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Supporting Information

Structure-designed synthesis of yolk-shell hollow $ZnFe_2O_4$/C@N-doped carbon sub-microspheres as a competitive anode for high-performance Li-ion batteries

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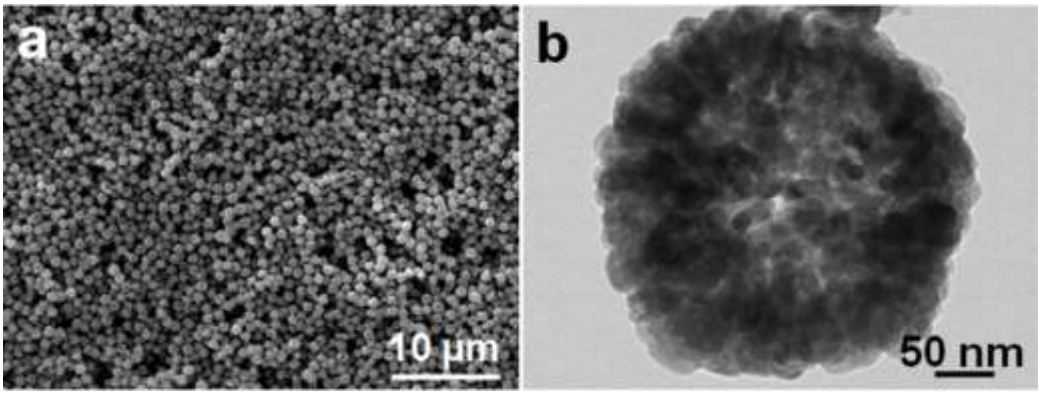

Fig. S1 (a) FESEM and (b) TEM images of the H-ZFO-O

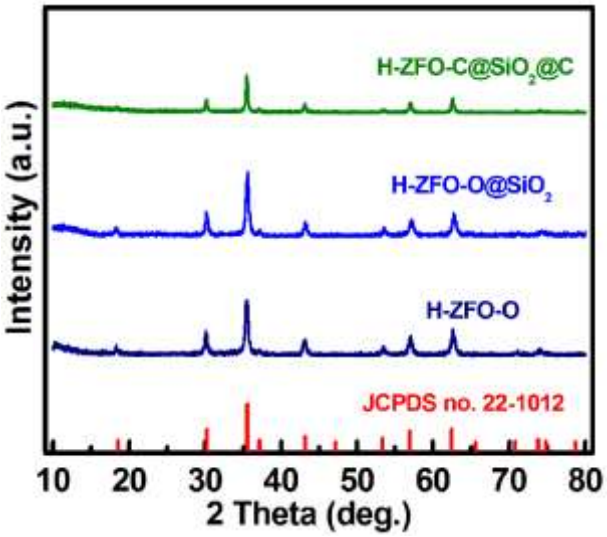

Fig. S2 XRD pattern of theH-ZFO-O, H-ZFO-O@SiO_2 and H-ZFO-C@SiO_2@C samples as indicated

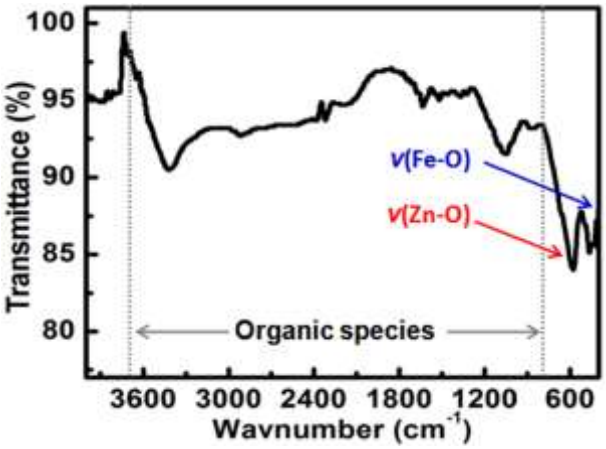

Fig. S3 FT-IR spectrum of the H-ZFO-O

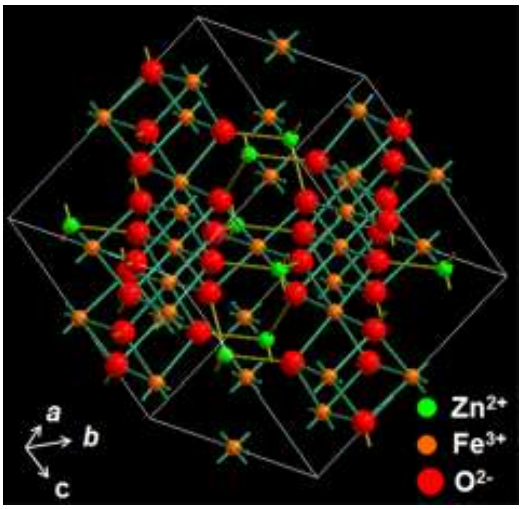

Fig. S4 Crystallological structure of the spinel ZFO

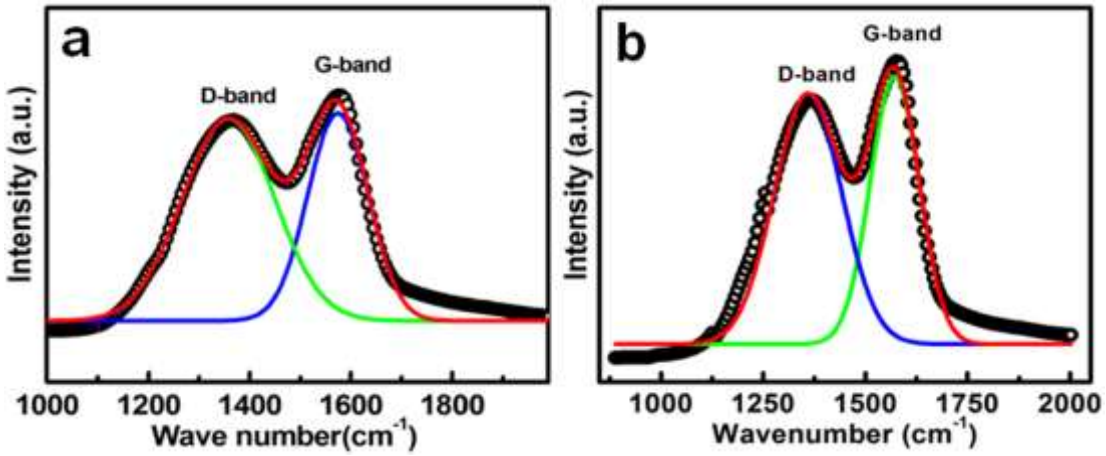

Fig. S5 Typical Raman spectra of (a) H-ZFO-C and (b) H-ZFO-C@void@C products

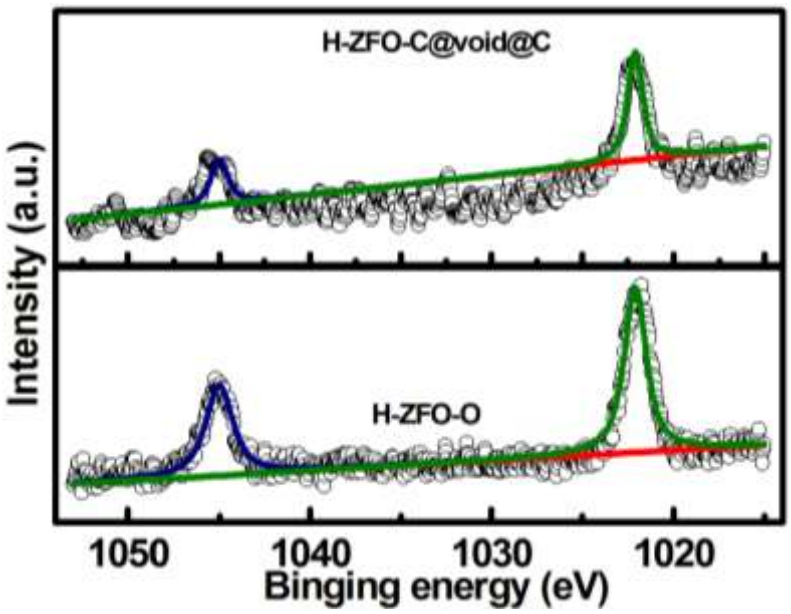

Fig. S6 Zn XPS spectrum for the H-ZFO-O and H-ZFO-C@void@C products

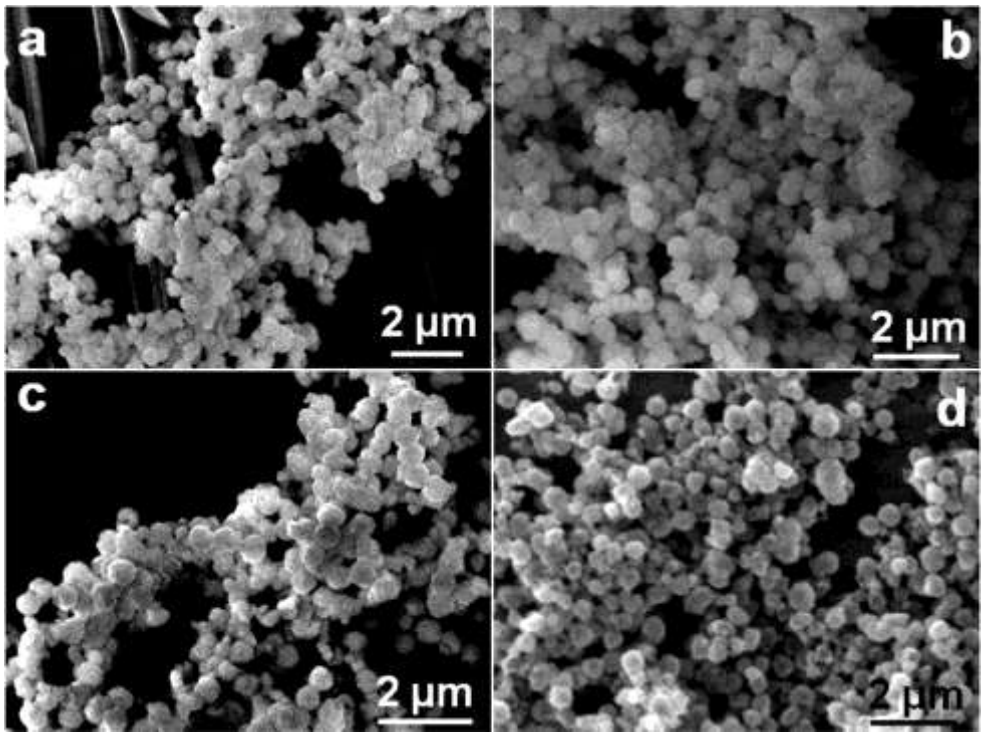

Fig. S7 Typical FESEM images of (a) H-ZFO-O@SiO_2, (b) H-ZFO-O@SiO_2@PDA, (c) H-ZFO-C@SiO_2@C and (d)H-ZFO-C@void@C products

Table S1 Corresponding collection of SSA, average pore size and pore volume for the H-ZFO-C and H-ZFO-C@void@C samples

Samples	SSA ($m^2 g^{-1}$)	Average pore size (nm)	Pore volume ($cm^3 g^{-1}$)
H-ZFO-C	~16.1	~17.6	~0.09
H-ZFO-C@void@C	~67.9	~12.7	~0.16

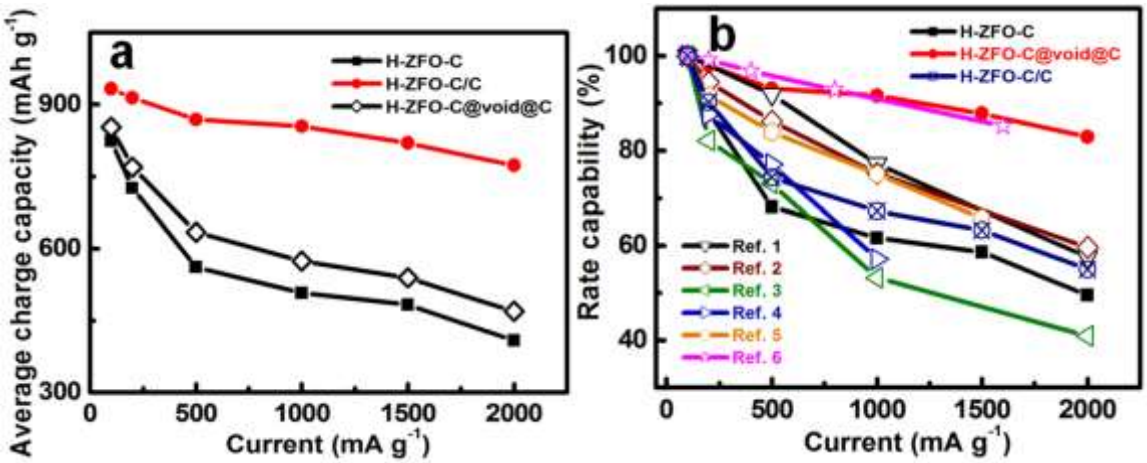

Fig. S8 (a) Capacities of the H-ZFO-C, H-ZFO-C/C and H-ZFO-C@void@C anodes as a function of current density, and (b) comparison in rate capability of the H-ZFO-C, H-ZFO-C/C and H-ZFO-C@void@C with other ZFO/C composite anodes

References:

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[2] Y. C. Dong, Y. Xia, Y. S. Chui and C. W. Cao and J. A. Zapien, *J. Power Sources*, 2015, **275**, 769.

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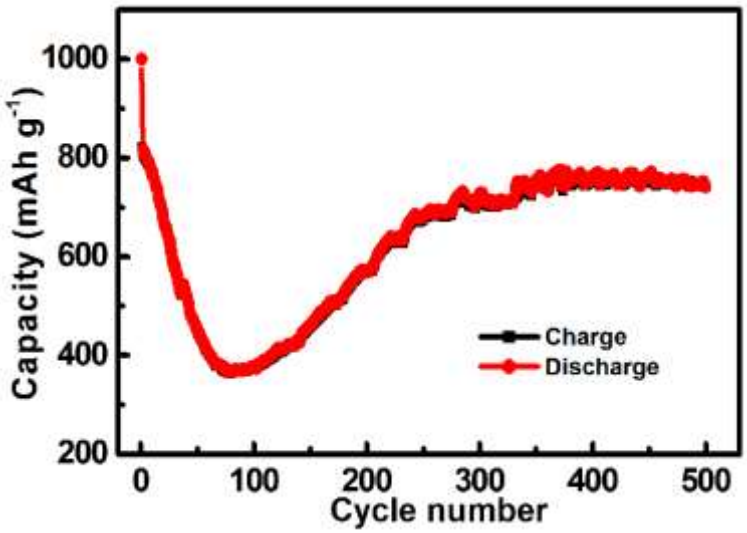

Fig. S9 Cycvling performance of the H-ZFO-C/C electrode at a current density of 1000 mA g^{-1}