Electronic supplementary information (ESI)

Ni-enhanced Co$_3$O$_4$ nanoarrays in-situ grown on Cu substrate as integrated anode materials for high-performance Li-ion batteries

Xiaoyu Liu,$^{ab}$ Shimou Chen,$^b$ Jia Yu,$^b$ Wenlong Zhang,$^a$ Yajie Dai$^a$ and Suojiang Zhang$^{*b}$

$^a$ School of Electrical and Electronic Engineering, Harbin University of Science and Technology, Harbin, Heilongjiang,150040, PR China.

$^b$ Beijing Key Laboratory of Ionic Liquids Clean Process, Key Laboratory of Green Process and Engineering, Institute of Process Engineering (IPE), Chinese Academy of Sciences (CAS), Beijing 100190, PR China.

Figure S1 EDS mapping of Co (a), O (b), Ni (c), and Cu (d) from the Co$_3$O$_4$-Ni@Cu.
Figure S2 XRD spectrum of Co$_3$O$_4$-Ni@Cu nanoarrays.

Figure S3 SEM image of Co$_3$O$_4$@Cu nanoarrays.
**Figure S4** SEM image of Co$_3$O$_4$-Ni@Cu nanoarrays with electrodepositing time of (a) 2s and (b) 6000s, respectively. Inset: photographs of the products with an electrodepositing time of 6000s.

**Figure S5** Cycling performance of the Co$_3$O$_4$-Ni@Cu nanoarray anodes and Co$_3$O$_4$@Cu nanoarray anodes with a current of 0.1 C.
Figure S6 Impedance spectra of Co$_3$O$_4$@Cu nanoarray anodes and Co$_3$O$_4$-Ni@Cu nanoarray anodes before cycling.