Supplementary

Synthesis of sustainable lignin-derived mesoporous carbons for supercapacitor by nano-sized MgO template coupled with Pluronic F127

Yaoguang Song, Junli Liu*, Kang Sun, Wei Xu

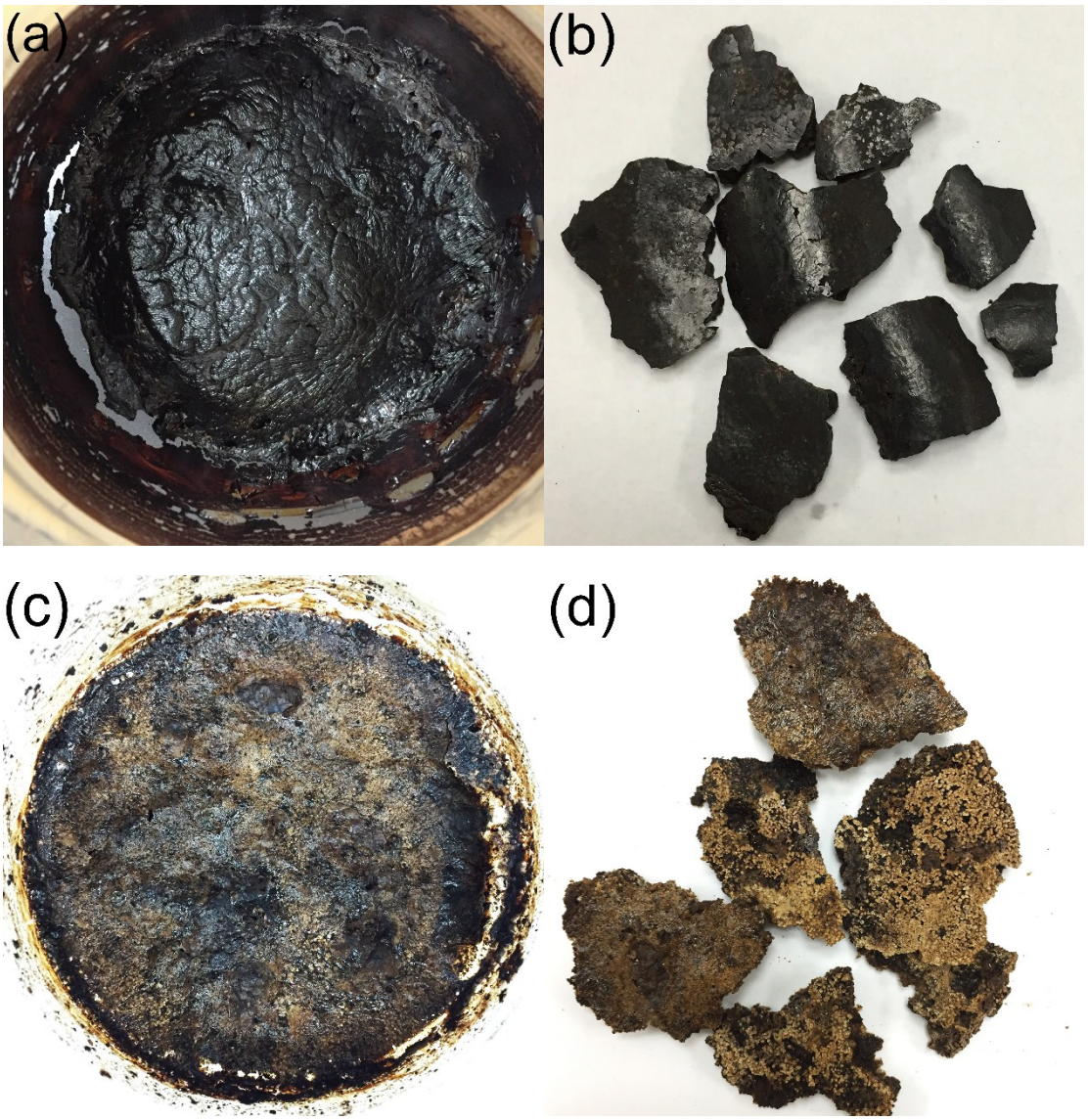

Fig. S1 (a, b) Homogeneous chocolate-like dried precursors composite via dual templating method; (c, d) sample LMC_{MgO} before carbonization

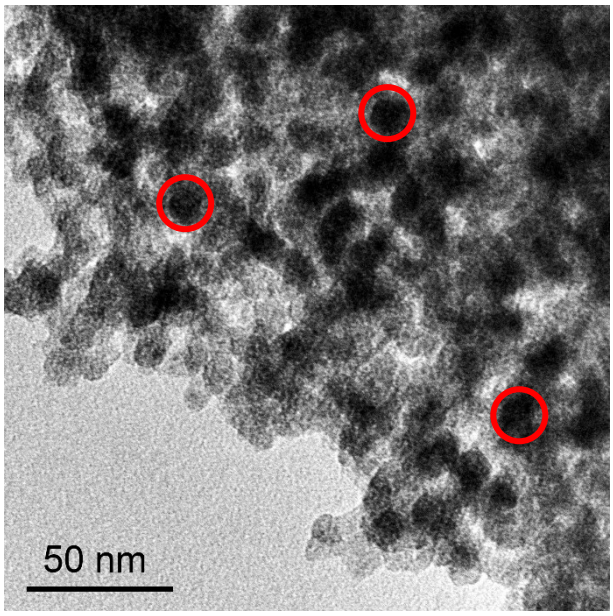

Fig. S2 TEM micrograph for $LMC_{10\text{-}1\text{-}16}$ before MgO extraction

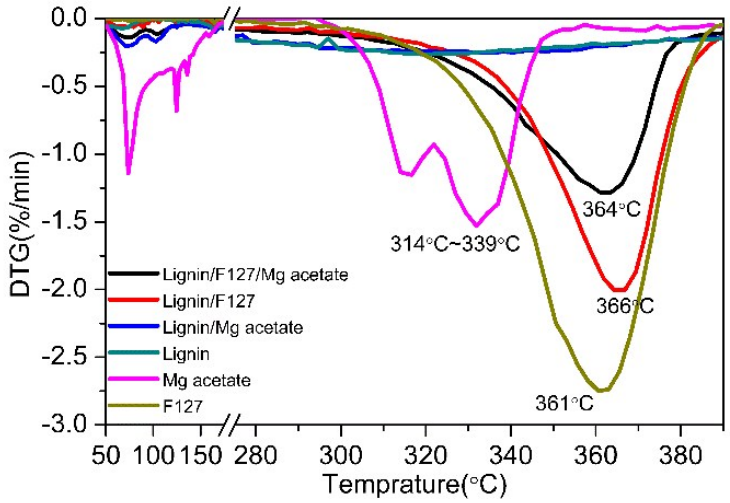

Fig. S3 Derivative thermogravimetric curves of lignin, templates and mixtures of precursor

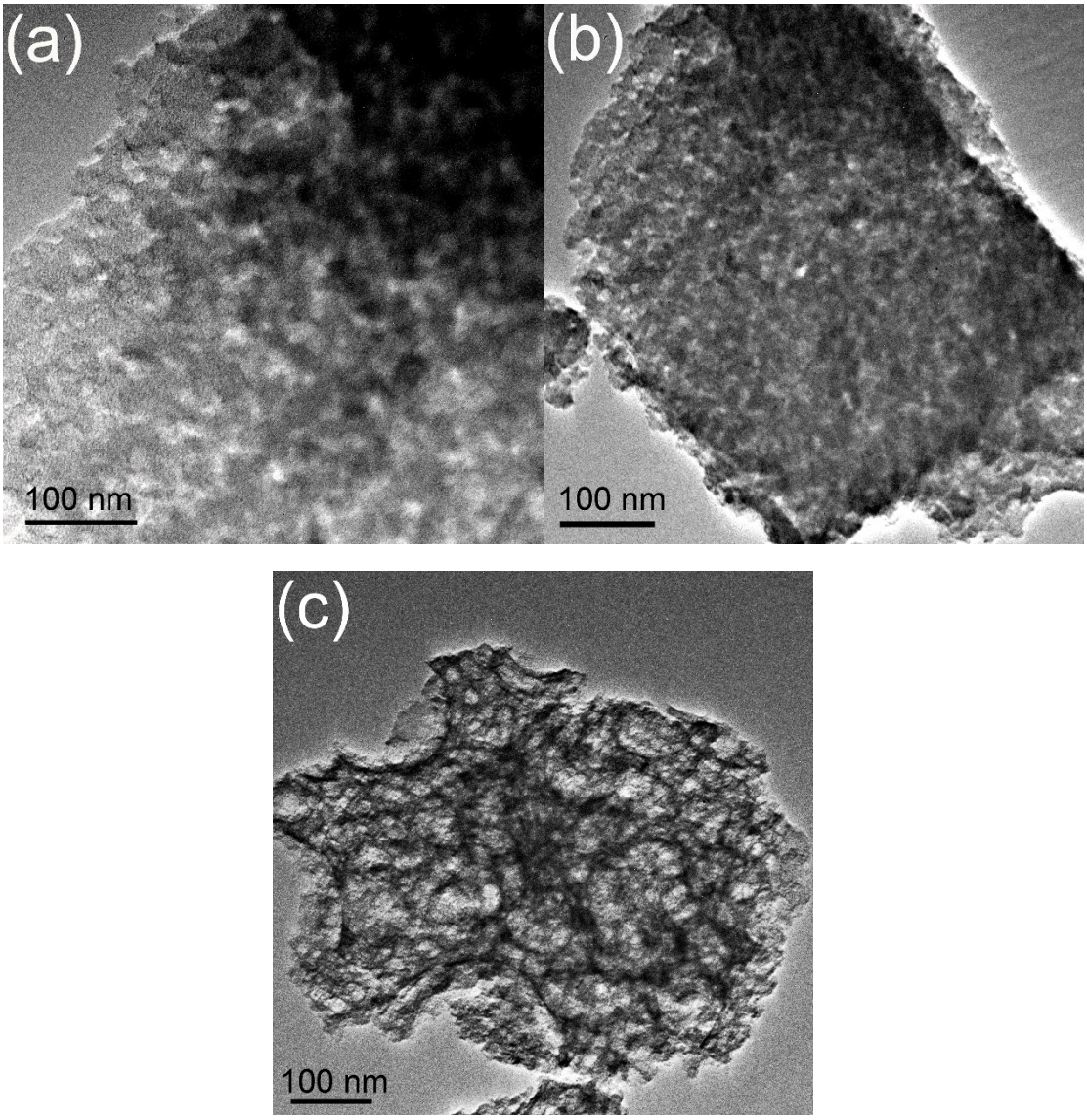

Fig. S4 TEM micrographs for (a) LMC_{MgO}, (b) LC, and (c) $LMC_{10\text{-}8\text{-}16,\ F}$

The peak intensity of D band and G band, as well as its corresponding I(D)/I(G), for LMC_{F127}, LMC_{MgO}, $LMC_{10\text{-}8\text{-}16}$, $LMC_{10\text{-}8\text{-}16,\ V}$ and $LMC_{10\text{-}8\text{-}16,\ F}$ were obtained from Raman spectra, respectively. Details for the I_D/I_G value are listed in Table S1.

Table S1 I(D), I(G) and corresponding I(D)/I(G) for obtained carbons

Sample	I(D)	I(G)	I(D)/I(G)
LMC_{F127}	44.01	42.84	1.027
LMC_{MgO}	39.37	37.05	1.063
$LMC_{10\text{-}8\text{-}16}$	60.73	59.76	1.016
$LMC_{10\text{-}8\text{-}16,\ V}$	19.64	19.95	0.985
$LMC_{10\text{-}8\text{-}16,\ F}$	28.32	28.78	0.984

Table S2 Surface oxygen content of XPS measurements for obtained carbons

times	LMC_{F127}		LMC_{MgO}		$LMC_{10\text{-}8\text{-}16}$		$LMC_{10\text{-}8\text{-}16,\ V}$		$LMC_{10\text{-}8\text{-}16,\ F}$	
	C%	O%	C%	O%	C%	O%	C%	O%	C%	O%
1st	85.54	14.46	82.15	17.85	85.91	14.09	87.17	12.85	83.60	16.40
2nd	82.41	17.59	75.55	24.45	81.50	18.50	74.81	25.19	77.43	22.57
3rd	81.65	18.35	78.40	21.60	79.47	20.53	83.88	16.12	82.28	17.72
4th	86.20	13.80	82.74	17.26	84.83	15.17	87.48	12.52	83.27	16.73
average	83.95	16.05	79.71	20.29	82.93	17.07	83.34	16.66	81.64	18.36

Cyclic voltammetry (CV) data of LMC_{F127}, LMC_{MgO}, $LMC_{10\text{-}8\text{-}16}$, $LMC_{10\text{-}8\text{-}16,\ V}$ and $LMC_{10\text{-}8\text{-}16,\ F}$ was obtained at different scan rates ranging from 5 to 100 mv/s within the potential window of 0 to 0.8 V.

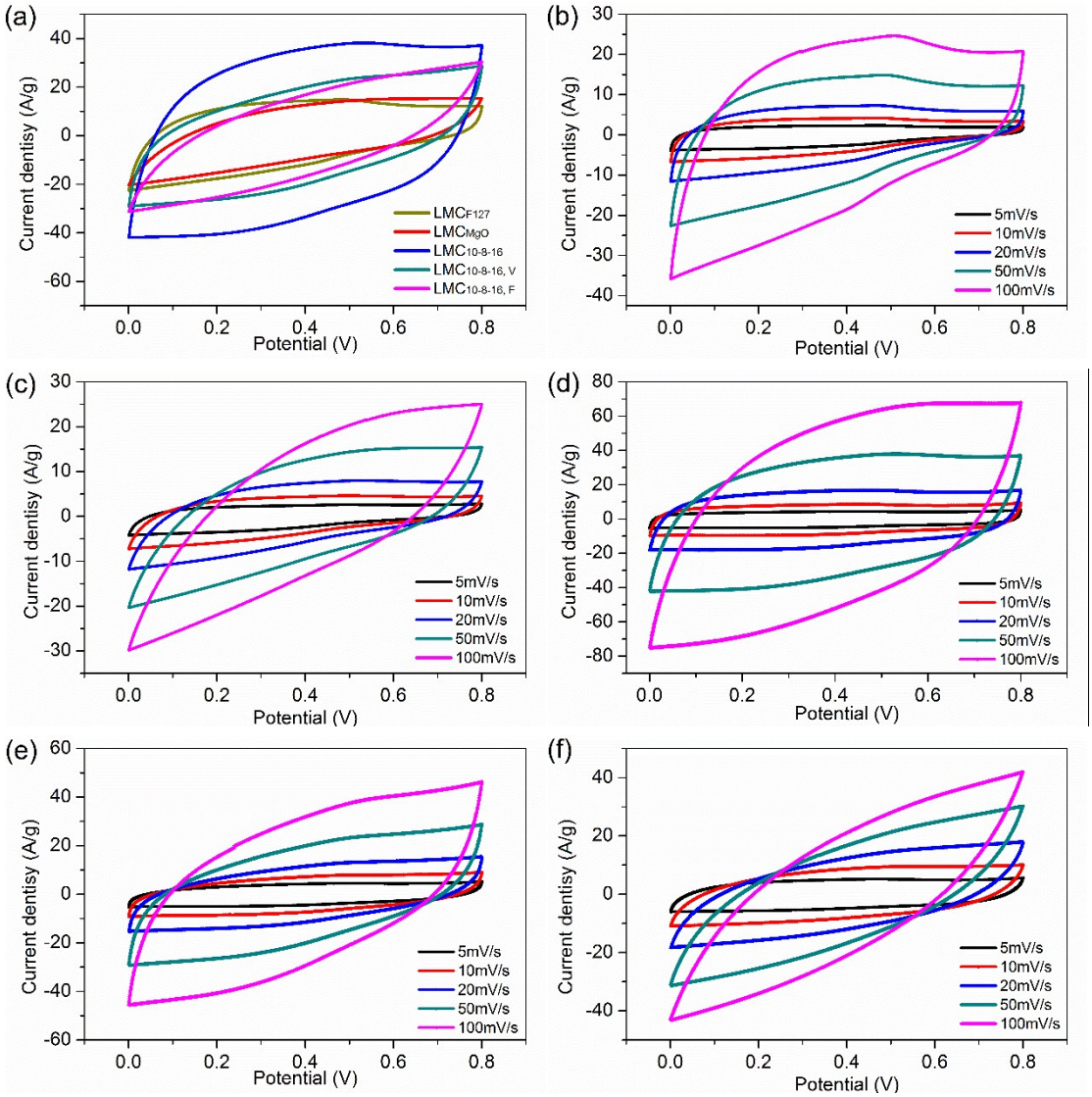

Fig. S5 Electrochemical performance of carbons determined in a three-electrode configuration: cyclic voltammograms: (a) at 50 mv/s scan rate, of (b) LMC_{F127}, (c) LMC_{MgO}, (d) $LMC_{10\text{-}8\text{-}16}$, (e) $LMC_{10\text{-}8\text{-}16,\ V}$, and (f) $LMC_{10\text{-}8\text{-}16,\ F}$.

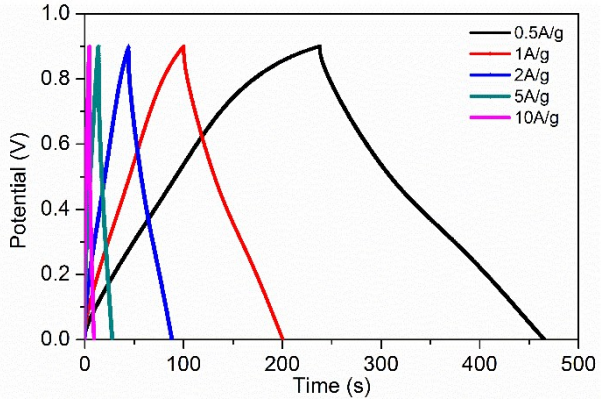

Fig. S6 Galvanostatic charge/discharge curves at different current densities ranging from 0.5 A/g to 10 A/g for $LMC_{10\text{-}8\text{-}16}$