Supporting Information for

New Facile Synthesis of One-Dimensional Ag@TiO_2 Anatase Core-Shell Nanowires for Enhanced Photocatalytic Properties

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1. Characterization

The morphology and size of the as-prepared products were characterized by using a field-emission scanning electron microscope (JSM-6701F, JEOL), and the SEM-EDS line analysis was performed with a field-emission scanning electron microscope operated at an accelerating voltage of 5 kV (Quanta 450, FEI). The XRD measurements were performed on a PANalytical X'Pert PRO instrument with CuKa radiation (40 kV). The XRD patterns were recorded from 20 to 80 °with a scan rate of 0.0678 s^{-1}. UV-Vis diffuse-reflectance spectra were recorded on a UV-2550 (Shimadzu) spectrometer by using $BaSO_4$ as reference. The elemental composition was determined by XPS (Kratos Axis Ultra DLD). HRTEM imaging was carried out by using an FEI Tecnai TF 20 microscope operated at 200 kV.

2. Additional Figures:

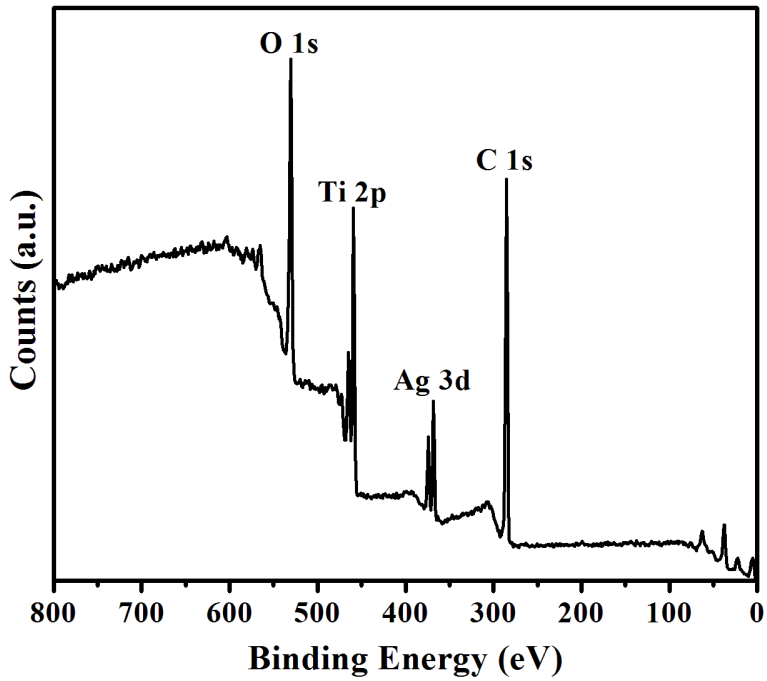

Figure S1. XPS spectra of the as-synthesized Ag@TiO_2 core-shell nanowires as shown in Figure 1B-D.

Because the structures of core-shell nanocomposites are usually not perfect, the element analysis can be characterized by XPS technique[1–4]. As shown in Figure S2, the material of Ag@TiO_2 core-shell nanowires reported by us are also not absolutely perfect, small parts of Ag nanowires are exposed (as shown in the red circles), so Ag signals can be shown in the XPS spectrum of the Ag@TiO_2 core-shell nanowires.

[1] Y. An, L. Yang, J. Hou, Z. Y. Liu and B. H. Peng, *Optical Materials*, 2014, **36**, 1390.
[2] B. Cheng, Y. Le and J.G. Yu, *Journal of Hazardous Materials*, 2010, **177**, 971.
[3] X. H. Yang, H. T. Fu, K. Wong, X. C. Jiang and A. B. Yu, *Nanotechnology*, 2013, **24**, 415601.
[4] J. Du, J. Zhang, Z. Liu, B. Han, T. Jiang and Y. Huang, *Langmuir*, 2006**, 22**, 1307.

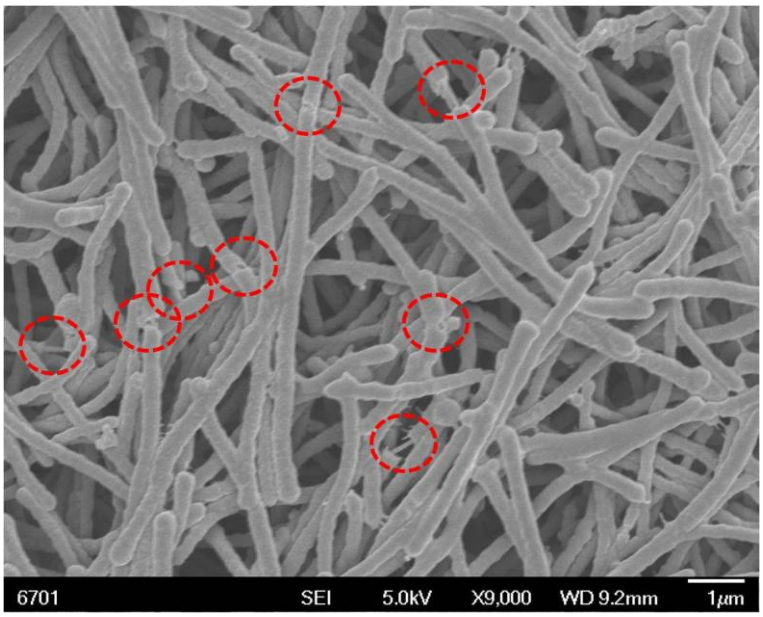

Figure S2. SEM image of Ag@TiO_2 core–shell nanowires prepared by hydrolysis reaction.

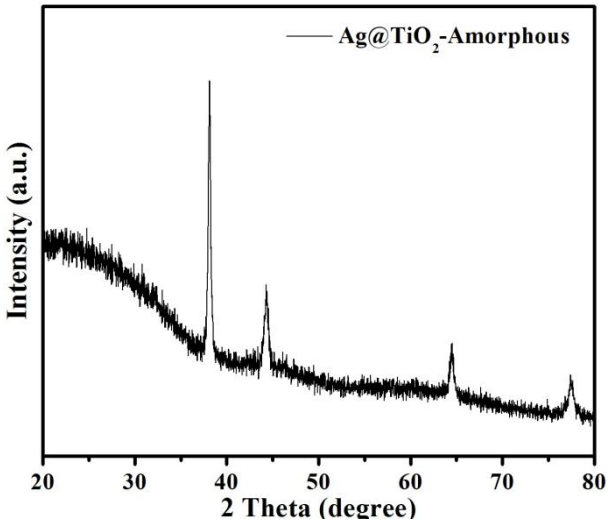

Figure S3. XRD patterns of the Ag@TiO_2-amorphous core-shell nanowires.