

## Supporting Information

### Facile synthesis of hierarchical porous $\text{Co}_3\text{O}_4$ nanoboxes as the efficient cathode catalysts for Li-O<sub>2</sub> batteries

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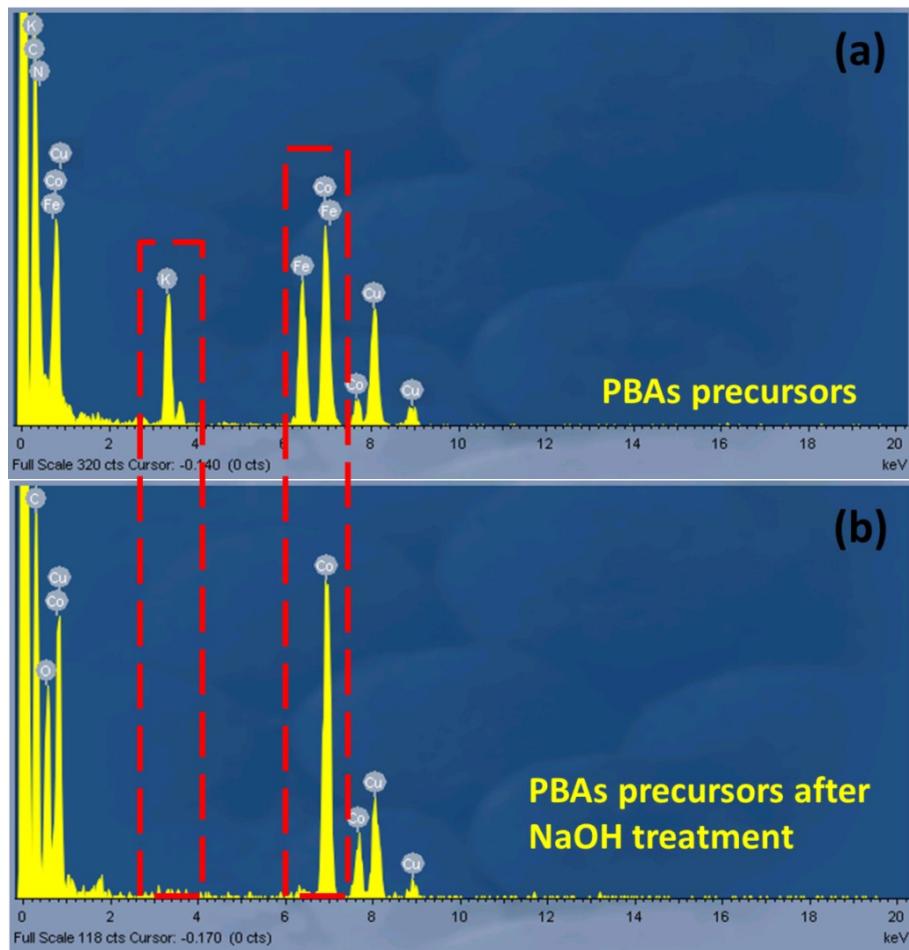
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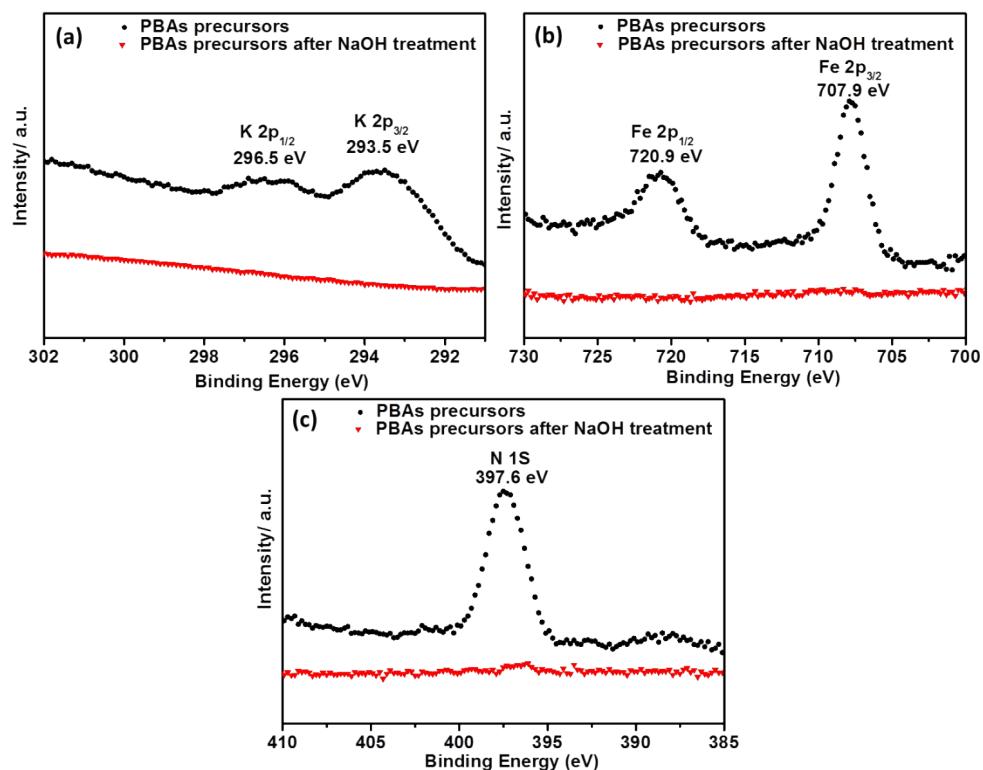
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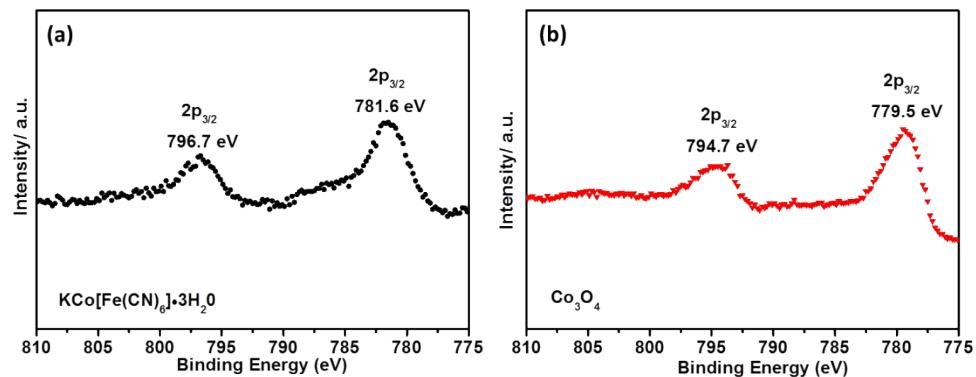
‡These authors contributed equally to this work.



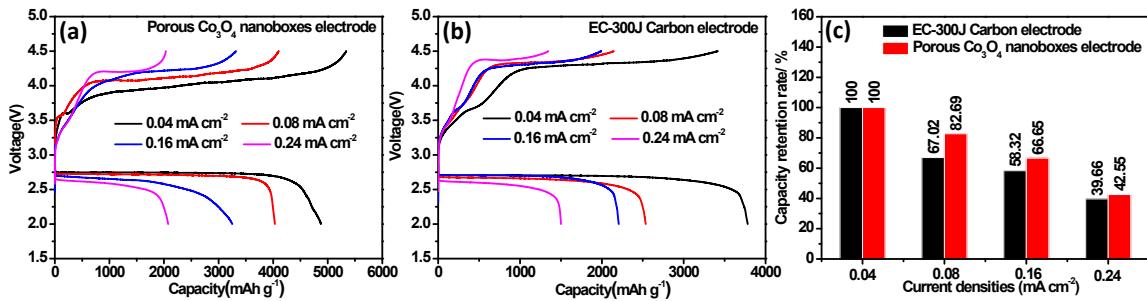
**Fig. S1** EDX spectra of the PBAs precursors (a) before and (b) after the NaOH treatment.



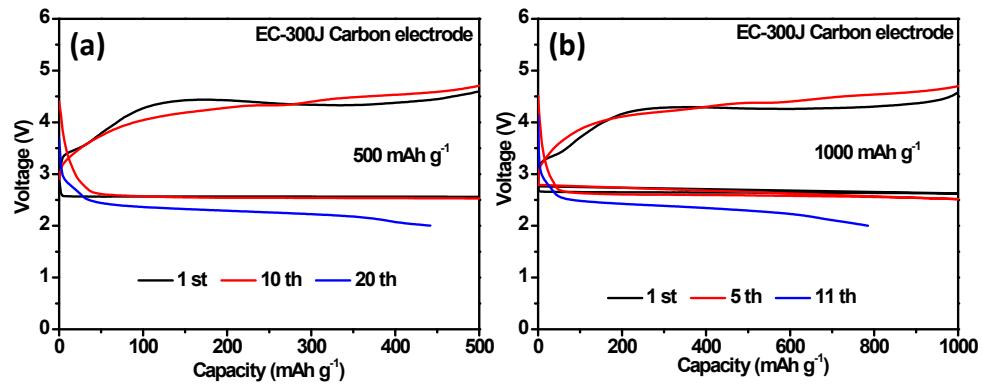
**Fig. S2** XPS spectra of (a) K, (b) Fe and (c) N elements for the PBAs precursor before (black) and after (red) NaOH treatment.



**Fig. S3** XPS Co 2p core level spectra of (a) porous PBAs precursors and (b) hollow  $Co_3O_4$  nanoboxes.



**Fig. S4** First discharge-charge curves of Li-O<sub>2</sub> batteries with (a) porous porous  $\text{Co}_3\text{O}_4$  nanoboxes and (b) EC-300J carbon electrodes at various current densities; (c) Discharge capacity retention of Li-O<sub>2</sub> battery cells with different electrodes at various current densities.



**Fig. S5** Cyclic performance of EC-300J carbon electrodes at 0.16  $\text{mA cm}^{-2}$  with limited capacity of (a) 500  $\text{mAh g}^{-1}$  and (b) 1000  $\text{mAh g}^{-1}$ , respectively.