# Supporting information

## Interfacial Modification of $Co(OH)_2/Co_3O_4$ Nanosheet Heterostructure Arrays for Efficient Oxygen Evolution Reaction

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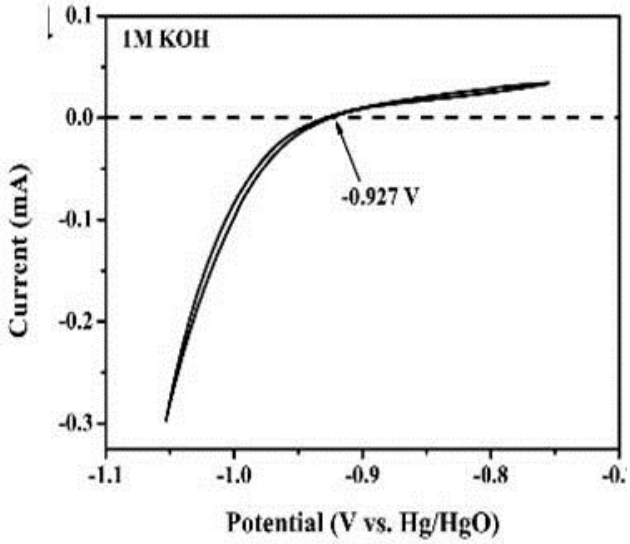
**Calibration of Hg/HgO electrode and conversion to RHE:** The reference electrodes were calibrated prior to measurement in hydrogen saturated solution using two platinum wires as working and counter electrodes in a standard three-electrode system. Cyclic voltammograms (CV) were performed at a scan rate of 1 mV/s, and the average of the two potentials where the current crossed zero was taken to the thermodynamic potential of the HER. In 1 M KOH, the zero current point is at -0.927 V, so $E_{(RHE)} = E_{(Hg/HgO)} + 0.927$ V.




**Supporting information consists of 8 pages, including this page.**

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$Co(OH)_2$/CC.

**Figure S7.** (a) XRD pattern, (b) SEM images, (c) Co 2p and (d) O 1s spectra of α-Co(OH)2/Co3O4/CC-600s after long-term durability test.

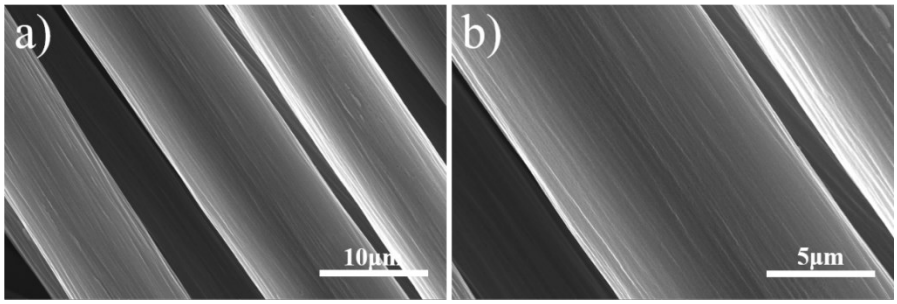


**Figure S1.** (a, b) SEM images of pure carbon cloth at different magnifications.

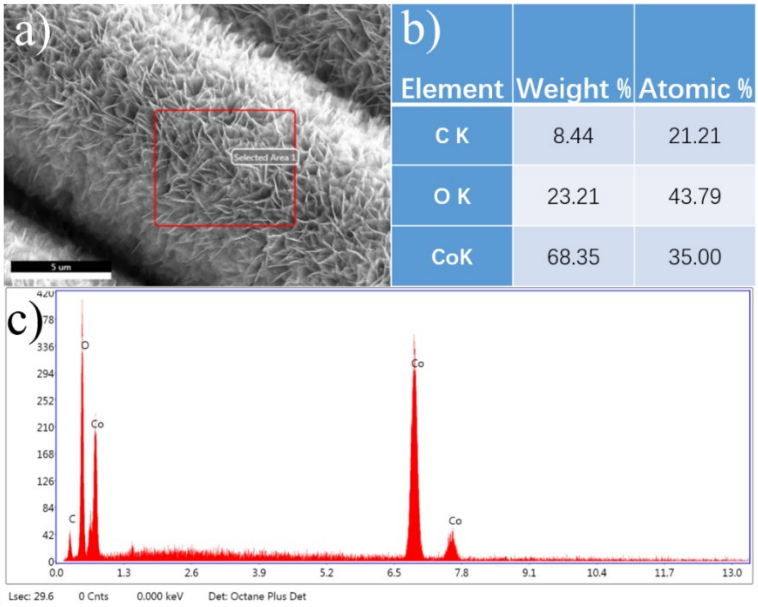


**Figure S2.** (a) The SEM image and (b, c) EDS spectra of α-$Co(OH)_2$/$Co_3O_4$/CC-600s.

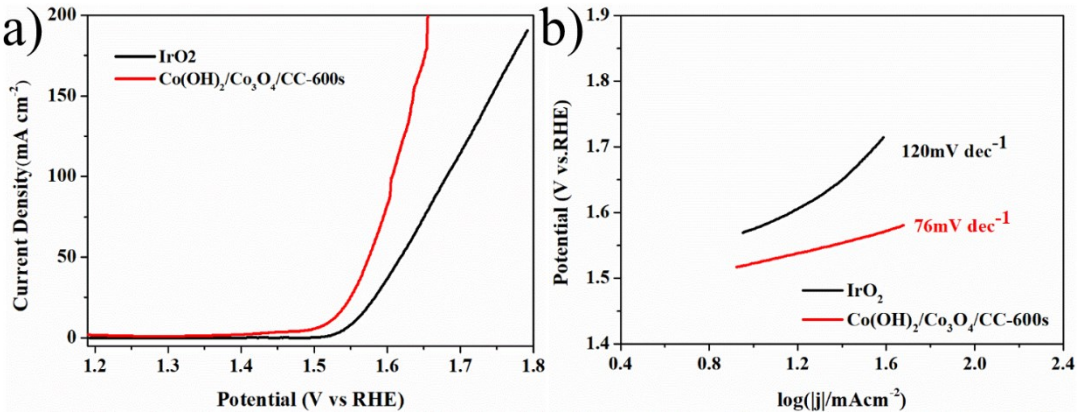


**Figure S3.** (a) LSV and (b) Tafel curves of $IrO_2$ and α-$Co(OH)_2$/$Co_3O_4$/CC.

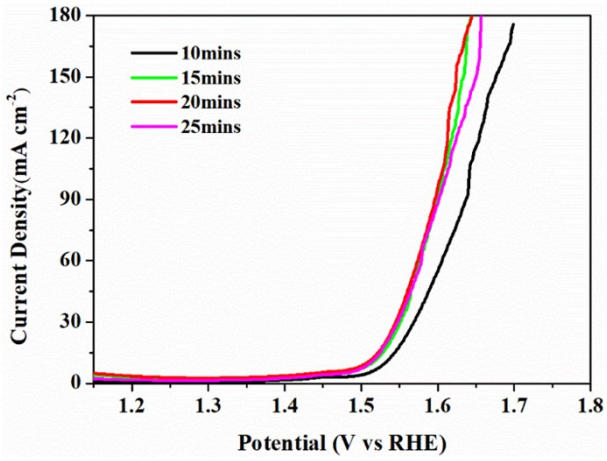


**Figure S4.** LSV curves corresponding to different deposition time of α-$Co(OH)_2/Co_3O_4$/CC in the first step (10, 15, 20, 25mins).

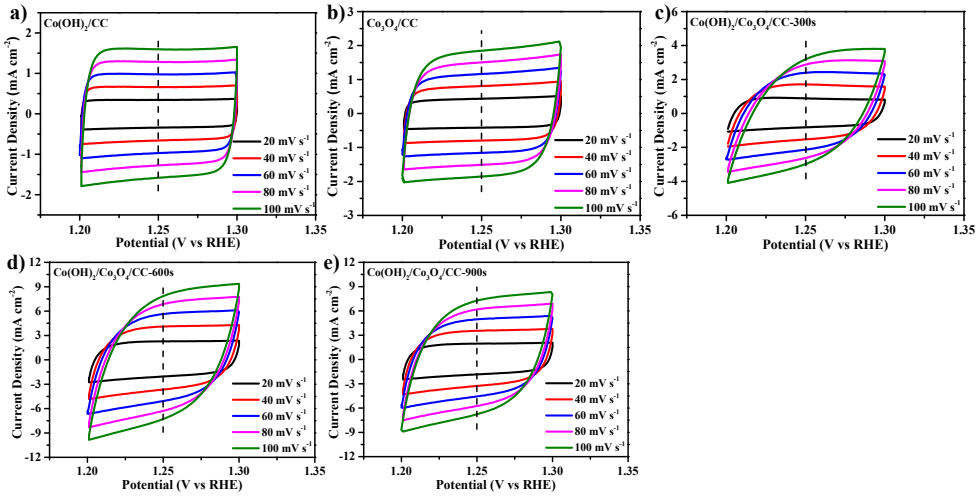


**Figure S5.** (a) α-$Co(OH)_2$/CC, (b) $Co_3O_4$/CC, (c) α-$Co(OH)_2/Co_3O_4$/CC-300, (d) α-$Co(OH)_2/Co_3O_4$/CC-600 and (e) α-$Co(OH)_2/Co_3O_4$/CC-900 of CV curves.

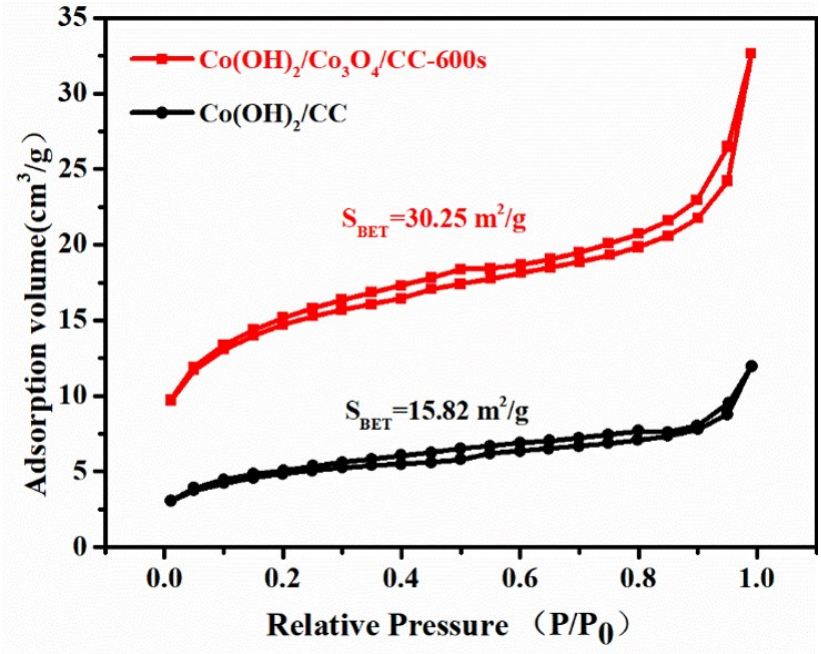


**Figure S6.** Adsorption and desorption curves of $Co(OH)_2/Co_3O_4$/CC-600s and $Co(OH)_2$/CC.

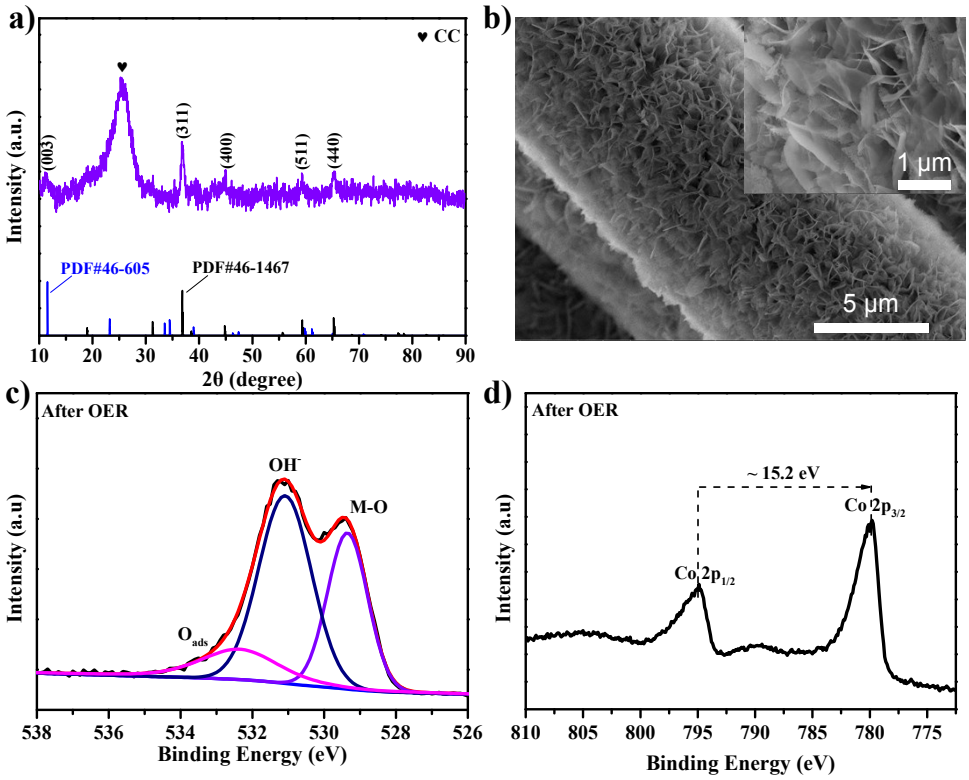


**Figure S7.** (a) XRD pattern, (b) SEM images, (c) Co 2p and (d) O 1s spectra of α-$Co(OH)_2/Co_3O_4$/CC-600s after long-term durability test.

**Table S1.** The OER performances of α-$Co(OH)_2$/$Co_3O_4$/CC with previously reported non-precious metal electrocatalysts.

| Catalyst | Substrate | Electrolyte | $\eta_{10}$(mv vs RHE) | Tafel slope (mV dec-1) | Ref. |
|---|---|---|---|---|---|
| This work | CC | 1M KOH | 275 | 76 | |
| Fe-CoP/CoO | GCE | 1M KOH | 219 | 52 | 1 |
| $Co_{1.8}Ni(OH)_{5.6}$@$Co_{1.8}NiS_{0.4}(OH)_{4.8}$ | GCE | 0.1M KOH | 274 | 45 | 2 |
| Fe/Co200 | GCE | 1M KOH | 302 | 45 | 3 |
| $Co(OH)_2$ NPs/$Co_3O_4$ NCs | GCE | 1M KOH | 281 | 52.7 | 4 |
| $Co_3O_4$/$CeO_2$@N-CNFs | GCE | 0.1 M KOH | 310 | 85 | 5 |
| $Co_3O_4$/$Co(OH)_2$ | GCE | 1M KOH | 373 | 103.1 | 6 |
| $Fe_3O_4$/$Co(OH)_2$ NSs | GCE | 0.1 M KOH | 390 | 61.1 | 7 |
| CoFe LDH/$Co_{0.85}Se$ | CC | 1M KOH | 241 | 48 | 8 |

CC: Carbon cloth

GCE: Glassy carbon electrode

**Reference**


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