## Modified template synthesis and electrochemical performance of

## Co<sub>3</sub>O<sub>4</sub>/mesoporous carbon composite as a cathode material for

## lithium-oxygen batteries

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 Cathode Current Collector

 Oxgen Path

 Valve

 PTE Full

 Sign electrode layer

 Oxgen electrode layer

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Fig. S1 The construction view of the homemade Lithium air battery device



Fig. S2 The X-ray photoelectron spectrum for B of the Co<sub>3</sub>O<sub>4</sub>/C sample



Fig. S3 The TG-DSC curves of the as-prepared  $Co_3O_4/C$  sample in air, conducted at a heating rate of 10 °C min<sup>-1</sup>.



Fig. S4 The XRD patterns of the as-prepared  $Co_3O_4/C$  sample (H<sub>3</sub>BO<sub>4</sub>-free) without additional addition of H<sub>3</sub>BO<sub>4</sub> during synthesis.



Fig. S5 The FE-SEM image of the as-prepared Co<sub>3</sub>O<sub>4</sub>/C (H<sub>3</sub>BO<sub>4</sub>-free) sample.



Fig. S6 The XRD patterns of the as-prepared nano Co<sub>3</sub>O<sub>4</sub> sample.



Fig. S7 The FE-SEM image of the as-prepared nano Co<sub>3</sub>O<sub>4</sub> sample.