

Table S1 Content of each element ratio in different samples.

Element	Atomic %		
	La-TiO ₂ @g-C ₃ N ₄	TiO ₂ @g-C ₃ N ₄	g-C ₃ N ₄
C K	29.19	32.43	42.93
N K	46.48	48.95	57.07
O K	13	10.73	
Ti K	7.48	7.89	
La K	3.85		

Table S2 Effects of La content on the physical properties of La-TiO₂@g-C₃N₄ samples.

Sample	S _{BET} (m ² /g)	Average pore size (nm)	Pore Volume (cm ³ /g)
La-TiO ₂ @g-C ₃ N ₄	14.2	13.98	0.046
g-C ₃ N ₄	7.3	32	0.027
TiO ₂	43.1	7.1	0.035

Table S3 Reaction rate constants and their correlation coefficients under different operating conditions

No.	Vis	Gas	4% La/TiO ₂ @g-C ₃ N ₄	PDS (mmol/L)	pH ₀	C ₀ (mg/L)	TBA (mmol/L)	EtOH (mmol/L)	BQ (mmol/L)	K ₂ Cr ₂ O ₇ (mmol/L)	EDTA (mmol/L)	<i>k</i> (min ⁻¹)	r ²
1		Air	0.5	6	6	20						0.0095	0.99
2	√	Air	0.5		6	20						0.0055	0.99
3	√	Air	0.5	6	6	20						0.083	0.99
4	√	Air	0.2	6	6	20						0.048	0.98
5	√	Air	1.0	6	6	20						0.091	0.97
6	√	Air	1.5	6	6	20						0.099	0.93
7	√	Air	0.5	6	3	20						0.033	0.99
8	√	Air	0.5	6	5	20						0.042	0.98
9	√	Air	0.5	6	7	20						0.069	0.99
10	√	Air	0.5	6	9	20						0.026	0.99
11	√	Air	0.5	6	6	10						0.145	0.99
12	√	Air	0.5	6	6	20						0.116	0.99
13	√	Air	0.5	6	6	40						0.064	0.99
14	√	Air	0.5	6	6	20	10					0.066	0.98
15	√	Air	0.5	6	6	20		10				0.031	0.98
16	√	Air	0.5	6	6	20			10			0.050	0.97
17	√	Air	0.5	6	6	20				10		0.062	0.99
18	√	Air	0.5	6	6	20					10	0.055	0.99
19	√	O ₂	0.5	6	6	20						0.102	0.99
20	√	N ₂	0.5	6	6	20						0.0304	0.99