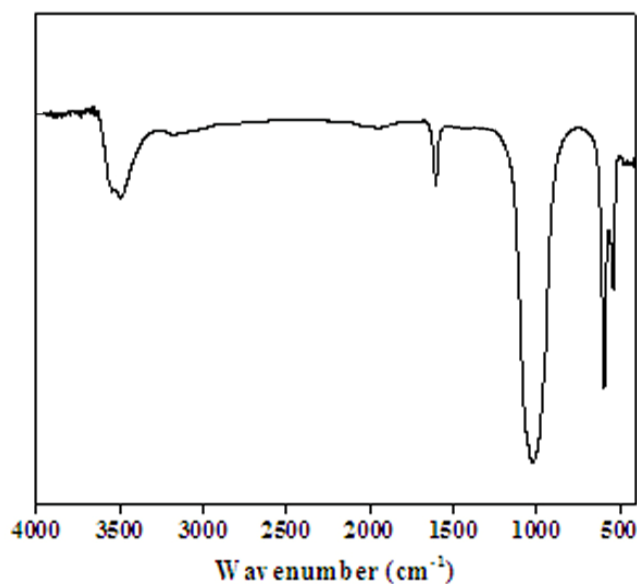
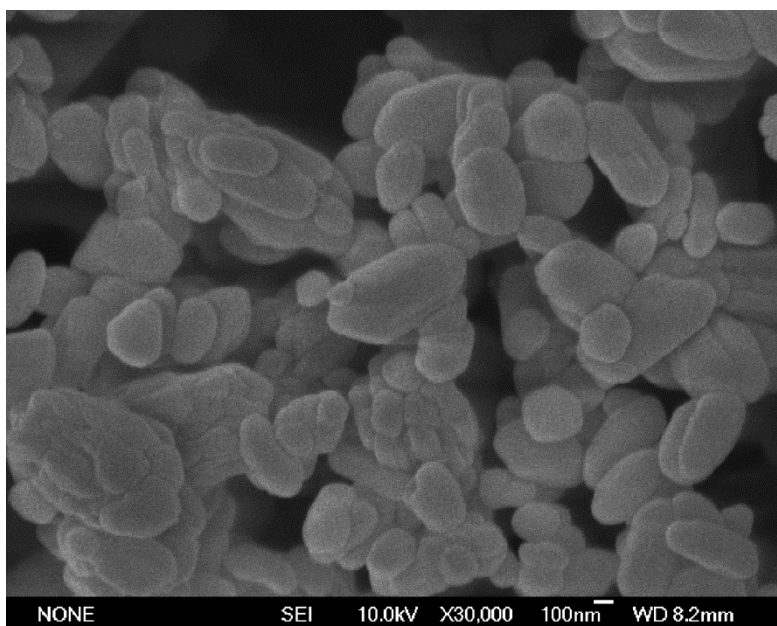


### Supporting information

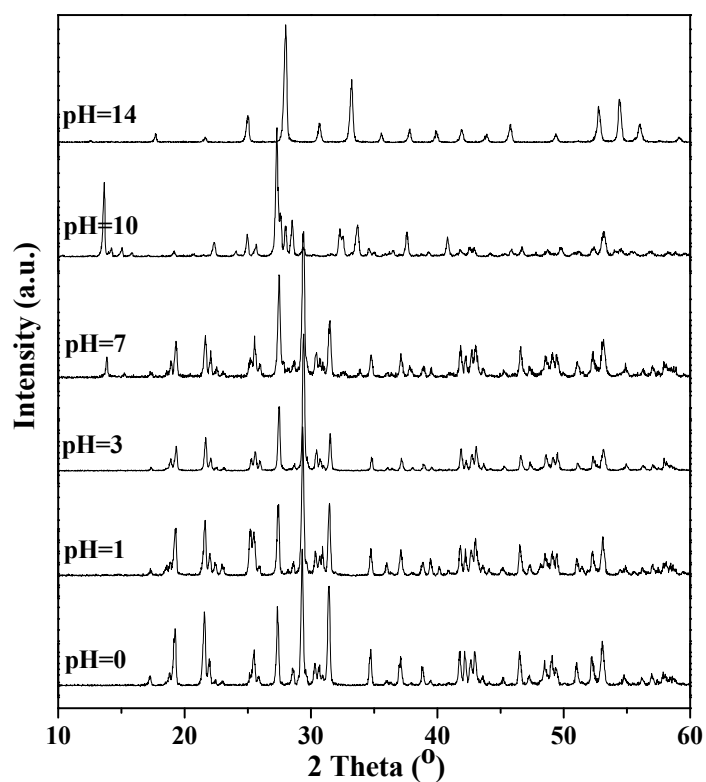


**Figure S1.** FT-IR spectrum of the HP precursor prepared via a coprecipitation method at room temperature.

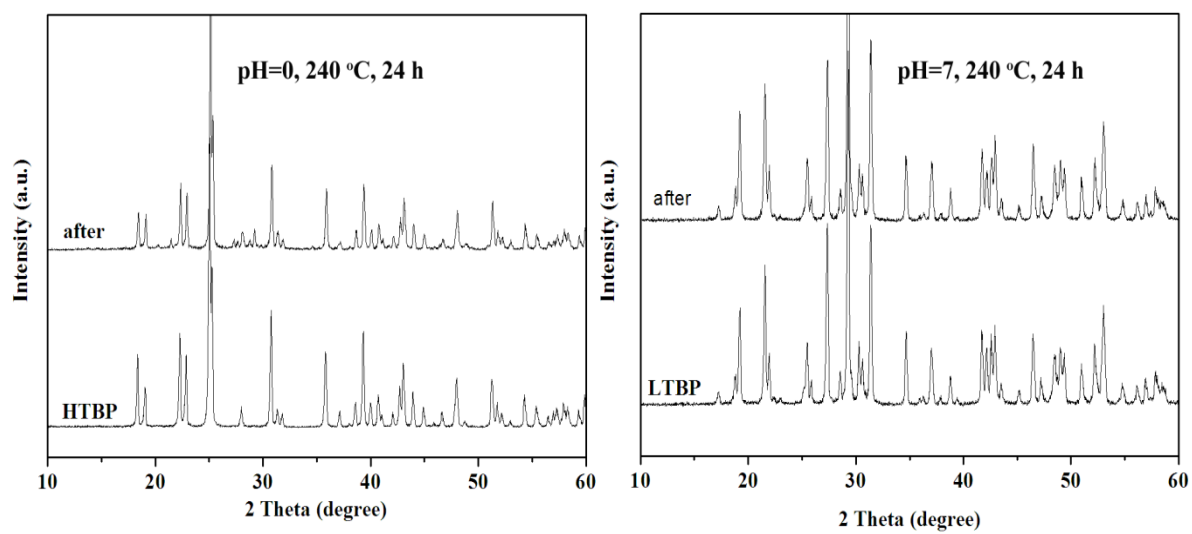
Infrared spectrum of the HP precursor was measured on a Perkin-Elmer IR spectrophotometer at a resolution of 4 cm<sup>-1</sup> by KBr pellet technique. The band observed at 3488 cm<sup>-1</sup> is attributed to the vibrations of O–H bonds for the water absorbed on sample surfaces and the band centered at 1607 cm<sup>-1</sup> is associated with the deformation vibration for H–O–H bonds of the physisorption water. The bands appeared at 1023, 591, 538 cm<sup>-1</sup> are the characteristic of the intrinsic vibrations of PO<sub>4</sub> for HP.



**Figure S2.** SEM image of the HP precursor prepared via a coprecipitation method at room temperature.



**Figure. S3** XRD patterns of the samples prepared by one-step hydrothermal method at 240 oC for 24 h in given solutions.



**Figure S4.** XRD patterns of the samples under hydrothermal treatment.