

# Supporting Information

## **Hierarchical interconnected macro-/mesoporous Co-containing**

## **N-doped carbon for efficient oxygen reduction reactions**

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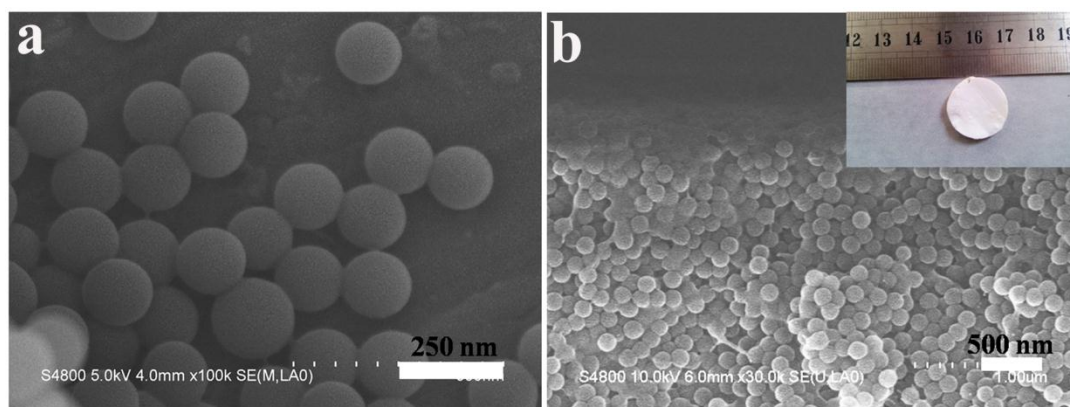
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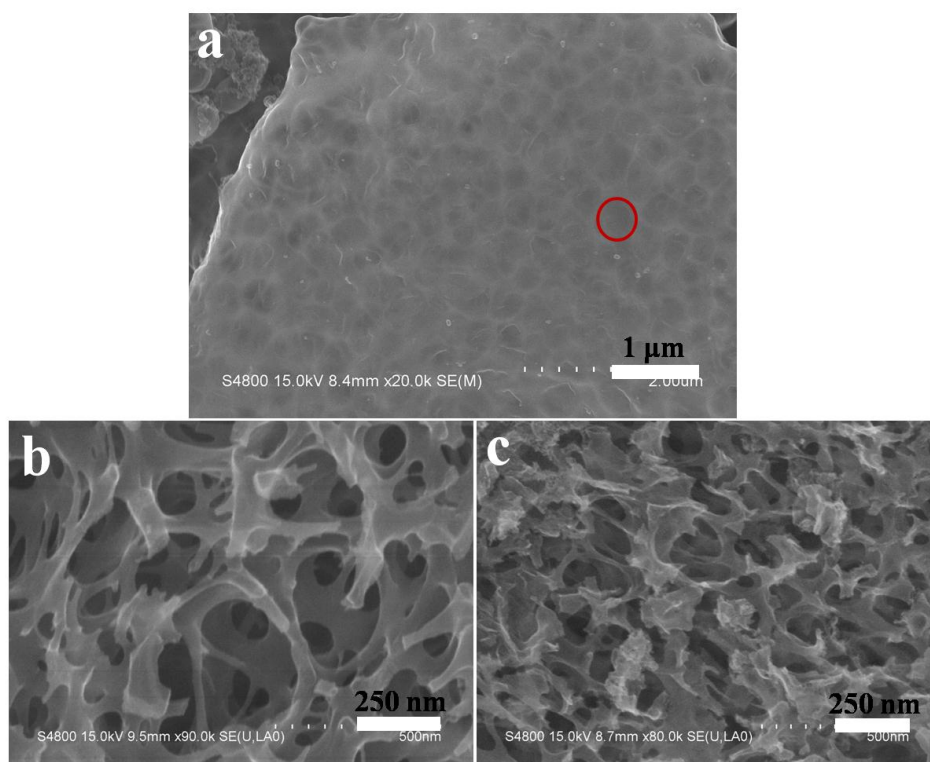
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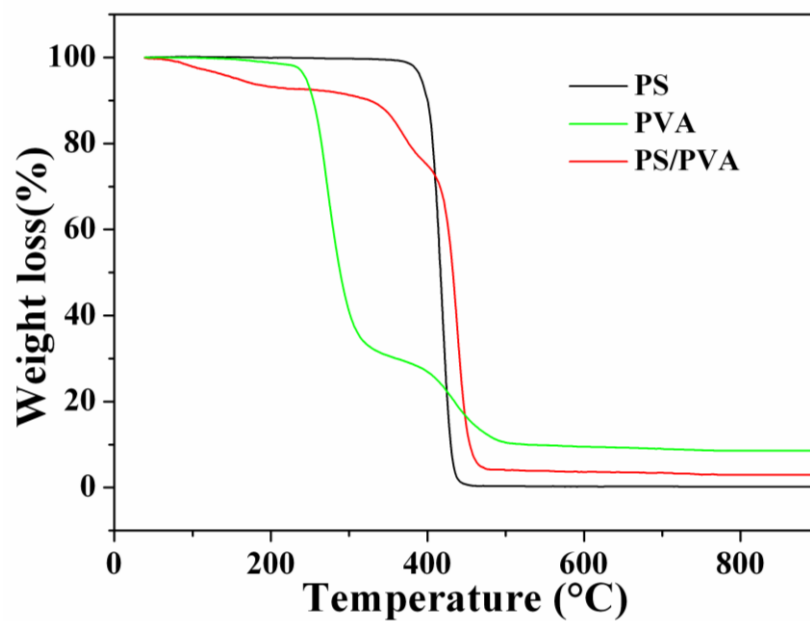
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**Figure S1.** SEM images of (a) PS colloidal spheres and (b) composites of PVA and PS. Inset: an optical photo of the composites of PVA and PS.



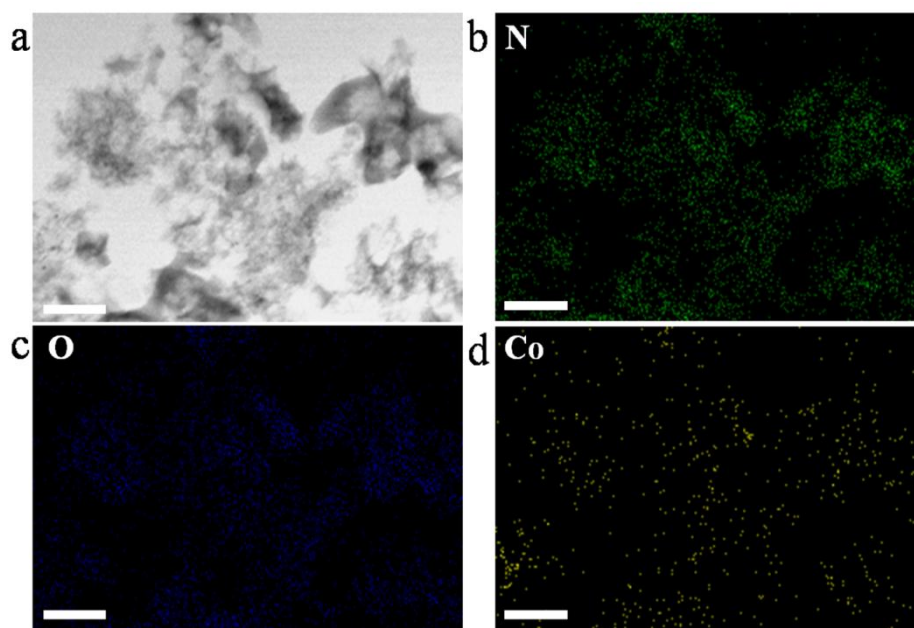
**Figure S2.** SEM images of (a) HP-Co-CN-550, (b) HP-Co-CN-800, and (c) HP-Co-1000.



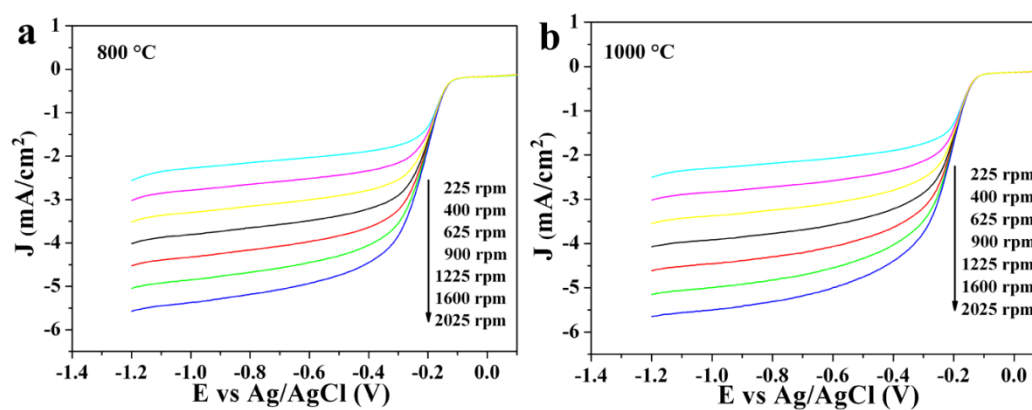
**Figure S3.** The thermogravimetric analysis (TGA) of PS, PVA, and PS/PVA.

**Table 1.** Atomic concentrations (at%) of C, Co, and heterocyclic N components of all as-prepared samples from XPS analysis.

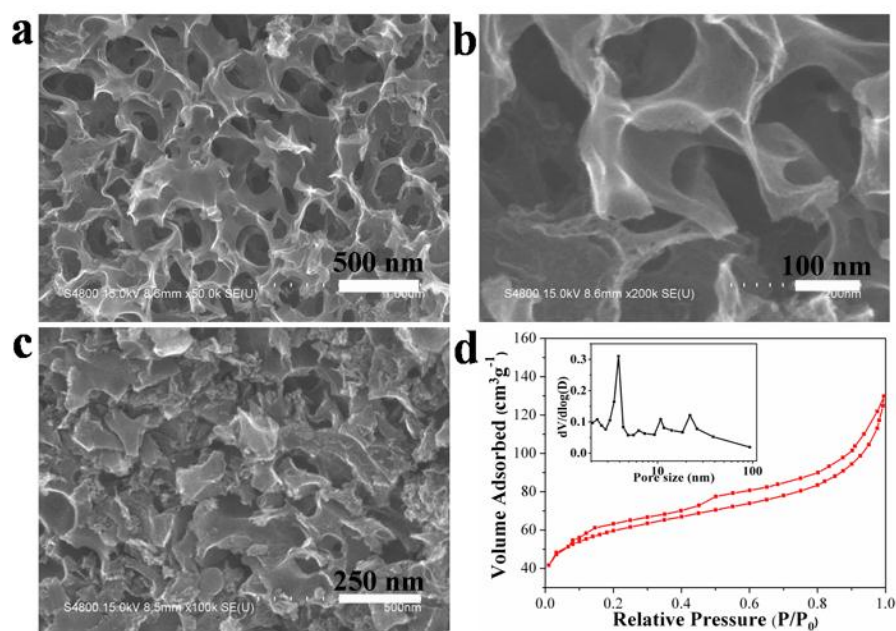
Sample	Co	C	N	N1	N2	N3	N4
HP-Co-CN-800	0.22	77.14	10.13	4.39	2.14	2.36	1.24
HP-Co-CN-900	0.35	81.85	9.08	3.07	1.91	3.57	0.53
HP-Co-CN-1000	0.18	83.72	6.80	0.92	2.01	2.70	1.17
HP-CN	0	82.15	9.12	3.15	1.87	3.51	0.59
Co-CN	0.3	83.12	9.65	3.40	1.95	3.47	0.83



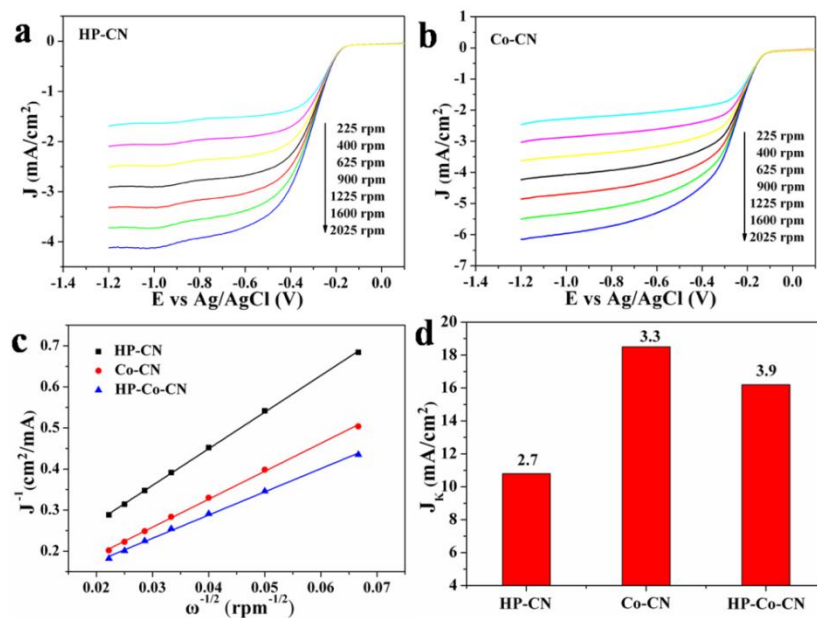
**Figure S4** EDS elemental mapping indicating the distribution of N, O, and Co in HP-Co-CN-900.



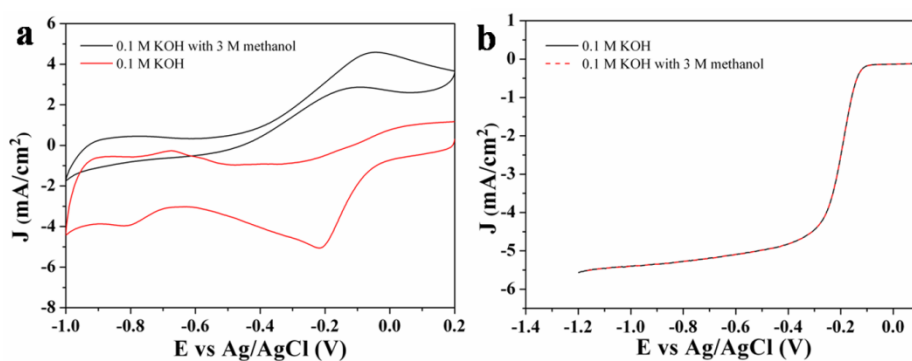
**Figure S5.** RDE linear sweep voltammograms recorded for HP-Co-CN-800 and HP-Co-CN-1000 supported on a GC electrode in an O<sub>2</sub>-saturated 0.1M KOH solution at a scan rate of 10 mV s<sup>-1</sup> and different rotation rates.



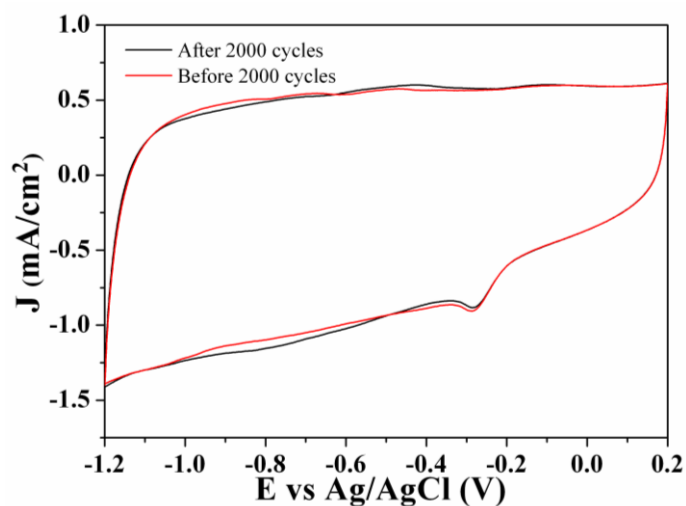
**Figure S6.** (a) Low-magnification and (b) high-magnification SEM images of as-synthesized HP-CNs. (c) SEM images of the Co-CNs. (d) N<sub>2</sub> adsorption-desorption isotherms and the corresponding pore size distribution (inset) of the Co-CNs.



**Figure S7.** Linear sweep voltammograms recorded for HP-CNs and Co-CNs supported on a GC electrode (c) K-L plots and (d) electrochemical activity given as the kinetic current density ( $J_K$ ) at -0.5 V from HP-CNs, Co-CNs, and HP-Co-CNs, respectively.



**Figure S8.** (a) Cyclic voltammograms of Pt/C and (b) linear sweep voltammograms of HP-Co-CN-900 in O<sub>2</sub>- or N<sub>2</sub>-saturated 0.1 M KOH solutions as well as O<sub>2</sub>-saturated 0.1 M KOH solution with 3 M CH<sub>3</sub>OH.



**Figure S9.** CV of HP-Co-CN-900 before and after stability test (2000 cycles in oxygen-saturated 0.1 M KOH at a scan rate of 100 mV s<sup>-1</sup>).