Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supplemental files

Bifunctional conjugated microporous polymers based filters for highly efficient PM and gaseous iodine capture

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Characterization

The AVANCE III 400 MHz solid-state NMR analyzer from Bruker, USA was used for ^{13}C CP/MAS NMR. The morphology of the CMPs was taken on Scanning electron microscope (SEM JSM-6701F) and Transmission electron microscope (TEM TecnaiG2 TF20). The morphology of the samples was taken on scanning electron microscope (TESCAN MIRA3) under a vacuum environment. The specific surface area and porosity of the as prepared CMPs was measured by N_2 adsorption and desorption at 77.3 k using a volumetric sorption analyzer (micromeritics ASAP 2020). Before analysis, the samples were degassed at 120 °C for 12 h under vacuum. XPS spectra were measured using a Physical Electronics 5000 Versa Probe II Scanning ESCA (XPS) Microprobe. TGA analysis was carried out using a STA 6000 (PerkinElmer Instrument Co., Ltd. USA) to investigate thermal stability of the samples over a temperature range of 25 to 800 °C at a rate of 5 °C min^{-1} under N_2 atmosphere. Filtration efficiency were tested by particle counter (DT-9881M, Shenzhen Huachang Science and Technology Industry Co., Ltd.).

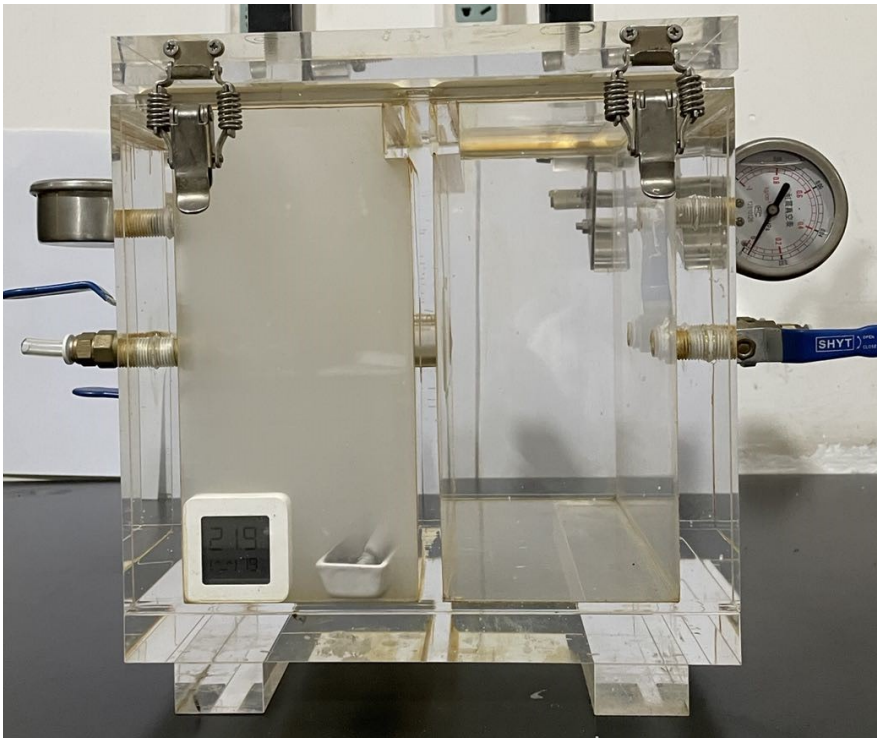

Figure S1. The image of the acrylic box and the demo image of PM filtration.

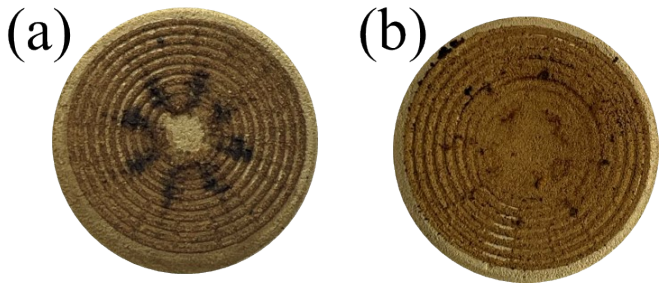

Figure S2. The digital images of CMPs@6 and CMPs@7 after PM filtration for 48 h.

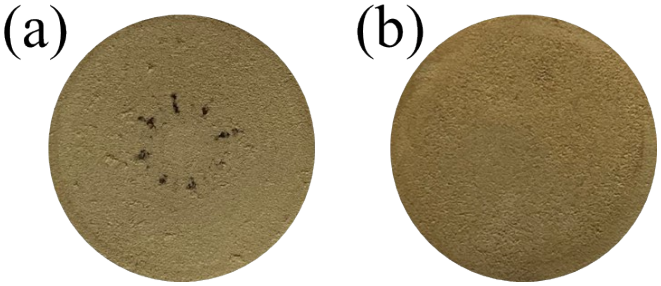

Figure S3. The digital images of CMPs@6 and CMPs@7 after washed by methanol 5 times.

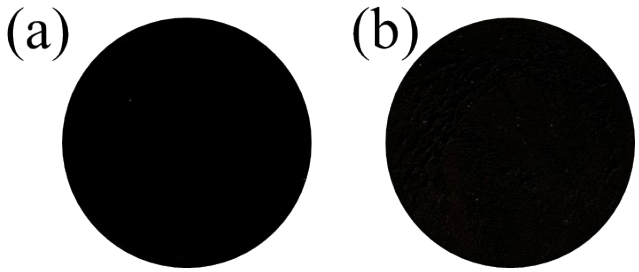

Figure S4. The digital images of CMPs@6 and CMPs@7 heated to 500 °C.

Table S1. The QF of CMPs@6 and CMPs@7.

Temperature (°C)	QF of CMPs@6		QF of CMPs@7	
	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
100	0.0148	0.0167	0.019	0.0617
200	0.0138	0.0163	0.0178	0.0186
300	0.014	0.0202	0.0197	0.0214
400	0.0177	0.0231	0.0199	0.0242
500	0.0225	0.0298	0.0227	0.0286

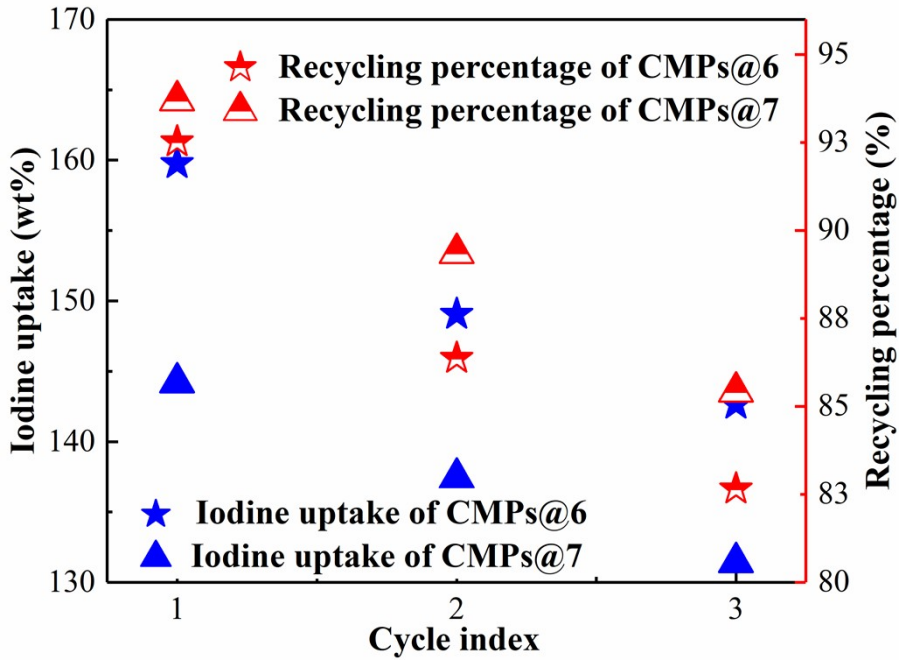

Figure S5. The capture performance of CMPs@6 and CMPs@7 in three cycles.

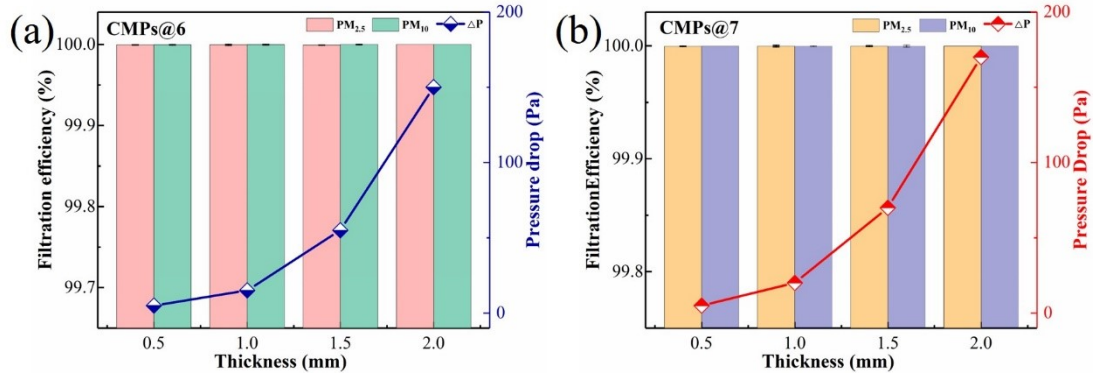

Figure S6. Filtration efficiency and pressure drop for CMPs@6(a) and CMPs@7(b) with different thickness.