Supplementary Material (ESI) for Journal of Materials Chemistry

Photocatalytic Properties of Porous Silicon Nanowires

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(1) Figure S1.

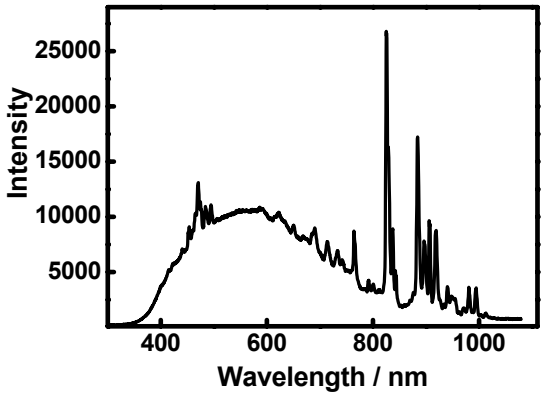

Figure S1. Optical spectrum of the 300 W xenon light used in the photocatalytic reaction. Our reactions are typically carried in pyrex glass vial with the UV end of Xenon light significantly weakened by glass absorption.

(2) Figure S2.

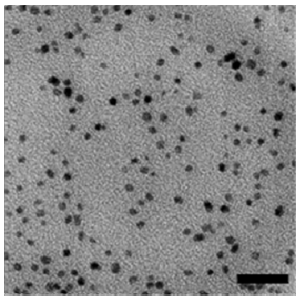

Figure S2. TEM images of platinum nanoparticles. Scale bare is 20 nm.

(3) Figure S3.

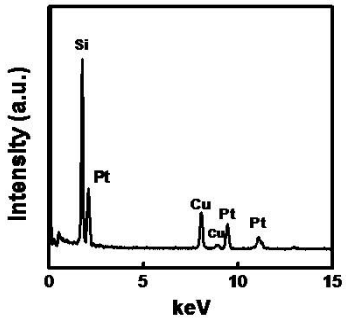

Figure S3. EDX spectrum of PtNP-pSiNW-C catalysts.

(4) Figure S4.

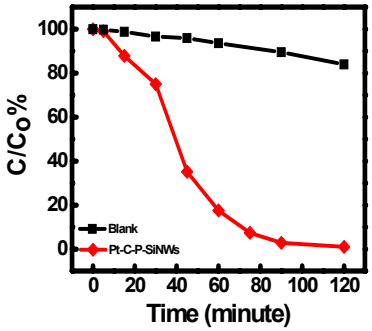

Figure S4. Photocatalytic characteristics of fresh PtNP-pSiNW-C catalysts. Black squares represent the IC solution without catalysts under the light irradiation. Red diamonds represent the catalytic behavior of the fresh PtNP-pSiNW-C.

(5) Figure S5.

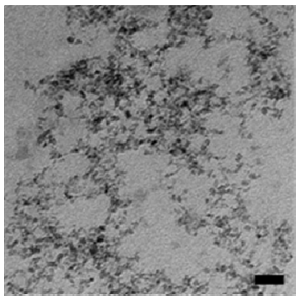

Figure S5. TEM image of anatase TiO_2 nanoparticles. Scale bare is 40 nm. To synthesize anatase TiO_2 nanoparticles, 5 ml of titanium-n-butoxide ($Ti(OBu)_4$) was dissolved in 1.6 ml of isopropanol and then drop-wisely added into 40 ml of HNO_3 acid solution with a pH value of 2.5 under vigorous stirring. The mixture was kept at 75 °C for 24 hours. The as-synthesized TiO_2 nanoparticles were centrifuged off and washed with water for five times.

(6) Figure S6.

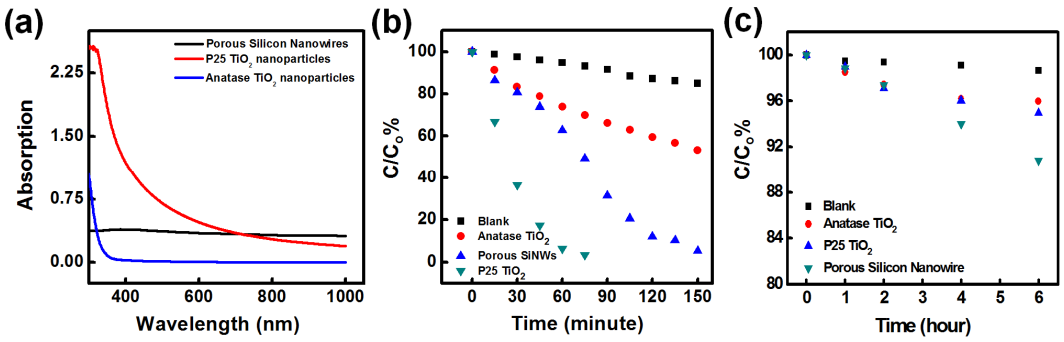

Figure S6. Comparison of photocatalytic activities between porous SiNWs and TiO_2 nanoparticles. (a) Absorption spectra of porous SiNWs, 5 nm anatase TiO_2 nanoparticles and P25 TiO_2 nanoparticles. The concentration of the catalysts was controlled at 0.1 mg/ml. (b) Photocatalytic activities of the three catalysts dispersed in 10 ml of 100 μM indigo carmine (IC) aqueous solution. 3 mg of catalysts was used for the photoreactions. (c) Photocatalytic activities under IR light with 3 mg photocatalyst dispersed in 10 ml of 20 μM IC solution for three different photocatalysts. The light was cut off at 715 nm.