

XRD of used Ag_3PO_4

As shown in Figure S1, after 4 hours of photocatalytic reaction, a new diffraction peak appears at 38° , corresponding to the 111 crystal surface of the elemental silver (Figure S2a), indicating that the elemental silver is formed, which is caused by photoreduction¹.

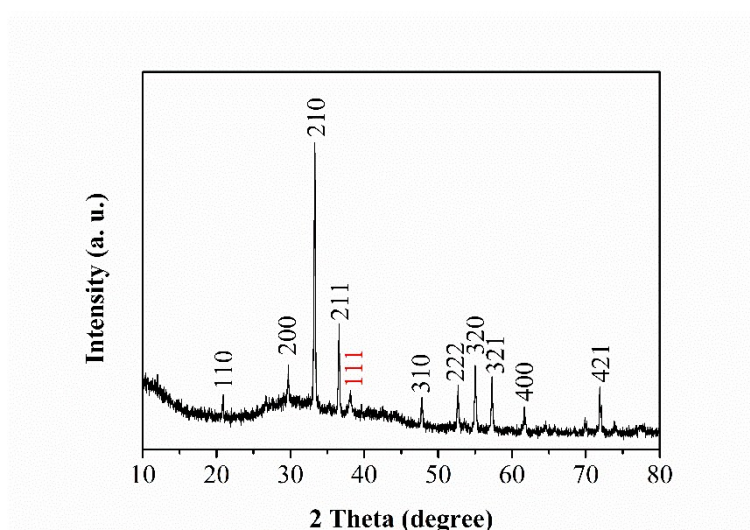


Figure S1 XRD image of Ag_3PO_4 after photocatalysis.

Preparation of Ag nanoparticles (NPs)

4 mL Silver nitrate (0.1 M) and 4 mL sodium hydroxide (0.2 M) were mixed, and then 12 mL ethylene glycol was added. The reaction was conducted at room temperature in dark and constantly stirred for 24 h. After centrifugation, the precipitate was washed with deionized water and ethanol for several times, and then dried in vacuum at 60°C overnight.

Characterization of Ag NPs

XRD analysis of Ag NPs (Figure S2a) reveals a face centered cubic crystal structure (JCPDS no.04-0783). SEM picture shows the formation of nanoparticles in dispersed

and aggregated forms (Figure S2b). TEM image reveals Ag NPs with a mean diameter of 180 nm (Figure S2c).

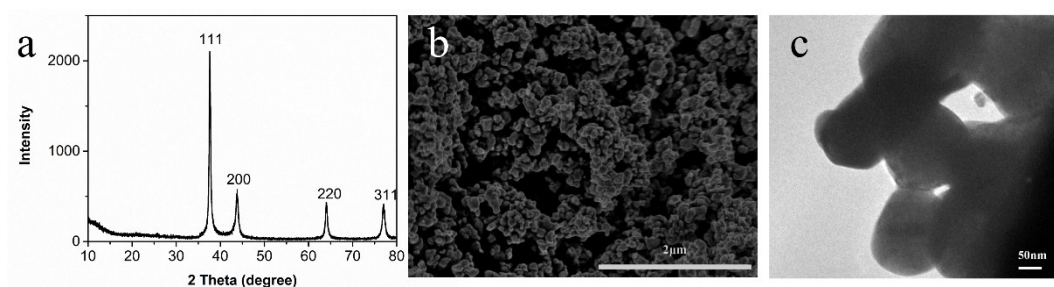


Figure S2 XRD (a), SEM (b) and TEM (c) images of Ag NPs.

Table S1 Zone of inhibition (mm) of ceftazidime against *E.coli* in absence and in presence of Ag NPs.

Antibiotics ($\mu\text{g}/\text{disc}$)	inhibition zone diameters (mm)			
	without Ag	Ag 0.01 $\mu\text{g}/\text{disc}$	Ag 0.1 $\mu\text{g}/\text{disc}$	Ag 1 $\mu\text{g}/\text{disc}$
Ceftazidime 30	19.25	19.25	19.25	19.25

The antibacterial ability of the middle and final degradation products

Sample No.1 contains 1 g/L Ag_3PO_4 and 16 mg/L ceftazidime, sample No.2 contains 1 g/L Ag_3PO_4 and 32 mg/L ceftazidime. After photocatalysis for 0 h, 0.5 h, 1 h, 2 h and 4 h, the samples were added to blank susceptibility papers and the inhibition zone diameters were measured. As shown in Table S2, after half an hour of photocatalysis, all the samples basically lost the bacteriostatic ability, which reduced the disturbance to the microbial ecosystem.

Table S2 Zone of inhibition (mm) of Sample No.1 and Sample No.2 against *E.coli* after photocatalysis.

Photocatalytic time (h)	0	0.5	1	2	4
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Inhibition zone	Sample No.1	18.0	8.0	7.5	7.5	7.5
diameters (mm)	Sample No.2	22.0	8.5	8.0	8.0	8.0

References

(1) Martin, D. J.; Liu, G.; Moniz, S. J. A.; Bi, Y.; Beale, A. M.; Ye, J.; Tang, J. Efficient visible driven photocatalyst, silver phosphate: performance, understanding and perspective. *Chem. Soc. Rev.* **2015**, 44 (21), 7808-7828.