Electronic Supplementary Information (ESI)

Amino-functionalized hypercross-linked polymers for highly selective anionic dye removal and CO_2/N_2 separation

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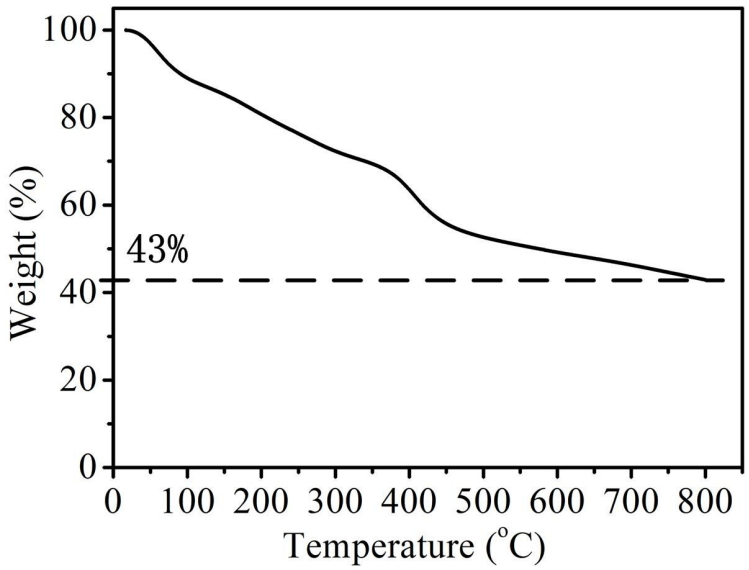


Fig. S1 TGA analysis of the prepared NH_2-HCPs.

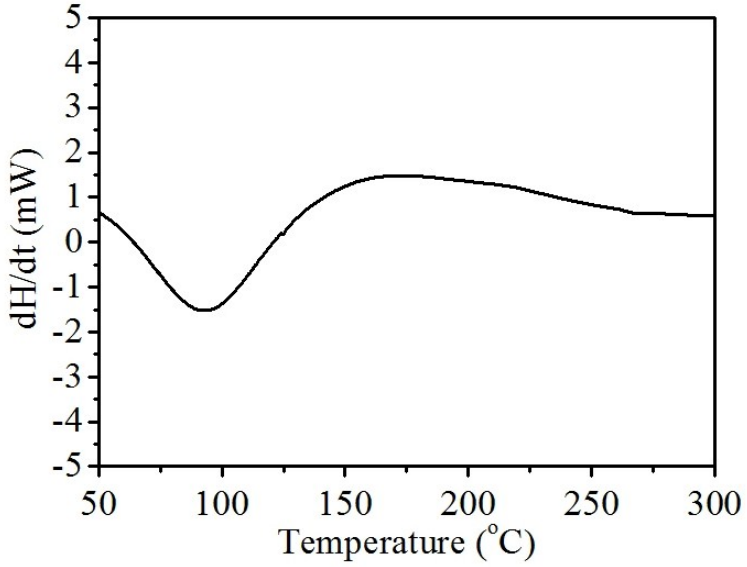


Fig. S2 DSC curve of the prepared NH_2-HCPs at the heating rate of 10 ºC/min under nitrogen atmosphere.

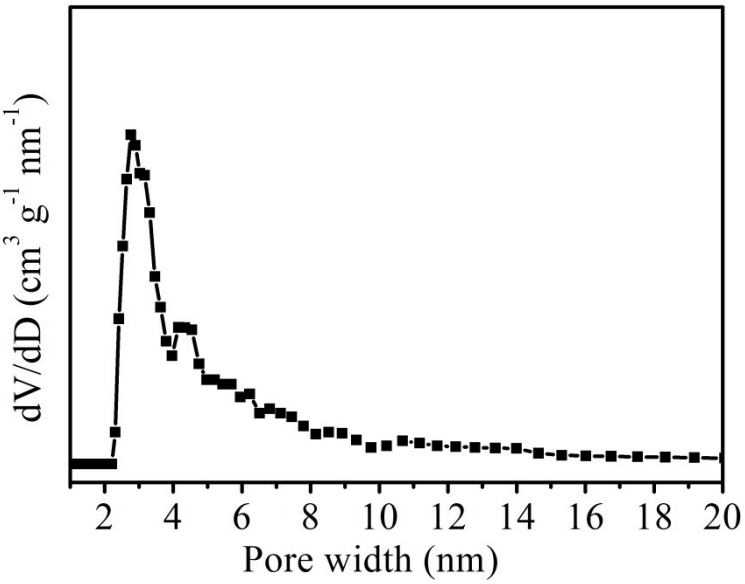


Fig. S3 Corresponding pore size distribution of NH_2-HCPs.

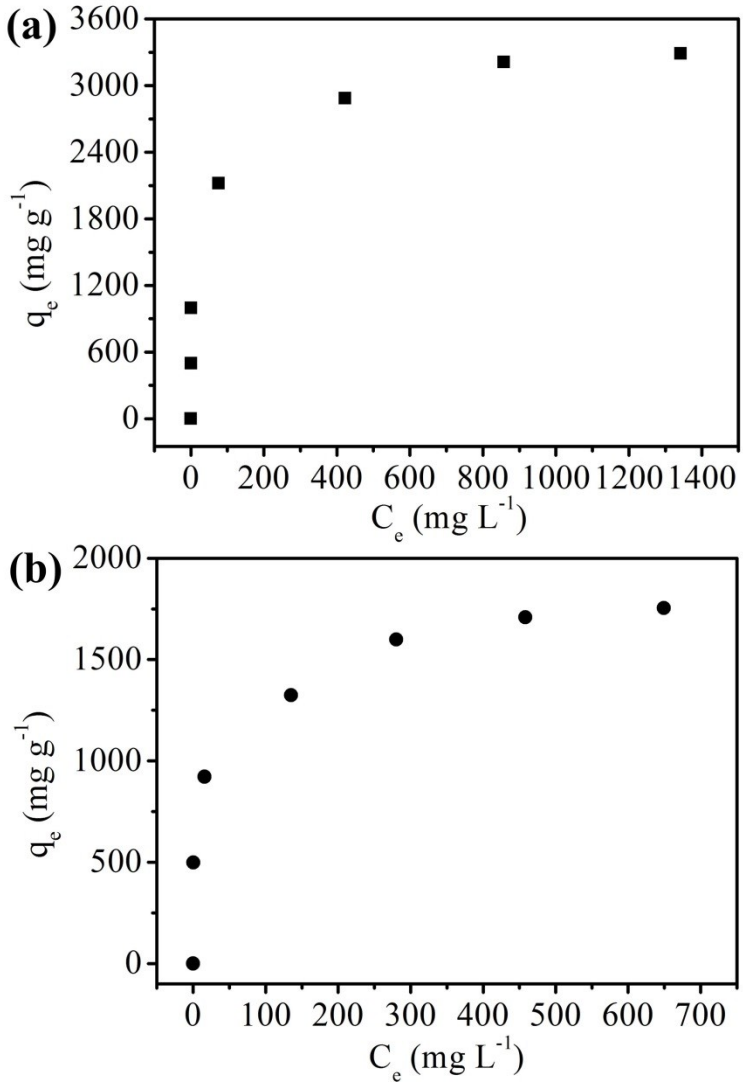


Fig. S4 Equilibrium adsorption isotherms of X-3B (a) and MO (b) onto the NH_2-HCPs.

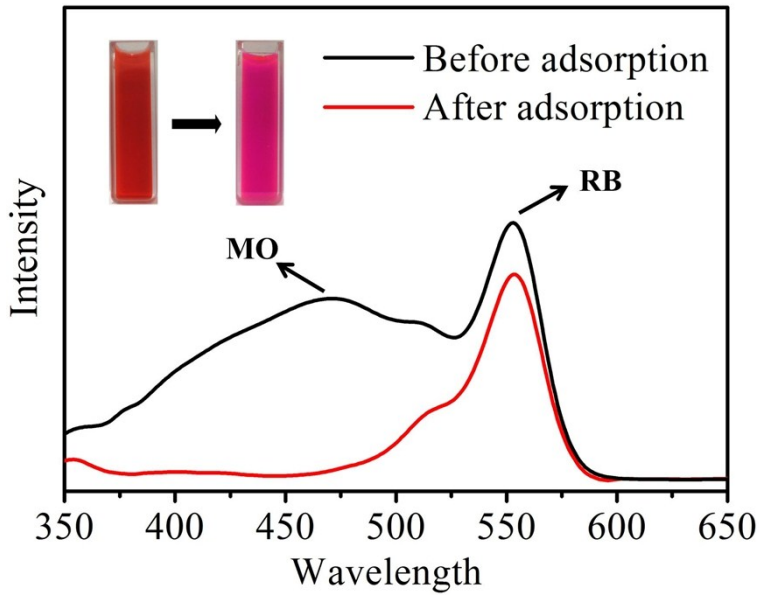


Fig. S5 UV/Vis spectras together with dramatic colour changes of the mixed dye solutions before and after adsorption by NH_2-HCPs for 12 hours (MO 100 mg L^{-1} RB 50 mg L^{-1}).

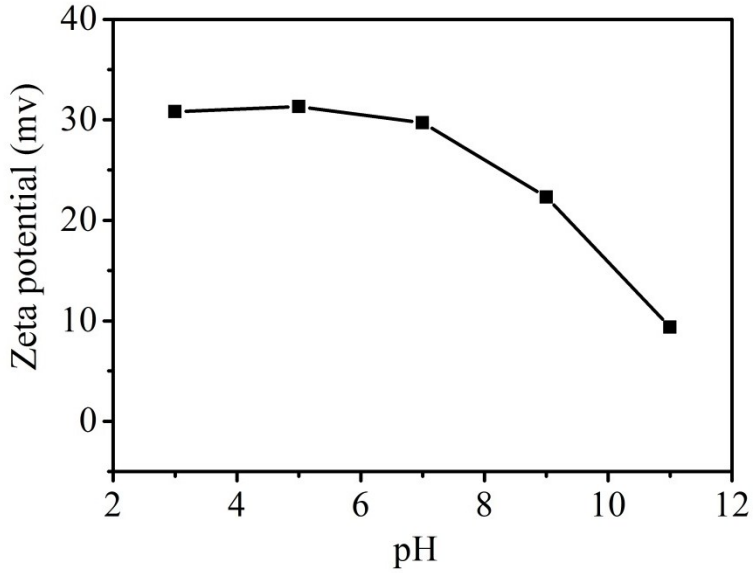


Fig. S6 Influence of pH on the zeta potentials of NH_2-HCPs.

Table S1 The chemical structures and general information of dyes used in this work.

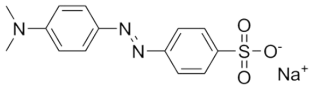
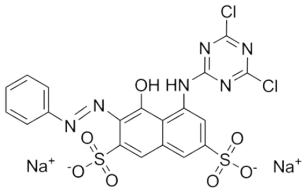
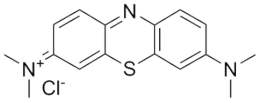
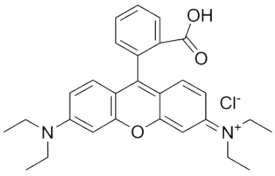
Dye	Structure	Formula	Molar mass (g/mol)
MO		$C_{14}H_{14}N_3SO_3Na$	327.3
X-3B		$C_{19}H_{10}Cl_2N_6Na_2O_7S_2$	615.3
MB		$C_{16}H_{18}ClN_3S$	319.86
RB		$C_{28}H_{31}ClN_2O_3$	479.01

Table S2. Comparison of the adsorption capacity (Q) of X-3B with other reported adsorbents.

Adsorbent	Q/mg g^{-1}	References
Fe_3O_4@SiO_2-NH_2	233.1	1
Fe_3O_4/chitosan NPs	340	2
$[Cu(bipy)(SO_4)]_n$	915	3
Hydrotalcite-like LDHs	35	4
CTF	264.6	5
SBA-3	294.1	6
NH_3^+-MCM-41	209.2	7
Acid-modified TiO_2	19.03	8
Py-MS	891.1	9
NiO(111) nanosheets	30.4	10
Carbon aerogels (CAs)	425	11
Organic aerogels (AGs)	210	11
$[NiBDP]_n$	243.72	12
CB[8]	1434.5	13
CB[6]	158.5	13
1-3-AB	72.2	14
NH_2-HCPs	3290	This work

Table S3. Comparison of the adsorption capacity (Q) of MO with other reported adsorbents.

Adsorbent	Q/mg g^{-1}	References
NH_3^+-MCM-41	366.6	7
PANF-g-HPEI	194	15
NH_2-$Co_{0.3}Ni_{0.7}Fe_2O_4$@SiO_2	116.2	16
NH_2-MWCNTs	185.5	17
NH_2-rGO−CNT	294	18
NH_2-MIL-101(Al)	188	19
MOF-235	477	20
Carboxymethyl CCMDs	20.85	21
Activated clay	16.78	22
Polyaniline hollow spheres	384.6	23
ZnAlLDH	1273	24
G-LDO	1062.3	25
TiO_2@GAC	32.36	26
NCMS	416.3	27
CMP-YA	481	28
hPEA-NG/CS	582	29
Fe_3O_4@HCP	211	30
NH_2-HCPs	1754	This work

Table S4 Comparison of the CO_2 uptake and CO_2/N_2 selectivity of NH_2-HCPs particles at 298K and 1 bar with other reported porous polymers.

Adsorbent	CO_2 uptake (mmol/g)	CO_2/N_2 selectivity	References
Benzene-HCP	1.61 (300 K)	15.9	31
Aniline-HCP	0.35 (300 K)	49.2	31
TSP-1	1.9	28.9	32
TSP-2	2.6	24.2	32
HC-PCz-8	3.5	17	33
azo-COP-2	1.53	130.6	34
Py-1	2.7 (273 K)	117	35
Ara-1	0.98	26	36
Glc-3	1.45	27	36
Gal-2	1.38	34	36
BILP-4	3.59	32	37
PMOP	3.17	28.7	38
BTLP-5	2.0	42	39
BOLP-5	1.8	65	39
TNB	2.35	19.4	40
NH_2-HCPs	0.63	122	This work

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