

Supplementary Information

Hydrothermal synthesis and formation mechanism of the anatase nanocrystals with co-exposed high-energy {001}, {010} and [111]-facets for enhanced photocatalytic performance

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Table S1. Crystal phase, Morphology, Exposed Facet, Crystal Size, and Surface Area for TiO₂ Nanocrystals.

sample	crystal phase	morphology	exposed facet	Crystal size ^a (nm)	S _{BET} (m ² /g)
P25- TiO ₂	anatase /rutile	cuboid /near-spherical	[111]-facet	21.9	49.7
T130- TiO ₂	anatase	cuboid	—	27.0	12.8
T140- TiO ₂	anatase	cuboid /truncated bipyramid	—	32.9	15.9
T150- TiO ₂	anatase	cuboid /truncated bipyramid	{001} and {010}	34.2	15.3
T160- TiO ₂	anatase	cuboid /truncated bipyramid	{001}, {010}, and [111]-facet	37.9	15.0
T170- TiO ₂	anatase	cuboid /truncated bipyramid	{001}, {010}, and [111] -facet	38.4	10.5
T180- TiO ₂	anatase	cuboid /truncated bipyramid	{001}, {010}, and [111]-facet	40.5	6.3

^a Average crystal size was calculated by applying the Debye-Scherrer formula¹ to (101) plane at $2\theta = 25.3^\circ$, and k was set as 0.94 without consideration the crystal morphology.

1. Cullity, B. D. *Elements of X-Ray Diffraction*; Addison-Wesley: Reading, MA, 1978.

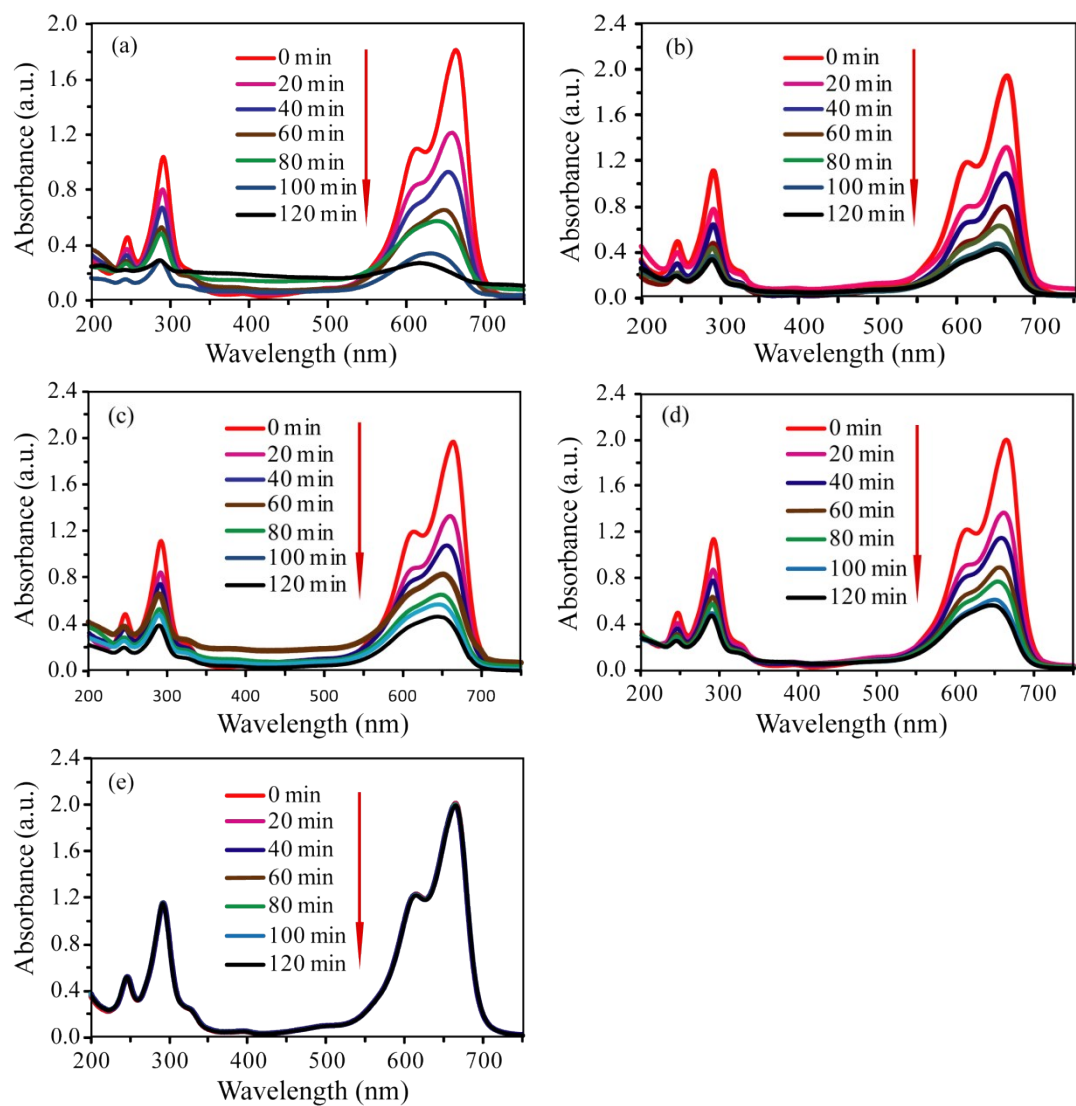


Fig. S1 UV-visible absorption spectra changes of methylene blue solution as a function of irradiation time in the presence of (a) P25-TiO₂, (b) T150-TiO₂, (c) T170-TiO₂, (d) T180-TiO₂ and (e) absence of TiO₂ nanocrystals catalyst.