Supporting Information

for

Enhanced visible light responsive photocatalytic activity of TiO_2-based nanocrystallites: impact of doping sequence

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Table S1. The molecular structure and spectroscopic information of the tested dyes

Dye	Electric property	Molecular structure	Molecular weight	λ_{max} (nm)	Molar extinction coefficient ($L \cdot mol^{-1} \cdot cm^{-1}$)
AO7	Anionic	azo	350.32	484	15400
MO	Anionic	azo	327.33	463	25500
ARS	Anionic	anthroquinone	342.26	423	3300
BO	Cationic	azo	248.71	442	15300
MG	Cationic	triphenylmethane	364.92	617	43500
RhB	Cationic	triphenylmethane	479.01	552	88400

Figures

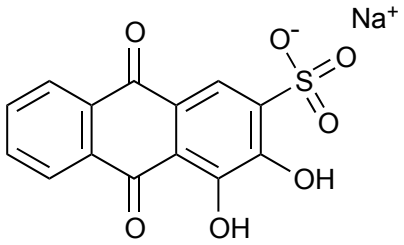
Fig. S1. Molecular structures of the tested dyes.

Fig. S2. XRD patterns of the four doped TiO_2 nanocrystallites.

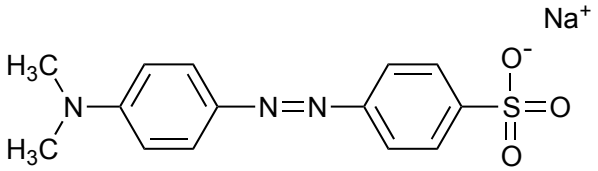
Fig. S3. Particle size distribution of the four doped TiO_2 nanocrystallites.

Fig. S4. Correlation of photocatalytic activity with (a) dopant content, (b) crystallite size, (c) particle size, and (d) specific surface area. Scatter: experimental data, line: linear fitting.

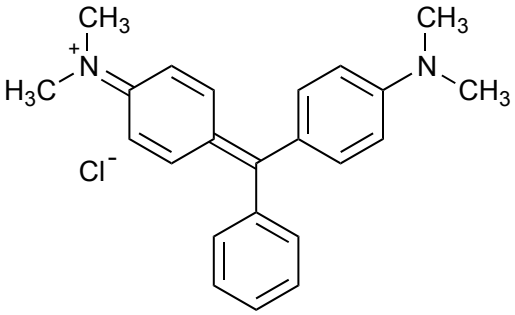
Fig. S5. Zeta potential of the four TiO_2 nanoparticles as a function of solution pH.



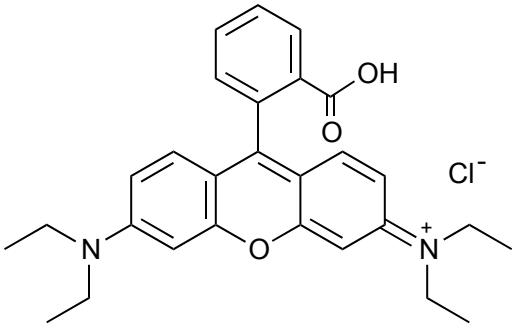
ARS



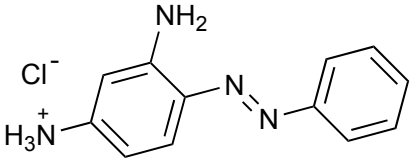
MO



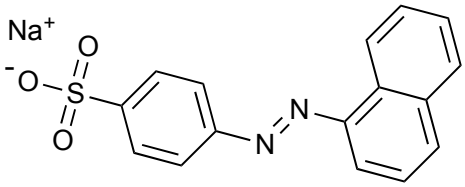
MG



RhB



BO



AO7

Fig. S1

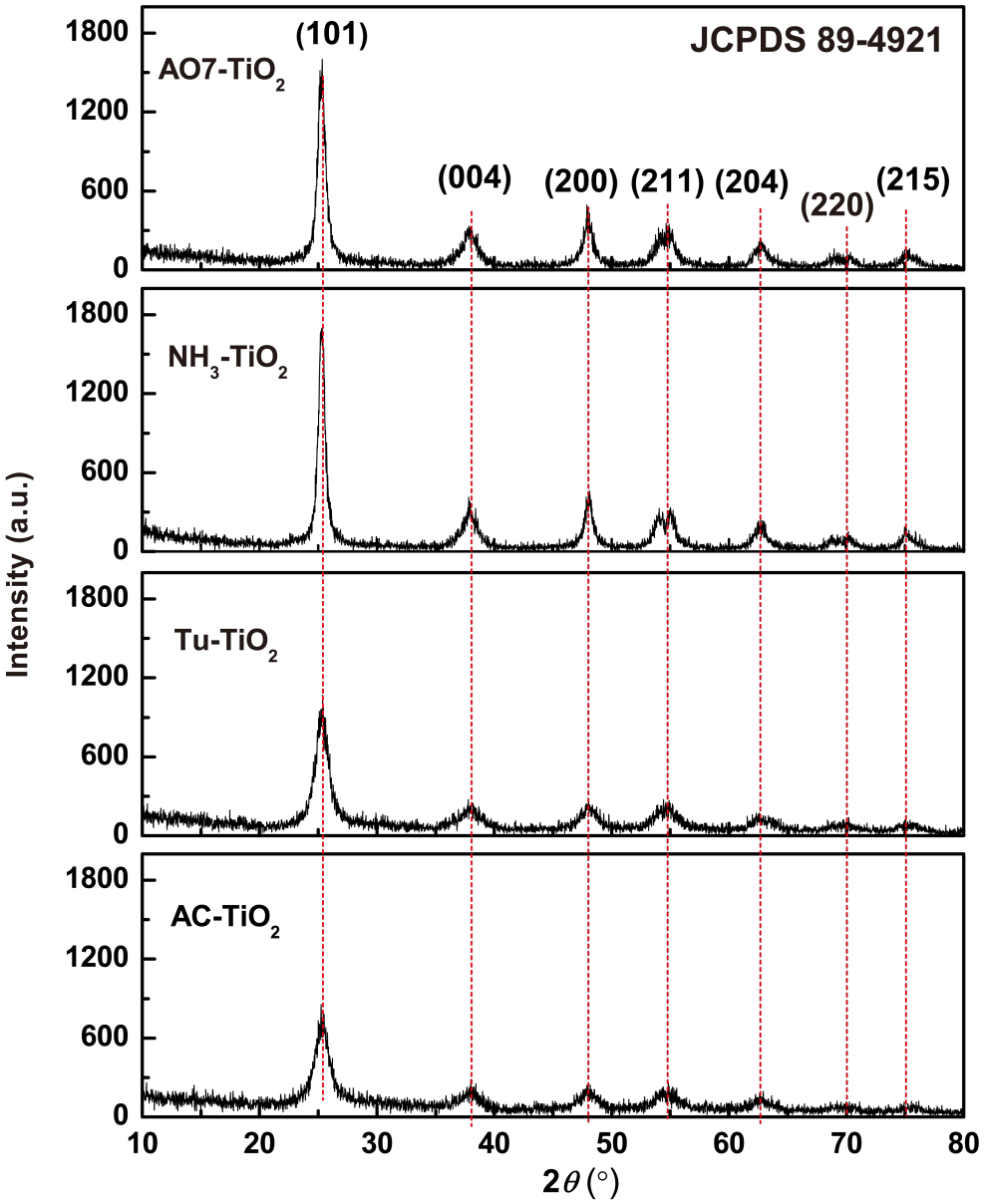

JCPDS 89-4921
(101)
(004)
(200)
(211)
(204)
(220)
(215)
AO7-TiO2
NH3-TiO2
Tu-TiO2
AC-TiO2
Intensity (a.u.)
2θ (°)
0
600
1200
1800
10
20
30
40
50
60
70
80

Fig. S2

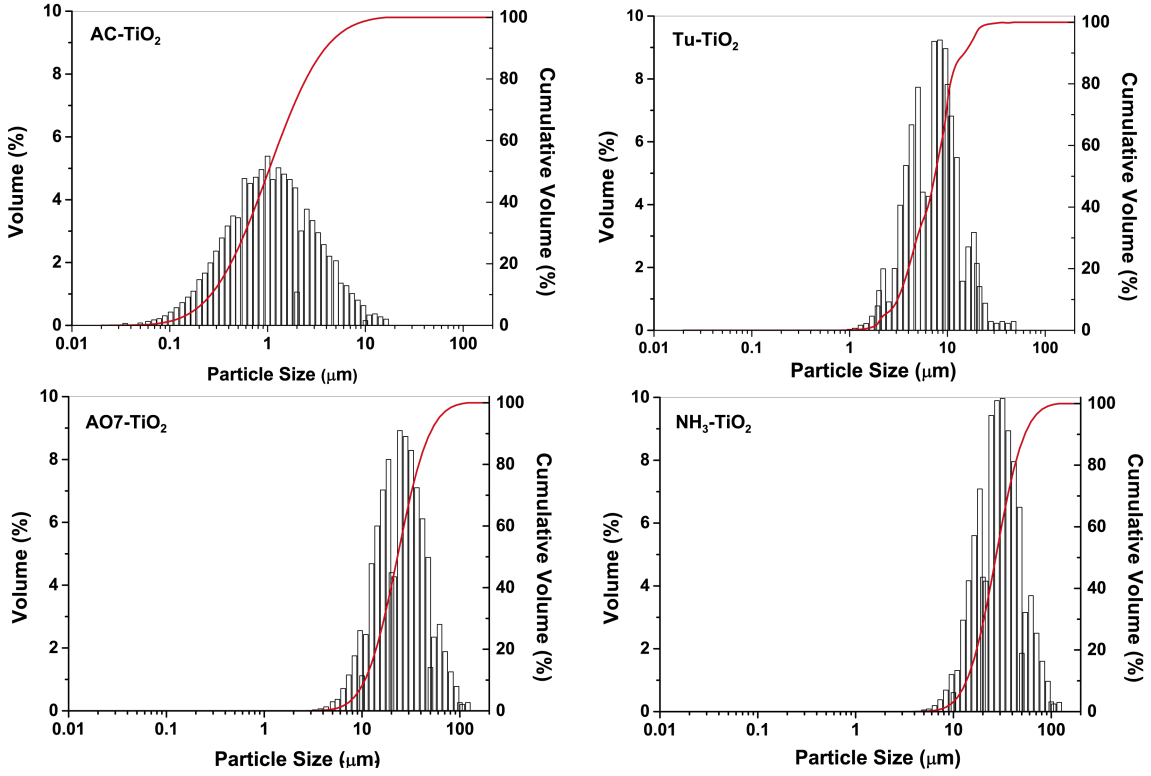

AC-TiO2
Tu-TiO2
AO7-TiO2
NH3-TiO2
Volume (%)
Cumulative Volume (%)
Particle Size (μm)
0.01
0.1
1
10
100
0
2
4
6
8
10
0
20
40
60
80
100

Fig. S3

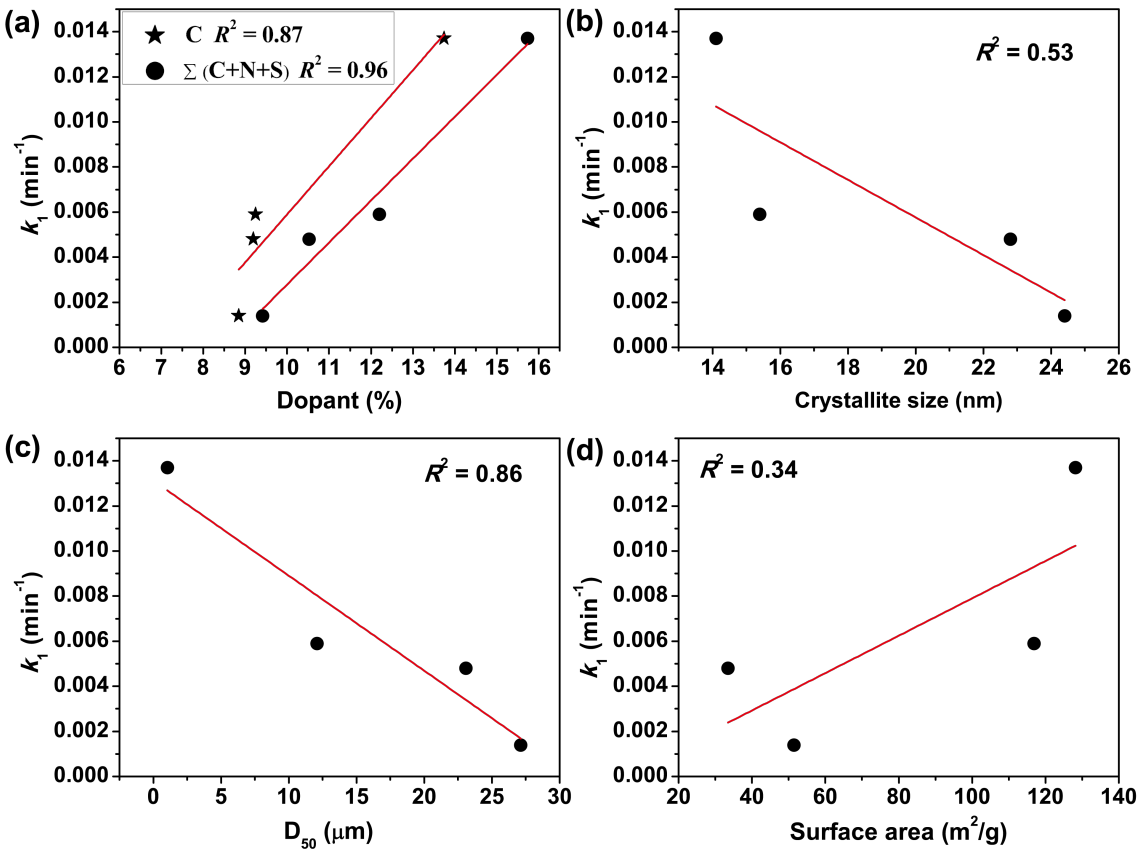

(a)
C $R^2 = 0.87$
Σ (C+N+S) $R^2 = 0.96$
k_1 (min^{-1})
Dopant (%)
(b)
$R^2 = 0.53$
k_1 (min^{-1})
Crystallite size (nm)
(c)
$R^2 = 0.86$
k_1 (min^{-1})
D_{50} (μm)
(d)
$R^2 = 0.34$
k_1 (min^{-1})
Surface area (m^2/g)

Fig. S4

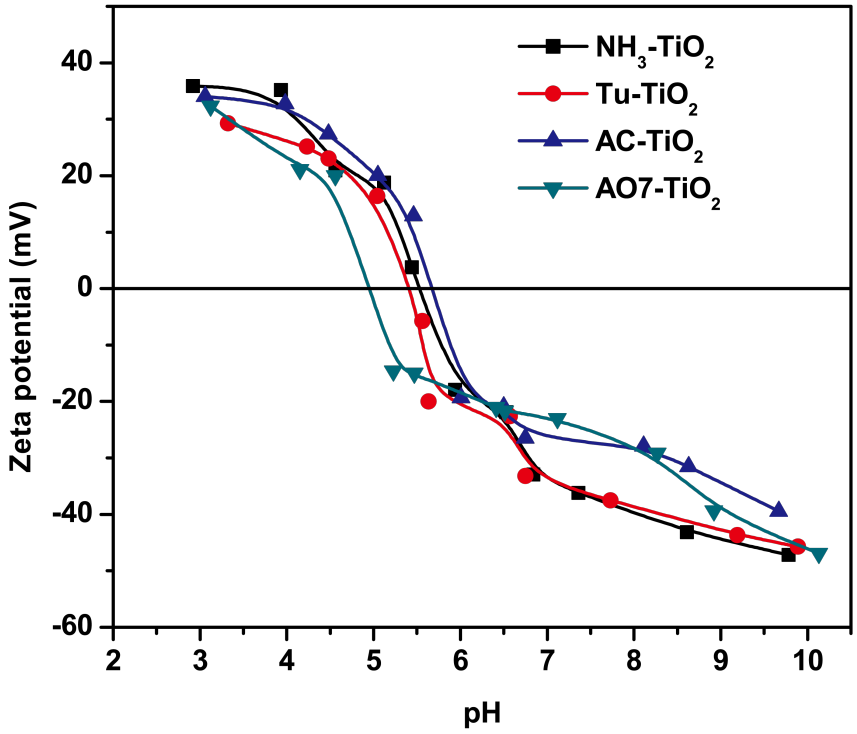

NH3-TiO2
Tu-TiO2
AC-TiO2
AO7-TiO2
Zeta potential (mV)
pH
40
20
0
-20
-40
-60
2
3
4
5
6
7
8
9
10

Fig. S5