Supplementary Material

Constructing robust Si-Ni alloy/carbon nanofiber composites for high-rate lithium-ion battery anodes

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Electronic Supplementary Information

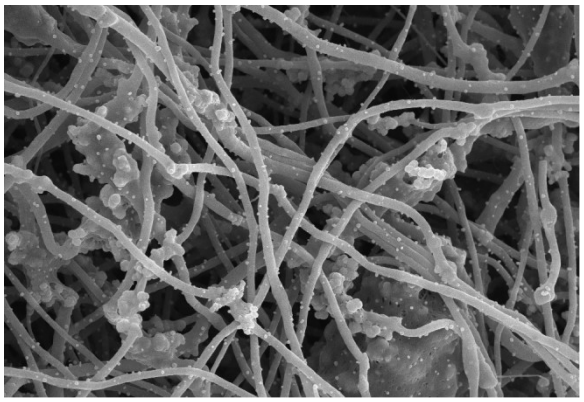

Fig. S1. SEM morphology image of $SiNi_{1\text{-}2}$@CNFs nanofiber electrode

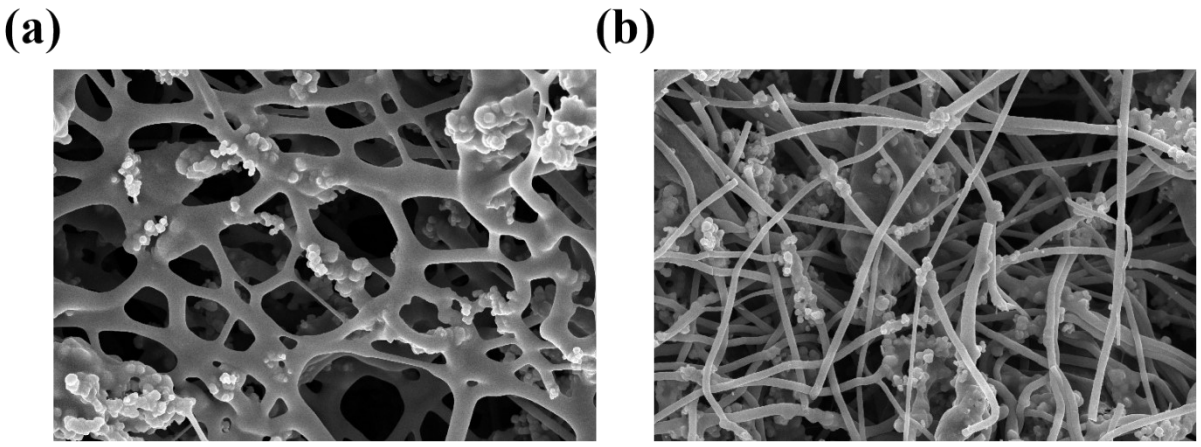

Fig. S2. (a) SEM morphology image of $SiNi_{1\text{-}0}$@CNFs nanofiber electrode, (b) SEM morphology image of $SiNi_{1\text{-}1}$@CNFs nanofiber electrode

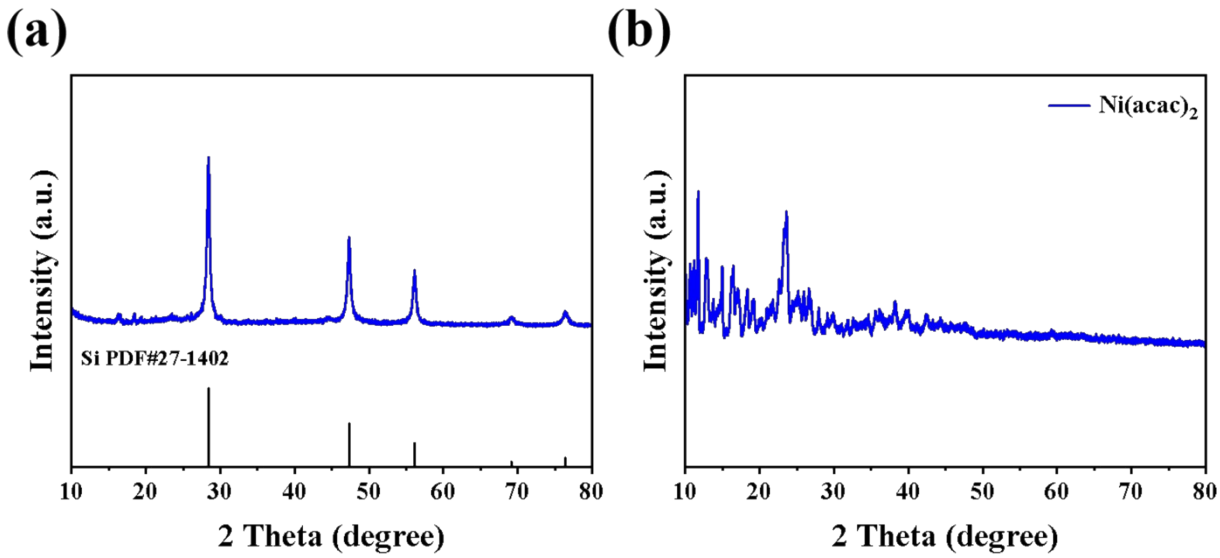

Fig. S3. XRD patterns of (a) Si-Ni alloys prepared by ball milling, (b) $Ni(acac)_2$.

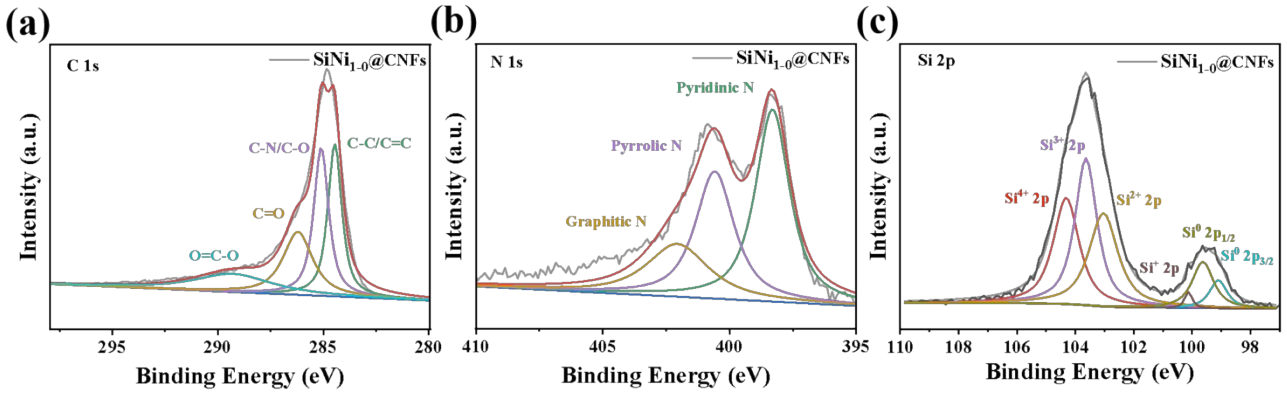

Fig. S4. (a) XPS spectrum of C 1s for the $SiNi_{1\text{-}0}$@CNFs nanofiber electrode, (b) XPS spectrum of N 1s for the $SiNi_{1\text{-}0}$@CNFs nanofiber electrode, (c) XPS spectrum of Si 2p for the $SiNi_{1\text{-}0}$@CNFs nanofiber electrode

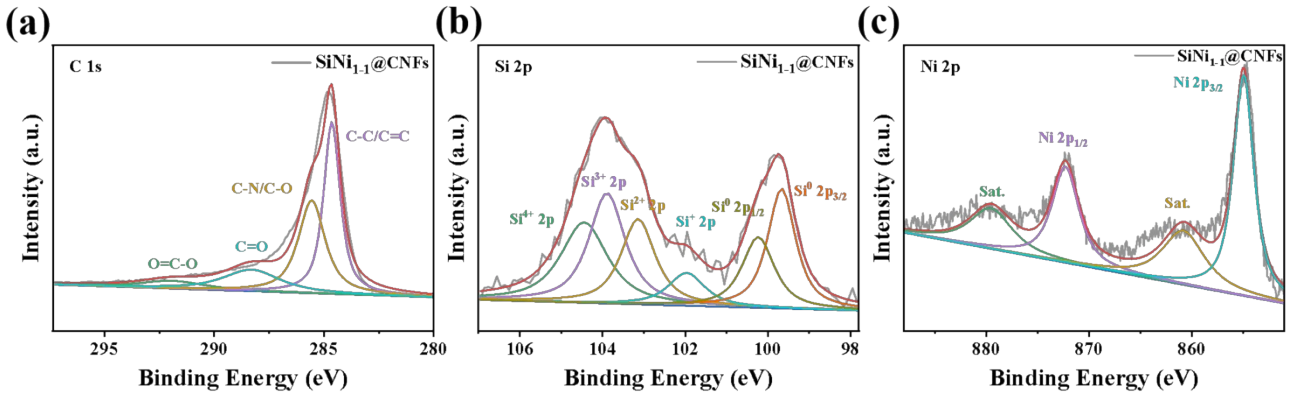

Fig. S5. (a) XPS spectrum of C 1s for the $SiNi_{1\text{-}1}$@CNFs nanofiber electrode, (b) XPS spectrum of Si 2p for the $SiNi_{1\text{-}1}$@CNFs nanofiber electrode, (c) XPS spectrum of Ni 2p for the $SiNi_{1\text{-}1}$@CNFs nanofiber electrode

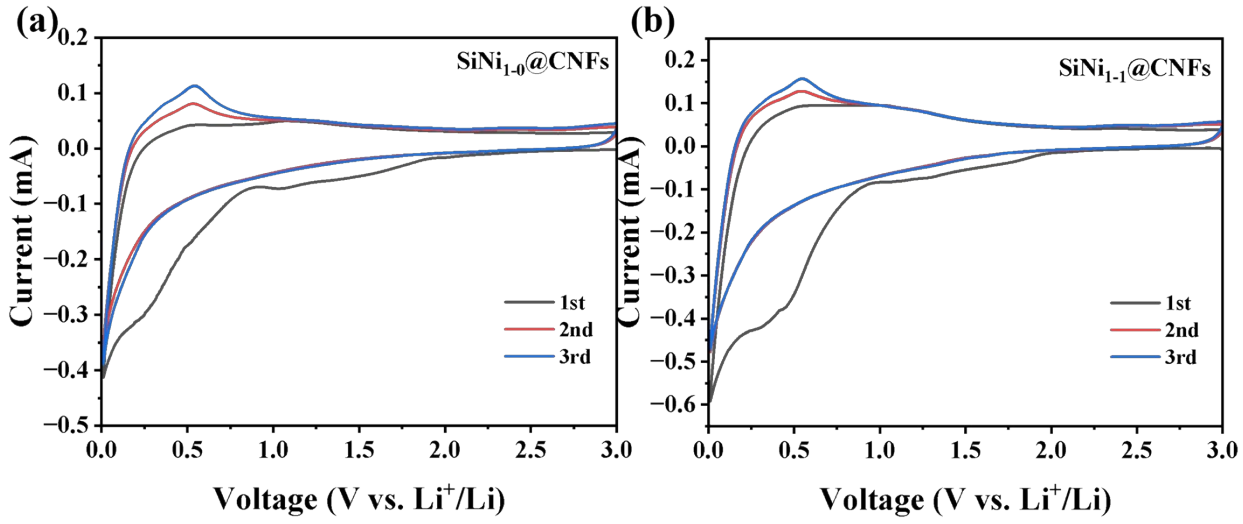

Fig. S6. (a) CV curve of $SiNi_{1\text{-}0}$@CNFs nanofiber electrode, (b) CV curve of $SiNi_{1\text{-}1}$@CNFs nanofiber electrode

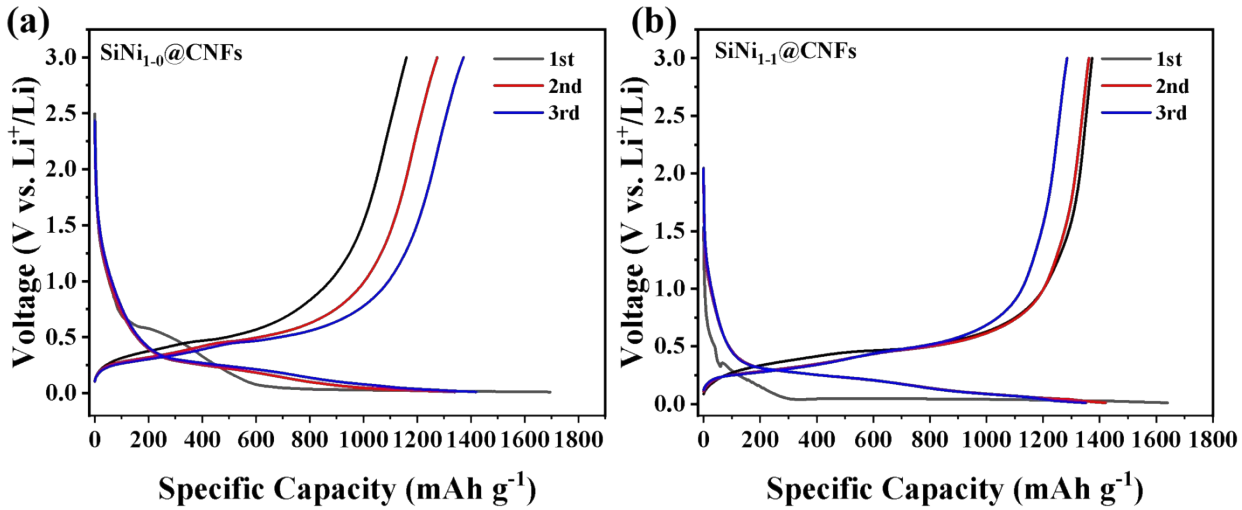

Fig. S7. (a) Charge-discharge curves of $SiNi_{1-0}$@CNFs nanofiber electrodes at different cycle numbers, (b) Charge-discharge curves of $SiNi_{1-1}$@CNFs nanofiber electrodes at different cycle numbers

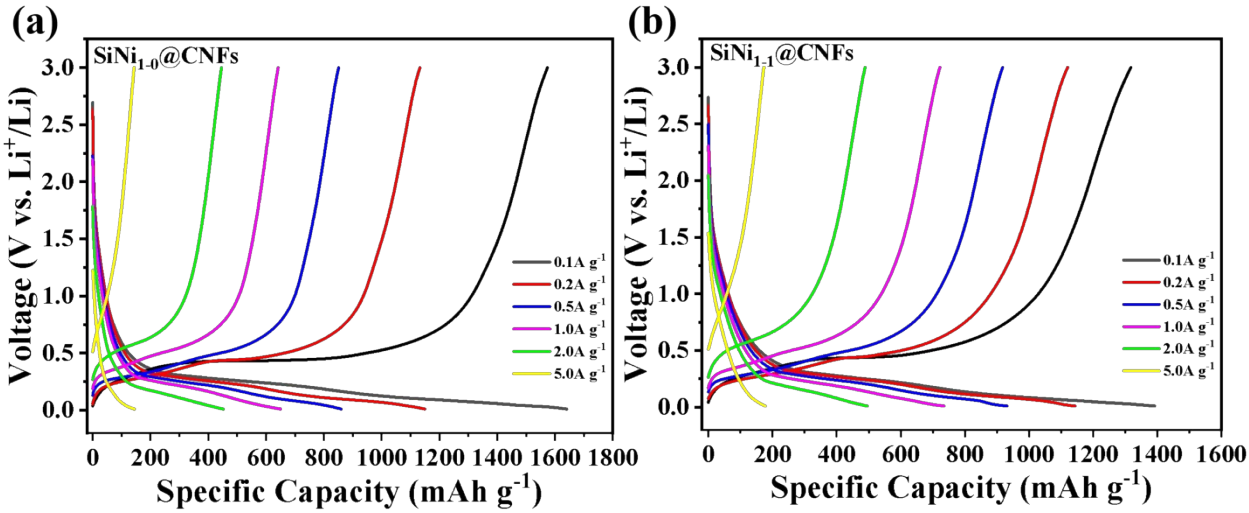

Fig. S8. (a) Charge-discharge curves of $SiNi_{1-0}$@CNFs nanofiber electrodes at different current densities, (b) Charge-discharge curves of $SiNi_{1-1}$@CNFs nanofiber electrodes at different current densities

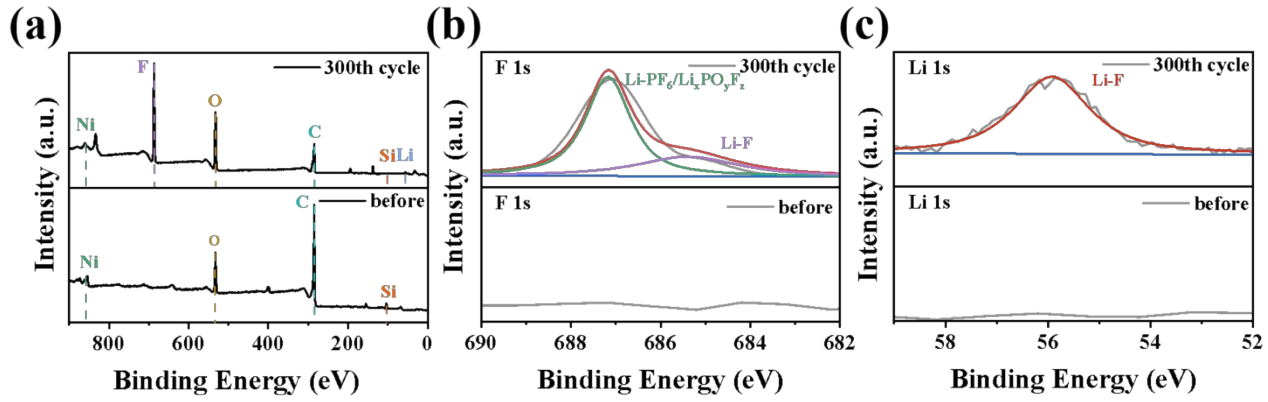

Fig. S9. XPS spectrum of the $SiNi_{1-2}$@CNFs: (a) XPS score, (b) F 1s, (c) Li 1s

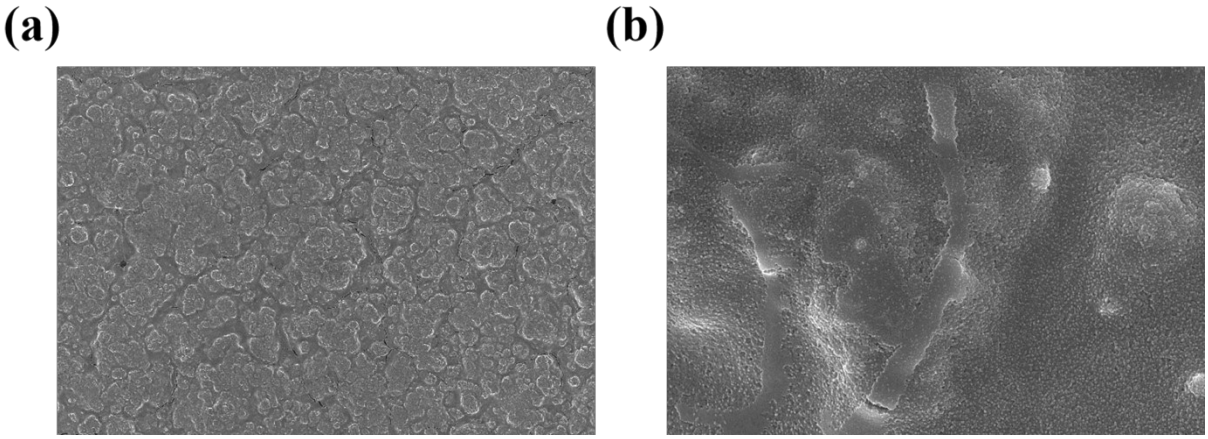

Fig. S10. SEM image of $SiNi_{1-2}$@CNFs after 300 cycles: (a) 30 μm, (b) 500 nm

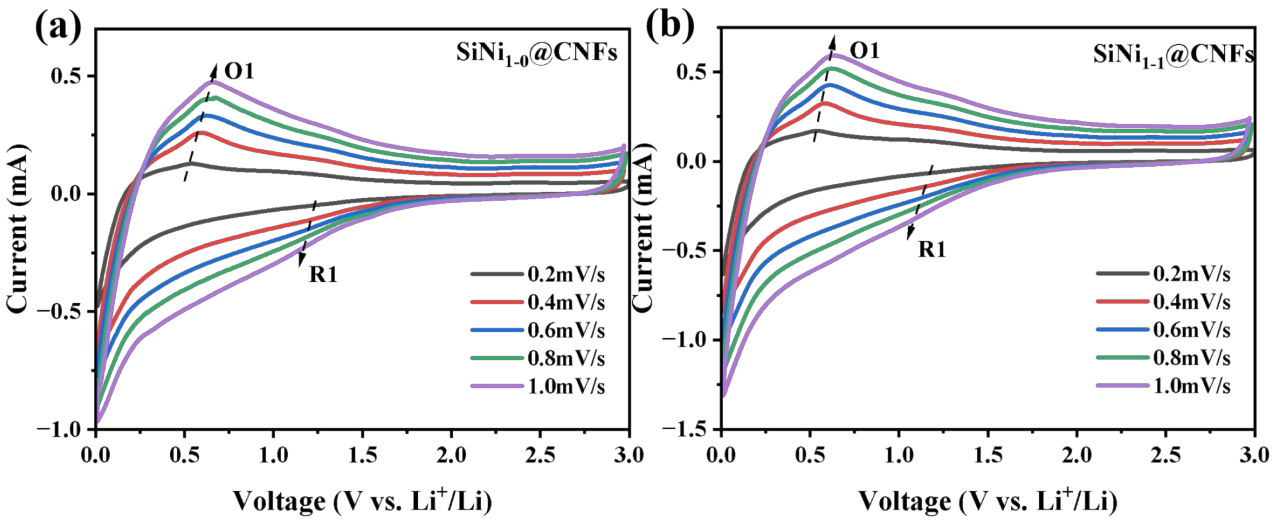

Fig. S11. (a) CV curves of $SiNi_{1-0}$@CNFs nanofiber electrodes at different scan rates, (b) CV curves of $SiNi_{1-1}$@CNFs nanofiber electrodes at different scan rates

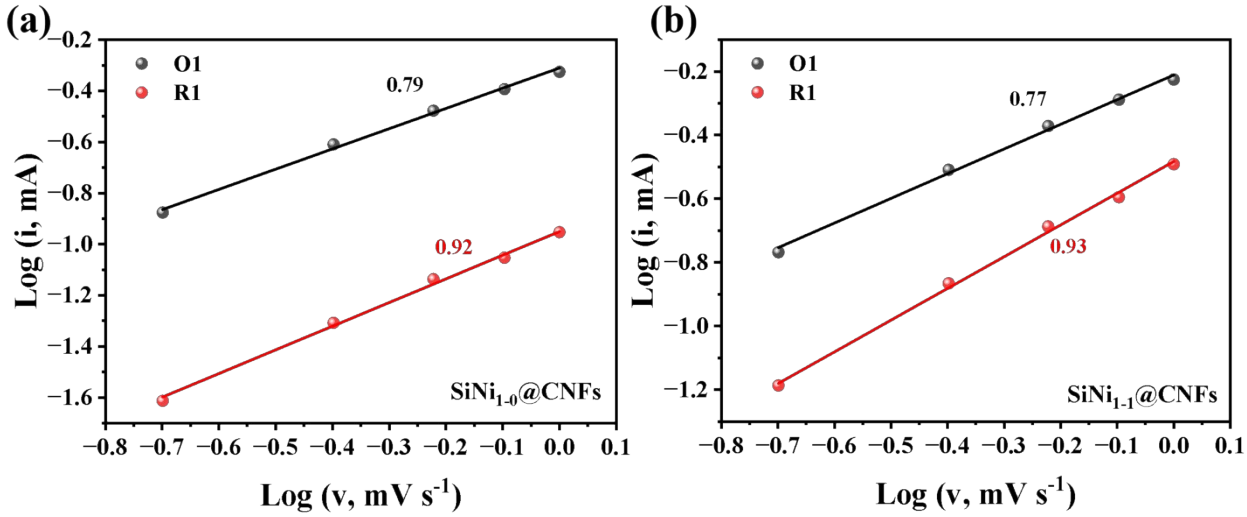

Fig. S12. (a) b-value of redox peaks on $SiNi_{1\text{-}0}$@CNFs nanofiber electrodes, (b) b-value of redox peaks on $SiNi_{1\text{-}1}$@CNFs nanofiber electrodes

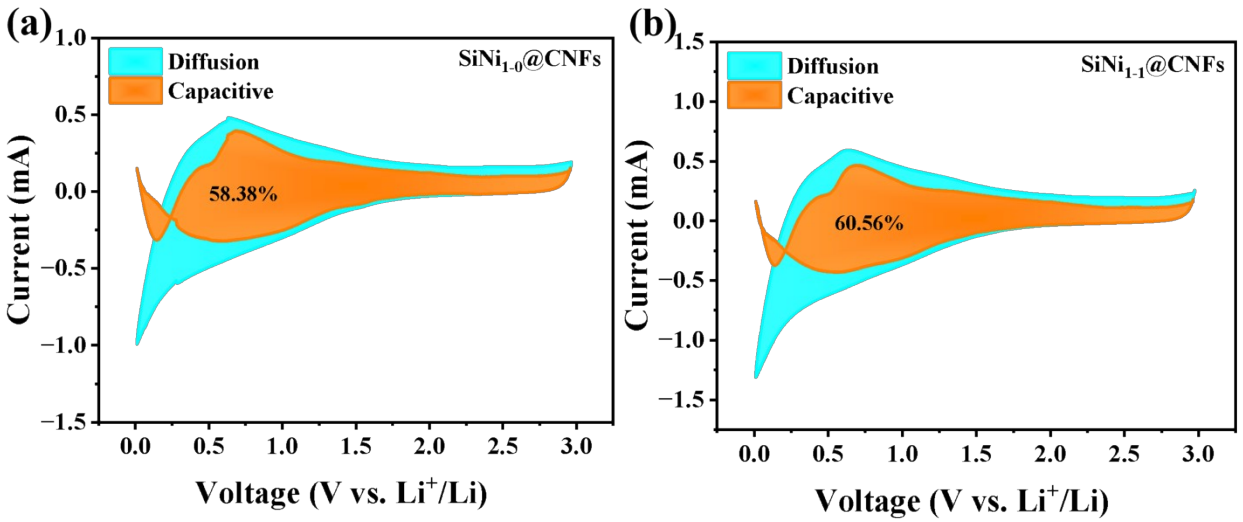

Fig. S13. (a) Capacitance contribution of $SiNi_{1\text{-}0}$@CNFs nanofiber electrodes at 1.0 mV s^{-1}, (b) Capacitance contribution of $SiNi_{1\text{-}1}$@CNFs nanofiber electrodes at 1.0 mV s^{-1}