Electronic supplementary information

High-level nitrogen-doped, micro/mesoporous carbon as an efficient metal-free electrocatalyst for oxygen reduction reaction: optimizing reaction surface area by a solvent-free mechanochemical method

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Table S1 Pore textural properties of CMC, PCMC, NCMC and NPCMC. [a]

Material	S_{BET} ($m^2\ g^{-1}$)	$V_{micropores}$ ($cm^3\ g^{-1}$)	$V_{effective\ micropores}$ ($cm^3\ g^{-1}$)	$V_{mesopores}$ ($cm^3\ g^{-1}$)
CMC	48.8	0.014	—	0.011
PCMC	1978.4	0.68	0.39	0.11
NCMC	38.4	0.011	—	0.016
NPCMC	1675.7	0.49	0.31	0.23

[a] S_{BET}: BET specific surface area; $V_{micropores}$: micropore volume; $V_{effective\ micropores}$: volume of the effective micropores (pore width > 0.7 nm); $V_{mesopores}$: mesopore volume.

Table S2 XPS analyses of CMC, PCMC, NCMC and NPCMC.

Material	C (at%)	N (at%)	O (at%)
CMC	91.56	1.10	6.95
PCMC	92.68	—	7.32
NCMC	79.57	14.73	4.92
NPCMC	83.23	11.55	5.23

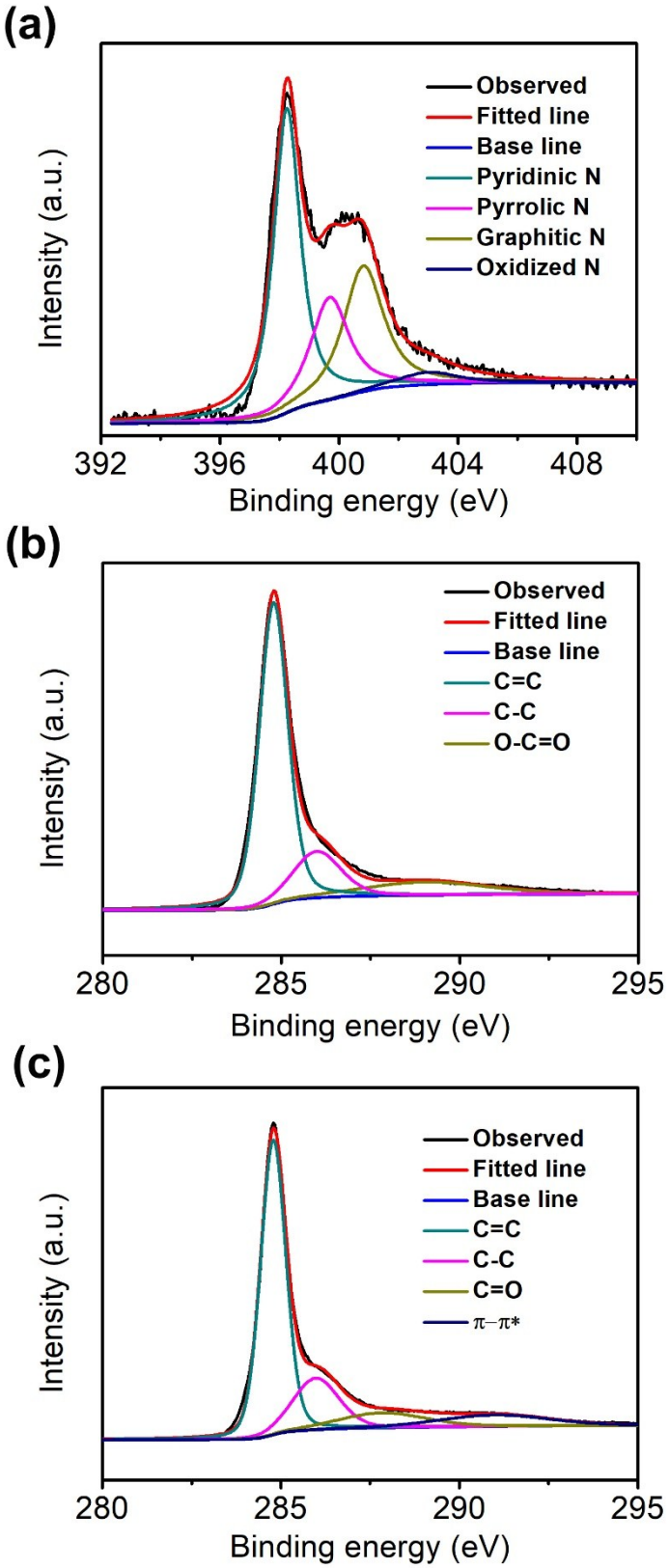

Fig. S1 a) High-resolution XPS N 1s spectrum of NCMC. High-resolution XPS C 1s spectra of CMC (b) and PCMC (c).

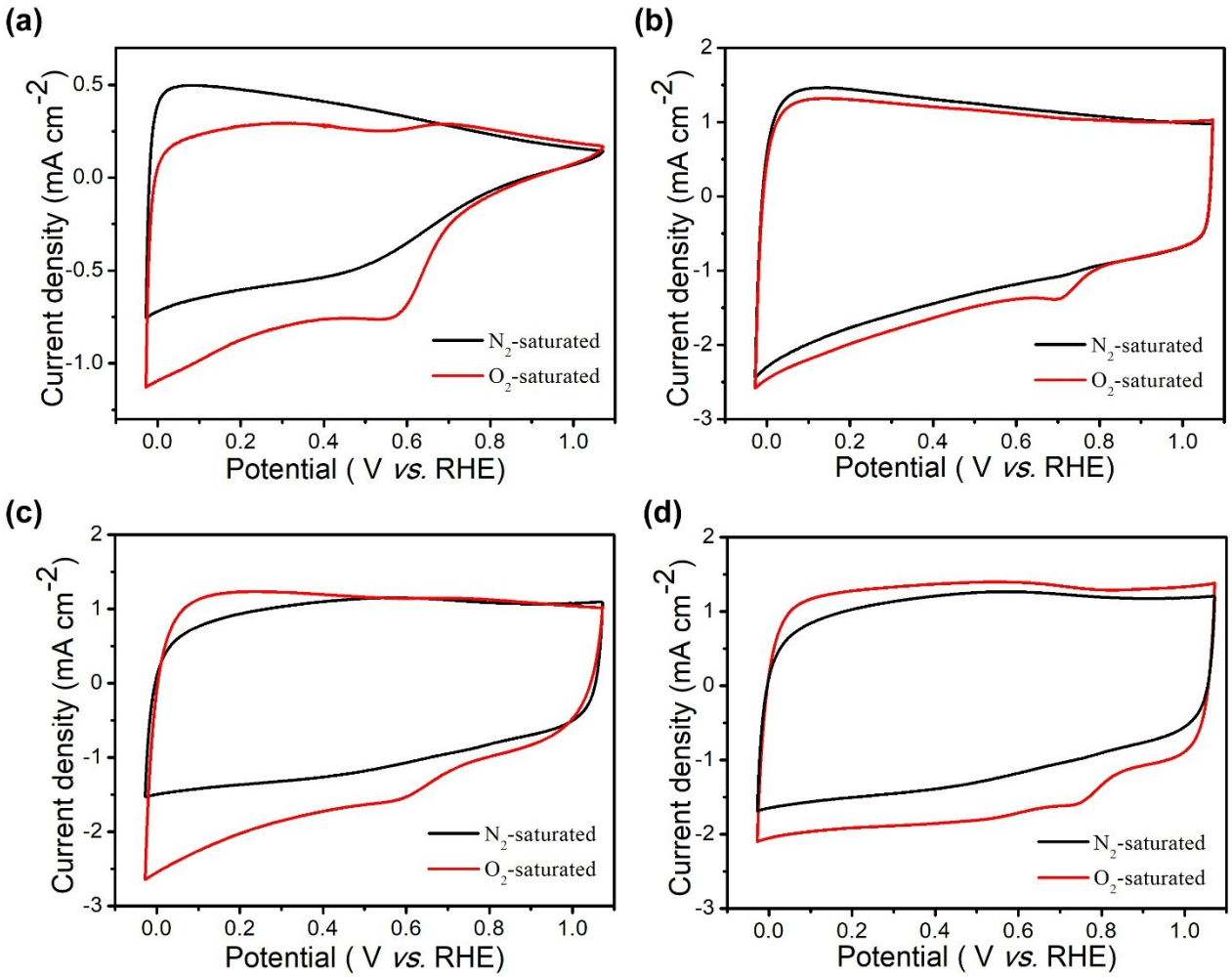

Fig. S2 CV curves of CMC (a), PCMC (b), NCMC (c) and NPCMC (d) at a scan rate of 50 mV s^{-1} in N_2 (black) and O_2 (red) saturated 0.1 M KOH aqueous solutions at 25 °C.

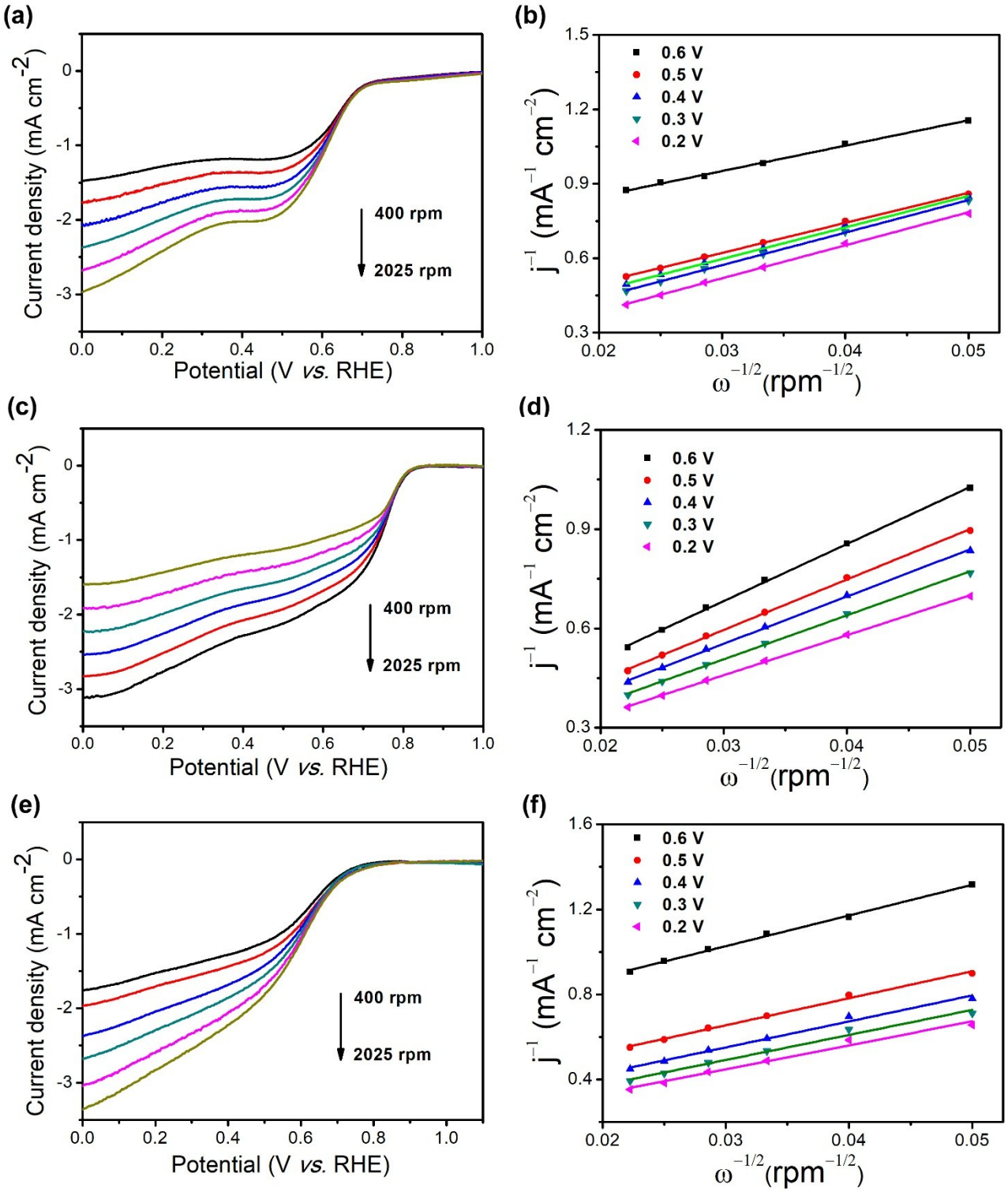

Fig. S3 LSV curves of CMC (a), PCMC (c) and NCMC (e) at different rotation rates (400, 625, 900, 1225, 1600 and 2025 rpm) with a sweep rate of 10 mV s^{-1} in 0.1 M KOH aqueous solution at 25 °C. K-L plots of CMC (b), PCMC (d) and NCMC (f) in the potential range from 0.2 to 0.6 V *vs.* RHE.