Supporting Information

Molecular recognition with cyclodextrin polymer: a novel method for removing sulfides efficiently

Linlin Li, Zunbin Duan, Jinshe Chen, Yulu Zhou, Lijun Zhu, Yuzhi Xiang, and Daohong Xia*

State Key Laboratory of Heavy Oil Processing, China University of Petroleum, Qingdao 266580, People's Republic of China

*Corresponding Author: xiadh@upc.edu.cn.

Figures:

Figure S1. The TG curves of (A) α-CDP, (B) β-CDP, (C) γ-CDP, (D) (β&γ)-CDP.

Figure S2. [13]C solid-state NMR of (a) α-CDP, (b) β-CDP, (c) γ-CD, (d) (β&γ)-CDP.

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Figure S4. Pseudo-second order kinetic of β-CDP for DBT.

Figure S5 Nitrogen adsorption isotherms of (A) fresh β-CDP and (B) used β-CDP.

Figure S6 FTIR spectra of (a) used β-CDP and (b) fresh β-CDP.

Equation E1:

Equation of The desulfurization efficiency in Table S1.

Tables:

Table S1. The desulfurization selectivity to DBT of β-CDP.

Figures:

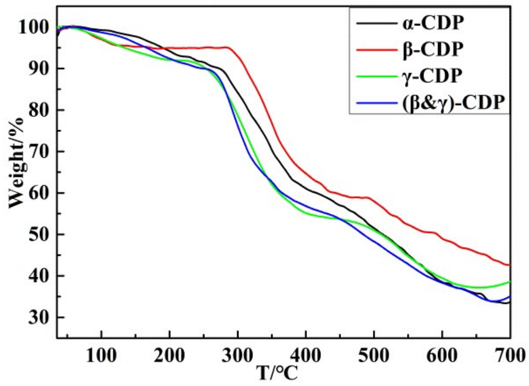

Figure S1 The TG curves of (A) α-CDP, (B) β-CDP, (C) γ-CDP, (D) (β&γ)-CDP.

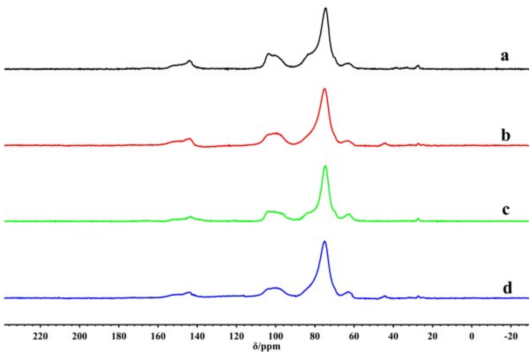

Figure S2 [13]C solid-state NMR of (a) α-CDP, (b) β-CDP, (c) γ-CD, (d) (β&γ)-CDP.

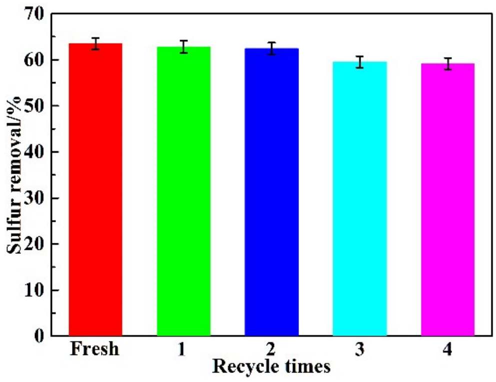

Figure S3 Regeneration performance of β-CDP for removing DBT.

Desulfurization conditions: temperature=25 ^oC, time=2h, mass ration of β-CDP to n-heptane solution of DBT is 1:40, initial sulfur concentration is 100 $\mu g \cdot g^{-1}$. All results were obtained in triplicate, and standard deviation is indicated by the error bars.

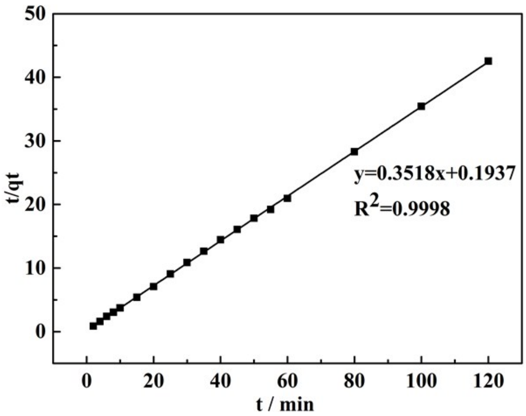

Figure S4 Pseudo-second order kinetic of β-CDP for DBT.

Desulfurization conditions: temperature=25^oC, time=2h, mass ration of β-CDP to n-heptane solution of DBT is 1:40.

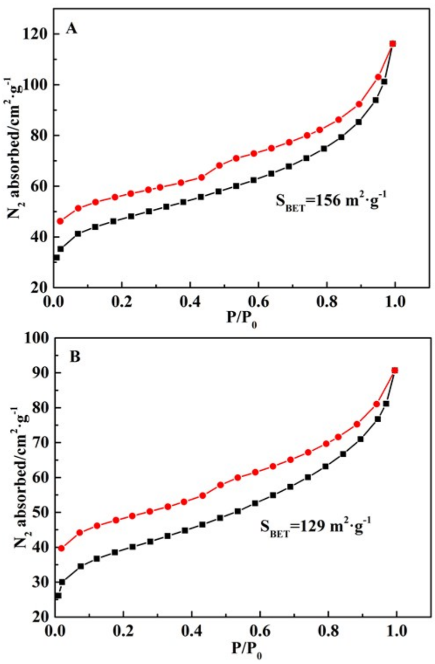

Figure S5 Nitrogen adsorption isotherms of (A) fresh β-CDP and (B) used β-CDP.

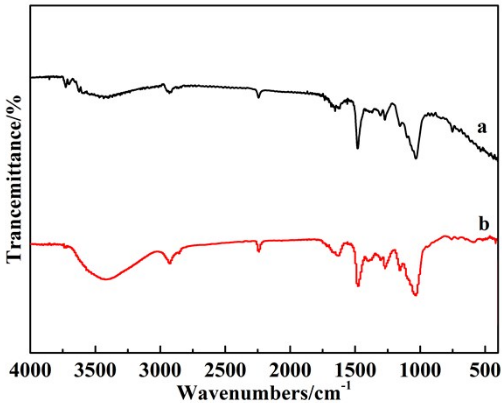

Figure S6 FTIR spectra of (a) used β-CDP and (b) fresh β-CDP.

Equation E1:

The desulfurization efficiency in Table S1 was calculated according to the following equation (E1).

$$Y = 100\% (S_0 - S_t) / S_0 \qquad E1$$

Where Y is the desulfurization efficiency for DBT , S_0 (μg/g) is the initial sulfur concentration of DBT in n-heptane solution, and S_t (μg/g) is the sulfur concentration of DBT in n-heptane solution after desulfurization.

Tables:

Table S1. The desulfurization selectivity to DBT of β-CDP.

	Before desulfurization/μg·g^{-1}			After desulfurization/μg·g^{-1}		DBT removal/%
	Total	DBT	Other sulfides	DBT	Other sulfides	
A	94.7	17.5	77.2	1.5	49.0	91.4
B	98.8	63.8	33.0	7.7	31.5	87.9

A: The sulfur concentration ratio of DBT:BT:Th:TP:EPS was 1:1:1:1:1

B: The sulfur concentration ratio of DBT:BT:Th:TP:EPS was 6:1:1:1:1

Desulfurization conditions: temperature=25°C, time=2h, mass ratio of β-CDP to n-heptane solution of mixed-sulfides is 1:20.

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