

## Supporting Information

### **Oxygen Vacancies Confined in Co<sub>3</sub>O<sub>4</sub> Quantum Dots for Promoted Oxygen Evolution Electrocatalysis**

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## S1. Crystal structure of pristine $\text{Co}_3\text{O}_4$ and oxygen defected $\text{Co}_3\text{O}_4$ quantum dots

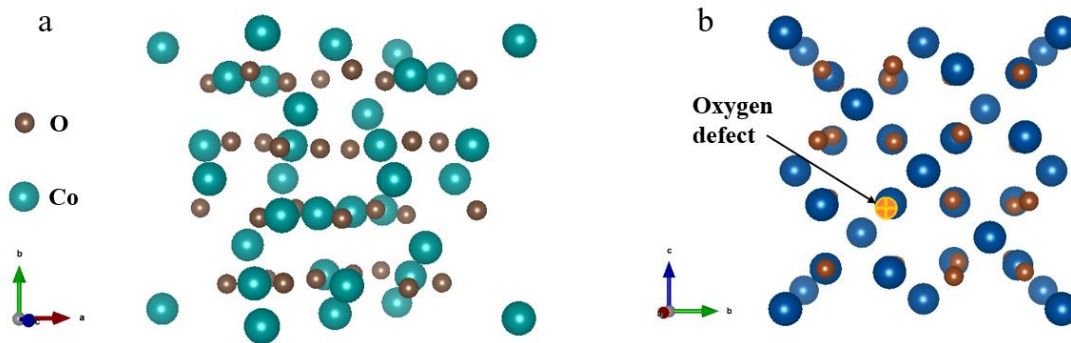


Figure S1 (a) The crystal structure of p- $\text{Co}_3\text{O}_4$  sample. (b) The schematic diagram of oxygen defects in the framework of  $\text{Co}_3\text{O}_4$  material.

## S2. TEM image and size distribution of p- $\text{Co}_3\text{O}_4$ quantum dots

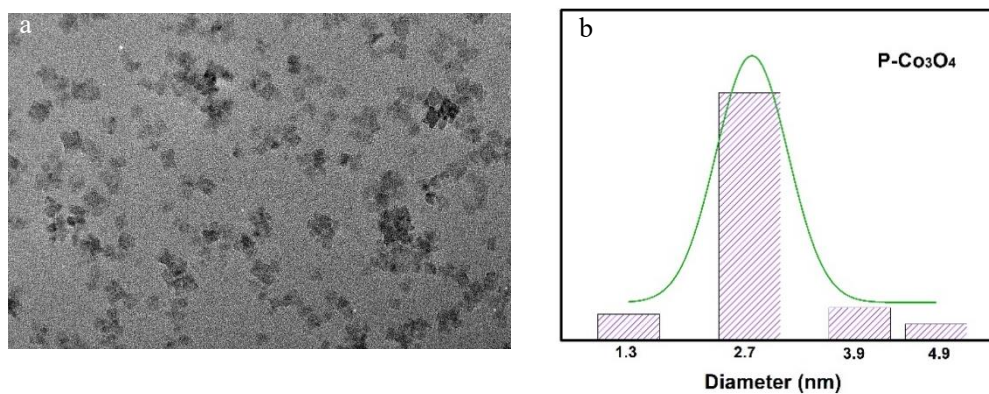


Figure S2 (a) TEM image of the obtained pristine  $\text{Co}_3\text{O}_4$  quantum dots. (b) Distribution diagram of particle size of pristine  $\text{Co}_3\text{O}_4$  quantum dots.

### S3. HRTEM image of p-Co<sub>3</sub>O<sub>4</sub> quantum dots

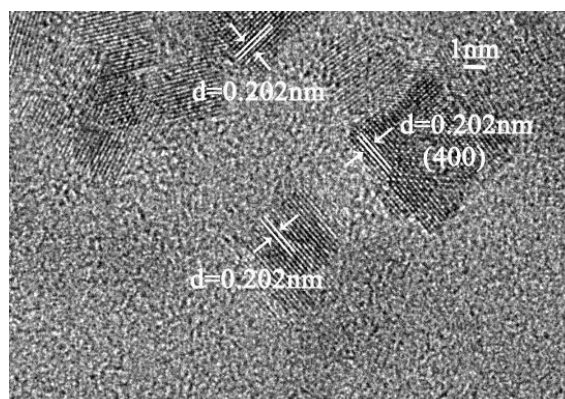


Figure S3 The HRTEM image of synthesized pristine Co<sub>3</sub>O<sub>4</sub> quantum dots.

### S4. The XRD patterns of various Co<sub>3</sub>O<sub>4</sub> products at different temperature

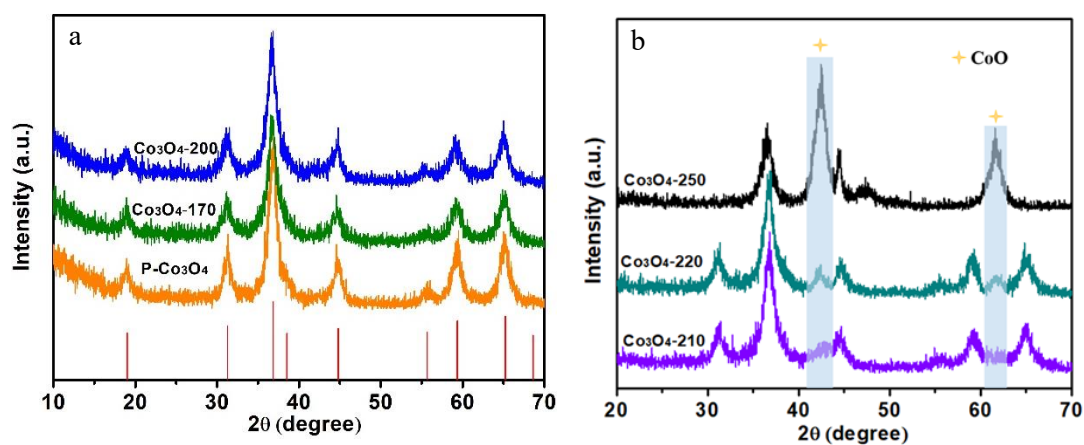


Figure S4 a-b) XRD patterns of as-obtained various Co<sub>3</sub>O<sub>4</sub> quantum dots that synthesized at different treatment temperature.

### S5. X-ray photoelectron spectroscopy investigation of p-Co<sub>3</sub>O<sub>4</sub> sample

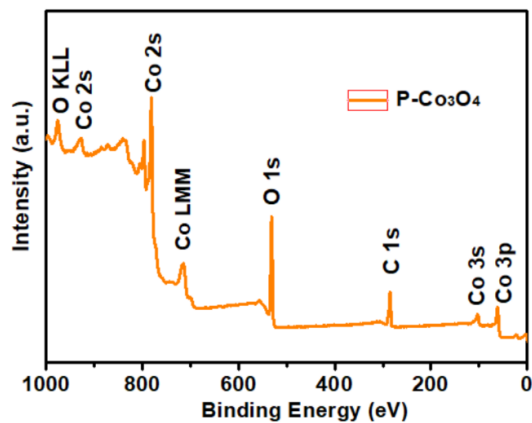


Figure S5 The XPS survey of as-obtained p-Co<sub>3</sub>O<sub>4</sub> products.

### S6. X-ray photoelectron spectroscopy investigation of Co<sub>3</sub>O<sub>4</sub>-200

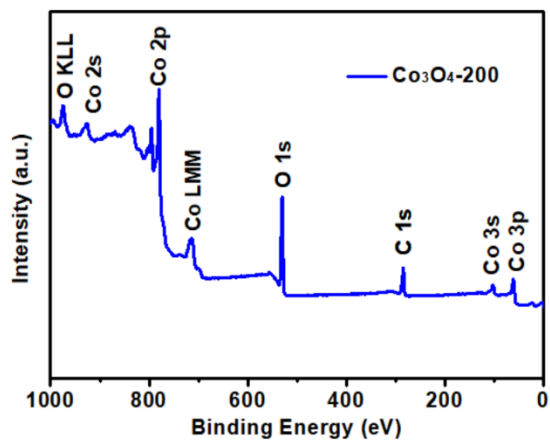


Figure S6 The XPS survey of as-obtained Co<sub>3</sub>O<sub>4</sub>-200 products.

### S7. The Co 2p XPS spectra of various Co<sub>3</sub>O<sub>4</sub> samples

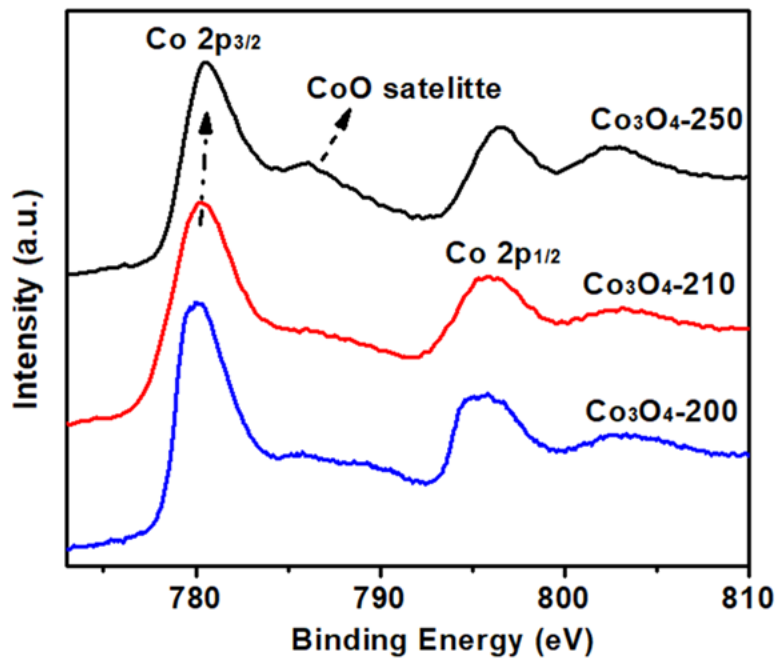


Figure S7 The Co2p XPS survey of as-obtained Co<sub>3</sub>O<sub>4</sub>-200, Co<sub>3</sub>O<sub>4</sub>-210 and Co<sub>3</sub>O<sub>4</sub>-250 products.

### S8. The stability test of Co<sub>3</sub>O<sub>4</sub>-200 for OER process

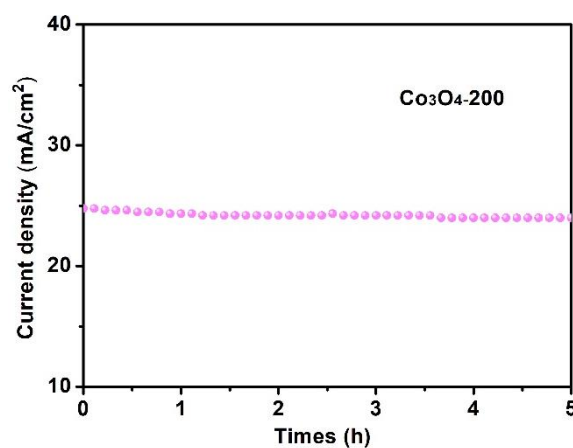


Figure S8 Chronoamperometric response of Co<sub>3</sub>O<sub>4</sub>-200 catalyst at the applied potential of 0.55V vs. Ag/AgCl.

### S9. The stability test of Co<sub>3</sub>O<sub>4</sub>-170 for OER process

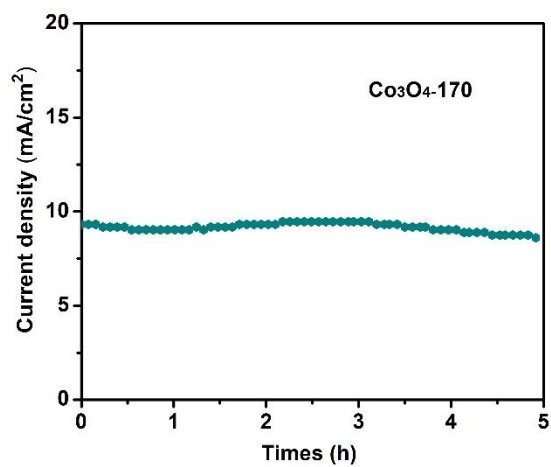


Figure S9 Chronoamperometric response of Co<sub>3</sub>O<sub>4</sub>-170 catalyst at the applied potential of 0.55V vs. Ag/AgCl.