Supporting Information

β-Cyclodextrin-based Hollow Nanoparticles with Excellent Adsorption Performance towards Organic and Inorganic Pollutants

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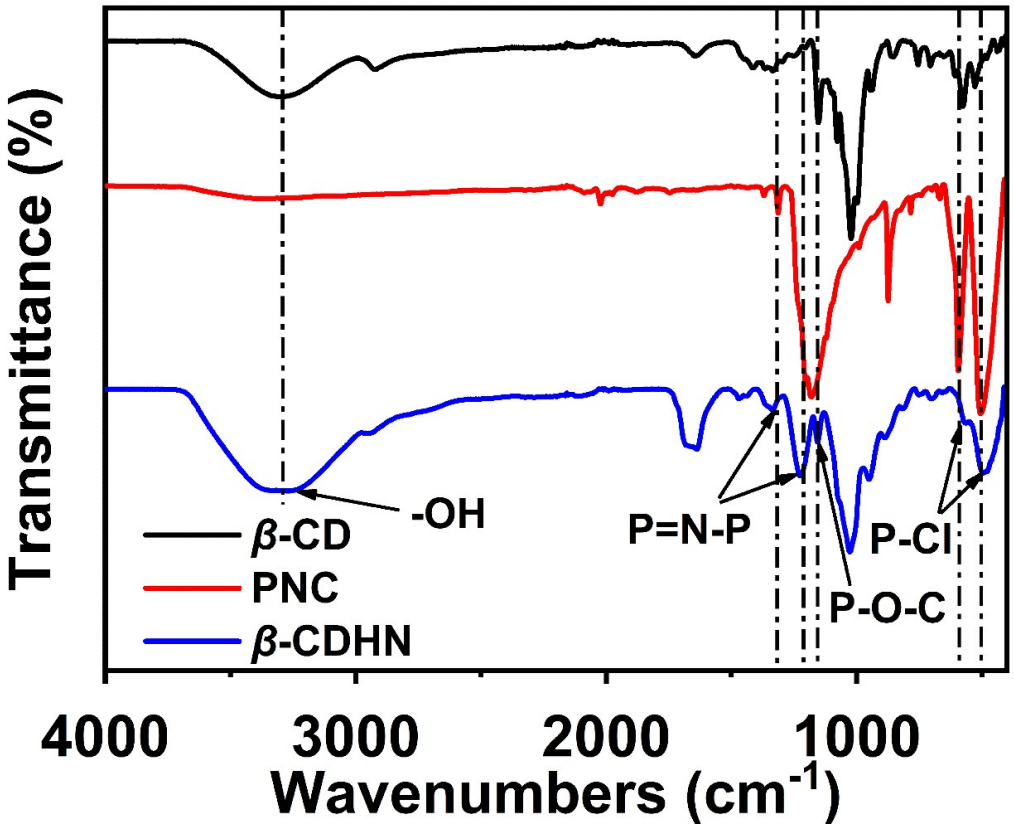

Figure S1. FTIR spectra of β-CD, PNC and β-CDHN.

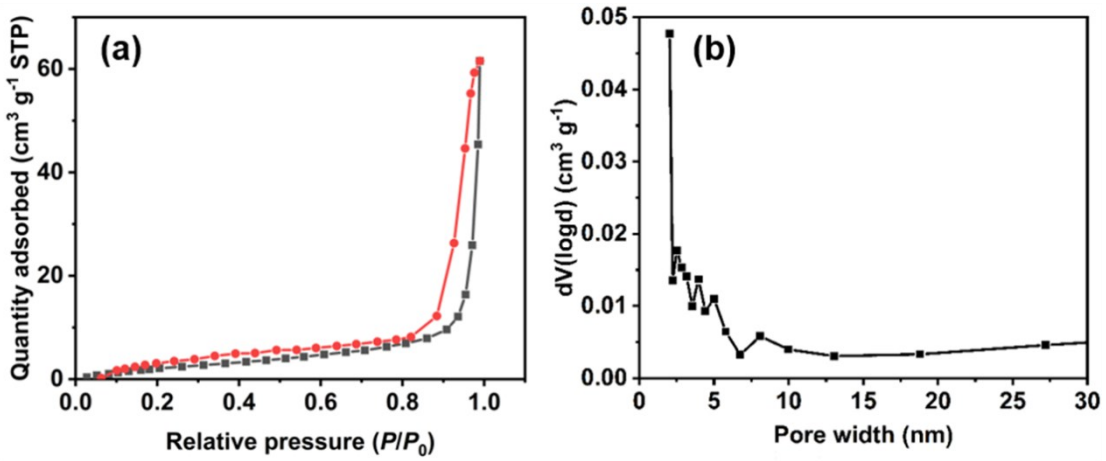

Figure S2. (a) N_2 sorption isotherms of β-CDP. Pore size distribution of (b) β-CDP determined by using density functional theory (DFT) model.

Table S1 Preparation and pore parameters of β-CDHN and β-CDP.

Samples	rotational speed (rpm)	yield (%)	pore width (nm)	BET (m^2/g)	pore volume (cm^3/g)
β-CDHN	1500	57.45	2.0	456.57	0.581
β-CDP	0	59.16	2.1	76.39	0.216

Table S2. Summary of adsorption kinetics model fitting parameters of MB, Pb^{2+} and BPA on β-CDHN at 25 °C.

Adsorbent	pollutants	Pseudo-first-order			Pseudo-second-order		
		q_{1e} (mg g^{-1})	K_1 (min^{-1})	R^2	q_{2e} (mg g^{-1})	K_2 (g mg^{-1} min^{-1})	R^2
β-CDHN	MB	99.29	2.64	0.921	100	0.19	0.999
	Pb^{2+}	9.91	1.79	0.991	9.97	1.5	0.999
	BPA	21.90	3.55	0.996	21.99	1.54	0.999

Table S3. Summary of adsorption isotherm fitting parameters of MB, Pb^{2+} and BPA on β-CDHN and β-CDP at 25 °C.

Adsorbents	pollutants	Experimental q_m (mg/g)	Langmuir isotherm			Freundlich isotherm		
			q_m（mg/g）	b（L/mg）	R^2	K_F	n	R^2
β-CDHN	MB	1828.26	2080.35	0.158	0.996	257.18	1.83	0.899
	Pb^{2+}	399.52	427.35	0.014	0.992	31.15	1.82	0.981
	BPA	106.86	120.48	0.048	0.995	16.74	2.85	0.904
β-CDP	MB	1305.76	1481.96	0.126	0.998	128.16	1.07	0.867
	Pb^{2+}	305.89	374.86	0.005	0.992	25.74	1.53	0.937
	BPA	85.32	94.82	0.038	0.993	14.31	2.48	0.952

Table S4. Adsorption capacity of pollutants on β-CDHN at different temperatures.

Adsorbent	pollutants	Adsorption capacity (mg g^{-1})		
		298.15K	308.15K	313.15K
β-CDHN	MB	2080.35	2267.58	2392.41
	Pb^{2+}	427.35	461.54	504.27
	BPA	120.48	130.12	143.37