Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Bicrystalline TiO_2 heterojunction for enhanced organics photodegradation: engineering and exploring surface chemistry

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1. Photocurrent measurement

Photocurrent was measured on CHI660D electrochemical workstation with a standard three-electrodes system, including a counter electrode (graphite), a reference electrode (standard calomel) and a working electrode (the as-prepared samples). The electrolyte was 0.5 mol/l sodium sulfate solution. The light source was 300W xenon lamp (PLS-SXE300, Beijing Trust-tech Co., Ltd., China). To prepare working electrodes, 6 mg catalyst was dispersed into 1ml deionized water, sonicated for 30min to make slurry. 120 µl slurry was coated on a fluorine-tin oxide (FTO) glass substrate by drop casting. After the slurry was dried naturally, photocurrent measurement was measured by switching light on/off at a given interval of 50 seconds.

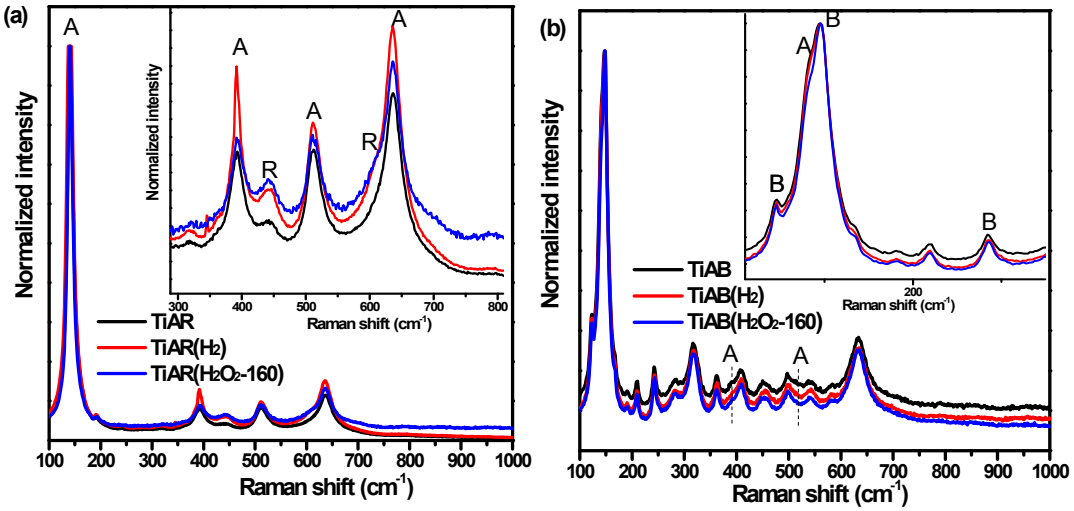

Figure S1. Raman patterns for TiAR and TiAB samples treated by H_2 and H_2O_2

Consistent with XRD results, Raman spectra of TiAR-based samples (Figure 3a) exhibited five characteristic Raman-active modes for anatase and three for rutile phase. TiAB-based samples (Figure 3b) showed multiple-peaks that were related to the 36 Raman-active modes of a typical brookite phase. One can also clearly find that there were three small shoulders at 140 cm^{-1}, 395 cm^{-1}, and 510 cm^{-1} for anatase, directly supporting XRD results that TiAB-based samples were dominated by brookite phase with a small fraction of anatase.

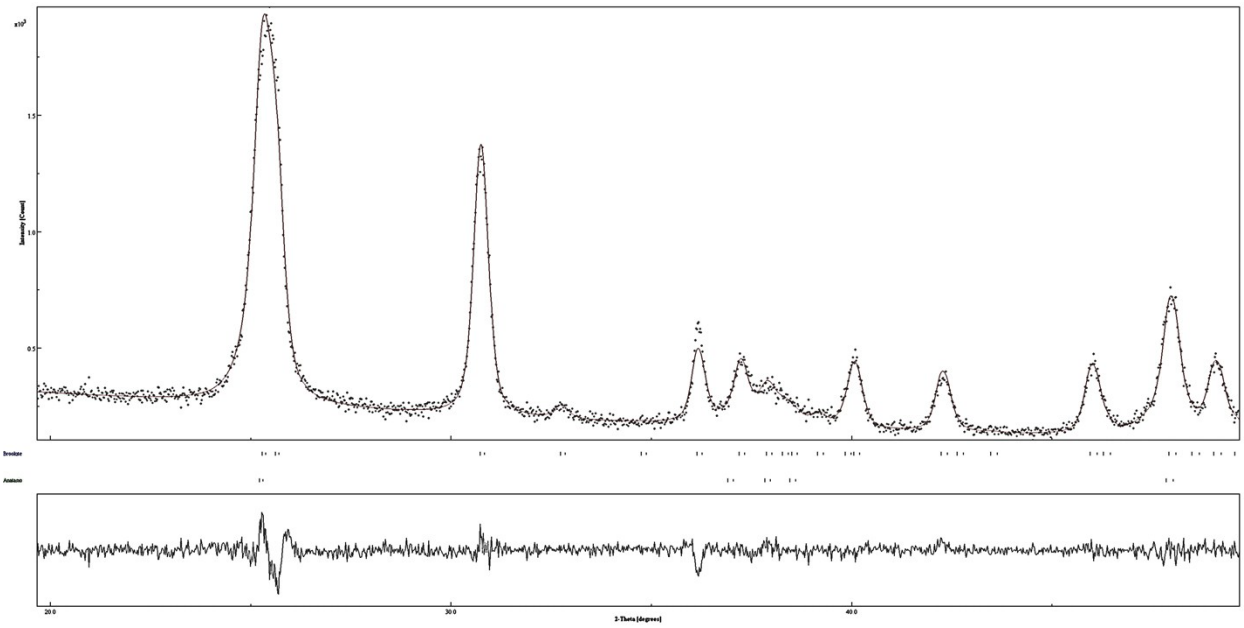

Figure S2. Rietveld refinement result for the TiAB sample – solid line: fitting curve; black dots: experimental data; bottom panel: goodness of fitting (GOF).

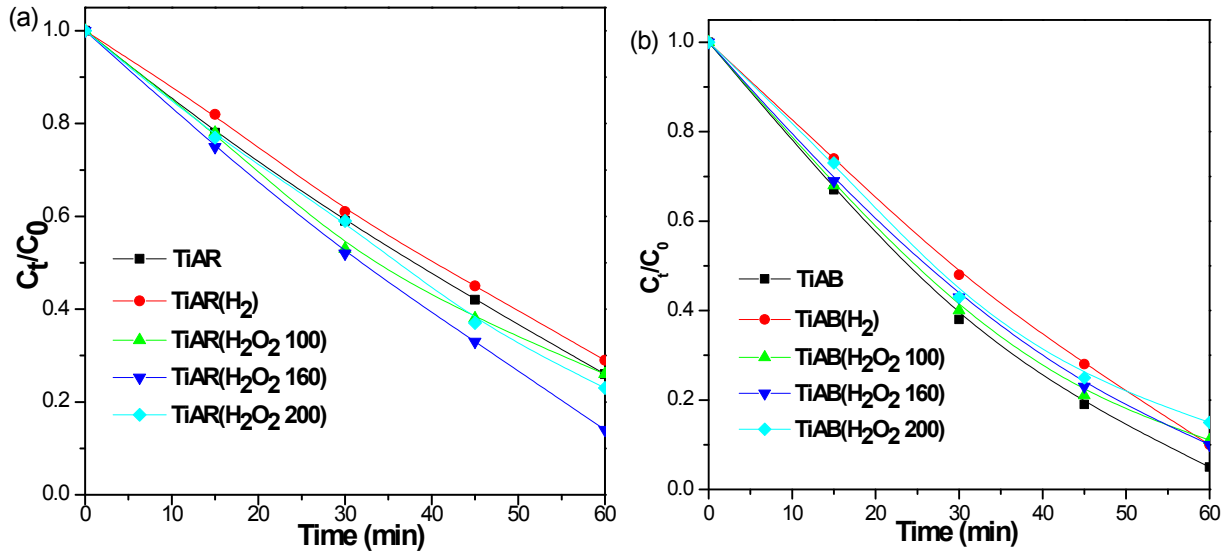

Figure S3. Photocatalytic performance of (a) TiAR- and (b) TiAB-based samples for degradation of methylene blue (MB) under UV-Vis irradiation