Supporting information

Primary Amine Modulated Synthesis of Two-Dimensional Porous Nanocarbons with Tunable Ultramicropores

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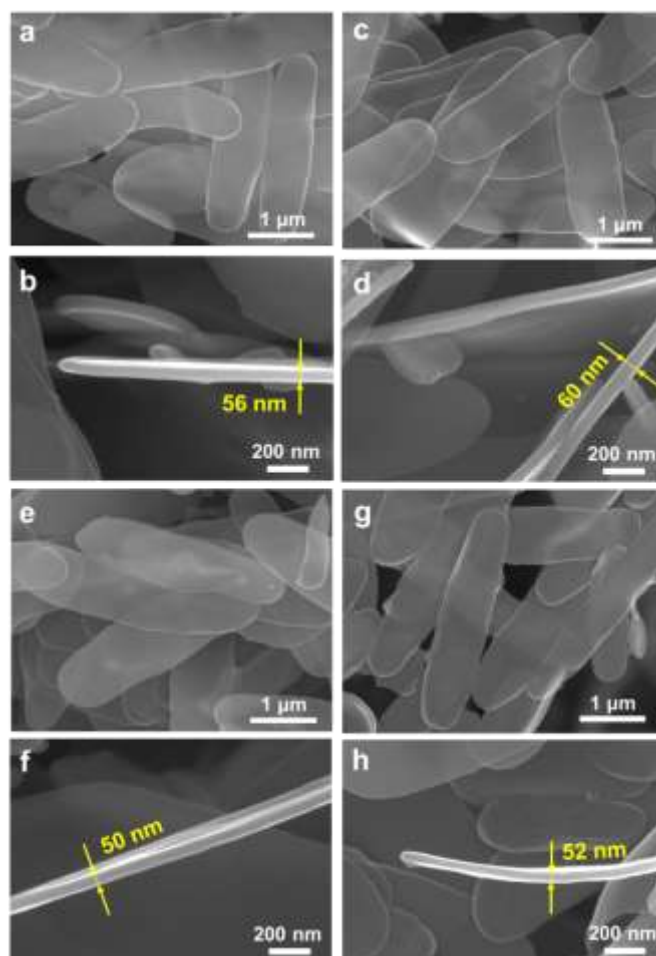**Table of Contents**

Fig. S1 SEM images of (a, b) C-EA, (c, d) C-DPA, (e, f) C-BA, (g, h) C-HA.
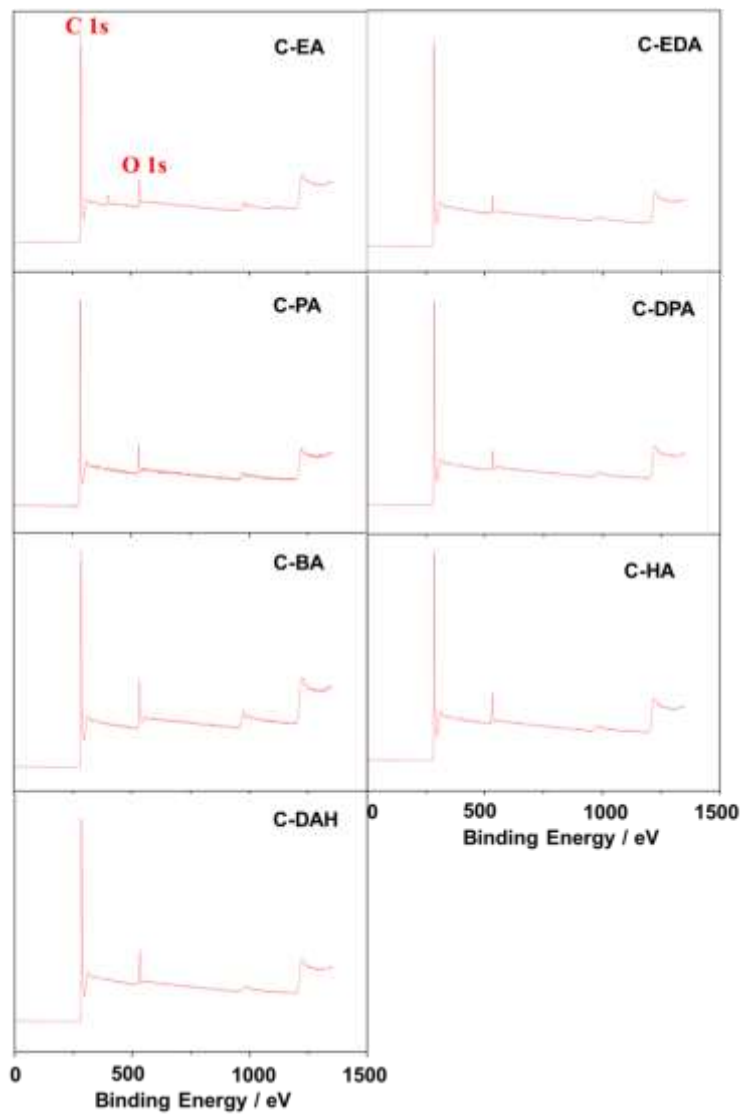
Fig.S2 XPS of 2D porous nanocarbons

Fig. S3 (a) N_2 sorption isotherms and (b) corresponding PSDs of C-PA-KC

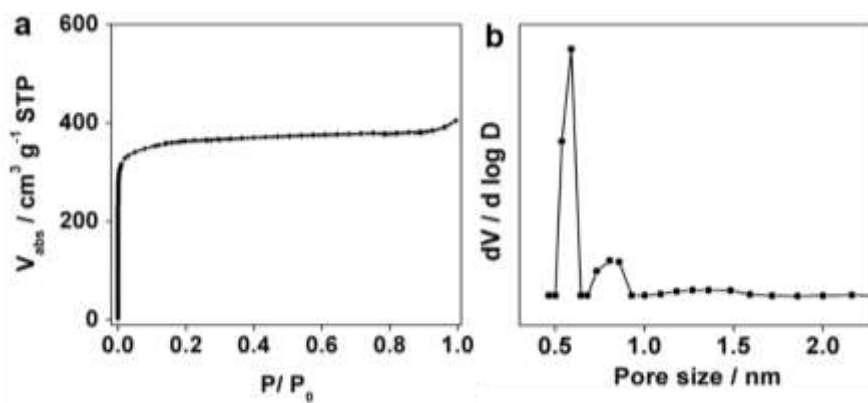**Fig.S4** (a) N_2 sorption isotherms and (b) corresponding PSDs of C-DAH-KC.

The surface area and pore volume of C-DAH-KC is 1107 m^2 g^{-1} and 0.58 cm^3 g^{-1}, respectively.
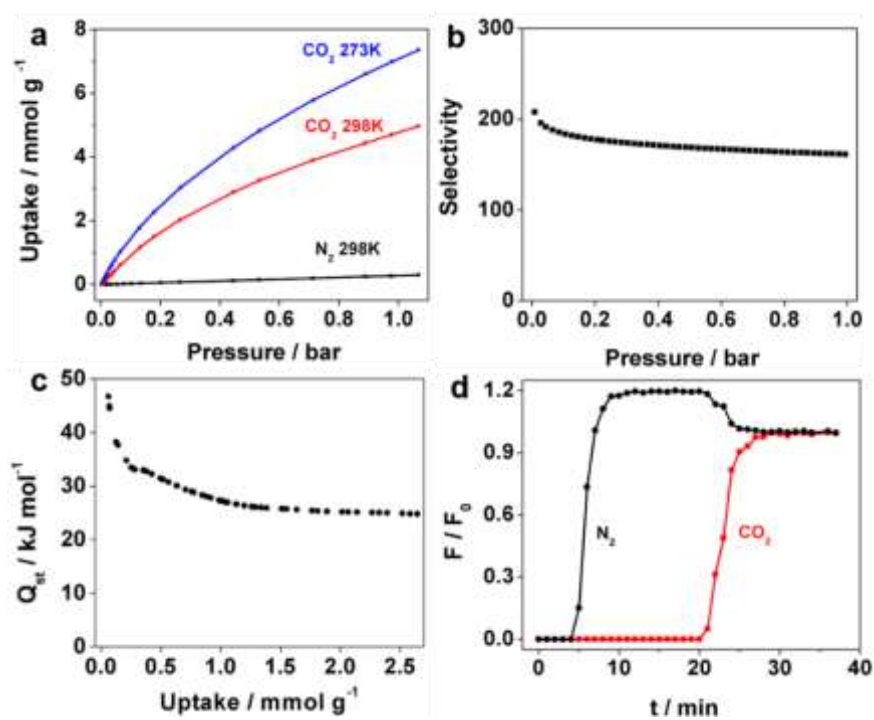

Fig. S5 (a) Gas adsorption isotherms for CO_2 and N_2, (b) IAST selectivity, (c) isosteric heat of adsorption of CO_2, and (d) breakthrough curves for C-DAH-KC.

Tab. S1 Elemental compositions of 2D porous nanocarbons

Sample	XPS (at.%)			Elemental analysis (wt.%)			
	C	N	O	C	H	N	O
C-EA	93.8	1.5	4.7	89.6	0.8	1.5	8.1
C-EDA	95.9	--	4.1	90.4	0.6	1.6	7.4
C-PA	92.7	1.2	6.1	91.3	0.6	1.8	6.3
C-DPA	90.5	1.1	8.4	84.5	0.8	2.1	12.6
C-BA	90.8	--	9.2	86.7	0.8	0.5	12
C-HA	89.9	1.4	8.7	82.9	1.4	1.4	14.3
C-DAH	88.1	1.1	10.8	83.1	2.1	2.5	12.3

Tab. S2 Relative surface concentrations of carbon species obtained by fitting the C 1s core level XPS spectra

Sample	284.6 eV (sp^2 carbon)	285.9 eV (sp^3 carbon)	287.4 eV (C-O)	289.1 eV (O-C=O)	291.0 eV (HO-C=O)
C-EA	0.72	0.15	0.04	0.05	0.04
C-EDA	0.71	0.15	0.05	0.04	0.05
C-PA	0.78	0.11	0.04	0.04	0.03
C-DPA	0.66	0.17	0.07	0.04	0.05
C-BA	0.64	0.18	0.07	0.06	0.04
C-HA	0.62	0.20	0.08	0.07	0.03
C-DAH	0.61	0.22	0.08	0.06	0.03

Tab. S3 Characterization results of 2D porous nanocarbons through XRD and Raman

Sample	2θ	d_{002} (nm)	L_c (nm)	2θ	L_a (nm)	I_D/I_G ratio
C-EDA	22.46°	0.39	1.07	43.80°	3.42	1.58
C-PA	22.44°	0.39	1.08	44.03°	3.40	1.55
C-DAH	22.45°	0.39	1.09	43.87°	3.35	1.61