

Supporting Information

Sandwich-like Nitrogen-Doped Porous Carbon/Graphene Nanoflakes with High-rate Capacitive Performance

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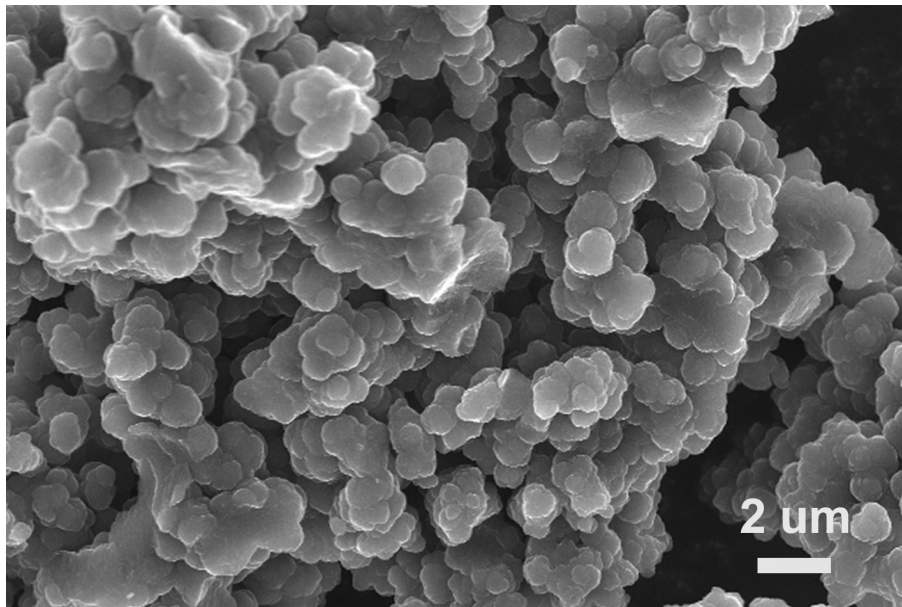


Fig. S1. FESEM image of pure PPy.

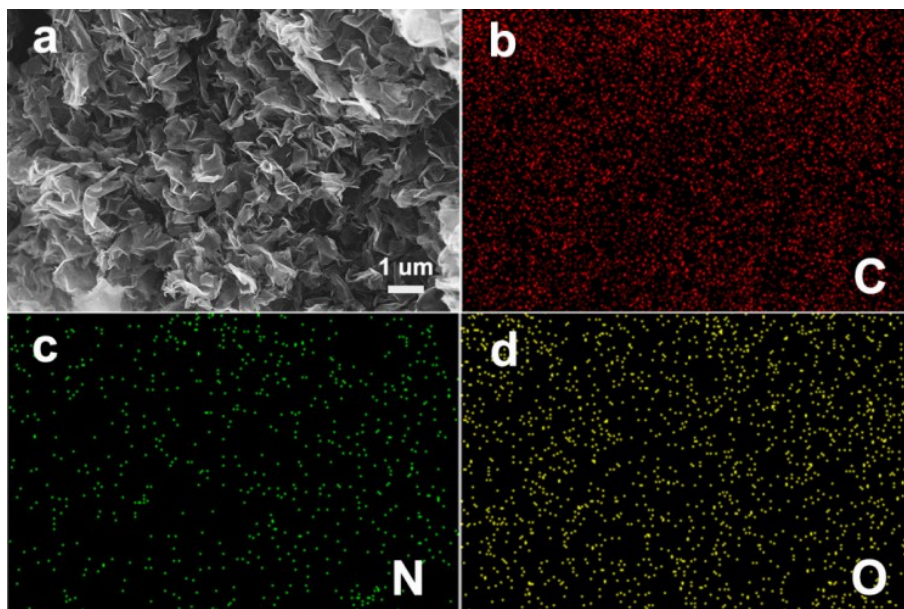


Fig. S2. (a) Selected area for elemental mapping of NPCFs-2 sample and (b), (c), (d) Elemental mappings of C, N and O.

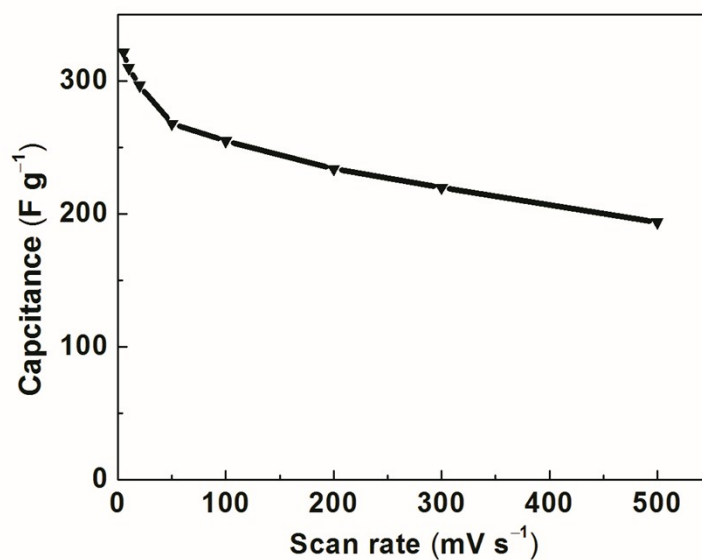


Fig. S3. Specific capacitance of NPCFs-2 at various scan rates from 5 to 500 mV s⁻¹.

Specific capacitance was obtained from the CV curves according to the following equation:

$$C_{sp} = \frac{\oint I dv}{vm\Delta v}$$

where I is the response current (A), m is the total mass of electrodes (g), Δv is the potential range (V),

and v is the scan rate (mV s⁻¹).

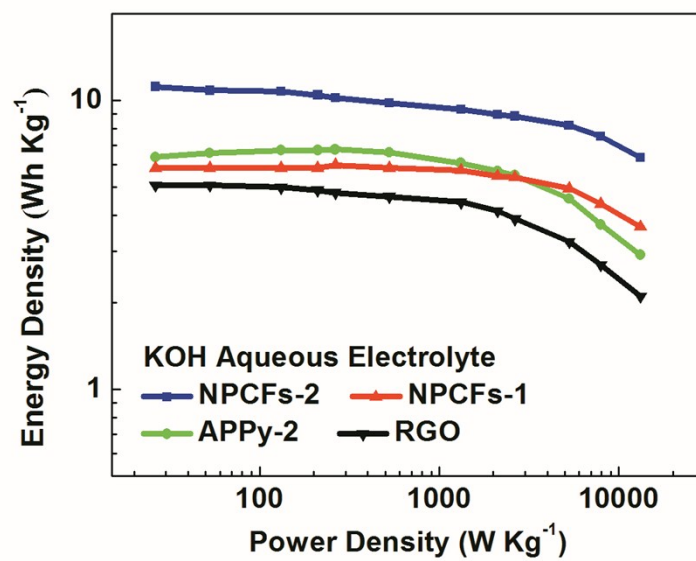


Fig. S4. Ragone plots of RGO, NPCFs-1, NPCFs-2, and APPy-2 supercapacitors in 30 wt% KOH aqueous electrolyte.

Table S1 The relative contents of N-containing functional groups in NPCFs-1 and NPCFs-2.

Samples	Content of different N groups (%)			
	N-6	N-5	N-Q	N-4
NPCFs-1	44	53.8	0	2.2
NPCFs-2	48.5	42.1	3.1	6.3

Table S2. Comparison of capacitive performance of NPCFs-2 with other carbon electrodes reported in aqueous electrolyte

Carbon materials	Testing method	C ^a (F g ⁻¹)	C ^b (F g ⁻¹)	Electrolyte (mol L ⁻¹)	Ref.
microporous carbon	GCD	254 (0.5 A g ⁻¹)	140 (30 A g ⁻¹)	H ₂ SO ₄ (1)	[1]
3D porous graphene	GCD	206 (2 A g ⁻¹)	185 (15 A g ⁻¹)	H ₂ SO ₄ (1)	[2]
graphene aerogel	GCD	204 (0.2 A g ⁻¹)	140 (30 A g ⁻¹)	KOH (6)	[3]
hierarchically porous carbon	GCD	238 (0.2 A g ⁻¹)	178 (30 A g ⁻¹)	KOH (6)	[4]
hierarchically porous carbon	CV	239 (5 mV s ⁻¹)	166 (100 mV s ⁻¹)	H ₂ SO ₄ (1)	[5]
microporous carbon fibers	GCD	215 (0.2 A g ⁻¹)	113 (100 A g ⁻¹)	KOH (6)	[6]
MOF-derived carbon	CV	252 (5 mV s ⁻¹)	159 (200 mV s ⁻¹)	H ₂ SO ₄ (1)	[7]
MOF-derived carbon	GCD	251 (0.25 A g ⁻¹)	204 (0.5 A g ⁻¹)	H ₂ SO ₄ (1)	[8]
porous carbon	GCD	245 (0.05 A g ⁻¹)	188 (8 A g ⁻¹)	KOH (6)	[9]
porous carbon	GCD	300 (0.1 A g ⁻¹)	228 (8 A g ⁻¹)	Na ₂ SO ₄ (1)	[10]
NPCFs-2	GCD	341 (0.1 A g ⁻¹)	220 (30 A g ⁻¹)	KOH (6)	This work

^a Specific capacitance at low current density or voltage scan rate

^b Specific capacitance at high current density or voltage scan rate

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