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Supplementary Information

A universal strategy to prepare porous graphene film: binder-free anode for high-rate lithium-ion and sodium-ion batteries

Xiaoting Zhang, Jisheng Zhou,* Chengcheng Liu, Xiaohong Chen and Huaihe Song*

State Key Laboratory of Chemical Resource Engineering, Beijing Key Laboratory of Electrochemical Process and Technology for Materials, Beijing University of Chemical Technology, Beijing 100029, China.

* E-mail: songhh@mail.buct.edu.cn, zhoujs@mail.buct.edu.cn

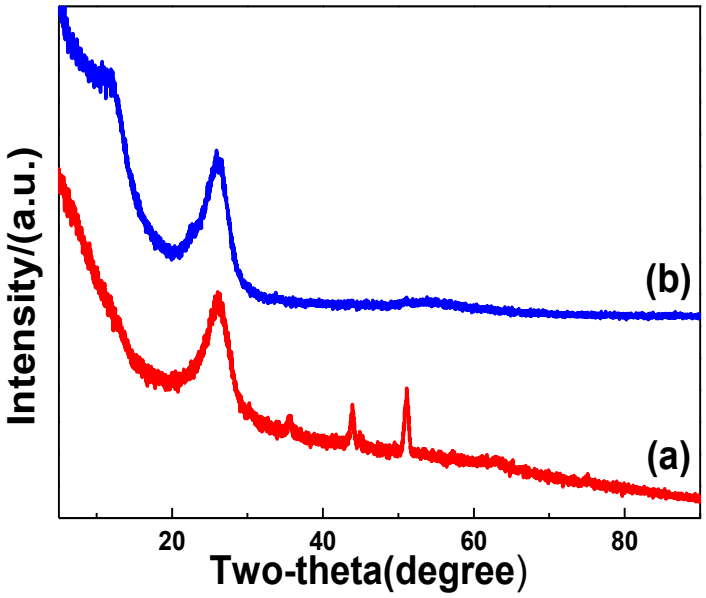

Fig. S1 XRD patterns of (a) PGF/Fe_3C and (b) PGF-1.

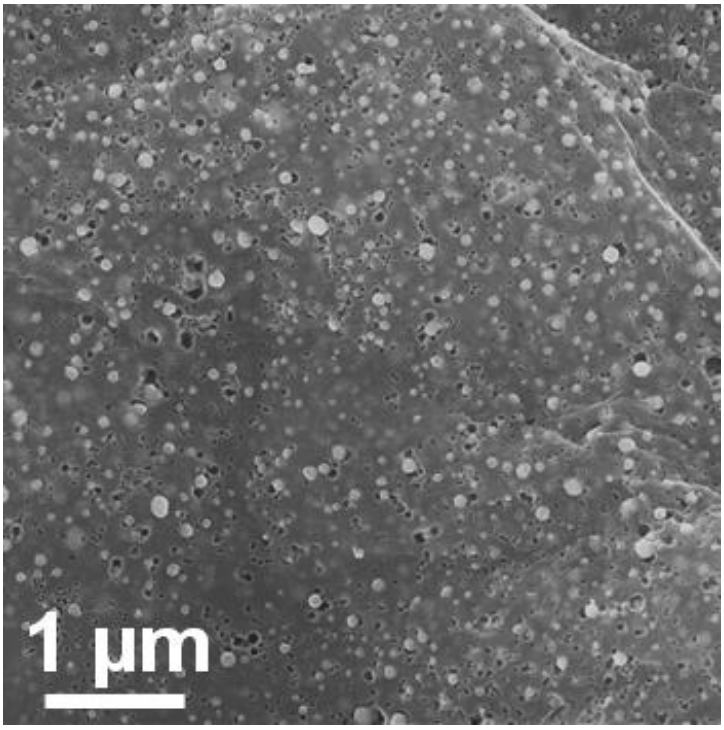

Fig. S2 SEM image of PGF-1-Fe$(NO_3)_3$.

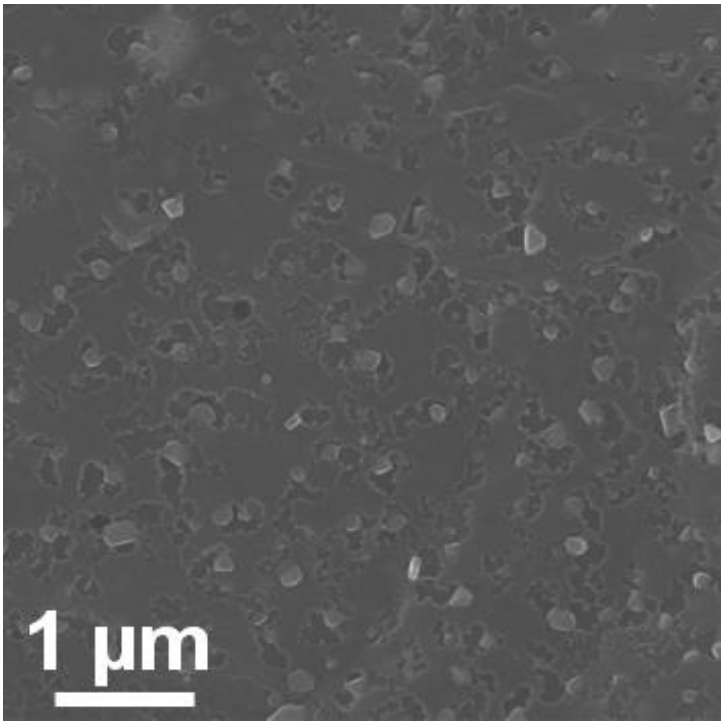

Fig. S3 SEM image of PGF-2-Fe$(NO_3)_3$.

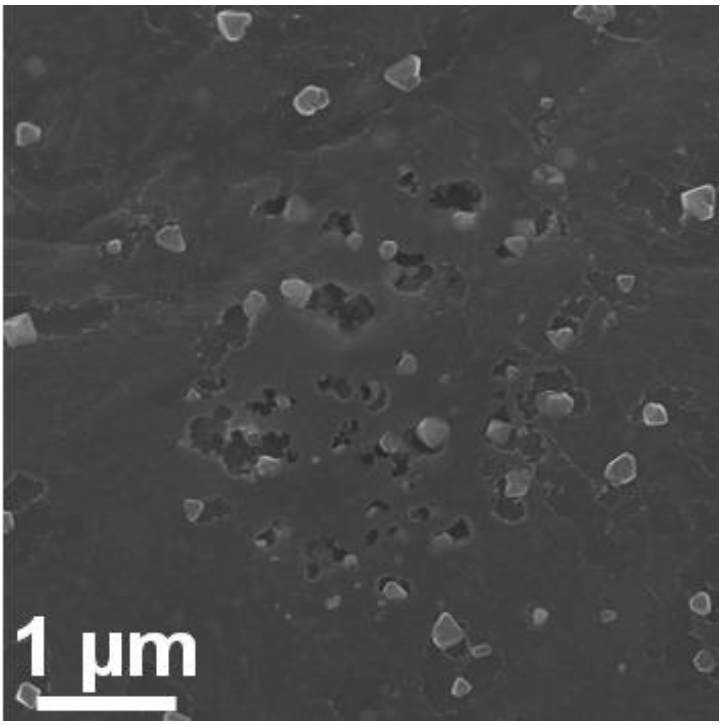

Fig. S4 SEM image of PGF-3-Fe$(NO_3)_3$.

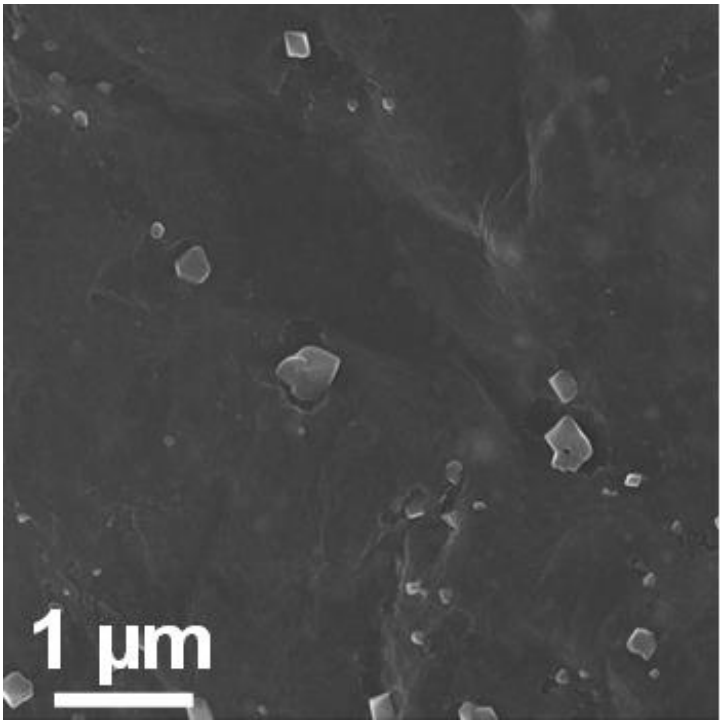

Fig. S5 SEM image of PGF-4-Fe$(NO_3)_3$.

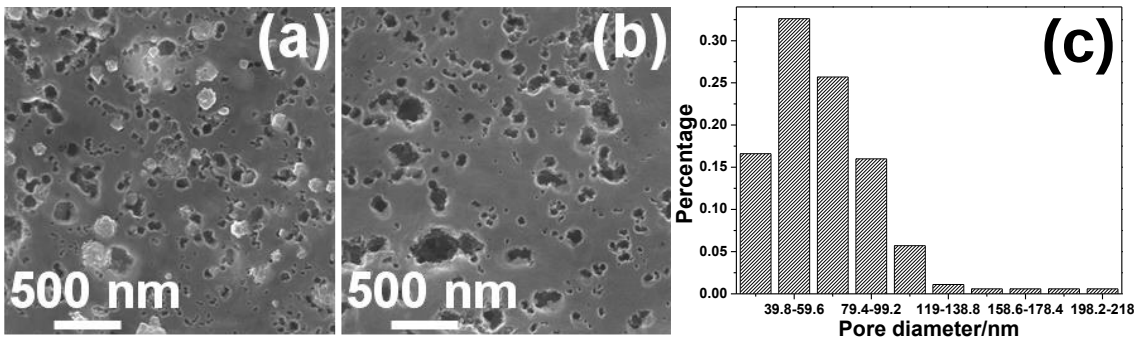

Fig. S6 SEM images of (a) PGF-$FeCl_3$ and (b) corresponding PGF, (c) pore-size distribution of corresponding PGF**.**

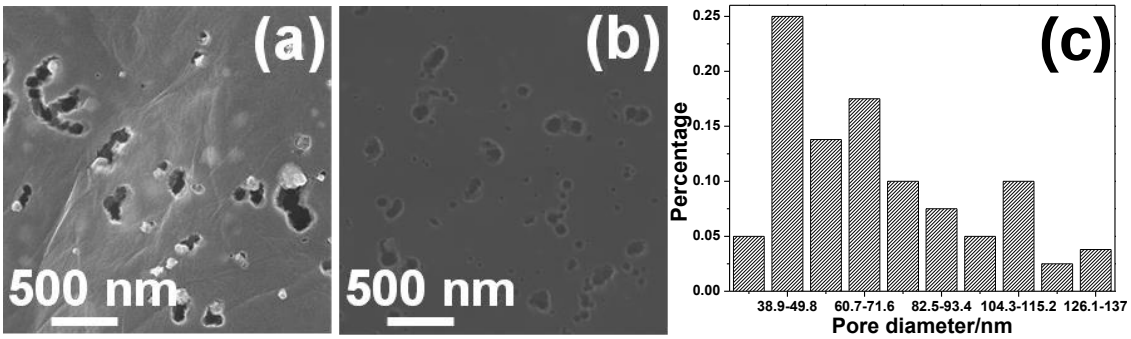

Fig. S7 SEM images of (a) PGF-$Co(NO_3)_2$ and (b) corresponding PGF, (c) pore-size distribution of corresponding PGF**.**

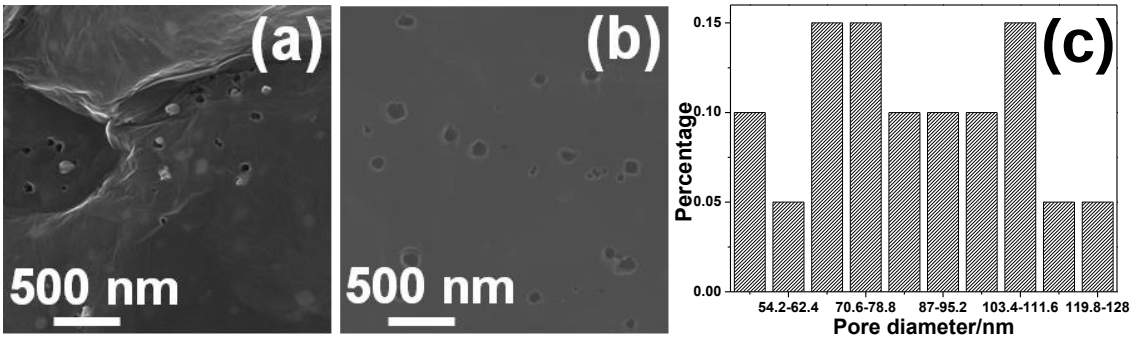

Fig. S8 SEM images of (a) PGF-$CoCl_2$ and (b) corresponding PGF, (c) pore-size distribution of corresponding PGF**.**

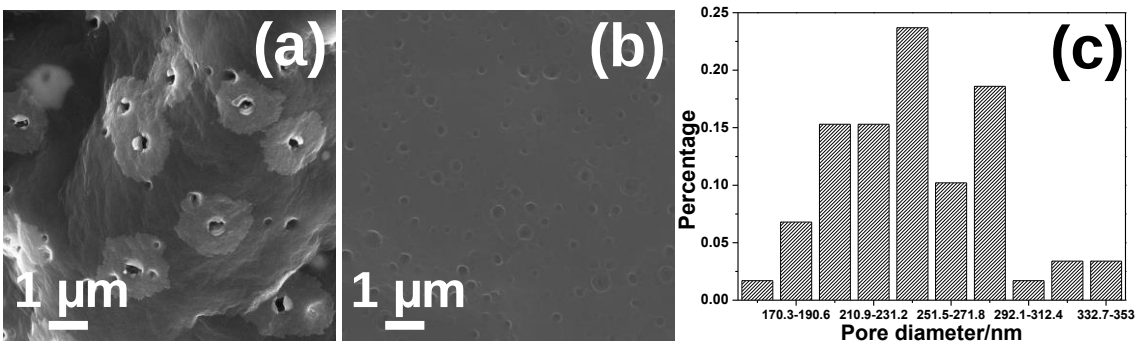

Fig. S9 SEM images of (a) PGF-$Cu(NO_3)_2$ and (b) corresponding PGF, (c) pore-size distribution of corresponding PGF**.**

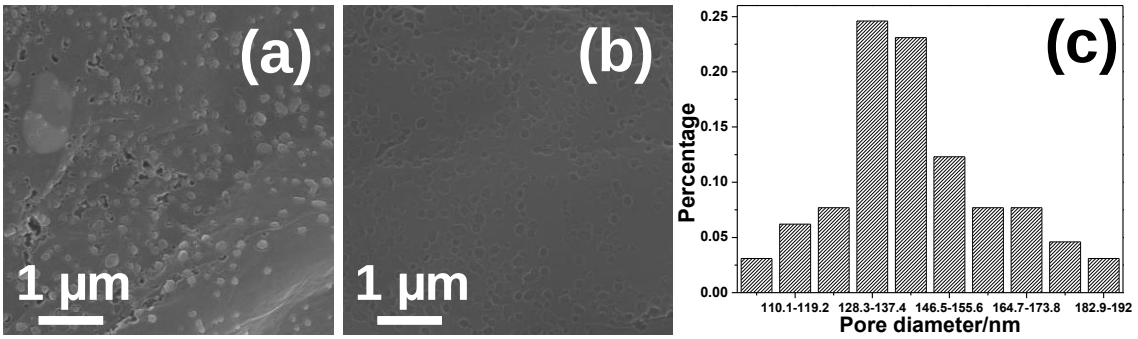

Fig. S10 SEM images of (a) PGF-$MnSO_4$ and (b) corresponding PGF, (c) pore-size distribution of corresponding PGF**.**

Table S1 The initial Coulombic efficiency and dynamical parameters of AC impedance spectra for GF, PGF-1, PGF-2, PGF-3, and PGF-4 as LIBs and SIBs.

	LIBs			SIBs		
	Coulombic efficiency	R_f (Ω)	R_{ct} (Ω)	Coulombic efficiency	R_f (Ω)	R_{ct} (Ω)
GF	51 %	26.95	38.58	33 %	25.25	252.10
PGF-1	35 %	2.58	19.34	29 %	14.29	184.40
PGF-2	34 %	18.51	24.97	-	- -	-
PGF-3	33 %	22.21	32.35	-	- -	-
PGF-4	36 %	19.21	36.37	-	- -	-

Table S2 The specific capacity value of porous graphene in previous literature and this paper.

Materials (PG=Porous graphene)	Current density (Ag^{-1})	Discharge specific capacity ($mAhg^{-1}$)	Cycle numbers
N-Doped PG[1]	5	450	1500
PG[2]	5	560	3000
PG paper[3]	10	~75	1000
PG[4]	20C	211	100
PG[5]	20	199	50
PG[6]	10	346.5	60
N-S-Doped PG[7]	1	556	50
N-Doped PG[8]	10	210	25
PG paper[9]	2	420	100
PG[10]	20	100	10000
Our result: PGF-1	**10**	**971**	**10000**
Our result: PGF-1	**30**	**298**	**10000**
Our result: PGF-1	**50**	**163**	**10000**

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