Supporting Information

Bifunctional CoNi/$CoFe_2O_4$ /Ni Foam Electrodes for Efficient Overall Water Splitting at a High Current Density

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with scan rates of 10, 20, 30, 50, 70, and 100 mV/s in KOH solution. (**Fig. S6**)

7. Polarization curve for overall water splitting of CoNi/$CoFe_2O_4$/NF to show the high current density performance. (The inset is the optical photograph showing the strong generation of H_2 and O_2 bubbles on the electrodes.) (**Fig. S7**)
8. Characterizations after the stability test. (a) SEM (b) High-resolution SEM images, and (c) EDS elemental mapping of the CoNi/$CoFe_2O_4$/NF after the overall water splitting stability test (anode for OER). (**Fig. S8**)

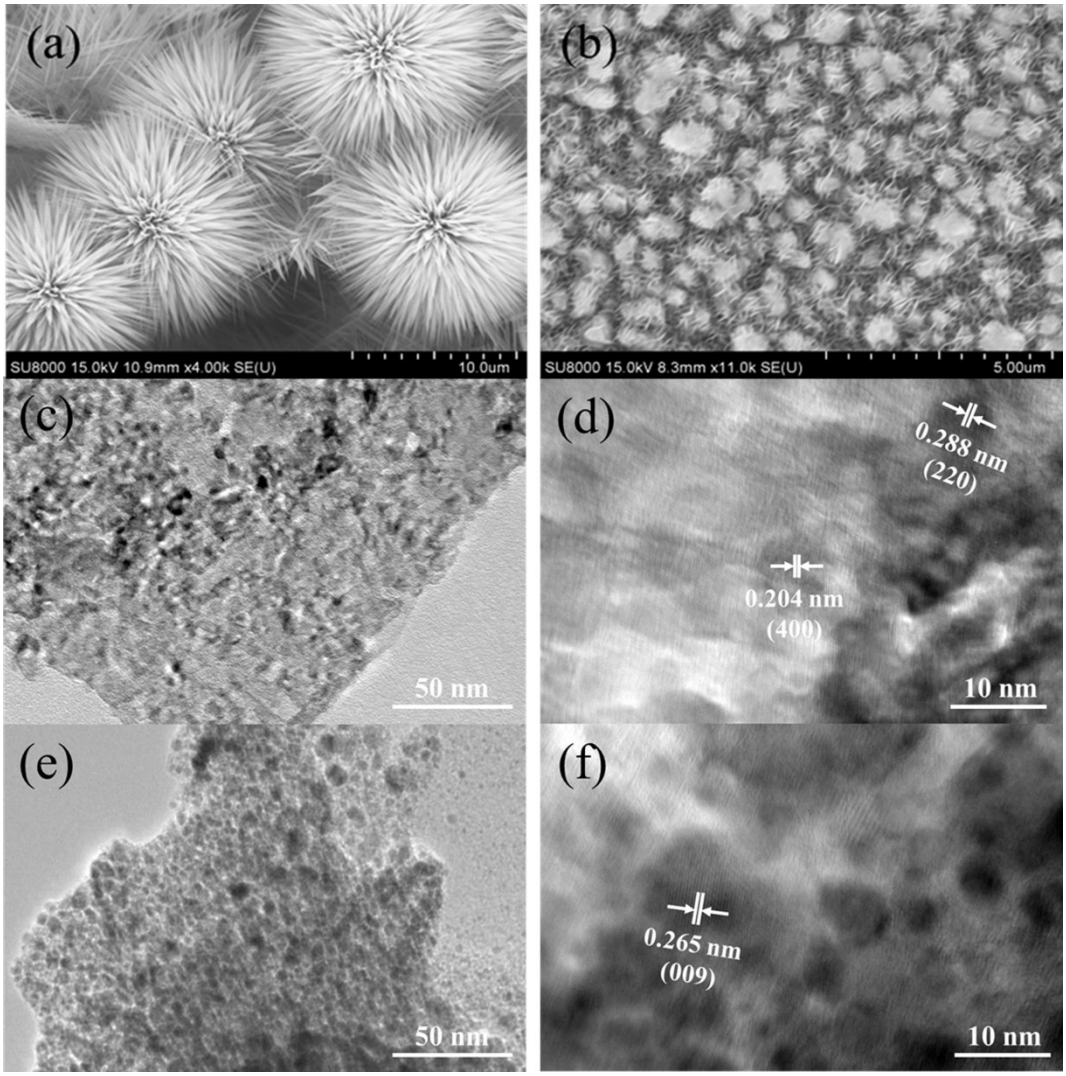

Fig. S1 SEM images of Co_3O_4/NF(a) and CoNi/NF (b), and the TEM image of $CoFe_2O_4$ (c, d) and CoNi NSs (e, f).

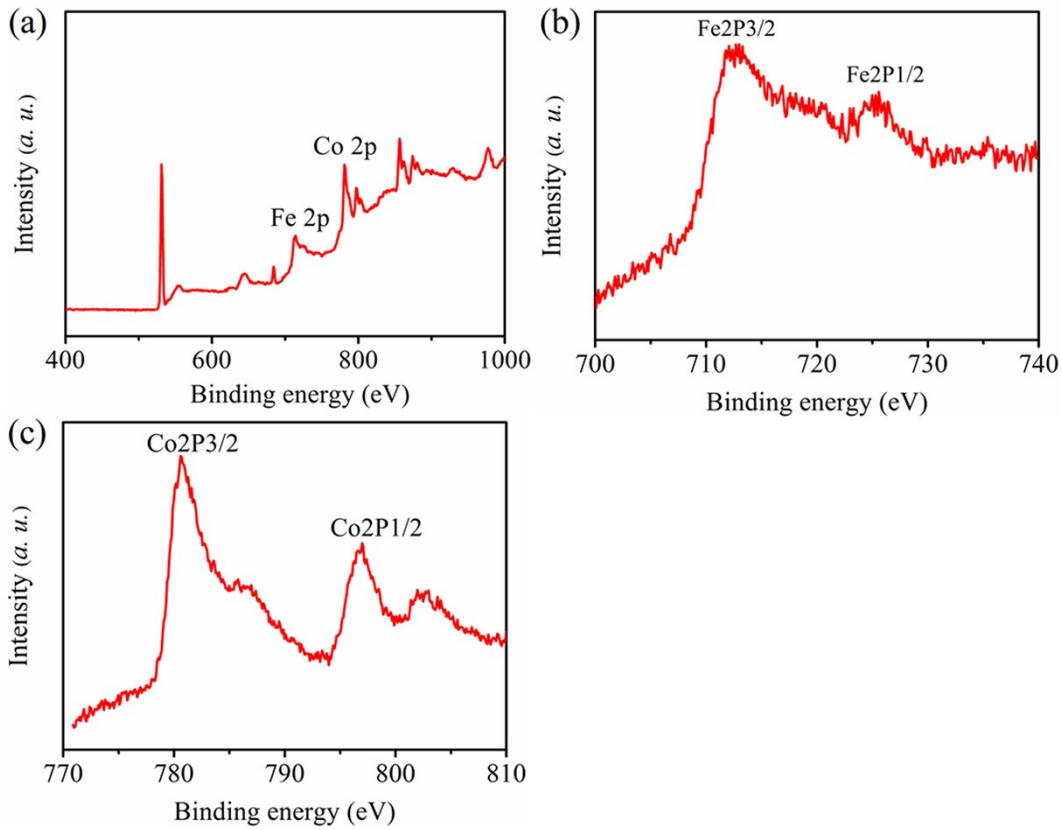

Fig. S2 XPS spectra of flower-like $CoFe_2O_4$.

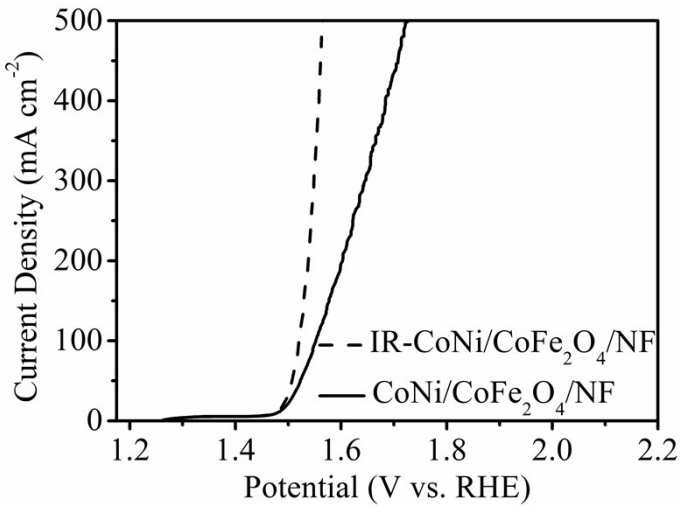

Fig. S3 Original and iR-compensation polarization curves of $CoNi/CoFe_2O_4/NF$.

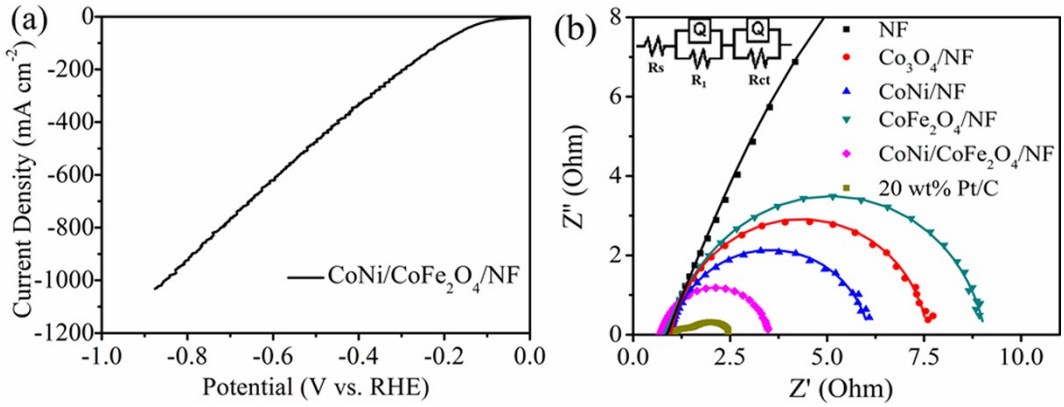

Fig. S4 (a) HER polarization curves of CoNi/$CoFe_2O_4$/NF at the large current density without iR-compensation. (b) Nyquist plots (overpotential = 100 mV) for the samples.

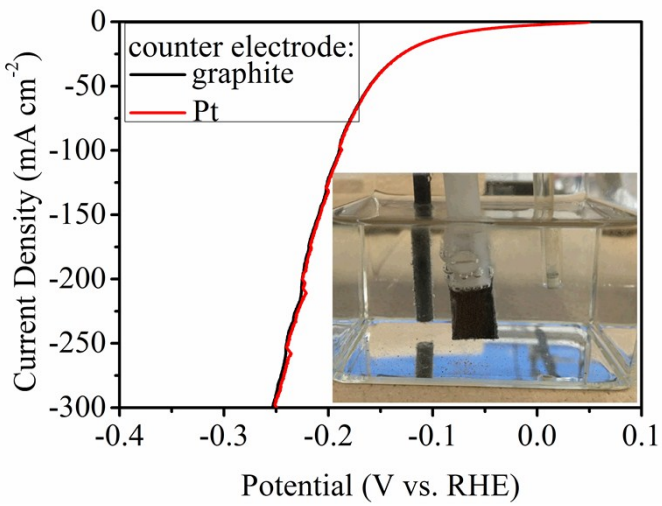

Fig. S5 HER polarization curves of $CoNi/CoFe_2O_4/NF$ in 1.0 M KOH with graphite rod and Pt as the counter electrode. (The inset is the optical photograph showing the graphite rod as counter electrode of H_2 bubbles on the electrode.)

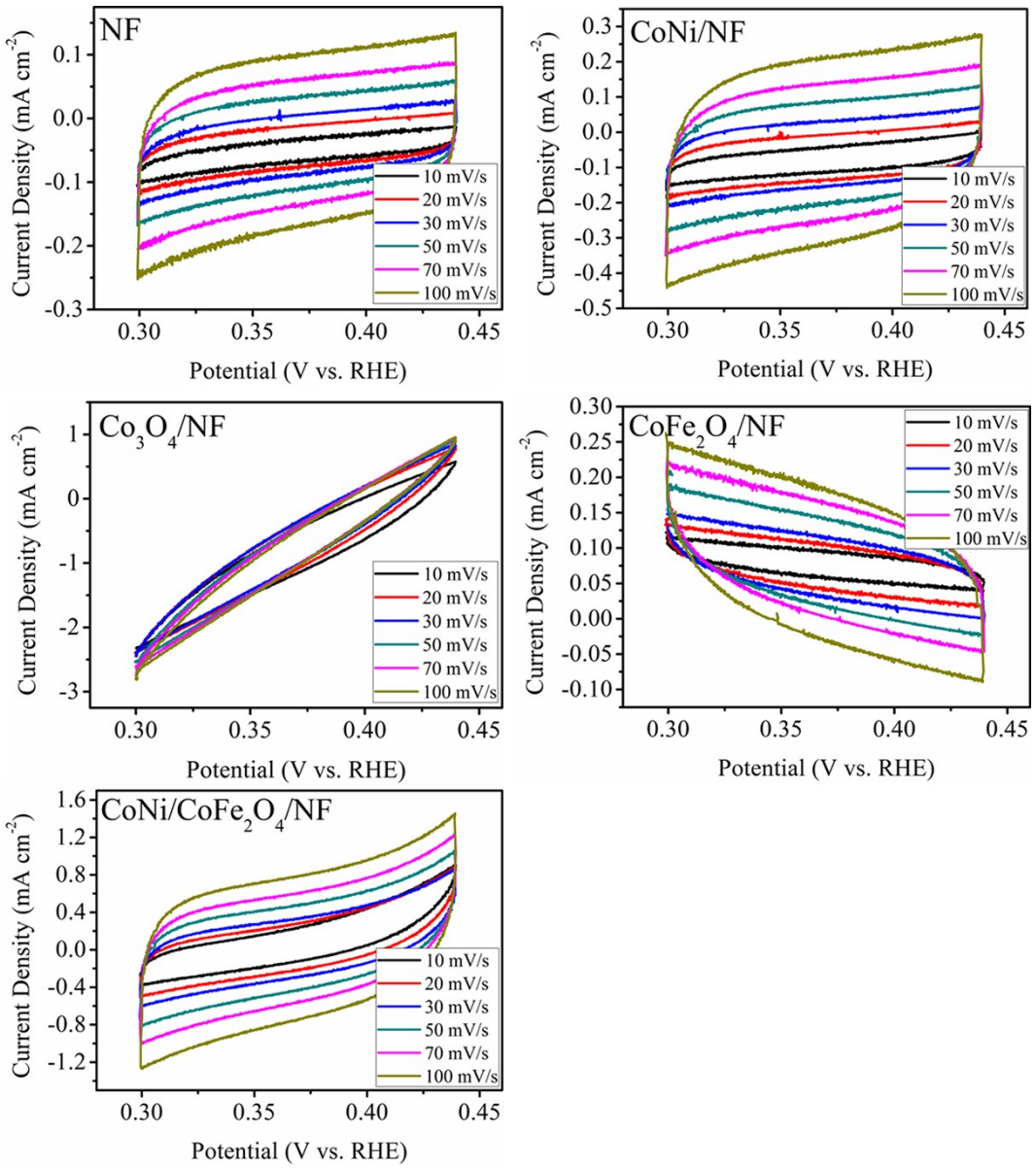

Fig. S6 CVs of pure NF, CoNi/NF, Co_3O_4/NF, $CoFe_2O_4$/NF and CoNi/$CoFe_2O_4$/NF composite electrodes between the potential regions of 0.2 and 0.5 V (vs Hg/HgO) with scan rates of 10, 20, 30, 50, 70, and 100 mV/s in KOH solution.

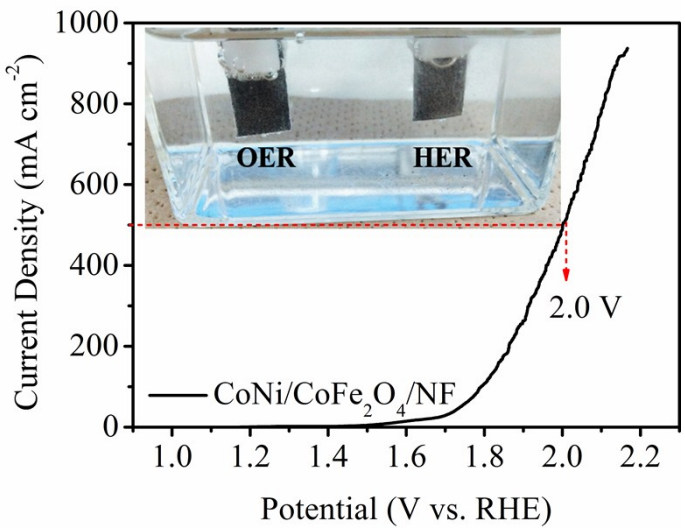

Fig. S7 Polarization curve for overall water splitting of $CoNi/CoFe_2O_4/NF$ to show the high current density performance. (The inset is the optical photograph showing the strong generation of H_2 and O_2 bubbles on the electrodes.)

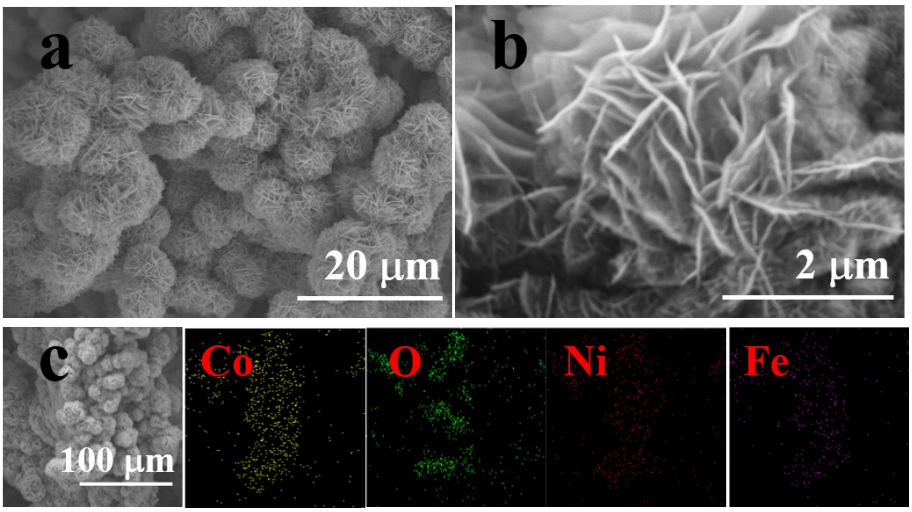

Fig. S8 Characterizations after the stability test. (a) SEM (b) High-resolution SEM images, and (c) EDS elemental mapping of the CoNi/$CoFe_2O_4$/NF after the overall water splitting stability test (anode for OER).