Supporting information

Trace Fe$^{3+}$ mediated synthesis of micro/nano structures LiFePO$_4$
towards electrochemical performance for Lithium-ion Batteries

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**Fig. S1.** (a) The TEM image of LFP-4 (b) The SAED pattern and HRTEM image of the side location of bulk LiFePO$_4$ (c) Schematic illustration of LFP-4

**Fig. S2** (a) The equipments of FeSO$_4$-EG solution stirred under an inert circumstance. (b) SEM images of LFP-5 (c) XRD patterns of the samples
Fig. S3. XRD patterns of the samples: (a) LFP-1A (b) LFP-2A (c) LFP-3A and (d) LFP-4A.
Fig. S4. The lower magnification SEM images (a) LFP-1 (b) LFP-2 (c) LFP-3 (d) LFP-4 and carbon coating LiFePO₄ samples (e) LFP-1A (f) LFP-2A (g) LFP-3A (h) LFP-4A