Electronic Supplementary Information for

Formation and its mechanism of nano-monocrystalline $\gamma$-Fe$_2$O$_3$ with graphene-shell for high-performance lithium ion battery

Jiangtao Hu, Wen Li, Chaokun Liu, Hanting Tang, Hua Guo, Tongchao Liu, Xiaohe Song, Jiaxin Zheng, Yidong Liu, Yandong Duan* and Feng Pan*

School of Advanced Materials, Peking University Shenzhen Graduate School, Peking University, Shenzhen 518055, China

* Corresponding author: panfeng@pkusz.edu.cn

‡ Jiangtao Hu and Wen Li contributed equally to this work.

Figure S1. The crystal structure of $\gamma$-Fe$_2$O$_3$. 
Figure S2. The X-ray photoelectron spectroscopy (XPS) spectra (Fe 2p spectra) of monocrystal $\gamma$-Fe$_2$O$_3$@Graphene.
Figure S3. The cycle stability and coulombic efficiency of monocrystalline $\gamma$-Fe$_2$O$_3$@Graphene at 1C.
Figure S4. The TEM data of monocrystal γ-Fe$_2$O$_3$@Graphene after 100 cycles.
Figure S5. (a) EIS data of monocrystal γ-Fe$_2$O$_3$@Graphene with the fresh battery; (b and c) EIS data and equivalent circuit of our previous work (Core-Shell Nanohollow-γ-Fe$_2$O$_3$@Graphene) and monocrystal γ-Fe$_2$O$_3$@Graphene after different cycle numbers.