

## **The Effect of Metal Ions on Photocatalytic Performance Based on Isostructural Framework**

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## Supporting Information

**Fig. S1** Supporting structure figures.

**Fig. S2** PXRD data of **1** and **5**.

**Fig. S3** Thermogravimetric curve of **1** and **5**.

**Fig. S4** PXRD data of **1-5** after refluxing in water system.

**Fig. S5** Photocatalytic results of four kinds of dyes.

**Fig. S6** Absorption spectra of six kinds of dyes during the decomposition reaction in the presence of **5**.

**Fig. S7** The MS spectrum of photocatalytic decomposition of MB solution.

**Fig. S8** Photocatalytic reaction rate with complex **5**.

**Fig. S9** The PXRD patterns of **1** and **5** after bleaching experiment.

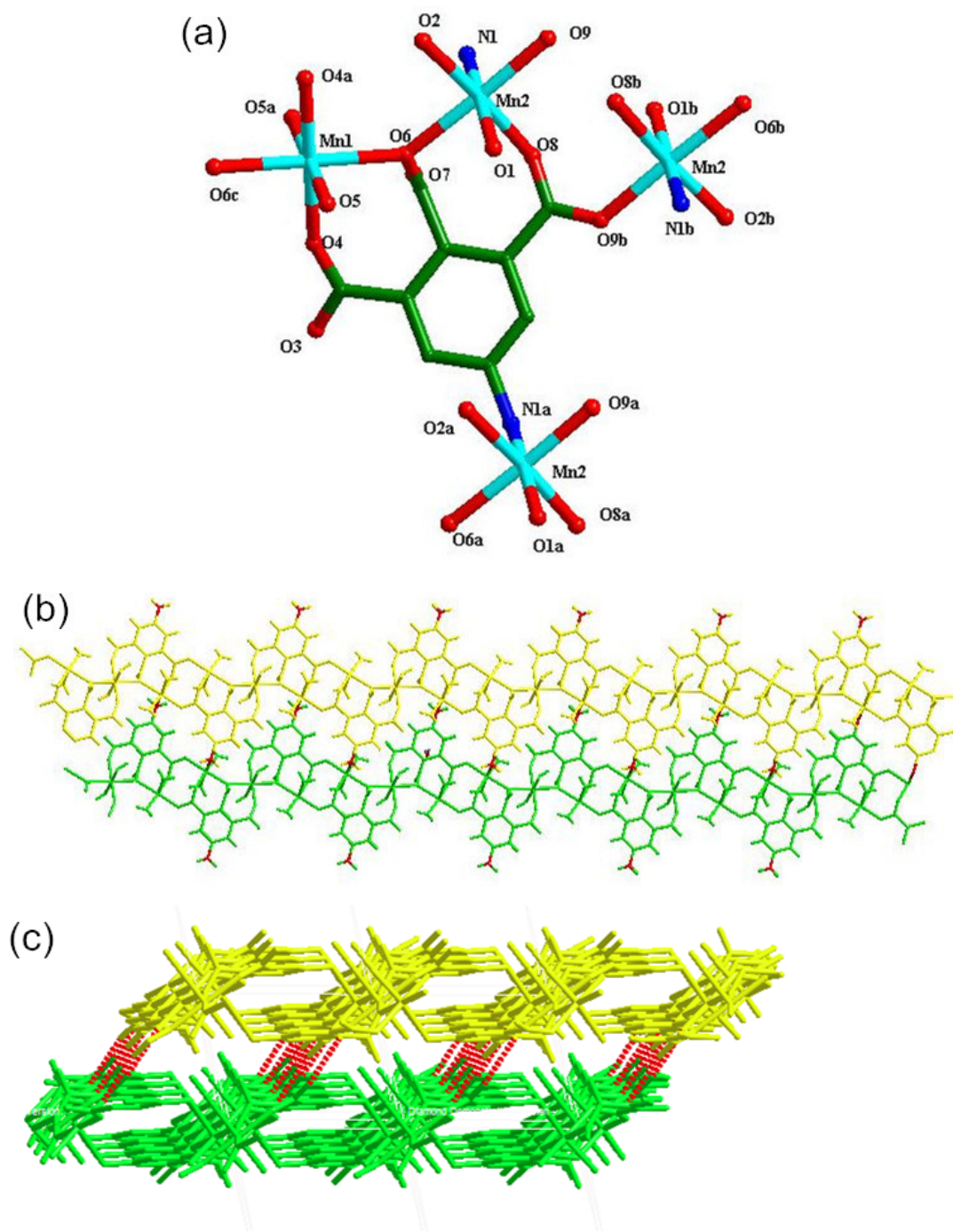
**Fig. S10** UV/Vis spectra of **1** and **5**.

**Fig. S11** Kubelka-Munk-transformed diffuse reflectance of complexes **1** and **5**.

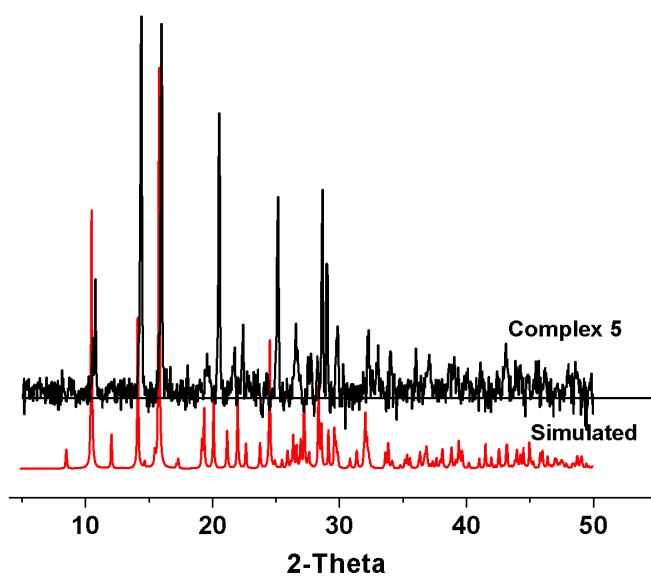
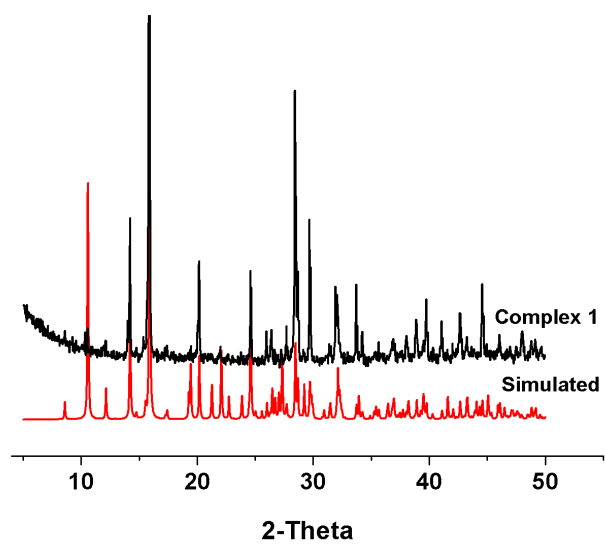
**Table S1** Selected bond lengths (Å) and bond angles (deg) for **1** and **5**.

**Table S2** Crystallographic parameters of **2-4**.

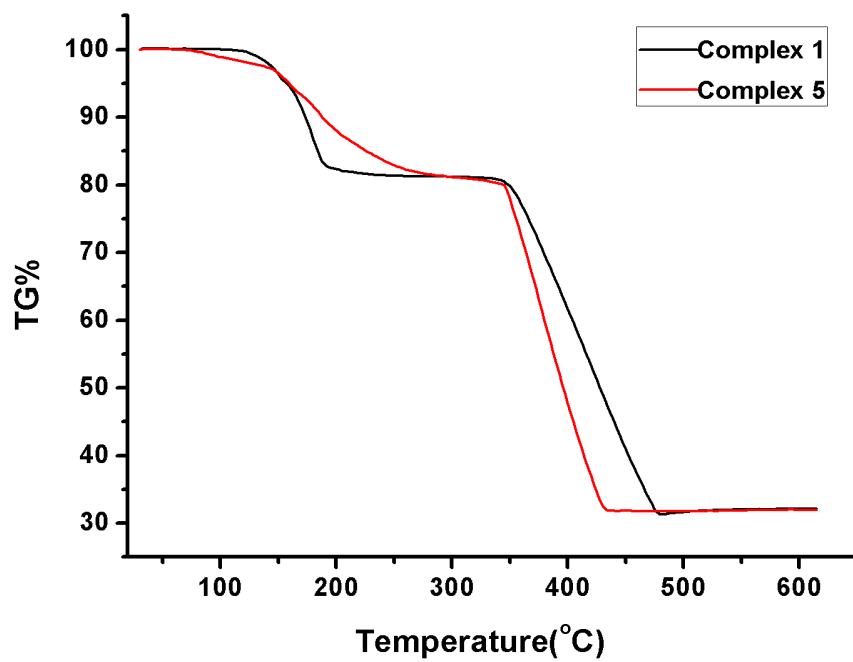
**Table S3.** Hydrogen Bonds of complexes **5**.



**Fig. S1** (a) Coordination environment around  $\text{Mn}^{\text{II}}$  in **1**. (b) View of connection between 1D chains. (c) View of hydrogen bond in **5**.



**Fig. S2** Simulated and experimental PXRD data for **1** (up) and **5** (down).



**Fig. S3** Thermogravimetric analyses of **1** and **5**.

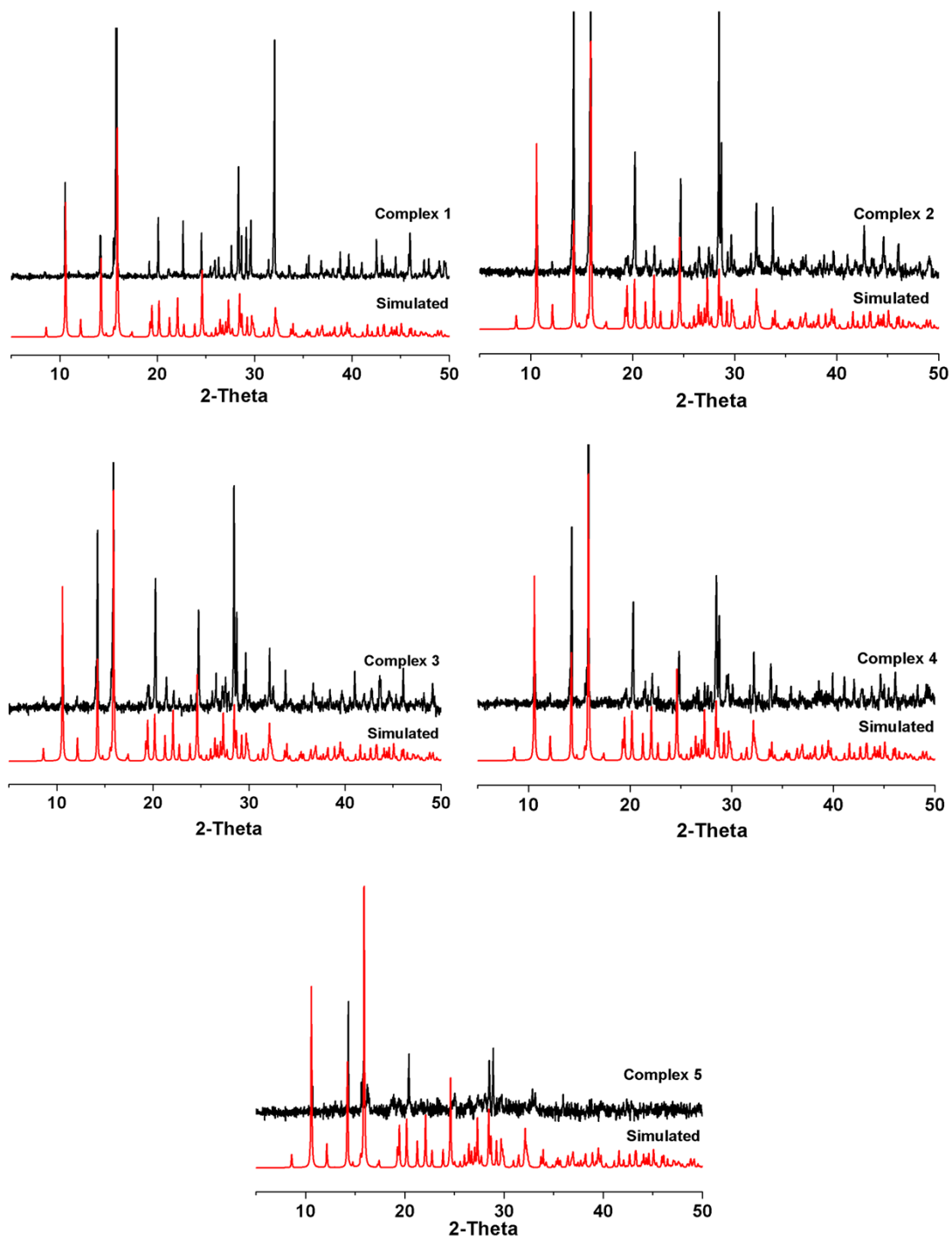
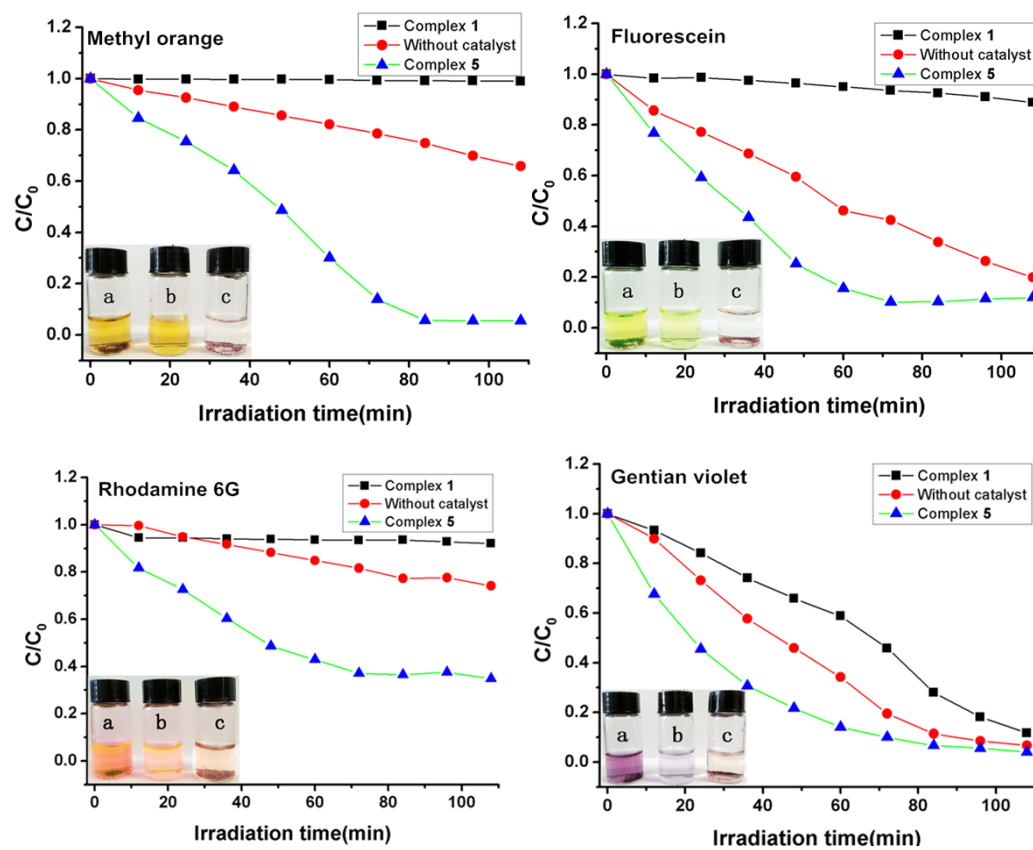
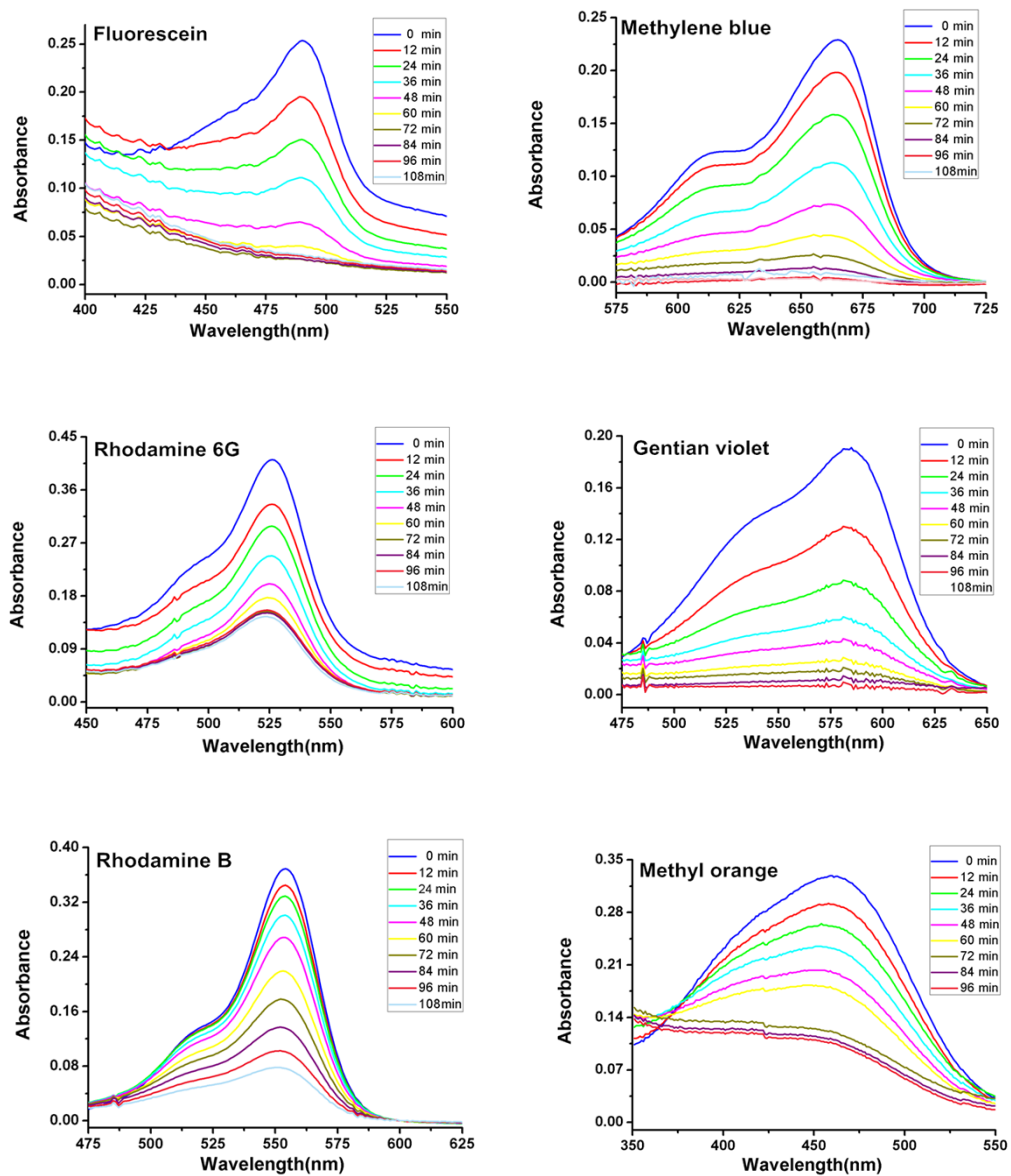


Fig. S4 Simulated and experimental PXRD data of 1-5 after refluxing in water system.



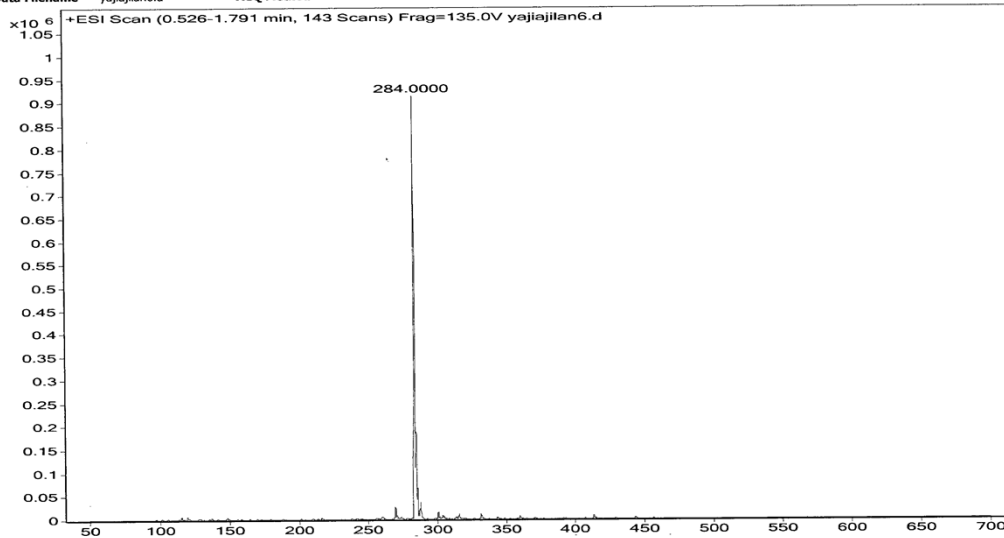
**Fig.S5** Photocatalytic decomposition of four kinds of dyes in the presence of complexes **1**, **5** and the control experiment without any catalyst under the same conditions (a: **1**, b: without catalyst, c: **5**).



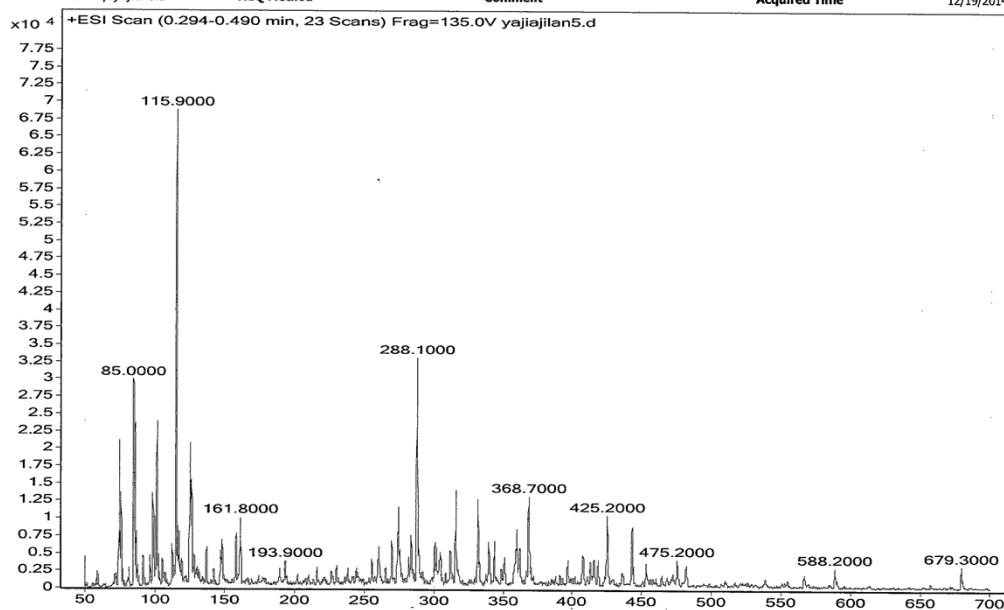
**Fig.S6** Absorption spectra of six kinds of dyes during the decomposition reaction under visible light irradiation in the presence of complex **5**.



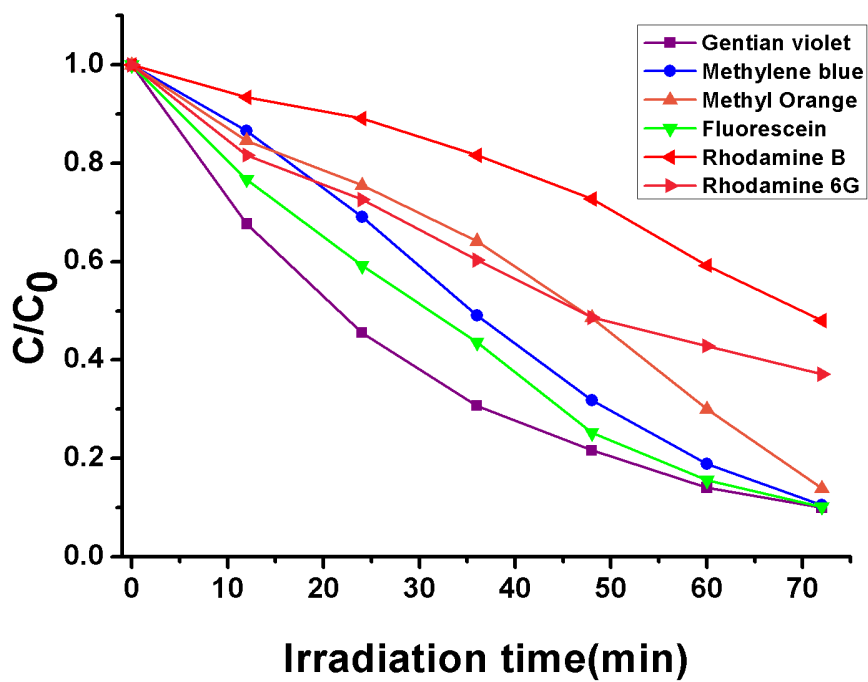
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Inj Vol	2	InjPosition		SampleType	Sample	IRM Calibration Status	Not Applicable
Data Filename	yajiajilan6.d	ACQ Method		Comment		Acquired Time	12/19/2014 3:34:27 PM



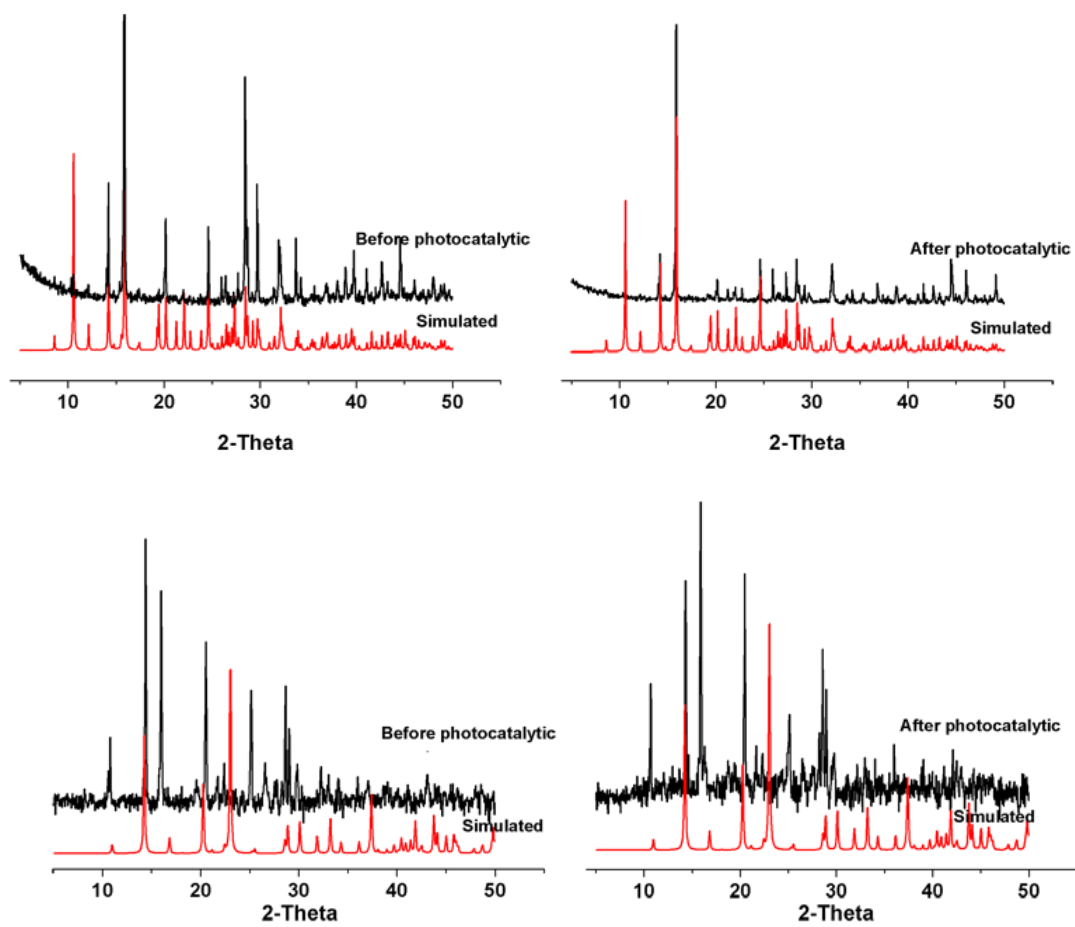
Sample Name	yajiajilan-2	Position	Vial 71	Instrument Name	SG14237006	User Name	6420-HP\admin
Inj Vol	2	InjPosition		SampleType	Sample	IRM Calibration Status	Not Applicable
Data Filename	yajiajilan5.d	ACQ Method		Comment		Acquired Time	12/19/2014 3:30:10 PM



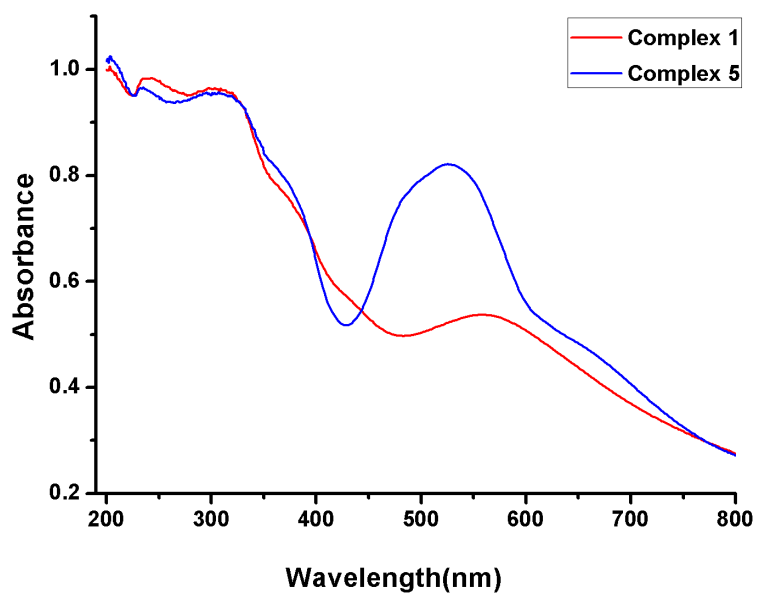
**Fig.S7** MS spectrum before (up) and after (down) the reaction of photocatalytic decomposition of MB solution.



**Fig.S8** Photocatalytic decomposition of six kinds of dyes solution under visible light irradiation in the presence of complex 5.



**Fig.S9** The PXRD patterns of **1** (up) and **5** (down) at the end of final repeated bleaching experiment.



**Fig.S10** UV/Vis spectra of **1** and **5**.

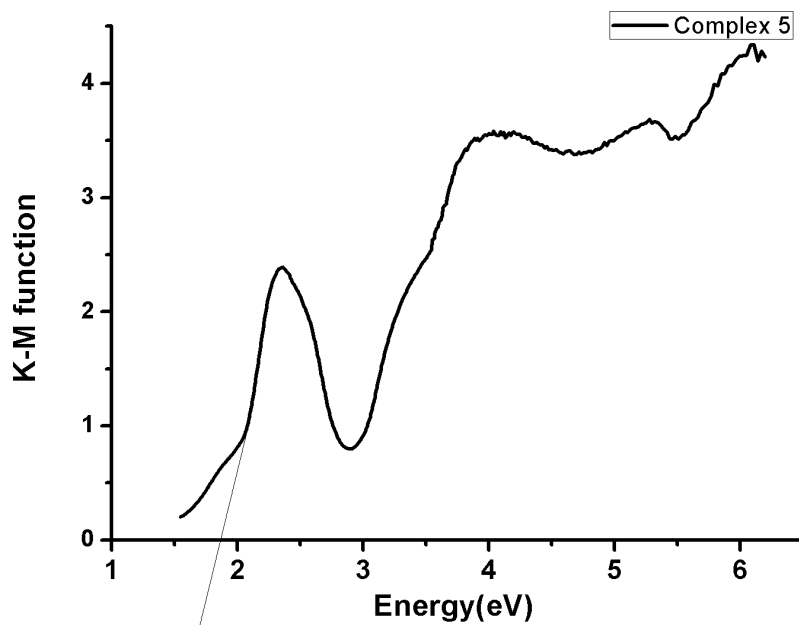
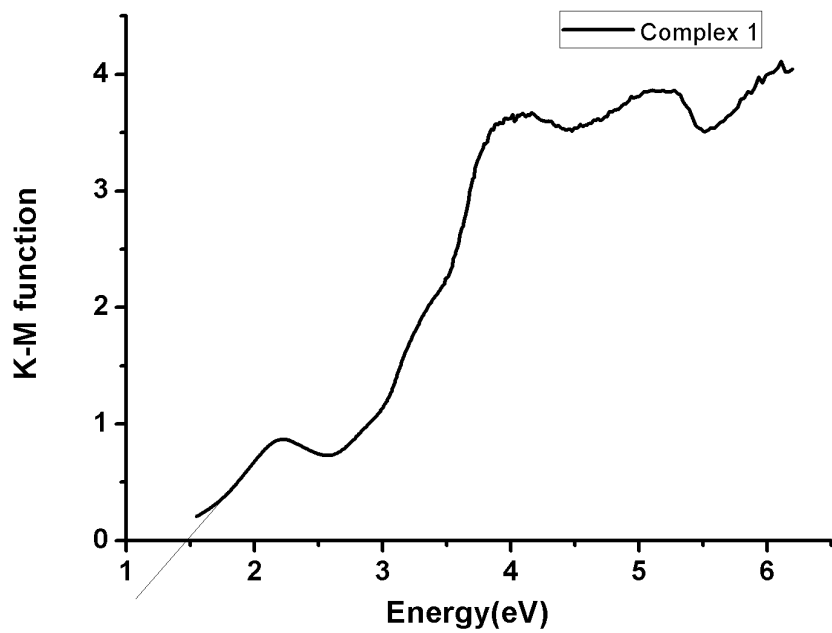


Fig.S11 Kubelka-Munk-transformed diffuse reflectance of complexes 1 and 5.

**Table S1** Selected bond lengths (Å) and bond angles (deg) for **1** and **5** crystal structure description.

Complex 1			
O(1)-Mn(1)	2.2201(19)	Mn(1)-O(3)#2	2.169(2)
O(1)-Mn(2)#1	2.255(2)	Mn(1)-O(7)#2	2.173(3)
O(7)-Mn(1)	2.173(3)	Mn(1)-O(1)#2	2.2201(19)
O(8)-Mn(2)	2.109(2)	Mn(2)-O(6)#3	2.114(2)
O(5)-Mn(2)#1	2.156(2)	Mn(2)-O(5)#4	2.156(2)
O(9)-Mn(2)	2.224(2)	Mn(2)-O(1)#4	2.255(2)
O(3)-Mn(1)	2.169(2)	Mn(2)-N(1)	2.316(2)
O(6)-Mn(2)#3	2.114(2)	O(6)#3-Mn(2)-O(1)#4	174.52(7)
O(3)#2-Mn(1)-O(3)	180.000(1)	O(5)#4-Mn(2)-O(1)#4	82.36(7)
O(3)#2-Mn(1)-O(7)#2	90.06(11)	O(9)-Mn(2)-O(1)#4	86.37(8)
O(3)-Mn(1)-O(7)#2	89.94(11)	O(8)-Mn(2)-N(1)	96.86(11)
O(3)#2-Mn(1)-O(7)	89.94(11)	O(6)#3-Mn(2)-N(1)	91.40(9)
O(3)-Mn(1)-O(7)	90.06(11)	O(5)#4-Mn(2)-N(1)	81.60(8)
O(7)#2-Mn(1)-O(7)	180.0	O(9)-Mn(2)-N(1)	168.20(8)
O(3)#2-Mn(1)-O(1)#2	83.98(7)	O(1)#4-Mn(2)-N(1)	84.47(8)
Symmetry codes:	#1 x,y-1,z	#2 -x,-y,-z+2	#3 -x+1,-y+1,-z+1
		#4 x,y+1,z	
Complex 5			
Co(1)-O(5)	2.069(3)	Co(2)-O(2)	2.020(3)
Co(1)-O(5)#1	2.069(3)	Co(2)-O(9)#2	2.054(2)
Co(1)-O(4)#1	2.115(2)	Co(2)-O(8)#3	2.107(2)
Co(1)-O(4)	2.115(2)	Co(2)-O(1)	2.134(3)
Co(1)-O(6)#1	2.162(2)	Co(2)-O(6)#3	2.168(2)
Co(1)-O(6)	2.162(2)	Co(2)-N(1)	2.176(3)
O(5)-Co(1)-O(5)#1	180.0	O(2)-Co(2)-O(9)#2	88.21(11)
O(5)-Co(1)-O(4)#1	90.37(11)	O(2)-Co(2)-O(8)#3	175.30(10)
O(5)#1-Co(1)-O(4)#1	89.63(11)	O(9)#2-Co(2)-O(8)#3	96.07(9)
O(5)-Co(1)-O(4)	89.63(11)	O(2)-Co(2)-O(1)	91.64(12)
O(5)#1-Co(1)-O(4)	90.37(11)	O(9)#2-Co(2)-O(1)	92.39(10)
O(4)#1-Co(1)-O(4)	180.00(12)	O(8)#3-Co(2)-O(1)	90.12(10)
O(5)-Co(1)-O(6)#1	88.45(10)	O(2)-Co(2)-O(6)#3	89.99(10)
O(5)#1-Co(1)-O(6)#1	91.55(10)	O(9)#2-Co(2)-O(6)#3	178.06(8)
O(4)#1-Co(1)-O(6)#1	86.53(9)	O(8)#3-Co(2)-O(6)#3	85.70(8)
O(4)-Co(1)-O(6)#1	93.47(9)	O(1)-Co(2)-O(6)#3	88.39(10)
O(5)-Co(1)-O(6)	91.55(10)	O(2)-Co(2)-N(1)	95.40(12)
O(5)#1-Co(1)-O(6)	88.45(10)	O(9)#2-Co(2)-N(1)	91.89(10)
O(4)#1-Co(1)-O(6)	93.47(9)	O(8)#3-Co(2)-N(1)	82.56(9)
O(4)-Co(1)-O(6)	86.53(9)	O(1)-Co(2)-N(1)	171.87(10)
O(6)#1-Co(1)-O(6)	180.0	O(6)#3-Co(2)-N(1)	87.54(9)
Symmetry codes:	#1 -x+2,-y+2,-z	#2 -x+1,-y+1,-z+1	#3 x,y-1,z
		#4 x,y+1,z	

**Table S3.** Hydrogen Bonds of complexes **5**.

Complex	D-H···A	d(D-H) (Å)	d(H···A) (Å)	d(D···A) (Å)	<(D-H···A) (deg)
<b>5</b>	O(2)-H(2W1)...O(3)#1	0.852(19)	1.86(2)	2.701(4)	167(4)
Symmetry codes: #1 x-1,y,z					

**Table S2** Crystallographic parameters of **2-4**.

Complex	<b>2</b>	<b>3</b>	<b>4</b>
a/Å	7.4267(15)	7.4136(14)	7.4158(11)
b/Å	8.5085(17)	8.5154(11)	8.4779(12)
c/Å	10.381(2)	10.279(3)	10.165(9)
a/u	82.69(4)	82.64(2)	82.67(4)
b/u	83.44(6)	83.45(9)	83.36(8)
c/u	79.82(8)	79.72(3)	79.89(6)
V/Å <sup>3</sup>	632.7(2)	629.2(4)	625.6(7)