Supporting Information

Synthesis and Characterization of High Efficiency and Stable Ag_3PO_4/TiO_2 Visible Light Photocatalyst for the Degradation of Methylene Blue and Rhodamine B Solutions

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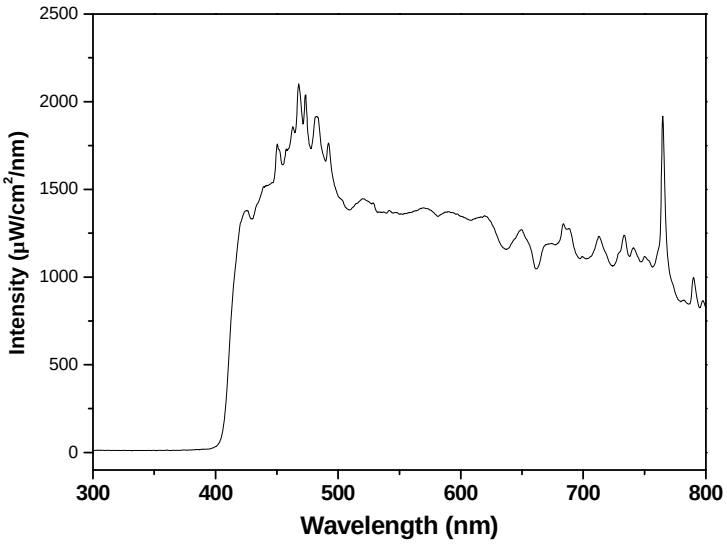

Figure S1. Spectrum of an Xe light attached to a 400nm filter (UVCUT400, λ > 400 nm)

The lamp we used in photocatalytic experiments was a 300 W Xe arc lamp (Perfectlight Co., PLS-SXE300) equipped with a UV cutoff filter (UVCUT400, λ > 400 nm) to simulate sunlight irradiation. The illumination intensity was 140 mW cm^{-2} from wavelength ranges of 400 to 500 nm.

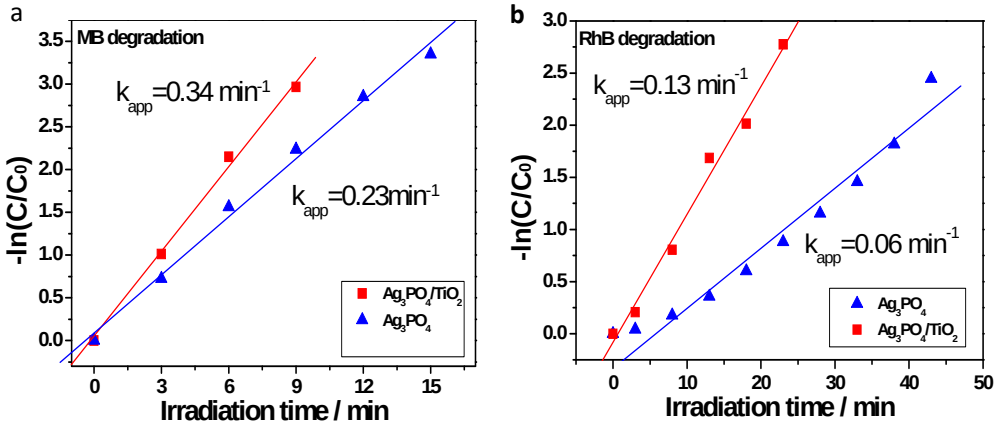

Figure S2. $-\ln(C/C_o)$ as a function of irradiation time for MB degradation (a) and RhB degradation (b) over Ag_3PO_4/TiO_2 and Ag_3PO_4 photocatalysts. The linear relationship suggests that degradation of MB and RhB is a first order reaction.

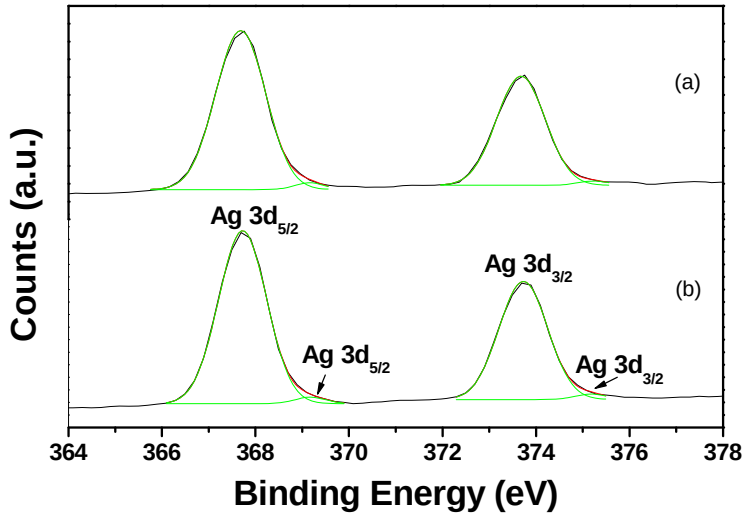

Figure S3. Typical XPS spectra of Ag 3d of (a) Ag_3PO_4/TiO_2 and (b) Ag_3PO_4 after the photocatalytic reactions.

Figure S3 shows typical XPS spectra of Ag 3d of (a) Ag_3PO_4/TiO_2 and (b) Ag_3PO_4 after the photocatalytic reactions. Two bands at ca. 367.7 and 373.7 eV, are ascribed to Ag $3d_{5/2}$ and Ag $3d_{3/2}$ binding energies. These bands could be further deconvoluted into two peaks, respectively, at 367.7, 369.2 eV and 373.7, 375.8 eV, where the bands at 367.5 and 373.7 eV are ascribed to the Ag^+ of Ag_3PO_4, and those at 369.2 and 375.8 eV are attributed to the metallic Ag^0. Similar results have been reported by other researchers. [1-3] These results verify the existence of metallic Ag^0 on Ag_3PO_4 and Ag_3PO_4/TiO_2 photocatalysts after the reaction.

Reference:

1. Wang, P.; Huang, B.; Qin, X.; Zhang, X.; Dai, Y.; Whangbo, M. *Inorg. Chem.* 2009, 48, 10697–10702.
2. Wang, P.; Huang, B.; Lou, Z.; Zhang, X.; Qin, X.; Dai, Y.; Zheng, Z.; Wang, X. *Chem. Eur. J.* 2010, 16, 538–544.
3. Wang, P.; Huang, B.; Zhang, Q.; Zhang, X.; Qin, X.; Dai, Y.; Zhan, J.; Yu, J.; Liu, H.; Lou, Z. *Chem. Eur. J.* 2010, 16, 10042–10047.

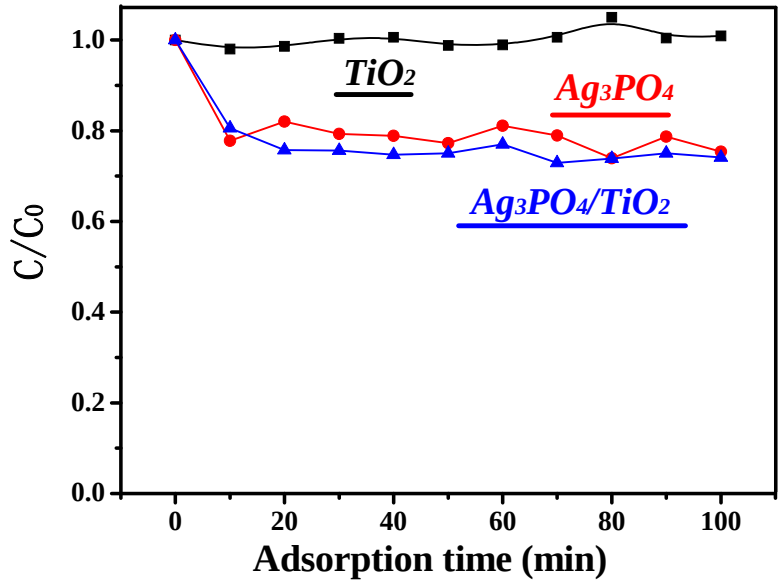

Figure S4. MB adsorption as a function of adsorption time over the used catalysts under a dark condition.