Supporting information

A three-dimensional sponge of graphene nanoribbons crosslinked by Fe₃O₄ nanoparticles for Li⁺ storage

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1.1 Calculation of energy and power densities (*E,P*)

$$E = \int_{0}^{\Delta t} IV(t)dt$$
(Eq.1)
$$P = \frac{E}{t}$$
(Eq.2)

I is the discharging current, *V* is discharging voltage, d*t* is time differential, and

 Δt is the discharging time.



Figure S1(a-b) A photo of bulk 3D Fe₃O₄@GNRs.



Figure S2 (a) Cycling profiles of the blank CFP electrode at 0.1 A g^{-1} . (b) Galvanostatic discharge-charge profiles of blank CFP electrode at a current density of 0.1 A g^{-1} for the 1st, 2nd and 3rd cycles in the voltage range between 3.00 and 0.01 V.



Figure S3 (a) SEM image of GNRs and (b,c) TEM images of GNRs.



Figure S4 A SEM image of pure Fe₃O₄ electrode.



Figure S5 (a-b) SEM images of 3D Fe₃O₄ @GNRs as the fresh electrode.



Figure S6 X-ray photoelectron spectroscopy of O1s in 3D Fe₃O₄@GNRs.



Figure S7 (a) The nitrogen adsorption/desorption isotherms and porosity distribution of 3D Fe₃O₄@GNRs. (b) Porosity distribution of 3D Fe₃O₄@GNRs.



Figure S8 TGA curves of GNRs and 3D Fe₃O₄@GNRs composite.



Figure S9 Cycling profiles of the 3D $Fe_3O_4@GNRs$ electrodes at 1 A g^{-1} .