

**Visible-LEDs-induced photocatalytic activity of Bi₂WO₆/BiVO₄ heterojunctions prepared
by a novel and green methodology**

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Table S1. Atomic % of elements calculated through XPS and key molar ratios to determine the formulation of the BiW, BiV, and Ag/1BiW/1BiV catalysts.

Catalyst	Atomic %						Molar ratios		
	Bi		W	V	Ag	O	O/(Bi+Me1)*	O/Bi	Me2/Bi&
	A#	B#							
BiW	20.50	1.49	9.48			68.53	2.18	3.12	0.43
BiV	15.74			16.31		61.04	2.12	4.32	1.04
Ag/1BiW/1BiV	17.96	1.17	4.36	9.48	1.18	58.86	1.99	3.44	0.23 ^a , 0.50 ^b

Me1 refers to W in BiW, V in BiV and both W+V in Ag/1BiW/1BiV. & Me2 refers to W in BiW, V in BiV and either W^a or V^b in Ag/1BiW/1BiV. # Two different species of Bi were identified in BiW and Ag/1BiW/1BiV and are quantified separately as A and B.

Table S2. Binding energy summary of the three samples.

Catalyst	Binding Energy (eV)										
	Bi				W		V		Ag		O
	4f _{7/2}	4f _{5/2}	4f _{7/2}	4f _{5/2}	4f _{7/2}	4f _{5/2}	2p _{3/2}	2p _{1/2}	3d _{5/2}	3d _{3/2}	1s
BiW	158.85	164.16	156.52	161.9	35.11	37.26					529.85
BiV	158.96	164.27					516.70	524.20			529.82
Ag/1BiW/1BiV	158.96	164.26	156.90	162.3	35.14	37.29	516.69	524.27	367.93	373.93	529.96

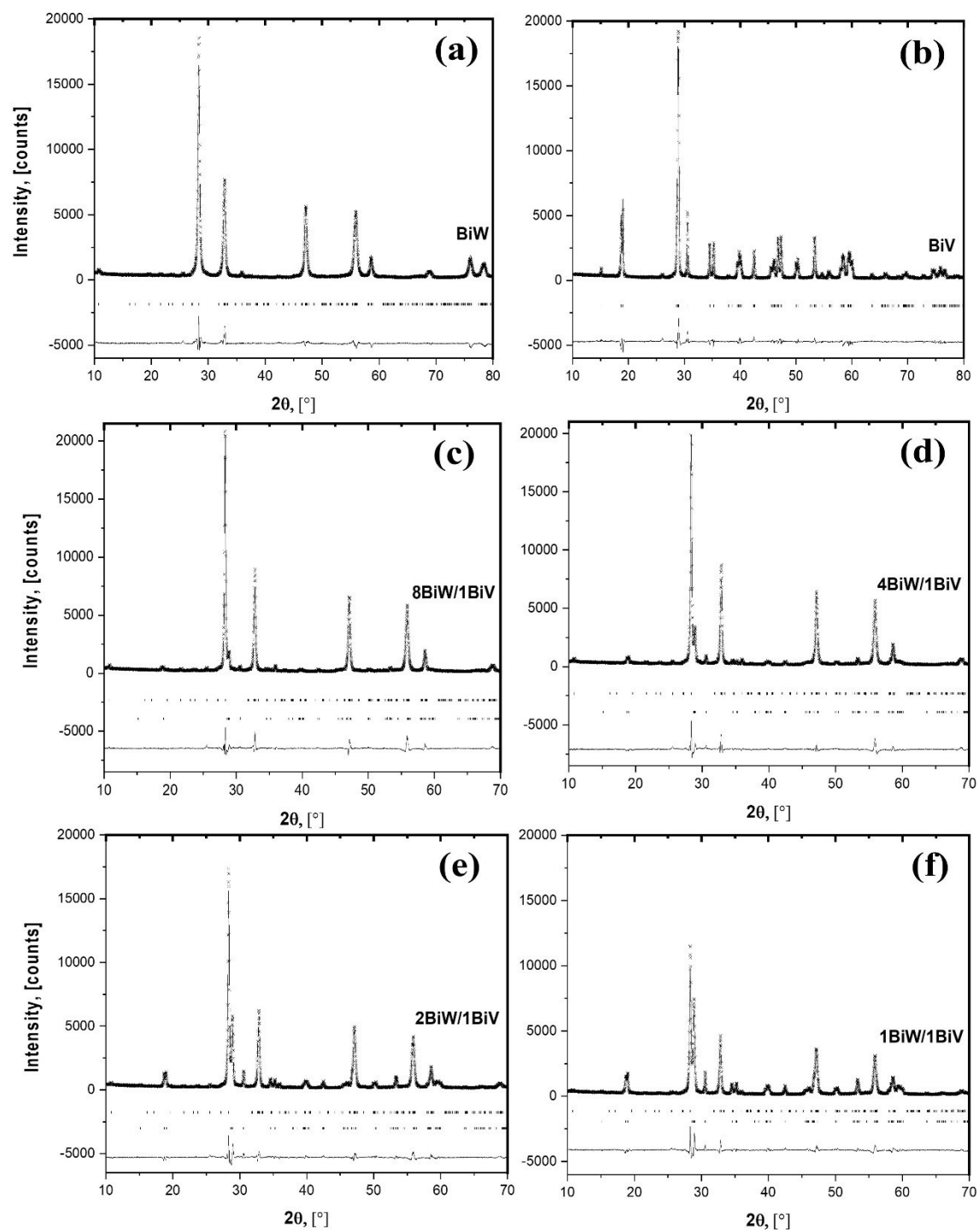


Fig. S1. Final Rietveld fitting of the XRD patterns of the as-prepared photocatalysts (a-f) showing the observed (crosses), calculated (full line), difference profiles (lower trace), and Bragg peak position (vertical line) of the Bi_2WO_6 and BiVO_4 phases.

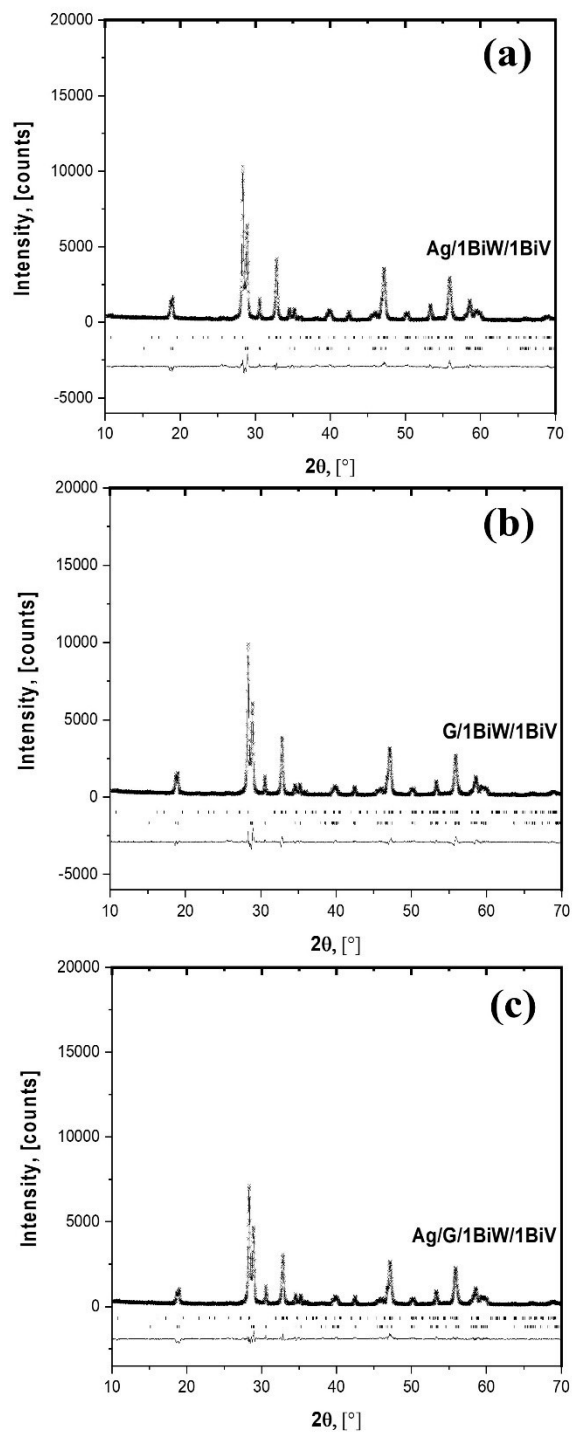


Fig. S2. Final Rietveld fitting of the XRD patterns of the 1BiW/1BiV heterojunction decorated with Ag-NPs and G (a-c) showing the observed (crosses), calculated (full line), difference profiles (lower trace), and Bragg peak position (vertical line) of the Bi_2WO_6 and BiVO_4 phases.

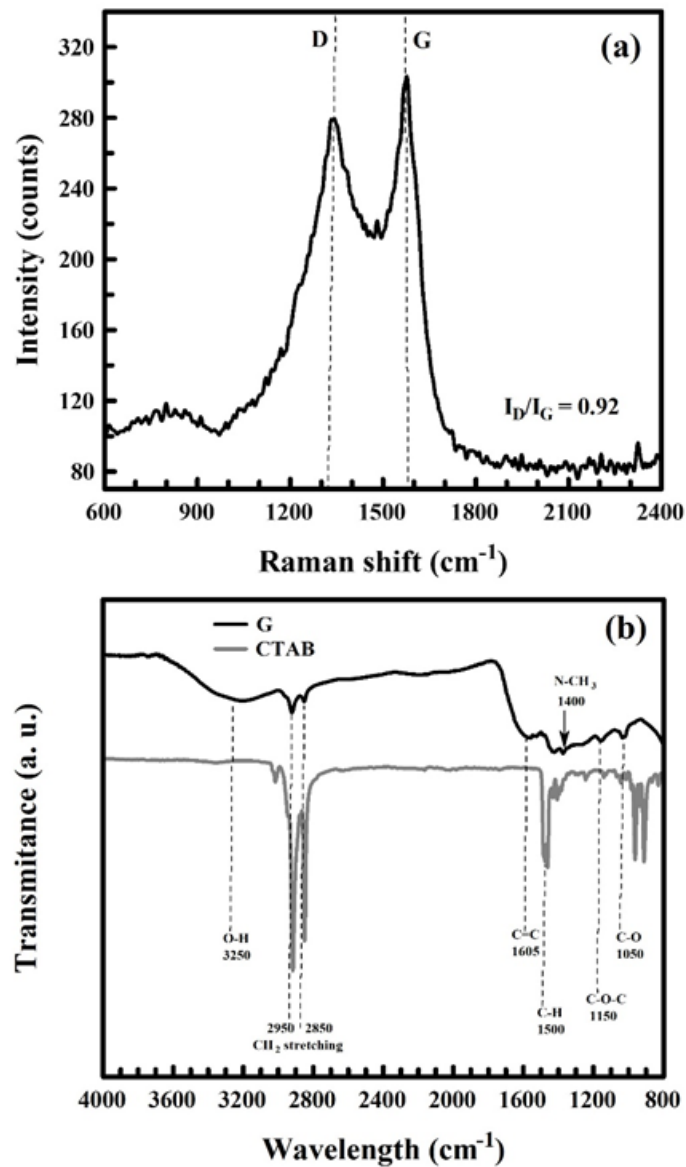


Fig. S3. Raman spectra of graphene (a), and FTIR spectra of graphene (b).

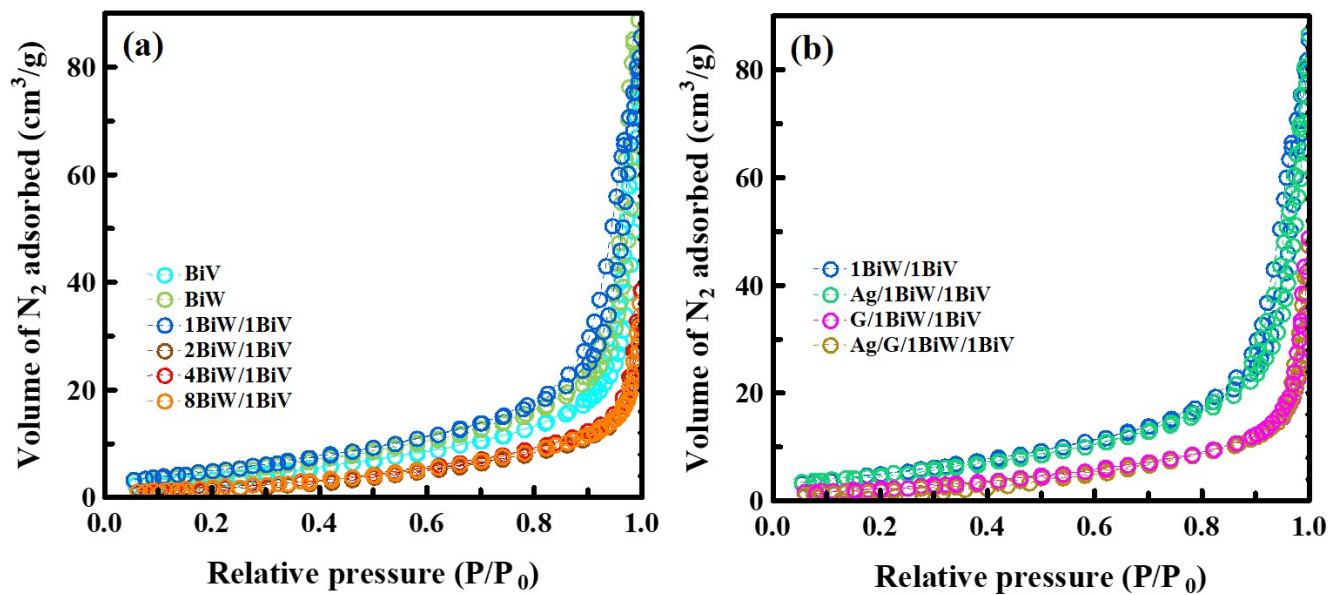


Fig. S4. N_2 adsorption-desorption isotherms at 77 K on BiV, BiW, 8BiW/1BiV, 4BiW/1BiV, 2BiW/1BiV, 1BiW/1BiV (a), and 1BiW/1BiV (a) decorated with Ag-NPs and G (b).

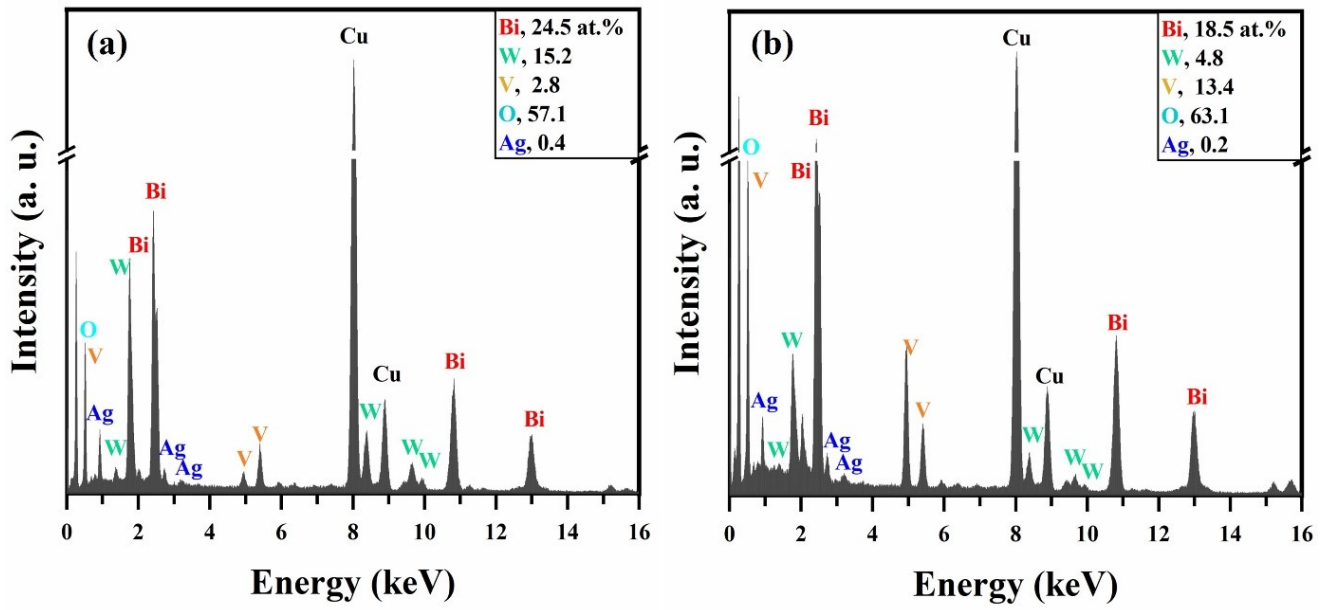


Fig. S5. EDX spectra of Ag/1BiW/1BiV confirmed the existence of Bi, W, V, O and Ag elements and the quantitative composition. EDX spectra are related to the areas depicted in Fig. 5 (b) and (c).

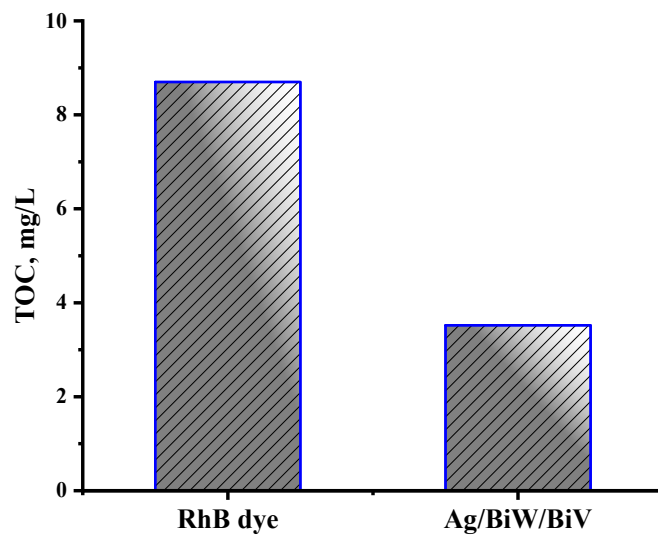


Fig. S6. TOC removal during the RhB photocatalytic degradation using Ag/1BiW/1BiV heterojunction.

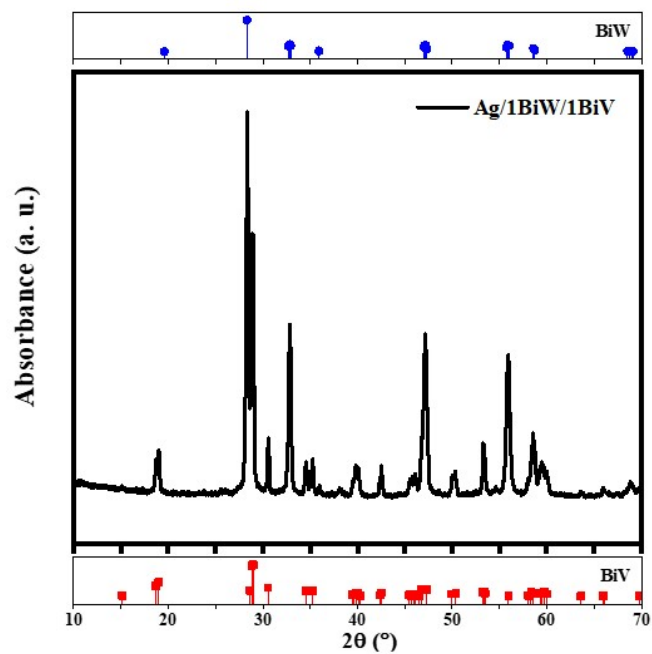


Fig. S7. XRD pattern of Ag/1BiW/1BiV recovered from photocatalysis run.

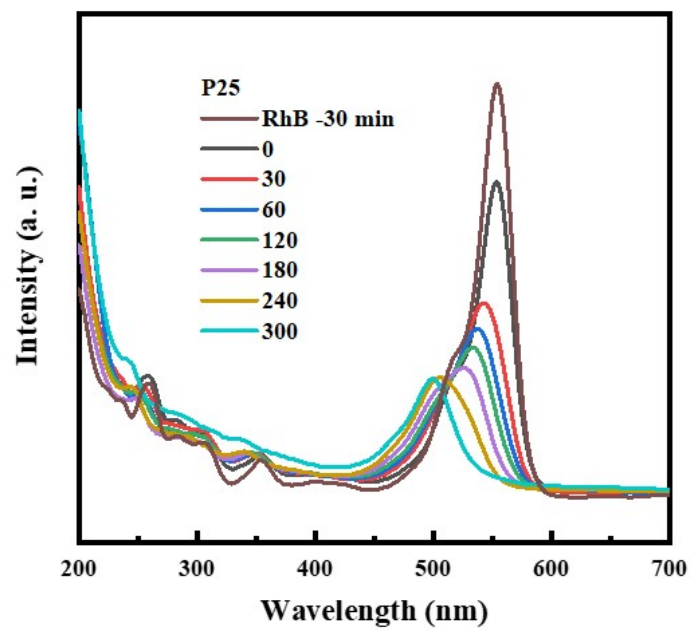


Fig. S8. UV-vis spectra of RhB degradation over P25, pH=7.

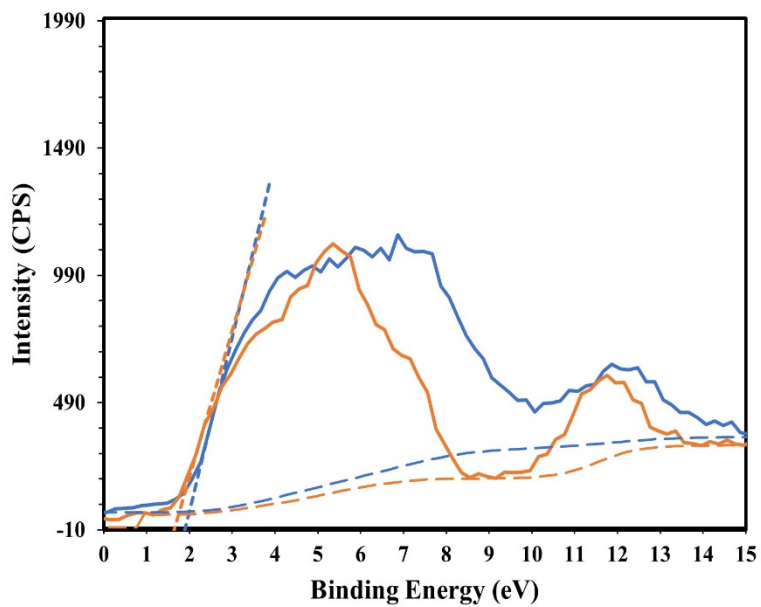


Fig. S9. Valence band maxima calculations based on XPS for BiW (blue) and BiV (orange) catalysts. A Tougaard baseline is shown for every catalyst in a dashed line and was used to determine the intercept and calculate the VB maximum. The values determined from the intercept are BiW VB = 2.00 eV; and BiV VB = 1.60 eV.
