Three novel Co(II)/Ni(II)-based Coordination Polymers as efficient heterogeneous catalysts for the dye degradation

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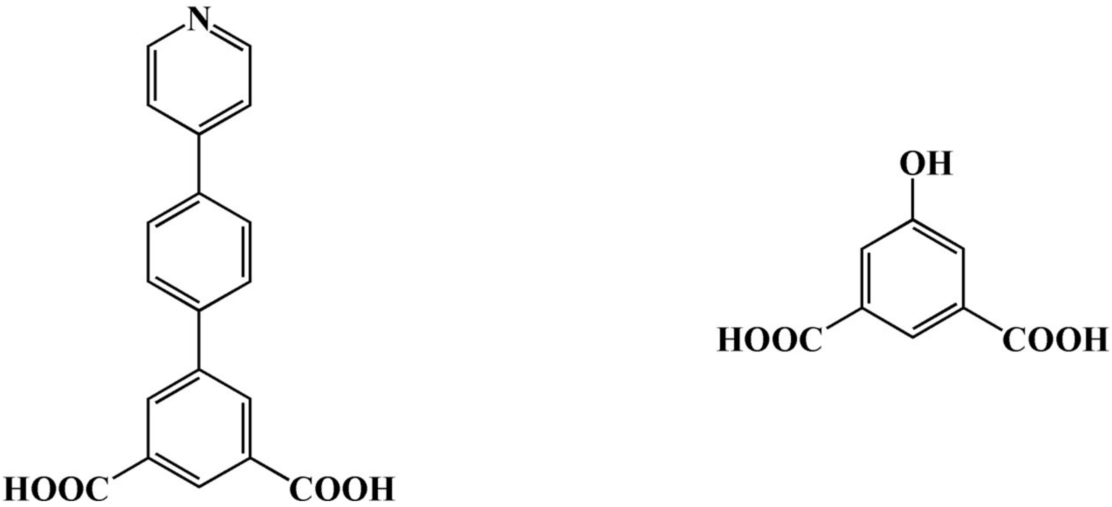

Scheme S1. Mixed ligands used in this article.

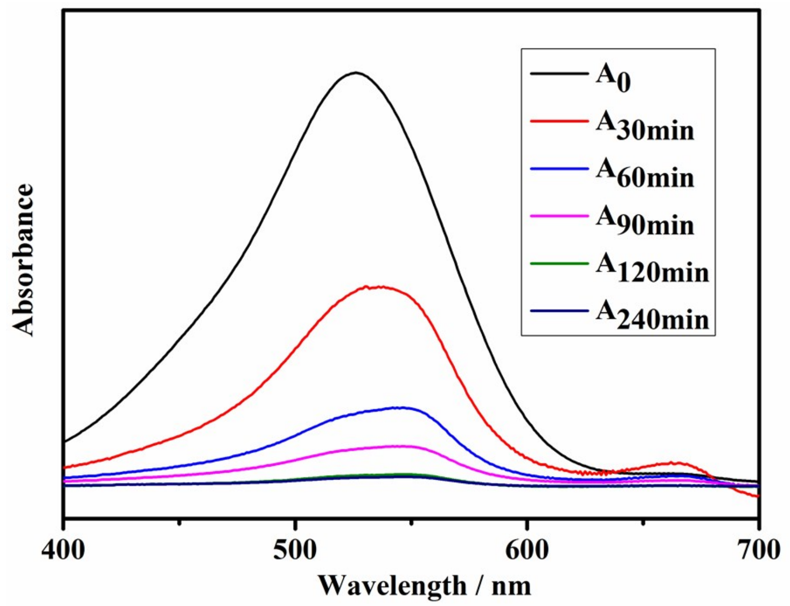

Figure S1. Time dependent UV-vis spectra of 8 mL of 20.0 ppm NR aqueous solution in the presence of 8 mg compound **1**, and 0.5mL H_2O_2 (30%).

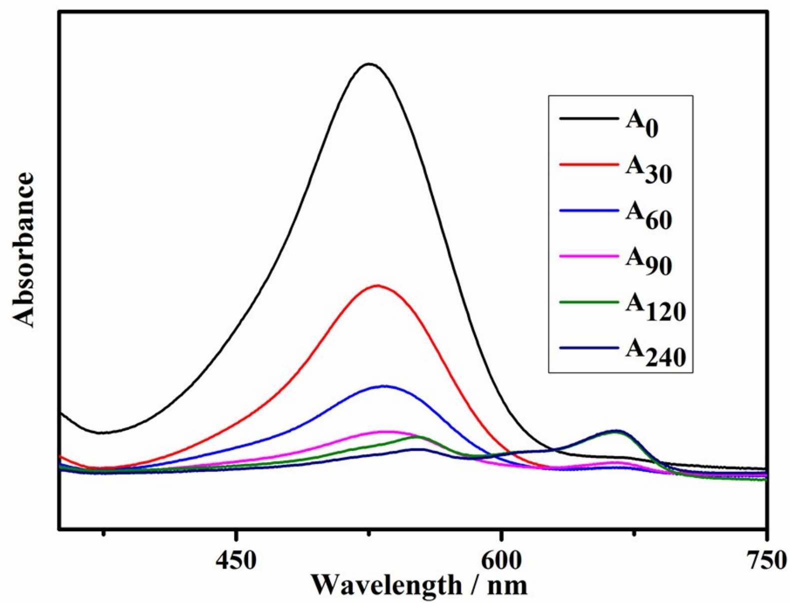

Figure S2. Time dependent UV-vis spectra of 8 mL of 20.0 ppm NR aqueous solution in the presence of 8 mg compound **2**, and 0.5mL H_2O_2 (30%).

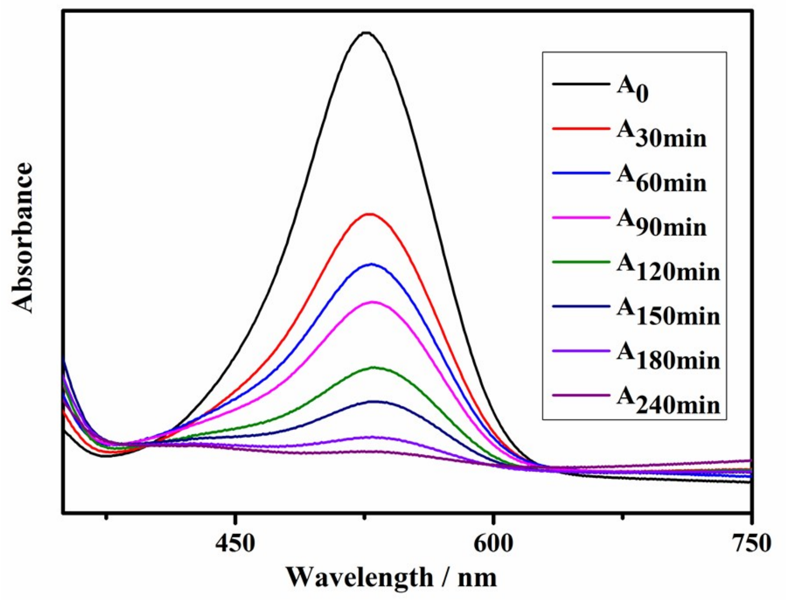

Figure S3. Time dependent UV-vis spectra of 8 mL of 20.0 ppm NR aqueous solution in the presence of 8 mg compound **3**, and 0.5mL H_2O_2 (30%).

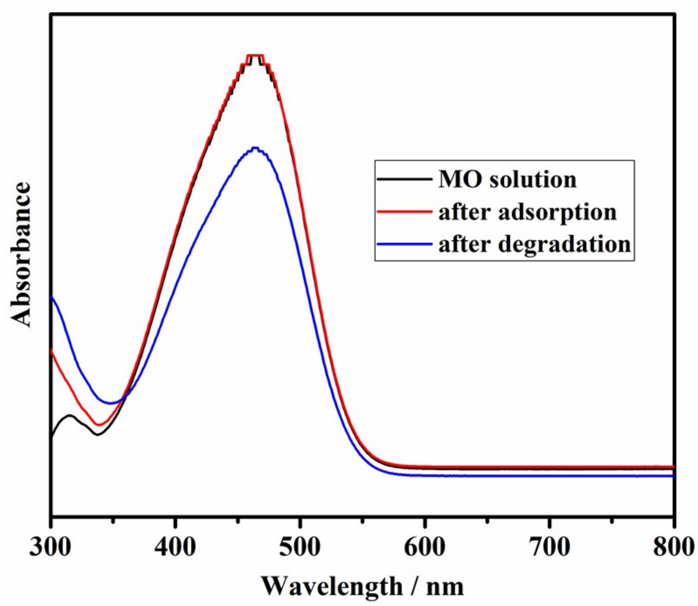

Figure S4. The UV-vis absorption spectra of the MO solution during the adsorption and degradation reaction in the presence of compound **2**.

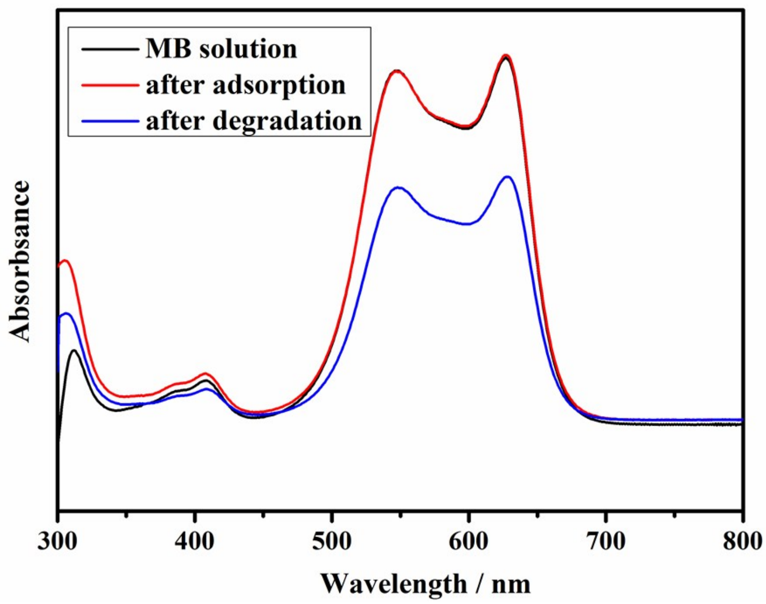

Figure S5. The UV-vis absorption spectra of the MB solution during the adsorption and degradation reaction in the presence of compound **2**.

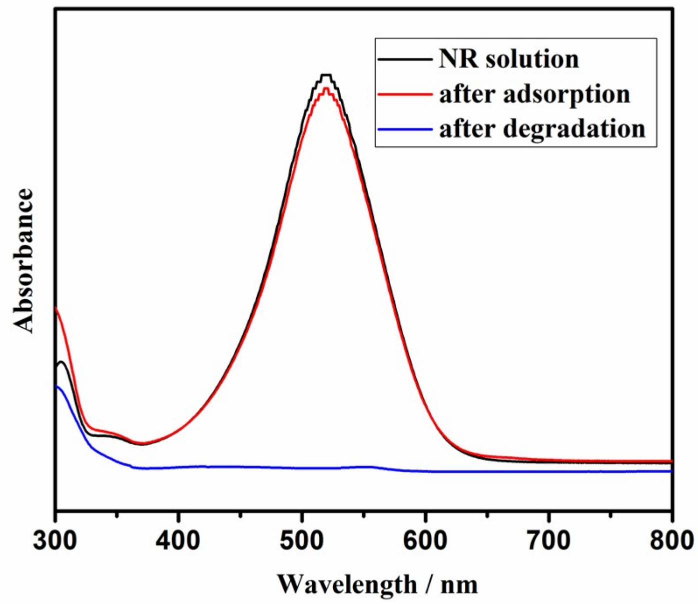

Figure S6. The UV-vis absorption spectra of the NR solution during the adsorption and degradation reaction in the presence of compound **2**.

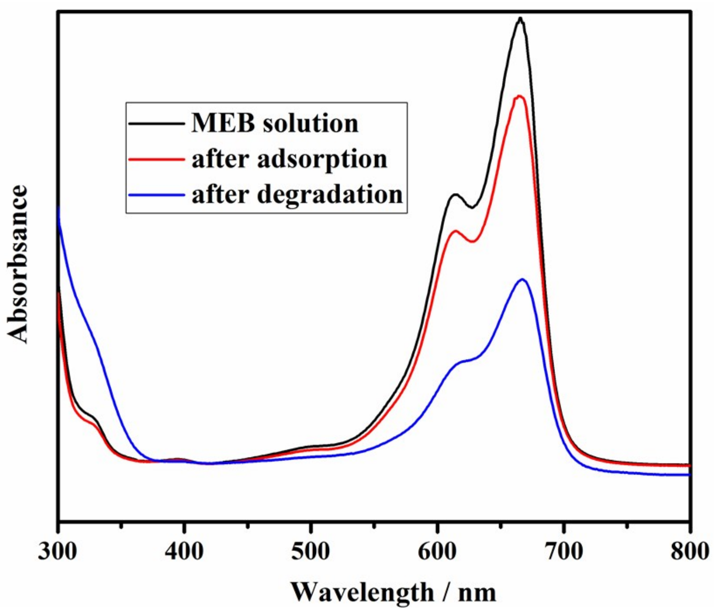

Figure S7. The UV-vis absorption spectra of the MEB solution during the adsorption and degradation reaction in the presence of compound **2**.

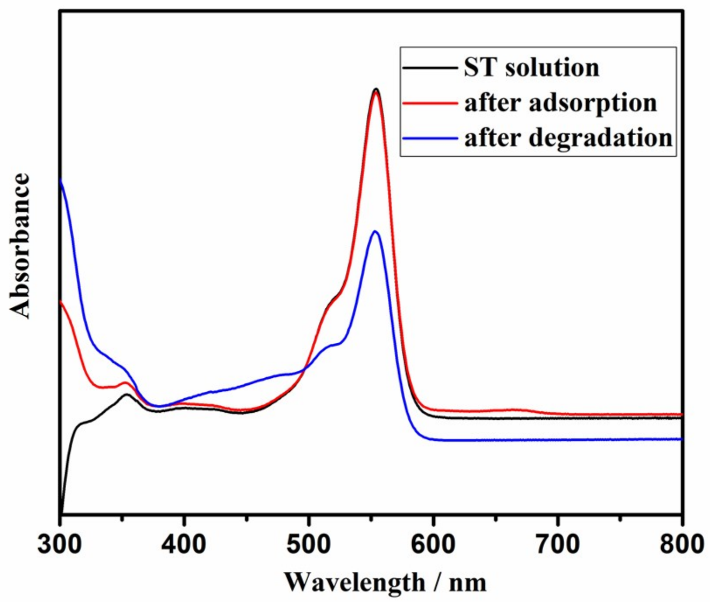

Figure S8. The UV-vis absorption spectra of the ST solution during the adsorption and degradation reaction in the presence of compound **2**.

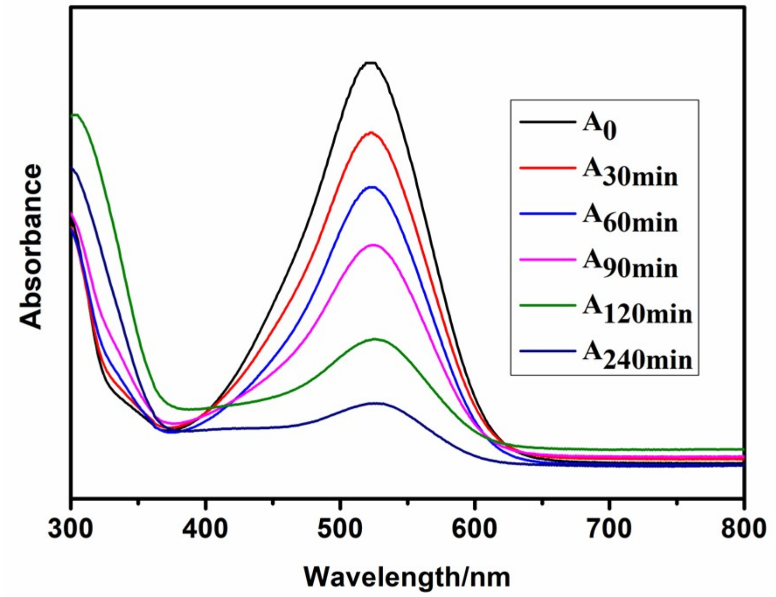

Figure S9. The UV-vis absorption spectra of the NR solution in the presence of compound **2**.

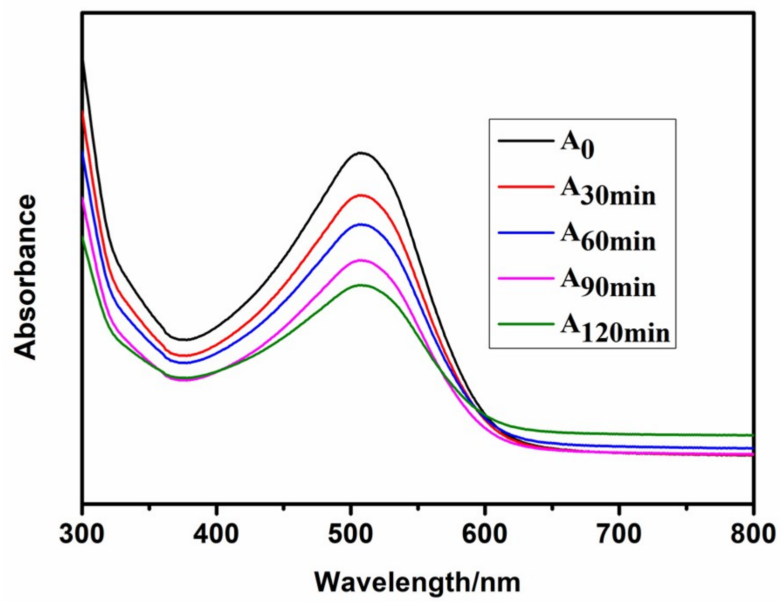

Figure S10. The UV-vis absorption spectra of the NR solution in the presence of H_2O_2.

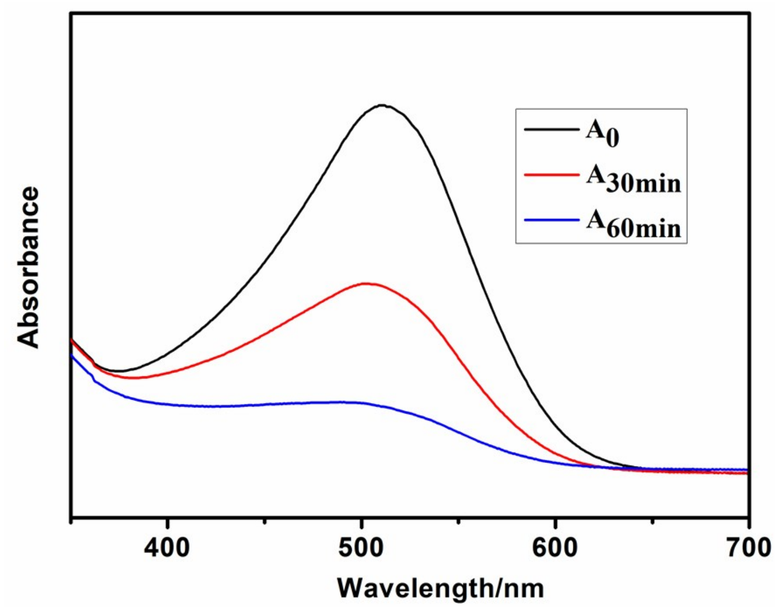

Figure S11. The UV-vis absorption spectra of the NR solution, H_2O_2, in the presence of CP-**2**.

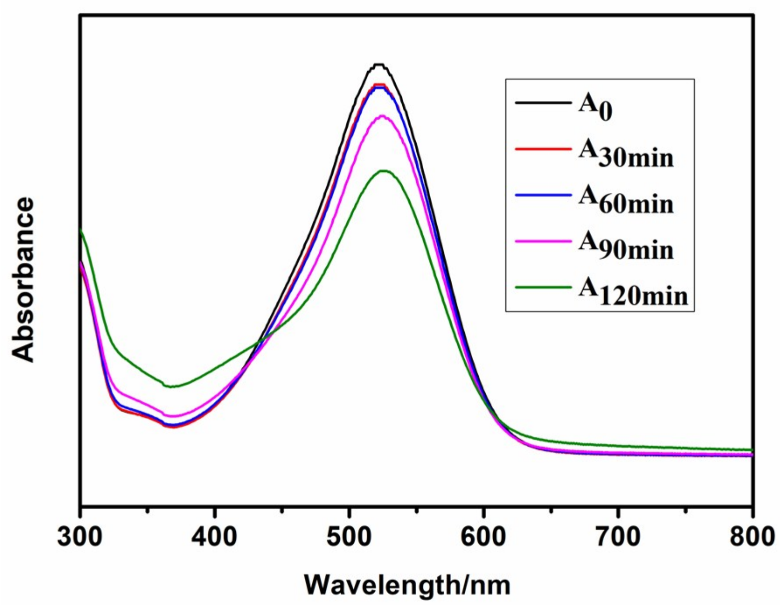

Figure S12. The UV-vis absorption spectra of the NR solution.

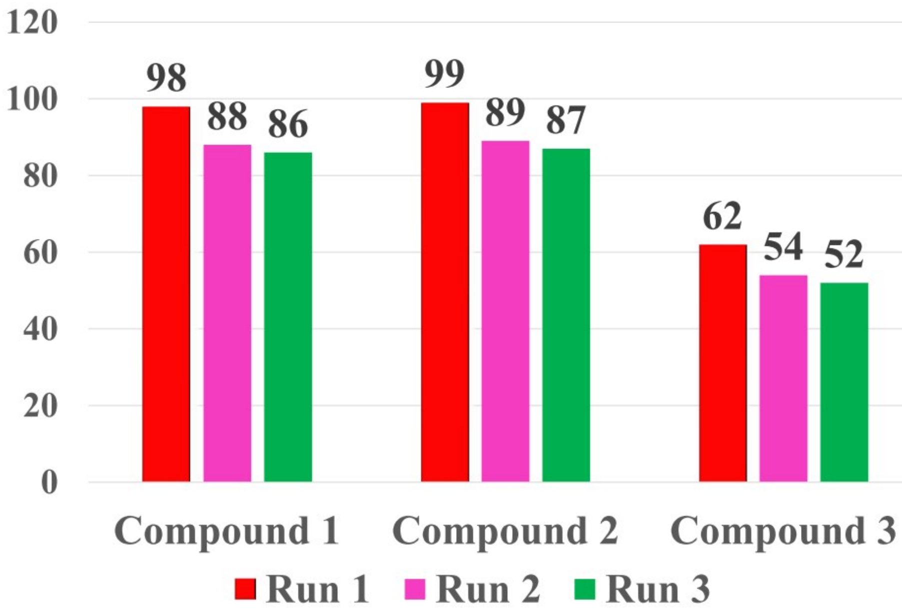

Figure S13. Reusability of compounds **1-3** as catalysts for Neutral red.

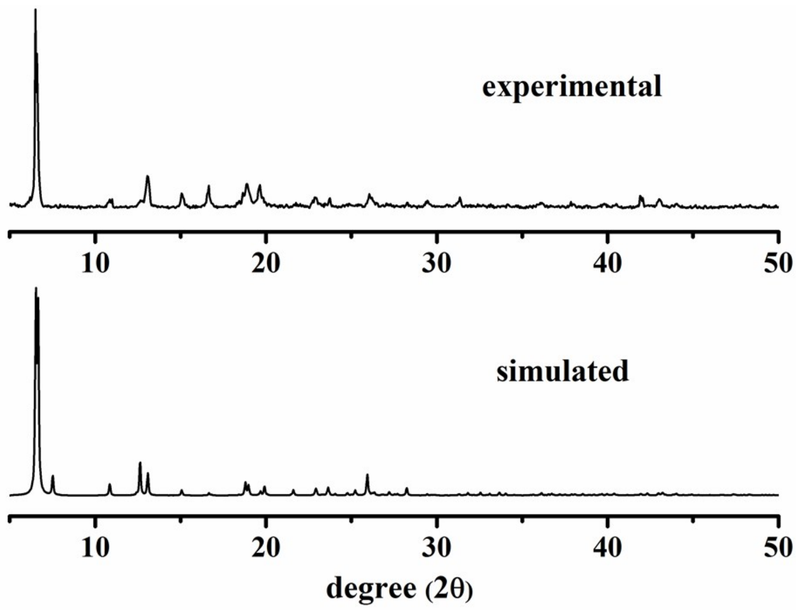

Figure S14. PXRD spectra of **1**.

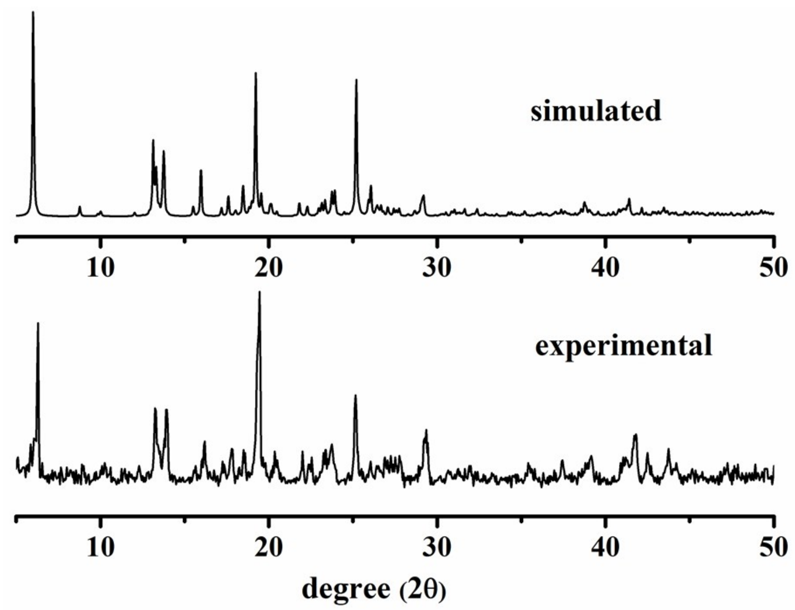

Figure S15. PXRD spectra of **2**.

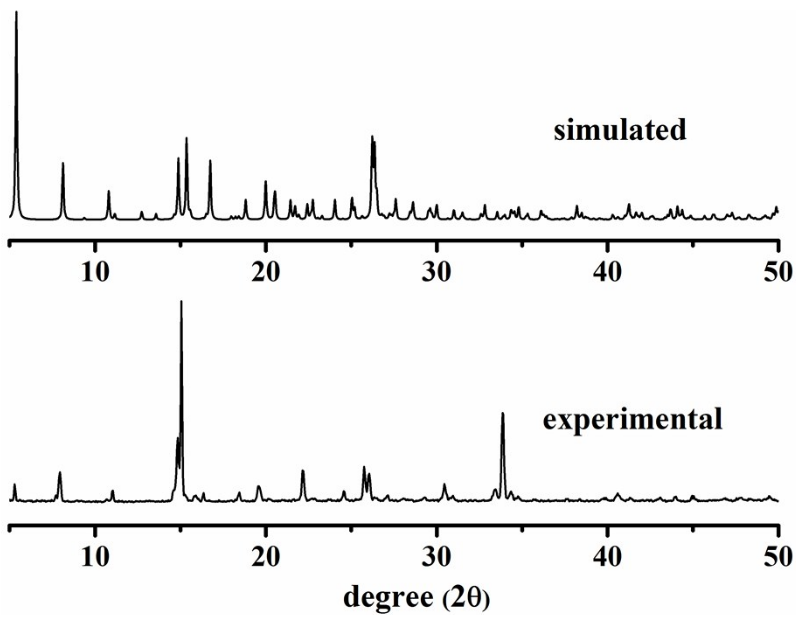

Figure S16. PXRD spectra of **3**.

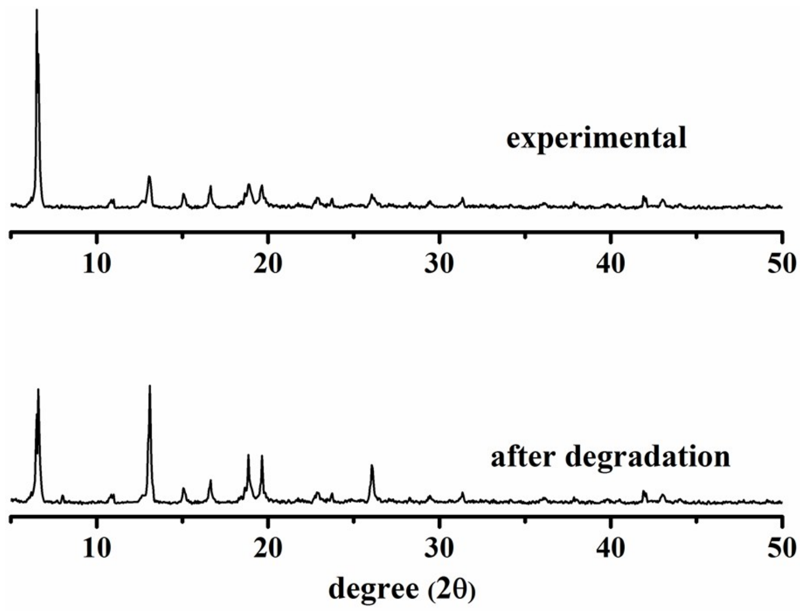

Figure S17. PXRD spectra of **1** after degradation.

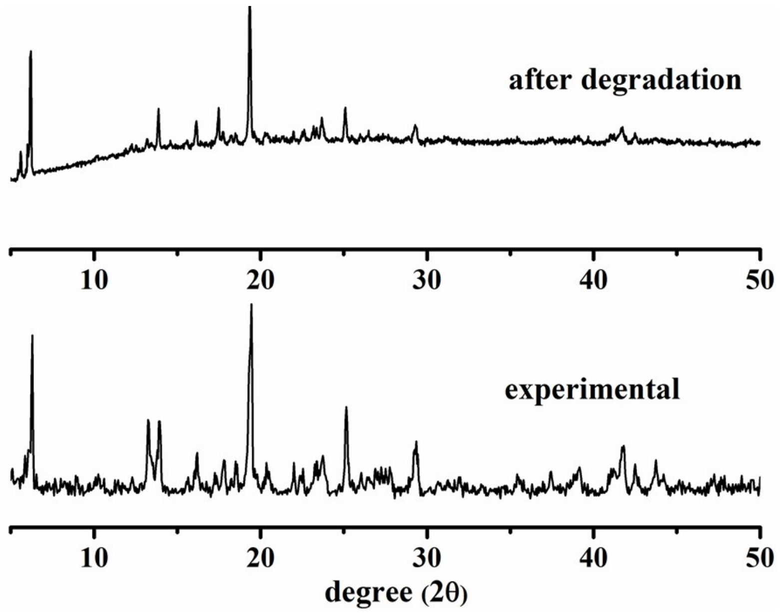

Figure S18. PXRD spectra of **2** after degradation.

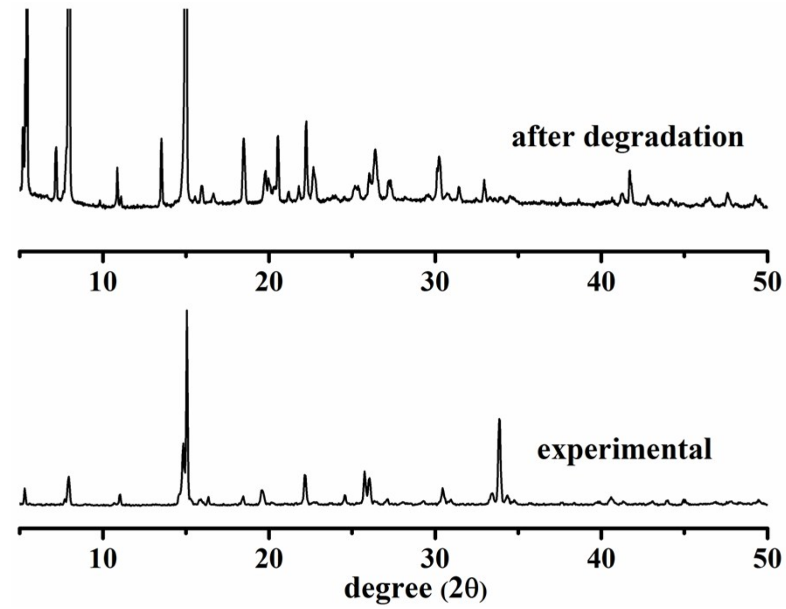

Figure S19. PXRD spectra of **3** after degradation.

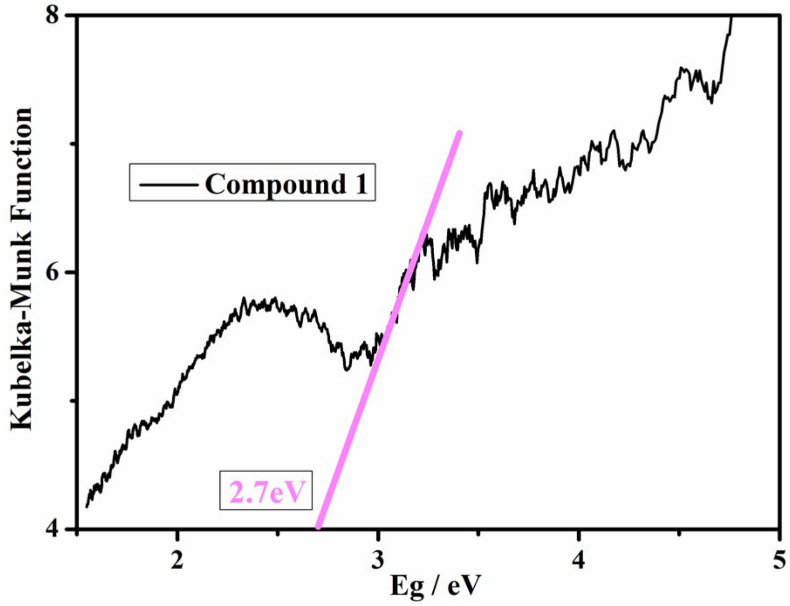

Figure S20. Plot of Kubelka-Munk as a function of energy of the compound **1** at room temperature.

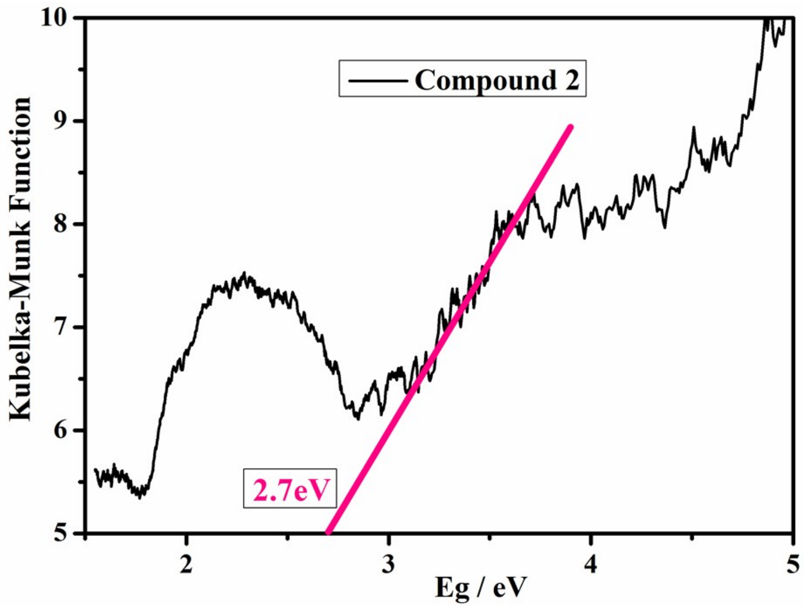

Figure S21. Plot of Kubelka-Munk as a function of energy of the compound **2** at room temperature.

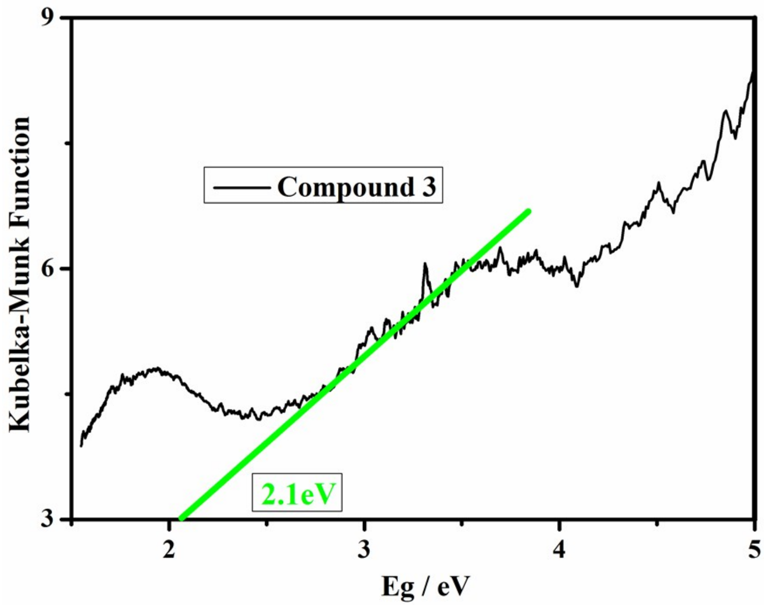

Figure S22. Plot of Kubelka-Munk as a function of energy of the compound **3** at room temperature.

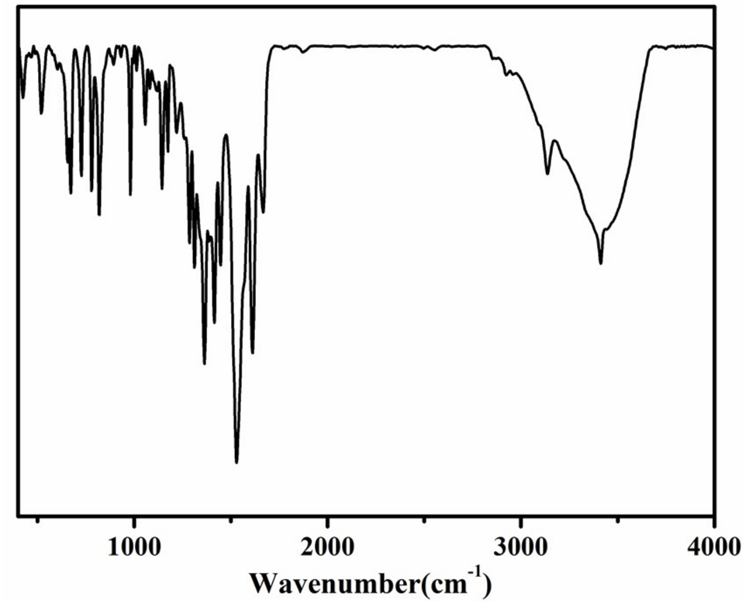

Figure S23. IR spectra for compound **1**.

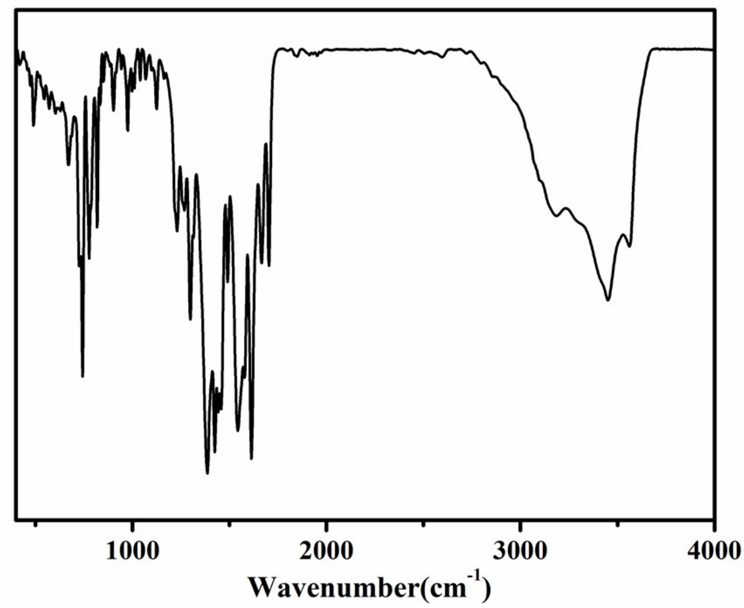

Figure S24. IR spectra for compound **2**.

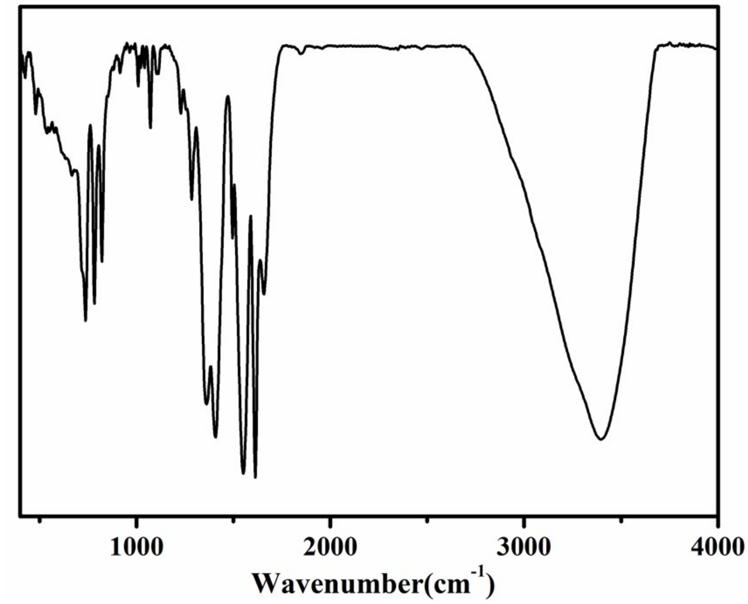

Figure S25. IR spectra for compound **3**.

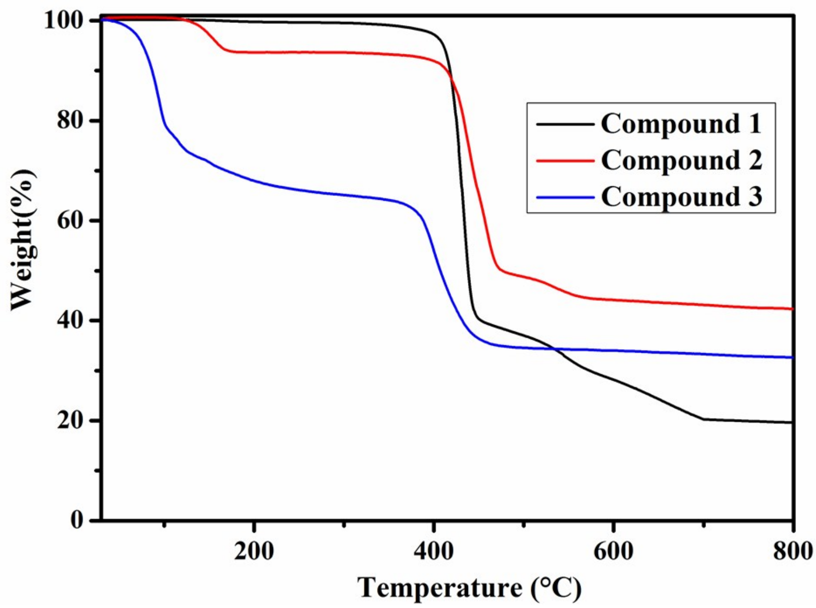

Figure S26. TGA curves for compounds **1**-**3**.

Table S1. Selected Bond Lengths (Å) and Angles (deg) for Complexes **1**-**3**.

Complex **1**

Co1-O1	2.0921(12)	Co1-N1_a	2.145(3)
Co1-N1	2.145(3)	Co1-O2_b	2.0940(11)
Co1-O2_c	2.0940(11)	Co1-O1_a	2.0921(12)
O1_a -Co1-N1_a	92.12(8)	O1-Co1-N1	92.12(8)
O1-Co1-O2_b	89.51(4)	O1-Co1-O2_c	90.49(4)
O1-Co1-O1_a	180.00	O2_b -Co1-N1	83.38(8)
O1-Co1-N1_a	87.88(8)	O2_c -Co1-N1	96.62(8)
O1_a -Co1-N1	87.88(8)	N1 -Co1-N1_a	180.00
O2_b -Co1-O2_c	180.00	O1_a -Co1-O2_b	90.49(4)
O2_b -Co1-N1_a	96.62(8)	O1_a -Co1-O2_c	89.51(4)
O2_c -Co1-N1_a	83.38(8)		
Complex **2**			
Co1-O1	2.288(7)	Co1-O3_d	2.283(7)
Co1-O14	2.052(6)	Co1-O15	2.080(6)
Co1-N1_c	2.138(7)	Co1-O4_d	2.192(7)
Co3-O4	1.786(8)	Co3-O11	1.928(8)
Co3-O2_a	2.137(9)	Co3-O12_e	1.844(10)
Co2-N3_g	2.132(6)	Co2-O7_f	2.144(7)
Co2-O16	2.136(6)	Co2-O5	2.064(6)
Co2-O6_b	2.035(6)	Co2-O8_b	2.317(5)
O1 -Co1- O3_d	55.7(2)	O1 -Co1-O14	92.6(3)
O1 -Co1-O15	90.3(3)	O1 -Co1-N1_c	88.5(3)
O1 -Co1-O4_d	127.6(2)	O3_d -Co1-O14	86.3(3)
O5 -Co2-N3_g	92.3(2)	O5 -Co2-O16	174.9(3)
O5 -Co2-O6_b	96.2(2)	O3_d -Co1-O15	99.8(3)
O5 -Co2-O7_f	100.2(2)	O3_d -Co1-N1_c	143.0(3)

O3_d -Co1-O4_d	74.3(3)	O7_f -Co2-N3_g	93.1(3)
O6_b-Co2-O7_f	138.0(2)	O14-Co1-O15	174.0(3)
O14-Co1-N1_c	86.8(3)	O4_d-Co1-O14	99.2(3)
O6_b-Co2-N3_g	124.7(3)	O16-Co2-N3_g	88.0(2)
O15-Co1-N1_c	87.9(3)	O6_b-Co2-O16	79.5(3)
O4_d-Co1-O15	83.2(3)	O7_f-Co2-O16	85.0(3)
O4_d-Co1-N1_c	142.7(3)	O4-Co3-O11	96.3(4)
O2_a-Co3-O4	86.7(3)	O4-Co3-O12_e	131.6(5)
O2_a-Co3-O11	141.7(4)	O11-Co3-O12_e	116.0(4)
O2_a -Co3-O12_e	88.5(4)	O6_b-Co2-O8_f	83.6(2)
O5-Co2-O8_f	87.7(2)	N3_g-Co2-O8_f	151.4(2)
O16-Co2-O8_f	94.6(2)	O7_f -Co2-O8_b	58.94(19)
Complex **3**			
Ni1-O1W	2.052(3)	Ni1-O2W	2.078(3)
Ni1-O3W	2.057(3)	Ni1-O4W	2.078(4)
Ni1-O5W	2.036(4)	Ni1-N1	2.049(3)
O1W-Ni1-O2W	90.58(13)	O1W-Ni1-O3W	88.04(16)
O1W-Ni1-O4W	174.26(15)	O1W-Ni1-O5W	89.64(13)
O1W-Ni1-N1	92.60(16)	O2W-Ni1-O3W	89.58(16)
O2W-Ni1-O4W	89.36(13)	O2W-Ni1-O5W	179.64(15)
O2W-Ni1-N1	91.11(17)	O3W-Ni1-O4W	86.22(13)
O3W-Ni1-O5W	90.15(16)	O3W-Ni1-N1	179.05(14)
O4W-Ni1-O5W	90.39(14)	O4W-Ni1-N1	93.14(14)
O5W-Ni1-N1	89.15(16)		

Symmetry codes: for complex **1**: (a) = 1 - x, 1 - y, - z. (b) = - x, 1 - y, - z. (c)=1 + x, y, z. for complex **2**: (a) = - 1 + x, y, z. (b) = 2 - x, - y, 1 – z. (c) = x, y, 1 + z. (d) = 1 + x, y, z. (e) = - x, 1 - y, - z. (f) = 1 - x, - y, 1 - z. (g) = 2 - x, - y, - z.