Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting information

Synthesis of Microporous Organic Polymers *via* Radical Polymerization of Fumaronitrile with Divinylbenzene

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Table S1. Formulas of preparation of HCPNs.[a]

Samples	DVB (g)	FN (g)	AIBN (g)	Toluene (mL)
HCPN-0.25	0.2600	0.0390	0.0030	10.0
HCPN-0.5	0.2600	0.0780	0.0034	10.0
HCPN-0.75	0.2600	0.1170	0.0038	10.0
HCPN-1	0.2600	0.1560	0.0040	10.0
HCPN-1.25	0.2600	0.1950	0.0045	10.0
HCPN-1.5	0.2600	0.2340	0.0049	10.0
HCPN-1.75	0.2600	0.2730	0.0053	10.0
HCPN-2	0.2600	0.3120	0.0057	10.0
HCPN-2.5	0.2600	0.3900	0.0065	10.0

[a] The amount of AIBN is fixed at 1 wt% of monomer mass in all experiments.

Table S2. Surface areas and pore properties of HCPNs.

Samples	S_{BET}[a] ($m^2\ g^{-1}$)	S_{micro}[b] ($m^2\ g^{-1}$)	MPV[c] ($cm^3\ g^{-1}$)	PV[d] ($cm^3\ g^{-1}$)
HCPN-0.25	589	225	0.23	0.59
HCPN-0.5	702	305	0.28	0.57
HCPN-0.75	805	278	0.32	0.82
HCPN-1	719	289	0.29	0.54
HCPN-1.25	667	293	0.27	0.49
HCPN-1.5	582	312	0.24	0.41
HCPN-1.75	538	275	0.22	0.38
HCPN-2	468	286	0.20	0.33
HCPN-2.5	443	245	0.18	0.30

[a] Surface area calculated from the nitrogen adsorption isotherms at 77.3 K using the BET equation. [b] Micropore surface area calculated from the nitrogen adsorption isotherms at 77.3 K using the t-plot equation. [c] Micropore volume calculated from the nitrogen isotherm at P/P_0 = 0.15, 77.3 K using the t-plot equation. [d] Pore volume calculated from the nitrogen isotherm at P/P_0 = 0.99, 77.3 K.

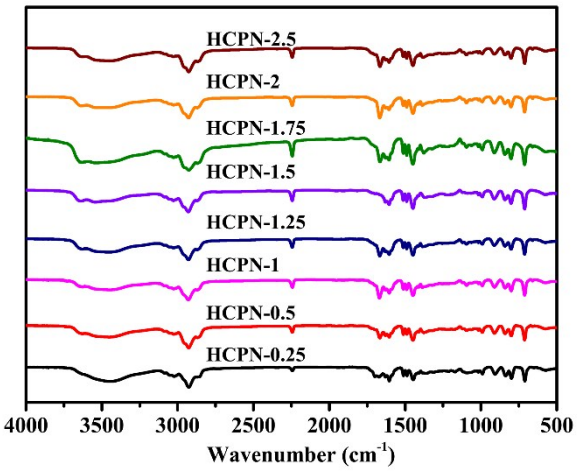

Fig. S1 FTIR spectra of HCPNs.

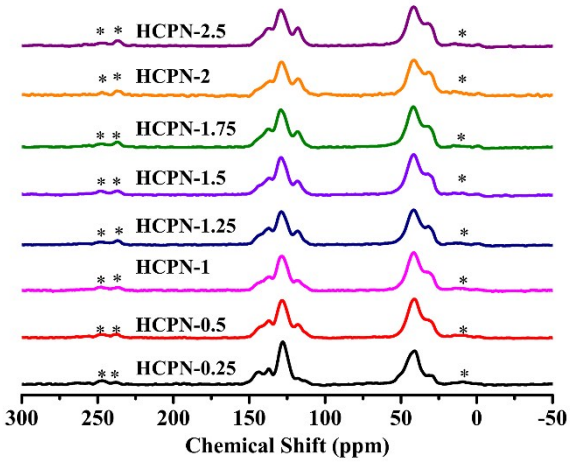

Fig. S2 Solid state ^{13}C cross-polarization magic-angle spinning (CP/MAS) NMR spectra of HCPNs. Asterisks denote spinning sidebands.

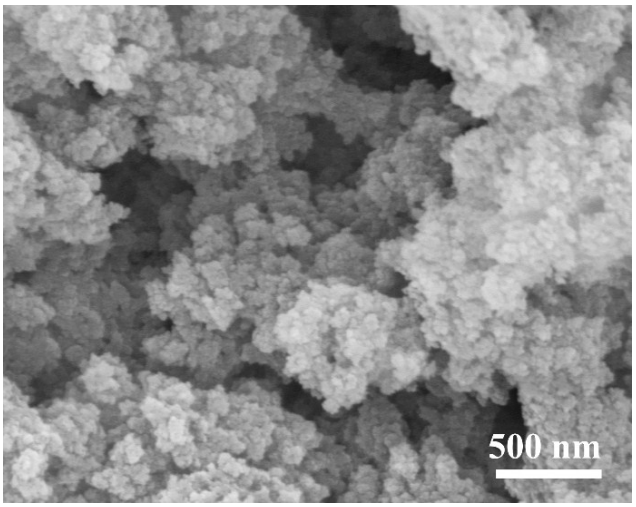

Fig. S3 SEM image of HCPN-0.75.

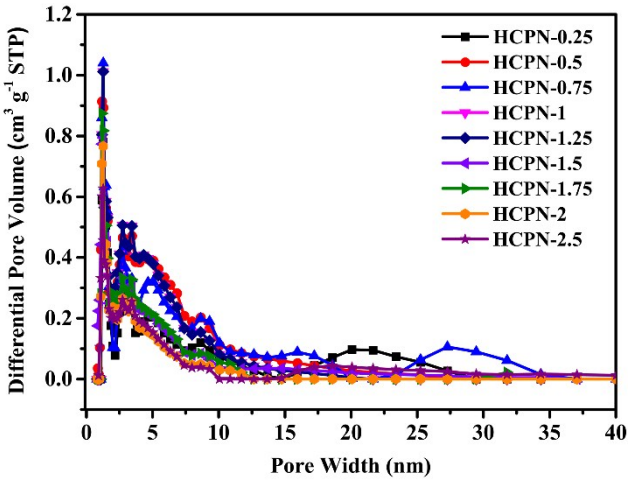

Fig. S4 Pore size distributions calculated using NLDFT method (slit pore models, differential pore volume vs. pore width).

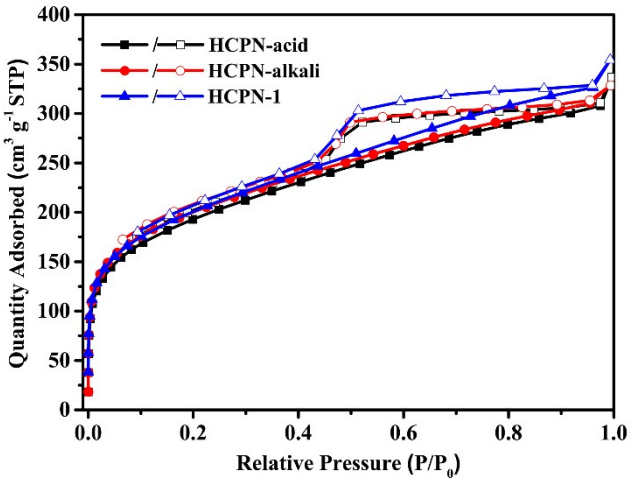

Fig. S5 Nitrogen adsorption-desorption isotherms for HCPN-1 before and after being immersed and stirred in 1 M NaOH (red) and 1 M HCl (black) for 24 h, respectively.

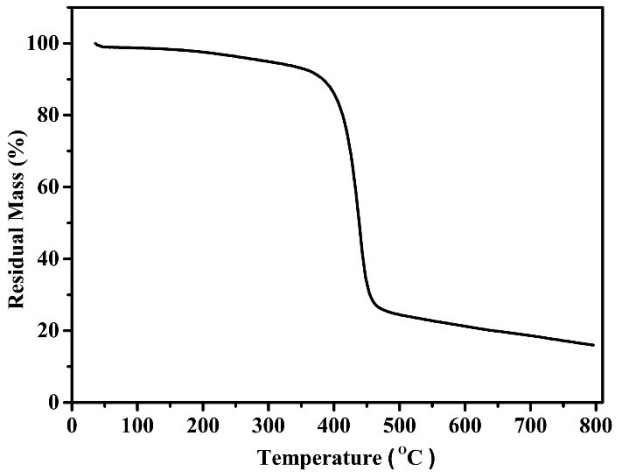

Fig. S6 Themogravimetric analysis of HCPN-0.75 under N_2 flow.

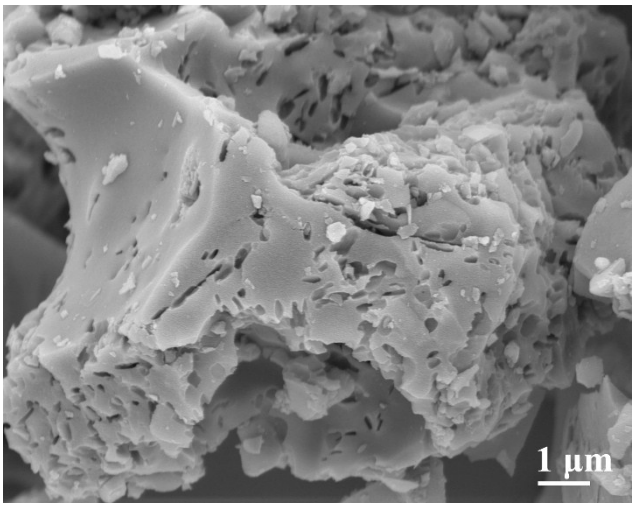

Fig. S7 SEM image of CHCPN-1.

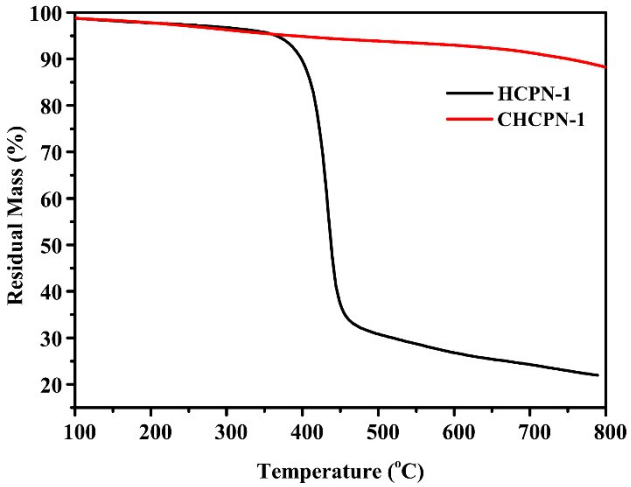

Fig. S8 Thermogravimetric analysis of HCPN-1 and CHCPN-1 under N_2 flow (to exclude the influence of moisture adsorpted in the microspores on the TG measurement, the onset temperature is 100 °C).

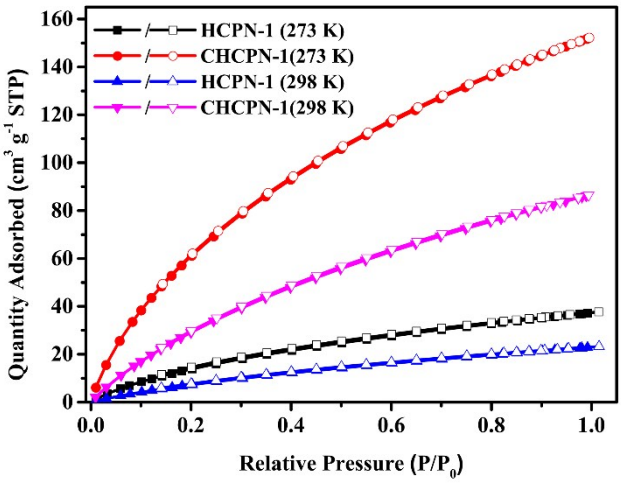

Fig. S9 CO_2 adsorption and desorption isotherms under 1bar at 273 and 298 K for HCPN-1 and CHCPN-1.

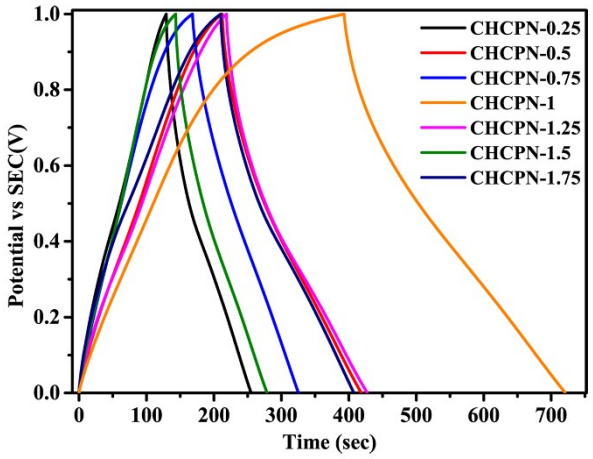

Fig S10 Galvanostatic charge-discharge curves at a density of 1A g^{-1} in 1M H_2SO_4 electrode for CHCPNs.