Electronic Supplementary Information

1D Chains from Mn_6 Single-Molecule Magnet Building Blocks

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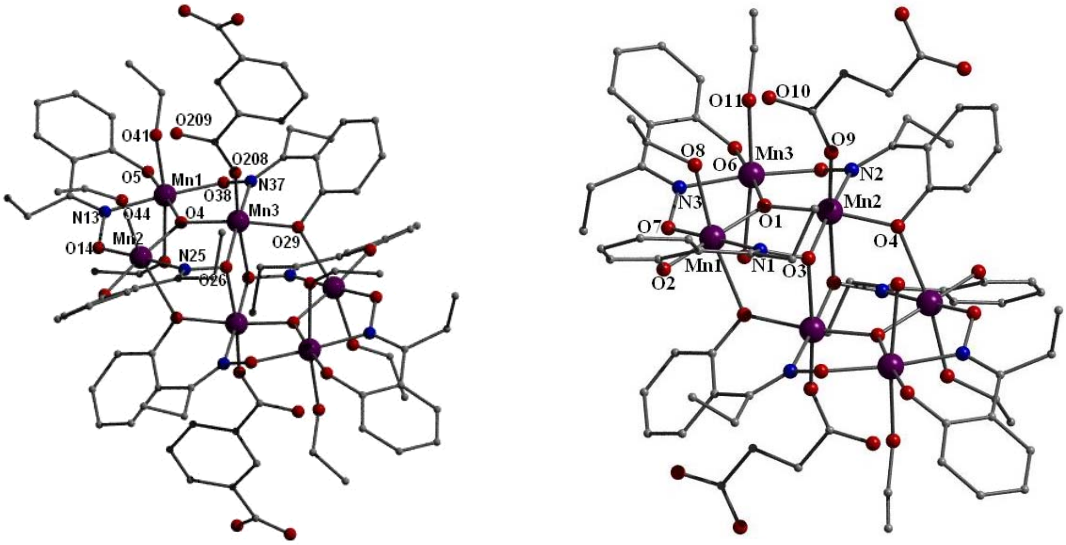


Figure SI1 Structures of the hexametallic building blocks in **1** (left) and **2** (right). H-atoms have been omitted for clarity.

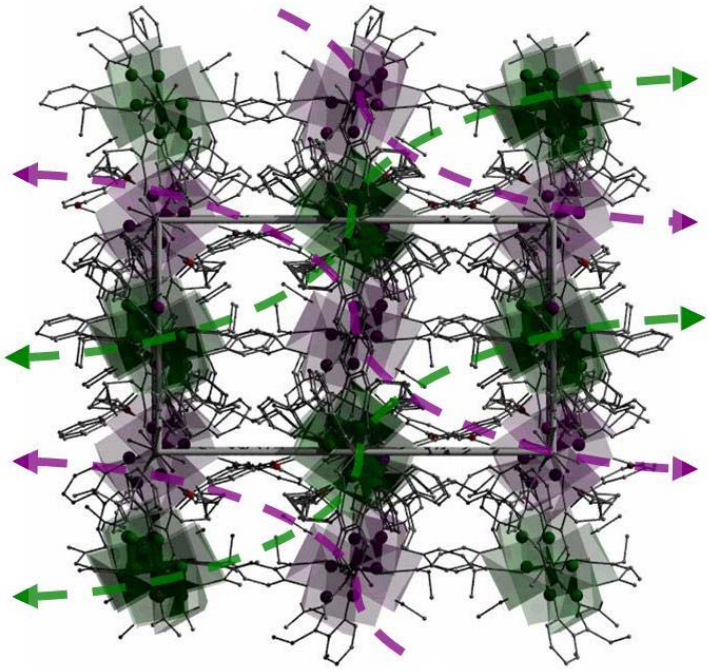


Figure SI2. Polyhedral representation of the packing of **1** in the crystal, viewed down the *ac* plane.

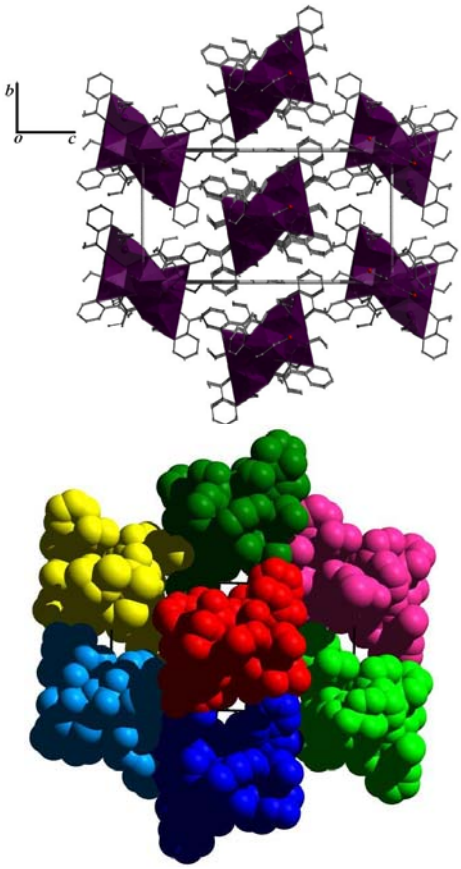
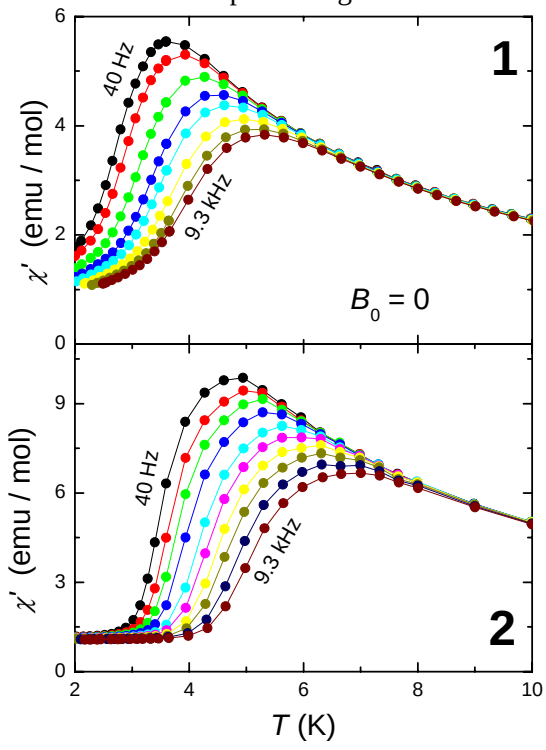


Figure SI3 (top) A Polyhedral representation of the packing observed in the crystal structure of **2** (H atoms have been omitted for clarity). The 1D chains comprising [Mn_6] units propagate out of the page (along the *a* axis). (bottom) A space-fill representation also viewed along the *a* axis with each colour representing a different 1D chain.



SI4 Plots of temperature-dependencies of the in-phase χ' susceptibility for **1** (top) and **2** (bottom) for frequencies ranging from 40 to 9300 Hz.

Experimental Procedures

(**1**): $Mn(ClO_4)_2.6H_2O$ (0.25 g, 0.7 mmol), Et-$saoH_2$ (0.13 g, 0.7 mmol) and disodium isophthalate (0.15 g, 0.7 mmol) were dissolved in EtOH and added to this clear solution was 2 ml of a $NEt_4(OH)$ solution (1 M in water) which resulted in the solution turning a dark red / black colour. The solution was stirred for 1 h and upon filtration and slow evaporation black crystals of **1** were obtained in 35 % yield after 4 days.

(**2**): $Mn(ClO_4)_2.6H_2O$ (0.7 mmol), Et-$saoH_2$ (0.7 mmol) and disodium succinate (0.7 mmol) were dissolved in EtOH and added to this clear solution was 2 ml of a $NEt_4(OH)$ solution (1 M in water) which resulted in the solution turning a dark red / black colour. The solution was stirred for 1 h and upon filtration and slow evaporation black crystals of **1** were obtained in 30 % yield after 5 days.

Table SI1: Selected bond lengths (Å) and angles (°) for 1.

Mn(1)-O(4)	1.877(4)	Mn(101)-O(104)	1.886(4)	O(4)-Mn(1)-O(5)	176.60(18)	O(29)#1-Mn(2)-O(44)	166.99(16)
Mn(1)-O(5)	1.855(4)	Mn(101)-O(105)	1.890(4)	O(4)-Mn(1)-O(38)	91.48(17)	O(4)-Mn(2)-O(44)	88.70(17)
Mn(1)-N(13)	1.995(5)	Mn(101)-N(113)	2.002(6)	O(5)-Mn(1)-O(38)	90.09(18)	O(14)-Mn(2)-O(44)	93.83(19
Mn(1)-O(38)	1.922(4)	Mn(101)-O(138)	1.925(4)	N(13)-Mn(1)-O(38)	176.23(19)	O(17)-Mn(2)-O(44)	94.52(18)
Mn(1)-O(41)	2.215(4)	Mn(101)-O(141)	2.240(5)	O(4)-Mn(1)-O(41)	89.63(16)	N(25)-Mn(2)-O(44)	87.91(18)
Mn(1)-O(47)	2.336(5)	Mn(101)-O(147)	2.258(5)	O(5)-Mn(1)-O(41)	93.29(18)	O(26)#1-Mn(3)-O(4)	84.86(15)
Mn(2)-O(29)#1	2.444(4)	Mn(102)-O(129)#2	2.412(4)	N(13)-Mn(1)-O(41)	90.19(19)	O(26)#1-Mn(3)-O(26)	85.61(15)
Mn(2)-O(4)	1.893(4)	Mn(102)-Mn(103)	3.2545(1	O(38)-Mn(1)-O(41)	93.50(17)	O(4)-Mn(3)-O(26)	89.84(17)
Mn(2)-O(14)	1.898(4)	Mn(102)-O(104)	1.890(4)	O(4)-Mn(1)-O(47)	89.09(17)	O(26)#1-Mn(3)-O(29)	84.81(14)
Mn(2)-O(17)	1.854(4)	Mn(102)-O(114)	1.901(4)	O(5)-Mn(1)-O(47)	87.75(18)	O(4)-Mn(3)-O(29)	169.60(16)
Mn(2)-N(25)	1.979(5)	Mn(102)-O(117)	1.864(4)	N(13)-Mn(1)-O(47)	80.87(19)	O(26)-Mn(3)-O(29)	90.56(16)
Mn(2)-O(44)	2.241(4)	Mn(102)-N(125)	1.989(5)	O(38)-Mn(1)-O(47)	95.45(17)	O(26)#1-Mn(3)-N(37)	84.89(16)
Mn(3)-O(26)	2.453(4)	Mn(102)-O(144)	2.242(6)	O(41)-Mn(1)-O(47)	170.99(18)	O(4)-Mn(3)-N(37)	88.87(18)
Mn(3)-O(4)	1.867(4)	Mn(103)-O(126)#2	2.459(4)	O(29)#1-Mn(2)-O(4)	86.75(14)	O(26)-Mn(3)-N(37)	170.49(17)
Mn(3)-O(26)	1.944(4)	Mn(103)-O(104)	1.865(4)	O(29)#1-Mn(2)-O(14)	98.54(16)	O(26)#1-Mn(3)-O(208	174.92(16)
Mn(3)-O(29)	1.915(4)	Mn(103)-O(126)	1.966(4)	O(4)-Mn(2)-O(14)	92.63(17)	O(4)-Mn(3)-O(208)	100.10(17)
Mn(3)-N(37)	2.025(5)	Mn(103)-O(129)	1.902(4)	O(29)#1-Mn(2)-O(17)	89.40(16)	O(26)-Mn(3)-O(208)	95.43(17)
Mn(3)-O(208)	2.090(4)	Mn(103)-N(137)	1.986(5)	O(4)-Mn(2)-O(17)	175.38(17)	O(29)-Mn(3)-N(37)	89.03(18)
		Mn(103)-O(211)	2.109(4)	O(14)-Mn(2)-O(17)	90.45(18)	O(29)-Mn(3)-O(208)	90.20(17)
				O(29)#1-Mn(2)-N(25)	79.78(16)	N(37)-Mn(3)-O(208)	94.07(18)
				O(4)-Mn(2)-N(25)	88.33(18)	Mn(2)-O(4)-Mn(1)	118.49(19)
				O(14)-Mn(2)-N(25)	178.03(19)	Mn(2)-O(4)-Mn(3)	120.9(2)
				O(17)-Mn(2)-N(25)	88.49(19)	Mn(1)-O(4)-Mn(3)	120.0(2)

Table SI2: Selected bond lengths (Å) and angles (°) for 2.

Mn(1)-O(28)#1	2.4067(18)	O(28)#1-Mn(1)-O(29)#1	83.46(7)	N(27)-Mn(2)-O(29)	80.83(7)
Mn(1)-O(29)#1	1.9090(17)	O(28)#1-Mn(1)-O(4)	84.68(7)	O(4)-Mn(2)-O(45)	87.98(7)
Mn(1)-O(4)	1.8676(17)	O(29)#1-Mn(1)-O(4)	167.75(8)	O(16)-Mn(2)-O(45)	93.36(8)
Mn(1)-O(28)	1.9534(17)	O(28)#1-Mn(1)-O(28)	85.20(7)	O(17)-Mn(2)-O(45)	90.99(8)
Mn(1)-N(39)	2.009(2)	O(29)#1-Mn(1)-O(28)	91.78(7)	N(27)-Mn(2)-O(45)	88.99(8)
Mn(1)-O(41)	2.0877(19)	O(4)-Mn(1)-O(28)	90.24(7)	O(29)-Mn(2)-O(45)	169.44(7)
Mn(2)-O(4)	1.8956(17)	O(28)#1-Mn(1)-N(39)	88.07(8)	O(4)-Mn(3)-O(5)	174.91(9)
Mn(2)-O(16)	1.9129(18)	O(29)#1-Mn(1)-N(39)	88.07(8)	O(4)-Mn(3)-N(15)	88.44(8)
Mn(2)-O(17)	1.8728(17)	O(4)-Mn(1)-N(39)	88.52(8)	O(5)-Mn(3)-N(15)	88.38(8)
Mn(2)-N(27)	1.986(2)	O(28)-Mn(1)-N(39)	173.25(9)	O(4)-Mn(3)-O(40)	91.59(7)
Mn(2)-O(29)	2.3483(17)	O(28)#1-Mn(1)-O(41)	174.80(7)	O(5)-Mn(3)-O(40)	91.11(7)
Mn(2)-O(45)	2.218(2)	O(29)#1-Mn(1)-O(41)	91.89(7)	N(15)-Mn(3)-O(40)	173.29(9)
Mn(3)-O(4)	1.8688(17)	O(4)-Mn(1)-O(41)	100.08(7)	O(4)-Mn(3)-O(51)	85.44(8)
Mn(3)-O(5)	1.8770(18)	O(28)-Mn(1)-O(41)	92.64(7)	O(5)-Mn(3)-O(51)	90.08(10)
Mn(3)-N(15)	2.004(2)	N(39)-Mn(1)-O(41)	94.12(8)	N(15)-Mn(3)-O(51)	79.72(9)
Mn(3)-O(40)	1.9222(19)	O(4)-Mn(2)-O(16)	91.06(7)	O(4)-Mn(3)-O(48)	93.29(8)
Mn(3)-O(51)	2.382(3)	O(4)-Mn(2)-O(17)	176.14(8)	O(5)-Mn(3)-O(48)	90.86(9)
Mn(3)-O(48)	2.204(2)	O(16)-Mn(2)-O(17)	92.72(8)	N(15)-Mn(3)-O(48)	93.36(8)
		O(4)-Mn(2)-N(27)	88.28(8)	O(40)-Mn(3)-O(51)	93.59(9)
		O(16)-Mn(2)-N(27)	177.54(9)	O(40)-Mn(3)-O(48)	93.34(8)
		O(17)-Mn(2)-N(27)	87.98(8)	O(51)-Mn(3)-O(48)	172.99(9)
		O(4)-Mn(2)-O(29)	88.91(7)	Mn(2)-O(4)-Mn(3)	119.67(9)
		O(16)-Mn(2)-O(29)	96.79(7)	Mn(2)-O(4)-Mn(1)	119.77(8)
		O(17)-Mn(2)-O(29)	91.43(7)	Mn(3)-O(4)-Mn(1)	120.29(9)