Supporting Information

Dramatic activities of Vanadate Intercalated Bismuth Doped LDH for solar light photocatalysis

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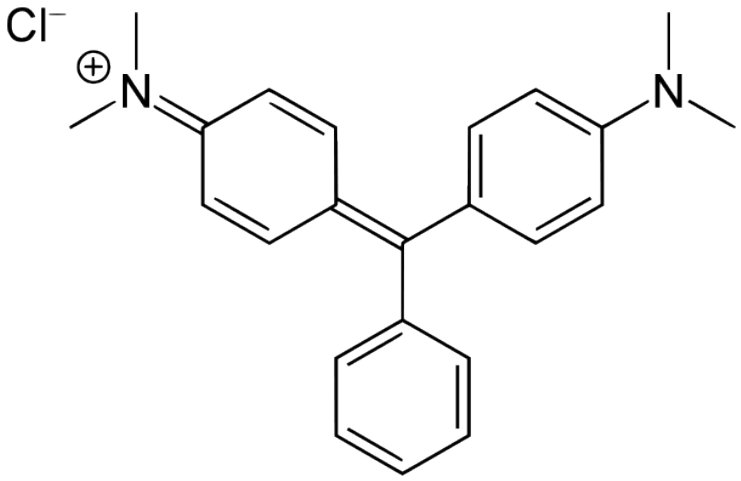
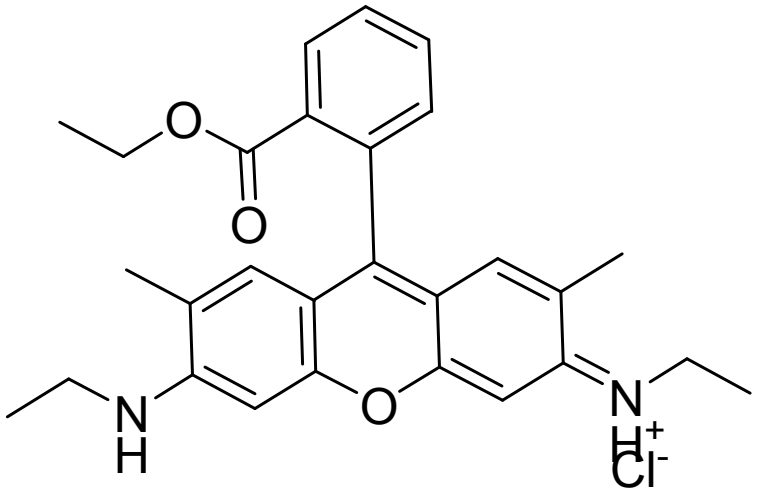
(a)



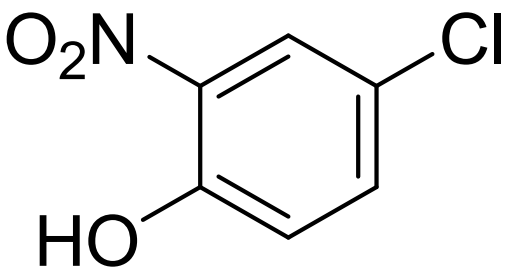
$C_{23}H_{25}ClN_2$ (chloride), *N*-[4-[[4-(Dimethylamino) phenyl] phenylmethylene]-2, 5-cyclohexadien-1-ylidene]-*N*-methylmethanaminium chloride, Malachite green

(b)



$C_{28}H_{31}N_2O_3Cl$, [9-(2-ethoxycarbonylphenyl)-6-(ethylamino)-2,7-dimethylxanthen-3-ylidene]-ethylazanium chloride , Rhodamine 6G dye

(c)



2 nitro-4-chloro phenol

Fig. S1 The structures of (a) Malachite green (b) Rhodamine 6G(c) 2 nitro-4-chloro phenol

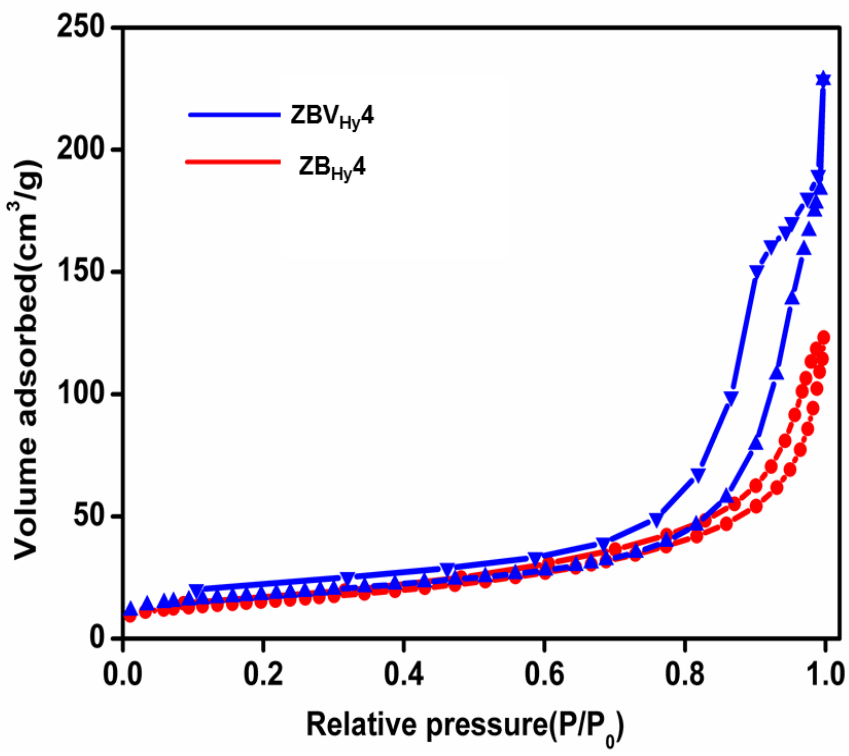
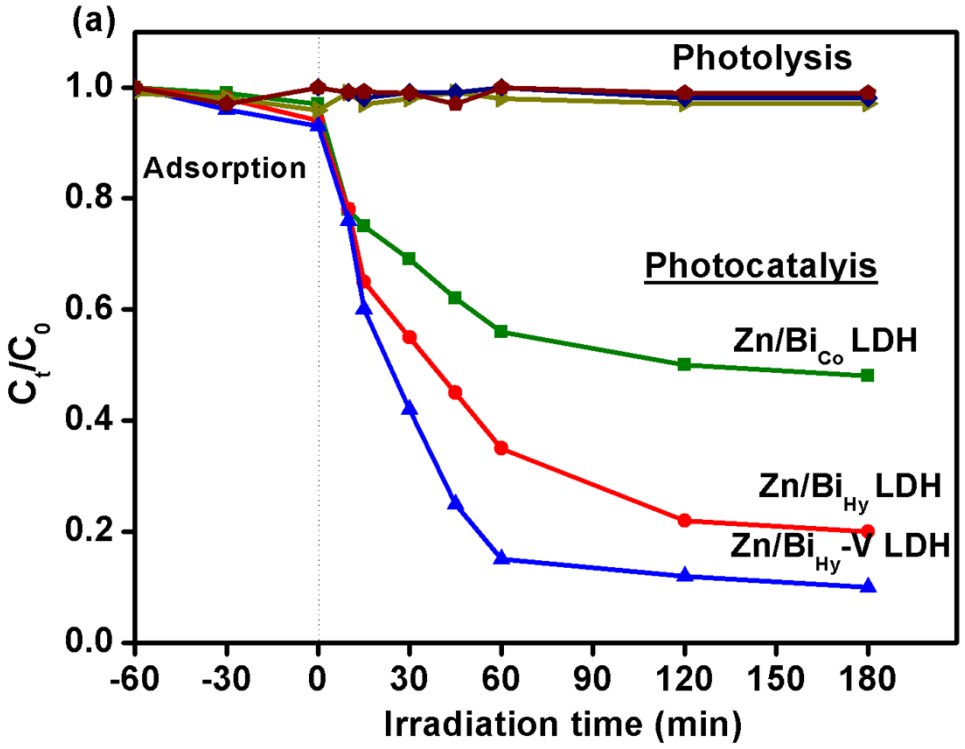
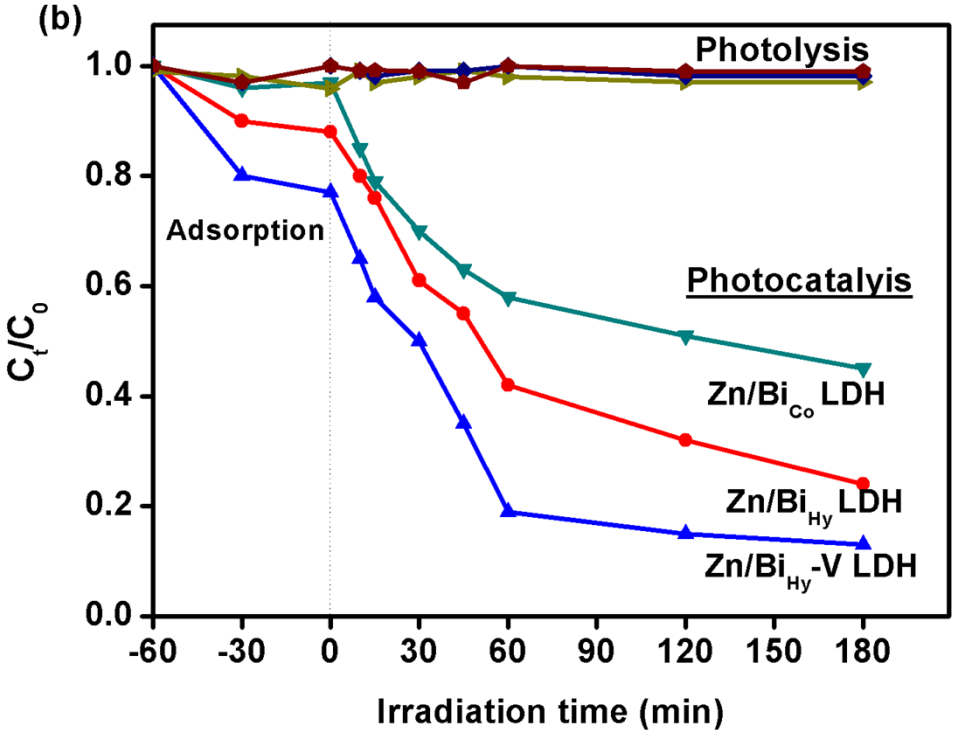


Fig. S2 The nitrogen sorption isotherm of ZB$_{Hy}$4 LDH and ZBV$_{Hy}$4 LDH.


(a)
Photolysis
Adsorption
Photocatalysis
Zn/Bi$_{Co}$ LDH
Zn/Bi$_{Hy}$ LDH
Zn/Bi$_{Hy}$-V LDH
C_t/C_0
1.0
0.8
0.6
0.4
0.2
0.0
-60
-30
0
30
60
90
120
150
180
Irradiation time (min)


(b)
Photolysis
Adsorption
Photocatalysis
Zn/Bi$_{Co}$ LDH
Zn/Bi$_{Hy}$ LDH
Zn/Bi$_{Hy}$-V LDH
C_t/C_0
1.0
0.8
0.6
0.4
0.2
0.0
-60
-30
0
30
60
90
120
150
180
Irradiation time (min)

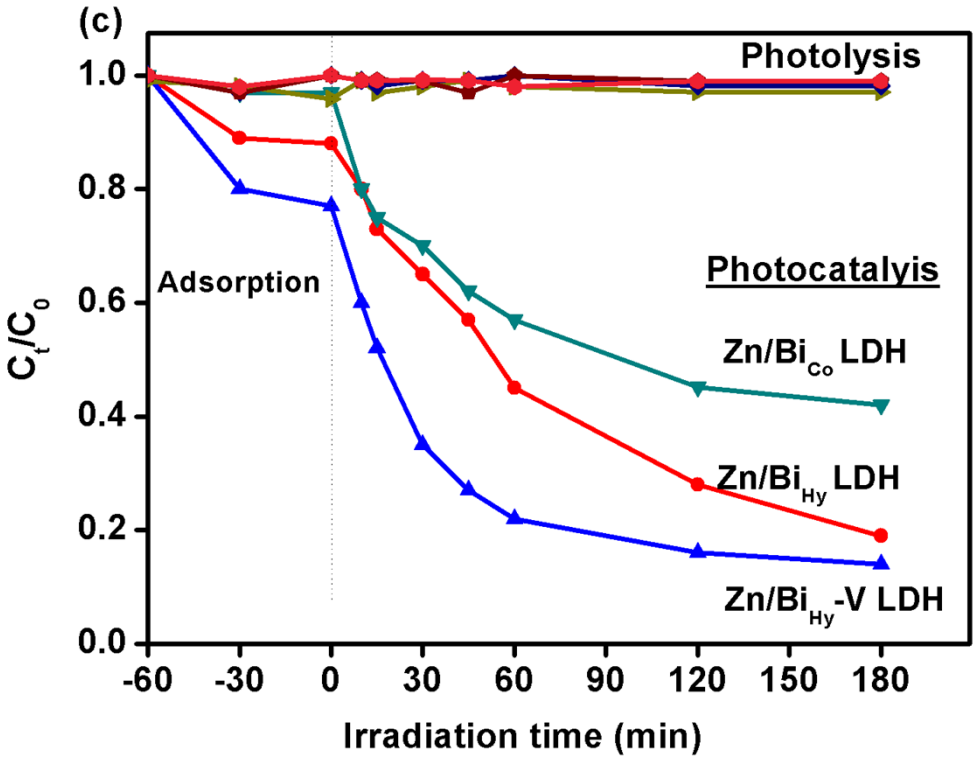


Fig. S3 Adsorption, Photolysis and photocatalytic degradation of (a) MG (b) RHG (c) CNP in aqueous solution (80 ppm) with ZB4LDH, ZB_{Hy4} LDH, ZBV_{Hy} 4 LDH.

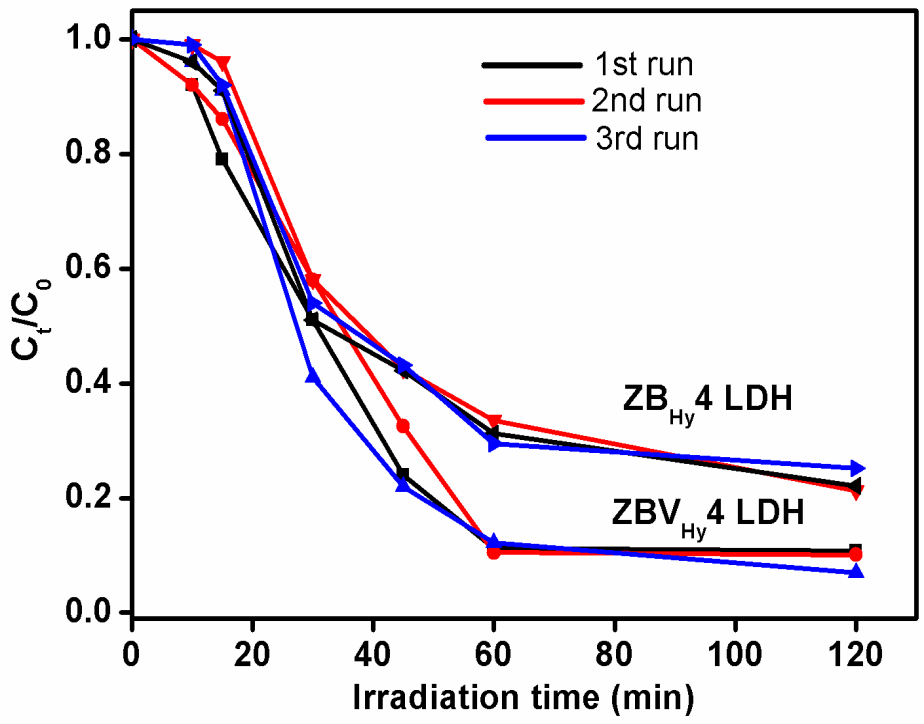


Fig. S4 Recycle test of the ZB_{Hy4} LDH and ZBV_{Hy} 4 LDH.

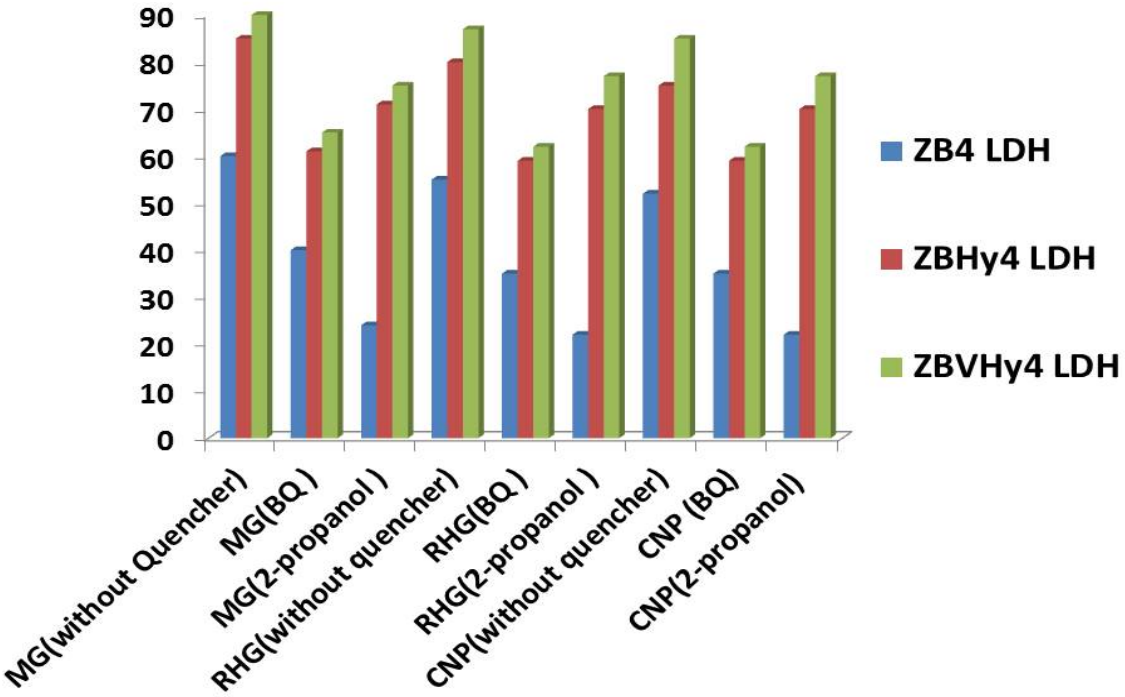


Fig. S5 Photocatalytic degradation of MG, RHG, and CNP for as prepared LDHs under visible irradiation in the presence of different quencher.

Table S1 The values of k_{obs} and $t_{1/2}$ parameters (time required to degrade half of the initial concentration of dyes).

Materials	K_{obs} (MG)	$t_{1/2}$	K_{obs} (RHG)	$t_{1/2}$	K_{obs} (CNP)	$t_{1/2}$
ZB 4 LDH	**0.0118**	**58**	**0.0112**	**61**	**0.008**	**86**
ZB $_{Hy}$ 4 LDH	**0.022**	**31**	**0.020**	**35**	**0.018**	**38**
ZBV $_{Hy}$ 4 LDH	**0.042**	**16**	**0.040**	**17**	**0.038**	**18**