Support Information

Delineating the Roles of Co_3O_4 and N-doped Carbon Nanoweb (CNW) in Bifunctional Co_3O_4/CNW Catalysts for Oxygen Reduction and Oxygen Evolution Reactions

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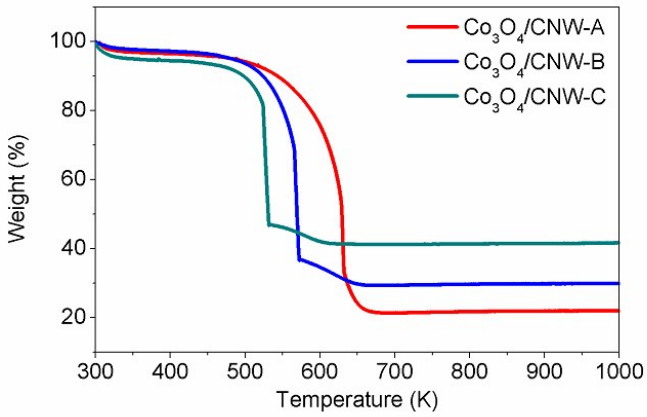

Figure S1. Thermogravimetric analysis of Co_3O_4/CNW.

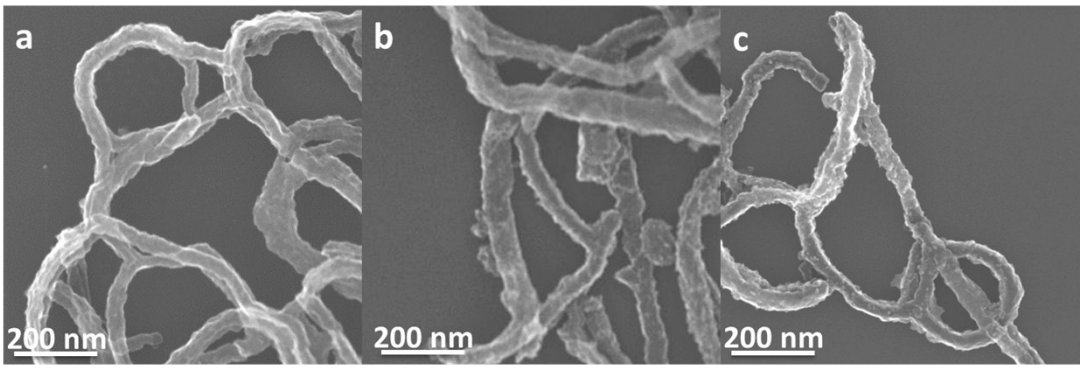

Figure S2. SEM images of (a) Co_3O_4/CNW-A, (b) Co_3O_4/CNW-B, and (c) Co_3O_4/CNW-C.

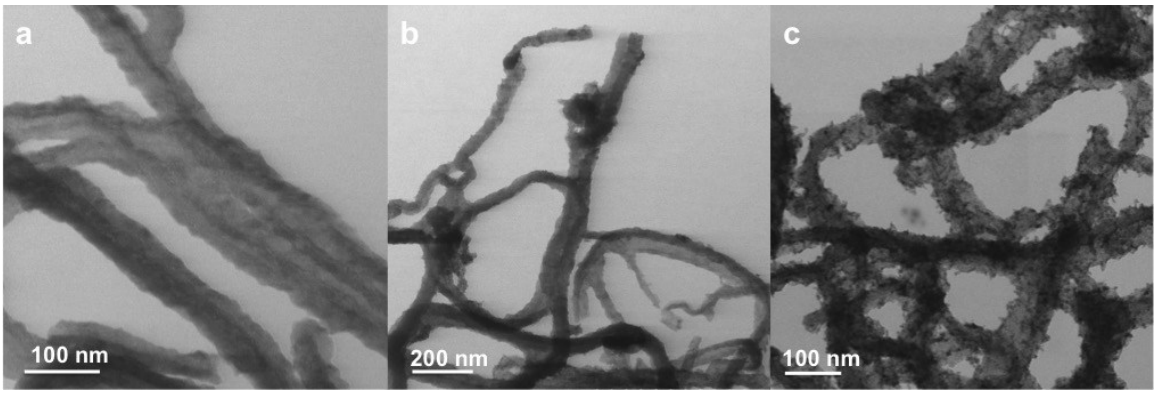

Figure S3. Scanning transmission electron microscopy images of (a) Co_3O_4/CNW-A, (b) Co_3O_4/CNW-B, and (c) Co_3O_4/CNW-C.

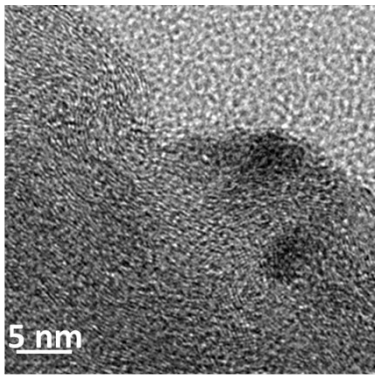

Figure S4. High-resolution TEM image of Co_3O_4/CNW-C.

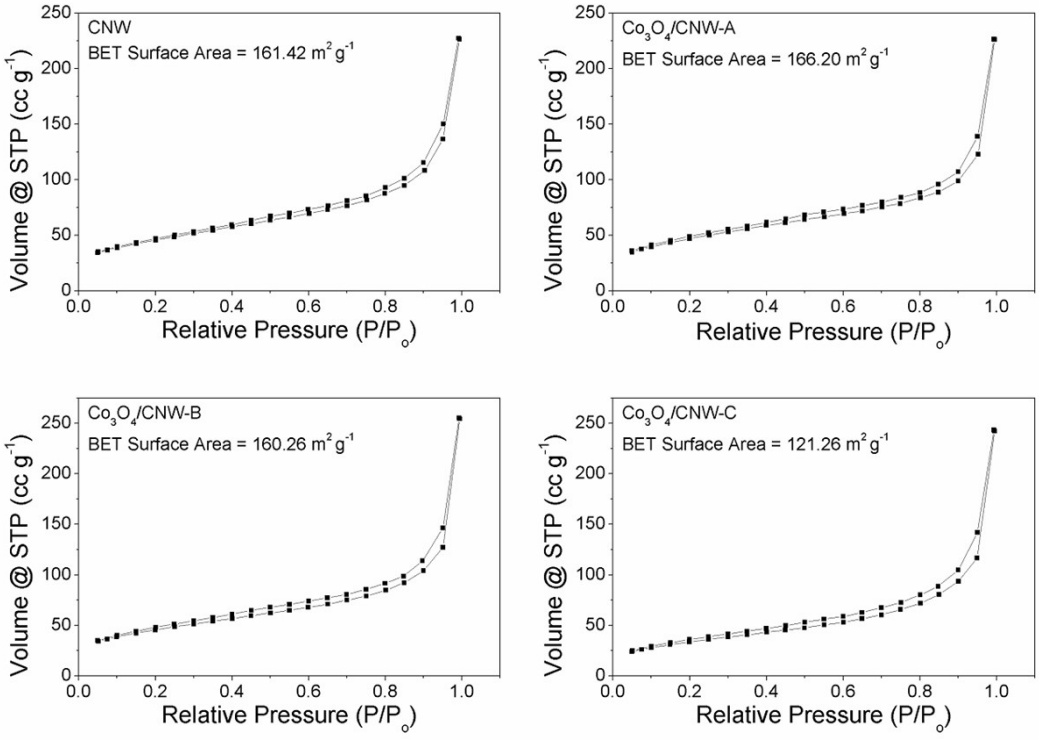

Figure S5. Brunner-Emmett-Teller (BET) isotherms of CNW and Co_3O_4/CNW composite materials.

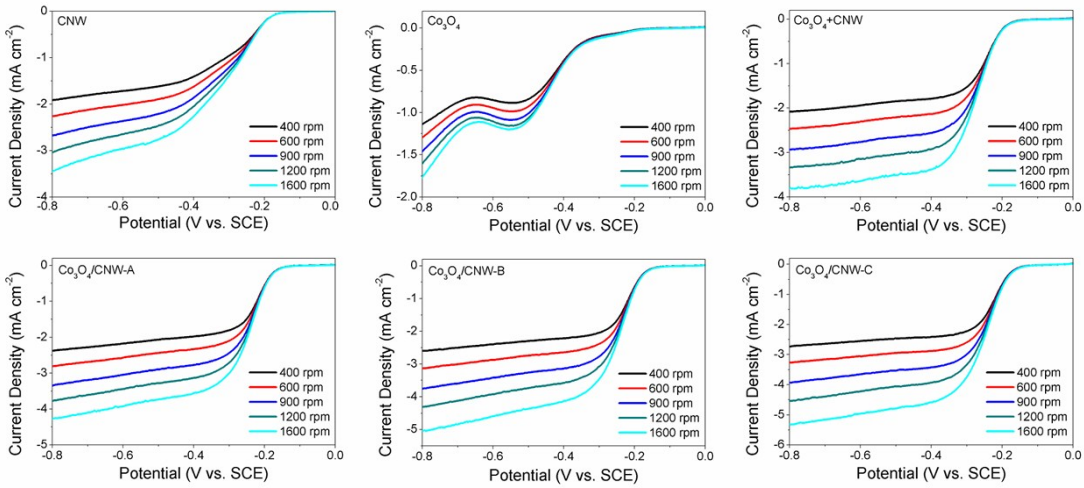

Figure S6. Linear voltammograms of catalysts cast onto a rotating disk electrode at various rotation speeds from 0 to -0.8 V *vs.* SCE.

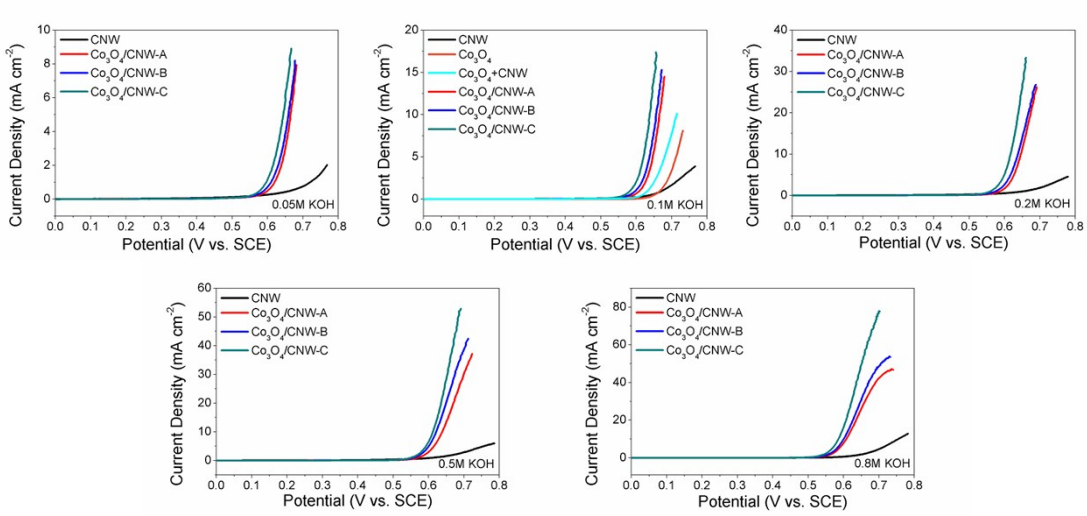

Figure S7. Rotating disk electrode voltammograms after iR correction at 2000 rpm from 0 to 0.8 V *vs.* SCE in different concentrations of KOH solutions.

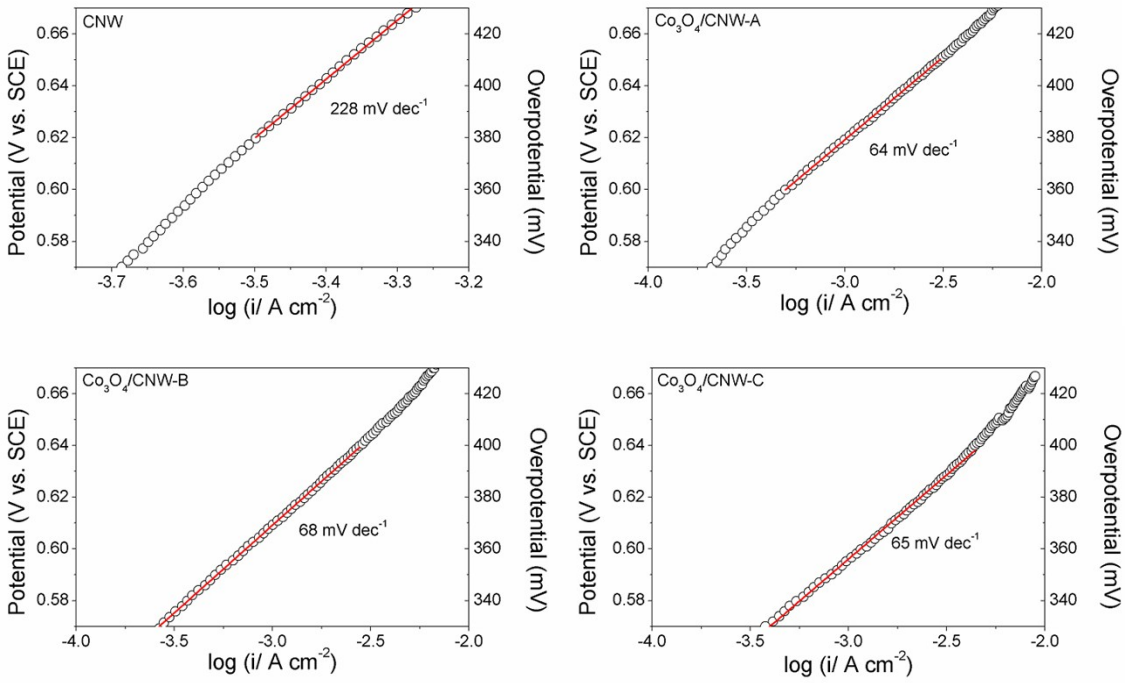

Figure S8. Tafel plots of catalysts loaded onto a glassy carbon electrode recorded at 1 mV s^{-1} in 0.05 M KOH.

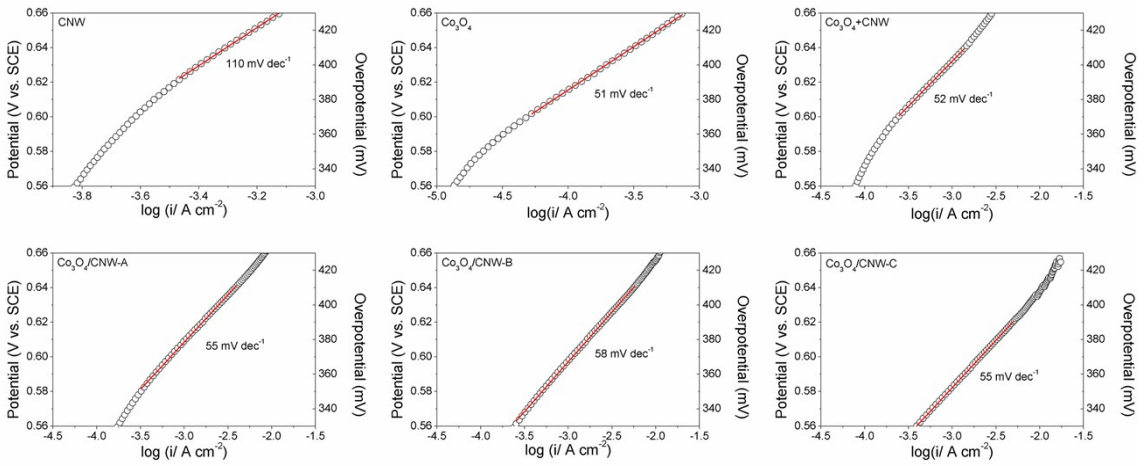

Figure S9. Tafel plots of catalysts loaded onto a glassy carbon electrode recorded at 1 mV s^{-1} in 0.1 M KOH.

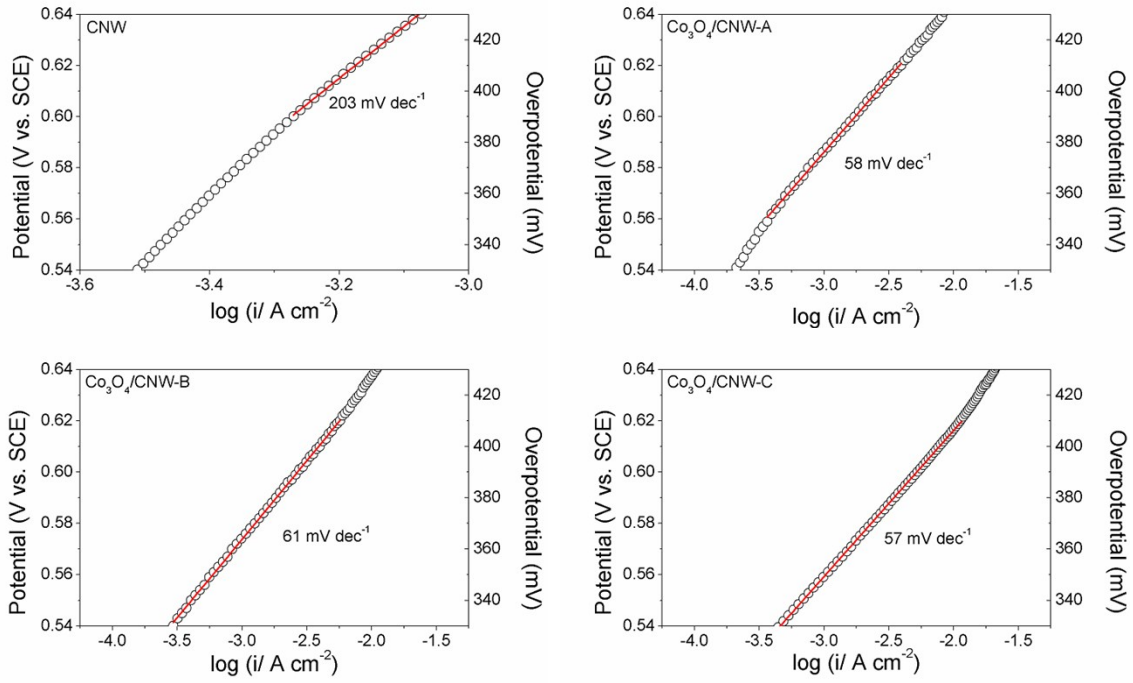

Figure S10. Tafel plots of catalysts loaded onto a glassy carbon electrode recorded at 1 mV s^{-1} in 0.2 M KOH.

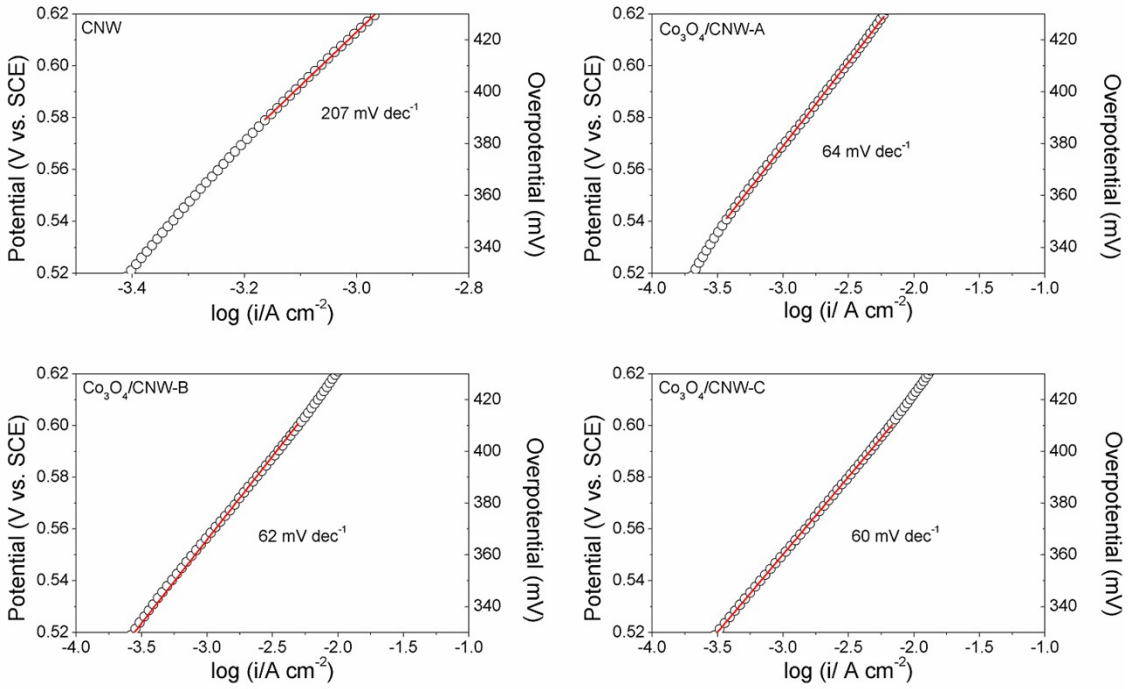

Figure S11. Tafel plots of catalysts loaded onto a glassy carbon electrode recorded at 1 mV s^{-1} in 0.5 M KOH.

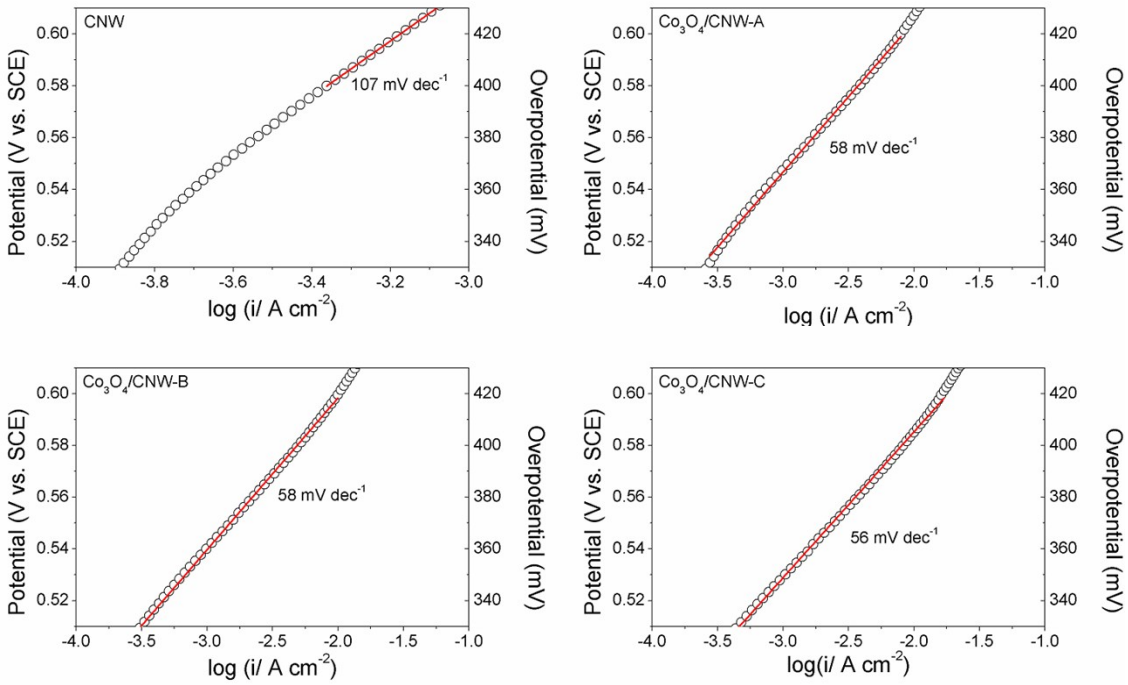

Figure S12. Tafel plots of catalysts loaded onto a glassy carbon electrode recorded at 1 mV s^{-1} in 0.8 M KOH.

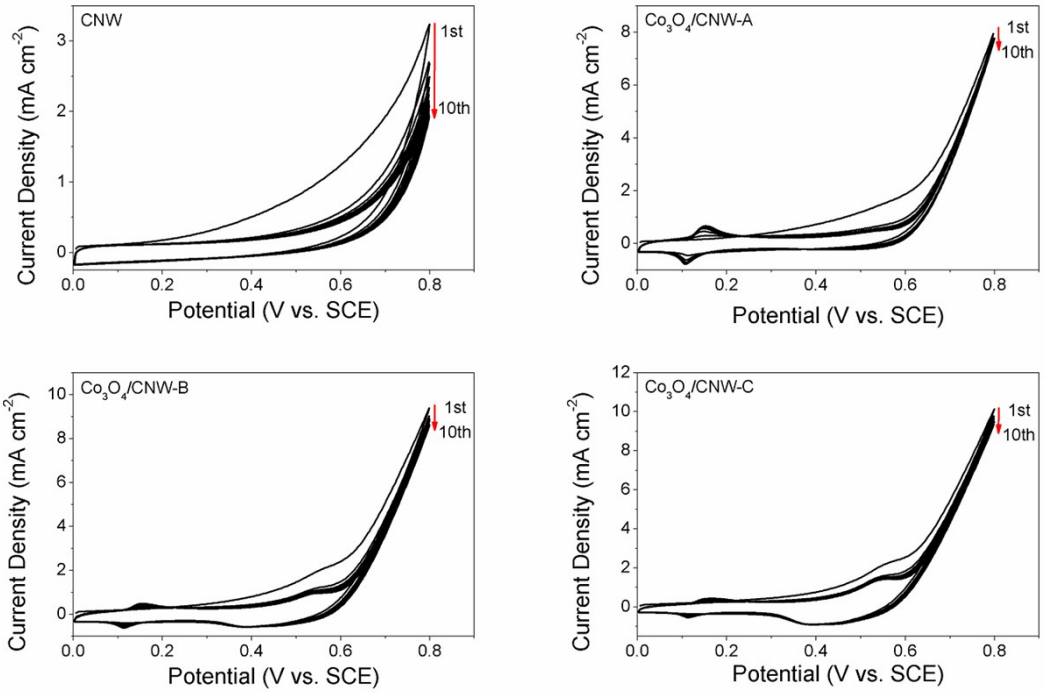

Figure S13. Cyclic voltammograms in N_2-saturated 0.05 M KOH from 0 to 0.8 V *vs.* SCE.

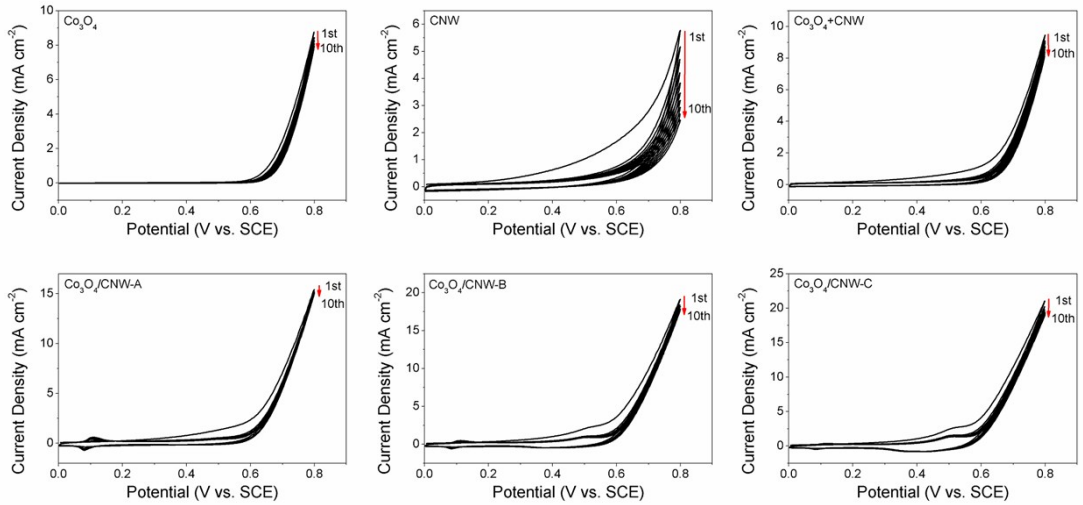

Figure S14. Cyclic voltammograms in N_2-saturated 0.1 M KOH from 0 to 0.8 V *vs.* SCE.

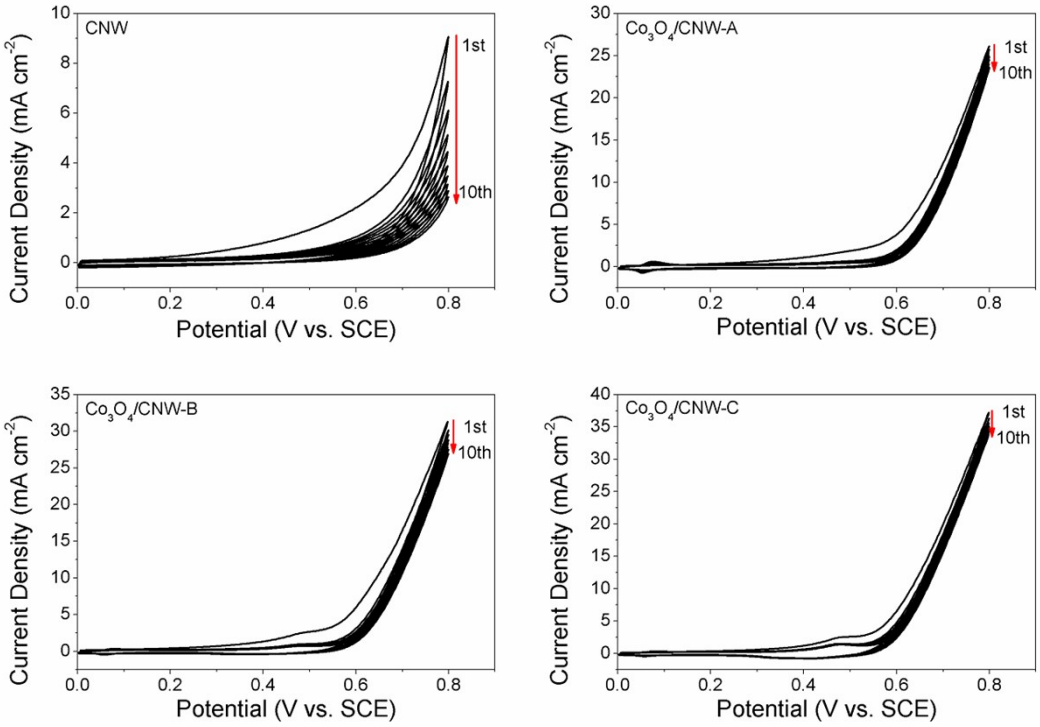

Figure S15. Cyclic voltammograms in N_2-saturated 0.2 M KOH from 0 to 0.8 V *vs.* SCE.

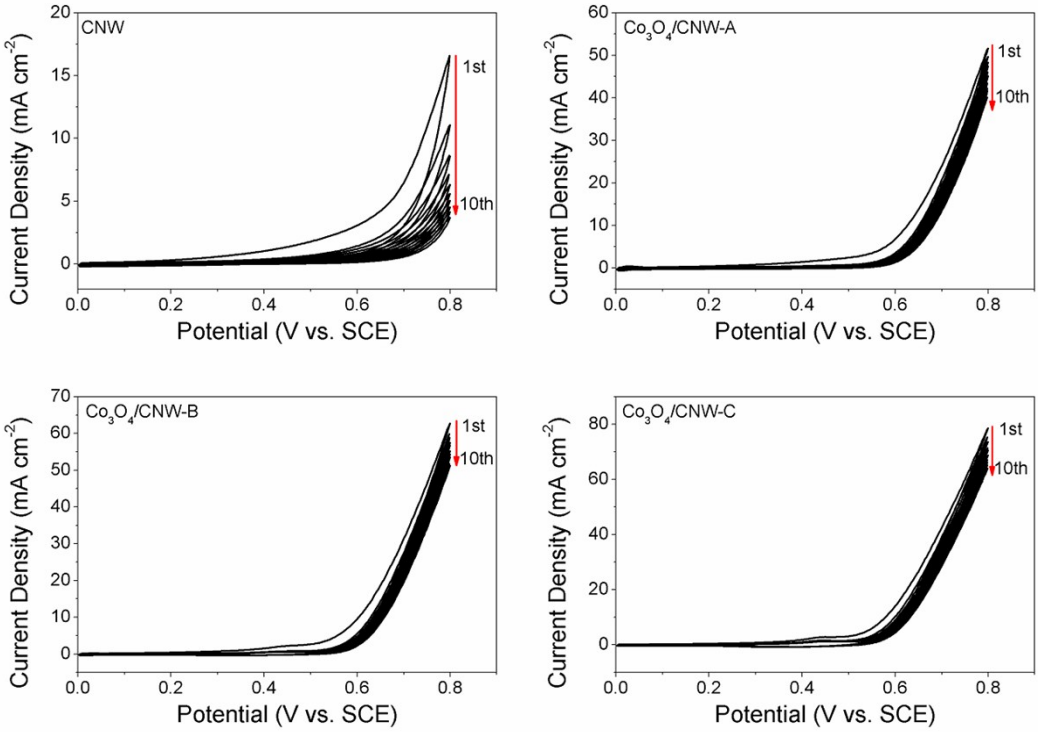

Figure S16. Cyclic voltammograms in N_2-saturated 0.5 M KOH from 0 to 0.8 V *vs.* SCE.

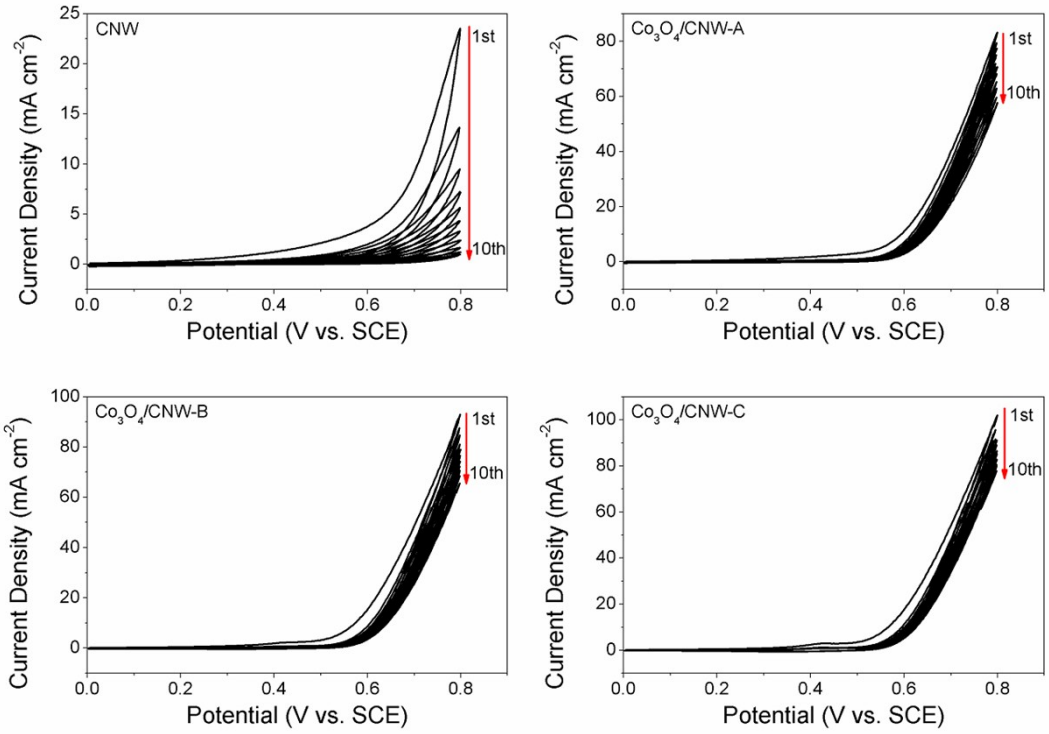

Figure S17. Cyclic voltammograms in N_2-saturated 0.8 M KOH from 0 to 0.8 V *vs.* SCE.

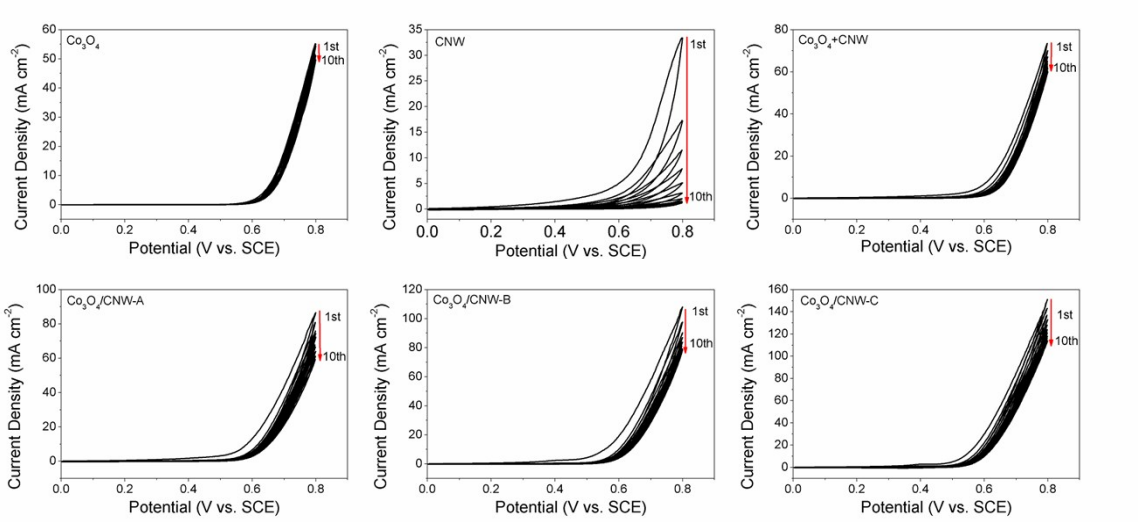

Figure S18. Cyclic voltammograms in N_2-saturated 1 M KOH from 0 to 0.8 V *vs.* SCE.

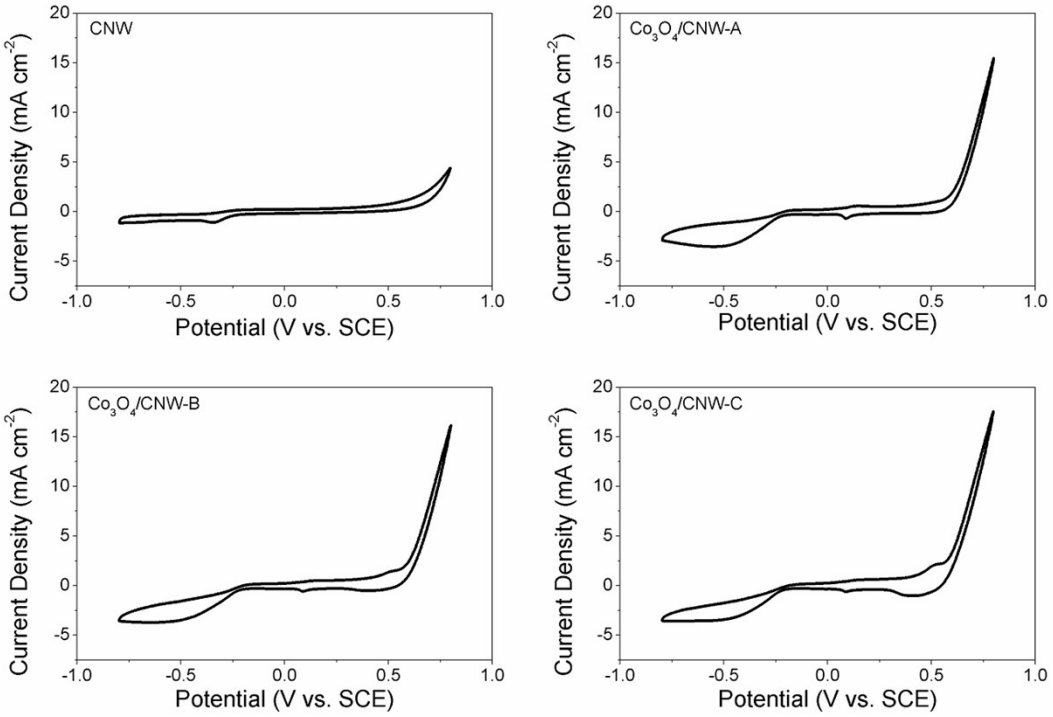

Figure S19. Cyclic voltammograms in N_2-saturated 0.1 M KOH from -0.8 V to 0.8 V *vs.* SCE recorded after two cycles at the scan speed of 30 mV s^{-1}.

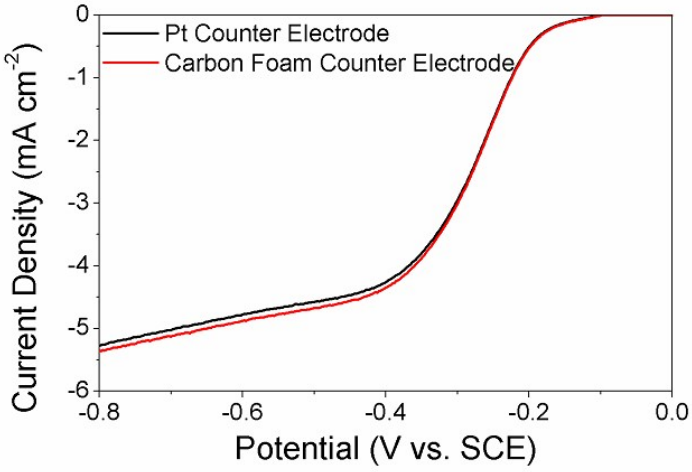

Figure S20. Linear voltammograms of Co_3O_4/CNW-C cast onto a rotating disk electrode from 0 to -0.8 V *vs.* SCE with a mesh as the counter electrode (black) or a carbon foam (GoodFellow) as the counter electrode (red). Rotation speed was 1600 rpm and scan rate was 10 mV s^{-1}.

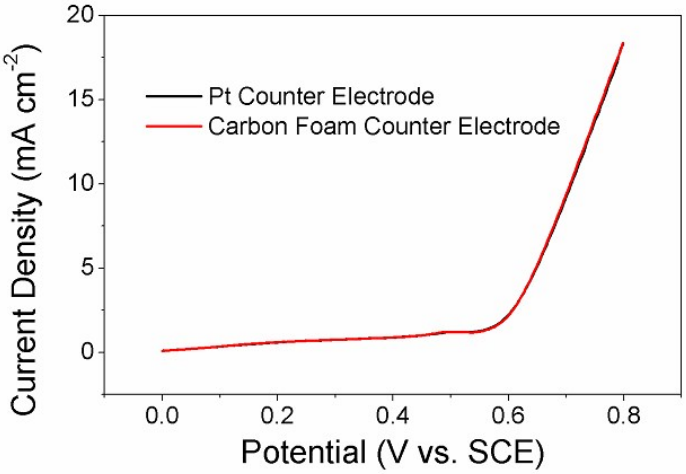

Figure S21. Linear voltammograms of Co_3O_4/CNW-C cast onto a rotating disk electrode from 0 to 0.8 V *vs.* SCE with a Pt mesh as the counter electrode (black) or a carbon foam (GoodFellow) as the counter electrode (red). Rotation speed was 2000 rpm and scan rate was 10 mV s^{-1}.