Electronic Supplementary information

Mediator-Free Direct Z-Scheme Photocatalytic System: $BiVO_4$/g-C_3N_4 Organic-Inorganic Hybrid Photocatalyst with Highly Efficient Visible-Light-Induced Photocatalytic Activity

Na Tian[a], Hongwei Huang[a]*, Ying He[a], Yuxi Guo[a], Tieriu Zhang[b], Yihe Zhang[a]*

[a] *Beijing Key Laboratory of Materials Utilization of Nonmetallic Minerals and Solid Wastes, National Laboratory of Mineral Materials, School of Materials Science and Technology, China University of Geosciences, Beijing, 100083, China*

[b] *Key Laboratory of Photochemical Conversion and Optoelectronic Materials, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China*

*Corresponding author e-mail: hhw@cugb.edu.cn (H.W. Huang); zyh@cugb.edu.cn. (Y.H. Zhang)

Tel:010-82332247

Table S1. Absolute electronegativity, energy band gap, calculated conduction band edge position and valence band edge position of g-C_3N_4 and $BiVO_4$ semiconductors.

Semiconductors	X(eV)	CB(eV)	VB(eV)	Eg(eV)
g-C_3N_4	4.67	-1.13	1.47	2.60
$BiVO_4$	6.16	0.43	2.88	2.45

$E_{VB} = X - E^e + 0.5E_g$; $E_{CB} = E_{VB} - E_g$

where E_{VB} is the VB edge potential; X is the electronegativity of the semiconductor, which is the geometric average of the absolute electronegativity of the constituent atoms (X values of g-C_3N_4 and $BiVO_4$ are 4.67eV and 6.16eV, respectively); E_e is the energy of free electrons on the hydrogen scale ($E_e \approx 4.5$ eV); and E_g is the band gap energy of the semiconductor.

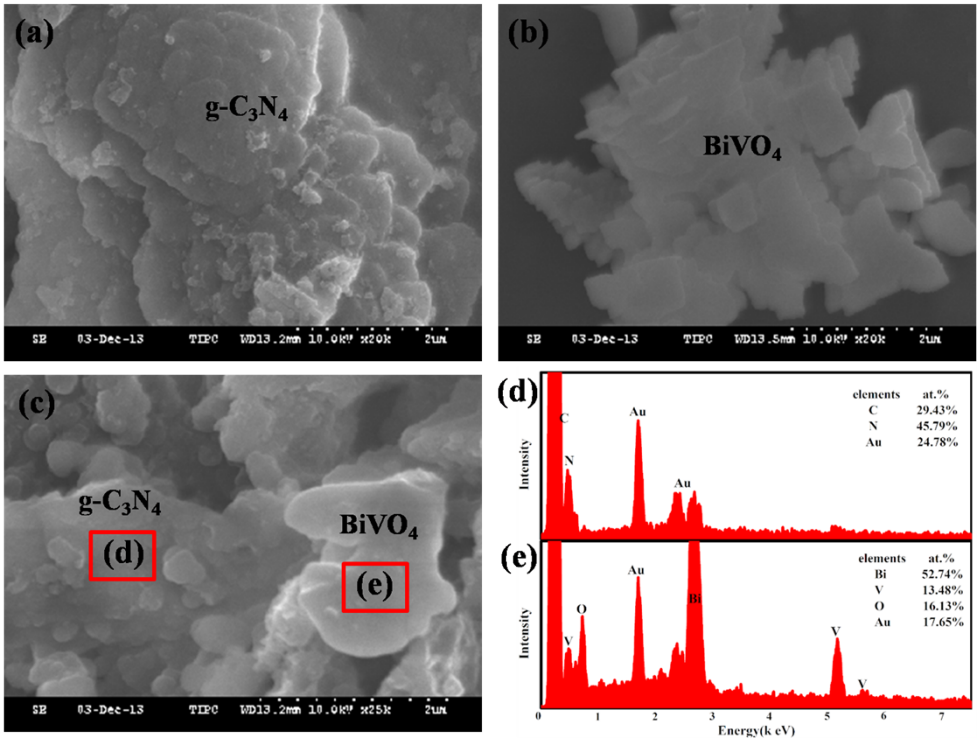

Fig. S1. SEM images of the as-obtained samples: (a) g-C_3N_4, (b) $BiVO_4$, (c) 3:7 $BiVO_4$/g-C_3N_4; and EDS images of the 3:7 $BiVO_4$/g-C_3N_4 samples (d) g-C_3N_4, (e) $BiVO_4$.

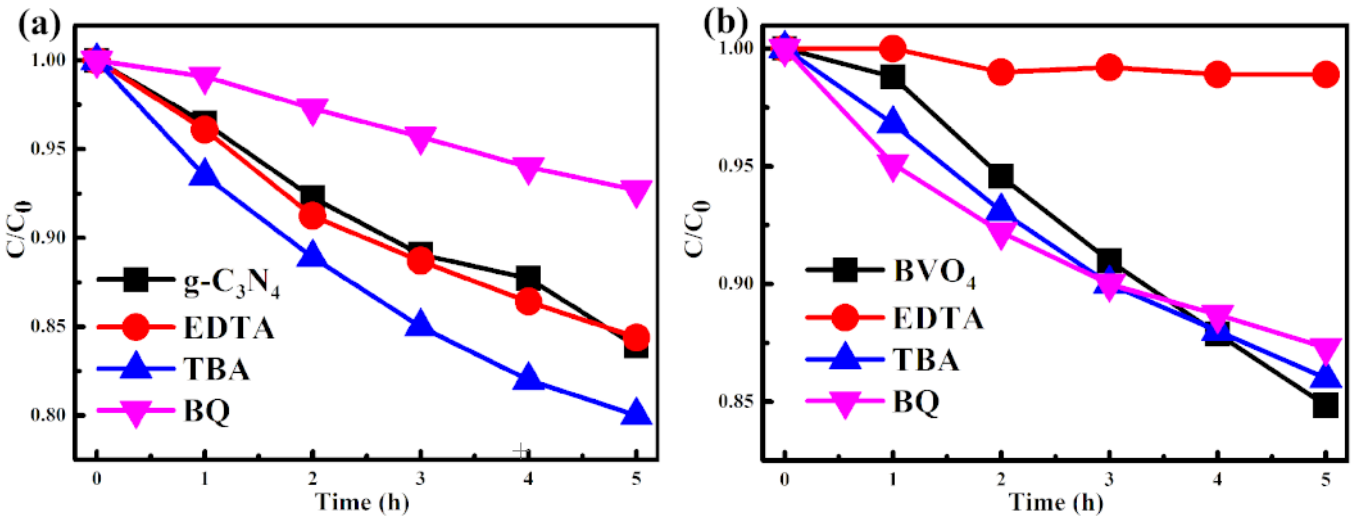

Fig. S2. Photocatalytic degradation curves of RhB over (a) $g\text{-}C_3N_4$ and (b) $BiVO_4$ photocatalysts alone and with the addition of TBA, EDTA, or BQ.