

Scheme 1 Binuclear phthalocyanine (bi-CoPc)

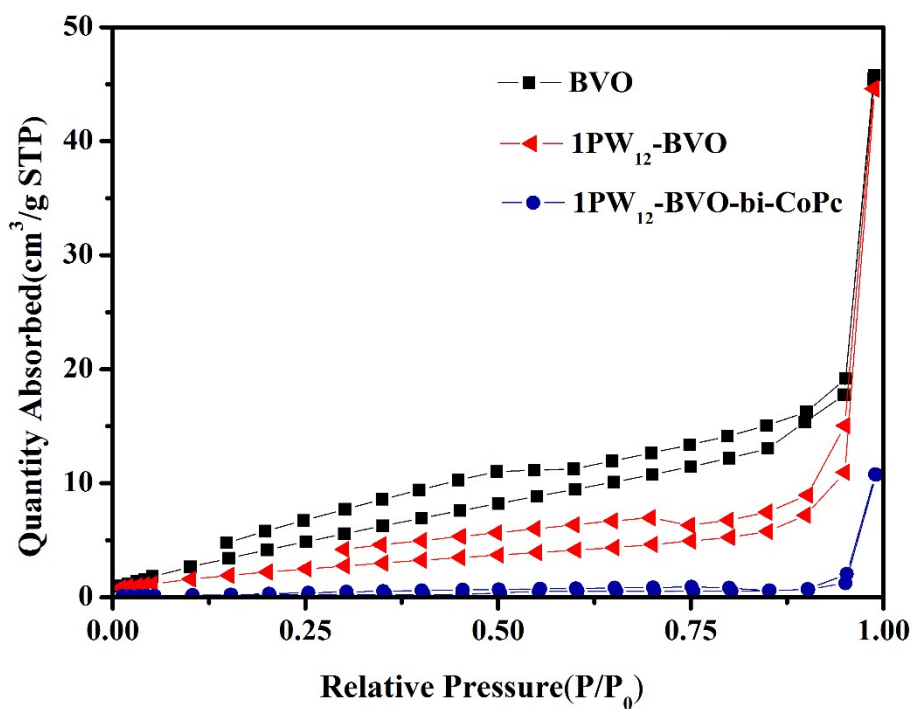


Fig. S1. Nitrogen adsorption-desorption isotherms curves of samples BVO, 1PW₁₂-BVO, and 1PW₁₂-BVO-bi-CoPc.

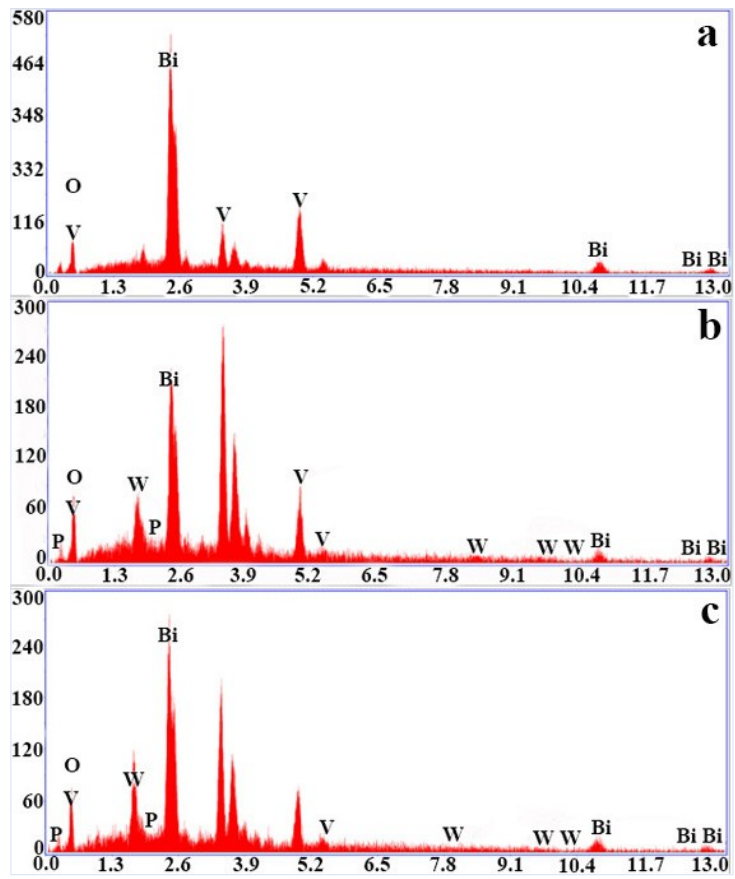


Fig. S2. EDX of different samples of (a) BVO; (b) 1PW₁₂-BVO; (c) 2PW₁₂-BVO.

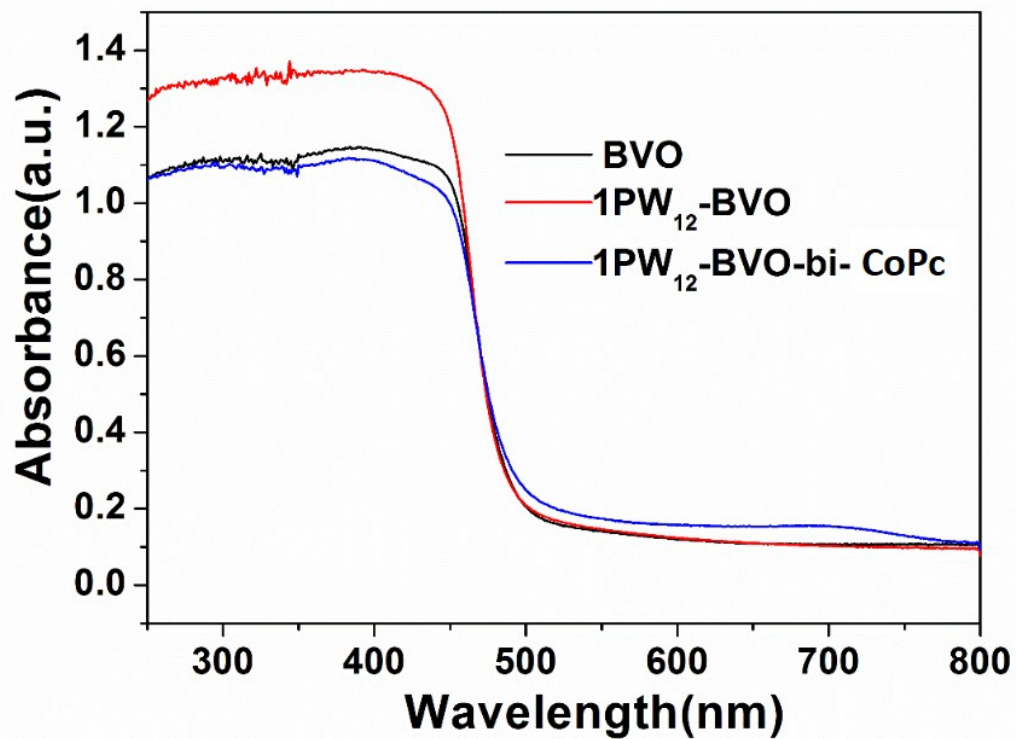


Fig. S3. UV-visible diffuse reflection spectra of BVO, 1PW₁₂-BVO and 1PW₁₂-BVO-bi-CoPc.

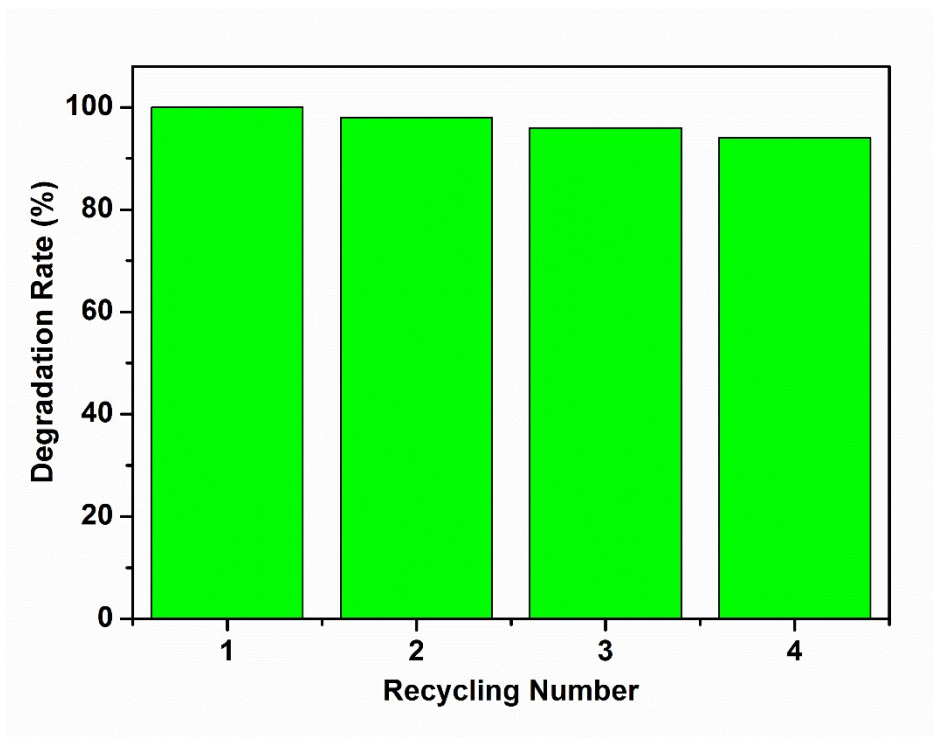


Fig S4. The degradation rate of NO₂ over recycled 1PW₁₂-BVO-bi-CoPc film.

Table S1. The BET surface area of BVO, 1PW₁₂-BVO, and 1PW₁₂-BVO-bi-CoPc.

Sample	BET/m²·g⁻¹
BVO	10.35
1PW₁₂-BVO	8.89
1PW₁₂-BVO-bi-CoPc	0.17

Table S2. The resistances of different photocatalysts from the fitting results with the equivalent circuit.

Sample	R_s	R_{ct}
	[Ω cm ²]	[Ω cm ²]
BVO	280	14742
1PW ₁₂ -BVO	195.8	9115
2PW ₁₂ -BVO	266	13999
BVO-bi-CoPc	244	11794
1PW ₁₂ -BVO-bi-CoPc	137.1	6381
2PW ₁₂ -BVO-bi-CoPc	215.4	10032