Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Electronic Supporting Information

In-situ Quantization of Ferroferric Oxide Embedded in Micro 3D Carbon for Ultrahigh Performance Sodium-Ion Battery

Li-Ya Qi,[a] Yi-Wei Zhang,[a] Zi-Cheng Zuo,[b] Yue-Long Xin,[a] Cheng-Kai Yang,[a] Bin Wu,[b] Xin-Xiang Zhang[a] and Heng-Hui Zhou[a*]

[a] College of Chemistry and Molecular Engineering, Peking University,

Beijing, P. R. China.

[b] Beijing Engineering Research Center of Power Lithium-ion Battery,

Beijing 102200

* Corresponding Author: E-mail: hhzhou@pku.edu.cn; wubin@pulead.com.cn

Fax & Tel: +861062757908.

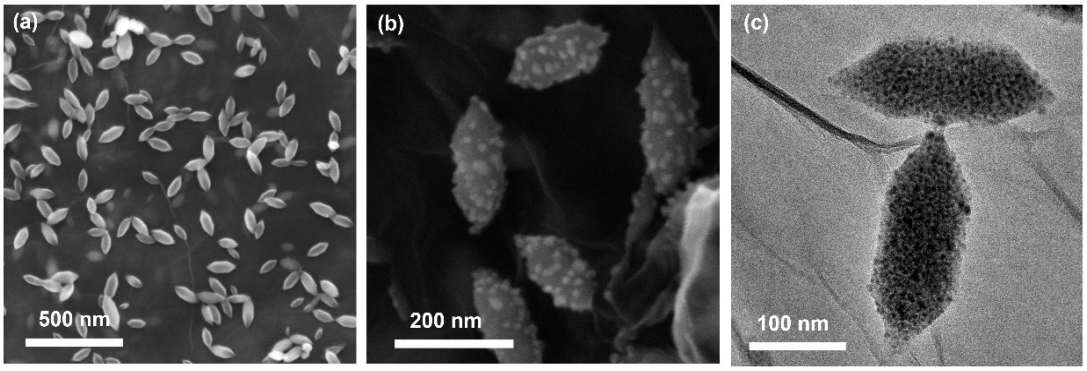

Figure S1. a) SEM image of the as-prepared iron-based MOF composite. b) SEM image of raspeberry-like microstructures anchored on graphene sheets. c) TEM image of Fe_3O_4 QD@C-GN.

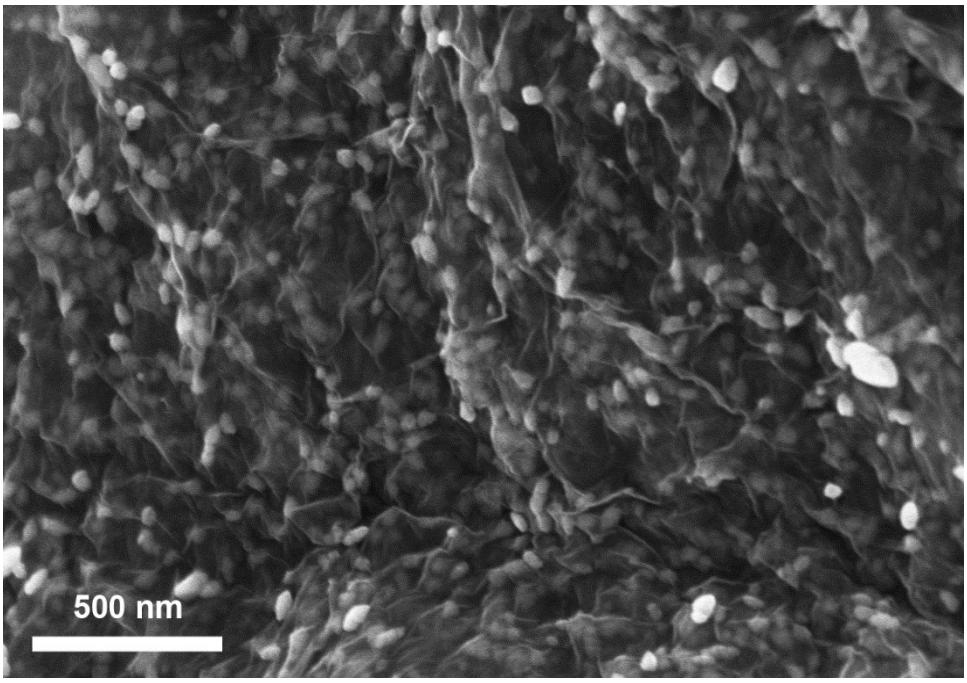

Figure S2. SEM image of bulk Fe_3O_4-GN obtained under a similar condition.

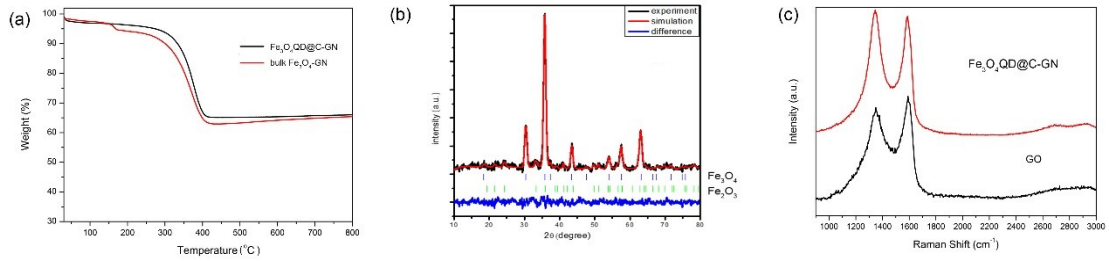

Figure S3. a) TGA curves of Fe_3O_4 QD@C-GN and bulk Fe_3O_4-GN. b) refinement XRD patterns. c) Raman spectra of Fe_3O_4 QD@C-GN and GO.

Table S1. Physical features of rolling and slurry-casting method

Method	Diameter	Thickness	Mass (Electrode)	Mass (Active Material)
Rolling	1.2 cm	10 µm	1 mg	1 mg
Slurry-casting	1.2 cm	30 µm	16 mg	5 mg

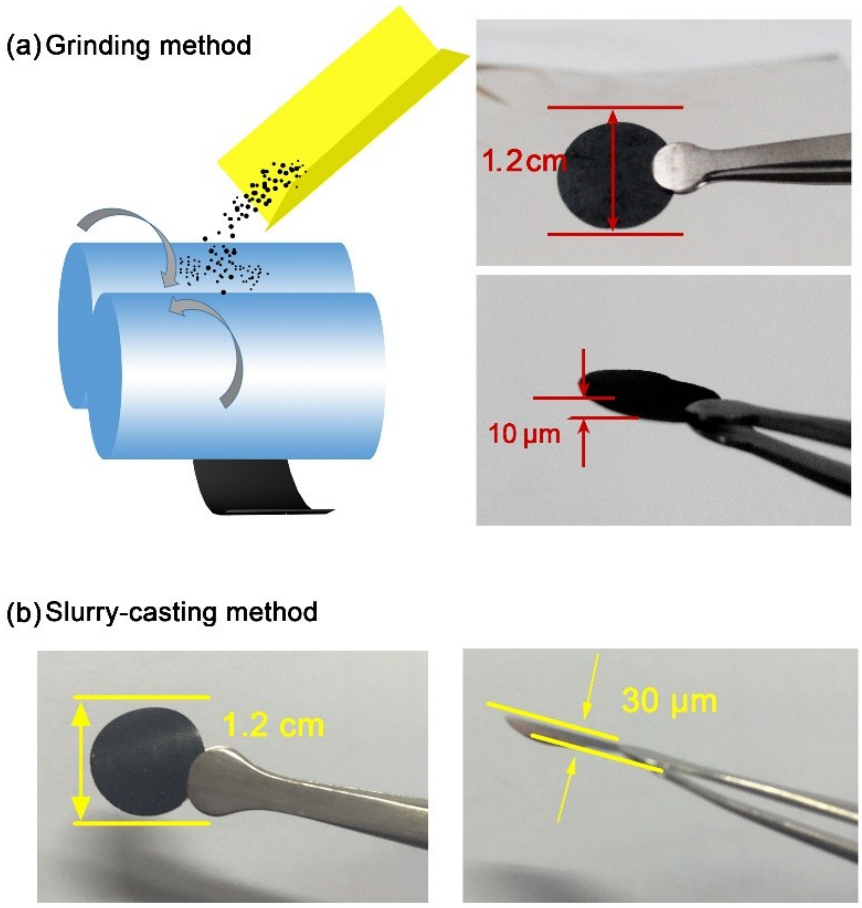

Figure S4. a) Schematic illustration of the preparation process of a "rolling" method and the obtained free-standing electrodes. b) The obtained electrodes through traditional slurry-casting method.

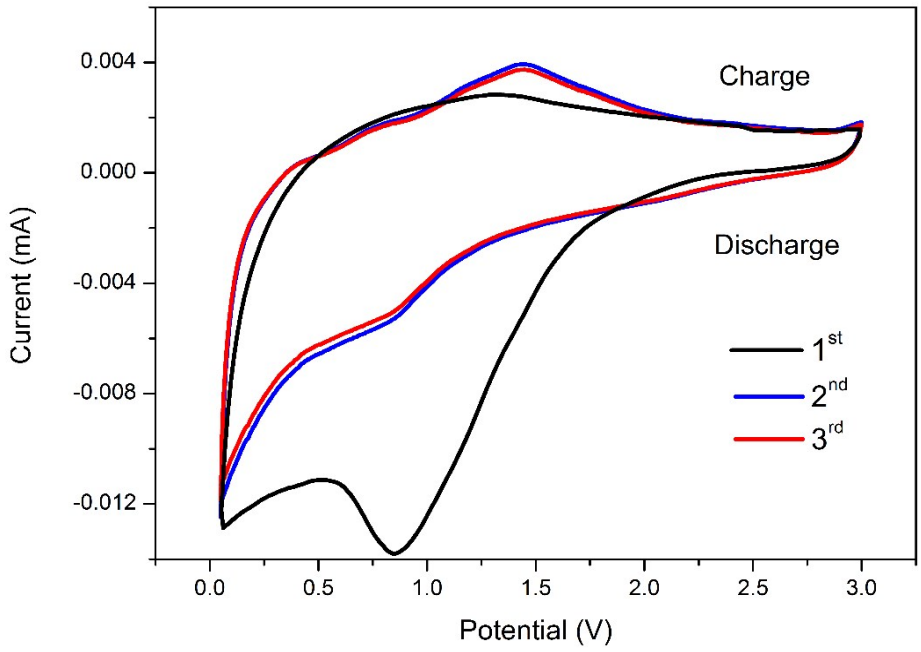

Figure S5. The first three cycles of CVs at a scanning rate of 0.1 mV s^{-1}.

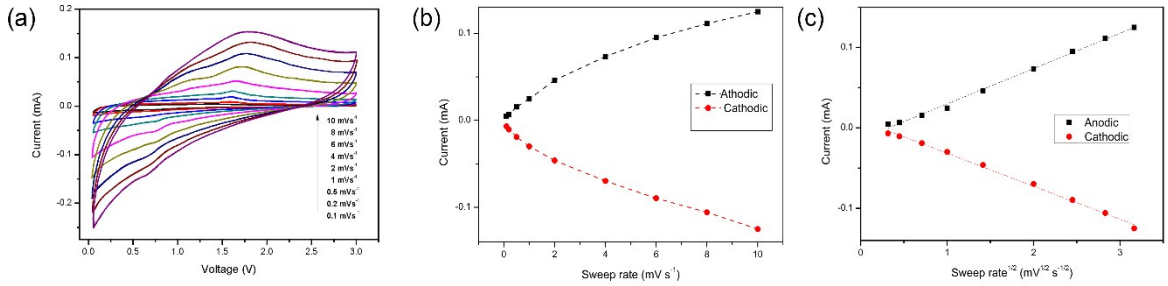

Figure S6. a) CVs of bulk Fe_3O_4-GN at a potential scanning rate from 0.1 to 10 mV s^{-1}. b) Peak currents of various sweep rates. c) Peak currents vs. square root of sweep rate.

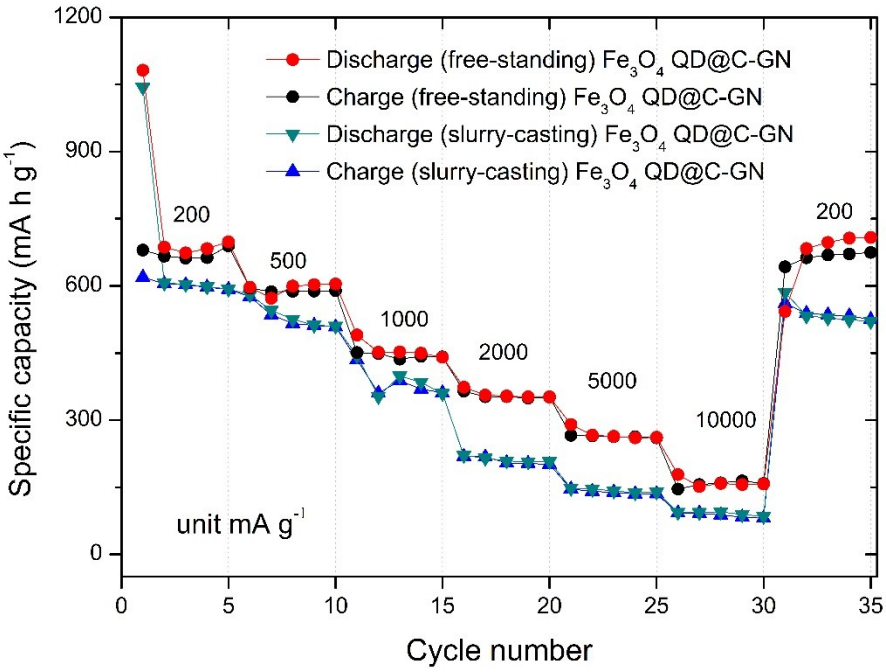

Figure S7. Rate capacity of Fe_3O_4 QD-GN electrode prepared through rolling and slurry-casting method by at different current densities.