Supporting information

For

Small pore SAPO-14-based zeolites with improved propylene selectivity in methanol to olefins

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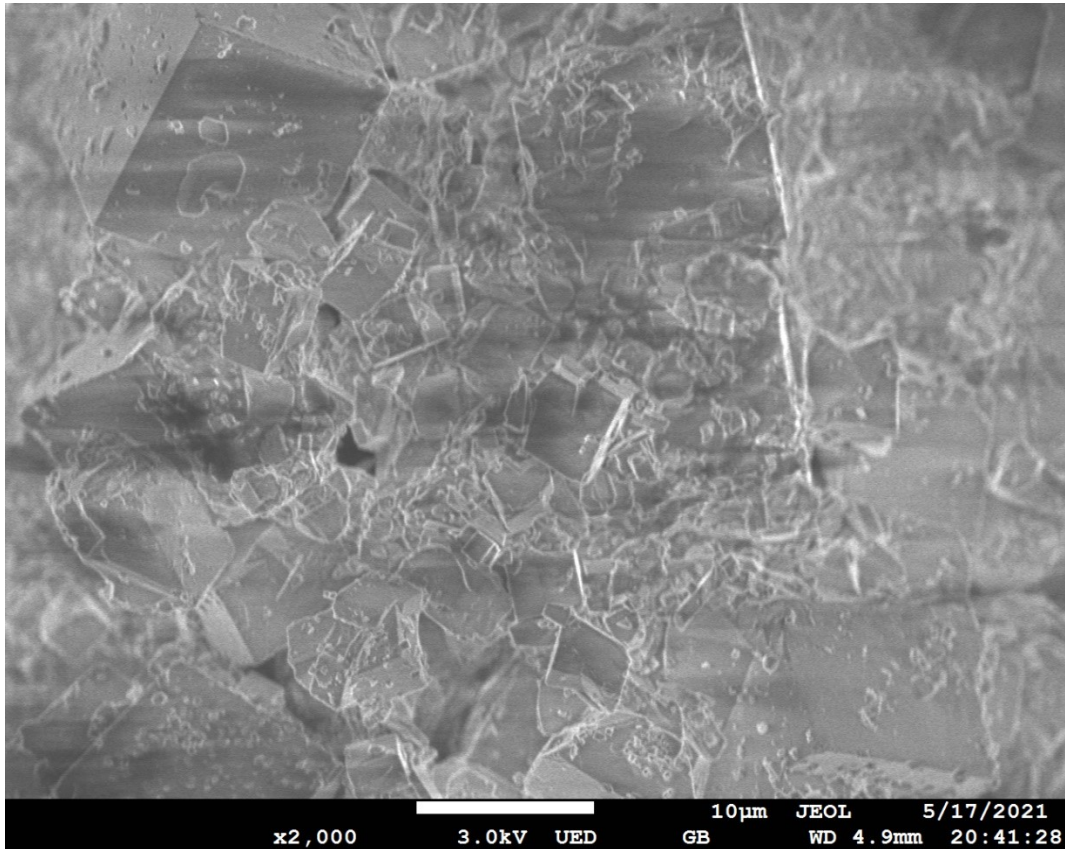
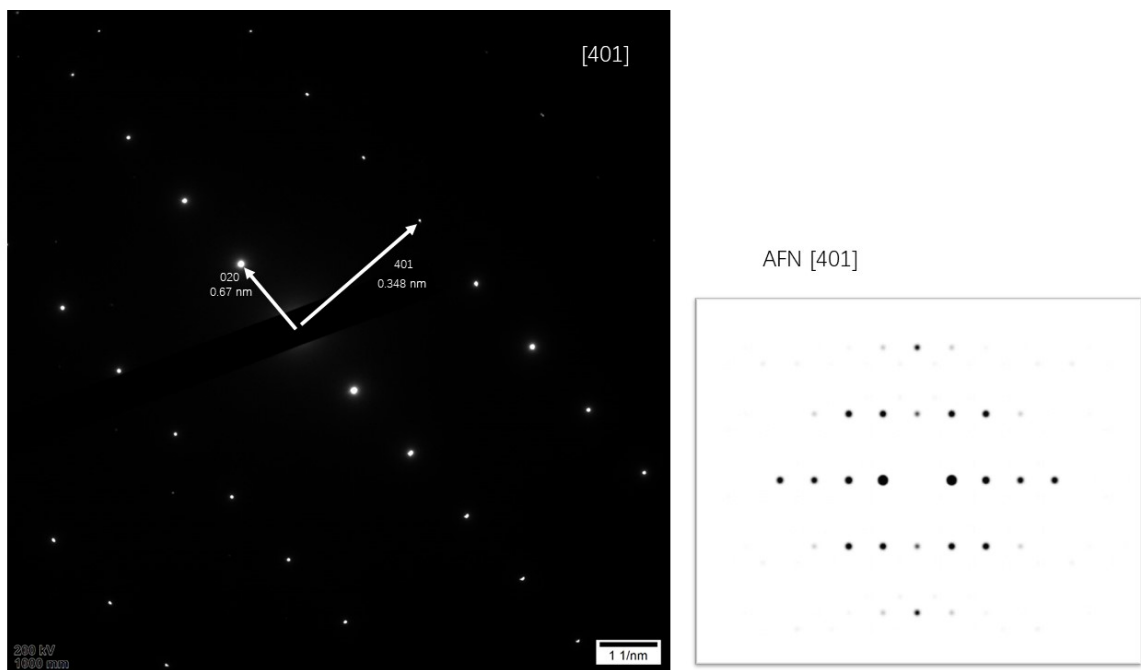Fig. S1 SEM image of S-M sample (the mixture of S-14 and S-34)

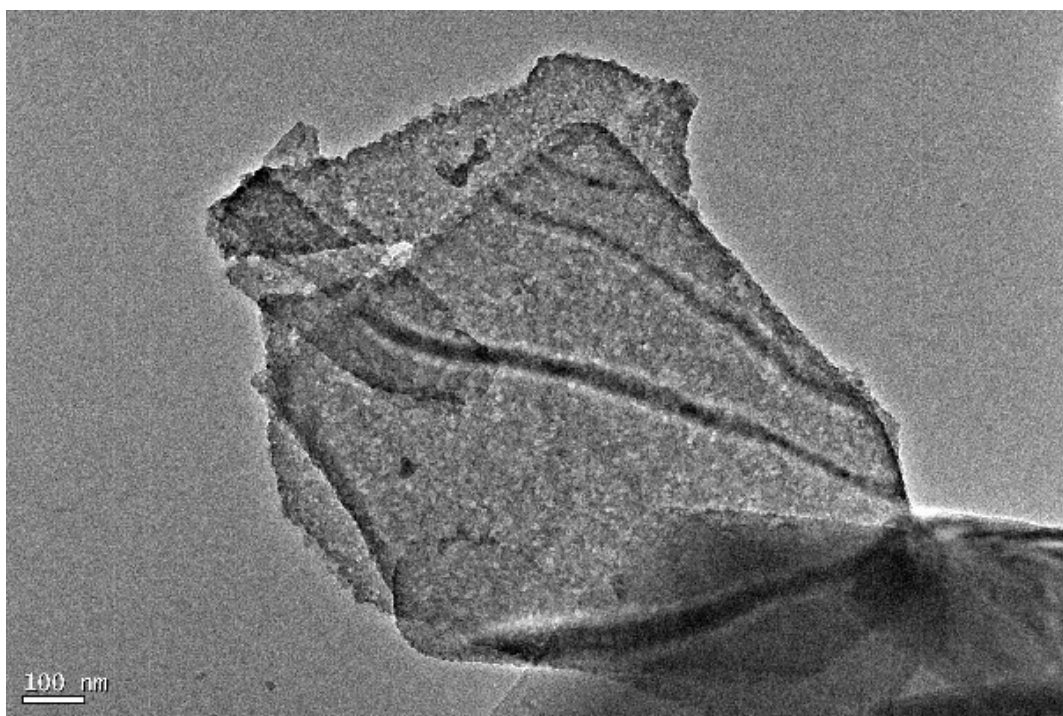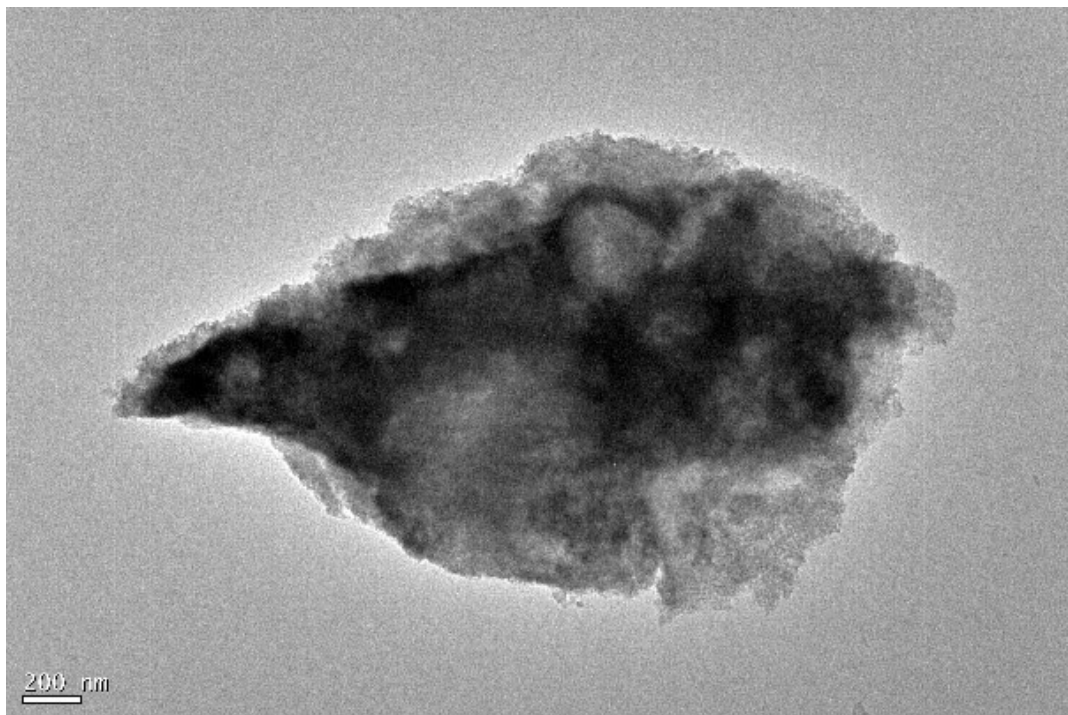Fig. S2 The electron diffraction of S-14

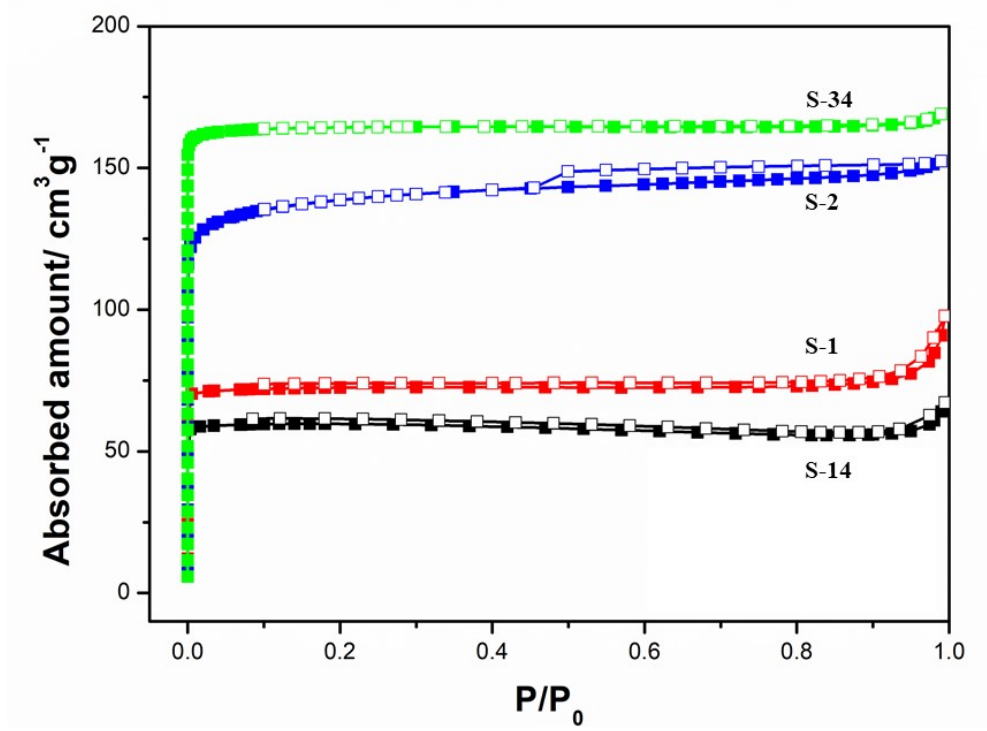Fig. S3 Hierarchical porous structure observed in TEM images of SAPO-34/SAPO-14 particles in S-2 sample

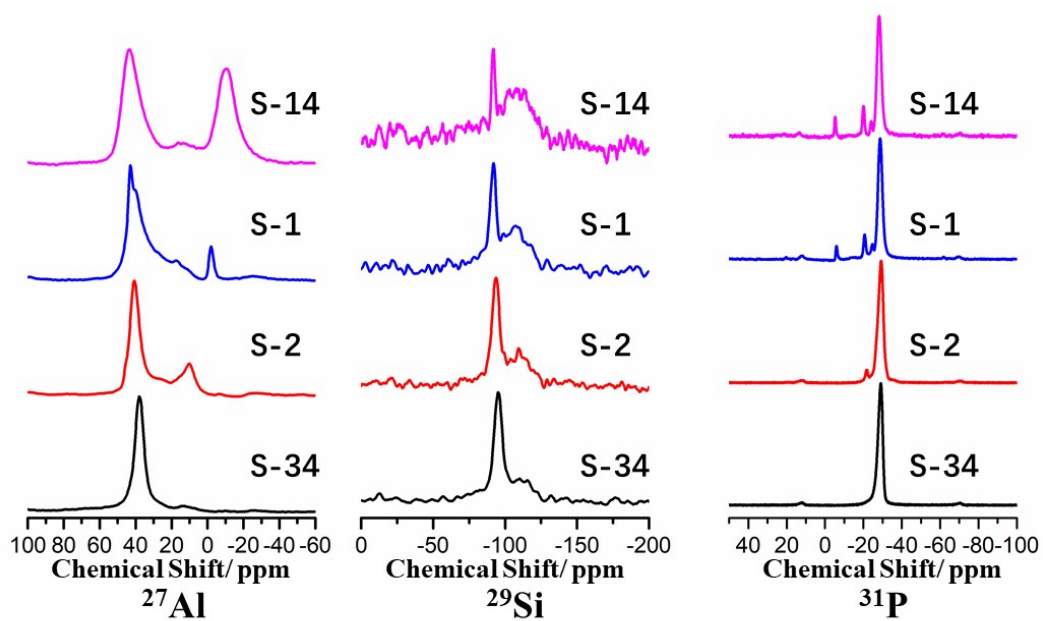Fig. S4 N_2 adsorption-desorption curves of S-34, S-14, S-1 and S-2 samples.

Fig. S5 ^{27}Al, ^{29}Si and ^{31}P solid state MAS NMR of S-34, S-14, S-1 and S-2 samples.
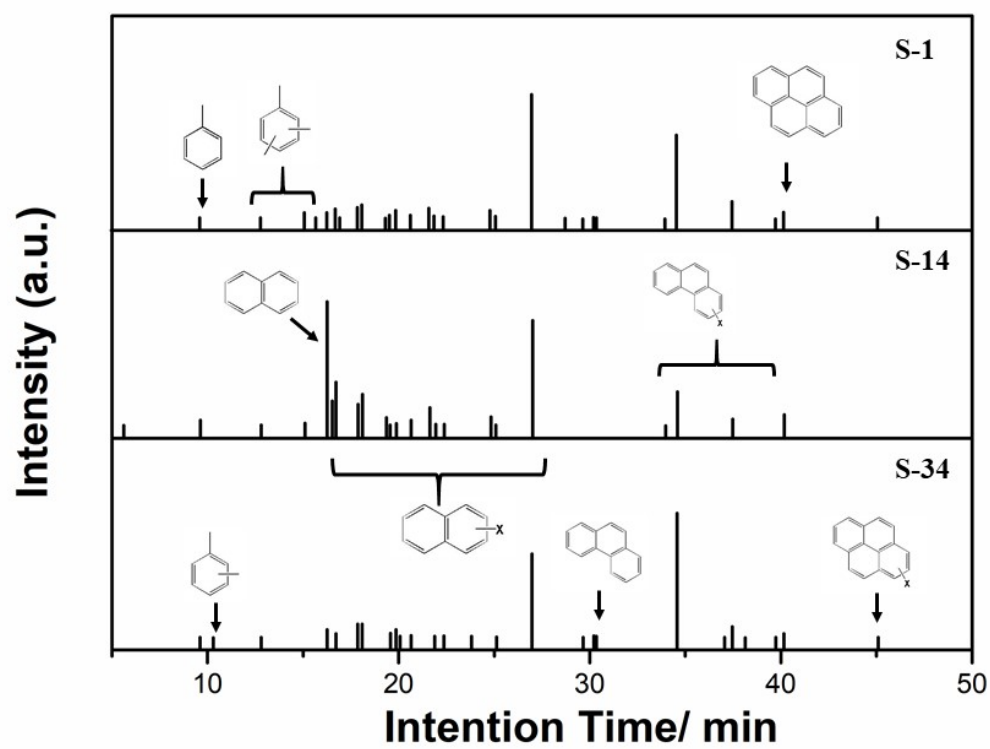
Fig. S6 Coke analyst by GC-MS of S-34, S-14 and S-1 samples.

Table S1 SAPO-14 zeolites with different Si/Al ratios obtained from the gel consists of 1.0 Al_2O_3:1.0 P_2O_5: x SiO_2: 3.0 i-PA: 50.0 H_2O

Sample name	X	Si/Al ratio[a]	Topological
1	0	0	AFN
2	0.1	0.054	AFN
3	0.2	0.101	AFN
4	0.3	0.148	AFN
5	0.4	0.228	AFN
6	0.5	0.241	AFN (slight impurity)
7	0.6	0.243	AFN-CHA
8	0.7	0.292	AFN-CHA-AFI

[a] calculated from ICP.

Table S2 Textural properties of as-synthesized samples.

Sample names	$S_{BET}(m^2/g)^a$	$S_{micro}(m^2/g)^b$	$S_{ext}(m^2/g)^b$	$V_{micro}(cm^3/g)^b$
S-34	694.1	682.5	11.55	0.26
S-14	195.0	194.9	0.1	0.09
S-1	242.1	233.1	8.9	0.11
S-2	408.7	336.2	72.5	0.18

a. S_{BET} (total surface area) is calculated by BET formula, the data from 0.05<P/Po<0.30. b. S_{micro} (micropore surface area), S_{ext} (external surface area) and V_{micro} (micropore volume) are calculated by t-plot method.

Table S3 The selectivity of sample S-1.

Sample names	TOS (min)	Selectivity(%)						
		CH_4	C_2H_4	C_2H_6	C_3H_6	C_3H_8	C_4H_8	C_4H_{10}
S-1	126	3.6	18.2	0.87	48.4	3.8	14.7	5.0