Supporting Information for manuscript entitled

Visible-light-driven Z-scheme rGO/Bi_2S_3-BiOBr heterojunction with tunable exposed BiOBr (102) facets for efficient synchronous photocatalytic degradation of 2-nitrophenol and Cr(VI) reduction

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This Supporting Information Contains the Following Sections:

S1: Tauc's formula:

$$(\alpha hv)^n = k(hv - E_g)$$

where α, v and h is absorption coefficient, light frequency and Planck's constant, respectively. n =2 for a direct semiconductor and n =1/2 for indirect semiconductor.

Fig. S1 The proportion optimization of Bi_2S_3-BiOBr.

Fig. S2 (a) UV-Vis diffuse reflectance spectra of pure Bi_2S_3, pure BiOBr, Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr, (b) curves of $(\alpha hv)^2$ versus hv of pure BiOBr and $(\alpha hv)^{1/2}$ versus hv of pure Bi_2S_3, (c) curves of $(\alpha hv)^{1/2}$ versus hv of Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr.

Fig. S3 Mott-Schottky curves of pure Bi_2S_3, pure BiOBr, Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr.

Fig. S4 (a) Photocurrent response, (b) electrochemical impedance spectra of pure Bi_2S_3, pure BiOBr, Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr.

Fig. S5 Dark adsorption behavior (catalyst without light) of pure Bi_2S_3, pure BiOBr, Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr.

Table S1 E_g, V_{fb}, E_{CB} and E_{VB} values of pure Bi_2S_3, pure BiOBr, Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr.

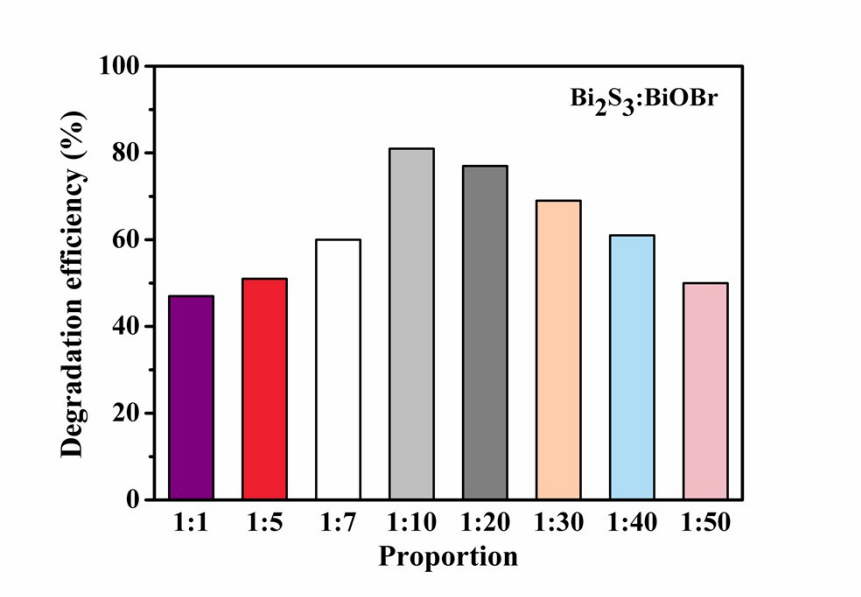

Fig. S1

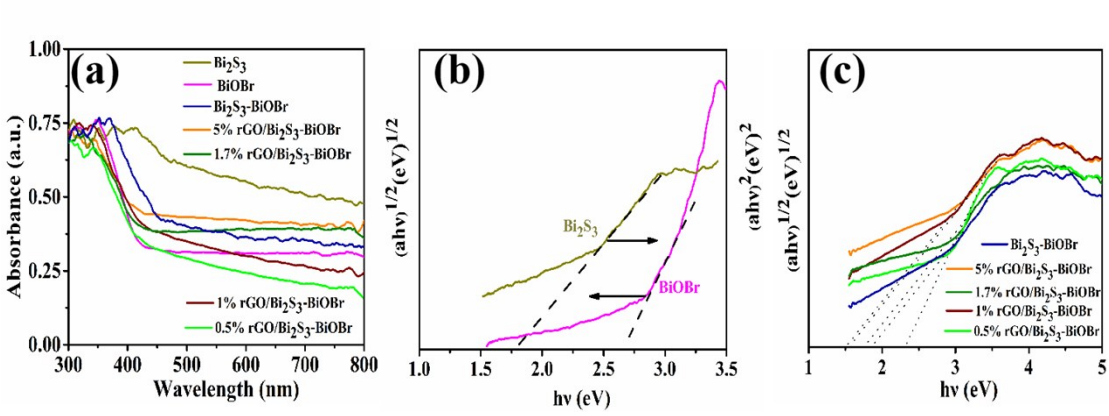

Fig. S2

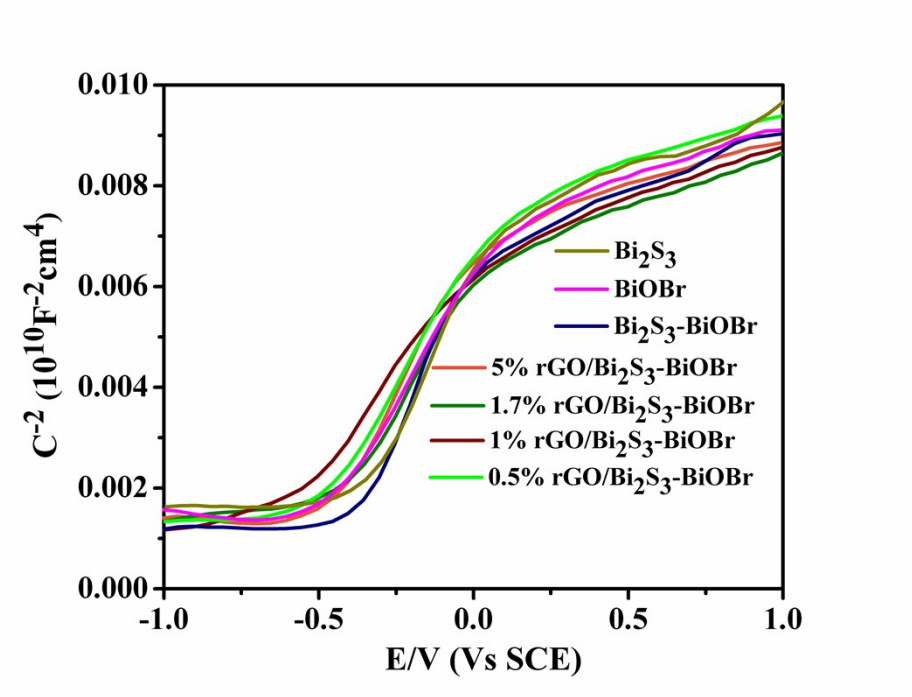
0.010
0.008
0.006
0.004
0.002
0.000
-1.0
-0.5
0.0
0.5
1.0
E/V (Vs SCE)
C-2 (10^10F-2cm4)
Bi2S3
BiOBr
Bi2S3-BiOBr
5% rGO/Bi2S3-BiOBr
1.7% rGO/Bi2S3-BiOBr
1% rGO/Bi2S3-BiOBr
0.5% rGO/Bi2S3-BiOBr

Fig. S3

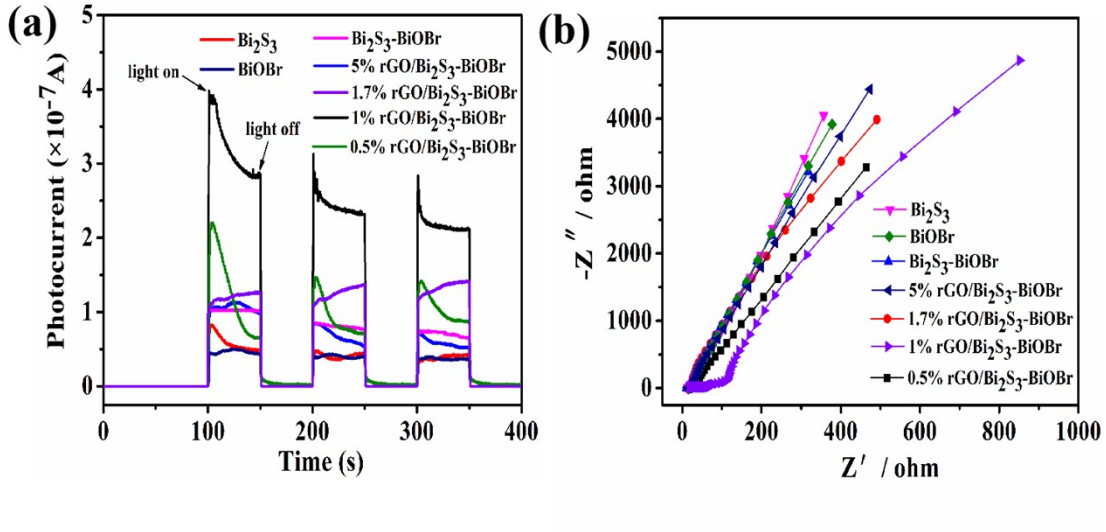
(a)
Photocurrent (×10^-7A)
Time (s)
light on
light off
Bi2S3
BiOBr
Bi2S3-BiOBr
5% rGO/Bi2S3-BiOBr
1.7% rGO/Bi2S3-BiOBr
1% rGO/Bi2S3-BiOBr
0.5% rGO/Bi2S3-BiOBr
(b)
-Z″ / ohm
Z′ / ohm

Fig. S4

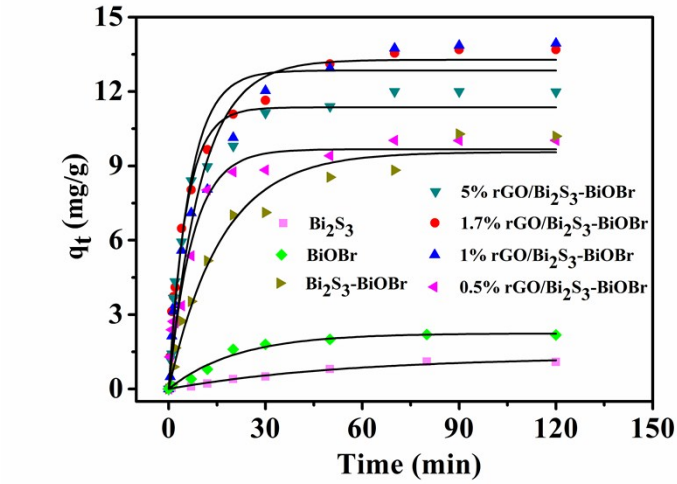

Fig. S5

Table S1 E_g, V_{fb}, E_{CB} and E_{VB} values of pure Bi_2S_3, pure BiOBr, Bi_2S_3-BiOBr and rGO/Bi_2S_3-BiOBr

Samples	E_g (eV)	V_{fb} (V vs. SCE)	E_{CB} (eV)	E_{VB} (eV)
Bi_2S_3	1.76	-0.35	-0.11	1.65
BiOBr	2.72	-0.56	-0.32	2.40
Bi_2S_3-BiOBr	1.85	-0.41	-0.17	1.68
0.5% rGO/Bi_2S_3-BiOBr	2.31	-0.61	-0.37	1.94
1% rGO/Bi_2S_3-BiOBr	1.49	-0.72	-0.48	1.01
1.7% rGO/Bi_2S_3-BiOBr	1.75	-0.54	-0.30	1.45
5% rGO/Bi_2S_3-BiOBr	1.58	-0.55	-0.31	1.27