Enhancing Aromatics Yield by Zeolites in Polypropylene Hydrocracking to Jet Fuel over Ru_1-ZrO_2 without Forming CH_4

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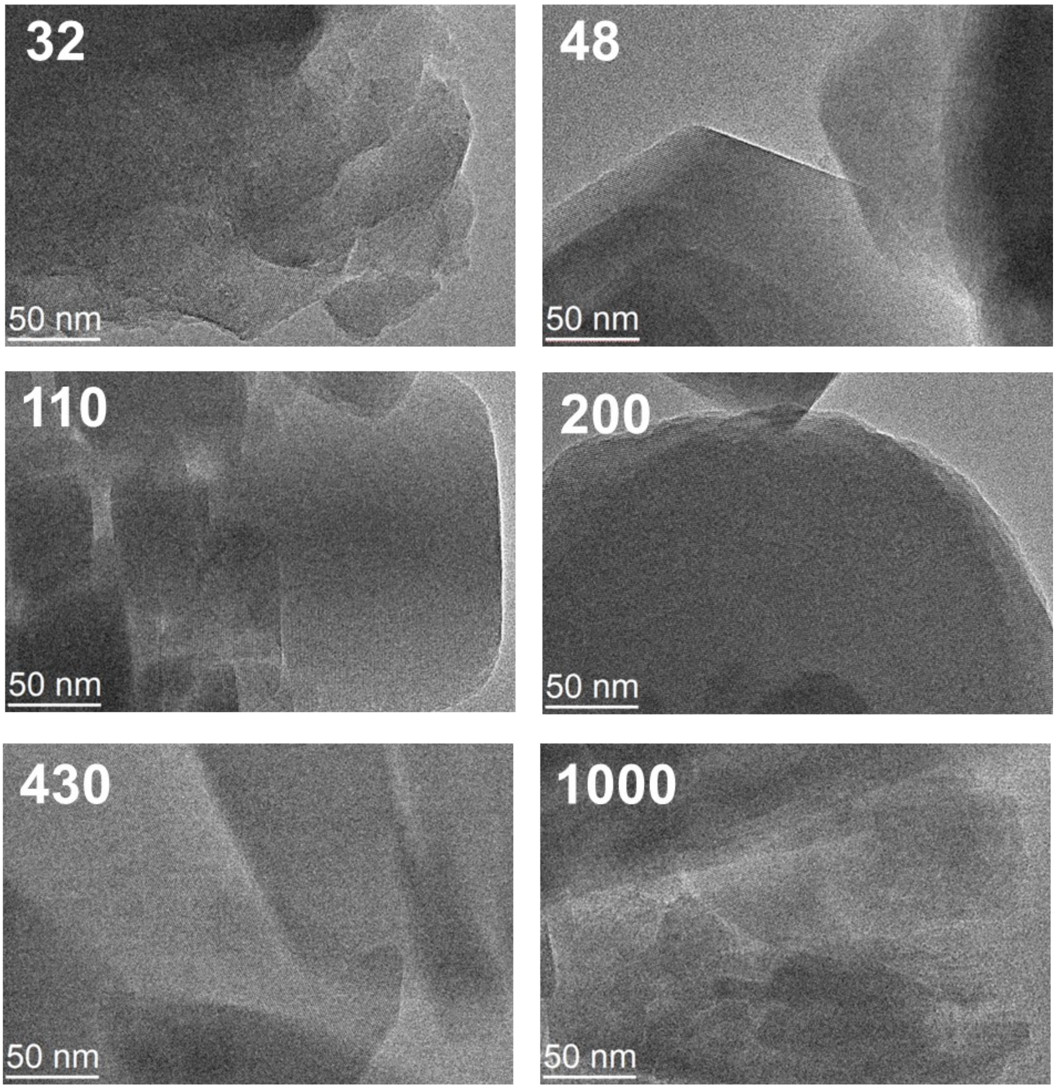

Fig. S1 TEM images of ZSM-5 zeolite with different Si/Al ratio.

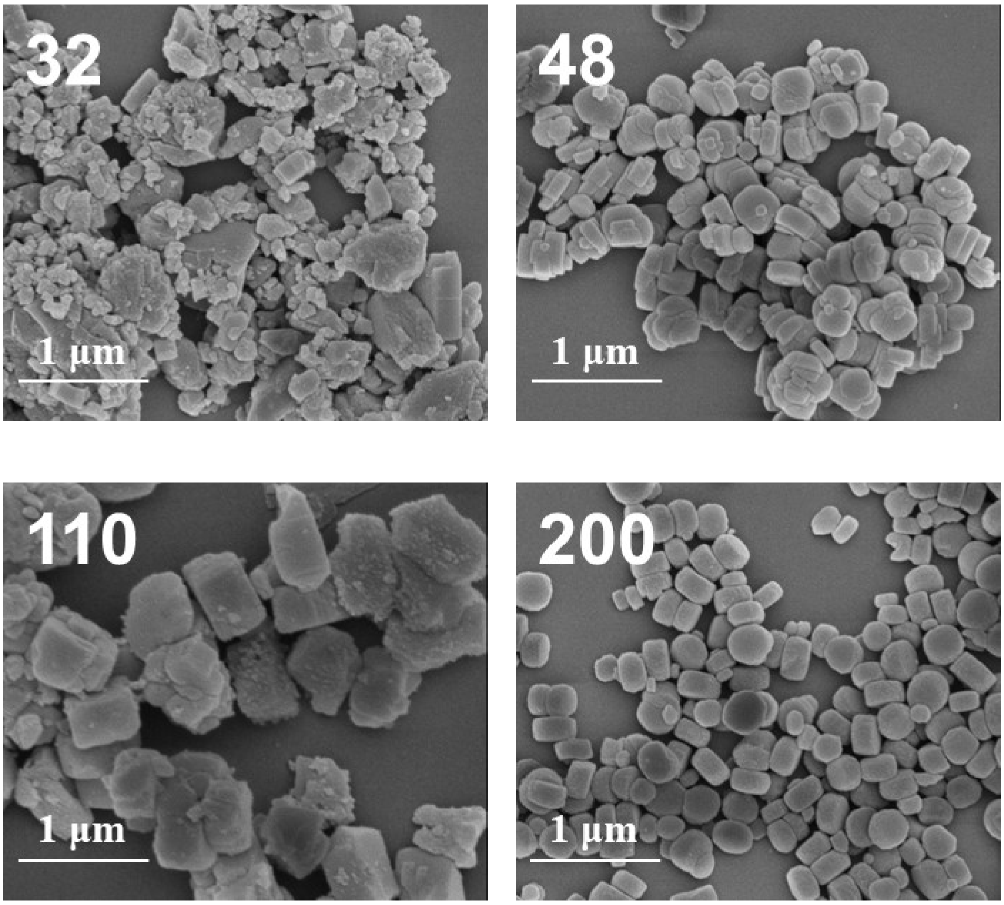

Fig. S2 SEM images of ZSM-5 zeolite with different Si/Al ratio.

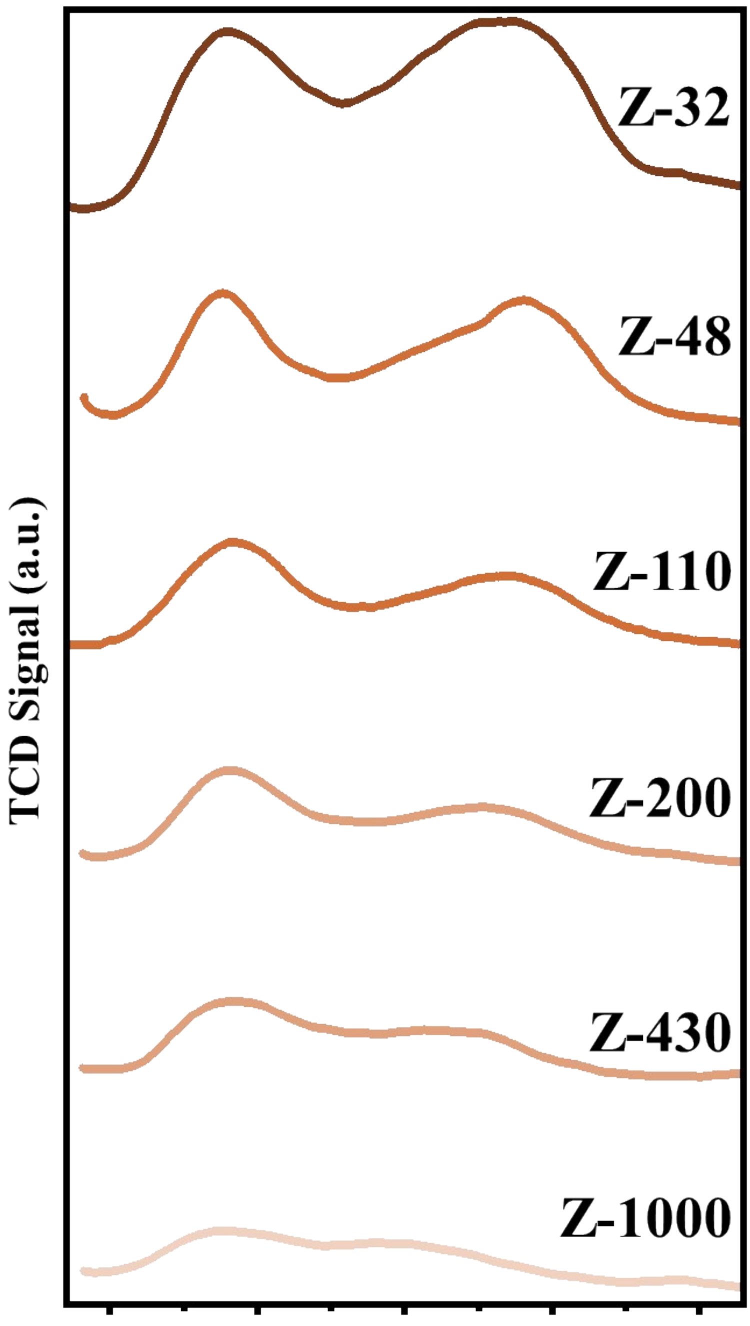

Fig. S3 NH_3-TPD test results of ZSM-5 zeolite with different Si/Al.

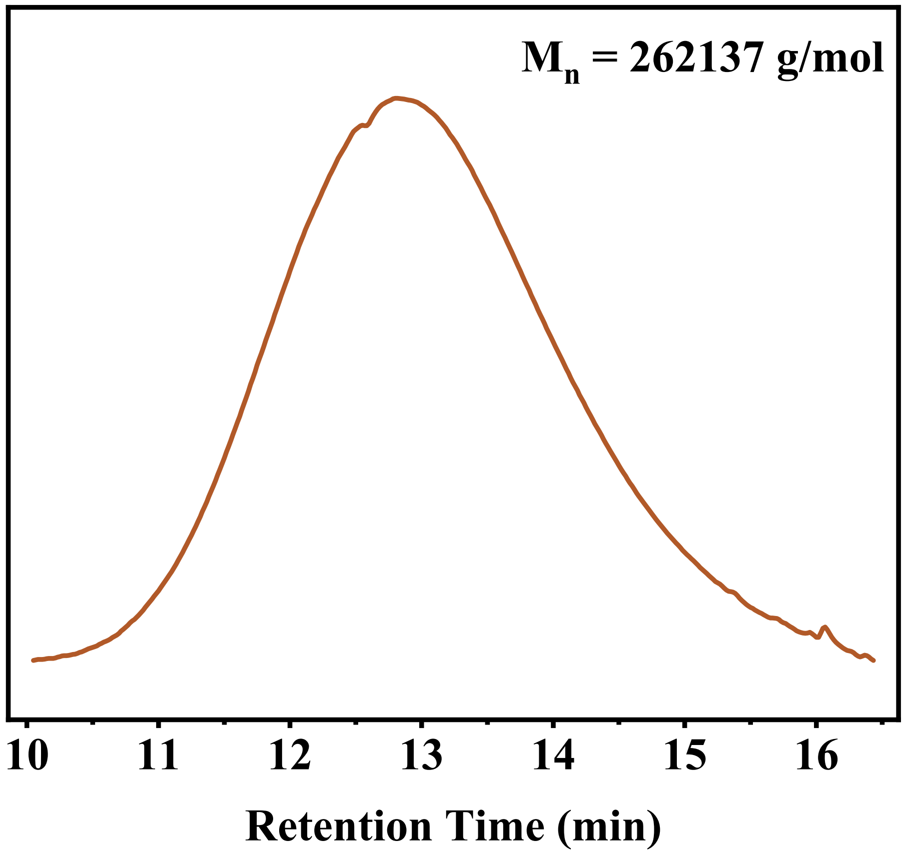

Fig. S4 GPC test results of PP Z30S.

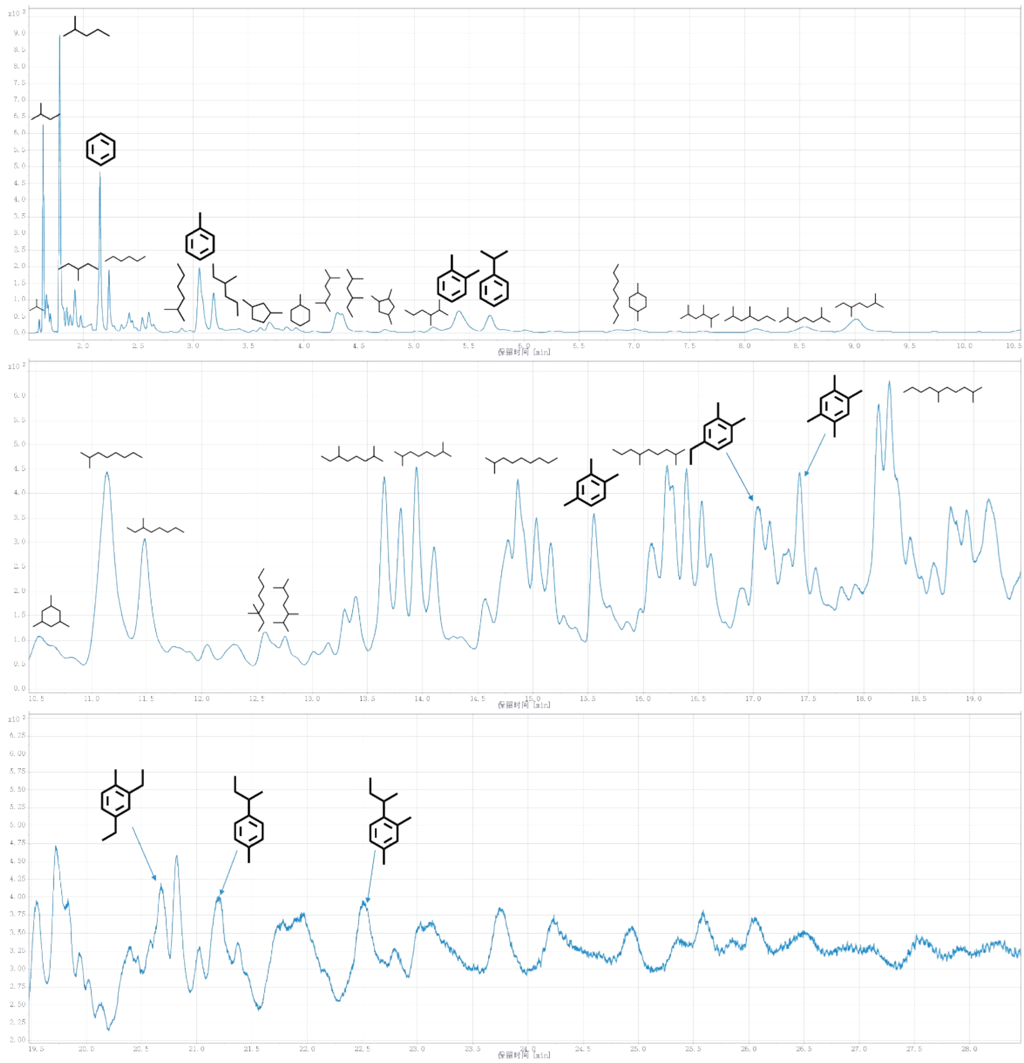

Fig. S5 GC-MS chromatogram of products from the reaction of PP over ZSM-5/Ru_1-ZrO_2 at 250 °C under 3 MPa of H_2 for 4 hours.

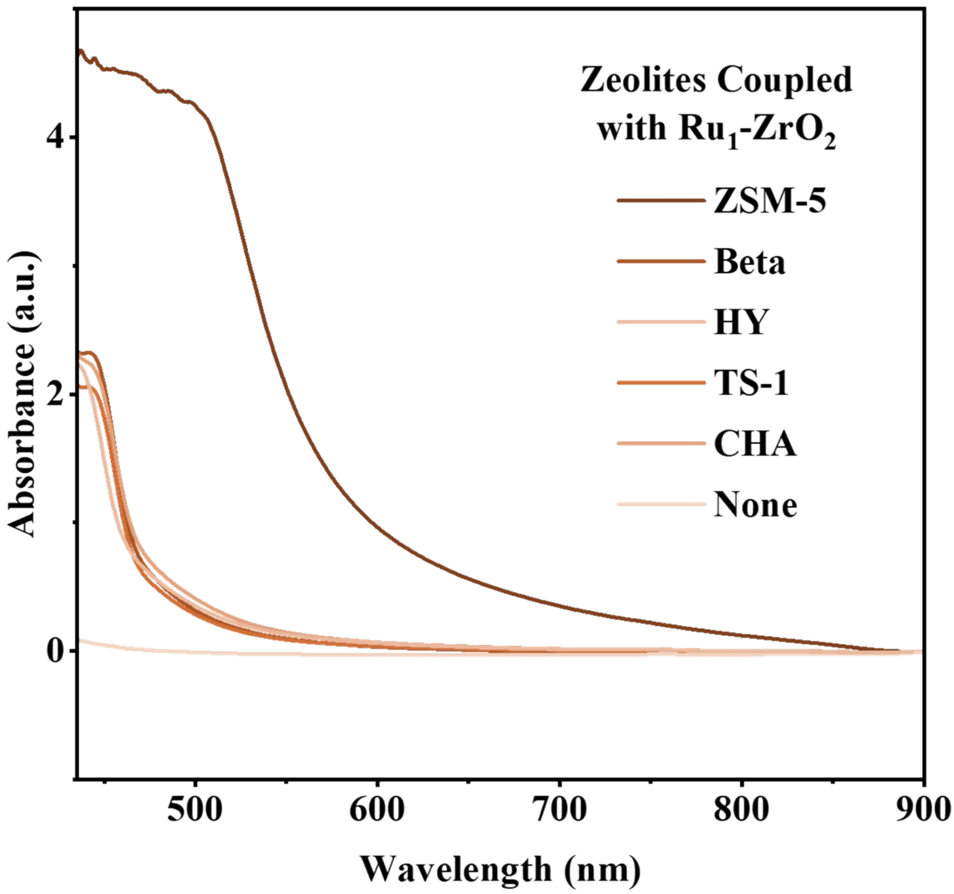

Fig. S6 UV-vis absorption spectra of the liquid product.

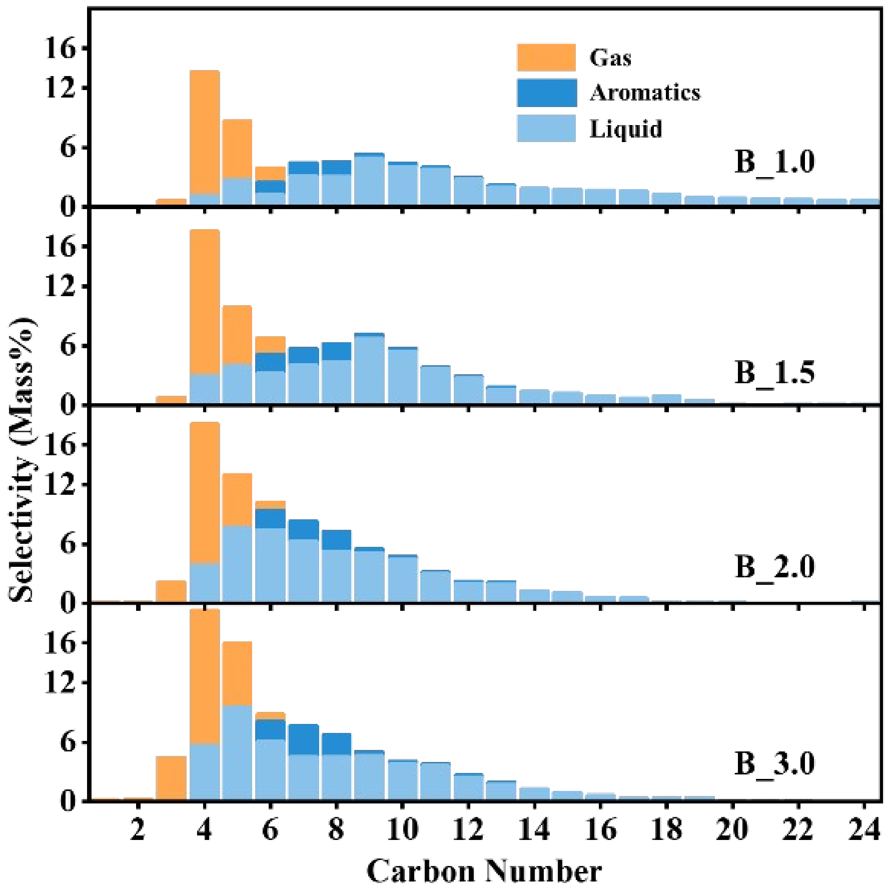

Fig. S7 Catalytic hydrocracking PP over catalyst with different Beta + Ru_1-ZrO_2 mass ratio. Product yield distribution by carbon number and aromatics yield. Catalysts are prepared 0.2-0.6 g Beta, 0.2 g Ru_1-ZrO_2, with Beta and Ru_1-ZrO_2 mass ratios of 1.0, 1.5, 2.0 and 3.0, hereafter denoted as B_1.0 (0.2 g Beta), B_1.5 (0.3 g Beta), B_2.0 (0.4 g Beta), and B_3.0 (0.6 g Beta). Reaction conditions: 4.0 g PP, 3 MPa H_2, 250°C, 600 rpm, and 4 h.

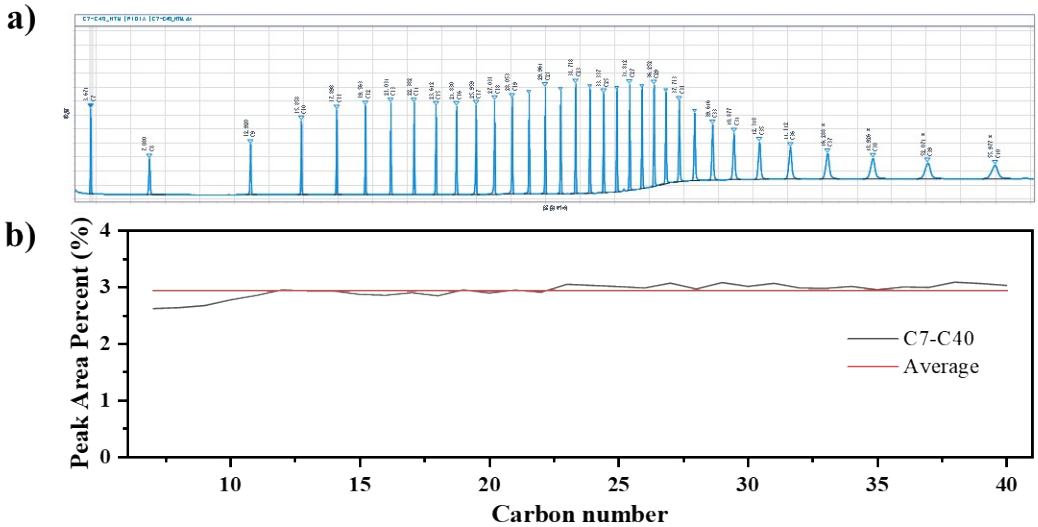

Fig. S8 GC signals and peak percentages of C7-C40 hydrocarbons obtained from Sigma-Aldrich.

Figure No.	Name	Zeolites in 0.2 g Ru_1-ZrO_2		
		Types	Mass (g)	Si/Al ratio
2	None	/	/	/
	CHA	CHA	0.2	/
	TS-1	TS-1	0.2	/
	Beta	Beta	0.2	/
	ZSM-5	ZSM-5	0.2	/
3	Z_0	/	/	/
	Z_0.5	ZSM-5	0.1	32
	Z_1.0	ZSM-5	0.2	32
	Z_1.5	ZSM-5	0.3	32
	Z_2.0	ZSM-5	0.4	32
4, 5	Ru_1-ZrO_2	/	/	/
	RZ-1000	ZSM-5	0.2	1000
	RZ-430	ZSM-5	0.2	430
	RZ-200	ZSM-5	0.2	200
	RZ-110	ZSM-5	0.2	110
	RZ-48	ZSM-5	0.2	48
	RZ-32	ZSM-5	0.2	32

Table S1 The name of different catalysts