Electronic Supplementary Material (ESI) for RSC Advances.

SUPPORTING INFORMATION

Three Way Electron Transfer of C-N-S Tri Doped Two-Phase Junction of TiO_2 Nanoparticles for Efficient Visible Light Photocatalytic Dye Degradation

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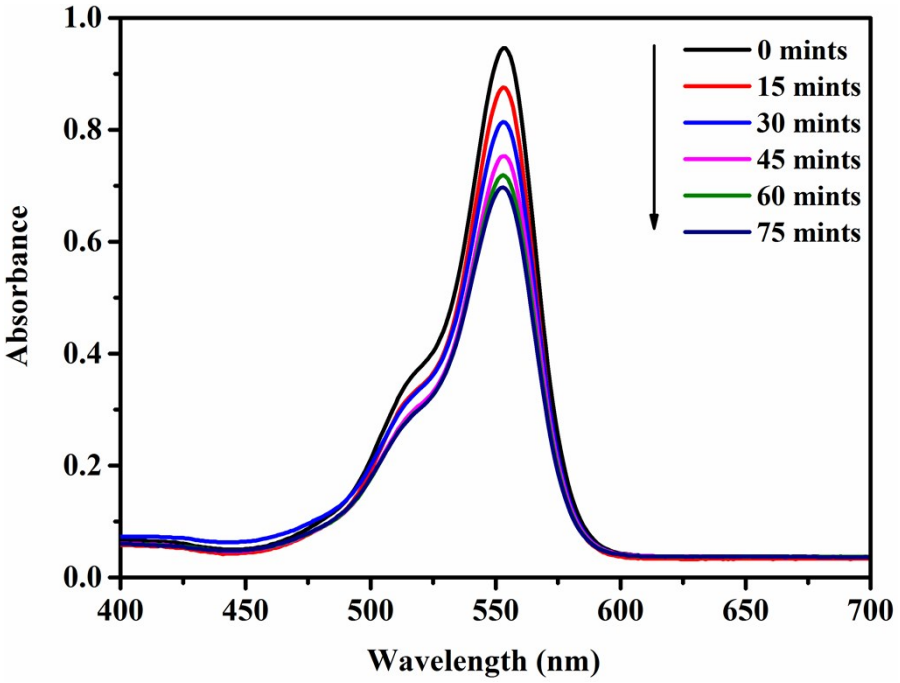

Figure S1. Adsorption – Desorption equilibrium determination of D4 sample under dark with different run time

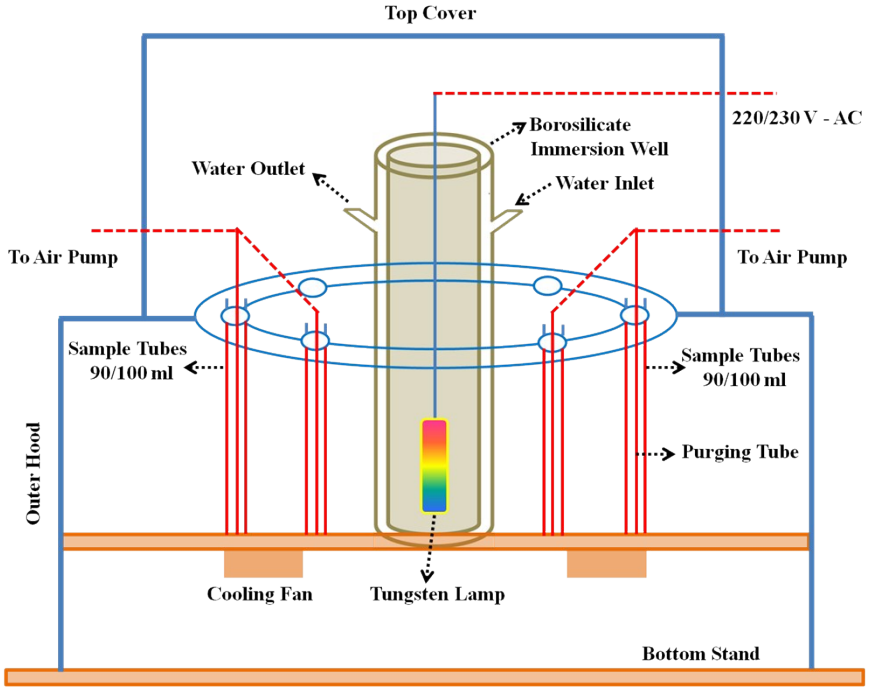

Figure S2. Schematic picture of photocatalytic reactor

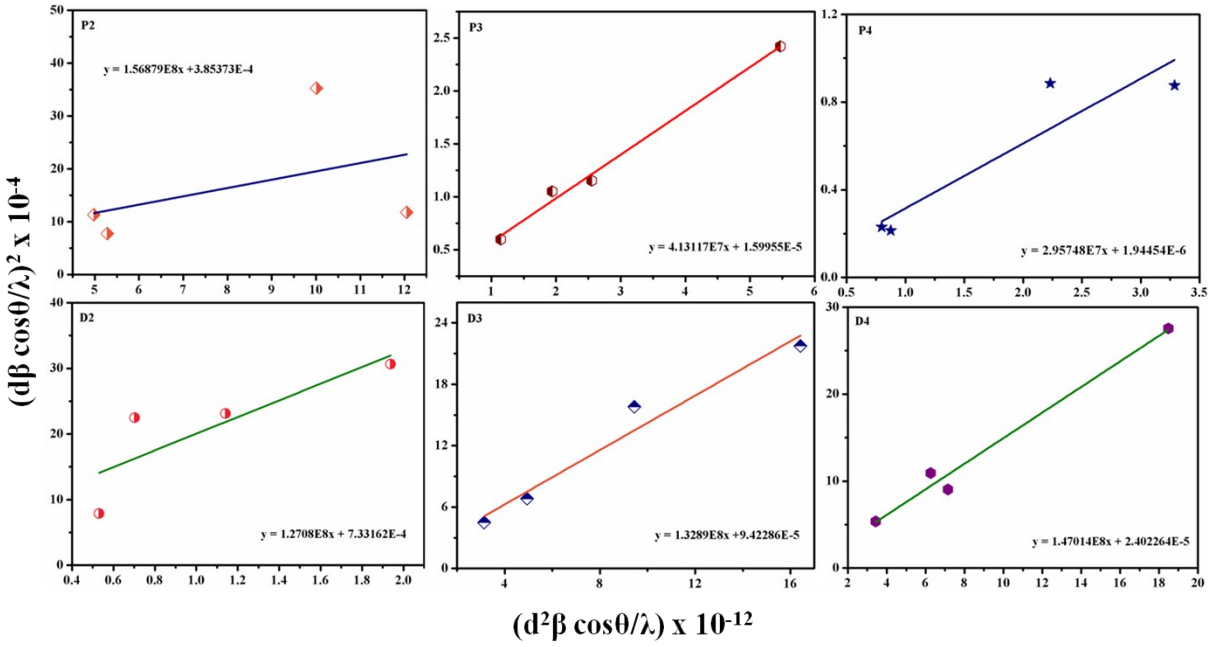

Figure S3. SSP – plot of undoped and C-N-S doped TiO_2 nanoparticles with different annealing temperature.

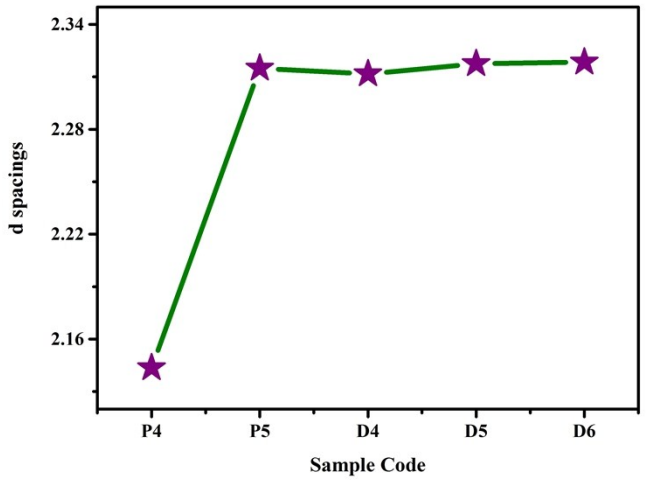

Figure S4. d-spacing variation of undoped and C-N-S doped TiO_2 nanoparticles.

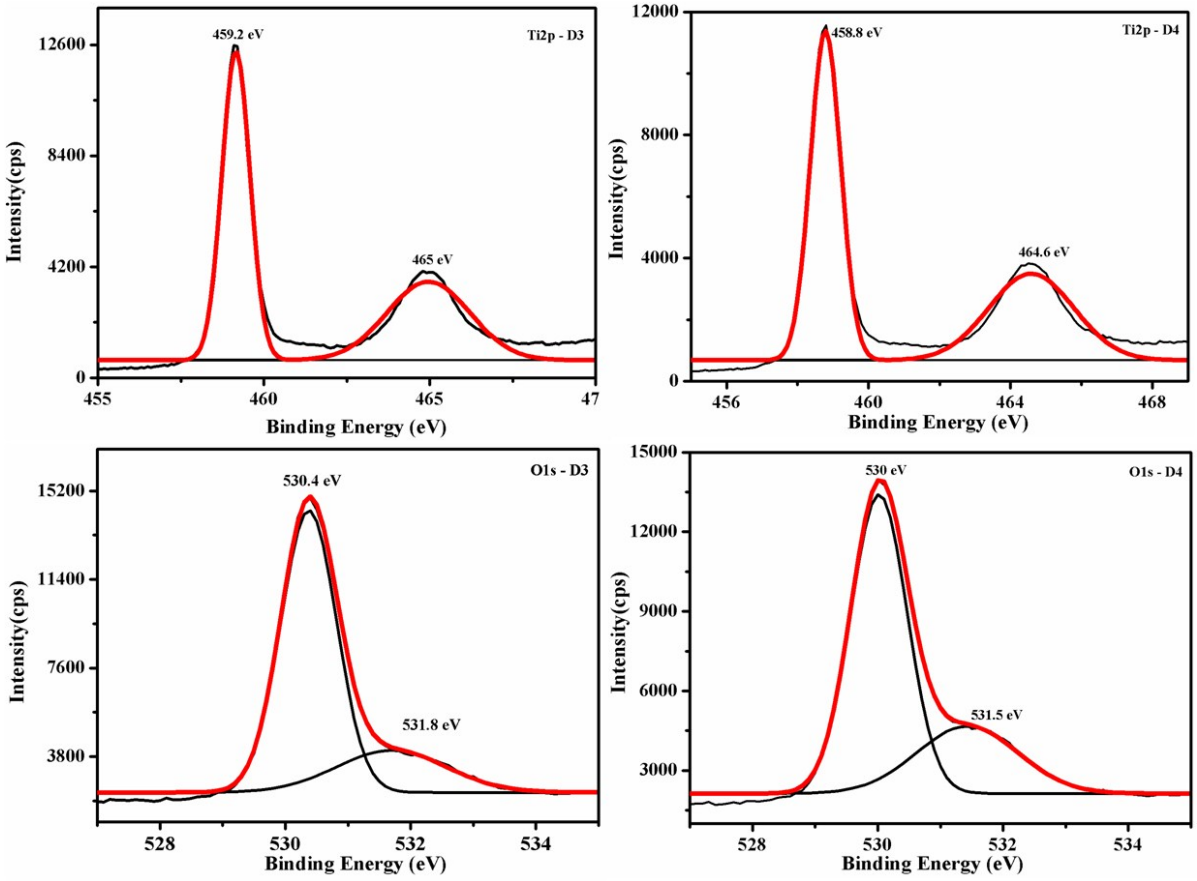

Figure S5. Ti 2p and O 1s XPS spectra of D3 and D4.

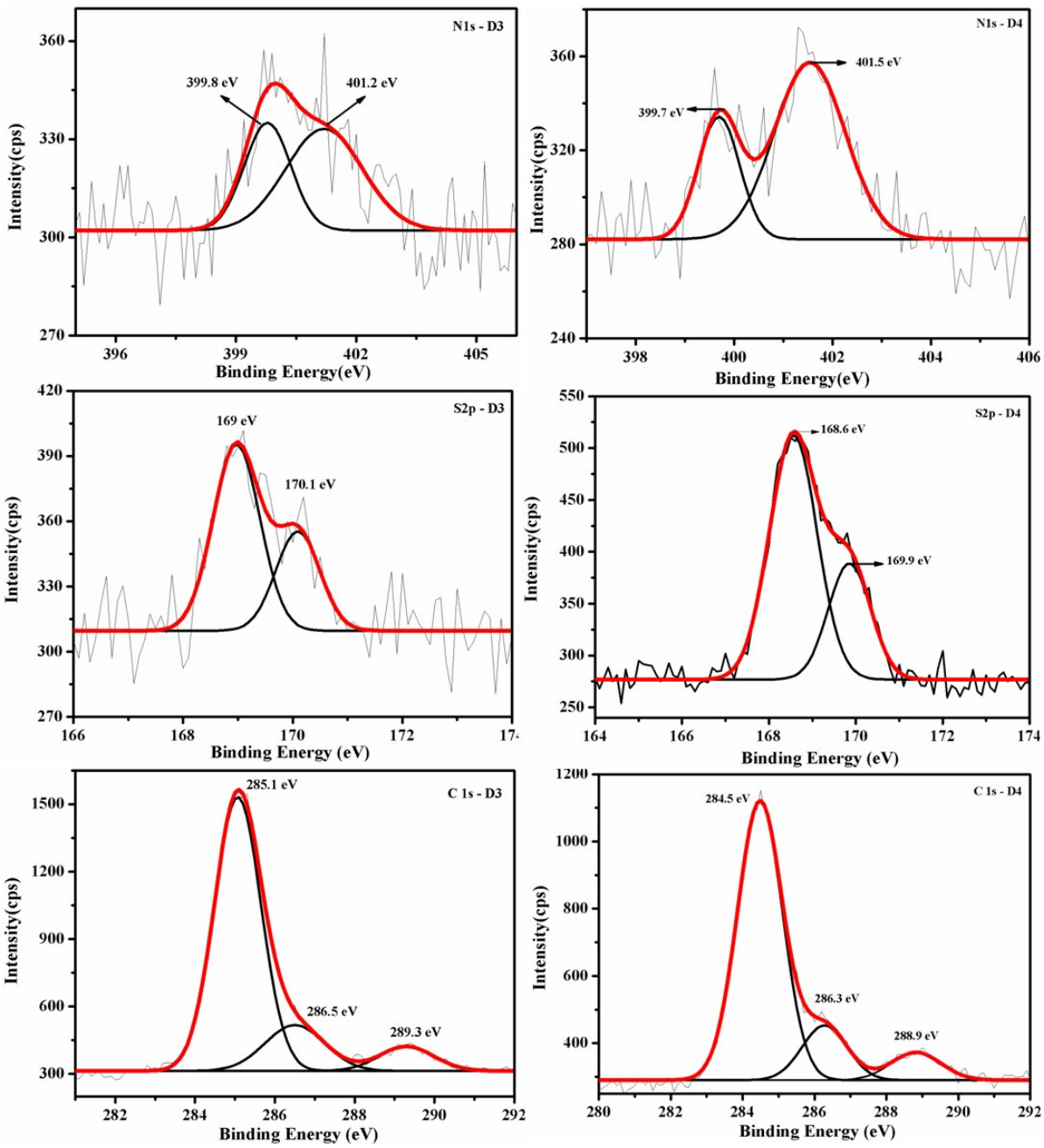

Figure S6. N 1s, S 2p and C 1s XPS spectra of D3 and D4.

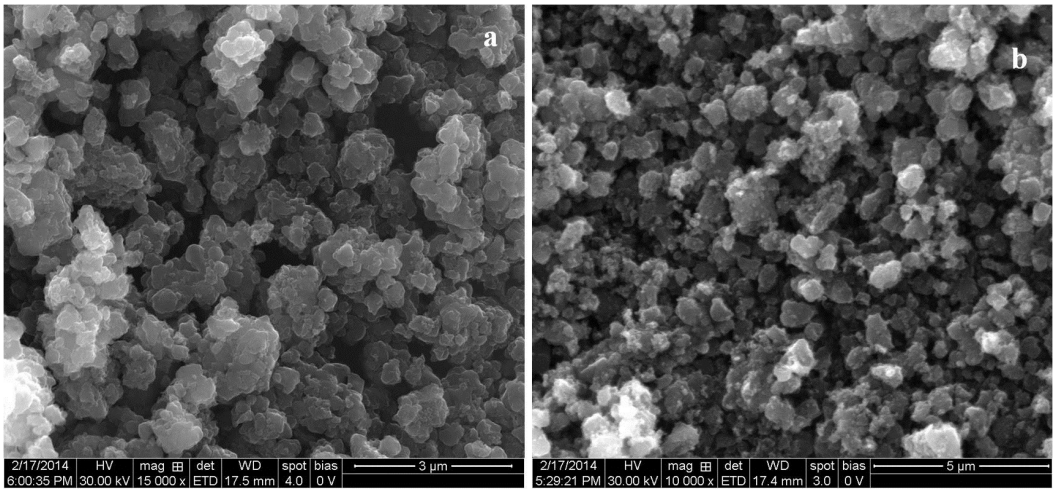

Figure S7. FESEM images of (a) P6 and (b) D6 catalysts.

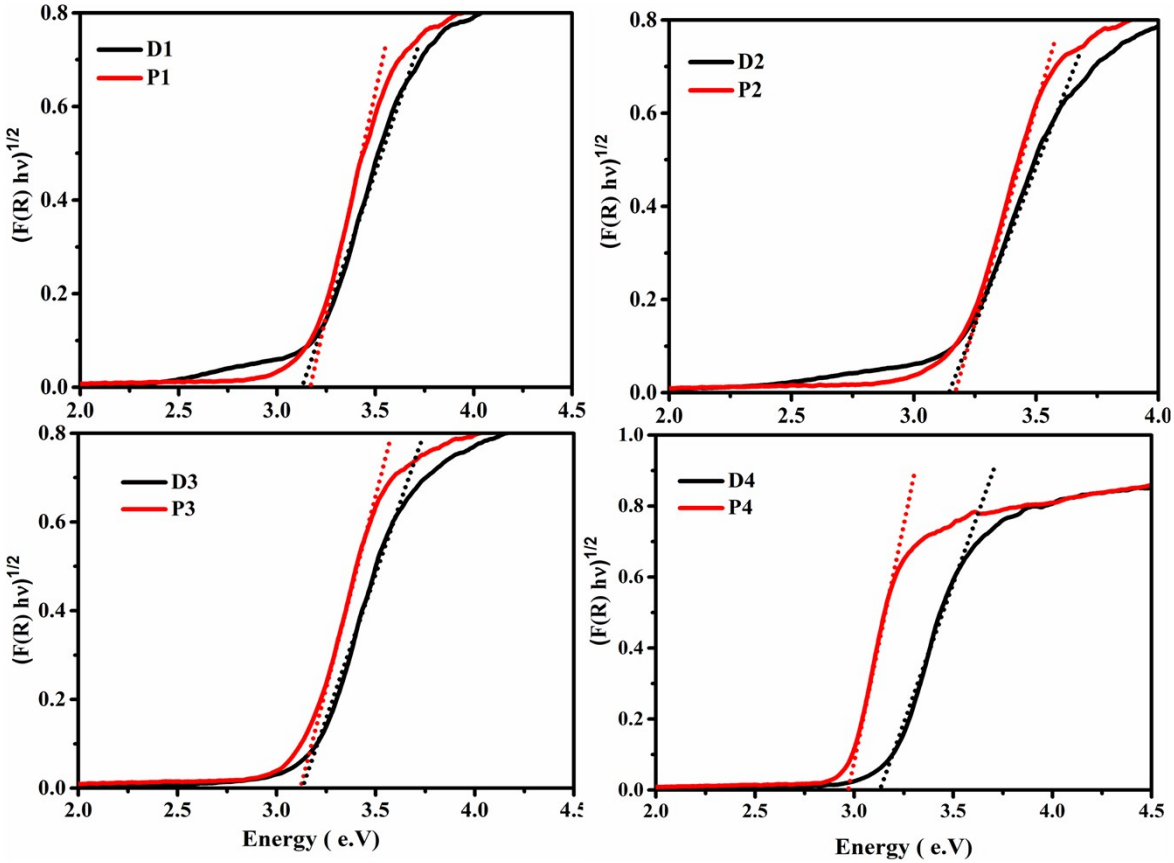

Figure S8. Bandgap determination of undoped and C-N-S doped TiO_2 nanoparticles with different annealing temperature using Kubelka – Munk function

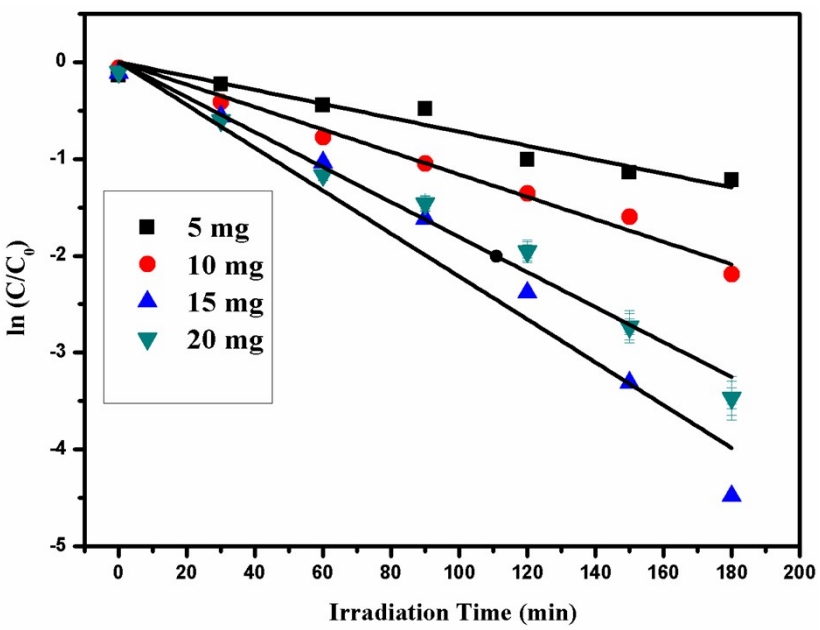

Figure S9. Kinetics of catalyst optimization of D4 sample

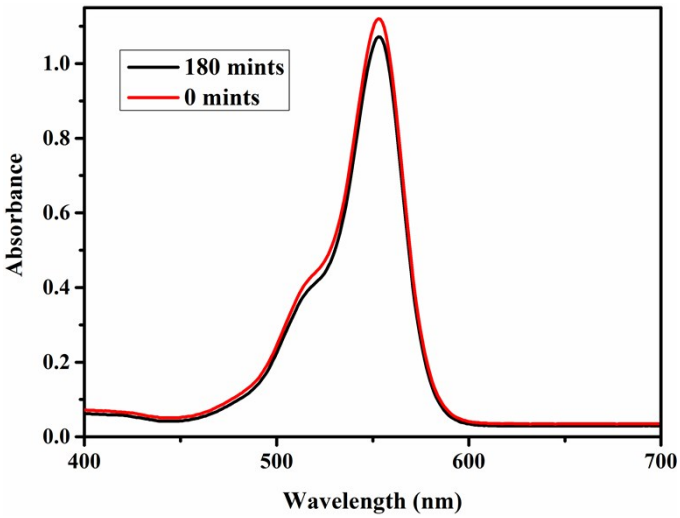

Figure S10. Absorbance spectra of Rh B without catalyst

Table S1. Lattice parameters and the grain size of the synthesized TiO_2 nanoparticles

Sample	Lattice parameter (Å)		Anatase (%)	Rutile (%)
	a	c		
P1	a = 3.79	c = 9.45	100	-
P2	a = 3.79	c = 9.41	100	-
P3	a = 3.78	c = 9.51	100	-
P4	a = 4.59	c = 2.96	14	86
D1	a = 3.79	c = 9.42	100	-
D2	a = 3.78	c = 9.41	100	-
D3	a = 3.81	c = 9.48	100	-
D4	a =3.79	c = 9.56	88	12

Table S2. Atomic percentage of C-N-S doped TiO_2 nanoparticles with different annealing temperatures.

Sample	Atomic concentration (%)				
	Ti 2p	O 1s	N 1s	S 2p	C 1s
D3	19.46	46.35	1.42	1.68	31.09
D4	21.73	55.33	1.51	2.04	19.4