/Na⁺ at various C-rates (1 C = 847 mA/g).

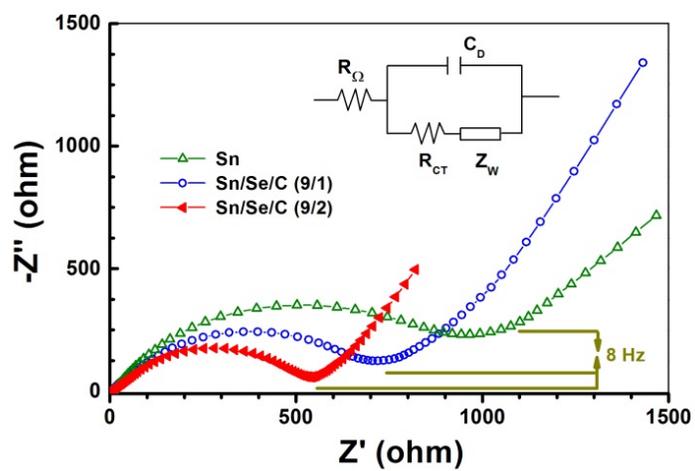


Figure S8: Electrochemical impedance spectra of the electrodes of Figure 6 of the main text and Figure S6 after their cycling. The Nyquist plots were fitted for the equivalent circuit shown in the inset.