Supplementary material (ESI) for Journal of Materials Chemistry

Electronic Supplementary Information

for

Unprecedented application of lead zirconate titanate in degradation of Rhodamine B under visible light irradiation

Fig. S1. UV-Vis diffuse reflection spectra of different photocatalysts, (a) TiO_2 (b) PZT / TiO_2 (5% PZT) (c) PZT (d) Band gap of PZT. The adsorption of visible light (from 400 nm to 800 nm) to PZT / TiO_2 composite are clearly more than TiO_2 itself. The plot of transformed Kubelka-Munk function versus the energy of light for PZT affords band gap energies of 2.5 eV. [1]

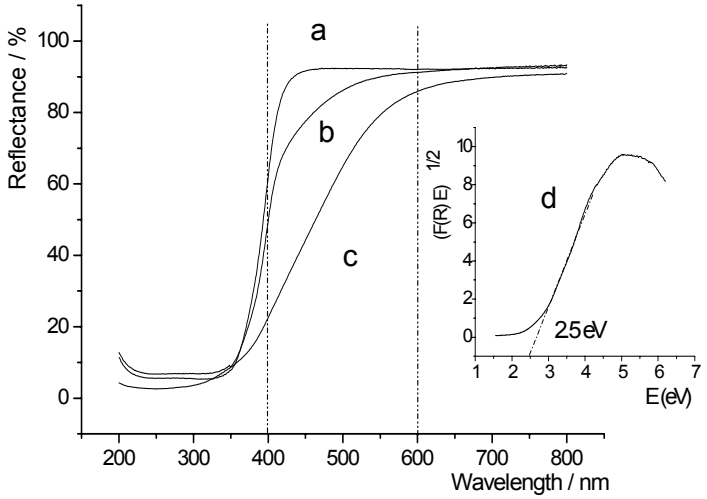


Fig. S2. Degradation of RhB with PZT / TiO_2 (5 mol% PZT) and TiO_2 in dark. There are almost no variance of after 40 minutes which can be seen from the figure. The concentration of Rhodamine B with PZT/TiO_2 is a little more than Rhodamine B with TiO_2 after 40 minutes.

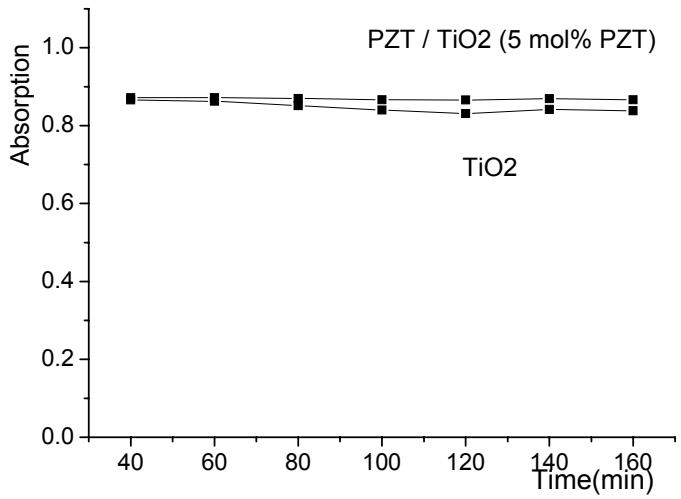


Fig. S3. UV-Vis transmission spectra of two filters which are set between light source and pyrex glass vessel. Apparently, no ultraviolet ray will be permeated.

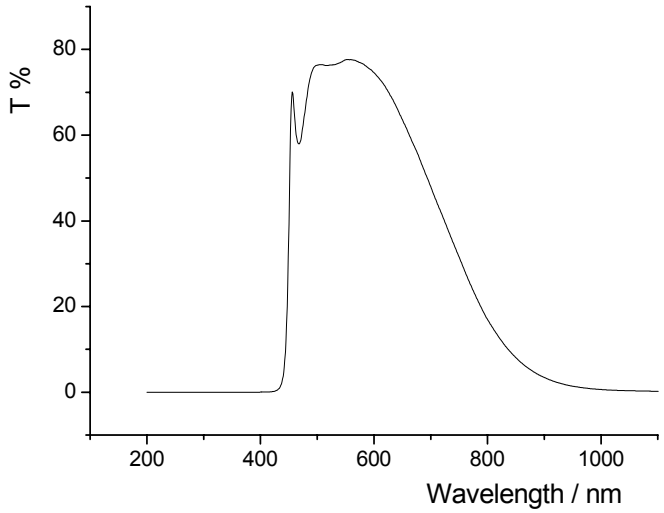


Fig. S4. X-ray powder diffraction patterns, (a) PZT; (b) PZT / TiO_2 (5% PZT), (c) self-made TiO_2.

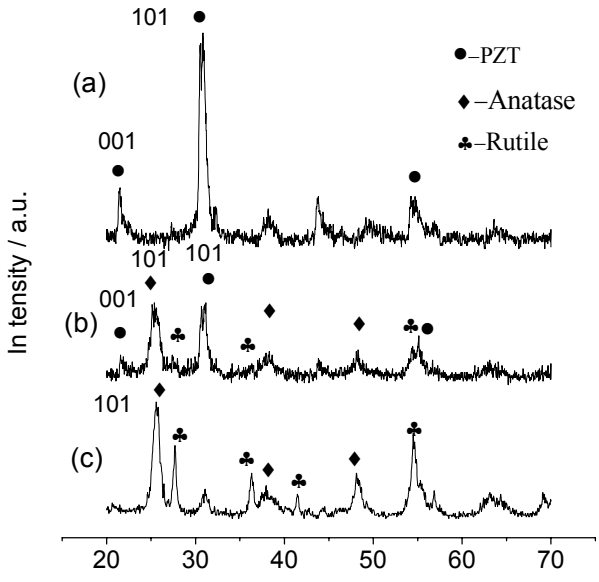
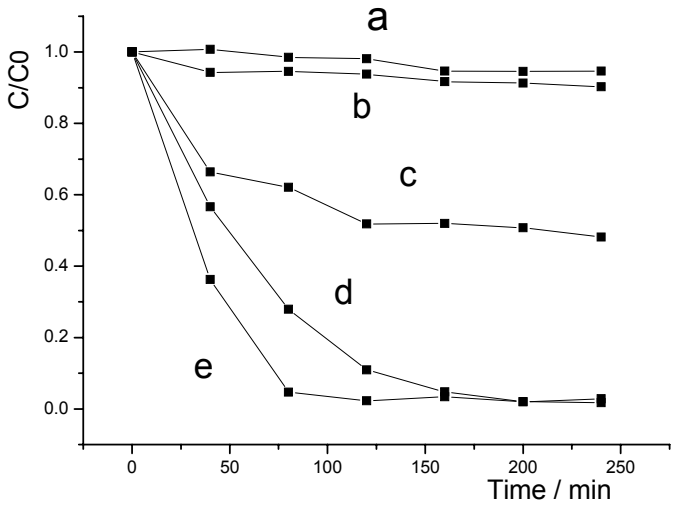


Fig. S5. The influence of H_2O_2 in Photocatalytic degradation of RhB on PZT / TiO_2 composite in aqueous solution. (a) PZT / TiO_2 (5%) with 0.2ml H_2O_2 in dark; (b) RhB with 0.2 ml H_2O_2 under visible light. (c) PZT with 0.2 ml H_2O_2 under visible light. (d) PZT / TiO_2 (5%) unde visible light; (e) PZT / TiO_2 (5%) with 0.2ml H_2O_2 under visible light. Either the experiment is conducted in dark or solely with H_2O_2 under visible light, there are almost no degradation can be found from the figure. However, a remarkable decrease of concentration of RhB can be observed during visible irradiation. Especially, The activity of compostie was obviously increased with only a little of H_2O_2.



Reference

1 Wei Zhao, Wanhong Ma, Chuncheng Chen, Jincai Zhao, and Zhigang Shuai, *J. Am. Chem. Soc.,* 2004, **126**, 4782.