Supporting Information

Study of the zeolite catalyzed isomerization of 1-methylnaphthalene

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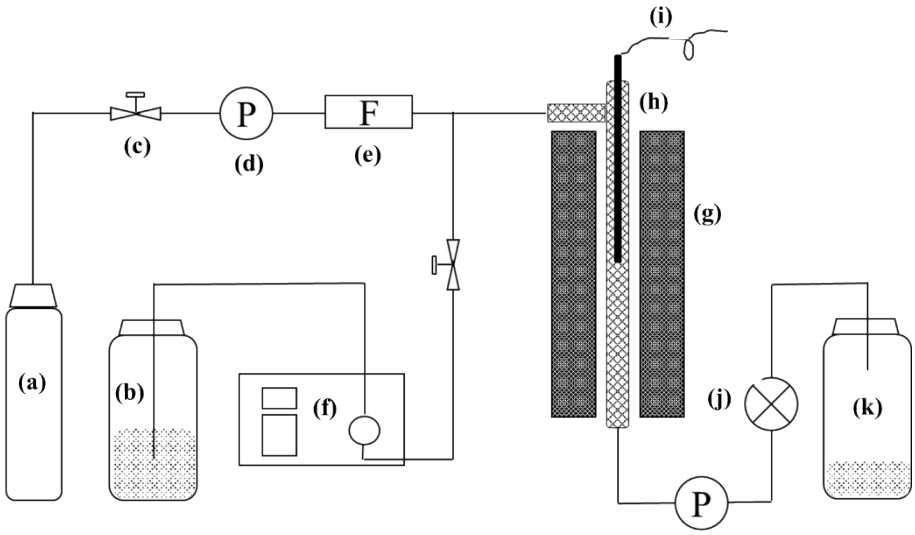

Fig. S1. The schematic flow diagram of the catalyst evaluation equipment. **(a)** N_2 cylinder, **(b)** feedstocks, **(c)** globe valve, **(d)** pressure gauge, **(e)** flowmeter, **(f)** pump, **(g)** furnace, **(h)** reactor, **(i)** thermocouple, **(j)** back pressure valve, **(k)** products.

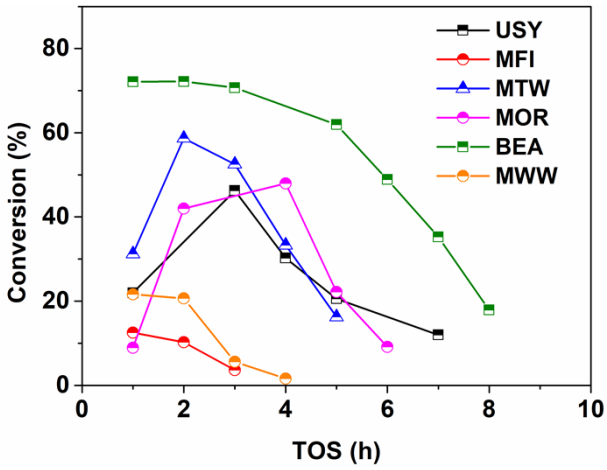

Fig. S2. Comparison of the catalytic performances of zeolites with different frameworks. Reaction conditions: vapor phase, 260 °C, 0.1 MPa, 13 wt% 1-MN/benzene, 5 h^{-1}, 20 ml/min N_2.

The isomerization of 1-MN was conducted over zeolites with different frameworks. As can be seen from Fig. S2, MFI and MWW exhibited poor activity, and the conversion of MWW decreased to 0 in only 4 h. MOR, USY and ZSM-12 exhibited similar performances, of which the

conversion all increased firstly, and then decreased gradually. Among all the tested zeolites, Beta exhibited the superior performance, therefore the discussion in the main text was mainly based on Beta.

S1. Preparation of feedstocks with different amount sulfide and nitride

The amount of sulfide and nitride within the raw feedstocks is shown in TableS1. Different amount of sulfide and nitride was prepared by the adsorption process. Specifically, 3.6 g HY or clay was mixed with 60 ml 1-MN, and then the mixture was stirred at 25 ℃ for 24 h. After that, the mixture was filtered to obtain the purified feedstocks. As can be seen from Table S1, HY exhibits better performance than clay.

Table S1 Feedstocks with different amount of sulfide and nitride.

	Sulfide (ppm)	Nitride (ppm)
Initial state	4744.19	1188.28
Adsorption by HY	4767.96	824.57
Adsorption by clay	4768.68	1103.02