$W_{18}O_{49}$ Nanowire Alignments with BiOCl Shell as Efficient Photocatalyst

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Abbreviations	WCl_6 [g]	$BiCl_3$ [g]	morphology	BET [m^2/g]	[Bi:W][a]
BiOCl		0.236	sheet	15.1	
W@BiOCl-1	0.297	0.016	NW	51.2	1:15
W@BiOCl-2	0.297	0.03	NW	50.3	1:8
W@BiOCl-3	0.297	0.047	NW	49.1	1:5
W@BiOCl-4	0.297	0.079	NW	41.7	1:3

Abbreviations	WCl_6 [g]	$NaNO_3$ [g]	morphology	BET [m^2/g]
WA-1	0.297	0.01	alignments	56.7
WA-2	0.297	0.015	alignments	62.1
WA-3	0.297	0.02	alignments	59.4
WA-4	0.297	0.03	alignments	54.2

Abbreviations	WCl_6 [g]	$Bi(NO_3)_3{\cdot}5H_2O$ [g]	morphology	BET [m^2/g]	[Bi:W]
$W_{18}O_{49}$	0.297		NW	60	
WA@BiOCl-1	0.297	0.024	alignments	74.5	(1:15)[a] (6.5%)[b]; (8.2%)[c]
WA@BiOCl-2	0.297	0.045	alignments	51.8	(1:8)[a] (11.1%)[b]; (15.1%)[c]
WA@BiOCl-3	0.297	0.073	alignments	52.9	(1:5)[a] (19.1%)[b]; (31.6%)[c]
WA@BiOCl-4	0.297	0.121	alignments	37.3	(1:3)[a] (33.7%)[b]; (50.1%)[c]

Table S1. Synthetic parameters of all the samples. ([a], [b] and [c]: ratios defined in the starting materials, determined by ICP, and determined by XPS, respectively.)

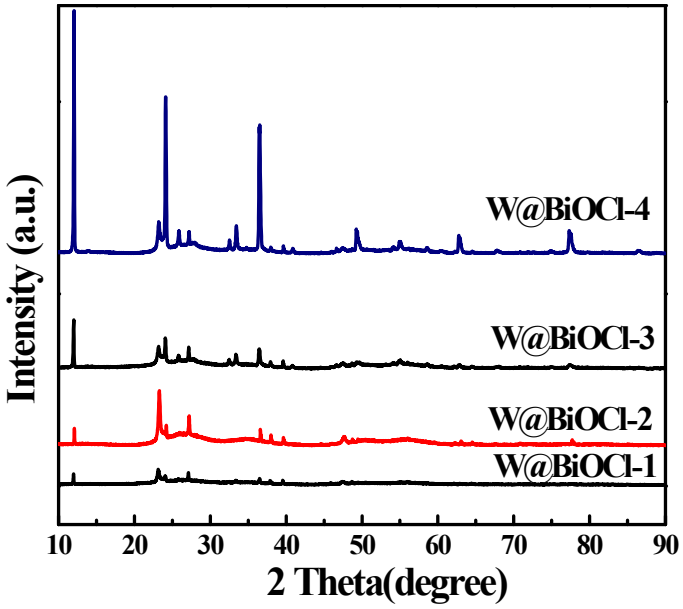

Figure S1. XRD patterns of W@BiOCl synthesized with $BiCl_3$ content increasing from W@BiOCl-1 to W@BiOCl-4.

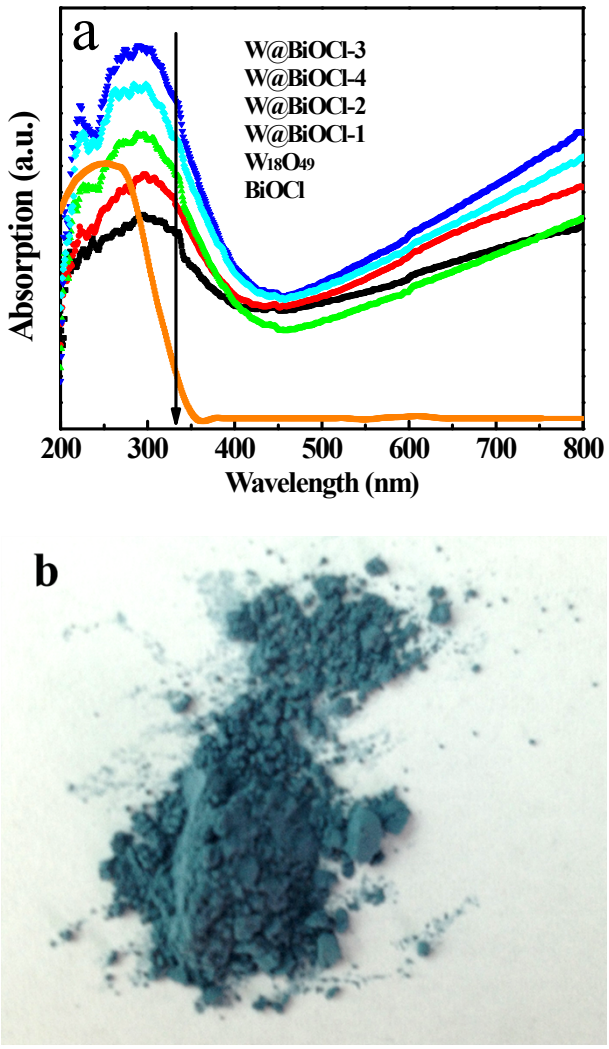

Figure S2. (a) UV-vis diffuse reflectance spectra of W@BiOCl with synthesized with $BiCl_3$ content increasing from W@BiOCl-1 to W@BiOCl-4, pure $W_{18}O_{49}$ and BiOCl, and (b) Photo image of W@BiOCl-3.

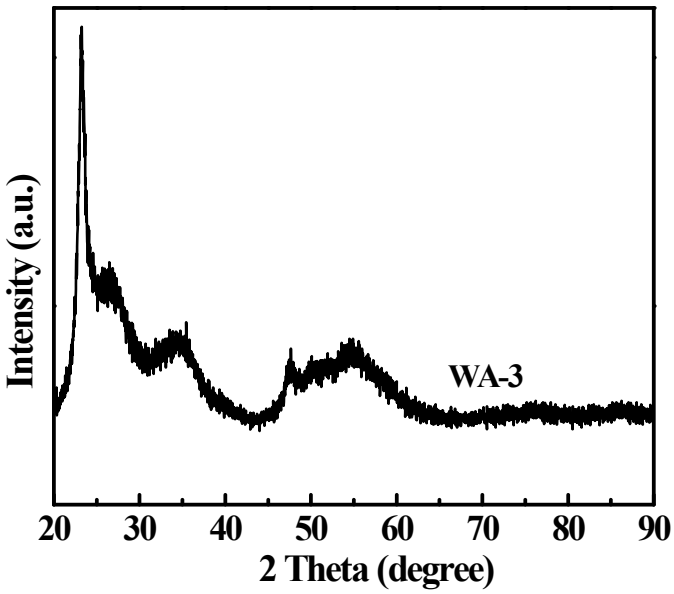

Figure S3. XRD pattern of WA-3.

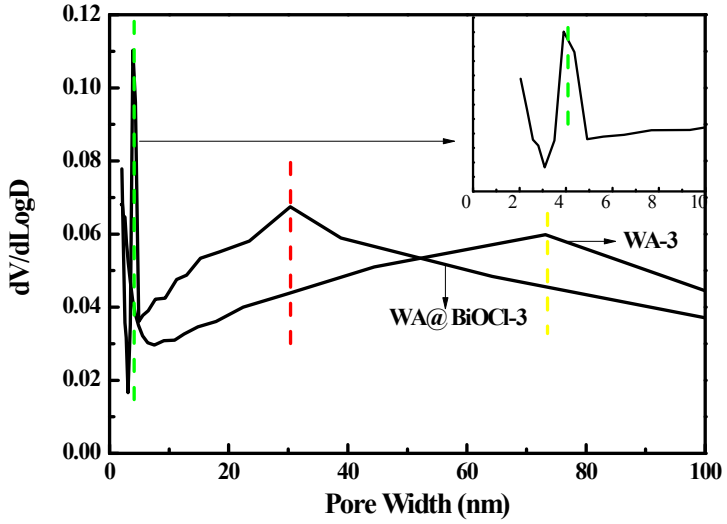

Figure S4. BJH pore distribution of WA-3 and WA@BiOCl-3.

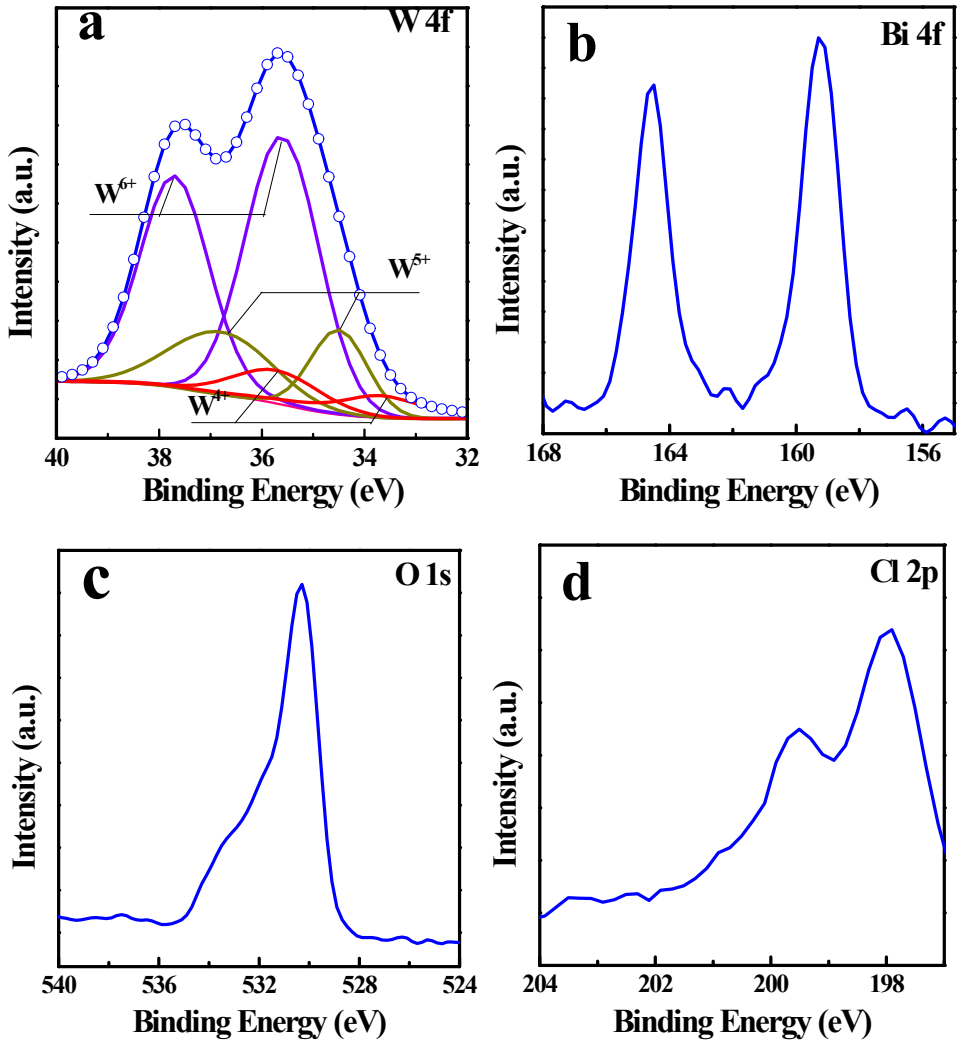

Figure S5. XPS spectra of (a) W 4f, (b) Bi 4f, (c) O 1s, and (d) Cl 2p from WA@BiOCl-3.

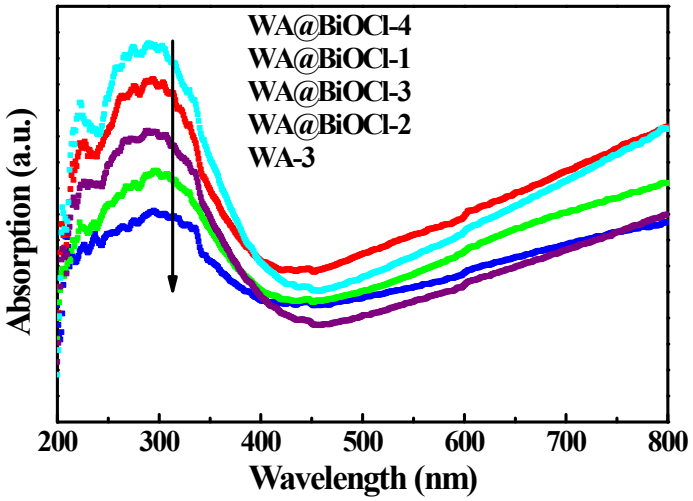

Figure S6. UV-vis diffuse reflectance spectra of WA@BiOCl synthesized with $Bi(NO_3)_3$ content increasing from WA@BiOCl-1 to WA@BiOCl-4.

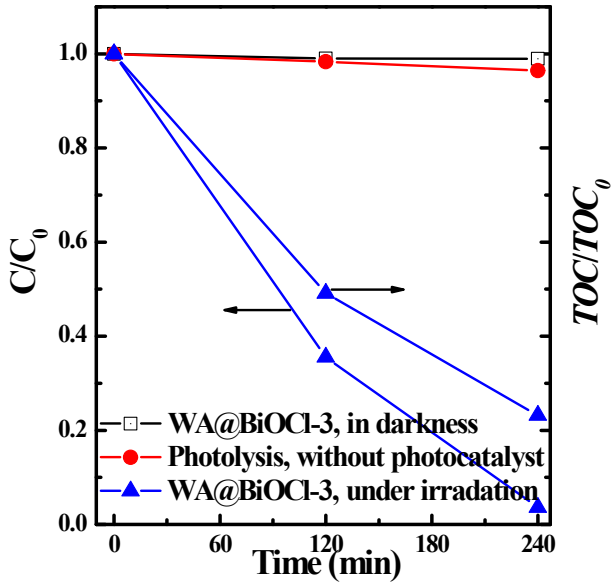

Figure S7. Changes of MO concentration with irradiated time with the presence of WA@BiOCl-3 under simulated sunlight.

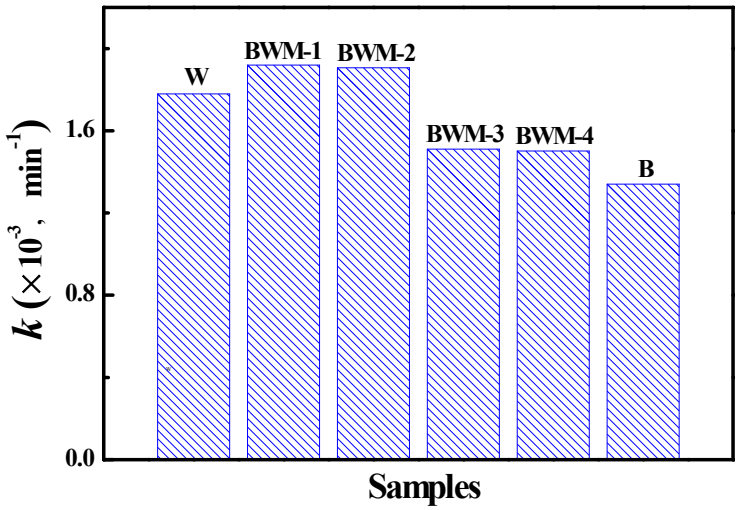

Figure S8. Photoactivity of $W_{18}O_{49}$/BiOCl physical mixtures (BWM) by mixing the individual semiconductors with composition identical to WA@BiOCl counterparts under simulated sunlight.

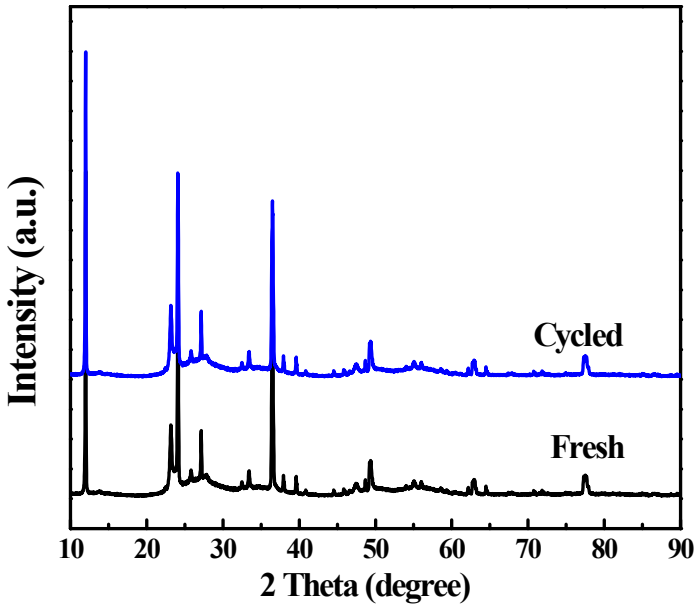

Figure S9. XRD patterns of WA@BiOCl-3 before and after the 5-cycling of MO degradation under simulated sunlight.