

**Bi metal modified Bi₄O₅I₂ hierarchical microsphere with oxygen vacancies for
the improved photocatalytic performance and mechanism insights**

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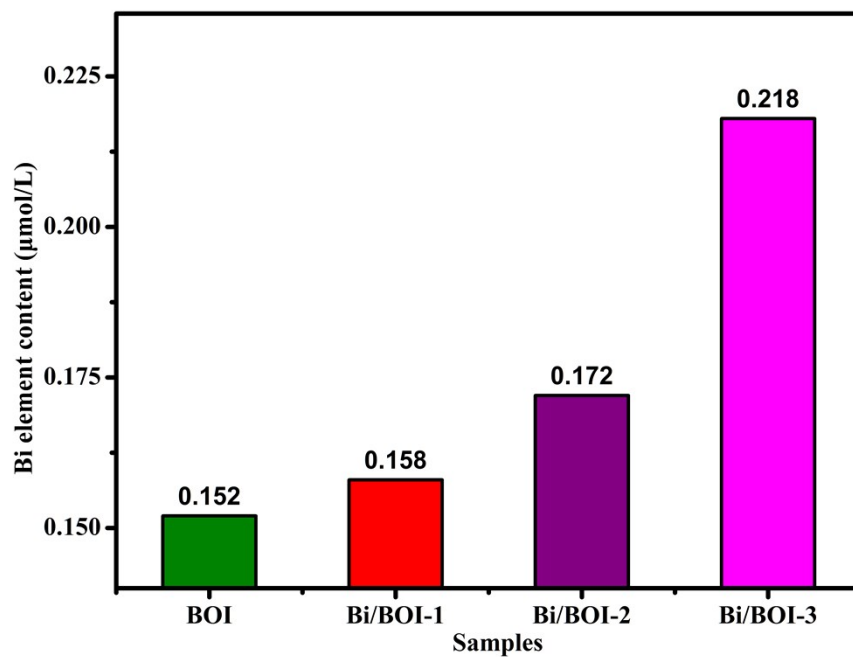


Fig. S1 Bismuth content in BOI, Bi/BOI-1, Bi/BOI-2, and Bi/BOI-3.

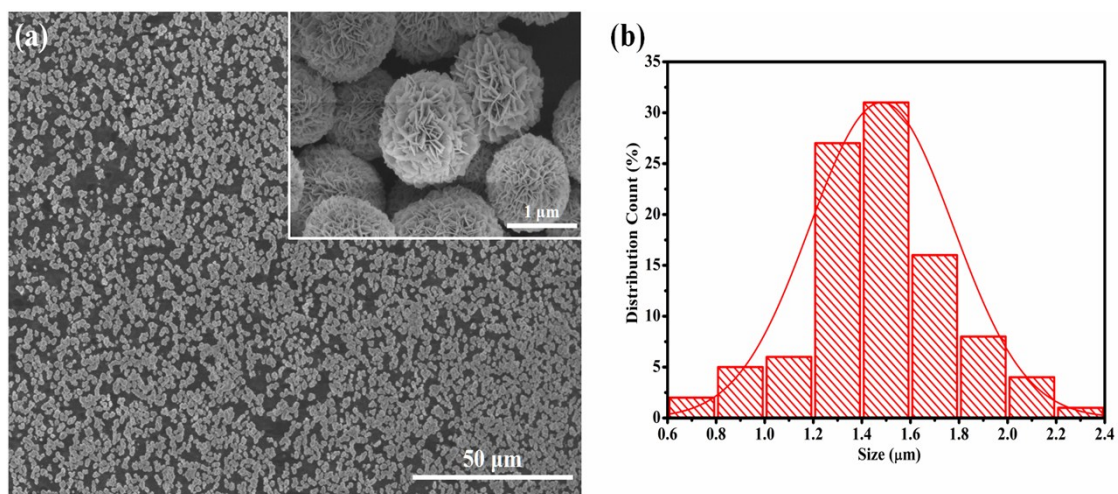


Fig. S2 (a) Low-magnification SEM image of Bi/BOI-2 sample, and magnified SEM image (inset).
 (b) Size distribution count of the Bi/BOI-2 sample.

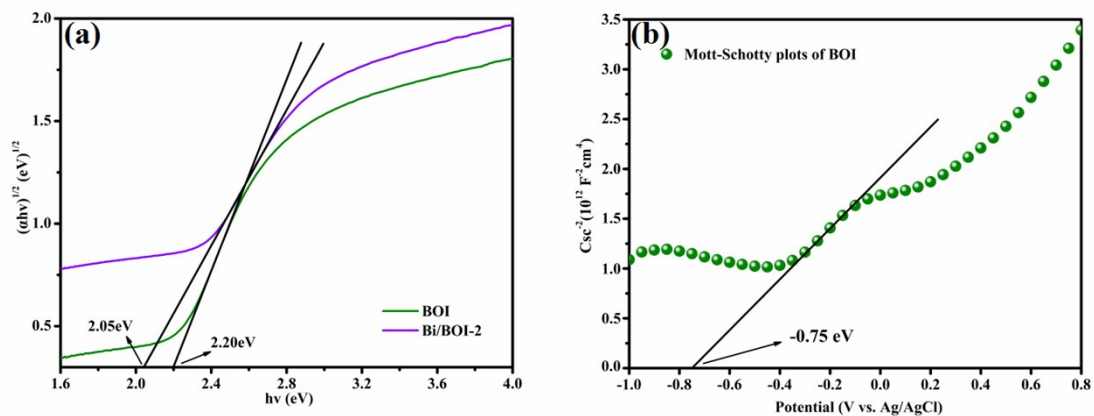


Fig. S3 (a) Transformed Kubelka-Munk function versus light energy over BOI and Bi/BOI-2, (b) Mott-Schottky plots of BOI.

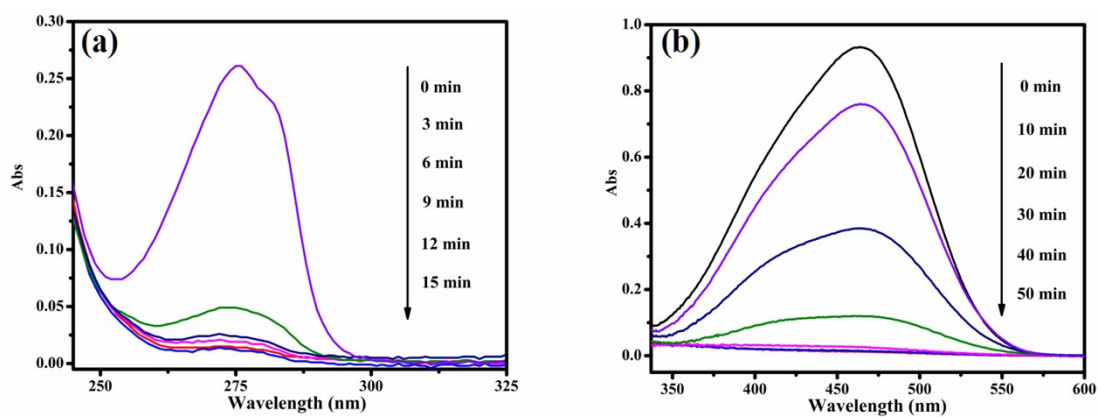


Fig. S4 UV-Vis adsorption spectra of (a) BPA and (b) MO during the degradation process with Bi/BOI-2.

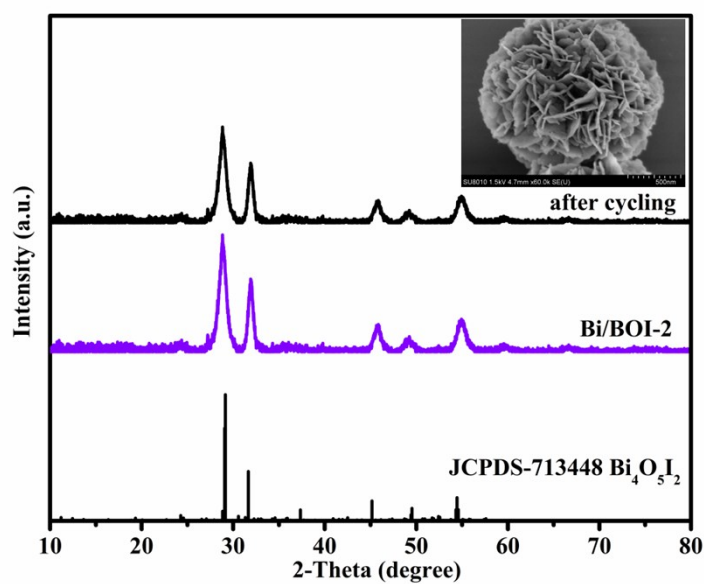


Fig. S5 XRD patterns of Bi/BOI-2 after cycling and the corresponding SEM image (inset).

Table S1 Photocatalytic efficiencies of Bisphenol-A over Bi-based photocatalysts under different conditions.

Samples	Solution	Light source	photocatalytic efficiency	Ref.
Bi ₅ O ₇ I (50 mL)	15 mg/L 50 ml	400 W halogen lamp with a 420 nm cut-off filter	T _{90%} =18 min	1
Bi ₁₂ O ₁₅ Cl ₆ (10 mg)	10 mg/L 40 mL	350 W Xe arc lamp with a 420 nm cut-off filter	T _{90%} = 6h	2
Bi ₇ O ₉ I ₃ (50 mg)	20 mg/L 50 mL	1000 W Xe lamp combined with a 420 nm cut-off filter	T _{90%} = 60 min	3
Bi/BiOI (5 mg)	20 mg/L 10 ml	350 W Xe lamp with light intensity of 5.8 mW/cm ²	T _{90%} = 60 min	4
g-C ₃ N ₄ /BiOI (50 mg)	20 mg/L 100 mL	300 W Xe lamp with a 400 nm cutoff filter	T _{90%} =60 min	5
Bi ₁₂ O ₁₇ Cl ₂ (20 mg)	10 mg/L 40 mL	500 W Xe arc lamp with a 420 nm cut-off filter	T _{90%} =120 min	6
BiOI/BiOCl (50 mg)	20 mg/L 50 mL	1000 W Xe lamp with a 420 nm cut-off filter	T _{90%} = 20 min	7
BiOBr/Bi ₁₂ O ₁₇ Cl ₂ 2 (30 mg)	10 mg/L 50 mL	500 W Xe lamp	T _{73%} = 4h	8
CQD-Bi ₂ MoO ₆ 100 mg	10 mg/L 100 mL	300 W Xe with a 400 nm cut-off filter	T _{88%} = 2h	9
BiOI/Bi ₁₂ O ₁₇ Cl ₂ 50 mg	10 mg/L 50 mg	500 W Xe lamp with 420 nm cut-off filter	T _{90%} = 2h	10

Reference

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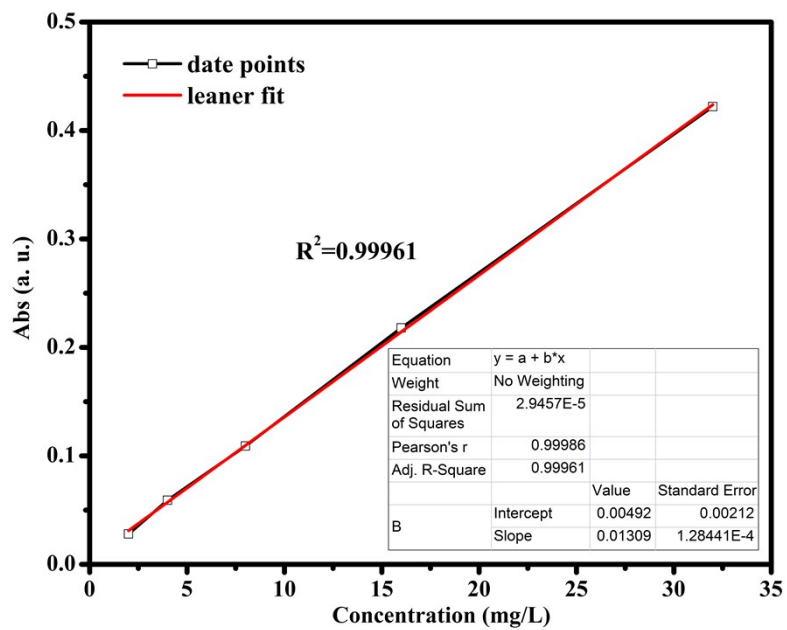


Fig. R1 The standard curve of Abs vs. BPA concentration

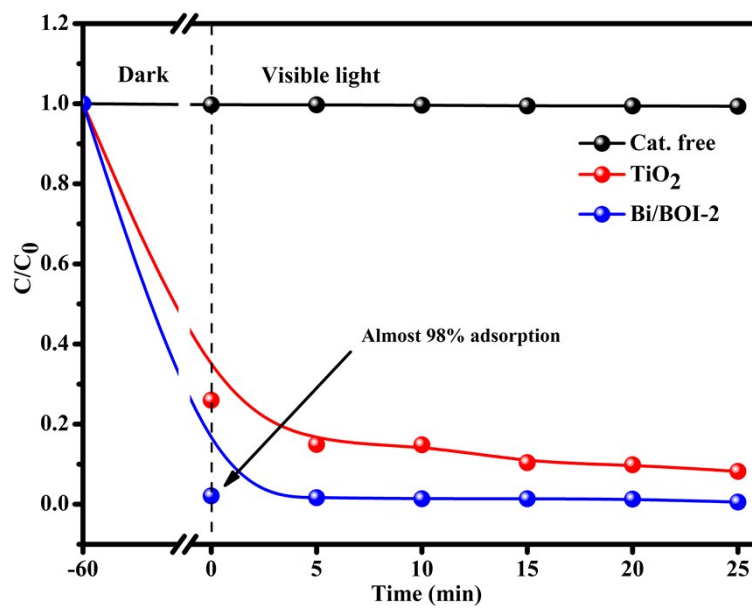


Fig. R2 C_t/C_0 versus time curves of CR under visible light irradiation