Supporting Information

The wide angle XRD patterns of MNT-1/5 and MNT-1/5 after phosphate adsorption were showed in fig. S1. The well defined crystal structure of magnetite was evidenced by the diffraction peaks. In the XRD patterns of MNT-1/5, peaks for 44.85°(110), 38.06°(10-2) and 50.01°(10-3) appeared, which are the typical XRD pattern of La₂O₃ (JCPDS 40-1279). The Fe₃O₄ nanoparticles exhibited well-resolved peaks at 35.4°, 57.0°, and 62.7°, which are attributed to (311), (422) and (440) reflections of Fe₃O₄, respectively. After phosphate adsorption, the major peaks represent for crystalline LaPO₄ occur at 2θ values of (in decreasing order of intensity) 29.36°, 41.58° and 14.56°. And peaks for 26.267°(100) and 9.89°(64) appeared, which are the XRD pattern of Fe(H₂PO₄)₃ (JCPDS 43-0106).

![Fig.S1. The wide angle XRD patterns of MNT-1/5 (a) and MNT-1/5 after phosphate adsorption (b).](image)

The MNT’s dosage added into the adsorption isothermal experiment was 2 g L⁻¹. Then the centrifuge tubes were placed in a thermostatic shaker bath at 25 °C for certain time. Then the solution was filtrated by using 0.45 μm membrane syringe filter, and the filtrate was detected by ICP-OES. While the data showed the MNT basically have no adsorptive action for phosphate, showed in following fig. S2.
Fig. S2. The adsorb capacity of the blank MNT