Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Electronic Supporting Information (ESI)

Ethanol-water ambient precipitation of {111} facets exposed Ag_3PO_4 tetrahedra and the hybrid with graphene oxide for outstanding photoactivity and stability

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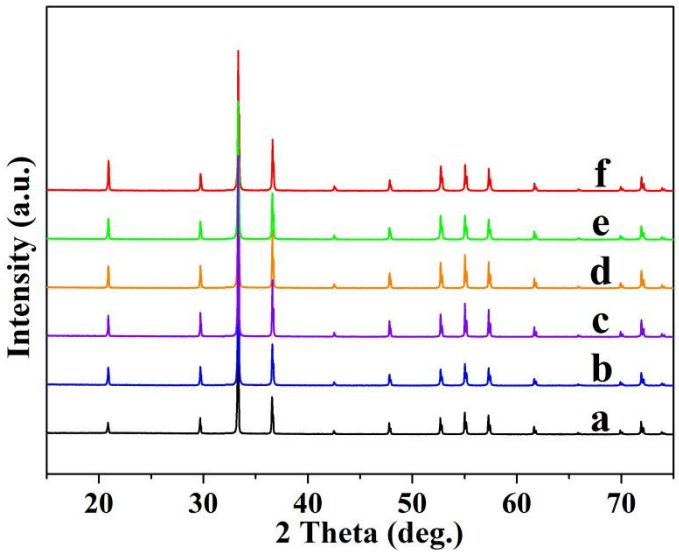

Fig. S1 XRD patterns of series Ag_3PO_4 products obtained with ethanol volume of (a) 0 mL, (b) 3.0 mL, (c) 6.0 mL, (d) 9.0 mL, (e) 12.0 mL and (f) 17.0 mL.

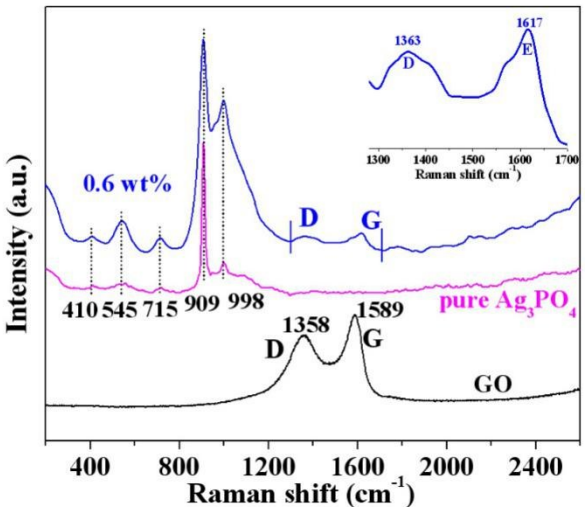

Fig S2. Raman spectra of GO sheets, pristine Ag_3PO_4 and GO/Ag_3PO_4-0.6wt% hybrid with magnified D and G bands in inset.

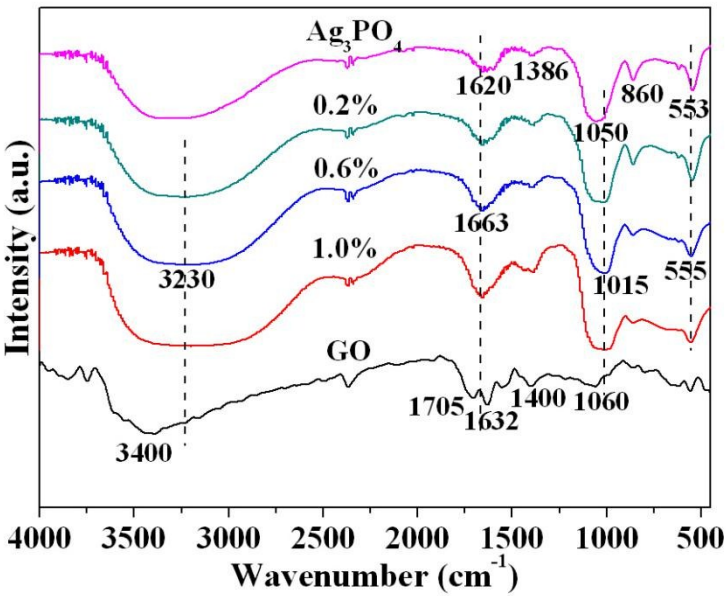

Fig. S3 FTIR spectra of GO, Ag_3PO_4 and series GO/Ag_3PO_4 hybrids.

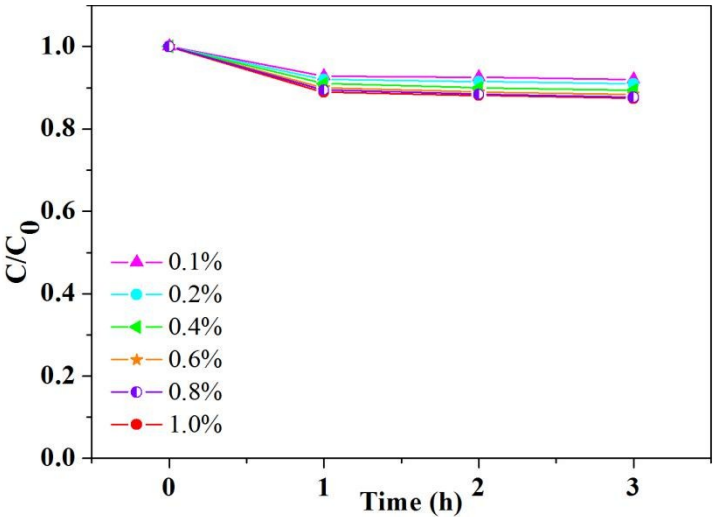

Fig. S4 Adsorption-desorption experiments of GO/Ag_3PO_4 hybrids.

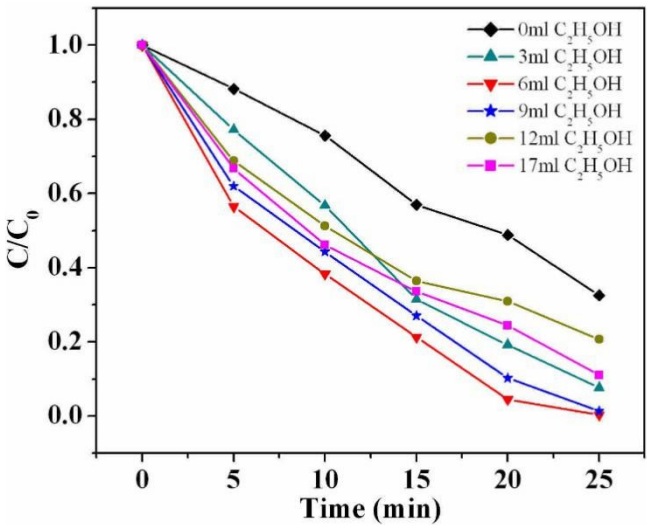

Fig. S5 Photocatalytic degradation of RhB in 25 min irradiation over series Ag_3PO_4 samples prepared in ethanol-water solvent with different ethanol volume.

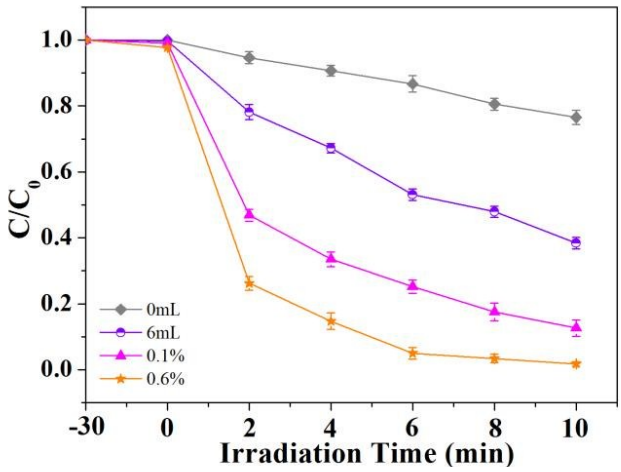

Fig. S6 Reproducibility of bare Ag_3PO_4 bulks and tetrahedra obtained without and with 6.0 mL ethanol as well as GO hybridized Ag_3PO_4 tetrahedra with different GO amount.

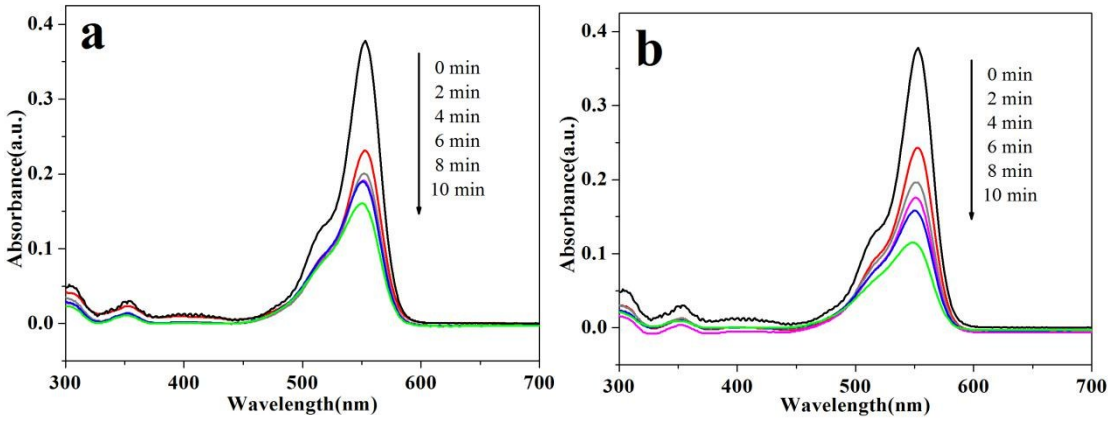

Fig. S7 Temporal evolution of RhB absorption over GO hybridized Ag_3PO_4 nanoparticles in Refs [23] (a) and [25] (b), respectively.

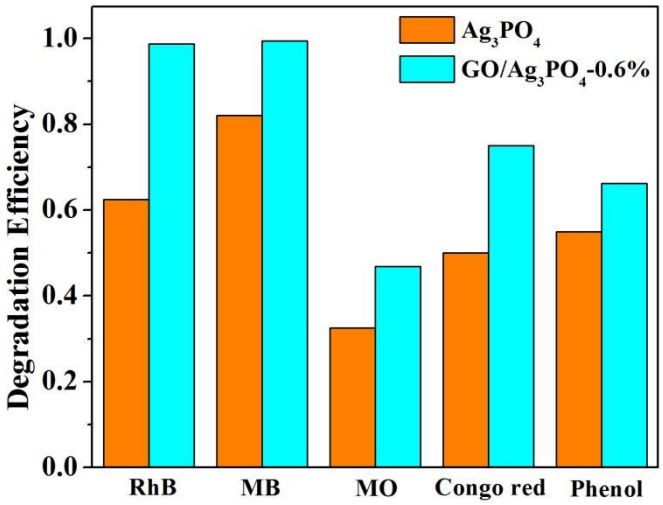

Fig. S8 Comparison of photocatalytic activity to different dyes in 10 min and to colorless phenol in 30 min over the Ag_3PO_4 tetrahedra and GO/Ag_3PO_4-0.6wt% hybrid.

Table S1 Band potential levels of Ag_3PO_4 tetrahedra calculated from absolute electronegativity of the semiconductor.

Semiconductor	Absolute electronegativity(X)	Estimated band-gap E_g(eV)	Calculated CB edge (V)	Calculated VB edge (V)
Ag_3PO_4	5.96	2.08	0.42	2.50

The valence band (VB) and conduction band (CB) potentials of Ag_3PO_4 tetrahedra are theoretically calculated by the equation $E_{CB}^0 = X - E^c - 1/2E_g$, where X is the absolute electronegativity of Ag_3PO_4, E^c is the energy of free electrons on the hydrogen scale (ca. 4.5 eV), and E_g is the band gap of Ag_3PO_4 tetrahedra which can be obtained from the DRS spectrum.