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

Supporting Information

Approaching FeS_2 micron particles as the electrode material for lithium ion batteries via the simultaneous construction of CNTs' internal network and external cage

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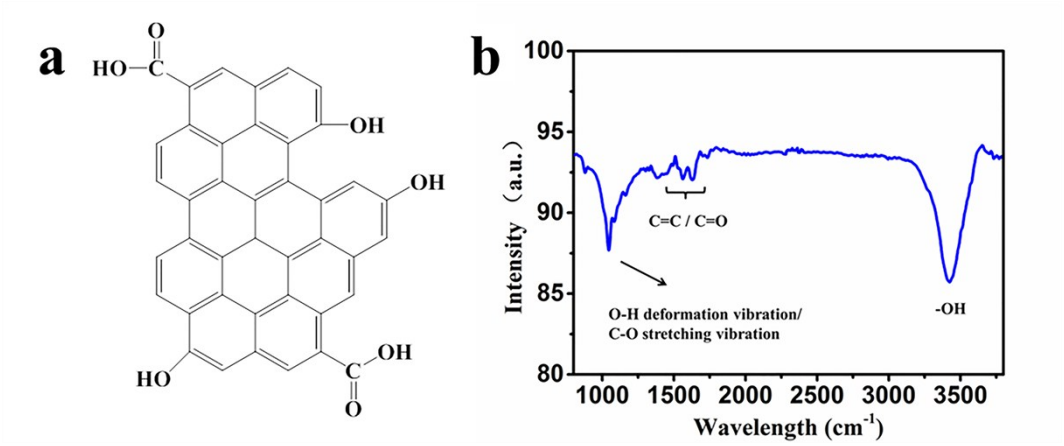

Fig. S1 Schematics of oxygen functional groups on the surface of CNTs after oxidation treatment (a); FTIR general spectra of multi-wall carbon nanotubes (b)

Table S1 The properties of CNTs after oxidation treatment

Product	Purity (%)	BET ($m^2 \cdot g^{-1}$)	Length (μm)	Diameter (nm)	Resistivity (Ω·cm)
Multi-wall CNTs	⩾98	110-170	0.5-2	13-25	0.0761

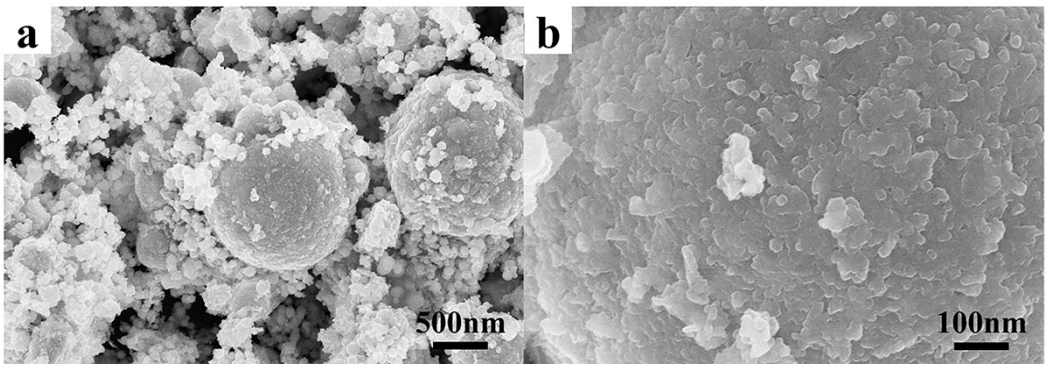

Fig. S2 SEM images of FeS_2 without CNTs

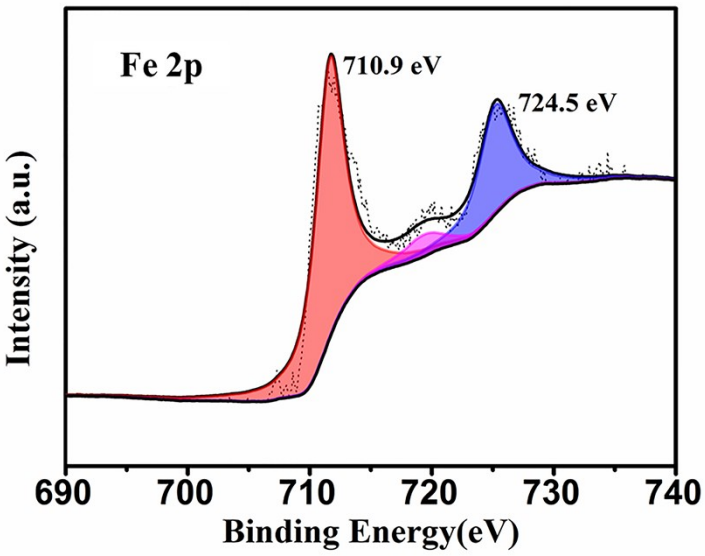

Fig. S3 The Fe 2p XPS spectrum of FeS_2@B-CNTs

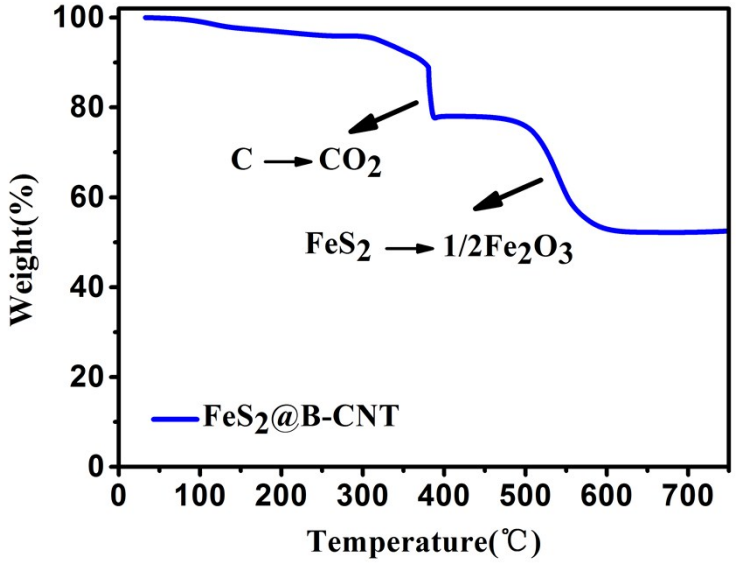

Fig. S4 TGA result of FeS_2@B-CNTs microspheres under air atmosphere

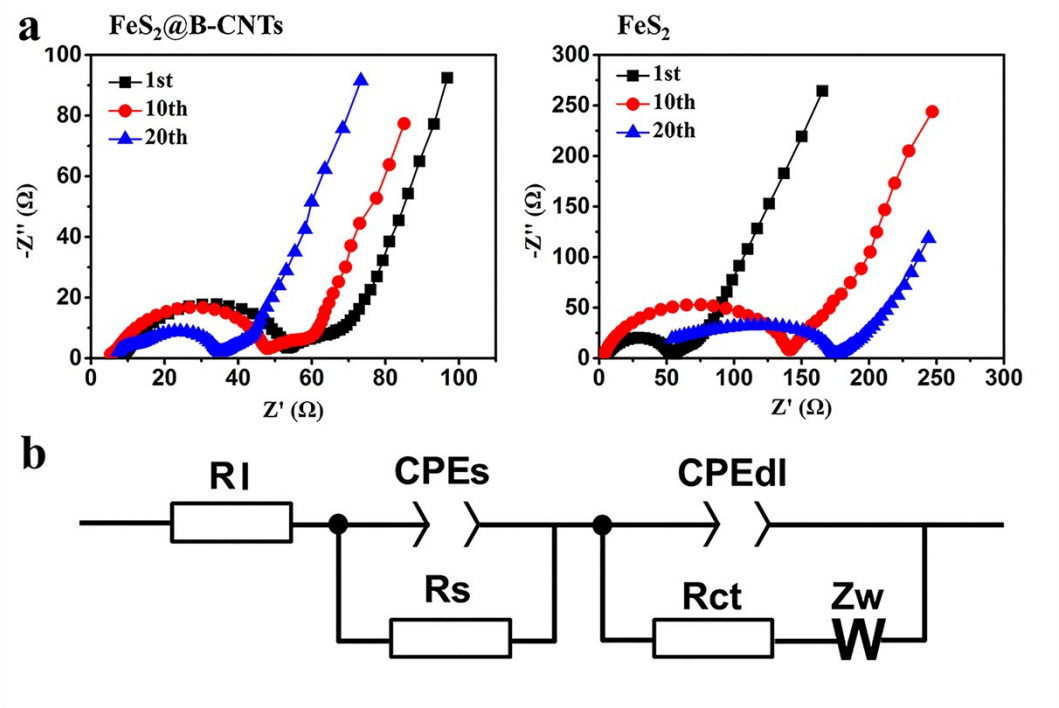

Fig. S5 The electrochemical impedance plots of FeS_2@B-CNTs and FeS_2 electrodes (a); equivalent circuit model for the FeS_2@B-CNTs and FeS_2 electrodes (b)

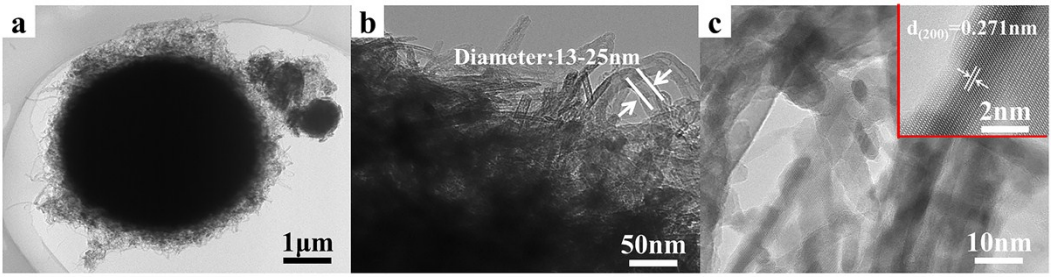

Fig. S6 TEM images (a-c) of FeS_2@B-CNTs electrodes after cycled

Table S2. Comparison of electrochemical performance between FeS_2@B-CNTs and FeS_2 electrodes of previous reports for Li–ion storage

Material	Current ($mA \cdot g^{-1}$)	Capacity ($mAh \cdot g^{-1}$)	Particle size
pitaya–structured FeS_2 [1]	300	614 (100^{th})	nanometer
PAN–FeS_2 [2]	89.4	470 (50^{th})	nanometer
FeS_2 nanowires [3]	89.4	350 (50^{th})	nanometer
FeS_2@N-graphene [4]	500	401 (400^{th})	nanometer
FeS_2 nanocrystals [5]	200	630 (100^{th})	nanometer
This work	1000	697 (500^{th})	micrometer

Reference

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