Supplementary Information

Preparation of carboxymethyl β-cyclodextrin polymer and its rapid adsorption performance for basic fuchsin

Hongyu Pu,[a] Peixiao Tang,[*a] Ludan Zhao,[a] Qiaomei Sun,[a] Yuanming Zhai,[b] Zhiqiang Li,[c] Na Gan,[a] Yuanyuan Liu,[a] Xiuyun Ren,[a] and Hui Li[*a]

[a] *School of Chemical Engineering, Sichuan University, Chengdu 610065, PR China*

[b] *Analytical & Testing Center, Sichuan University, Chengdu 610064, PR China*

[c] *China Tobacco Yunnan Industrial co., LTD., Kunming 650231, PR*

[*] Corresponding author. Tel.: +86 028 85405220; fax: +86 028 85401207.
E-mail address: lihuilab@sina.com (H. Li); tangpeixiao@126.com (P. Tang)

Table S1. Comparison of the adsorption equilibrium time of some new adsorbents for removal BF.

Adsorbent	Water System	Adsorbent dose (g/L)	Equilibrium time (min)	q_{max} (mg/g)	References
β-CDP-COOH	triple-distilled water with pH value of 6	1	1	70	This work
bottom ash	water	4	105	7	1
deoiled soya	water	2	90	13	1
anionic polyacrylamide/graphene oxide aerogels	deionized water	0.5	4200	1034	2
cation-exchange resin	purified water	1	25	114	3
gangue microspheres	unmentioned	20	60	24	4
Al-MCM-41	unmentioned	1	90	54	5
activated carbon/ferrospinel composite	unmentioned	2	30	101	6
βcyclodextrin–carboxymethyl cellulose–graphene oxide composite	unmentioned	15	150	59	7
β-cyclodextrin-	double-	1	90	64	8

styrene-based polymer	distilled water				
maleamic acid cross-linked β-cyclodextrin polymer	purified water	3.3	80	28	9

Table S2. Water regain analysis of β-CDP and β-CDP-COOH (data were determined from the average of three measurements).

Polymers	W_d	W_w	Water regain
β-CDP	3.68	6.50	76.66%
β-CDP-COOH	3.85	8.15	111.69%

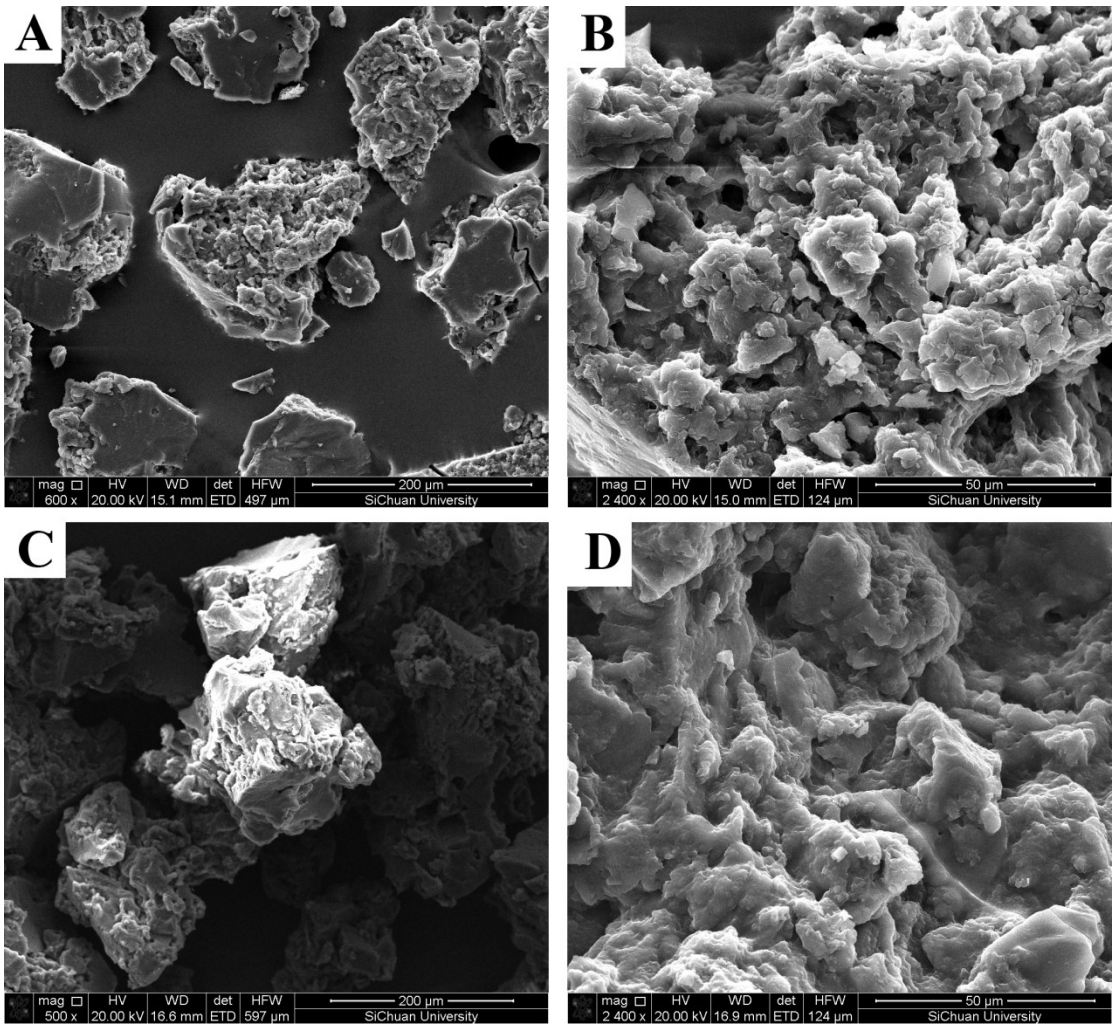

Fig. S1 SEM images of (A) β-CDP (600×), (B) β-CDP (2400×), (C) β-CDP-COOH

(500×) and (D) β-CDP-COOH (2400×)

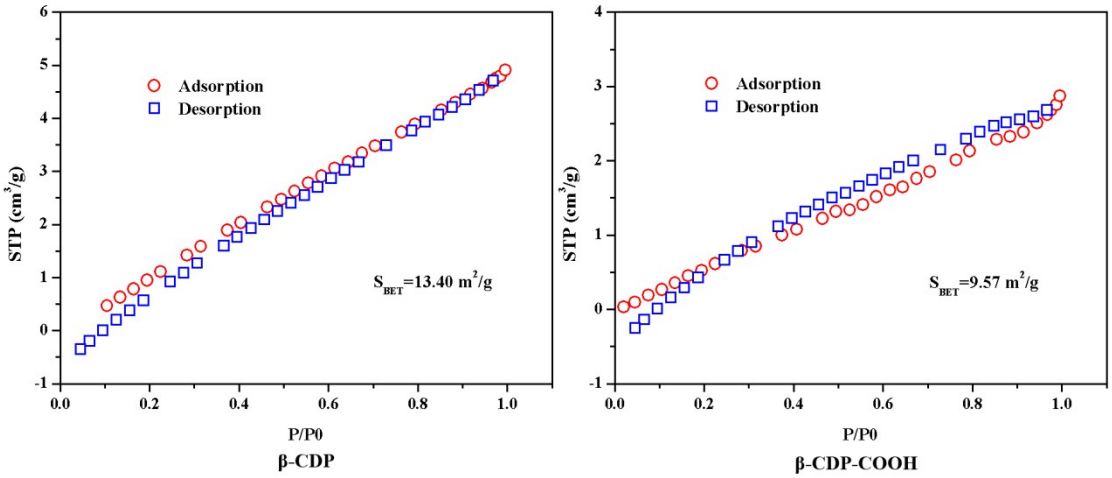

Fig. S2 N_2 adsorption−desorption isotherms and surface area data analysis of β-CDP and β-CDP-COOH.

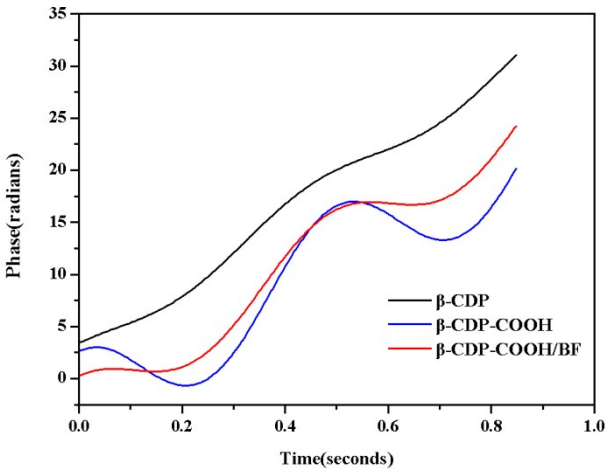

Fig. S3 Zeta potential of β-CDP, β-CDP-COOH before and after adsorption.

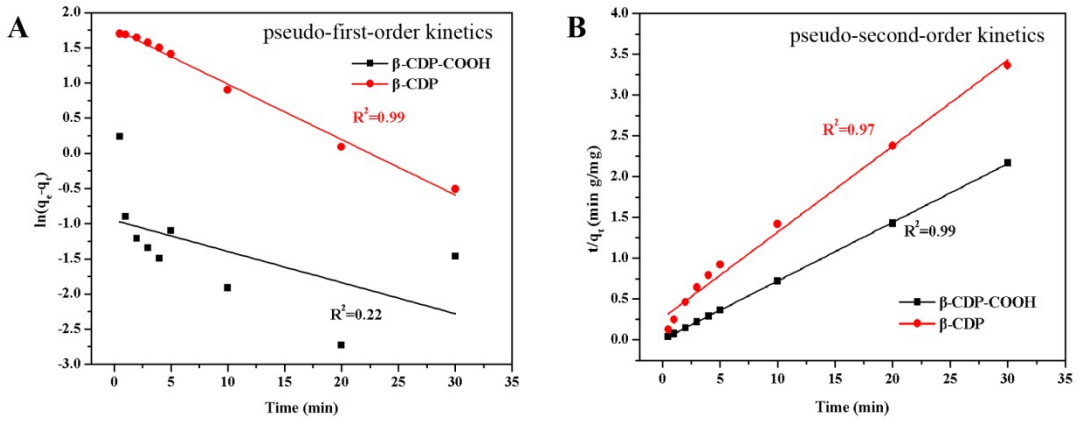

Fig. S4 Plots of (A) pseudo-first-order kinetics and (B) pseudo-second-order kinetics.

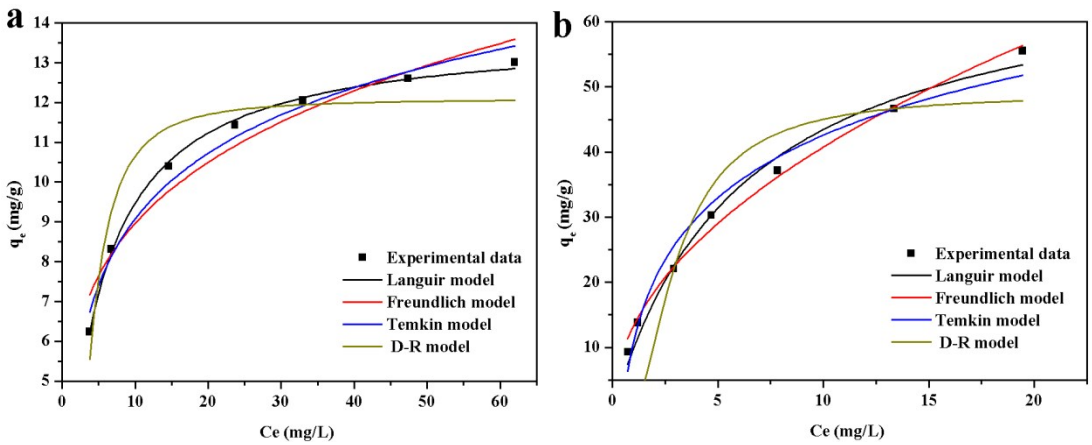

Fig. S5 Fitting curve of BF adsorption isotherms onto β-CDP (a) and β-CDP-COOH (b) of the Langmuir, Freundlich, Temkin, and Dubnin–Radushkevich (D-R) isotherm models.

References

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