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# Supporting Information

### Self-template synthesized ZIF-derived polyhedron-connected

#### porous Co-N-C as oxygen reduction catalyst for Zn-Air batteries

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#### 1.Characterization of Co-ZnO



Fig. S1 XRD of Co-ZnO.



Fig. S2 SEM of Co- ZnO with different Co contents:(a-b) 5%, (c-d) 7%.

2.Characterization of Co-ZnO@ZIF



Fig. S3 Co-ZnO@ZIF with different amount of Co doping



Fig. S4 SEM of Co-doped catalysts with different Co contents (a-b) 5%, (c-d)

7%.

3. Characterization of Co-ZIF-67 and C-Co-ZIF-67



Fig. S5 (a-b) SEM of Co-ZIF-67 precursor, (c-d) SEM of C-Co-ZIF-67 catalysts

4. Characterization and electrochemical test of electrocatalysts



Fig. S6 (a) SEM of Co-N-C-7%. (b)SEM of Co-N-C-7% after stability testing.



Fig S7 (a) Nyquist plots of Co-N-C-7% and Co-N-C-10%, (b) Fitted EIS and equivalent circuit of Co-N-C-7%, (c) Fitted EIS and equivalent circuit of Co-N-C-10%.

Table.	S1	Specific	surface	area and	average	nore s	size o	of Co	N-C	catal	vsts
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Sample	BET surface area (m <sup>3</sup> g <sup>-1</sup> )	Average pore diameter (nm)
Co-N-C-5%	336.81	1.946
Co-N-C-7%	312.23	2.197
Co-N-C-10%	292.78	1.634