Supplementary Material (ESI) for Photochemical & Photobiological Sciences

Electronic Supplementary Information

for

New synthesis of a Porous Si / TiO_2 photocatalyst: testing its efficiency and stability under visible light irradiation

Qingping Wu, Danzhen Li*, Zhixin Chen and Xianzhi Fu

Fig. S1. SEM image of porous silicon. The nanoparticles and mesopore can be seen from the surface of porous silicon.

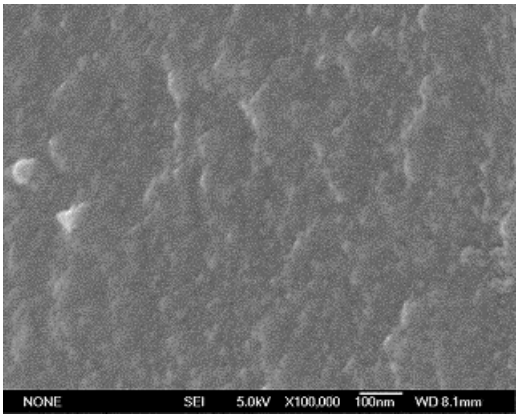


Fig. S2 Degradation of RhB with PS / TiO_2 (50 mol% PS) in dark. There are almost no variance after 40 minutes which can be seen from the figure.

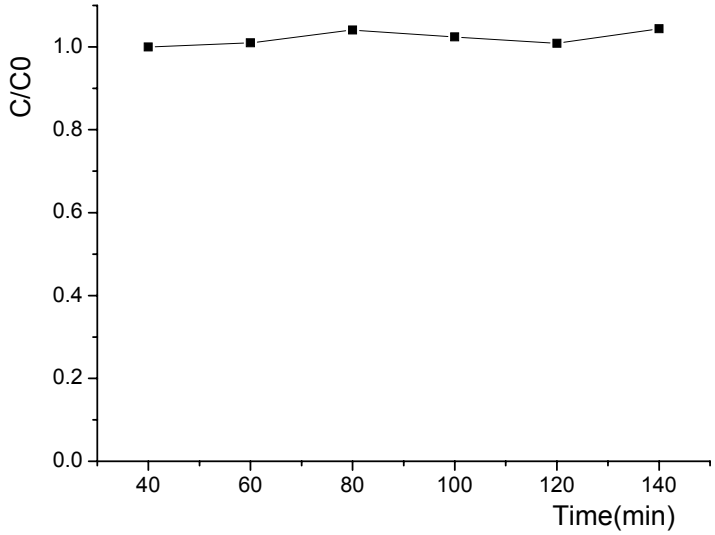


Fig. S3. X-ray powder diffraction patterns, (a) PS / TiO_2 (50 mol% PS) (b) self-made TiO_2 (C) PS.

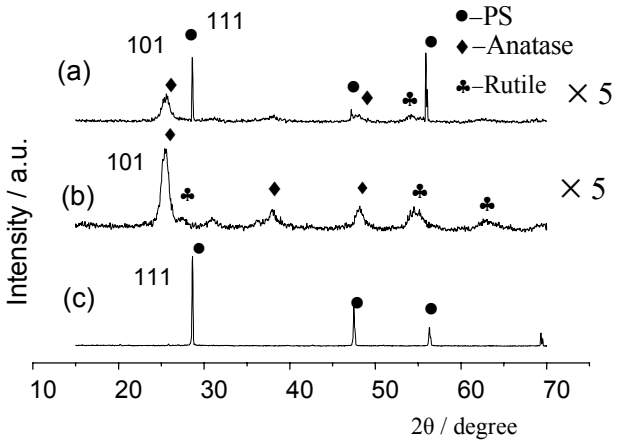


Fig. S4. UV-Vis reflection spectra of different photocatalysts, (a) TiO_2 (b) PS / TiO_2 (50% PS) composite. The adsorption of visible light (from 400 nm to 800 nm) to PS / TiO_2 composite are clearly much more than TiO_2 itself

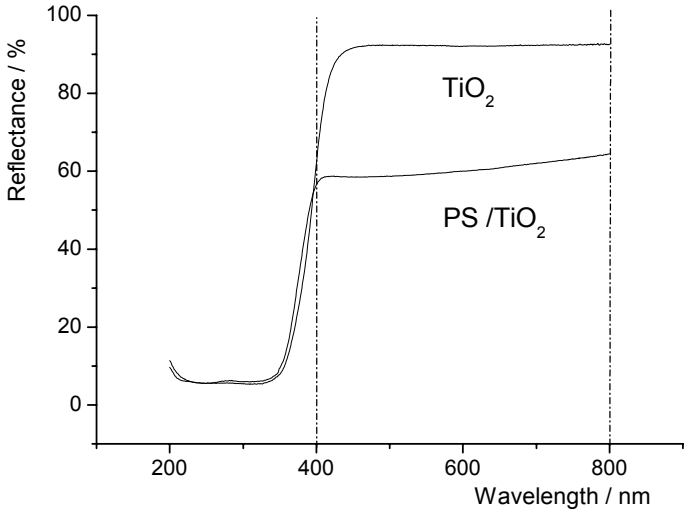
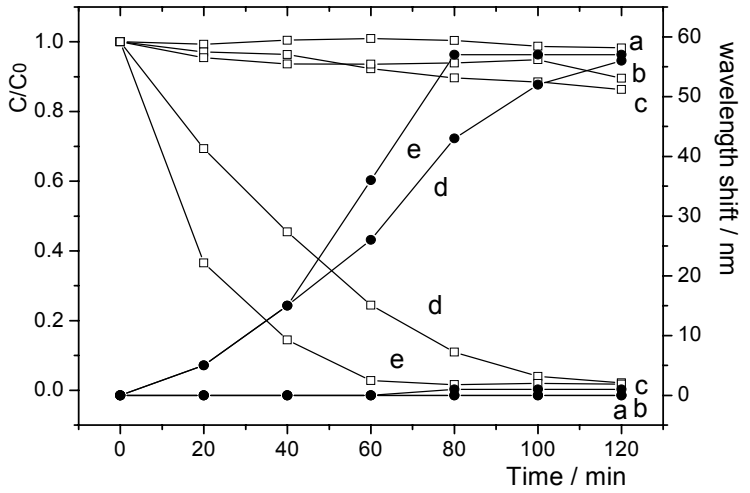


Fig. S5. The influence of H_2O_2 in photocatalytic degradation of RhB on PS / TiO_2 composite in aqueous solution. (a) without H_2O_2 (b) with 0.2 ml H_2O_2. When the experiment is conducted in dark, there is almost no degradation can be found from the figure. Meanwhile, no variance of wavelength can be detected. However, a remarkable decrease of concentration of RhB and great wavelength shift can be observed during visible irradiation. Especially, The activity of compostie was obviously increased with only a little of H_2O_2.



a, without any catalyst under visible light b, PS / TiO_2 (50% PS) composite in dark c, 0.1ml H_2O_2 under visible light d, PS / TiO_2 (50% PS) composite under visible light e, PS / TiO_2 (50% PS) + 0.1ml H_2O_2 under visible light. The solid symbols are the results of wavelength.

Scheme S1. Proposed mechanism for photocatalytic degradation of Rhodamine B in aqueous solution. [8, 15]

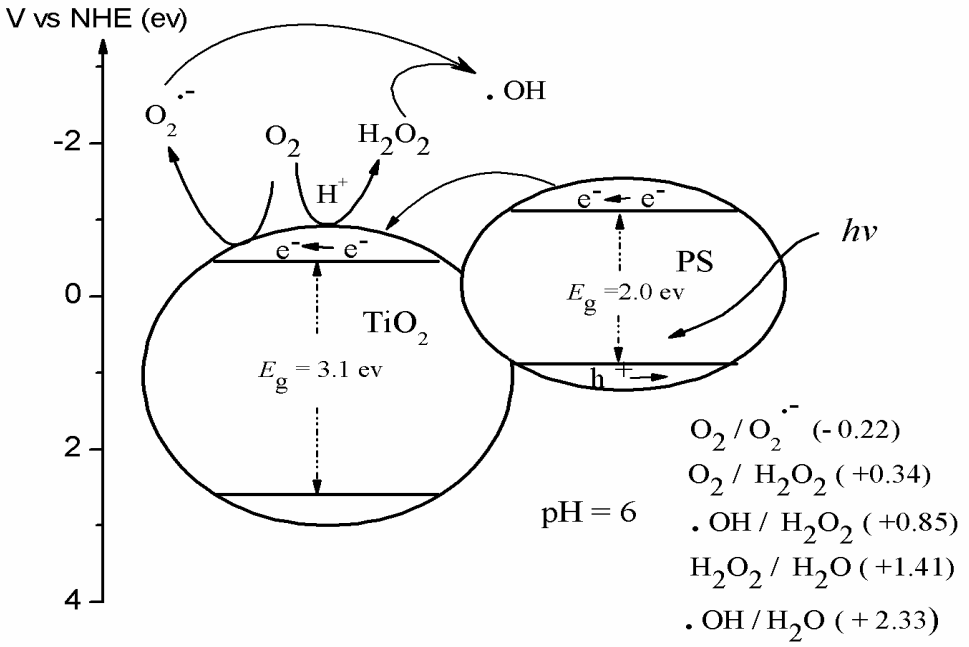
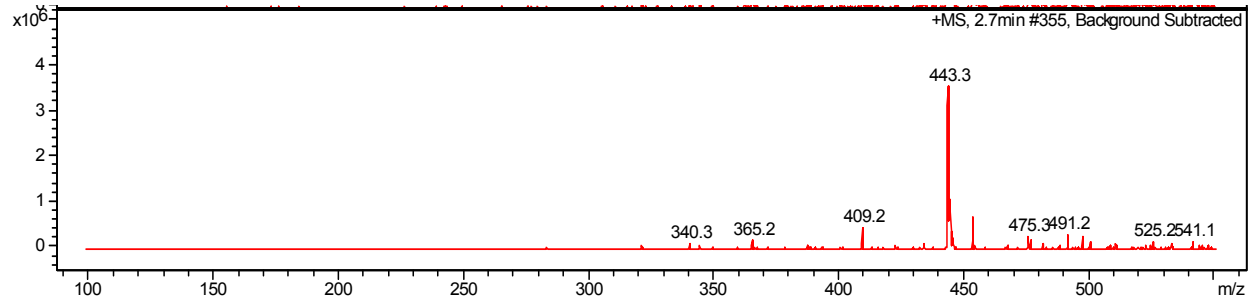
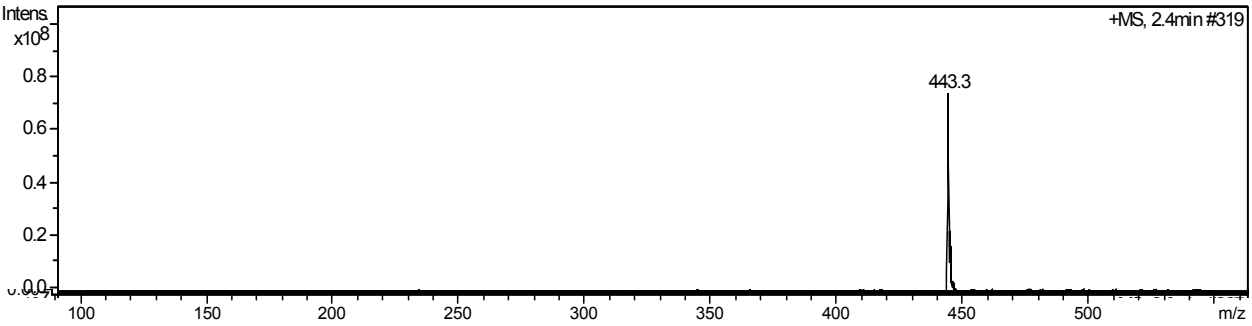


Fig. S6. **Mass spectra recorded in the positive ion mode of RhB aqueous solution after photodegradation.**

PS/TiO_2-1-1-400 □-120min



RhB-blank



TiO_2 120 min

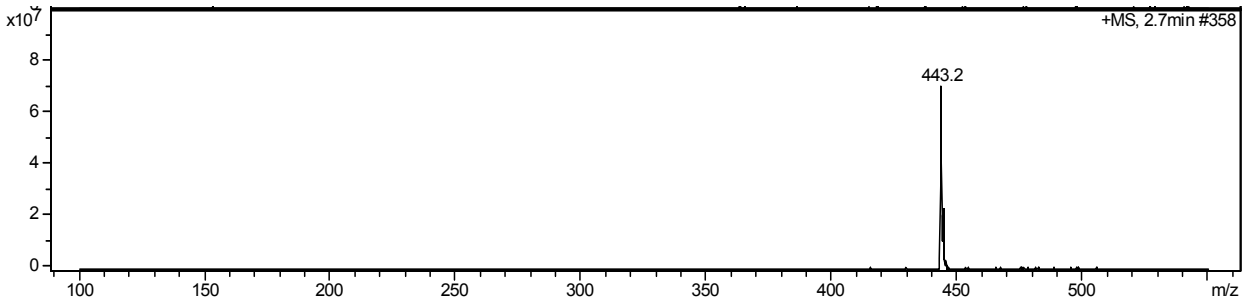


Fig. S7. TOC data of RhB aqueous solution after photodegradation for 2 hour.