catalysts

Supplementary Material: An Efficient Photocatalyst for Fast Reduction of Cr(VI) by Ultra-Trace Silver Enhanced Titania in Aqueous Solution

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1. Tables

Table S1 BET data for different silver loadings.

Ag/TiO_2 wt%	0	0.01	0.03	0.06	0.10	0.30	0.60	1	3
Specific surface area (m^2/g)	45.49	48.88	50.37	48.26	47.26	46.85	46.29	50.32	51.62

Table S2 BET data for different solvent concentration.

Solvent concentration	0%	25%	50%	75%	100%
Specific surface area (m^2/g)	44.92	35.80	46.23	50.18	48.26

Table S3 XPS date of atomic ($Ag@TiO_2$, 0.6 wt%).

Name	Area (N) TPP-2M	Atomic %
Ti2p	0.2	15.25
O1s	0.58	43.93
C1s	0.54	40.65
Ag3d	0	0.17

2. Equations

The reaction mechanism of Cr(VI) reduction in acidic condition was as following:

$$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O \quad (S1)$$

$$E^0 = 0.98\ eV$$

The reaction mechanism of Cr(VI) reduction in neutral condition was as following:

$$Cr_2O_7^{2-} + 8H^+ + 3e^- \rightarrow Cr^{3+} + 4H_2O \quad (S2)$$

$$E^0 = 0.56\ eV$$

The reaction mechanism of Cr(VI) reduction in alkaline condition was as following:

$$Cr_2O_7^{2-} + 4H_2O + 3e^- \rightarrow Cr(OH)_3 + 5OH^- \quad (3)$$

$$E^0 = 0.56\ Ev$$

3. Figures

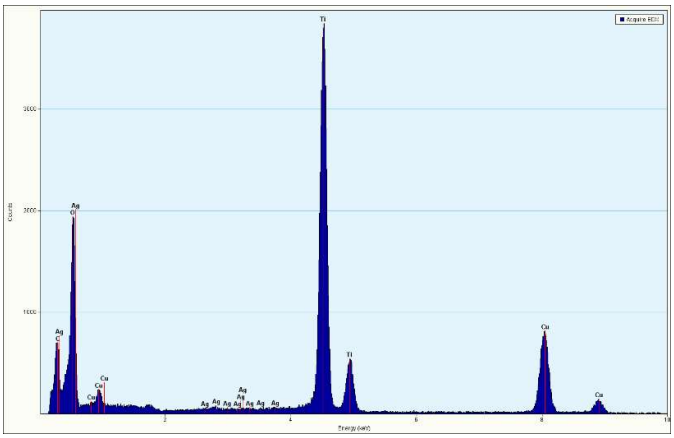

Figure S1 The Energy Dispersive Spectrdmeter of Ag@TiO_2 catalyst.

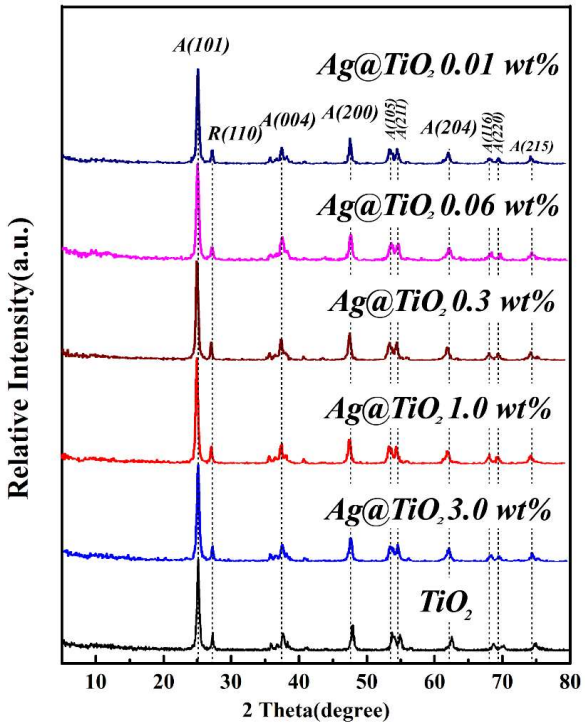

Figure S2 XRD patterns of the Ag@TiO_2 nanocomposites, in which A is anatase phase and R is rutile phase.

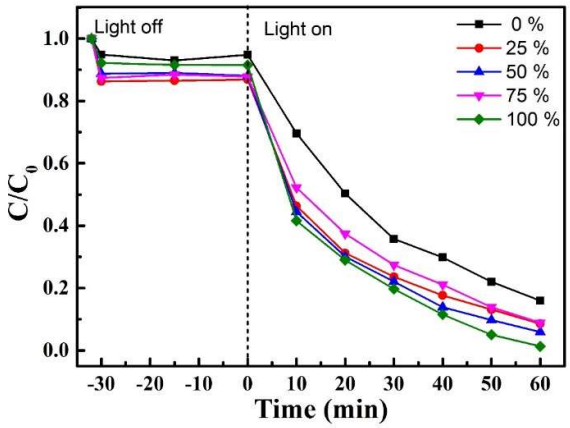

Figure S3 Effect of different concentration of empty scavenger (Ethanol) on Cr reduction.

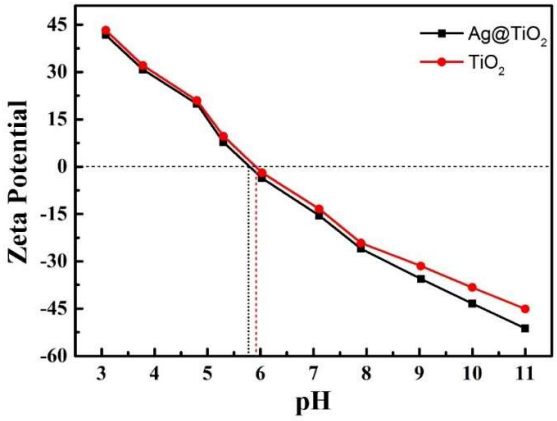

Figure S4 Zeta potential of bare TiO_2 and $Ag@TiO_2$ catalyst.

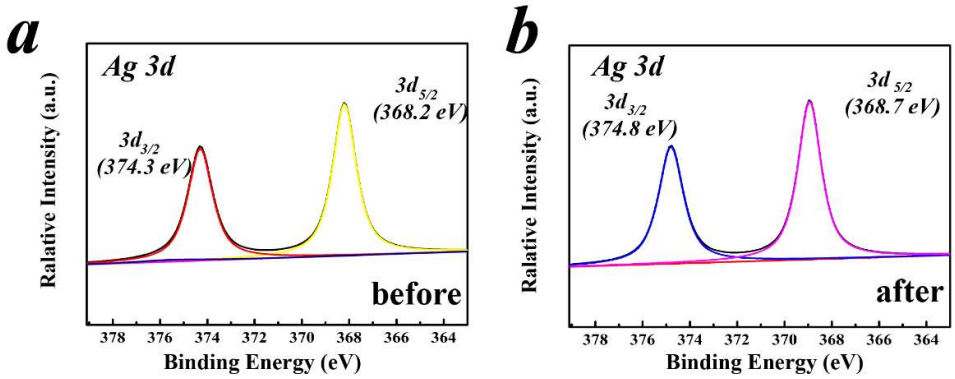

Figure S5 High resolution XPS of Ag 3d of $Ag@TiO_2$ catalyst before (**a**) and after (**b**) reaction.

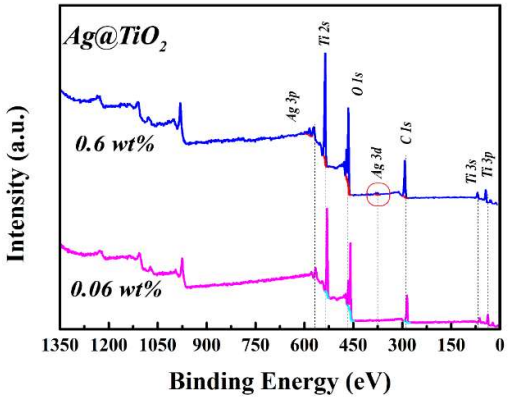

Figure S6 The survey spectrum XPS spectra of the $Ag@TiO_2$ composites.