

Supporting Information

Large-scale synthesis of ultrafine Fe₃C nanoparticles embedded in mesoporous carbon nanosheets for high-rate lithium storage

Ying Yu^{a,b,c,†}, Xuanli Wang^{a,†}, Hongkun Zhang^{b,c,}, Zhiqin Cao^d,*

Haoyang Wu^{a,}, Baorui Jia^a, Jun Jun Yang^a, Xuanhui Qu^{a,e}, Mingli Qin^{a,e,*}*

^a Institute for Advanced Materials and Technology, University of Science and Technology Beijing, Beijing 100083, China

^b China United Test & Certification Co., Ltd

^c GRINM Group Corporation Limited

^d College of Vanadium and Titanium, Pan Zhihua University, Pan Zhihua 617000, China

^e Beijing Advanced Innovation Center of Materials Genome Engineering, University of Science and Technology Beijing, Beijing 100083, China

†These authors contributed equally to this work.

Corresponding author:

E-mail:

zhk@cutc.net (Hongkun Zhang),

wuhaoyang@ustb.edu.cn (Haoyang Wu),

qinml@mater.ustb.edu.cn (Mingli Qin).

Supplementary Figures

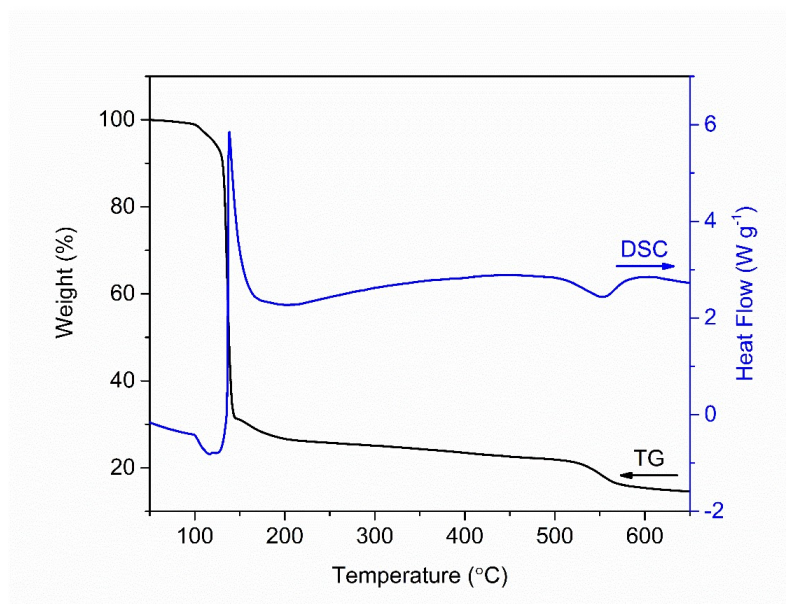


Fig. S1 TG -DSC curves of SCS precursor.

A violent exothermic reaction takes place at about 150 °C accompanied by about 70% weight loss, which is attributed to the thermally induced redox reaction between iron nitrate and glycine. With the heating temperature increasing, another small endothermic peak appears at about 550°C, with a loss of about 15%. This may be ascribed to the oxidation of carbon generated by the decomposition of glucose. Further increase in temperature does not change the weight, implying the end of reaction.

Supplementary Tables

Table. S1 The discharge capacity comparison between this work and related reference.

Ref	anode material	reversible capacity/mAh/g	current density/mA/g
this work	Fe ₃ C@MCNSs	706 (300cycles)	1000
Electrochim. Acta, 2013,87:180-185	Fe@Fe ₃ C/C	500 (30cycles)	50
ACS Nano, 2014,8:3939-3946	Fe ₂ O ₃ /Fe ₃ C-graphene heterogeneous thin film	983 (100cycles)	0.17C
ACS Nano,2015,9:3369-3376.	Fe ₃ O ₄ @Fe ₃ C core@shell carbon nanospindles	530.2	500
Nano Research, 2017,10(9):3164-3177.	Fe ₂ O ₃ /Fe ₃ C-porous carbon nanosheets	857 (100cycles)	100
Chemical Engineering Journal, 2014,258:93-100	N-doped graphene/Fe-Fe ₃ C	607 (100cycles)	1000
Electrochimica Acta, 2015,180:78-85	Fe ₃ C/porous carbon sphere	533.6 (250cycles)	100
Electrochim Acta,2014,116:292-299	Fe ₃ C embedded into nitrogen-doped carbon	750 (120cycles)	100
Journal of Alloys and Compounds, 2021,881:10661	Fe ₃ C/porous carbon	584 (150cycles)	100
Electrochimica Acta, 2015,178:468-475	Fe ₃ C@carbon nanocapsules/expanded graphite	451.5	200