

Supporting Information

Enhanced photocatalytic removal of bromate in drinking water by Au/TiO₂ under ultraviolet light

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Table S1. Characteristics of tap water.

Parameter	
pH	7.62
Turbidity (NTU)	0.15
DOC (mg/L)	1.31
UV ₂₅₄ (cm ⁻¹)	0.011
DO (mg/L)	7.85
Chloride (mg/L)	19.2
Nitrate (mg N/L)	1.3
Sulfate (mg/L)	29.1
Bromide (µg/L)	15.5
Bromate (µg/L)	< 2.5

Table S2. Rate constants (k) and the correlation coefficients (R²) of linear least squares regression for the photo-reduction data of BrO₃⁻ over different photocatalysts.

Catalyst	k(min ⁻¹)	R ²
TiO ₂	0.0163	0.991
0.5% Au/TiO ₂	0.0405	0.995
1% Au/TiO ₂	0.0707	0.977
5% Au/TiO ₂	0.0327	0.994

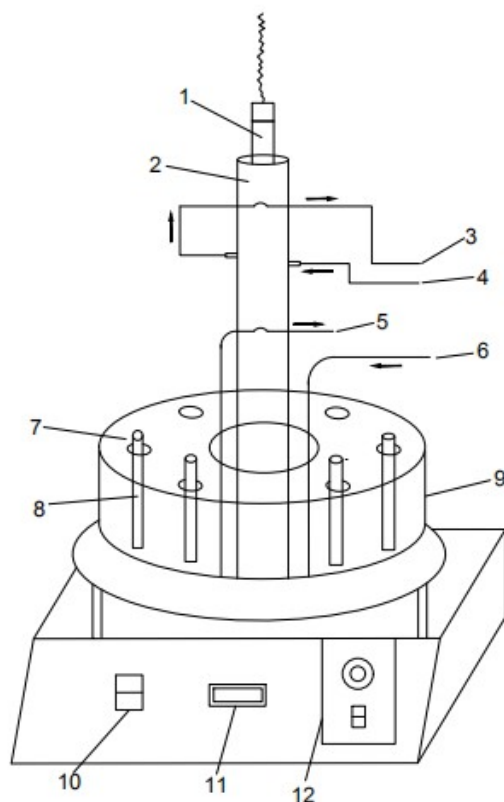


Fig. S1. The photoreactor for reduction of BrO_3^- . (1) UV lamp; (2) quartz vessel; (3) cooling water outlet of quartz vessel; (4) cooling water inlet of quartz vessel; (5) cooling water outlet of tube holder; (6) cooling water inlet of tube holder; (7) quartz test tube; (8) reaction solution; (9) quartz rotatable tube holder; (10) rotary button; (11) temperature display; (12) magnetic stirrer button.

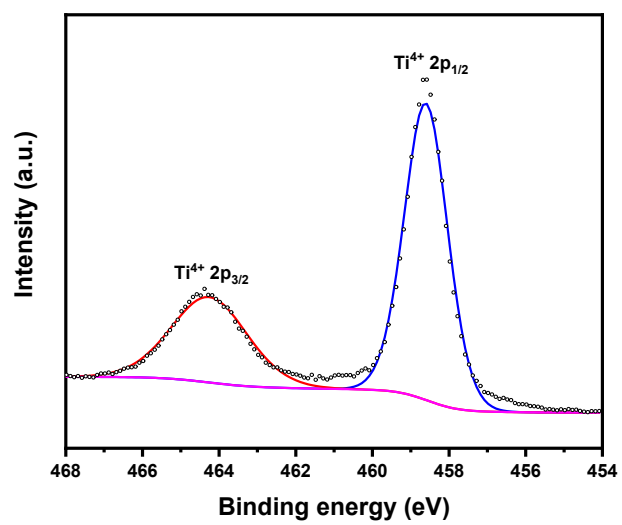


Fig. S2. The high-resolution XPS scans over the Ti 2p peak.

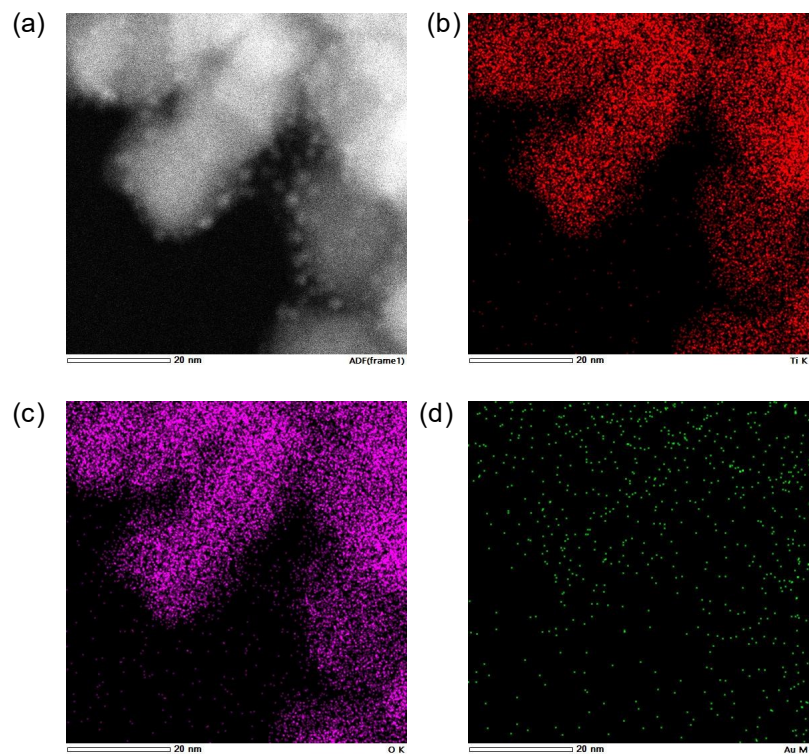


Fig. S3. (a) TEM image and EDS mapping of (b) Ti, (c) O, and (d) Au element of the 1% Au/TiO₂ photocatalyst.

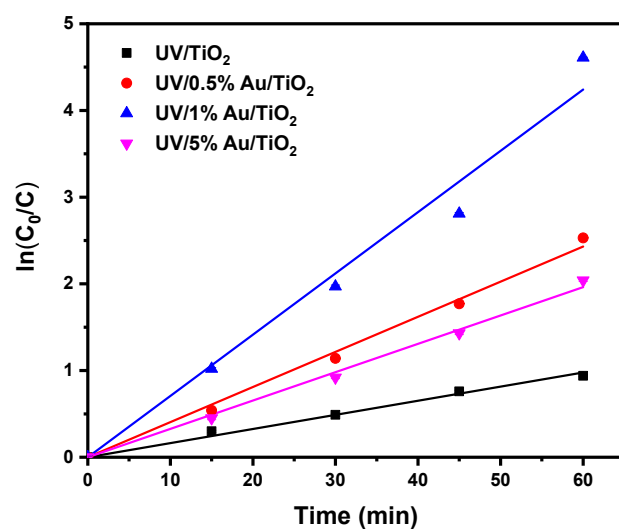


Fig. S4. The linear relationship between $\ln(C_0/C)$ and reaction time over the different ARP.

Conditions: $[\text{BrO}_3^-]_0=0.078$ mM (10 mg/L), catalyst dose=0.3 g/L, pH= 7.0 ± 0.2 , DO = 8.1 mg/L,

T= 25 ± 0.5 °C, and UV-L light intensity= 2.42 mW cm⁻².

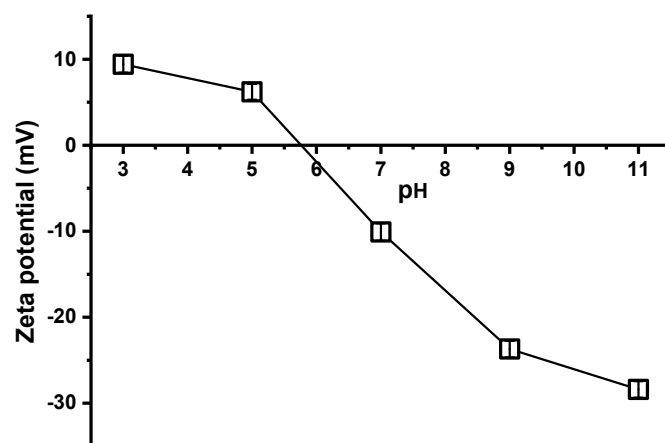


Fig. S5. Zeta potential of 1% Au/TiO₂ at 0.3 g/L in DI water as a function of solution pH.

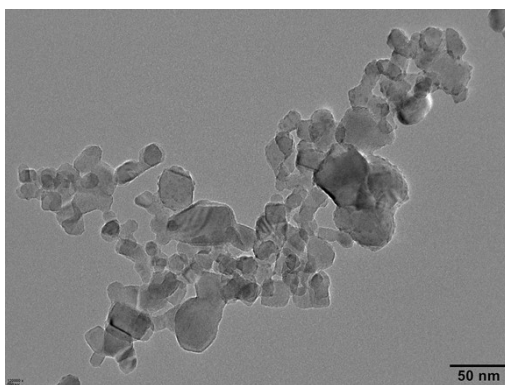


Fig. S6. TEM image of 1% Au/TiO₂ photocatalyst after photocatalytic tests.

