Supplementary Information

Fig. S1

Fig. S1 XRD patterns of as-synthesized transition metal oxide/hydroxide samples, (a) Co$_3$O$_4$, (b) Ni(OH)$_2$, (c) NiO, and (d) CuO.
Fig. S2

Fig. S2 XRD patterns of Co-based products synthesized at 160 °C for different reaction time: (a) 3 and (b) 6.0 hours.
Fig. S3

Fig. S3 SEM images of (a) Co-based, (b) Ni-based, and (c) CuO products obtained by the conventional hydrothermal method and (d) corresponding XRD patterns for these products.
Fig. S4

Fig. S4 Coulombic efficiency of Co$_3$O$_4$ hierarchical structures at the current density of 89 mA/g with a voltage window of 0.01–3.0 V.
Fig. S5 Cycling performance of Co-based material prepared by the conventional hydrothermal method at a current density of 89 mA/g with a voltage window of 0.01–3.0 V.
Fig. S6

Fig. S6 Nitrogen adsorption and desorption isotherms for (a) the Co$_3$O$_4$ hierarchical structures synthesized through the modified hydrothermal process; (b) Co$_3$O$_4$ obtained through the conventional hydrothermal method.
Fig. S7 Cycling performances of (a) NiO and (b) CuO samples, obtained through the conventional hydrothermal method, at 0.1 C, e.g. (a) 72 mA/g and (b) 67 mA/g, within a voltage window of 0.01–3.0 V, respectively.