

Supporting Materials for:

Opposite photocatalytic activity order of low-index facets of anatase

TiO₂ for liquid phase dye degradation and gaseous phase CO₂

photoreduction

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Photoactivity test of •OH generation

The photocatalytic activity was evaluated with 300 W high pressure mercury lamp ($\lambda = 365$ nm, Changzhou Yuyu Electro-Optical Device Co., Ltd. China) irradiation. The photocatalytic process is arranged with following way: 50 mL solution of terephthalic acid (TA) (5×10^{-4} mol/L) and NaOH (2×10^{-3} mol/L) mixed solution was transferred to a quartz glass beaker, and then 10 mg TiO₂ samples were added to the above beaker. Prior to irradiation, the suspensions can be get desorption-adsorption equilibrium with ultrasonic treatment for 10 min and then magnetically stirred in dark for 30 min. The suspensions were kept under constant air-equilibrated conditions with magnetic stirring during irradiation. At certain time intervals, 4 mL suspensions were centrifuged by centrifuge (TGL-16G, Shanghai Anting Scientific Instrument Factory, China) at 10000 rpm for 15 min to remove the TiO₂ nanoparticles. The upper clear liquid of TA was analyzed by recording the maximum PL peak (426 nm for TAOH) and PL spectra of dyes using a Shimadzu spectrofluorophotometer (RF-5301pc) with $\lambda_{\text{exc}} = 315$ nm.

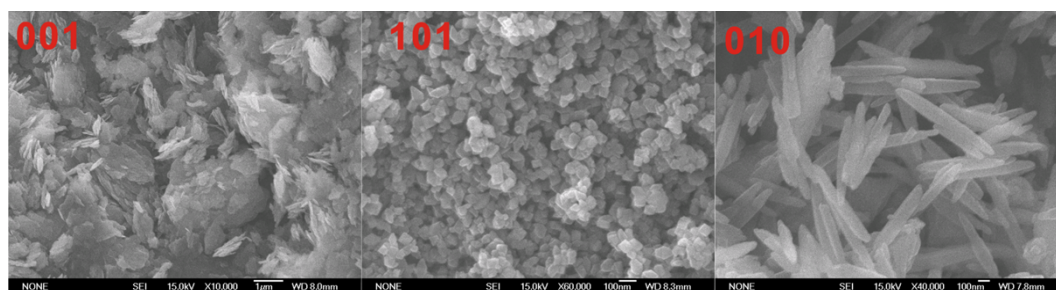


Figure S1. SEM images of the samples with different facets.

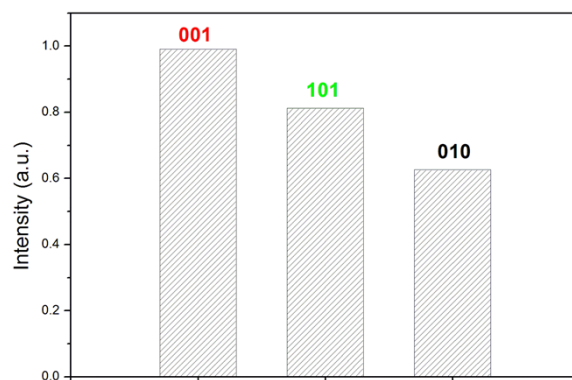


Figure S2. Photocatalytic orders upon for RhB normalization by the surface area.

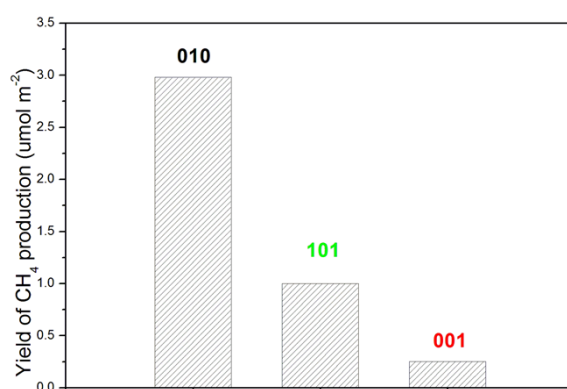


Figure S3. Photocatalytic orders upon for CO₂ photoreduction normalization by the surface area.

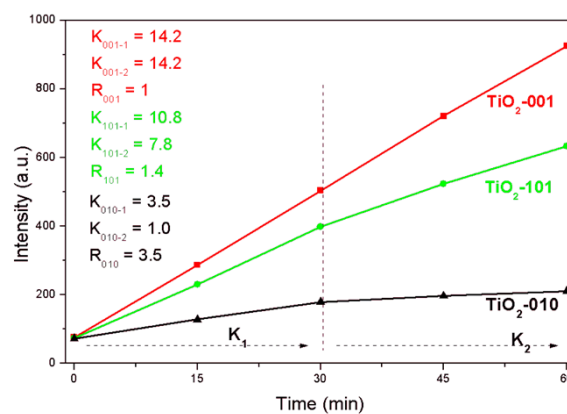


Figure S4. Photocatalytic activity of {101}, {001} and {010} single facets anatase TiO₂ for •OH generation activity

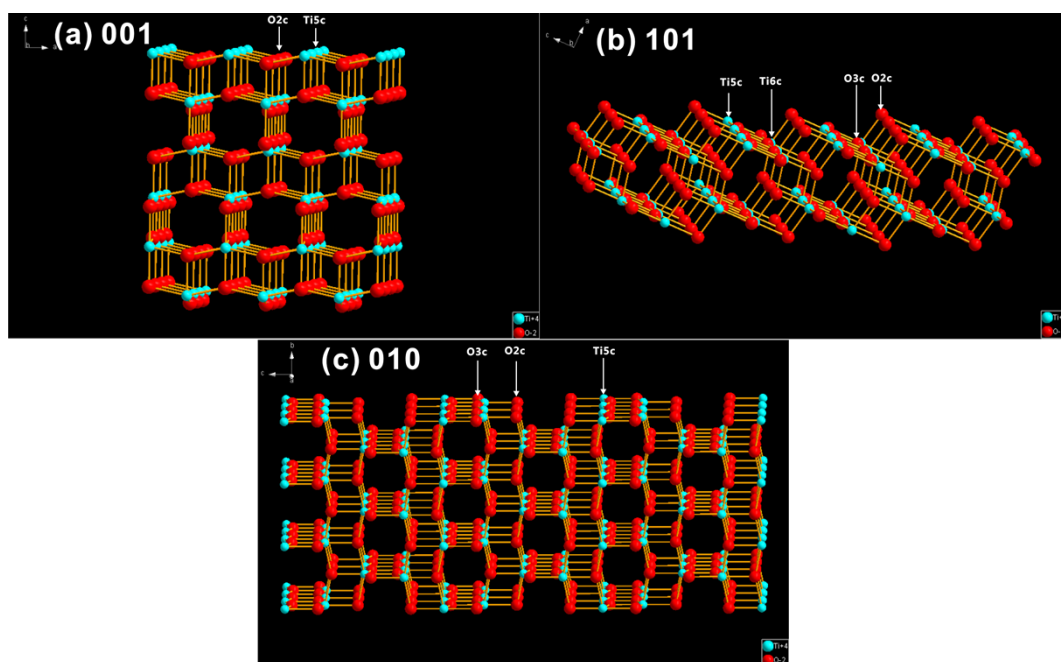


Figure S5. Surface atomic structure of $\{001\}$, $\{101\}$ and $\{010\}$ facets.