Supporting Information

Highly efficient Sn-modified Pt/KY catalyst for *n*-octane reforming: the synergistic effect of Pt in different electronic states

Mengxia Yan[a,c], Baoshan Wu[a,b]*, Yong Yang[a,b], Yongwang Li[a,b]

[a] State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan 030001, People's Republic of China.

[b] National Energy Research Center for Clean Fuels, Synfuels China Co., Ltd., Beijing 101400, People's Republic of China.

[c] University of Chinese Academy of Sciences, Beijing 100049, People's Republic of China.

* Corresponding author

E-mail addresses: wbs@sxicc.ac.cn (B.S. Wu)

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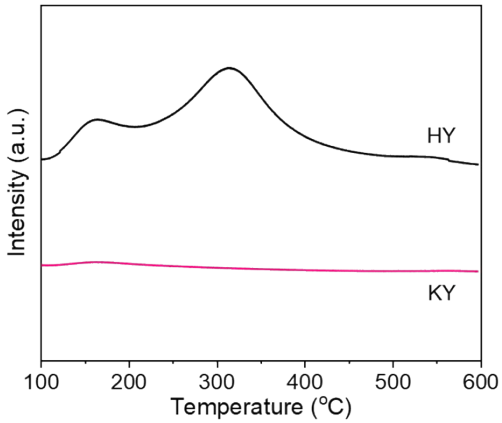

Fig. S1 NH_3-TPD results of obtained KY and parent HY zeolite.

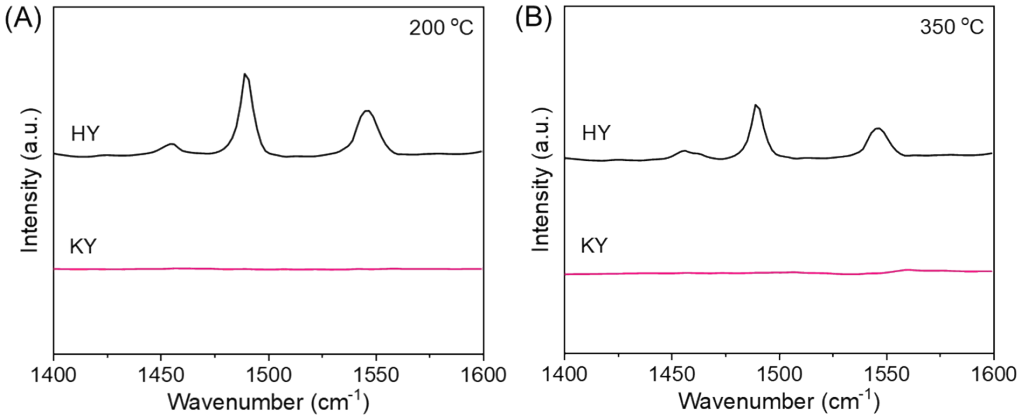

Fig. S2 Py-IR spectra of obtained KY and parent HY zeolite: (A) 200 °C; (B) 350 °C.

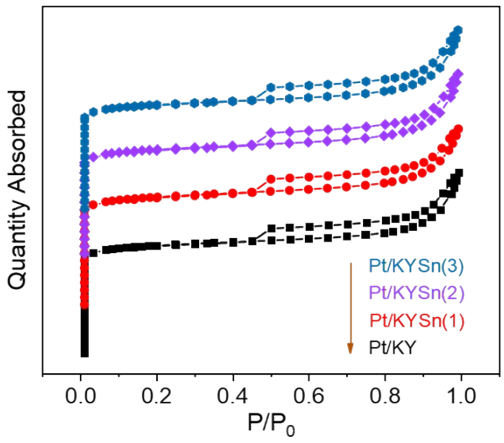

Fig. S3 The N_2 adsorption-desorption isotherm of Pt/KYSn(*x*) catalysts.

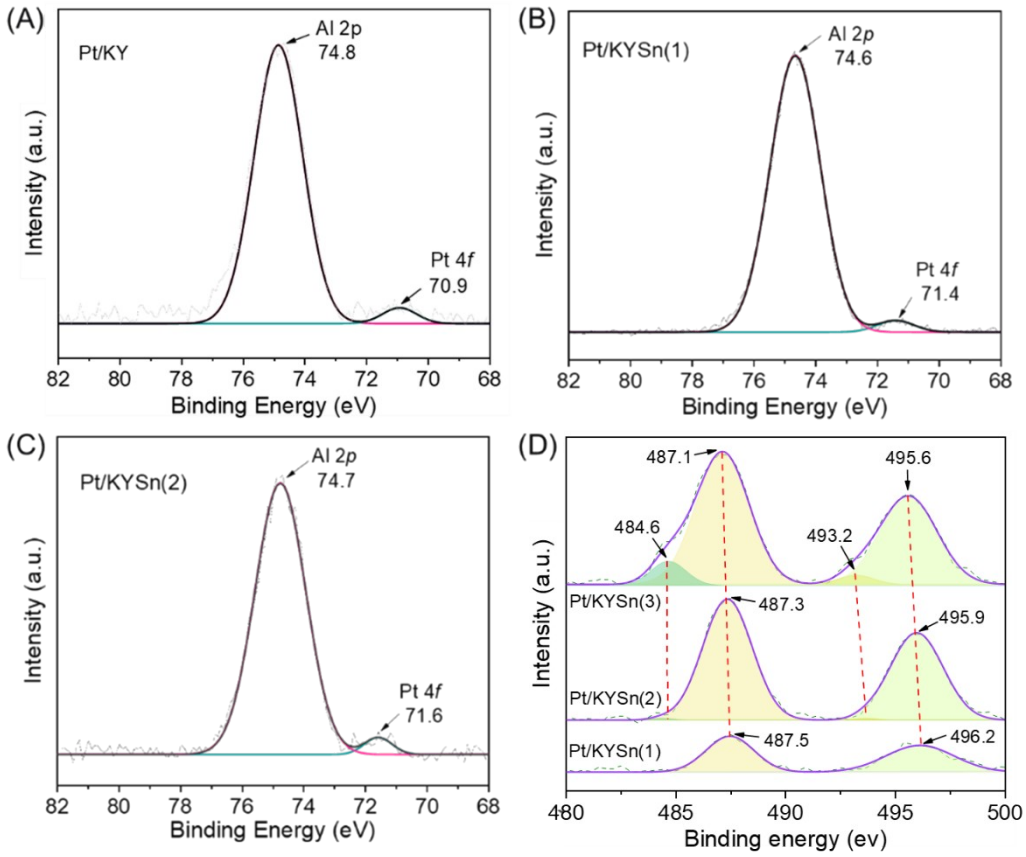

Fig. S4 The Pt 4*f* XPS spectra of Pt/KYSn(*x*) catalysts: (A) Pt/KY; (B) Pt/KYSn(1); (C) Pt/KYSn(2) and (D) the Sn 3*d* spectra of Pt/KYSn(*x*) catalysts.

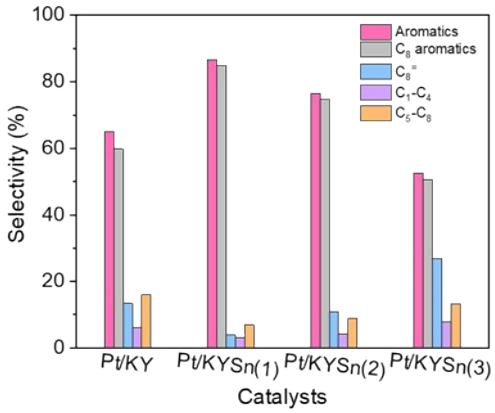

Fig. S5 The comparison of products selectivity on obtained Pt/KYSn(*x*) catalysts at similar *n*-octane conversion (70%-80%). Note: The aromatics (benzene, toluene, ethylene and xylene) and octene were not included in C_5-C_8 species (Reaction condition: 500 ^{o}C; 0.1 Mpa).

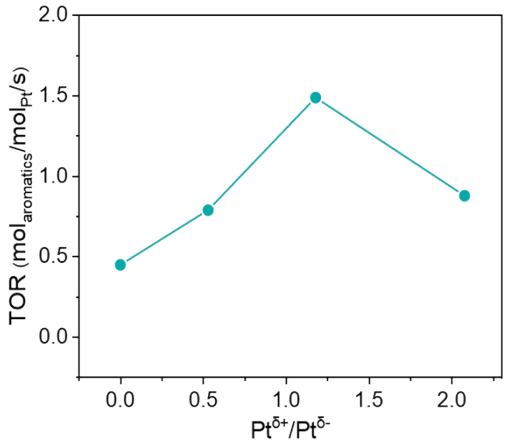

Fig. S6 The relationship between $Pt^{\delta+}/Pt^{\delta-}$ and aromatization ability. (Note: the value of $Pt^{\delta+}/Pt^{\delta-}$ was calculated according to CO-DRIFTS results, and one of these points was obtained by analyzing the Pt/KYSn(0.5) catalyst with 0.06 wt% Sn content).

Table S1.

The detailed data of kinetics experiments over Pt/KYSn(*x*) catalysts.

Catalysts	Temperature (°C)	Conversion (%)	Reaction rate (10^{-7} mol g_{cat}^{-1} s^{-1})
Pt/KY	373	10.1	3.11
	376	11.7	3.60
	382	15.0	4.63
Pt/KYSn(1)	348	13.6	4.19
	351	15.0	4.63
	353	16.9	5.21
Pt/KYSn(2)	363	12.7	3.90
	365	14.0	4.31
	367	15.0	4.63
Pt/KYSn(3)	455	12.2	3.76
	459	13.7	4.22
	465	17.1	5.27

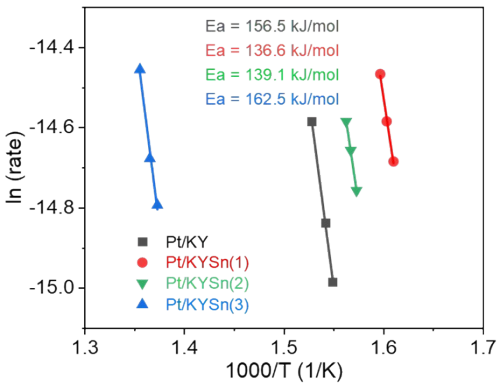

Fig. S7 The Arrhenius curve of Pt/KYSn(*x*) catalysts for the *n*-octane aromatization.

Table S2. The distribution of C_8 aromatics products over Pt/KYSn(*x*) catalysts.

Catalysts	$Sel._{EB}$ (%)	$Sel._{OX}$ (%)	$Sel._{PX+MX}$ (%)	EB/OX
Pt/KY	54.6	41.8	3.6	1.31
Pt/KYSn(1)	44.6	51.0	4.4	0.87
Pt/KYSn(2)	40.3	49.0	10.7	0.82
Pt/KYSn(3)	41.4	47.6	11.0	0.87

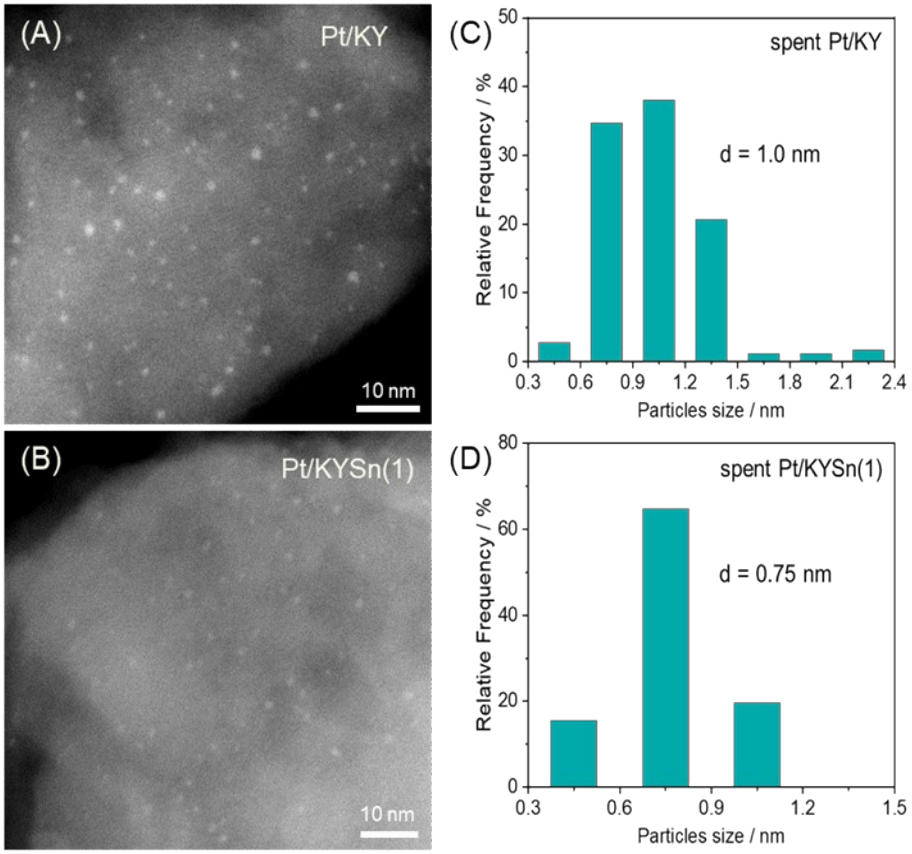

Fig. S8 The HAADF-STEM images of used Pt/KYSn(*x*) catalysts: (A) Pt/KY; (B) Pt/KYSn(1) and the particles size distribution (C-D).

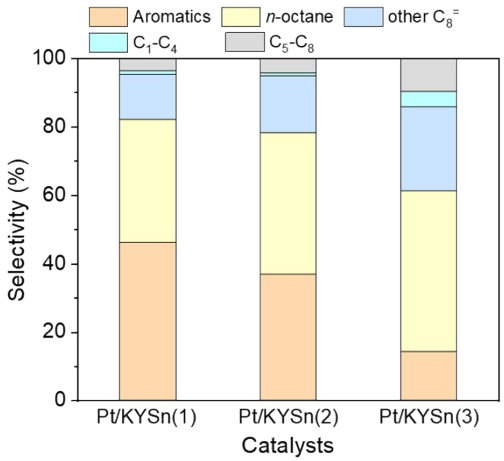

Fig. S9 The aromatization of 1-octene over Pt/KYSn(*x*) catalysts (Reaction condition: T = 500 ^{o}C; 0.1 MPa; H_2/*n*-octane = 6). Note: The aromatics (benzene, toluene, ethylene and xylene), octene and *n*-octane were not included in C_5-C_8 species.