Supplementary Information (SI) for Nanoscale.
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Supporting Information

Amorphous FeP@Porous Carbon Nanofibers with Sterically Conducting Networks for Stable Potassium-ions Storage

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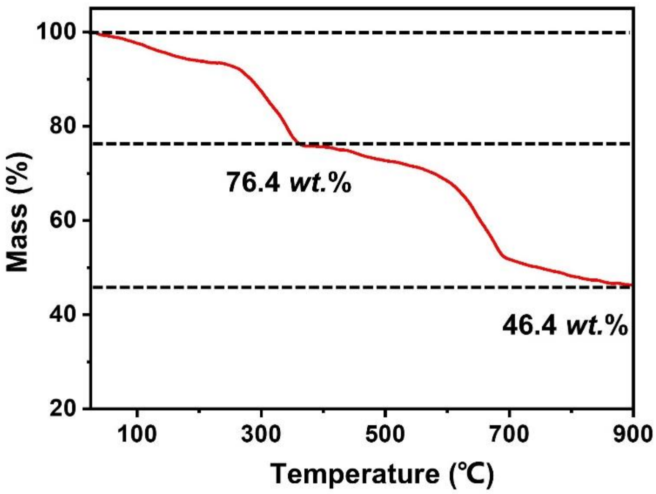

Figure S1. TGA profile of PB.

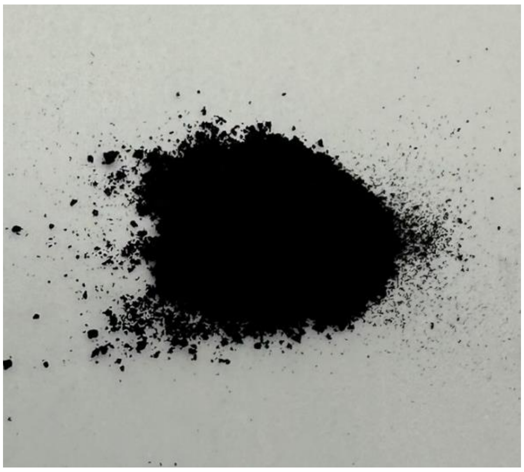

Figure S2. Real-life image of A-FeP@PCNFs.

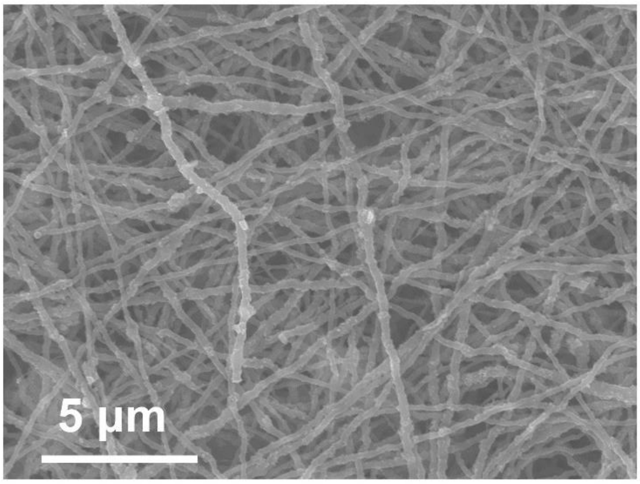

Figure S3. SEM images of A-FeP@PCNFs at low magnifications.

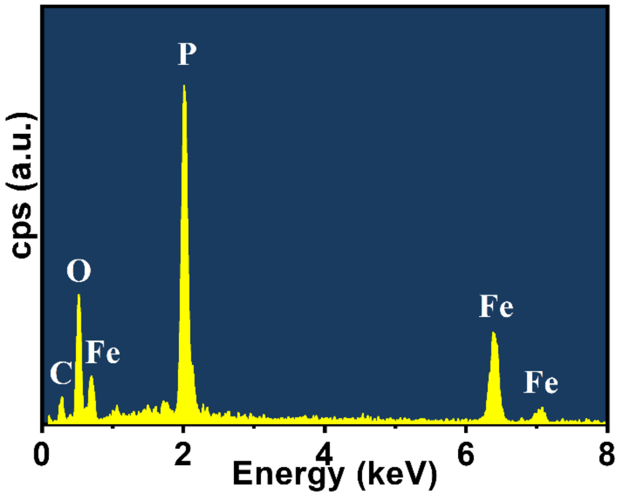

Figure S4. EDS Spectrum of A-FeP@PCNFs.

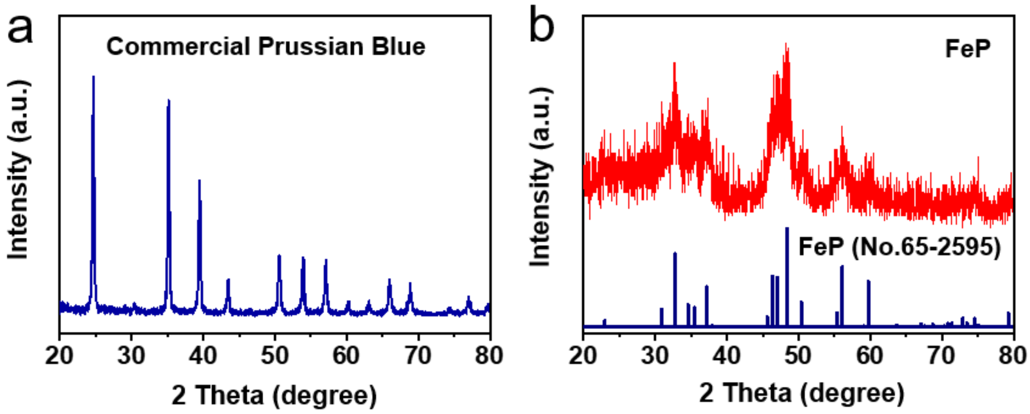

Figure S5. XRD patterns of (a) PB and (b) commercial Prussian blue powder after phosphating treatment.

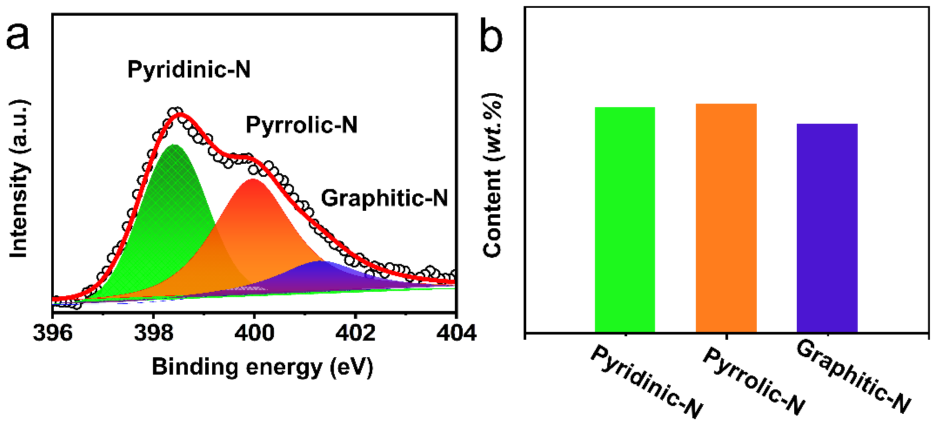

Figure S6. (a) High-resolution N 1s XPS spectra and (b) statistical comparison chart of A-FeP@PCNFs.

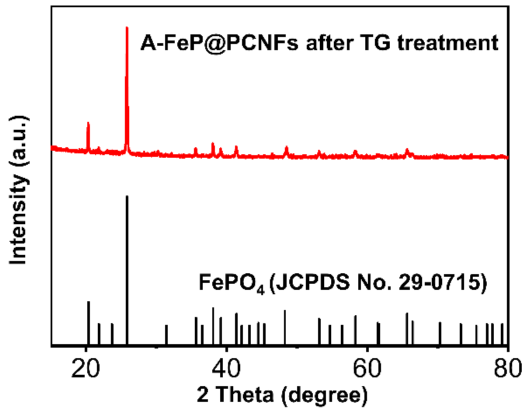

Figure S7. XRD patterns of A-FeP@PCNFs after TG treatment.

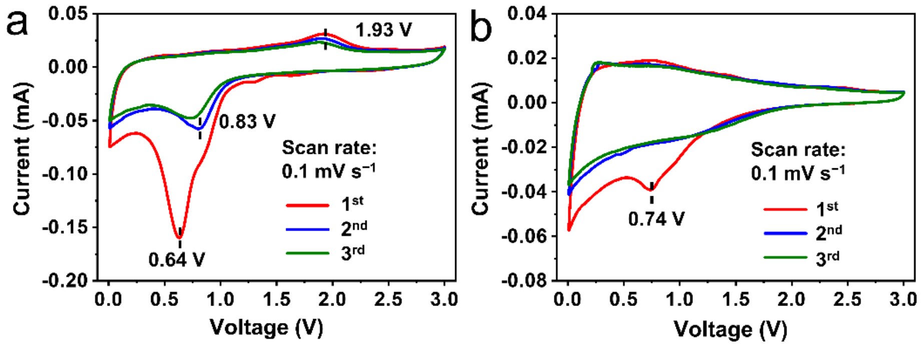

Figure S8. Cycle voltammetry profiles recorded at a sweep rate of 0.1 mV s^{-1} of (a) FeP and (b) PAN-C.

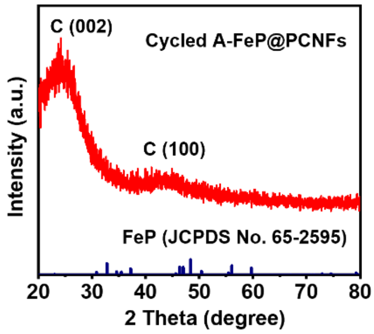

Figure S9. XRD patterns of A-FeP@PCNFs electrode after 5 cycles at 0.5 A g^{-1}.

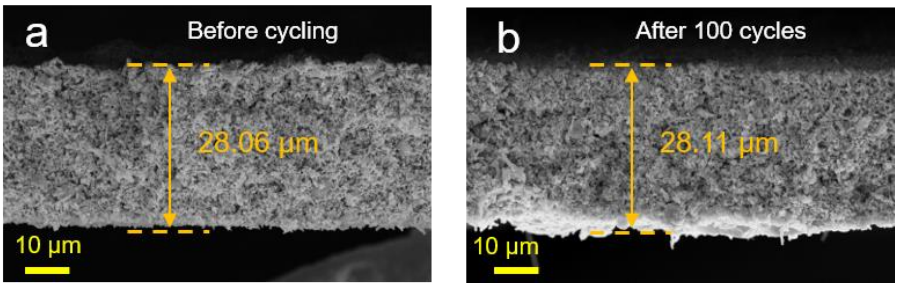

Figure S10. Cross-sectional SEM images of A-FeP@PCNFs electrode. (a) Before cycling. (b) After 100 cycles.

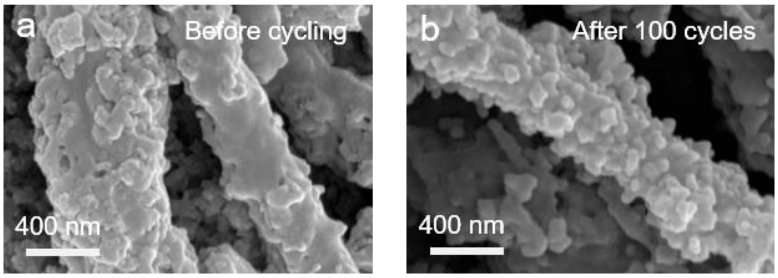

Figure S11. Surface SEM images of A-FeP@PCNFs electrode. (a) Before cycling. (b) After 100 cycles.

Table S1. EDS results of A-FeP@PCNFs for C, Fe and P elements.

Elements	Atomic fraction (%)	Mass fraction (%)	*wt*. % Sigma
C	77.49	50.84	3.48
Fe	9.93	30.35	3.05
P	9.80	16.58	1.63
N	2.78	2.23	2.64

Table S2. The ratio of Fe/P in A-FeP@PCNFs powders.

Samples	Fe/P mole percentage (a.u.)
A-FeP@PCNFs	0.996

Table S3. The statistic N contents of A-FeP@PCNFs based on the XPS results.

N	Contents
Pyridinic	33.70%
Pyrrolic	33.86%
Graphitic-N	32.44%

Table S4. Performance comparison of some FeP-based composite materials for KIBs.

Active materials	Battery type Voltage	Rate capability	Cycle stability	Ref.
A-FeP@PCNFs	KIBs (0.01–3.0V)	326.2 mA h g^{-1} at 100 mA g^{-1} 312.5 mA h g^{-1} at 200 mA g^{-1} 292.5 mA h g^{-1} at 500 mA g^{-1} 272.5 mA h g^{-1} at 1000 mA g^{-1}	358.3 mA h g^{-1} after 100 cycles at 100 mA g^{-1}	This work
FeP@CNBs	KIBs (0.01–2.5V)	201 mA h g^{-1} at 100 mA g^{-1} 156 mA h g^{-1} at 200 mA g^{-1} 101 mA h g^{-1} at 500 mA g^{-1} 65 mA h g^{-1} at 1000 mA g^{-1}	205 mA h g^{-1} after 300 cycles at 100 mA g^{-1}	[1]
FeP	KIBs (0.01–3.0V)	125.2 mA h g^{-1} at 100 mA g^{-1} 97.7 mA h g^{-1} at 200 mA g^{-1} 73.4 mA h g^{-1} at 500 mA g^{-1} 53.3 mA h g^{-1} at 1000 mA g^{-1}	~110 mA h g^{-1} after 100 cycles at 50 mA g^{-1}	[2]
FeP/C	KIBs (0.01–3.0V)	185.8 mA h g^{-1} at 100 mA g^{-1} 156.2 mA h g^{-1} at 200 mA g^{-1} 112.5 mA h g^{-1} at 500 mA g^{-1} 78.6 mA h g^{-1} at 1000 mA g^{-1}	~200 mA h g^{-1} after 50 cycles at 50 mA g^{-1}	[3]

[1] F. Yang, H. Gao, J. Hao, S. Zhang, P. Li, Y. Liu, J. Chen, Z. Guo, Yolk–Shell Structured FeP@C Nanoboxes as Advanced Anode Materials for Rechargeable Lithium-/Potassium-Ion Batteries, Adv. Funct. Mater. 29 (2019) 1808291.
[2] M. Ma, K. Yao, Y. Wang, D. Fattakhova-Rohlfing, S. Chong, Decoupling the Kinetic Essence ofIron-Based Anodes through Anionic Modulation for Rational Potassium-Ion Battery Design, Adv. Funct. Mater. 34 (2024) 2315662.
[3] Li W, Yan B, Fan H, Zhang C, Xu H, Cheng X, Li Z, Jia G, An S, Qiu X, FeP/C composites as an anode material for K-ion batteries, ACS Appl. Mater. Inter. 11 (2019) 22364-22370.