SUPPORTING INFORMATION

Controllable Hydrothermal Synthesis of 2D and 3D Dendritic Aluminum Phosphate Crystals

Qing Yang, [a] Ruwei Shen, [a] Changfeng Zeng,[b] Lixiong Zhang [a*]

[a] *State Key Laboratory of Materials-oriented Chemical Engineering, College of Chemistry and Chemical Engineering, Nanjing University of Technology*
[b] *College of Mechanic and Power Engineering, Nanjing University of Technology*

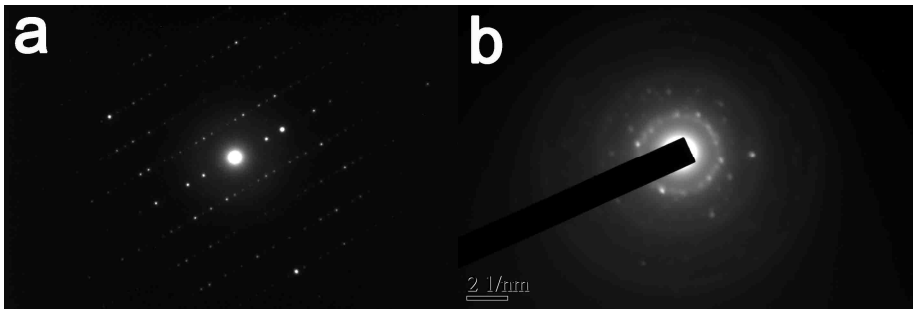

Fig. S1 ED patterns of the dendritic aluminum phosphates prepared at 180 °C for 6 h with molar compositions of (A) $1Al_2O_3$: $1.3P_2O_5$: 1.6TEA: $1.3HNO_3$: $425H_2O$ and (B) $1Al_2O_3$: $1.3P_2O_5$: 1.6TEA: $1.3HNO_3$: 0.05CTAB: $425H_2O$.

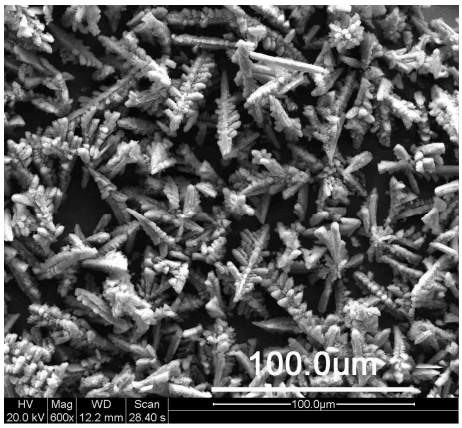

Fig. S2 A low magnification SEM image of dendritic aluminum phosphates prepared at 180 °C for 6 h with molar compositions of $1Al_2O_3$: $1.3P_2O_5$: 1.6TEA: $1.3HNO_3$: $425H_2O$.

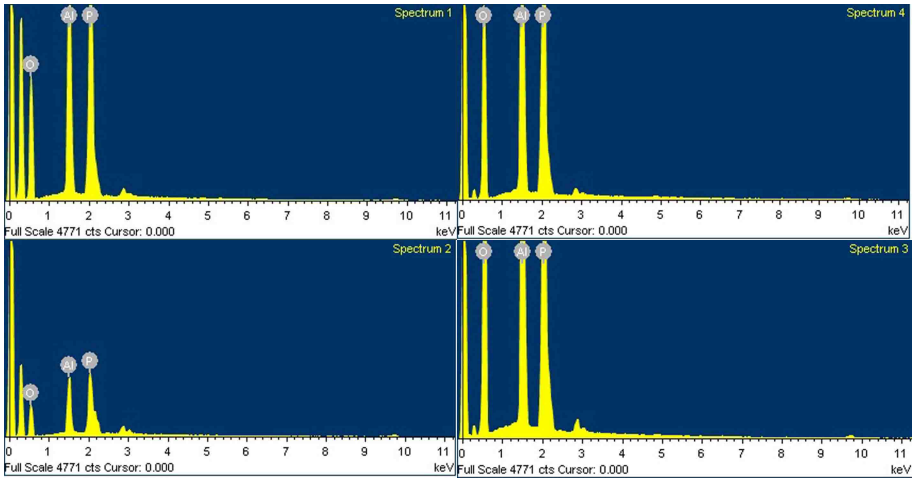

Fig. S3 EDX spectra of the 2D dendritic structure in trunk (Spectrum1), branch (Spectrum2) and 3D dendritic structure in trunk (Spectrum3), branch (Spectrum4).

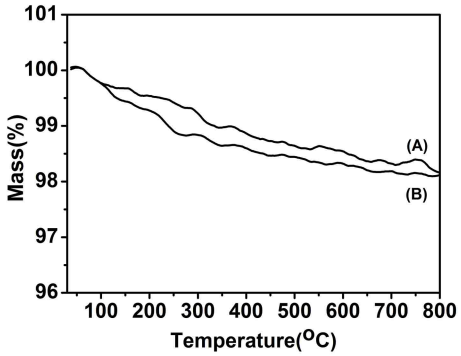

Fig. S4 TG profiles of the samples prepared at 180 °C for 6 h with molar compositions of (A) $1Al_2O_3$: $1.3P_2O_5$: 1.6TEA: $1.3HNO_3$: $425H_2O$ and (B) $1Al_2O_3$: $1.3P_2O_5$: 1.6TEA: $1.3HNO_3$: 0.05CTAB: $425H_2O$.

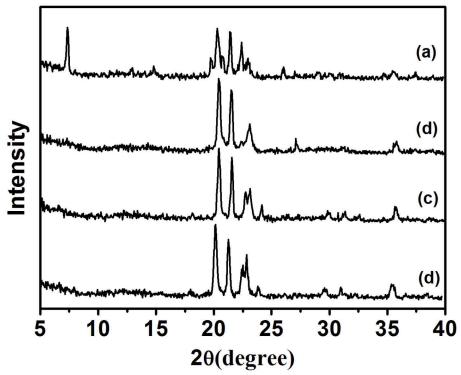

Fig. S5 XRD patterns of the samples prepared at 180 °C for 6 h with HNO_3/Al_2O_3 molar ratios of: (a) 0.8, (b) 1.0, (c) 1.6 and (d) 2.0.

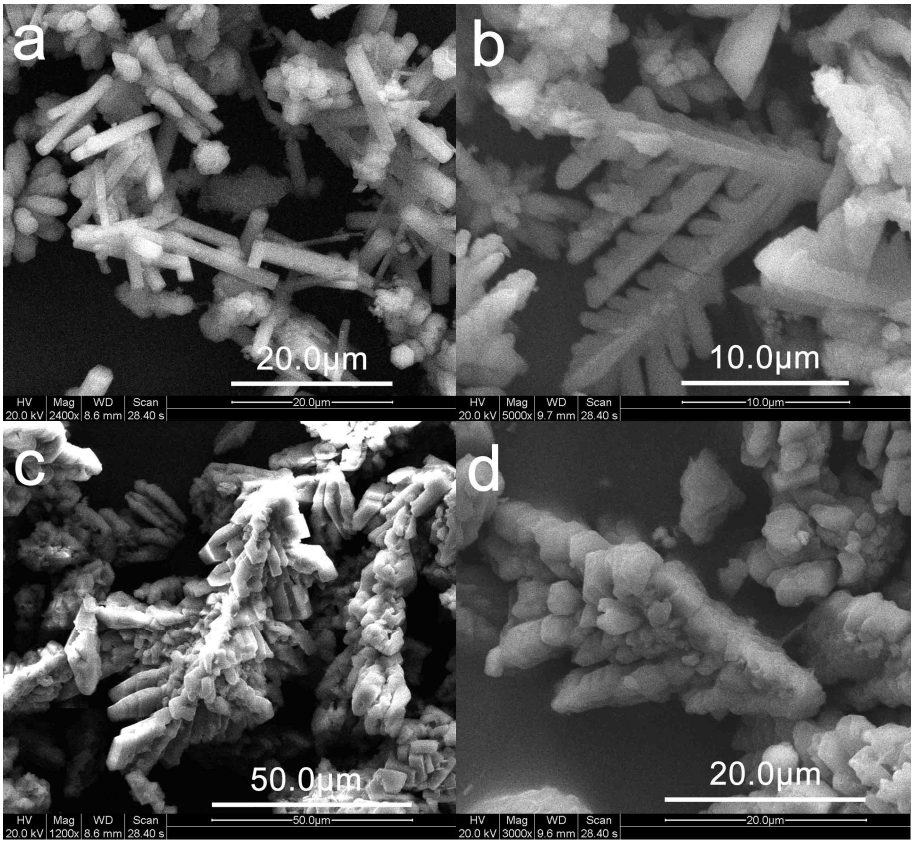

Fig. S6 SEM images of the samples prepared at 180 °C for 6 h with HNO_3/Al_2O_3 molar ratios of (a) 0.8, (b) 1.0, (c) 1.6 and (d) 2.0

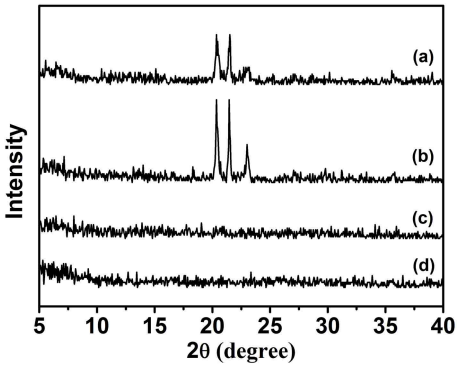

Fig. S7 XRD patterns of the samples prepared at 180 °C for 6 h using (a) HAc, (b) HCl instead of HNO_3 and (c) ammonia, (d) NaOH instead of TEA at the PH value of 3.8, respectively.

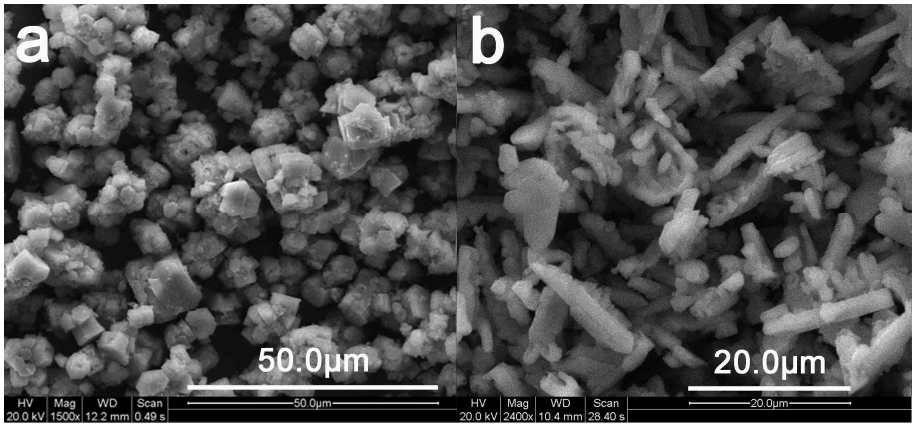

Fig. S8 SEM images of the samples prepared at 180 °C for 6 h using (a) HAc, (b) HCl instead of HNO_3 at the pH value of 3.8, respectively.

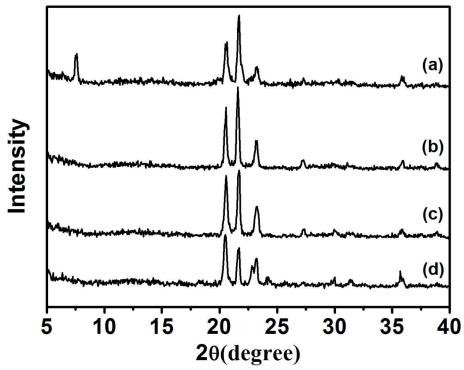

Fig. S9 XRD patterns of the samples prepared at 180 °C for 6 h with P_2O_5/Al_2O_3 molar ratios of: (a) 1.0, (b) 1.1, (c) 1.2 and (d) 1.4.

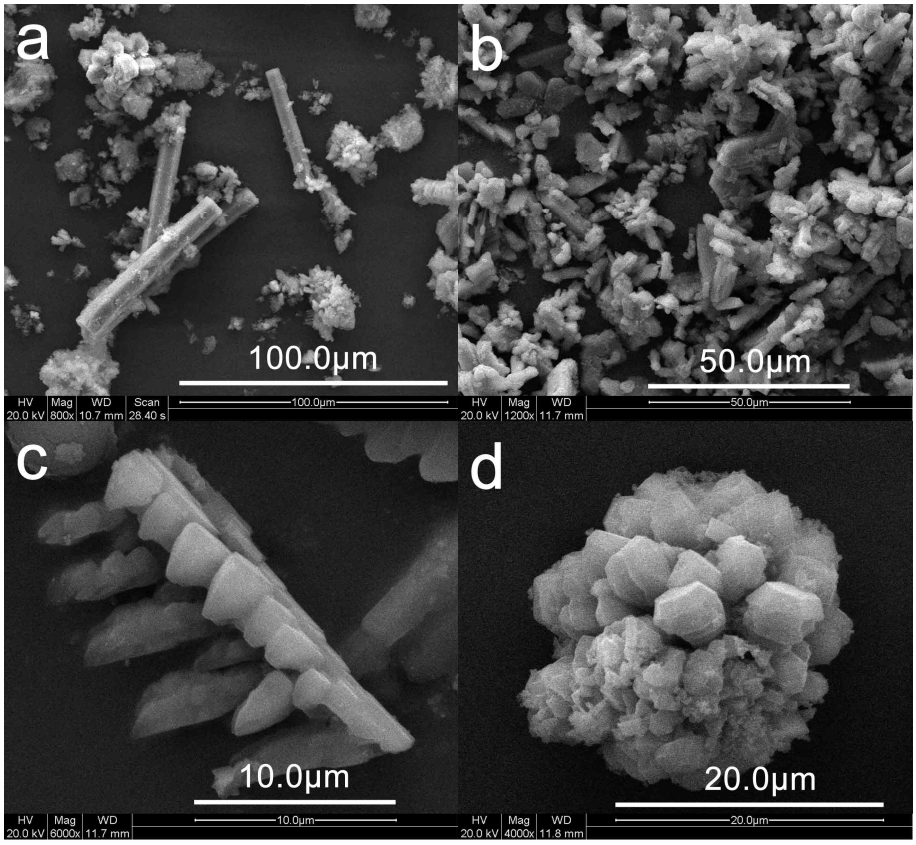

Fig. S10 SEM images of the samples prepared at 180 °C for 6 h with P_2O_5/Al_2O_3 molar ratios of (a) 1.0, (b) 1.1, (c) 1.2 and (d) 1.4.

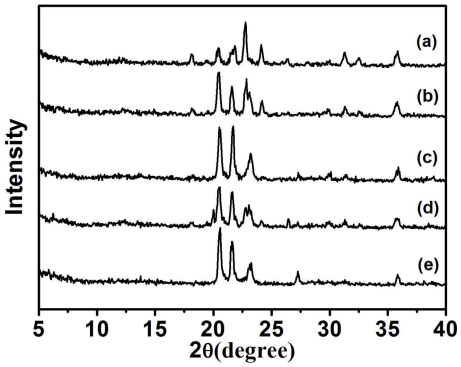

Fig. S11 XRD patterns of the samples prepared at 180 °C for 6 h with TEA/Al_2O_3 molar ratios of: (a) 0, (b) 0.4, (c) 0.8, (d) 1.2, (e) 2.0 and (f) 2.5.

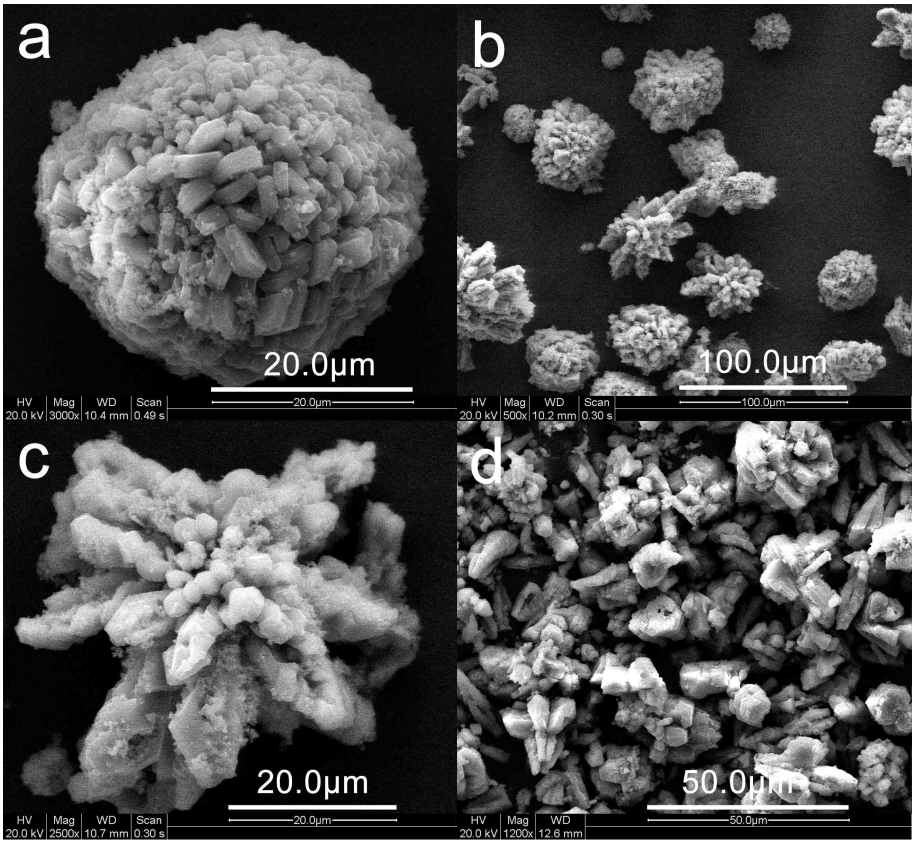

Fig. S12 SEM images of the samples prepared at 180 °C for 6 h with TEA/Al_2O_3 molar ratios of (a) 0.4, (b) 0.8, (c) 1.2 and (d) 2.0.

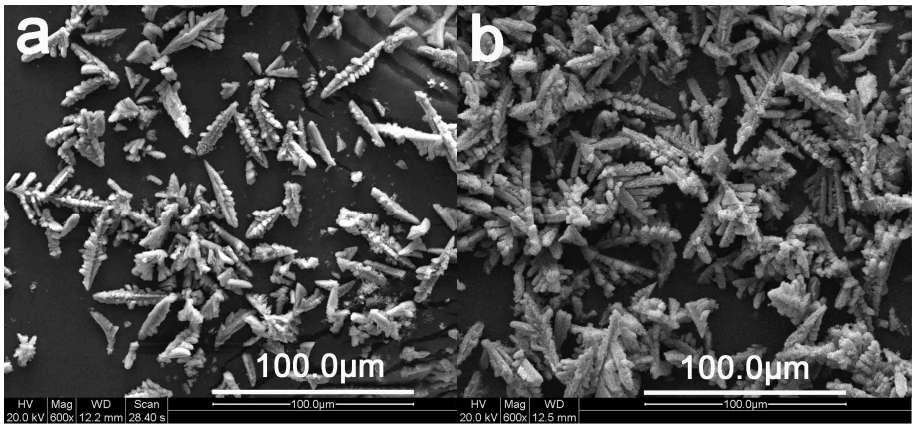

Fig. S13 SEM images of the samples prepared at 180 °C for 6 h with H_2O/Al_2O_3 molar ratios of (a) 500, (b) 350.

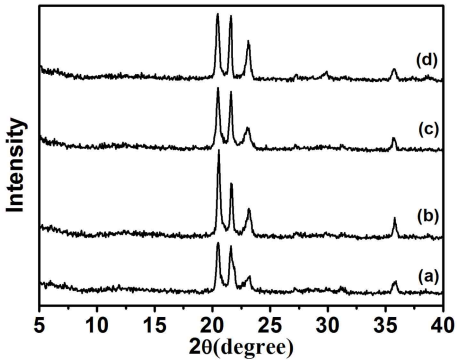

Fig. S14 XRD patterns of the samples prepared at 180 °C for 6 h with CTAB/Al_2O_3 molar ratios of: (a) 0.10, (b) 0.15, (c) 0.20 and (d) 0.25.

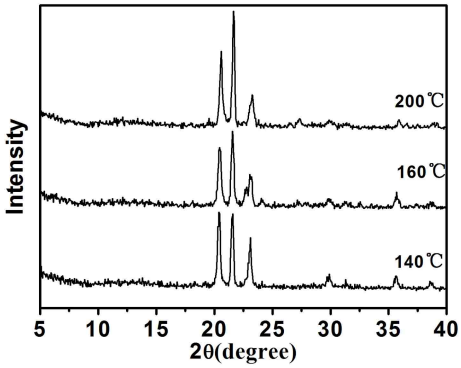

Fig. S15. XRD patterns of the samples synthesized for 6 h at different crystallization temperatures.

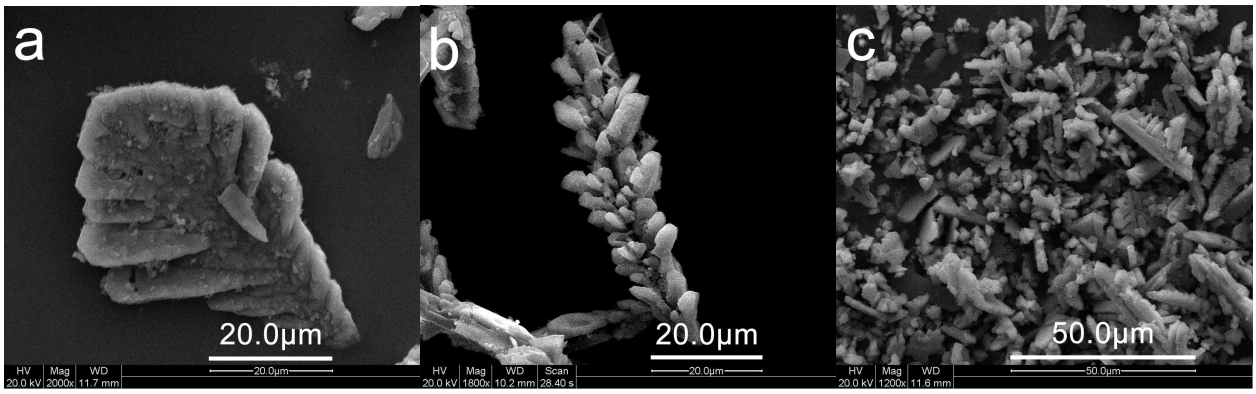

Fig. S16 SEM images of the samples prepared from hydrogels with molar compositions of 1Al_2O_3: 1.3P_2O_5: 1.6TEA: 1.3HNO_3: 425H_2O at crystallization temperatures of (a) 140 °C, (b) 160 °C and (c) 200 °C for 6 h.