

Supporting information for

Promoted Electron Transfer along the Newly-Formed

Bi-O-S Bond in $\text{Bi}_2\text{O}(\text{OH})_2\text{SO}_4$

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This material contains **6 Figures and 4 Tables**: Photosensitization of RhB, SEM images and XRD patterns of the samples prepared at different pH values, H_2O_2 and SO_4^{2-} amounts added, hydrothermal temperatures and times

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Figure S1

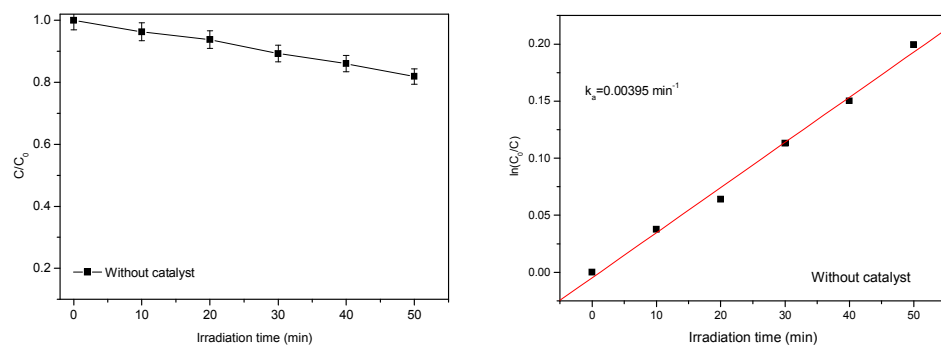


Figure S1 (a) Degradation activities and (b) reaction kinetic curves of RhB over WB and WOB under ultraviolet light irradiation ($\lambda < 420$ nm)

Figure S2

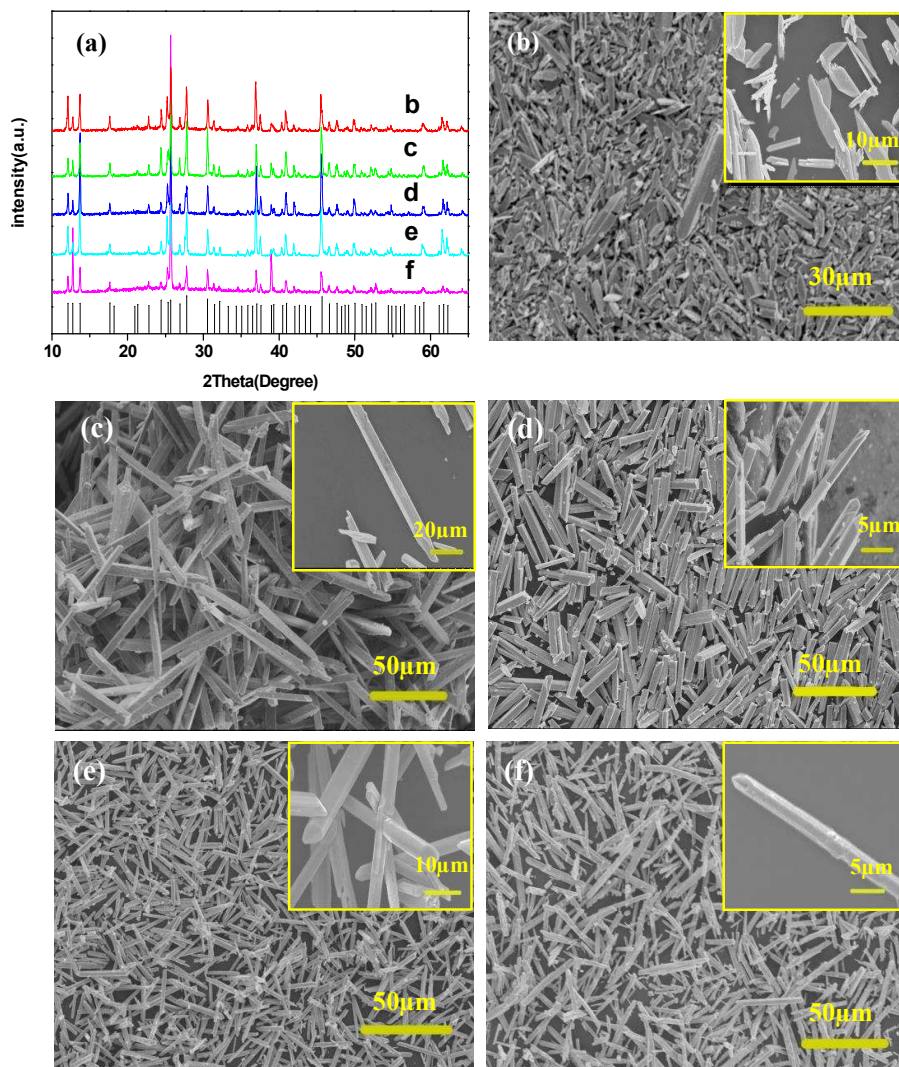


Figure S2 XRD patterns (a) and SEM images (b-f) of $\text{Bi}_2\text{O}(\text{OH})_2\text{SO}_4$ with Bi-O-S (WB) samples prepared at different volume ratios of H_2O_2 (30wt.%) to H_2O : (b) 0/30; (c) 15/15; (d) 20/10; (e) 24/6; (f) 30/0

Figure S3

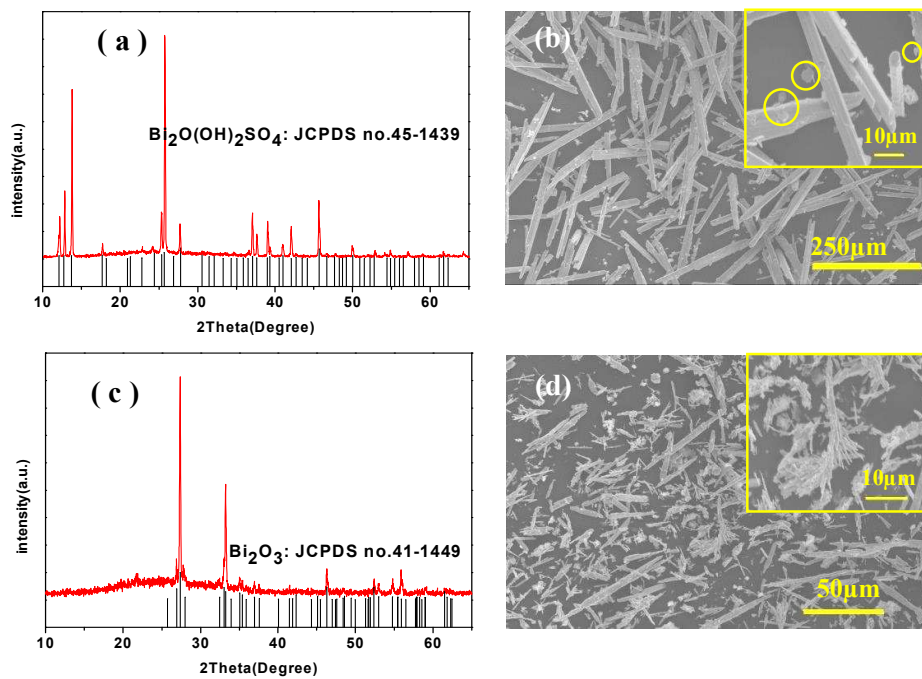


Figure S3 XRD patterns (a,c) and (b,d) SEM images of the samples prepared at different pH values: (a,b) pH=1.6, $\text{Bi}_2\text{O}(\text{OH})_2\text{SO}_4$ (WB); (c,d) pH=10.2, Bi_2O_3

Figure S4

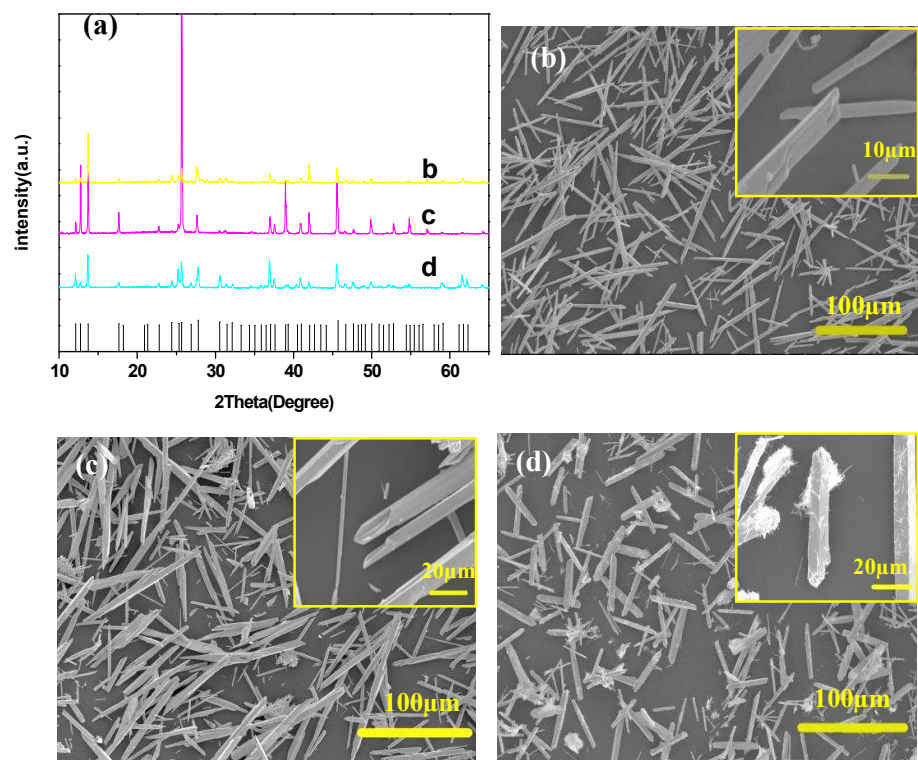


Figure S4 XRD patterns (a) and SEM images (b-d) of WB samples prepared at different amounts of SO_4^{2-} added: (b) 0.5 mmol; (c) 2 mmol; (d) 4 mmol

Figure S5

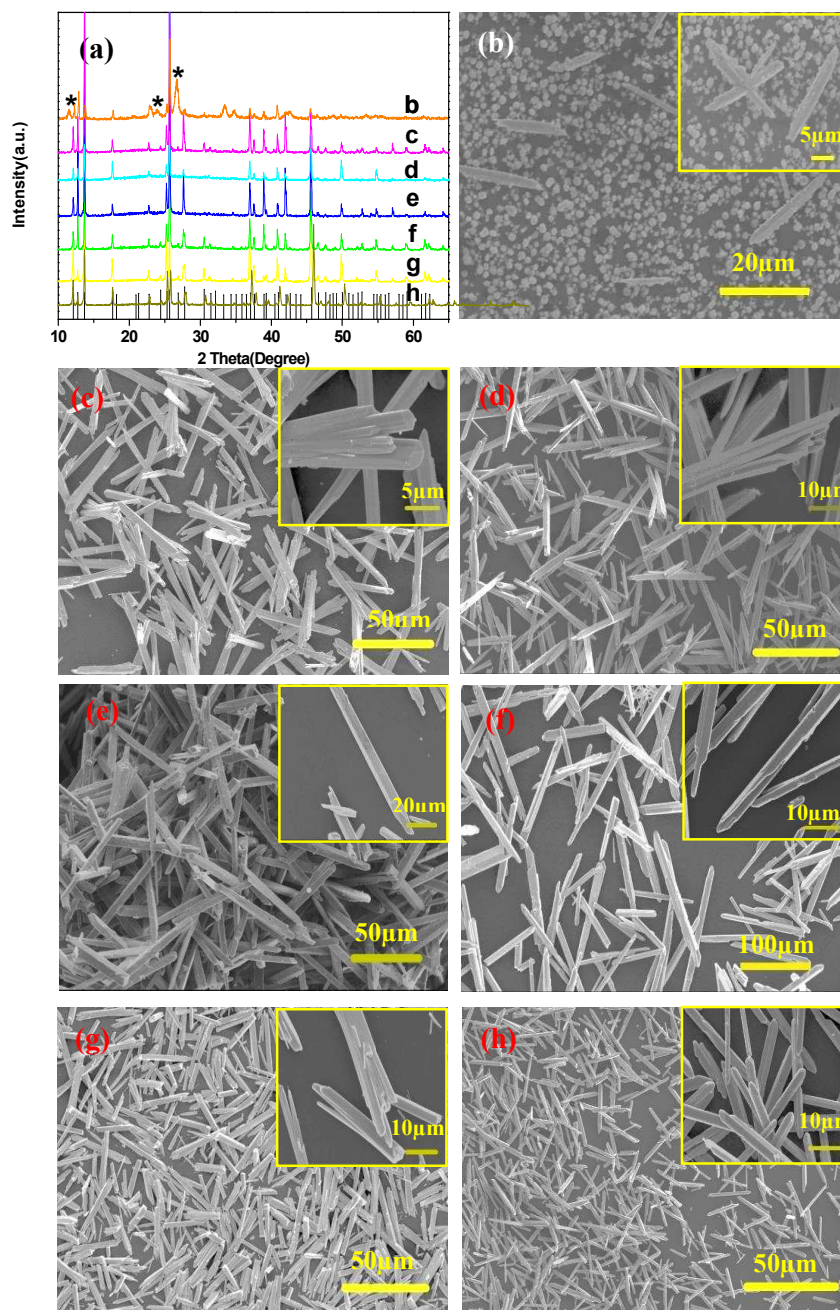


Figure S5 XRD patterns (a) and SEM images (b-g) of WB samples prepared at different temperatures: (b) 60 °C; (c) 80 °C; (d) 100 °C; (e) 120 °C; (f) 140 °C; (g) 160 °C; (h) 180 °C

Figure S6

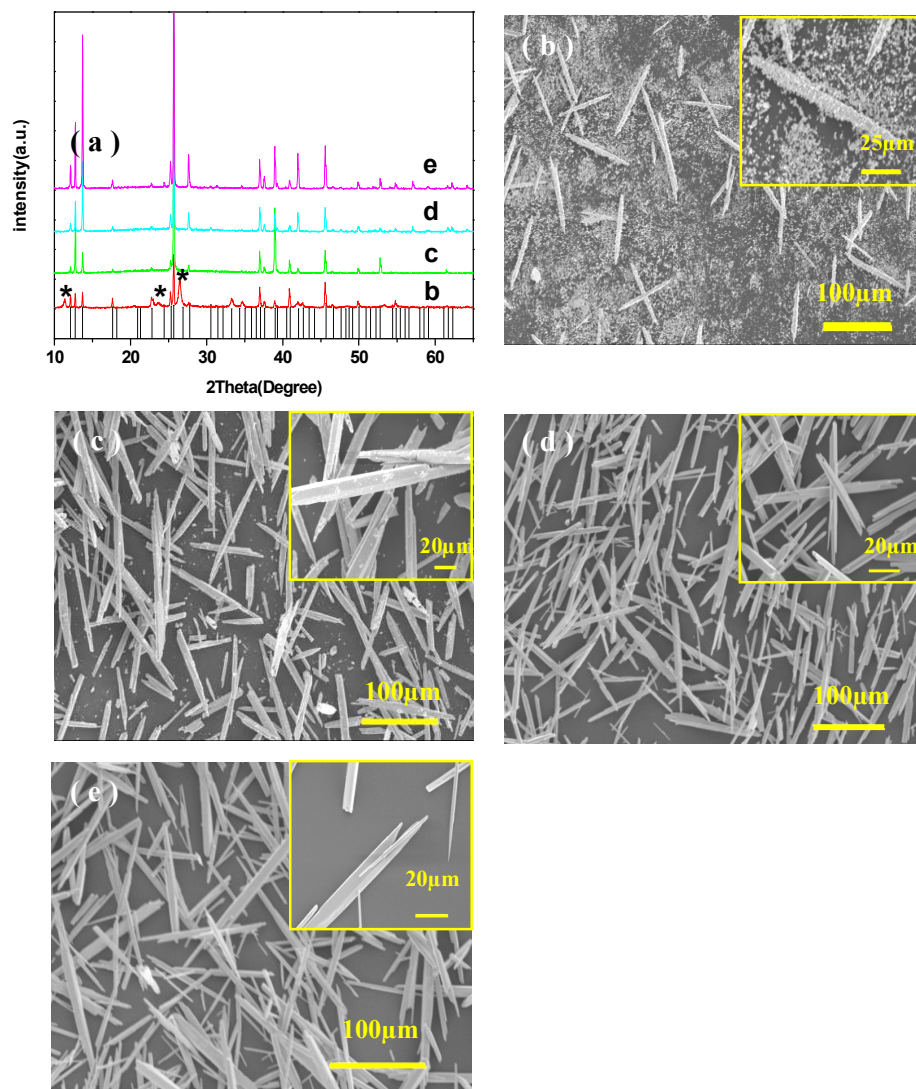


Figure S6 XRD patterns (a) and SEM images (b-e) of WB samples prepared at different times: (b) 1 h; (c) 2 h; (d) 5 h; (e) 12 h

Table S1

Effect of $V_{\text{H}_2\text{O}_2}/V_{\text{H}_2\text{O}}$ on $\text{Bi}_2\text{O}(\text{OH})_2\text{SO}_4$ with Bi–O–S bonds (WB) sample

$V_{\text{H}_2\text{O}_2}/V_{\text{H}_2\text{O}}$ \ Property	Morphology	Mean diameter / μm	Mean length / μm	Aspect ratio
0/1	Irregular	-	-	-
1/1	Microrod	6	83	13.8
2/1	Microrod	4	28	7
4/1	Microrod	3	32	10.7
1/0	Microrod	3	47	15.7

$V_{\text{H}_2\text{O}_2}$: the volume of 30 wt.% H_2O_2

Table S2

Effect of SO_4^{2-} amount added on WB sample

C /(mmol)	Property	Shape	Mean diameter / μm	Mean length / μm	Aspect ratio
0.5		Microrod	5	69	13.8
1		Microrod	6	90	15
2		Microrod	9	240	26.7
4		Microrod	8	90	11.3

Table S3

Effect of reaction temperature on WB sample

Property Temperature/°C	Shape	Mean diameter /μm	Mean length /μm	Aspect ratio
60	Microparticle and microrod	10	10	1
80	Microrod	6	76	12.7
100	Microrod	5	60	12
120	Microrod	6	83	13.8
140	Microrod	6	87	13.2
160	Microrod	4	58	14.5
180	Microrod	4	55	13.8

Table S4

Effect of reaction time on WB sample.

Time /h	Property	Shape	Mean diameter / μm	Mean length / μm	Aspect ratio
1		Particle and microrod	4	97	13.8
2		Microrod	7	98	12.6
5		Microrod	8	186	13.8
12		Microrod	7	160	11.3
24		Microrod	6	83	12.1