

## Electronic Supplementary Material

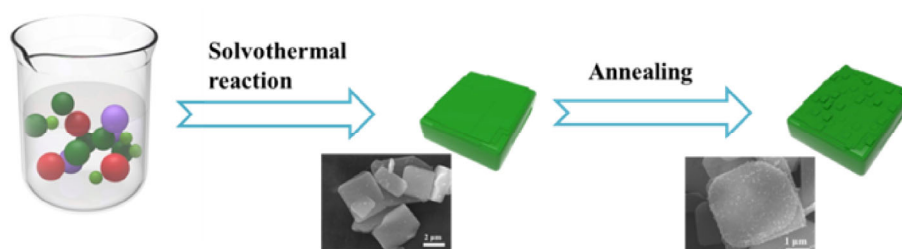
**Amine-assisted synthesis of FeS@N-C porous nanowires for highly reversible lithium storage**

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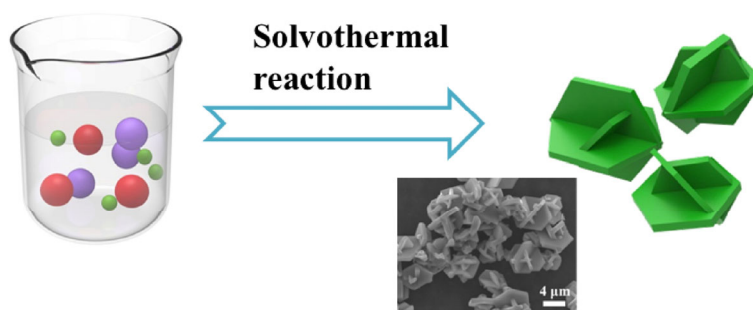
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Supporting information to <https://doi.org/10.1007/s12274-018-2140-7>

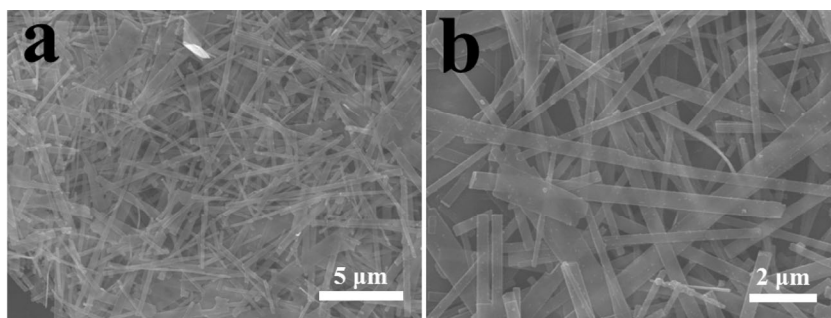


**Figure S1** Schematic representation of the fabrication process of FeS@N-C microsheets.

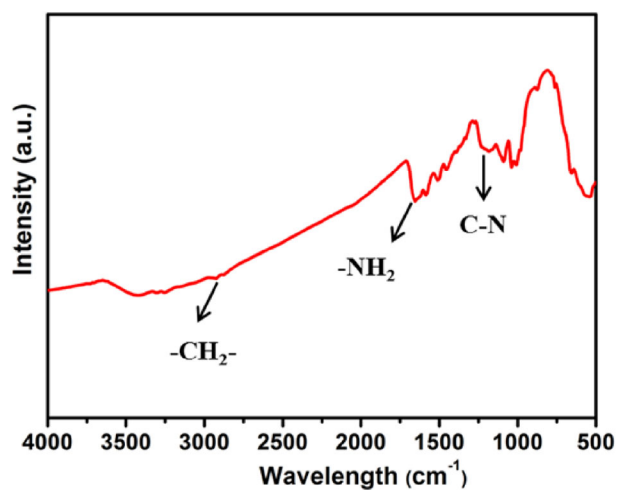


**Figure S2** Schematic representation of the fabrication process of caved FeS polyhedron.

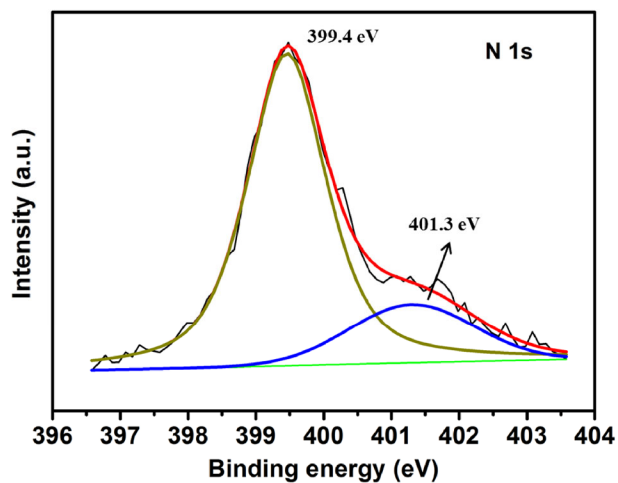
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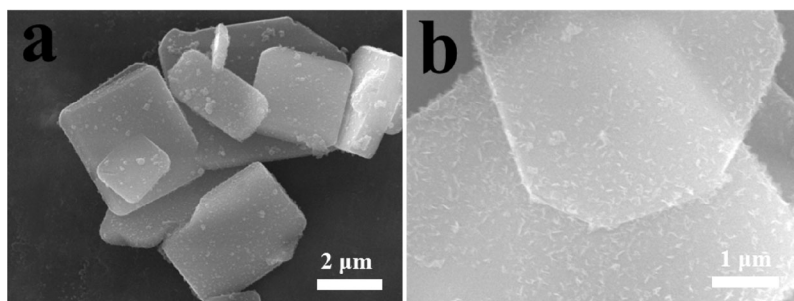
**Figure S3** (a) and (b) SEM images of the as-prepared FeS@N-C nanowire precursors.



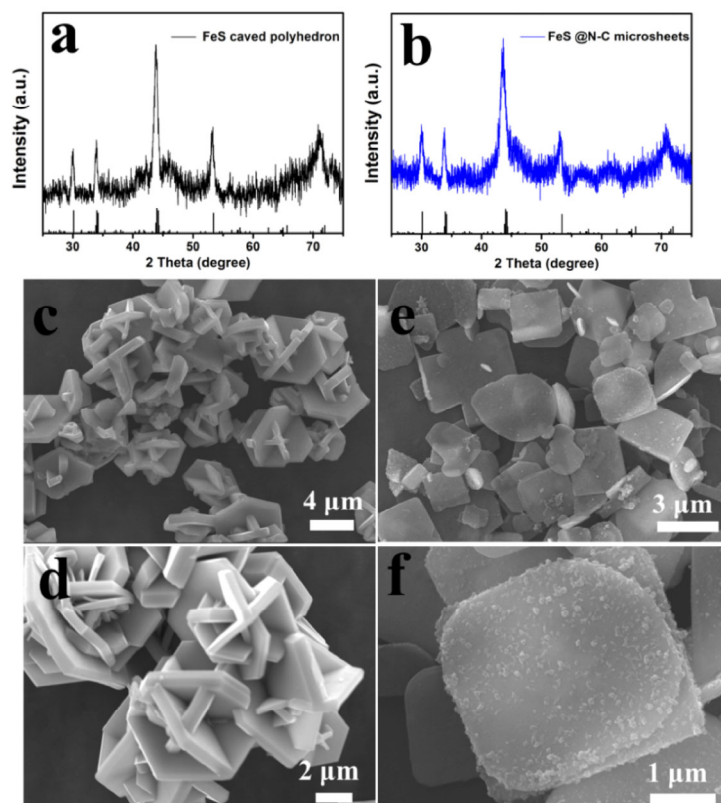
**Figure S4** FT-IR spectrum of the as-prepared FeS@N-C nanowire precursors.



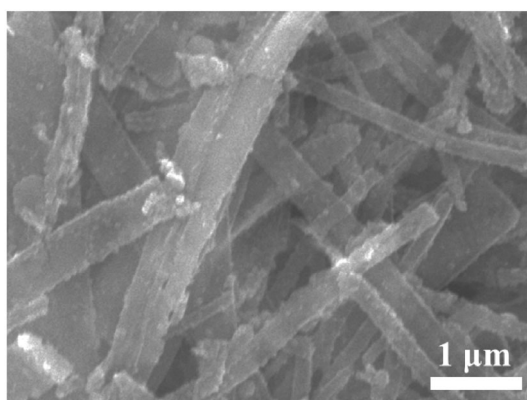
**Figure S5** XPS spectrum of the N 1s region for the as-prepared FeS@N-C nanowire precursors.



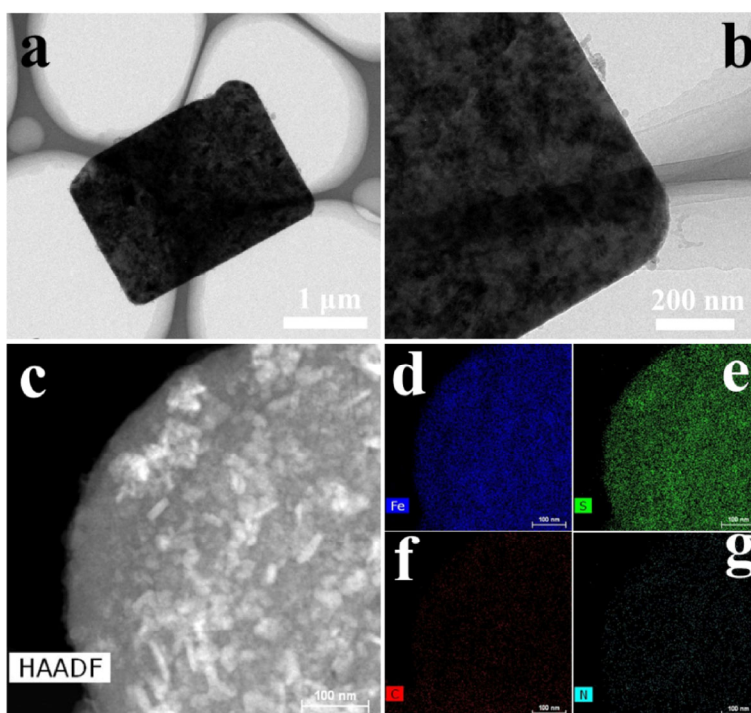
**Figure S6** (a) and (b) SEM images of the as-prepared FeS@N-C microsHEET precursors.



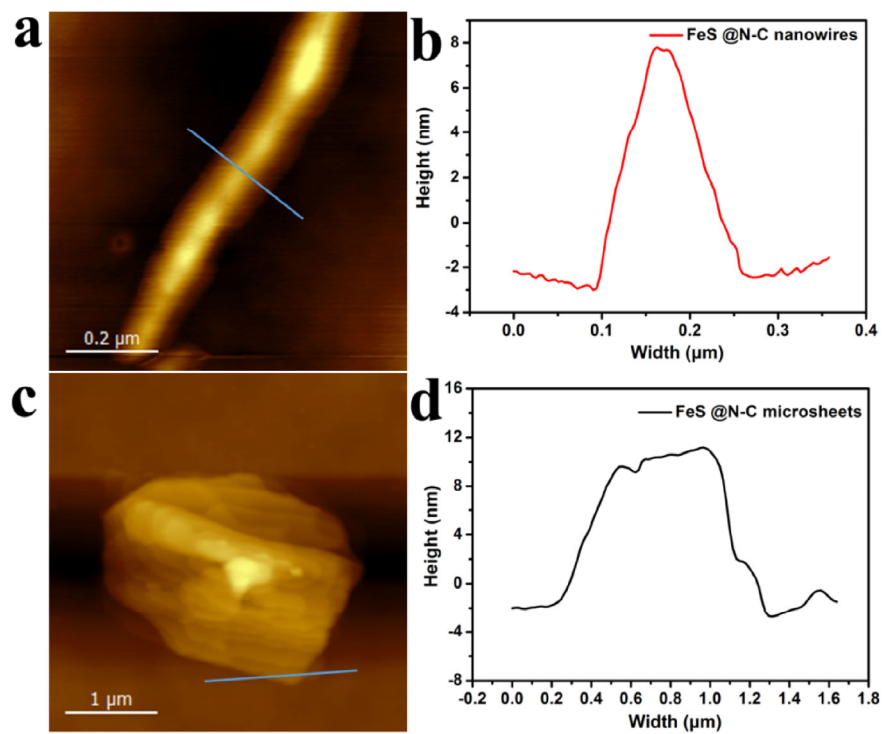
**Figure S7** XRD patterns of (a) the caved FeS polyhedron and (b) the FeS@N-C microsheets. SEM images of (c, d) the caved FeS polyhedron and (e, f) the FeS@N-C microsheets.



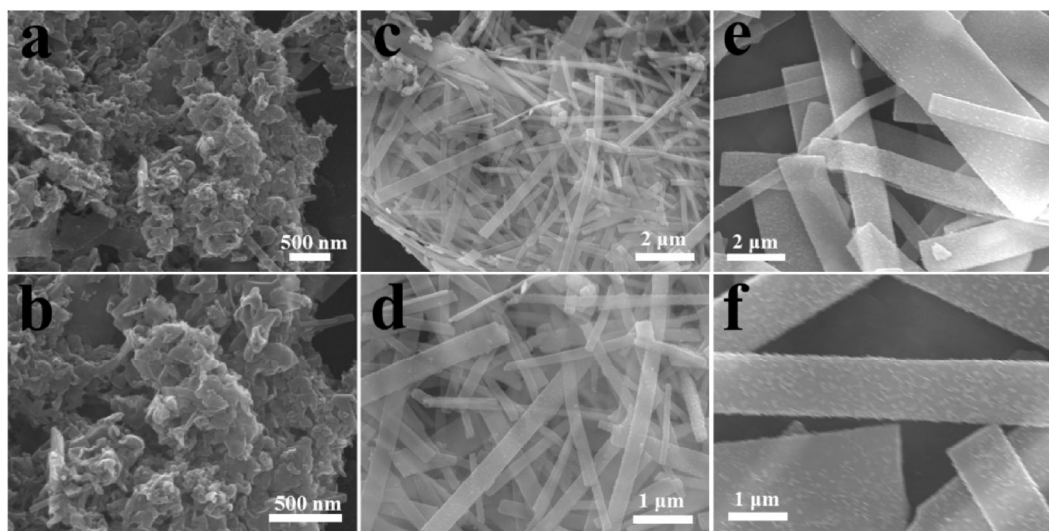
**Figure S8** SEM image of the as-prepared FeS@N-C nanowires.



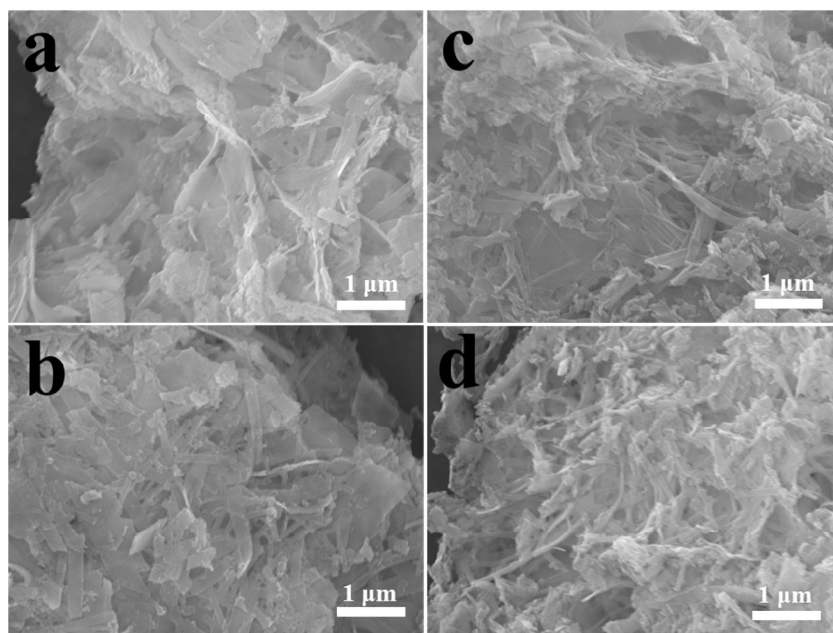
**Figure S9** (a) and (b) TEM images of the FeS@N-C microsheets, (c)–(g) HAADF and corresponding elemental mapping images of the FeS@N-C microsheets.



**Figure S10** AFM images and surface topographies of FeS@N-C nanowires and microsheets on a silica surface.

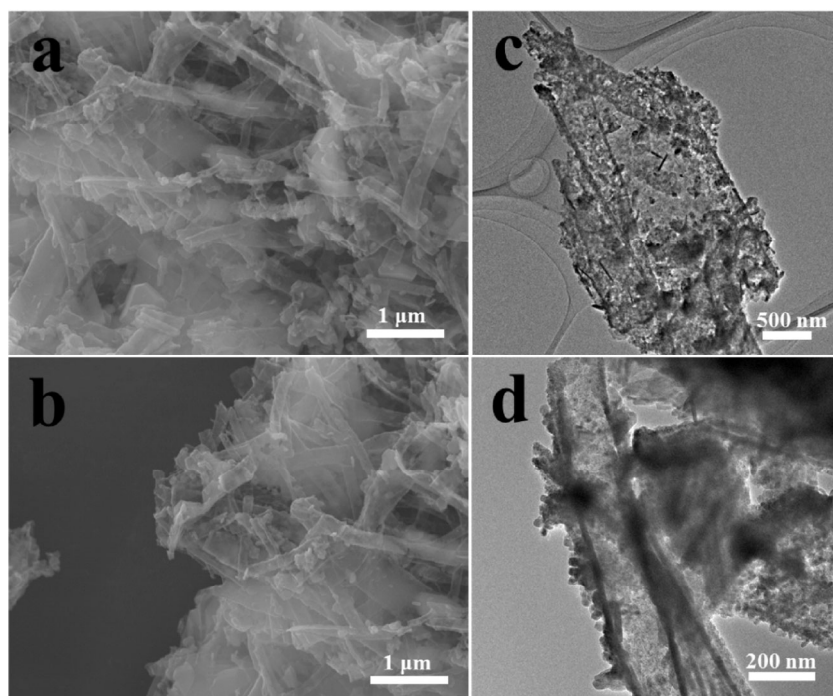


**Figure S11** SEM images of the nanowire precursors prepared at (a) and (b) 120 °C, (c) and (d) 160 °C, (e) and (f) 200 °C.

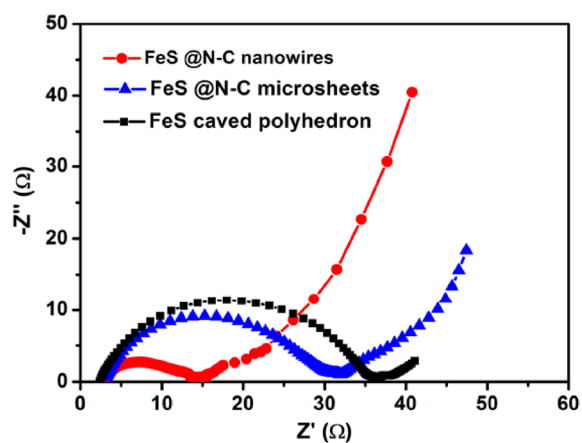


**Figure S12** SEM images of the nanowire precursors with different reaction durations: (a) and (b) 6 h, (c) and (d) 12 h.





**Figure S13** (a, b) SEM and (c, d) TEM images of the FeS@N-C nanowires annealed at 600 °C.



**Figure S14** Electrochemical Impedance Spectroscopy (EIS) of FeS@N-C nanowires, FeS@N-C microsheets and caved FeS polyhedron before cycling.

**Table S1** Weight percent of C, N and S of FeS@N-C nanowires and FeS@N-C microsheets

	Wt.(N) (%)	Wt.(C)(%)	Wt.(S)(%)
FeS@N-C nanowires	1.91	2.83	28.46
FeS@N-C microsheets	3.56	5.08	26.45