

**pH-tuned diverse structures and properties: Two Anderson-type
polyoxometalate-based metal-organic complexes for selective
photocatalysis and adsorption of organic dyes**

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Table. S1. Selected bond distances (Å) and angles (°) for the title complexes.

Complex **1**

Cu(1)-N(1)	1.969(3)
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Cu(1)-O(1W)#1	2.016(3)
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Cu(1)-O(1)#1	2.415(2)
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Cu(2)-O(5) 1.915(3)

Cu(2)-O(6) 1.981(3)

Cu(2)-O(4) 2.344(3)

Cu(3)-O(3) 2.399(3)

Cu(3)-O(4W) 1.991(3)

Cu(3)-N(4) 2.011(3)

N(1)-Cu(1)-O(1W)#1 89.88(13)

N(1)-Cu(1)-O(1W) 90.12(13)

O(1W)#1-Cu(1)-O(1W) 180.0

N(1)#1-Cu(1)-O(1)#1 90.49(11)

O(1W)-Cu(1)-O(1)#1	87.74(10)	N(1)-Cu(1)-O(1)
N(1)#1-Cu(1)-O(1)	89.51(11)	O(1W)#1-Cu(1)-O(1)
O(1W)-Cu(1)-O(1)	92.26(10)	O(1)#1-Cu(1)-O(1)
O(5)-Cu(2)-O(2W)	176.90(11)	O(5)-Cu(2)-O(6)

O(2W)-Cu(2)-O(6)	94.40(11)	O(5)-Cu(2)- O(3W)
O(2W)-Cu(2)-O(3W)	90.31(12)	O(6)-Cu(2)- O(3W)
O(5)-Cu(2)-O(4)	92.24(10)	O(2W)-Cu(2)- O(4)
O(6)-Cu(2)-O(4)	91.25(10)	O(3W)-Cu(2)- O(4)
N(1)-Cu(1)-N(1)#1	180.0	O(5)-Cu(3)- O(4W)

O(5)-Cu(3)-O(6)

81.92(10)

O(4W)-Cu(3)-
O(6)

O(5)-Cu(3)-N(4)

93.77(11)

O(4W)-Cu(3)-
N(4)

O(6)-Cu(3)-N(4)

171.17(11)

O(5)-Cu(3)-
O(3)

O(4W)-Cu(3)-O(3)

86.48(10)

O(6)-Cu(3)-
O(3)

N(4)-Cu(3)-O(3)

84.08(10)

Symmetry codes for **1**: #1 -x,-y,-z+2

Complex **2**

Cu(1)-O(1W)

1.934(6)

Cu(1)-O(1)

Cu(1)-N(1)	1.971(7)	Cu(1)-O(2W)
Cu(1)-O(14)#1	2.331(6)	Cu(1)-O(27)
O(1W)-Cu(1)-N(1)	95.8(3)	O(1)-Cu(1)- N(1)
O(1W)-Cu(1)-O(2W)	172.5(3)	O(1)-Cu(1)- O(2W)
N(1)-Cu(1)-O(2W)	90.6(3)	O(1W)-Cu(1)- O(14)#1

O(1)-Cu(1)-O(14)#1

81.0(2)

N(1)-Cu(1)-
O(14)#1

O(2W)-Cu(1)-O(14)#1

90.7(2)

O(1W)-Cu(1)-
O(1)

Symmetry codes for **2**: #1 $x-1, y, z$

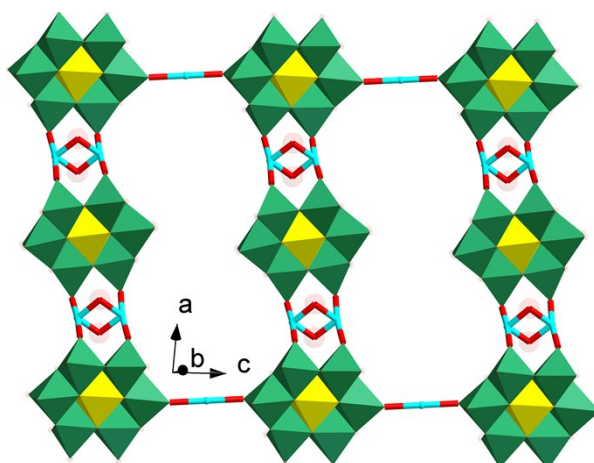


Fig. S1. The 2D Cu–CrMo₆ inorganic layer in **1**

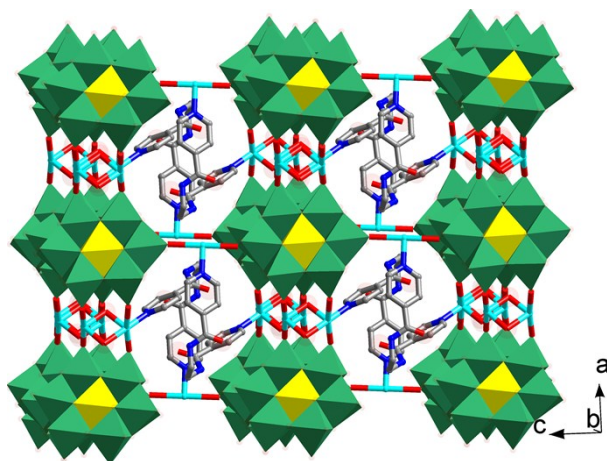


Fig. S2. The 3D inorganic-organic hybrid framework in **1**

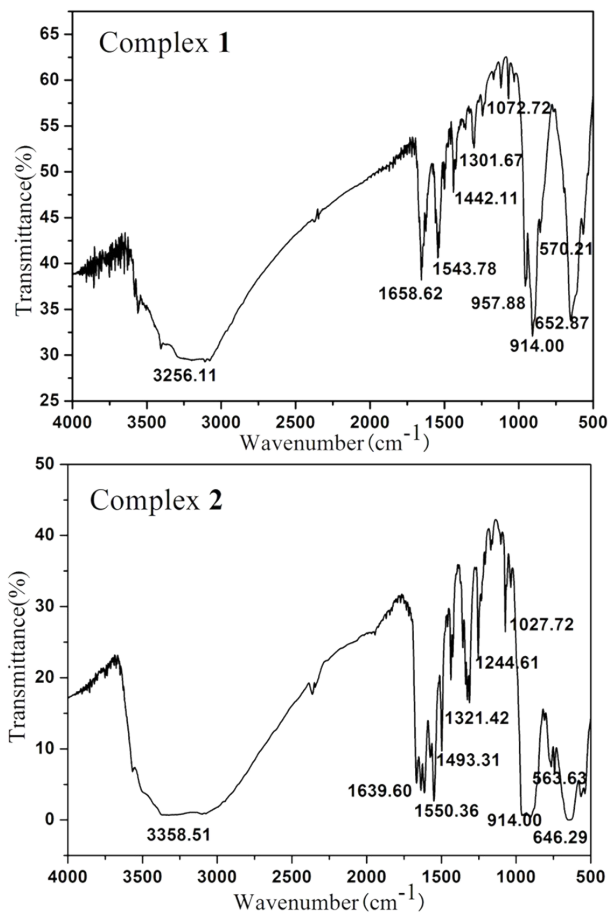


Fig. S3. The IR spectra of the title complexes.

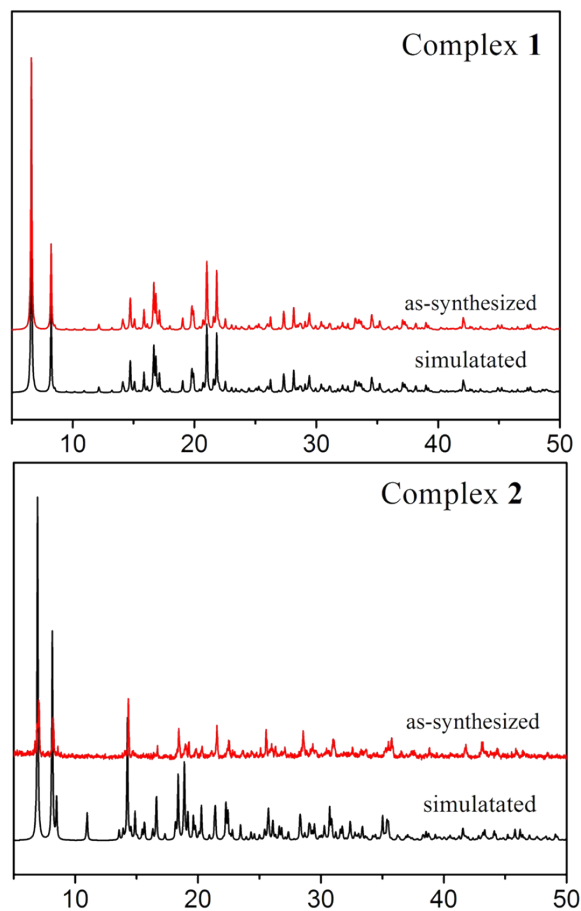


Fig. S4. Powder X-ray diffraction patterns of the title complexes.

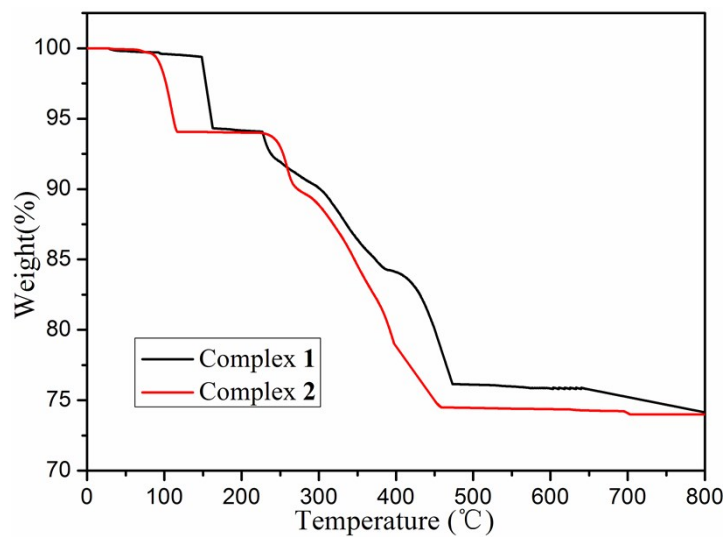


Fig. S5. The TGA curves of the title complexes.

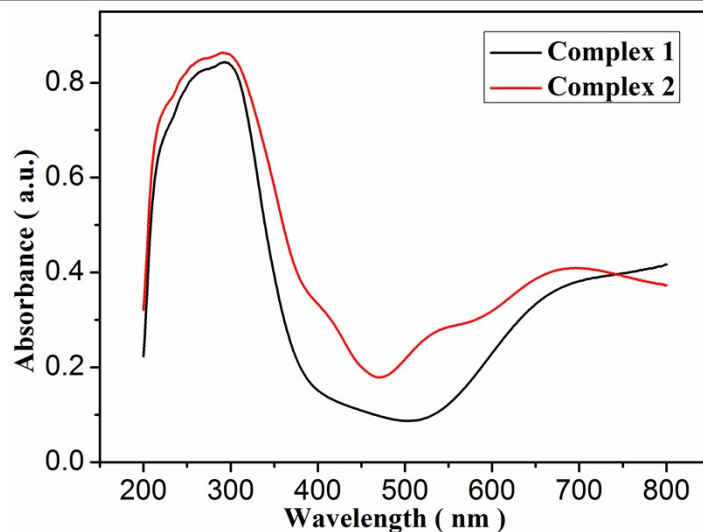


Fig. S6. The diffuse reflection spectra of complexes 1-2 in the crystalline state.

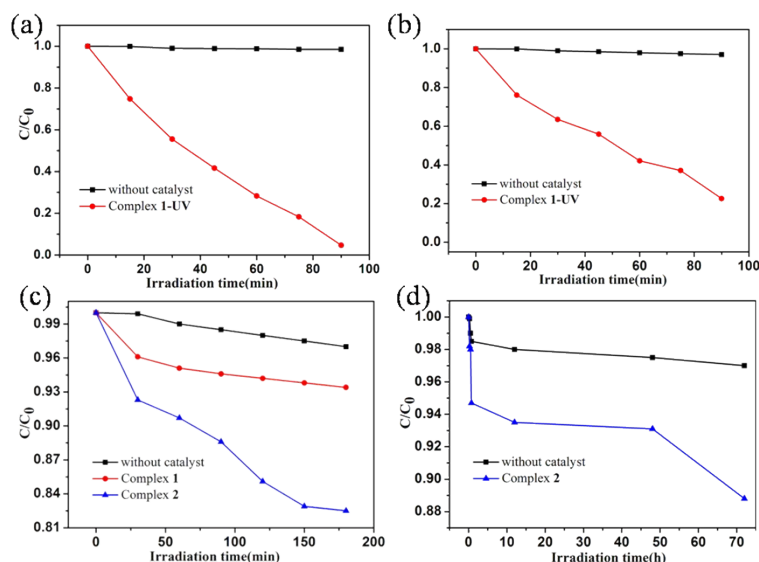


Fig. S7 Photocatalytic decomposition rate of MB solution (a), CR solution (b), RhB solution under UV irradiation (c) and RhB solution in the darkness (d) with the use of title complexes.

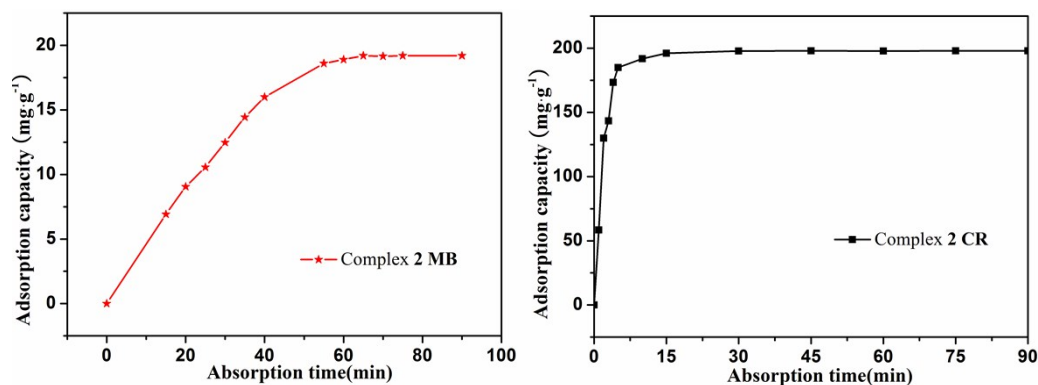


Fig. S8. The corresponding removal efficiency of MB (red) and CR (black) over 2.

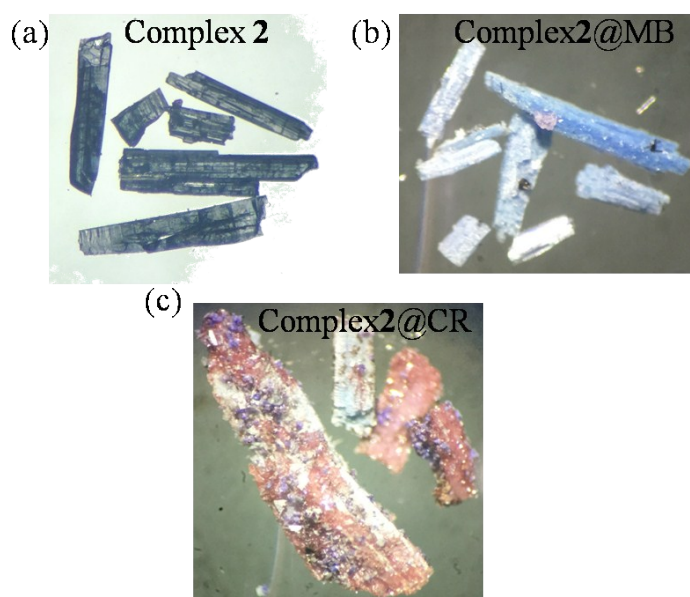


Fig. S9. (a) Complex 2, (b) Complex 2@MB, (c) Complex 2@CR

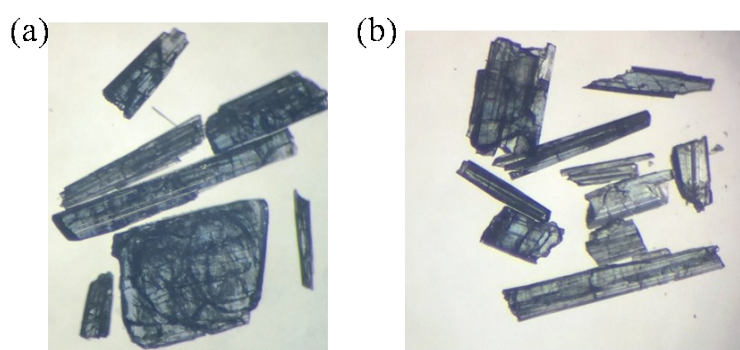


Fig. S10. (a) Complex 2 after MB-released, (b) Complex 2 after CR-released

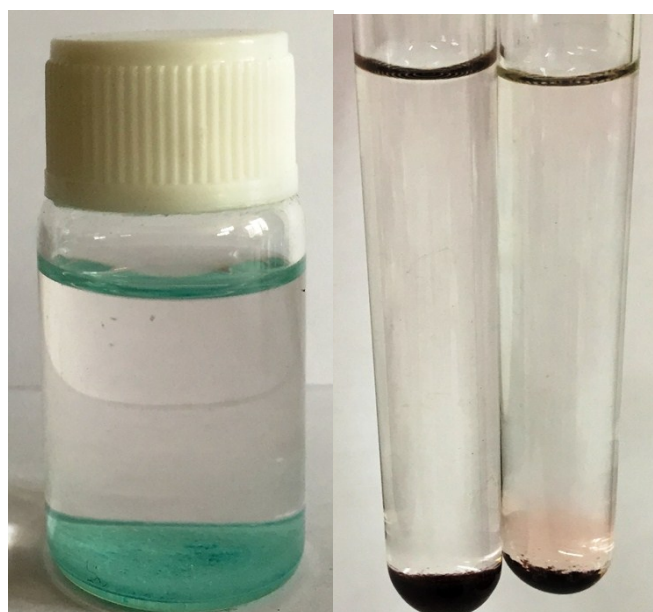


Fig. S11. Organic dyes releasing from complex 2 in pure DMF solution.