

Supplementary Information

Binder-free SnO₂-TiO₂ composite anode with high durability for lithium-ion batteries

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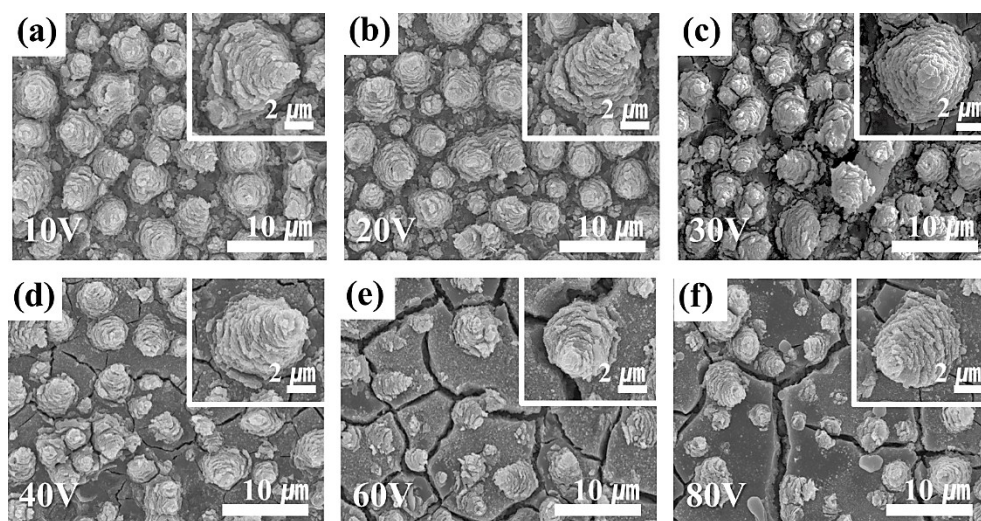


Figure S1. The representative FE-SEM images of MCs and SnO₂/TiO₂ MCs. The applied shock potentials are expressed at the bottom of large images identically. The high-magnification images indicates the conical structure can be withstand even in high anodic shock potential.

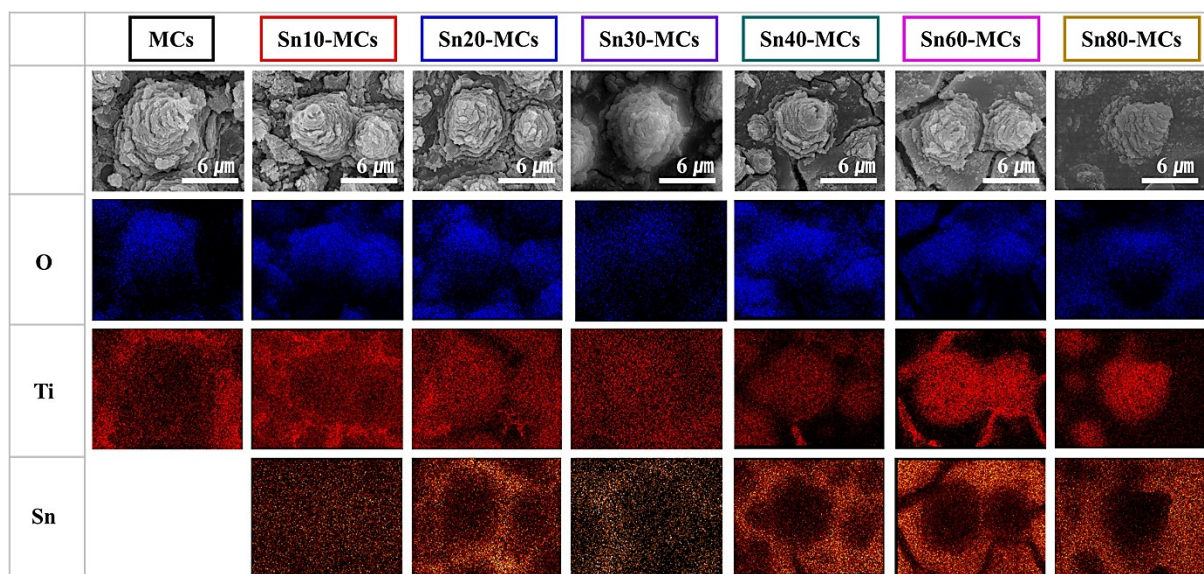


Figure S2. EDS element maps of O, Ti and Sn for all prepared specimens. From 20 V of anodic shock potential, the Sn distribution morphology is apparently formed.

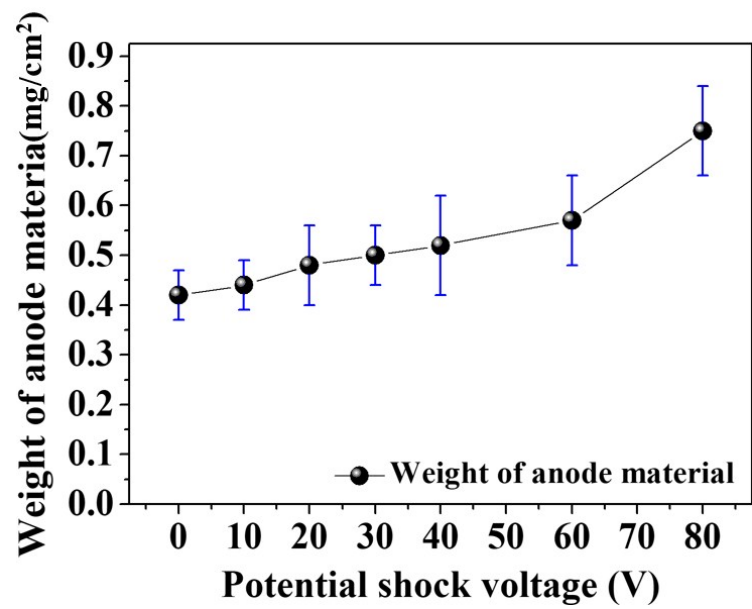


Figure S3. The average mass of binder-free electrodes which are shown as a function of shock potential.

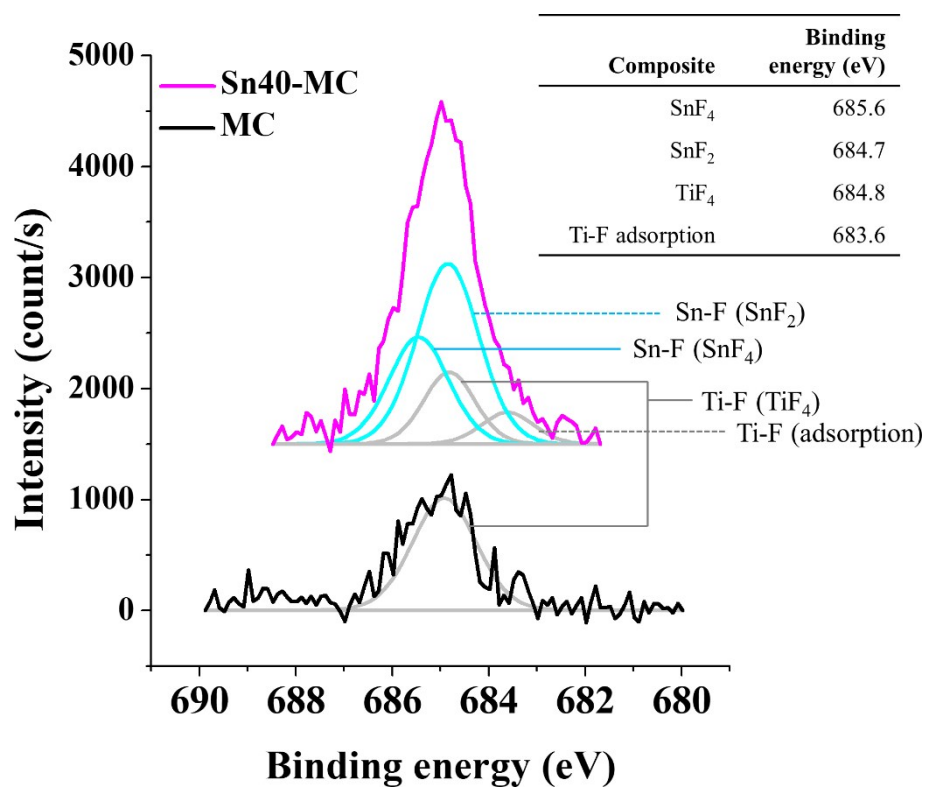


Figure S4. XPS spectra illustrating the change of F1s binding states after potential shock at 40 V for 10 sec.¹⁻⁴ All measurements are performed before cell assembly.

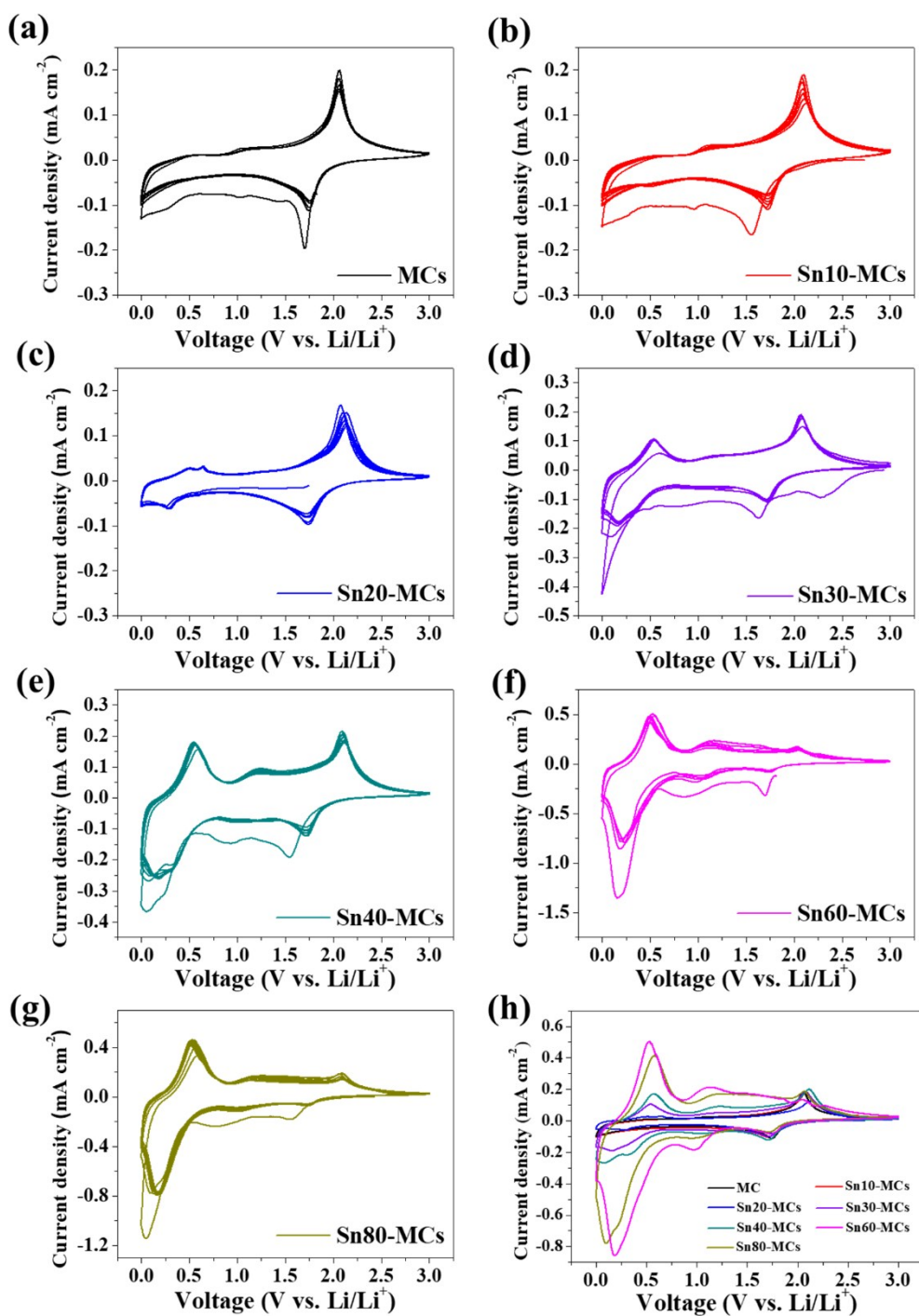


Figure S5. All CV result cycled at 0.1 mV sec^{-1} (vs Li/Li^+) for 5 times on the $\text{SnO}_2\text{-TiO}_2$ MCs prepared at each anodic shock potential; 0 V (a), 10 V (b), 20 V (c), 30 V (d), 40 V (e), 60 V (f) and 80 V (g). (h) is the identical CV image enclosed in manuscript.

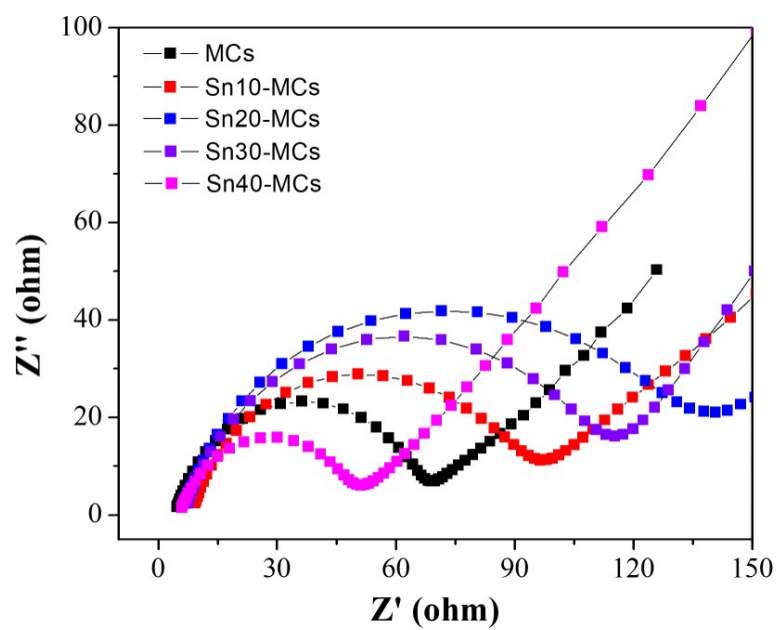


Figure S6. EIS Nyquist plots that are measured on SnO₂-TiO₂ MCs prepared at divers shock voltage.

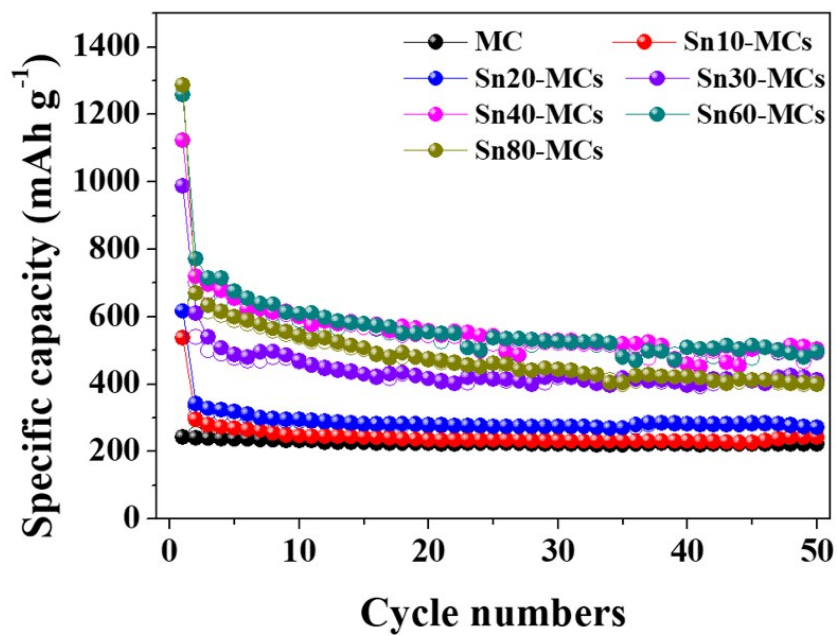


Figure S7. Cyclability plot vs cycle numbers of the tested samples (various shock voltages) at 0.5 C.

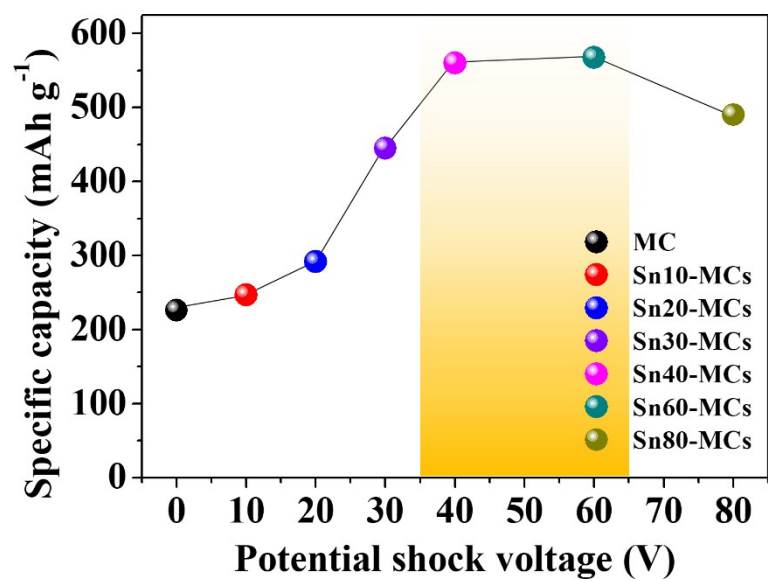


Figure S8. The average specific capacity of each sample in Fig. 6b showing convexity around Sn40-MCs and Sn60-MCs.

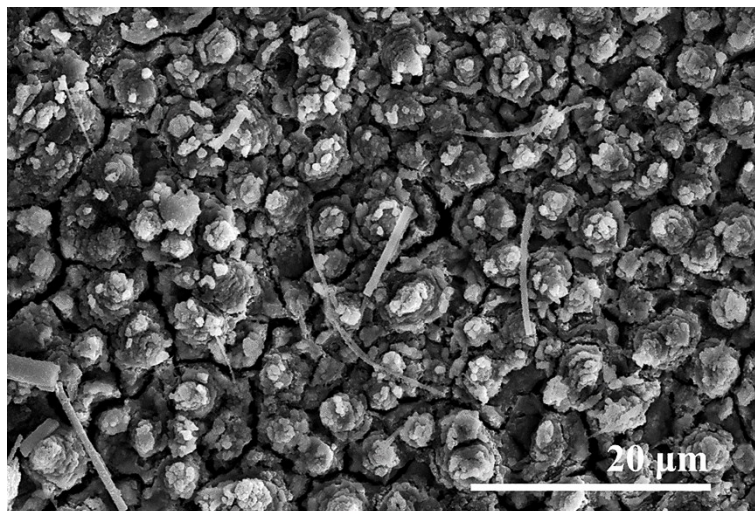


Figure S9. SEM images of the Sn40-MC electrode at first full-charging.

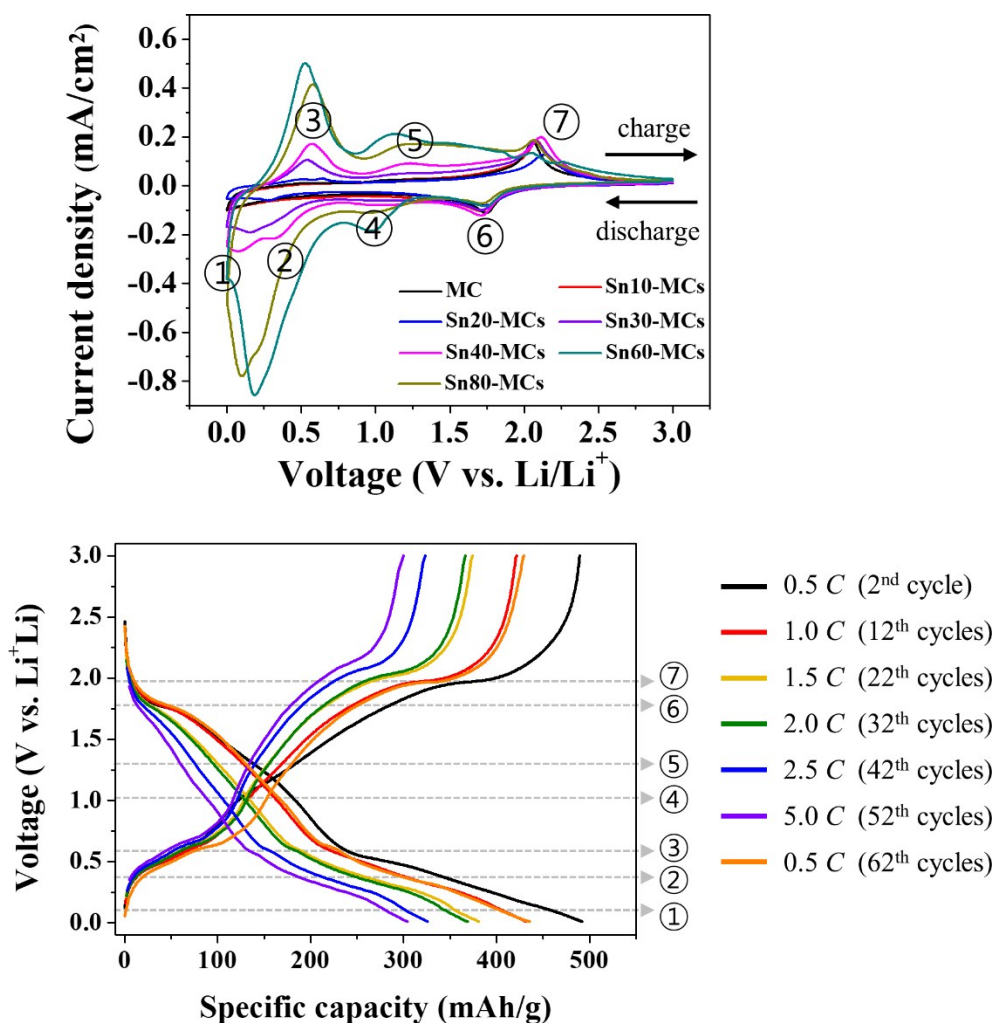


Figure S10. The galvanostatic charge/discharge profile of Fig. 6d. Individual profiles are extracted from 2nd cycle at each scan rate. The plateaus in profile are compared to cyclic voltammogram in Fig. 6a to match with each peak in Fig. 6a.

References

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