Supplementary Information for:

Rechargeable zinc-air battery using Co₃O₄ nanoparticle-modified MnO₂ nanotubes as air-cathode catalysts

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Fig. S1. The photo of the home-made zinc-air cell device.

A home-made zinc-air cell device was designed for the battery test. The air electrode was prepared by spraying the catalyst onto a gas diffusion layer (SGL Carbon paper, Germany, 2 cm \times 2 cm) to achieve a loading of 2 mg cm⁻². The electrolyte used in the zinc-air battery was 6 M KOH, and a polished zinc plate was used as the anode.



Fig. S2. XPS spectrum of MnO₂/Co₃O₄ hybrid nanomaterials.

X-ray photoelectron spectroscopy (XPS) was utilized to probe the Mn, Co, O and C elements of the hybrid nanomaterials.



Fig. S3. Power densities of the zinc-air battery using MnO_2 nanotubes and MnO_2/Co_3O_4 hybrid nanomaterials as bifunctional air cathode catalysts.

The maximum power density of the MnO_2 nanotubes and MnO_2/Co_3O_4 hybrid nanomaterials is 36 and 33 mW/cm² at 25 °C, respectively.