Supporting Information

Heterometallic 3d-4d coordination polymers assembled from *trans*-[Ru^{III}(L)(CN)$_2$]$^-$ tectons and 3d cations

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[d]*Univ. Bordeaux, CNRS, Centre de Recherche Paul Pascal, UMR 5031, F-33600 Pessac, France. E-mail: clerac@crpp-bordeaux.cnrs.fr*
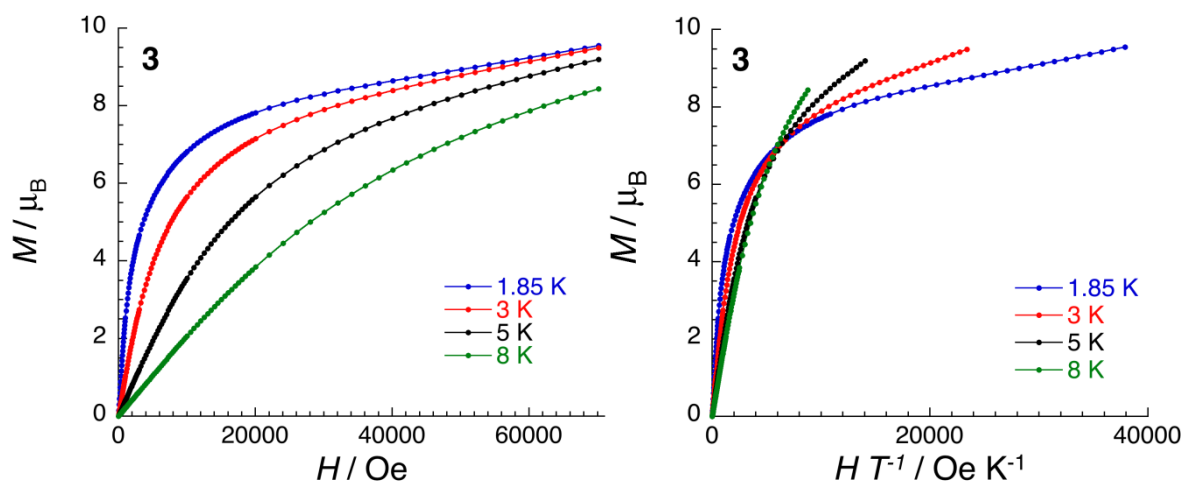
Figure S1: (Left) Field dependence of magnetization for **3** at the temperatures indicated, scanning at $100 - 400$ Oe.min^{-1} for $H < 1$ T and $500 - 2500$ Oe.min^{-1} for $H > 1$ T. (Right) Field dependence of reduced magnetization at the temperatures indicated. Solid lines are guides for the eye.

Figure S2: (Left) Field dependence of magnetization for **4** at the temperatures indicated, scanning at $100 - 400$ Oe.min^{-1} for $H < 1$ T and $500 - 2500$ Oe.min^{-1} for $H > 1$ T. (Right) Field dependence of reduced magnetization at the temperatures indicated. Solid lines are guides for the eye.
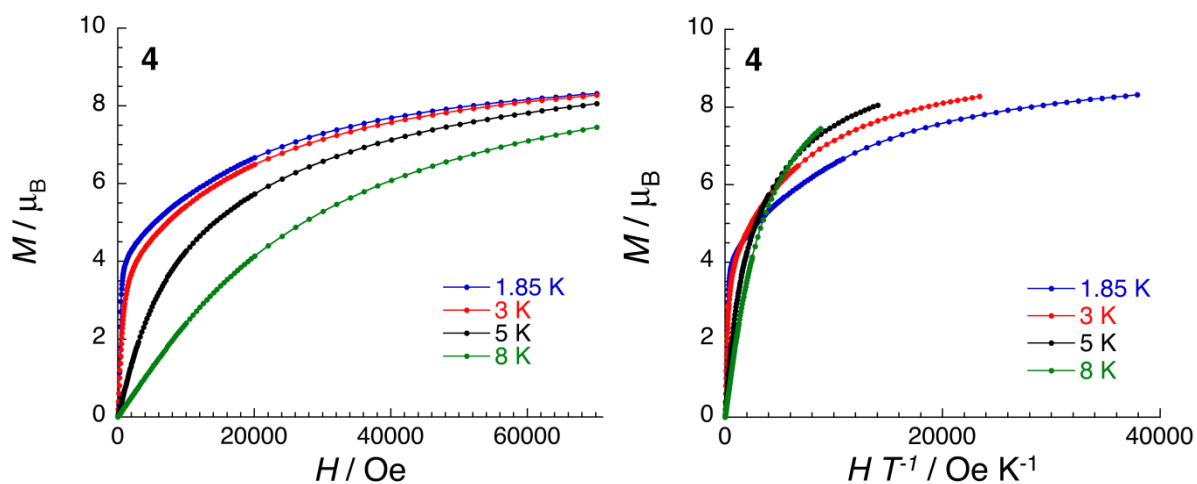
Figure S3: (Left) Field dependence of magnetization for **5** at the temperatures indicated, scanning at 100 – 400 Oe.min^{-1} for H< 1 T and 500 – 2500 Oe.min^{-1} for H> 1 T. (Right) Field dependence of reduced magnetization at the temperatures indicated. Solid lines are guides for the eye.
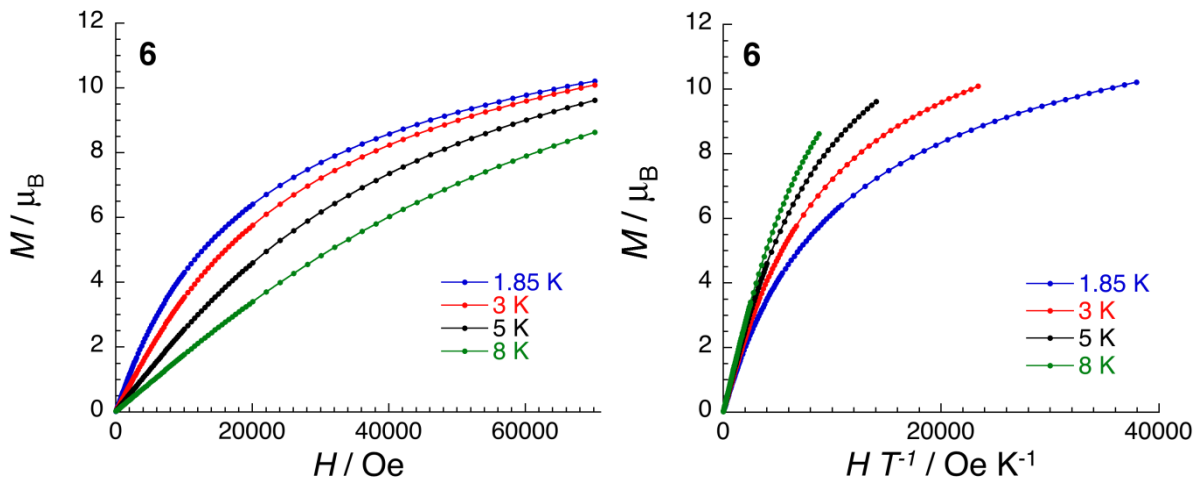
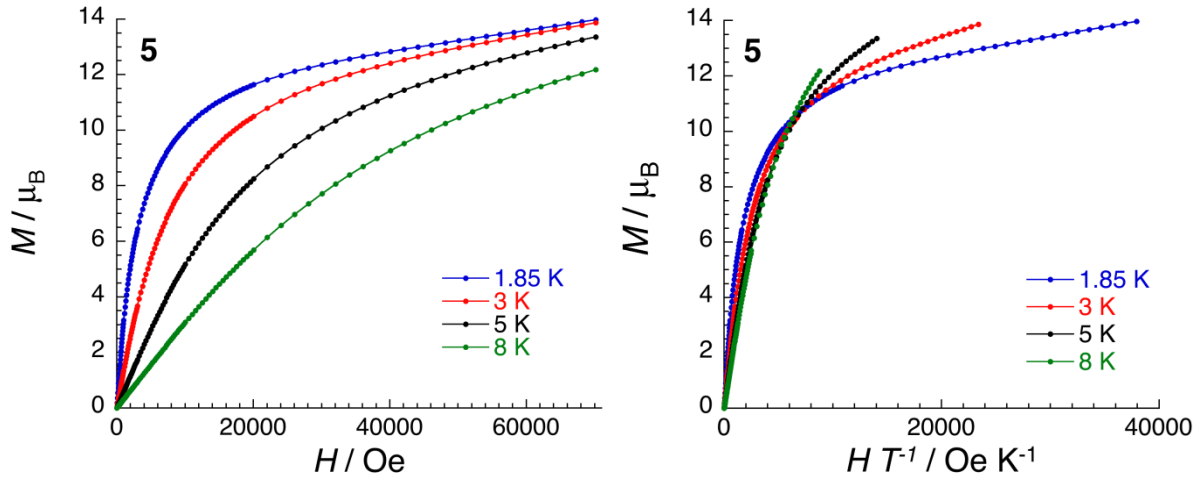**Figure S4**: (Left) Field dependence of magnetization for **6** at the temperatures indicated, scanning at 100 – 400 Oe.min^{-1} for H< 1 T and 500 – 2500 Oe.min^{-1} for H> 1 T. (Right) Field dependence of reduced magnetization at the temperatures indicated. Solid lines are guides for the eye.

Figure S5: (Left) Field dependence of magnetization for **7** at the temperatures indicated, scanning at $100 - 400$ Oe.min^{-1} for $H < 1$ T and $500 - 2500$ Oe.min^{-1} for $H > 1$ T. (Right) Field dependence of reduced magnetization at the temperatures indicated. Solid lines are guides for the eye.
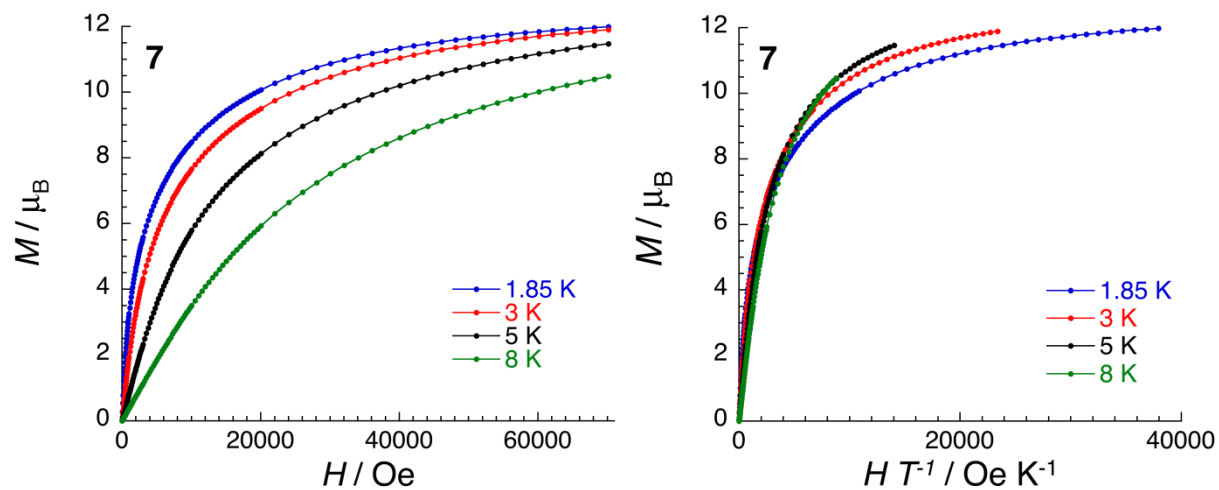
Table S1. Crystallographic data, details of data collection and structure refinement parameters for compounds **2-7**.

Compounds	2	3	4	5	6	7
Chemical formula	$C_{44}H_{55}AsN_4$ $O_{12.50}Ru$	$C_{87}H_{118}ClMn_2$ $N_{22}O_{20}Ru_3$	$C_{87}H_{118}ClCo_2$ $N_{22}O_{20}Ru_3$	$C_{122}H_{170}Cl_2Mn_3$ $N_{30}O_{38}Ru_4$	$C_{122}H_{170}Cl_2Co_3$ $N_{30}O_{38}Ru_4$	$C_{122}H_{170}Cl_2Ni_3$ $N_{30}O_{38}Ru_4$
FW (g mol^{-1})	1015.91	2240.57	2248.55	3304.87	3316.84	3316.18
Temperature, (K)	173(2)	173(2)	173(2)	159.9(1)	160.0(1)	200(2)
Wavelength, (Å)	0.71073	0.71073	0.71073	0.71073	0.71073	0.71073
Crystal system	Monoclinic	Monoclinic	Monoclinic	Monoclinic	Monoclinic	Monoclinic
Space group	P2$_1$/n	P2/n	P2/n	P2$_1$/c	P2$_1$/c	P2$_1$/a
a (Å)	9.6118(6)	20.2861(3)	20.2057(3)	14.1723(4)	14.2633(6)	13.4193(6)
b (Å)	21.7897(12)	10.4360(4)	10.3240(4)	41.9114(12)	41.4370(27)	41.433(2)
c (Å)	22.9503(17)	25.5399(5)	25.4271(5)	13.5236(4)	13.5049(12)	14.2634(7)
β (°)	97.831(5)	109.437(6)	108.911(6)	111.873(3)	111.638(4)	111.803(3)
V (Å^3)	4761.8(5)	5098.8(3)	5017.9(3)	7454.5(4)	7419.3(5)	7363.2(6)
Z	4	2	2	2	2	2
D_c (g cm^{-3})	1.417	1.459	1.488	1.472	1.485	1.496
μ (mm^{-1})	1.082	0.776	0.868	0.759	0.843	0.895
$F(000)$	2096	2306	2314	3402	3414	3420
Goodness-of-fit on F^2	0.739	0.918	0.913	1.114	1.094	0.884
Final R_1, wR_2 [$I > 2\sigma(I)$]	0.0539, 0.1263	0.0617, 0.1279	0.0415, 0.0905	0.0668, 0.1159	0.0688, 0.1641	0.0648, 0.1065
R_1, wR_2 (all data)	0.1235, 0.1616	0.1482, 0.1613	0.0809, 0.1027	0.0897, 0.1240	0.0869, 0.1784	0.1896, 0.1470
Largest diff. peak and hole (eÅ^{-3})	0.456, -0.764	1.225, -0.975	0.987, -1.052	1.013, -1.327	1.241, -1.420	0.533, -0.937