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Supplementary Information

N-doped graphitized porous carbon derived from N-rich polymer for improved supercapacitor performance

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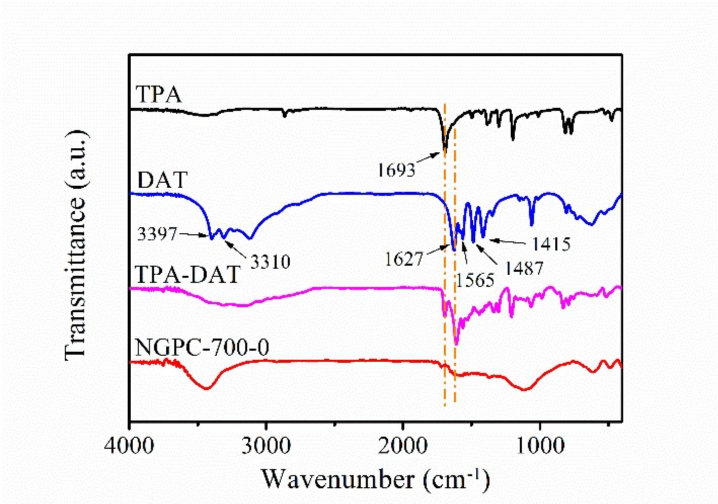

Fig. S1 FT-IR spectra of the monomers (TPA and DAT), TPA-DAT and the derived carbon material (NGPC-700-0).

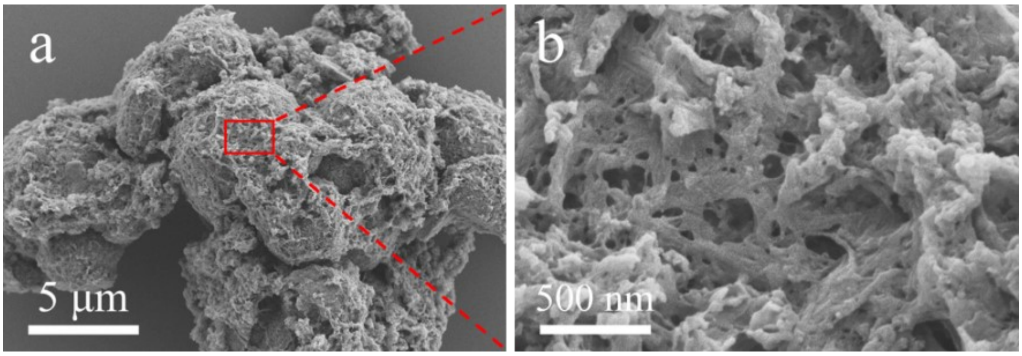

Fig. S2 SEM images of TPA-DAT.

Table S1. Porosity parameters and element contents of NGPCs.

Sample	SSA (m^2 g^{-1})		Pore volume (cm^3 g^{-1})			D_{aver} (nm)	Element content (at%)		
	S_{BET}	S_{micro}	V_{total}	V_{micro}	$V_{meso/macro}$		C	N	O
NGPC-700-0	96.6	58.2	0.18	0.03	0.15	-	83.34	12.82	3.84
NGPC-600-1	1470.2	981.2	0.78	0.45	0.33	2.11	81.70	7.92	10.38
NGPC-700-0.5	1270.6	789.3	0.70	0.39	0.31	2.21	78.80	8.86	12.34
NGPC-700-1	2123.7	1248.9	1.30	0.58	0.72	2.45	85.60	6.20	8.20
NGPC-700-2	1719.7	935.2	1.51	0.46	1.05	3.52	89.16	3.40	7.44
NGPC-800-1	2258.5	1052.3	1.48	0.53	0.95	4.10	88.07	1.87	10.06

Table S2. The electrochemical parameters of NGPCs.

Sample	Specific capacitance		Capacitance retention (%)	R_s (Ω)	R_{ct} (Ω)	Phase angle (°)	τ_0 (s)
	0.5 A g^{-1}	50 A g^{-1}					
NGPC-700-0	113.2	57.6	50.9	0.57	0.56	-73.2	-
NGPC-600-1	269.1	198.6	73.8	0.53	0.25	-84.4	0.63
NGPC-700-0.5	257.5	190.7	74.1	0.54	0.19	-82.2	0.63
NGPC-700-1	322.7	255.4	79.1	0.52	0.13	-85.4	0.28
NGPC-700-2	225.2	173.5	77.0	0.47	0.18	-83.5	0.40
NGPC-800-1	231.6	181.6	78.4	0.50	0.20	-84.8	0.35

Table S3. Performance comparison with other N doped carbon materials for supercapacitor electrode materials.

Sample	S_{BET} (m^2 g^{-1})	Nitrogen content (at%)	Specific capacitance	Rate capability	Electrolyte	Ref.
N-doped porous carbon nanofiber aerogel	401.8	2.68	279 F g^{-1} (0.5 A g^{-1})	59% (20 A g^{-1})	1 M H_2SO_4	[1]
Nitrogen-doped holey carbon nanosheet	701.7	5.30	205 F g^{-1} (0.5 A g^{-1})	67% (20 A g^{-1})	6 M KOH	[2]
Nitrogen-doped hierarchical porous carbon	2160	5.79	283 F g^{-1} (0.1 A g^{-1})	61.8% (150 A g^{-1})	6 M KOH	[3]
N-doped porous carbon nanosheet	879	3.73	263 F g^{-1} (1 A g^{-1})	73.8% (20 A g^{-1})	2 M KOH	[4]
Nitrogen-doped ordered mesoporous carbon	272	24.1	382 F g^{-1} (0.5 A g^{-1})	61.4% (20 A g^{-1})	1 M H_2SO_4	[5]
Porous nitrogen-doped carbon	2453	6.95	306.5 F g^{-1} (0.5 A g^{-1})	70.3% (50 A g^{-1})	6 M KOH	[6]
Nitrogen-enriched nanoporous carbon	533	18.06	306 F g^{-1} (0.5 A g^{-1})	72.4% (30 A g^{-1})	6 M KOH	[7]
N-doped microporous /mesoporous carbon	1969	0.3	261.6 F g^{-1} (0.5 A g^{-1})	78% (10 A g^{-1})	6 M KOH	[8]
N-doped microporous carbon hollow sphere	1524	6.37	326 F g^{-1} (0.5 A g^{-1})	30.7% (50 A g^{-1})	6 M KOH	[9]
Nitrogen-doped graphitized porous carbon	2123.7	6.20	322.7 F g^{-1} (0.5 A g^{-1})	79.1% (50 A g^{-1})	6 M KOH	This work

Table S4. Supercapacitive performance comparison with other carbon materials derived from Schiff-base polymer.

Sample	Activator	S_{BET} ($m^2 g^{-1}$)	Specific capacitance	Rate capability	Electrolyte	Ref.
Porous carbon spheres	KOH	1302	344 $F g^{-1}$ (1 $A g^{-1}$)	61.0% (20 $A g^{-1}$)	6 M KOH	[10]
N-doped microporous carbon spheres	KOH	1478	292 $F g^{-1}$ (1 $A g^{-1}$)	68.5% (20 $A g^{-1}$)	6 M KOH	[11]
N, O codoped carbon nanospheres	KOH	2660	376 $F g^{-1}$ (0.5 $A g^{-1}$)	54.8% (50 $A g^{-1}$)	6 M KOH	[12]
N/O co-doped porous carbons	KOH	1656	292 $F g^{-1}$ (0.5 $A g^{-1}$)	57.2% (50 $A g^{-1}$)	6 M KOH	[13]
N-doped porous carbon materials	KOH	1164	297 $F g^{-1}$ (0.5 $A g^{-1}$)	62.6% (20 $A g^{-1}$)	1 M Na_2SO_4	[14]
Hierarchical porous carbons	$ZnCl_2$	1203	301 $F g^{-1}$ (1 $A g^{-1}$)	72.4% (30 $A g^{-1}$)	6 M KOH	[15]
N-doped porous carbon nanorods	$CuCl_2$	2048.7	271 $F g^{-1}$ (0.5 $A g^{-1}$)	64.6% (20 $A g^{-1}$)	6 M KOH	[16]
	KOH	3291.8	126 $F g^{-1}$ (0.5 $A g^{-1}$)	75.4% (20 $A g^{-1}$)		
N/O co-doped carbon nanospheres	$CuCl_2$	2957.8	273.9 $F g^{-1}$ (0.5 $A g^{-1}$)	65.8% (20 $A g^{-1}$)	6 M KOH	[17]
Nitrogen-doped graphitized porous carbon	K_2FeO_4	2123.7	322.7 $F g^{-1}$ (0.5 $A g^{-1}$)	79.1% (50 $A g^{-1}$)	6 M KOH	This work

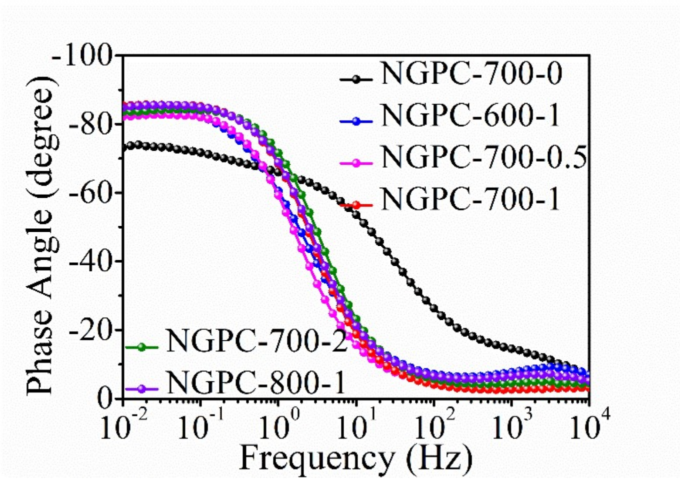

Fig. S3 The bode plots of NGPCs.

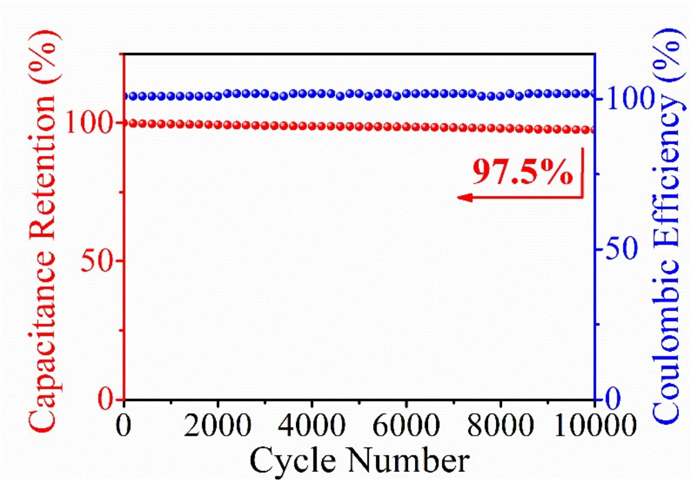

Fig. S4 The stability evaluation of NGPC-700-1 at 10 A g^{-1}.

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