

Facile Synthesis of Mesoporous Melamine-Formaldehyde Spheres for Carbon Dioxide Capture

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Supplementary Tables

Table S1 Physical and gas adsorption properties of MMFSs.^a

Sample	PFA/M	BET area (m ² g ⁻¹) ¹⁾	BJH pore size (nm)	Pore volume (cm ³ g ⁻¹)	CO ₂ Uptake (mg g ⁻¹) ^b	CO ₂ Uptake (mg g ⁻¹) ^c	N ₂ Uptake (mg g ⁻¹) ^d
MMFS-2.0	2.0	109	4.4	0.21	42.2	----	----
MMFS-2.5	2.5	100	5.6	0.19	39.1	----	----
MMFS-3.0	3.0	298	3.0	0.46	48.0	28.1	1.1
MMFS-3.5	3.5	106	3.2	0.20	33.4	----	----
MMFS-4.0	4.0	63	----	0.11	32.5	----	----
MMFS-4.5	4.5	63	----	0.10	30.2	----	----

^aMMFSs with PFA/M molar ratio between 2.0 to 4.5 were synthesized by a facile route as described in Figure 1 and Chemical Section. ^bCO₂ adsorption measured at 273K. ^cCO₂ adsorption measured at 298K. ^dN₂ adsorption measured at 298K.

Table S2 Structural characteristics of MMFS-2.5, MMFS-3.0 and MMFS-3.5 from the solid-state ^{13}C NMR spectroscopy.^a

Sample	C _{1,2} (%)	C ₃ (%)	C ₄ (%)
MMFS-2.5	60.13	26.24	13.63
MMFS-3.0	59.52	26.15	14.33
MMFS-3.5	57.81	26.53	15.66

^aMMFSs with PFA/M molar ratio between 2.5 to 3.5 were synthesized by a facile route as described in Figure 1 and Chemical Section.

Table S3 Element analysis of MMFSs with different PFA/M molar ratios.^a

Element	C	N	H	O
MMFS-2.0	31.22	42.94	4.35	21.49
MMFS-2.5	33.91	45.88	4.24	15.97
MMFS-3.0	33.81	45.59	4.24	16.36
MMFS-3.5	32.52	43.23	4.45	19.80
MMFS-4.0	34.26	42.68	4.34	18.72
MMFS-4.5	33.32	42.91	4.52	19.25

^aMMFSs with PFA/M molar ratio between 2.0 to 4.5 were synthesized through a facile route as described in Figure 1 and Chemical Section.

Table S4 Element analysis of MMFSs with different PFA/M molar ratios.^a

Element Molar ratio	C	N	H	O
MMFS-2.0	1	1.18	1.67	0.52
MMFS-2.5	1	1.16	1.50	0.35
MMFS-3.0	1	1.16	1.50	0.36
MMFS-3.5	1	1.14	1.64	0.46
MMFS-4.0	1	1.07	1.52	0.41
MMFS-4.5	1	1.10	1.63	0.43

^aMMFSs with PFA/M molar ratio between 2.0 to 4.5 were synthesized through a facile route as described in Figure 1 and Chemical Section.

Figure captions.

Figure S1. N₂ adsorption/desorption isotherms of MMFS-2.0 (A), MMFS-2.5 (B), MMFS-3.5 (C), MMFS-4.0 (D) and MMFS-4.5 (E); pore size distributions of MMFS-2.0 (a), MMFS-2.5 (b) and MMFS-3.5 (c).

Figure S2. SEM images of MMFS-2.0 (A), MMFS-2.5 (B), MMFS-3.0 (C), MMFS-3.5 (D), MMFS-4.0 (E) and MMFS-4.5 (F).

Figure S3. TGA curves of MMFS-3.0.

Figure S4. O₂ adsorption isotherm of MMFS-3.0 at 1 bar and 298 K.

Figure S5. CO₂ adsorption isotherms of MMFS-4.5 at the first time (A), second time (B), third time (C) and fourth time (D) at 273 K and 1 bar.

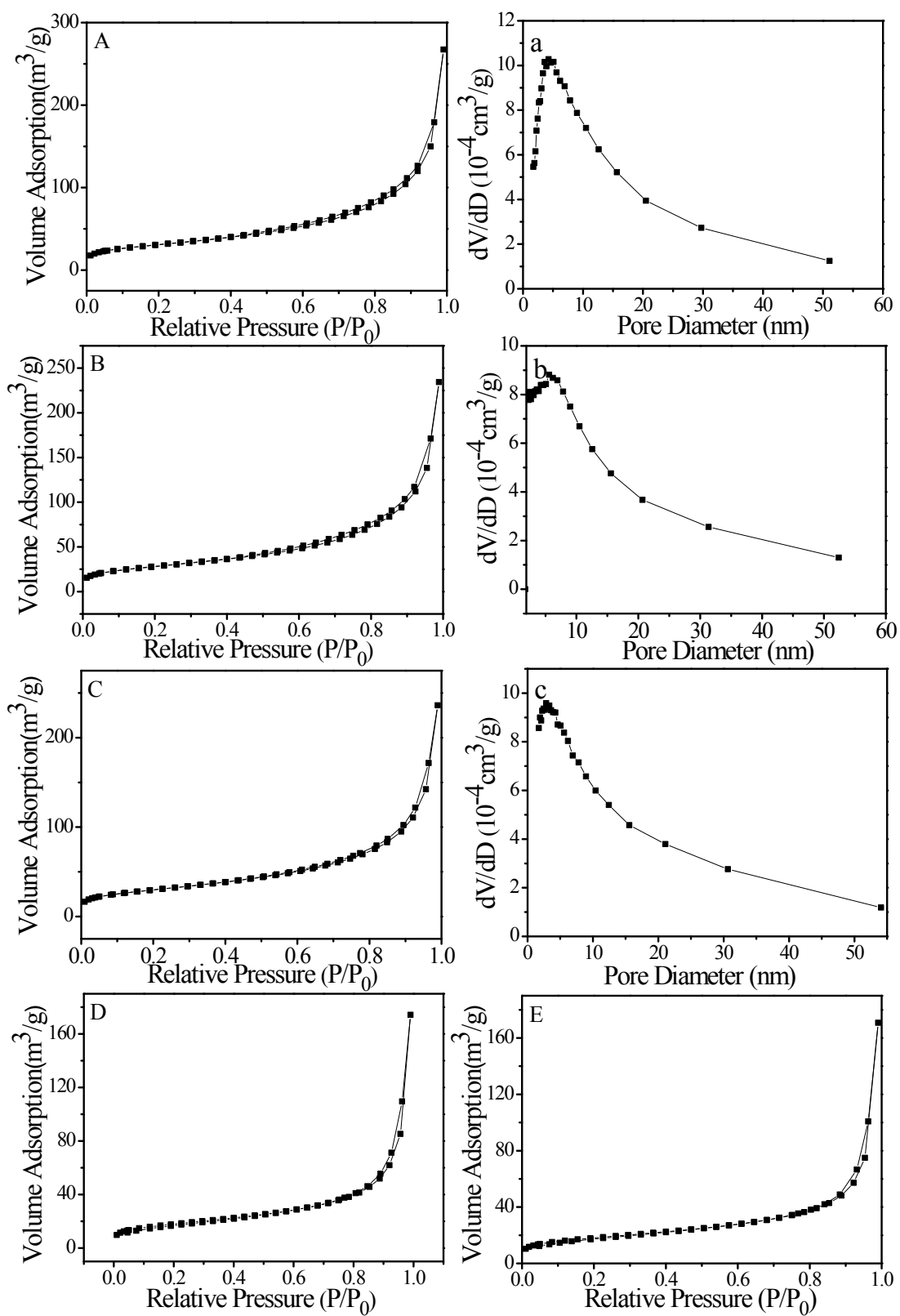


Figure S1

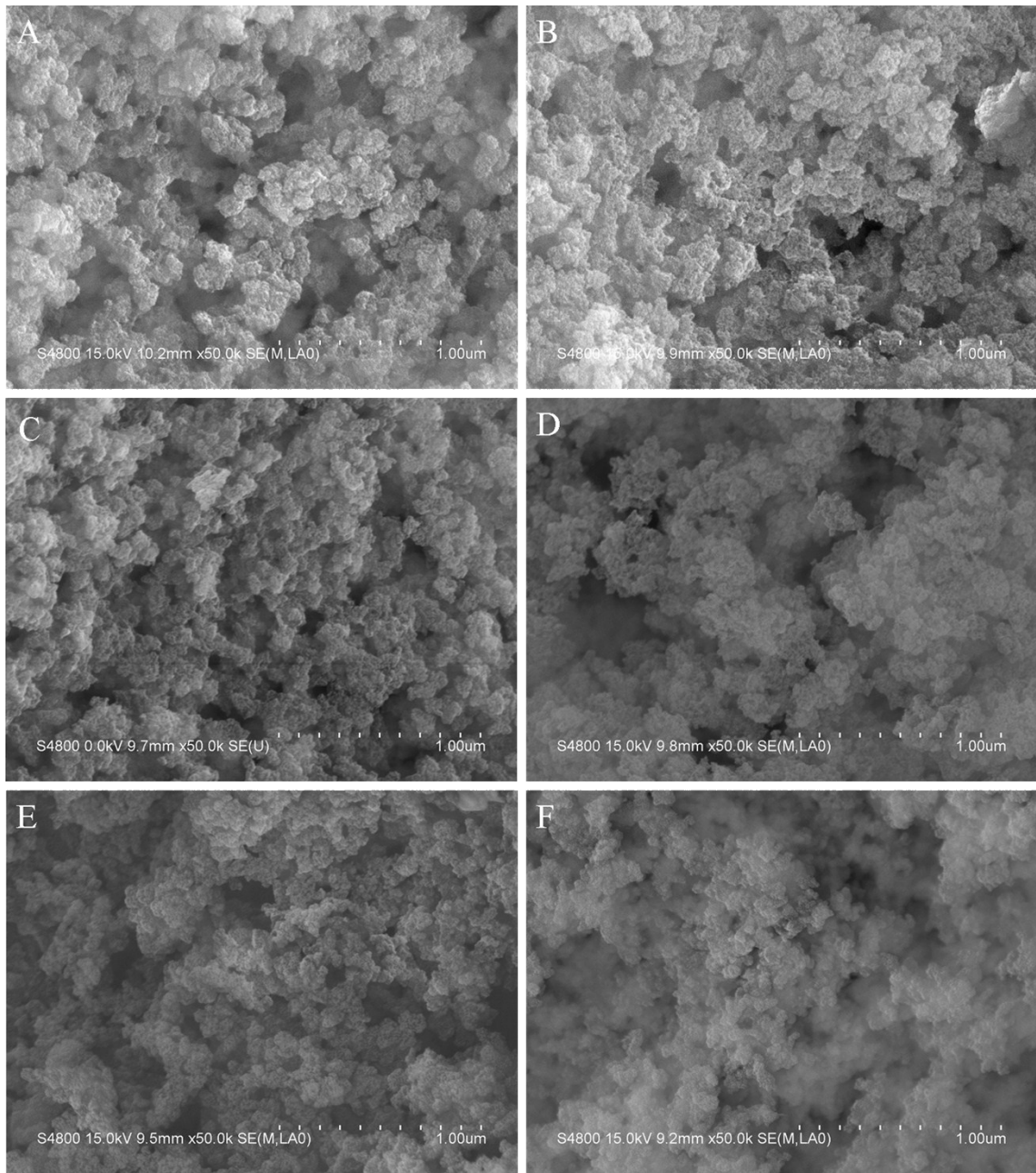


Figure S2

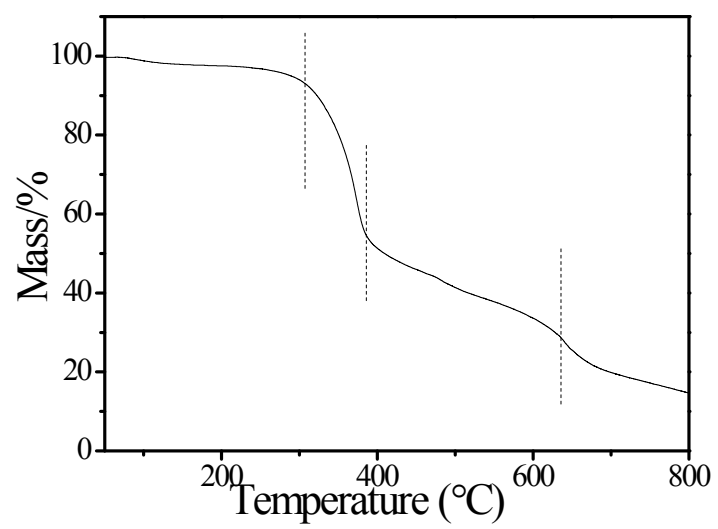


Figure S3

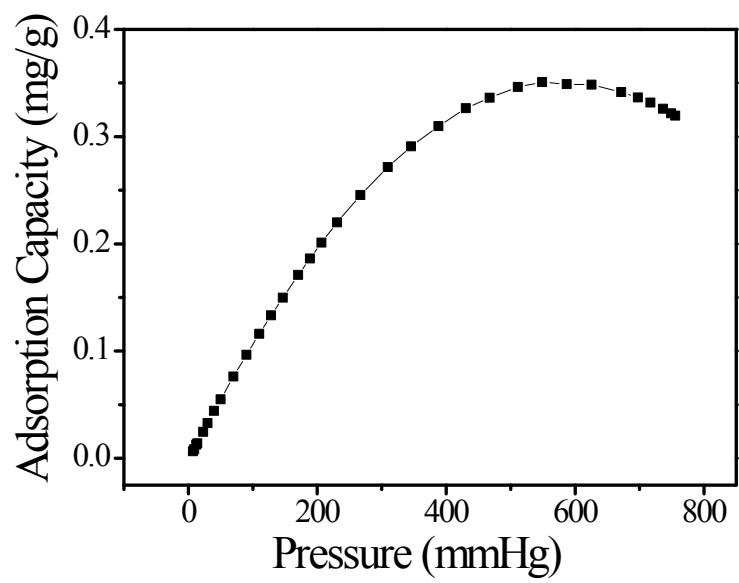


Figure S4

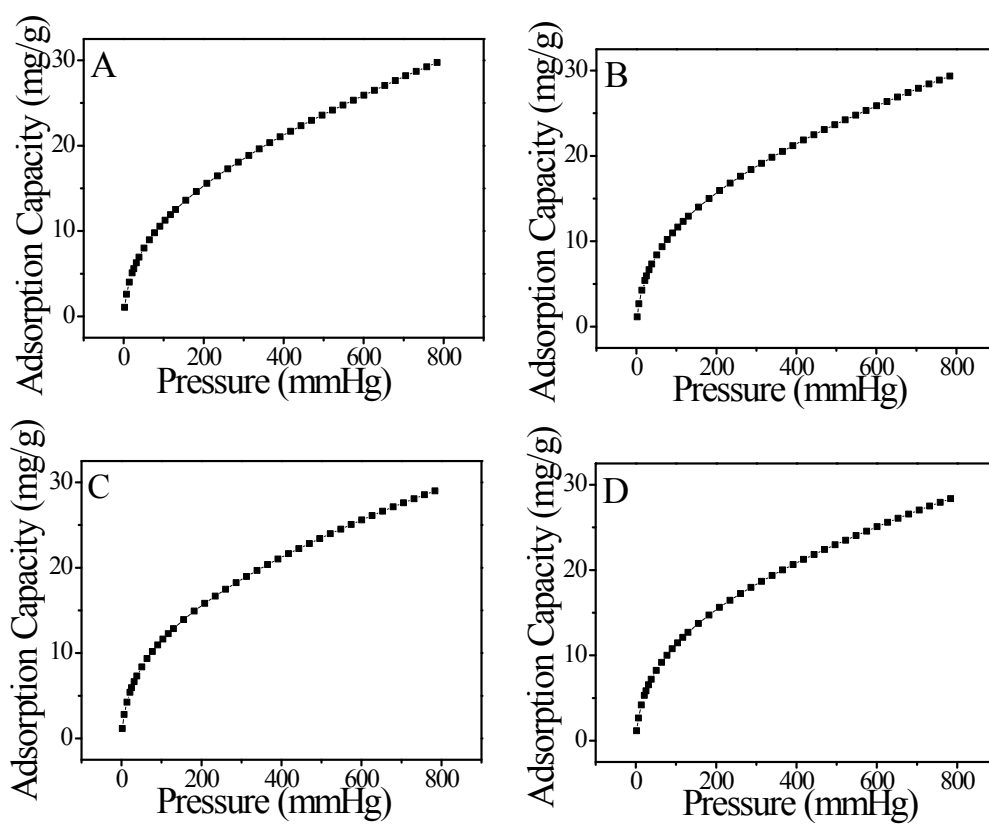


Figure S5