

Supplementary Material (ESI) for New Journal of Chemistry
This journal is © The Royal Society of Chemistry

A series of metal-organic loops templated by $[\text{SiMo}_{12}\text{O}_{40}]^{4-}$ and $[\beta\text{-Mo}_8\text{O}_{26}]^{4-}$ anions by using double chelate ligands: amperometric sensing and selective photocatalytic properties

Ai-xiang Tian,* Yu-bo Fu, Hong-tao Cui, Jun Ying, Meng-le Yang, Yan Yang, Xiu-li Wang*

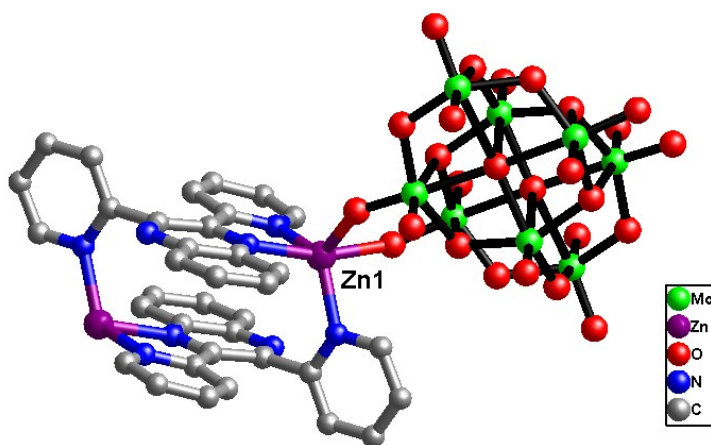


Fig. S1. Ball/stick view of the asymmetric unit of **6**. The hydrogen atoms are omitted for clarity.

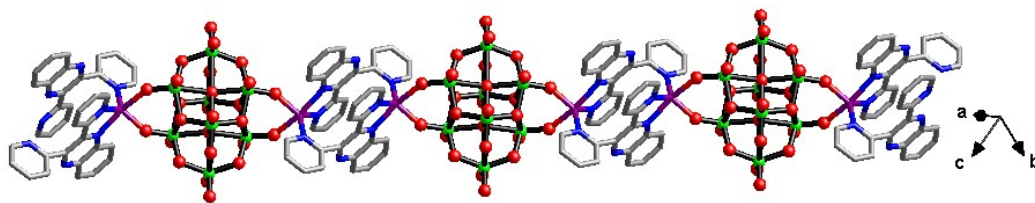


Fig. S2. The 1D chain in compound **6**.

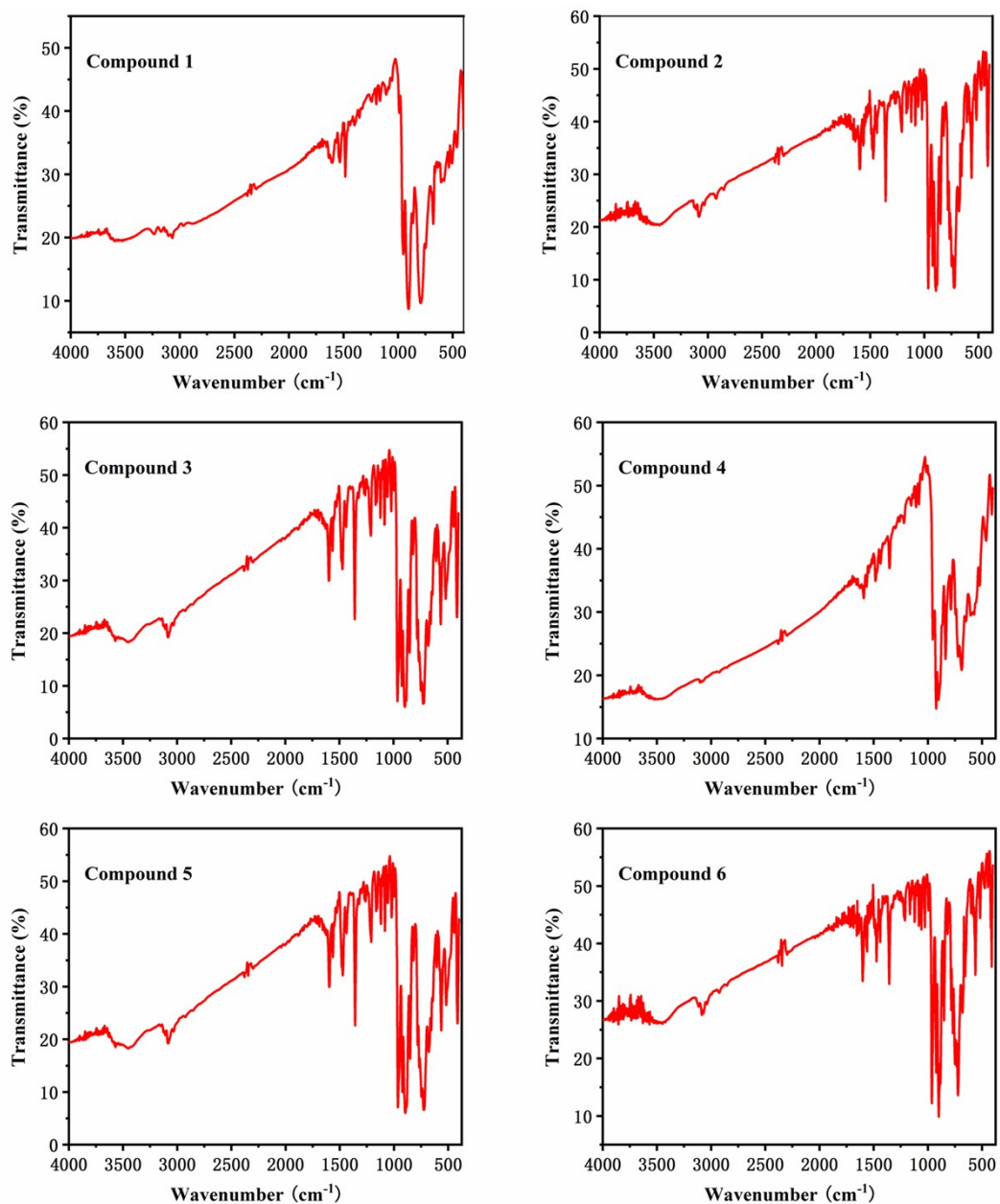


Fig. S3. The IR spectra of compounds 1–6.

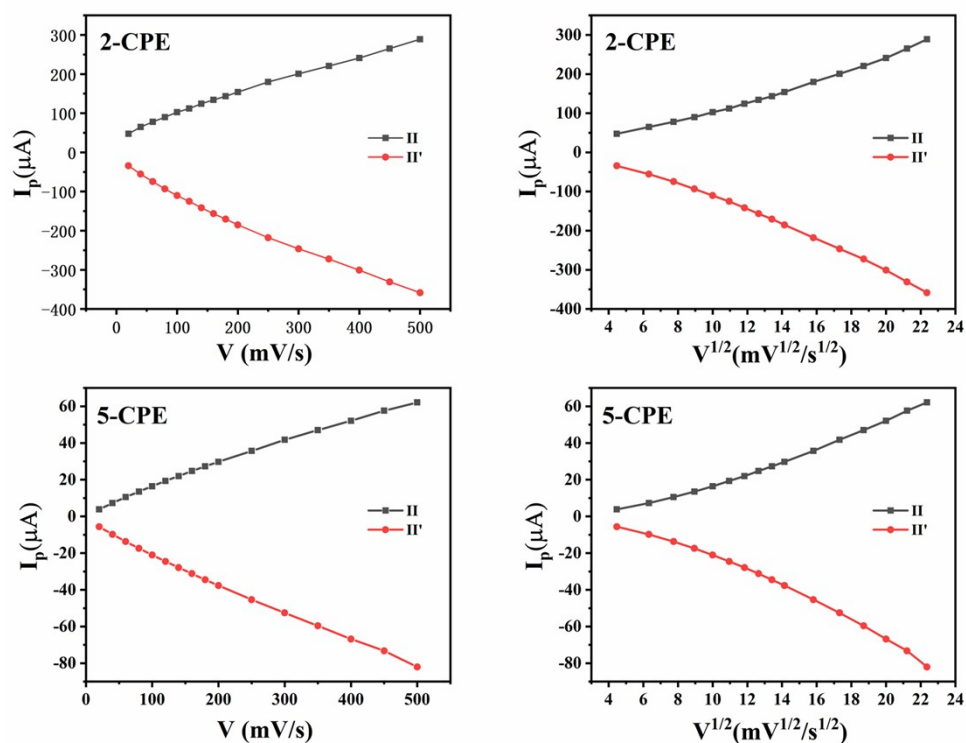


Fig. S4. Plots of the anodic and the cathodic peak II–II' current against v and $v^{1/2}$ of 2– and 5–CPEs.

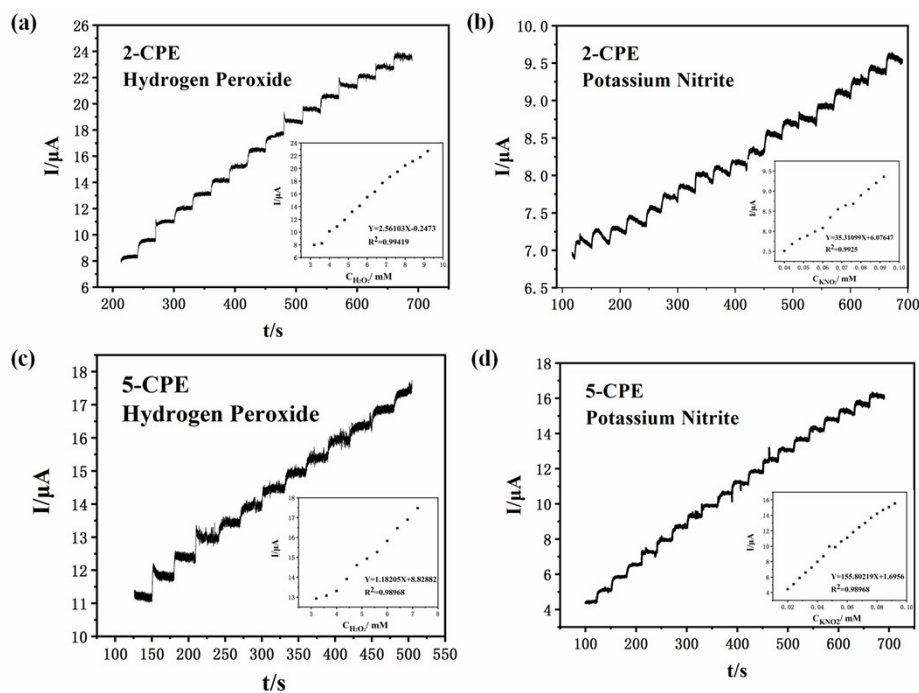


Fig. S5. Amperometric response for the 2– and 5–CPE on successive addition of 0.1 mM nitrite to 0.1M H_2SO_4 +0.5M Na_2SO_4 aqueous solution. The inset: the steady-state calibration curve for

current versus nitrite concentration (applied potential: -150 mV for **2**- and **5**-CPE).

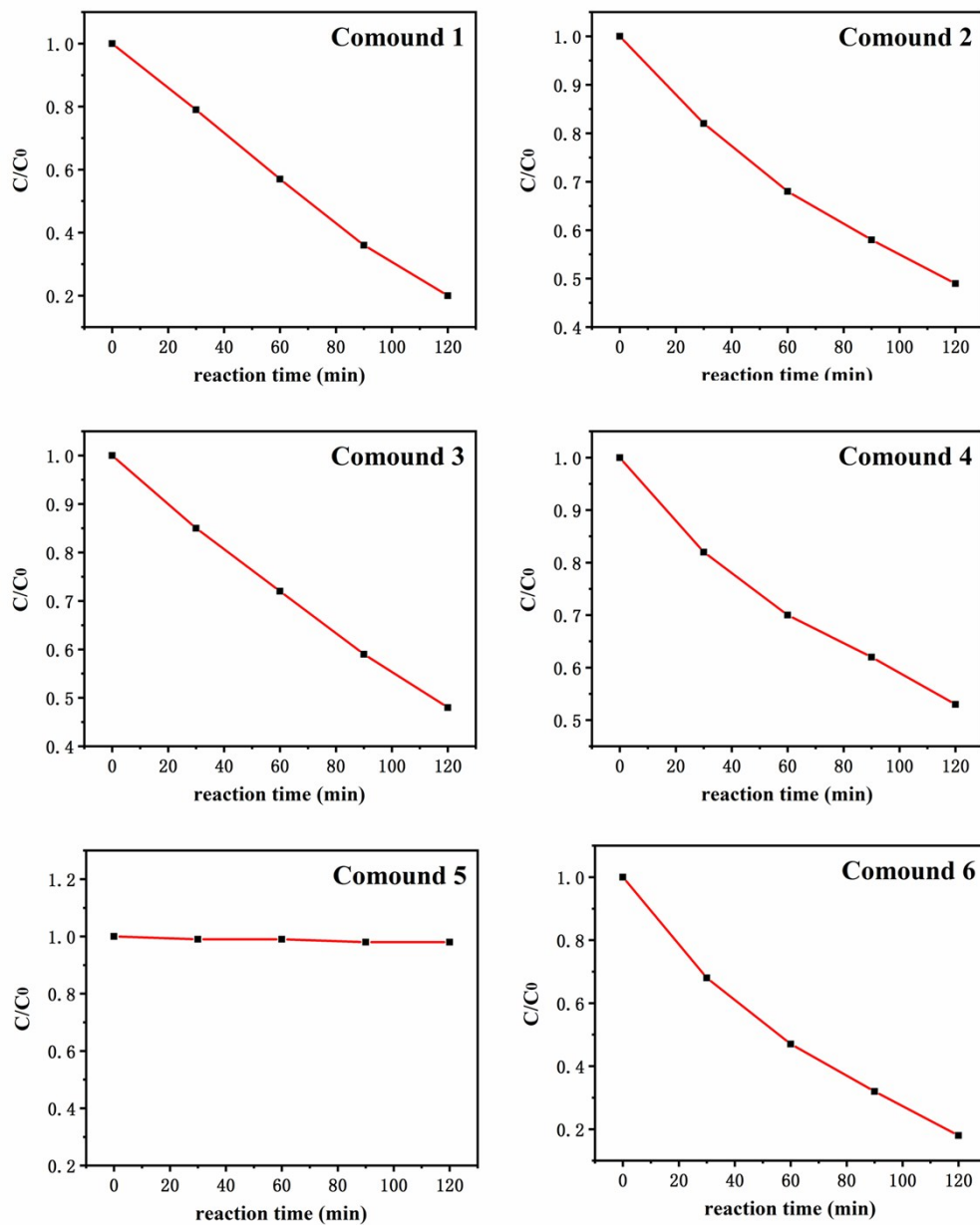


Fig. S6. Photocatalytic decomposition rates of MB solutions under UV irradiation with the use of compounds **1**-**6**.

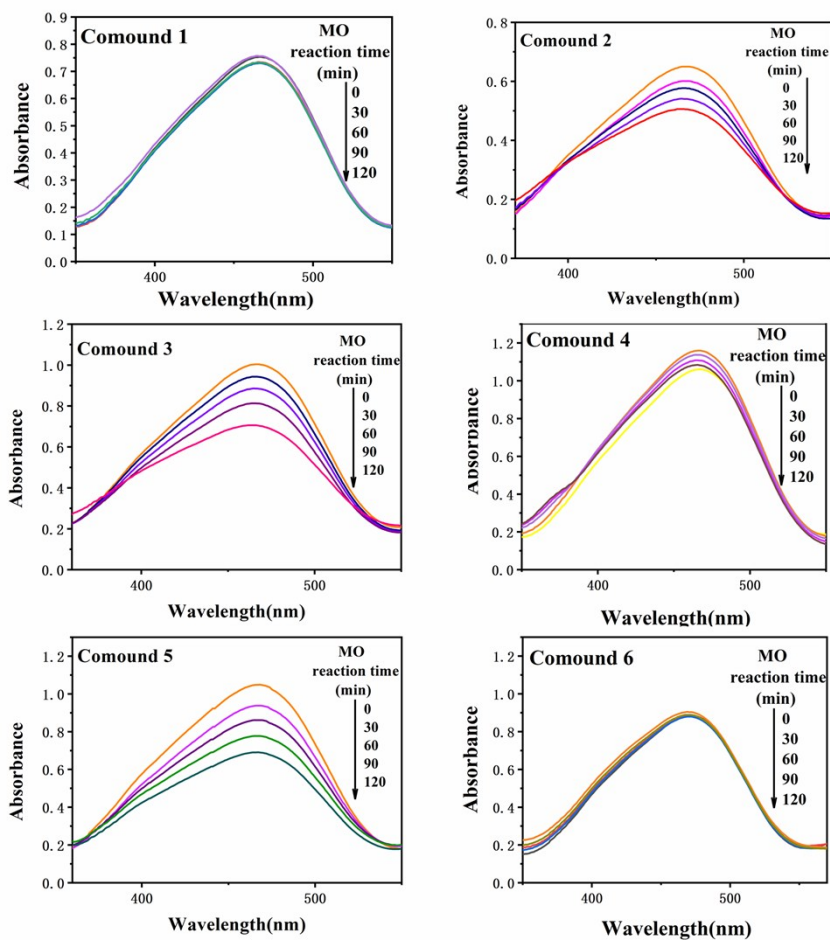


Fig. S7. Absorption spectra of the MO solution during the decomposition reaction under UV irradiation with the presence of compounds 1–6.

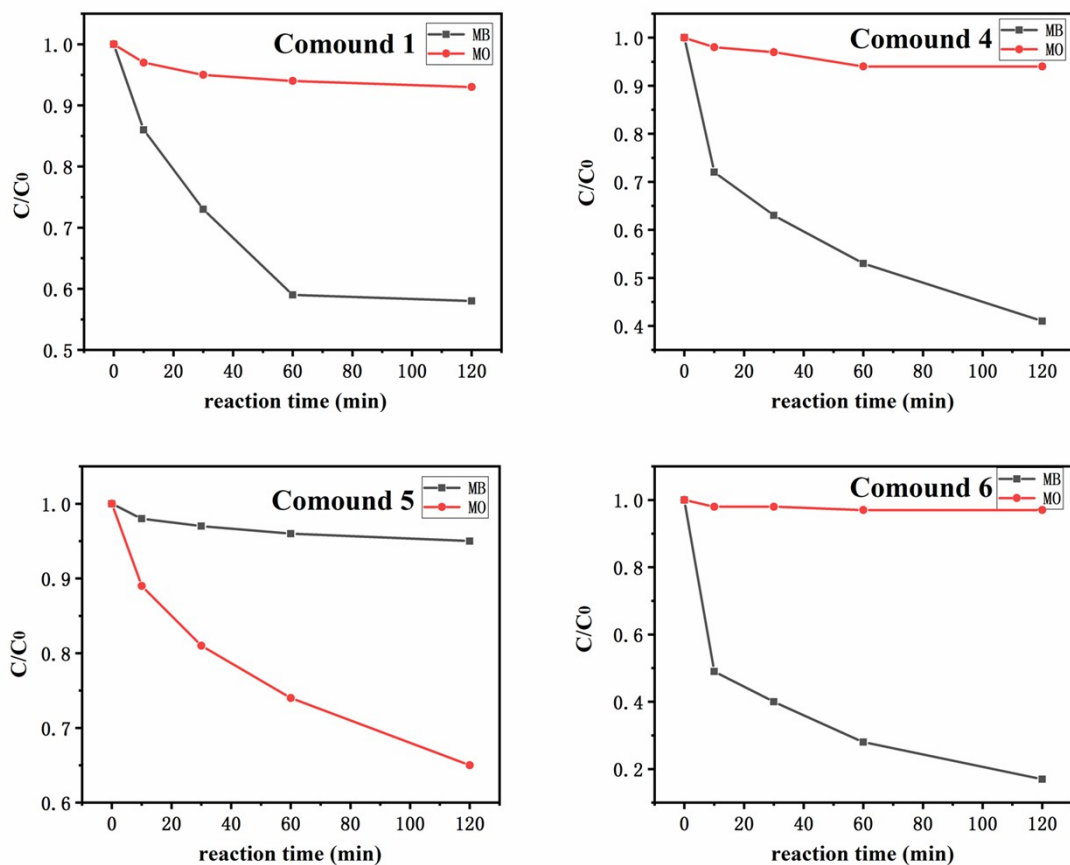


Fig. S8. Photocatalytic decomposition rates of the MB solution under UV irradiation with the use of **1**, **4**, **5** and **6**.

Table S1. Selected bond distances (Å) and angles (°) for compounds 1–6.

Compound 1			
Ag(1)-N(2)	2.231(4)	Ag(1)-N(13)	2.237(5)
Ag(1)-N(1)	2.506(6)	Si(1)-O(7)	1.620(3)
O(1)-Mo(5)	1.901(4)	O(1)-Mo(3)	1.928(4)
N(1)-C(6)	1.324(8)	C(1)-N(10)	1.335(8)
C(1)-C(6)	1.364(9)	Mo(3)-O(3)	1.924(4)
N(2)-Ag(1)-N(13)	161.51(17)	N(2)-Ag(1)-N(1)	70.51(17)
N(13)-Ag(1)-N(1)	123.62(18)	Mo(5)-O(1)-Mo(3)	149.0(2)
C(6)-N(1)-C(8)	118.5(6)	C(6)-N(1)-Ag(1)	127.4(5)
N(10)-C(1)-C(6)	120.2(6)	N(2)-C(2)-C(20)	124.1(5)
O(6)-Mo(3)-O(1)	101.09(19)	Si(1)-O(7)-Mo(3)	124.21(18)
Compound 2			
Mo(1)-O(1)	1.645(6)	Mo(1)-O(2)	2.407(8)
Si(1)-O(2)	1.613(9)	Si(1)-O(18)	1.652(9)
N(1)-C(5)	1.329(10)	C(1)-C(2)	1.371(11)
Mo(2)-O(15)	1.810(7)	Mo(2)-O(21)	2.015(7)
N(3)-C(13)	1.317(9)	C(4)-C(5)	1.362(14)
C(9)-C(10)	1.400(13)	C(10)-C(11)	1.380(13)
O(1)-Mo(1)-O(21)	102.8(4)	O(1)-Mo(1)-O(8)	102.1(4)
O(2)-Si(1)-O(19)	69.7(4)	O(2)-Si(1)-O(18)	69.6(4)
O(19)-Si(1)-O(18)	108.6(4)	C(5)-N(1)-C(1)	122.9(8)
N(1)-C(1)-C(2)	119.0(7)	N(1)-C(1)-C(6)	114.1(7)
C(2)-C(1)-C(6)	126.7(7)	C(1)-C(2)-C(3)	119.1(8)
Compound 3			
Mo(1)-O(14)	1.692(2)	Mo(1)-O(6)	1.712(2)
Mo(1)-O(15)	1.885(2)	Mo(1)-O(10)	1.9969(19)
Cu(1)-O(1W)	1.988(2)	Cu(1)-N(2)	1.989(2)
Cu(1)-N(1)	2.040(2)	N(1)-C(22)	1.325(4)

N(1)-C(30)	1.349(3)	O(1)-Mo(4)	1.718(2)
C(2)-C(29)	1.371(5)	C(22)-C(35)	1.386(4)
O(14)-Mo(1)-O(6)	104.66(11)	O(6)-Mo(1)-O(15)	101.25(9)
O(1W)-Cu(1)-N(2)	93.60(9)	O(1W)-Cu(1)-N(1)	173.24(9)
N(2)-Cu(1)-N(1)	80.60(9)	O(1W)-Cu(1)-O(1)	96.90(8)
N(1)-Cu(1)-O(1)	79.93(8)	C(22)-N(1)-C(30)	119.6(2)
C(22)-N(1)-Cu(1)	126.92(19)	N(2)-C(1)-C(32)	122.5(3)

Compound 4

Mo(1)-O(11)	1.685(4)	Mo(1)-O(7)	1.718(4)
O(1)-Mo(3)	2.334(3)	N(1)-C(23)	1.322(7)
N(1)-Ag(2)	2.256(4)	Ag(1)-N(2)	2.228(4)
Ag(1)-N(3)	2.329(5)	C(14)-C(8)	1.370(9)
Ag(2)-O(13)	2.423(4)	Ag(2)-O(4)	2.501(4)
Ag(2)-O(7)	2.470(4)	C(9)-C(11)	1.386(8)
O(11)-Mo(1)-O(7)	105.8(2)	O(11)-Mo(1)-	101.28(18)

O(12)

O(7)-Mo(1)-O(10)	162.04(17)	O(12)-Mo(1)-O(1)	76.89(14)
N(2)-Ag(1)-N(3)	126.81(17)	C(8)-C(14)-C(5)	119.2(6)
O(15)-Mo(2)-O(9)	102.80(19)	O(15)-Mo(2)-O(5)	92.16(17)
C(21)-N(2)-C(12)	117.8(5)	C(23)-N(1)-Ag(2)	121.6(4)
N(1)-Ag(2)-O(7)	123.71(15)	N(1)-Ag(2)-O(4)	116.00(14)
N(2)-C(21)-C(5)	123.7(6)	C(2)-C(25)-C(18)	119.2(5)

Compound 5

Mo(1)-O(8)	1.695(6)	Mo(1)-O(7)	1.756(6)
Mo(1)-O(20)	2.009(6)	Cu(1)-O(7)	1.949(6)
Cu(1)-N(1)	1.991(7)	Cu(1)-N(2)	1.996(7)
Cu(1)-O(6)	2.105(6)	O(1)-Mo(2)	1.747(6)
N(1)-C(4)	1.348(11)	N(2)-C(11)	1.352(11)
Mo(4)-O(12)	1.945(6)	C(4)-C(14)	1.368(13)

O(8)-Mo(1)-O(7)	105.2(3)	O(8)-Mo(1)-O(20)	97.3(3)
O(7)-Cu(1)-N(1)	94.5(3)	O(7)-Cu(1)-N(1)	94.5(3)
O(7)-Cu(1)-N(2)	169.1(3)	N(1)-Cu(1)-N(2)	81.1(3)
O(7)-Cu(1)-O(6)	84.3(2)	N(1)-Cu(1)-O(6)	119.3(3)
N(2)-Cu(1)-O(6)	89.1(3)	C(4)-N(1)-C(6)	120.2(8)
N(4)-C(1)-C(11)	121.5(9)	N(4)-C(1)-C(21)	114.2(9)
C(11)-N(2)-C(7)	118.7(8)	Mo(1)-O(7)-Cu(1)	151.7(3)

Compound 6

Mo(1)-O(12)	1.6866(17)	Mo(1)-O(6)	1.7362(16)
Mo(1)-O(4)	1.8759(16)	Zn(1)-O(9)	1.9849(16)
Zn(1)-N(1)	2.0290(18)	Zn(1)-N(13)	2.0441(19)
Zn(1)-O(6)	2.1497(17)	N(1)-C(22)	1.337(3)
C(1)-N(2)	1.328(3)	N(2)-C(38)	1.368(3)
Mo(4)-O(5)	1.6975(18)	C(5)-C(19)	1.384(3)
O(12)-Mo(1)-O(6)	104.92(9)	O(6)-Mo(1)-O(4)	102.31(8)
O(9)-Zn(1)-N(1)	122.21(7)	N(1)-Zn(1)-N(13)	122.87(7)
O(9)-Zn(1)-O(6)	83.44(7)	N(1)-Zn(1)-O(6)	93.16(7)
N(13)-Zn(1)-O(6)	90.81(7)	C(22)-N(1)-C(19)	119.95(19)
N(2)-C(1)-C(37)	119.28(19)	O(10)-Mo(2)-O(2)	102.60(8)
C(19)-C(5)-C(25)	119.8(2)	N(1)-C(19)-C(5)	119.9(2)

Symmetry codes: #1 -x+3/2,y-1/2,-z+3/2 #2 -x+3/2,y+1/2,-z+3/2
