Electronic Supplementary Information for:

Co(II) and Ni(II) Complexes Based on Anthraquinone-1,4,5,8-Tetracarboxylic Acid (H_4AQTC): Canted Antiferromagnetism and Slow Magnetization Relaxation in $\{[Co_2(AQTC)(H_2O)_6]\cdot 6H_2O\}$

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Table S1. Selected bond lengths [Å] and angles [deg] for compounds **1- 3**.

D-H···A	*d*(D-H)	*d*(H···A)	*d*(D···A)	□DHA
		Complex 1[a]		
O1W-H1C···O1H	0.850	1.842	2.692	178.24
O1W-H1D···O5WL	0.850	2.097	2.870	150.99
O2W-H2C···O2	0.850	1.795	2.626	165.39
O2W-H2C···O1	0.850	2.586	3.048	115.34
O2W-H2D···O4M	0.850	1.803	2.622	161.15
O3W-H3D···O3J	0.849	1.863	2.707	172.07
O3W-H3C···O5W	0.849	2.141	2.937	155.71
O4W-H4C···O3WK	0.854	2.175	2.976	156.04
O5W-H5D···O5	0.850	2.183	2.978	155.77
O6W-H6C···O4W	0.764	2.262	2.748	122.40
		Complex 2[b]		
O1W-H1WA ···O1H	0.851	1.938	2.786	173.34
O1W-H1WB ···O2I	0.856	1.889	2.739	172.06
O2W-H2WA ···O3	0.853	1.888	2.716	163.13
O2W-H2WB···O4W	0.856	1.847	2.694	169.92
O3W-H3WA···O1I	0.856	1.838	2.690	173.19
O3W-H3WB···O5WJ	0.852	1.843	2.693	175.77
O4W-H4WA···O5WK	0.854	1.966	2.786	160.46
O4W-H4WB···O6WL	0.849	1.988	2.750	148.75
O5W-H5WA···O2H	0.853	1.830	2.682	177.37
O5W-H5WB···O3C	0.852	1.959	2.806	172.25
O6W-H6WA···O4F	0.852	2.104	2.952	174.15
O6W-H6WB···O1M	0.855	2.550	3.157	128.81
		Complex 3[c]		
O1W-H1WA ···O1H	0.850	1.947	2.790	171.07
O1W-H1WB ···O2I	0.850	1.897	2.742	172.60
O2W-H2WA ···O3	0.850	1.865	2.690	163.03
O2W-H2WB···O4W	0.850	1.849	2.690	170.33
O3W-H3WA···O1I	0.850	1.864	2.709	172.32
O3W-H3WB···O5WJ	0.850	1.844	2.691	173.75
O4W-H4WA···O5WK	0.850	1.960	2.780	161.63
O4W-H4WB···O6WL	0.848	1.997	2.755	148.46
O5W-H5WA···O2H	0.850	1.837	2.686	177.62
O5W-H5WB···O3C	0.850	1.944	2.789	172.32
O6W-H6WA···O4F	0.850	2.104	2.950	173.26
O6W-H6WB···O1M	0.850	2.598	3.127	121.53

[a]Symmetry codes: H: x, 1.5-y, 0.5+z; J: x+1, y, z; K: 1-x, 1-y, 1-z; L: 1-x, y+0.5, 1.5-z; M: x+1, y, z+1.

[b]Symmetry codes: C: -x+1,y+0.5,-z+1.5; F: x,y+1,z; H: x,-y+0.5,z+0.5; I: -x,-y.-z+1; J: x,y-1,z; K: -x+1,-y+1,-z+2; L: -x+1,y-0.5,-z+1.5; M: -x,-y+1,-z+1.

[c]Symmetry codes: C: -x+1,y+0.5,-z+1.5; F: x,y+1,z; H: x,-y+0.5,z+0.5; I: -x,-y.-z+1; J: x,y-1,z; K: -x+1,-y+1,-z+2; L: -x+1,y-0.5,-z+1.5; M: -x,-y+1,-z+1.

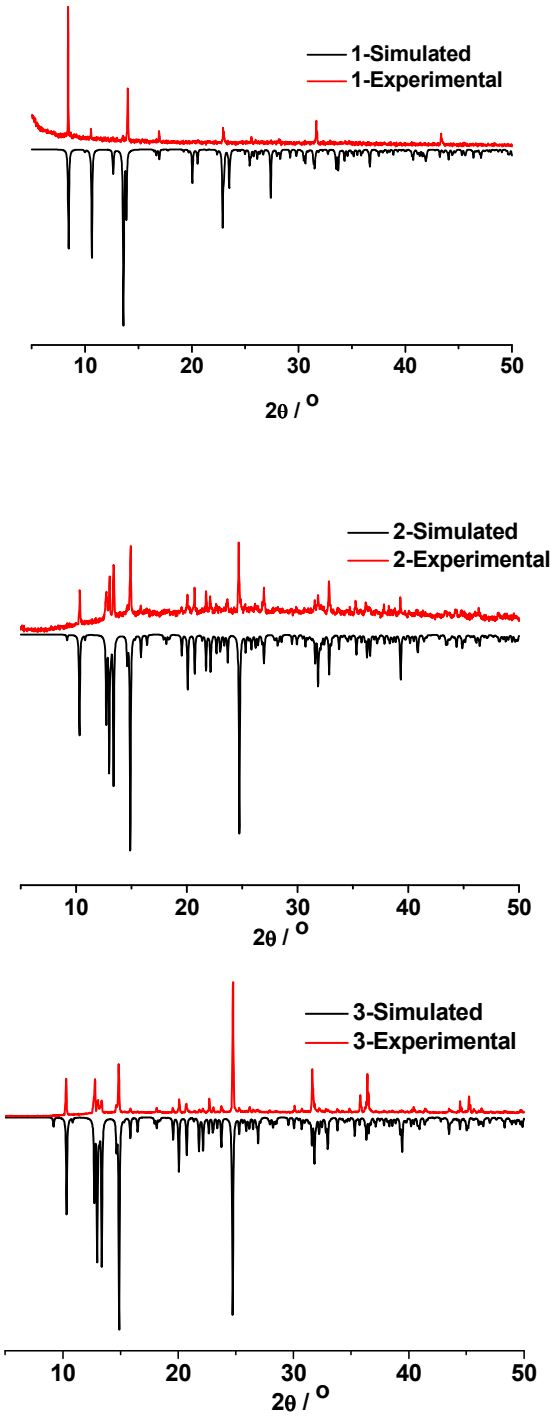


Figure. S1. XRD patterns for compounds **1**-**3**.

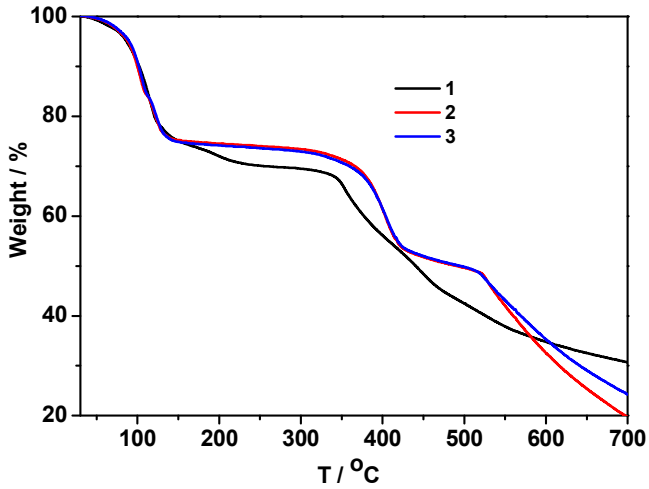


Figure. S2. TGA curve for compounds **1**–**3**.

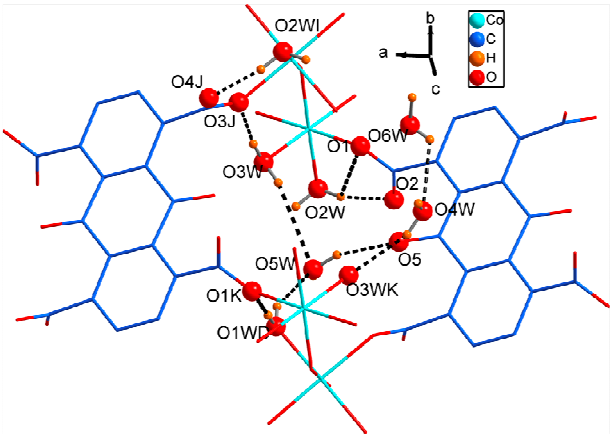


Figure S3. Intermolecular H-bonds in complex **1**. (symmetry codes: D: 1-x, y-0.5, 1.5-z; I: x, y, z-1; J: x+1, y, z; K: 1-x, 1-y, 1-z)

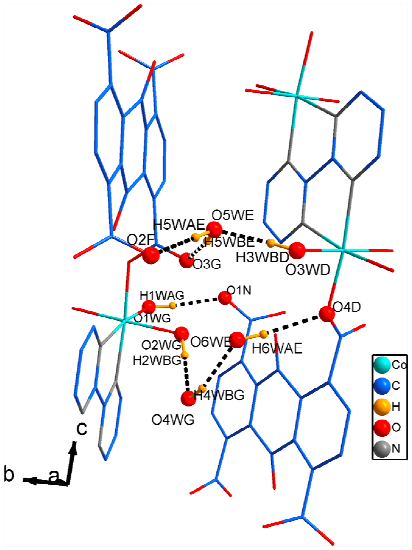
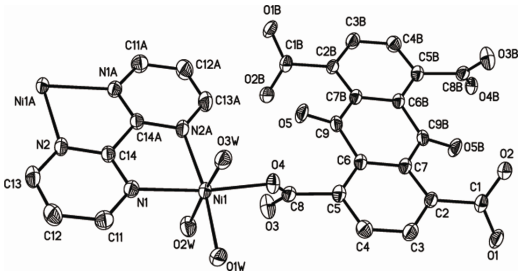
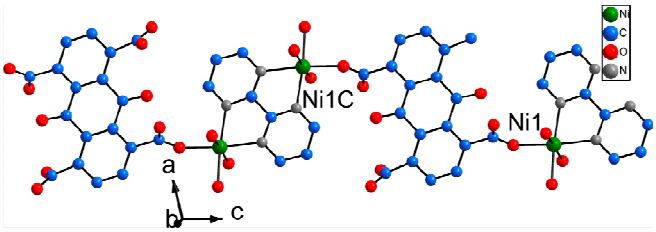


Figure S4. Intermolecular H-bonds in complex **2**. (symmetry codes:D:x,0.5-y,z-0.5; E:x,1.5-y,z-0.5; F:x,1+y,z; G:1-x,1-y,1-z; N:1-x,0.5+y,0.5-y)

(a)



(b)



(c)

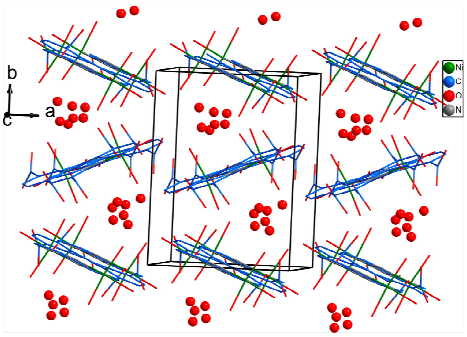


Figure S5. (a) Building unit of compound **3** with atomic labelling scheme (50% probability). (b) One chain in compound **3** running along the *c*-axis. (c) The crystal packing of compound **3**. All H atoms are omitted for clarity. Symmetry codes: A: -x+1,-y,-z+2; B: -x+1,-y,-z+1; C: 1-x,1-y,1-z.

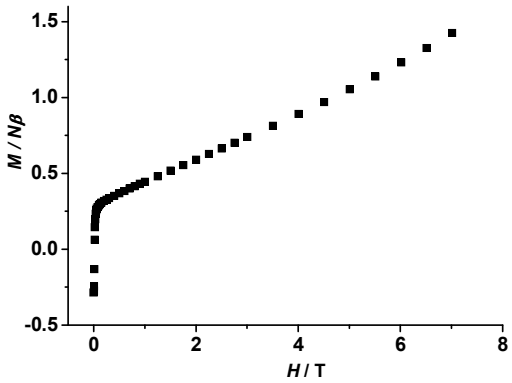


Figure S6. Magnetization data *vs*. *H* at 1.8 K for **1**.

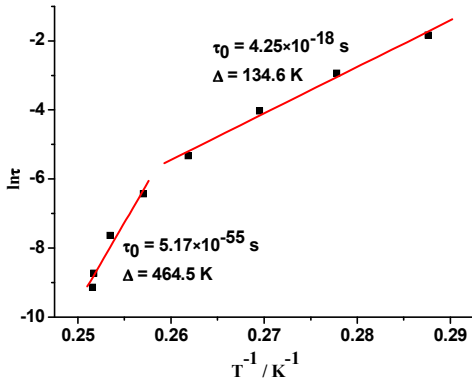


Figure S7. Magnetization relaxation time, $\ln\tau$ *vs*. T^{-1} plot for complex **1**. The red line is fitted with the Arrhenius law.

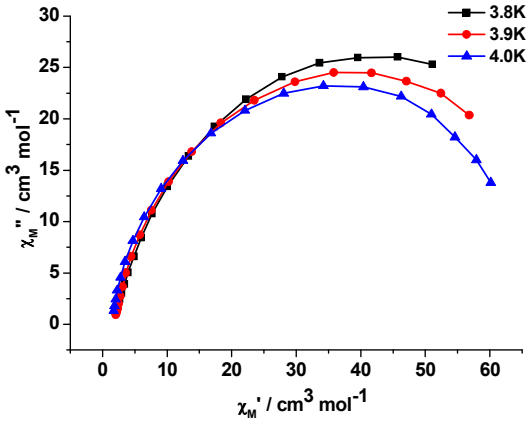


Figure S8. Cole-Cole diagram of complex **1** at 3.8 K, 3.9 K, 4.0 K with zero dc field.

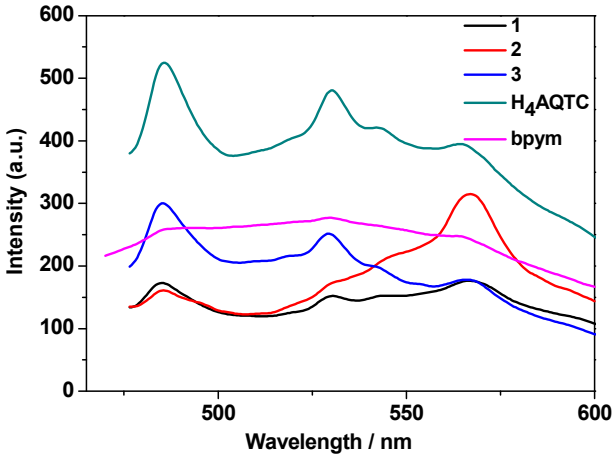


Figure S9. Fluorescent emission spectra of complexes **1**-**3** and free ligands in solid state at room temperature.