Supporting Information

One Minute from Pristine Carbon to Electrocatalyst for Hydrogen Peroxide Production

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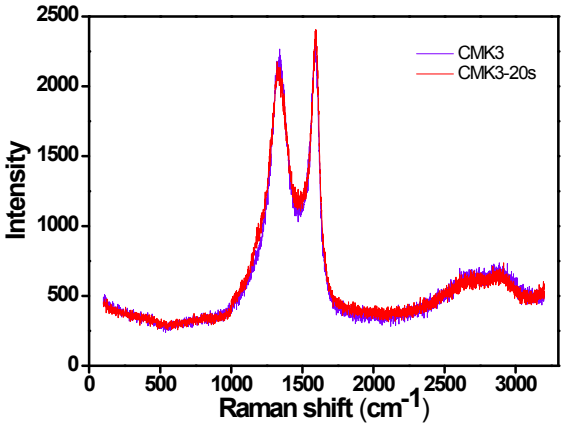

Figure S1 Raman spectra of CMK3 and CMK3-20s.

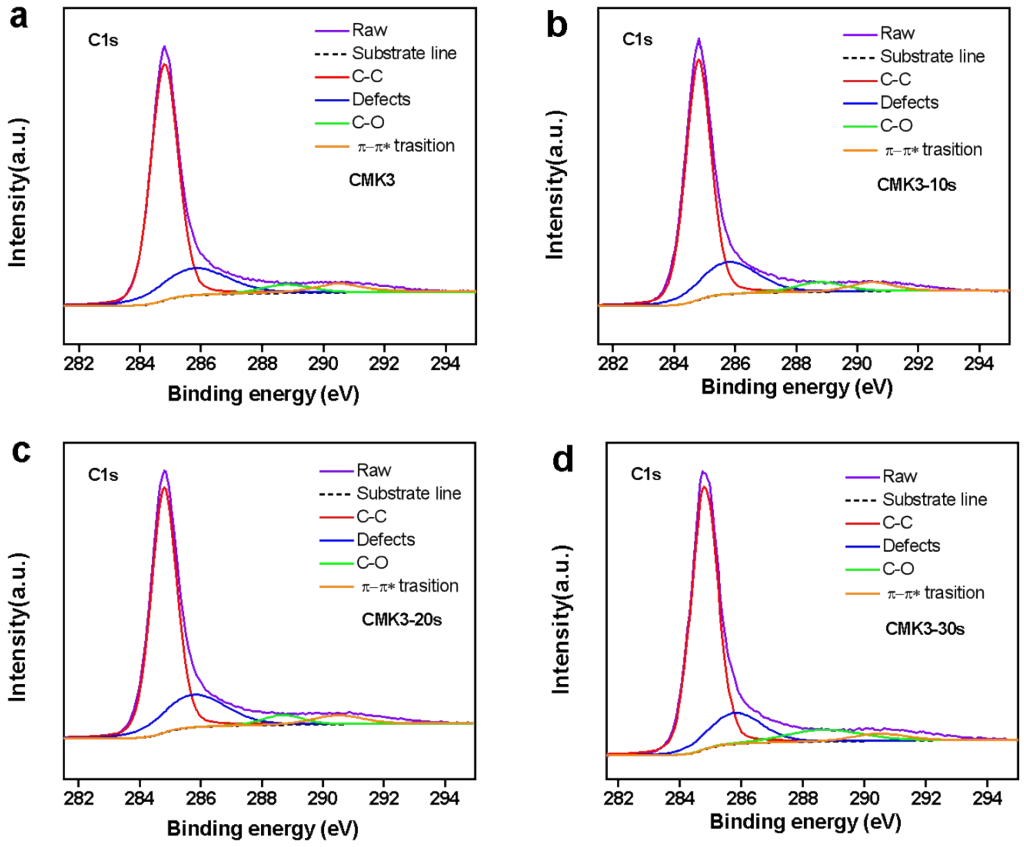

Figure S2 (a-d) High resolution C1s spectra of CMK3, CMK3-10s, CMK3-20s and CMK3-30s.

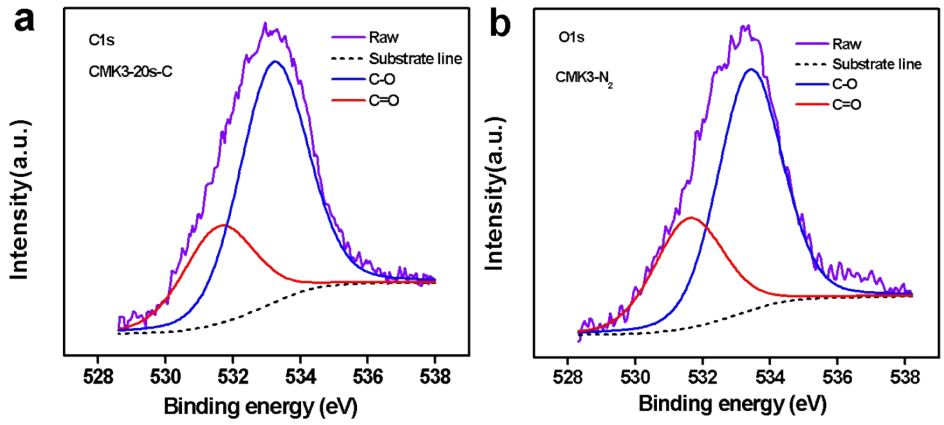

Figure S3 (a) High resolution O1s spectrum of CMK3-20s-C; (b) High resolution O1s spectrum of CMK3-N_2

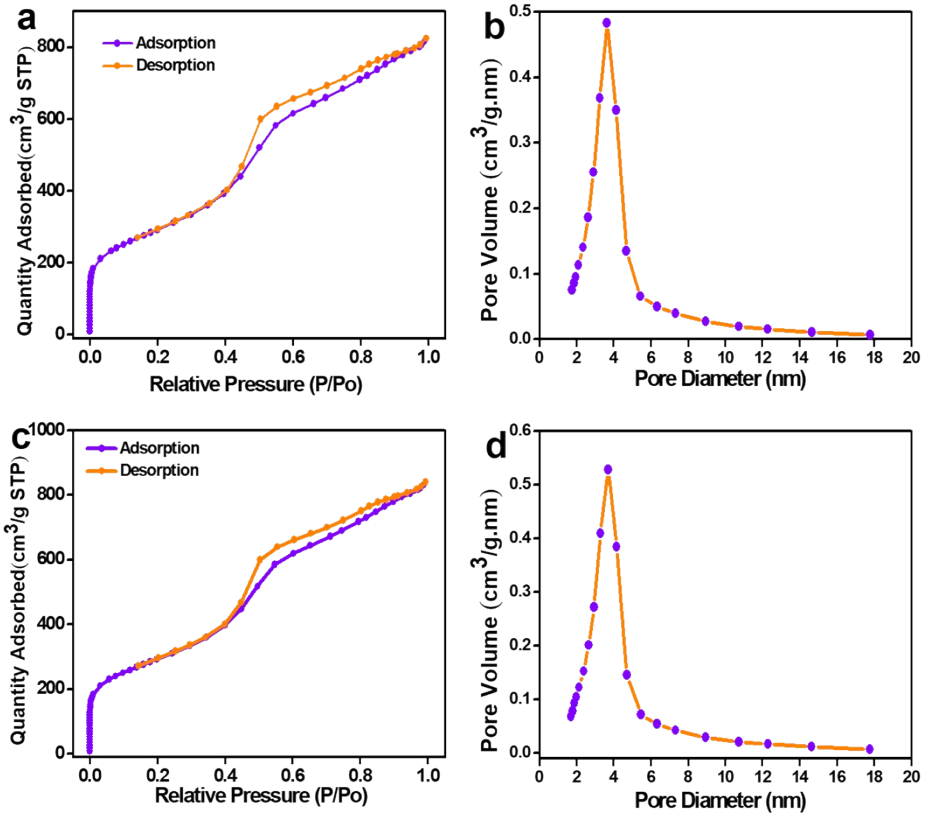

Figure S4 (a-b) Nitrogen adsorption-desorption isotherm curve and pore size distribution of CMK3-10s; (c-d) Nitrogen adsorption-desorption isotherm curve and pore size distribution of CMK3-30s

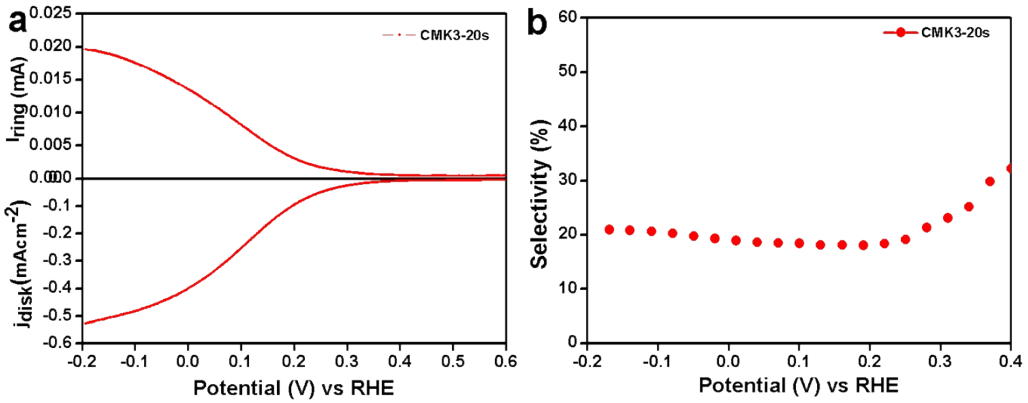

Figure S5 (a) RRDE voltammograms of CMK3-20s in O_2-saturated 0.5 M H_2SO_4 (at rotating speed of 1,600 rpm, sweep rate of 10 mV s^{-1}); (b) The selectivity of the peroxide yield obtained from the RRDE curves for CMK3-20s in 0.5 M H_2SO_4.

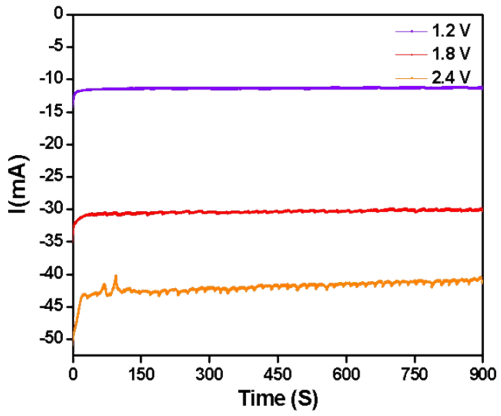

Figure S6 I-t curve of CMK3-20s measured at the different applied potentials the flow cell (0.1 M KOH).

Table. S1 Content of carbon and oxygen elements in CMK3, CMK3-10s, CMK3-20s and CMK3-30s, and the ratio of functional groups containing oxygen element.

Sample	C at.%	O at.%	(C=O) %	(C-O) %
CMK3	96.2	2.85	33	67
CMK3-10s	95.8	3.22	28	72
CMK3-20s	96.2	2.97	24	76
CMK3-30s	96.1	2.93	21	79

Table. S2 The value of BET surface area, pore volume and pore diameter of CMK3, CMK3-10s, CMK3-20s and CMK3-30s.

Sample	BET surface area (m^2/g)	Total Pore Volume (cm^3/g)	average pore diameter (nm)
CMK3	1,009.4	1.32	4.00
CMK3-10s	1,017.4	1.28	4.01
CMK3-20s	1,018.8	1.30	4.05
CMK3-30s	1,054.6	1.34	4.01

Table. S3 Comparison of performance of different samples with the prepared CMK3-20s

Sample	pH	Potential (V vs. Ag/AgCl)	$[H_2O_2]$ ($mg\ L^{-1}h^{-1}$)	Faradaic Efficiency (%)	Ref.
O-CNTs	14	-0.24	197.5	~95	[1]
o-GOMC-1	13	-0.23	~55	99	[2]
AGF1100	13	-0.7	~385	72.3	[3]
Nitrogen-doped mesoporous carbon	13	-0.85	~70	70	[4]
Vulcan carbon	13	-0.7	~55	41.0	[5]
CeO_2/C	13	-0.7	~100	44	[5]
Biomass derived N/C catalyst	13	-0.67	2.04	40	[6]
Carbon supported MnO_2	7	-0.7	100	none	[7]
N-O-P-Carbon-800	13	-0.7	320	95	[8]
rGO-PEI aerogel	13	-0.2	~160	90.7	[9]
CMK3-20s	13	-0.55	421	92.5	This work

Supporting References

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