

## Supporting Information for

# MOF-Templated Nanorice-Nanosheet Core-Satellite Iron Dichalcogenides by Heterogeneous Sulfuration for High- Performance Lithium Ion Batteries

Huicong Pang<sup>†</sup>, Weiwei Sun<sup>†</sup>, Li-Ping Lv, Feiying Jin and Yong Wang\*

*Department of Chemical Engineering, School of Environmental and Chemical  
Engineering, Shanghai University, Shangda Road 99, Shanghai, P. R. China, 200444*

\*Corresponding authors: Tel: +86-21-66137723; fax: +86-21-66137725.

Email address: [yongwang@shu.edu.cn](mailto:yongwang@shu.edu.cn)

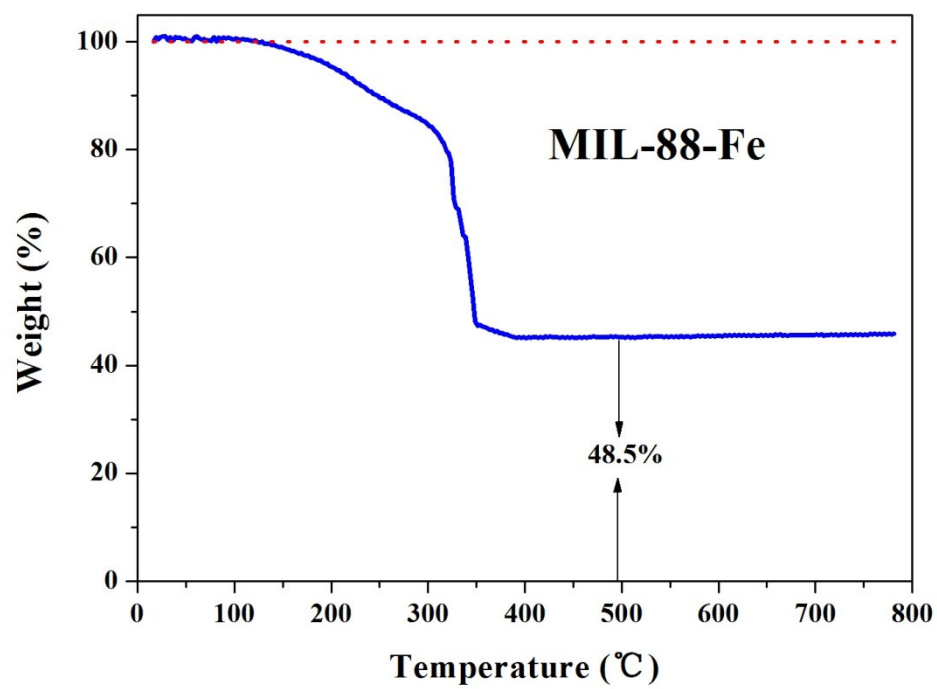


Fig. S1 TGA curve of MIL-88-Fe

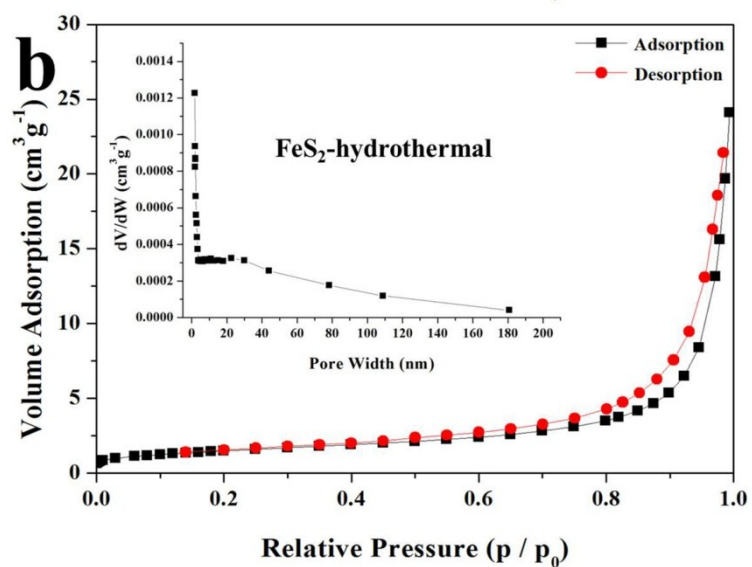
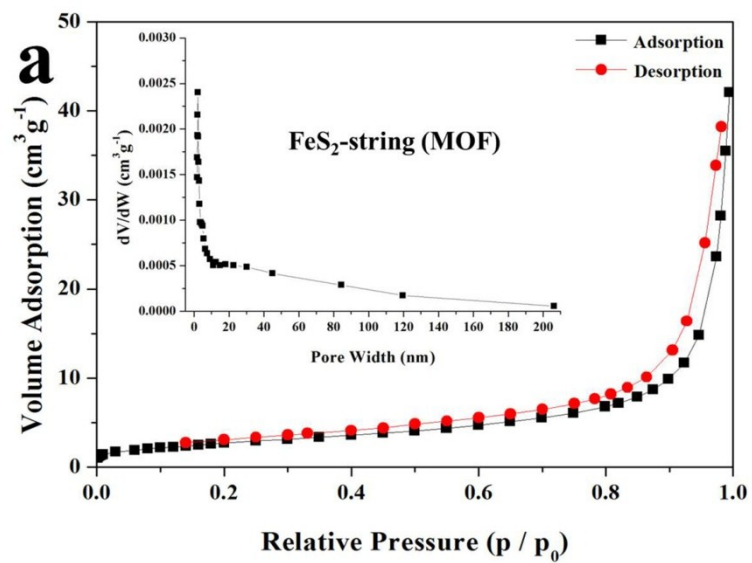


Fig. S2 Nitrogen adsorption isotherms of (a) FeS<sub>2</sub>-string (MOF) and (b) FeS<sub>2</sub>-hydrothermal

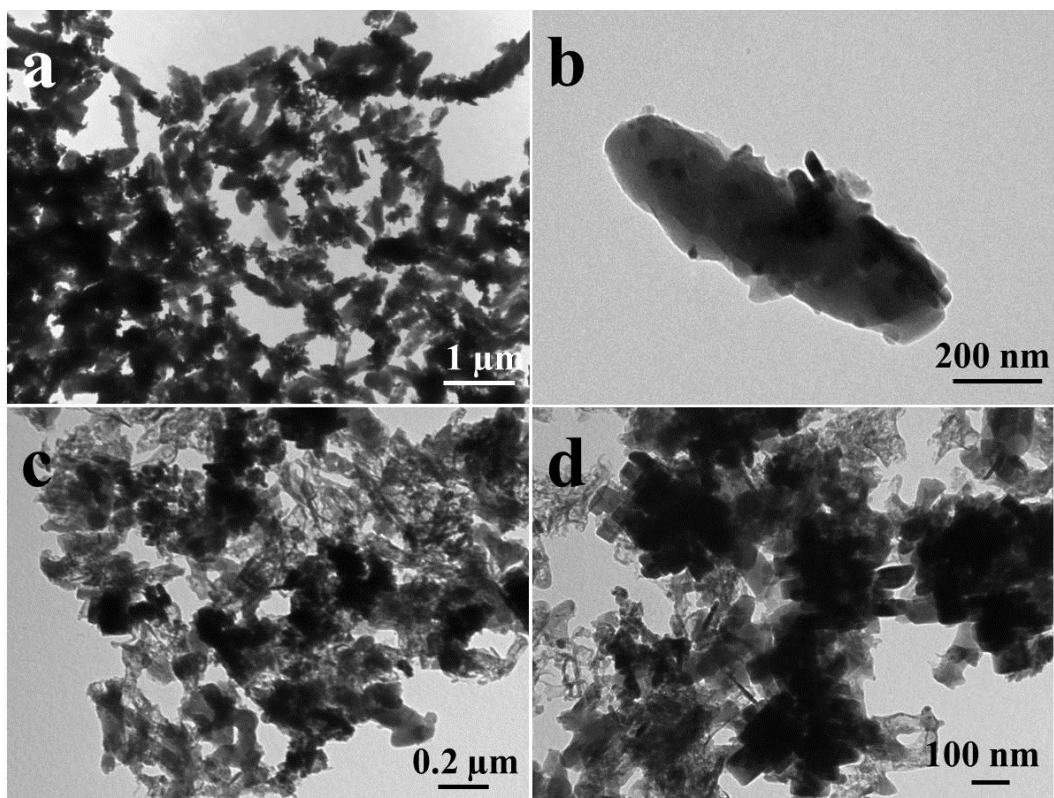


Fig. S3 TEM images of FeS<sub>2</sub> products with different ratios of the MOF intermediate and sulfur: (a-b) 1 : 2.5, (c-d) 1 : 10.

**Table S1.** Electrochemical property comparison between FeS<sub>2</sub>@C of this work and previous relative reports.

Material	FeS <sub>2</sub>	Electrochemical Performances (charge capacity refers to the lithium extraction capacity)	Reference
	Morphology		
FeS <sub>2</sub> @C	Nanorice-nanosheet core-satellite with carbon overlayer	An initial charge capacity of 1256.3 mA h g <sup>-1</sup> and the retained capacity of 1336.5 mA h g <sup>-1</sup> after 200 cycles. (100 mA g <sup>-1</sup> , 0.005-3.0 V)	This work
FeS <sub>2</sub>	Nanoparticle	An initial charge capacity of ~580 mA h g <sup>-1</sup> and the retained capacity of ~600 mA h g <sup>-1</sup> after 100 cycles. (100 mA g <sup>-1</sup> , 0.005-3.0 V)	13
FeS <sub>2</sub>	Nanoparticle	An initial charge capacity of ~580 mA h g <sup>-1</sup> and the retained capacity of ~400 mA h g <sup>-1</sup> after 30 cycles. (89 mA g <sup>-1</sup> , 1.2-2.6 V)	14
FeS <sub>2</sub>	Nanoparticle	An initial charge capacity of ~590 mA h g <sup>-1</sup> and the retained capacity of ~480 mA h g <sup>-1</sup> after 50 cycles (89 mA g <sup>-1</sup> , 1.0-3.0 V)	15
FeS <sub>2</sub>	Nanoparticle	An initial charge capacity of ~500 mA h g <sup>-1</sup> and the retained capacity of ~360 mA h g <sup>-1</sup> after 30 cycles. (100 mA g <sup>-1</sup> , 0.001-3.0 V)	16
FeS <sub>2</sub>	Nanoparticle	An initial charge capacity of ~810 mA h g <sup>-1</sup> and the retained capacity of ~420 mA h g <sup>-1</sup> after 40 cycles. (89 mA g <sup>-1</sup> , 0.8-2.4 V)	17
FeS <sub>2</sub>	Hollow microsphere	An initial charge capacity of ~820 mA h g <sup>-1</sup> and the retained capacity of ~537 mA h g <sup>-1</sup> after 30 cycles. (178 mA g <sup>-1</sup> , 1.0-2.5 V)	18
FeS <sub>2</sub>	Nanocube	An initial charge capacity of ~650 mA h g <sup>-1</sup> and the retained capacity of ~540 mA h g <sup>-1</sup> after 150 cycles. (1000 mA g <sup>-1</sup> , 0.001-3.0 V)	19
FeS <sub>2</sub>	Nanowire	An initial charge capacity of 409 mA h g <sup>-1</sup> and the retained capacity of 350 mA h g <sup>-1</sup> after 50 cycles. (89 mA g <sup>-1</sup> , 1.1-2.4 V)	20

FeS <sub>2</sub> @C	Nanoparticle in carbon	An initial charge capacity of ~620 mA h g <sup>-1</sup> and the retained capacity of ~490 mA h g <sup>-1</sup> after 50 cycles. (45 mA g <sup>-1</sup> , 1.2-2.6 V)	21
FeS <sub>2</sub> @CNT	Nanoparticle in carbon nanotube	An initial charge capacity of ~690 mA h g <sup>-1</sup> and the retained capacity of ~800 mA h g <sup>-1</sup> after 200 cycles. (200 mA g <sup>-1</sup> , 0.01-3.0 V)	22
FeS <sub>2</sub> /carbon fiber	Nanoparticle on carbon fiber	An initial charge capacity of 1382 mA h g <sup>-1</sup> and the retained capacity of ~680 mA h g <sup>-1</sup> after 100 cycles. (100 mA g <sup>-1</sup> , 0.01-3.0 V)	23
FeS <sub>2</sub> /Graphene	Nanoparticle on graphene	An initial charge capacity of 923 mA h g <sup>-1</sup> and the retained capacity of ~1000 mA h g <sup>-1</sup> after 80 cycles. (89 mA g <sup>-1</sup> , 0.005-3.0 V)	24
FeS <sub>2</sub> /Graphene	Microsphere on graphene	An initial charge capacity of ~750 mA h g <sup>-1</sup> and the retained capacity of ~950 mA h g <sup>-1</sup> after 300 cycles. (890 mA g <sup>-1</sup> , 0.01-3.0 V)	25
FeS <sub>2</sub> @C	Microsphere with carbon overlayer	An initial charge capacity of ~860 mA h g <sup>-1</sup> and the retained capacity of ~440 mA h g <sup>-1</sup> after 50 cycles. (250 mA g <sup>-1</sup> , 1.0-2.6 V)	26
FeS <sub>2</sub> /Graphene	Nanocube on graphene	An initial charge capacity of 1147 mA h g <sup>-1</sup> and the retained capacity of 1001 mA h g <sup>-1</sup> after 60 cycles. (100 mA g <sup>-1</sup> , 0.01-3.0 V)	27
FeS <sub>2</sub> @C	Nanowire with carbon overlayer	An initial charge capacity of 657 mA h g <sup>-1</sup> and the retained capacity of 560 mA h g <sup>-1</sup> after 100 cycles. (100 mA g <sup>-1</sup> , 1.0-3.0 V)	28
Co/FeS <sub>2</sub> @C	Nanoflake with carbon overlayer on Co nanowire	An initial charge capacity of ~750 mA h g <sup>-1</sup> and the retained capacity of ~530 mA h g <sup>-1</sup> after 70 cycles. (222.5 mA g <sup>-1</sup> , 1.2-2.6 V)	29
FeS <sub>2</sub> @C	Nanooctahedra with carbon overlayer	An initial charge capacity of 566 mA h g <sup>-1</sup> and the retained capacity of ~470 mA h g <sup>-1</sup> after 50 cycles. (447 mA g <sup>-1</sup> , 1.0-3.0 V)	30