Supporting Information for

A facile synthesis of Fe_3O_4 nanoparticles/graphene for high-performance lithium/sodium-ion batteries

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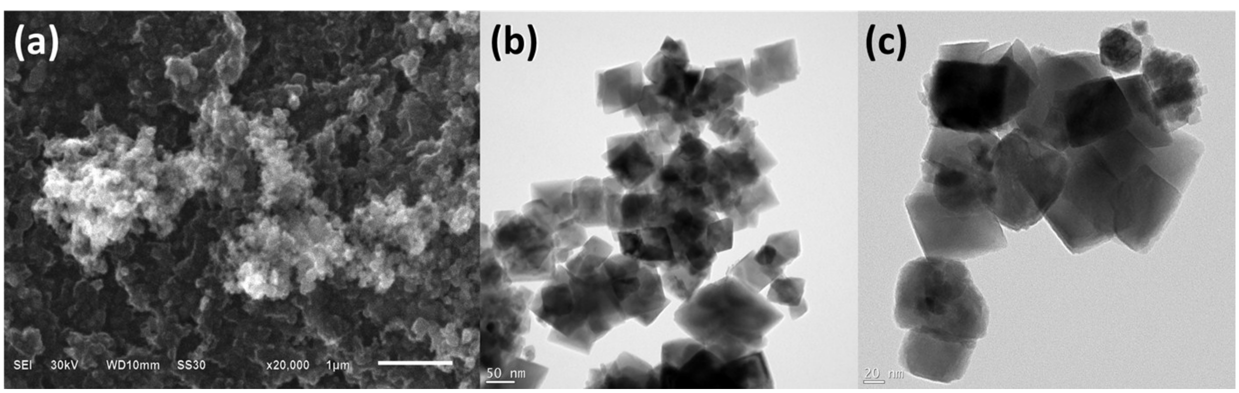

Fig. S1 SEM (a), TEM (b and c) images of Fe_3O_4.

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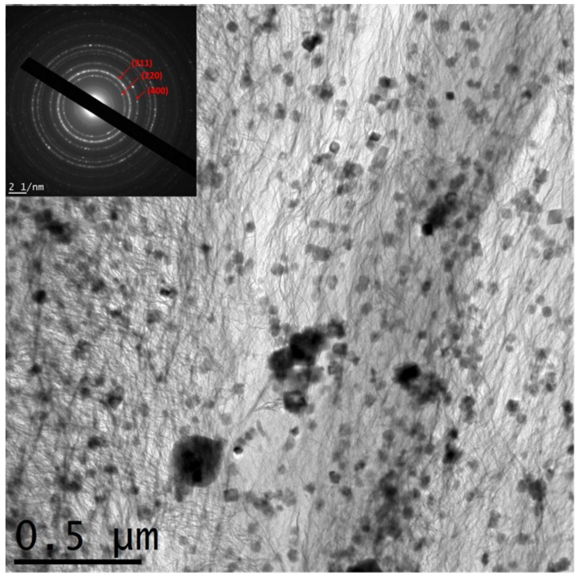

Fig. S2 TEM image of Fe_3O_4/graphene (inset: SAED image).

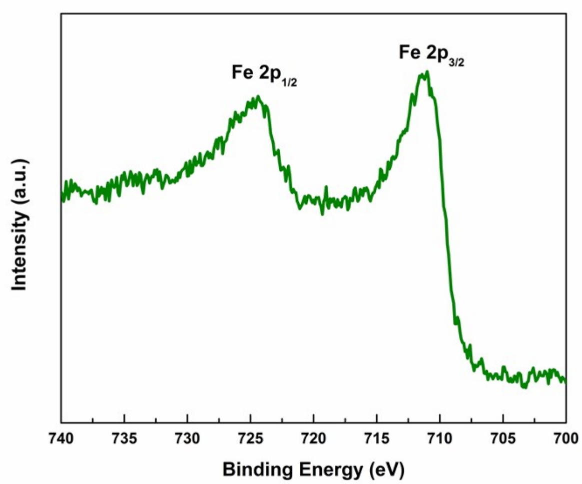

Fig. S3 presents the corresponding high-resolution Fe 2p spectrum. Two distinct peaks located at the binding energies of around 710.5 and 724.8 eV belong to Fe $2p_{3/2}$ and Fe $2p_{1/2}$ of Fe_3O_4, respectively. Besides, the absence of the obvious satellite peaks corroborates the assignment of typical Fe_3O_4.

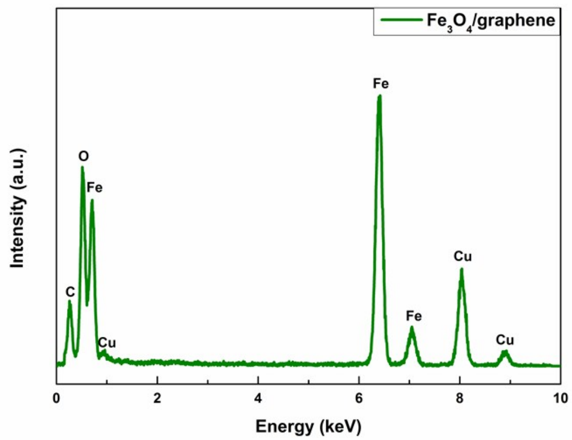

Fig. S4 EDS reveals the Fe_3O_4/graphene composed of C, Fe and O elements (the Cu in the spectrum comes from the copper grid).

Table S1 Comparison of the recent works on graphene-based Fe_3O_4 materials as anodes for LIBs.

Sample	Weight percentage of Fe_3O_4/	Current density/mAg^{-1}	Cycle numbers	Capacity/$mAhg^{-1}$ after cycles	Ref.
3D Fe_3O_4/porous graphene	52.6	100	180	1154	1
Graphene-wrapped Fe_3O_4	89.7	35	30	1026	2
Graphene-encapsulated hollow Fe_3O_4	—	100	50	900	3
Fe_3O_4/RGO	~46	83	100	1397	4
graphene-Fe_3O_4 nanoparticles	—	100	10	1102	5
Sandwich-Structured graphene-Fe_3O_4@Carbon	69.6	92.4	100	860	6
Graphene-Fe_3O_4-GNRs[a)]	60	400	300	708	7
Fe_3O_4/GNS[b)]-PVP	78	100	100	892	8
Fe_3O_4/RGO	79	500	100	890	9
Fe_3O_4 nanocrystals@graphene	67	200	50	539	10
Diamond-like Fe_3O_4/G composites	83.5	200 500	100 400	1430 1132	This work

[a)](GNRs refers to graphene nanoribbons); [b)](GNSs refers to graphene nanosheets)

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