Electronic Supplementary Material

Enhanced Sodium Storage Kinetics by Rational Designed Volume Regulation and Surface Engineering in Hierarchical Porous FeP@C/rGO †

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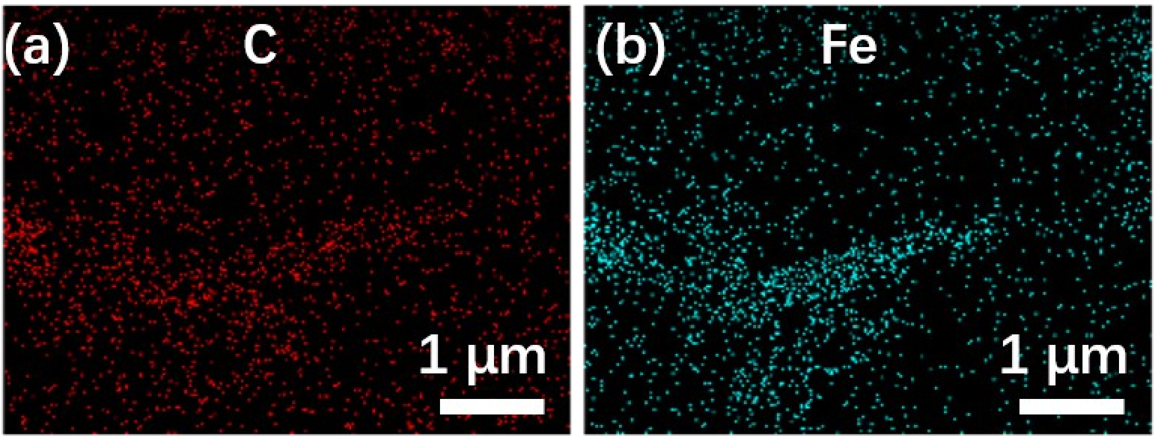

Fig. S1. EDX mapping of Fe-MOF/GO nanocomposite (SEM image of Fig. 1c) with carbon and iron elements distributions.

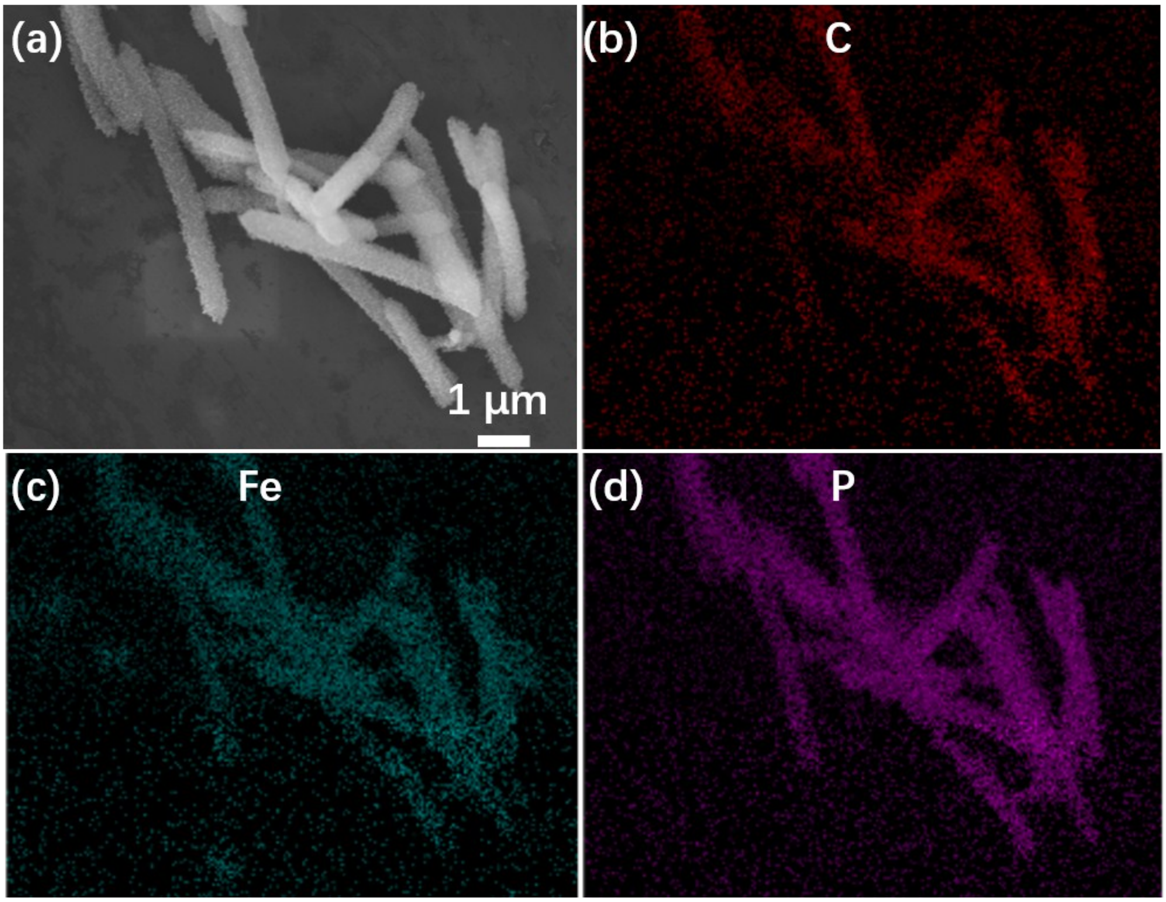

Fig. S2. (a) SEM image and related EDX mapping of FeP@C nanocomposite with (b) carbon, (c) iron and (d) phosphorus elements distributions.

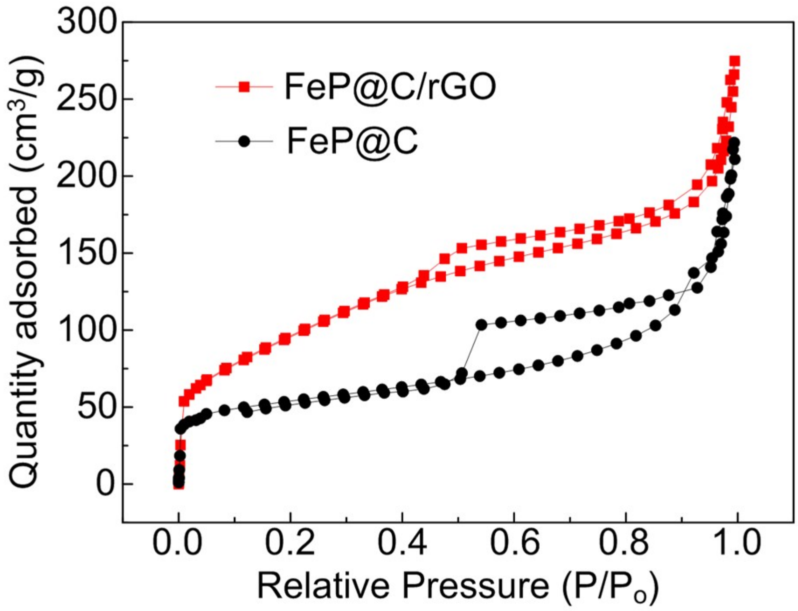

Fig. S3. Nitrogen adsorption–desorption isotherms at 77 K to measure the surface area of FeP@C and FeP@C/rGO nanocomposites.

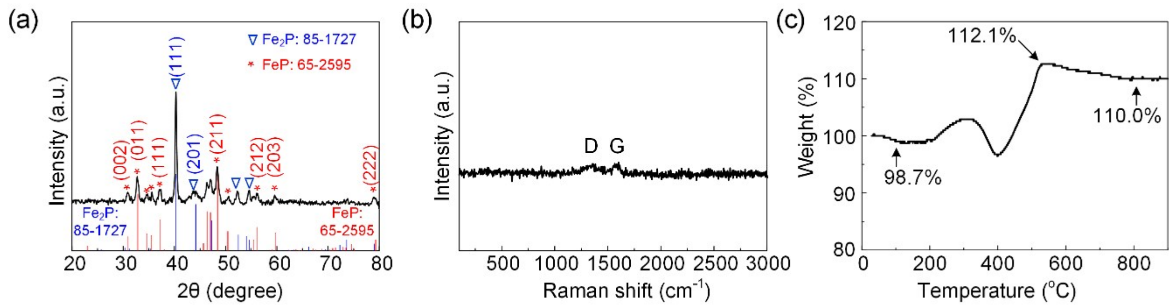

Fig. S4. (a) XRD pattern, (b) Raman and (c) TGA curve of the FeP@C nanocomposites.

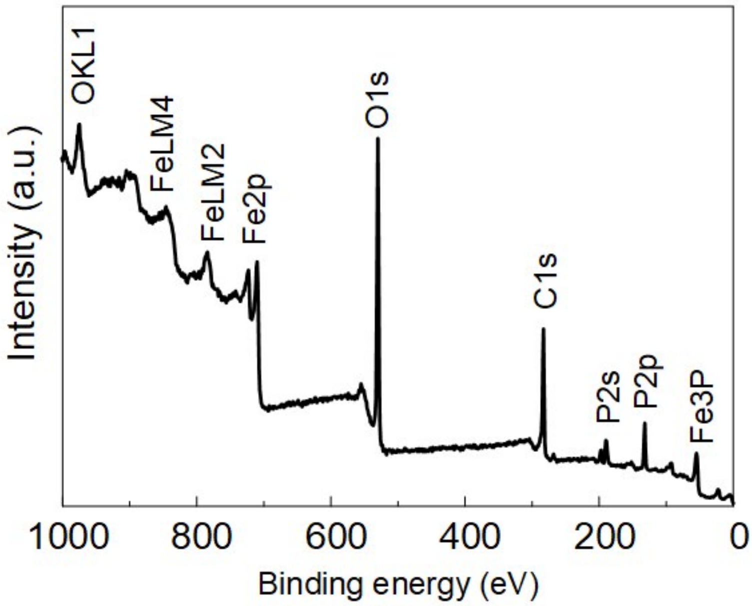

Fig. S5. XPS spectra of FeP@C nanocomposites.

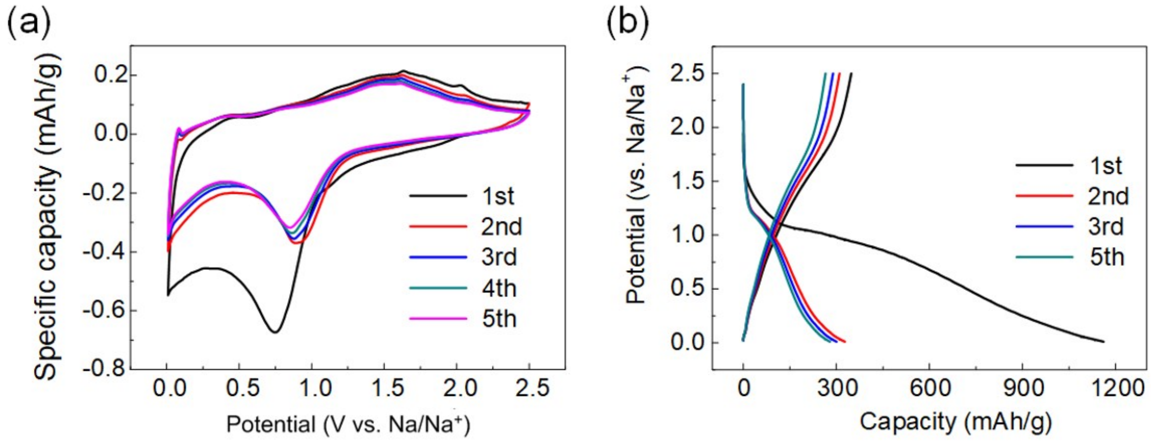

Fig. S6. (a) CV curves of the FeP@C electrode of the first 5 cycles at a scan rate of 0.1 mV s^{-1} in a potential range of 0.01–2.5 V vs. Na/Na^+. (b) Galvanostatic discharging/charging curves of the FeP@C/rGO electrode of the first 5 cycles at a current density of 20 mA g^{-1}.

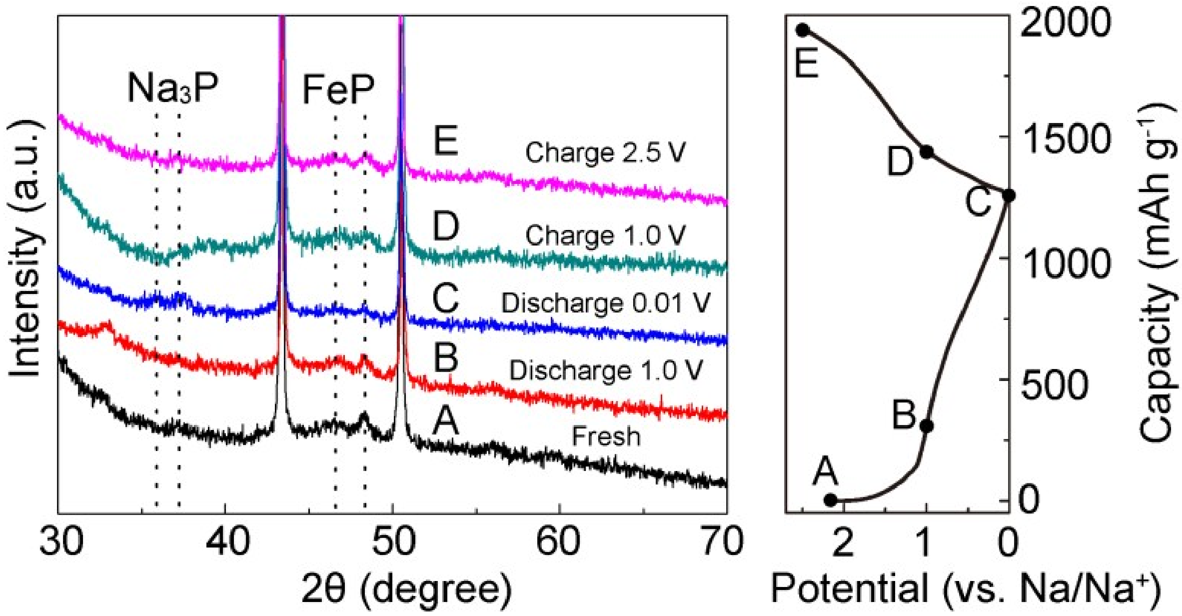

Fig. S7. Ex-situ XRD patterns (left) and discharge/charge curve (right) of the FeP@C/rGO nanocomposites at different discharge/charge stage in the 1st cycle.

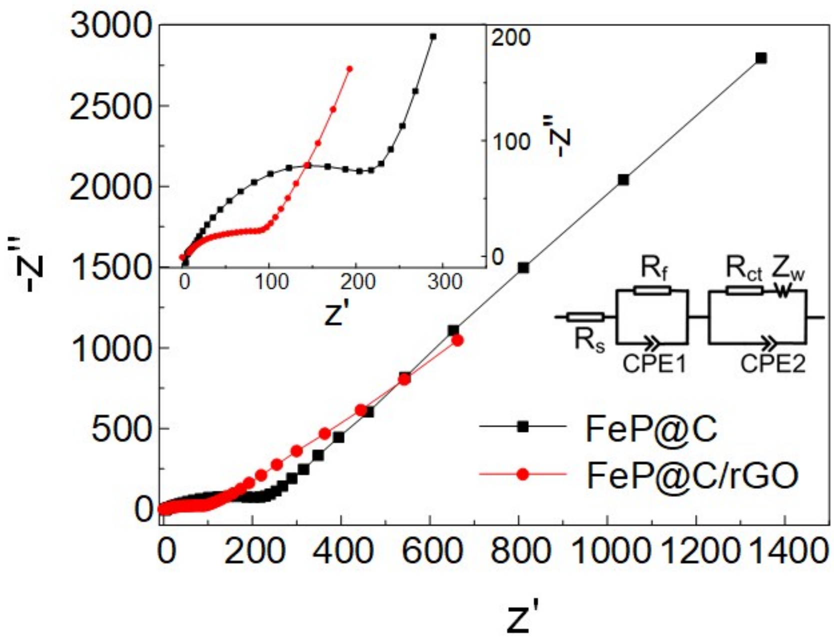

Fig. S8. EIS spectra and corresponding fittings of the FeP@C/rGO and FeP@C nanocomposites electrodes. Insets show the equivalent circuit model used for the fittings and enlarged area at the high frequency range. R_s, R_f, R_{ct}, CPE and W are the current collector and electrolyte resistance, SEI layer resistance, charge transfer resistance, constant phase element related double layer capacitor and Warburg impedance related to the solid-state sodium diffusion, respectively.

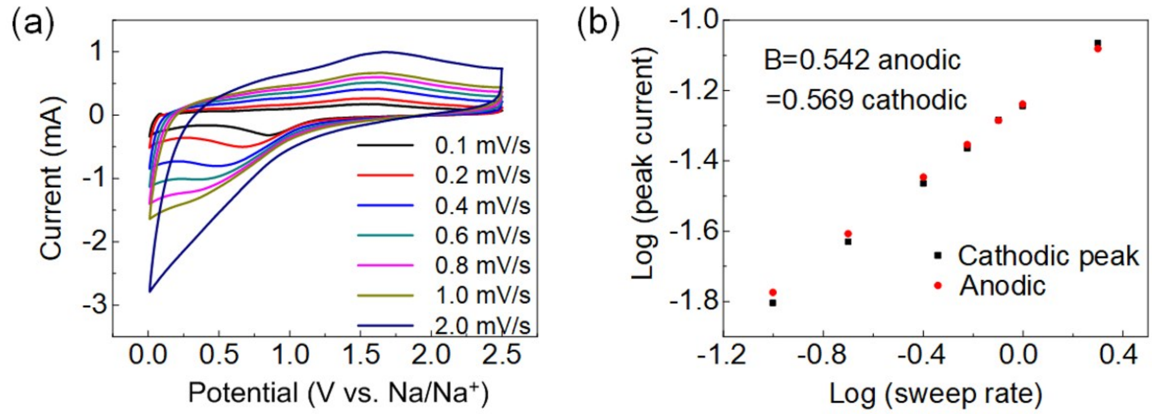

Fig. S9. (a) CV curves at various scan rates and (b) b value fitting of FeP@C nanocomposites electrode.

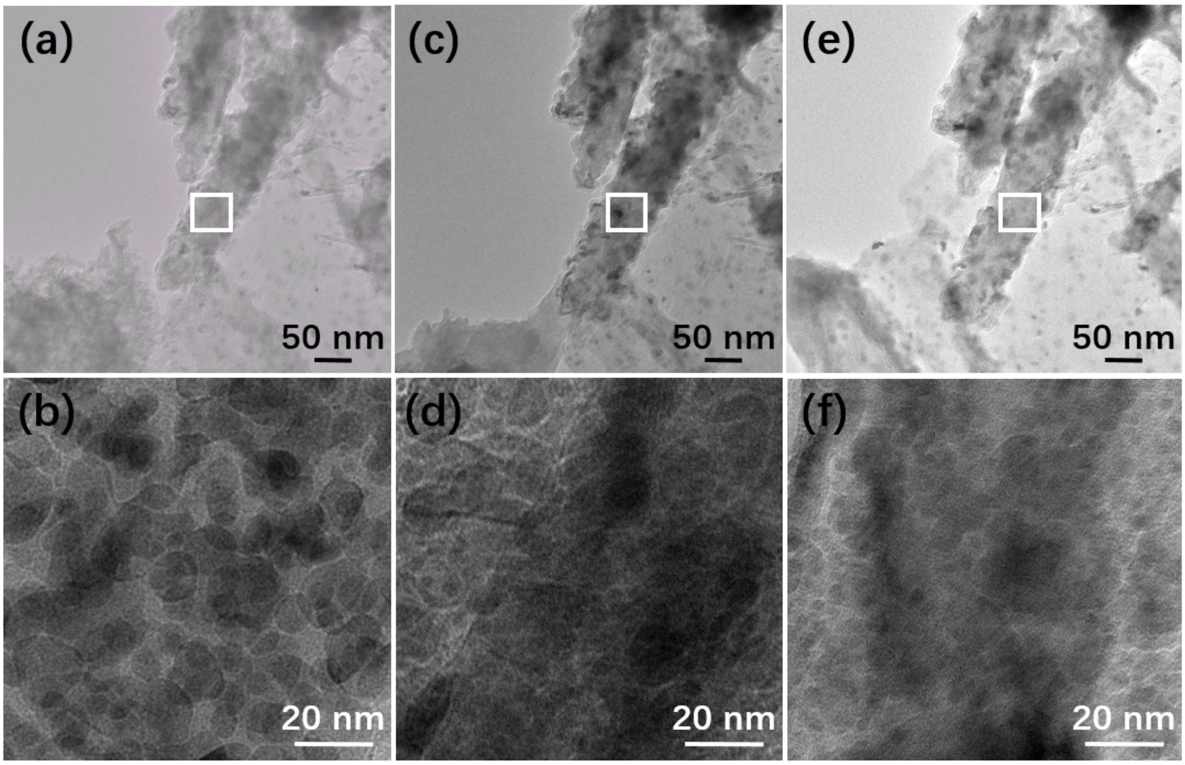

Fig. S10. In-situ TEM images of FeP@C/rGO nanocomposites of (a, b) before sodiation, (c, d) end of 1st sodiation and (e, f) end of 1st desodiation process.

Table S1. Fitting results of the EIS curves in Fig. S8 using the equivalent circuit model

Sample	R_s (Ω)	R_f (Ω)	R_{ct} (Ω)
FeP@C	4.42	47.5	258.3
FeP@C/rGO	3.95	39.11	30.7