

Supporting Information

Improved lithium ion battery performance by mesoporous Co_3O_4 nanosheets grown on self-standing NiSi_x nanowires on nickel foam

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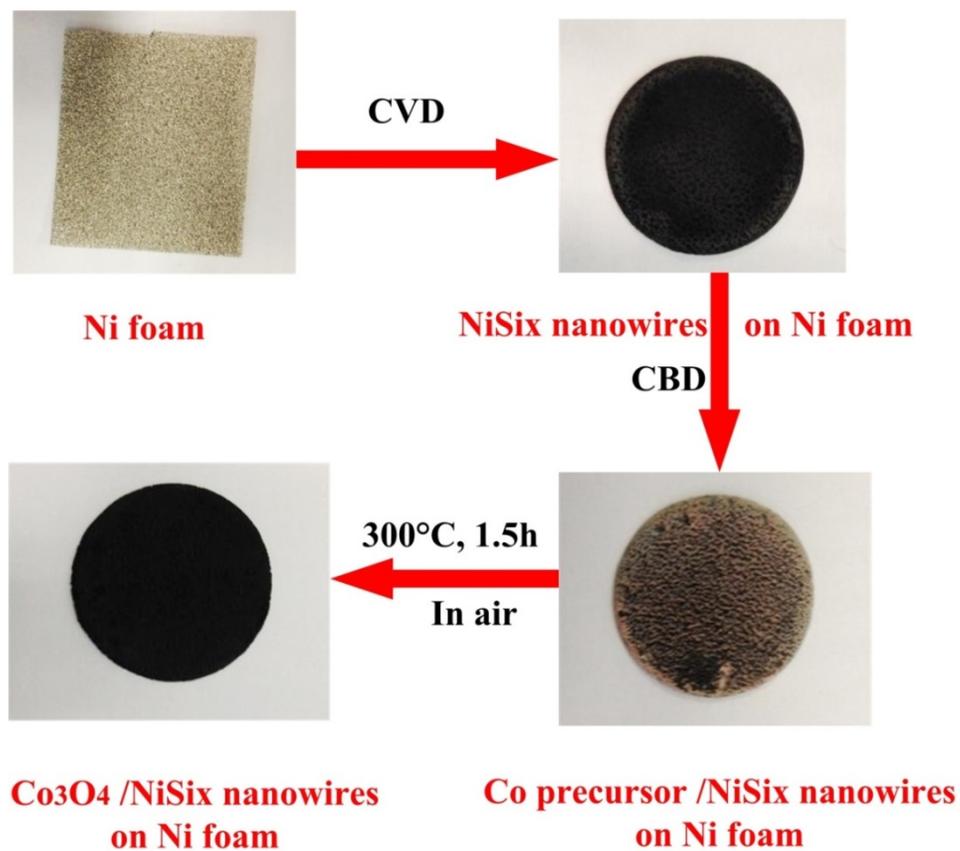


Figure S1. Photographs of the synthesis procedure.

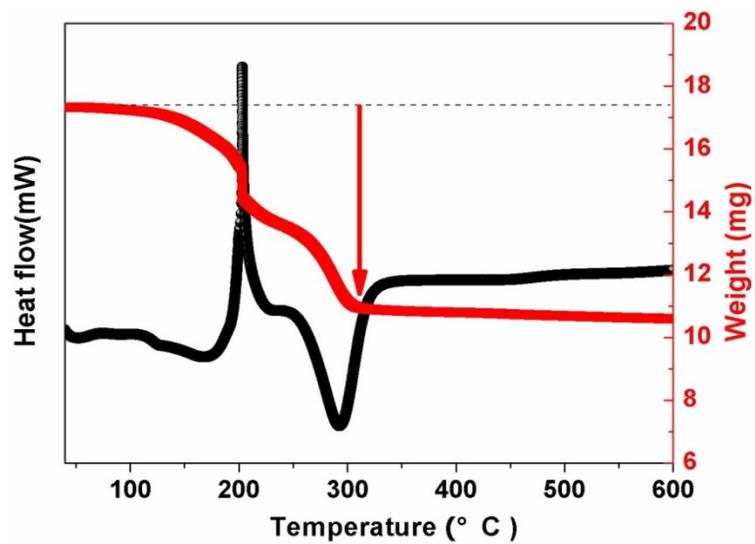


Figure S2. DTA-TG curves of Co-precursor (cobalt hydroxide carbonate).

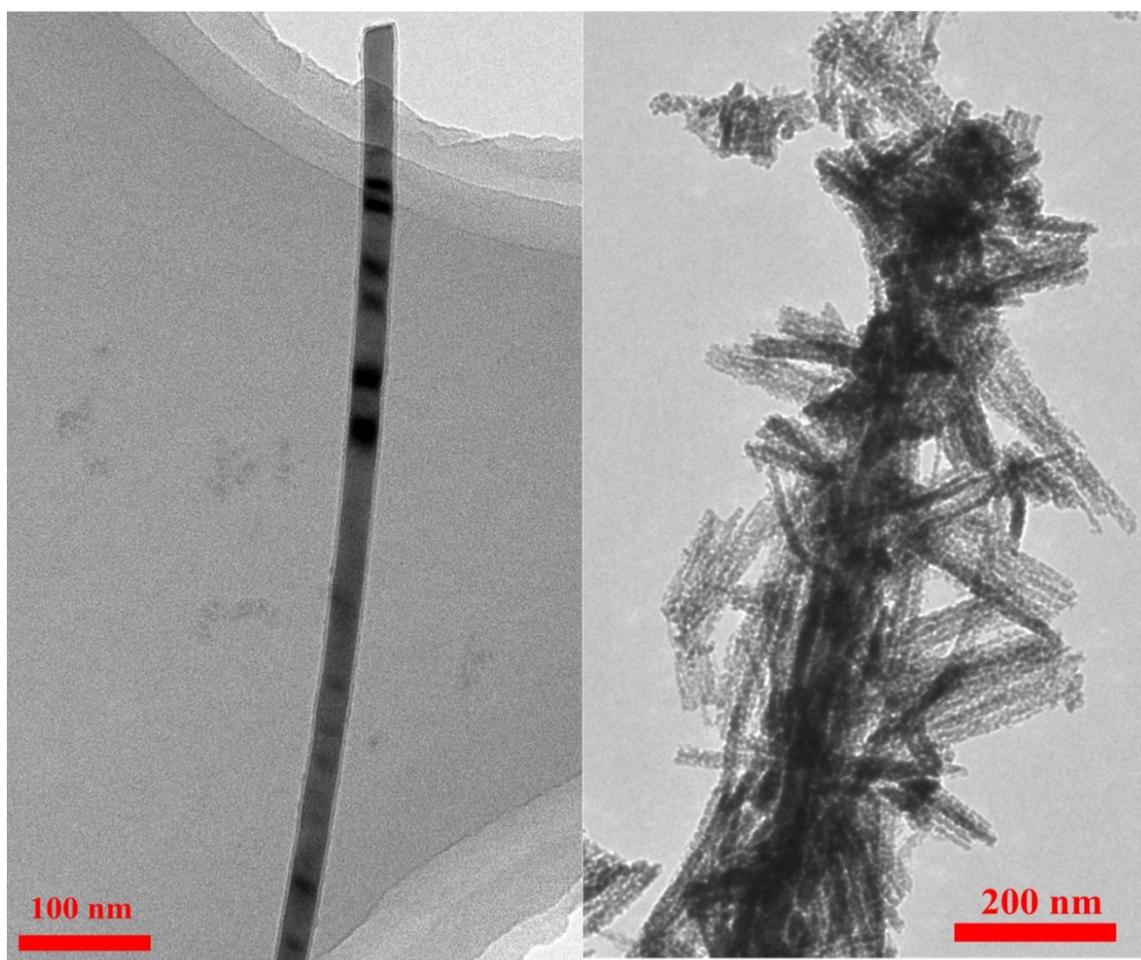


Figure S3. (a) TEM image of an individual NiSi_x nanowire and (b) TEM image of a $\text{NiSi}_x/\text{Co}_3\text{O}_4$ core/shell nanowire.

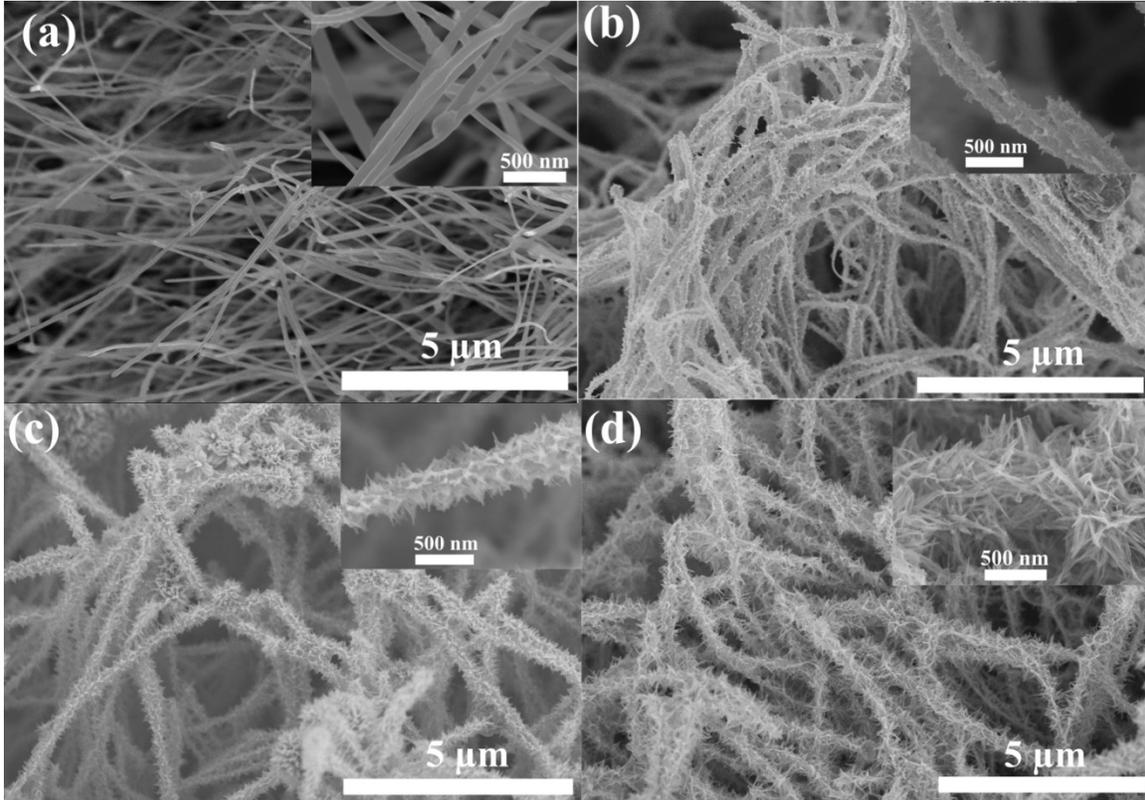


Figure S4. SEM images of $\text{NiSi}_x/\text{Co}_3\text{O}_4$ core/shell nanowire arrays on nickel foam prepared at different reaction time of CBD: (a) 0 h, (b) 0.5 h, (c) 1h, and (d) 2h.

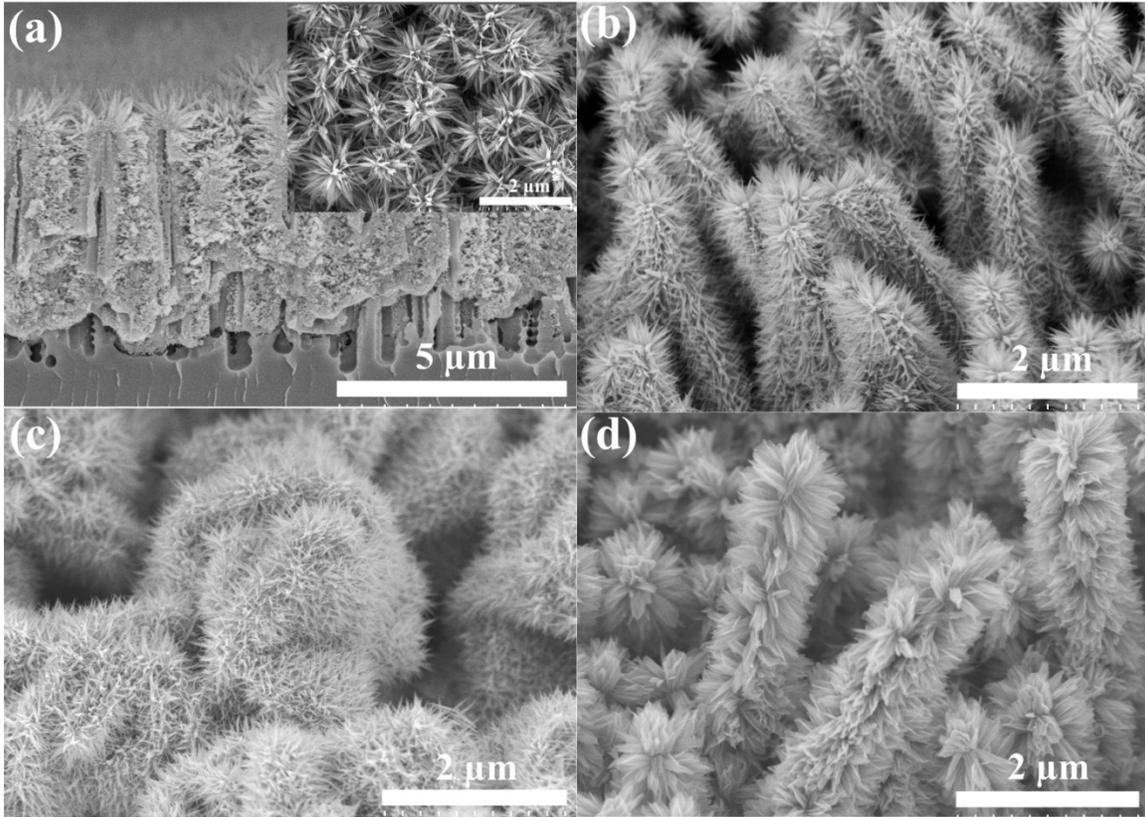


Figure S5. SEM images of different 3D Co_3O_4 -based heterohierarchical nanostructures: (a) $\text{Co}_3\text{O}_4/\text{Si}$ nanowires, (b) $\text{Co}_3\text{O}_4/\text{CuO}$ nanoneedles, (c) $\text{Co}_3\text{O}_4/\text{CuO}$ nanoflowers, and (d) $\text{Co}_3\text{O}_4/\text{CuO}$ nanowires.

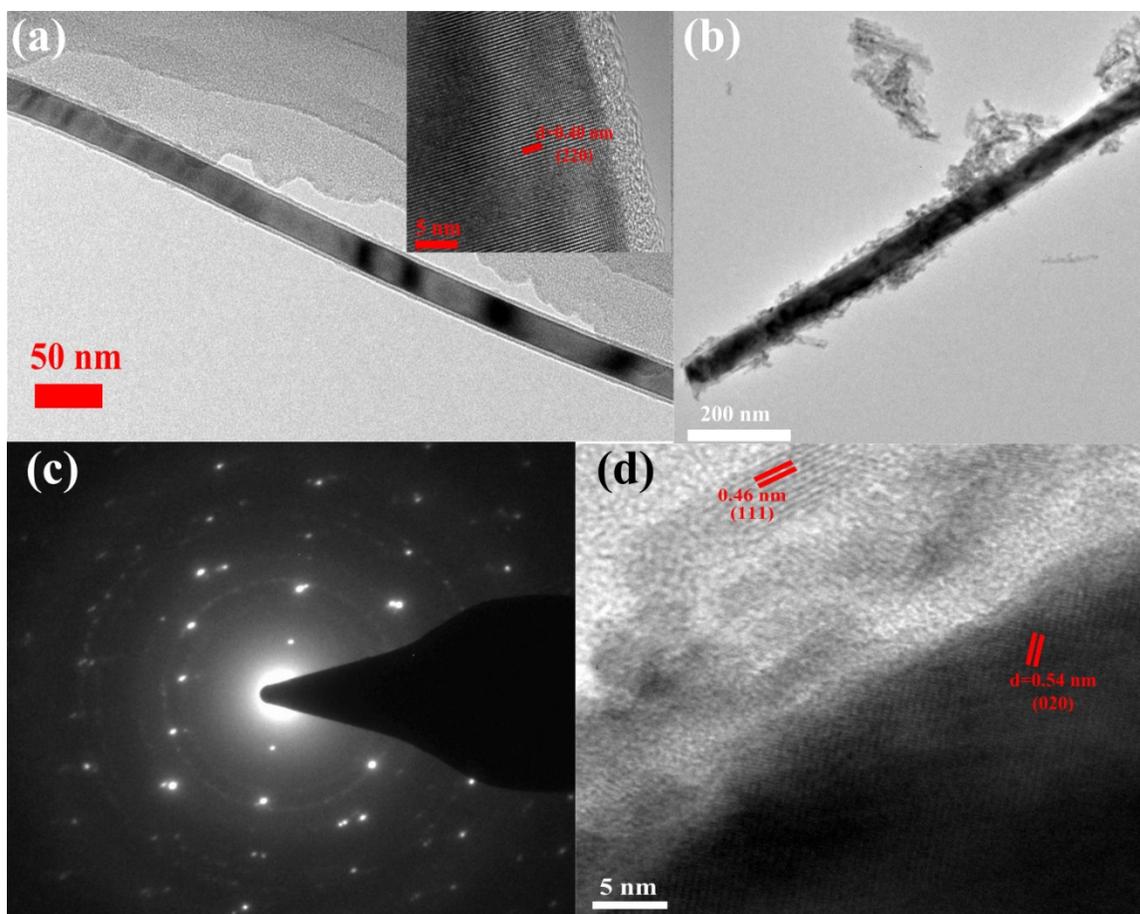


Figure S6. (a) TEM image of an individual NiSi_x nanowire, the inset is its HRTEM, (b) TEM image of an individual NiSi_x/Co₃O₄ core/shell nanowire with the growth of Co₃O₄ for 0.5h, (c) the corresponding SAED of an individual NiSi_x/Co₃O₄ core/shell nanowire with the growth of Co₃O₄ for 0.5h, and (d) HRTEM of NiSi_x/Co₃O₄ core/shell nanowire with the growth of Co₃O₄ for 0.5 h.

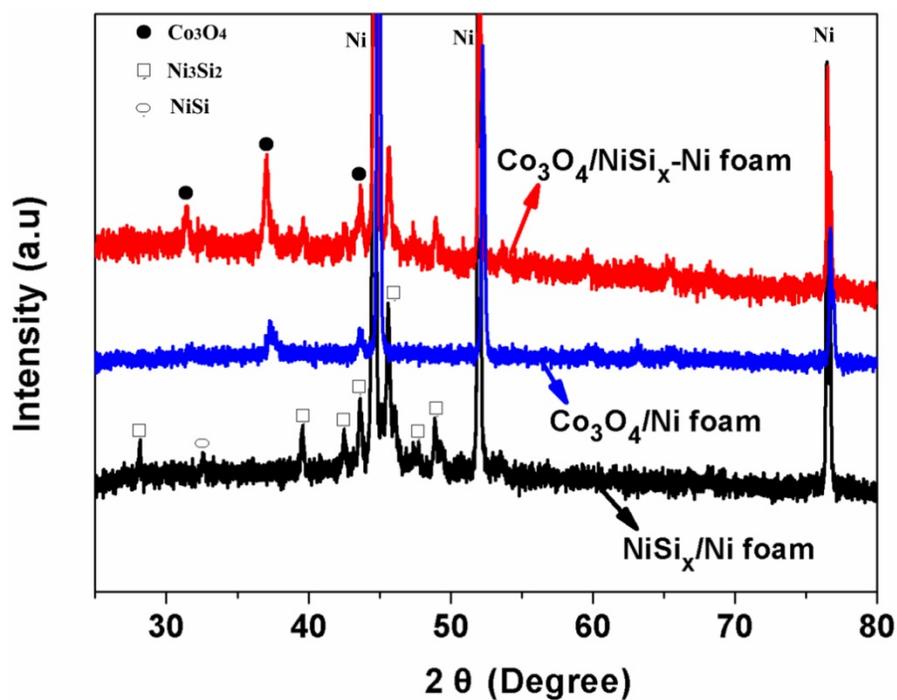


Figure S7. XRD patterns of the as-prepared NiSi_x nanowires, Co_3O_4 nanosheets, and $\text{NiSi}_x/\text{Co}_3\text{O}_4$ core/shell nanowire arrays on nickel foam.

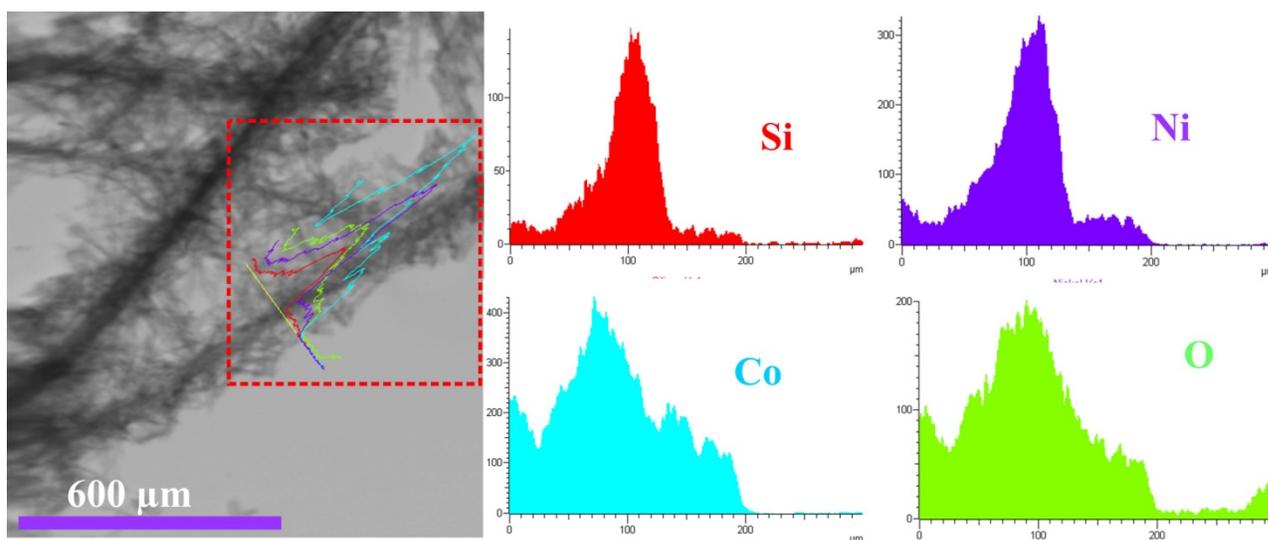


Figure S8. TEM scan line of $\text{NiSi}_x/\text{Co}_3\text{O}_4$ core/shell nanowire with the growth of Co_3O_4 for 2h and its corresponding element mapping distribution.

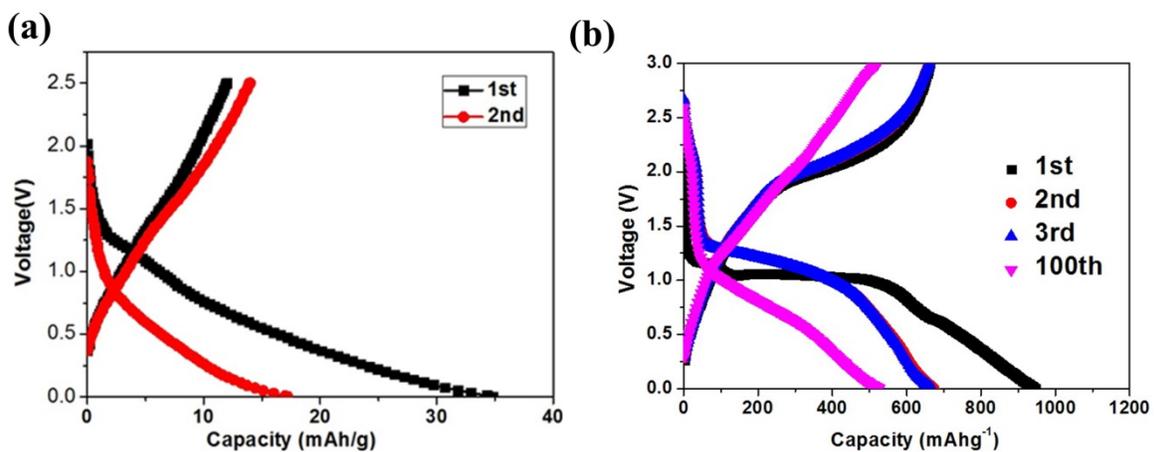


Figure S9. (a) The charge/discharge curve of NiSi_x grown on Ni foam after the same heat treatment for the 1st and 2nd cycles and (b) the discharge-charge curves of $\text{Co}_3\text{O}_4/\text{Ni}$ foam at a current density of 400 mA g^{-1} .