Electronic supplementary information (ESI)

The loading of PPy on surface of transition metal coordination polymer modified polyoxometalate (TMCP/POM): a feasible strategy to obtain visible light active and high quantum yields POM based photocatalyst

Xinxin Xu, Xin Gao, Zhongping Cui, Xiaoxia Liu* and Xia Zhang*

Department of Chemistry, College of Science, Northeast University, Shenyang, Liaoning, 110819, People's Republic of China

Table S1. Crystal data and structure refinement results for **$CuSiW_{12}$**

Empirical formula	$C_{36}H_{32}N_8O_{52}SiW_{12}Cu_4$
Formula weight	3897.15
Crystal system	Monoclinic
Space group	$P\ 2_1/c$
a/Å	12.0612(7)
b/Å	19.6783(11)
c/Å	16.3392(7)
α/°	90
β/°	116.804(3)
γ/°	90
V/Å^3	3461.3(3)
Z	2
D_{calcd}/(g cm^{-3})	3.739
Reflections collected	18903
Reflections unique	5761
R(int)	0.0315
Goodness - of - fit on F^2	1.279
R_1 [$I > 2\sigma(I)$]	0.0584
wR_2 [$I > 2\sigma(I)$]	0.2220
R_1 (all data)	0.0599
wR_2 (all data)	0.2240

Note. $R_1 = \Sigma||F_o|-|F_c||/\Sigma|F_o|$; $wR_2 = \Sigma[w(F_o^2-F_c^2)^2]/\Sigma[w(F_o^2)^2]^{1/2}$

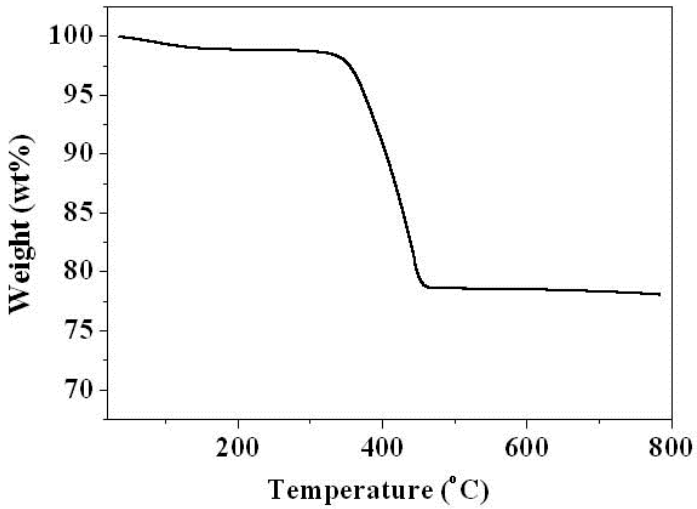


Figure S1. TG curve of **$CuSiW_{12}$**

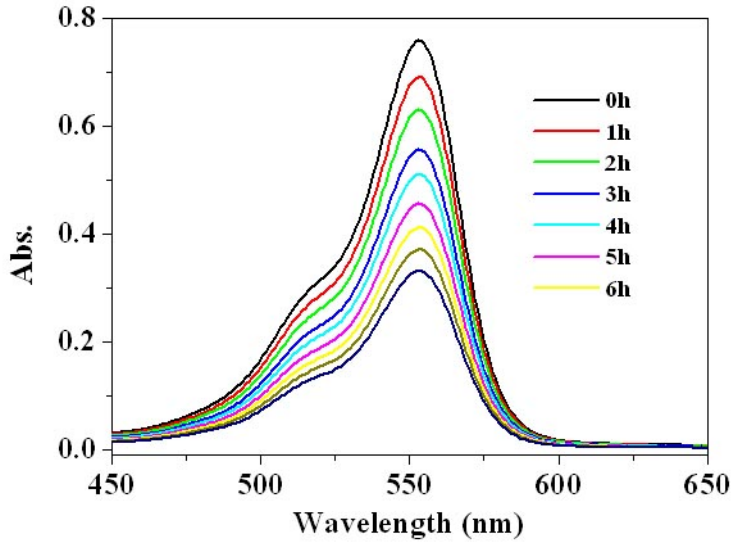
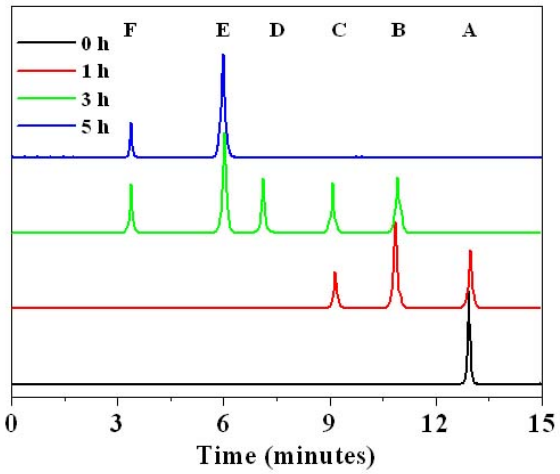


Figure S2. Absorption spectra of RhB degraded by **$CuSiW_{12}$** under ultraviolet light irradiation



Peak	Retention time	Decomposition products	MS peak
A	13	Rhodamine B	443.3
B	11.2	N, N-diethyl-N'-ethylorhodamine	415.3
C	9.1	N-diethyl-N'-ethylorhodamine	387.2
D	7.2	N, N' -diethylrhodamine	387.2
E	5.6	N-ethylrhodamine	359.2
F	3.8	rhodamine	331.2

Figure S3. HPLC-MS of the decomposition products at different times.

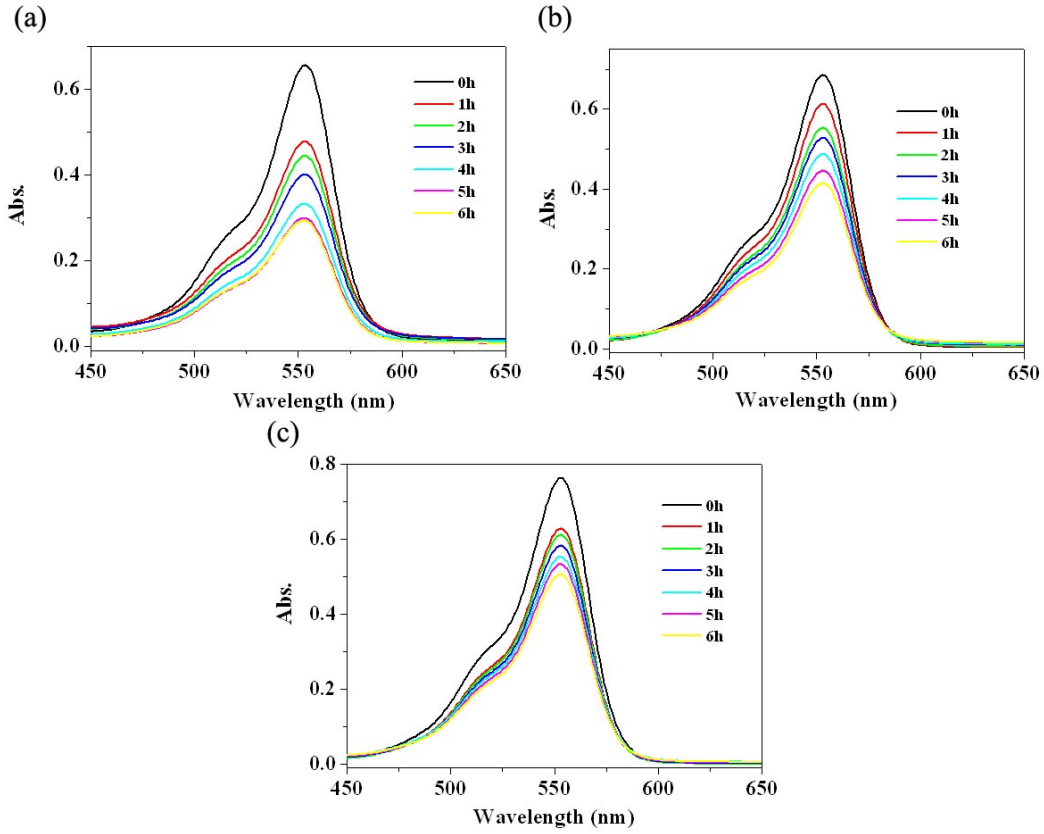


Figure S4. Absorption spectra of RhB degraded by: (a) **PPy(A)**; (b) **PPy(B)**; (c) **PPy(C)** under visible light irradiation.

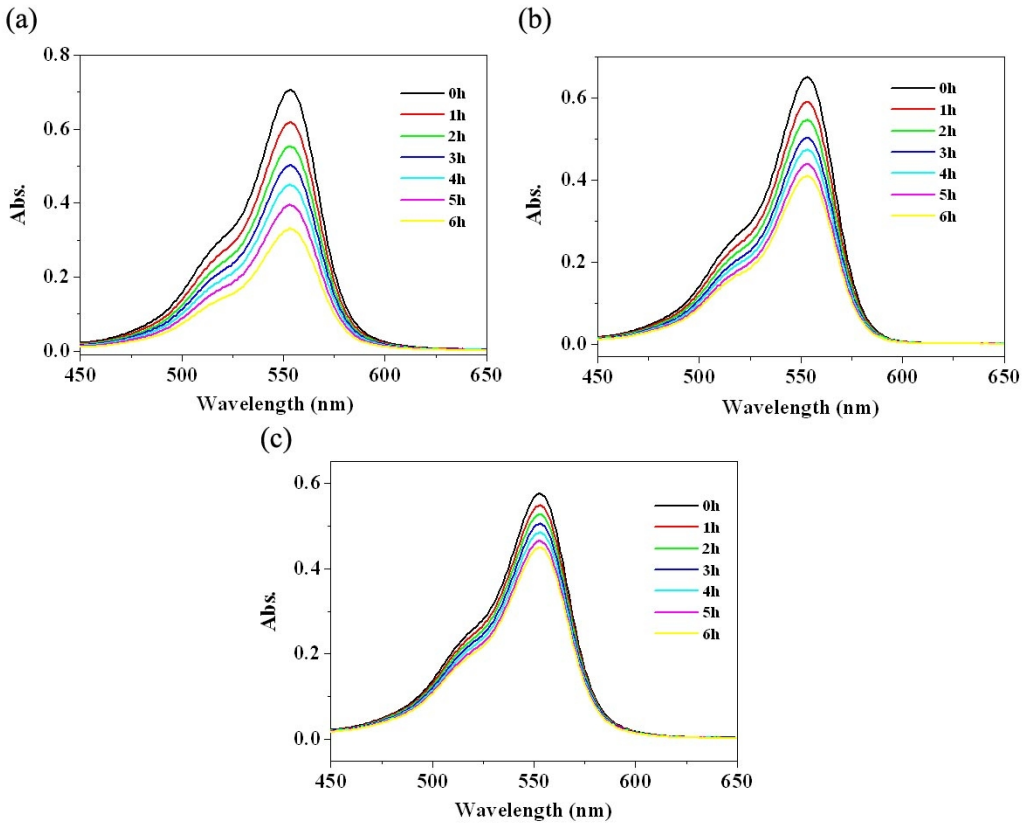
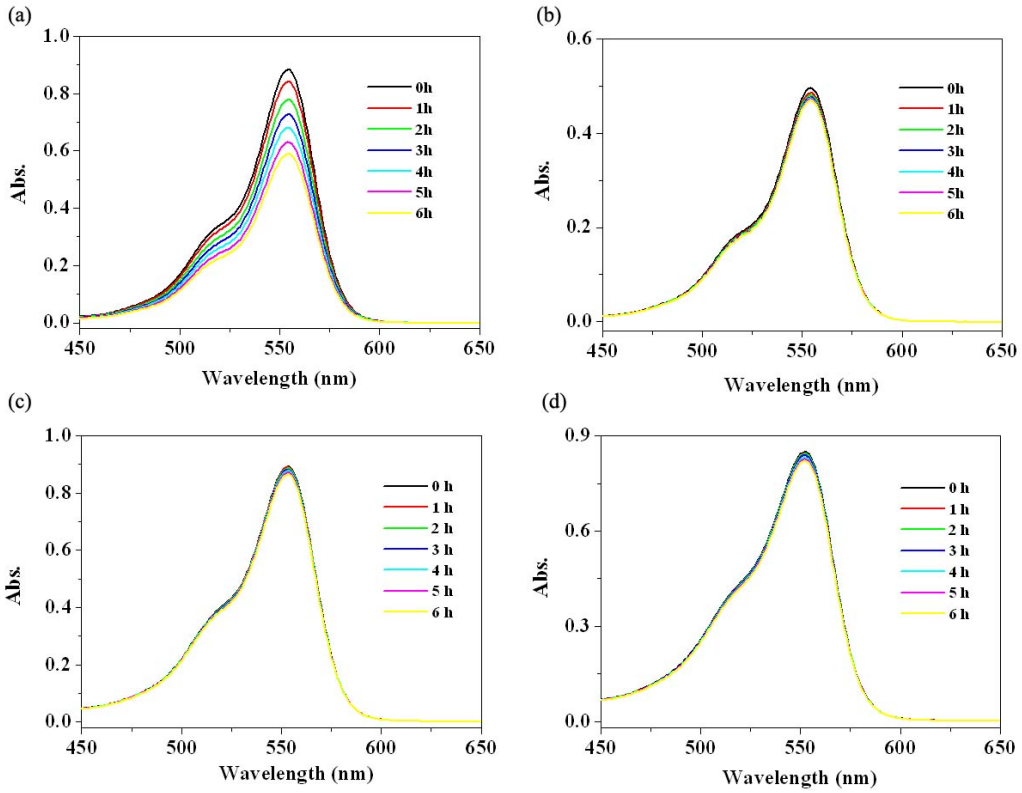


Figure S5. Absorption spectra of RhB degraded with **PPy/CuSiW$_{12}$M**: (a) **PPy(A)/CuSiW$_{12}$M**; (b) **PPy(B)/CuSiW$_{12}$M**; (c) **PPy(C)/CuSiW$_{12}$M** by visible light irradiation.

1



2

3 **Figure S6.** Absorption spectra of RhB degraded by: (a) $Cu(NO_3)_2 \cdot 3H_2O$; (b) bpca; (c)

4 pca; (d) $H_4SiW_{12}O_{40}$ under visible light irradiation.

5