Electronic Supplementary Material (ESI) for RSC Advances.

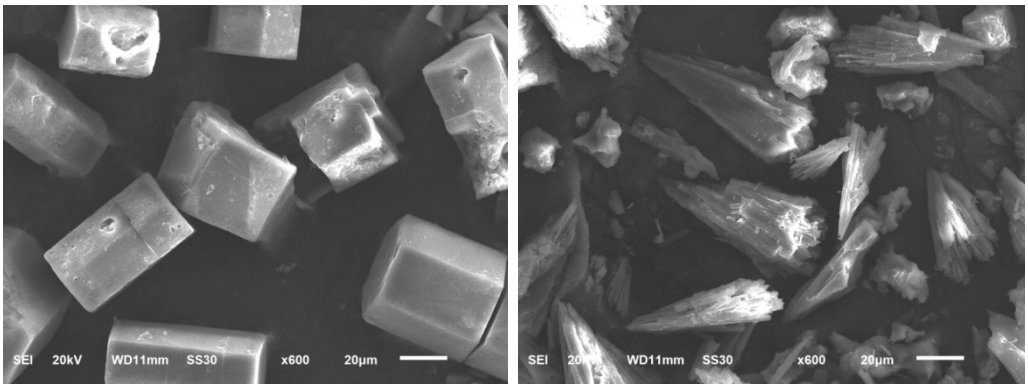
The temperature-dependence of the structure-directing effect of 2-methylpiperazine in the synthesis of open-framework aluminophosphates

Pai Huang[a‡], *Jun Xu*[b‡], *Chao Wang*[b], *Feng Deng*[b], *Wenfu Yan*[a]*

[a] State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, College of Chemistry, Jilin University, 2699 Qianjin Street, Changchun 130012, PR China
[b] Wuhan Center for Magnetic Resonance, State Key Laboratory of Magnetic Resonance and Atomic and Molecular Physics, Wuhan Institute of Physics and Mathematics, The Chinese Academy of Sciences, Wuhan 430071, PR China

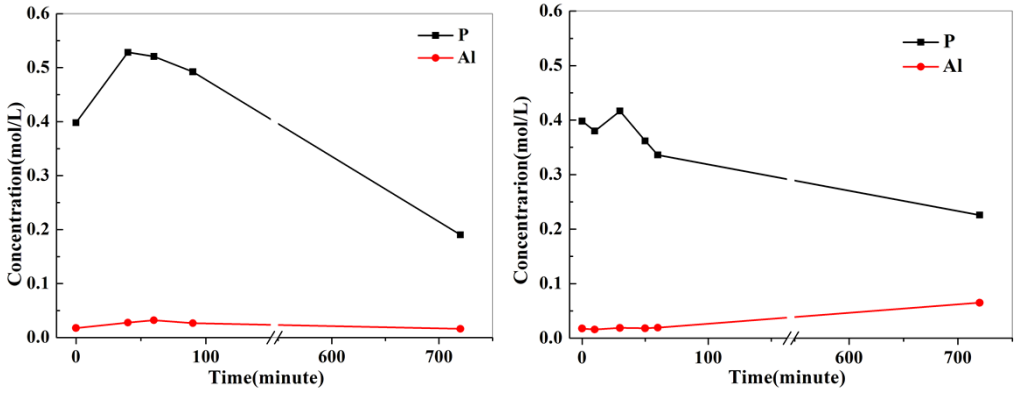
*Corresponding authors: yanw@jlu.edu.cn;

‡ These authors contributed equally to this work.



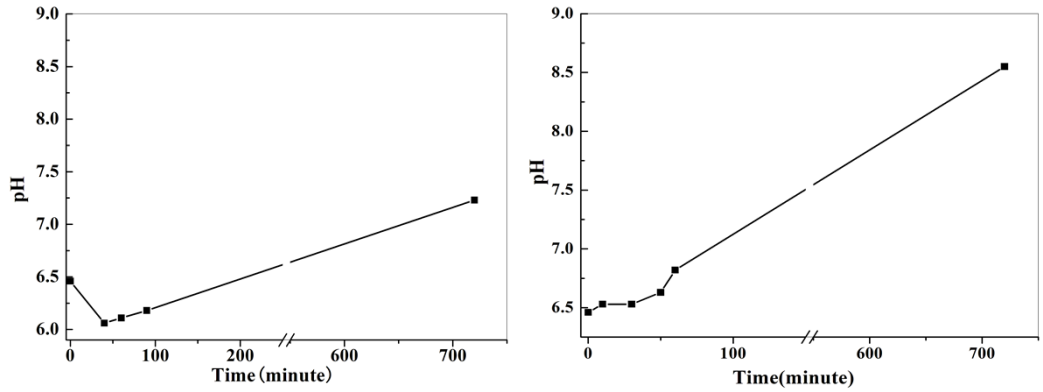
(a) (b)

Fig. S1. The SEM images of the as-synthesized APMeP150 (a) and APMeP200 (b).



(a) (b)

Fig. S2. The concentrations of the Al and P in the liquid phase of the samples that were isolated throughout the hydrothermal treatment period in the APMeP150 (a) and APMeP200 (b) crystallization.



(a) (b)

Fig. S3. The pH values of the liquid phase of the samples that were isolated throughout the hydrothermal treatment period in the APMeP150 (a) and APMeP200 (b) crystallization.

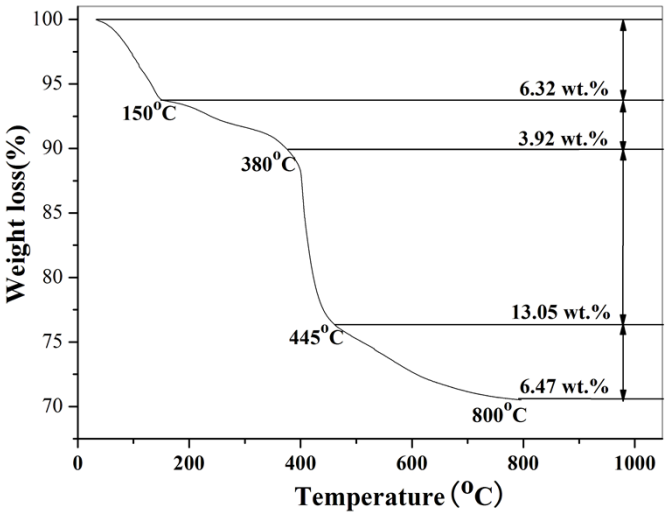


Fig. S4 TG curve of APMeP150

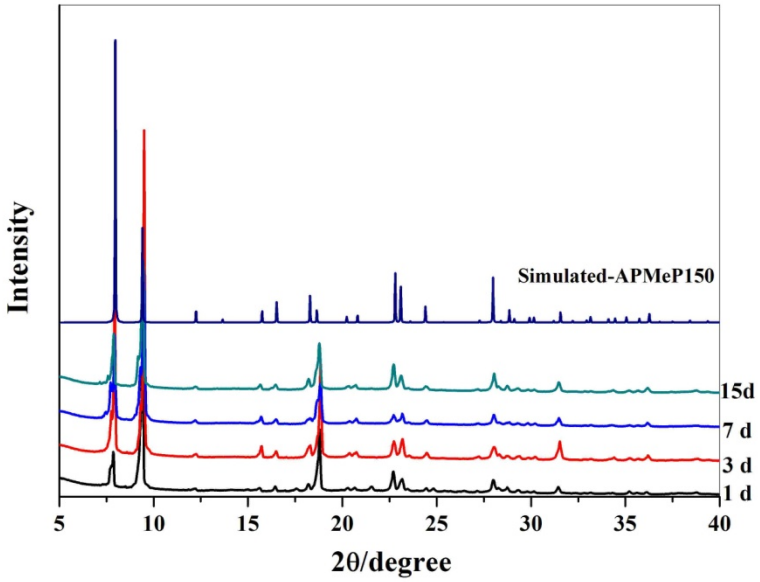


Fig. S5 The simulated XRD patterns of APMeP150 and the experimental patterns of the as-synthesized samples at 150ºC for 1, 3, 7, and 15 days.

Table S1 The concentration of Al and P in the liquid phase of the samples isolated throughout the hydrothermal treatment period in the APMeP150 crystallization.

Time(minute)	0	40	60	90	720
Al(mol/L)	0.0177	0.0277	0.0320	0.0266	0.0061
P (mol/L)	0.3980	0.5283	0.5206	0.4922	0.1903

Table S2 The pH values of the liquid phase of the samples isolated throughout the hydrothermal treatment period in the APMeP150 crystallization.

Time(minute)	0	40	60	90	720

pH	6.46	6.06	6.11	6.18	7.23

Table S3 The concentration of Al and P in the liquid phase of the samples isolated throughout the hydrothermal treatment period in the APMeP200 crystallization.

Time(minute)	0	10	30	50	60	720
Al(mol/L)	0.0177	0.0158	0.0187	0.0181	0.0191	0.0650
P (mol/L)	0.3980	0.3800	0.4167	0.3619	0.3361	0.2258

Table S4 The pH values of the liquid phase of the samples isolated throughout the hydrothermal treatment period in the APMeP200 crystallization.

Time(minute)	0	10	30	50	60	720
pH	6.46	6.53	6.53	6.63	6.82	8.55

Table S5 The bond lengths of the C-C and C-N bonds in the unique MeP molecules in APMeP150 and APMeP200.

Structure	Unique MeP	Bond length (Å)						
		N-C	N-C	N-C	N-C	C-C	C-C	C-C_{methyl}
APMeP150	1	1.419	1.505	1.512	1.430	1.539	1.479	1.514
APMeP200	1	1.467	1.478	1.470	1.460	1.534	1.480	1.405
	2	1.505	1.488	1.502	1.452	1.521	1.486	1.576
	3	1.443	1.451	1.474	1.425	1.501	1.528	1.325
	4	1.491	1.439	1.456	1.494	1.532	1.541	1.448
	5	1.463	1.474	1.463	1.474	1.512	1.512	1.127×2