

Electronic Supplementary Information

Surface plasmon resonance-induced visible light photocatalytic reduction of graphene oxide: Using Ag nanoparticles as a plasmonic photocatalyst

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Experimental section

All chemicals were purchased from Aladin Ltd. (Shanghai, China) and used as received without further purification. The water used throughout all experiments was purified through a Millipore system. The GO sheets were prepared by a modified Hummers method¹ and an aqueous dispersion with concentration of 0.5 mg/mL was obtained after dialysis to remove remaining ions and acids. The AgNPs were prepared as follows: In brief, 0.02 mL of 0.5 M AgNO₃ aqueous solution was added into 5 mL of N, N-dimethylformamide (DMF) under rapid stirring, leading to a yellow colored dispersion of AgNPs within 1 min. The VLPCR of GO was carried out as follows: 0.4 mL of GO dispersion and 2.6 mL of Ag dispersion (2 mM) were mixed together first, and then the resulting mixture was irradiated under visible light over a period of 40 min after removing the dissolved oxygen via flowing N₂ (the visible light source is a

400 W Xe lamp with a water cooling cover, WG 420 filter, $\lambda > 420$ nm). UV-vis spectra were collected on a UV5800 Spectrophotometer. Transmission electron microscopy (TEM) measurement was made on a HITACHI H-8100 EM (Hitachi, Tokyo, Japan) with an accelerating voltage of 200 kV. Raman spectra were obtained on a J-Y T64000 Raman spectrometer with 514.5 nm wavelength incident laser light. X-ray photoelectron spectroscopy (XPS) analysis was measured on an ESCALAB MK II X-ray photoelectron spectrometer using Mg as the exciting source.

References

1. W. S. Hummers and R. E. Offeman, *J. Am. Chem. Soc.*, 1958, **80**, 1339

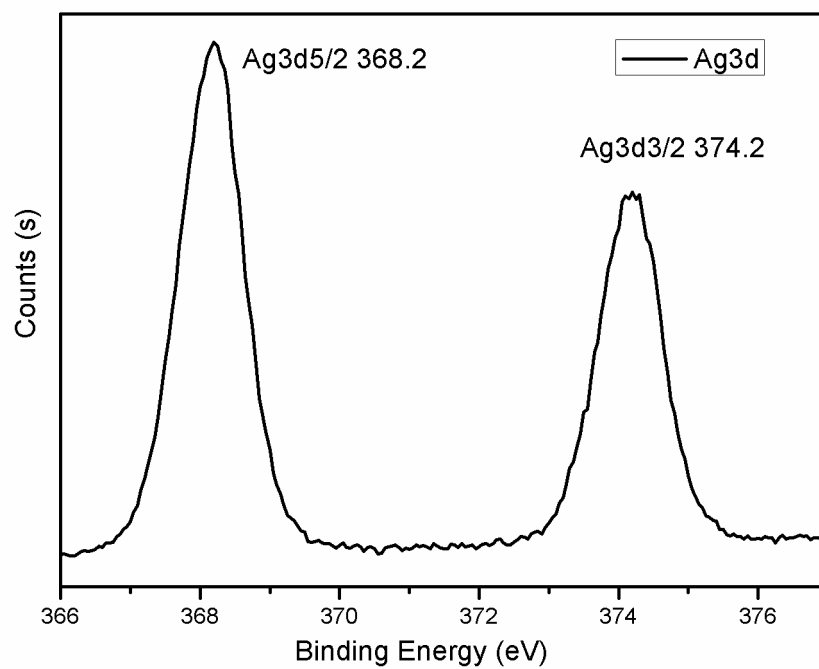


Fig. S1 Ag 3d XPS spectrum of Ag/rGO.