**Supplementary Information**

**Cobalt-based** **multicomponent nanoparticles supported on N-doped graphene as advanced cathodic catalyst for zinc-air batteries**

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**Fig. S1.** EDS spectrum and relative contents of different elements in Co/Co3O4/CoN/NG.



**Fig. S2.** High resolution spectrum of C 1s for pristine GO.



**Fig. S3.**  Galvanostatic charge-discharge cycling curves of Co/Co3O4/CoN/NG+RuO2-based rechargeable ZABs at the current density of 10 mA∙cm−2.