Electronic Supplementary Information (ESI) available:

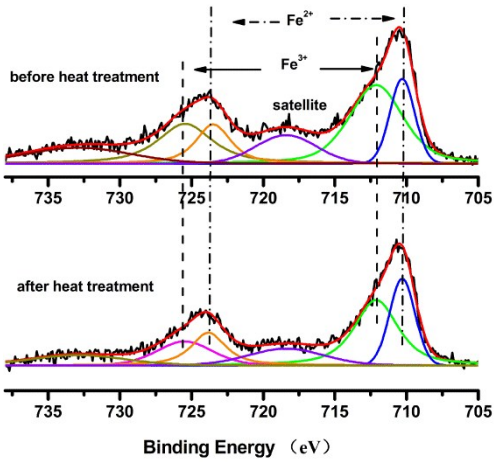

Figure S1. Fe 2p XPS spectra of Fe_3O_4/ GS before and after heat treatment

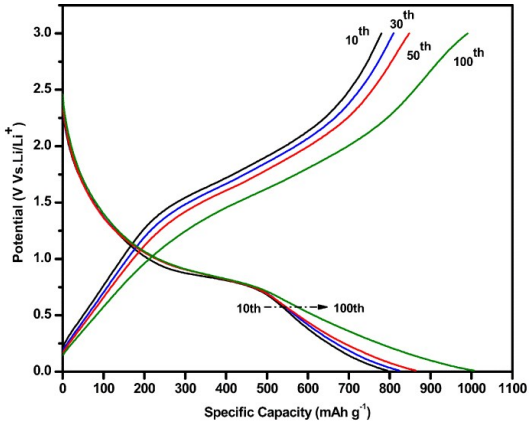

Figure S2. The specific capacity-potential curves of 10^{th}, 50^{th}, 100^{th} and 150^{th} for the Fe_3O_4/GS at a current density of 0.5 A g^{-1}.

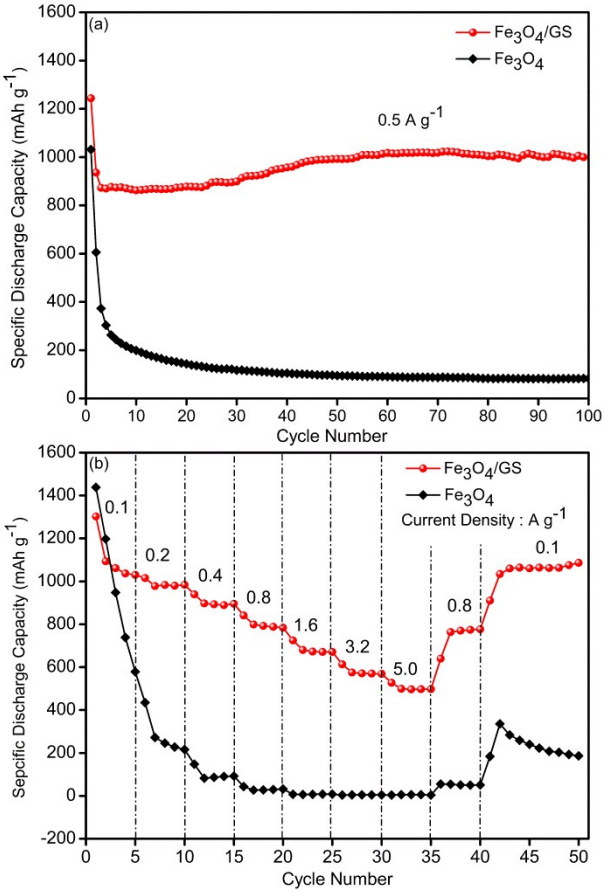

Figure S3 the test electrode is prepared with a weight ratio of 80:10:10 for active material, acetylene black and binder, respectively. Cycling performance (a) 0.5 A g^{-1} and Rate Capability (b) at various current densities are shown.

Table S1. Comparison of electrochemical performance of Fe_3O_4/GS with the other reported iron oxide/ carbon composites

Sample	Current ($mA\ g^{-1}$)	Cycles (N)	Capacity ($mAh\ g^{-1}$)	Ref.
Fe_3O_4/GS	500	175	1002	This
α-Fe_2O_3/Carbon nanofiber	500	100	288	(40)
γ-Fe_2O_3/Carbon nanofiber	50	40	837	(3)
Fe_3O_4/CNTs microspheres	390	100	840	(41)
Fe_3O_4/carbon coating	500	50	976	(42)
rGO/Fe_2O_3	500	100	690	(43)
Fe_3O_4/C	100	40	1000	(18)
Fe2O3@PANI	100	100	893	(45)
Fe2O3/CNT/graphene	372	100	620	(46)
Fe3O4@CNTs	100	145	656	(47)

Table S2 Comparison of Nyquist plots of Fe_3O_4/GS and Fe_3O_4 after 5 cycles and 50 cycles

Sample	$R_{(sf+ct)}$ (Ω) after 5 cycles	$R_{(sf+ct)}$ (Ω) after 50 cycles
Fe_3O_4/GS	18.3	14.6

Fe_3O_4	106.6	46.5