Supporting Information for

Bridged-multi-octahedral Cobalt Oxide Nanocrystals with Co-terminated Surface as Oxygen Evolution and Reduction Electrocatalyst

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Supporting Figures

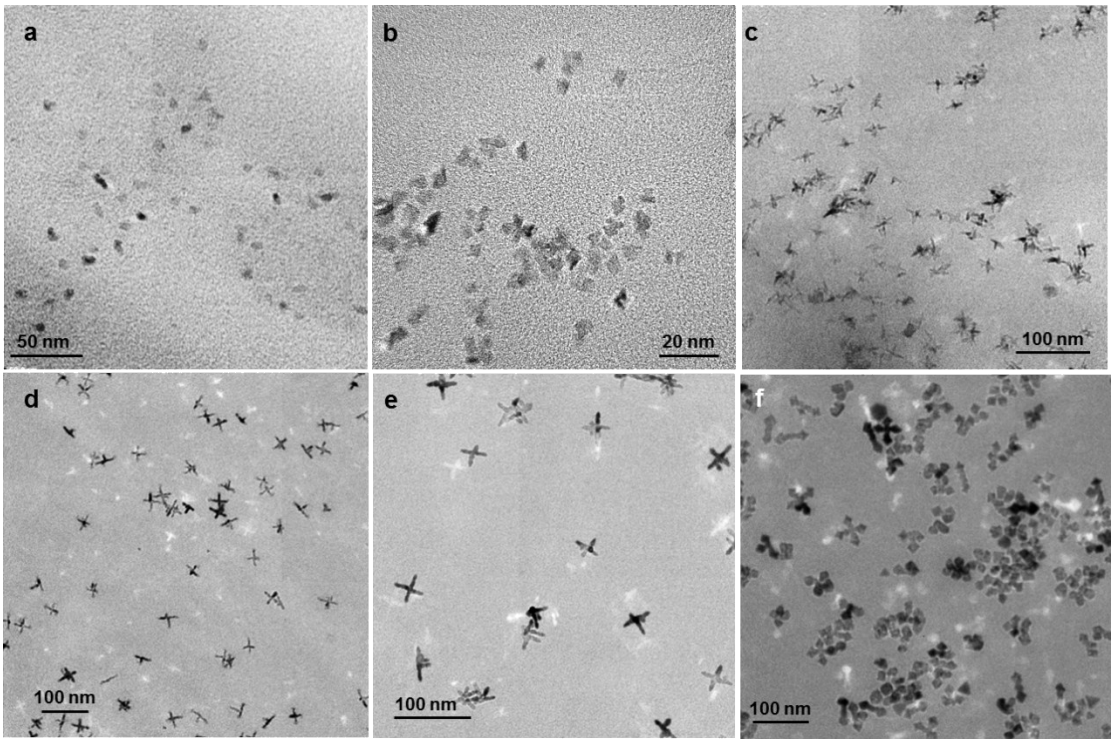

Figure S1. TEM images of cobalt oxide NCs obtained from (a) 1 min, (b) 5 min, (c) 15 min, (d) 60 min, (e) 90 min, and (f) 5 h reaction time.

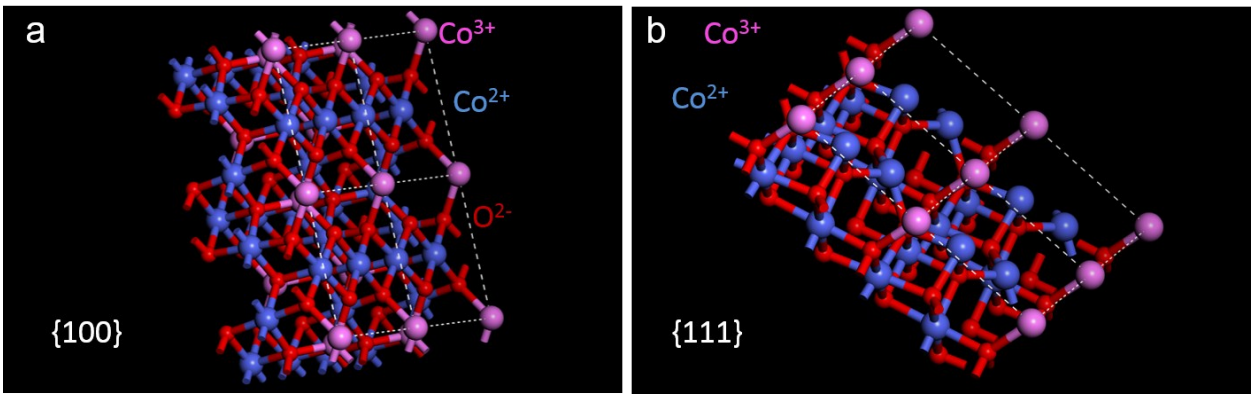

Figure **S2**. Structural models of (a) the {100} crystal facets of intermediate NCs (cubic spinel Co_3O_4), and (b) the {111} crystal facet of final NCs (cubic spinel Co_3O_4).

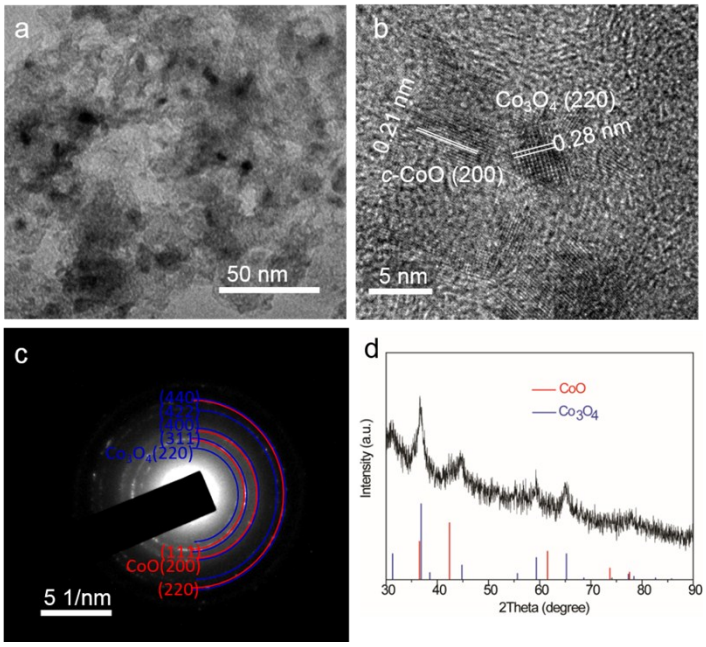

Figure S3. (a) TEM image of as-made hydrothermally synthesized CoO_x (CoO_x-HT) and inset SAED pattern indicates the cubic crystalline structure (JCPDS No. 43-1004) of the hydrothermally synthesized CoO_x. (b) HRTEM image of CoO_x-HT.

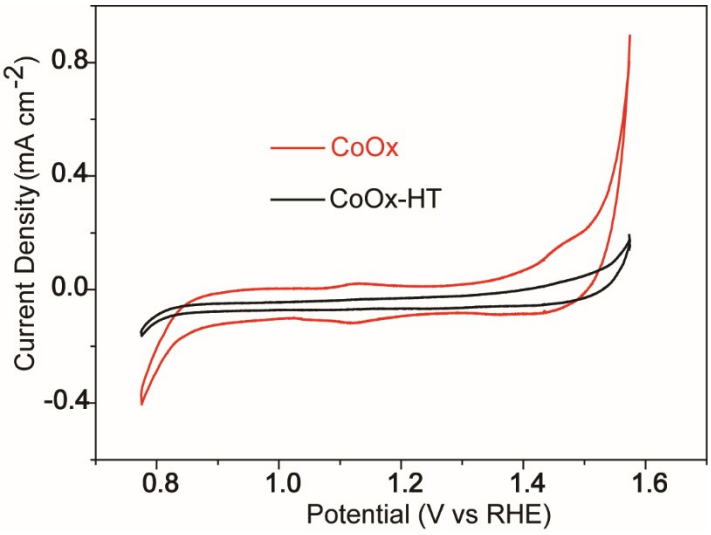

Figure S4. CV curves for the CoO_x NC and CoO_x-HT.

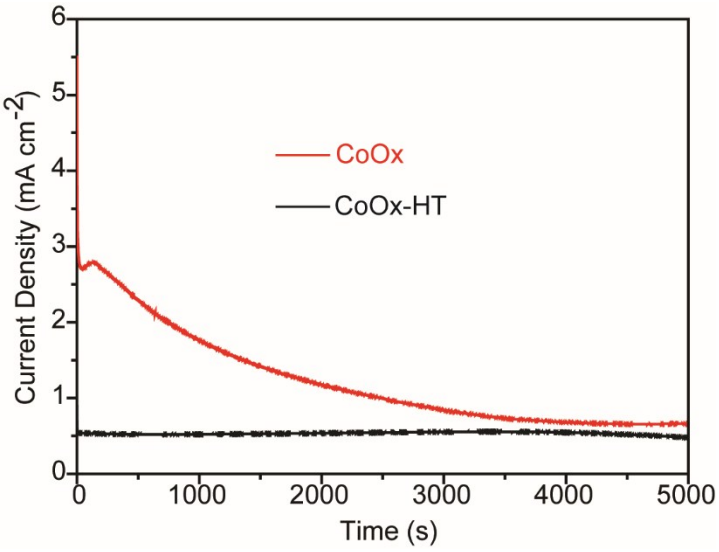

Figure S5. OER durability test of the CoO_x NC and CoO_x-HT.

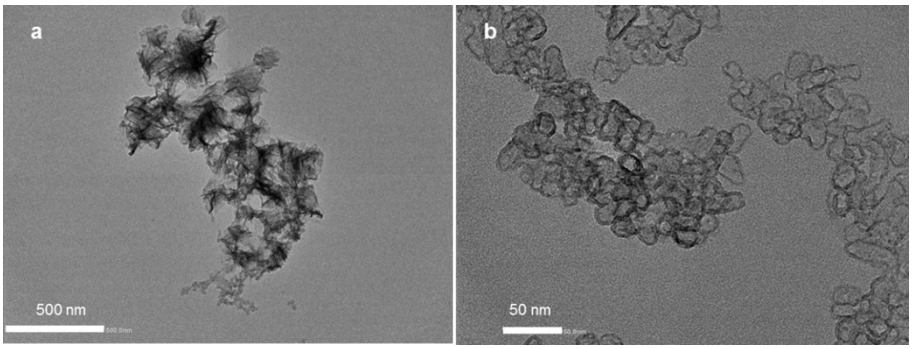

Figure S6. (a, b) TEM images of the CoO_x NC catalyst after the stability tests, indicating the degradation of CoO_x NC catalyst during the catalytic process.

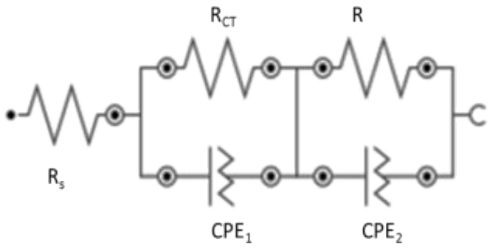

Figure S7. The electrical equivalent circuit for the EIS test.

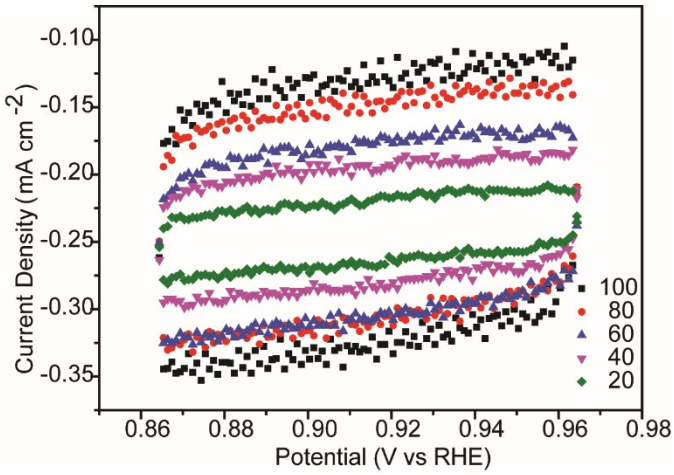

Figure S8. CVs scanned with different rates from 20 to 100 mV s^{-1} in the potential range of near 0.87 – 0. 97 V vs RHE for CoO_x-HT catalyst.

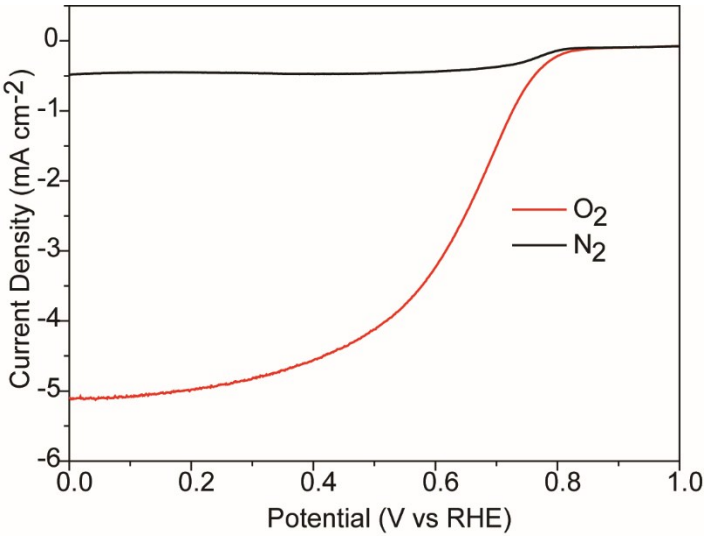

Figure S9. LSVs of CoO_x NC in oxygen and nitrogen saturated 0.1M KOH.

Supporting Table

Table S1. Comparison of the values of the fitted Nyquist plots for each sample.

Sample	R_s (Ω)	R_{CT} (Ω)	R (Ω)	CPE_1 (mF cm^{-2})	CPE_2 (mF cm^{-2})
CoO_x NC	5.43	**0.60**	47.3	4.01	1.68
CoO_x-HT	5.24	**4.37**	534	2.42	0.32