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Electronic Supplementary Information

Highly Efficient Visible–Light–Driven Plasmonic Photocatalysts Based on Graphene Oxide Hybridized One–Dimensional Ag/AgCl Heteroarchitectures

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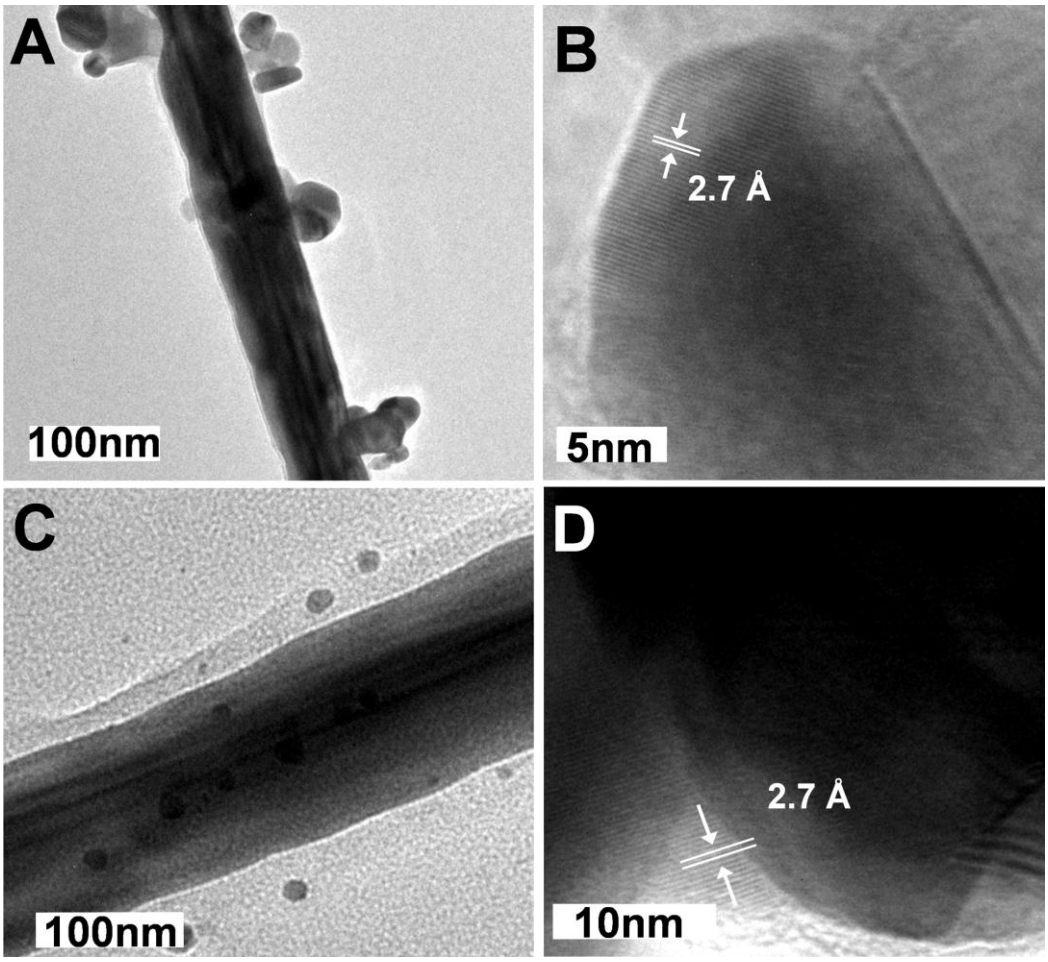

Fig. S1. LRTEM images (A and C) of the 1D Ag/AgCl (A) and Ag/AgCl/GO (C) nanostructures, and HRTEM images (B and D) of the AgCl nanoparticles loaded on Ag/AgCl (B) and Ag/AgCl/GO (D) nanospecies.

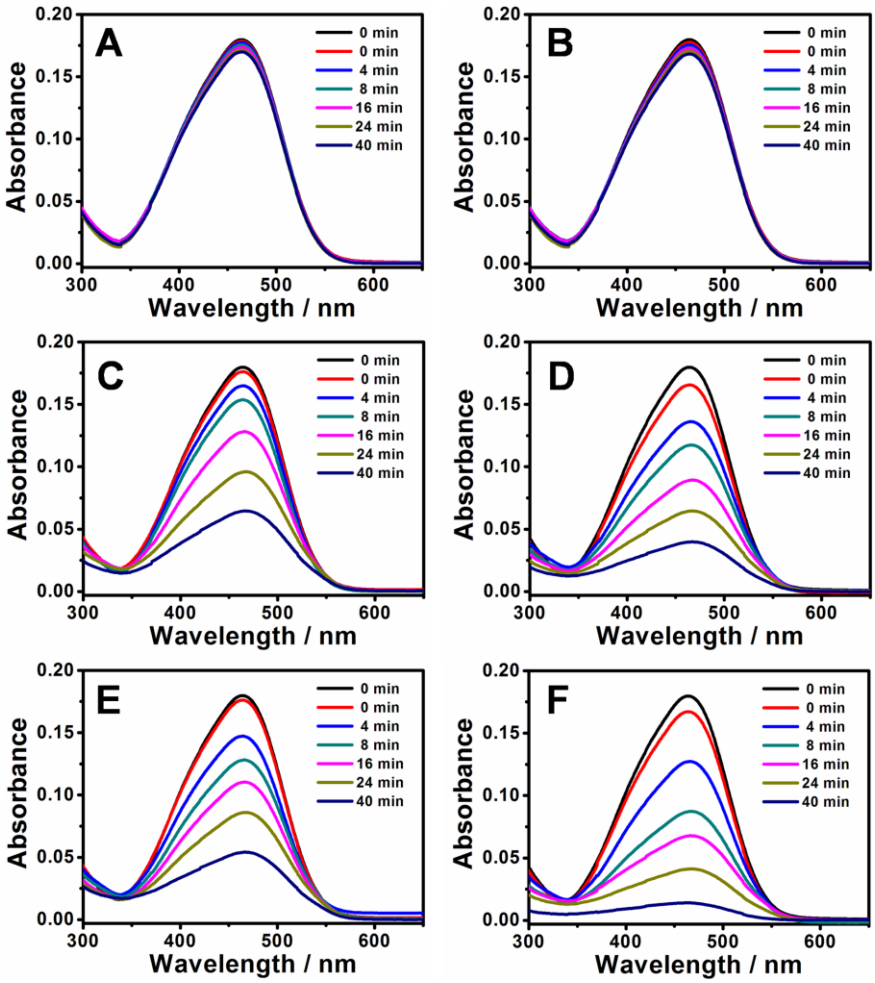

Fig. S2. Real–time absorption spectra of MO dye during the photodegradation process over various Ag/AgCl–based photocatalysts under visible light illumination. The employed catalysts for (A), (B), (C), (D), (E) and (F) are the parent bare 1D Ag nanowires, commercial available P25–TiO_2, spherical Ag/AgCl and Ag/AgCl/GO nanoparticles, 1D Ag/AgCl and Ag/AgCl/GO nanospecies, respectively. The black and red curves marked as 0 min in each panel are the absorption spectra detected from the original MO solution before (black) and after (red) the dark adsorption experiment, respectively.

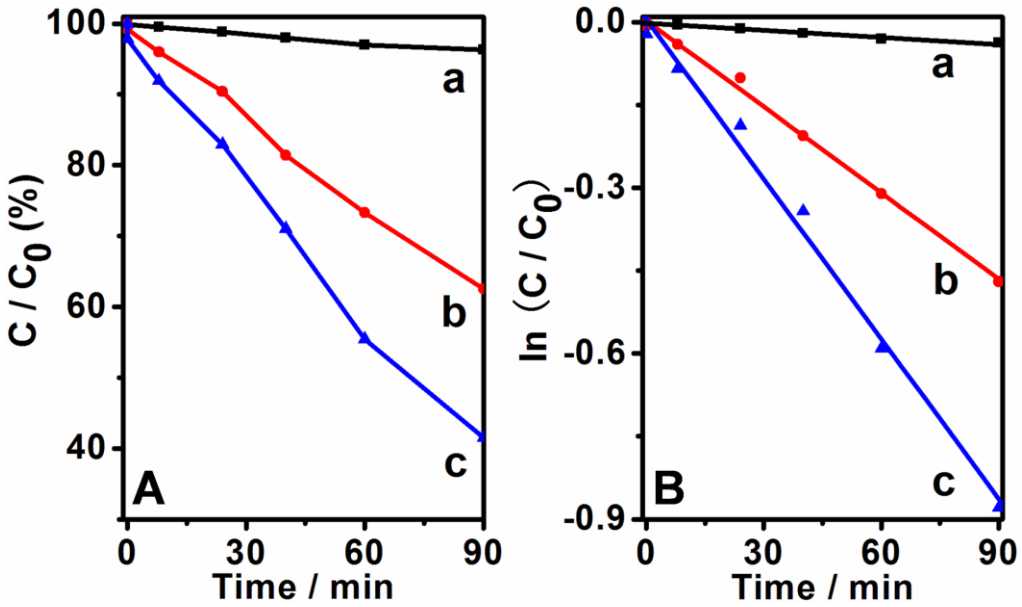

Fig. S3. Photocatalytic activities (A) and kinetic linear simulation curves (B) of the as–prepared plasmonic photocatalysts for the photodegradation of 4-CP pollutant under visible–light irradiations (>400 nm). The employed catalysts for curve (a), (b), and (c) are the parent bare 1D Ag nanowires, 1D Ag/AgCl heterostructures, and 1D Ag/AgCl/GO heterostructures, respectively. The catalytic performance was monitored by measuring the absorbance at a wavelength of 280 nm of 4-CP.

As shown in Fig. S3A, when the parent bare 1D Ag nanowires were used as the photocatalysts, no more than 4% of 4-CP molecules were decomposed within 90 minutes. In contrast, when our present 1D Ag/AgCl nanostructures were employed as the photocatalysts, ca. 37.5% of 4-CP molecules were photodecomposed under the similar experimental conditions. Importantly, when the 1D Ag/AgCl/GO heterostructures were used as the photocatalysts, about 58.5% of 4-CP pollutants were decomposed. Furthermore, as shown in Fig. S3B, it can be seen that the rate constant of the 1D Ag/AgCl/GO heterostructures was determined to be 0.0097 min^{-1}, which were distinctly higher than that of the 1D Ag/AgCl nanospecies (0.0052 min^{-1}). These results are essentially similar to what we have observed from the photodegradation of MO described in the main context, further suggesting that the photocatalytic performance of our 1D Ag/AgCl nanomaterials could be further enhanced *via* the hybridization of GO nanosheets, and that out 1D Ag/AgCl/GO hybridized nanostructures could be used as efficient visible–light–driven plasmonic photocatalysts for the photodegradation of organic pollutants.