Supporting Information

Efficient and robust photocatalysts based on $\{P_2W_{18}\}$ modified by Ag complex

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1. Structural data

Table S1 Selected bond lengths (Å) and bond angles (º) of compound **1**

W(1)-O(45)	1.704(10)	W(1)-O(7)	1.886(8)	W(1)-O(11)	1.914(10)
W(1)-O(46)	1.927(10)	W(1)-O(36)	1.935(9)	W(1)-O(15)	2.387(8)
W(2)-O(47)	1.712(10)	W(2)-O(6)	1.872(10)	W(2)-O(20)	1.915(9)
W(2)-O(22)	1.921(9)	W(2)-O(12)	1.969(10)	W(2)-O(33)	2.365(8)
W(3)-O(52)	1.706(9)	W(3)-O(44)	1.880(9)	W(3)-O(17)	1.909(10)
W(3)-O(20)	1.910(8)	W(3)-O(2)	1.927(9)	W(3)-O(33)	2.368(8)
W(4)-O(48)	1.710(10)	W(4)-O(5)	1.888(9)	W(4)-O(3)	1.893(10)
W(4)-O(32)	1.911(10)	W(4)-O(26)	1.940(10)	W(4)-O(29)	2.367(9)
W(5)-O(56)	1.685(10)	W(5)-O(11)	1.886(10)	W(5)-O(44)	1.910(9)
W(5)-O(43)	1.911(9)	W(5)-O(16)	1.957(9)	W(5)-O(23)	2.380(8)
W(6)-O(57)	1.715(9)	W(6)-O(14)	1.892(10)	W(6)-O(34)	1.902(9)
W(6)-O(41)	1.926(8)	W(6)-O(6)	1.937(10)	W(6)-O(21)	2.360(9)
W(7)-O(54)	1.711(10)	W(7)-O(27)	1.880(9)	W(7)-O(46)	1.910(10)
W(7)-O(39)	1.924(10)	W(7)-O(40)	1.930(9)	W(7)-O(18)	2.385(8)
W(8)-O(37)	1.855(10)	W(8)-O(24)	1.890(9)	W(8)-O(36)	1.922(9)
W(8)-O(10)	1.960(10)	W(8)-O(63)	1.732(9)	W(8)-O(15)	2.339(8)
W(9)-O(51)	1.680(9)	W(9)-O(17)	1.871(10)	W(9)-O(7)	1.906(9)
W(9)-O(34)	1.927(9)	W(9)-O(27)	1.947(10)	W(9)-O(21)	2.397(8)
W(10)-O(60)	1.709(11)	W(10)-O(12)	1.875(10)	W(10)-O(31)	1.907(10)
W(10)-O(38)	1.917(9)	W(10)-O(13)	1.944(9)	W(10)-O(4)	2.368(9)
W(11)-O(22)	1.881(9)	W(11)-O(42)	1.901(10)	W(11)-O(32)	1.921(10)
W(11)-O(38)	1.924(10)	W(11)-O(61)	1.708(10)	W(11)-O(29)	2.356(9)
W(12)-O(53)	1.704(9)	W(12)-O(8)	1.887(10)	W(12)-O(5)	1.898(9)
W(12)-O(43)	1.917(9)	W(12)-O(37)	1.961(10)	W(12)-O(23)	2.352(8)
W(13)-O(50)	1.717(9)	W(13)-O(30)	1.900(9)	W(13)-O(24)	1.906(9)
W(13)-O(3)	1.915(10)	W(13)-O(35)	1.930(10)	W(13)-O(25)	2.371(8)
W(14)-O(55)	1.709(10)	W(14)-O(16)	1.873(9)	W(14)-O(28)	1.906(10)
W(14)-O(2)	1.912(9)	W(14)-O(31)	1.936(9)	W(14)-O(4)	2.387(8)
W(15)-O(13)	1.900(9)	W(15)-O(26)	1.904(10)	W(15)-O(8)	1.923(9)
W(15)-O(28)	1.940(9)	W(15)-O(62)	1.695(10)	W(15)-O(4)	2.383(9)
W(16)-O(64)	1.717(10)	W(16)-O(41)	1.884(8)	W(16)-O(42)	1.889(10)
W(16)-O(9)	1.924(10)	W(16)-O(30)	1.936(9)	W(16)-O(25)	2.347(9)
W(17)-O(58)	1.685(11)	W(17)-O(19)	1.886(9)	W(17)-O(9)	1.910(9)
W(17)-O(14)	1.934(10)	W(17)-O(39)	1.956(9)	W(17)-O(18)	2.381(9)
W(18)-O(59)	1.691(10)	W(18)-O(10)	1.887(10)	W(18)-O(35)	1.904(10)
W(18)-O(40)	1.927(9)	W(18)-O(19)	1.939(10)	W(18)-O(18)	2.369(9)
P(1)-O(23)	1.522(9)	P(1)-O(29)	1.525(9)	P(1)-O(33)	1.529(9)
P(2)-O(21)	1.528(9)	P(2)-O(25)	1.531(9)	P(2)-O(15)	1.540(9)
Ag(1)-N(1)	2.02(2)	Ag(2)-N(4)	2.126(11)	Ag(2)-N(5)	2.116(12)

Ag(1)-C(30)	2.26(3)	Ag(1)-C(34)	2.32(2)	Ag(1)-O(61)	2.493(11)
Ag(1)-O(64)#2	2.467(12)				
O(45)-W(1)-O(7)	102.7(4)	O(45)-W(1)-O(11)	98.5(4)	O(45)-W(1)-O(46)	98.5(5)
O(7)-W(1)-O(11)	89.1(4)	O(7)-W(1)-O(46)	86.1(4)	O(7)-W(1)-O(36)	158.1(4)
O(6)-W(2)-O(20)	91.5(4)	O(6)-W(2)-O(22)	89.4(4)	O(6)-W(2)-O(12)	164.7(4)
O(20)-W(2)-O(22)	157.3(3)	O(20)-W(2)-O(12)	88.2(4)	O(20)-W(2)-O(33)	72.9(3)
O(44)-W(3)-O(17)	88.3(4)	O(44)-W(3)-O(20)	157.6(4)	O(44)-W(3)-O(2)	86.6(4)
O(52)-W(3)-O(44)	102.2(4)	O(52)-W(3)-O(17)	98.1(4)	O(52)-W(3)-O(20)	100.2(4)
O(48)-W(4)-O(5)	102.3(4)	O(48)-W(4)-O(3)	98.4(5)	O(48)-W(4)-O(32)	101.0(4)
O(5)-W(4)-O(32)	156.5(4)	O(5)-W(4)-O(26)	85.8(4)	O(5)-W(4)-O(29)	83.5(3)
O(56)-W(5)-O(11)	99.0(5)	O(56)-W(5)-O(44)	102.3(5)	O(56)-W(5)-O(43)	99.8(5)
O(11)-W(5)-O(44)	88.7(4)	O(11)-W(5)-O(43)	90.2(4)	O(11)-W(5)-O(16)	163.1(4)
O(57)-W(6)-O(14)	98.2(5)	O(57)-W(6)-O(34)	99.6(4)	O(57)-W(6)-O(41)	101.9(4)
O(14)-W(6)-O(34)	92.1(4)	O(14)-W(6)-O(41)	86.2(4)	O(14)-W(6)-O(6)	162.9(4)
O(54)-W(7)-O(27)	103.5(4)	O(54)-W(7)-O(46)	102.8(5)	O(54)-W(7)-O(39)	100.3(5)
O(27)-W(7)-O(46)	86.7(4)	O(27)-W(7)-O(39)	89.2(4)	O(27)-W(7)-O(40)	157.1(4)
O(63)-W(8)-O(37)	100.0(4)	O(63)-W(8)-O(24)	102.8(4)	O(63)-W(8)-O(36)	98.2(4)
O(37)-W(8)-O(24)	90.6(4)	O(37)-W(8)-O(36)	91.8(4)	O(37)-W(8)-O(10)	164.9(4)
O(51)-W(9)-O(17)	101.0(5)	O(51)-W(9)-O(7)	101.3(5)	O(51)-W(9)-O(34)	101.0(5)
O(17)-W(9)-O(7)	89.1(4)	O(17)-W(9)-O(34)	90.9(4)	O(17)-W(9)-O(27)	161.9(4)
O(60)-W(10)-O(12)	102.6(5)	O(60)-W(10)-O(31)	101.6(5)	O(60)-W(10)-O(38)	102.2(5)
O(12)-W(10)-O(31)	90.5(4)	O(12)-W(10)-O(38)	85.8(4)	O(12)-W(10)-O(13)	157.0(4)
O(61)-W(11)-O(22)	102.6(5)	O(61)-W(11)-O(42)	99.1(5)	O(61)-W(11)-O(32)	99.1(5)
O(22)-W(11)-O(42)	87.9(4)	O(22)-W(11)-O(32)	158.3(4)	O(22)-W(11)-O(38)	86.8(4)
O(8)-W(12)-O(5)	87.9(4)	O(8)-W(12)-O(43)	92.8(4)	O(8)-W(12)-O(37)	164.4(4)
O(53)-W(12)-O(8)	98.3(4)	O(53)-W(12)-O(5)	101.1(5)	O(53)-W(12)-O(43)	101.1(4)
O(50)-W(13)-O(30)	100.9(4)	O(50)-W(13)-O(24)	102.2(4)	O(50)-W(13)-O(3)	98.3(5)
O(30)-W(13)-O(24)	156.9(4)	O(30)-W(13)-O(3)	89.1(4)	O(30)-W(13)-O(35)	90.9(4)
O(55)-W(14)-O(16)	102.6(5)	O(55)-W(14)-O(28)	100.9(4)	O(55)-W(14)-O(2)	102.1(4)
O(16)-W(14)-O(28)	90.0(4)	O(16)-W(14)-O(2)	86.6(4)	O(16)-W(14)-O(31)	156.8(4)
O(62)-W(15)-O(13)	102.2(5)	O(62)-W(15)-O(26)	100.7(5)	O(62)-W(15)-O(8)	101.6(5)
O(13)-W(15)-O(26)	90.4(4)	O(13)-W(15)-O(8)	156.2(4)	O(13)-W(15)-O(28)	88.8(4)
O(64)-W(16)-O(41)	102.6(5)	O(64)-W(16)-O(42)	100.6(5)	O(64)-W(16)-O(9)	94.7(5)
O(41)-W(16)-O(42)	89.9(4)	O(41)-W(16)-O(49)	87.2(4)	O(41)-W(16)-O(30)	158.5(4)
O(58)-W(17)-O(19)	102.7(5)	O(58)-W(17)-O(9)	101.4(5)	O(58)-W(17)-O(14)	101.2(4)
O(19)-W(17)-O(9)	91.2(4)	O(19)-W(17)-O(14)	156.1(4)	O(19)-W(17)-O(39)	88.3(4)
O(59)-W(18)-O(10)	102.1(5)	O(59)-W(18)-O(35)	104.2(5)	O(59)-W(18)-O(40)	98.7(5)
O(10)-W(18)-O(35)	86.4(4)	O(10)-W(18)-O(40)	90.7(4)	O(10)-W(18)-O(19)	156.1(4)
O(23)-P(1)-O(29)	111.7(5)	O(23)-P(1)-O(33)	111.8(5)	O(23)-P(1)-O(4)	107.2(5)
O(21)-P(2)-O(25)	112.3(5)	O(21)-P(2)-O(15)	111.9(5)	O(21)-P(2)-O(18)	107.3(5)
N(5)-Ag(2)-N(4)	173.1(5)	N(1)-Ag(1)-C(30)	157.4(10)	N(1)-Ag(1)-C(34)	150.9(13)
N(1)-Ag(1)-O(64)#2	96.1(12)	N(1)-Ag(1)-O(61)	94.4(9)	C(30)-Ag(1)-C(34)	34.5(7)
C(30)-Ag(1)-O(64)#2	87.7(6)	C(34)-Ag(1)-O(64)#2	112.9(7)	C(30)-Ag(1)-O(61)	108.2(7)
C(34)-Ag(1)-O(61)	89.6(6)	O(64)#2-Ag(1)-O(61)	78.9(4)		

Symmetry transformations used to generate equivalent atoms: #1 -x,-y,-z；#2 -x+1/2,-y+1/2,-z

Table S2 Selected bond lengths (Å) and bond angles (º) of compound **2**

W(1)-O(56)	1.699(13)	W(1)-O(32)	1.895(12)	W(1)-O(43)	1.904(12)
W(1)-O(14)	1.907(12)	W(1)-O(20)	1.912(13)	W(1)-O(7)	2.371(12)
W(2)-O(61)	1.719(14)	W(2)-O(2)	1.896(12)	W(2)-O(51)	1.899(12)

W(2)-O(33)	1.925(13)	W(2)-O(39)	1.928(13)	W(2)-O(27)	2.406(11)
W(3)-O(35)	1.706(13)	W(3)-O(4)	1.870(11)	W(3)-O(13)	1.890(14)
W(3)-O(18)	1.908(13)	W(3)-O(6)	1.976(13)	W(3)-O(26)	2.364(12)
W(4)-O(59)	1.684(13)	W(4)-O(45)	1.875(13)	W(4)-O(32)	1.912(12)
W(4)-O(22)	1.916(12)	W(4)-O(30)	1.941(12)	W(4)-O(28)	2.366(12)
W(5)-O(21)	1.720(13)	W(5)-O(52)	1.898(12)	W(5)-O(18)	1.914(12)
W(5)-O(2)	1.914(12)	W(5)-O(3)	1.931(13)	W(5)-O(26)	2.383(12)
W(6)-O(58)	1.688(13)	W(6)-O(52)	1.905(12)	W(6)-O(11)	1.911(12)
W(6)-O(47)	1.921(13)	W(6)-O(17)	1.933(13)	W(6)-O(19)	2.373(12)
W(7)-O(44)	1.699(12)	W(7)-O(5)	1.890(12)	W(7)-O(47)	1.906(13)
W(7)-O(45)	1.914(13)	W(7)-O(1)	1.948(13)	W(7)-O(19)	2.377(12)
W(8)-O(43)	1.712(13)	W(8)-O(5)	1.895(12)	W(8)-O(34)	1.898(13)
W(8)-O(29)	1.935(13)	W(8)-O(10)	1.948(12)	W(8)-O(25)	2.380(12)
W(9)-O(37)	1.720(13)	W(9)-O(40)	1.893(14)	W(9)-O(9)	1.898(12)
W(9)-O(33)	1.899(14)	W(9)-O(4)	1.927(11)	W(9)-O(27)	2.331(12)
W(10)-O(41)	1.687(13)	W(10)-O(8)	1.884(14)	W(10)-O(40)	1.913(13)
W(10)-O(20)	1.917(12)	W(10)-O(12)	1.928(14)	W(10)-O(7)	2.371(12)
W(11)-O(11)	1.896(12)	W(11)-O(51)	1.901(12)	W(11)-O(29)	1.903(14)
W(11)-O(15)	1.946(12)	W(11)-O(62)	1.710(14)	W(11)-O(25)	2.349(12)
W(12)-O(49)	1.698(15)	W(12)-O(6)	1.861(13)	W(12)-O(31)	1.906(14)
W(12)-O(48)	1.936(13)	W(12)-O(50)	1.941(13)	W(12)-O(24)	2.361(12)
W(13)-O(42)	1.710(13)	W(13)-O(10)	1.897(12)	W(13)-O(14)	1.914(12)
W(13)-O(53)	1.916(15)	W(13)-O(38)	1.938(13)	W(13)-O(23)	2.390(12)
W(14)-O(57)	1.728(13)	W(14)-O(15)	1.906(12)	W(14)-O(39)	1.913(12)
W(14)-O(16)	1.921(12)	W(14)-O(53)	1.925(13)	W(14)-O(23)	2.391(13)
W(15)-O(60)	1.704(13)	W(15)-O(17)	1.892(14)	W(15)-O(3)	1.902(13)
W(15)-O(31)	1.935(13)	W(15)-O(54)	1.947(14)	W(15)-O(24)	2.391(12)
W(16)-O(46)	1.725(13)	W(16)-O(30)	1.885(13)	W(16)-O(48)	1.905(13)
W(16)-O(13)	1.915(14)	W(16)-O(8)	1.916(14)	W(16)-O(28)	2.368(13)
W(17)-O(55)	1.702(13)	W(17)-O(1)	1.886(13)	W(17)-O(22)	1.922(12)
W(17)-O(50)	1.926(13)	W(17)-O(54)	1.930(14)	W(17)-O(24)	2.406(12)
W(18)-O(36)	1.717(13)	W(18)-O(38)	1.898(13)	W(18)-O(12)	1.912(14)
W(18)-O(16)	1.919(13)	W(18)-O(9)	1.932(12)	W(18)-O(23)	2.377(12)
P(1)-O(7)	1.523(14)	P(1)-O(25)	1.540(12)	P(1)-O(23)	1.578(13)
P(2)-O(28)	1.526(13)	P(2)-O(19)	1.529(12)	P(2)-O(24)	1.572(12)
Ag(1)-N(12)	2.12(2)	Ag(2)-N(6)	2.063(18)		
O(56)-W(1)-O(32)	98.4(6)	O(56)-W(1)-O(34)	103.1(6)	O(56)-W(1)-O(14)	98.1(6)
O(32)-W(1)-O(34)	87.4(5)	O(32)-W(1)-O(14)	163.1(5)	O(32)-W(1)-O(20)	89.8(6)
O(61)-W(2)-O(2)	99.7(6)	O(61)-W(2)-O(51)	103.4(6)	O(61)-W(2)-O(33)	99.7(6)
O(2)-W(2)-O(33)	88.6(6)	O(2)-W(2)-O(39)	162.6(5)	O(2)-W(2)-O(27)	81.3(5)
O(35)-W(3)-O(4)	100.0(6)	O(35)-W(3)-O(13)	101.0(6)	O(35)-W(3)-O(18)	101.3(6)
O(4)-W(3)-O(13)	90.3(5)	O(4)-W(3)-O(18)	91.1(5)	O(4)-W(3)-O(6)	163.8(5)
O(59)-W(4)-O(45)	103.2(6)	O(59)-W(4)-O(32)	97.8(6)	O(59)-W(4)-O(22)	98.9(6)
O(45)-W(4)-O(32)	90.3(5)	O(45)-W(4)-O(22)	86.5(5)	O(45)-W(4)-O(30)	157.0(5)
O(21)-W(5)-O(52)	103.0(6)	O(21)-W(5)-O(18)	99.6(6)	O(21)-W(5)-O(2)	99.3(6)
O(52)-W(5)-O(18)	157.2(5)	O(52)-W(5)-O(2)	88.7(5)	O(52)-W(5)-O(3)	86.4(5)
O(58)-W(6)-O(52)	102.4(6)	O(58)-W(6)-O(11)	99.4(7)	O(58)-W(6)-O(47)	99.1(6)
O(52)-W(6)-O(11)	89.8(5)	O(52)-W(6)-O(47)	158.2(5)	O(52)-W(6)-O(17)	84.8(5)
O(44)-W(7)-O(5)	99.7(6)	O(44)-W(7)-O(47)	101.7(6)	O(44)-W(7)-O(45)	101.1(6)
O(5)-W(7)-O(47)	91.3(5)	O(5)-W(7)-O(45)	87.5(6)	O(5)-W(7)-O(1)	163.1(5)
O(43)-W(8)-O(5)	99.2(6)	O(43)-W(8)-O(34)	100.9(6)	O(43)-W(8)-O(29)	101.2(6)
O(5)-W(8)-O(34)	90.1(5)	O(5)-W(8)-O(29)	89.5(6)	O(5)-W(8)-O(10)	164.4(5)
O(37)-W(9)-O(40)	101.3(6)	O(37)-W(9)-O(9)	96.9(6)	O(37)-W(9)-O(33)	99.5(6)

O(40)-W(9)-O(9)	86.1(6)	O(40)-W(9)-O(33)	159.2(5)	O(40)-W(9)-O(4)	85.3(5)
O(41)-W(10)-O(8)	98.9(6)	O(41)-W(10)-O(40)	101.1(6)	O(41)-W(10)-O(20)	101.1(6)
O(8)-W(10)-O(40)	89.7(6)	O(8)-W(10)-O(20)	89.4(6)	O(8)-W(10)-O(12)	164.3(5)
O(62)-W(11)-O(11)	99.6(6)	O(62)-W(11)-O(51)	101.4(6)	O(62)-W(11)-O(29)	100.1(6)
O(11)-W(11)-O(51)	88.8(5)	O(11)-W(11)-O(29)	89.3(6)	O(11)-W(11)-O(15)	163.7(6)
O(49)-W(12)-O(6)	104.3(6)	O(49)-W(12)-O(31)	100.7(6)	O(49)-W(12)-O(48)	101.3(6)
O(6)-W(12)-O(31)	91.0(6)	O(6)-W(12)-O(48)	87.4(6)	O(6)-W(12)-O(50)	157.3(5)
O(42)-W(13)-O(10)	102.6(6)	O(42)-W(13)-O(14)	103.0(6)	O(42)-W(13)-O(53)	101.3(6)
O(10)-W(13)-O(14)	86.1(5)	O(10)-W(13)-O(53)	88.9(6)	O(10)-W(13)-O(38)	157.0(5)
O(57)-W(14)-O(15)	101.9(6)	O(57)-W(14)-O(39)	102.4(6)	O(57)-W(14)-O(16)	101.7(6)
O(15)-W(14)-O(39)	85.3(5)	O(15)-W(14)-O(16)	156.4(5)	O(15)-W(14)-O(53)	88.0(6)
O(60)-W(15)-O(17)	101.4(6)	O(60)-W(15)-O(3)	102.4(6)	O(60)-W(15)-O(31)	101.7(7)
O(17)-W(15)-O(3)	86.4(5)	O(17)-W(15)-O(31)	156.9(6)	O(17)-W(15)-O(54)	87.8(6)
O(46)-W(16)-O(30)	100.7(6)	O(46)-W(16)-O(48)	96.7(6)	O(46)-W(16)-O(13)	102.2(6)
O(30)-W(16)-O(48)	90.1(5)	O(30)-W(16)-O(13)	157.0(5)	O(30)-W(16)-O(8)	90.8(6)
O(55)-W(17)-O(1)	102.8(7)	O(55)-W(17)-O(22)	103.4(6)	O(55)-W(17)-O(50)	100.7(6)
O(1)-W(17)-O(22)	86.5(5)	O(1)-W(17)-O(50)	156.5(5)	O(1)-W(17)-O(54)	87.5(6)
O(36)-W(18)-O(38)	102.9(6)	O(36)-W(18)-O(12)	101.5(6)	O(36)-W(18)-O(16)	101.6(6)`
O(38)-W(18)-O(12)	90.2(6)	O(38)-W(18)-O(16)	88.2(6)	O(38)-W(18)-O(9)	157.2(5)
O(7)-P(1)-O(25)	112.9(7)	O(7)-P(1)-O(27)	111.2(7)	O(7)-P(1)-O(23)	106.8(7)
O(28)-P(2)-O(26)	112.3(7)	O(28)-P(2)-O(19)	112.2(7)	O(28)-P(2)-O(24)	106.5(7)
N(12)-Ag(1)-N(12)#2	179.999(2)	N(6)-Ag(2)-N(6)#1	179.999(2)		

Symmetry transformations used to generate equivalent atoms: #1 -x,-y,-z；#2 -x+1/2,-y+1/2,-z

SQUEEZE analyses on Solvent assignment for compound 2.

The structure refinement of 2 with a symmetry 'P -1' and non-SQUUEEZE data reveals a formula $(H_2bimb)_2[Ag(bimb)]_{0.5}[Ag(eim)_2]_{0.5}[P_2W_{18}O_{62}]\cdot H_3O$. However, this refinement leads to the slightly larger R_1 and wR_2 values (0.0616 for R_1 and 0.1822 for wR_2 for the data $I>2\sigma(I)$). The residual electron density were treated as diffuse contributions using the program SQUEEZE. SQUEEZE analysese estimate the elcetron count to be 146 within 315 $Å^3$ void per cell for **2**, and located a voids (see below) with 14 possible water molecules per cell (i.e. 7 water molecules per formula unit). There are two formula units in one cell. On base of these results, it might be possible that the formula unit includes 8 (i.e. 1+7) water molecules. These solvent molecules are included in the sum formula, formula weight, calculated density, and F(000), respectively. The TENTATIVE formula for 2 is $(H_2bimb)_2[Ag(bimb)]_{0.5}[Ag(eim)_2]_{0.5}[P_2W_{18}O_{62}]\cdot H_3O\cdot 7H_2O$. The result can be further proved by TG analysis.

_platon_squeeze_void_nr

_platon_squeeze_void_average_x

_platon_squeeze_void_average_y

_platon_squeeze_void_average_z

_platon_squeeze_void_volume

_platon_squeeze_void_count_electrons

_platon_squeeze_void_content

1 0.000 0.500 0.000 315 146 ' '

_platon_squeeze_void_probe_radius 1.20

_platon_squeeze_details ?

2. Structural figure

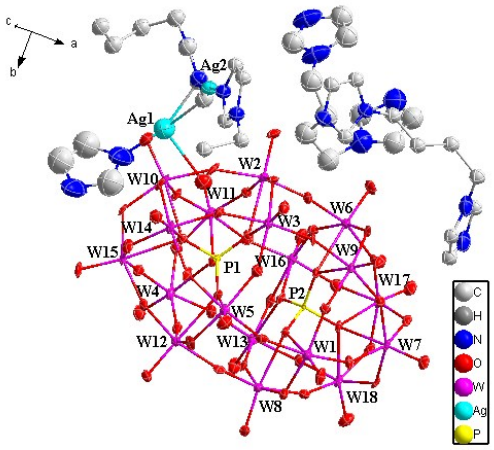

Fig. S1 Ellipsoid representation of the molecular structure unit of **1**.

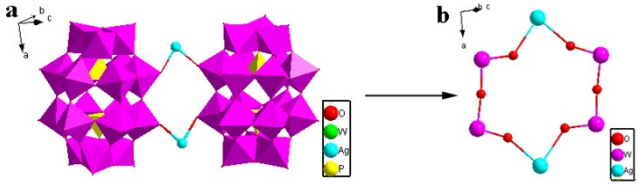

Fig. S2 (a) The diagram of P_2W_{18} dimer (b) The diagram of ring of P_2W_{18}

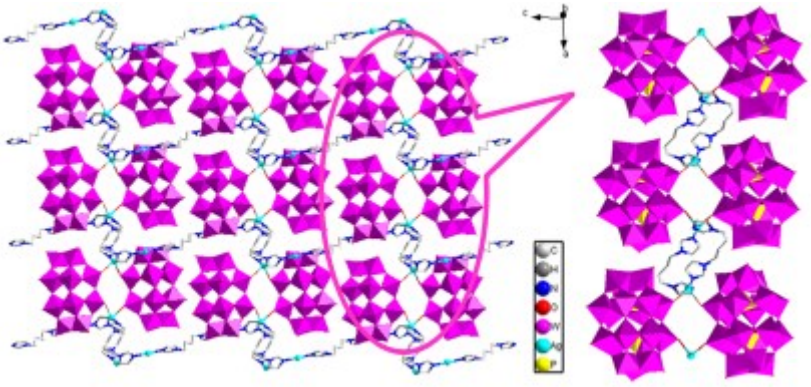

Fig. S3 The unique organic-inorganic 2-D layer based on Z-shaped metallic organic chains and $\{P_2W_{18}\}$ dimer linker.

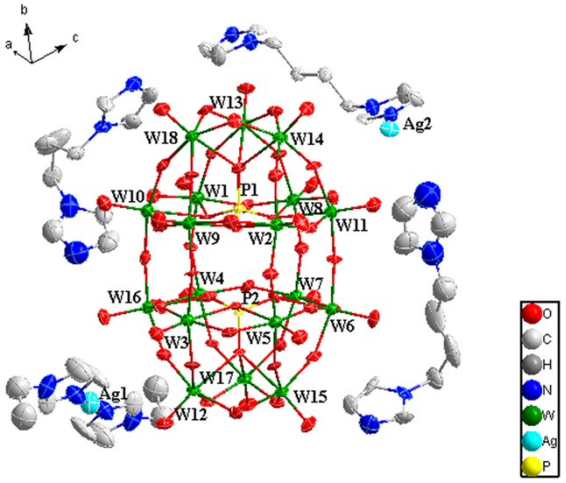

Fig. S4 Ellipsoid representation of the molecular structure unit of compound **2**.

3. Physical characterization

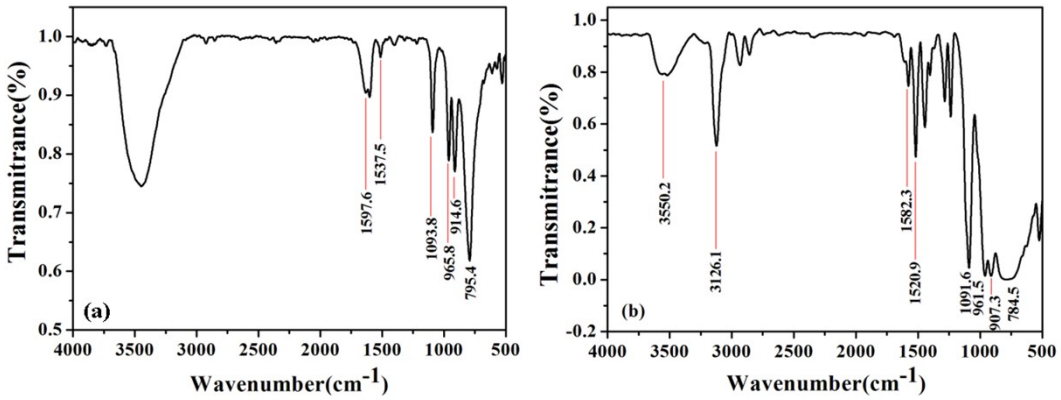

Fig. S5 IR spectra of sandwich compounds: **1**(a), **2** (b)

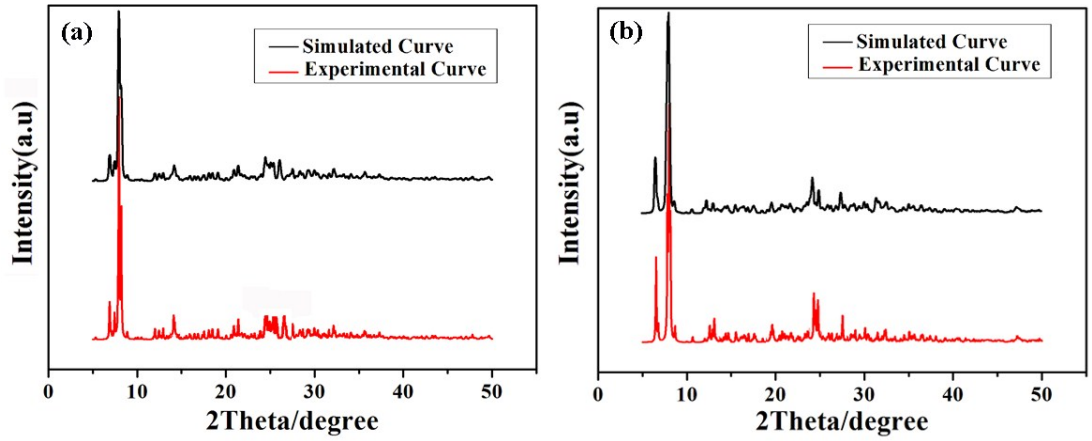

Fig. S6 The PXRD contrast curves of compounds: **1**(a), **2**(b)

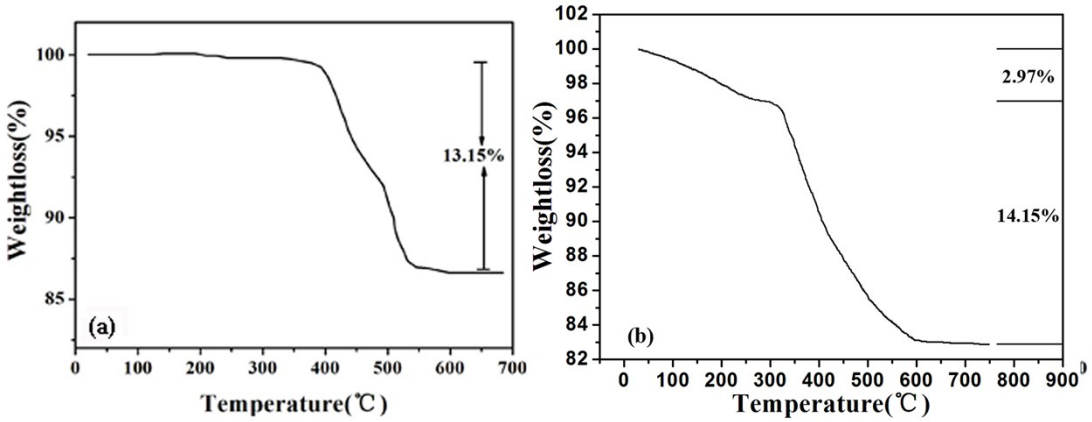

Fig. S7 TG of sandwich compounds: **1**(a), **2**(b)

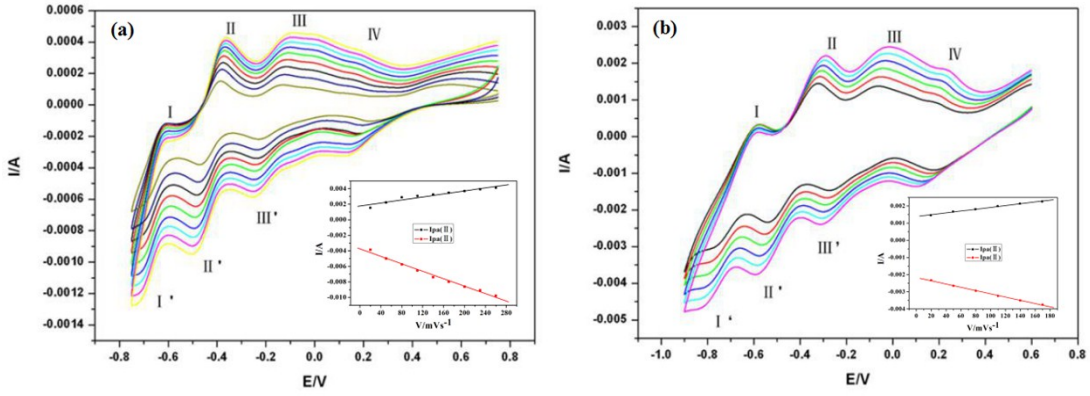

Fig. S8 (a) The cyclic voltammograms of the **1**-CPE in 1M H_2SO_4 at different scan rates (from inner to outer: 20, 50, 80, 110, 140, 170, 200，230 and 260 mVs^{-1}) (b) The cyclic voltammograms of the **2**-CPE in 1M H_2SO_4 at different scan rates(from inner to outer: 20, 50, 80, 110, 140 and 170mVs^{-1}(Insert plots: The dependence of cathode and anode peak currents II on scan rates.)

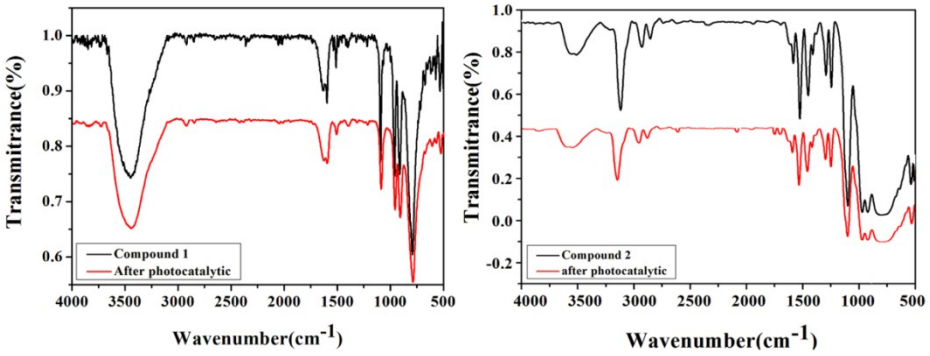

Fig. S9 the IR spectra of the compounds **1** and **2** before and after recycling reactions

Table S3 Some classical P_2W_{18} structure photocatalytic degradation rate summar

compound	RhB				MB				MO				literature
	T/min	rates /%	lamp	cycle	T/min	rates /%	lamp	cycle	T/min	rates /%	lamp	cycle	
Compound 1	150	93.0	UV	5	150	93.5	UV	0	150	81.1	UV	0	This work
Compound 2	150	96.3	UV	5	150	94.2	UV	0	150	82.8	UV	0	This work
$Ag_7(bbi)_5(OH)(P_2W_{18}O_{62})$	72	67	UV	0									[1]

$Cu^{II}(Bbi)_{1.5}(H_2Bbi)_2[P_2W_{18}O_{62}]$	36	71.6	UV	0									[2]
$Cu^{II}_{2.5}(Mimin)(HMimin)(Bbi)_3[P_2W_{18}O_{62}]_3 \cdot 3H_2O$	360	62.2	UV	0									
$Cu^{II}(Bbtz)(H_2Bbi)(H_2Btp)[P_2W_{18}O_{62}]$	240	86.2	UV	0									
$H_5Ag(Bbi)_{1.5}(Bbi)_2[P_2W_{18}O_{62}]$	240	86.6	UV	0									[3]
$[Cu_7(3\text{-}btz)_{16}(OH)_2(H_2O)_4(PW_{18}O_{62})_2]\cdot 16H_2O$	105	88	UV	0	105	58	UV	0					[4]
$H[Cu(L)_2(P_2W_{18}O_{62})_{0.5}]\cdot 3H_2O$					180	80	UV	0					[5]
$[Ag_7(ptz)_4(NO_3)(H_2O)][H_4P_2W_{18}O_{62}]\cdot 5H_2O$					180	86.1	UV	0					[6]
$[Cd_3(H_2biim)_6P_2W_{18}O_{62}]\cdot 2H_2O$					120	66	UV	0					[7]
$K_2Na_2(H_2O)_2[Co_{11}(trz)_{14}(H_2O)_{14}][P_2W_{18}O_{62}]_2\cdot 29H_2O$					120	97.3	UV	0					[8]
$[Cu_{12}(trz)_{10}(Htrz)_2(OH)_4(SO_4)_2)H_2O)_6][P_2W_{18}O_{62}]\cdot 28H_2O$					120	89.9	UV	0					
$[Ag_{13}(L)_6(N_2)(HP_2W_{18}O_{62}]$					150	89.8	UV	0					[9]

5、Notes and references

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