Supplementary Materials

Templating Synthesis of Hierarchically Porous Carbon with Magnesium Salts for Electrocatalytic Reduction of 4-Nitrophenol

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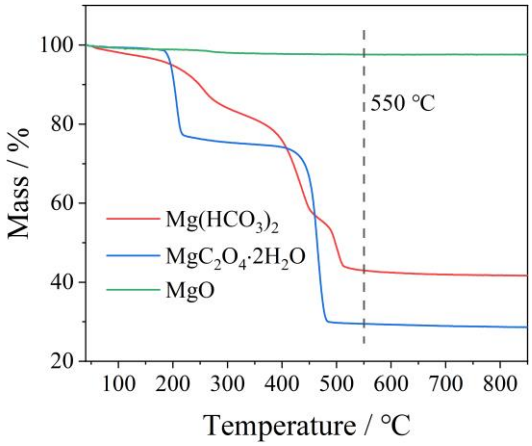

Figure S1. TGA profiles of magnesium precursors conducted in N_2 atmosphere.

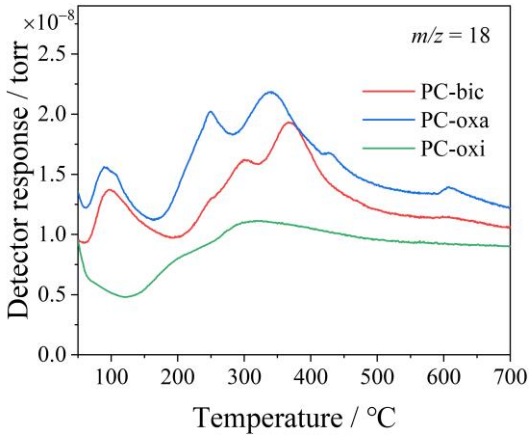

Figure S2. MS signal of H_2O obtained from the TPD of PC-n (n = bic, oxa and oxi).

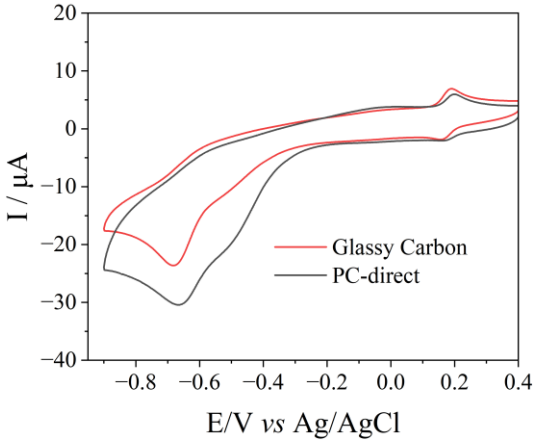

Figure S3. CV curves of the PC-direct and Glassy Carbon for electrocatalytic reduction of 4-nitrophenol (0.1 mM) in 0.2 M phosphate buffer solution at pH 6.0, with a scan rate of 20 mV s^{-1}.

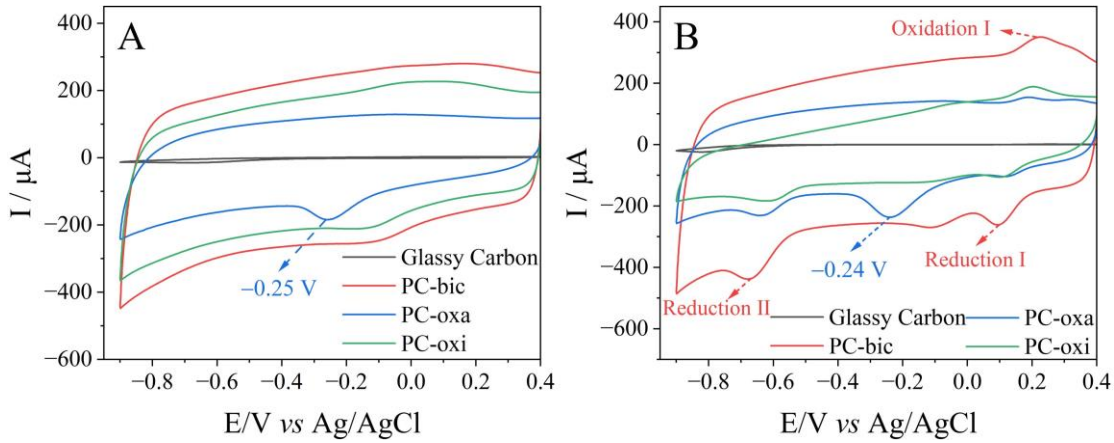

Figure S4. CV curves of PCs and Glassy Carbon electrode in (A) 0.2 M phosphate buffer solution at pH 6.0 and (B) 0.2 M phosphate buffer solution at pH 6.0 containing 4-nitrophenol (0.1 mM), with a scan rate of 20 mV s^{-1}.

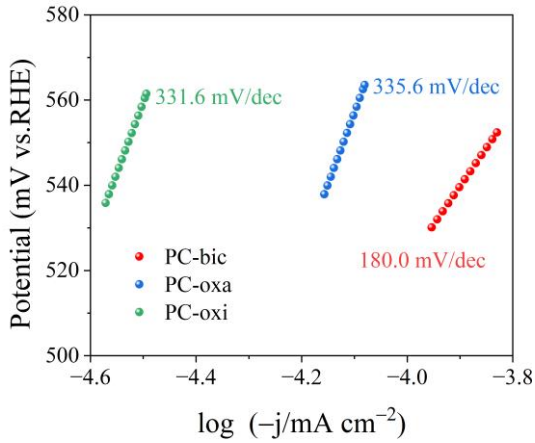

Figure S5. The Tafel slopes of PC-bic, PC-oxi and PC-oxa samples.

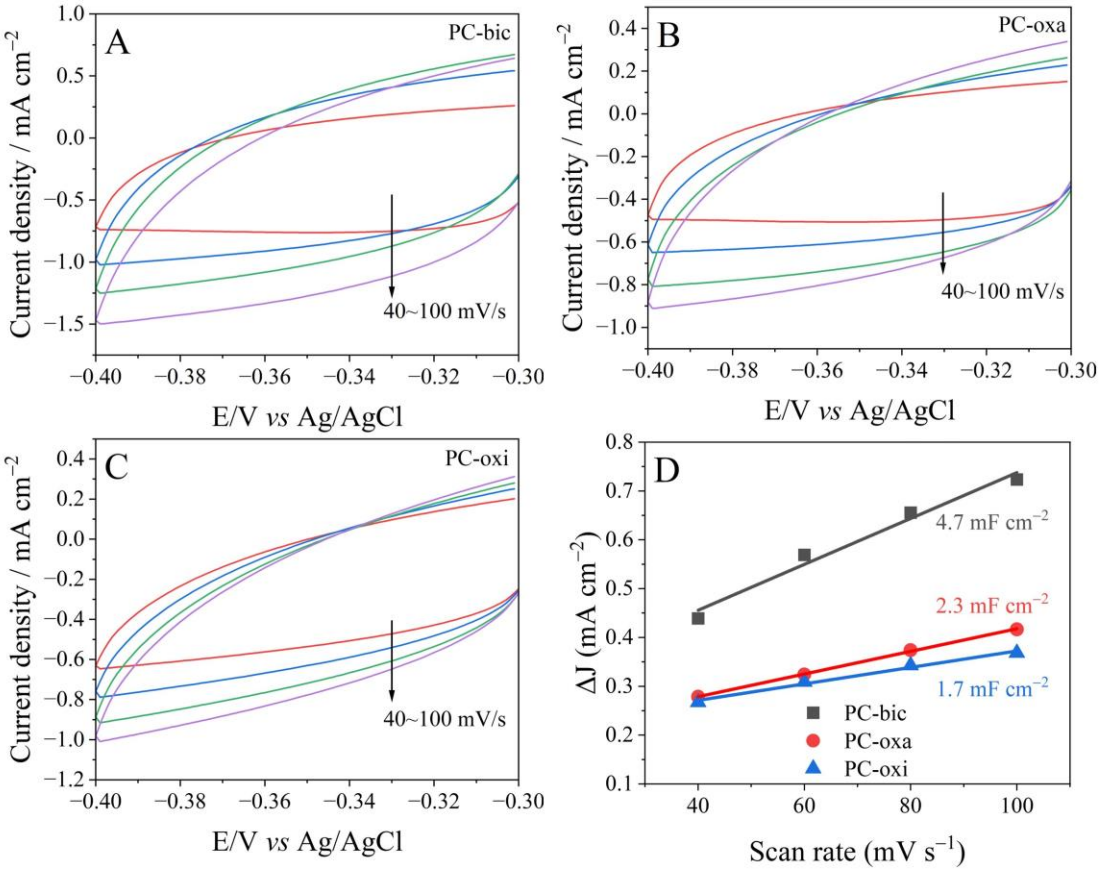

Figure S6. CV curves of (A) PC-bic, (B) PC-oxa, (C) PC-oxi with different scan rate; (D) C_{dl} curves of PC-bic, PC-oxa and PC-oxi.

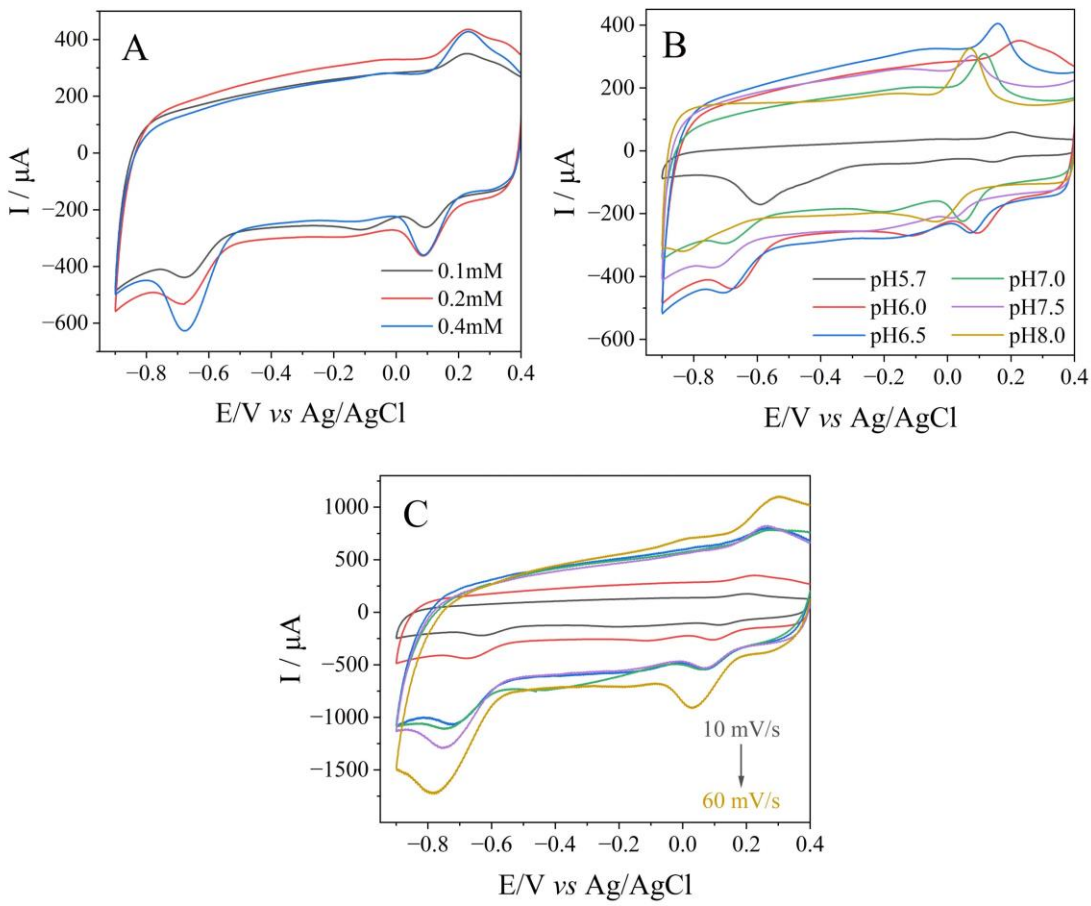

Figure S7. (A) CV curves of PC-bic in 0.2 M phosphate buffer solution (pH = 6.0) at various concentrations of 4-nitrophenol; (B) Effect of pH on the CV curves of PC-bic in 0.2 M phosphate buffer solution (pH = 6.0) with 0.1 mM 4-nitrophenol solution; (C) CV curves of PC-bic for electrocatalytic reduction of 4-nitrophenol (0.1 mM) obtained at scan rates of 10–60 mV s^{-1} in a 0.2 M phosphate buffer solution (pH = 6.0).

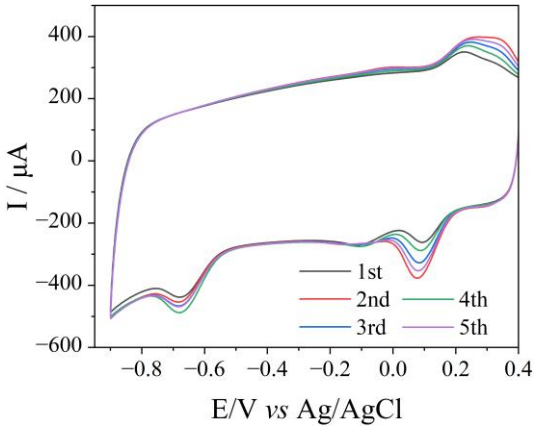

Figure S8. CV curves of PC-bic for electrocatalytic reduction of 4-nitrophenol (0.1 mM) within five cycles in 0.2 M phosphate buffer solution (pH = 6.0).

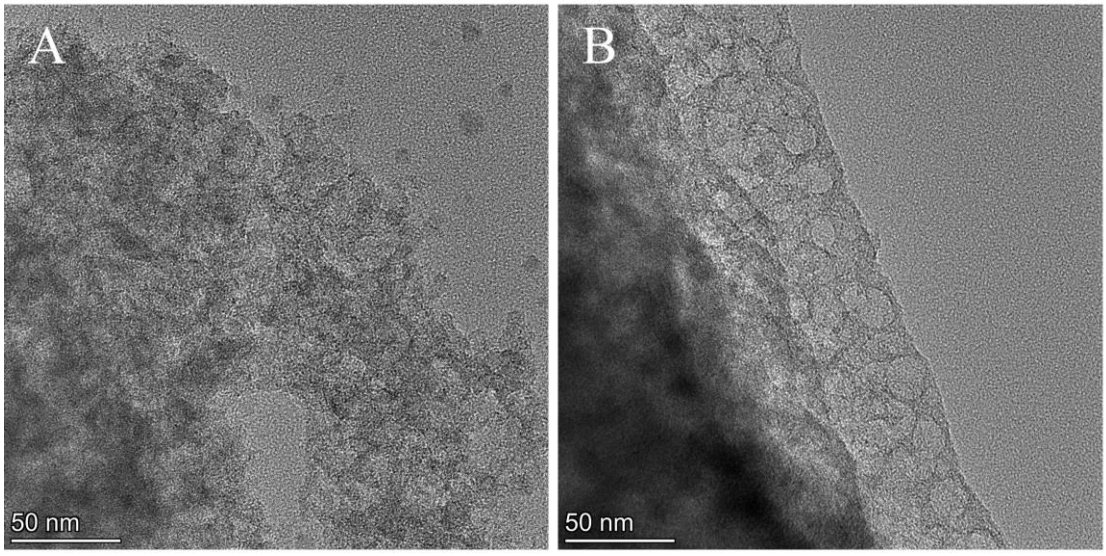

Figure S9. TEM images of (A) Fresh PC-bic and (B) recycled PC-bic after the electrocatalytic reduction of 4-NP.

Table S1. The reaction conditions and activities of varied catalysts for electrocatalytic reduction of 4-NP.

Entry	Catalyst	Electrolyte	pH	4-NP conc. / μM	Scan rate / mV s^{-1}	Potential / V	Current / μA	Current density / μA cm^{-2}	Ref
1	g-C_3N_4	0.1 M PB	5.0	150	50	--	--	--	[1]
2	$ZnFe_2O_4$/g-C_3N_4	0.1 M PB	5.0	150	50	−0.58 V	−8.1	--	[1]
3	rGO	0.1 M PBS[a]	7.0	10	50	−0.73	−1.3	−58.8	[2]
4	$NiFe_2O_4$	0.1 M PBS[a]	7.0	10	50	−0.72	−7.2	−335.3	[2]
5	$NiFe_2O_4$/rGO_{10}	0.1 M PBS[a]	7.0	10	50	−0.81	−10.9	−509.8	[2]
6	RGO	0.2 M PB	5.5	100[b]	50	−0.571	−51.0	−721.9	[3]
7	GO	0.2 M PB	5.5	100[b]	50	−0.615	−6.4	−90.6	[3]
8	Fe_3O_4/$Ag_{2.0}$	0.1 M BR[c]	4.0	100	100	−0.574	−13.3	--	[4]
9	Cu	0.1 M PB	6.0	1000	50	−0.76	−48.4	−691.4	[5]
10	Cu-curcumin	0.1 M PB	6.0	1000	50	−0.62	−76.3	−1090.0	[5]
11	PC-c	0.2 M PB	6.0	100	50	−0.520	−167.3	−1943.4	[6]
12	PC-bic	0.2 M PB	6.0	100	50	−0.759	−566.4	−2886.1	This work

[a] phosphate buffer saline (Na_2HPO_4, $NaH_2PO_4 \cdot H_2O$ and KCl); [b] m-NP concentration; [c] Britton–Robinson (BR) buffer solutions (H_3BO_3, H_3PO_4, and CH_3COOH).

References:

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