

Supporting Information

Cyanide-Bridged Bimetallic 3D Hoffman-Like Coordination Polymers with Tunable Magnetic Behaviour

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Table S1. Selected bond lengths [\AA] and angles [$^\circ$] for **1**.

	300 K	225 K	150K
Fe-N1	2.115(7)	1.946(5)	1.930(5)
Fe-N2	2.128(8)	1.939(5)	1.928(5)
Fe-N3	2.198(7)	2.027(5)	2.005(4)
Ag-C1	2.048(9)	2.066(7)	2.055(6)
Ag-C2 ^[a]	2.060(10)	2.050(7)	2.040(6)
N2 ^[b] -Fe-N1	91.4(3)	90.8(2)	90.77(19)
N2-Fe-N1	88.6(3)	89.2(2)	89.23(19)
N2 ^[b] -Fe-N3	89.5(3)	89.2(2)	89.38(18)
N1-Fe-N3 ^[b]	90.0(3)	89.9(2)	89.81(18)
N2-Fe-N3	90.5(3)	90.8(2)	90.62(18)
N1-Fe-N3	90.0(3)	90.1(2)	90.19(18)
C1-Ag-C2 ^[a]	173.9(5)	173.4(3)	173.2(3)
Fe1-N1-C1	171.1(9)	176.3(6)	176.0(5)
Fe1-N2-C2	169.1(8)	174.0(6)	175.0(5)
Ag-C1-N1	176.1(10)	174.4(6)	173.8(5)
Ag ^[c] -C2-N2	175.4(10)	174.0(7)	171.2(5)

Symmetry codes: a) -x+3/2, y+1/2, -z+1/2; b) -x+3/2, -y+1/2, -z+1; c) -x+3/2, y-1/2, -z+1/2.

Table S2. Selected bond lengths [Å] and angles [°] for **2**.

	273 K	100K
Fe-N1	2.111(9)	1.940(6)
Fe-N2 ^[a]	2.123(9)	1.930(5)
Fe-N3	2.178(10)	2.005(6)
Au-C1	1.961(12)	1.972(6)
Au-C2	1.987(13)	1.971(7)
N2 ^[b] -Fe-N1	89.9(4)	89.9(2)
N2 ^[b] -Fe-N1 ^[c]	90.1(4)	90.1(2)
N2 ^[b] -Fe-N3 ^[c]	89.4(4)	89.5(2)
N1-Fe-N3 ^[c]	90.1(4)	90.7(2)
N2 ^[b] -Fe-N3	90.6(4)	90.5(2)
N1-Fe-N3	89.9(4)	89.3(2)
C1-Au-C2	176.7(5)	176.2(3)
Fe1-N1-C1	174.4(12)	178.1(7)
Fe1 ^[d] -N2-C2	167.1(10)	174.2(6)
Au-C1-N1	177.7(15)	175.0(7)
Au-C2-N2	176.4(11)	174.6(7)

Symmetry codes: a) -x+3/2, y+1/2, -z+3/2; b) x, -y+1, z-1/2; c) -x+3/2, -y+3/2, -z+1; d) -x+3/2, y-1/2, -z+3/2.

Table S3. Selected bond lengths [Å] and angles [°] for **3** at 150 K.

Fe-N1	2.217(3)	Ni-C9	1.880(4)
Fe-N3	2.194(3)	Ni-C10	1.870(3)
Fe-N4 ^[a]	2.144(2)		
N4 ^[a] -Fe-N3	90.89(10)	N3 ^[c] -Fe-N1	95.10(11)
N4 ^[a] -Fe-N3 ^[c]	89.11(10)	N3-Fe-N1	84.90(10)
N4 ^[d] -Fe-N1	90.98(10)	Fe-N3-C9	138.3(3)
N4 ^[a] -Fe-N1	89.02(10)	Fe ^[e] -N4-C10	160.3(3)

Symmetry codes: a) $-x+2, y-1/2, -z+1/2$; b) $x, -y+5/2, z+1/2$; c) $-x+2, -y+2, -z+1$; d) $x, -y+5/2, z+1/2$; e) $-x+2, y+1/2, -z+1/2$.

Table S4. Selected interatomic distances [\AA] at variant temperatures for **1** and **2**.

T [K]	1			2	
	300	225	150	273	100
$\langle \text{Fe-N} \rangle$	2.147(8)	1.971(5)	1.954(5)	2.137(10)	1.958(6)
Fe-N_{ax}	2.198(7)	2.027(5)	2.005(4)	2.178(10)	2.005(6)
Fe-N_{eq}	2.122(8)	1.943(5)	1.929(5)	2.117(9)	1.935(6)
$\text{Fe}\cdots\text{Fe}$	16.622(2)	16.317(9)	16.240(7)	16.7493(16)	16.4515(8)

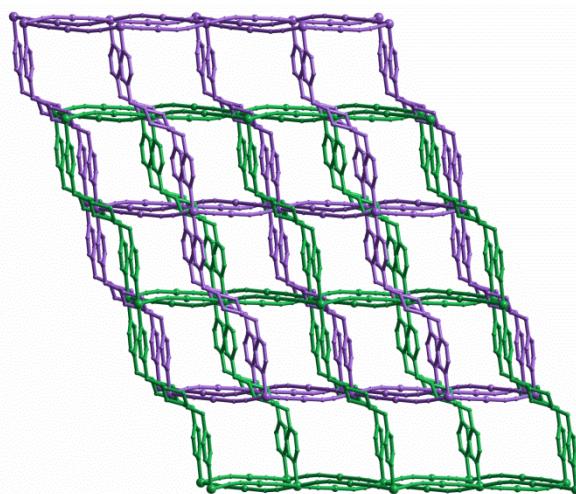


Fig. S1 View of a portion of 3D structure in **1**.

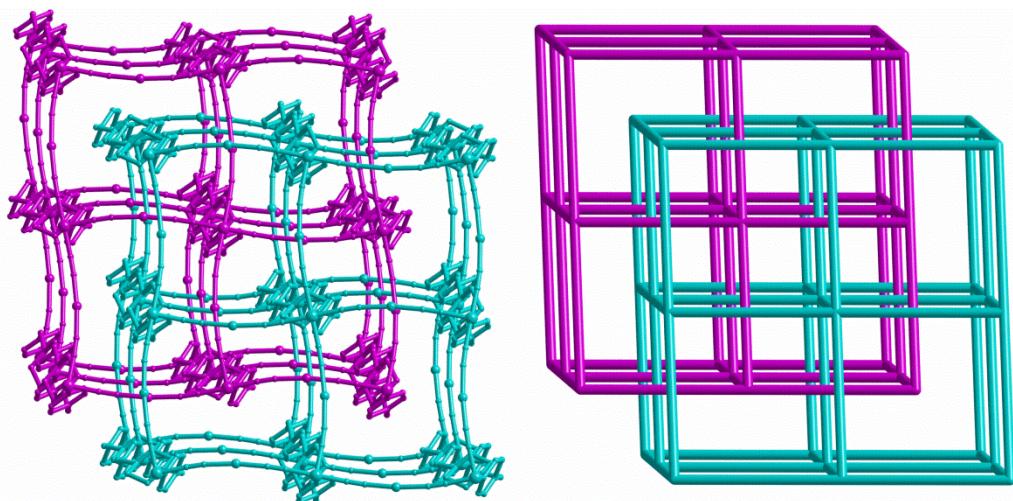


Fig. S2 View of a fragment of the 3D interpenetrated framework and the corresponding topological network in **1**.

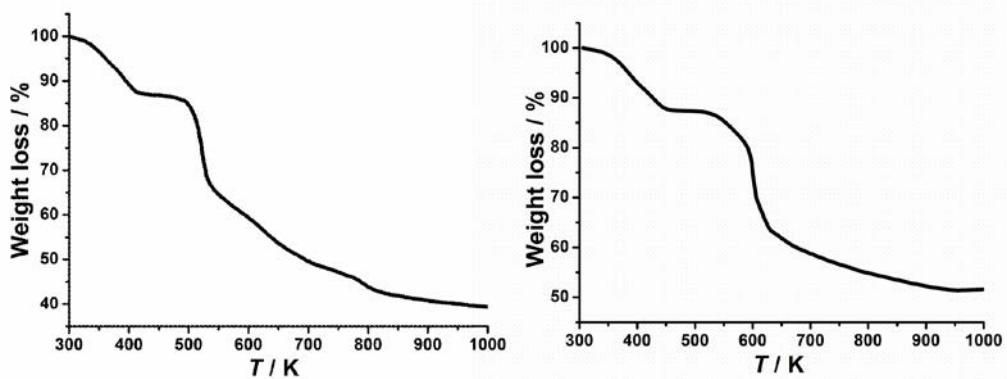


Fig. S3 Thermogravimetric analysis of compounds **1** (left) and **2** (right).

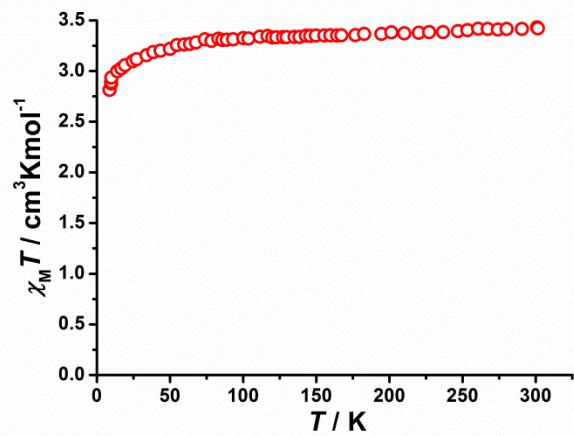


Fig. S4 Temperature dependence of $\chi_M T$ for **3**.