Supplementary Information for

Enhancement of Ti_3C_2 MXene on Au@Ag/TiO_2 for the visible-light-driven photoreduction of nitroaromatics

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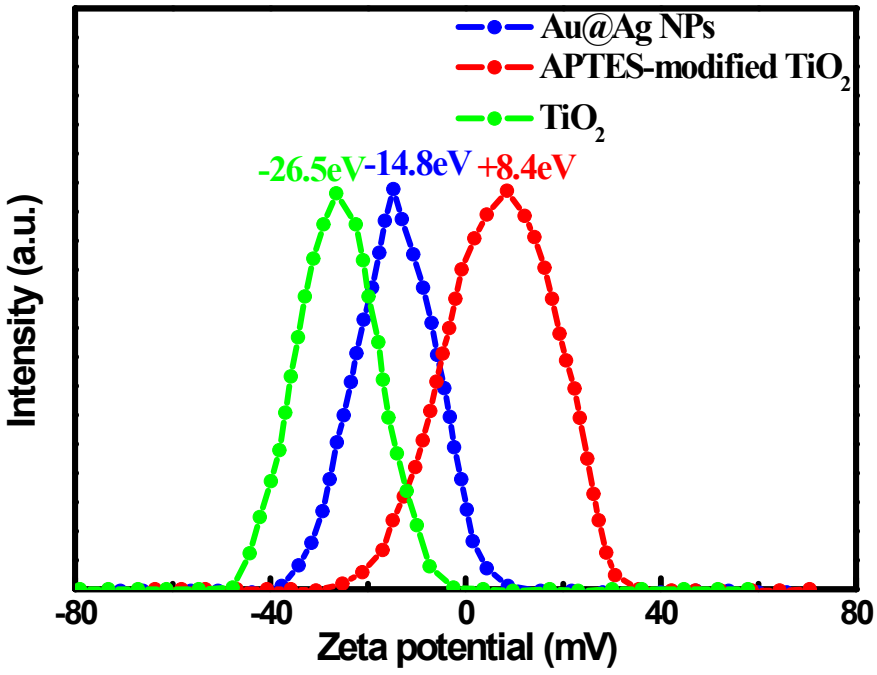

Figure S1. Zeta potentials of TiO_2 microspheres, Au@Ag NPs and APTES-modified TiO_2 microspheres.

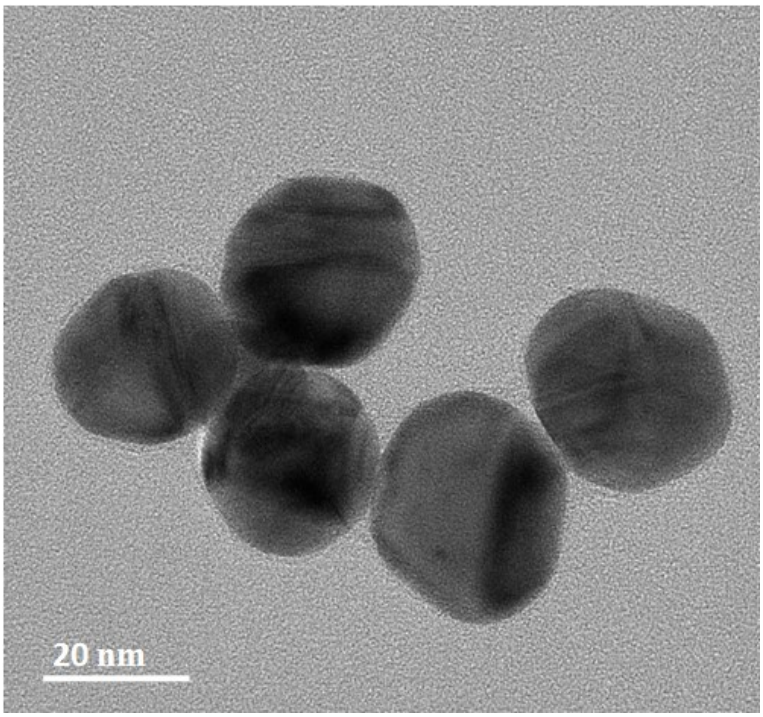

Figure S2. HRTEM image of Au NPs.

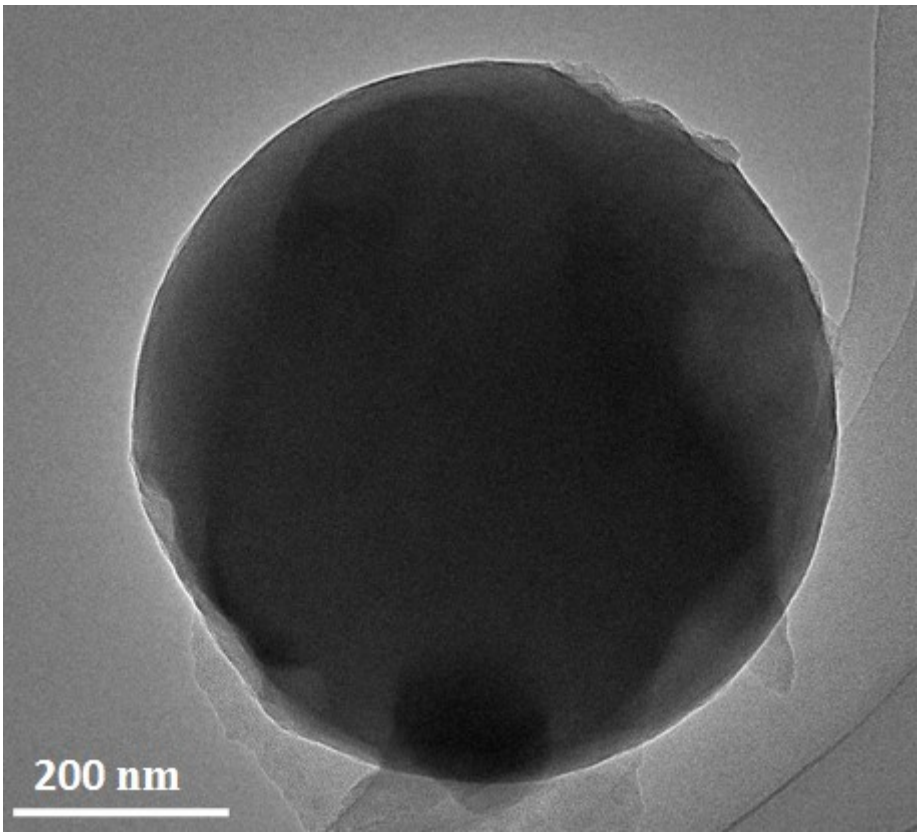

Figure S3. TEM image of TiO_2 microspheres.

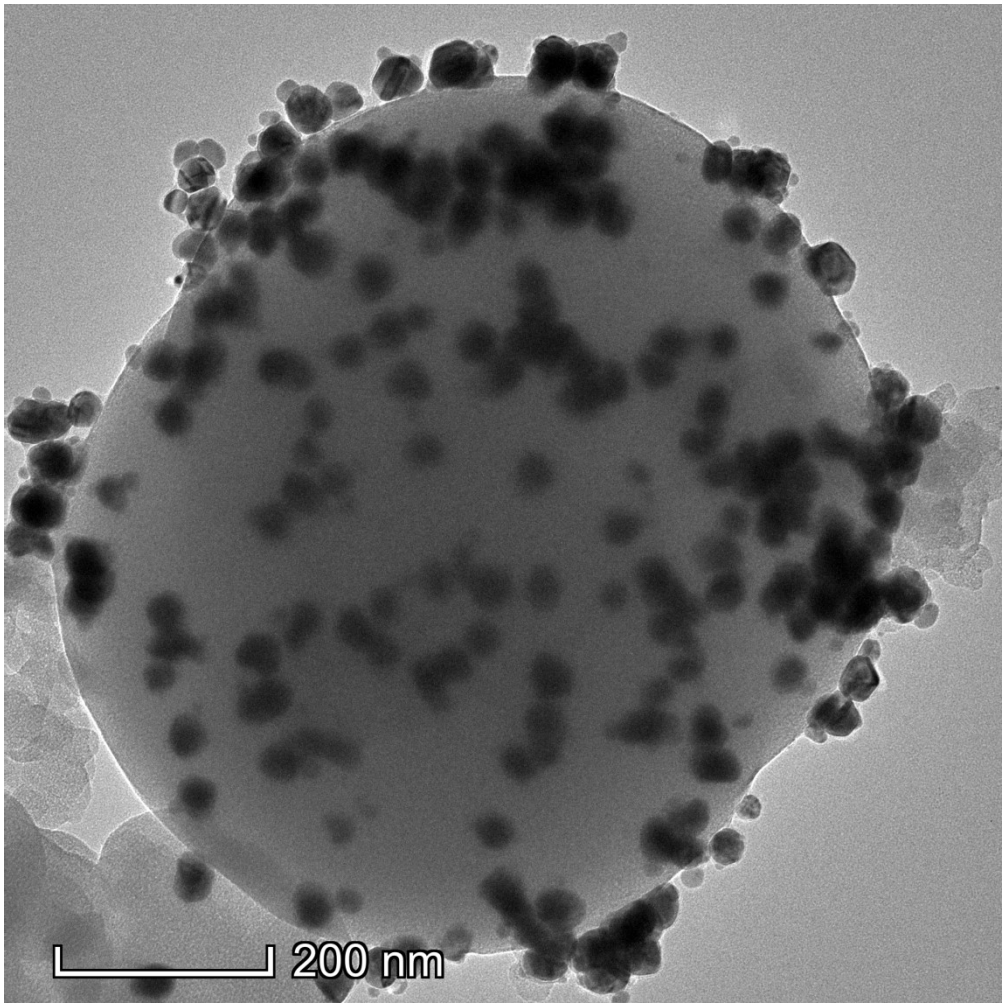

Figure S4. TEM image of Au@Ag/TiO_2.

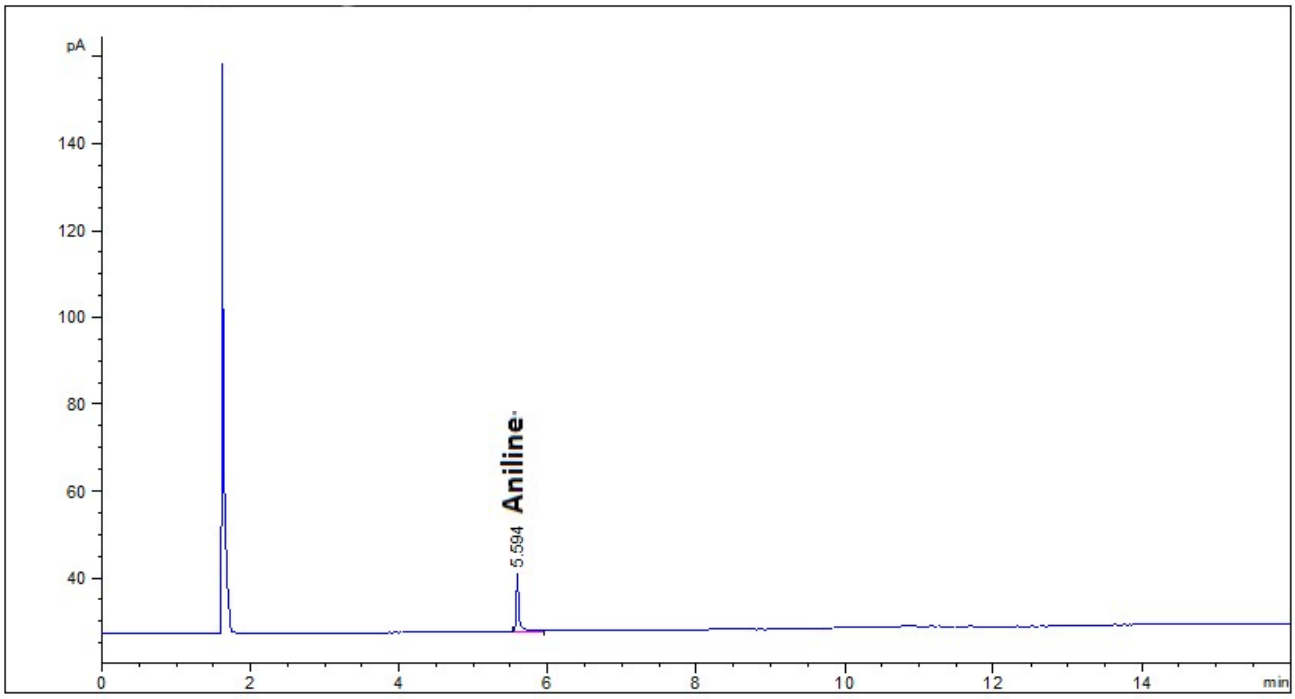

Figure S5. The gas chromatography of products after photoreaction of nitrobenzene over Au@Ag/TiO_2/Ti_3C_2.

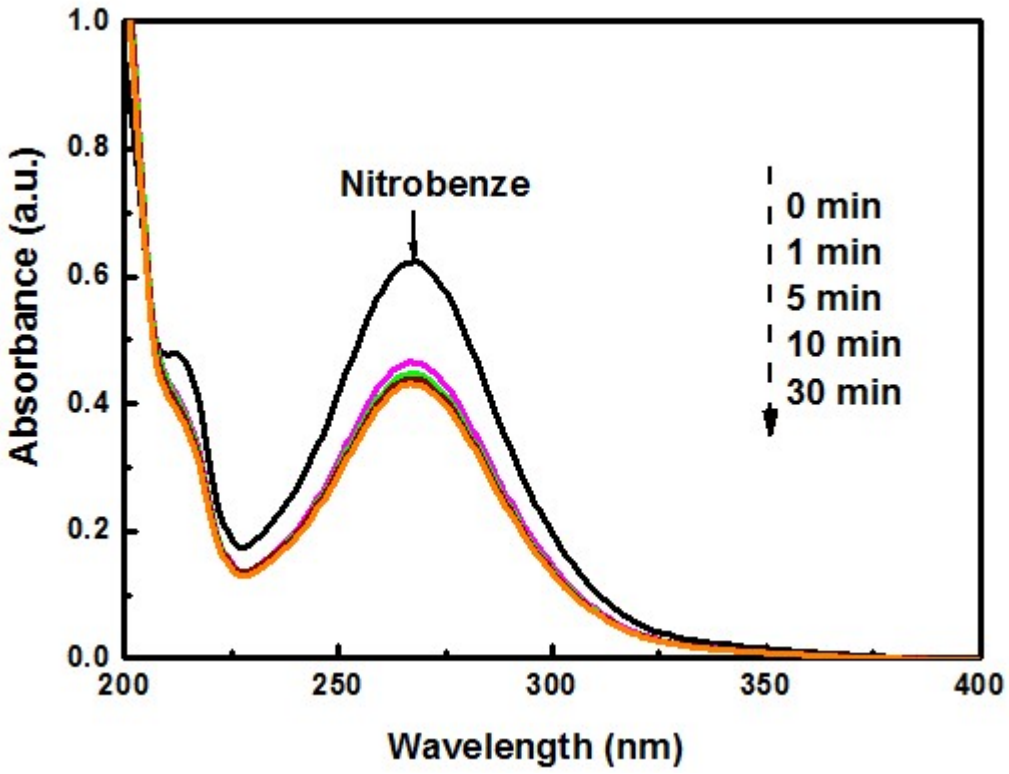

Figure S6. UV-vis adsorption spectra of nitrobenzene solution as a function of time over pure TiO_2 microspheres.

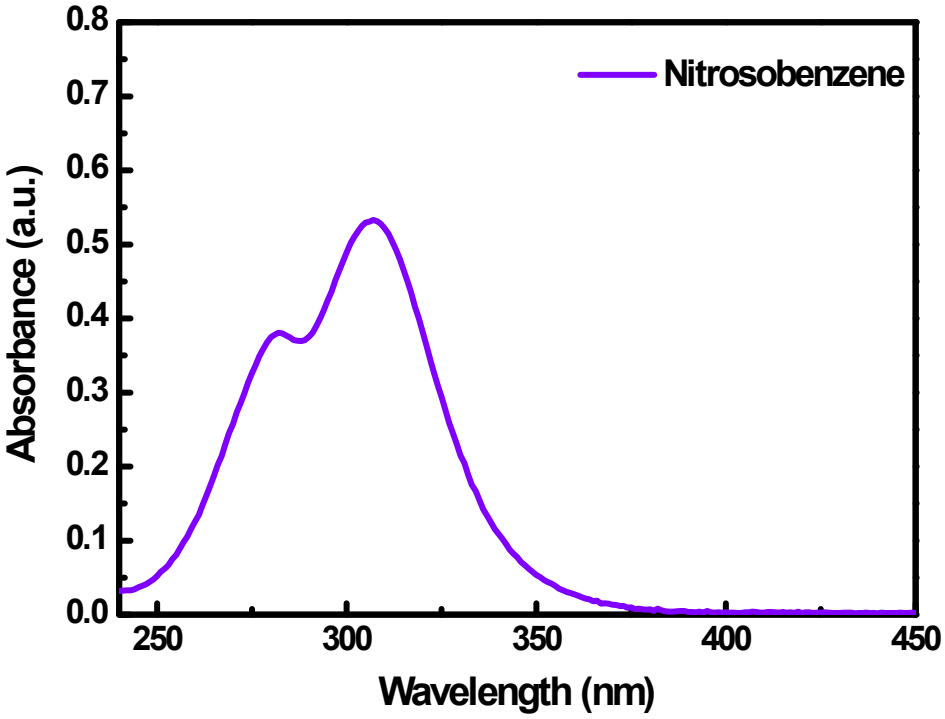

Figure S7. UV-vis adsorption spectra of standard nitrosobenzene.

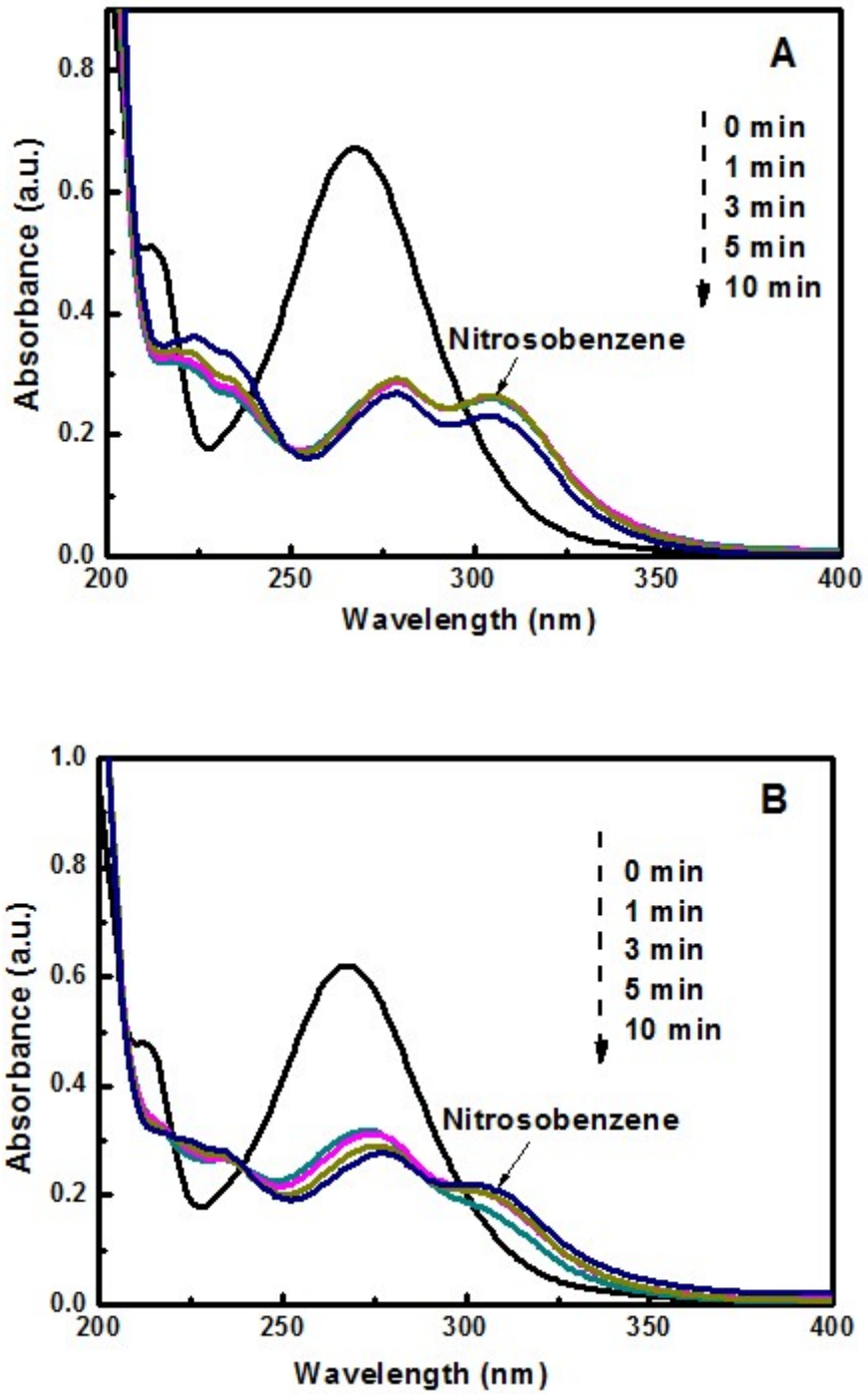

Figure S8. UV-vis adsorption spectra of nitrobenzene solution as a function of time over Ag/TiO_2 (A) and Au/TiO_2 (B).

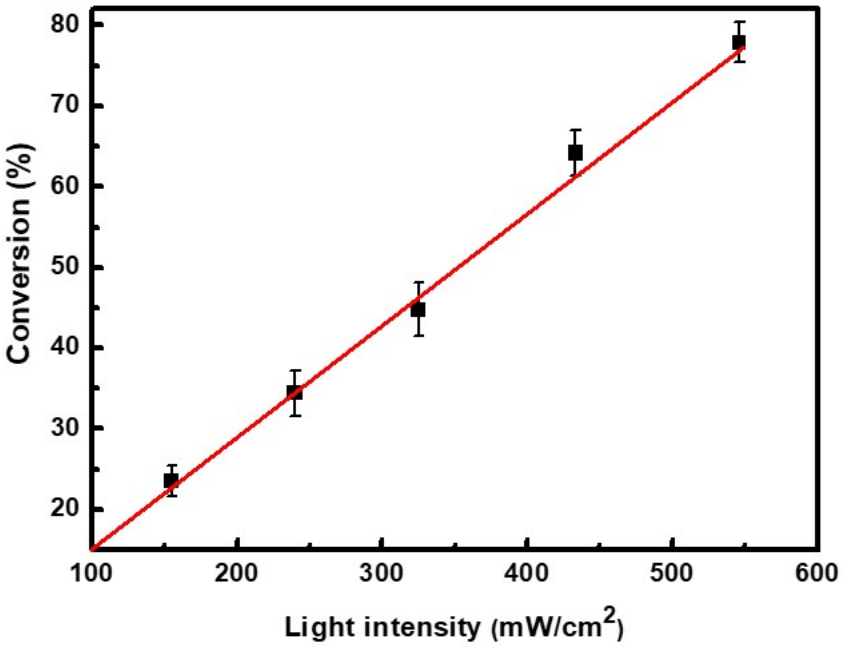

Figure S9. Dependence of nitrobenzene concersion on the light intensity over Au@Ag/TiO_2/Ti_3C_2.

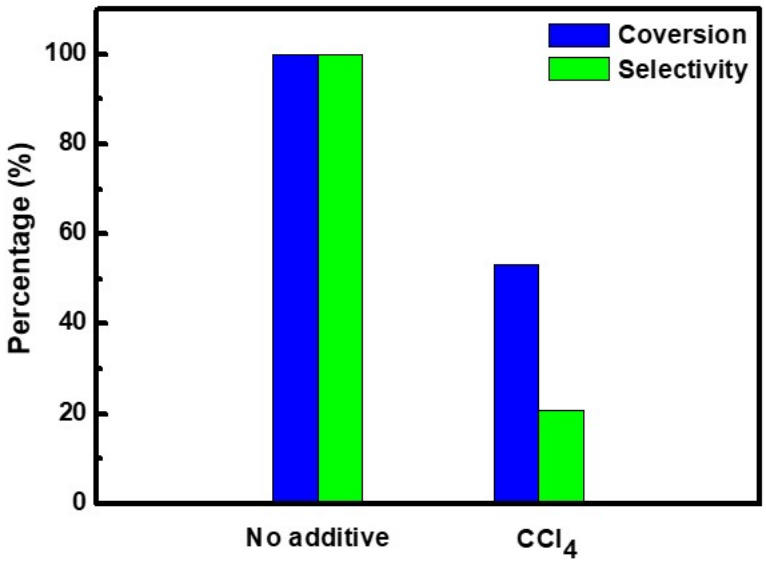

Figure S10. Photoreduction activity of Au@Ag/TiO_2/Ti_3C_2 with or without 5 μL of CCl_4 under illumination of 5 min.

Table S1. The data of conversion and selectivity over various samples displayed in Figure 7A.

Samples	Conversion (%)	Selectivity (%)
Au/TiO_2	87.7	44.6
Ag/TiO_2	82.5	38.5
$Au@Ag/TiO_2$	95.8	84.6
$Au@Ag/TiO_2/Ti_3C_2$	100	100

Table S2. The data of conversion and selectivity over Au@Ag/TiO_2/Ti_3C_2 displayed in Figure 7C.

Au@Ag/TiO_2/Ti_3C_2	Conversion (%)	Selectivity (%)
1st	100	100
2nd	100	98.1
3rd	99.8	96.5
4th	99.3	97.3
5th	98.4	93.8

Table S3. Photocatalytic activity over Au@Ag/TiO_2/Ti_3C_2 with different substrates for mechanistic route study.

Entry	Substrates	Time (min)	Conversion (%)	Selectivity (%)
1	Nitrobenzene	5	100	100
2	Nitrosobenzene	5	100	99.6