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Supporting Information

Block Copolymer-based Porous Carbons for Supercapacitors

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Table S1. Summary of capacitive performances of block copolymer-derived porous carbons.

Electrode	Precursor	Mass Loading[1)] ($mg\ cm^{-2}$)	Electrolyte[2)]	Gravimetric Capacitance ($F\ g^{-1}$)	Rate Capability	Cycling Stability	Ref.
Zero-Dimensional Porous Carbon Powders							
Partially-graphitized ordered mesoporous carbon	F127+Phenolic Resin	–[3)]	6 M KOH	175 (2 $mV\ s^{-1}$)	64% (2–1000 $mV\ s^{-1}$)	~95% (4000 cycles)	1
3D ordered mesoporous carbon/CNT	F127+Phenolic Resin	0.9-1.2	6 M KOH	338.1 (1 $A\ g^{-1}$)	38.5% (1–50 $A\ g^{-1}$)	91.6% (4000 cycles)	2
N-doped mesoporous/microporous carbon	F127+Phenolic Resin	–	1 M H_2SO_4	325 (0.2 $A\ g^{-1}$)	54.2% (0.2–20 $A\ g^{-1}$)	100% (2000 cycles)	3
Hollow core/mesoporous shell carbon	F127+Phenolic Resin	–	0.1 M KOH	125 (50 $mV\ s^{-1}$)	–	–	4
Ordered mesoporous carbon	F127+Phenolic Resin	–	1 M H_2SO_4	231 (0.5 $A\ g^{-1}$)	75.8% (0.5–20 $A\ g^{-1}$)	98% (5000 cycles)	5
Nanocast ordered mesoporous carbon	F127+Mimosa tannin	–	1 M H_2SO_4	277 (0.5 $mV\ s^{-1}$)	53% (0.5–100 $mV\ s^{-1}$)	80.6% (5000 cycles)	6
Ordered mesoporous carbon sphere	F127+Resorcinol	–	1-ethyl-3-methylimidazolium tetrafluoroborate (ionic liquid)	140.2 (0.5 $A\ g^{-1}$)	71.3% (0.5–20 $A\ g^{-1}$)	–	7
N-doped carbon sphere	F127+Melamine-formaldehyde	3.0	6 M KOH	204 (1 $A\ g^{-1}$)	64% (1–30 $A\ g^{-1}$)	84.5% (5000 cycles)	8
N-doped porous carbon	F127+Pyrrole	–	1 M H_2SO_4	156 (0.1 $A\ g^{-1}$)	86.5% (0.1–5 $A\ g^{-1}$)	~100% (10000 cycles)	9

Activated lignin-derived mesoporous carbon	F127+Lignin	–	6 M KOH	102.3 (1 mV s^{-1})	95.8% (1–10 mV s^{-1})	–	10
Starch-derived mesoporous carbon	F127+Starch	–	6 M KOH	144 (0.05 A g^{-1})	72.4% (0.05–1 A g^{-1})	88.2% (1000 cycles)	11
N-doped, flower-shaped ordered mesoporous carbon	F127+Fructose	–	6 M KOH	~240 (0.2 A g^{-1})	~75% (0.2–10 A g^{-1})	90% (1000 cycles)	12
N-doped mesoporous carbon	F127+Fructose	–	–	212 (1 mV s^{-1})	–	–	13
Bowl-shaped, N-doped carbon hollow particle	PS-*b*-PEO	–	1 M H_2SO_4	385 (0.1 A g^{-1})	51.9% (0.1–2 A g^{-1})	100% (10000 cycles)	14
N-doped hierarchical porous carbon	PS-*b*-P4VP	3.0	6 M KOH	284 (0.2 A g^{-1})	67% (0.2–30 A g^{-1})	96% (5000 cycles)	15
Structure-controllable mesoporous carbon	PAN-*b*-PMMA	–	2 M KOH	254 (0.5 A g^{-1})	78% (0.5–5 A g^{-1})	96% (10000 cycles)	16
N-doped hierarchical porous carbon	PS-*b*-PAN	2.6	6 M KOH	257 (0.5 A g^{-1})	49.8% (0.5–20 A g^{-1})	90.4% (10000 cycles)	17
Well-defined N/S co-doped nanocarbon	PAN-*b*-PBA	15	6 M KOH	236 (0.1 A g^{-1})	53.6% (0.2–10 A g^{-1})	89% (5000 cycles)	18
N-doped hierarchical porous carbon	PAN-*b*-PMMA	–	2 M KOH	314 (0.5 A g^{-1})	67.8% (0.5–20 A g^{-1})	90% (10000 cycles)	19
Mesoporous carbon nanoparticle	PAN-*b*-PMMA	–	6 M KOH	220 (0.05 A g^{-1})	–	91% (10000 cycles)	20
Mesoporous carbon	PAN-*b*-PS-*b*-PAN	8 mg	2 M KOH	185 (0.625 A g^{-1})	67.5% (0.625–6.25 A g^{-1})	97.5% (10000 cycles)	21
Hierarchical porous carbon framework	PVDC-*b*-PS	1–2	6 M KOH	241.9 (0.5 A g^{-1})	70.7% (0.5–20 A g^{-1})	93.3% (10000 cycles)	22
One-Dimensional Porous Carbon Fibers							

Porous carbon fiber	PMMA-*b*-PAN	1	6 M KOH	360 (1 A g^{-1})	62.7% (1–10 A g^{-1})	100% (10000 cycles)	23
MnO_2-coated porous carbon fiber	PMMA-b-PAN	6.8	6 M KOH	462 (10 mV s^{-1})	50.2% (10–1000 mV s^{-1})	98% (5000 cycles)	24
Well-aligned ordered mesoporous carbon nanofiber	PS-*b*-PEO	–	–	172.8 (0.23 A g^{-1})	68.3% (0.23–11.25 A g^{-1})	79.2% (1000 cycles)	25
Two-Dimensional Porous Carbon Films and Sheets							
N-doped mesoporous carbon sheet	F127+GO	5–8 mg	6 M KOH	268.9 (0.2 A g^{-1})	76.2% (0.2–20 A g^{-1})	87% (4000 cycles)	26
Mesoporous reduced GO	F127+GO	7 mg	6 M KOH	210 (1 mV s^{-1})	73.8% (1–100 mV s^{-1})	95.6% (1000 cycles)	27
Ordered mesoporous, highly uniform carbon sheet	F127+Resol	–	PVA/H_2SO_4 (gel)	208 (0.2 A g^{-1})	51% (0.2–100 A g^{-1})	99% (20000 cycles)	28
Bimodal nanoporous carbon	PS-*b*-P2VP	–	6 M KOH	173 (1 A g^{-1})	92.5% (1–10 A g^{-1})	100% (10000 cycles)	29
Hierarchically ordered mesoporous cabon	F127+Resol	3	1 M H_2SO_4	212 (0.25 A g^{-1})	96.2% (0.25–10 A g^{-1})	97% (5000 cycles)	30
Activated hierarchical porous carbon	PAN-*b*-PMMA-*b*-PAN	–	6 M KOH	297 (0.5 A g^{-1})	74.9% (0.5–5 A g^{-1})	90% (2000 cycles)	31
Three-Dimensional Porous Carbon Monoliths and Aerogels							
S-rich carbon cryogel	F127+RF resin	–	1 M tetraethylammon ium tetrafluoroborate (organic)	27.5 (0.5 A g^{-1})	54.5% (0.5–10 A g^{-1})	98.8% (1000 cycles)	32
Heteroatom-doped	F127+PF resin	2	6 M KOH	433	63.5%	–	33

carbon aerogel				(0.2 A g^{-1})	(0.5–2 A g^{-1})		
Hierarchical porous carbon foam	F127+PF resin	–	6 M KOH	379 (0.2 A g^{-1})	29.3% (0.2–20 A g^{-1})	94% (1000 cycles)	34
Graphene-based ordered mesoporous carbon hybrid	F127+PF resin	1	6 M KOH	227 (5.5 A g^{-1})	85% (5.5–111.1 A g^{-1})	92% (10000 cycles)	35
Ordered mesoporous nanorod monolith	F127+RF resin	–	6 M KOH	230 (5 mV s^{-1})	71.7% (5–100 mV s^{-1})	–	36
N-doped carbon net	F127+dicyandiamide	–	0.5 M H_2SO_4	537.3 (0.5 A g^{-1})	69.1% (0.5–10 A g^{-1})	98.8% (10000 cycles)	37
Layer-by-layer motif structured hierarchical porous carbon	F127+Resol	–	6 M KOH	249 (1 A g^{-1})	75.5% (1–40 A g^{-1})	98% (7000 cycles)	38
KOH activated, O, N, S-doped hierarchical porous graphene aerogel	F127+GO	1.32	6 M KOH	402.5 (1 A g^{-1})	76.6% (1–100 A g^{-1})	90% (30000 cycles)	39
N-doped multiscale porous carbon	PEO-*b*-PPO-*b*-PEO	2 mg	20 mol kg^{-1} LiTFSI	167 (0.1 A g^{-1})	67.1% (0.1–5 A g^{-1})	61% (10000 cycles)	40
Rich N-doped mesoporous carbon	PS-*b*-PAA	1.34	1 M H_2SO_4	252 (0.2 A g^{-1})	61% (0.2–10 A g^{-1})	100% (5000 cycles)	41

Acronyms:

PS = polystyrene; PEO = poly(ethylene oxide); PPO = poly(propylene oxide); P4VP = poly(4-vinyl pyridine); PAN = polyacrylonitrile; PMMA = poly(methyl methacrylate); PBA = poly(butyl acrylate); PVDC = poly(vinylidene chloride-*co*-methylacrylate); PAA = poly(acrylic acid); PVA = poly(vinyl alcohol); GO = graphene oxide; PF = phenol-formaldehyde; RF = resorcinol-formaldehyde; LiTFSI = Lithium bis(trifluoromethanesulfonyl)imide

Notes:

1) Unless otherwise specified, the unit is mg cm^{-2}. The masses of porous carbons are listed in the table for reports where no mass loadings are available.

2) Unless otherwise stated, all electrolytes are aqueous solutions.

3) "–" means not reported.

Supplementary References

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