Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Self-assembled Graphene Coupled Hollow-Structured γ-Fe_2O_3 Spheres with Crystal of Transition for Enhanced Supercapacitors

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Table S1. Physical and electrochemical properties reported in recent papers for FeOx-based electrodes in a negative potential range in various aqueous electrolytes.[1-10]

Material	Electrolyte	Measurement system	Specific Capacitance ($F\ g^{-1}$)	Method	Cycle life	Ref. (year)
Porous α- Fe_2O_3 film	1 M Li_2SO_4	Three-electrode	146	CV 5 $mV\ s^{-1}$	500 (~60%)	2009
α-Fe_2O_3 NTs/ RGO	1 M Na_2SO_4	Three-electrode	215	CV 2.5 mV^{-1}	2000 (stability)	2012
Mesoporous α-Fe_2O_3	1 M Li_2SO_4	Three-electrode	116	CD 0.75 A g^{-1}	1000 (74%)	2011
Nanosized α- LiFeO2	0.5 M Li_2SO_4	Three-electrode	40	CV 5 mV^{-1}	500 (100%)	2010
FeOx-carbon nanofoams	2.5 M Li_2SO_4	Three-electrode	84	CV 5 mV^{-1}	1000 (~81%)	2010
Fe_3O_4 nanocrystal	1M Na_2SO_4	Three-electrode	5.3	CD 15 mA g^{-1}	Not reported	2003
Fe_3O_4 particles graphene	1 M KOH	Three-electrode	220.1	CD 0.5 A g^{-1}	1000 (~78%)	2014
Fe_3O_4/carbon nanosheets	1 M Na_2SO_3	Three-electrode	163.4	CD 1 A g^{-1}	1000 (~85%)	2013
Fe_3O_4 nanoparticles	1 M Na_2SO_3	Three-electrode	207.7	CD 0.4 A g^{-1}	Not reported	2013

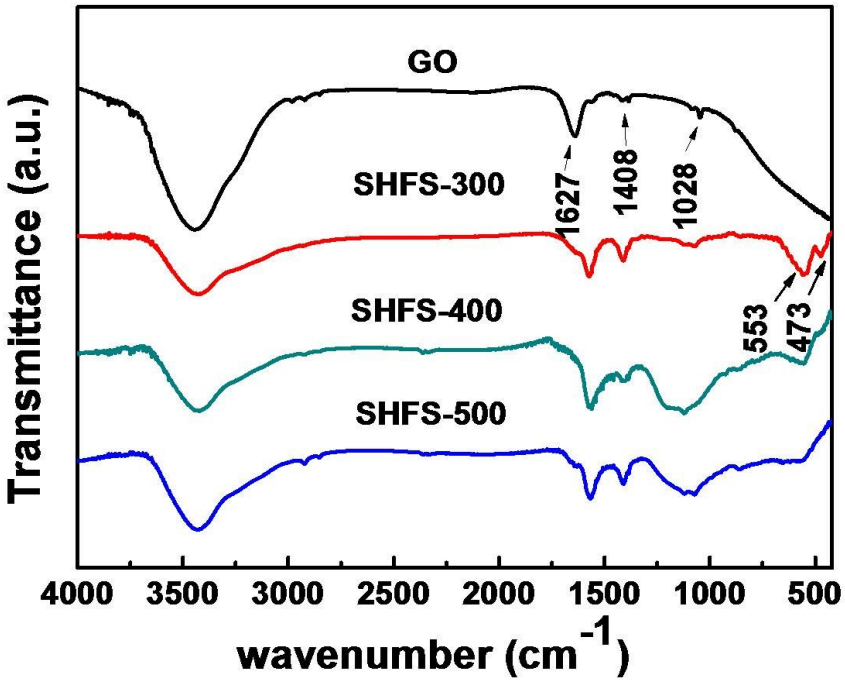

Fig S1. Fourier transform infrared spectra of Self-assembled Graphene Coupled Hollow-Structured γ-Fe2O3 Spheres (SHFS-300, SHFS-400, SHFS-500) and GO.

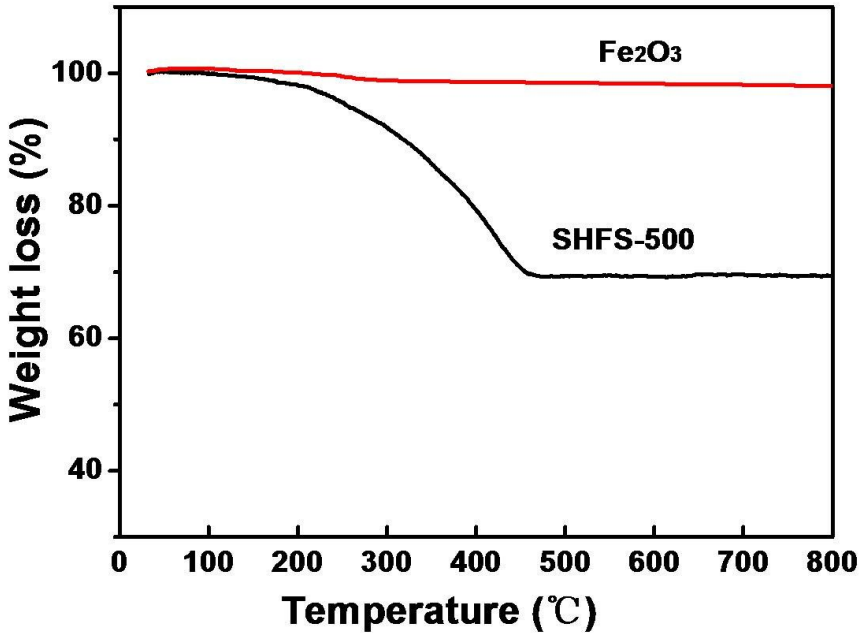

Fig S2. TGA curve of SHFS-500 under air at a rate of 10℃ min-1 from 50 to 800 ℃. The mass ratio of γ-Fe_2O_3 is 68.7% in SHFS-500.

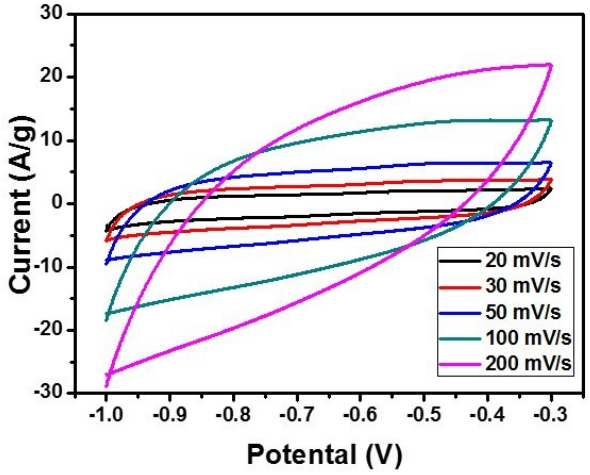

Fig S3. CV curves of SHFS at different scan rates.

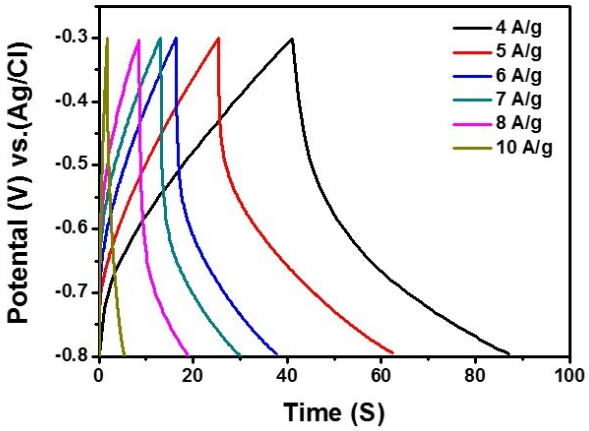

Fig S4. CD curves of SHFS at different current densities.

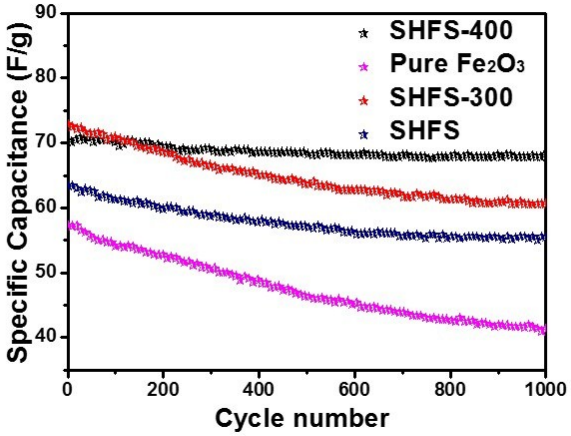

Fig S5. Cycle life of SHFS, SHF-300 and SHF-400 pure Fe_2O_3 at 10 A g^{-1} in 1 M Na_2SO_4 solution.

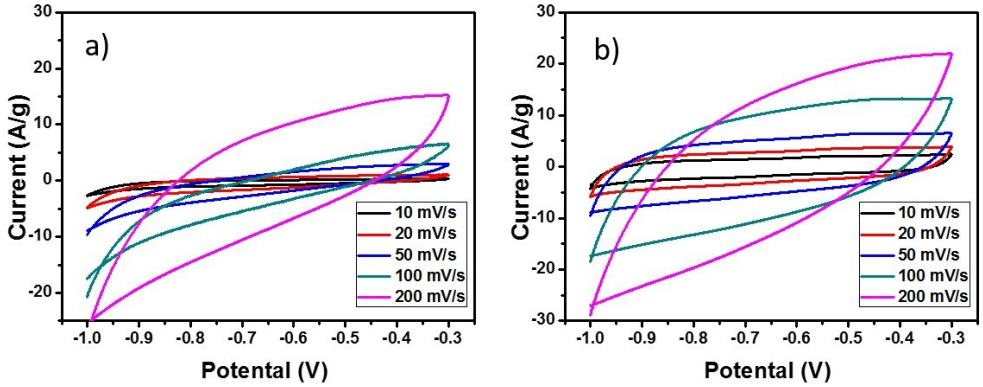

Fig S6. (a,b) CV curves of SHF-300 and SHFS-400 at different scan rates.

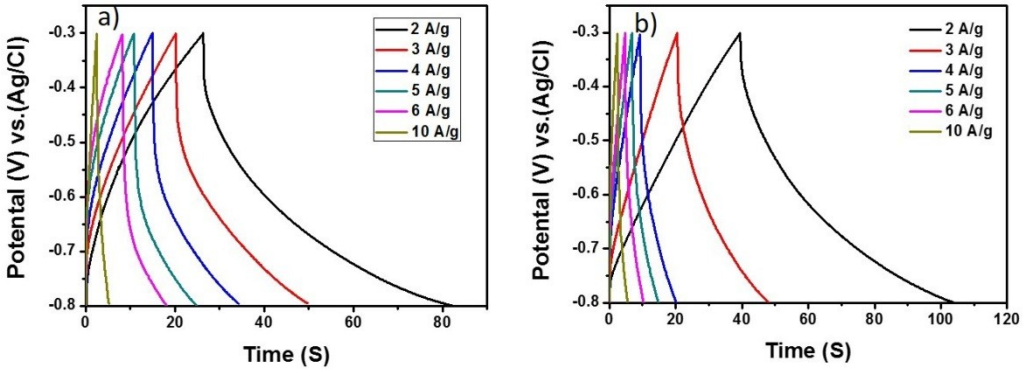

Fig S7. (a,b) CD curves of SHF-300 and SHFS-400 at different current densities.

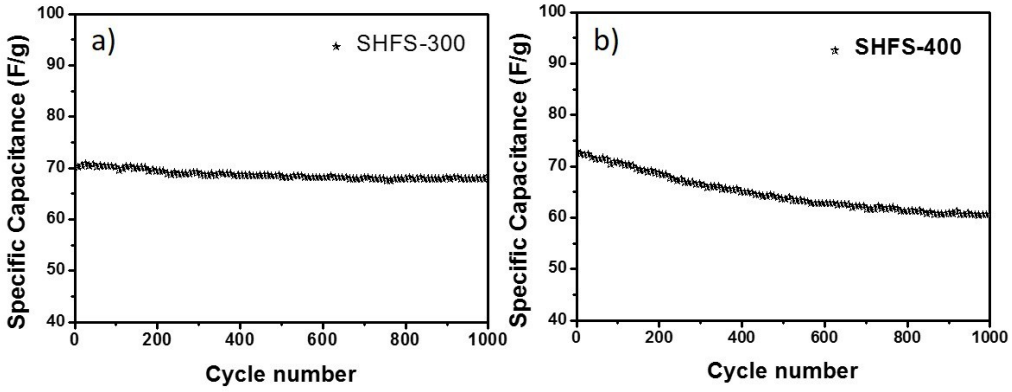

Fig S8. (a,b) Cycle life of SHF-300 and SHF-400 at 10 A g^{-1} in 1 M Na_2SO_4 solution.

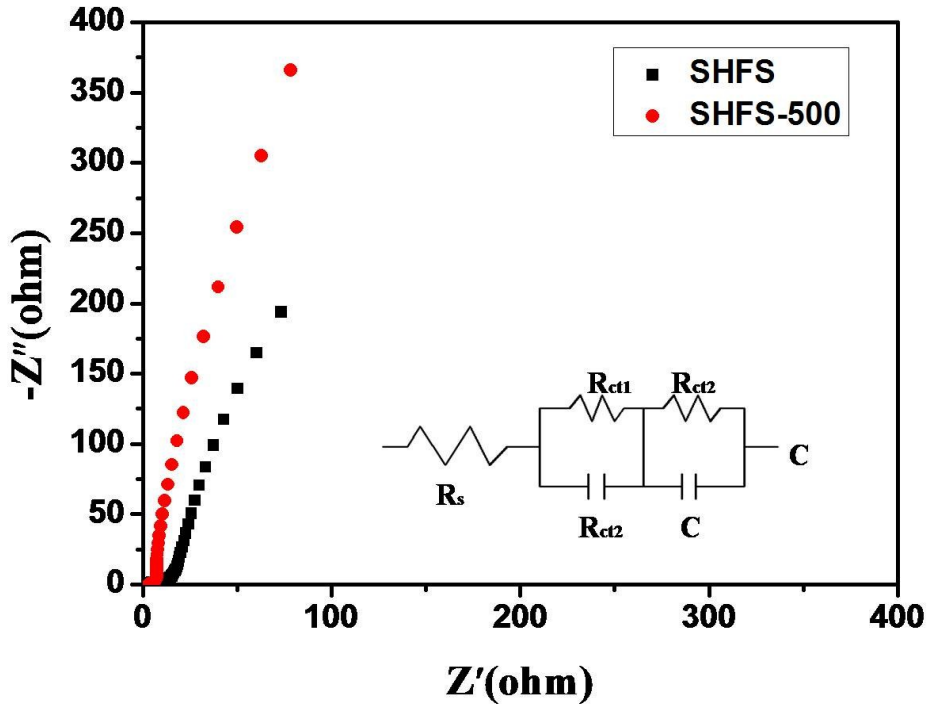

Fig S9. EIS spectra of the electrode material SHFS and SHFS-500.

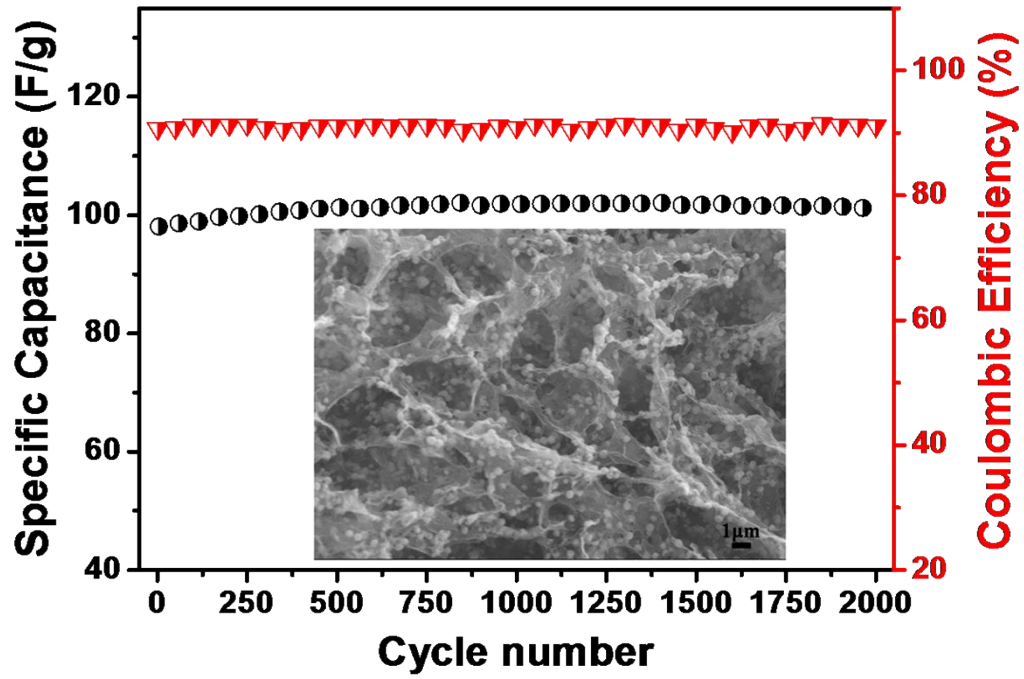

Fig S10. Cycle life of SHFS-500 at 10A g^{-1} in 1 M Na_2SO_4 solution.

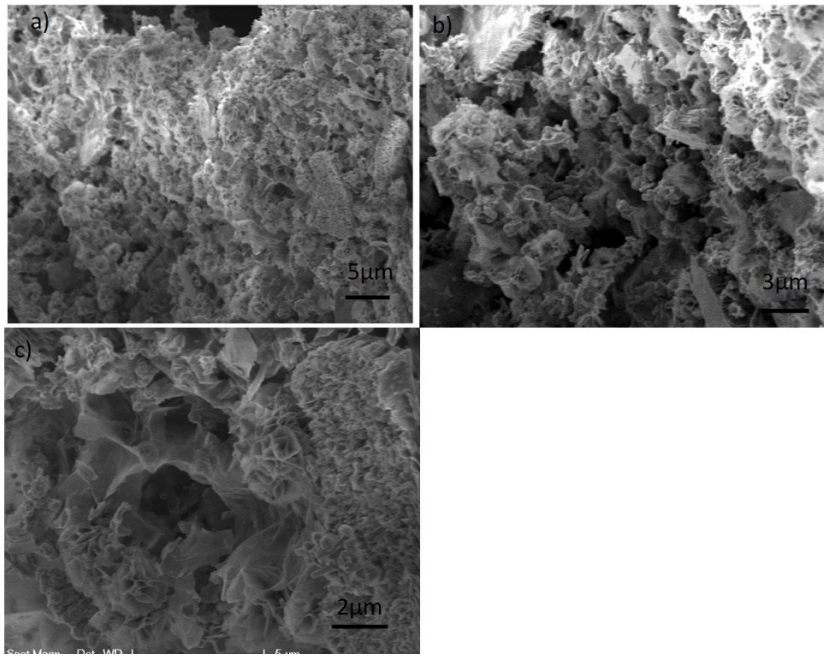

Fig S11. (a–b) Typical SEM image of pure Fe_2O_3 nanoparticles.

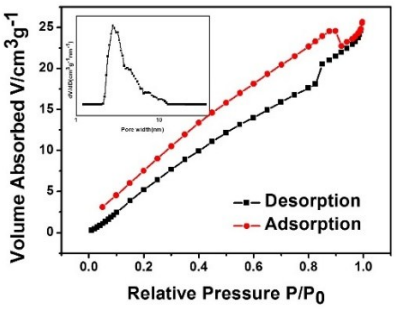

Fig S12. Nitrogen adsorption and desorption isotherms and the corresponding pore size distribution curve of pure Fe_2O_3.

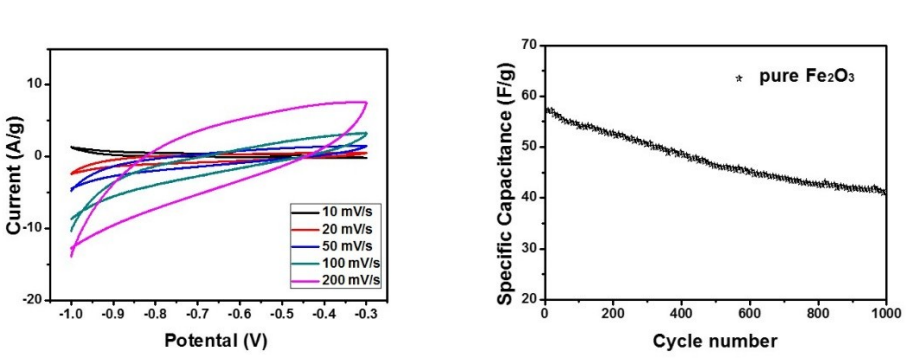

Fig S13. (a) CV curves of pure Fe_2O_3 at different scan rates. (b) Cycle life of pure Fe_2O_3 at 10A g^{-1} in 1 M Na_2SO_4 solution.

References

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