Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

$Fe_{1-x}S$/Nitrogen and Sulfur Co-doped Carbon Composite Derived from Nanosized Metal-Organic Framework for High-Performance Lithium-Ion Batteries

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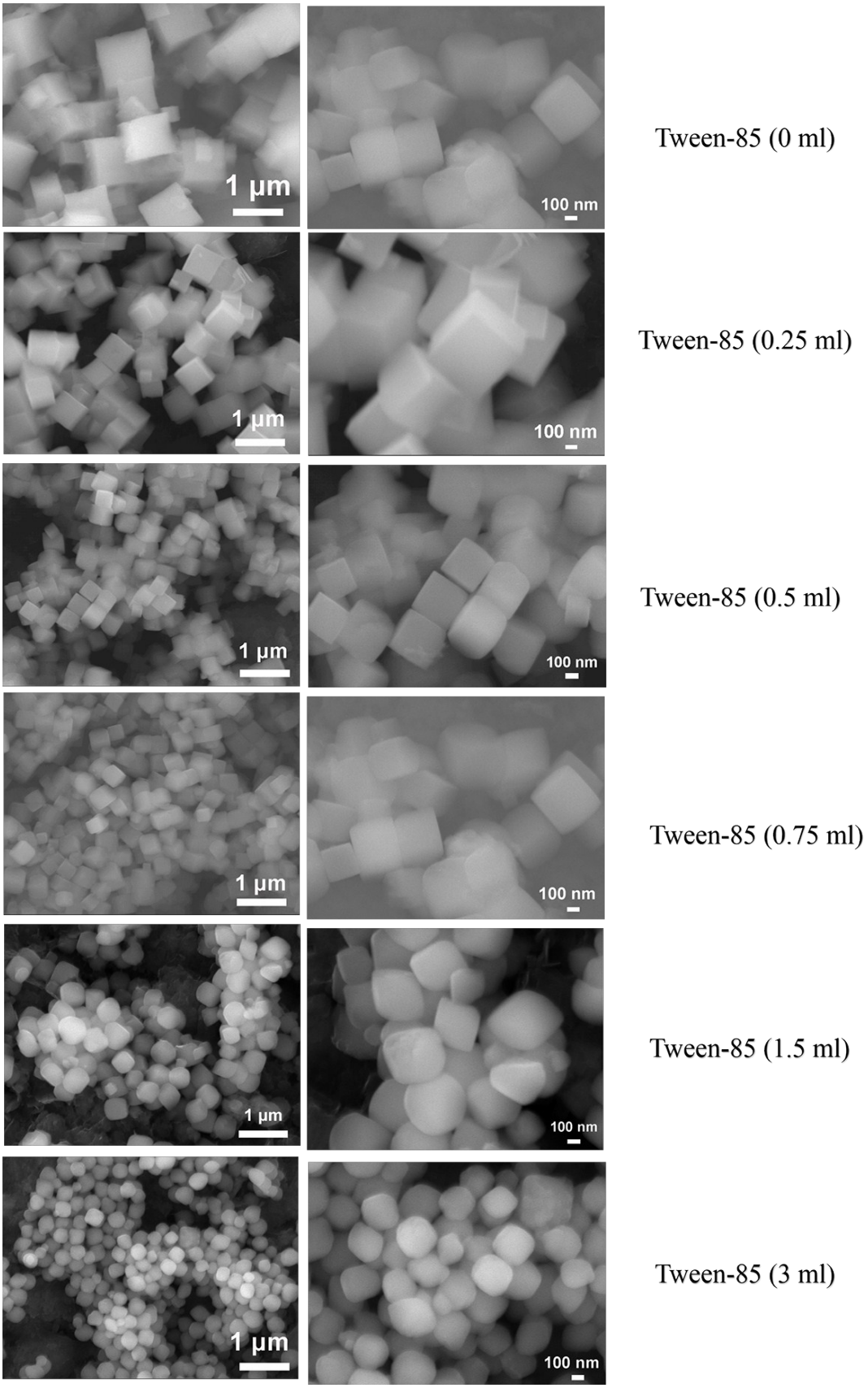


Fig. S1 The morphologies of Fe-MOF with adding different amounts of Tween-85.

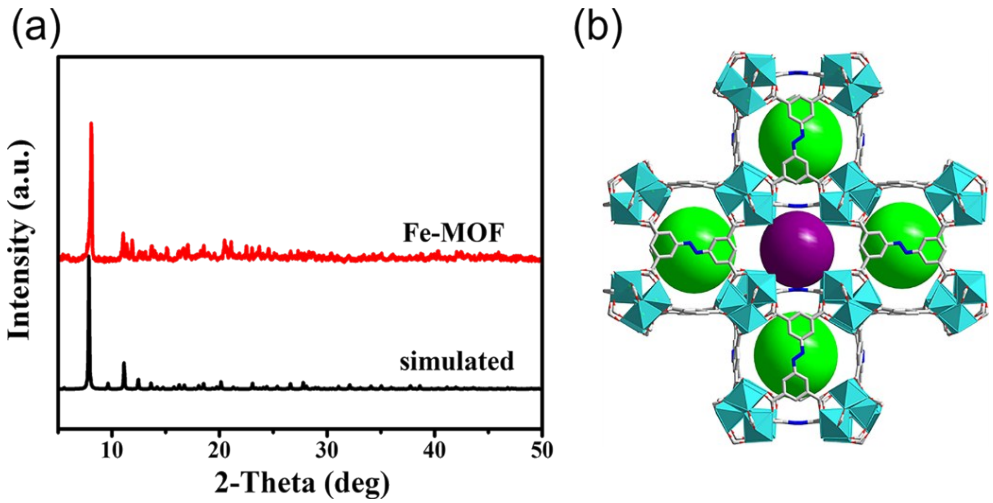


Fig. S2 (a)XRD pattern and (b) crystal structure of Fe-MOF.

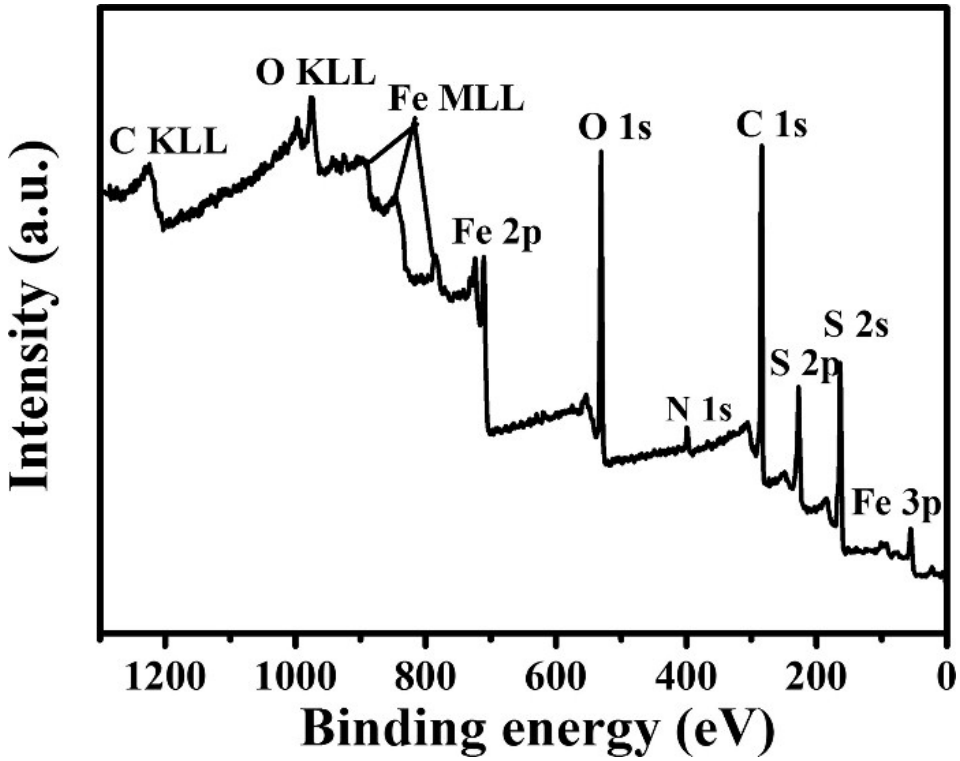


Fig. S3 The XPS survey spectrum of $Fe_{1-x}S$/NSC composite.

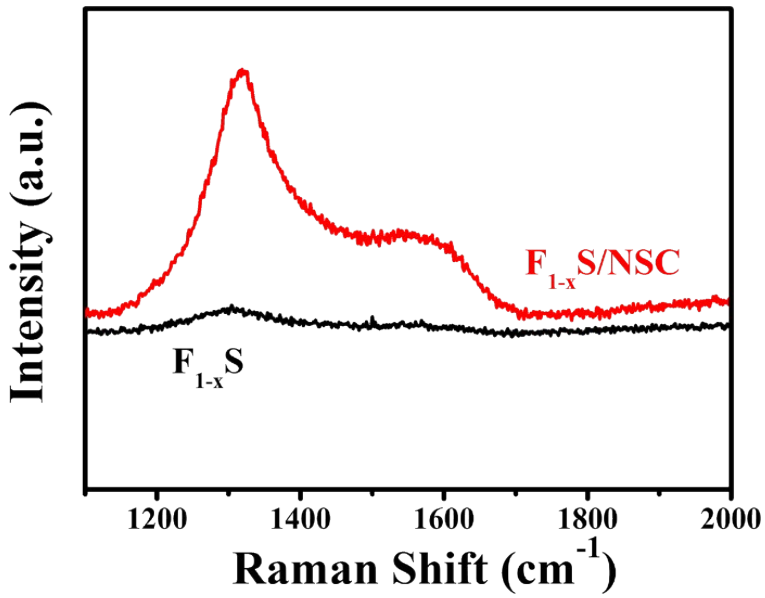


Fig. S4 Raman spectra of $Fe_{1-x}S$/NSC and $Fe_{1-x}S$.

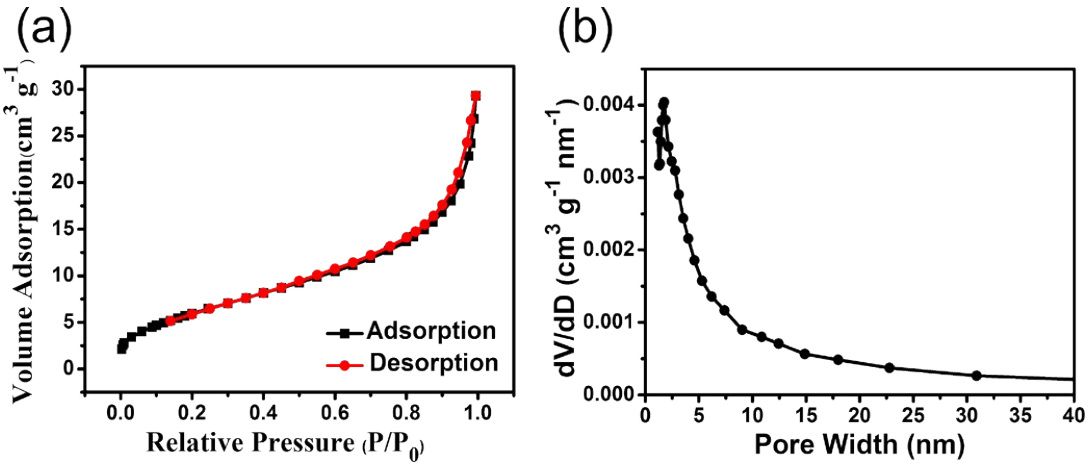


Fig. S5 N_2 sorption/desorption isotherms (a) and pore size distribution curve (b) of $Fe_{1-x}S$/NSC nanocomposite.

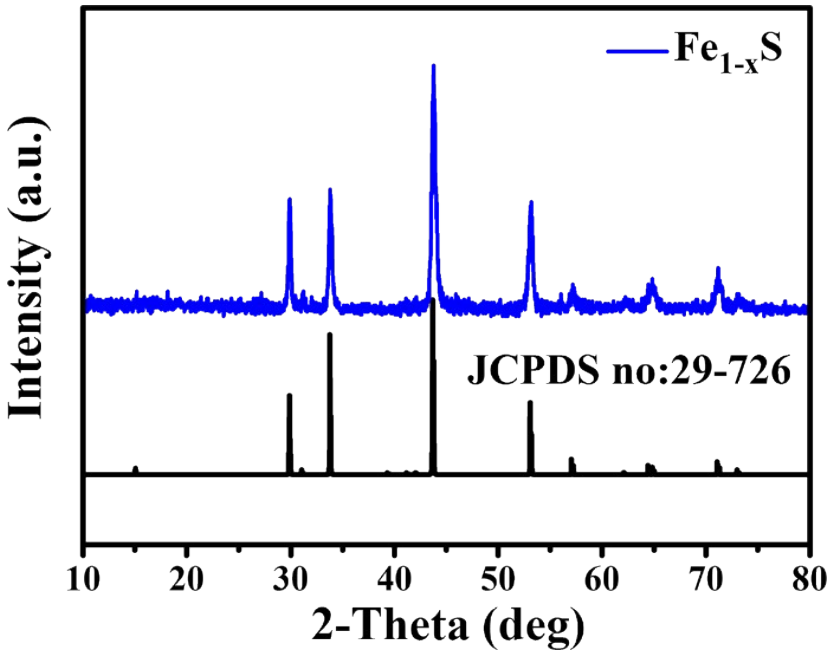


Fig. S6 The XRD pattern of $Fe_{1-x}S$.

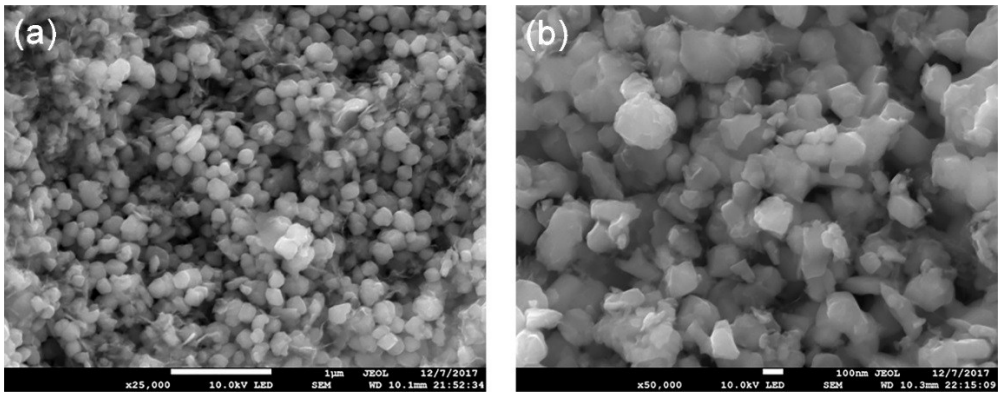
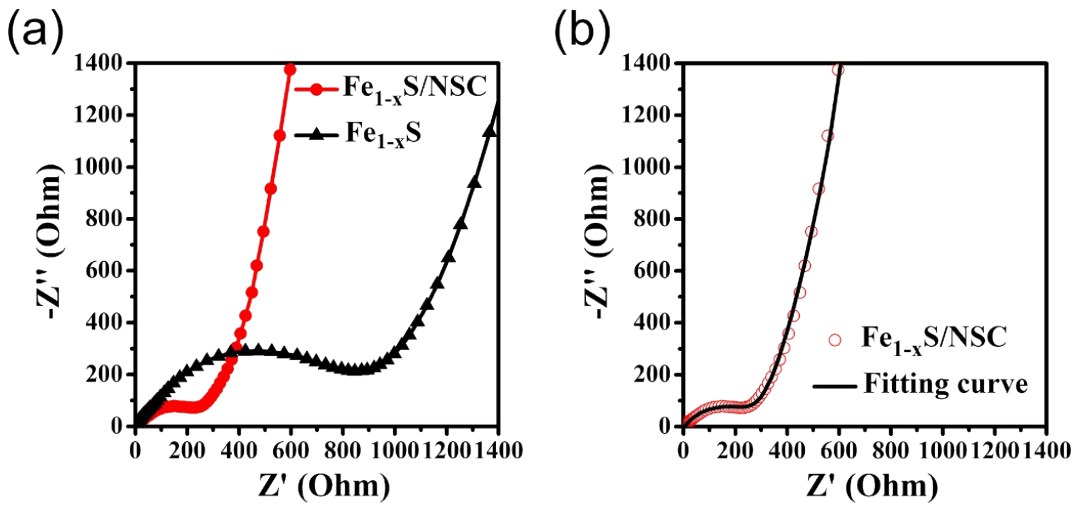
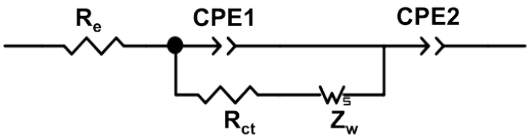


Fig. S7 The SEM images of $Fe_{1-x}S$.



(c)



(d)

	R_e(Ω)	R_{ct}(Ω)
$Fe_{1-x}S$/NSC	4.82	285.1

Fig. S8 (a) Nyquist plots of the $Fe_{1-x}S$/NSC and $Fe_{1-x}S$ electrodes; (b) Nyquist plots of the $Fe_{1-x}S$/NSC and corresponding fitting curve; (c) Equivalent circuit model for interpreting Nyquist plots and (d) derived parameters of the $Fe_{1-x}S$/NSC. (R_e: electrolyte resistance; R_{ct}: charge transfer resistance; CPE: constant phase element: Z_W: Warburg impedance.)

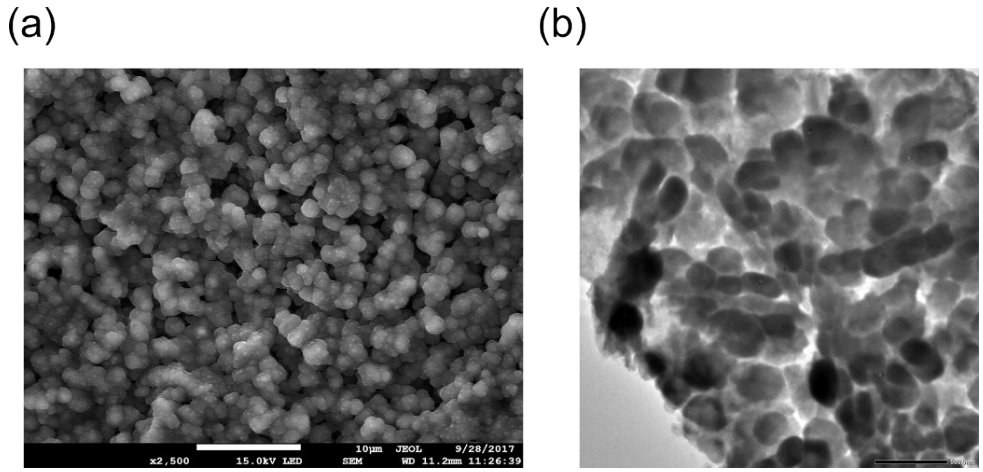


Fig. S9 (a) SEM images and (b)TEM images of the $Fe_{1-x}S$/NSC electrode after 100 cycles.

Table S1. Comparison of the specific capacity and cycling performance for $Fe_{1-x}S$/NSC composite in this work with the previously reported iron sulfides-based electrodes.

Materials	Current density (A g^{-1})	Specific Capacity (mAh g^{-1})	Cycle number	Ref.
$Fe_{1-x}S$/NSC	0.1/1.0	1135/707	100/200	**This work**
Fe-S-CM	0.05	736	50	8
FeS@RGO	0.1	978	40	39
C@FeS	0.1	623	100	46
FeS@CNS	1.0	664	150	47
FeS@C	0.09	420	100	48
FeS_2@C	0.1	570	100	49
FeS@rGO	0.2/1.0	887/662	150/200	50