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

Supplementary Information

Fe_2O_3@SnO_2 Nanoparticles Decorated Graphene Flexible Films as High-erformance Anode for Lithium-ion Batteries

Shuo Liu, Ronghua Wang, Miaomiao Liu, Jianqiang Luo, Xihai Jin and Jing Sun**

The State Key Lab of High Performance Ceramics and Superfine Microstructure,

Shanghai Institute of Ceramics, Chinese Academy of Sciences, 1295 Ding Xi Road,

Shanghai 200050, China

*Corresponding authors. Tel: +86 21 52412720. Fax: +86 21 52413122.

E-mail address: jingsun@mail.sic.ac.cn, jinxihai@hotmail.com

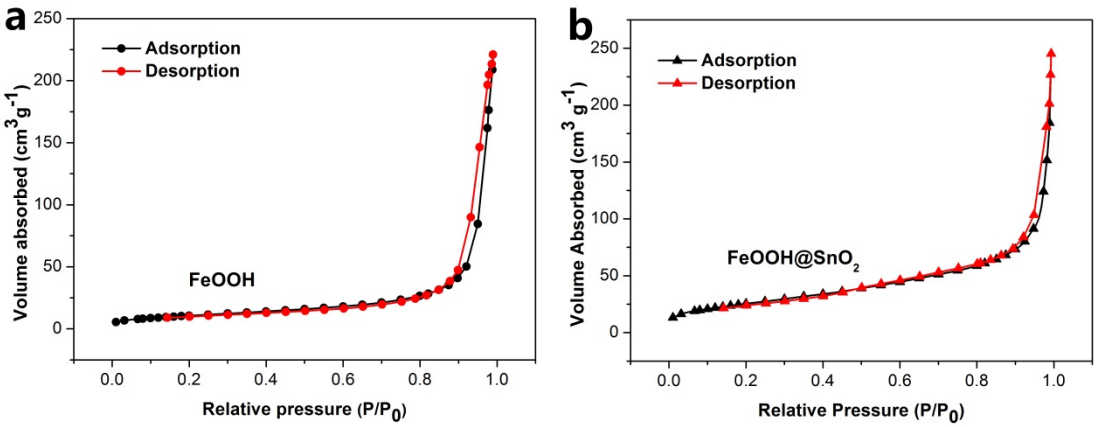

Fig. S1 N_2 adsorption/desorption isotherms of (a) FeOOH nanoparticles and (b) FeOOH@SnO_2 nanoparticles.

Fig. S2 Images of water dispersion of FeOOH nanoparticles (left) and FeOOH@SnO_2 nanoparticles (middle), dispersion of FeOOH@SnO_2 nanoparticles in GO water solution (right).

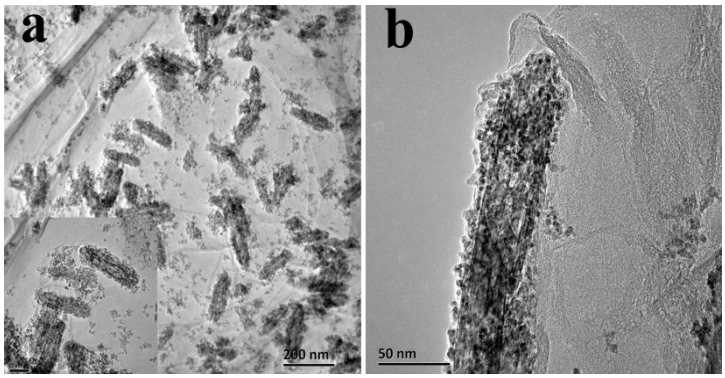

Fig. S3 TEM images of Fe_2O_3@SnO_2/GS film.

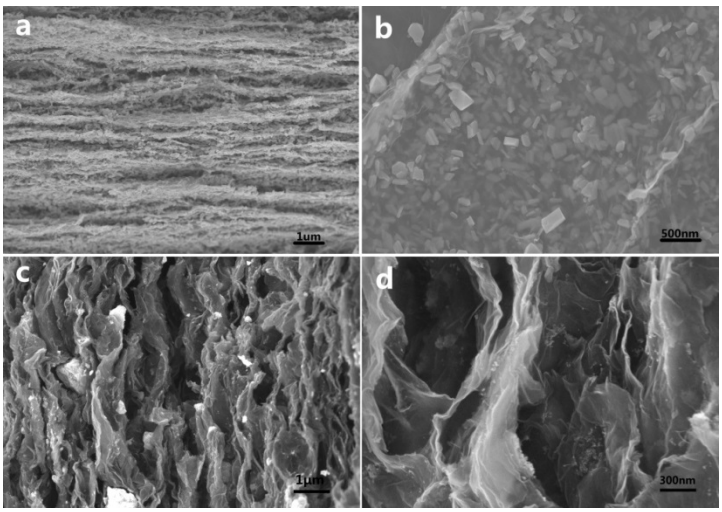

Fig. S4 (a) Cross-section SEM image of Fe_2O_3/GS film. (b) Top-view SEM image of Fe_2O_3/GS film. (c) Cross-section SEM image of SnO_2/GS film. (d) Enlarged cross-section SEM image of SnO_2/GS film.

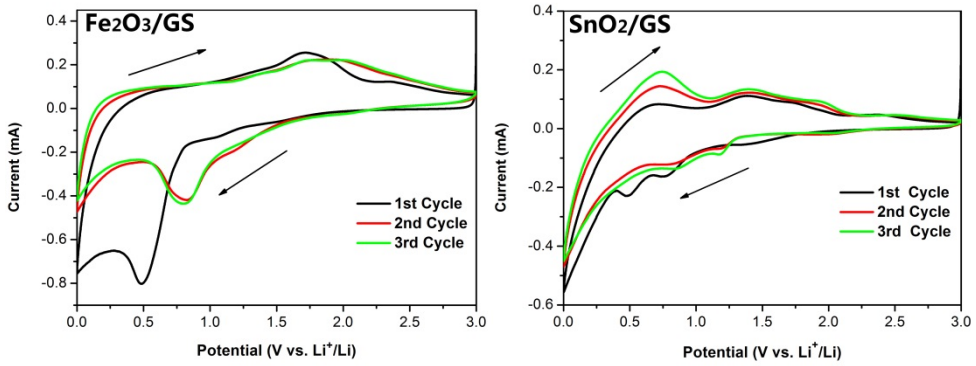

Fig. S5 First three CV curves of (a) Fe_2O_3/GS electrode and (b) SnO_2/GS electrode at a scan rate of 0.5 mV s^{-1} over the voltage range of 0-3.0 V. The scan direction follows with the arrows.

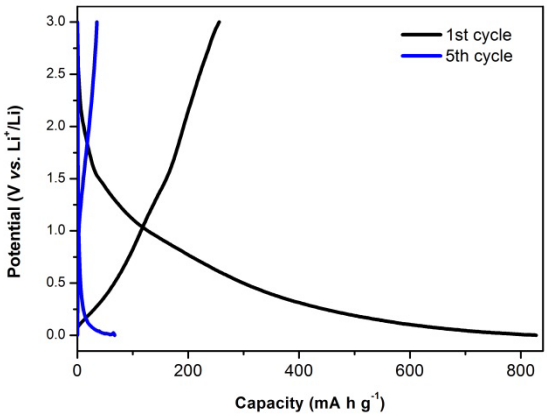

Fig. S6 Charge-discharge profiles of the bare graphene paper anode at a current density of 100 mA h g^{-1}, with a first discharge capacity of 827.4 mA h g^{-1} and a discharge capacity of 67.3 mA h g^{-1} after 5 cycles.

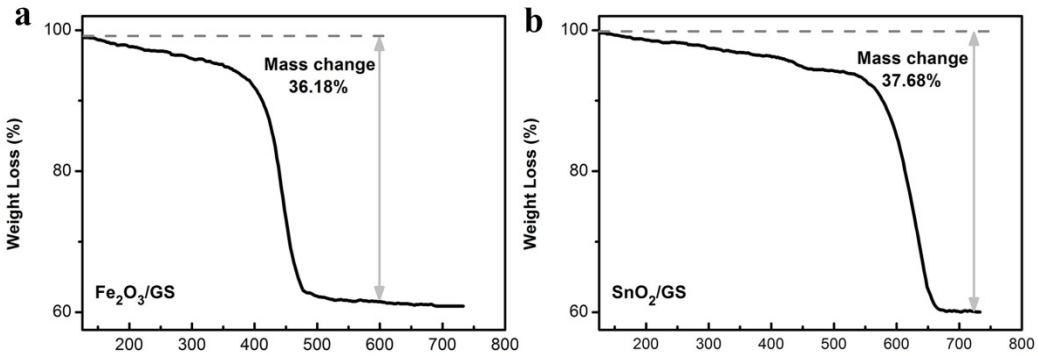

Fig. S7 TGA curves of Fe_2O_3/GS and SnO_2/GS films, revealing that contents of Fe_2O_3 and SnO_2 in the Fe_2O_3/GS and SnO_2/GS composites are 63.82% and 62.32%, respectively.

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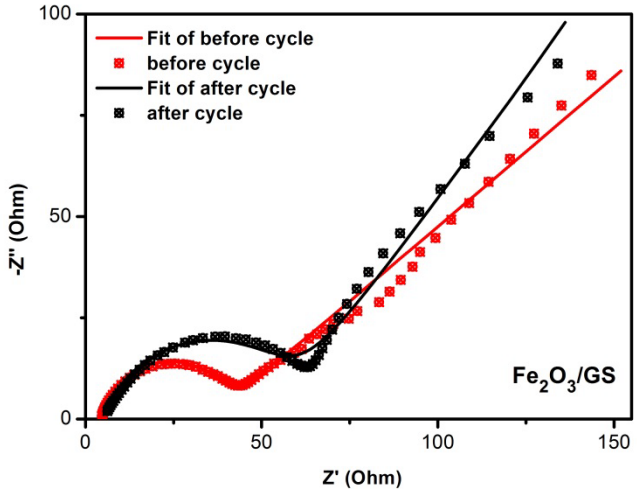

Fig. S8 EIS spectra and equivalent circuit fitting of Fe_2O_3 /GS electrode before and after ten cycles at a current density of 100 mA g^{-1}.

		Rs/Ω	CPE-P/Ω	CPE-T/s	Rct/Ω	Wo-R/Ω	Wo-T/s	Wo-P
Fe_2O_3 @SnO_2 /GS	Before	4.382	0.769	2.62E-5	34.31	403.2	17.38	0.38
	After	6.08	0.77	4.92E-5	22.57	84.78	0.68	0.496
Fe_2O_3/GS		5.107	0.694	3.84E-5	66.54	313.2	0.43	0.578
SnO_2/GS		6.092	0.661	8.95E-5	41.46	262.1	17.43	0.494

Fig. S9 The fitted EIS results from the equivalent circuit.