Supporting Information

A Novel Viologen-Based Coordination Polymer with Multi -Stimulate Chromic Properties: Photochromism, Thermochromism, Chemochromism and Electrochromism

Xiao-Nan Li,[a] Zu-Ming Tu,[b] Li Li,[a] Zhi-Hui Wang,[a] Hong Zhang[a*]

[a]Institute of Polyoxometalate Chemistry, Department of Chemistry, Northeast Normal University, Changchun, Jilin 130024, PR China.

[b]Department of Chemistry, Wuhan Institute of Technology. Wuhan 430000, PR China

Fax: +86-0431-85098827; Tel: +86-0431-85099372; E-mail: hope 20130122@163.com, zhangh@nenu. edu. cn

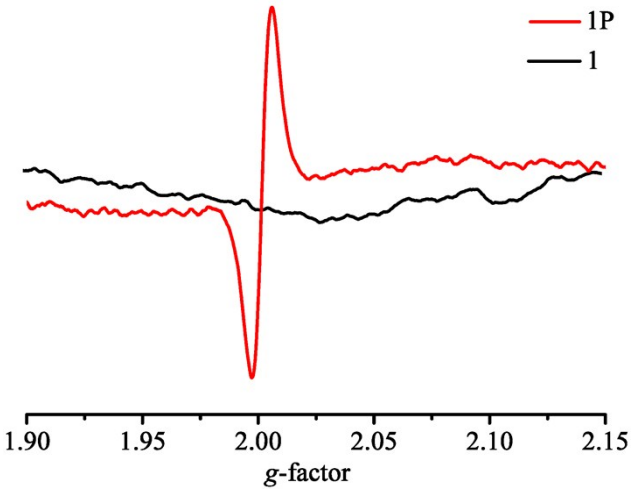

Figure S1. ESR spectra of **1**and **1p**.

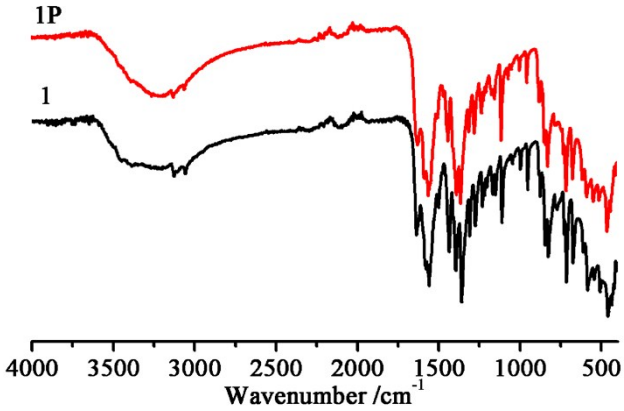

Figure S2. The IR spectra of **1** and **1p**.

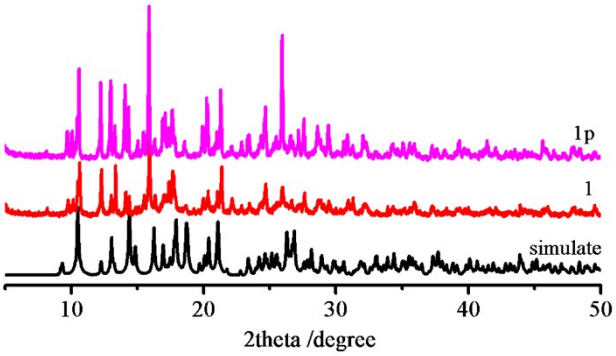

Figure S3. Simulated and experimental powder X-ray diffraction of **1**and **1p**.

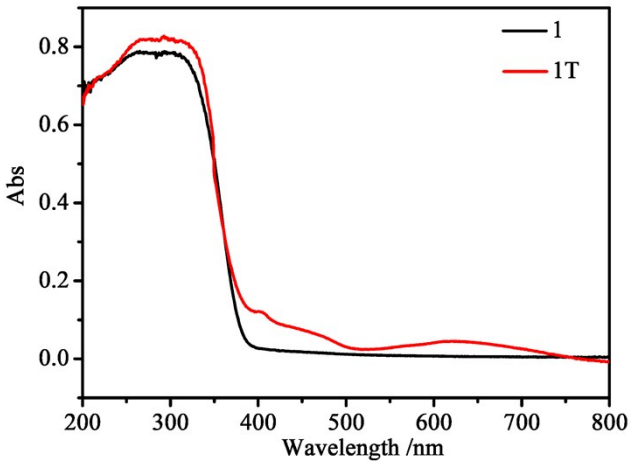

Figure S4. The UV-vis diffuse-reflectance spectra of **1** and **1T.**

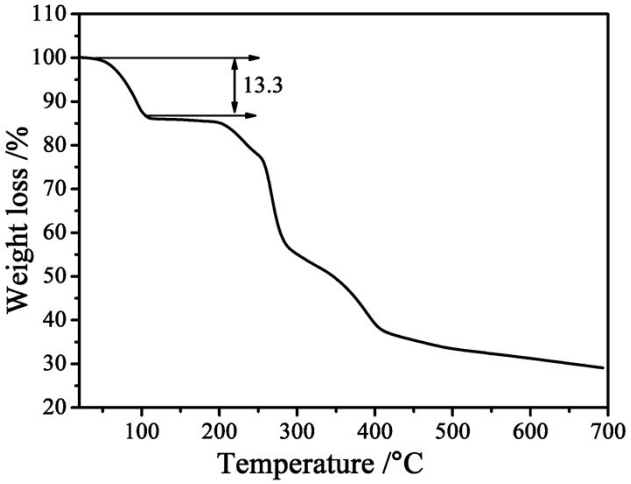

Figure S5. TG curve of **1**.

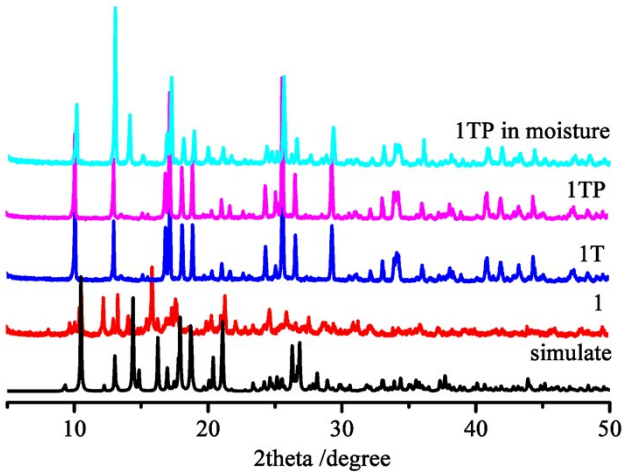

Figure S6. PXRD patterns of simulated and experimental samples of **1**, **1T**, **1TP**, and **1TP** in moisture.

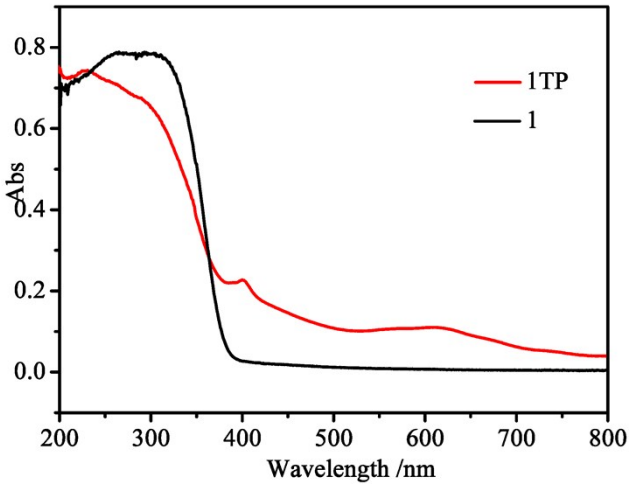

Figure S7. The UV-vis diffuse-reflectance spectra of **1** and **1TP.**

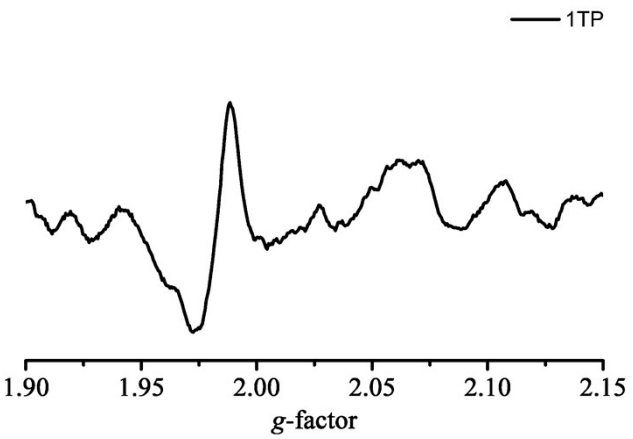

Figure S8. ESR spectrum of **1TP.**

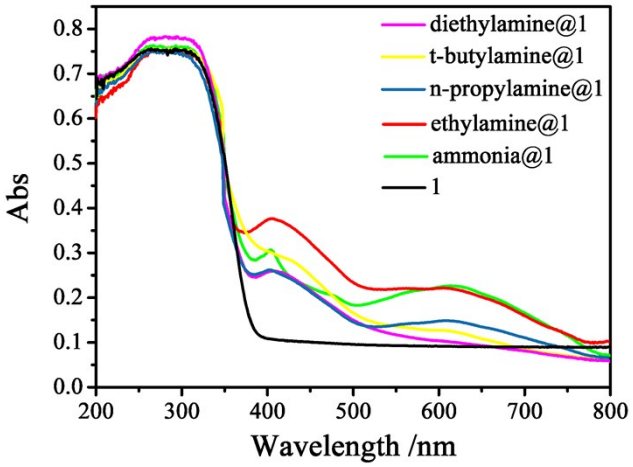

Figure S9. Solid state UV-vis spectra of amine@1.

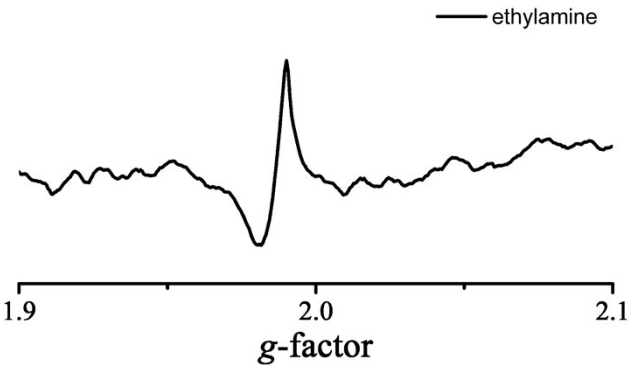

Figure S10. ESR spectrum of ethylamine@**1** in the solid state.

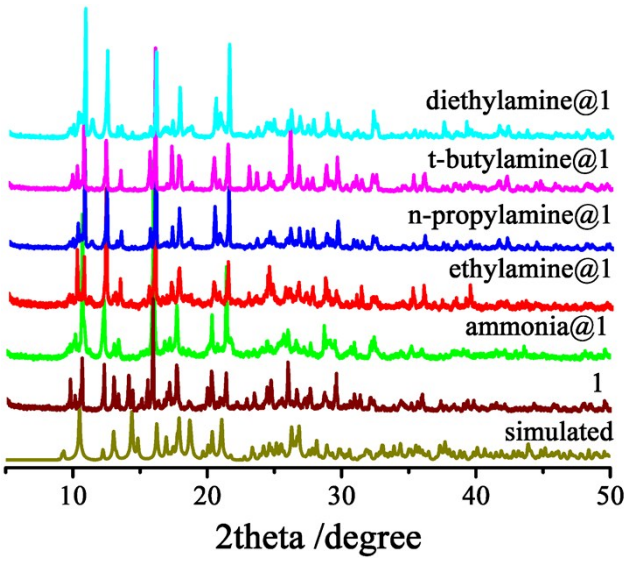

Figure S11. PXRD pattern of amine@**1** compared with the simulated pattern of **1.**

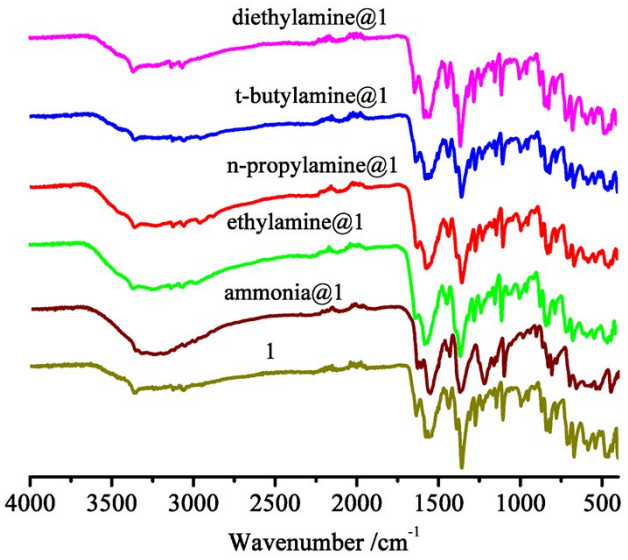

Figure S12. The FT-IR spectra of **1** and amine@**1.**

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Table S1. Crystal data and structure refinement of compound 1.

Empirical formula	C30H26N4O15Zn2
Formula weight	813.29
Temperature/K	300.01
Crystal system	triclinic
Space group	P^{-1}
a/Å	10.4442(6)
b/Å	11.2777(5)
c/Å	14.8434(8)
α/°	103.166(2)
β/°	107.531(2)
γ/°	102.434(2)
Volume/Å3	1545.57(14)
ρcalcg/cm3	1.748
μ/mm 1	1.637
F(000)	828.0
Goodness-of-fit on F2	1.109
Final R indexes [I>=2σ (I)]	R1 = 0.0329, wR2 = 0.0883
Final R indexes [all data]	R1 = 0.0464, wR2 = 0.1051

[a]$R1=\sum||F0|-|Fc||/\sum|F0|$. [b]$wR2=[\sum w(Fo^2-Fc^2)^2/\sum w(Fo^2)]^{1/2}$

Table S2. Selected bond lengths for compound **1.**

Zn1-O1	2.0166(19)	N5-C31	1.333(4)
Zn1-O31	2.091(2)	O12-C7	1.225(4)
Zn2-O8	1.985(2)	C4-C10	1.392(4)
Zn2-N12	2.134(2)	C5-C22	1.517(4)
O1-C12	1.273(3)	C5-C24	1.394(4)
O2-C3	1.230(3)	C7-C23	1.519(4)
O3-C6	1.268(3)	C8-C20	1.398(4)
O3-Zn1[1]	2.091(2)	C8-C9	1.482(4)
N1-Zn2[2]	2.134(2)	C13-C24	1.380(4)
N1-C4	1.341(3)	C14-C27	1.518(5)
N2-C2	1.344(3)	C21-C25	1.377(4)
N2-C17	1.344(4)	C23-C30	1.516(4)

Symmetry transformations used to generate equivalent atoms: [1]1-X, 1-Y, 1-Z; [2]1-X, 1-Y, 2-Z.

Table S3. Selected angles for **1.**

O1-Zn1-N2[1]	102.87(9)	C2-C5-C22	123.4(2)
O1-Zn1-O14	87.49(8)	C2-C5-C24	117.7(3)
O6-Zn1-O1	94.95(9)	C24-C5-C22	118.9(2)
N2[1]-Zn1-O3[1]	78.38(8)	O8-C7-C23	114.6(3)
O14-Zn1-N2[1]	129.89(11)	O12-C7-C23	120.4(3)
O4-Zn2-O7	90.28(8)	C26-C8-C9	120.6(3)
O8-Zn2-O4	99.44(9)	C4-C10-C12	123.7(2)
O8-Zn2-O7	96.02(10)	C21-C10-C12	119.1(2)
C12-O1-Zn1	120.61(18)	O13-C11-O6	124.9(3)
C6-O3-Zn1[1]	115.88(18)	O13-C11-C14	120.3(3)
C22-O4-Zn2	120.62(19)	O1-C12-C10	115.0(2)
C3-O5-Zn2[2]	117.64(17)	O9-C12-O1	125.7(3)
C11-O6-Zn1	122.4(2)	O9-C12-C10	119.2(3)

Symmetry transformations used to generate equivalent atoms: [1]1-X, 1-Y, 1-Z; [2]1-X, 1-Y, 2-Z.